

# MIAMI-TECH, INC.

"AST" STANDS FOR MECHANICAL UNITS  
HVHZ & NON-HVHZ

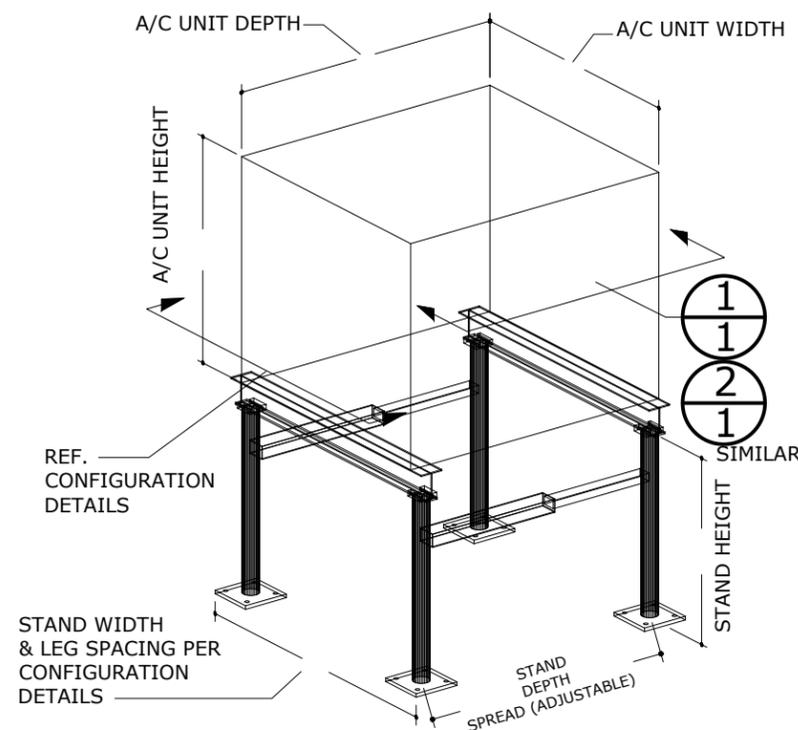
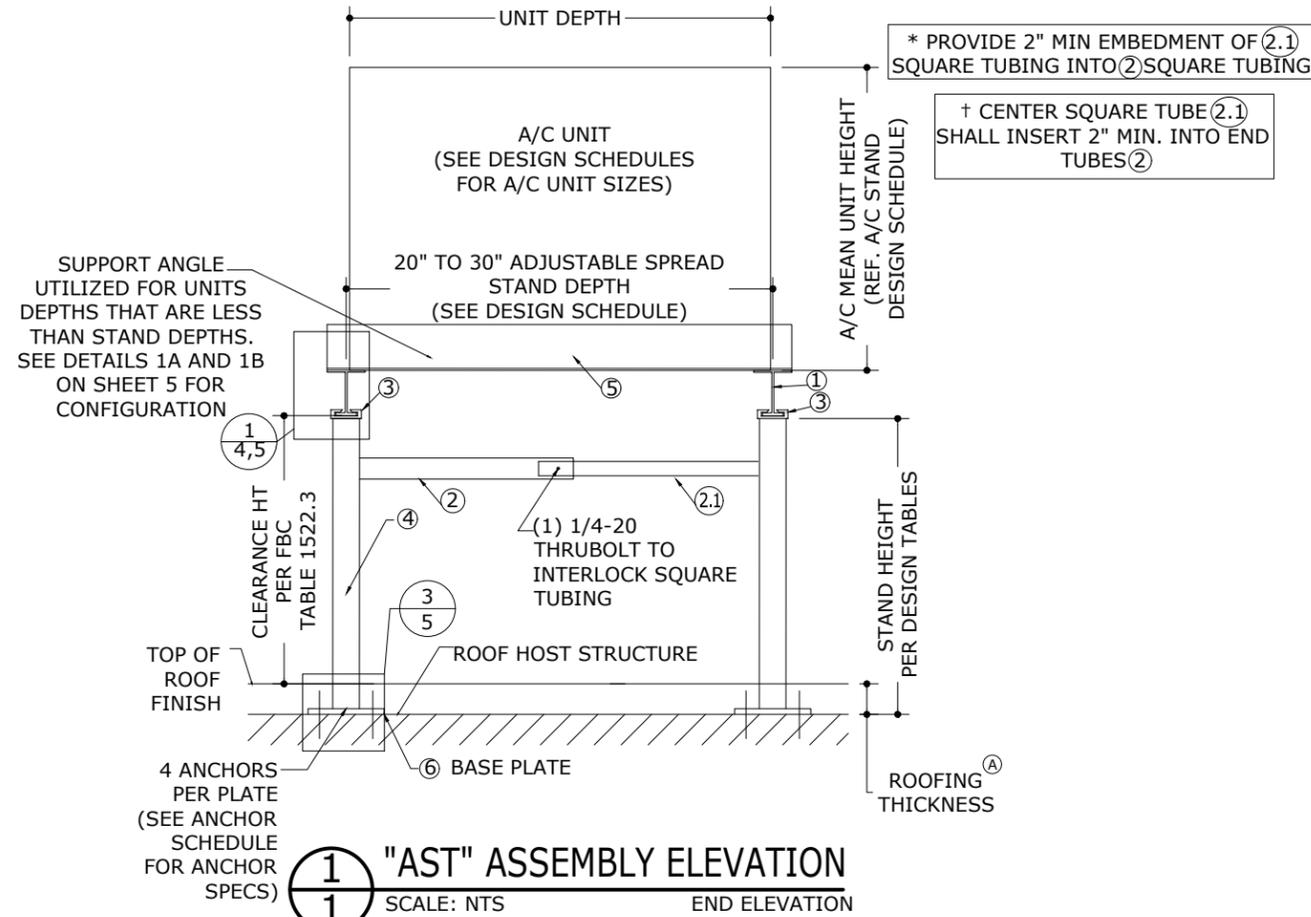
NON-SITE-SPECIFIC STRUCTURAL PERFORMANCE EVALUATION. A DESIGN PROFESSIONAL SHALL BE RESPONSIBLE FOR CERTIFYING THE APPLICATION OF THIS INFORMATION TO ANY SITE-SPECIFIC LOCATION.

**NOTE REGARDING USE OF THIS DOCUMENT & USE OUTSIDE FLORIDA:**

NON-SITE-SPECIFIC STRUCTURAL PERFORMANCE EVALUATION. THIS PRODUCT EVALUATION IS VALID FOR USE IN **FLORIDA ONLY**. USE OF THIS EVALUATION REQUIRES A REVIEW & CERTIFICATION BY A LOCAL DESIGN PROFESSIONAL WHO SHALL BE RESPONSIBLE FOR THE PROPER ADAPTATION OF THIS GENERAL PERFORMANCE EVALUATION TO ANY SITE-SPECIFIC PROJECT. CONTACT THIS OFFICE AT **ENGINEERINGEXPRESS.COM/QUOTE** FOR ASSISTANCE WITH YOUR PROJECT-SPECIFIC NEEDS & FOR ADAPTATION & CERTIFICATION OF THIS DOCUMENT OUTSIDE OF FLORIDA.

RICHARD NEET, P.E.  
PE# 86488 CA# 9885

APRIL 30, 2024



<sup>A</sup>ROOFING FINISH THICKNESS SHALL BE ACCOUNTED FOR BY CONTRACTOR WHEN DETERMINING REQUIRED STAND HEIGHT IN ACCORDANCE WITH THE FBC OR THE LOCAL JURISDICTION.

REQUIRED STAND DEPTH SHALL BE DETERMINED BY CONTRACTOR

75# MIN./450 # MAX UNIT WEIGHT AS VERIFIED BY OTHERS, TYP.

## MAXIMUM ALLOWABLE DESIGN PRESSURES:

AS NOTED IN DESIGN SCHEDULES

## DESIGN NOTES:

DESIGN PRESSURES CALCULATED FOR USE WITH THIS SYSTEM SHALL BE DETERMINED SEPARATELY ON A JOB-SPECIFIC BASIS IN ACCORDANCE WITH THE ASCE 7-22 AND CHAPTER 16 OF THE FLORIDA BUILDING CODE EIGHTH EDITION (2023) USING ASD METHODOLOGY. SITE-SPECIFIC PRESSURE REQUIREMENTS AS DETERMINED IN ACCORDANCE WITH ASCE 7-22 AND CHAPTER 16 OF THE FLORIDA BUILDING CODE EIGHTH EDITION (2023) SHALL BE LESS THAN OR EQUAL TO THE LATERAL AND UPLIFT DESIGN PRESSURE CAPACITY VALUES LISTED HEREIN FOR ANY ASSEMBLY AS SHOWN.

## GENERAL NOTES

- THIS SYSTEM HAS BEEN DESIGNED AND SHALL BE FABRICATED IN ACCORDANCE WITH THE STRUCTURAL PROVISIONS OF THE FLORIDA BUILDING CODE EIGHTH EDITION (2023).
- MAXIMUM DIMENSIONS AND WEIGHT OF A/C UNIT SHALL CONFORM TO SPECIFICATIONS STATED HEREIN, MINIMUM 75LB OR MAXIMUM AS LISTED HEREIN.
- THE ARCHITECT/ENGINEER OF RECORD FOR THE PROJECT SUPERSTRUCTURE WITH WHICH THIS DESIGN IS USED SHALL BE RESPONSIBLE FOR THE INTEGRITY OF ALL SUPPORTING SURFACES TO THIS DESIGN WHICH SHALL BE COORDINATED BY THE PERMITTING CONTRACTOR.
- REACTION FORCES LISTED FOR USE WITH HOST STRUCTURE VERIFICATION ARE CALCULATED USING ASD METHODOLOGY. DESIGN PROFESSIONAL OF RECORD TO VERIFY APPLICABILITY AND/OR ADDITIONAL FACTORS FOR USE WITH HOST STRUCTURE VERIFICATION.
- ALL FASTENERS TO BE #10 OR GREATER SAE GRADE 5, UNLESS NOTED OTHERWISE, CADMIUM PLATED OR OTHERWISE CORROSION RESISTANT MATERIAL AND SHALL COMPLY WITH J.3.3, SPECIFICATIONS FOR ALUM. STRUCTURES -SECTION 1, THE ALUMINUM ASSOCIATION, INC., & APPLICABLE FEDERAL, STATE, AND LOCAL CODES. PROVIDE (3) PITCHES MIN PAST THREAD PLANE.
- ALL EXTRUDED MEMBERS SHALL BE ALUMINUM ALLOY TYPE 6061-T6 OR 6005-T5.
- ALL 22GA DEFORMED STEEL STRAPS USED FOR UNIT TIE-DOWNS SHALL BE  $F_y = 36$ KSI MIN. STEEL. FABRICATION OF STEEL STRAPS SHALL BE BY STRAP MANUFACTURER ONLY.
- ALL EXISTING CONCRETE SUBSTRATE SHALL HAVE MINIMUM  $f'_c$  COMPRESSIVE STRENGTH OF 3000 PSI AS VERIFIED BY OTHERS, U.N.O.
- ALUMINUM WELDING SHALL BE PERFORMED IN ACCORDANCE WITH FBC SECTION 2003.8.1 WITH WELD FILLER ALLOYS MEETING ANSI/AWS A5.10 STANDARDS TO ACHIEVE ULTIMATE DESIGN STRENGTH IN ACCORDANCE WITH THE ALUMINUM DESIGN MANUAL, TABLE J.2.1. SUGGESTED WELD FILLER: 5356 ELECTRODES. ALL ALUMINUM CONSTRUCTION SHALL BE IN CONFORMANCE WITH THE TOLERANCES, QUALITY AND METHODS OF CONSTRUCTION AS SET FORTH IN FBC SECTION 2003.2 AND THE AMERICAN WELDING SOCIETY'S STRUCTURAL WELDING CODE-ALUMINUM (D1.2). MINIMUM WELD IS  $\frac{1}{8}$ " THROAT FULL PERIMETER FILLET WELD UNLESS OTHERWISE NOTED.
- THE CONTRACTOR IS RESPONSIBLE TO INSULATE MEMBERS FROM DISSIMILAR MATERIALS TO PREVENT ELECTROLYSIS.
- ELECTRICAL GROUND, WHEN REQUIRED, TO BE DESIGNED & INSTALLED BY OTHERS. ALL MECHANICAL SPECIFICATIONS (CLEAR SPACE, TONNAGE, ETC.) SHALL BE AS PER MANUFACTURER RECOMMENDATIONS AND ARE THE EXPRESS RESPONSIBILITY OF THE CONTRACTOR.
- ENGINEER SEAL AFFIXED HERETO VALIDATES STRUCTURAL DESIGN AS SHOWN ONLY. USE OF THIS SPECIFICATION BY CONTRACTOR, et. al. INDEMNIFIES & SAVES HARMLESS THIS ENGINEER FOR ALL COST & DAMAGES INCLUDING LEGAL FEES & APPELLATE FEES RESULTING FROM MATERIAL FABRICATION, SYSTEM ERECTION, CONSTRUCTION PRACTICES BEYOND THAT WHICH IS CALLED FOR BY LOCAL, STATE, & FEDERAL CODES & FROM DEVIATIONS OF THIS PLAN.
- THE SYSTEM DETAILED HEREIN IS GENERIC AND DOES NOT PROVIDE INFORMATION FOR A SPECIFIC SITE. FOR SITE CONDITIONS DIFFERENT FROM THE CONDITIONS DETAILED HEREIN, A LICENSED ENGINEER OR REGISTERED ARCHITECT SHALL PREPARE SITE SPECIFIC DOCUMENTS FOR USE IN CONJUNCTION WITH THIS DOCUMENT.
- EXCEPT AS EXPRESSLY PROVIDED HEREIN, NO ADDITIONAL CERTIFICATIONS OR AFFIRMATIONS ARE INTENDED.
- AC STANDS SHALL LABELLED PER MIAMI-DADE REQUIREMENTS FOR NON-MANDATORY PRODUCT APPROVALS IN ACCORDANCE WITH THE FLORIDA BUILDING CODE.

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"AST" STAND FOR MECHANICAL UNITS  
FLORIDA BUILDING CODE EIGHTH EDITION (2023)  
FLORIDA STATEWIDE APPROVAL (FSA FL#21464.1)

REMARKS	DATE	DRWN	CHKD
PREV. SUBMITTAL (20-26328)	06/09/20	CB	RWN
2023 FBC UPDATE	03/25/24	MRT	RWN

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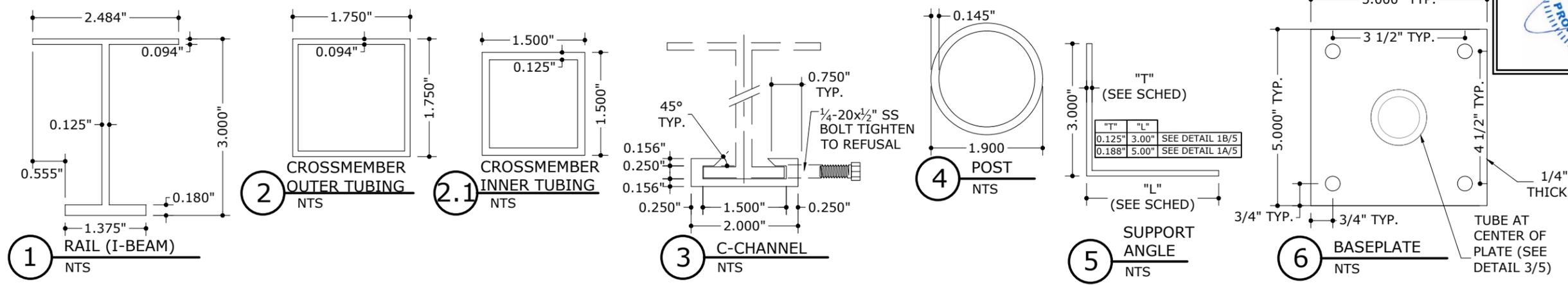
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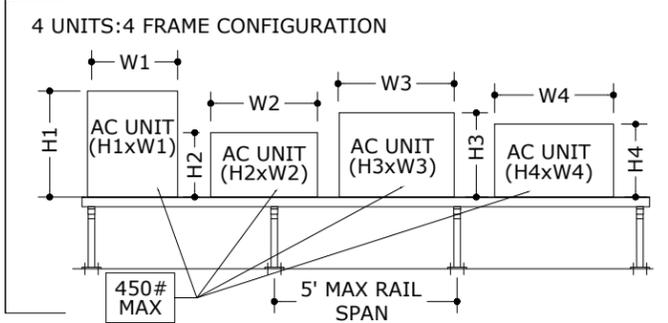
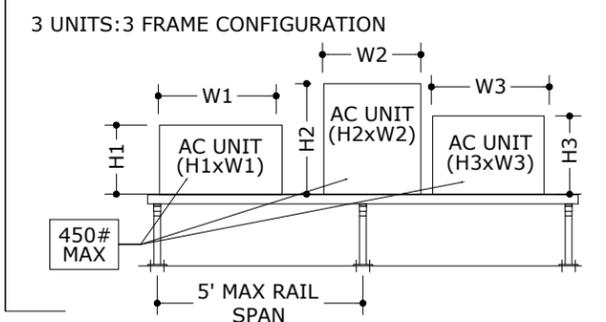
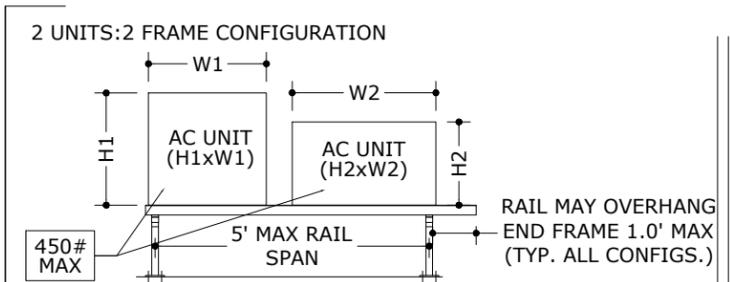
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# STAND COMPONENTS

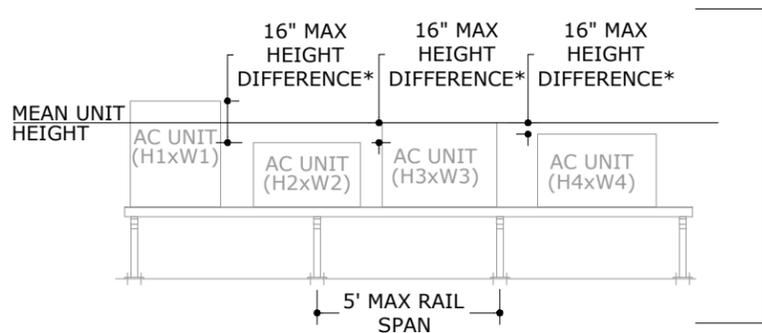
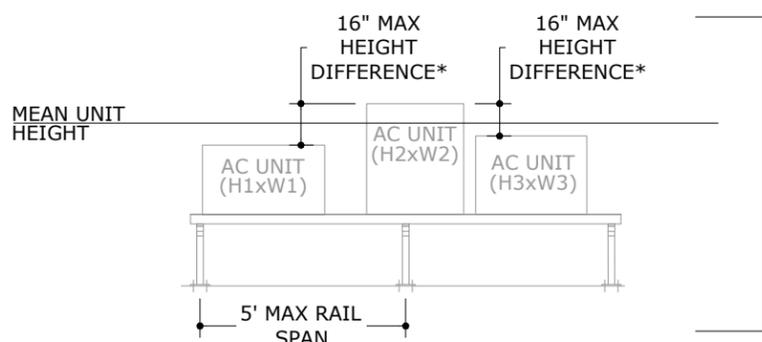
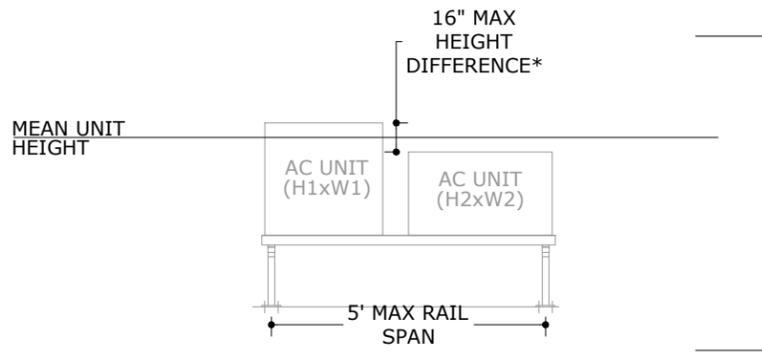


## MEAN UNIT HEIGHT & MAX FACE AREA CALCULATION DIRECTIVE: THIS DIRECTIVE SHALL BE USED TO CALCULATE THE MEAN UNIT HEIGHT & MAXIMUM FACE AREA OF ANY MULTIPLE UNIT CONFIGURATION.

### EXAMPLE CONFIGURATIONS:



NOTE: THE NUMBER OF UNITS PER STAND CONFIGURATION MAY BE UNLIMITED PROVIDED THAT MULTIPLE UNITS CONFORM TO THE MEAN UNIT HEIGHT & MAXIMUM UNIT FACE AREA RESTRICTIONS UTILIZED IN THE DESIGN SCHEDULES.



\*MAXIMUM ALLOWABLE HEIGHT DIFFERENCE BETWEEN ANY UNITS IN A MULTIPLE UNIT CONFIGURATION IS RESTRICTED TO 16" MAX.

### FORMULAS USED FOR DETERMINING MEAN UNIT HEIGHT & MAXIMUM UNIT FACE AREA:

1. CALCULATE THE MEAN UNIT HEIGHT BY THE FOLLOWING EQUATION:

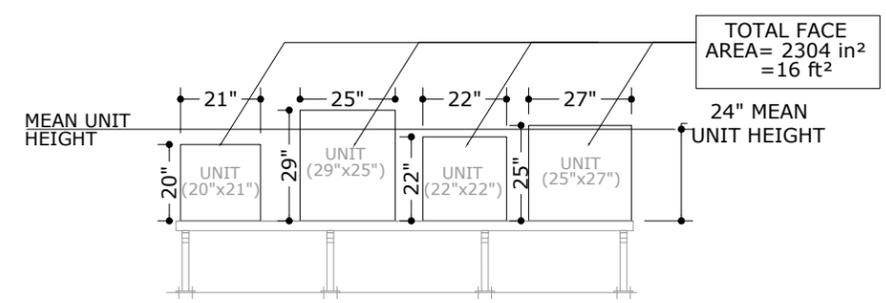
- TWO UNITS:  $\frac{H1+H2}{2}$
- THREE UNITS:  $\frac{H1+H2+H3}{3}$
- FOUR UNITS:  $\frac{H1+H2+H3+H4}{4}$
- "n" UNITS:  $\frac{H1+H2+H3+...+Hn}{n}$

2. CALCULATE THE MAXIMUM UNIT FACE AREA BY THE FOLLOWING EQUATION:

- TWO UNITS:  $(H1 \times W1) + (H2 \times W2)$
- THREE UNITS:  $(H1 \times W1) + (H2 \times W2) + (H3 \times W3)$
- FOUR UNITS:  $(H1 \times W1) + (H2 \times W2) + (H3 \times W3) + (H4 \times W4)$
- "n" UNITS:  $(H1 \times W1) + \dots + (Hn \times Wn)$

### EXAMPLE SCENARIO:

- CONSIDER A FOUR UNIT CONFIGURATION WITH THE DIMENSIONS AS SHOWN BELOW.
- CALCULATE THE MEAN UNIT HEIGHT.
  - FOUR UNITS:  $\frac{H1+H2+H3+H4}{4} = \frac{20"+29"+22"+25"}{4} = 24"$  MEAN UNIT HEIGHT
- CALCULATE THE MAXIMUM FACE AREA.
  - FOUR UNITS:  $(H1 \times W1) + (H2 \times W2) + (H3 \times W3) + (H4 \times W4) = (20" \times 21") + (29" \times 25") + (22" \times 22") + (25" \times 27") = 2304 \text{ in}^2 = 16 \text{ ft}^2$



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REMARKS	DRWN	CHKD	DATE
PREV. SUBMITTAL (20-26328)	CB	RWN	06/09/20
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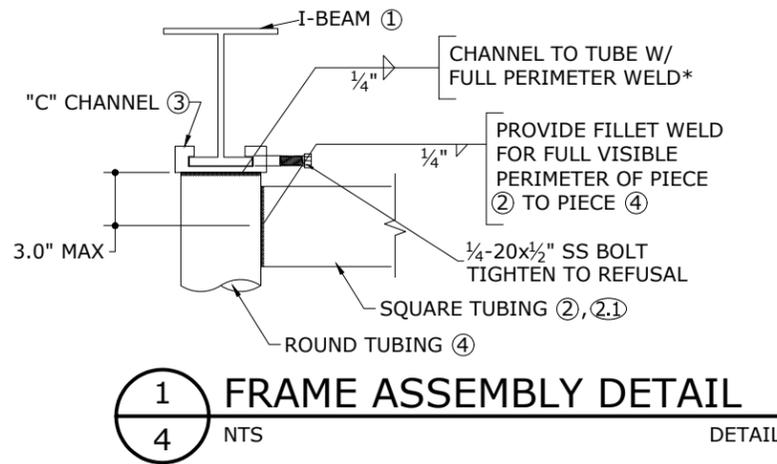
# FRAME ASSEMBLY & UNIT TIE-DOWN DETAILS:

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PE# 86488 CA# 9885

APRIL 30, 2024



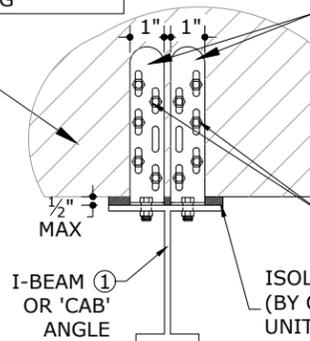
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**1** FRAME ASSEMBLY DETAIL  
4 NTS

THIS DETAIL IS APPLICABLE FOR UNITS UP TO 48" TALL MAX. UNITS TALLER THAN 48" REQUIRE SITE SPECIFIC OR SEPARATE TIEDOWN ENGINEERING

22 GA (0.0299" MIN., Fu=58KSI MIN.) STEEL A/C HOUSING UNIT



(2) 1" WIDE x 14GA (0.070") OR x 12GA (0.105") ASTM A-653 GRADE 33 GALV STEEL ANGLE (CUTD-1 BY MIAMI TECH). UTILIZE (2) MIN. PER CORNER.

FASTEN CLIP VERTICAL LEG TO 22 GA (0.0299" MIN.) STEEL HOUSING WITH (5) #10 SAE GRADE 2 MIN. SHEET METAL SCREWS PER CLIP. FASTEN CLIP HORIZONTAL LEG TO I-BEAM RAIL WITH (1) 1/4" Ø SAE GRADE 2 MIN. THRU BOLT CENTERED ABOUT LEG.

**2** A/C UNIT TIE-DOWN DETAIL  
4 NTS (SEE TIEDOWN STRAP SCHED. FOR STRAP REQUIREMENTS)

NOTE: UNIT TIEDOWN DETAILS MAY ALSO BE USED TO ANCHOR THE UNIT TO THE SUPPORT ANGLE SHOWN ON NEXT SHEET. (I.E. I-BEAM CAN BE SUBSTITUTED WITH ANGLE SUPPORT AS BASE MATERIAL)

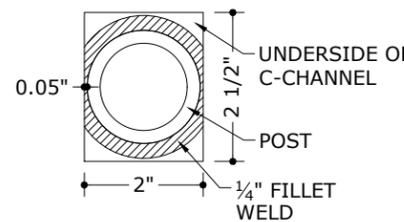
## TIEDOWN STRAP SCHEDULE

MAX UNIT HEIGHT (in)	MIN UNIT DEPTH (in)	MAX LATERAL PRESSURE (psf)	NO. OF STRAPS REQUIRED (PER UNIT)
UP TO 24	12-19	UP TO 80	0
		UP TO 120	0
		UP TO 200	2
	20	UP TO 80	0
		UP TO 120	0
		UP TO 200	0
UP TO 30	12-19	UP TO 80	0
		UP TO 120	2
		UP TO 200	2
	20	UP TO 80	0
		UP TO 120	0
		UP TO 200	0
UP TO 36	12-19	UP TO 80	0
		UP TO 120	2
		UP TO 200	3
	20	UP TO 80	0
		UP TO 120	0
		UP TO 200	2
UP TO 40	14-23	UP TO 80	0
		UP TO 120	2
		UP TO 200	3
	24	UP TO 80	0
		UP TO 120	2
		UP TO 200	3
UP TO 48	16-23	UP TO 80	3
		UP TO 120	4
		UP TO 200	5
	24	UP TO 80	0
		UP TO 120	2
		UP TO 200	4
UP TO 54	16-23	UP TO 80	4
		UP TO 120	5
		UP TO 200	6
	24	UP TO 80	2
		UP TO 120	3
		UP TO 200	5

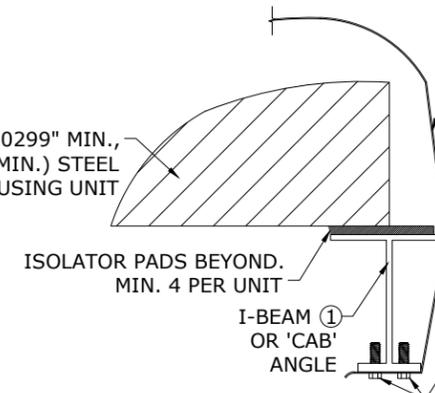
### TIEDOWN SCHEDULE NOTES:

- THE TIEDOWN CLIP AND STRAP REQUIREMENTS ON THIS SHEET DO NOT ACCOUNT FOR INTEGRATED FEET OR RAILS ON THE MECHANICAL UNITS. IF INTEGRATED TIEDOWN FEET OR RAILS EXIST ON THE UNIT, SEPARATE ENGINEERING IS REQUIRED.
- THE TIEDOWN REQUIREMENTS ON THIS SHEET ACCOUNT FOR RECTANGULAR SHAPED UNITS ONLY. CIRCULAR OR OTHER SHAPED MECHANICAL EQUIPMENT (FANS, DUCTWORK, PIPES, ETC.) SHALL BE CERTIFIED SEPARATELY.

\*C-CHANNEL TO POST WELD NOTE:  
IN AREAS WHERE 1/4" WELD DIAMETER CANNOT BE ACHIEVED, CONTINUE WELD AROUND FULL PERIMETER OF POST TO PREVENT WATER INFILTRATION. WELD DIAMETER WILL DECREASE TO 0.05" ALONG C-CHANNEL EDGE. SEE DETAIL BELOW.



22 GA (0.0299" MIN., Fu=58KSI MIN.) STEEL A/C HOUSING UNIT

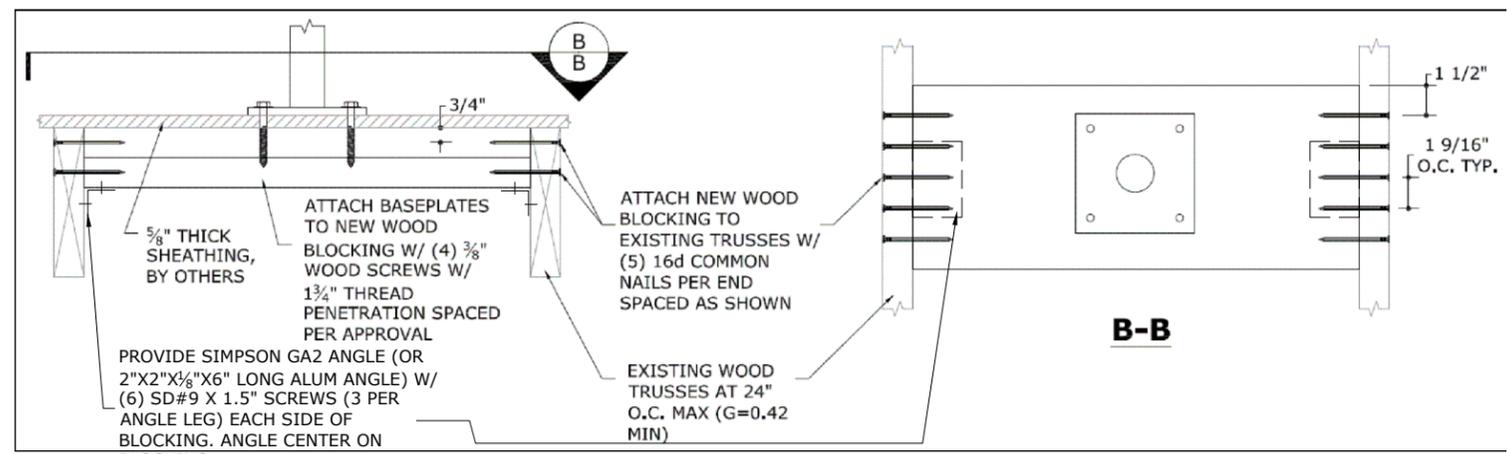


1"x 22ga CONTINUOUS GALV. STEEL STRAP (Fy = 36 KSI MIN.) SHALL PASS OVER UNIT TO I-BEAM ON OPPOSITE SIDE TIGHTENED SNUG AGAINST UNIT. STRAPS SHALL BE SPACED SYMMETRICALLY OVER UNITS NO CLOSER THAN 2" FROM UNIT EDGES, TYP.

SEE TIEDOWN STRAP SCHEDULE FOR REQUIRED NUMBER OF STRAPS PER UNIT

(2) #14 SAE GR 2 MIN. SMS WITH WASHERS AT EACH STRAP END TO UNDERSIDE OF I-BEAM OR SIDE OF 'CAB' ANGLE

**3** TIE-DOWN STRAP DETAIL \*\*  
4 NTS \*SHALL BE USED IN COMBINATION WITH ANY A/C UNIT TIE-DOWN DETAIL ON THIS SHEET



**4** ALT. BASEPLATE TO WOOD TRUSS ATTACHMENT (2X10 WOOD BLOCKING)  
4 NTS SCALE: NTS WOOD (G=0.55 MIN.)

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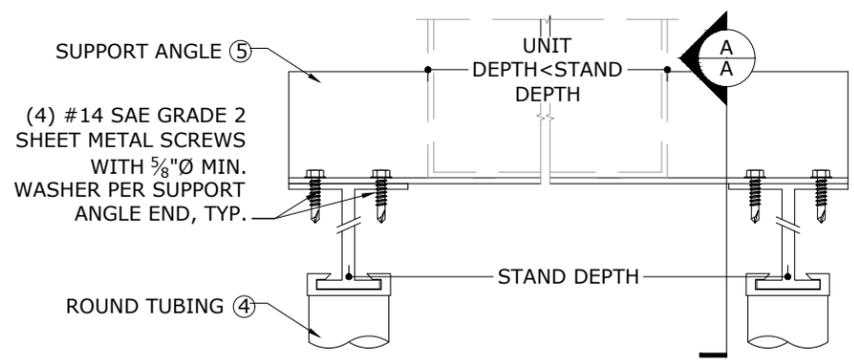
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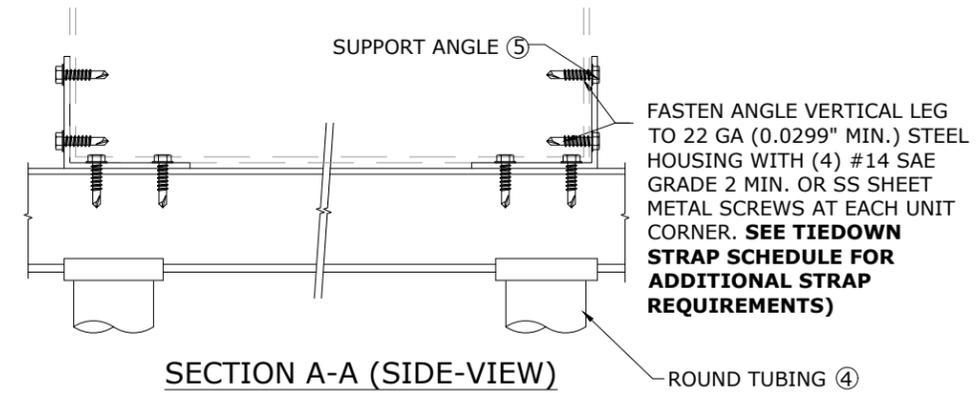
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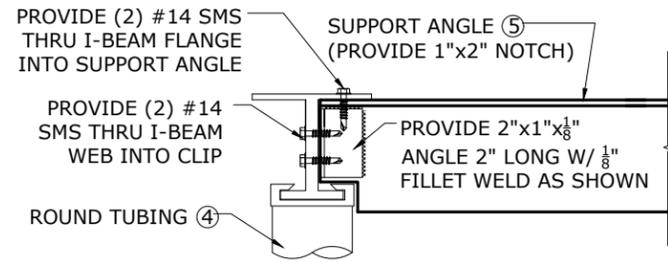
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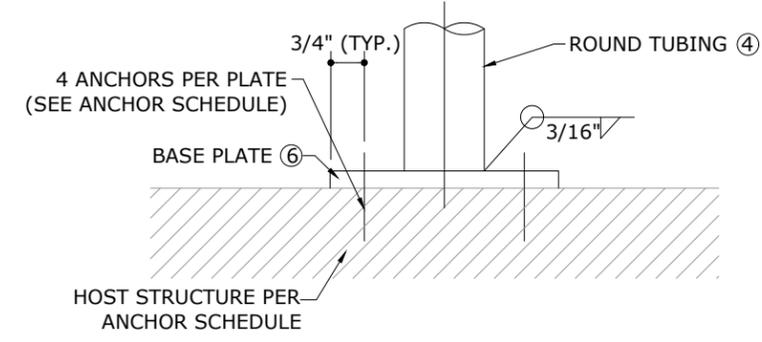
**1A**  
**5** NTS  
**SUPPORT ANGLE ATTACHMENT DETAIL**



**SECTION A-A (SIDE-VIEW)**  
ROUND TUBING 4



**1B**  
**5** NTS  
**SUPPORT ANGLE ATTACHMENT DETAIL**



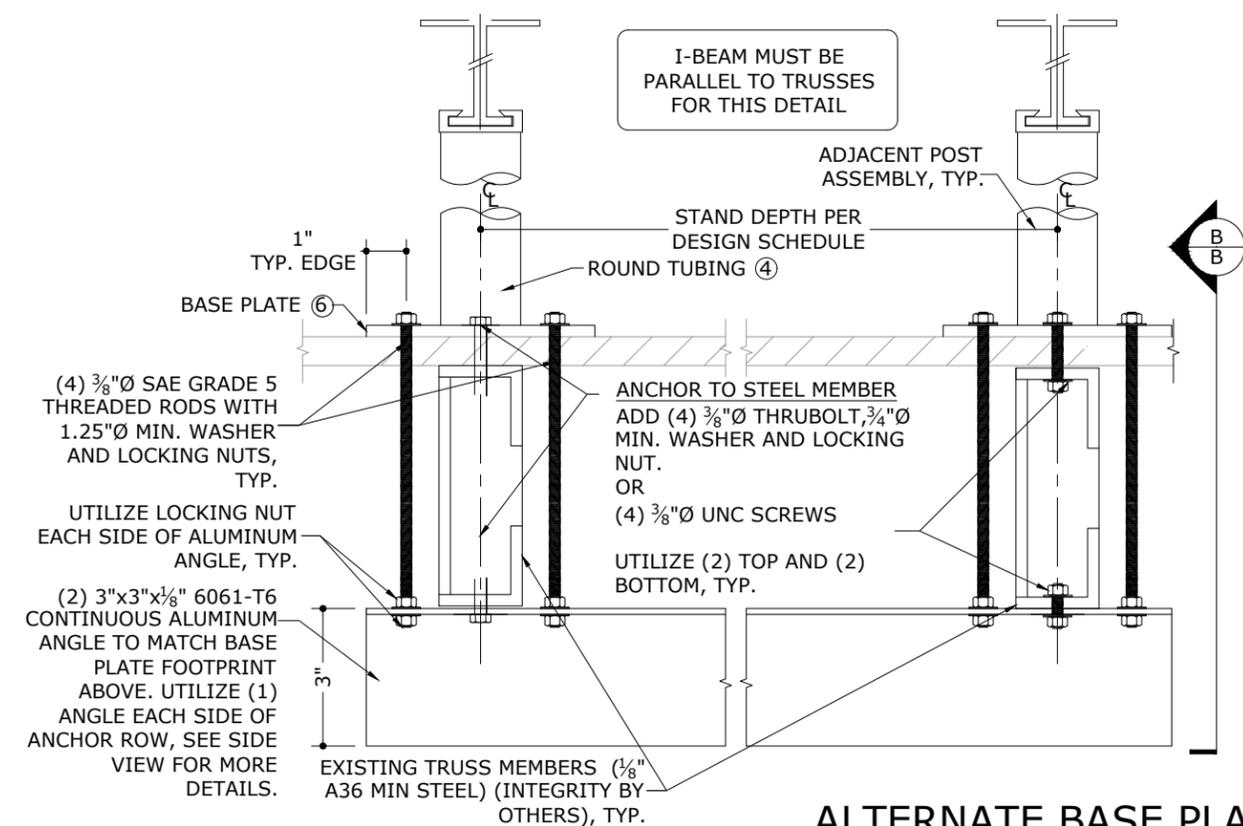
**3**  
**5** NTS  
**STANDARD BASE PLATE ATTACHMENT DETAIL**

**ANCHOR SCHEDULE**

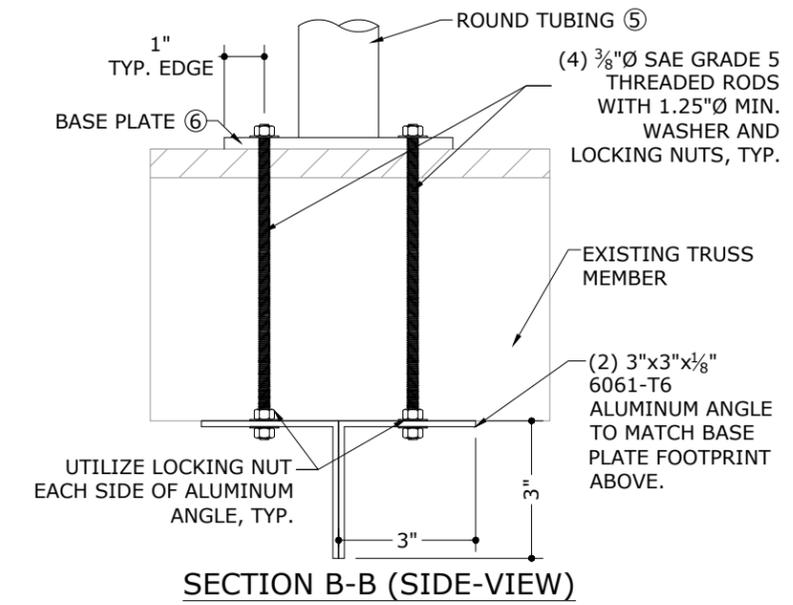
ANCHOR TYPE	HOST STRUCTURE	ANCHOR DESCRIPTION
1	STEEL	3/8"Ø SAE GRADE 5 SHEET METAL SCREWS WITH 1"Ø MIN. WASHER, TO STRUCTURAL A36 STEEL MEMBERS (3/16" MIN HOST THICKNESS)
2A	CONCRETE (3.0 KSI MIN)	3/8"Ø DEWALT CARBON STEEL SCREW-BOLT CONCRETE ANCHOR WITH 1"Ø MIN. WASHER, 2-1/2" EMBEDMENT & 6" MIN EDGE DISTANCE, SEE BASE PLATE COMPONENT #6 (ON SHEET 2) FOR TYPICAL ANCHOR SPACING.
2B	CONCRETE (5.0 KSI MIN)	1/2"Ø DEWALT MINI-DROPIN ANCHOR WITH 1.0" EMBEDMENT & 6" MIN EDGE DISTANCE, SEE BASE PLATE COMPONENT #6 (ON SHEET 2) FOR TYPICAL ANCHOR SPACING. <b>NOTE: MAX ALLOWABLE PRESSURES LISTED IN THE STAND DESIGN SCHEDULE SHALL BE MULTIPLIED BY 0.8 WHEN USING THIS ANCHOR OPTION</b>
3	WOOD*	*SEE DETAIL 4/4 OR SITE SPECIFIC ENGINEERING IS REQUIRED
4	STEEL	3/8"Ø SAE GRADE 5 THRUBOLT WITH 1"Ø MIN. WASHER & NUT, TO STRUCTURAL A36 STEEL MEMBERS (3/16" MIN HOST THICKNESS)

**ANCHOR NOTES:**

- ANCHORS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS' RECOMMENDATIONS.
- ENSURE MINIMUM EDGE DISTANCE AS NOTED IN ANCHOR SCHEDULE FOR EACH ANCHOR.
- WOOD HOST STRUCTURE SHALL BE "SOUTHERN PINE" G=0.55 OR GREATER DENSITY. ALL CONCRETE SUBSTRATE SHALL BE UN-CRACKED CONCRETE AND SHALL HAVE MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI, U.N.O. CONCRETE SUBSTRATE THICKNESS SHALL BE GREATER THAN OR EQUAL TO 1.5xANCHOR EMBEDMENT. INSTALL CONCRETE ANCHORS TO UN-CRACKED CONCRETE ONLY.
- MINIMUM EMBEDMENT SHALL BE AS NOTED IN ANCHOR SCHEDULE. MINIMUM EMBEDMENT AND EDGE DISTANCE EXCLUDES ROOFING FINISHES.
- WHERE EXISTING STRUCTURE IS WOOD TRUSSES, EXISTING CONDITIONS MAY VARY. FIELD VERIFY THAT FASTENERS ARE INTO ADEQUATE WOOD TRUSS MEMBERS, NOT INTO PLYWOOD.



**4**  
**5** NTS  
**ALTERNATE BASE PLATE ATTACHMENT AT STEEL TRUSS MEMBERS**  
DETAIL



**SECTION B-B (SIDE-VIEW)**

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