



OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION

APPLICATION FOR OSHPD SPECIAL SEISMIC
CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY

APPLICATION #: OSP – 0222-10

OSHPD Special Seismic Certification Preapproval (OSP)

Type: ☐ New ☒ Renewal

Manufacturer Information

Manufacturer: Technibus Inc.

Manufacturer's Technical Representative: Mike Baker

Mailing Address: 1501 Raff Road S.W. Canton, Ohio 44710

Telephone: (330) 478-6395 Email: mbaker@technibus.com

Product Information

Product Name: Metal Enclosed Bus Duct

Product Type: 600V, 5kV, and 15kV Bus Duct

Product Model Number: 600V, 5kV, and 15kV – Brand Labeled for GE, Square D, and Siemens – See Attached
(List all unique product identification numbers and/or part numbers)

General Description: Metal Enclosed Bus Duct consisting of an internally supported bus bar within a metal enclosure that is mounted either horizontally or vertically. Bus segments are combined and include horizontal/vertical elbows, phase-transpositions, expansion joints, tee-tap segments, fire-stops, heaters, and thermostats.

Mounting Description: Bottom and side mounts on each side of the duct.

Applicant Information

Applicant Company Name: W.E. Gundy & Associates

Contact Person: Travis Soppe, SE

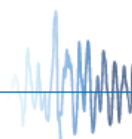
Mailing Address: 250 Bobwhite Ct, Suite 100, Boise, ID 83706

Telephone: (208) 342-5989 Email: tsoppe@wegai.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: 1/20/2017

Title: Vice President Company Name: W.E. Gundy & Associates, Inc.





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

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

Company Name: W.E. Gundy & Associates, Inc.

Name: Travis E. Soppe, SE California License Number: S6115

Mailing Address: 250 Bobwhite Ct, Suite 100, Boise, ID 83706

Telephone: (208) 342-5989 Email: tsoppe@wegai.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): _____

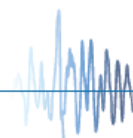
Testing Laboratory

Company Name: Clark Dynamic Test Laboratory

Contact Name: Russel Matich

Mailing Address: 1801 Route 51 South, Jefferson Hills, PA 15025

Telephone: (412) 387-1004 Email: rmatich@clarktesting.com





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Seismic Parameters

Design in accordance with ASCE 7-10 Chapter 13: ☒ Yes ☐ No

Design Basis of Equipment or Components (F_p/W_p) = 1.44

S_{DS} (Design spectral response acceleration at short period, g) = 2.0

a_p (In-structure equipment or component amplification factor) = 1.0

R_p (Equipment or component response modification factor) = 2.5

Ω_0 (System overstrength factor) = 2.0

I_p (Importance factor) = 1.5

z/h (Height factor ratio) = 1.0

Equipment or Component Natural Frequencies (Hz) = Multiple, See Attachment

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

Equipment or Components @ grade designed in accordance with ASCE 7-10 Chapter 15: ☐ Yes ☒ No

Design Basis of Equipment or Components (VW) = _____

S_{DS} (Design spectral response acceleration at short period, g) = _____

S_{D1} (Design spectral response acceleration at 1 second period, g) = _____

R (Response modification coefficient) = _____

Ω_0 (System overstrength factor) = _____

C_d (Deflection amplification factor) = _____

I_p (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 ☐ No

List of Attachments Supporting Special Seismic Certification

☒ Test Report(s) ☐ Drawings ☐ Calculations ☐ Manufacturer's Catalog

☒ Other(s) (Please Specify): Certified Product Matrix, UUT Summary Sheets, Subcomponent Certification Letter

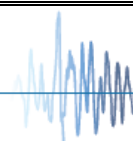
OSHDP Approval (For Office Use Only) – Approval Expires on December 31, 2022

Signature: M. R. Karim Date: 2/27/2017

Print Name: M. R. Karim Title: SHFR

Special Seismic Certification Valid Up to : S_{DS} (g) = 2.0 z/h = 1.0

Condition of Approval (if applicable): _____



**TECHNIBUS METAL ENCLOSED 600V, 5kV, and 15kV
CERTIFIED PRODUCT LINE MATRIX
VERTICAL BUS BAR ORIENTATION**



Technibus Identification Number	Bus Material	Bus # and Size (in)	Bus Support Material	Bus Support Spacing (min-max)	Enclosure Material	Width	Depth	Duct Weight (lbs/ft) (min - max)	Representative UUT
6-a-12	AL	(3) 0.50x3	GPO3*/PORC	4" - 9"	AL*/SS/STL	21"	8"	21* - 42	UUT 4-L, UUT 3-U
6-a-12 w/neutral	AL	(4) 0.50x3	GPO3/PORC	4" - 9"	AL/SS/STL	21"	8"	23 - 44	
6-c-12	CU	(3) 0.38x3	GPO3/PORC	5" - 8"	AL/SS/STL	21"	8"	29 - 50	
6-c-12 w/neutral	CU	(4) 0.38x3	GPO3/PORC	5" - 8"	AL/SS/STL	21"	8"	34 - 55	
6-a-16	AL	(3) 0.62x4	GPO3/PORC	7" - 14"	AL/SS/STL	21"	10"	26 - 48	
6-a-16 w/neutral	AL	(4) 0.62x4	GPO3/PORC	7" - 14"	AL/SS/STL	21"	10"	29 - 51	
6-c-16	CU	(3) 0.50x3	GPO3/PORC	6" - 11"	AL/SS/STL	21"	8"	33 - 55	
6-c-16 w/neutral	CU	(4) 0.50x3	GPO3/PORC	6" - 11"	AL/SS/STL	21"	8"	39 - 61	
6-a-20	AL	(3) 0.62x6	GPO3/PORC	8" - 17"	AL/SS/STL	21"	14"	32 - 57	
6-a-20 w/neutral	AL	(4) 0.62x6	GPO3/PORC	8" - 17"	AL/SS/STL	21"	14"	36 - 41	
6-c-20	CU	(3) 0.62x4	GPO3/PORC	9" - 16"	AL/SS/STL	21"	10"	47 - 69	
6-c-20 w/neutral	CU	(4) 0.62x4	GPO3/PORC	9" - 16"	AL/SS/STL	21"	10"	56 - 78	
6-a-25	AL	(6) 0.38x6	GPO3/PORC	8" - 17"	AL/SS/STL	27"	14"	37 - 65	
6-a-25 w/neutral	AL	(8) 0.38x6	GPO3/PORC	8" - 17"	AL/SS/STL	27"	14"	42 - 70	
6-c-25	CU	(3) 0.50x6	GPO3/PORC	8" - 15"	AL/SS/STL	21"	14"	54 - 79	
6-c-25 w/neutral	CU	(4) 0.50x6	GPO3/PORC	8" - 15"	AL/SS/STL	21"	14"	66 - 91	
6-a-32	AL	(6) 0.62x6	GPO3/PORC	14" - 28"	AL/SS/STL	27"	14"	47 - 76	
6-a-32 w/neutral	AL	(8) 0.62x6	GPO3/PORC	14" - 28"	AL/SS/STL	27"	14"	56 - 85	
6-c-32	CU	(6) 0.38x6	GPO3/PORC	10" - 19"	AL/SS/STL	27"	14"	75 - 104	
6-c-32 w/neutral	CU	(8) 0.38x6	GPO3/PORC	10" - 19"	AL/SS/STL	27"	14"	92 - 122	
6-c-40	CU	(6) 0.63x6	GPO3/PORC	24" - 42"	AL/SS/STL	36"	14"	111 - 138	
6-c-40 w/neutral	CU	(8) 0.63x6	GPO3/PORC	21" - 37"	AL/SS/STL	36"	14"	155 - 182	
5/15-c-40	CU	(6) 0.63x6	GPO3/PORC	30"	AL/SS/STL	36"	14"	125 - 163	
6-c-50	CU	(6) 0.50x8	GPO3/PORC	24" - 43"	AL/SS/STL	42"	24"	131 - 165	
6-c-50 w/neutral	CU	(8) 0.50x8	GPO3/PORC	22" - 39"	AL/SS/STL	42"	24"	160 - 194	
5/15-c-50	CU	(8) 0.50x8	GPO3/PORC	42"	AL/SS/STL	42"	24"	143 - 187	
5/15-c-60	CU	(12) 0.38x6	GPO3*/PORC*	36"* & 42"	AL/SS*/STL*	42"	28"	162 - 206*	UUT 3-L, UUT 2-U
6-c-60	CU	(12) 0.38x6	GPO3*/PORC*	18"* - 39"	AL/SS*/STL*	42"	28"	162 - 206*	UUT 3-L, UUT 2-U

General Notes:

- 1) Tested configuration consists of horizontal main span with support spacing ≤ 180", vertical main span with support spacing ≤ 48", horizontal elbow with support spacing ≤ 30", vertical transition elbow with support spacing ≤ 24", and phase-reversal and tee-tap sections supported on both sides.
 - 2) See drawings X-023-0004-2, X-023-0014-2, X-023-0020-2, X-023-0021-2, and X-023-022-2 for cross section information.
 - 3) Listed Duct weights represent the duct with an aluminum enclosure (low weight) and steel enclosure (high weight).
- * Indicates the material of bus and enclosure, bus support spacing, and duct weight represented by the UUT.

**TECHNIBUS METAL ENCLOSED 600V, 5kV, and 15kV
CERTIFIED PRODUCT LINE MATRIX
HORIZONTAL BUS BAR ORIENTATION**



Technibus Identification Number	Bus Material	Bus # and Size (in)	Bus Support Material	Bus Support Spacing (min-max)	Enclosure Material	Width	Depth	Duct Weight (lbs/ft) (min - max)	Representative UUT
5*/15-a-12	AL	(3) 0.50x3	POLY*/PORC*	20" - 48"*	AL*/SS/STL	27"	14"	30* - 61	UUT 2-L, UUT 1-U
5/15-UL-c-12	CU	(3) 0.38x3	POLY	24"	AL	27"	14"	34	
5/15-c-12	CU	(3) 0.25x3	POLY/PORC	20" - 48"	AL/SS/STL	27"	14"	34 - 65	
5/15-a-16	AL	(3) 0.62x4	POLY/PORC	23" - 48"	AL/SS/STL	30"	14"	34 - 68	
5/15-UL-c-16	CU	(3) 0.50x3	POLY	36"	AL	27"	14"	41	
5/15-c-16	CU	(3) 0.50x3	POLY/PORC	20" - 48"	AL/SS/STL	27"	14"	41 - 74	
5/15-a-20	AL	(3) 0.62x6	POLY/PORC	29" - 48"	AL/SS/STL	36"	14"	41 - 79	
5/15-UL-c-20	CU	(3) 0.62x4	POLY	39"	AL	30"	14"	55	
5/15-c-20	CU	(3) 0.62x4	POLY/PORC	23" - 48"	AL/SS/STL	30"	14"	55 - 89	
5/15-a-25	AL	(6) 0.62x4	POLY/PORC	46" - 48"	AL/SS/STL	30"	14"	44 - 77	
5/15-UL-c-25	CU	(3) 0.50x6	POLY	42"	AL	36"	14"	64	
5/15-c-25	CU	(3) 0.50x6	POLY/PORC	29" - 48"	AL/SS/STL	36"	14"	64 - 101	
5/15-a-32	AL	(6) 0.62x6	POLY/PORC	48"	AL/SS/STL	36"	14"	55 - 93	
5/15-UL-c-32	CU	(6) 0.38x6	POLY	48"	AL	36"	14"	85	
5/15*-c-32	CU	(6) 0.38x6	POLY*/PORC*	48"	AL/SS*/STL*	36"	14"	85 - 122*	UUT 1-L, UUT 4-U

General Notes:

- 1) Tested configuration consists of horizontal main span with support spacing $\leq 180"$, vertical main span with support spacing $\leq 48"$, horizontal elbow with support spacing $\leq 30"$, vertical transition elbow with support spacing $\leq 24"$, and phase-reversal and tee-tap sections supported on both sides.
- 2) See drawings X-027-001-2 and X-027-002-2 for cross section information.
- 3) Listed Duct weights represent the duct with an aluminum enclosure (low weight) and steel enclosure (high weight).

* Indicates the material of bus and enclosure, bus support spacing, and duct weight represented by the UUT.

TECHNIBUS METAL ENCLOSED 600V, 5kV, and 15kV CERTIFIED SUBCOMPONENT MATRIX

Subassembly Type	Manufacturer	Item Number/Description	Representative UUT
Shipping Split - S1	Technibus	Bus hdwr ZP w/LK, Cover hdwr 316ss	UUT 1-L & UUT 3-L
Shipping Split - S2	Technibus	Bus hdwr 304ss w/LK, Cover hdwr tek screw	UUT 1-L
Shipping Split - S3	Technibus	Bus hdwr ZP w/Bell, Cover hdwr tek screw	UUT 2-L & UUT 4-L
Shipping Split - S4	Technibus	Bus hdwr 304ss w/Bell, Cover hdwr 304ss thru-bolt	UUT 2-L
Shipping Split - S5	Technibus	Bus hdwr 316ss w/Bell, Cover hdwr 300 series tek screw	UUT 2-L
Bus Split - S6	Technibus	Bus hdwr 304ss w/Bell	UUT 3-L
Shipping Split - S7	Technibus	Bus hdwr SBZ w/Bell, Cover hdwr 300 series tek screw	UUT 4-L
12" Strip Heater 240v/150w	Chromalox	OT-1225 129402	UUT 1-L
12" Strip Heater 415v/250w	Chromalox	PT-12VW 600002108	UUT 1-L
8" Strip Heater 240v/150w	Chromalox	OT-815 129349	UUT 2-L
8" Strip Heater 415v/250w	Chromalox	OT-827vw 275w 813290	UUT 2-L
Large Ring Heater 750w	Chromalox	A-70 792826	UUT 1-L & UUT 3-L
Small Ring Heater 500w	Chromalox	A-70 792825	UUT 4-L
Termination Box	Technibus	24 x 24 x 42 - AL/SS/STL - Assembly 4A5	UUT 1-L & 2-L
Termination Box	Technibus	24 x 36 x 48 - AL/SS/STL - Assembly 2A5	UUT 3-L & 4-L
Heater Monitor Box	Technibus	X-115-0001 - Heater remote thermostat & alarm	UUT 1-L & 2-L
Outdoor Junction Box	Technibus	2 x 4 x 4 14ga	UUT 3-L
Indoor Junction Box	Technibus	2 x 4 x 4 14ga	UUT 4-L
Standard Thermostat	Thermodisc	6OT21 202877	UUT 3-L
Explosion Proof Thermostat	Johnson Controls	A19AUC-3C	UUT 4-L
Adjustable Thermostat	Penn	A19ABC-24E	UUT 2-L
1/2 Hour Firestop	Technibus	1/2 HR rating - 2001 silicone RTV foam	UUT 3-U, UUT 1-U
3 Hour Firestop	Technibus	3 HR rating - 2001 silicone RTV foam	UUT 3-L
Expansion Joint	Technibus	Indoor 5kv - 1200amp	UUT 1-U
Expansion Joint	Technibus	Outdoor 600v - 6000amp	UUT 2-U
Expansion Joint	Technibus	Indoor 600v - 1200amp	UUT 3-U
Expansion Joint	Technibus	Outdoor 15v - 3200amp	UUT 4-U

TECHNIBUS METAL ENCLOSED 600V, 5kV, and 15kV MULTIPLE LISTING / BRANDED PRODUCT LINE MATRIX VERTICAL BUS BAR ORIENTATION



Technibus Identification #	Square D Identification #  SQUARE D by Schneider Electric	Siemens Identification # 	GE Identification # 	Representative UUT
6-a-12	SQD-6-a-12	SM-6-a-12	GE-6-a-12	UUT 4-L, UUT 3-U
6-a-12 w/neutral	SQD-6-a-12 w/neutral	SM-6-a-12 w/neutral	GE-6-a-12 w/neutral	
6-c-12	SQD-6-c-12	SM-6-c-12	GE-6-c-12	
6-c-12 w/neutral	SQD-6-c-12 w/neutral	SM-6-c-12 w/neutral	GE-6-c-12 w/neutral	
6-a-16	SQD-6-a-16	SM-6-a-16	GE-6-a-16	
6-a-16 w/neutral	SQD-6-a-16 w/neutral	SM-6-a-16 w/neutral	GE-6-a-16 w/neutral	
6-c-16	SQD-6-c-16	SM-6-c-16	GE-6-c-16	
6-c-16 w/neutral	SQD-6-c-16 w/neutral	SM-6-c-16 w/neutral	GE-6-c-16 w/neutral	
6-a-20	SQD-6-a-20	SM-6-a-20	GE-6-a-20	
6-a-20 w/neutral	SQD-6-a-20 w/neutral	SM-6-a-20 w/neutral	GE-6-a-20 w/neutral	
6-c-20	SQD-6-c-20	SM-6-c-20	GE-6-c-20	
6-c-20 w/neutral	SQD-6-c-20 w/neutral	SM-6-c-20 w/neutral	GE-6-c-20 w/neutral	
6-a-25	SQD-6-a-25	SM-6-a-25	GE-6-a-25	
6-a-25 w/neutral	SQD-6-a-25 w/neutral	SM-6-a-25 w/neutral	GE-6-a-25 w/neutral	
6-c-25	SQD-6-c-25	SM-6-c-25	GE-6-c-25	
6-c-25 w/neutral	SQD-6-c-25 w/neutral	SM-6-c-25 w/neutral	GE-6-c-25 w/neutral	
6-a-32	SQD-6-a-32	SM-6-a-32	GE-6-a-32	
6-a-32 w/neutral	SQD-6-a-32 w/neutral	SM-6-a-32 w/neutral	GE-6-a-32 w/neutral	
6-c-32	SQD-6-c-32	SM-6-c-32	GE-6-c-32	
6-c-32 w/neutral	SQD-6-c-32 w/neutral	SM-6-c-32 w/neutral	GE-6-c-32 w/neutral	
6-c-40	SQD-6-c-40	SM-6-c-40	GE-6-c-40	
6-c-40 w/neutral	SQD-6-c-40 w/neutral	SM-6-c-40 w/neutral	GE-6-c-40 w/neutral	
5/15-c-40	SQD-5/15-c-40	SM-5/15-c-40	GE-5/15-c-40	
6-c-50	SQD-6-c-50	SM-6-c-50	GE-6-c-50	
6-c-50 w/neutral	SQD-6-c-50 w/neutral	SM-6-c-50 w/neutral	GE-6-c-50 w/neutral	
5/15-c-50	SQD-5/15-c-50	SM-5/15-c-50	GE-5/15-c-50	
5/15-c-60	SQD-5/15-c-60	SM-5/15-c-60	GE-5/15-c-60	UUT 3-L, UUT 2-U
6-c-60	SQD-6-c-60	SM-6-c-60	GE-6-c-60	UUT 3-L, UUT 2-U

General Notes:

- 1) Tested configuration consists of horizontal main span with support spacing $\leq 180"$, vertical main span with support spacing $\leq 48"$, horizontal elbow with support spacing $\leq 30"$, vertical transition elbow with support spacing $\leq 24"$, and phase-reversal and tee-tap sections supported on both sides.
- 2) See drawings X-023-0004-2, X-023-0014-2, X-023-0020-2, X-023-0021-2, and X-023-022-2 for cross section information.

TECHNIBUS METAL ENCLOSED 600V, 5kV, and 15kV MULTIPLE LISTING / BRANDED PRODUCT LINE MATRIX HORIZONTAL BUS BAR ORIENTATION



Technibus Identification #	Square D Identification # 	Siemens Identification # 	GE Identification # 	Representative UUT
5/15-a-12	SQD-5/15-a-12	SM-5*/15-a-12	GE-5*/15-a-12	UUT 2-L, UUT 1-U
5/15-UL-c-12	SQD-5/15-UL-c-12	SM-5/15-UL-c-12	GE-5/15-UL-c-12	
5/15-c-12	SQD-5/15-c-12	SM-5/15-c-12	GE-5/15-c-12	
5/15-a-16	SQD-5/15-a-16	SM-5/15-a-16	GE-5/15-a-16	
5/15-UL-c-16	SQD-5/15-UL-c-16	SM-5/15-UL-c-16	GE-5/15-UL-c-16	
5/15-c-16	SQD-5/15-c-16	SM-5/15-c-16	GE-5/15-c-16	
5/15-a-20	SQD-5/15-a-20	SM-5/15-a-20	GE-5/15-a-20	
5/15-UL-c-20	SQD-5/15-UL-c-20	SM-5/15-UL-c-20	GE-5/15-UL-c-20	
5/15-c-20	SQD-5/15-c-20	SM-5/15-c-20	GE-5/15-c-20	
5/15-a-25	SQD-5/15-a-25	SM-5/15-a-25	GE-5/15-a-25	
5/15-UL-c-25	SQD-5/15-UL-c-25	SM-5/15-UL-c-25	GE-5/15-UL-c-25	
5/15-c-25	SQD-5/15-c-25	SM-5/15-c-25	GE-5/15-c-25	
5/15-a-32	SQD-5/15-a-32	SM-5/15-a-32	GE-5/15-a-32	
5/15-UL-c-32	SQD-5/15-UL-c-32	SM-5/15-UL-c-32	GE-5/15-UL-c-32	
5/15*-c-32	SQD-5/15*-c-32	SM-5/15*-c-32	GE-5/15*-c-32	UUT 1-L, UUT 4-U

General Notes:

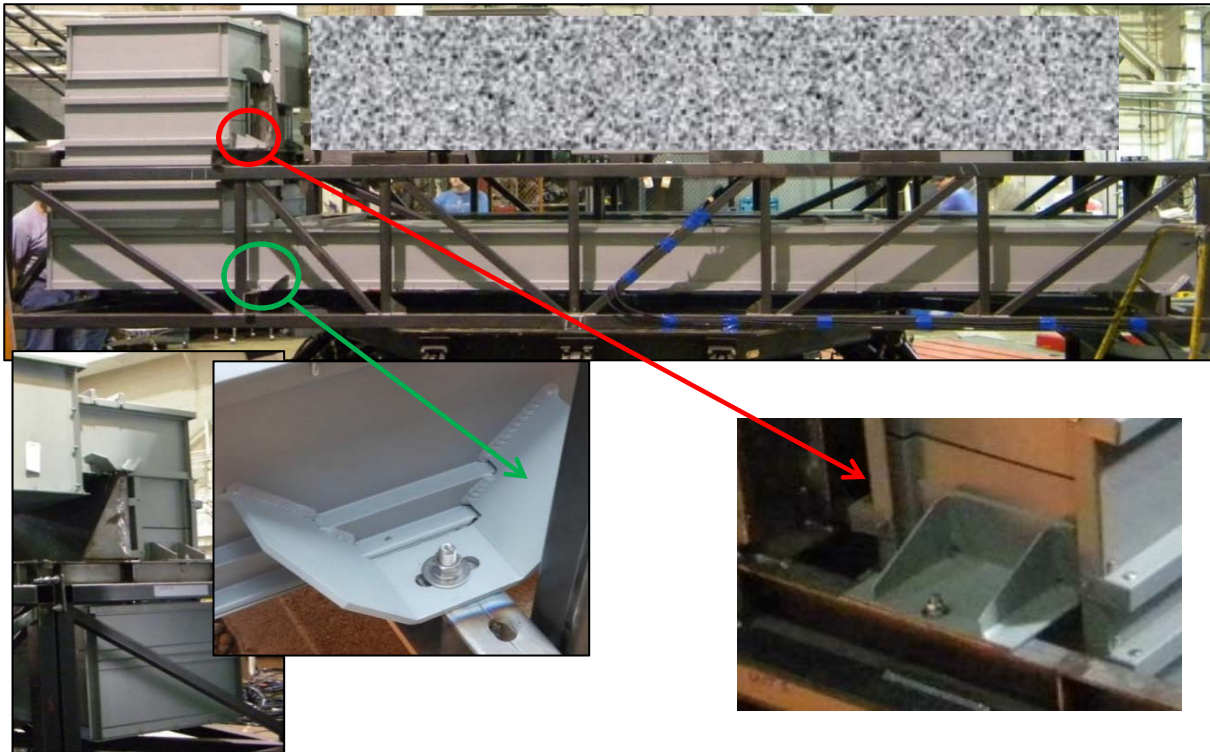
- 1) Tested configuration consists of horizontal main span with support spacing $\leq 180"$, vertical main span with support spacing $\leq 48"$, horizontal elbow with support spacing $\leq 30"$, vertical transition elbow with support spacing $\leq 24"$, and phase-reversal and tee-tap sections supported on both sides.
- 2) See drawings X-027-001-2 and X-027-002-2 for cross section information.

UUT 1-L

UNIT UNDER TEST (UUT) SUMMARY SHEET



Mounting Details: Bottom mount (horizontal bus, green) with a 1/2" diameter grade 5 bolt on each side of the duct and side mount (vertical bus, red) with a 1/2" diameter grade 5 bolt on each side of the duct.



End View

Manufacturer: Technibus

Product Line: 600V, 5kV, and 15kV Metal Enclosed Bus Duct

Identification Number: 15-c-32

UUT Function: Transmission and Distribution of Electricity

UUT Description: 180" main span, horizontal-vertical transition elbow, 48" vertical mount section, vertical elbow section that ties into a junction box, S1/S2 shipping splits, heater monitoring box, 750w large ring heater, 12" strip heater 240v/150w, and 12" strip heater 415v/150w.

UUT Construction/Component Description: Enclosure is a combination of 14ga SS, 14ga STL, and 11ga STL, 3/8"x6" horizontal copper bus bar, epoxy insulation, polyester/porcelain bus bar supports spaced at 48" o.c., copper ground bar, S1/S2 shipping splits, termination box, heater monitoring box, ring heater, and 2 - 12" strip heaters.

UUT PROPERTIES

Weight (lb)	Dimensions (inches)			Natural Frequency (Hz)		
	Duct Height	Duct Width	Total Duct Length	FB	SS	V
2,520	14.25	38	288	na	na	na

SEISMIC TEST PARAMETERS

Building Code / Test Criteria	S _{DS}	z / h	I _p	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
CBC 2016 / ICC-ES AC156	2.0	1.0	1.5	3.2	2.4	1.33	0.53

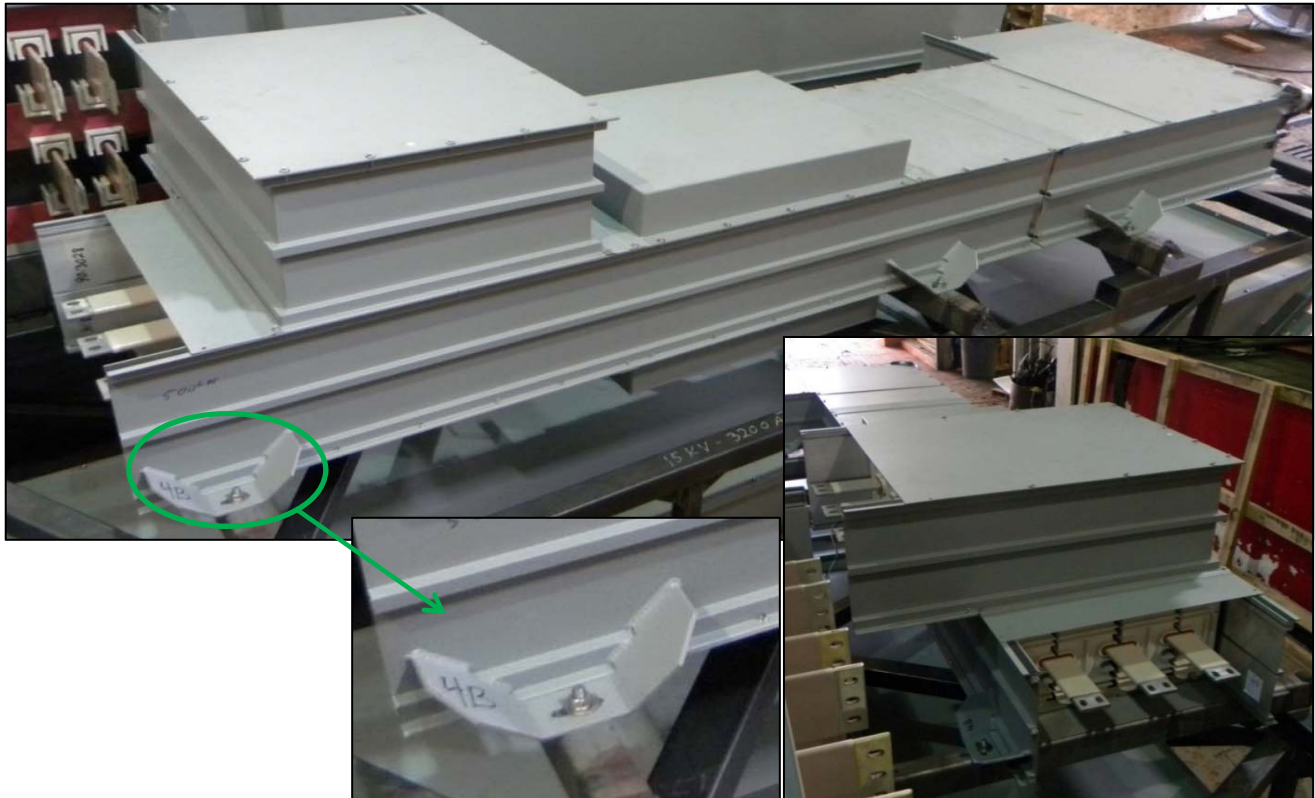
Note: The unit was full of contents during testing and remained functional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.

UUT 1-U

UNIT UNDER TEST (UUT) SUMMARY SHEET



Mounting Details: Bottom mount (horizontal bus, green) with a 1/2" diameter grade 5 bolt on each side of the duct.



Manufacturer: Technibus

Product Line: 600V, 5kV, and 15kV Metal Enclosed Bus Duct

Identification Number: 5-a-12

UUT Function: Transmission and Distribution of Electricity

UUT Description: (top picture from left to right) Tee-tap section, phase reversal section, 31" indoor expansion joint, horizontal elbow, and 1/2 hour firestop.

UUT Construction/Component Description: Enclosure constructed of Aluminum, 1/2"x3" horizontal aluminum bus bar, expoxy insulation, polyester bus bar supports spaced at 48" o.c..

UUT PROPERTIES

Weight (lb)	Dimensions			Natural Fequency (Hz)		
	Duct Height	Duct Width	Total Duct Length	FB	SS	V
460	14.25	27	204	na	na	na

SEISMIC TEST PARAMETERS

Building Code / Test Criteria	S _{DS}	z / h	I _p	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
CBC 2016 / ICC-ES AC156	2.0	1.0	1.5	3.2	2.4	1.33	0.53

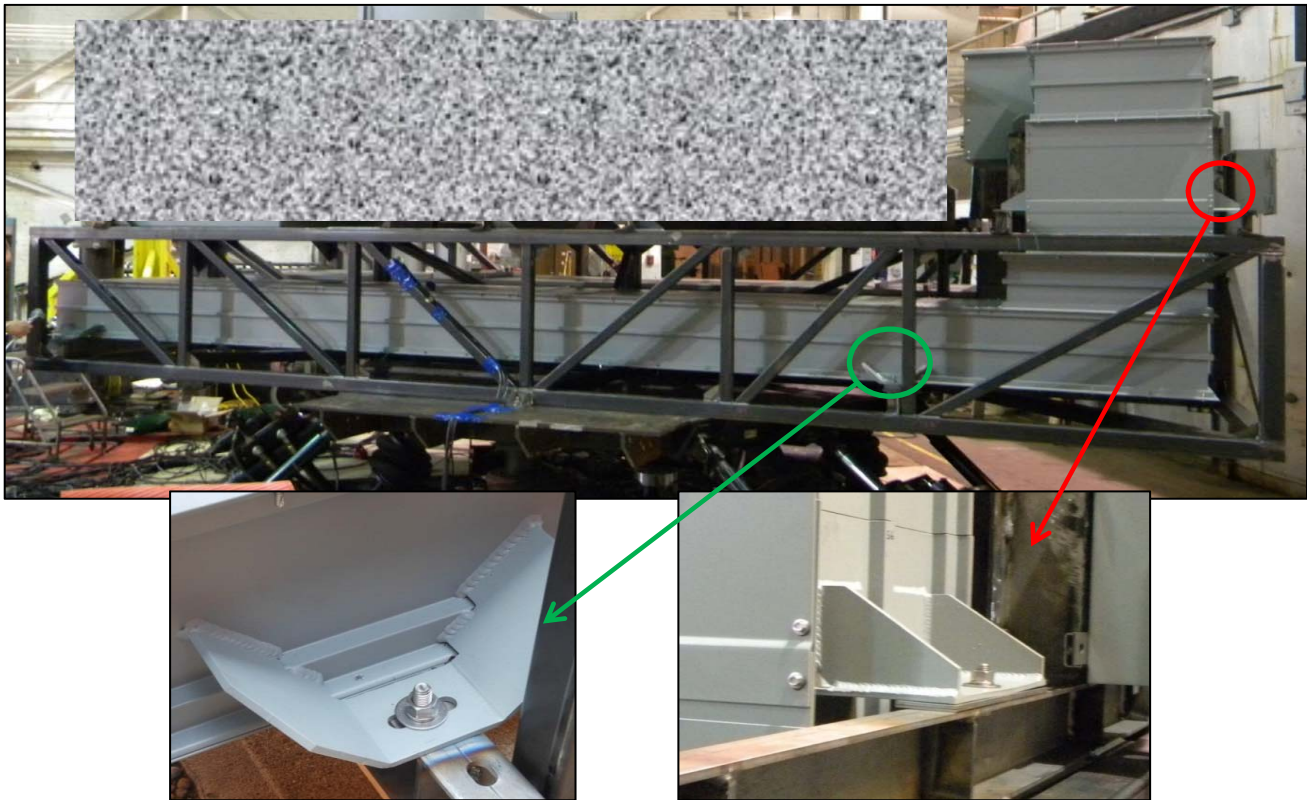
Note: The unit was full of contents during testing and remained fuctional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.

UUT 2-L

UNIT UNDER TEST (UUT) SUMMARY SHEET



Mounting Details: Bottom mount (horizontal bus, green) with a 1/2" diameter grade 5 bolt on each side of the duct and side mount (vertical bus, red) with a 1/2" diameter grade 5 bolt on each side of the duct.



Manufacturer: Technibus

Product Line: 600V, 5kV, and 15kV Metal Enclosed Bus Duct

Identification Number: 5-a-12

UUT Function: Transmission and Distribution of Electricity

UUT Description: 180" main horizontal span, horizontal-vertical transition elbow, 48" vertical mount section, vertical elbow section that ties into a junction box, S4/S5 shiping splits, adjustable thermostat, heater monitor box, 8" strip heater 240v/150w, and 8" strip heater 415v/250w.

UUT Construction/Component Description: Enclosure constructed of Aluminum, 1/2"x3" horizontal aluminum bus bar, expoxy insulation, polyester/porcelain bus bar supports spaced at 48" o.c., S4/S5 shipping splits, adjusutable thermostat, heater monitor box, and 2 - 8" strip heaters.

UUT PROPERTIES

Weight (lb)	Dimensions (inches)			Natural Fequency (Hz)		
	Duct Height	Duct Width	Total Duct Length	FB	SS	V
650	14.25	27	288	na	na	na

SEISMIC TEST PARAMETERS

Building Code / Test Criteria	S _{DS}	z / h	I _p	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
CBC 2016 / ICC-ES AC156	2.0	1.0	1.5	3.2	2.4	1.33	0.53

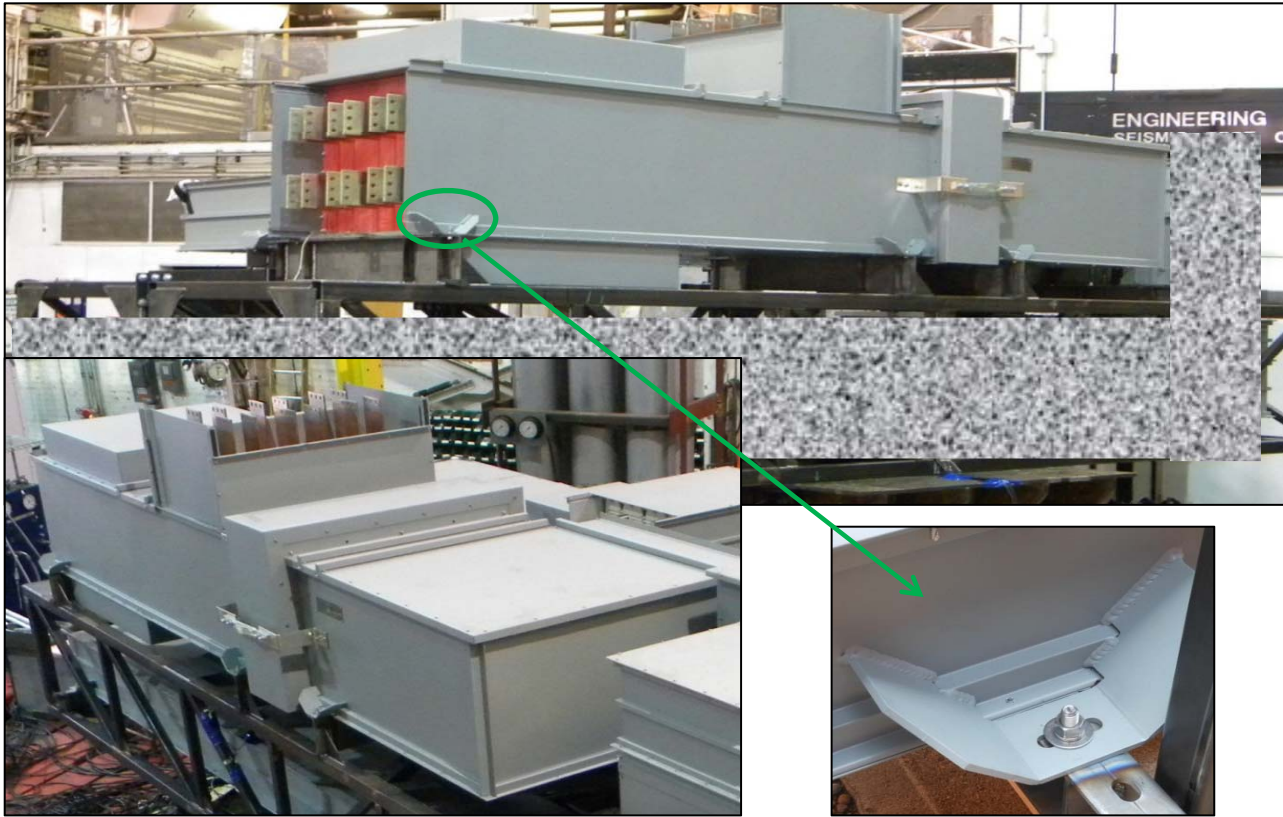
Note: The unit was full of contents during testing and remained fuctional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.

UUT 2-U

UNIT UNDER TEST (UUT) SUMMARY SHEET



Mounting Details: Bottom mount (horizontal bus, green) with a 1/2" diameter grade 5 bolt on each side of the duct.



Manufacturer: Technibus

Product Line: 600V, 5kV, and 15kV Metal Enclosed Bus Duct

Identification Number: 6-c-60

UUT Function: Transmission and Distribution of Electricity

UUT Description: (top picture from left to right) Phase reversal section, tee-tap section, 22" outdoor expansion joint, and horizontal elbow.

UUT Construction/Component Description: Enclosure constructed of 14ga SS, 3/8"x6" vertical copper bus bar, expoxy insulation, glastic/porcelain bus bar supports spaced at 18" o.c., and copper ground bus bar.

UUT PROPERTIES

Weight (lb)	Dimensions			Natural Frequency (Hz)		
	Duct Height	Duct Width	Total Duct Length	FB	SS	V
4,410	28	42	294	na	na	na

SEISMIC TEST PARAMETERS

Building Code / Test Criteria	S _{DS}	z / h	I _p	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
CBC 2016 / ICC-ES AC156	2.0	1.0	1.5	3.2	2.4	1.33	0.53

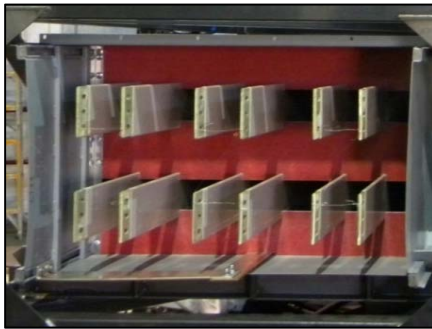
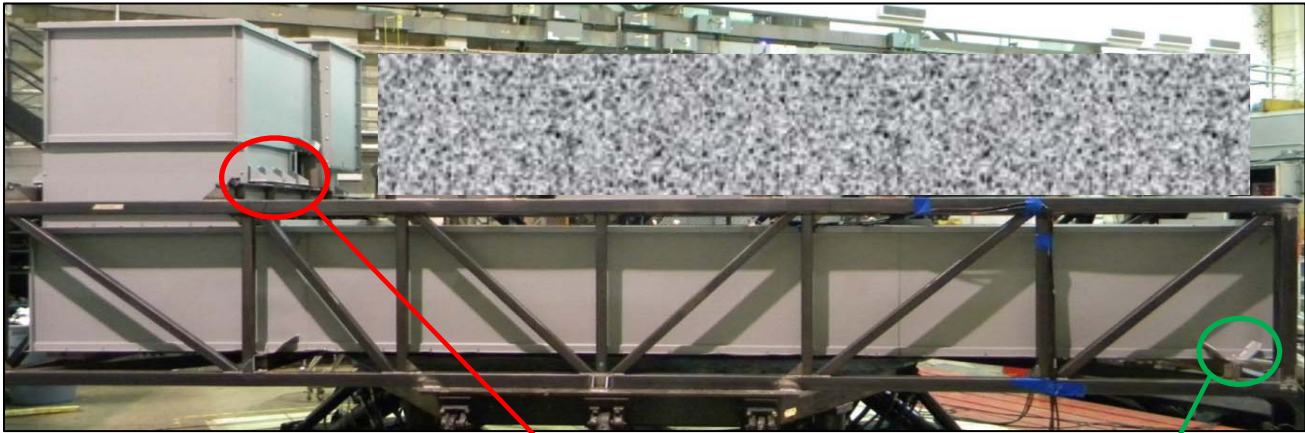
Note: The unit was full of contents during testing and remained fuctional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.

UUT 3-L

UNIT UNDER TEST (UUT) SUMMARY SHEET



Mounting Details: Bottom mount (horizontal bus, green) with a 1/2" diameter grade 5 bolt on each side of the duct and side mount (vertical bus, red) with a 1/2" diameter grade 5 bolt on each side of the duct.



End View



Manufacturer: Technibus

Product Line: 600V, 5kV, and 15kV Metal Enclosed Bus Duct

Identification Number: 6-c-60 and 5/15-c-60

UUT Function: Transmission and Distribution of Electricity

UUT Description: 180" main horizontal span, 3 hour firestop, horizontal to vertical transition elbow, 48" vertical mount section, vertical elbow section that ties into a junction box, S1/S6 shipping splits, outdoor junction box, standard thermostat, large ring heater 750w.

UUT Construction/Component Description: Enclosure constructed of 14ga SS, 3/8"x6" vertical copper bus bar, expoxy insulation, glastic/porcelain bus bar supports spaced at 36" o.c., copper ground bus, S1/S6 shipping splits, standard thermostat, and a large ring heater.

UUT PROPERTIES

Weight (lb)	Dimensions (inches)			Natural Frequency (Hz)		
	Duct Height	Duct Width	Total Duct Length	FB	SS	V
4,410	28	42	294	na	na	na

SEISMIC TEST PARAMETERS

Building Code / Test Criteria	S _{DS}	z / h	I _p	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
CBC 2016 / ICC-ES AC156	2.0	1.0	1.5	3.2	2.4	1.33	0.53

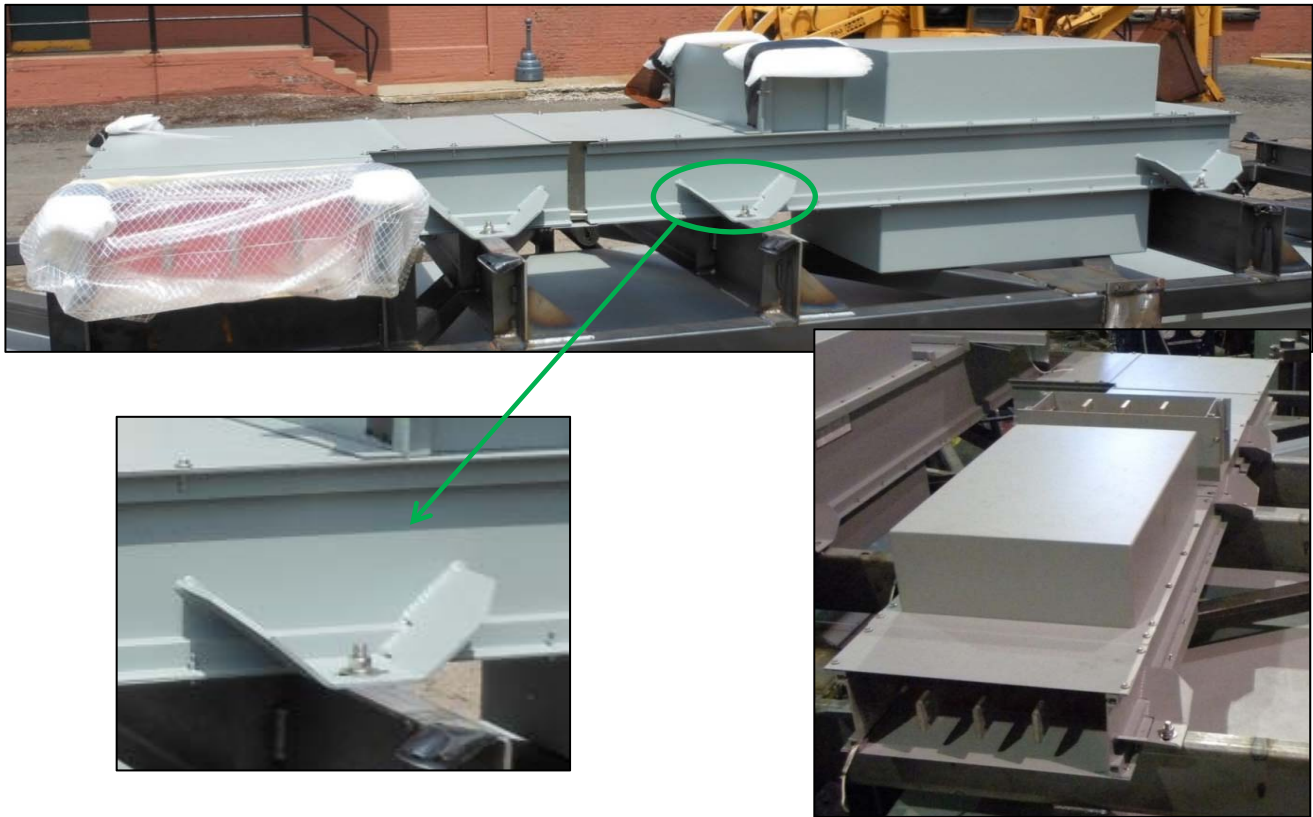
Note: The unit was full of contents during testing and remained fuctional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.

UUT 3-U

UNIT UNDER TEST (UUT) SUMMARY SHEET



Mounting Details: Bottom mount (horizontal bus, green) with a 1/2" diameter grade 5 bolt on each side of the duct.



Manufacturer: Technibus

Product Line: 600V, 5kV, and 15kV Metal Enclosed Bus Duct

Identification Number: 6-a-12

UUT Function: Transmission and Distribution of Electricity

UUT Description: (top picture from right to left) Phase reversal section, tee-tap section, 22" indoor expansion joint, horizontal elbow, and 1/2 hr firestop.

UUT Construction/Component Description: Enclosure constructed of Aluminum, 1/2"x3" vertical aluminum bus bar, expoxy insulation, glastic bus bar supports spaced at 9" o.c., and 1/2 hr firestop.

UUT PROPERTIES

Weight (lb)	Dimensions			Natural Frequency (Hz)		
	Duct Height	Duct Width	Total Duct Length	FB	SS	V
210	8.25	21	132	na	na	na

SEISMIC TEST PARAMETERS

Building Code / Test Criteria	S _{DS}	z / h	I _p	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
CBC 2016 / ICC-ES AC156	2.0	1.0	1.5	3.2	2.4	1.33	0.53

Note: The unit was full of contents during testing and remained fuctional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.

UUT 4-L**UNIT UNDER TEST (UUT)
SUMMARY SHEET**

Mounting Details: Bottom mount (horizontal bus, green) with a 1/2" diameter grade 5 bolt on each side of the duct and side mount (vertical bus, red) with a 1/2" diameter bolt on each side of the duct.



Manufacturer: Technibus

Product Line: 600V, 5kV, and 15kV Metal Enclosed Bus Duct

Identification Number: 6-a-12

UUT Function: Transmission and Distribution of Electricity

UUT Description: 180" main horizontal span, horizontal-vertical transition elbow, 48" vertical mount section, vertical elbow section that ties into a junction box, S3/S7 shipping splits, explosion proof thermostat, and a small ring heater 500w.

UUT Construction/Component Description: Enclosure constructed of Aluminum, 1/2"x3" vertical aluminum bus bar, epoxy insulation, glastic bus bar supports spaced at 9" o.c., S3/S7 shipping splits, explosion proof thermostat, and a small ring heater.

UUT PROPERTIES

Weight (lb)	Dimensions (inches)			Natural Frequency (Hz)		
	Duct Height	Duct Width	Total Duct Length	FB	SS	V
450	8.25	21	282	na	na	na

SEISMIC TEST PARAMETERS

Building Code / Test Criteria	S _{DS}	z / h	I _p	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
CBC 2016 / ICC-ES AC156	2.0	1.0	1.5	3.2	2.4	1.33	0.53

Note: The unit was full of contents during testing and remained functional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.

UUT 4-U

UNIT UNDER TEST (UUT) SUMMARY SHEET



Mounting Details: Bottom mount (horizontal bus, green) with a 1/2" diameter grade 5 bolt on each side of the duct.



Manufacturer: Technibus

Product Line: 600V, 5kV, and 15kV Metal Enclosed Bus Duct

Identification Number: 15-c-32

UUT Function: Transmission and Distribution of Electricity

UUT Description: (top picture from left to right) Tee-tap section, phase reversal section, 31" outdoor expansion joint, horizontal elbow.

UUT Construction/Component Description: Enclosure constructed of 14ga SS, 3/8"x6" horizontal copper bus bar, expoxy insulation, polyester bus bar supports spaced at 48" o.c..

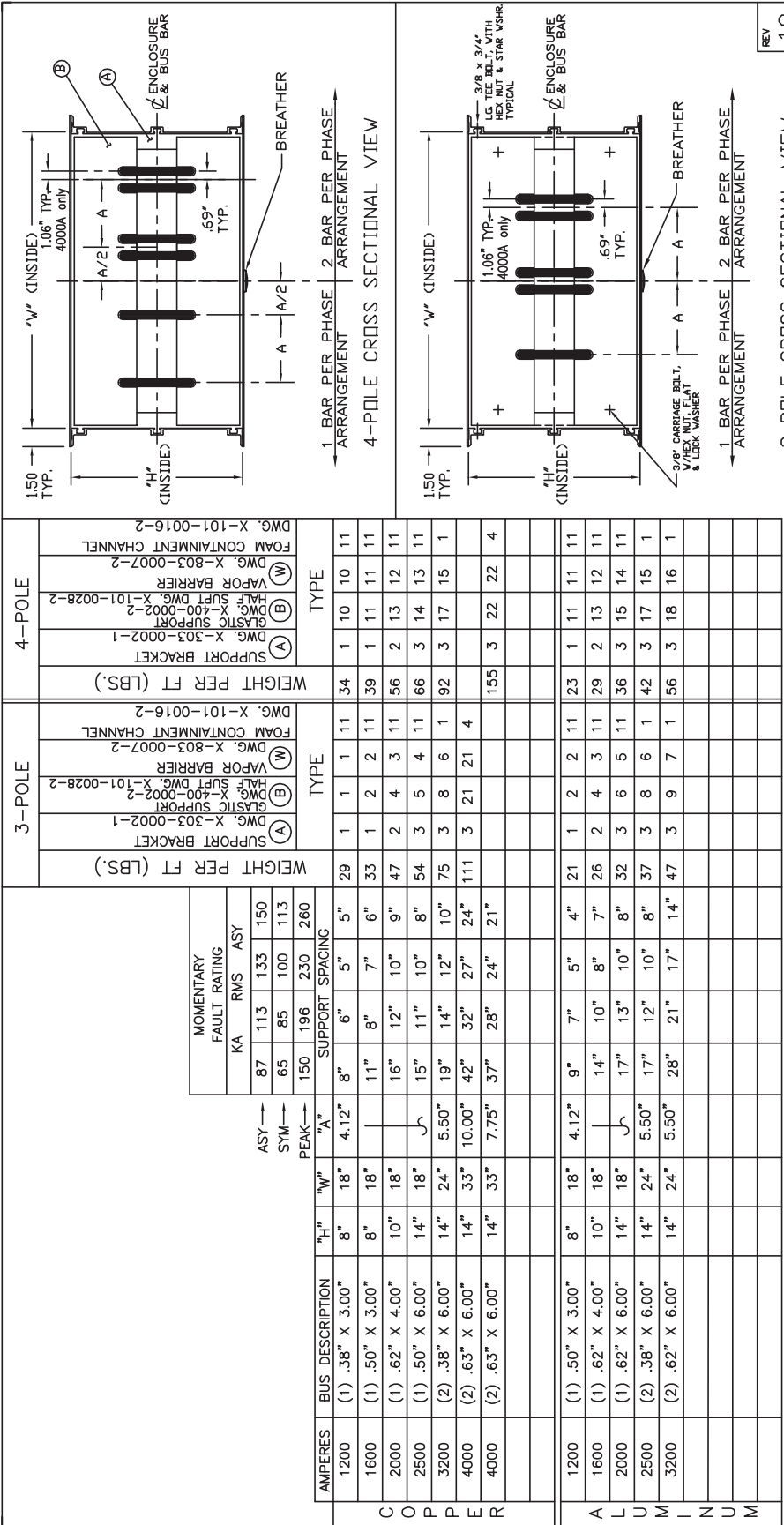
UUT PROPERTIES

Weight (lb)	Dimensions			Natural Frequency (Hz)		
	Duct Height	Duct Width	Total Duct Length	FB	SS	V
1,995	14.25	36	228	na	na	na

SEISMIC TEST PARAMETERS

Building Code / Test Criteria	S _{DS}	z / h	I _p	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
CBC 2016 / ICC-ES AC156	2.0	1.0	1.5	3.2	2.4	1.33	0.53

Note: The unit was full of contents during testing and remained fuctional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.

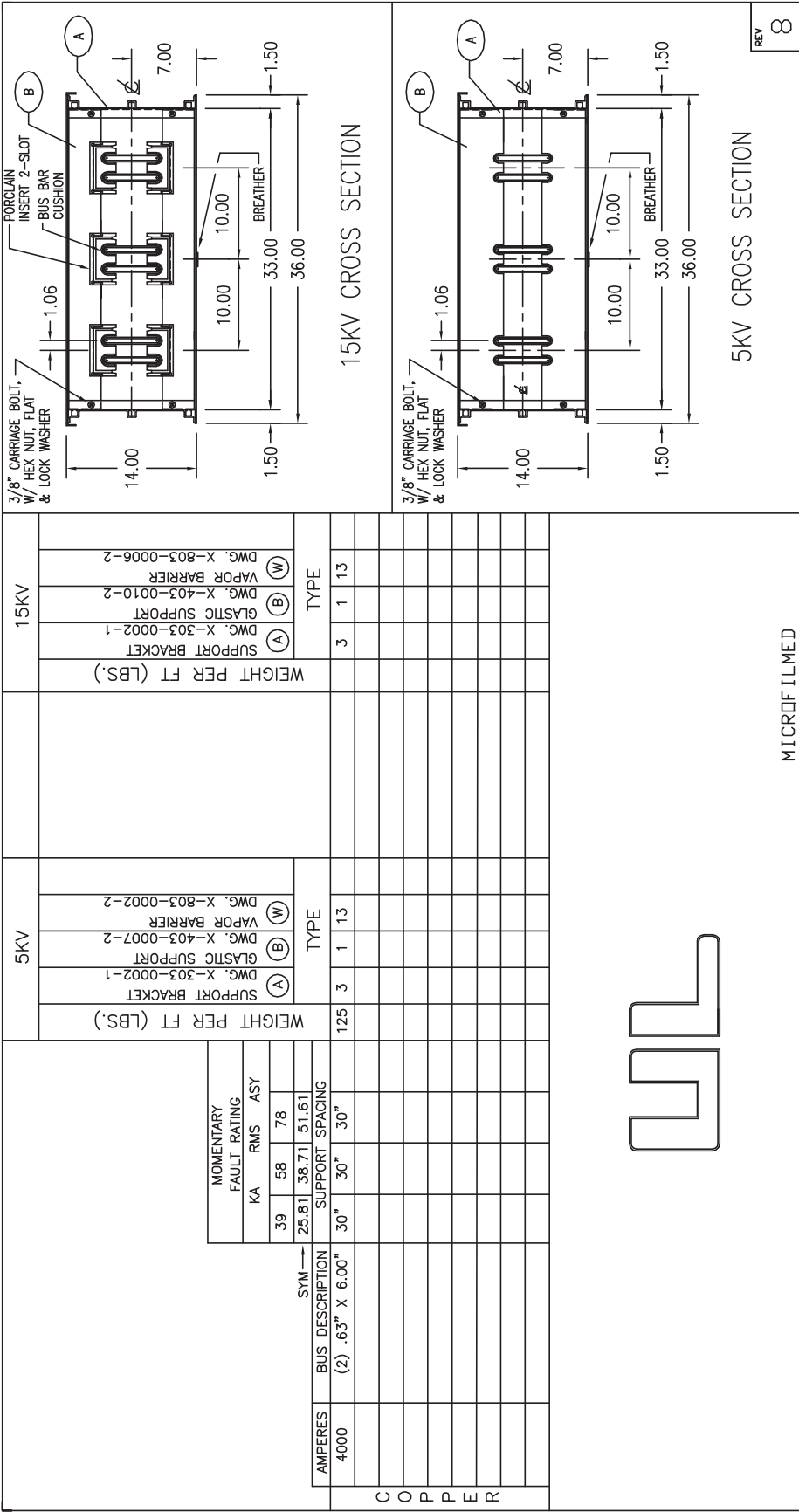


REV		10	
ADDED SHEET 2		3-POLE CROSS SECTIONAL VIEW	
1 JWL 5-18-98		MICROFILMED	
NO BY DATE		TITLE	
2 RDM 3-6-03		600V, AC 1200 TO 4000A DUCT NON-VENTED	
REV. MOMENTARY		INDOOR/OUTDOOR 3 & 4P	
3 JWL 3-12-03		CROSS SECTION (VERT. CONFIGURATION)	
ADDED HALF		DWG. No. X-023-0004-2 SHT.1 OF 2	
SUP'T & CONT		ORIGINAL PROJECT	
4 JWL 4-22-03		SYSTEM NAME	
MINOR CHG'S		TECHNIBUS	
5 JWL 5-20-04		METAL ENCLOSED BUS SYSTEMS	
REMOVED 5000A		1501 RAFF RD. SW.	
6 RCH 3-2-06		CANTON, OHIO 44710	
SHORT CIRCUIT		Tolerances:	
7 JWL 11-7-07		Unless otherwise noted, ± .03	
REVISED 4000A		all tolerances shall be	
8 JWL 12-10-07		X-023-0004-2	
ADDED 1.06		F. I. SIZE	
9 JB 1-11-11		2	
(K CU) CHANGE FAULT			
RATING AND			
SUPPORT SPACING			
10 RDM 9-13-11			
CHANGE WEIGHTS			
DRAWN BY		EOM/RDF	
DATE		11/30/93	
SCALE: 1/25=1		SEQ.	
CHK' D.		TYPE	
APP' D.		EQP.	
		MFG.	
		F. I.	
		SIZE	

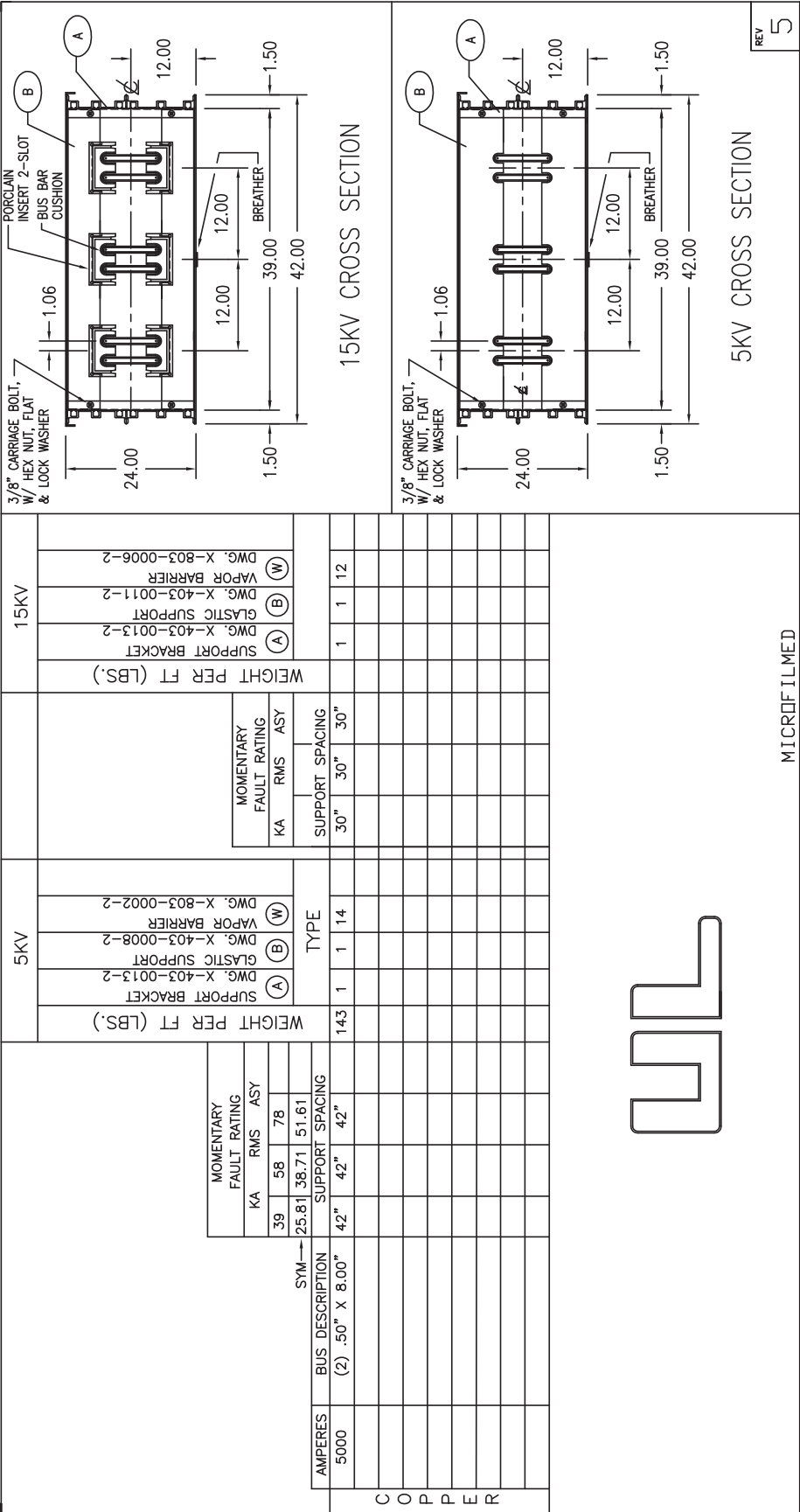
REV		10	
ADDED SHEET 2		CHANGE WEIGHTS	
1 JWL 5-18-98		10 RDM 9-13-11	
DATE		SUPPRT SPACING	
		RATING AND	
		(CU) CHANGE FAULT	
		9 JB 1-11-11	
		BAR SPACING	
		ADDED 1.06	
		8 JWL 12-10-07	
		REVISED 4000A	
		7 JWL 11-7-07	
		SHORT CIRCUIT	
		SPACING	
		6 RCH 3-2-06	
		REMOVED 5000A	
		5 JWL 5-20-04	
		MINOR CHG'S	
		4 JWL 4-22-03	
		ADDED HALF	
		SUP'T & CNT	
		3 JWL 3-12-03	
		FAULT RATING	
		REV. MOMENTARY	
		2 RDM 3-6-03	
		ADDED SHEET 2	

REVISIONS		NO	BY	DATE
		1	JWL	3/11/03
ADDED HALF SUP'T & CONT		2	RCH	3-2-06
SHORT CIRCUIT SPACING				
		3	JWL	11-7-07
REVISED ENCL & SPACING				
		4	JWL	12-10-07
REVISED BAR SPACING @ 1.06				
		5	JB	1-11-11
CHANGE FAULT RATING AND SUPPORT SPACING				
		6	RDM	9-13-11
CHANGE WEIGHTS				

REVISIONS										NO BY DATE		1 JWL 3/12/03		ADDED HALF		ADDED CHN'L		2 RCH 3-2-06		SHORT CIRCUIT		SPACING		3 JWL 11-12-07		REDESIGN PER		5KV DESIGN		4 JB 1-11-11		CHANGE FAULT		RATING AND		SUPPORT SPACING		5 RDM 9-13-11		CHANGE WEIGHTS																																							
MICROFILMED																																																																															
DRAWN BY JWL DATE 5/21/98 SCALE 1/25=1 CHK' D. APP' D.										ORIGINAL PROJECT		SYSTEM NAME		TITLE 600V, 6000A AC BUSDUCT NON-VENTED INDOOR/OUTDOOR 3P CROSS SECTION (VERT. CONFIGURATION) DWG. No. X-023-0014-2		SEQ.		TYPE		EQP.		MFG.		F. I.		SIZE																																																					
										X-023-0014-2																																																																					
3-POLE										4-POLE																																																																					
WEIGHT PER FT (LBS.)										WEIGHT PER FT (LBS.)										TYPE										TYPE																																																	
SUPPORT BRACKET										DWG. X-304-0014-2										GLASTIC SUPPORT										DWG. X-403-0009-2										GLASTIC SUPPORT										DWG. X-403-0009-2										VAPOR BARRIER										DWG. X-803-0009-2									
①										②										③										④																																																	
1										1										1										2																																																	
162										18"										25"										30"																																																	
6000										(4) .38" X 6.00"																																																																					
AMPERES										BUS DESCRIPTION																																																																					



REV ISIONS		NO		BY		DATE		1 JL		10/30/01		ADDED UL		2 KK		3/20/03		CHANGED MOMENTARY		3 JL		4/22/03		MINOR CHG'S		4 RCH		3-2-06		SHORT CIRCUIT		5 JWL		8-6-08		REVISED SUP'T		TYPE NUMBER		6 JAZ		10-20-08		REV'D MOMENTARY SUP'T		SPACING PER UL SPEC		7 JWL		9-22-09		CHANGED SUP'T		8 RDM		9-13-11		CHANGED WEIGHT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			



REV		5	
REVISIONS		NO BY DATE	
1	KK	3/20/03	REVISED FAULT RATINGS
2	JL	4/22/03	MINOR CHGS
3	RCH	3-2-06	SHORT CIRCUIT
4	JAZ	10-20-08	SPACING
REV'D MOMENTARY SUP'T		SPACING PER UL SPEC	
5	RDM	9-13-11	CHGD. WEIGHT
DRAWN BY		JWL	
DATE		7/05/01	
SCALE		1/25=1	
CHK' D.		APP' D.	
ORIGINAL PROJECT		SYSTEM NAME	
DWG. No. X-023-0021-2		UL-CROSS SECTION	
INDOOR/OUTDOOR 3 PHASE		TITLE	
5 & 15KV 5000A AC BUSDUCT NON-VENTED		5 & 15KV 5000A AC BUSDUCT NON-VENTED	

[illegible]

TEST	TEST LEVEL	TEST LEVEL	TEST LEVEL
EPOXY INSULATION	TEST 15KV	TEST LEVEL .09	
EPOXY INSULATION	TEST 25KV	TEST LEVEL .12	
EPOXY INSULATION	TEST 38KV	TEST LEVEL .18	

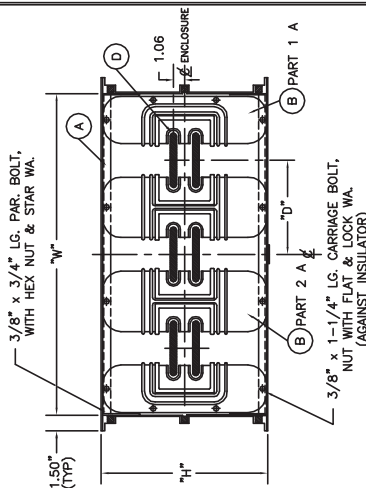


FIG. 1

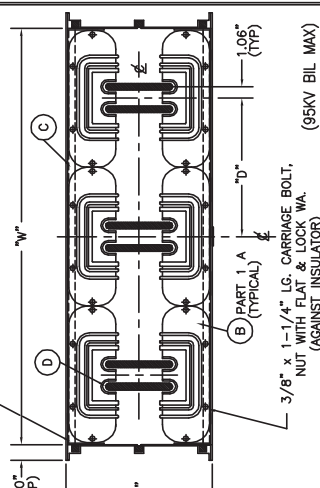


FIG 2

[illegible]

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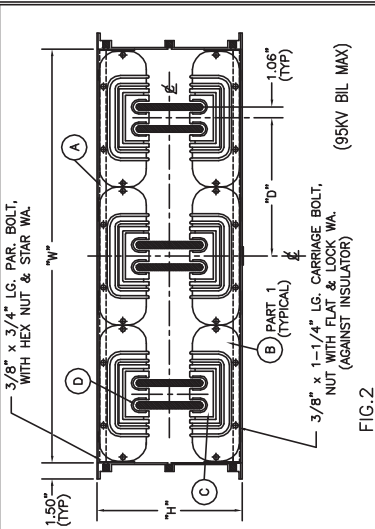
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NO.	BY	DATE	REVISION
7	RCH	3-4-86	SHORT CIRCUIT SPACING
6	JWL	4/22/03	MINOR CHGS
5	ROM	3/6/03	ADDED B/L NOTE
4	JL	10/29/01	ADDED 4000A & 5000A INFO.
3	KK	7/06/01	REVISED SPACING
2	KK	6/27/01	DELETED 4000A & 5000A INFO.
1	JWL	12/4/00	REVISED WARP BARBER

NO. 8

REV. 3

DATE 12/4/00



METAL ENCLOSED BUS SYSTEMS

1301 Raff Road SW,
Canton, Ohio 44710

[illegible][illegible]