

# PROJECT:

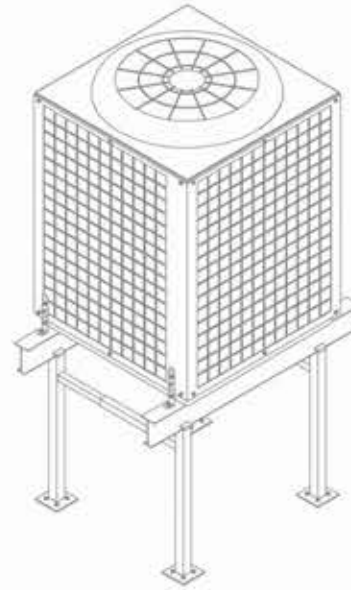
## Aluminum Roof Top Condenser Stand

### THE METAL SHOP

2541 W. Dunnellon Road  
Dunnellon, FL 34433

www.metalshop.org

Phone: 888-441-2492 Fax: 352-522-0007



### NOTES

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE 2020 FLORIDA BUILDING CODE, 7TH EDITION, BUILDING VOLUME AND ASCE 7-16 MINIMUM DESIGN LOADS ON BUILDINGS AND OTHER STRUCTURES.
2. ANY CHANGE FROM THE DRAWINGS AND/OR FIELD CHANGE CONDITIONS MUST IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE STRUCTURAL ENGINEER SO THAT NECESSARY CHANGES CAN BE MADE AND THE INTENDED DESIGN IS CARRIED OUT TO ITS FULLEST EXTENT.
3. IT IS THE RESPONSIBILITY OF THE INSTALLING CONTRACTOR TO PROVIDE ADEQUATE ANCHORAGE AND A CORROSION RESISTANT SEPARATION BARRIER/COATING AT THE BOTTOM OF ALL BASE PLATES WHEN BEARING DIRECTLY ON CONCRETE AND STEEL STRUCTURES. THE SEPARATION BARRIER IS INTENDED ONLY FOR THE PREVENTION OF CORROSION.
4. MINIMUM DESIGN LOADS: DEAD LOADS AND LIVE LOADS IN ACCORDANCE WITH THE 2020 FLORIDA BUILDING CODES, CHAPTER 16. AIR CONDENSER AND FRAME WITHSTANDS WIND SPEEDS UP TO 160 MPH PER 2020 FBC AND 7-16 STANDARDS.
5. CALCULATIONS ARE BASED ON AIR CONDENSER SURFACE AREA. THIS IS DETERMINED BY MULTIPLYING THE UNIT WIDTH BY THE UNIT HEIGHT, WITH THE RESULT BEING THE SURFACE SQUARE FOOTAGE. MAXIMUM SIZES ALLOWED FOR THE CONDENSER STAND ARE DENOTED IN THE TABLE ON SHEET RT-2.
6. 6061-T6/6005-T5 ALUMINUM ALLOY CONSTRUCTION FOR EXTERIOR EXPOSURE APPLICATIONS.
7. ROOF STAND SHALL HAVE ALL WELDED JOINTS AND SEAMS UNLESS OTHERWISE STATED.
8. WELD FILLER SHALL BE ALUMINUM ALLOY 4043 WITH TENSILE STRENGTH OF 15 KSI.
9. ALL ANCHOR/CONNECTION BOLTS SHALL BE IN ACCORDANCE WITH ASTM A-307 OR A-325F.
10. EXPANSION BOLTS AND LAG SCREWS SHALL HAVE A MINIMUM SPACING OF 25" AND MINIMUM EDGE DISTANCE OF 3" FOR EXPANSION BOLTS AND 1" FOR LAG SCREWS.
11. VIBRATION ISOLATOR PADS SHALL BE PROVIDED BY THE A/C CONTRACTOR BETWEEN THE BOTTOM OF THE CONDENSER AND THE TOP RAIL SO AS NOT TO CAUSE VIBRATION TO EXISTING SUB-STRUCTURE. SEE SHEET RT-2 FOR DETAILS.
12. BASE PLATE ANCHORING IS BASED ON A MAXIMUM ULTIMATE WIND SPEED OF 165 MPH FOR RISK CATEGORY II AND III BUILDINGS IN EXPOSURE CATEGORY B AND C ONLY! CONTACT ENGINEER FOR SITE SPECIFIC ENGINEERING FOR ANY OF THE FOLLOWING CONDITIONS: ROOF MOUNTING ABOVE 60 FEET IN HEIGHT, OR EXPOSURE D LOCATIONS, RISK CATEGORY IV BUILDINGS, OR FOR WIND SPEED LOCATIONS ABOVE 165 MPH.
13. ROOF TOP STAND ARE DESIGN FOR A MAXIMUM UNIT WEIGHT OF 350 LBS. AND AN ASSUMED MINIMUM UNIT WEIGHT OF 120 LBS. SEE ENGINEER FOR SITE SPECIFIC ENGINEERING AND ROOF ANCHORING FOR 1-TON AND ALL CONDENSER UNITS UNDER 120 LBS.

This plan has been digitally signed and sealed by Joseph D. Hiller, P.E., using a Digital signature. Printed copies of this document are not considered signed and sealed and the digital signature must be verified on any electronic copies.

REVISIONS		
NO.	DESCRIPTION	DATE

PROFESSIONAL SEAL

Digitally signed by  
Joseph D. Hiller  
P.E.#74583  
Date: 2021.01.12  
17:31:44 -05'00'

JOSEPH D. HILLER, P.E.  
Florida P.E. License #74583

THIS DRAWING IS NOT VALID UNLESS SIGNED, SEALED AND DATED BY A REGISTERED PROFESSIONAL

Hiller Engineering Services  
FL COA 30596

P.O. Box 290855  
Port Orange, FL  
32129  
O: 386-248-1700  
E: Hillerengineering@gmail.com

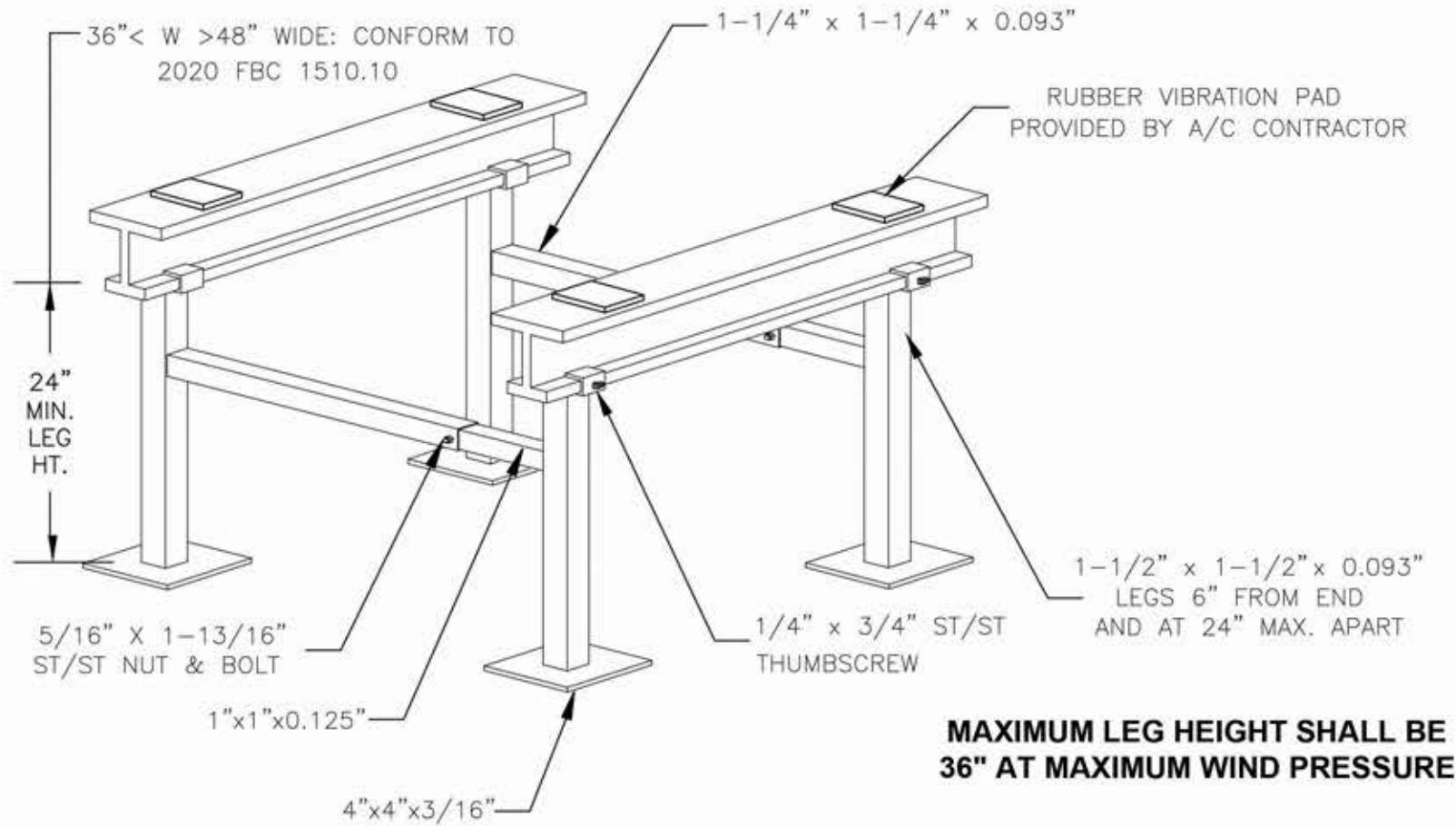
PROJECT

AC Roof Top Stands  
for  
THE METAL SHOP  
2541 W. Dunnellon Rd.  
Dunnellon, FL 34433

DRAWN BY:	A. NOTO
DATE:	1/8/2021
SCALE:	N/A

S-1  
01 OF 04

# 1 Unit System



**MAXIMUM LEG HEIGHT SHALL BE 36" AT MAXIMUM WIND PRESSURE**

PROVIDE ONE OF THE FOLLOWING ATTACHMENT METHODS

### INSTALLATION INSTRUCTIONS:

USE 3/8" x 1-1/4" STAINLESS OR COATED BOLT, NUT & 1" WASHER AT 4 LOCATIONS THROUGH UNITS BOTTOM PAN AND TOP RAIL OF UNIT STAND.

USE 4 'METAL SHOP' ANCHOR CLIPS #771, 773, 883 AT 4 CORNERS OF UNIT AND TOP RAIL OF UNIT STAND.

WRAP UNIT AND TOP RAIL WITH 22 GA. HURRICANE COIL STRAP, GALVANIZED AT 2 LOCATIONS AND BOLT STRAP TO TOP RAIL OF STAND USING 1/4" GALVANIZED OR STAINLESS STEEL BOLTS, NUTS, & WASHERS

**TABLE 1510.10  
CLEARANCE BELOW RAISED ROOF  
MOUNTED MECHANICAL UNITS**

WIDTH OF MECHANICAL UNIT	MINIMUM CLEARANCE ABOVE SURFACES
W < 24"	14"
24" < W < 36"	18"
36" < W < 48"	24"
48" < W < 60"	30"
W > 60"	48"

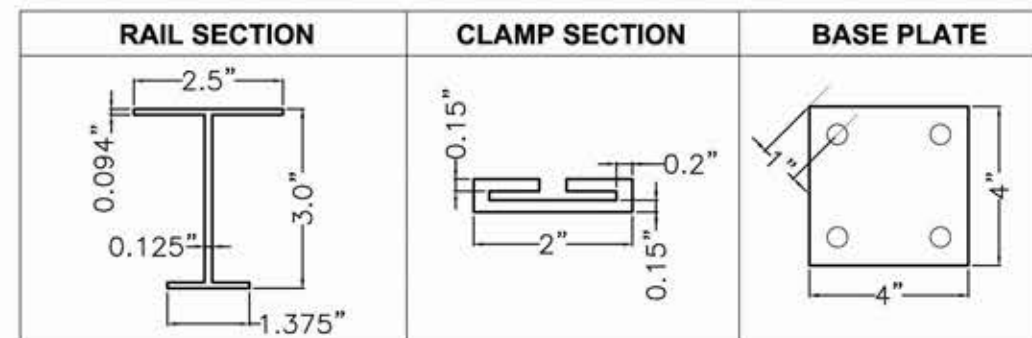
DESIGN WIND PRESSURE CALCULATED PER CHAPTER 30: COMPONENTS & CLADDING OF ASCE 7-16 FOR 145 MPH, CAT. II, EXP. D, AT AN ELEVATION OF 60 FT.

**A/C STAND REACTIONS TABLE**

ROOF MATERIAL	ALLOWABLE BUILDING HEIGHT AT 160 MPH	MAXIMUM ALLOWABLE WEIGHT PER UNIT	UPLIFT	LATERAL	COMP.	BENDING MOMENT
CONC. DECK/STEEL JOIST	120'	350 LBS	294#	331#	605#	262 FT-LB
WOOD DECK	75'	350 LBS	294#	331#	605#	295 FT-LB

**MAXIMUM DESIGN WIND PRESSURE**

A/C STAND ATTACHED TO :	MAX WIND PRESSURE
CONCRETE OR, STEEL HOST STRUCTURE	82.3 PSF
WOOD HOST STRUCTURE	79.0 PSF



This plan has been digitally signed and sealed by Joseph D. Hiller, P.E., using a Digital signature. Printed copies of this document are not considered signed and sealed and the digital signature must be verified on any electronic copies.

THIS DRAWING AND ITS REPRODUCTIONS ARE THE PROPERTY OF HILLER ENGINEERING AND MAY NOT BE REPRODUCED IN WHOLE OR PART WITHOUT THE WRITTEN PERMISSION OF THE ENGINEER.

REVISIONS

NO.	DESCRIPTION	DATE	INITIALS

PROFESSIONAL SEAL

Digitally signed by Joseph D. Hiller  
P.E.#74583  
Date: 2021.01.12 17:32:04 -05'00'

**JOSEPH D. HILLER, P.E.**  
Florida P.E. License #74583

Hiller Engineering Services  
FL COA 30596

P.O. Box 290855  
Port Orange, FL 32129  
O: 386-248-1700  
E: Hillerengineering@gmail.com

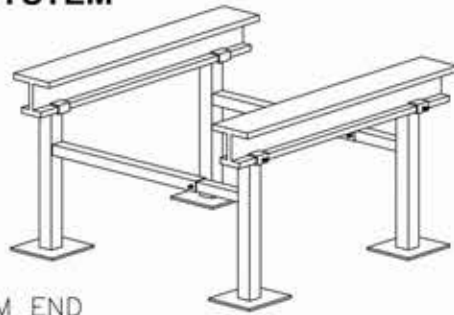
PROJECT

**AC Roof Top Stands**  
for  
**THE METAL SHOP**  
2541 W. Dunnellon Rd.  
Dunnellon, FL 34433

DRAWN BY:	A. NOTO
DATE:	1/8/2021
SCALE:	N/A

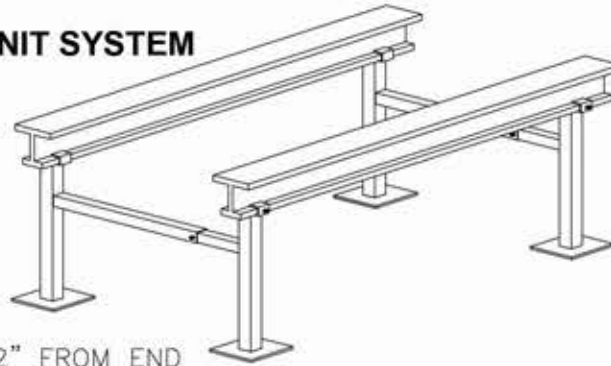
**S-2**  
02 OF 04

**1-UNIT SYSTEM**



LEGS 6" FROM END  
INSIDE LEGS MAX. 24" APART

**2-UNIT SYSTEM**



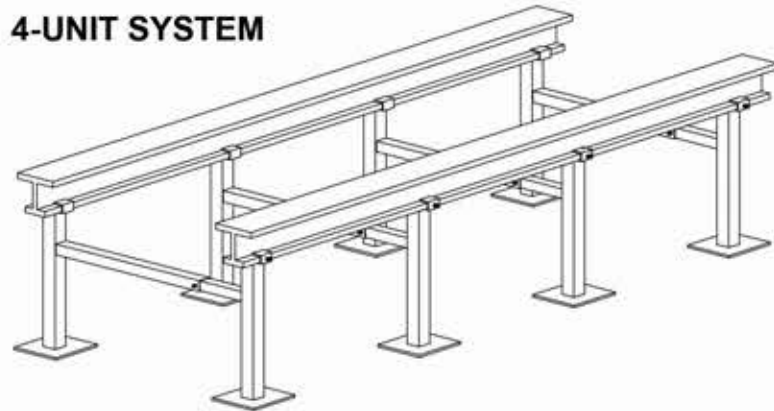
LEGS 12" FROM END  
INSIDE LEGS MAX. 48" APART

**3-UNIT SYSTEM**



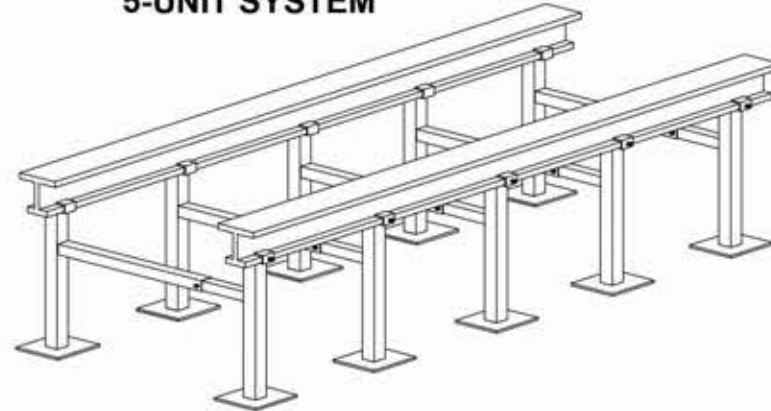
LEGS 12" FROM END  
INSIDE LEGS MAX. 42" APART

**4-UNIT SYSTEM**



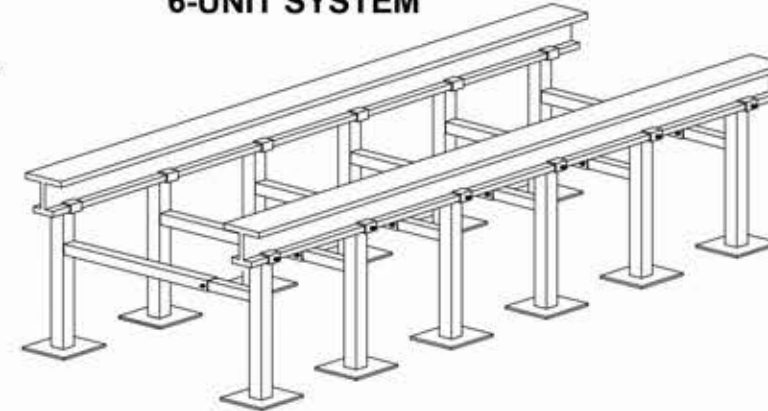
LEGS 12" FROM END  
INSIDE LEGS MAX. 40" APART

**5-UNIT SYSTEM**



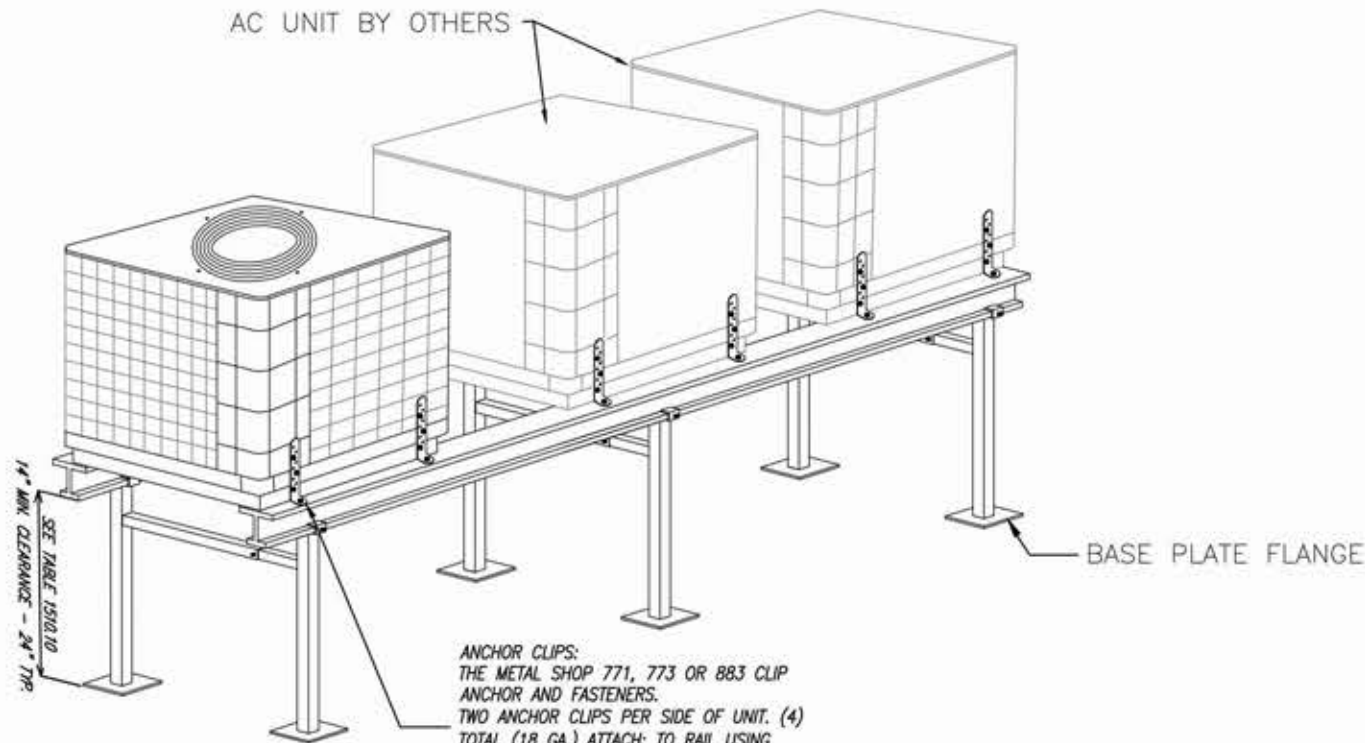
LEGS 12" FROM END  
INSIDE LEGS MAX. 38" APART

**6-UNIT SYSTEM**



LEGS 12" FROM END  
INSIDE LEGS MAX. 38" APART

AC UNIT BY OTHERS



ANCHOR CLIPS:  
THE METAL SHOP 771, 773 OR 883 CLIP  
ANCHOR AND FASTENERS.  
TWO ANCHOR CLIPS PER SIDE OF UNIT. (4)  
TOTAL (18 GA.) ATTACH TO RAIL USING  
#14x3/4" SELF TAPPING SHEET METAL SCREW,  
TO EXISTING CONDENSER USING (2) #14x3/4"  
SCREWS FOR 4" AND 6" CLIP AND (3) FOR AN  
8" CLIP.

BASE PLATE FLANGE

**TYPICAL AC MOUNTING DETAIL**

NOT TO SCALE

**NOTE:**

**MAINTAIN EQUAL LEG SPACING PER UNIT SYSTEM CONFIGURATION**

UNIT/SIZE TABLE						
AC STAND LENGTH	3 FT	6 FT	9 FT	12 FT	15 FT	18 FT
ROOF TYPE	ALL	ALL	ALL	ALL	ALL	ALL
MAX # UNITS	1	2	3	4	5	6
MAX SURFACE AREA PER UNIT	9 SF	9 SF	9 SF	9 SF	9 SF	9 SF
TOTAL SURFACE AREA	9 SF	18 SF	27 SF	36 SF	45 SF	54 SF

**3-UNIT SYSTEM SHOWN**

BEAM MAY EXTEND 12" MAX. FROM END LEG  
INSIDE LEGS MAX. 42" APART

This plan has been digitally signed and sealed by Joseph D. Hiller, P.E., using a Digital signature. Printed copies of this document are not considered signed and sealed and the digital signature must be verified on any electronic copies.

THIS DRAWING AND ITS REPRODUCTIONS ARE THE PROPERTY OF HILLER ENGINEERING AND MAY NOT BE REPRODUCED IN WHOLE OR PART WITHOUT THE WRITTEN PERMISSION OF THE ENGINEER.

REVISIONS

NO.	DESCRIPTION	DATE	INITIALS

PROFESSIONAL SEAL

Digitally signed by Joseph D. Hiller  
P.E.#74583  
Date: 2021.01.12  
17:32:21 -05'00'

JOSEPH D. HILLER, P.E.  
Florida P.E. License #74583  
THIS DRAWING IS NOT VALID UNLESS SIGNED, SEALED AND DATED BY A REGISTERED PROFESSIONAL

Hiller Engineering Services  
FL COA 30596

P.O. Box 290855  
Port Orange, FL 32129  
O: 386-248-1700  
E: Hillerengineering@gmail.com

PROJECT

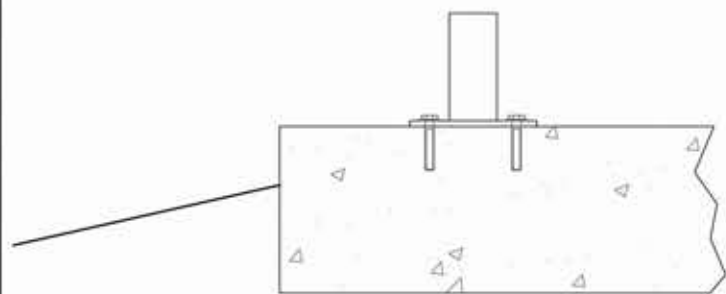
**AC Roof Top Stands**  
for  
**THE METAL SHOP**  
2541 W. Dunnellon Rd.  
Dunnellon, FL 34433

DRAWN BY:	A. NOTO
DATE:	1/8/2021
SCALE:	N/A

**S-3**  
03 OF 04

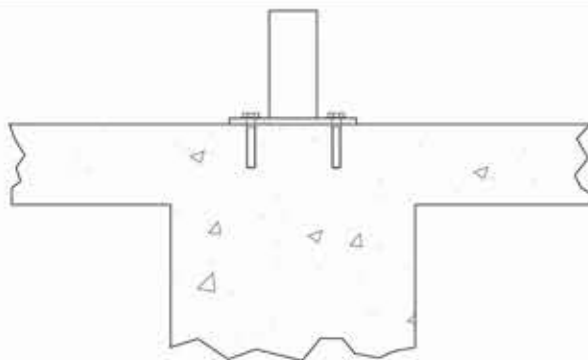
# TYPICAL BASE PLATE CONNECTIONS

## TO SLAB ON GRADE



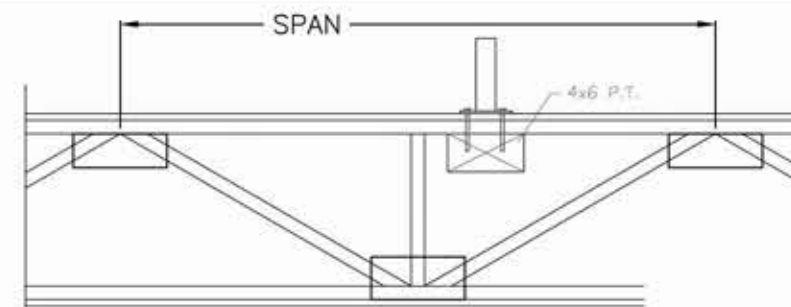
**FASTENERS:**  
 (4) 1/4" DIA. HEX-HEAD  
 TAP-CONS WITH 1-1/2" EMBED

## TO STD. WEIGHT CONCRETE



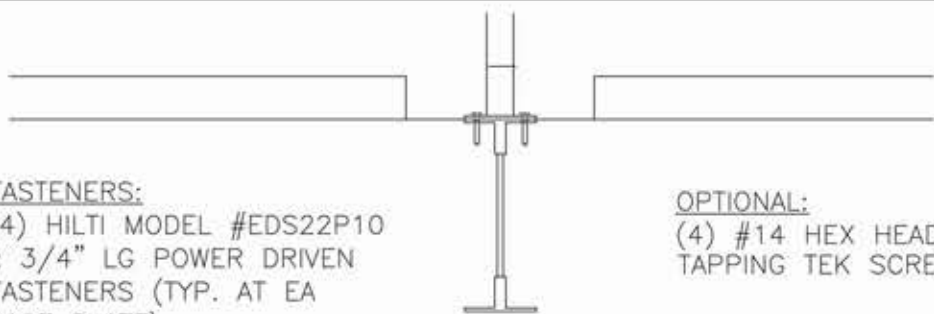
**FASTENERS:**  
 (4) 1/4" HILTI "KWIK BOLT II" W/ 2" EMBED OR (4) 1/4"  
 DIA. RAWL MUSHROOM HEAD SPIKES W/ 1-1/4" EMBED.  
 MIN. ANCHOR SPACING SHALL BE 2.5"  
 MIN. EDGE DISTANCE SHALL BE 3.0"

## TO WOOD BEAM/TRUSS



**FASTENERS:**  
 (4) 3/8" LAG SCREWS W/ 2-1/2" MIN. EMBED INTO  
 TRUSS/BEAM (TYP. EACH BASE PLATE)  
 MIN. ANCHOR SPACING: 2.5"  
 MIN. EDGE DISTANCE: 1.0"  
 PRE-DRILL FOR LAG SCREWS

## TYPICAL CONNECTION TO STEEL JOIST



**FASTENERS:**  
 (4) HILTI MODEL #EDS22P10  
 x 3/4" LG POWER DRIVEN  
 FASTENERS (TYP. AT EA  
 BASE PLATE)

**OPTIONAL:**  
 (4) #14 HEX HEAD SELF  
 TAPPING TEK SCREWS

## ROOF TOP UNIT FRAMING

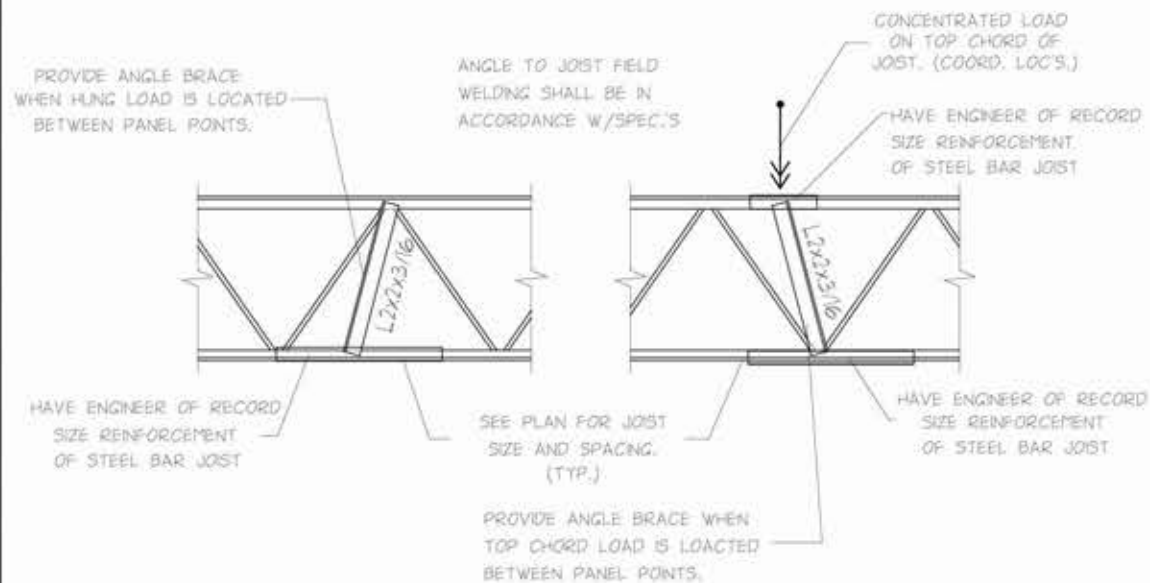
COORDINATE WITH STRUCTURAL ENGINEER PRIOR TO STARTING  
 CONSTRUCTION FOR LARGER ROOF TOP UNITS. STRUCTURAL  
 ENGINEER TO VERIFY THAT EXISTING ROOF STRUCTURE IS CAPABLE  
 OF SUPPORTING THE EXCESSIVE POINT LOAD.

STEEL CHANNEL OR STEEL TUBE MAY BE SUBSTITUTED FOR STEEL  
 ANGLE SIZES SHOWN ABOVE.

VERIFY ALL DIM'S AND DETAILS W/MECH  
 CONTRACTOR BEFORE FABRICATION

### ROOF TOP UNIT FRAME SCHEDULE

UNIT WEIGHT	ANGLE SIZE:
0 - 675 LBS	L3x3x 3/16
676 - 1500 LBS.	L4x4x1/4
1501 - 3000 LBS.	L6x4x3/8 (L.L.H.)
3001 - 6000 LBS.	L6x6x7/16



## STEEL JOIST REINFORCING DETAIL

NOT TO SCALE

REVISIONS

NO.	DESCRIPTION	DATE	INITIALS

PROFESSIONAL SEAL

Digitally signed by  
 Joseph D. Hiller  
 P.E.#74583  
 Date: 2021.01.12  
 17:32:40 -05'00'

JOSEPH D. HILLER, P.E.  
 Florida P.E. License #74583

Hiller Engineering Services

FL COA 30596  
 P.O. Box 290855  
 Port Orange, FL  
 32129  
 O: 386-248-1700  
 E: Hillerengineering@gmail.com

PROJECT

**AC Roof Top Stands**  
 for  
**THE METAL SHOP**  
 2541 W. Dunnellon Rd.  
 Dunnellon, FL 34433

DRAWN BY: A. NOTO  
 DATE: 1/8/2021  
 SCALE: N/A

**S-4**  
 04 OF 04

This plan has been digitally signed and sealed by Joseph D. Hiller, P.E., using a Digital signature. Printed copies of this document are not considered signed and sealed and the digital signature must be verified on any electronic copies.

THIS DRAWING AND ITS REPRODUCTIONS ARE THE PROPERTY OF HILLER ENGINEERING AND MAY NOT BE REPRODUCED IN WHOLE OR PART WITHOUT THE WRITTEN PERMISSION OF THE ENGINEER.