



**OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION**

**APPLICATION FOR OSHPD SPECIAL SEISMIC
CERTIFICATION PREAPPROVAL (OSP)**

OFFICE USE ONLY

APPLICATION #: OSP – 0590 – 10

OSHPD Special Seismic Certification Preapproval (OSP)

Type: New Renewal

Manufacturer Information

Manufacturer: Frank M. Booth, Inc.

Manufacturer's Technical Representative: Jack Brassington

Mailing Address: 4220 Douglas Blvd., Granite Bay, CA 95746

Telephone: (916) 784-0707 Email: JackB@frankbooth.com

Product Information

Product Name: Temperature Control Panels

Product Type: Control Panels

Product Model Number: See Certified Product Table attached
(List all unique product identification numbers and/or part numbers)

General Description: Temperature control panels consisting of controller, transformers, power supply, relays, switches, fans, manual overrides, and network connectivity parts.

Mounting Description: Wall mounted-rigid & isolated; may be wall mounted on equipment or vertical supports.

Applicant Information

Applicant Company Name: TRU Compliance, by Structural Integrity Associates, Inc.

Contact Person: Galen Reid

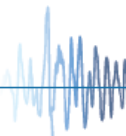
Mailing Address: 5215 Hellyer Ave., Suite 210, San Jose, CA 95138

Telephone: 844-878-0200 Email: greid@structint.com

I hereby agree to reimburse the Office of Statewide Health Planning and Development review fees in accordance with the California Administrative Code, 2016.

Signature of Applicant:  Date: 8/22/2019

Title: Program Manager Company Name: TRU Compliance, by Structural Integrity Associates, Inc.





**OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION**

California Licensed Structural Engineer Responsible for the Engineering and Test Report(s)

Company Name: TRU Compliance, by Structural Integrity Associates, Inc.

Name: Andrew M. Coughlin California License Number: S6082

Mailing Address: 5215 Hellyer Ave., Suite 210, San Jose, CA 95138

Telephone: 844-878-0200 Email: acoughlin@structint.com

Supports and Attachments Preapproval

- Supports and attachments are preapproved under OPM- _____
(Separate application for OSHPD Preapproval of Manufacturer's Certification (OPM) of Supports and attachments is required)
- Supports and attachments are not preapproved

Certification Method

- Testing in accordance with: ICC-ES AC156
- Other (Please Specify): _____

Testing Laboratory

Company Name: National Technical Systems – Silicon Valley

Contact Name: Ray Chavez

Mailing Address: 38995 Cherry Street, Newark, CA 94560

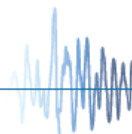
Telephone: (877)245-7800 Email: Ray.Chavez@nts.com

Company Name: National Technical Systems – Plano

Contact Name: Kimberly Zavala

Mailing Address: 1701 E. Plano Pkwy #150, Plano TX 75074

Telephone: (972)509-2566 Email: Kimberly.Zavala@nts.com





OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION

Seismic Parameters

Design in accordance with ASCE 7-10 Chapter 13: [X] Yes [] No

Design Basis of Equipment or Components (Fp/Wp) = 1.50 (rigid) & 4.50 (isolated) at SDS = 2.00, z/h = 1
1.13 (rigid) & 1.88 (isolated) at SDS = 2.50, z/h = 0

SDS (Design spectral response acceleration at short period, g) = 2.00 (z/h = 1), 2.50 (z/h = 0)

ap (In-structure equipment or component amplification factor) = 2.5 (rigid and isolated)

Rp (Equipment or component response modification factor) = 6.0 (rigid), 2.0 (isolated)

Omega_0 (System overstrength factor) = 2.0

Ip (Importance factor) = 1.5

z/h (Height factor ratio) = 1 (SDS = 2.00), 0 (SDS = 2.50)

Equipment or Component Natural Frequencies (Hz) = See Attachment

Overall dimensions and weight (or range thereof) = See Attachment

Equipment or Components @ grade designed in accordance with ASCE 7-10 Chapter 15: [] Yes [X] No

Design Basis of Equipment or Components (V/W) =

SDS (Design spectral response acceleration at short period, g) =

SD1 (Design spectral response acceleration at 1 second period, g) =

R (Response modification coefficient) =

Omega_0 (System overstrength factor) =

Cd (Deflection amplification factor) =

Ip (Importance factor) = 1.5

Height to Center of Gravity above base =

Equipment or Component Natural Frequencies (Hz) =

Overall dimensions and weight (or range thereof) =

Tank(s) designed in accordance with ASME BPVC, 2015: [] Yes [X] No

List of Attachments Supporting Special Seismic Certification

[X] Test Report(s) [] Drawings [] Calculations [X] Manufacturer's Catalog

[X] Other(s) (Please Specify): Product Matrices

OSHPD Approval (For Office Use Only) - Approval Expires on December 31, 2022

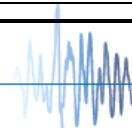
Signature: [Handwritten Signature] Date: December 12, 2019

Print Name: Timothy J. Piland Title: SSE

Special Seismic Certification Valid Up to: SDS (g) = See Above z/h = See Above

Condition of Approval (if applicable):

[Blank lines for condition of approval]



SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX

TRU PROJECT NO. 1801528



Manufacturer: Frank M. Booth, Inc.						TABLE 1	
Model Line: System Control Panels							
Certified Product Construction Summary: NEMA 3R, 14 gauge carbon steel enclosure							
Certified Options Summary:							
Mounting Configuration: Wall mounted - rigid Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.							
Building Code: CBC 2016		Seismic Certification Limits:			$S_{DS} = 2.0 g$ $z/h = 1.0$		
					$S_{DS} = 2.5 g$ $z/h = 0.0$		
					$I_P = 1.5$		
Model Line	Model	Dimensions (in)			Weight (lb)	Notes	UUT
		Depth	Width	Height			
System Control Panels	FMB-1	6	12	16	26		Extrap.
	FMB-2	6	16	16	27		Extrap.
	FMB-3	6	18	18	34		Extrap.
	FMB-4	6	16	20	33.4		Extrap.
	FMB-5	8	20	20	55.4		Extrap.
	FMB-6	8	20	24	66.2		Extrap.
	FMB-7	8.5	23.5	24	81		1
	FMB-8	8	24	30	98		Interp.
	FMB-9	10	18	18	53.5		Interp.
	FMB-10	8	30	30	115		Interp.
	FMB-11	10	24	24	89		Interp.
	FMB-12	10	24	30	107		Interp.
	FMB-13	10	36	36	186		Interp.
	FMB-14	12	30	30	150		Interp.
	FMB-15	12	24	36	138		Interp.
	FMB-16	12	30	36	165		Interp.
	FMB-17	12	30	42	189		Interp.
	FMB-18	12	36	36	191		Interp.
	FMB-19	12	36	42	218		Interp.
	FMB-20	12	36	48	244		Interp.
	FMB-21	12.5	35	60	296		2

SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX

TRU PROJECT NO. 1801528



Manufacturer: Frank M. Booth, Inc.	TABLE 2
Model Line: System Control Panels	

Certified Product Construction Summary:
NEMA 3R, 14 gauge carbon steel enclosure

Certified Options Summary:

Mounting Configuration:
Wall mounted - isolated
Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.

Building Code: CBC 2016 **Seismic Certification Limits:** $S_{DS} = 2.0 g$ $z/h = 1.0$ $I_p = 1.5$
 $S_{DS} = 2.5 g$ $z/h = 0.0$

Model Line	Model	Dimensions (in)			Weight (lb)	Notes	UUT
		Depth	Width	Height			
System Control Panels	FMB-1	6	12	16	26		Extrap.
	FMB-2	6	16	16	27		Extrap.
	FMB-3	6	18	18	34		Extrap.
	FMB-4	6	16	20	33.4		Extrap.
	FMB-5	8	20	20	55.4		Extrap.
	FMB-6	8	20	24	66.2		Extrap.
	FMB-7	8.5	23.5	24	81		3
	FMB-8	8	24	30	98		Interp.
	FMB-9	10	18	18	53.5		Interp.
	FMB-10	8	30	30	115		Interp.
	FMB-11	10	24	24	89		Interp.
	FMB-12	10	24	30	107		Interp.
	FMB-13	10	36	36	186		Interp.
	FMB-14	12	30	30	150		Interp.
	FMB-15	12	24	36	138		Interp.
	FMB-16	12	30	36	165		Interp.
	FMB-17	12	30	42	189		Interp.
	FMB-18	12	36	36	191		Interp.
	FMB-19	12	36	42	218		Interp.
	FMB-20	12	36	48	244		Interp.
	FMB-21	12.5	35	60	296		4

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

TRU PROJECT NO. 1801528



Manufacturer: Frank M. Booth, Inc.		Table Description: Panels, Back Plates, Hoods			TABLE 3
Model Line: System Control Panels					
Building Code: CBC 2016		Seismic Certification Limits:		$S_{DS} = 2.0 g \quad z/h = 1.0$ $S_{DS} = 2.5 g \quad z/h = 0.0$	
				$I_p = 1.5$	
Component Type	Manufacturer	Model	Description	Notes	UUT
NEMA 3R Enclosure	Hoffman	A16R126HCR	16"x 12"x 6", 14 ga carbon steel, 14.6 lbs.		Extrap.
		A16R166HCR	16"x 16"x 6", 14 ga. carbon steel, 14.9 lbs.		Extrap.
		A18R186HCR	18"x 18"x 6", 14 ga. carbon steel, 18.9lbs.		Extrap.
		A20R166HCR	20"x 16"x 6", 14 ga. carbon steel, 18.6 lbs.		Extrap.
		A20R208HCR	20"x 20"x 8", 14 ga. carbon steel, 30.8 lbs.		Extrap.
		A24R208HCR	24"x 20"x 8", 14 ga. carbon steel, 36.8 lbs.		Extrap.
		A24R248HCR	24"x 24"x 8", 14 ga. carbon steel, 43.9 lbs.		1,3
		A30R248HCR	30"x 24"x 8", 14 ga. carbon steel, 54.6 lbs.		Interp.
		A18R1810HCR	18"x 18"x 10", 14 ga. carbon steel, 30.6 lbs.		Interp.
		A30R308HCR	30"x 30 "x 8", 14 ga. carbon steel, 67.6 lbs.		Interp.
		A24R2410HCR	24"x 24"x 10", 14 ga. carbon steel, 53.8 lbs.		Interp.
		A30R2410HCR	30"x 24"x 10", 14 ga. carbon steel, 66.9 lbs.		Interp.
		A36R3610HCR	36"x 36"x 10", 14 ga. carbon steel, 119.8lbs.		Interp.
		A30R3012HCR	30"x 30"x 12", 14 ga. carbon steel, 99.4 lbs.		Interp.
		A36R2412HCR	36"x 24"x 12", 14 ga. carbon steel, 94.9 lbs.		Interp.
		A36R3012HCR	36"x 30"x 12", 14 ga. carbon steel, 118.1 lbs.		Interp.
		A42R3012HCR	42"x 30"x 12", 14 ga. carbon steel, 137.0 lbs.		Interp.
		A36R3612HCR	36"x 36"x 12", 14 ga. carbon steel, 140.2 lbs.		Interp.
		A42R3612HCR	42"x 36"x 12", 14 ga. carbon steel, 162.8 lbs.		Interp.
		A48R3612HCR	48"x 36"x 12", 14 ga. carbon steel, 185.1 lbs.		Interp.
A60R3612HCR	60"x 36"x 12", 14 ga. carbon steel, 230.3 lbs.		2,4		
Back Plates	Hoffman	A16P12	13"x 9", 12 ga. carbon steel, 3.7 lbs.		Extrap.
		A16P16	13"x 13", 12 ga. carbon steel, 5.3 lbs.		Extrap.

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

TRU PROJECT NO. 1801528



Manufacturer: Frank M. Booth, Inc. Model Line: System Control Panels		Table Description: Panels, Back Plates, Hoods			TABLE 3	
Building Code: CBC 2016		Seismic Certification Limits:			$S_{DS} = 2.0g \quad z/h = 1.0$ $S_{DS} = 2.5g \quad z/h = 0.0$	
					$I_p = 1.5$	
Component Type	Manufacturer	Model	Description	Notes	UUT	
Back Plates	Hoffman	A18P18	15"x 15", 12 ga. carbon steel, 7.1 lbs.		Extrap.	
		A20P16	17"x 13", 12 ga. carbon steel, 7 lbs.		Extrap.	
		A20P20	17"x 17", 12 ga. carbon steel, 9.1 lbs.		Extrap.	
		A24P20	21"x 17", 12 ga. carbon steel, 11.2 lbs.		Extrap.	
		A24P24	21"x 21", 12 ga. carbon steel, 13.9 lbs.		1,2	
		A30P24	27"x 21", 12 ga. carbon steel, 17.9 lbs.		Interp.	
		A30P30	27"x 27", 12 ga. carbon steel, 22.9 lbs.		Interp.	
		A36P24	33"x 21", 12 ga. carbon steel, 21.8 lbs.		Interp.	
		A36P30	33"x 27", 12 ga. carbon steel, 28 lbs.		Interp.	
		A36P36	33"x 33", 12 ga. carbon steel, 34.3 lbs.		Interp.	
		A42P30	39"x 27", 12 ga. carbon steel, 33.1 lbs.		Interp.	
		A42P36	39"x 33", 12 ga. carbon steel, 40.5 lbs.		Interp.	
		A48P36	45"x 33", 12 ga. carbon steel, 46.7 lbs.		Interp.	
		A60P36	57"x 33", 12 ga. carbon steel, 59.2 lbs.		2,4	
Hood	Hammond	RH20000LG	7.8'x 10.4'x 2.17", carbon steel, 3.7 lbs.		1,3	

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

TRU PROJECT NO. 1801528



Manufacturer: Frank M. Booth, Inc.		Table Description: Electrical Subcomponents			TABLE 4
Model Line: System Control Panels					
Building Code: CBC 2016		Seismic Certification Limits:		$I_p = 1.5$	
		$S_{DS} = 2.0 g \quad z/h = 1.0$			
		$S_{DS} = 2.5 g \quad z/h = 0.0$			
Component Type	Manufacturer	Model	Description	Notes	UUT
Transformers	Functional Devices	TR100VA001	Single Hub 120/24VAC 96VA, Cu Windings, 3.4 lbs.		1,2,3,4
		TR100VA001US	Single Hub 120/24VAC 96VA,Cu Windings, 3.4 lbs.	US in Model number denotes where component was manufactured, identical to TR100VA001	Interp.
		TR100VA002	Dual Hub 120/24VAC 96VA, Cu Windings, 4.13lbs		2,4
Relays	Functional Devices	RIBAN24G	10 AMP Control Relay		2,4
		RIBU1C	Power Switching Relay		2,4
	IDEC	RH1B-UL	24 VAC Illuminated Single Pole C-Form Relay		1,2,3,4
		RH2B-UL	24 VAC Illuminated Double Pole C-Form Relay		2,4
		RH3B-UL	24 VAC Illuminated Three Pole C-Form Relay		2,4
		RH4B-UL	24 VAC Illuminated Four Pole C-Form Relay		2,4
Relay Sockets	IDEC	SH1B-05	Socket Single Pole		1,2,3,4
		SH2B-05	Socket Double Pole		2,4
		SH3B-05	Socket Three Pole		2,4
		SH4B-05	Socket Four Pole		2,4
Fuse Holder	BUSS	HRK	Fuse Holder		2,4
Controller	Siemens	JACE-8000	IoT Controller		1,3
Communication Module	Siemens	TNM-8000	Two isolated RS 485 ports		2,4
Module (I/O)	Siemens	588-692	Remote IO MODULE NRIO 16		1,3
		IO-R-16	Remote I/O, 3.25"x 4.5"x 2.4"		2,4
		IO-R-34	Remote I/O, 6.8"x 4.5"x 2.4",		2,4
		PPM-2U22.BPF	BACnet Input / Output Module		2,4
		MSTP_PPM	BACnet Input / Output Module		2,4

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

TRU PROJECT NO. 1801528



Manufacturer: Frank M. Booth, Inc.		Table Description: Electrical Subcomponents			TABLE 4
Model Line: System Control Panels					
Building Code: CBC 2016		Seismic Certification Limits:			
		$S_{DS} = 2.0g \quad z/h = 1.0$		$I_P = 1.5$	
		$S_{DS} = 2.5g \quad z/h = 0.0$			
Component Type	Manufacturer	Model	Description	Notes	UUT
Power Supply Module	Siemens	588-679	NPB-PWR-UN Power Supply Module		1,3
		588-678 NPB-PWR	Power Supply Module		2,4
Power Supply	Kele	DCP-1.5-W	24 VAC to 24 VDC Power Supply		1,3
Port Expander	Siemens	NPB-8000-2X-485	RS-485 Port Expander		1,3
Manual Override	ACI	MAO	Manual Analog Override w/Alarm		1,3
	Kele	MOB-8	Manual digital override board w/alarm, plastic, 0.8 lbs., 7.5"x 3.25"		2,4
Grounding Block	Phoenix Contact	3046223	Grounding Block		1,2,3,4
Terminal Block	Phoenix Contact	3118203	Fuse Terminal Block		1,2,3,4
		3046139	Disconnecting Terminal Block		1,3
Fan	EBM PAPST	4314/2U	24 VDC Fan		1,3
Circuit Breaker	Phoenix Contact	0712194	1 Amp Thermal CB		1,2,3,4
		0712314	10 Amp Thermal Circuit Breaker		1,2,3,4
Power Receptacle	Leviton	GFNT1-W	15 Amp 115 V GFI Receptacle		1,3
Switches	IDEC	ABW-110	Momentary Pushbutton Switch		2,4
		LA1B-M1C5-B	Momentary Pushbutton Switch		2,4
		ASW-220	Two Position Selector Switch		2,4
		LA1S-2C6	Two Position Selector Switch		2,4
		APW199D-G-24V	24 VAC LED Pilot Light	Indicating Light	2,4
		LA1P-1C04-R	24 VAC LED Pilot Light	Indicating Light	2,4
	LA1L-M1C54-R	24 VAC Illuminated Momentary Switch		2,4	
	Veris	PAS03	Dry Differential Switch		2,4

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

TRU PROJECT NO. 1801528



Manufacturer: Frank M. Booth, Inc.	Table Description: Electrical Subcomponents	TABLE 4
Model Line: System Control Panels		

Building Code: CBC 2016	Seismic Certification Limits:	$S_{DS} = 2.0 g \quad z/h = 1.0$	$I_p = 1.5$
		$S_{DS} = 2.5 g \quad z/h = 0.0$	

Component Type	Manufacturer	Model	Description	Notes	UUT
Switches	Veris	PX3ULX05	Digital Pressure Transducer (Dry Media)	Transducer	2,4
	Dwyer	1910-10	Pressure Switch		2,4
Ethernet Switch	Contemporary Controls	EIBA5-100T/R	5-Port Unmanaged Switch		1,3

UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 1801528



Manufacturer: Frank M. Booth, Inc.

Model Line: System Control Panels

UUT	Unit Description	Report Number	Testing Laboratory	S _{DS}	z/h	I _p
1	System Control Panel FMB-7 Wal Mounted - Rigid	TR-089325.01 ENV Rev.4	National Technical Systems - Silicon Valley	2.0 2.5	1.0 0.0	1.5
2	System Control Panel FMB-21 Wall Mounted - Rigid	TR-089325.01 ENV Rev.4	National Technical Systems - Silicon Valley	2.0 2.5	1.0 0.0	1.5
3	System Control Panel FMB-7 Wall Mounted - Isolated	TR-089325.01 ENV Rev.4	National Technical Systems - Plano	2.0 2.5	1.0 0.0	1.5
4	System Control Panel FMB-21 Wall Mounted - Isolated	TR-089325.01 ENV Rev.4	National Technical Systems - Plano	2.0 2.5	1.0 0.0	1.5

Notes:

UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 1801528



Manufacturer: Frank M. Booth, Inc.	UUT 1
Model Line: System Control Panels	
Model Number: FMB-7 Serial Number: N/A	

Product Construction Summary:
14 ga. carbon steel enclosure, 12 ga. carbon steel back panel

Options/Subcomponent Summary:
Manual Analog Override (MAO), Transformer (TR100VA001), Single Pole Relay (RH1B-UL), Relay Socket (SH1B-05), IoT Controller (JACE-8000), I/O Module (588-692), Power Supply Module (588-679), Power Supply (DCP-1.5-W), Port Expander (NPB-8000-2X-485), Grounding Block (3046223), Fuse Terminal Block (3118203), Disconnecting Terminal Block (3046139), Fan (4314/2U), Circuit Breaker (0712194, 0712314), Power Receptacle (GFNT1-W), Switch (EIBA5-100T/R)

UUT Properties						
Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
81	8.5	23.5	24	N/A	N/A	N/A

UUT Highest Passed Seismic Run Information									
Building Code	Test Criteria	S _{DS} (g)	z/h	I _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)	
CBC 2016	ICC-ES AC156 (2015)	2.0	1.0	1.5	3.20	2.40	1.67	0.67	
		2.5	0.0						

Test Mounting Details:



Unit was wall mounted- rigid with four (4) 5/16" x 2" zinc hex head lag bolts (ungraded) and washers.
Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.
Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 1801528



Manufacturer:	Frank M. Booth, Inc.	UUT 2
Model Line:	System Control Panels	
Model Number:	FMB-21	
Serial Number:		N/A

Product Construction Summary:
14 ga. carbon steel enclosure, 12 ga. carbon steel back panel

Options/Subcomponent Summary:
Transformers (TR100VA001, TR100VA002), Control Relay (RIBAN24G), Power Switching Relay (RIBU1C), Single Pole Relay (RH1B-UL), Double Pole Relay (RH2B-UL), Three Pole Relay (RH3B-UL), Four Pole Relay (RH4B-UL), Relay Socket Single Pole (SH1B-05), Relay Socket Single Pole (SH2B-05), Relay Socket Three Pole (SH3B-05), Relay Socket Four Pole (SH4B-05), Fuse Holder (HRK), Controller (TNM-8000), I/O Remote Module (IO-R-16, IO-R-34), BACnet I/O Module (PPM-2U22.BFP, MSTP_PPM), Power Supply Module (588-678 NPB-PWR), Manual Digital Override (MOB-8), Grounding Block (3046223), Fuse Terminal Block (3118203), Circuit Breaker(0712194, 0712314), Pushbutton Switch (ABW-110, LA1B-M1C5-B), Selector Switch (ASW-220, LA1S-2C6), LED Pilot Light (APW199D-G-24V, LA19-1C04-R), Momentary Switch (LA1L-M1C54-R), Differential Switch (PAS03), Pressure Transducer (PX3ULX05), Pressure Switch(1910-10)

UUT Properties

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
296	12.5	35	60	N/A	N/A	N/A

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S _{DS} (g)	z/h	I _p	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 2016	ICC-ES AC156 (2015)	2.0	1.0	1.5	3.20	2.40	1.67	0.67
		2.5	0.0					

Test Mounting Details:



Unit was wall mounted- rigid with six (6) 5/16" x 2" zinc hex head lag bolts (ungraded) and washers.
Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.
Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 1801528



Manufacturer: Frank M. Booth, Inc.	UUT 3
Model Line: System Control Panels	
Model Number: FMB-7 Serial Number: N/A	

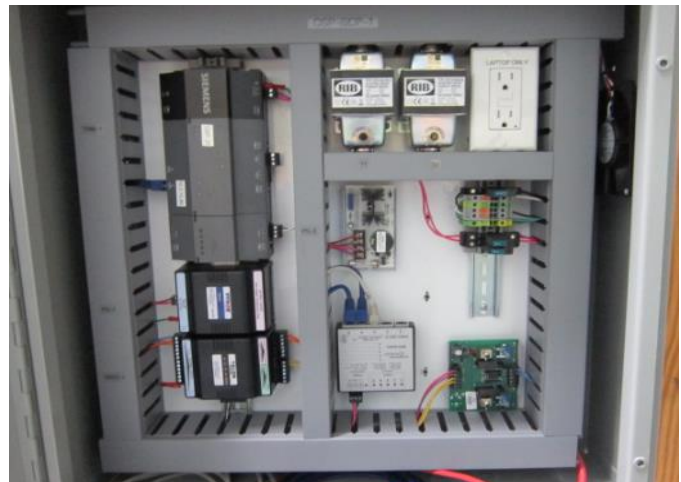
Product Construction Summary:
14 ga. carbon steel enclosure, 12 ga. carbon steel back panel

Options/Subcomponent Summary:
Manual Analog Override (MAO), Transformer (TR100VA001), Single Pole Relay (RH1B-UL), Relay Socket (SH1B-05), IoT Controller (JACE-8000), I/O Module (588-692), Power Supply Module (588-679), Power Supply (DCP-1.5-W), Port Expander (NPB-8000-2X-485), Grounding Block (3046223), Fuse Terminal Block (3118203), Disconnecting Terminal Block (3046139), Fan (4314/2U), Circuit Breaker (0712194, 0712314), Power Receptacle (GFNT1-W), Switch (EIBA5-100T/R)

UUT Properties						
Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
81	8.5	23.5	24	N/A	N/A	N/A

UUT Highest Passed Seismic Run Information									
Building Code	Test Criteria	S _{DS} (g)	z/h	I _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)	
CBC 2016	ICC-ES AC156 (2015)	2.0	1.0	1.5	3.20	2.40	1.67	0.67	
		2.5	0.0						

Test Mounting Details:



Unit was wall mounted- isolated. Unit was mounted to the wall fixture with four (4) 5/16" x 2" zinc hex head lag bolts (ungraded) and washers. Fixture was mounted to VibraSystem SMRT123 and SMRT124 with 1/2" Grade 5 bolt. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 1801528



Manufacturer:	Frank M. Booth, Inc.	UUT 4
Model Line:	System Control Panels	
Model Number:	FMB-21	
Serial Number:		N/A

Product Construction Summary:
14 ga. carbon steel enclosure, 12 ga. carbon steel back panel

Options/Subcomponent Summary:
Transformers (TR100VA001, TR100VA002), Control Relay (RIBAN24G), Power Switching Relay (RIBU1C), Single Pole Relay (RH1B-UL), Double Pole Relay (RH2B-UL), Three Pole Relay (RH3B-UL), Four Pole Relay (RH4B-UL), Relay Socket Single Pole (SH1B-05), Relay Socket Single Pole (SH2B-05), Relay Socket Three Pole (SH3B-05), Relay Socket Four Pole (SH4B-05), Fuse Holder (HRK), Controller (TNM-8000), I/O Remote Module (IO-R-16, IO-R-34), BACnet I/O Module (PPM-2U22.BFP, MSTP_PPM), Power Supply Module (588-678 NPB-PWR), Manual Digital Override (MOB-8), Grounding Block (3046223), Fuse Terminal Block (3118203), Circuit Breaker(0712194, 0712314), Pushbutton Switch (ABW-110, LA1B-M1C5-B), Selector Switch (ASW-220, LA1S-2C6), LED Pilot Light (APW199D-G-24V, LA19-1C04-R), Momentary Switch (LA1L-M1C54-R), Differential Switch (PAS03), Pressure Transducer (PX3ULX05), Pressure Switch(1910-10)

UUT Properties

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
296	12.5	35	60	N/A	N/A	N/A

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S _{DS} (g)	z/h	I _p	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 2016	ICC-ES AC156 (2015)	2.0	1.0	1.5	3.20	2.40	1.67	0.67
		2.5	0.0					

Test Mounting Details:



Unit was wall mounted- isolated. Unit was mounted to the wall fixture with six (6) 5/16" x 2" zinc hex head lag bolts (ungraded) and washers. Fixture was mounted to VibraSystem SMRT123 and SMRT124 with 1/2" Grade 5 bolt.
Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.
Contents were included in testing per operating conditions.