



Standard Specification for Microcomputer Signal Controller, 2014 edition

Errata No. 1

Revision Date: February 2017

The following is a list of changes made to the 332S Cabinet; attached drawings will hi-light the changes in red.

Page 1:

- Additional wiring shown fed from TB7 to TB8, TB9 and TB10 in Side View (Left and Right)
- Added Ped Pushbutton Comm Bus note and wire from TB1-3 to Ped Pushbutton Comm Bus in Side View (Left)
- Relocated cabinet light power supply from center of cabinet in Side View (Right)
- Modified TB7 layout and added Isobar power feed in Side View (Right)
- Added TBB and TBS jumper wiring in Side View (Right)
- Modified PDA securement method, removing wing nut in back of cabinet and added bracket in front of the cabinet
- Modified TB11 layout to physically separate 24 Vdc and 24 Vdc Controlled
- Added TB0 note to callout fuse

Page 2: No Changes

Page 3:

- Added note and wire from TB1-3 for Ped Pushbutton Comm Bus
- Added TB7, TB8, TB9, TB10, and TB11 to terminal block definitions
- Modified TB1 to show physical barrier separation
- Added TB11 to show wiring layout and physical barrier separation
- Modified TB4 to show as spare terminal block, wiring to be tied and bundled to farthest input file.
- Added ground wire to TB2-12 for GPS Clock from TB11-16

Page 4:

- Corrected TB1-1 to TB11-7 in C5 Connector
- Updated wiring layout in Detector Test Panel Wiring
- Modified C5-24 to be 24 Vdc Controlled

Page 5:

- Added note for Output File 2L (Aux File) to identify +24 Vdc Controlled
- Added notes to Output File 1L (Rear) TB02 to identify TB11 termination points

Page 6:

- Added Power Distribution Assembly definition to Legend
- Added Battery Backup Controller and Terminal Block-Battery Backup definitions to Legend
- Added Power Supply for Cabinet Light to Legend
- Added Second light for front door wiring to PDA #2 Elementary Diagram
- Added TBS and TBB jumper wiring to PDA #2 Elementary Diagram
- Updated terminal block locations to PDA #2 Elementary Diagram
- Added #10 gauge wiring to required locations in PDA #2 Elementary Diagram
- Modified Railroad Interconnect detail to show 2A fuse.
- Modified T3-2 to show wiring for 24 Vdc Controlled from TB11-7 in ODOT PDA 2 Layout (Rear View)
- Added wiring layout for 24 Vdc Controlled to PDA #2 Elementary Diagram
- Added Output File 1L and Output File 2L to PDA #2 Elementary Diagram

Page 7:

- Added Page for 206L Power Supply Hold Down detail.

Microcontroller Signal Specs:

- Added TB10 & TB11 to Section 3.1.1.3
- Modified Terminal Blocks for TB1 to be multi-conductor models to allow for four wire connections in Section 3.1.1.3
- Modified language for providing Cabinet Prints in Section 3.5.2.1
- Modified requirements for Surge Protection Device used on Twisted Pair Copper Communications in Section 3.6.2.1
- Removed language in Section 4.2.2
- Added language to identify type of fuse to be used for Model 255 Two-Channel AC Isolators in Section 5.4.1.3
- Modified method of securement for 206L Power Units in Section 7.1.1.3
- Modified language for Railroad Preemption Testing procedure in Section 8.7.3.10

Oregon Department of Transportation

Standard Specification

for

Microcomputer Signal

Controller – **Errata 1**

February 1, 2017



OREGON DEPARTMENT OF TRANSPORTATION
TRAFFIC-ROADWAY SECTION

The following Standard Specification for Microcomputer Signal Controller dated July 1st, 2014 and Appendix A dated July 2nd, 2014 should be modified or added.

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CHAPTER 2: GENERAL SPECIFICATIONS

SECTION 1- SPECIFICATIONS

2.1.1.1 All devices must meet the general specifications in the following specifications, as well as the ODOT Standard Specification for Microcomputer Signal Controller dated September 4, 2001, **ODOT Standard Specifications for Microcomputer Signal Controller dated July 1, 2014**, the Caltrans TEES Specifications as published March 12, 2009 and Errata 1 dated January 21, 2010.

2.1.1.2 In case of conflict, the Engineer will resolve any discrepancies between these documents in the following order or precedence:

- **ODOT Standard Specification for Microcomputer Signal Controller – Errata 1 dated February 1, 2017**
- ODOT Standard Specification for Microcomputer Signal Controller dated July 1, 2014
- ODOT Standard Specification for Microcomputer Signal Controller dated September 4, 2001
- Caltrans TEES Specifications dated March 12, 2009 and Errata 1 dated January 21, 2010

CHAPTER 3: SPECIFICATIONS FOR CABINET MODELS 332S, 332, 334, AND 336

SECTION 1- CABINET COMPOSITION

3.1.1 Requirements

3.1.1.2 The Model 332S Cabinet shall consist of the components shown on the cabinet print in **Appendix A**.

3.1.1.3 Terminal blocks (TB1 – **TB11**) shall be DIN rail mounted and labeled by mechanical means. All terminal blocks shall be one piece or factory assembled, sectional, color coded, double terminal, barrier type, with binder screw terminals. All wiring shall be terminated with insulated wire ferrules. Terminal blocks shall not interfere with the access or opening up to 60 degrees of back panels on devices mounted in the front of the cabinet. The terminal blocks shall meet the following minimum specifications:

- Listing: UL1059
- Voltage Rating: 600V
- Current Rating: 30A
- Wire Range: 10AWG to 22AWG

- Terminal blocks for TB1 shall be multi-conductor models that have a four wire connection.

SECTION 5- CABINET WIRING

3.5.2 Cabinet Wiring Diagram

3.5.2.1 Agency provided cabinet prints will be furnished on current ODOT drawings for the appropriate cabinet model. Copies will be made available within 14 days of request from TSSU. The drawings are available from the Traffic Standards unit.

3.5.3 Conductors

3.5.3.4 All conductors within the Power Distribution Assembly #2 Elementary Diagram, unless otherwise specified, shall be stranded No. 14 (or larger).

SECTION 6- CABINET TRANSIENT SURGE SUPPRESSION REQUIREMENTS

3.6.2 Twisted Pair Copper Communications Surge Protection Requirements

3.6.2.1 A surge protection device (SPD) shall be furnished to provide protection from electrical transients over twisted pair communications. The minimum performance specifications for the SPD (Phoenix Contact DT-TELE-RJ45 or approved equal) are:

- Listing: IEC-61643-21, 2012
- Peak surge current: 10kA (8x20us)
- Clamping voltage: 50 to 185 Volts
- Insertion loss: 0.3 dB @ 10 MHz
- Operating temperature: -40°F to 165° F

CHAPTER 4: SPECIFICATIONS FOR TRAFFIC SIGNAL CONTROLLERS

SECTION 1- GENERAL REQUIREMENTS

SECTION 2- MODEL 2070 CONTROLLER

4.2.2 Assembly

~~4.2.2.2~~ The 2070-6A 1200 Baud Modem Module may be supplied as a separate item as an option to the Agency if specified in the special provisions - **Removed**

CHAPTER 5: SPECIFICATIONS FOR INPUT DEVICES

SECTION 4- MODEL 255 TWO-CHANNEL AC ISOLATOR

5.4.1 Requirements

5.4.1.3 Model 255 Two-Channel AC Isolators shall be protected with a 2 Amp Glass Slow Blow type fuse.

CHAPTER 7: SPECIFICATIONS FOR POWER SUPPLY AND MONITOR UNITS

SECTION 1- MODEL 206L POWER UNIT

7.1.1 Requirements

7.1.1.1 Model 206L Power Supplies shall conform to the CALTRANS TEES Specifications in Chapter 3, **with exception to 7.1.1.3 below.**

7.1.1.3 Unit Chassis – The unit chassis shall be vented. The power supply cage and transformers shall be securely braced to prevent damage in transit. When resident in the PDA, the units shall be held firmly in place by its stud screws **and front latch attachment.**

SECTION 2- MODEL 210 MONITOR UNIT

7.2.2 Wiring Diagram Assignments

7.2.2.1 See **Appendix A**

CHAPTER 8: TESTING AND EQUIPMENT ACCEPTANCE

SECTION 7- TRAFFIC SIGNAL FIELD INSPECTION AND TURN ON

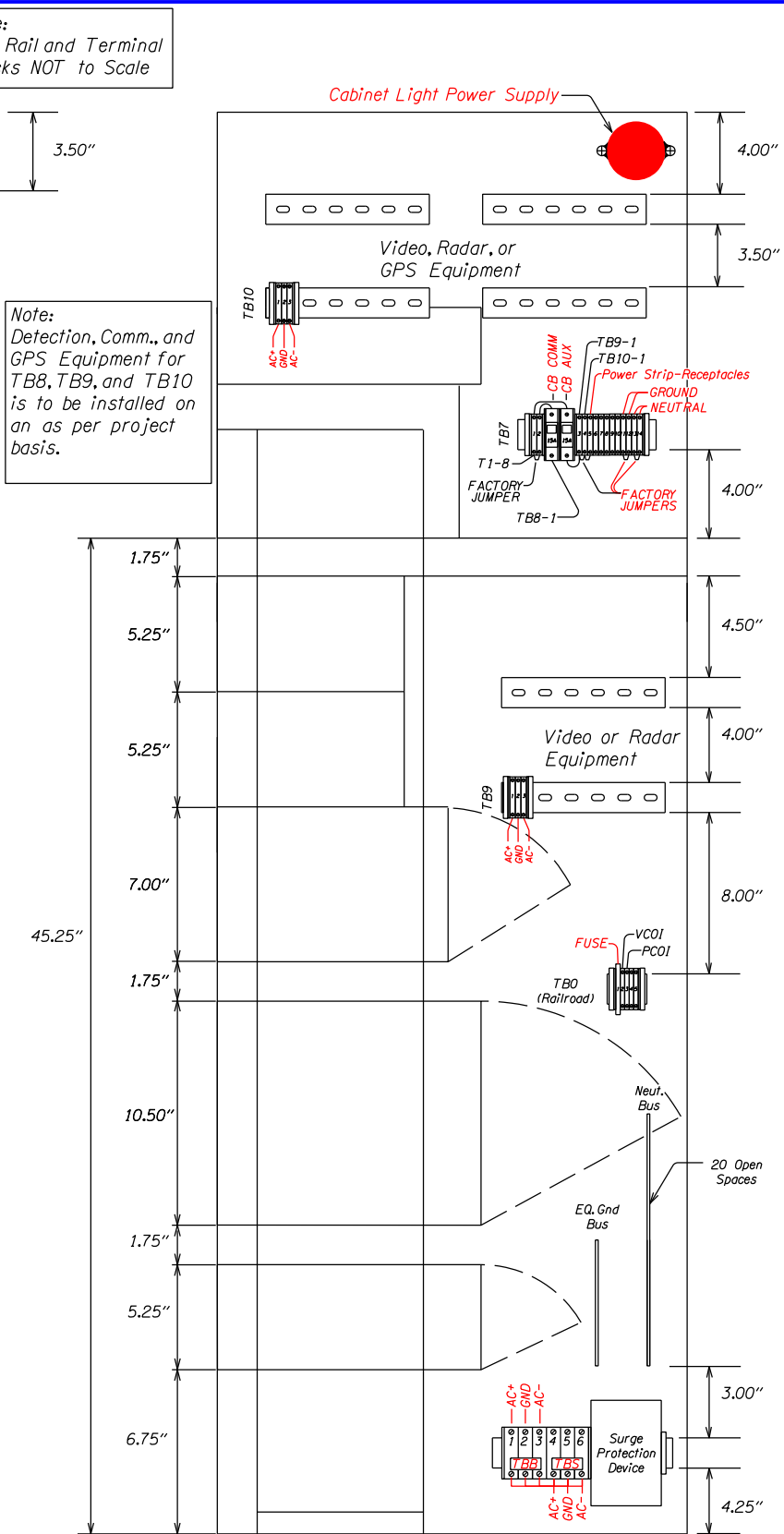
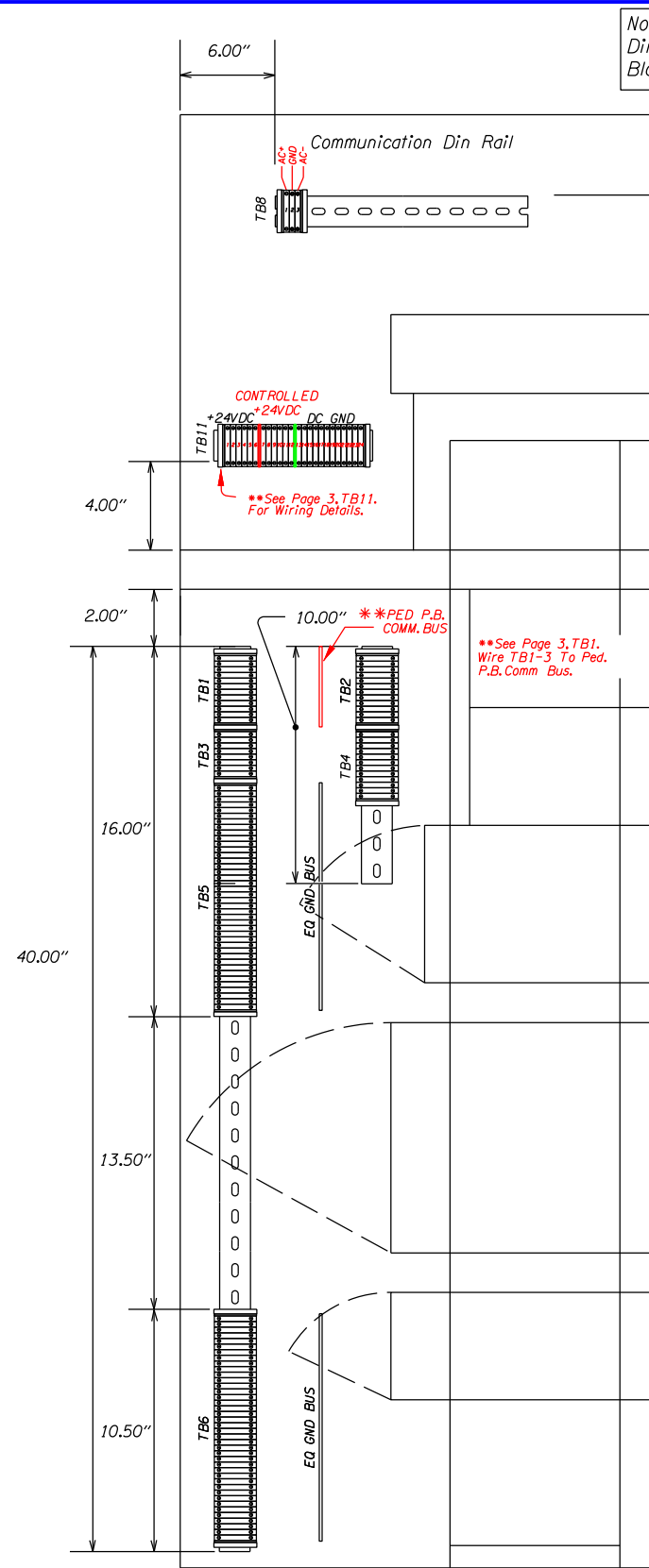
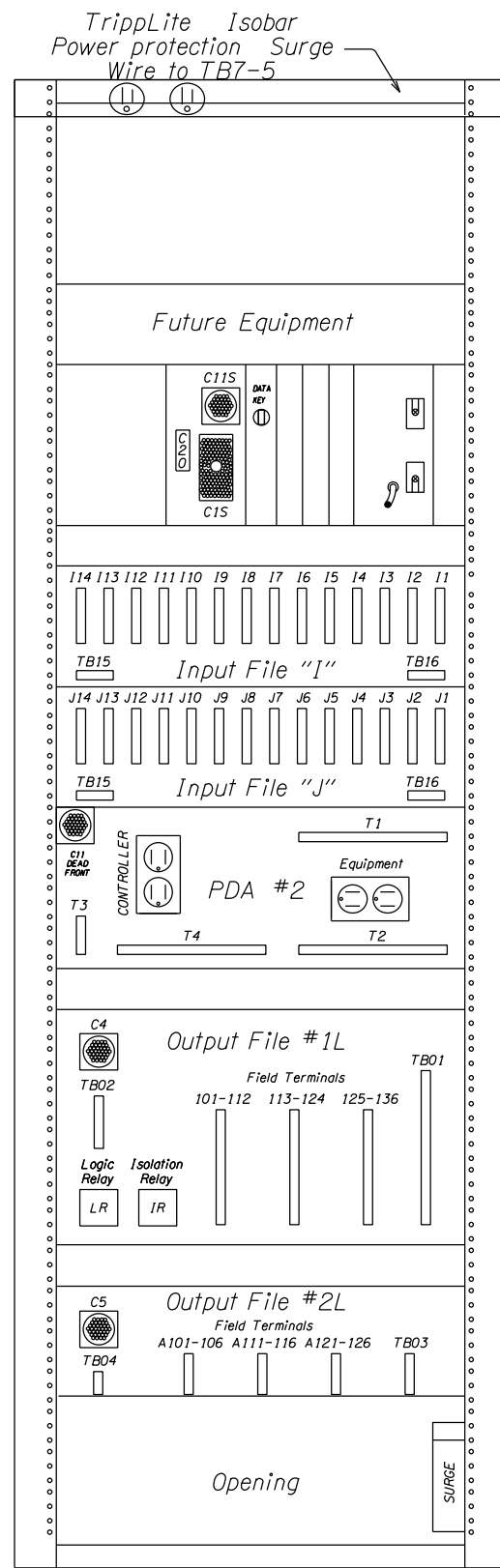
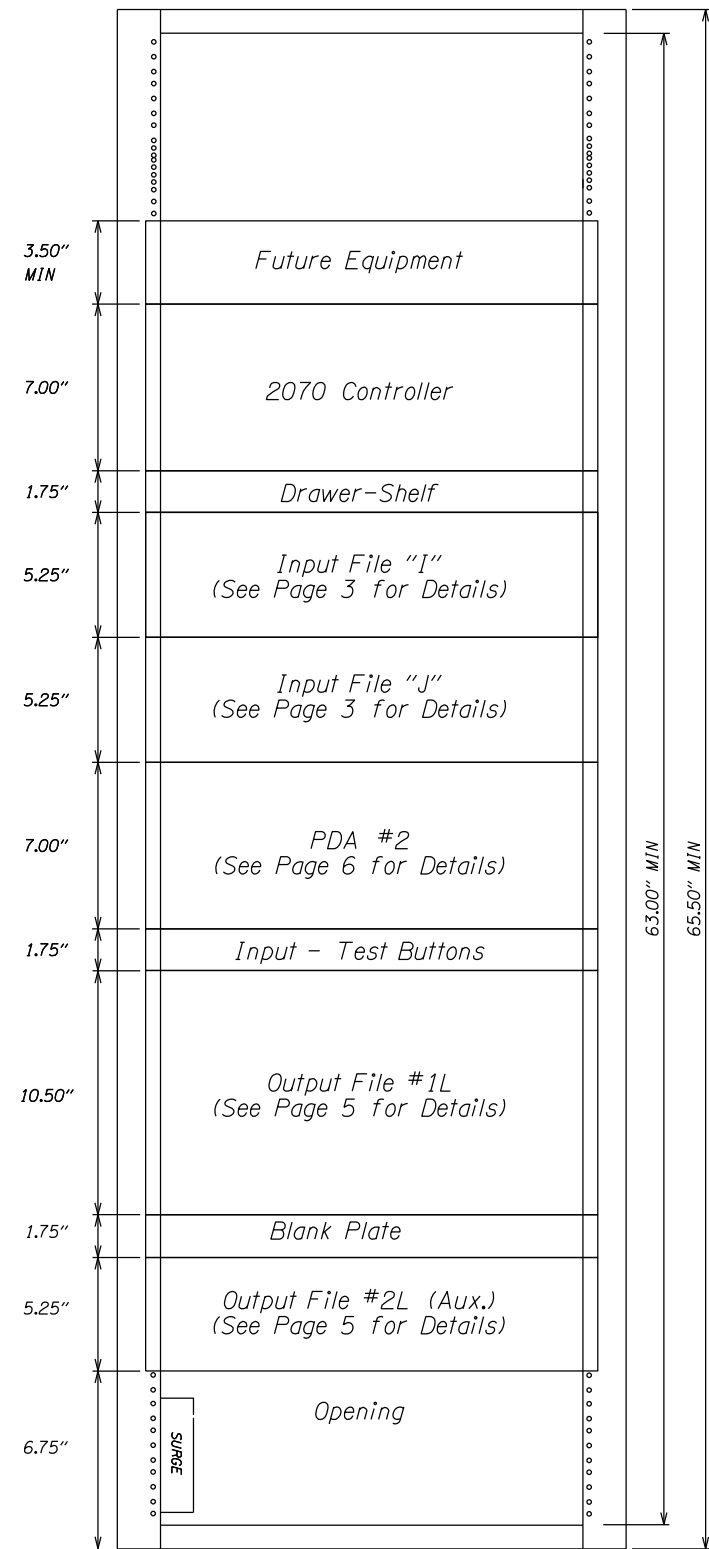
8.7.3 Inspection Procedures

8.7.3.10 Verify railroad preemption where applicable.

- Use test switch to place railroad preemption call to traffic signal controller.
A railroad preemption call shall be indicated on the traffic signal controller.
- Verify proper clearout and controller phasing.
- Verify proper operation of part time restriction signs where applicable.
- The railroad preemption call shall terminate when the test switch is deactivated and normal traffic controller operation shall resume.

APPENDIX A: 332S CABINET PRINT

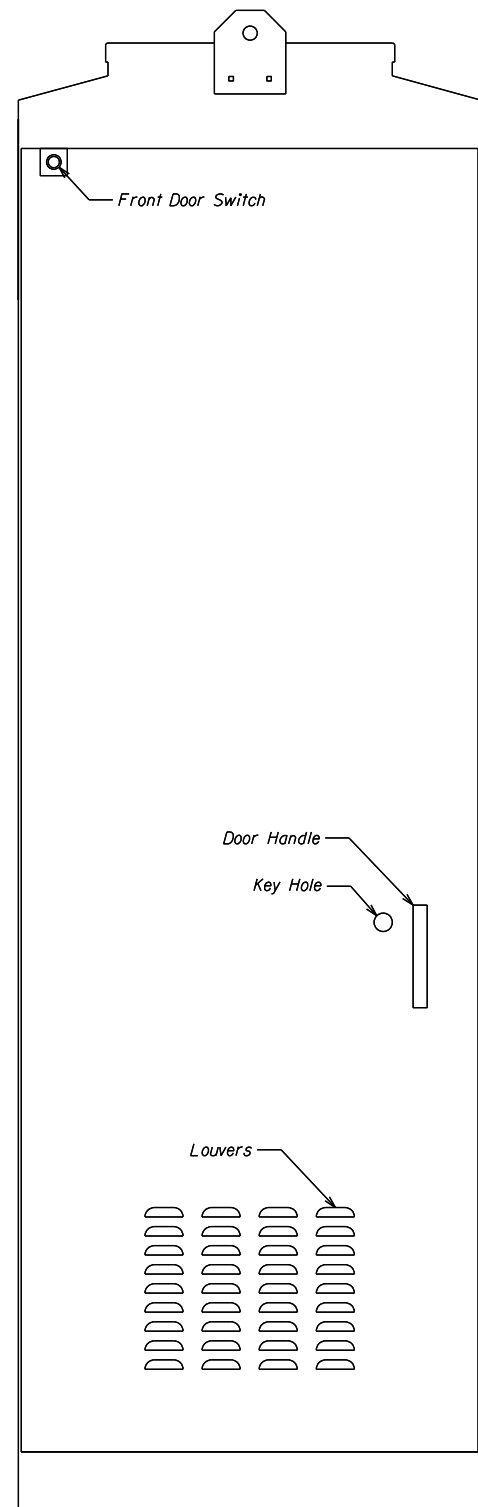
APPENDIX B: COMMUNICATIONS BRACKET



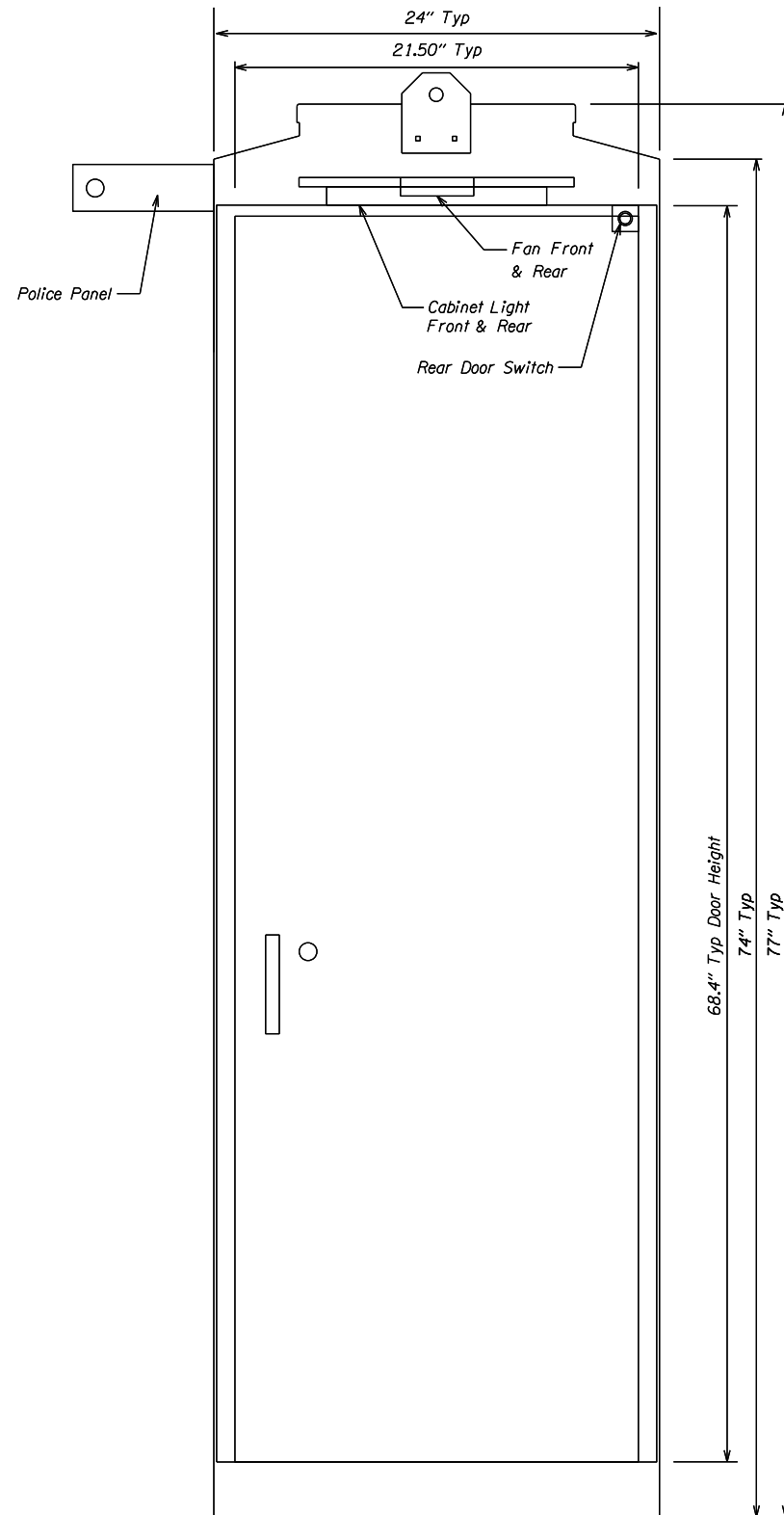
Note:
Din Rail and Terminal
Blocks NOT to Scale

Note:
Detection, Comm., and
GPS Equipment for
TB8, TB9, and TB10
is to be installed on
an as per project
basis.

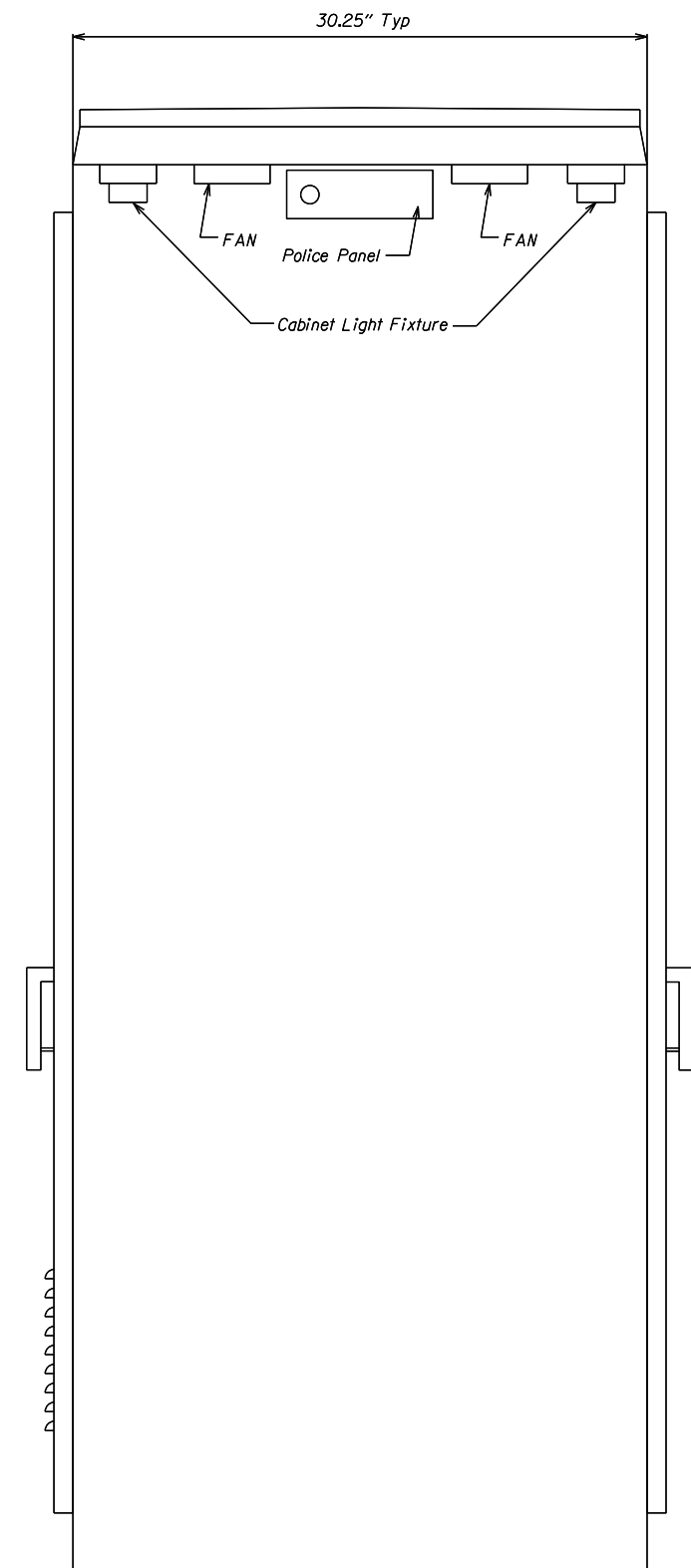
PAGE 1 of 6	332S ODOT STRETCH CABINET HOUSING	REV. NO.	DATE	INITIAL	REMARKS	INTERSECTION: _____	HWY*: _____ M.P.*: _____ TSSU ID*: _____	OREGON DEPARTMENT OF TRANSPORTATION TRAFFIC - ROADWAY SECTION 332S ODOT CABINET 11/30/2016 V-3.1
		1	11/30/16	JS	Updated Print			



332S ODOT STRETCH CABINET
(FRONT VIEW)



332S ODOT STRETCH CABINET
(REAR VIEW)



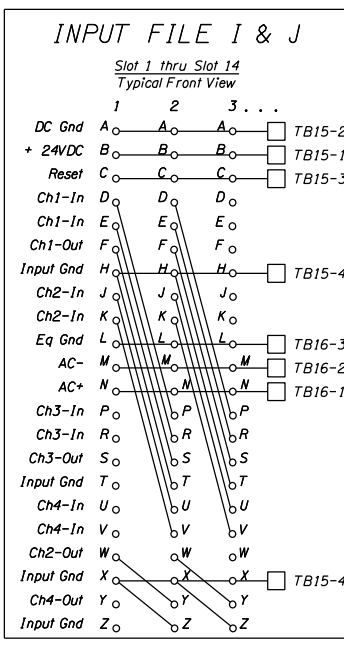
332S ODOT STRETCH CABINET
(RIGHT SIDE VIEW)

REV. NO.	DATE	INITIAL	REMARKS
1	11/30/16	JS	

INTERSECTION: _____
 HWY*: _____ M.P.*: _____ TSSU ID*: _____

TERMINAL BLOCK DEFINITIONS

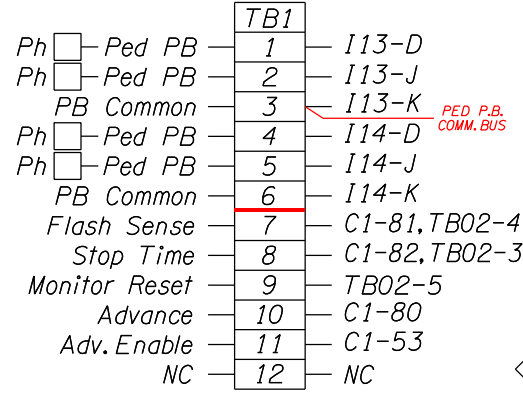
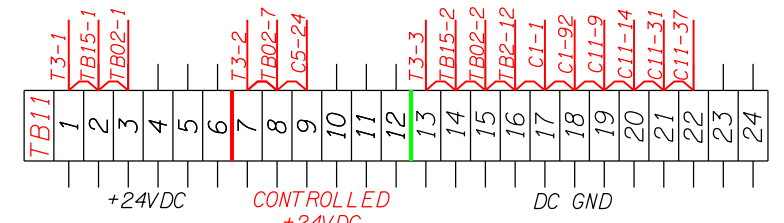
- TB0 - Railroad
- TB1 - PEDS & Controller
- TB2 - Spares - GPS Clock
- TB3 - EV Preemption
- TB4 - Spares
- TB5 - I File Loop Feeders
- TB6 - J File Loop Feeders
- TB7 - COMM. and AUX. Breakers
- TB8 - COMM. Equipment
- TB9 - Video or Radar Din Rail
- TB10 - Video or Radar Din Rail
- TB11 - 24VDC Bus Bar



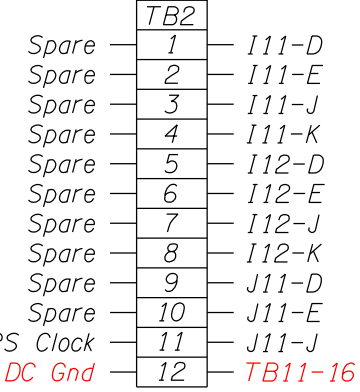
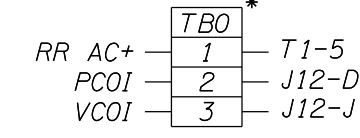
11	12	13	14	15	16	17	18	19	110	111	112	113	114
Φ 1 C1-56 VD1	Φ 1 C11-16 VD29	Φ 2 C1-39 VD9	Φ 2 C1-63 VD11	Φ 2 C1-47 VD13	Φ 3 C1-58 VD3	Φ 3 C11-18 VD32	Φ 4 C1-41 VD14	Φ 4 C1-65 VD16	Φ 4 C1-49 VD18	SPARE C11-23	SPARE C11-24	2 PED C1-67	6 PED C1-68
Φ 1 C1-60	Φ 1 C11-20	Φ 2 C1-43	Φ 2 C1-76	Φ 2 C11-10	Φ 3 C1-62	Φ 3 C11-22	Φ 4 C1-45	Φ 4 C1-78	Φ 4 C11-12	SPARE C11-25	SPARE C11-26	4 PED C1-69	8 PED C1-70
J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	J11	J12	J13	J14
Φ 5 C1-55 VD5	Φ 5 C11-15 VD35	Φ 6 C1-40 VD19	Φ 6 C1-64 VD21	Φ 6 C1-48 VD23	Φ 7 C1-57 VD7	Φ 7 C11-17 VD38	Φ 8 C1-42 VD24	Φ 8 C1-66 VD26	Φ 8 C1-50 VD28	SPARE C1-54	PCOI C1-51	EVA C1-71	EVB C1-72
Φ 5 C1-59	Φ 5 C11-19	Φ 6 C1-44	Φ 6 C1-77	Φ 6 C1-11	Φ 7 C1-61	Φ 7 C11-21	Φ 8 C1-46	Φ 8 C1-79	Φ 8 C11-13	C1-75 GPS	C1-52 VCOI	C1-73 EVC	C1-74 EVD

INPUT FILE - WIRING
TYPICAL WIRING DETAILS

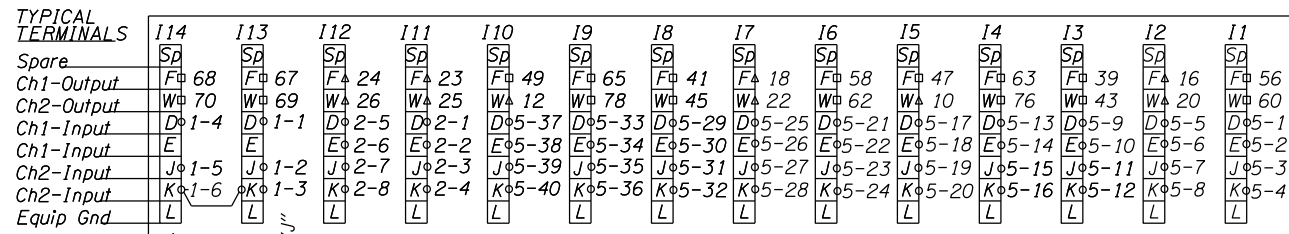
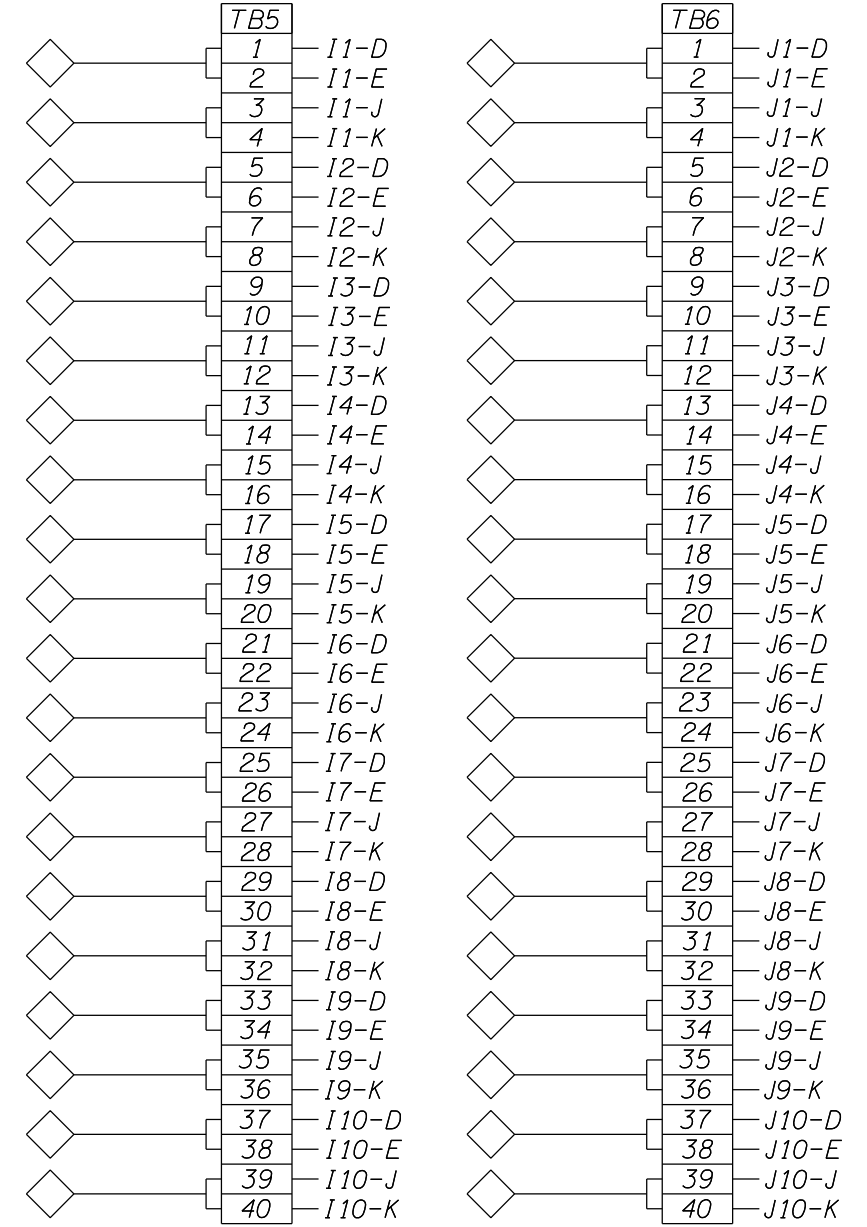
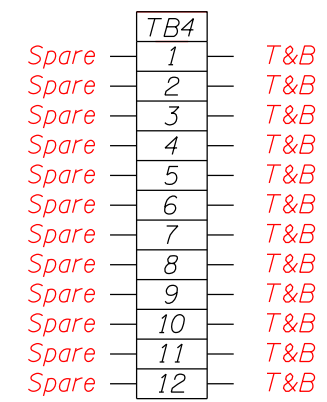
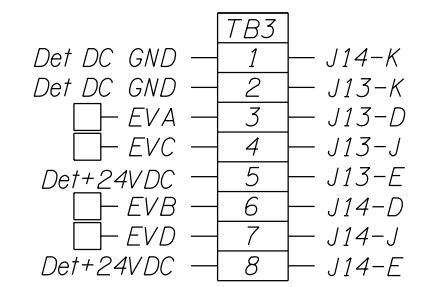
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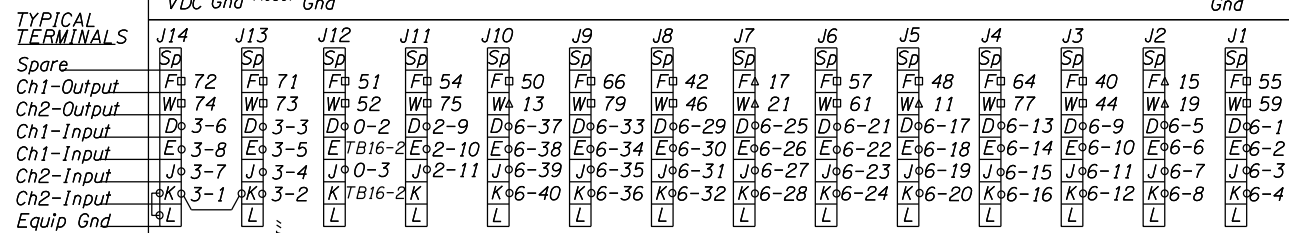
*NOTE - See Page 6 For Railroad Interconnect Wiring Details



GPS Clock DC Gnd TB11-16



INPUT FILE I



INPUT FILE J

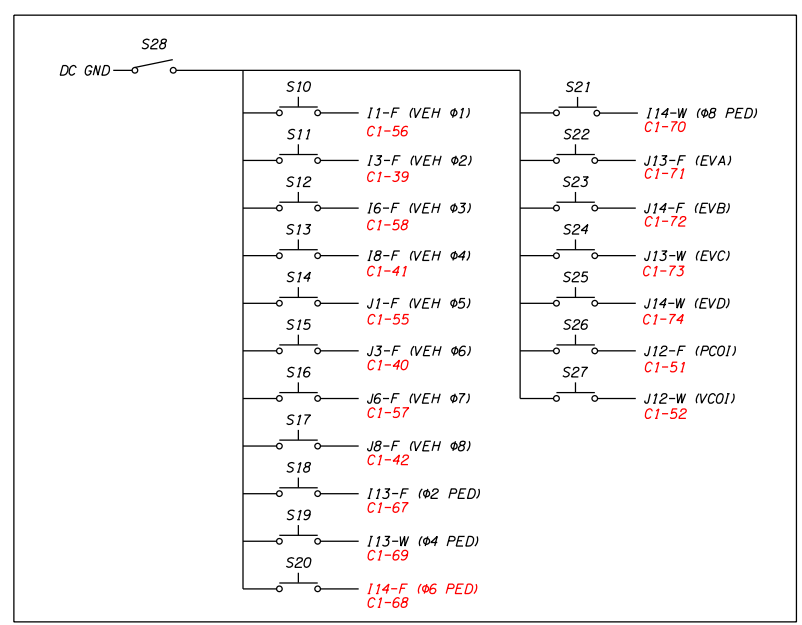
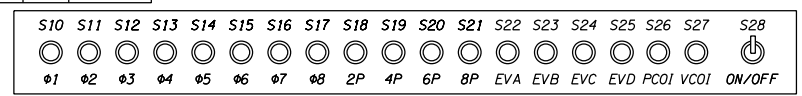
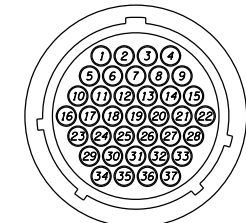
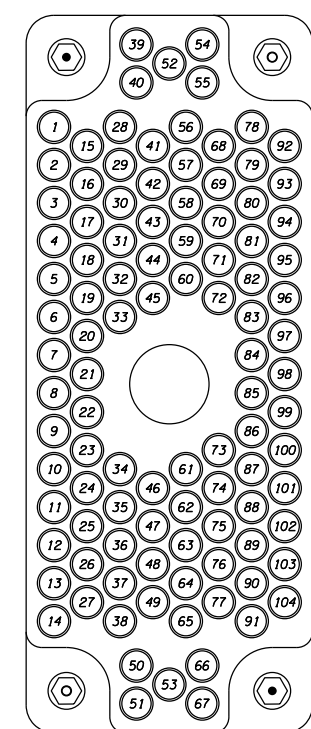
INPUT FILE I & J (REAR VIEW)
(NOT TO SCALE)

Program Assigned Functions	C1 Connector		C4 Connector				Field Term.
	Pin	Termination	Pin	Switch Pack			
				In	Position	Out	
DC Gnd	1	DC Gnd Bus	-	-	-	-	-
φ 4 D.WALK	2	C4-1	1	6	6-DW	3	104
φ 4 WALK	3	C4-2	2	10	6-W	7	106
φ 4 RED	4	C4-3	3	6	5-R	3	101
φ 4 YELLOW	5	C4-4	4	8	5-Y	5	102
φ 4 GREEN	6	C4-5	5	10	5-G	7	103
φ 3 RED	7	C4-6	6	6	4-R	3	116
φ 3 YELLOW	8	C4-7	7	8	4-Y	5	117
φ 3 GREEN	9	C4-8	8	10	4-G	7	118
φ 2 D.WALK	10	C4-9	9	6	3-DW	3	113
φ 2 WALK	11	C4-10	10	10	3-W	7	115
φ 2 RED	12	C4-11	11	6	2-R	3	128
φ 2 YELLOW	13	C4-12	12	8	2-Y	5	129
Input Gnd	14	TB15-4"J"	-	-	-	-	-
φ 2 GREEN	15	C4-13	13	10	2-G	7	130
φ 1 RED	16	C4-14	14	6	1-R	3	125
φ 1 YELLOW	17	C4-15	15	8	1-Y	5	126
φ 1 GREEN	18	C4-16	16	10	1-G	7	127
φ 8 D.WALK	19	C4-17	17	6	12-DW	3	110
φ 8 WALK	20	C4-18	18	10	12-W	7	112
φ 8 RED	21	C4-19	19	6	11-R	3	107
φ 8 YELLOW	22	C4-20	20	8	11-Y	5	108
φ 8 GREEN	23	C4-21	21	10	11-G	7	109
φ 7 RED	24	C4-22	22	6	10-R	3	122
φ 7 YELLOW	25	C4-23	23	8	10-Y	5	123
φ 7 GREEN	26	C4-24	24	10	10-G	7	124
φ 6 D.WALK	27	C4-25	25	6	9-DW	3	119
φ 6 WALK	28	C4-26	26	10	9-W	7	121
φ 6 RED	29	C4-27	27	6	8-R	3	134
φ 6 YELLOW	30	C4-28	28	8	8-Y	5	135
φ 6 GREEN	31	C4-29	29	10	8-G	7	136
φ 5 RED	32	C4-30	30	6	7-R	3	131
φ 5 YELLOW	33	C4-31	31	8	7-Y	5	132
φ 5 GREEN	34	C4-32	32	10	7-G	7	133
φ 1 FLTYA	35	C4-33	33	8	3-Y	5	114
φ 5 FLTYA	36	C4-34	34	8	9-Y	5	120
φ 3 FLTYA	37	C4-35	35	8	6-Y	5	105
φ 7 FLTYA	38	C4-36	36	8	12-Y	5	111

Program Assigned Functions	C1 Connector		Input Files		
	Pin	Termination	Terminals		Field Terminals
			Out	In	
φ 2 DET	39	I3-1	F	D&E	TB5-9&10
φ 6 DET	40	J3-1	F	D&E	TB6-9&10
φ 4 DET	41	I8-1	F	D&E	TB5-29&30
φ 8 DET	42	J8-1	F	D&E	TB6-29&30
φ 2 DET	43	I3-2	W	J&K	TB5-11&12
φ 6 DET	44	J3-2	W	J&K	TB6-11&12
φ 4 DET	45	I8-2	W	J&K	TB5-31&32
φ 8 DET	46	J8-2	W	J&K	TB6-31&32
φ 2 DET	47	I5-1	F	D&E	TB5-17&18
φ 6 DET	48	J5-1	F	D&E	TB6-17&18
φ 4 DET	49	I10-1	F	D&E	TB5-37&38
φ 8 DET	50	J10-1	F	D&E	TB6-37&38
PCOI	51	J12-1	F	D	TB0-2
VCOI	52	J12-2	W	J	TB0-3
ADV ENABLE	53	-	-	-	TB1-11
SPARE	54	J11-1	F	D&E	TB2-9&10
φ 5 DET	55	J1-1	F	D&E	TB6-1&2
φ 1 DET	56	I1-1	F	D&E	TB5-1&2
φ 7 DET	57	J6-1	F	D&E	TB6-21&22
φ 3 DET	58	I6-1	F	D&E	TB5-21&22
φ 5 DET	59	J1-2	W	J&K	TB6-3&4
φ 1 DET	60	I1-2	W	J&K	TB5-3&4
φ 7 DET	61	J6-2	W	J&K	TB6-23&24
φ 3 DET	62	I6-2	W	J&K	TB5-23&24
φ 2 DET	63	I4-1	F	D&E	TB5-13&14
φ 6 DET	64	J4-1	F	D&E	TB6-13&14
φ 4 DET	65	I9-1	F	D&E	TB5-33&34
φ 8 DET	66	J9-1	F	D&E	TB6-33&34
Ph 2 Ped	67	I13-1	F	D	TB1-1
Ph 6 Ped	68	I14-1	F	D	TB1-4
Ph 4 Ped	69	I13-2	W	J	TB1-2
Ph 8 Ped	70	I14-2	W	J	TB1-5
EVA	71	J13-1	F	D	TB3-3
EVB	72	J14-1	F	D	TB3-6
EVC	73	J13-2	W	J	TB3-4
EVD	74	J14-2	W	J	TB3-7
GPS CLOCK	75	J11-2	W	J&K	TB2-11&12
φ 2 DET	76	I4-2	W	J&K	TB5-15&16
φ 6 DET	77	J4-2	W	J&K	TB6-15&16
φ 4 DET	78	I9-2	W	J&K	TB5-35&36
φ 8 DET	79	J9-2	W	J&K	TB6-35&36
Advance	80	-	-	-	TB1-10
Flash Sense	81	-	-	-	TB1-7
Stop Time	82	-	-	-	TB1-8

Program Assigned Functions	C1 Connector		C5 Connector				Field Term.
	Pin	Termination	Pin	Switch Pack			
				In	Position	Out	
φ 3 D.WALK	83	C5-1	1	6	A6-DW	3	A104
φ 3 WALK	84	C5-2	2	10	A6-W	7	A106
OLD RED	85	C5-3	3	6	A5-R	3	A101
OLD YELLOW	86	C5-4	4	8	A5-Y	5	A102
OLD GREEN	87	C5-5	5	10	A5-G	7	A103
OLC RED	88	C5-6	6	6	A4-R	3	A114
OLC YELLOW	89	C5-7	7	8	A4-Y	5	A115
OLC GREEN	90	C5-8	8	10	A4-G	7	A116
φ 1 D.WALK	91	C5-9	9	6	A3-DW	3	A111
DC Gnd	92	DC Gnd Bus	-	-	-	-	-
φ 1 WALK	93	C5-10	10	10	A3-W	7	A113
OLB RED	94	C5-11	11	6	A2-R	3	A124
OLB YELLOW	95	C5-12	12	8	A2-Y	5	A125
OLB GREEN	96	C5-13	13	10	A2-G	7	A126
OLA RED	97	C5-14	14	6	A1-R	3	A121
OLA YELLOW	98	C5-15	15	8	A1-Y	5	A122
OLA GREEN	99	C5-16	16	10	A1-G	7	A123
PTR SIGN	100	C5-17	17	8	A6-Y	5	A105
PTR SIGN	101	C5-18	18	8	A3-Y	5	A112
FLASH OUT	102	TB15-3"J"	Monitor-Pin 22				
Watchdog	103	C4-37	Monitor-Pin 22				
Input Gnd	104	TB15-4"J"	Monitor-Pin 22				
			19...23	-	NC	-	-
			24	TB11-7	All	9	+24VDC CONTROL

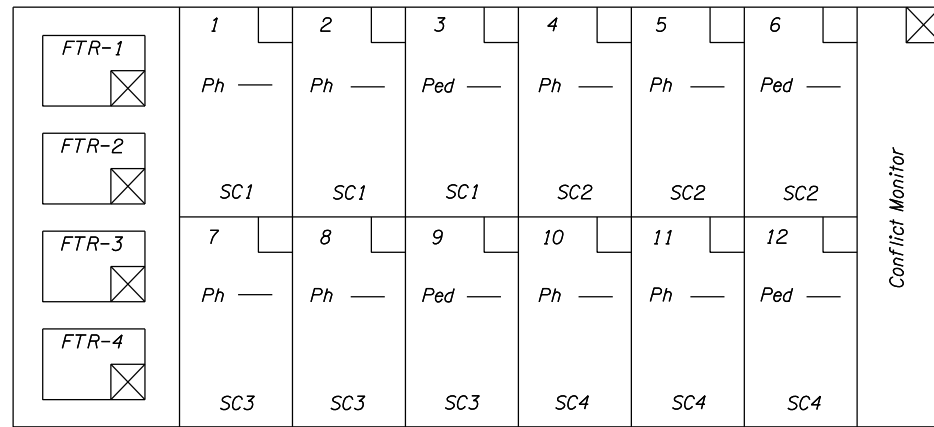
Program Assigned Functions	C11 Connector		Input Files		
	Pin	Termination	Terminals		Field Terminals
			Out	In	
NOT ASSIGN	1...8	T&B	-	-	-
DC Gnd	9	DC Gnd Bus	-	-	-
φ 2 DET	10	I5-2	W	J&K	TB5-19&20
φ 6 DET	11	J5-2	W	J&K	TB6-19&20
φ 4 DET	12	I10-2	W	J&K	TB5-39&40
φ 8 DET	13	J10-2	W	J&K	TB6-39&40
DC Gnd	14	DC Gnd Bus	-	-	-
φ 5 DET	15	J2-1	F	D&E	TB6-5&6
φ 1 DET	16	I2-1	F	D&E	TB5-5&6
φ 7 DET	17	J7-1	F	D&E	TB6-25&26
φ 3 DET	18	I7-1	F	D&E	TB5-25&26
φ 5 DET	19	J2-2	W	J&K	TB6-7&8
φ 1 DET	20	I2-2	W	J&K	TB5-7&8
φ 7 DET	21	J7-2	W	J&K	TB6-27&28
φ 3 DET	22	I7-2	W	J&K	TB5-27&28
SPARE	23	I11-1	F	D&E	TB2-1&2
SPARE	24	I12-1	F	D&E	TB2-5&6
SPARE	25	I11-2	W	J&K	TB2-3&4
SPARE	26	I12-2	W	J&K	TB2-7&8
NOT ASSIGN	27...30	T&B	-	-	-
DC Gnd	31	DC Gnd Bus	-	-	-
NOT ASSIGN	32...36	T&B	-	-	-
DC Gnd	37	DC Gnd Bus	-	-	-



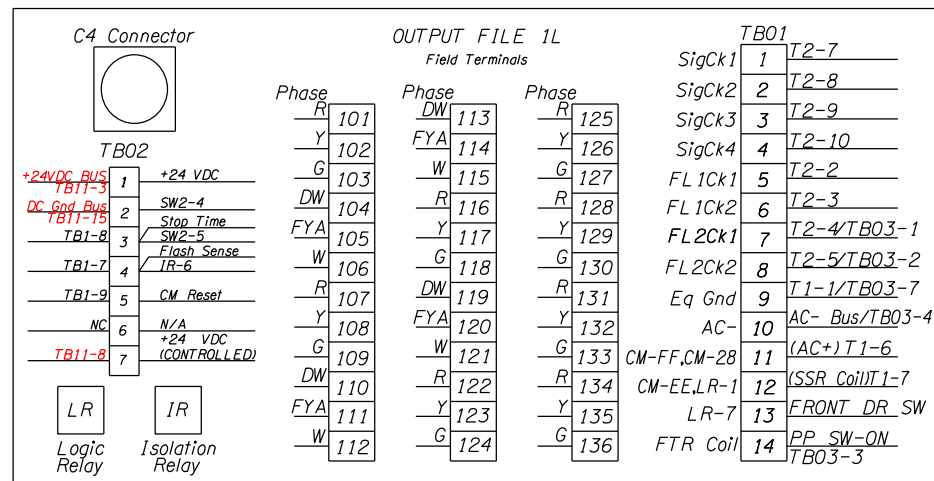
C1 PLUG PINOUT

C11 PLUG PINOUT

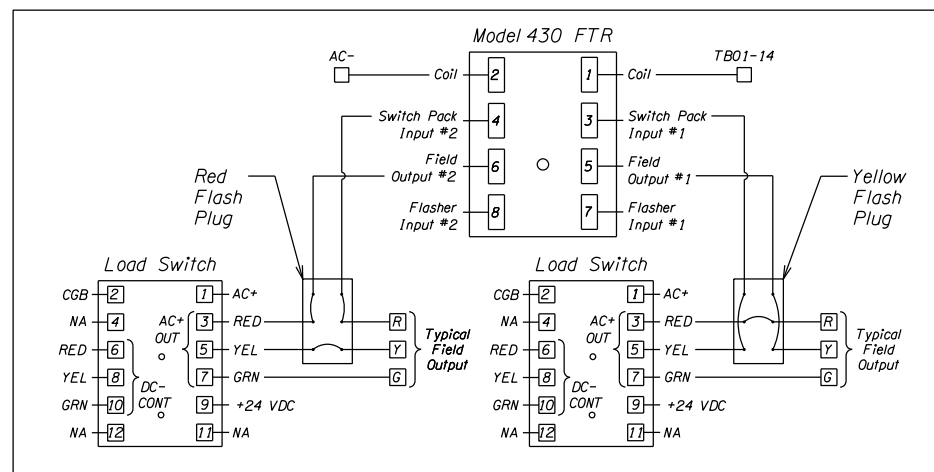
Detector Test Panel Wiring
Typical Wiring Diagram



OUTPUT FILE 1L (FRONT VIEW)
(NOT TO SCALE)



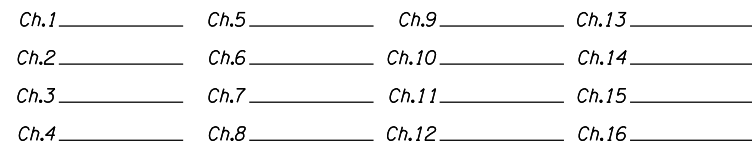
OUTPUT FILE 1L (REAR VIEW)
(NOT TO SCALE)



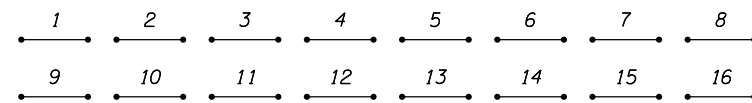
FIELD OUTPUTS - TYPICAL WIRING

CONFLICT MONITOR DIODE CARD

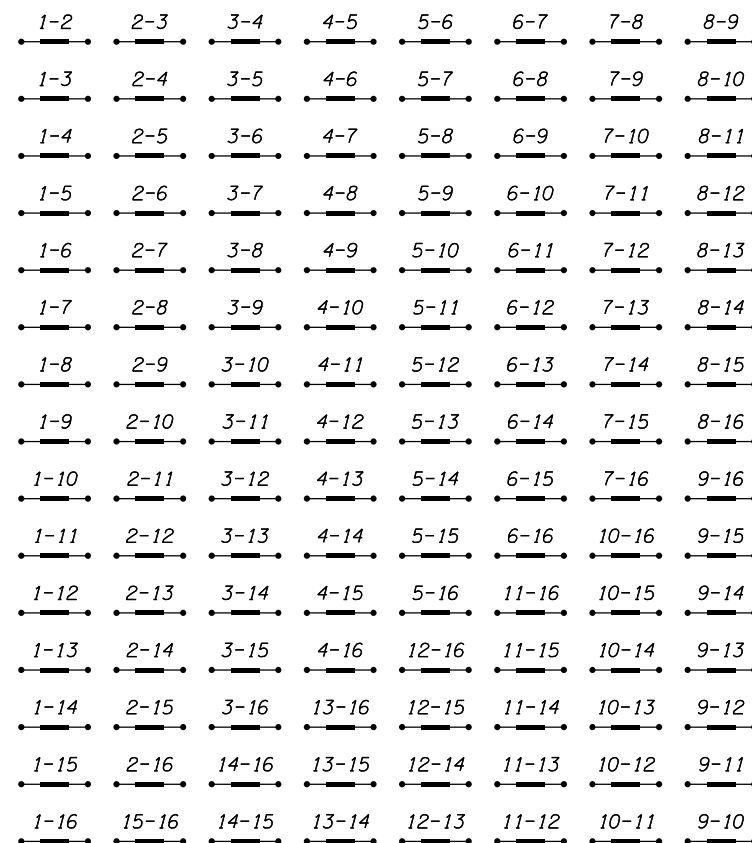
CHANNEL ASSIGNMENT



YELLOW INHIBIT JUMPERS



DIODES - Diode Removed Makes Movement Allowable (Diode IN4148)

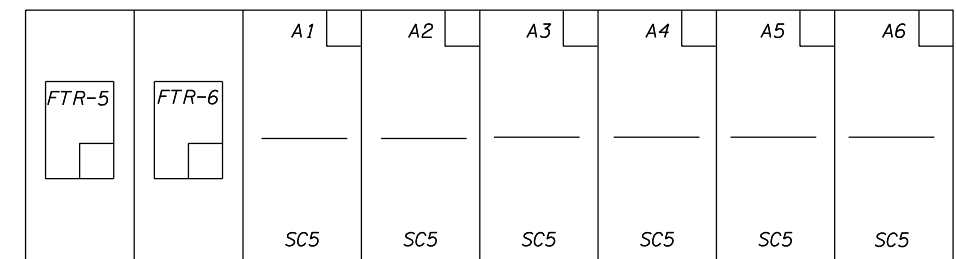


CONFLICT MONITOR DIODE CARD CUTOUT
(NOT TO SCALE)

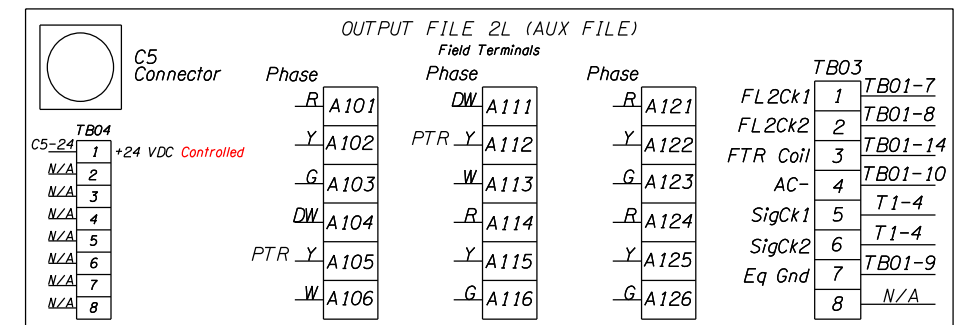
CONFLICT MONITOR - TYPICAL CONNECTOR PIN ASSIGNMENTS

Term	Function	Pin	Ch	PH	Pin	Function	Term		
130	SP2-G	1			A	SP2-Y	129		
115	SP3-W	2			B	SP8-G	136		
135	SP8-Y	3			C	SP9-W	121		
103	SP5-G	4			D	SP5-Y	102		
106	SP6-W	5			E	SP11-G	109		
108	SP-11Y	6			F	SP12-W	112		
133	SP7-G	7			H	SP7-Y	132		
114	SP3-Y (FLTYA)	8			J	SP1-G	127		
126	SP1-Y	9			K	SP9-Y (FLTYA)	120		
124	SP10-G	10			L	SP10-Y	123		
105	SP6-Y (FLTYA)	11			M	SP4-G	118		
117	SP4-Y	12			N	SP12-Y (FLTYA)	111		
A123	ASP1-G	13			P	NC	-		
-	NC	14			8	8	R	ASP2-G	A126
-	T&B	15			9	OLA	S	ASP4-G	A116
-	T&B	16			10	OLB	T	NC	-
-	NC	17			11	OLC	U	T&B	-
-	T&B	18			12	OLD	V	ASP5-G	A103
-	NC	19			13	2PED	W	NC	-
TB01-9	EQ Gnd	20			13	φ1 FLTYA	X	NC	-
TB01-10	AC-	21			14	4PED	Y	DC Gnd	TB02-2
C4-37	Watch Dog	22			14	φ3 FLTYA	Z	Ext. Reset	TB02-5
TB02-1	+24VDC	23			15	6PED	AA	T&B	-
LRCoIL	Interlock	24			15	φ5 FLTYA	BB	Stop Time	TB02-3
TB02-2	Interlock	25			16	8PED	CC	NC	-
-	NC	26				φ7 FLTYA	DD	NC	-
-	NC	27					EE	Clapper	TB01-12
TB01-11	Norm. Closed	28					FF	AC+	TB01-11

CONFLICT MONITOR - TYPICAL WIRING
(NOT TO SCALE)



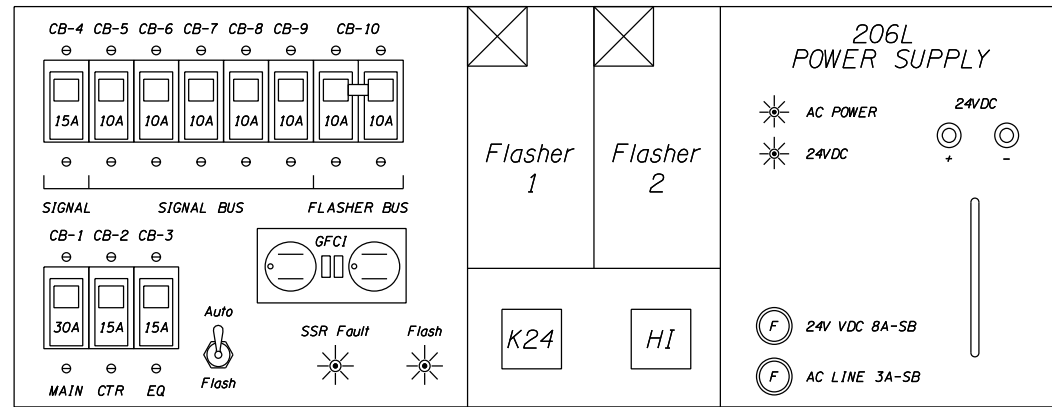
OUTPUT FILE 2L (AUX FILE)
FRONT VIEW - (NOT TO SCALE)



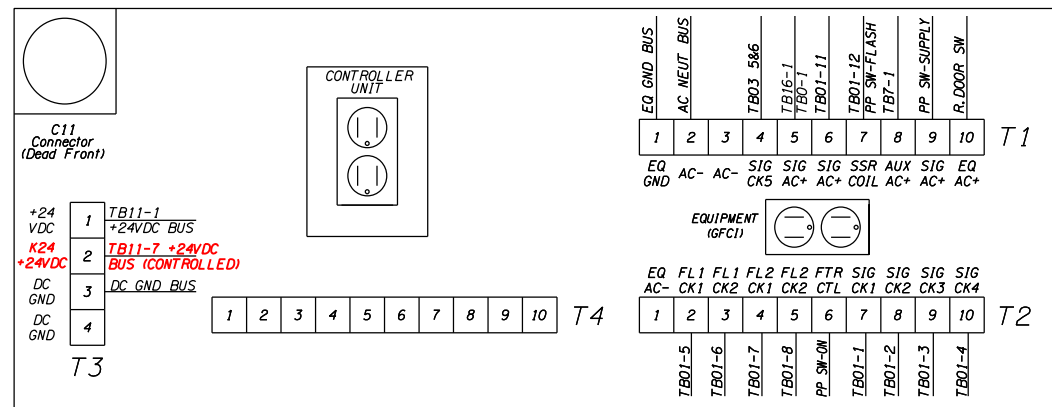
OUTPUT FILE 2L (AUX FILE)
REAR VIEW - (NOT TO SCALE)

REV. NO.	DATE	INITIAL	REMARKS
1	11/30/16	JS	

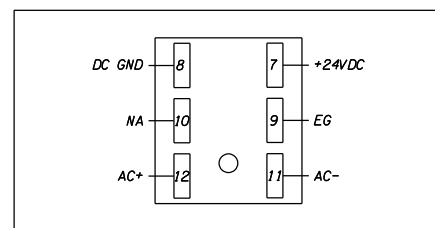
INTERSECTION: _____
HWY*: _____ M.P.*: _____ TSSU ID*: _____



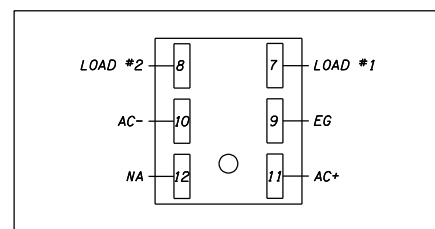
ODOT PDA 2 LAYOUT (FRONT VIEW)
(NOT TO SCALE)



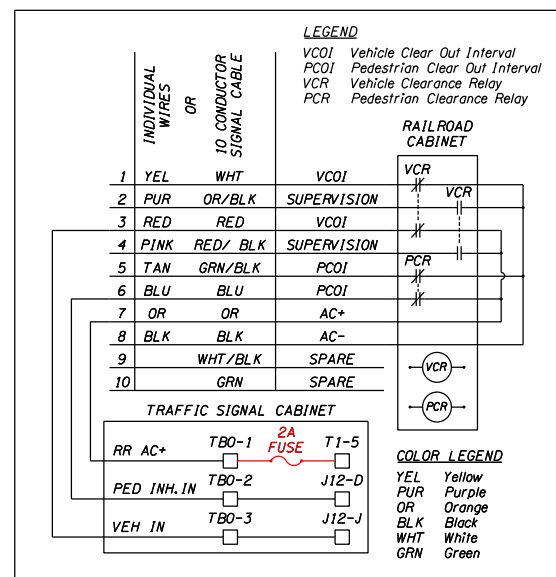
ODOT PDA 2 LAYOUT (REAR VIEW)
(NOT TO SCALE)



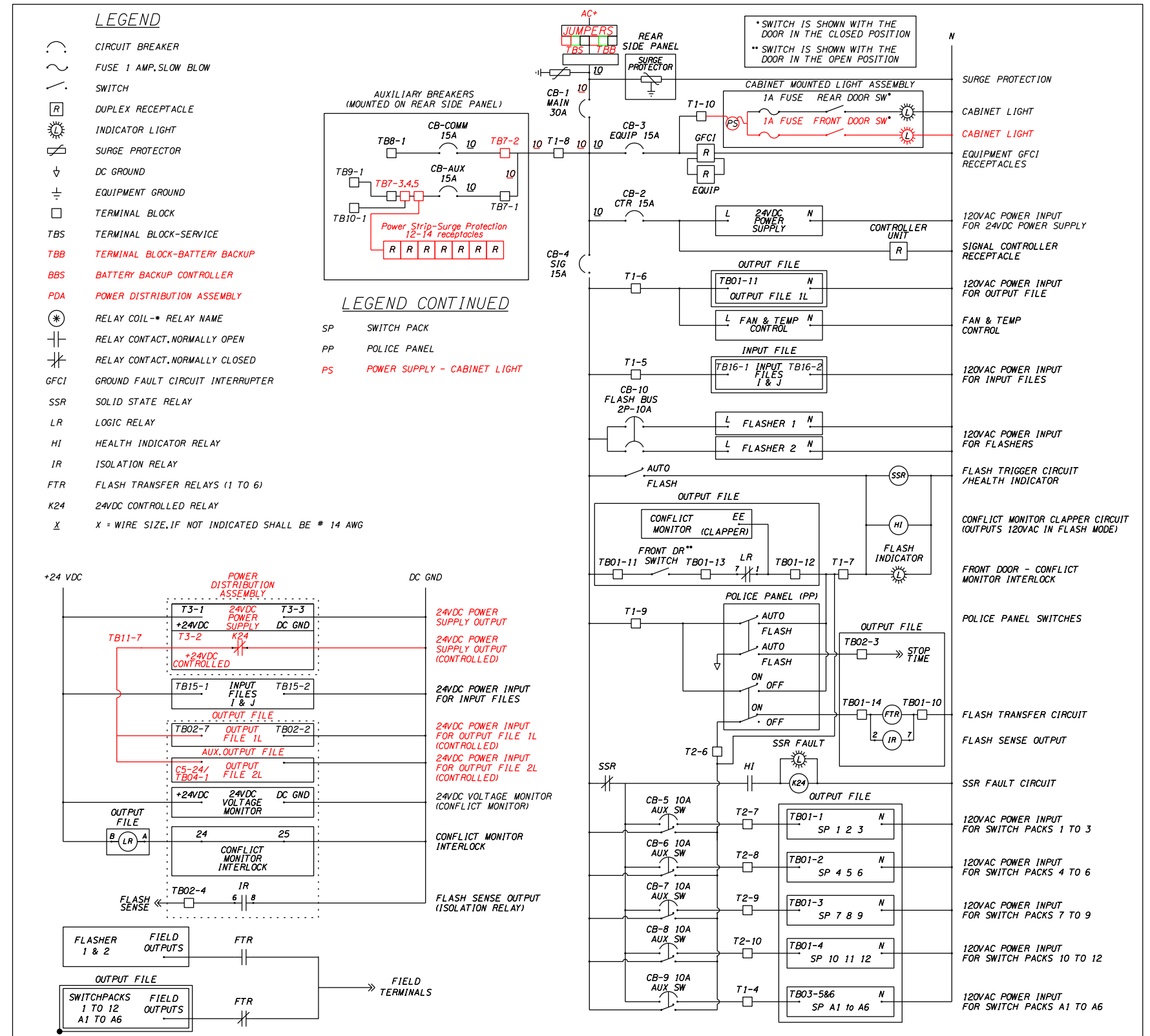
MODEL 206L POWER SUPPLY
TYPICAL CONNECTOR DETAIL



MODEL 204 FLASHER
TYPICAL CONNECTOR DETAIL

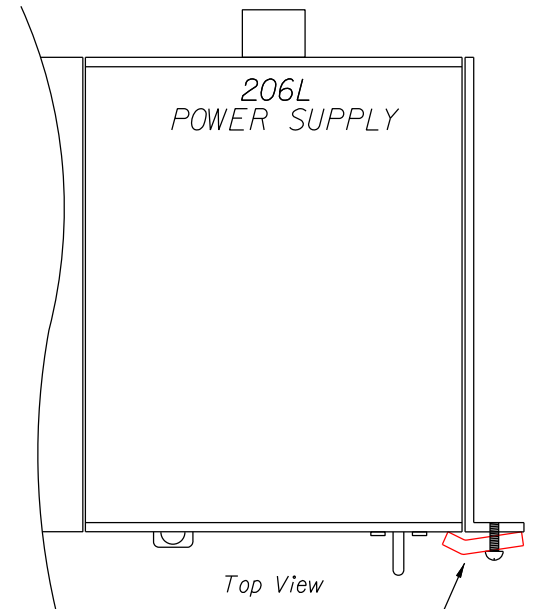
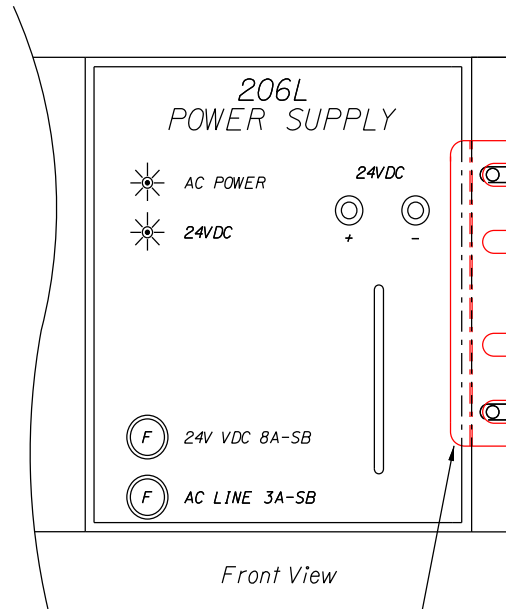
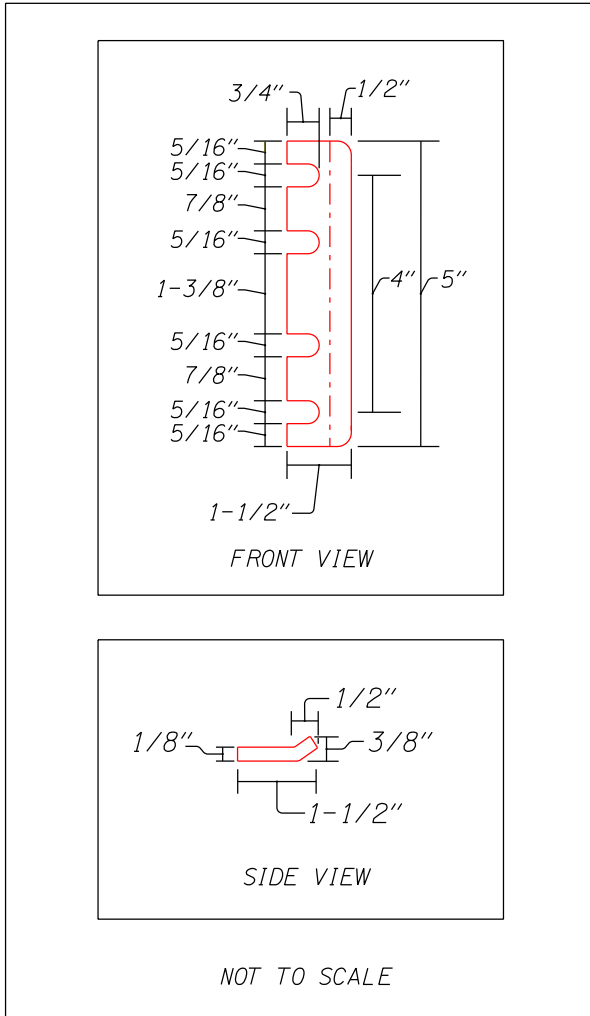


RAILROAD INTERCONNECT
TYPICAL WIRING DETAILS

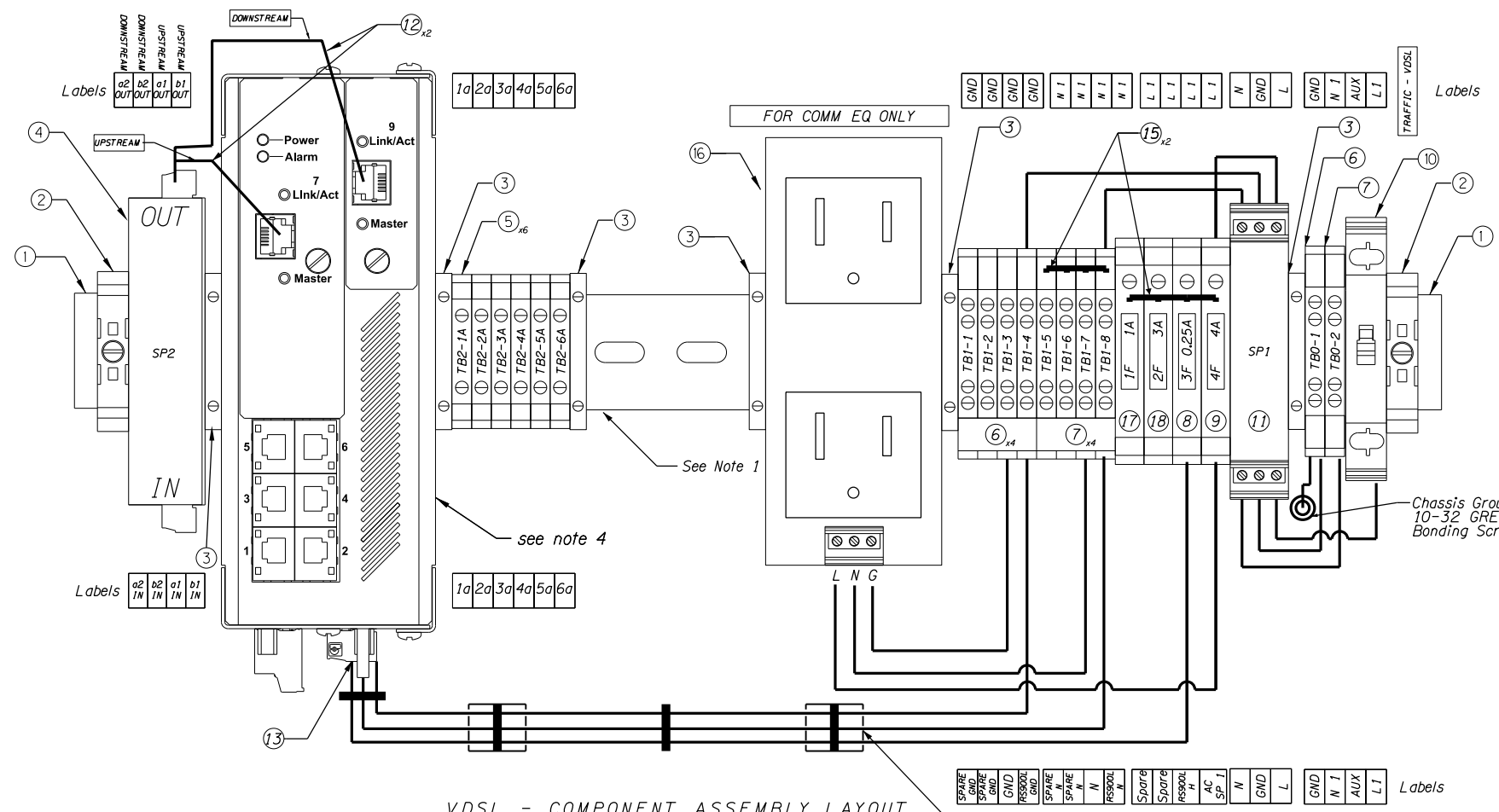


PDA #2 ELEMENTARY DIAGRAM
TYPICAL WIRING DETAILS

REV. NO.	DATE	INITIAL	REMARKS
1	11/30/16	JS	



HOLD DOWN for 206 POWER SUPPLY



VDSL - COMPONENT ASSEMBLY LAYOUT

Item	Description	Drawing #	Qty.
1	"35mm x 15mm" DIN Rail End Cap	-	2
2	"35mm x 15mm" DIN Rail End Clamp	-	2
3	"35mm x 15mm" DIN Rail Spacer	-	6
4	Communications Surge Protection Device, see specifications #2	SP2	2
5	Communications Terminal Block (Single Terminal), see specifications #4	TB2-1A to TB2-6A	6
6	Ground Terminal Block (Double Terminal), see specifications #4	TB0-1, TB1-1&2	3
7	Terminal Block (Double Terminal), see specifications #4	TB0-2, TB1-3&4	3
8	Resettable Fuse Terminal Block - 0.25A Fuse, see specifications #4	3F	1
9	Resettable Fuse Terminal Block - 4A Fuse, see specifications #4	4F	1
10	10A Modular Circuit Breaker, see specifications #3	CB1	1
11	Power Surge Protection Device, see specifications #1	SP1	1
12	RJ11 Pigtails, see note 5	-	2
13	RuggedCom Power Connector, see note 2	-	1
14	Labels	-	-
15	Terminal Jumpers	-	2
16	NEMA 5-15R Duplex Receptacle, see specifications #7	-	1
17	Resettable Fuse Terminal Block - 1A Fuse, see specifications #4	1F	1
18	Resettable Fuse Terminal Block - 3A Fuse, see specifications #4	2F	1

NOTES

- Assemble components on DIN rail as shown. Use additional DIN rail spacers, end clamps and end plates where necessary.
- Pre-wire assembly in accordance with wire diagram shown. RuggedCom Power Connector shall be Phoenix Contact Combincon plug P/N: "MVSTBW-2.5/5(3)-STF-5.08" or approved equal.
- Labeling - Clearly and permanently label all components as shown with mechanically printed labels. Mark UPSTREAM and DOWNSTREAM RJ-11 pigtails with labels placed on the cable within 2 inches of the RJ-11 plug. For devices that do not have slots for labels, apply labels via adhesive to the top surface of the device.
- Network switch is state furnished and installed.
- Pre-wire RJ11 Pigtails with outdoor rated, 2 pair - Category 3 UTP cable.

SPECIFICATIONS

- Power Surge Protection Device - Each communication rack shall be protected from electrical transients using surge suppression. Each surge suppressor shall meet the following specifications:
 Listing: UL 1449 2nd Edition
 Mounting: "35mm x 15mm" DIN Rail
 Peak Surge Current: 10,000 Amperes or more
 Suppression Voltage: 330 Volts or less
 Nominal Voltage: 120 Volts AC
 Max Continuous Current: 10 Amperes or more
- Communications Surge Protection Device - Each incoming communication line prior to the router/ switch connection shall be protected from electrical transients using surge suppression. Each surge suppressor shall meet the following specifications:
 Listing: IEC 61643-21, 2012
 Mounting: "35mm x 15mm" DIN Rail
 Peak surge current: 10,000 Amperes or more
 Suppression voltage: 50 to 185 Volts
 Insertion loss: 0.3 dB or less @ 10 MHz
 One known product to meet specification is: Phoenix Contact DT-TELE-RJ45
- Circuit Breaker - Each communication rack shall be protected from overload conditions using a supplemental circuit breaker. Each circuit breaker shall meet the following specifications:
 Listing: UL 489 or UL 1077
 Mounting: "35mm x 15mm" DIN Rail
 Voltage Rating: 120 Volts AC or more
 Current Rating: 10 Amperes

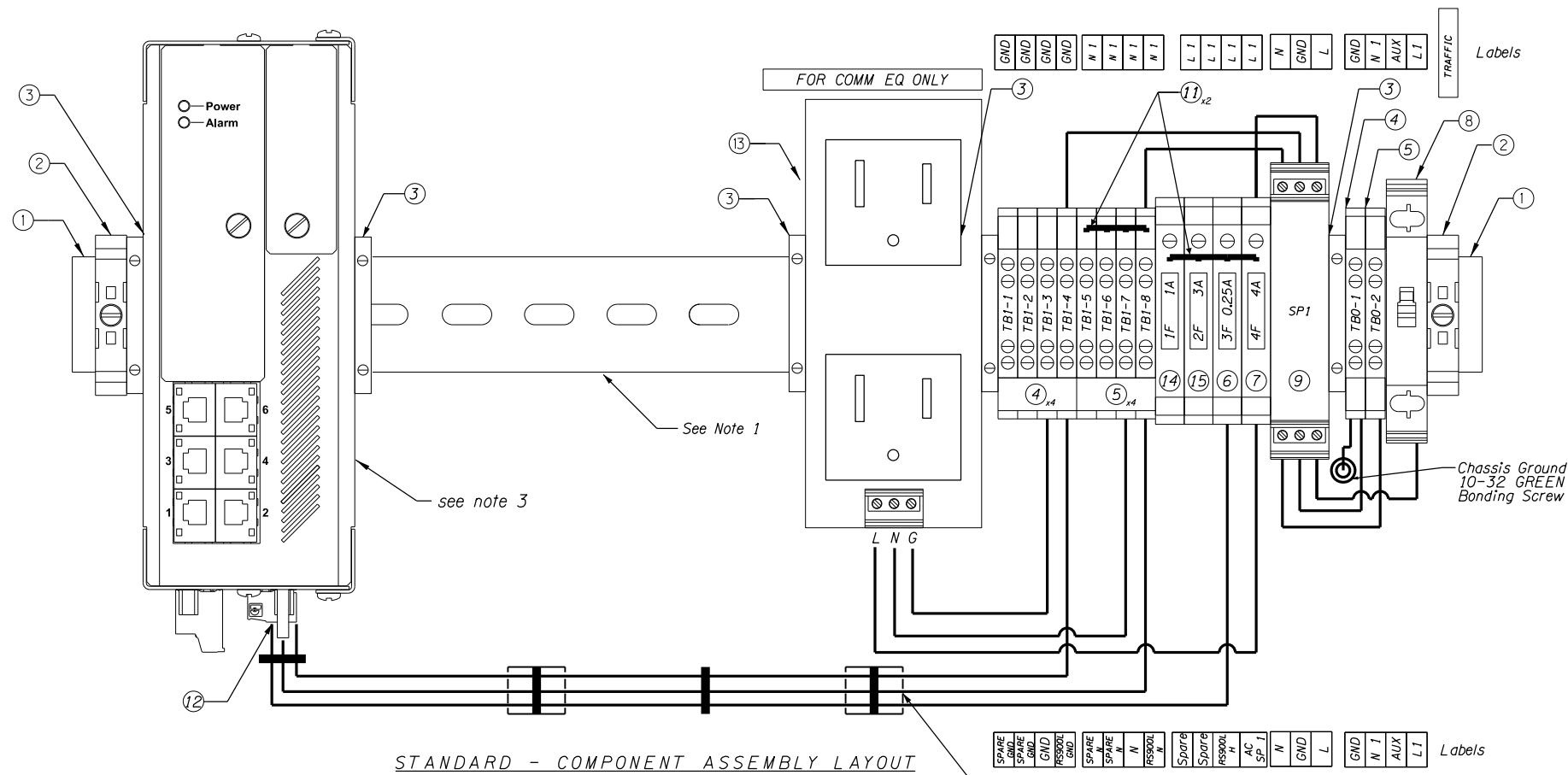
- All terminal blocks shall be DIN rail mounted and meet the requirements of UL 1059. All terminal blocks shall have a voltage rating of 300 Volts or more, current rating of 15A or more, and shall be one piece or factory assembled, sectional, single or double terminal, barrier type, with binder screw terminals. Fused terminals blocks shall be provided for protecting equipment which are not internally fused. Fuses shall be resettable, quick acting and sized as shown. Ground terminal blocks shall be mechanically and electrically connected to the DIN rail, green in color and accept wire sizes ranging from #22 to #12 AWG.
- Wiring - All point-to-point wire shall be UL 1015, 600V PVC insulated, stranded, tinned copper. Black (hot) and white (neutral) wire shall be 16 awg, green/ yellow (ground) wire shall be 16 awg. All conductors attached to a terminal block shall be terminated with insulated wire ferrules. 1/2" Adhesive back cable tie mounts and cable ties shall be used accordingly to secure conductors. All shown wiring connections must come pre-wired.
- Grounding and Bonding - Electrical grounds shall be bonded to the 10-32 x 1/2" green bonding screw. All grounding and bonding shall be in accordance with UL 467.
- NEMA 5-15R Duplex Receptacle shall meet the following specifications:
 Listing: UL 498
 Mounting: "35mm x 15mm" DIN Rail
 Nominal Voltage: 120 Volts AC
 Current Rating: 15 Amperes
 Dimensions: 1.65" x 3.9" x 2.0"

OREGON DEPARTMENT OF TRANSPORTATION
 TRAFFIC - ROADWAY SECTION

SIGNALS COMMUNICATION BRACKET
VDSL DIN RAIL ASSEMBLY
 (FOR VDSL COMMUNICATIONS ONLY)

REVISION HISTORY: REVISION 2 (1/1/17)

REVISION DATE: 1/1/17



Item	Description	Drawing #	Qty.
1	"35mm x 15mm" DIN Rail End Cap	-	2
2	"35mm x 15mm" DIN Rail End Clamp	-	2
3	"35mm x 15mm" DIN Rail Spacer	-	5
4	Ground Terminal Block, see specifications #3	TB0-1, TB1-1&2	3
5	Terminal Block, see specifications #3	TB0-2, TB1-3&4	3
6	Resettable Fuse Terminal Block - 0.25A Fuse, see specifications #3	3F	1
7	Resettable Fuse Terminal Block - 4A Fuse, see specifications #3	4F	1
8	10A Modular Circuit Breaker, see specifications #2	CB1	1
9	Power Surge Protection Device, see specifications #1	SP1	1
10	Labels	-	-
11	Terminal Jumpers	-	2
12	RuggedCom Power Connector, see note 3	-	1
13	NEMA 5-15R Duplex Receptacle, see specifications #6	-	1
14	Resettable Fuse Terminal Block - 1A Fuse, see specifications #3	1F	1
15	Resettable Fuse Terminal Block - 3A Fuse, see specifications #3	2F	1

NOTES

- Assemble components on DIN rail as shown. Use additional DIN rail spacers, end clamps and end plates where necessary.
- Network switch is state furnished and installed.
- Pre-wire assembly in accordance with wire diagram shown. RuggedCom Power Connector shall be Phoenix Contact Combincon plug P/N: "MVSTBW-2.5/5(3)-STF-5.08" or approved equal.

SPECIFICATIONS

1. Power Surge Protection Device - Each communication rack shall be protected from electrical transients using surge suppression. Each surge suppressor shall meet the following specifications:

- Listing: UL 1449 2nd Edition
- Mounting: "35mm x 15mm" DIN Rail
- Peak Surge Current: 10,000 Amperes or more
- Suppression Voltage: 330 Volts or less
- Nominal Voltage: 120 Volts AC
- Max Continuous Current: 10 Amperes or more

2. Circuit Breaker 10A - Each communication rack shall be protected from overload conditions using a supplemental circuit breaker. Each circuit breaker shall meet the following specifications:

- Listing: UL 489 or UL 1077
- Mounting: "35mm x 15mm" DIN Rail
- Voltage Rating: 120 Volts AC or more
- Current Rating: 10 Amperes

3. All terminal blocks shall be DIN rail mounted and meet the requirements of UL 1059. All terminal blocks shall have a voltage rating of 300 Volts or more, current rating of 15A or more, and shall be one piece or factory assembled, sectional, double terminal, barrier type, with binder screw terminals. Fused terminal blocks shall be provided for protecting equipment which are not internally fused. Fuses shall be resettable, quick acting and sized as shown.

Ground terminal blocks shall be mechanically and electrically connected to the DIN rail, green in color and accept wire sizes ranging from #22 to #12 AWG.

4. Wiring - All point-to-point wire shall be UL 1015, 600V PVC insulated, stranded, tinned copper. Black (hot) and white (neutral) wire shall be 16 awg, green/ yellow (ground) wire shall be 16 awg. All conductors attached to a terminal block shall be terminated with insulated wire ferrules. 1/2" adhesive back cable tie mounts and cable ties shall be used accordingly to secure conductors. All shown wiring connections must come pre-wired.

5. Grounding and Bonding - Electrical grounds shall be bonded to the 10-32 x 1/2" green bonding screw. All grounding and bonding shall be in accordance with UL 467.

6. NEMA 5-15R Duplex Receptacle shall meet the following specifications:

- Listing: UL 498
- Mounting: "35mm x 15mm" DIN Rail
- Nominal Voltage: 120 Volts AC
- Current Rating: 15 Amperes
- Dimensions: 1.65" x 3.9" x 2.0"

OREGON DEPARTMENT OF TRANSPORTATION
TRAFFIC - ROADWAY SECTION

SIGNALS COMMUNICATION BRACKET
STANDARD DIN RAIL ASSEMBLY
(FOR WIRELESS & FIBER COMMUNICATIONS)

REVISION HISTORY: REVISION 2 (1/1/17)

REVISION DATE 1/1/17