ENGINEERING EXPRESS®
ENGINEERINGEXPRESS.COM
POSTAL ADDRESS:
401 W. ATLANTIC AVE R10 #219
DELRAY BEACH, FL 33444

Technical Evaluation Report

DIVISION: 23 08 00 – COMMISSIONING OF HVAC

**THIS DOCUMENT CONTAINS (9) PAGES.
ENGINEER DIGITAL OR ORIGINAL HAND SEAL REQUIRED FOR USE.
COPIES ARE NOT VALID FOR PERMIT.**

(Subject to Renew January 1, 2025 or next code cycle)

EVALUATION SUBJECT: FUJITSU WIND LOAD AND TIE-DOWN CERTIFICATION TER-23-62245

REPORT HOLDER:
FUJITSU GENERAL AMERICA INC.
353 RT46 WEST
FAIRFIELD, NJ 07004, USA
FUJITSUGENERAL.COM

SCOPE OF EVALUATION (compliance with the following codes):

THIS IS A STRUCTURAL (WIND) PERFORMANCE EVALUATION ONLY. NO ELECTRICAL OR TEMPERATURE PERFORMANCE RATINGS OR CERTIFICATIONS ARE OFFERED OR IMPLIED HEREIN.
UNDER NO CIRCUMSTANCE DOES THIS PERFORMANCE EVALUATION GUARANTEE, IMPLY, OR STATE PERFORMANCE OF THE UNIT IS MAINTAINED DURING OR AFTER A DESIGN EVENT.

This Product Evaluation Report is being issued in accordance with the requirements of the **Florida Building Code Seventh Edition (2020)** per ASCE 7, FBC Building Ch. 16, FBC Building Sections 104.11 & 1522.2, FBC Existing Building Sections 707.1 & 707.2, FBC Mechanical 301.15, FBC Residential M1202.1 & M1301.1, FS 471.025, and Broward County Administrative Provisions 107.3.4. This report is also in accordance with the **International Building & Residential Codes (2012, 2015, & 2018).** The product noted on this report has been tested and/or evaluated as summarized herein.

IN ACCORDANCE WITH THESE CODES EACH OF THESE REPORTS MUST BEAR THE ORIGINAL SIGNATURE & RAISED SEAL OR DIGITAL SEAL OF THE EVALUATING ENGINEER.

SUBSTANTIATING DATA:
• Product Evaluation Documents
Substantiating documentation has been submitted to provide this TER and is summarized in the sections below.
• Structural Engineering Calculations
Structural engineering calculations have been prepared which evaluate the product based on comparative and/or rational analysis to qualify the following design criteria:

- Max. allowable lateral & uplift wind pressures certified herein
- Max. allowable sliding forces, uplift forces, & overturning moments (see Unit Reactions from Wind Guide on last page)
- Tie-down configuration and anchor capacity for concrete, aluminum, and steel host substrates (host by others).
- Unit panel wind pressure connection integrity

Calculation summary is included in this TER and appears herein. NOTE: No 33% increase in allowable stress has been used in the design of this product.

LIMITATIONS & CONDITIONS OF USE:
Use of the product(s) listed herein shall be in strict accordance with this TER as noted herein and manufacturer-provided model specifications. Installation shall conform to the minimum standards stated in the referenced building code(s) in addition to the specifications and limitations stated herein. See herein for complete limitations & conditions of use.

OPTIONS:
This evaluation is valid for the FUJITSU models described herein. The critical unit designs have been determined and used in this evaluation. Any structural changes outside of the design as described herein would void this certification.

UNIT CASING MATERIALS:
25ga galvanized sheet steel equivalent to ASTM A653 Cold Rolled Steel. Removable top & side covers secured with M4 sheet metal screws (see Panel Integrity Table for panel reinforcement). Knockouts provided for utility & control connections. Contact Report Holder for further unit construction information.

NOTE: THE GRAPHICAL DEPICTIONS IN THIS REPORT ARE FOR ILLUSTRATIVE PURPOSES ONLY AND MAY DIFFER IN APPEARANCE.

STRUCTURAL PERFORMANCE:
Models referenced herein are subject to the following design limitations:

Maximum Rated Wind Pressures*:
± 118 psf Lateral, 93 psf Uplift

- Required design wind pressures shall be determined according to the guide provided in the Appendix (see last page of this report) or on a site-specific basis in accordance with ASCE 7 and applicable sections of the building code(s) being referenced in accordance with ASD methodology.
- Required design pressures shall be less than or equal to the maximum pressures listed herein.
- *Maximum Rated Wind Pressures indicate the maximum pressures that all units listed herein are approved for. Valid for at-grade, wall-mounted and rooftop applications. See limitations herein.
- Valid for use inside and outside the High-Velocity Hurricane Zone (HVHZ).
- Site-specific wind analysis may produce alternate limitations provided maximum rated wind pressures stated herein are not exceeded.

VISIT ECALC.IO/62245
FOR ENGINEER CERTIFIED ORIGINALS & MORE INFORMATION ABOUT THIS DOCUMENT OR SCAN THE QR CODE TO THE RIGHT >
VISIT ENGINEERINGEXPRESS.COM/STORE FOR ADDITIONAL PLANS, REPORTS & RESOURCES

ORIGINAL SIGNATURE AND RAISED SEAL
OR DIGITAL SEAL REQUIRED TO BE VALID PER CODE:

FRANK L. BENNARDO LICENSE No PE0046549 STATE OF FLORIDA PROFESSIONAL ENGINEER

Digitally signed by Frank Bennardo
Reason: Printed copies of this document are not considered signed and sealed and the sigature must be verified on any electronic copies.
Date: 2023.08.11 14:47:27 -04'00'

VALID ONLY FOR ZIP CODE: 33122
VALID ONLY FOR: FUJITSU
FOR PERMIT USE WITHIN 21 DAYS OF DIGITAL SEAL
PE0046549 CA-9885

DIGITAL SEAL NOTICE: IF THIS DOCUMENT IS DIGITALLY SIGNED, THIS SHEET IS PART OF A DIGITALLY SIGNED FILE. IT SHALL REMAIN IN DIGITAL FORMAT, SHALL BE VERIFIED BY ELECTRONIC MEANS, & **PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED**. VISIT ECALC.IO/DS FOR MORE INFORMATION.
PRINTED DOCUMENT NOTICE: IF THIS DOCUMENT IS PRINTED **& DOES NOT CONTAIN AN ENGINEER'S ORIGINAL SIGNATURE & SEAL, THIS DOCUMENT IS VOID & NOT VALID FOR USE. PHOTOCOPIES ARE NOT PERMITTED FOR USE.**

MODEL INFORMATION (CONTINUED ON FOLLOWING PAGES)

Model Number	Cabinet Group
AOU 18/24 RLB	I
AOU 18/24 RLX	II
AOU 18/24 RLXFW1	II
AOU 18/24 RLXFWH	II
AOU 18/24 RLXS	II
AOU 30/36 RLXB	II
AOU 36/48 RLAVM	IV
AOU 9/12 RLFC	I
AOU 9/12 RLFFH	I
AOU 9/12 RLS2H	I
AOU 9/12 RLS3	I
AOU 9/12 RLS3H	I
AOU 9/12/15 RLFF	I
AOU124RLB	I
AOU12RL2	I
AOU12RL2	I
AOU12RLFC	I
AOU12RLFF	I
AOU12RLFFH	I
AOU12RLFW	I
AOU12RLFW1	I
AOU12RLS2	I
AOU15RLFF	I
AOU15RLFFH	I
AOU15RLFFH	I
AOU15RLS2	I
AOU15RLS2H	I
AOU15RLS3	I
AOU15RLS3H	I
AOU18RGLX	II
AOU18RLB	I
AOU18RLFC	I
AOU18RLFC	I
AOU18RLX	II
AOU18RLXFW	II
AOU18RLXFW1	II
AOU18RLXFWH	II
AOU18RLXFZ	II
AOU18RLXFZ	II
AOU18RLXFZH	II
AOU18RLXFZH	II
AOU24RGLX	II
AOU24RLX	II
AOU24RLXFW	II
AOU24RLXFW1	II
AOU24RLXFWH	II

Model Number	Cabinet Group
AOU24RLXFZ	II
AOU24RLXFZ	II
AOU24RLXFZH	II
AOU24RLXFZH	II
AOU30RGLX	II
AOU30RLX	II
AOU30RLXB	II
AOU30RLXEH	IV
AOU30RLXEH	IV
AOU36RGLX	II
AOU36RLAVM	IV
AOU36RLAVM4	IV
AOU36RLAVS	III
AOU36RLAVS4	III
AOU36RLX	II
AOU36RLX	II
AOU36RLXB	II
AOU36RLXFZ	II
AOU36RLXFZ1	II
AOU36RLXFZ1	II
AOU36RLXFZ1	II
AOU36RLXFZH	II
AOU36RLXFZH	III
AOU42RGLX	IV
AOU42RLX	IV
AOU42RLX	IV
AOU45RLXFZ	III
AOU45RLXFZ	III
AOU48RGLX	IV
AOU48RLAVM	IV
AOU48RLAVM4	IV
AOU48RLAVS	III
AOU48RLAVS4	III
AOU48RLXFZ1	III
AOU60RLAVM	IV
AOU60RLAVM	IV
AOU60RLAVM4	IV
AOU9RL2	I
AOU9RL2	I
AOU9RLFC	I
AOU9RLFF	I
AOU9RLFFH	I
AOU9RLFW	I
AOU9RLFW1	I
AOU9RLS2	I
AOUG09LMAS1	I

Model Number	Cabinet Group
AOUG09LZAH1	I
AOUG09LZAS1	I
AOUG12LMAS1	I
AOUG12LZAH1	I
AOUG12LZAS1	I
AOUG15LZAH1	I
AOUG15LZAS1	I
AOUG36LMAS1	III
AOUG48LMAS1	III
AOUH09LMAH1	I
AOUH09LMAS1	I
AOUH09LPAS1	I
AOUH09LUAS1	I
AOUH12LEAS1	I
AOUH12LMAH1	I
AOUH12LMAS1	I
AOUH12LMBH1	I
AOUH12LMBS1	I
AOUH12LPAS1	I
AOUH12LUAS1	I
AOUH18LMAS1	II
AOUH18LPAS1	I
AOUH18LUAS1	I
AOUH24LMAS1	II
AOUH24LPAS1	I
AOUH30LPAS1	II
AOUH30LUAH1	III
AOUH36LMAH1	IV
AOUH36LPAS1	II
AOUH48LMAH1	IV
WHM24SZA21S	II
WHM36SZA21S	II
WHM48SZA21S	IV
WHM60SZA21S	IV
WHP42M5A21S	III
WHU09SZA21S	I
WHU12SZA21S	I
WHU18SZA21S	II
WHU24SZA21S	II
WHU36SZA21S	III
WHZ09SZA21S	I
WHZ12SZA21S	I

MODEL INFORMATION (CONTINUED ON PREVIOUS/FOLLOWING PAGES)

Cabinet Group	Unit Dimensions (in)			Allowable Weight (lb)
	Width	Depth	Height	
I	26.00	11.34	21.25	40 - 100
	31.13	11.44	24.44	
	31.09	11.34	24.50	
	31.00	11.44	21.25	
	31.38	11.34	21.34	
	31.38	11.34	24.88	
	26.13	11.44	21.31	
	31.88	11.00	23.06	
	31.88	11.00	22.88	
II	35.38	13.00	32.75	100 - 180
	35.44	13.00	32.69	
	35.50	13.00	32.75	
	33.88	12.25	26.38	
	37.38	13.38	33.13	
	37.38	13.38	33.00	
	37.00	12.63	31.00	
III	38.25	14.63	36.00	100 - 250
	38.19	14.56	39.31	
	37.00	12.63	31.00	
	37.38	13.38	33.00	
	37.38	13.38	41.31	
	37.38	13.38	41.38	
	37.38	13.38	33.13	
IV	38.19	14.56	52.50	150 - 300
	35.50	13.00	50.88	
	35.44	13.00	50.81	
	42.52	18.90	64.49	
	41.88	18.81	52.50	
	37.38	13.38	54.63	

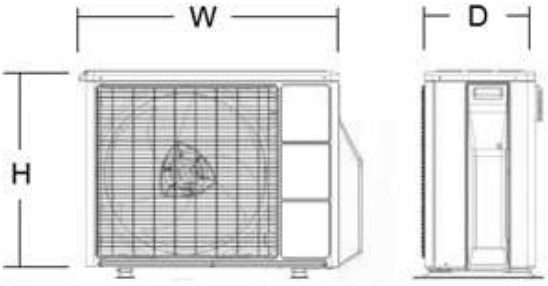
MODEL INFORMATION NOTES (CONTINUED ON NEXT PAGE)

Unit dimensions listed above are unit net dimensions (as opposed to packing/shipping dimensions). Unit net weights listed above are unit net/operating weights (as opposed to packing/shipping weights). Model information listed herein is based on information provided by the client. Cabinet Groups (also abbreviated herein as "Cab. Groups" or "Cab." as needed) are designated by Engineering Express based on the unit cabinet and panel layout. See Details on the next page for definitions of unit dimensions and Cabinet Groups. Dimensions are as follows: "D" for unit depth, "H" for unit height, and "W" for unit width, typ. Multiple sets of unit dimensions may be listed for each Cabinet Group; model numbers listed herein are permitted to be any set of unit dimensions from its respective Cabinet Group listings. Unit appearance may vary. Please contact Report Holder for more information.

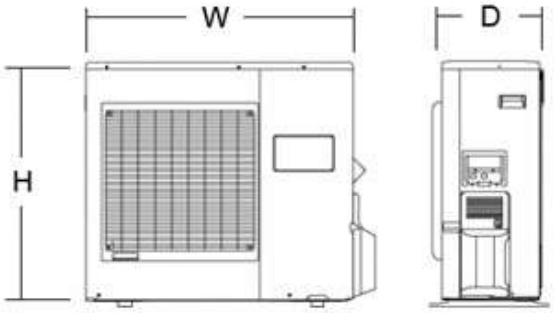
REMAINDER OF PAGE INTENTIONALLY LEFT BLANK

MODEL INFORMATION NOTES (CONTINUED FROM PREVIOUS PAGES)

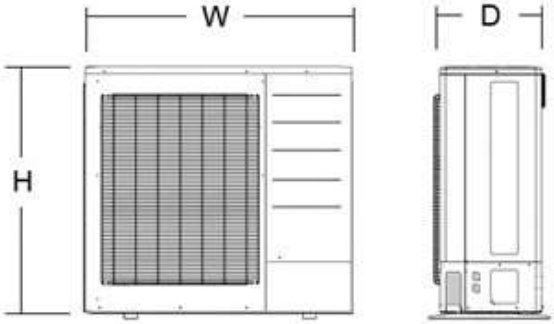
Cabinet Group I



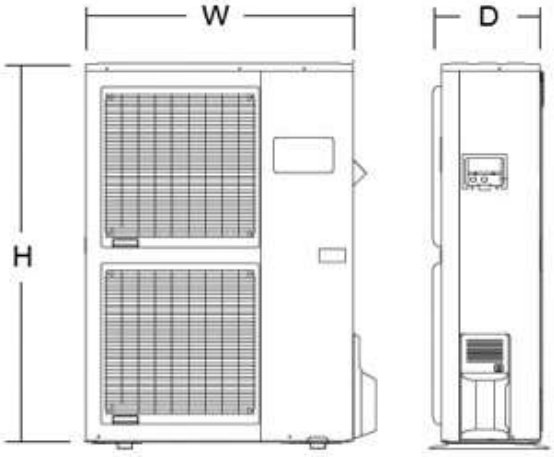
Cabinet Group II



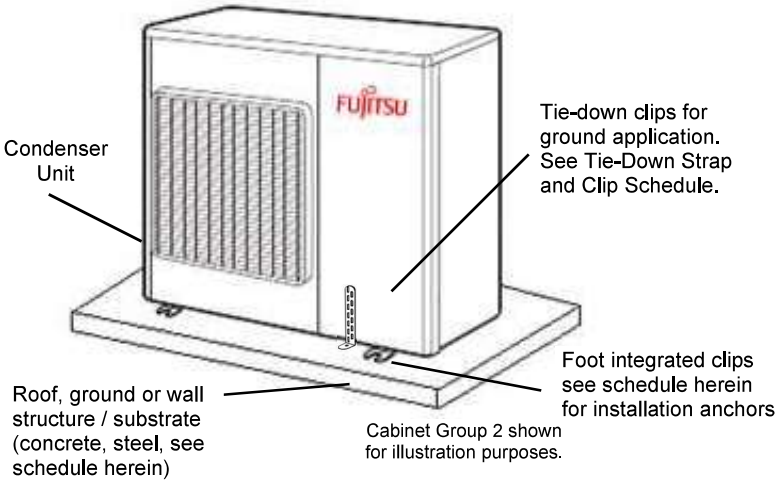
Cabinet Group III



Cabinet Group IV



PRODUCT INSTALLATION (CONTINUED ON FOLLOWING PAGES)



UNIT INTEGRATED FOOT

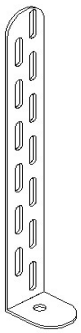
Equivalent to ASTM A653 galvanized cold rolled steel 0.027" thick for small cabinetry and 0.0538" for tall cabinetry; fasten cabinet using Anchor from Anchor Schedule to Host Structure Table herein and SAE GR5 ASTM-A449 OD 1" washer & nut to secure anchor to supporting structure.

INTEGRATED FOOT SMALLER UNITS

INTEGRATED FOOT LARGER UNITS

TIE-DOWN CLIP (GROUND APPLICATION)

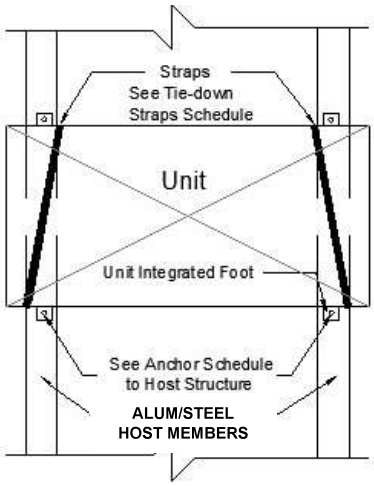
Miami Tech CUTD 1" ASTM A653 galvanized steel 0.07" thick (FL19731.2) or equivalent for all cabinets tied down at ground; fasten clip to host structure using anchor from Anchor Schedule to Host Structure Table and (4) #10 SS 410 self-drilling screw to fasten clip to unit. Install at the unit corners with quantities shown in the Tie-Down Strap and Clip Schedule table herein.

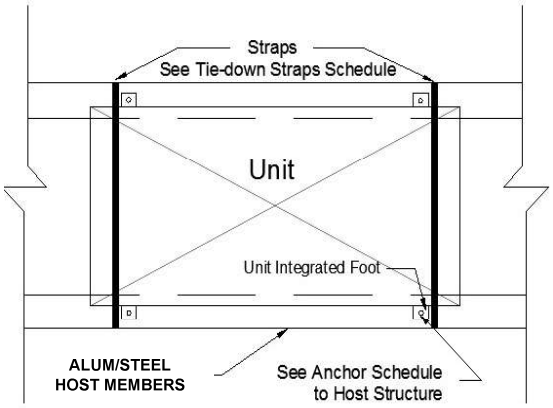


PRODUCT INSTALLATION (CONTINUED ON PREVIOUS/FOLLOWING PAGES)

TIE-DOWN STRAP AND CLIP SCHEDULE

Cabinet Group	Max. ASD Wind Pressures Lateral (Uplift)	Minimum number of straps	Minimum WLL per strap (lbs)	Number of Tie-down clips per long side
Cabinet Group I	± 40 psf (0 psf)	None	NA	2
	± 86 psf (68 psf)	2	400	NA
	± 100 psf (79 psf)	2	500	NA
	± 118 psf (93 psf)	2	500	NA
Cabinet Group II	± 40 psf (0 psf)	None	NA	2
	± 86 psf (68 psf)	2	800	NA
	± 100 psf (79 psf)	2	1000	NA
	± 118 psf (93 psf)	2	1000	NA
Cabinet Group III	± 40 psf (0 psf)	None	NA	2
	± 86 psf (68 psf)	2	1000	NA
	± 100 psf (79 psf)	2	1000	NA
	± 118 psf (93 psf)	2	1500	NA
Cabinet Group IV	± 40 psf (0 psf)	None	NA	3
	± 86 psf (68 psf)	2	2000	NA
	± 100 psf (79 psf)	2	2500	NA
	± 118 psf (93 psf)	2	2500	NA





Note:
Tie-down straps shall be wrapped around unit and roof stand rail, and shall be tightened using the buckle. Provide two straps per unit. Straps material shall be high strength webbing and shall be compliant for exterior grade use if they contain plastic components, per FBC chapter 26. Select strap from table based on WLL requirements.

Tie-down Strap Type: (for wall-mounted and roof installations)

Working Load Limit (WLL) is strap's manufacturer - specified per strap, strap length shall be verified on site for all cabinets. 1" wide ASTM A653 steel strap is acceptable in substitution of webbing strap, secured with (2) #14 SS SMS to the bottom of the stand rail.
NA. - No straps required

PRODUCT INSTALLATION (CONTINUED FROM PREVIOUS PAGE)

ANCHOR SCHEDULE TO HOST STRUCTURE

Installation Condition	Max. ASD Wind Pressures Lateral (Uplift)	Anchor Schedule to Host Structure By Others		
		f'c = 3.5 ksi min. Regular-Weight Concrete Host	1/8" Min A36 Steel	1/8" Min 6061-T6 Aluminum
Cabinet Group I - IV	± 40 psf (0 psf)	A	N/A	N/A
	± 86 psf (68 psf)	N/A	B	B
	± 100 psf (79 psf)	N/A	B	B
	± 118 psf (93 psf)	N/A	B	B

Anchor Types to Host Structure:

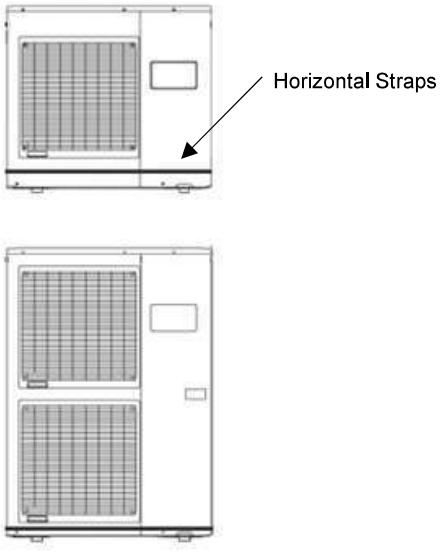
A. - 1/4" Ø DeWalt (formerly Elco) Crete-Flex 410 SS Anchor embedded 2" in 3,500 psi concrete. 2 1/2" from edge minimum. NOA No. 17-1227.18 for tie-down clip at ground.
B. - 3/8" -16 UNC SAE Grade 5 screw minimum 1/2" from edges with nut and washer specified, for integrated foot installed at roof.
NA. – NOT APPLICABLE

PANEL INTEGRITY SUMMARY

Cab. Group	Max. ASD Wind Pressures Lateral (Uplift)	Horizontal Strap Required	Number of Horizontal Straps	Minimum Strap WLL per Strap (lbs)
I - IV	± 40 psf (0 psf)	NO	-	-
	± 86 psf (68 psf)	YES	2	300
	± 100 psf (79 psf)	YES	2	300
	± 118 psf (93 psf)	YES	2	300

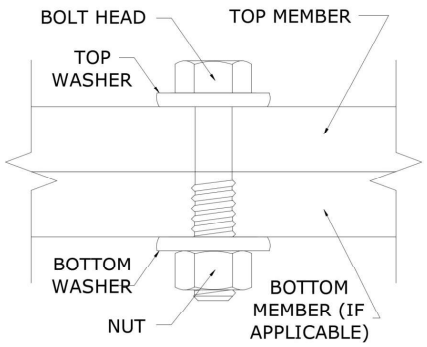
PANEL INTEGRITY SUMMARY NOTES

- Straps shall be wrapped and tightened to a snug fit around the unit. 1" wide ASTM A653 steel strap is acceptable in substitution of webbing strap, secured with (2) #14 SS SMS to the bottom of the stand rail.
- Calculations performed according to the information provided by the Client. Cabinets were assumed solid (0% porosity) for shear and tension calculation purposes. The unit integrity calculations is optional and shall be follow if required by the AHJ.
- Units depicted with straps are for illustration purposes.



TERMINOLOGY

The following abbreviations may appear in this report: "Addtl." for "additional", "AHJ" for "Authority Having Jurisdiction", "alum" for "aluminum", "ASCE" for "American Society of Civil Engineers", "ASD" for "Allowable Stress Design", "ASTM" for "American Society for Testing and Materials", "EA." for "each", "E.D." for edge distance", "EDDS" for "extra deep drawing steel", "e.g." for "*exempli gratia*" or "for example", "equiv." for "equivalent", "FBC" for "Florida Building Code", "FEA" for "Finite Element Analysis", "FLCA" for "Florida Certificate of Authorization", "FS" for "Florida Statutes", "Fu" for "ultimate tensile strength" or "ultimate tensile stress", "Fy" for "yield strength" or "yield stress" "GA" for "gauge", "GR." or "Gr." for "grade", "HVAC" for "heating, ventilation, and air conditioning", "HVHZ" for "High-Velocity Hurricane Zone", "i.e. " for "*id est*" or "in other words", "in" for "inch", "lb" for "pound (force)", "max." for "maximum", "min." for "minimum", "mm" for "millimeter", "NTS" for "not to scale", "O.C. " for "on center", "OD" for "outer diameter", "PE" for "Professional Engineer", "qty" for "quantity", "SAE" for "Society of Automotive Engineering", "SMS" for "sheet metal screws", "SS" for "stainless steel", "TER" for "Technical Evaluation Report", "typ." for "typical", "U.N.O." for "unless noted otherwise", "UTS" for "ultimate tensile strength" or "ultimate tensile stress", "WLL" for "working load limit", "w/o" for "without", "YS" for "yield strength" or "yield stress", "#" for "number", "&" for "and", and "Ø" for "diameter". For additional abbreviation/terminology clarifications, please contact this office.



SAMPLE THRU-BOLT
SCALE: NTS SECTION VIEW

Note: The term "Thru-Bolt" or through bolt, if used herein, refers to a bolt passing through the member(s) in contact and is fastened by a nut at the end opposite the screw head. Nut shall be equivalent to or exceed the strength of the bolt U.N.O. Nut shall be sized to accommodate the same nominal diameter as the bolt U.N.O. See diagram above-right for a sample thru-bolt configuration.

Note: For instances herein which list material specifications as *"[material type] or stronger":*
U.N.O. herein, the term "stronger" refers to a material with a UTS value equal to or greater than the UTS value of the stated material type. Consult appropriate literature for established material UTS values.

Note: Equivalent steel gauge thicknesses as used in this evaluation, U.N.O., are as follows:
22 GA (.030"), 20 GA (.036"), 18 GA (.048"), 16 GA (.060"), 14 GA (.075"), 12 GA (.098").

LIMITATIONS & CONDITIONS OF USE, CONTINUED

Use of this product shall be in strict accordance with this TER as noted herein. The supporting host structure shall be designed to resist all superimposed loads as determined by others on a site-specific basis as may be required by the authority having jurisdiction. Host structure conditions that are not accounted for in this product's respective anchor schedule shall be designed for on a site-specific basis by a registered Professional Engineer. No evaluation is offered for the host supporting structure by use of this document. Adjustment factors noted herein and the applicable building codes must be considered, where applicable. Product components shall be of the material(s) specified in the manufacturer-provided product specifications. All supporting components which are permanently installed shall be protected against corrosion, contamination, and other such damage at all times. All fasteners and anchors shall be installed in accordance with the applicable provisions specified herein in addition to the anchor/fastener manufacturers' published installation instructions. Fasteners must penetrate the supporting members such that the full length of the threaded portion is embedded within the main member.

All of the wind-resisting exterior panels (with accompanying retrofits) individually meet or exceed their capacity to resist the design wind loads as stated in the calculations as required by the codes and standards stated herein. Due to the indeterminate nature of these units, distortion, deflection, and material deformation cannot be accurately evaluated, but with the diaphragm action of external components and internal stiffeners, the base unit (with accompanying retrofits stated herein as applicable) has the capacity to withstand the design wind loads without detaching from the unit and becoming flying debris.

Survivability: Evaluation reports are valid for a newly installed unit and do not include certification of the product beyond a design event or if impacted by any debris. Inspections shall be implemented annually by the end user and after every named storm. All fasteners and cabinet components are to be verified, and all damaged, loose, corroded and/or broken fasteners and cabinet components shall be replaced to ensure structural integrity against hurricane wind forces. Contact this office for any reevaluation needs or as designated by the Authority Having Jurisdiction.

Durability: Components or component assemblies shall not deteriorate, crack, fail, or lose functionality due to galvanic corrosion or weathering. All supporting components which are permanently installed shall be protected against corrosion, contamination, and other such damage at all times. Each component or component assembly shall be supported and oriented in its intended installation position. All exposed plastic components shall be certified to resist sunlight exposure as specified by ASTM B117, or ASTM G155 in Broward or Miami Dade counties.

Extent of Certification: Certification pertains to the overall structural integrity of the unit components listed within the evaluation as required by code, subject to the limitations and criteria stated herein. Operability during or after a design event is not included in this certification. Water infiltration is outside the bounds of this certification. No other certifications are intended other than as described herein. This evaluation alone does not offer any evaluation for large missile impact debris or cyclic wind requirements unless specifically stated herein.

Proj. #	Remarks	By	Checked	Date	Proj. #	Remarks	By	Checked	Date
16-3202	Initial Issue	---	---	---					
23-62245	TER Update & New Models	MRT	EPR	06/01/23					

APPENDIX A: DESIGN WIND PRESSURE GUIDE

Max. Ult. Wind Speed (V_{ult})	Max. MRH (Roof Height)	Exposure Category	Required Design Wind Pressures (ASD)	
			Lateral Pressure	Uplift Pressure
140 mph	At-Grade (0 ft)	C	± 26 psf	0* psf
		D	± 31 psf	0* psf
	100 ft	C	± 63 psf	50 psf
		D	± 71 psf	56 psf
	200 ft	C	± 72 psf	57 psf
		D	± 80 psf	63 psf
175 mph	At-Grade (0 ft)	C	± 40 psf	0* psf
		D	± 49 psf	0* psf
	100 ft	C	± 98 psf	77 psf
		D	± 111 psf	87 psf
	200 ft	C	± 113 psf	89 psf
		~~D~~	~~± 124 psf~~	~~98 psf~~
186 mph	At-Grade (0 ft)	C	± 46 psf	0* psf
		D	± 54 psf	0* psf
	100 ft	C	± 111 psf	87 psf
		~~D~~	~~± 125 psf~~	~~99 psf~~
	~~200 ft~~	~~C~~	~~± 127 psf~~	~~100 psf~~
		~~D~~	~~± 140 psf~~	~~111 psf~~

~~100 psf~~ Note: Any table values with the format shown left, if present, indicate design wind pressures and site conditions that are **not approved for use** by this evaluation. Seek additional engineering or contact this firm for design solutions.

DIRECTIVE: This design pressure guide is for reference only and shall be approved for use by the Authority Having Jurisdiction (AHJ). If the design pressures listed in this guide are not used, required design pressures shall be calculated separately. For site-specific scenarios classified as Exposure Category B, the required design pressures stated for Exposure Category C in the above guide shall be used or design pressures shall be calculated separately. For heights and parameters beyond the parameters listed in this guide, visit our Online Calculator via the website link (https://ecalc.io/forces) or QR Code below, or obtain calculations separately by others.

The required ASD design pressures listed in this guide were calculated per the table's listed corresponding site conditions. The project design professional or permitting contractor shall verify that the site-specific conditions are equal to or less than the approved design parameters listed in the guide. Per the note below table: any values shown as "~~XX psf~~", indicate wind pressures and corresponding site conditions that are **not valid for use** with this evaluation (exceeds the max. rated pressures).

*Note: Per the codes and standards referenced herein, uplift is not required for mechanical equipment at-grade. If uplift at-grade is required by the AHJ, contact this firm for a site-specific evaluation.

At-Grade (0 ft MRH) Required Design Pressures:

- ASCE 7 "Design Wind Loads: Other Structures"
- Structure Shape = Square, flat terrain
- Height of structure (unit + stand or curb, if used) = 6 ft max.
- Width of unit = 1 ft min., Depth of unit = 11 in min.

Rooftop (>15 ft MRH) Required Design Pressures:

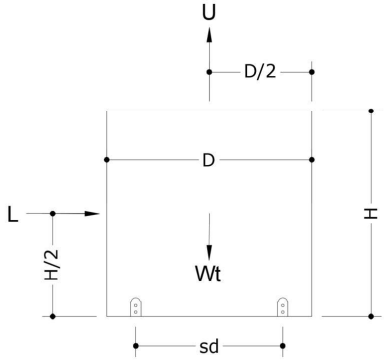
- ASCE 7 "Design Wind Loads: Other Structures: Rooftop Structures and Equipment for Buildings"
- Structure Shape = Square, flat terrain
- z = up to 7 ft, where z = height of stand or curb + ½ unit height
- Lateral GC_f = 1.90; Uplift GC_f = 1.50

VISIT ECALC.IO/FORCES

FOR DESIGN AID CALCULATORS AND RESOURCES RELATED TO THIS TER & GUIDES HEREIN, OR SCAN THE QR CODE RIGHT >

UNIT REACTIONS FROM WIND GUIDE

DIRECTIVE: This guide is intended for use by a design professional. Design parameters shall abide all specifications and limitations stated in this report. Design professional shall consider all forces, including seismic and snow loads, per the governing building code. Unit reactions obtained from this guide shall be verified by a registered Professional Engineer. Reactions are applicable for unit-to-host connections only. Sample calculations are provided below.



Design Parameters:

- Lateral Wind Pressure, P_lat
- Unit Height, H
- Unit Width, W
- Support Spacing across Depth, sd
- Uplift Wind Pressure, P_up
- Unit Depth, D
- Unit Weight, Wt
- Support Spacing across Width, sw

Unit Reaction Equations:

Long Side (Width x Height):

- Sliding Force, L = P_lat x W x H
- Uplift Force, U = P_up x W x D
- Total Tension per Long Side = (L x H/2 + U x sd/2 – Wt x 0.6 x sd/2) / sd

Short Side (Depth x Height):

- Sliding Force, L = P_lat x D x H
- Uplift Force, U = P_up x W x D
- Total Tension per Short Side = (L x H/2 + U x sw/2 – Wt x 0.6 x sw/2) / sw

Example: A (48" W x 36" D x 42" H), 250 lb net weight unit at wind pressures of 120 psf lateral and 95 psf uplift, on a 24" wide roof stand, shall have the following unit reactions:

Long Side (Width x Height):

1. Sliding Force, L = P_lat x W x H
   = (120 psf) x (48 in) x (42 in) x (1 in^2 / 144 ft^2) = **1680 lb**
2. Uplift Force, U = P_up x W x D
   = (95 psf) x (48 in) x (36 in) x (1 in^2 / 144 ft^2) = **1140 lb**
3. Total Tension per Long Side =
   = (L x H/2 + U x sd/2 – Wt x 0.6 x sd/2) / sd
   = ((1680 lb x 42/2 in) + (1140 lb x 24/2 in) – (250 lb x 0.6 x 24/2 in)) / 24 in = **1965 lb**

Short Side (Depth x Height):

1. Sliding Force, L = P_lat x D x H
   = (120 psf) x (36 in) x (42 in) x (1 in^2 / 144 ft^2) = **1260 lb**
2. Uplift Force, U = P_up x W x D
   = (95 psf) x (48 in) x (36 in) x (1 in^2 / 144 ft^2) = **1140 lb**
3. Total Tension per Short Side =
   = (L x H/2 + U x sw/2 – Wt x 0.6 x sw/2) / sw
   = ((1260 lb x 42/2 in) + (1140 lb x 48/2 in) – (250 lb x 0.6 x 48/2 in)) / 48 in = **1046 lb**

IN ALL CONDITIONS IT IS THE RESPONSIBILITY OF THE PERMIT HOLDER TO ENSURE THE HOST STRUCTURE IS CAPABLE OF WITHSTANDING THE RATED GRAVITY, LATERAL, AND UPLIFT FORCES BY SITE-SPECIFIC DESIGN. NO WARRANTY OF ANY KIND, EXPRESSED OR IMPLIED, IS OFFERED BY ENGINEERING EXPRESS AS TO THE INTEGRITY OF THE HOST STRUCTURE TO CARRY DESIGN FORCE LOADS INCURRED BY THIS UNIT.