



ENGINEER:

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REVISION HISTORY:

REV	DATE	DESCRIPTION
-	-	-

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PROJECT NAME:

GREE FLEXX CONDENSING UNIT PRODUCT EVALUATIONS-FLEXX60HP/AC230V1A0

DRAWING TITLE

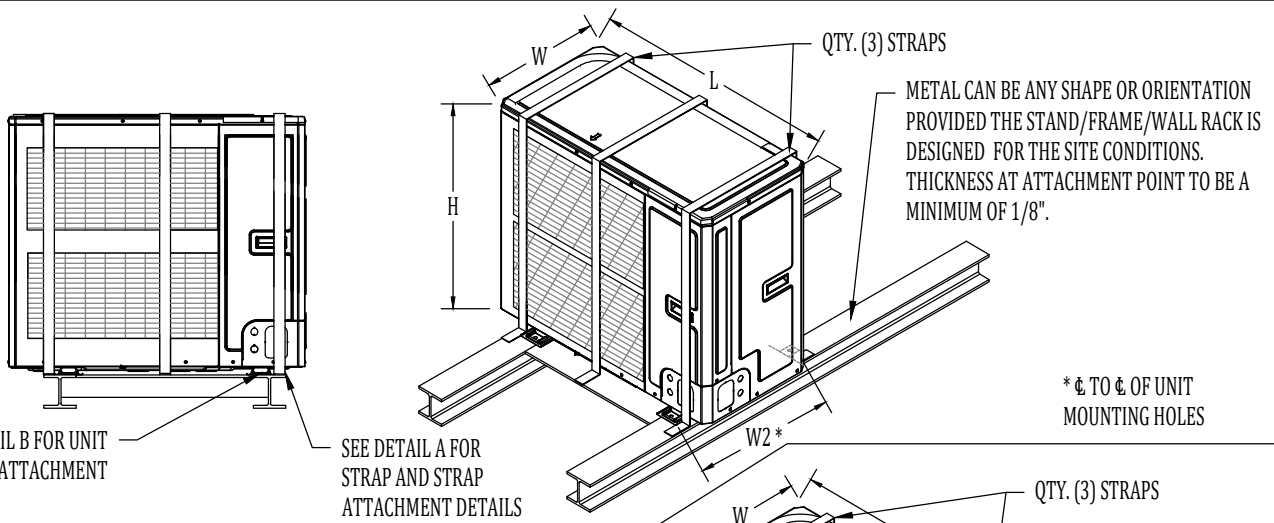
PRODUCT EVALUATION AND TIE-DOWN DETAILS

DATE 4/17/2023

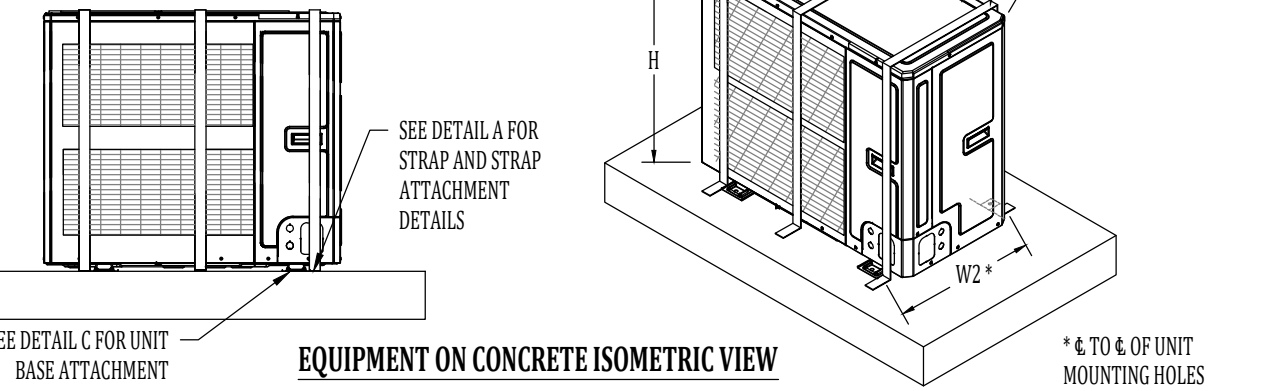
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DRAWING SCALE NTS

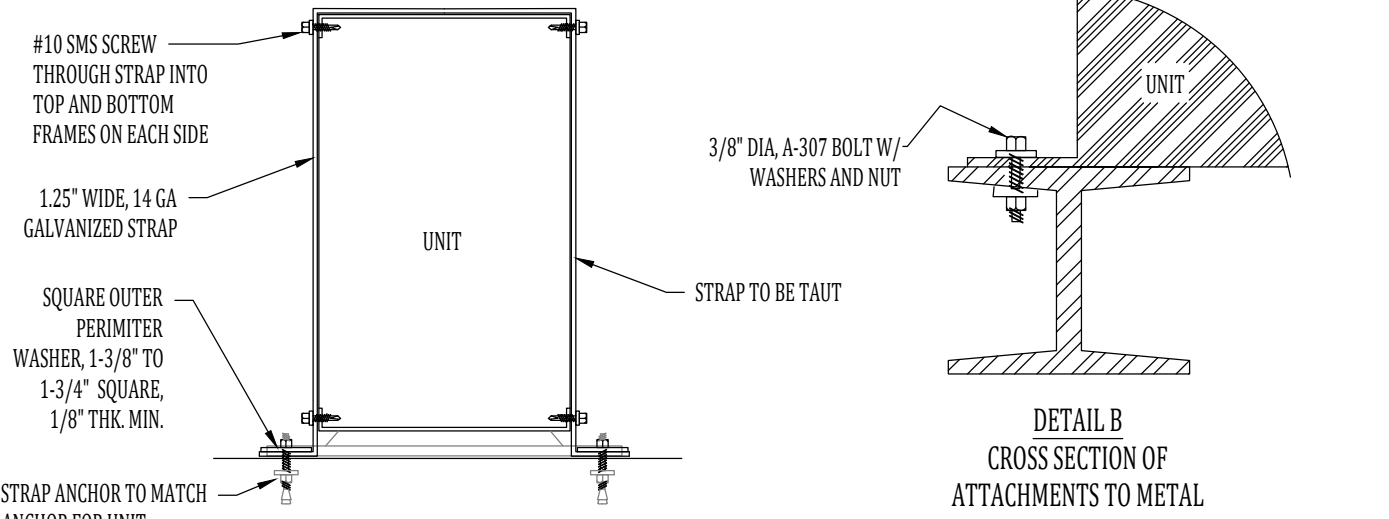
DRAWING NUMBER 21166-2 DWG SIZE B REVISION 0



EQUIPMENT ON METAL ISOMETRIC VIEW



EQUIPMENT ON CONCRETE ISOMETRIC VIEW

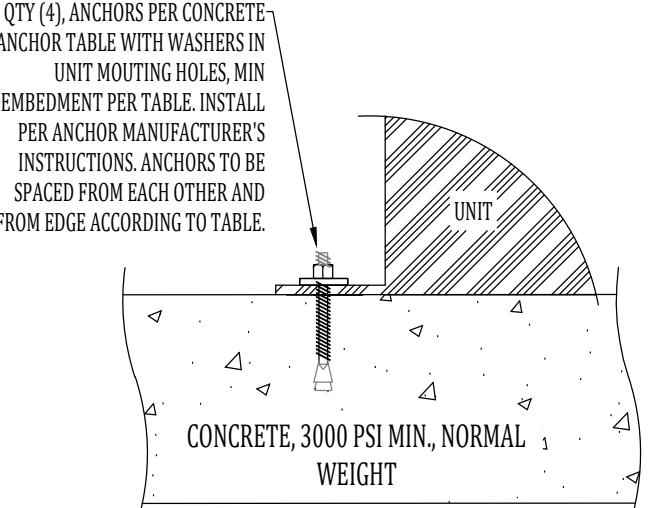


DETAIL A STRAP DETAIL

DETAIL B CROSS SECTION OF ATTACHMENTS TO METAL

CONCRETE ANCHOR TABLE:

ANCHOR SPECS	MIN. REQ'D SPACING BETWEEN CONCRETE ANCHORS	MIN. REQ'D DISTANCE TO CONCRETE EDGE FOR ANCHOR
3/8" DIA. SIMPSON WEDGE-ALL ANCHOR, WITH MIN EMBED OF 2.625" IN 3000 PSI MIN. CONCRETE	3.625"	3.75"
3/8" DIA. TAPCON+ ANCHOR, WITH MIN EMBED OF 2.5" IN 3000 PSI MIN. CONCRETE	3"	4.5"
5/16" DIA. TAPCON+ ANCHOR, WITH MIN EMBED OF 1.75", **FOR GROUND LEVEL MOUNT ONLY**	3"	3"



DETAIL C CROSS SECTION OF ATTACHMENTS TO CONCRETE

WIND LOAD CALCULATIONS PER APPLICABLE SECTIONS OF: FBC CHAPTERS 15&16, 2020, 7TH ED. ASCE7 CHAPTERS 26&29, 2016

- DESIGN CONDITIONS:
- EQUIPMENT DEAD LOAD: SEE CALCULATION
  - LOCATION: ROOF, 60' MAXIMUM ABOVE GRADE
  - WIND DESIGN CRITERIA:
    - Vult: 195 mph
    - Vasd: 151 mph
    - RISK CAT: IV
    - WIND EXPOSURE: D, HVHZ
  - USE ASD LOAD COMBINATIONS FOR WIND, FBC SECTION 1605.3:
    - 0.6D+(0.6W), EQ. 16-15, FOR UPLIFT (F<sub>h</sub> AND F<sub>v</sub>)
    - D+(0.6W), EQ. 16-12, FOR DOWNWARD FORCES

Wind Direction A, Normal to Long Side of Unit		F <sub>h</sub> =q <sub>h</sub> *(GC <sub>r</sub> )*A <sub>f</sub>	
H	56.3 in	GC <sub>r</sub>	1.9 Eq 29.5-2
L	37.2 in	A <sub>f unit</sub>	14.5 SQ FT
W	12.625 in	A <sub>f hoods-accessories</sub>	0.0 SQ FT
W <sub>2</sub>	13.9 in	A <sub>f total</sub>	14.5 SQ FT
Weight	262 lbs	F <sub>h</sub> =q <sub>h</sub> *(GC <sub>r</sub> )	209.1 lb/sq ft
V <sub>ult</sub>	195 mph	F <sub>min</sub> (lb/sq ft)	16 ASCE7, section 29.8
V <sub>ASD</sub>	151.0 mph	F <sub>h</sub> =q <sub>h</sub> *(GC <sub>r</sub> )*A <sub>f</sub>	3041 lb
Risk Category	IV	F <sub>v</sub> =q <sub>v</sub> *(GC <sub>r</sub> )*A <sub>r</sub>	
Exposure	D	GC <sub>r</sub>	1.5 Eq 29.5-3
		A <sub>f unit</sub>	3.3 SQ FT
K <sub>z</sub>	1.33 Table 29.3-1 (65 ft elev.)	A <sub>f hoods-accessories</sub>	0.0 SQ FT
K <sub>d</sub>	0.85 ASCE7, table 26.6-1	A <sub>f</sub>	3.3 SQ FT
K <sub>zt</sub>	1	F <sub>v</sub> =q <sub>v</sub> *(GC <sub>r</sub> )	165.1 lb/sq ft
q <sub>z</sub> =0.00256*K <sub>z</sub> *K <sub>zt</sub> *K <sub>d</sub> *V <sup>2</sup> (lb/sq ft)		F <sub>min</sub> (lb/sq ft)	16 ASCE7, section 29.8
q <sub>z</sub>	110.0 psf	F <sub>v</sub> =q <sub>v</sub> *(GC <sub>r</sub> )*A <sub>f</sub>	538.4 lb

Calculation Results	
<b>Totals at Base - Bolt:</b>	
# anchors on upwind side	5
# anchors per short side	0
0.6W+0.6D	755.6 LB uplift/anchor
Shear at base of equipment	
F <sub>h total</sub> (equipment)*0.6	1,825 LBS
# anchors	10
	182.5 LB shear/anchor
	3/8" rod/bolt assembly A307 steel
ANCHOR ALLOWABLE TENSION	2490.0
ANCHOR ALLOWABLE SHEAR	1330.0
Anchor installed horizontally (uplift loads hardware in shear)	
Anchor Combined loading value	0.33 must be less than or = to 1
Anchor is OK	
<b>Totals at Base - Concrete Anchor:</b>	
# anchors on upwind side	5
# anchors per short side	0
0.6W+0.6D	755 LB uplift/anchor
Shear at base	
# anchors	4
	456.2 LB shear/anchor
	Wedge Anchor, 3000psi normal weight concrete 3/8" anchors, 2.625" embed
ANCHOR ALLOWABLE TENSION	1100 LBS
ANCHOR ALLOWABLE SHEAR	1055 LBS
Anchor installed vertically (uplift loads hardware in tension)	
Anchor Combined loading value	0.78 must be less than or = to 1
Anchor is OK	

SCOPE:  
PRODUCT EVALUATION AND TIE-DOWN DETAIL FOR CONDENSING UNITS TO METAL (ALUMINUM OR STEEL) AND CONCRETE SURFACES. EVALUATION AND TIE-DOWNS INVESTIGATE WIND SHEAR AND OVERTURNING MOMENT. UNIT INTEGRITY IS ADDRESSED WITH THE STRAPS AND PREVENTS PANEL SEPARATION. CUs ARE MADE BY GREE, MODEL NUMBERS: FLEXX60HP230V1A0 AND FLEXX60AC230V1A0 (...60AC... IS GOVERNING).

- GENERAL NOTES:
- INTEGRITY OF METAL (STEEL OR ALUMINUM) OR CONCRETE STRUCTURE SHALL BE RATED FOR THE LOADS OF THE UNITS. THIS CAN BE ACHIEVED WITH STAND/FRAME/WALL RACK/PAD ETC. WITH NOA, FLORIDA PRODUCT APPROVAL, EOR SPECIFICATION, OR OTHER AHJ APPROVED METHOD.
  - ANCHORS, BOLTS, SCREWS, AND RODS TO HAVE CORROSION RESISTANT COATING SUITABLE FOR THE ENVIRONMENT. COASTAL INSTALLATIONS REQUIRE HOT DIP GALVANIZED OR STAINLESS STEEL.
  - IT IS OWNER'S RESPONSIBILITY TO ENSURE THAT ALL MANUFACTURER'S SCREWS, PANEL SCREWS, STRAP SCREWS, AND ANCHORS ARE IN PLACE AS PART OF THEIR PERIODIC MAINTENANCE AND HURRICANE PREPARATION PLANS.
  - IT IS OWNER'S RESPONSIBILITY TO ENSURE THAT ALL ATTACHMENT LOCATIONS AND FASTENERS ARE MAINTAINED AND DO NOT CORRODE OVER TIME