

VA MEDICAL CENTER ENERGY UPGRADE B208 SAN FRANCISCO, CALIFORNIA

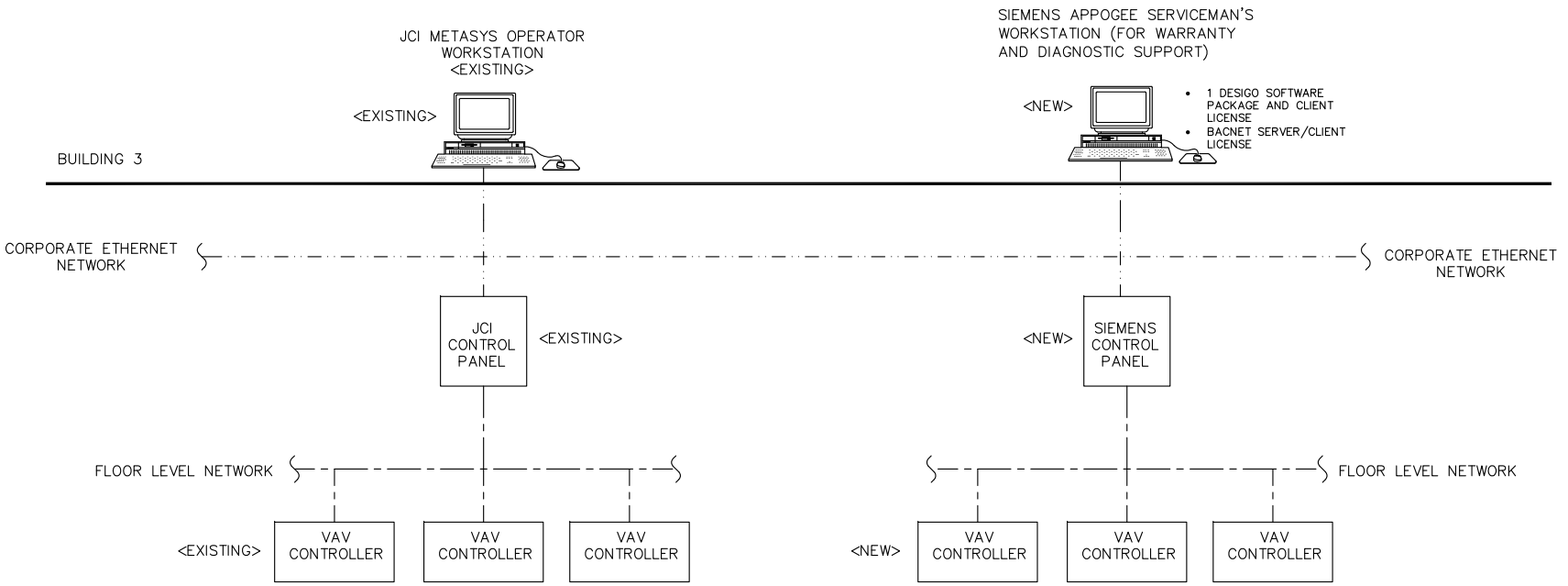
SCOPE OF WORK REFERENCE:
-ECO 2 (AHU-6 AND AHU-7)
-ECO 13 (REPAIR AHU ECONO DAMPERS AND ACTUATORS)
-ECO 14 (HVAC CONTROL RETRO-COMMISSIONING)

12/17/12 3:38:59 PM C:\Program Files\Autodesk\AutoCAD 2012\AutoCAD.exe		CLIENT:	PRIME:	CONSULTANT:	Drawing Title	Project Title	Project Number	Office of Facilities Management
		 Department of Veterans Affairs	  Pacific Gas and Electric Company	 AEI Affiliated Engineers	B208 COVER SHEET	VASF MEDICAL CENTER	440P-000000	
					Approved:	Location: VA Medical Center, 4150 Clement Street San Francisco, California 94121	Building Number B208	
						Date: 8/31/12	Checked: RG	Drawn: LO
							Drawing Number B208	Dep. 1 of 1

010	VASF JCI AND SIEMENS RISER
800	B208 BAS SIEMENS RISER
800A	B208 FLN SCHEDULE
801	B208 AHU-1
801A	B208 AHU-1 WIRING
801K	B208 AHU-1 BOM
802	B208 AHU-2
802A	B208 AHU-2 WIRING
802K	B208 AHU-2 BOM
821	B208 VAV WITH RH
821K	B208 VAV WITH RH BOM
850	B208 SEQUENCE OF OPERATIONS
851	B208 SEQUENCE OF OPERATIONS
DDC PANEL LAYOUTS	
880	VASF.B208.PXCM01 PANEL LAYOUT
881	VASF.B208.PXCM01
881.2	VASF.B208.PXCM01p002
885	VASF.B208.PXCM02 PANEL LAYOUT
886	VASF.B208.PXCM02
886.2	VASF.B208.PXCM02p002
GENERAL	
LEG	Legend & Abbreviations
TTRM	TEC Termination Specification
TTRM1	TX-I/O Termination Spec.
TTRM2	TX-I/O Termination Spec. 2
TWIR	TX-I/O Wiring Specification
TWIRE	3-WIRE FLN DIAGRAM

[illegible]

NOTE: THE SIEMENS BUILDING AUTOMATION SYSTEM
WILL COMMUNICATE AND INTERFACE WITH THE
EXISTING JCI AUTOMATION SYSTEM USING BACNET VIA
THE CORPORATE ETHERNET



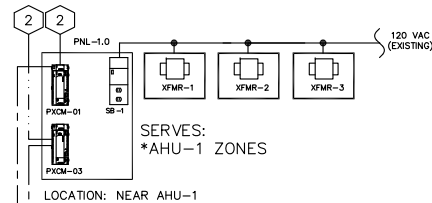
		CLIENT:		PRIME:		CONSULTANT:		Drawing Title		Project Title		Project Number		Office of Facilities Management			
		 Department of Veterans Affairs		 SIEMENS 33011 HUNTERS BLVD SUITE 300 PO BOX 100, SAN JOSE, CA 95128 PHONE: 415-952-3000 FAX: 415-952-1000		 Pacific Gas and Electric Company®		 AEI Affiliated Engineers 1210 BUSH STREET 7th FLOOR San Francisco, CA 94108 415 784-0100		VASF JCI AND SIEMENS BAS RISER		VASF MEDICAL CENTER				440P-000000	
																Building Number	
																Drawing Number	
																010	
AS-BUILT CONTROL DRAWINGS		12/1/2012						Approved:		Location: VAF Medical Center, 4150 Clement Street San Francisco, California 94121		Date		Checked		Drawn	
100% CONTROL DRAWINGS		8/31/2012										8/31/12		RG		LO	
Revisions:		Date															
																 Department of Veterans Affairs	

BUILDING 208

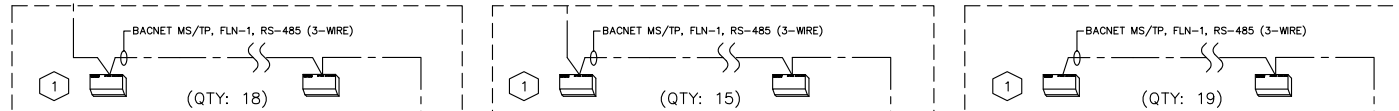
INSTALLATION NOTES:

- 1 REFER TO 821 DRAWINGS FOR CONTROL DETAILS AND 800A/B FOR SCHEDULE. THE EXISTING PNEUMATIC CONTROLS WILL BE UPGRADED TO SIEMENS DDC.
- 2 ETHERNET DROP

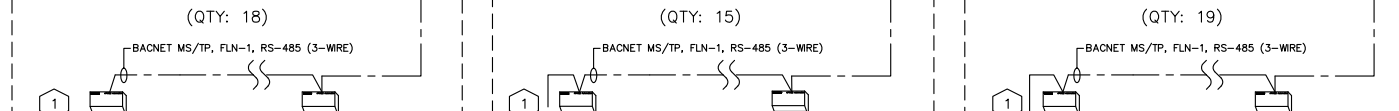
PENTHOUSE



1ST FLOOR



GND FLOOR

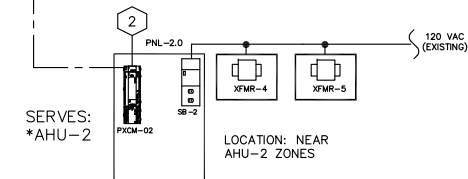
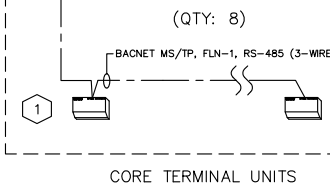


WEST WING TERMINAL UNITS

CORE TERMINAL UNITS

EAST WING TERMINAL UNITS

BASEMENT



CLIENT:



Department of
Veterans Affairs

PRIME:

SIEMENS

**Pacific Gas and
Electric Company**

3801 MISSION BLVD. SUITE 200
HAYWARD, CA 94545 USA
PHONE: (510) 644-0000
FAX: (510) 644-0100

CONSULTANT:

**AEI Affiliated
Engineers**

125 AUBURN STREET
7TH FLOOR
SAN FRANCISCO, CA
94102
415.784.0700

Drawing Title

B208 BAS SIEMENS RISER

Approved:

Project Title

VASF MEDICAL CENTER

Location:

VA Medical Center, 4150 Clement Street
San Francisco, California 94121

Date:

8/31/12

Checked:

RG

Drawn:

LO

Project Number

440P-000000

Building Number

B208

Drawing Number

800

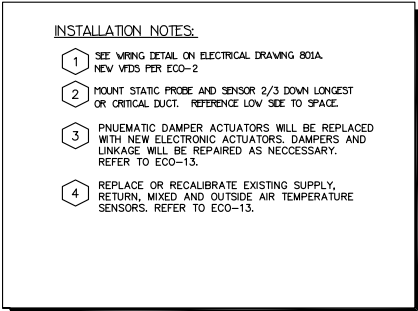
Dep. 1 of 1 -

Office of
Facilities
Management

Department of
Veterans Affairs

12/17/12 2:33:51 PM C:\Program Files\Autodesk\AutoCAD 2012\AutoCAD.exe
Revision: 1
Date:

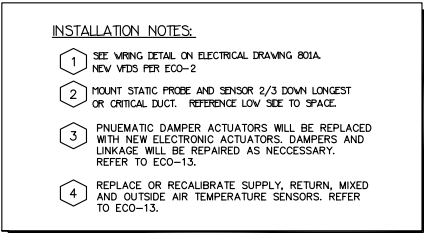
		CLIENT:		PRIME:		CONSULTANT:		Drawing Title		Project Title		Project Number		Office of Facilities Management	
				 <div> <i>Documents and Settings\user\Desktop\2017\09\09</i> </div>		 <div> 122 HEBBORN STREET 7th FLOOR SAN FRANCISCO, CA 94105 415.764.3702 </div>		B208 FLN SCHEDULE		VASF MEDICAL CENTER		440P-000000			
								Approved:		Location: VA Medical Center, 4150 Clement Street San Francisco, California 94121		Building Number B208			
AS-BUILTS CONTROL DRAWINGS		12/11/2012								Date		<div> 800A </div>			
100% CONTROL DRAWINGS		8/31/2012								<div> 8/31/12 </div>		<div> RG </div>		<div> Drawn LO </div>	
Revisions:		Date												<div> Date: 1 of 1 = </div>	



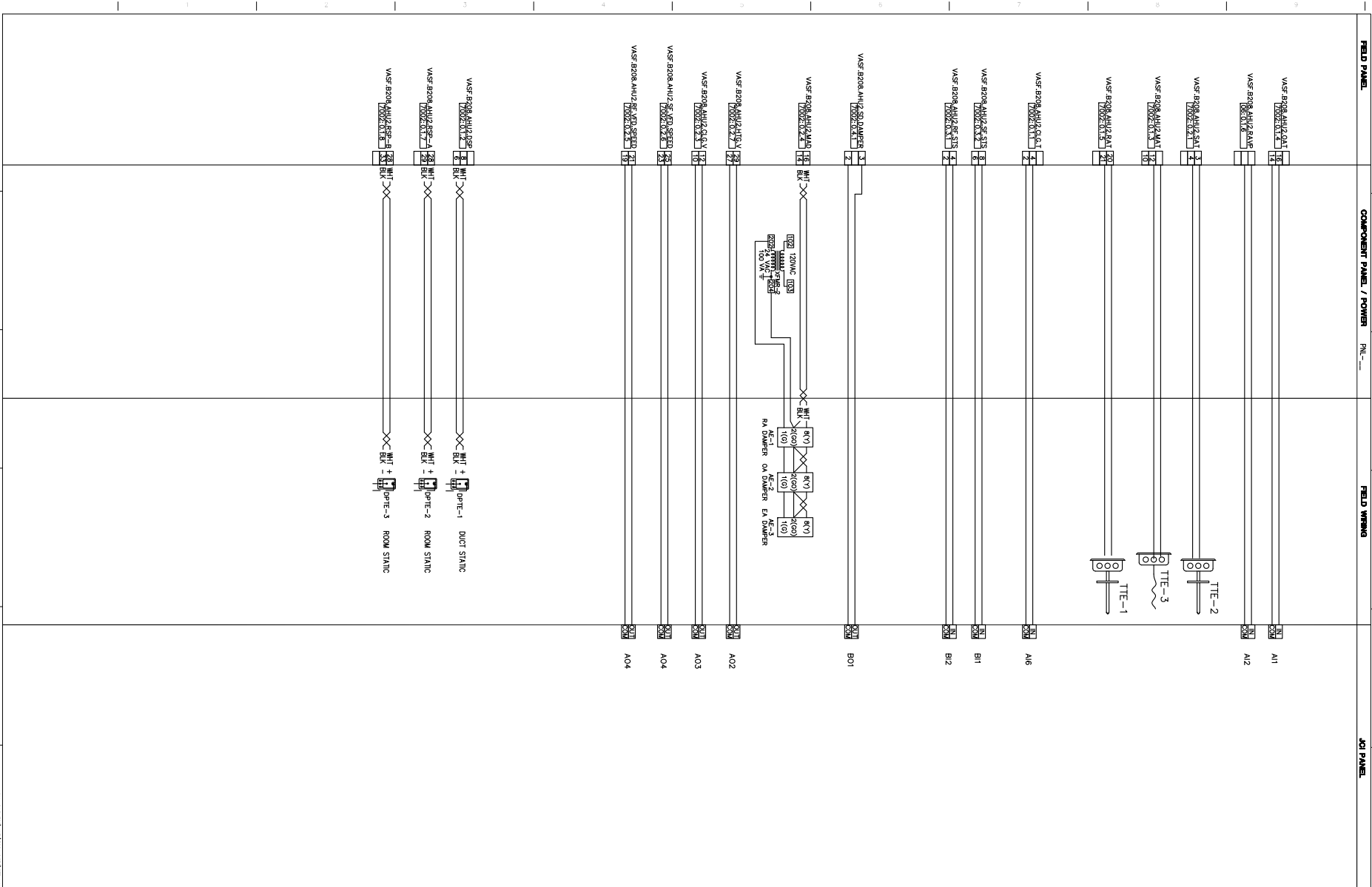
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--



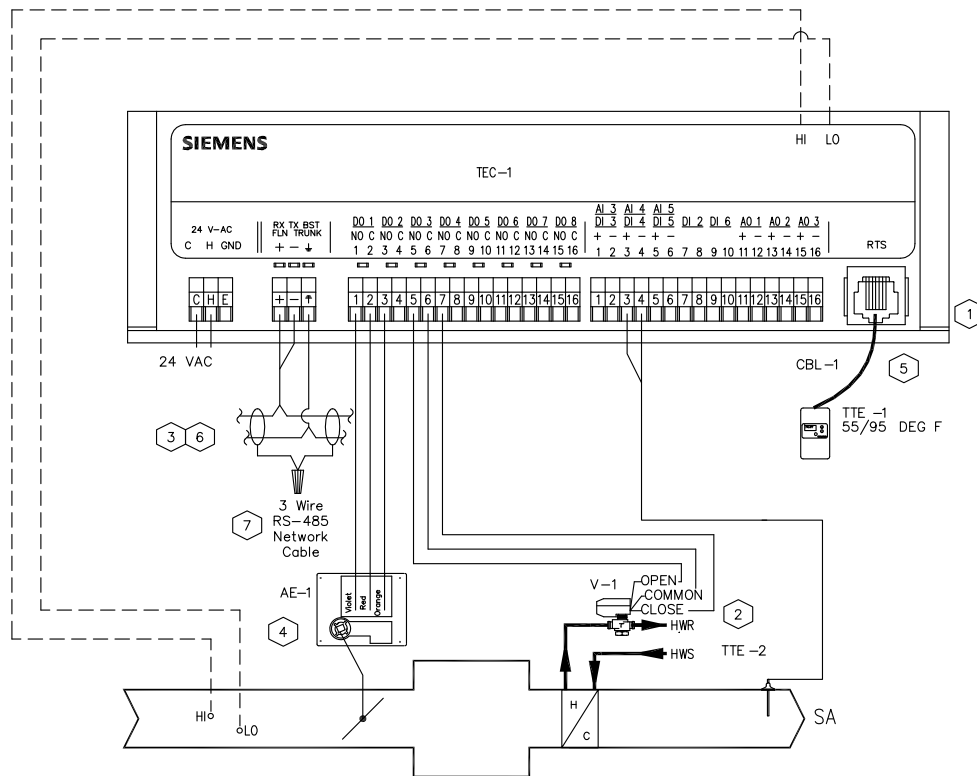
		CLIENT:		PRIME:		CONSULTANT:		Drawing Title:		Project Title:		Project Number:		Office of Facilities Management	
								B208 AHU-1 WIRING		VASF MEDICAL CENTER		440P-000000			
		 Department of Veterans Affairs		 		 <div>121 MIDBOW STREET 7811200 San Francisco, CA 94105 415/754-3733</div>		Approved:		Location: VAF Medical Center, 4150 Clement Street San Francisco, California 94121		Drawing Number: 801A Disp. 1 of 1			
AS-BUILT CONTROL DRAWINGS														12/11/2012	
100% CONTROL DRAWINGS														03/12/12	
Solutions		Date												 Department of Veterans Affairs	



		CLIENT:  Department of Veterans Affairs		PRIME:  Pacific Gas and Electric Company 200 INDUSTRIAL BLVD SUITE 300 SAN JOSE, CA 95128 USA PHONE: 1(415)7643000 FAX: 1(415)7643000		CONSULTANT:  Affiliated Engineers 122 HERRISON STREET 7th FLOOR SAN JOSE, CA 95105 415 784-0700		Drawing Title B208 AHU-2 Approved:		Project Title VASF MEDICAL CENTER Location: VA Medical Center, 4150 Clement Street San Francisco, California 94121		Project Number 440P-000000 Bidding Number B208 Drawing Number <div style="font-size: 2em; font-weight: bold;">802</div> Dwg. 1 of 1		Office of Facilities Management  Department of Veterans Affairs	
AS-BUILT CONTROL DRAWINGS 12/11/2012		12/11/2012													
100% CONTROL DRAWINGS 03/12/2012		03/12/2012													
Revision:		Date:													

[illegible]

AS-BUILT CONTROL DRAWINGS 100% CONTROL DRAWINGS Section: _____ Date: _____		CLIENT:  Department of Veterans Affairs	PRIME:   Pacific Gas and Electric Company 2882 MIDWAY BLVD SUITE 300 HAYWARD, CA 94541 USA PHONE: (510) 245-0000 FAX: (510) 245-0100	CONSULTANT:  AEI Affiliated Engineers 120 HUNTER STREET 7TH FLOOR SAN FRANCISCO, CA 94105 415 764-0700	Drawing Title B208 AHU-2 BOM Approved: _____	Project Title VASF MEDICAL CENTER Project Number 44OP-000000 Building Number B208 Location: VA Medical Center, 4150 Clement Street San Francisco, California 94121 Date 8/31/12 Checked RG Drawn LO Drawing Number 802K Dep. 1 of 1 -	Office of Facilities Management  Department of Veterans Affairs
---	--	--	--	--	---	--	--



APPROXIMATELY 114
EXISTING VAV BOXES WITH
REHEAT BEING SERVED BY
AHU-1 AND AHU-2. THE
EXISTING BOXES WILL BE
UPGRADED TO SIEMENS DDC

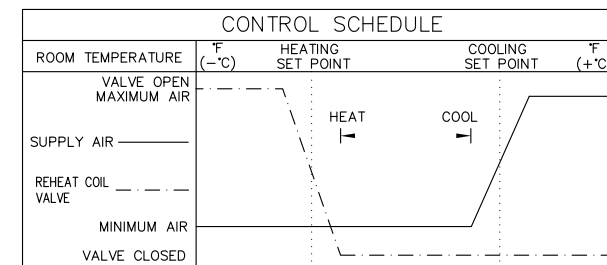
POWER CONSUMPTION

DEVICE	VA
AE-1	2.3
TEC-1	10
V-1	2.0
TOTAL	14.3

NOTE: NO MORE THAN 5
ZONE CONTROLLER PER
100VA CIRCUIT.

INSTALLATION NOTES:

- 1 TEC-1 TO BE MOUNTED IN ENCLOSURE.
- 2 REPLACE EXISTING VALVE ACTUATOR IF THEY ARE FUNCTIONAL.
- 3 REFER TO BUILDING POWER TRUNK DRAWING FOR 24 VAC POWER 110A.
- 4 MOUNT ACTUATOR WITH DAMPER IN FULL OPEN POSITION.
VERIFY TEC-1 AND ACTUATOR REQUIREMENT WITH THE
BOX MANUFACTURER
- 5 LOCATE NEAR OR AT EXISTING LOCATION.
- 6 A NEUTRAL TO EARTH BOND MUST BE MADE AT THE TRANSFORMER
- 7 FOR 2-WIRE RS-485 COMMUNICATIONS, ONLY THE SIGNAL (+,-)
TERMINATIONS ARE USED. THE COMMON REFERENCE WIRE IS NOT USED.



DEVICE	SIEMENS		MANUFACTURER	DIVISION 16	DIVISION 15
	FITTER	ELEC.			
TTE-1/2		M, W			
AE-1		M, W			
TEC-1		M, W, P			
V-1		W			
LAN TRUNK		W			
POWER (24VAC)		W			

M-MOUNTED
W-WIRED
P-PIPED

- 1 VAV WITH REHEAT COIL (#6523)
LOCATION: SEE MECHANICAL FLOOR PLANS
SERVES: TBD
TYPICAL OF 114

CLIENT:		PRIME:		CONSULTANT:		Drawing Title		Project Title		Project Number		Office of Facilities Management Department of Veterans Affairs
Department of Veterans Affairs		SIEMENS 201111050781BL BLVD SUITE 300 HAYWARD, CA 94545 USA PHONE: 510-281-8400 FAX: 510-281-7000		Pacific Gas and Electric Company® PG&E 123 MURKIN STREET 7th FLOOR San Francisco, CA 94102 415 784-0700		B208 VAV WITH RH		VASF MEDICAL CENTER		440P-000000		
AS-BUILT CONTROL DRAWINGS 12/11/2012						Approved:		Location: VA Medical Center 4150 Clement Street San Francisco, California 94121		Building Number B208		
100% CONTROL DRAWINGS 8/31/2012								Date 8/31/12		Drawing Number 821 Draw. of 1 -		
Revised: _____ Date _____								Checked RG		Drawn LO		

Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
AE 1	114	GDE131.1U	SIEMENS	154 011	ACT NSR 24/10BL 5Nm,NO PLENUM
V 1	114	14004932-001 M6410A1029	HONEYWELL	N/A	RETROFIT KIT/3-POS ACTUATOR
CBL 1	114	588-100B	SIEMENS	N/A	6-WIRE 2-RJ11 RS CABLE 50'PLMN
TEC 1	114	550-495P	SIEMENS	N/A	PROGRAMMABLE VAV CONTROLLER
TTE 1	114	QAA2280.EWSC	SIEMENS	N/A	ROOM TEMPERATURE SENSOR
	12	AQA2200-INTL	SIEMENS	N/A	RM SENSOR WALLPLATE
TTE 2	114	QAM2030.010	SIEMENS	149915	DUCT PT SNSR, NTC 10K OHM TYP2, 4 IN LG

CLIENT:  Department of Veterans Affairs		PRIME:  		CONSULTANT: 		Drawing Title: B208 VAV WITH RH BOM		Project Title: VASF MEDICAL CENTER		Project Number: 440P-000000		Office of Facilities Management 
AS-BUILT CONTROL DRAWINGS 100% CONTROL DRAWINGS		12/11/2012 8/31/2012		Approved: 		Location: VA Medical Center, 4150 Clement Street San Francisco, California 94121		Building Number: B208		Drawing Number: 821K		
12/11/12 2:33:58 PM C:\Program Files\Autodesk\LTPlot\LTPlot1-800.dwt		Date		Date 8/31/12		Checked: RG		Drawn: LO		Dep. 1 of 1 -		

zone temperature sensor is below 65 Deg F. During the Warm-up cycle, the hot water heating system shall be enabled, the auxiliary exhaust fans shall be off, and all VAV controllers with reheat coils shall be enabled. The cycle shall be initiated at the appropriate time so that the coolest zone temperature is at the building occupied mode heating set point (68 Deg F) by occupied time.

AHU Heating & Cooling and Economy Cycle Control:

This air handling unit has economy cycle dampers (outdoor, return and exhaust air dampers), a heating coil, and a cooling coil. The AHU outdoor air damper shall be controlled to maintain minimum outside air while AHU is operating (except during warm-up or pre-cool cycle). The economy cycle dampers shall be interlocked to operate when its respective air handling system is operating and the outdoor temperature is cooler than return air temperature, and the system is not in the Warm-up mode of operation.

When the Economy Cycle is active, the air handling unit's heating valve, economy cycle control dampers, and cooling valve shall be modulated without overlap to maintain the supply air temperature to set point. When the Economy Cycle is inactive, the air handling unit's heating valve, and cooling valve shall be modulated without overlap to maintain the supply air temperature to set point, and the economy cycle control dampers will be set to the minimum fresh outdoor air position.

The Supply Air Temperature Set Point shall be reset based on the warmest zone that is operating in cooling mode. If the warmest zone is 1.5 Deg F above its cooling set point and the zone controller cooling loop is at 100% for 10 minutes, the Supply Air Temperature Set Point shall be reset downward by 1 Deg F. This reset will continue every 10 minutes until the warmest zone has achieved set point. If all zones are below their cooling set point and any zone reheat valve is open for 10 minutes, the Supply Air Temperature Set Point shall be reset upward by 1 Deg F. This reset will continue every 10 minutes until all zone reheats are closed or the warmest zone has risen to its cooling set point.

Supply Fan Static Pressure Control:

The supply air static pressure shall be transmitted to the Air Handling System dedicated DDC controller.

Each terminal controller shall have a damper position output; the BAS shall monitor zone damper positions and determine the zone with its damper in the highest percentage open position (supply air demand).

A minimum supply air static pressure shall be established during system commissioning. This minimum set point shall be high enough to satisfy all damper controllers such that no damper is open greater than 95% in minimum cooling during occupied mode.

Provided the supply air static pressure is above the minimum set point, the supply air static pressure control point shall be ramped down at 0.05 inWC / 10 minutes until the zone with its damper in the most open position is greater than 85% open. At such a point, the static pressure control point shall be held constant. If a zone damper exceeds 95% open, the supply air static pressure control point shall be ramped up at 0.05 inWC / 10 minutes until the damper closes to 85% open at which point, the static pressure control point shall be held constant.

The BAS shall maintain the supply static pressure control set point by varying the speed of the supply fan variable frequency drive (VFD). The supply fan VFD shall automatically account for filter loading.

Return Fan Static Pressure Control:

The BAS shall monitor space static pressure at two locations. This static pressure input shall be utilized to control the Return Fan VFD Speed to maintain space static pressure to 0.03 in WC (slightly positive).

The BAS shall maintain the space static pressure control set point by varying the speed of the return fan variable frequency drive (VFD).

Peak Demand Limiting Control:

When the utility company has designated a Peak Demand Period, the zone cooling control set points will be raised by 2 Deg F for each zone. The AHU Supply and Return Fan VFDs will be limited to 85% speed. The AHU Supply Air Temperature Set Point will set to a fixed value (to be determined). The preceding configuration will remain in effect for

the duration of the PDL call. Once the PDL call has been removed, the Zone and AHU equipment will return to normal operation.

Alarms:

Supply and Return Fan operation, Exhaust Fan operation, Smoke Alarm, supply temperature above / below set point.

Variable Air Volume Zone Temperature Control

Zone Controller:

The VAV zone controller s shall be stand alone specific function devices designed for independent local control of their respective terminal units VAV. Each VAV controller's default set points shall be stored in non-volatile memory i.e. min/max CFM, cooling/heating set points etc. and in the event of a communication failure with its respective global controller these settings shall govern VAV operation.

The VAV controller shall monitor its space temperature sensor and position the VAV primary air damper as required to maintain its programmed set point. When the zone temperature falls below heating set point, the VAV controller shall position a hot water heating valve as required to maintain its programmed heating set point.

Each VAV controller's set points (min/max CFM, heating set point and cooling set point) shall be adjustable from the facility's BAS.

Peak Demand Limiting Control:

When the utility company has designated a Peak Demand Period, the zone cooling control set points will be raised by 2 Deg F for each zone. The preceding configuration will remain in effect for the duration of the PDL call. Once the PDL call has been removed, the Zone equipment will return to normal operation.

12/17/12 2:33:58 PM C:\Program Files\Autodesk\AutoCAD 2012\AutoCAD.exe		CLIENT:	PRIME:	CONSULTANT:	Drawing Title	Project Title	Project Number	Office of Facilities Management Department of Veterans Affairs
					B200 SEQUENCE OF OPERATIONS	VASF MEDICAL CENTER	440P-000000	
					Approved:	Location: VA Medical Center, 4150 Clement Street San Francisco, CA 94121	Building Number B200	
					Date	Checked	Drawn	
					8/31/12	RG	LO	Drawing Number 851
								Dep. 1 of 1 -

**Department of
Veterans Affairs**

**SIEMENS**
12011 HUNTER BLVD STE 200
HAYWARD, CA 94541 USA
PHONE: (510) 546-0000
FAX: (510) 546-0100

**Pacific Gas and
Electric Company**

**AEI Affiliated
Engineers**
125 AUBURN STREET
7TH FLOOR
SAN FRANCISCO, CA
94102
415.784.7100

VASF MEDICAL CENTER - B208

Safety Controls:

Time Program Control:

Pre-cool Cycle:

AHU Cooling and Economy Cycle Control:

When the Economy Cycle is active the economy cycle control dampers and cooling valve shall be modulated without overlap to maintain the supply air temperature to set point. When the Economy Cycle is inactive, the cooling valve shall be modulated to maintain the supply air temperature to set point, and the economy cycle control dampers will be set to the minimum fresh outdoor air position.

Temperature Control:

If all zones are below their cooling set point and any zone reheat valve is open for 10 minutes, the Supply Air Temperature Set Point shall be reset upward by 1 Deg F. This reset will continue every 10 minutes until all zone reheats are closed or the warmest zone has risen to its cooling set point.

Supply Fan Static Pressure Control:

The supply air static pressure shall be transmitted to the Air Handling System dedicated DDC controller.

Each terminal controller shall have a damper position output; the BAS shall monitor zone damper positions and determine the zone with its damper in the highest percentage open position (supply air demand).

A minimum supply air static pressure shall be established during system commissioning. This minimum set point shall be high enough to satisfy all damper controllers such that no damper is open greater than 95% in minimum cooling during occupied mode.

Provided the supply air static pressure is above the minimum set point, the supply air static pressure control point shall be ramped down at 0.05 InWC / 10 minutes until the zone with its damper in the most open position is greater than

The BAS shall maintain the supply static pressure control set point by varying the speed of the supply fan variable frequency drive (VFD). The supply fan VFD shall automatically account for filter loading.

Return Fan Static Pressure Control:

The BAS shall maintain the space static pressure control set point by varying the speed of the return fan variable frequency drive (VFD).

Peak Demand Limiting Control:

When the utility company has designated a Peak Demand Period, the zone cooling control set points will be raised by 2 Deg F for each zone. The AHU Supply and Return Fan VFDs will be limited to 85% speed. The AHU Supply Air Temperature Set Point will set to a fixed value (to be determined). The preceding configuration will remain in effect for the duration of the PDL call. Once the PDL call has been removed, the Zone and AHU equipment will return to normal operation.

Associated Exhaust Fans:

When the AHU Supply Fan is proofed ON and the AHU is operating in normal Occupied Mode, the associated Exhaust Fans will be started. The Associated Exhaust will be stopped if the associated AHU Supply Fan is not proofed ON, or the AHU is operating in any mode other than normal Occupied Mode.

Exhaust Fans will be associated as follows:

AHU-1 - EF-1, EF-4

Alarms:

Supply and Return Fan operation, Exhaust Fan operation, Smoke Alarm, supply temperature above / below set point.

B208 AHU-2 SEQUENCE OF OPERATIONS:

Safety Controls:

The supply and return air fans shall shut down if a return or supply air duct detector signals a smoke condition and shall be reported by the Building Automation System (BAS).

Time Program Control:

Periods of occupancy shall be programmed into the BAS Scheduler program. The AHU serving occupied areas shall be enabled at the most economical time to achieve programmed space temperature set point prior to occupancy (optimum start). The BAS through its optimum start program shall enable the AHU in the warm-up, pre-cool mode or occupied mode. The VAV terminals shall be controlled by digital controllers maintaining space temperature set points.

Pre-cool Cycle:

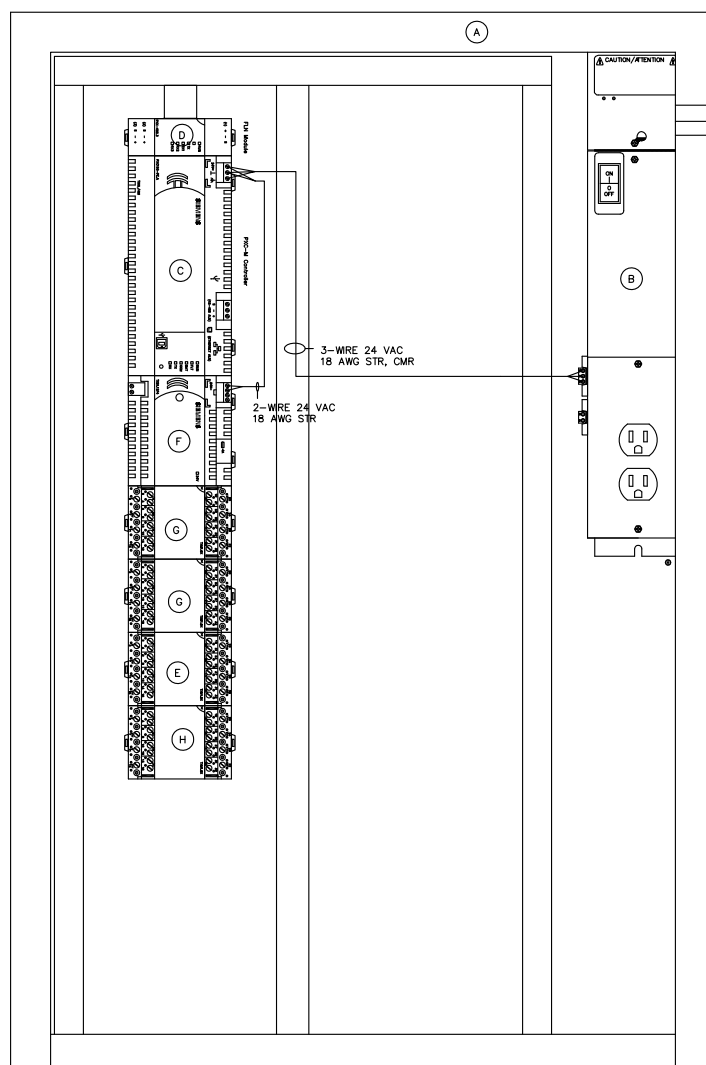
The BAS shall initiate an optimum start pre-cool cycle if the outdoor air temperature is above 50 Deg F and the warmest zone temperature sensor is above 78 Deg F. During the pre-cool cycle, the VAV terminals served by AHU shall be enabled in the occupied mode at the appropriate time so that the warmest zone temperature is at the building occupied mode cooling set point (76 Deg F) by occupied time.

Warm-Up Cycle:

The BAS shall initiate optimum start warm-up cycle if the outdoor air temperature is below 60 Deg F and the coolest

		CLIENT:		PRIME:		CONSULTANT:		Drawing Title		Project Title		Project Number		Office of Facilities Management	
		 Department of Veterans Affairs		SIEMENS  Pacific Gas and Electric Company 2565 INDUSTRIAL BLVD SUITE 300 WATSONVILLE, CA 95070 PHONE: (510) 545-0000 FAX: (510) 704-7010		 Affiliated Engineers 125 MESSERS STREET SAN FRANCISCO, CA 94109 415 764-0100		B200 SEQUENCE OF OPERATIONS		VASF MEDICAL CENTER		440P-000000		 Department of Veterans Affairs	
								Building Number B200		Building Number B200					
AS-BUILT CONTROL DRAWINGS 12/11/2012 100% CONTROL DRAWINGS 9/31/2012										Location: VAF Medical Center, 4150 Clement Street San Francisco, California 94121		Drawing Number 850 Dec. 11 / 12			
Revisions: _____ Date _____								Approved: _____ Checked: _____ Drawn: _____ 8/31/12 RG LO							

34" PX SERIES ENCLOSURE (PXA-ENC34)
34"H x 22"W x 5.75"D



INSTALLATION NOTES:

- 1 CONNECT EARTH TO NEUTRAL AS SHOWN. EACH TRANSFORMER MUST BE CONNECTED TO SAME OR APPROVED EARTH GROUND.

Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Panel Mounted Devices					
(A)	1	PXA-ENC34	SIEMENS	149475	ENCLOSURE ASSY 34
(B)	1	PXA-SB115V192VA	SIEMENS	N/A	SERVICE BOX, 192VA
(C)	1	PXC100-E96.A	SIEMENS	149478	PXC-Modular,BACnet/IP,TX-I/O,96 nodes
(D)	1	PXX-485.3	SIEMENS	149478	Expansion Module 3 x RS-485
(E)	1	TXA1.K24	SIEMENS	149476	ADDRESS KEY 1-24
(F)	1	TXS1.12F4	SIEMENS	149476	24VDC SUPPLY 1200MA, 4 A FUSE
(G)	2	TXM1.8X	SIEMENS	149476	8 UNIV I/O MODULE W/ 4-20MA
(E)	1	TXM1.8D	SIEMENS	149476	8 DIGITAL INPUT MODULE
(H)	1	TXM1.6R-M	SIEMENS	149476	6 RELAY OUTPUT MODULE W/OVD

1 B208 PXCM-01 PANEL LAYOUT
880
SERVES: AHU-1
LOCATION NEAR AHU-1

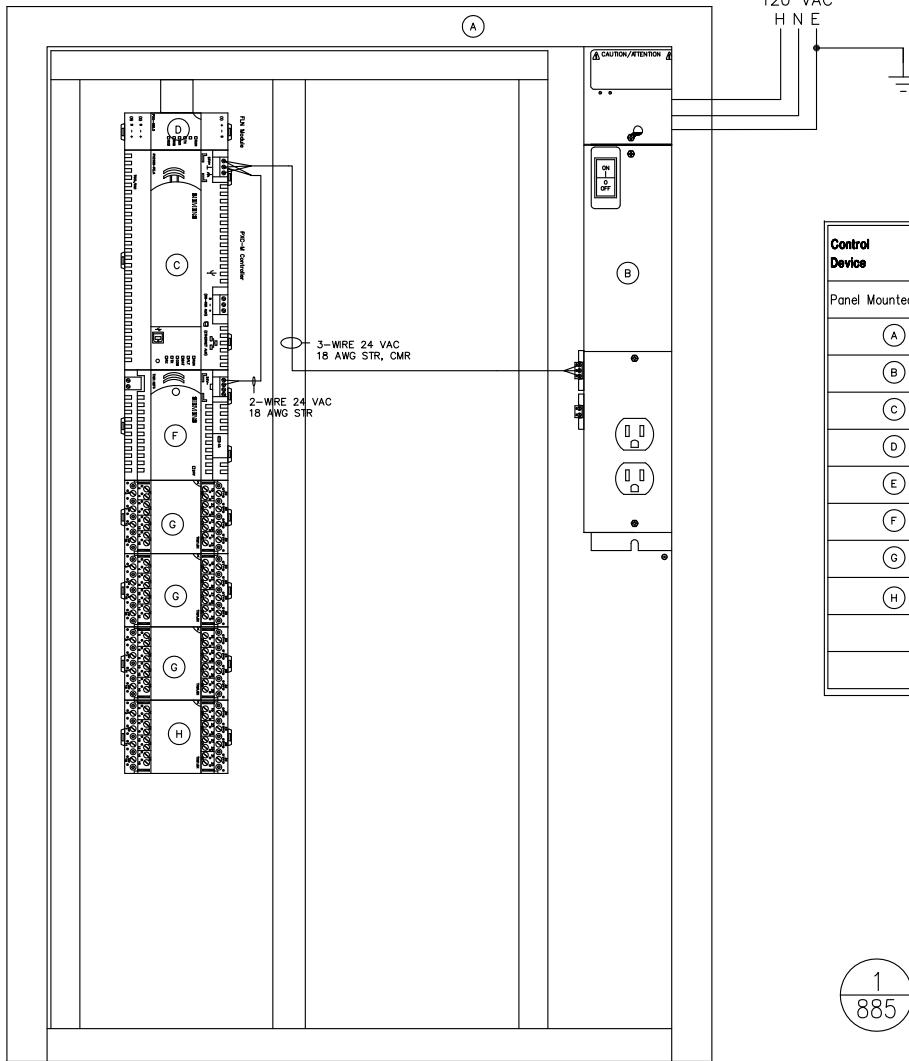
		CLIENT:		PRIME:		CONSULTANT:		Drawing Title		Project Title		Project Number		Office of Facilities Management	
								VASF.B208.PXCM01 PANEL LAYOUT		VASF MEDICAL CENTER		440P-000000			
												Building Number			
												B208			
AS-BUILT CONTROL DRAWINGS		12/11/2012		125 HARBOR STREET 7TH FLOOR SAN FRANCISCO, CA 94102 415.784.7100		Approved:		Location: VAF Medical Center, 4150 Clement Street San Francisco, California 94121		Drawing Number		880		Dep. 1 of 1	
100% CONTROL DRAWINGS		8/31/2012													
Revisions:		Date													

[illegible]



		CLIENT:	PRIME:	CONSULTANT:	Drawing Title:	Project Title:	Project Number:	Office of Facilities Management
			<div>SIEMENS</div> <div>Siemens and Settings/سايمنز/سيمنز</div> <div>2001 INDUSTRIAL BLVD SUITE 300 BAYVIEW, CA 94026, USA PHONE: 510.765.0000 FAX: 510.765.0010</div>	<div>AEI Affiliated Engineers</div> <div>123 MISSION STREET 7th FLOOR San Francisco, CA 94105 415.754.1300</div>	VASF.B208.PXCM01p002	VASF MEDICAL CENTER	440P-000000	
					Approved:	Location: VA Medical Center, 4150 Clement Street San Francisco, California 94121	Building Number B200	
AS-BUILT CONTROL DRAWINGS	12/11/2012	\\b208\cabinet_2_m\dwg\cabinet\va\0101\va_0101_3101.p				Drawing Number	881.2	
100% CONTROL DRAWINGS	8/31/2012					Date	Checked	Drawn
By Name	Date				RG	RG	L	881.2 Page 1 of 1

34" PX SERIES ENCLOSURE (PXA-ENC34)
34"H x 22"W x 5.75"D



INSTALLATION NOTES:

- 1 CONNECT EARTH TO NEUTRAL AS SHOWN. EACH TRANSFORMER MUST BE CONNECTED TO SAME OR APPROVED EARTH GROUND.

Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Panel Mounted Devices					
(A)	1	PXA-ENC34	SIEMENS	149475	ENCLOSURE ASSY 34
(B)	1	PXA-SB115V192VA	SIEMENS	N/A	SERVICE BOX, 192VA
(C)	1	PXC100-E96.A	SIEMENS	149478	PXC-Modular,BACnet/IP,TX-I/O,96 nodes
(D)	1	PXX-485.3	SIEMENS	149478	Expansion Module 3 x RS-485
(E)	1	TXA1.K24	SIEMENS	149476	ADDRESS KEY 1-24
(F)	1	TXS1.12F4	SIEMENS	149476	24VDC SUPPLY 1200MA, 4 A FUSE
(G)	3	TXM1.8X	SIEMENS	149476	8 UNIV I/O MODULE W/ 4-20MA
(H)	1	TXM1.6R-M	SIEMENS	149476	6 RELAY OUTPUT MODULE W/OVD

1
885

B203 PXCM-02 PANEL LAYOUT

SERVES: AHU-2
LOCATION NEAR AHU-2

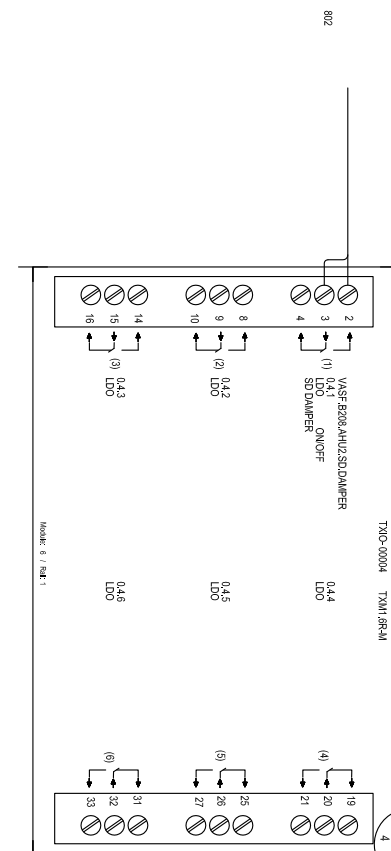
		CLIENT:		PRIME:		CONSULTANT:		Drawing Title		Project Title		Project Number		Office of Facilities Management	
								VASF.B208.PXCM02 PANEL LAYOUT		VASF MEDICAL CENTER		440P-000000			
												Building Number			
												B208			
												Drawing Number			
												885			
												Dep. 1 of 1			

SIEMENS **Pacific Gas and Electric Company**
3001 HILTON BLVD SUITE 200
HAYWARD, CA 94545 USA
PHONE: (510) 546-0000
FAX: (510) 546-2100

AEI Affiliated Engineers
125 HARBOR STREET
7TH FLOOR
SAN FRANCISCO, CA 94105
415.784.7100



12/11/12 3:44:23 PM C:\Program Files\Microsoft Office\Office12\Excel.exe



CLIENT:		PRIME:		CONSULTANT:		Drawing Title:		Project Title:		Project Number:		Office of Facilities Management	
						VASF.B208.PXCM02p002		VASF MEDICAL CENTER		44OP-000000			
										Building Number			
										B200			
										Drawing Number			
										886.2			
										Date		Dep. 1 of 1 -	
										8/31/12			
										Checked			
										RG			
										Drawn			
										LO			

AS-BUILT CONTROL DRAWINGS	12/11/2012
100% CONTROL DRAWINGS	8/31/2012
Rev	Date

SIEMENS

2501 MISSION BLVD SUITE 300
SAN FRANCISCO, CA 94133
PHONE 415-764-0000
FAX 415-764-0001

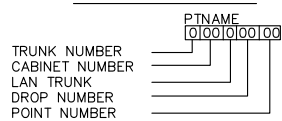
**Affiliated
Engineers**

121 MISSION STREET
7th FLOOR
SAN FRANCISCO, CA
94105
415-764-0700

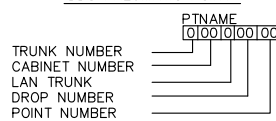
CONTROL SYMBOL

AC	AIR COMPRESSOR
AD	AIR DRYER
AE	ACTUATOR ELECTRIC
AEM	APOGEE ETHERNET MICROSERVER
AF	AIR FILTER
AFS	AIR FLOW STATION
AOP	ANALOG OUTPUT, PNEUMATIC
AP	ACTUATOR PNEUMATIC
APS	AUX. POWER SUPPLY
AT	AUTOMATIC TRAP
ATD	AUTO TANK DRAIN
ATEC	ACTUATOR TEC
AZM	AUTOZERO MODULE
BELL	BELL
BIM	BUS INTERFACE MODULE
BOIL	BOILER
CBL	CABLES
CKV	CHECK VALVE
CM	CONSTRUCTION MATERIALS
CP	COMPONENT PANEL
CPU	CENTRAL PROCESSING UNIT
CRT	CATHODE RAY TUBE
CS	CURRENT SWITCH
CT	CURRENT TRANSDUCER
CVC	CONSTANT VOLUME CONTROLLER
D	DAMPER
DDC	DUAL DUCT CONTROLLER
DEM	DEMAND ENERGY MONITOR
DP	DEW POINT TRANSMITTER
DPR	DIFFERENTIAL PRESS. REGULATOR
DPS	DIFFERENTIAL PRESSURE SWITCH
DPT	DIFF. PRESS. TRANSMITTER ELEC.
DPTP	DIFFERENTIAL PRESSURE PNEUMATIC
DPV	DIGITAL POINT UNIT
EC	ENTHALPY COMPARATOR
EP	ELECTRO-PNEUMATIC VALVE
ES	END SWITCH
ET	ENTHALPY TRANSMITTER
EXP	EXPANSION PANEL
FAN	FAN
FHC	FUME HOOD CONTROLLER
FM	FLOW MTR. (FLOW METER STATION)
FMS	FIRE MGMT. SYSTEM
FS	FLOW SWITCH
FTP	FLOW TRANSMITTER PNEU.
G	GAUGE

DDC ELECTRICAL POINT



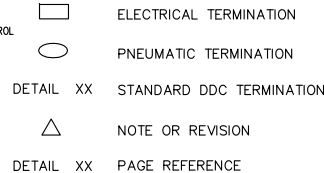
DDC PNEUMATIC POINT



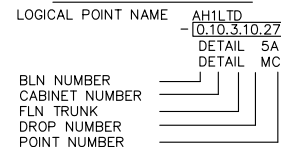
CONTROL SYMBOL

GD	GAS DETECTOR
HE	HUMIDIFIER ELECTRIC
H	HYGROSTATS
HHC	HAND-HELD OPERATOR'S TERMINAL
HL	HIGH LIMIT
HOA	HAND-OFF-AUTO SWITCH
HORN	HORN
HPC	HEAT PUMP CONTROLLER
HTD	HIGH TEMPERATURE DETECTOR
HTE	HUMIDITY TRANSMITTER ELECTRIC
HTP	HUMIDITY TRANSMITTER PNEUMATIC
INT	INTERCOM
KWM	ELECTRIC KILOWATT METER
LC	LIMIT CONTROLLER (LIMITER)
LLS	LIQUID LEVEL SWITCH
LLT	LIQUID LEVEL TRANS.
LPR	POWER SUPPLY 24VAC/24VDC
LTDE	LOW TEMP. DETECTOR ELECTRIC
LTDP	LOW TEMP. DETECTOR PNEUMATIC
LUI	LOCAL USER INTERFACE
MEC	MODULAR BUILDING CONTROLLER
MDM	MODEM
ME	ELECTRONIC ACTUATOR
MG	MODULAR EQUIPMENT CONTROLLER
MPU	MAGNETIC GAUGE
MS	MULTI-POINT UNIT
MOT	MOTOR STARTER
OBS	OBsolete
ODP	OPERATOR DATA PANEL
PA	PUMP
PCT	PULSE ACCUMULATOR
PE	PROGRAMMABLE CLOCK TIMER
PL	PRESSURE ELECTRIC SWITCH
PL	PILOT LIGHT
PM	POWER MONITOR
PNL	PANEL
PPM	POINT PICKUP MODULE
PRC	PRESSURE REG. CONTROLLER
PRV	PRESSURE REDUCING VALVE
PS	POSITIONING SWITCH
PSE	POSITION SENSOR ELECTRIC
PST	PULL STATION
PT	PITOT TUBE
PTE	PRESSURE TRANSMITTER ELECTRIC
PTP	PRESSURE TRANSMITTER PNEUMATIC
PTR	PRINTER
PV	PILOT VALVE
PXCC	PX COMPACT CONTROLLER

DETAILS



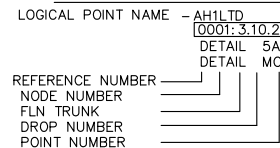
APOGEE: PII - EXAMPLE



READ AS " SEE PAGE 5A FOR MORE DETAIL "

DIGITAL INPUT

APOGEE: ETHERNET - EXAMPLE



READ AS " SEE PAGE 5A FOR MORE DETAIL "

DIGITAL INPUT

CLIENT:



PRIME:



CONSULTANT:



Drawing Title

LEGEND & ABBREVIATIONS

Approved:

Project Title

VASF MEDICAL CENTER

Location:

VA Medical Center, 4150 Clement Street, San Francisco, CA 94164-1401

Project Number

440P-000000

Drawing Number

LEG

Office of Facilities Management

Department of Veterans Affairs

Date

8/31/12

Checked

RG

Drawn

LO

Dep. 1 of 1

TEC - ELECTRONIC OUTPUT
WIRING TYPE AND GAUGE REQUIREMENTS

TABLE 1A

CIRCUIT TYPE	CLASS	WIRE TYPE	MAX. DISTANCE	CONDUIT SHARING
INPUT POWER	2	CHECK LOCAL CODES	AS REQUIRED	CHECK LOCAL CODES
DIGITAL OUTPUT	2	CHECK LOCAL CODES	150ft (46 m)	CHECK LOCAL CODES
DIGITAL INPUT	2	#18-22 TP #20 AWG TP	150ft (46 m)	CLASS 1 & 2 CHECK LOCAL CODES
ANALOG INPUT	2	#18-22 TP	100ft (30.5 m)	CLASS 2
ANALOG INPUT THERMISTOR	2	#20 TP	100ft (30.5 m)	CLASS 1 & 2 CHECK CODES
ROOM TEMP. SENSOR	2	6-WIRE RJ11	100ft (30.5 m)	CLASS 2
LAN TRUNK ¹	2	#18-22 AWG TSP	4kft (1220 m)	CLASS 2 ONLY

TEC - PNEUMATIC OUTPUT
WIRING TYPE AND GAUGE REQUIREMENTS

TBBLE 1B

CIRCUIT TYPE	CLASS	WIRE TYPE	MAX. DISTANCE	CONDUIT SHARING
POWER TRUNK (LOW VOLTAGE)	2	CHECK LOCAL CODES	AS REQUIRED	CHECK LOCAL CODES
POWER TRUNK (HIGH VOLTAGE)	1	CHECK LOCAL CODES	AS REQUIRED	CHECK LOCAL CODES
DAMPER OUTPUT (LOW VOLTAGE)	2	CHECK LOCAL CODES	AS REQUIRED	CHECK LOCAL CODES
DAMPER OUTPUT (HIGH VOLTAGE)	1	CHECK LOCAL CODES	AS REQUIRED	CHECK LOCAL CODES
DIGITAL INPUT	2	#18-22 TP	100ft (30.5 m)	CLASS 1 & 2 CHECK LOCAL CODES
ANALOG INPUT	2	#18-22 TP	100ft (30.5 m)	CLASS 2
ROOM TEMP. SENSOR	2	6-WIRE RJ11	100ft (30.5 m)	CLASS 2
LAN TRUNK ¹	2	#18-22 AWG TSP	4kft (1220 m)	CLASS 2 ONLY

TABLE 1A & 1B NOTES:

1. DISTANCE WILL DEPEND ON TRANSFORMER LOCATION.

TEC POWER SOURCE REQUIREMENTS

TEC TYPE	VOLTAGE	LINE FREQUENCY	MAX. POWER
ELECTRONIC OUTPUT	24 VAC +15% -20%	50 / 60 Hz	5.2 VA TO 43.5 VA ¹
PNEUMATIC OUTPUT (LOW VOLTAGE)	24 VAC +15% -20%	50 / 60 Hz	17 VA PLUS DAMPER VA
PNEUMATIC OUTPUT (HIGH VOLTAGE)	115/230 VAC +10% -15%	50 / 60 Hz	17 VA PLUS DAMPER VA

NOTES:

1. VA DEPENDS ON TEC APPLICATION.

DI, AI, AO WIRE SPECIFICATIONS

TABLE 2

SPECIFICATION	WIRE TYPE	
	SHIELDED	UNSHIELDED
CAPACITANCE WIRE TO WIRE	NOT SPECIFIED	NOT SPECIFIED
CAPACITANCE BETWEEN ONE CONDUCTOR WITH OTHER CONDUCTOR CONNECTED TO SHIELD	NOT SPECIFIED	N/A
WIRE LAY	2" MAX.	2" MAX.
AWG	18-22	18-22

LAN TRUNK WIRE

TABLE 3

SPECIFICATION	LENGTH OF TRUNK SECTION	
	4000 FT	10,000 FT
CAPACITANCE WIRE TO WIRE	60pF MAX.	24pF MAX.
CAPACITANCE BETWEEN ONE CONDUCTOR WITH OTHER CONDUCTOR CONNECTED TO SHIELD	100pF MAX.	44pF MAX.
WIRE LAY	2" MAX.	2" MAX.
AWG	24	18 MIN.

TABLE 2 & 3 NOTES:

1. OPTIMAL NOISE REDUCTION IS ACHIEVED WITH TIGHTER WIRE LAYS (E.G. 1/2").

GENERAL NOTES:

- COMPLY WITH LOCAL BUILDING CODES.
- SIZE WIRE FOR LOAD, CURRENT, AND VOLTAGE.
- ALL WIRE TO BE APPROVED OR LISTED FOR THE INTENDED APPLICATION BY AGENCIES SUCH AS UL, CSA.
- ALWAYS REFER TO LOCAL CODES FOR CONDUIT SHARING.
- WIRING MUST HAVE INSULATION RATED FOR HIGHEST VOLTAGE CIRCUIT IN CONDUIT.
- PLENUM WIRING MAY BE USED IN PLACE OF ANY LOW VOLTAGE WIRING WITHOUT CHANGES TO LENGTH EXCEPT FOR PMD OR LAN TRUNK. IN CASES WHERE PLENUM WIRE (#18 OR #20 AWG) IS USED FOR PMD OR LAN TRUNK, USE THE REDUCED LENGTHS OF #20 AWG CABLE.
- THE LAN TRUNK MUST BE AN UNINTERRUPTED RUN BETWEEN TEC'S. NO SPLICES ALLOWED.

TEC (ELECTRONIC OUTPUT) DO CONTACT RATING

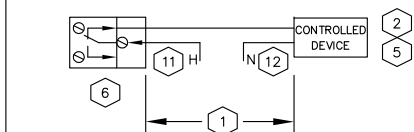
24 VAC HOT @ 0.5 AMPS

WARNING: DO IS NOT A DRY CONTACT!

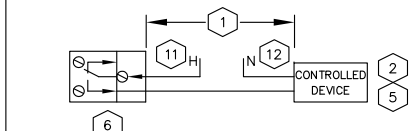
TEC (PNEUMATIC OUTPUT) DO CONTACT RATING

DO CONTACT RATING NOT SPECIFIED

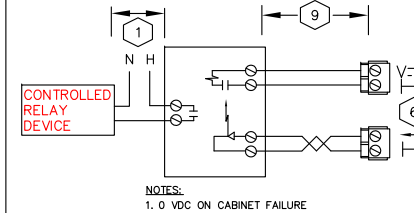
CLIENT:  Department of Veterans Affairs		PRIME:  SIEMENS <small>10001 HUNTINGTON BLVD. 10TH FLOOR HAYWARD, CA 94541, USA PHONE: (510) 644-0000 FAX: (510) 644-0100</small>		CONSULTANT:  Affiliated Engineers <small>125 HARBOR STREET 10TH FLOOR SAN FRANCISCO, CA 94102 415.784.0700</small>		Drawing Title: TEC TERMINATION SPECIFICATION		Project Title: VASF MEDICAL CENTER		Project Number: 440P-000000		Office of Facilities Management  Department of Veterans Affairs
AS-BUILT CONTROL DRAWINGS <small>12/11/2012</small>		100% CONTROL DRAWINGS <small>8/31/2012</small>		Approved:		Location: VA Medical Center, 4150 Clement Street San Francisco, CA 94121		Drawing Number: TTRM				
Date: 8/31/12		Checked: RG		Drawn: LO		Dep. 1 of 1 -						



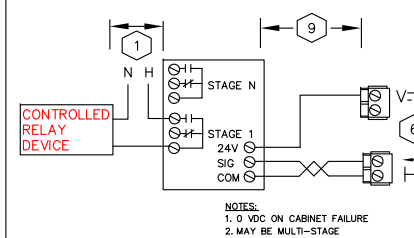
A
00
DIGITAL OUTPUT (6R) NC
PULSED OR LATCHED



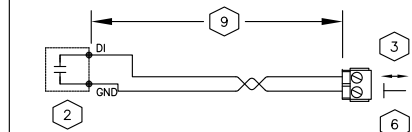
B
00
DIGITAL OUTPUT (6R) NO
PULSED OR LATCHED



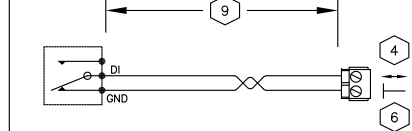
C
00
DIGITAL OUTPUT (8U,8X) Latched
VOLTAGE TO SOLID STATE RELAY



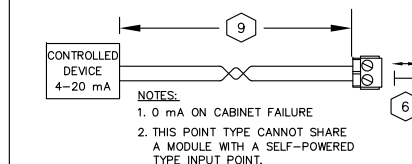
D
00
DIGITAL OUTPUT (8U,8X) Sequenced
VOLTAGE TO SEQUENCING MODULE



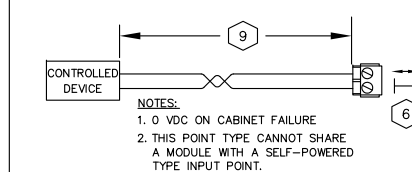
E
00
DIGITAL INPUT (8D,16D,8U,8X)
DRY CONTACT



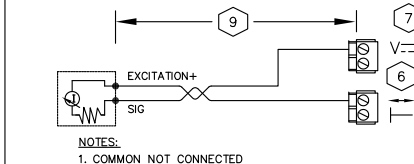
F
00
DIGITAL INPUT (8D,16D,8U,8X)
PULSE ACCUMULATOR



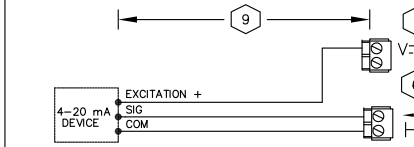
H
00
ANALOG OUTPUT (8X) 4-20 mA



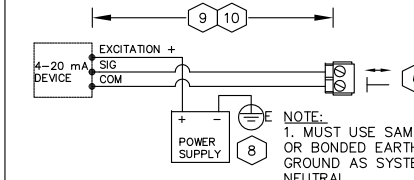
I
00
ANALOG OUTPUT (8U,8X) 0-10VDC



M
00
ANALOG INPUT (8X) 4-20 mA
2-WIRE INTERNAL POWERED



N
00
ANALOG INPUT (8X) 4-20mA
3-WIRE INTERNAL POWERED



O
00
ANALOG INPUT (8X) 4-20mA
3-WIRE EXTERNAL POWERED

NOTES:

1. MAXIMUM WIRE RUN LENGTHS ARE BASED ON THE CURRENT DRAW AND WIRE GAGE. SEE DRAWING TWIR.
2. SEE CONTROL DRAWINGS FOR NORMAL DE-ENERGIZED CONTACT STATE
3. MAXIMUM CONTACT CLOSURE RATE IS 10 PER SECOND
8D, 16D EXCITATION = 24VDC, 8mA
8U, 8X EXCITATION = 24VDC, 8mA, 20ms, 100mA

4. 8D, 16D MAXIMUM PULSE RATE = 10Hz (50ms PER STATE, 100ms PER PULSE)
8U, 8X MAXIMUM PULSE RATE = 20Hz (25ms PER STATE, 50ms PER PULSE)

5. PXC MODULAR DO CONTACT RATINGS
AC OPERATION:
4A @ 240VAC (RESISTIVE)
3A @ 240VAC (INDUCTIVE)
SIZE 4 MOTOR STARTER
DC OPERATION:
40W @ < 50VDC
20W @ > 50VDC

6. REFER TO PXC MODULAR PANEL FOR ACTUAL POINT ADDRESSES. REFER TO TXMI TERMINATION TABLES FOR ACTUAL TERMINALS FOR EACH PANEL ADDRESS. COMMON TERMINAL MAY BE SHARED BY 2 POINTS.

7. REFER TO DRAWING P1 ON TWIR FOR MAXIMUM CURRENT PROVIDED BY THE 24VDC SENSOR SUPPLY ON P1 BIM OR BUS POWER SUPPLY

8. EXTERNAL POWER SUPPLY CAN EITHER BE A 24VDC POWER SUPPLY OR A 24VAC TRANSFORMER DEPENDING ON THE SENSOR SELECTED. IF NOT AN ISOLATED NC CLASS 2 CIRCUIT THEN POWER SOURCE, NEUTRAL AND PXC MODULAR COMMON MUST BE BOTH CONNECTED TO THE SAME OR BONDED BUILDING APPROVED EARTH GROUND. FOR FURTHER DETAILS SEE EARTH GROUNDING RULES (125-3002) APOGEE WIRING GUIDELINES FOR FIELD PANELS AND EQUIPMENT CONTROLLERS.

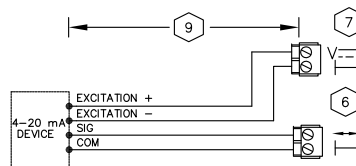
9. 50mA OR LESS - 750ft/230m
50mA TO 100mA - 375ft/115m

10. 100mA TO 150mA - 250ft/76m
150mA TO 200mA - 187ft/57m
200mA TO 250mA - 150ft/46m

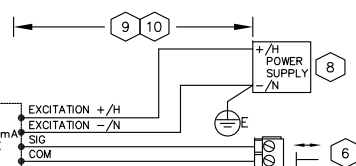
11. WHERE H TERMINAL IS NOT A NEC CLASS 2 CIRCUIT, RELAY COMMON TERMINAL BRANCH CURRENT MUST BE EXTERNALLY LIMITED TO 10A MAXIMUM BY AN NEC APPROVED MEANS. NOT A FUSE.

12. WHERE REQUIRED, N TERMINAL BRANCH CURRENT MUST BE EXTERNALLY LIMITED BY AN NEC APPROVED MEANS.

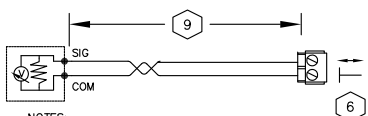
CLIENT: 		PRIME: 		CONSULTANT: 		Drawing Title: TX-I/O TERMINATION SPEC.		Project Title: VASF MEDICAL CENTER		Project Number: 440P-000000		Office of Facilities Management	
AS-BUILT CONTROL DRAWINGS: 12/11/2012 100% CONTROL DRAWINGS: 8/31/2012		12001 HUNTERTON BLVD, SUITE 200 HAYWARD, CA 94541, USA PHONE: (510) 546-0000 FAX: (510) 546-2100		125 HUBBARD STREET 7TH FLOOR SAN FRANCISCO, CA 94103 415.784.0700		Approved:		Location: VAF Medical Center, 4150 Clement Street San Francisco, California 94121		Drawing Number: TTRM1		Department of Veterans Affairs	
Date: 8/31/12 Revised: RG Drawn: LO													



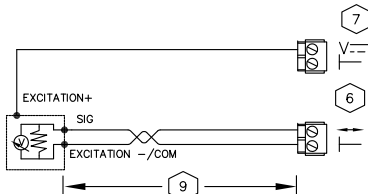
P 00 ANALOG INPUT (8X) 4-20mA
4-WIRE INTERNAL POWERED



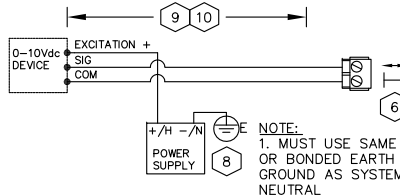
Q 00 ANALOG INPUT (8X) 4-20mA
4-WIRE EXTERNAL POWERED



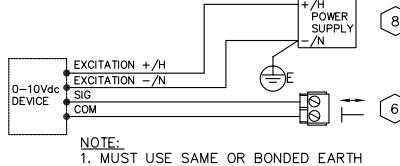
R 00 ANALOG INPUT (8X,8U) 0-10 Vdc
SELF POWERED TRANSDUCER



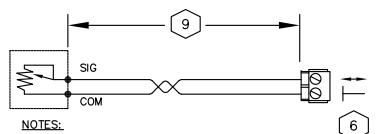
S 00 ANALOG INPUT (8X,8U) 0-10VDC
3-WIRE INTERNAL POWERED



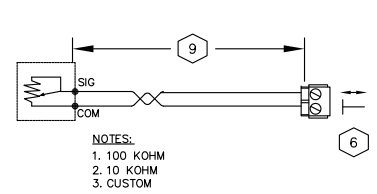
T 00 ANALOG INPUT (8X,8U) 0-10VDC
3-WIRE EXTERNAL POWERED



U 00 ANALOG INPUT (8X,8U) 0-10VDC
4-WIRE EXTERNAL POWERED



V 00 ANALOG INPUT (8X,8U) RTD



W 00 ANALOG INPUT (8X,8U) THERMISTOR

TXM1 TERMINATION TABLES

1. ALL TXM1 TERMINALS (MEASURING, NEUTRAL, RELAY, SUPPLY) ARE CONNECTED IN THE PLUG-IN I/O MODULE, NOT IN THE TERMINAL BUS.

TXM1.8D, TXM1.16D								
I/O POINT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
SYSTEM NEUTRAL ¹	1	3	5	7	9	11	13	15
DIGITAL INPUT	2	4	6	8	10	12	14	16

1. NEUTRAL CAN BE CONNECTED TO ANY NEUTRAL TERMINAL ON SAME MODULE AND SEVERAL CAN SHARE SAME NEUTRAL TERMINAL.

TXM1.16D																
I/O POINT	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
SYSTEM NEUTRAL	18	20	22	24	26	28	30	32								
DIGITAL INPUT ¹	19	21	23	25	27	29	31	33								

1. NO PULSE ACCUMULATOR

TXM1.8U, TXM1.8U-ML								
I/O POINT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
SYSTEM NEUTRAL	2	6	10	14	19	23	27	31
UNIVERSAL I/O	4	8	12	16	21	25	29	33
24V AC/DC ACTUATOR SUPPLY ¹		7		15		24		32

1. 24V DC ONLY AVAILABLE WITH BUS CONNECTOR MODULE (BCM) POWERED EXTERNALLY BY DC SUPPLY.

TXM1.8X, TXM1.8X-ML								
I/O POINT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
SYSTEM NEUTRAL	2	6	10	14	19	23	27	31
UNIVERSAL I/O	4	8	12	16	21	25	29	33
24V AC/DC ACTUATOR SUPPLY ²		7		15		24		32
24V DC SENSOR SUPPLY ³	3		11		20		28	

1. 4-20 mA OUTPUT AVAILABLE ON POINTS 5-8 ONLY.

2. 24V DC ONLY AVAILABLE WITH BUS CONNECTOR MODULE (BCM) POWERED EXTERNALLY BY DC SUPPLY.

3. MAY POWER EXTERNAL SENSORS 0.6w (25mA) OR 1.2w (50mA) PER TERMINATION UP TO 2.4w (100mA) MAXIMUM FOR ALL TERMINATIONS.

TXM1.6R, TXM1.6R-M						
I/O POINT	(1)	(2)	(3)	(4)	(5)	(6)
COMMON ¹	3	9	15	20	26	32
NORMALLY CLOSED	4	10	16	19	25	31
NORMALLY OPEN	2	8	14	21	27	33

1. COMMONS ARE NOT INTERNALLY CONNECTED.

NOTE: REFER TO TERMINATION SHEET #1 FOR INSTALLATION DETAILS.

CLIENT:		PRIME:		CONSULTANT:		Drawing Title:		Project Title:		Project Number:		Office of Facilities Management	
Department of Veterans Affairs		SIEMENS Pacific Gas and Electric Company		AEI Affiliated Engineers		TX-4/O TERMINATION SPEC. 2		VASF MEDICAL CENTER		440P-000000		Office of Facilities Management	
AS-BUILT CONTROL DRAWINGS		12/11/2012		12/11/2012		Approved:		Location: VA Medical Center, 4150 Clement Street, San Francisco, CA 94121		Building Number:		Drawing Number:	
100% CONTROL DRAWINGS		8/31/2012		8/31/2012		Date:		Checked:		Drawn:		TTRM2	
12/11/12 2:30:25 PM		C:\Program Files\Autodesk\LTPlot\LTPlot.exe		415 74-0700		8/31/12		RG		LO		Dep. 1 of 1 -	

TABLE 1

1. WHEN DAISY-CHAINING 24VAC POWER TO CONTROLLERS USE #14 WIRE
2. CONDUIT SHARTING RULES: ONLY WHERE LOCAL CODES PERMIT. BOTH CLASS1 AND CLASS 2 WIRING CAN BE RUN TO THE PXXC PROVIDED THE CLASS 2 WIRE IS UL LISTED 300V 75C(167F) OR HIGHER OR THE CLASS 2 WIRE IS NEC TYPE CM (F74) (75°C OR HIGHER) OR CMP(F76) (75°C OR HIGHER). NEC TYPE CL2 AND CL2P IS NOT ACCEPTABLE UNLESS ALSO UL LISTED AND MARKED 300V 75C (167F) OR HIGHER
3. TWISTED PAIR, NON-JACKETED UL LISTED 75C(167F) AND 300V. CABLE CAN BE USED IN PLACE OF CM(F74) OR CMP(F76)(BOTH MUST BE RATED 75°C OR HIGHER) CABLE WHEN CONTAINED IN CONDUIT PER LOCAL CODES SEE THE FIELD PURCHASING GUIDE FOR WIRE.

6. FOR 24AWG INSTALL CATEGORY5 OR BETTER CABLE PER ANSI/TIA/EIA-568-B.1 OR HIGHER. USE SOLID COPPER BETWEEN JACK BOXES. USE STRANDED COPPER PATCH CABLES 13ft (4m) TO CONNECT PXCC AND 20ft (6m) TO CONNECT SWITCH OR HUB.

TABLE 2

1. UL RECOGNIZED WIRE (LABELED WITH A BACKWARDS 'RU') IS NOT FIELD INSTALLABLE. USE ONLY UL-LISTED WIRE.
2. 300 VAC WIRE CAN BE USED IN FIELD PANELS CONTAINING VOLTAGES BELOW 150 VAC.

TABLE 3

TABLE 3 NOTES:
1. DISTANCES SHOWN ASSURE LESS THAN 10% VOLTAGE DROP ACROSS THE WIRE FOR A TYPICAL STARTER.

MAXIMUM NUMBER HSTIE IN SERIES ON ALN TRUNK

THE MUST BE USED TO ISOLATE ALN BETWEEN PXCM CONN
TO DIFFERENT SERVICE GROUNDS OR ON BOTH SIDES OF
ALN CABLE THAT EXITS BUILDING.
THE MAX ALN DISTANCE APPLIES TO EACH SIDE OF THE

COPPER WIRE LISTED FOR 90°C OR HIGHER

ONLY UL-LISTED WIRE.

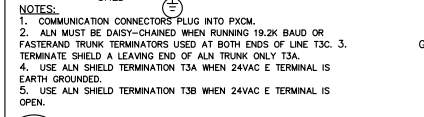
PXCM CONDUIT PENET

T1
00

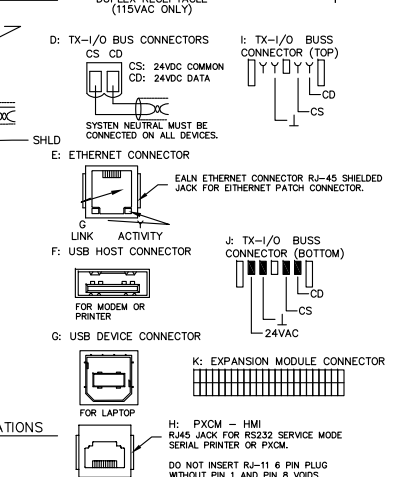
NOTES:

1. NO MORE THAN THREE (3) 384VA OR FIVE (5) 192VA FULLY LOADED PXA CABINETS ALLOWED ON A SINGLE 3-WIRE 115V, 15A CIRCUIT.
2. RECEPTACLE IS PREWIRED AND MOUNTED IN FACTORY, FOR 115VAC SERVICE BOX ONLY.
3. DC INPUT/OUTPUT ONLY AVAILABLE ON BUSS CONNECTION MODULES.

T2
00



T3	00
----	----

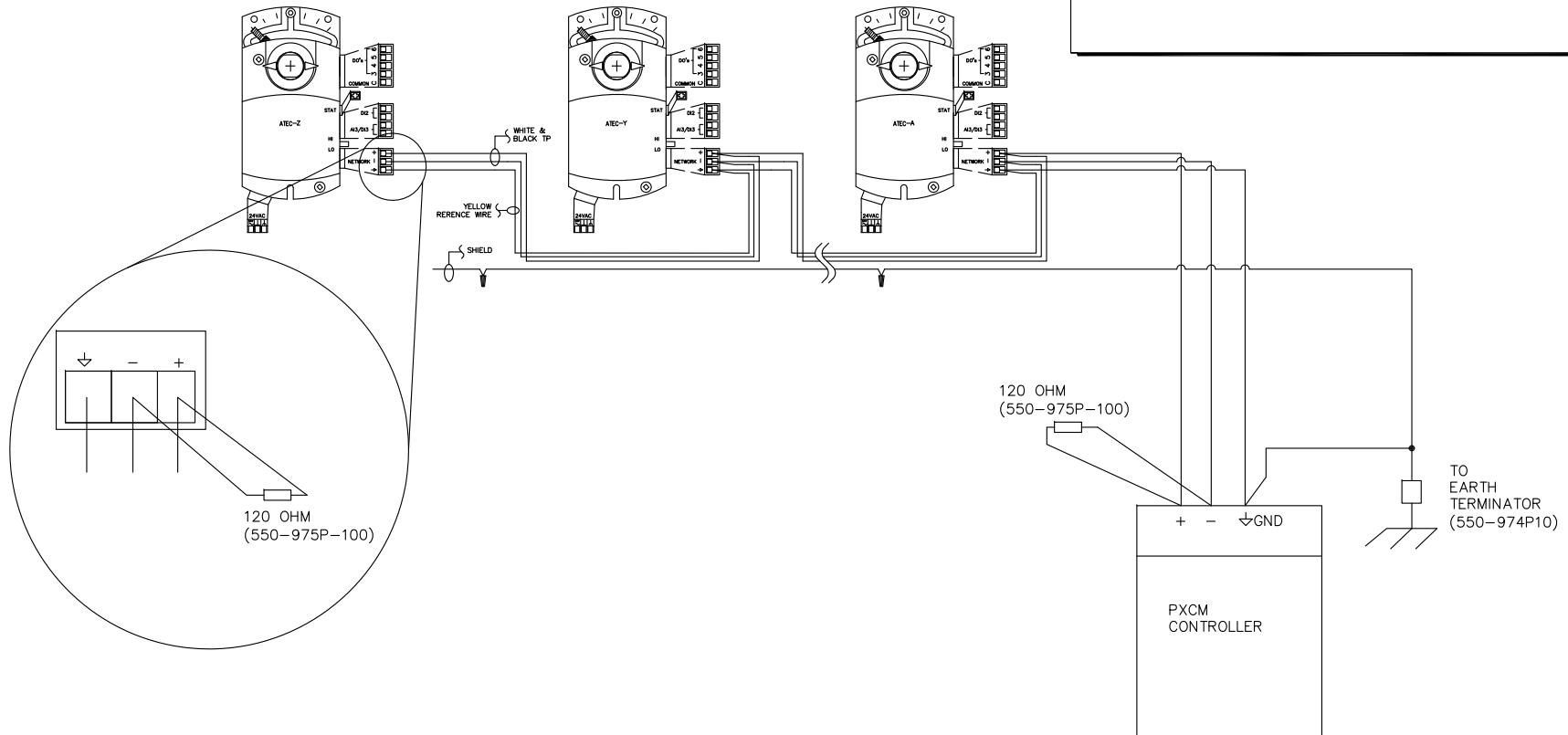
[illegible]

INSTALLATION NOTES:

1

BACNET THREE WIRE FLN DEVICES WILL REQUIRE RESISTORS (550-975P100) AT THE BEGINNING AND END. THE BAS CONNTRROLLER WILL REQUIRE AN EARTH GROUND TERMINATOR (550-974P10).

3-WIRE NODES ON A 1.5 PAIR CABLE



<p>12/17/12 2:30:30 PM C:\Program Files\Autodesk\AutoCAD 2012\AutoCAD.exe</p>	<p>CLIENT:</p>	<p>PRIME:</p> <p>SIEMENS </p> <p>3000 HUNTERTON BLVD SUITE 200 HAYWARD, CA 94541 USA PHONE: (510) 546-0000 FAX: (510) 546-0100</p>	<p>CONSULTANT:</p> <p>AEI  Affiliated Engineers</p> <p>125 HARBOR STREET 7TH FLOOR SAN FRANCISCO, CA 94102 415.784.0700</p>	<p>Drawing Title</p> <p>3-WIRE FLN DIAGRAM</p> <p>Approved:</p>	<p>Project Title</p> <p>VASF MEDICAL CENTER</p> <p>Location: VAF Medical Center, 4150 Clement Street San Francisco, California 94121</p> <p>Date: 8/31/12 Checked: RG Drawn: LO</p>	<p>Project Number</p> <p>440P-000000</p> <p>Building Number</p> <p>Drawing Number</p> <p>TWIRE</p> <p>Dep: 1 of 1</p> <p>Office of Facilities Management</p> <p>Department of Veterans Affairs</p>
---	----------------	--	--	--	--	--