

The Metal Shop AC Condenser Clip

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 6th EDITION FLORIDA BUILDING CODE, 2017, BUILDING VOLUME AND ASCE 7 - 2010 MINIMUM DESIGN LOADS ON BUILDINGS AND OTHER STRUCTURES.
2. IF, IN THE CONTRACTORS OPINION, ANY WORK THAT IS INDICATED IN THE DRAWINGS, OR SPECIFIED IN SUCH A MANNER WILL MAKE IT IMPOSSIBLE TO PRODUCE A FIRST CLASS PIECE OF WORK, OR SHOULD DISCREPANCIES APPEAR IN DIMENSIONS OR DETAILS THEY SHALL BE SUBMITTED TO OWNER BEFORE PROCEEDING WITH WORK.
3. ANY CHANGE FROM THE DRAWINGS AND / OR FIELD CHANGE CONDITIONS, MUST BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE STRUCTURAL ENGINEER SO THAT NECESSARY CHANGES CAN BE MADE AND INTENT OF THE DESIGN IS CARRIED OUT TO ITS FULLEST EXTENT.
4. ALL ANCHOR/CONNECTION BOLTS SHALL BE IN ACCORDANCE WITH ASTM A-307 OR A-325 F.
5. MINIMUM DESIGN LOADS : DEAD LOADS AND LIVE LOADS IN ACCORDANCE WITH THE 2017 FLORIDA BUILDING CODES, CHAPTER 16.
6. SEE MANUFACTURE INSTALLATION FOR AC CONDENSER UNIT.
7. DESIGN AND ENGINEERING IS FOR THE METAL SHOP ANCHOR CLIP ONLY. SEE MANUFACTURE INSTRUCTIONS AND CERTIFICATIONS FOR PROPER INSTALLATION OF AC UNIT.

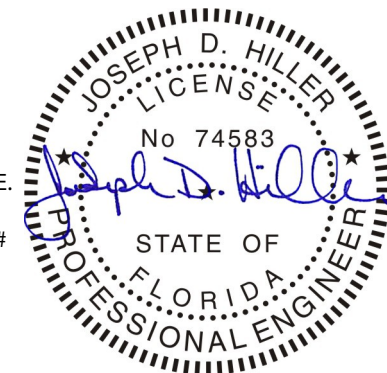
Anchor Clip Notes:

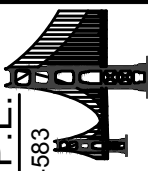
1. The anchor clip shall be 16 gauge, G-90 Hot Dipped galvanized steel, rated for coastal applications.
2. The anchor clips shall be installed with #14-3/4" self tapping sheet metal screws.
3. Anchor clip is intended for AC Condenser mounting installations only.
4. For ground installations, shall be installed on 2000 psi minimum strength concrete pad of concrete slabs ONLY. Other pads or installation configurations must be custom designed.
5. Minimum 4 clips required per ac condenser unit. Clip anchors shall be equally space around base of condenser unit. See detail on A-4 for number of #14-3/4" self tapping screws corresponding to clip size. Self tapping screws to have neoprene washers. Anchor clip shall be anchored to the concrete pad with 1/4" Tapcons 1 3/4" min. embedment.
6. Attach Tapcon anchor into concrete base per Tapcon installation instructions. Do not over tighten anchor.
7. All hardware must be fastened prior to connecting refrigerant lines and electrical power to the unit.
8. 196 MPH Ultimate wind speed rating is based on 3-second gust on a condenser unit 10.2 sq-ft surface area facing the wind. calculations are based on ASCE 7 and chapter 16 of 2017 FBC for exposure C, risk category II, unit weight 500 lbs.
9. 167 MPH Ultimate wind speed for 10.2 sf-ft of surface area facing the wind for exposure D, risk category III and IV for a unit weight of 500 lbs.

METAL SHOP # 771 - 4" ANCHOR CLIP
 METAL SHOP # 773 - 6" ANCHOR CLIP
 METAL SHOP # 883 - 8" ANCHOR CLIP

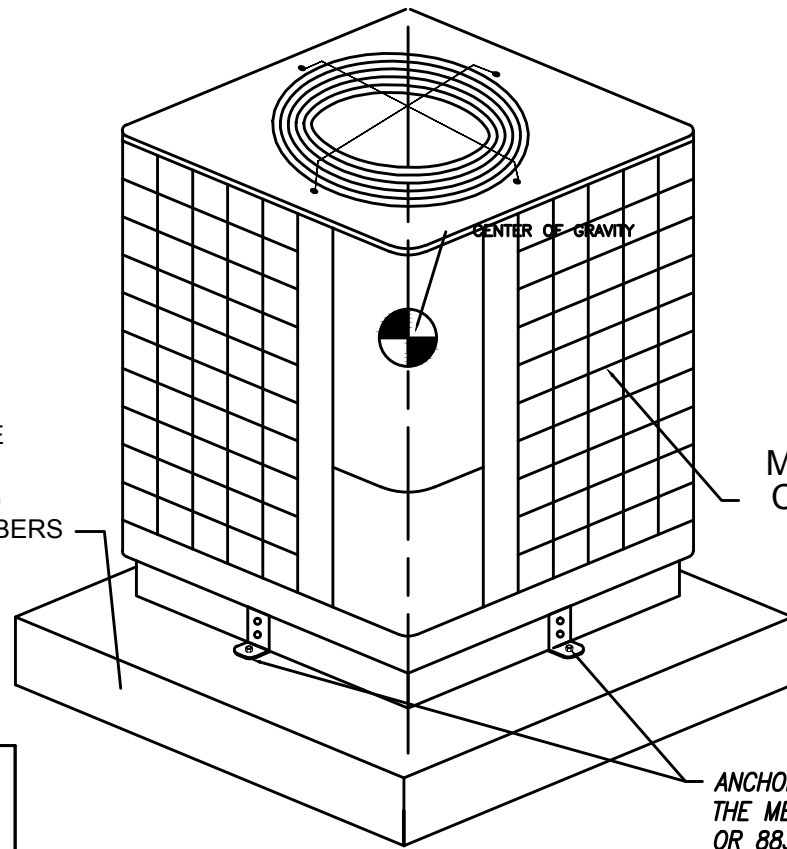
**Joseph D.
 Hiller P.E.**

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Joseph D. Hiller P.E. Florida P.E. License # 74583 5827 Southport Drive Port Orange, FL 32127 Phone: 386-248-1700 Fax: 386-265-4603	
AC Condenser Anchor Clip THE METAL SHOP 2541 W. Dunnellon Road Dunnellon, FL 34433 www.metalshop.org Phone: 888-441-2492 Fax: 352-522-0007	
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DATE:	1/8/2018
SCALE:	AS NOTED
DRAWN BY:	J. HILLER
JOB NO.	
SHEET	A-1
	1 of 4

CENTER OF GRAVITY OF UNIT IS ASSUMED TO AT THE GEOMETRIC CENTER OF THE MECHANICAL UNIT. ANCHORING IS FOR REGULAR SHAPED UNITS I.E. SQUARE OR RECTANGULAR. NO IRREGULAR SHAPED UNITS



CONCRETE BASE OR HOST STRUCTURE TO BE DESIGNED BY OTHERS. CONCRETE MUST BE 2000 PSI MINIMUM. SEE ENGINEERING FOR ROOF TOP MOUNTING APPLICATIONS OR WOOD SUPPORT MEMBERS

THIS ANCHORING DETAIL WILL WITHSTAND A MAXIMUM DESIGN WINDSPEED OF: 170 MPH Exp C, Cat II STRUCTURES
MAX WINDSPEED OF: 143 MPH for EXP D, Cat III or IV STRUCTURES

ANCHOR CLIPS: THE METAL SHOP CLIP MODEL 771, 773 OR 883 CLIP ANCHOR AND FASTENERS. ONE ANCHOR CLIP PER SIDE OF UNIT. (4) TOTAL (16 GA.) SEE DETAIL ON A-4 FOR CORRECT NUMBER OF #14-3/4" TO FASTEN TO BASE OF CONDENSER. ATTACH TO CONCRETE PAD/SLAB USING 1/4" x 1 3/4" TAPCON.

EXTERIOR EQUIPMENT TIE DOWN

SCALE: N.T.S.

GENERAL NOTES:

- THIS PRODUCT HAS BEEN DESIGNED AND SHALL BE FABRICATED IN ACCORDANCE WITH THE REQUIREMENTS OF THE 2017 FLORIDA BUILDING CODE, 6th EDITION FOR USE WITH ASCE 7-10. THIS PRODUCT MAY BE USED WITHIN AND OUTSIDE THE HIGH VELOCITY HURRICANE ZONE.
- NO 1/3% INCREASE IN ALLOWABLE STRESS HAS BEEN USED IN THE DESIGN OF THIS ANCHOR SYSTEM.
- ALLOWABLE DESIGN SHOWN ON TABLES IS BASED ON ALLOWABLE SHEAR AND TENSION LOADS OF MECHANICAL FASTENERS.
- MAXIMUM & MINIMUM DIMENSIONS AND WEIGHT UNITS SHALL CONFORM TO SPECIFICATIONS STATED ON THESE ENGINEERING SHEETS
- ALL MECHANICAL SPECIFICATIONS, CLEAR SPACE, TONNAGE, ETC. SHALL BE AS PER THE MANUFACTURER RECOMMENDATIONS AND ARE THE EXPRESS RESPONSIBILITY OF THE CONTRACTOR.
- FASTENERS TO BE # 14x3/4" SELF TAPPING SHEET METAL SCREWS. UNLESS NOTED OTHERWISE.
- TAPCONS SHALL BE ITW BUILDDEX OR ELCO BRAND, AND SHALL BE 1/4"x1 3/4" INSTALLED TO 2000 PSI MINIMUM COMPRESSIVE STRENGTH. SEE ANCHOR SCHEDULE FOR ANCHOR REQUIREMENTS.
- ALL STEEL CLIPS SHALL BE ASTM A283 STEEL WITH $F_y = 33$ KSI. ALL STEEL MEMBERS SHALL BE PROTECTED AGAINST CORROSION WITH G90-RATED GALVANIZED COATING, SUITABLE FOR ALL COASTAL INSTALLATIONS.
- INSTALL AN ELECTRICAL GROUND, WHEN REQUIRED. ALL ELECTRICAL CONNECTIONS INCLUDING GROUNDS TO BE DESIGNED & INSTALLED BY OTHERS.
- THE ADEQUACY OF ANY EXISTING STRUCTURE TO WITHSTAND SUPERIMPOSED LOADS SHALL BE VERIFIED AND IS NOT INCLUDED IN THIS CERTIFICATION. EXCEPT AS EXPRESSLY PROVIDED HEREIN, NO ADDITIONAL CERTIFICATIONS OR AFFIRMATIONS ARE INTENDED.
- THE SYSTEM DETAILED HEREIN IS A GENERIC UNIT INSTALLATION. THIS INSTALLATION DOES NOT PROVIDE INFORMATION FOR A SITE SPECIFIC INSTALLATION. 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.

STANDARD ANCHOR SCHEDULE

SUBSTRATE	ANCHOR
CONCRETE: (4" THICK MIN, 3192KSI MIN.)	(1)-1/4" x1 3/4" ITW BUILDDEX OR ELCO TAPCON, 1 3/4" FULL EMBED TO CONCRETE, 2-1/2" MIN. EDGE DISTANCE, 3" MIN. SPACING TO ANY ADJACENT ANCHOR.

MAXIMUM ALLOWABLE LATERAL WIND PRESSURE (ANCHOR TO CONCRETE PAD)
ONE (1) CLIP AT EACH CORNER (TOTAL OF 4 CLIPS PER UNIT.)

MAXIMUM SURFACE AREA OF UNITS LARGEST FACE	UNIT HEIGHT	UNIT WIDTH	1) CLIP AT EACH CORNER	
			TOTAL OF 4 CLIPS	1/4" TAPCON TO CONCRETE BASE
6 FT2	24" MAX	12" MIN	43 PSF	
9 FT2	32" MAX	15" MIN	32 PSF	
4 FT2	48" MAX	24" MIN	30 PSF	
6 FT2			60 PSF	
9 FT2			40 PSF	
12 FT2			30 PSF	
16 FT2	60" MAX	48" MIN	29 PSF	
20 FT2				
25 FT2				
30 FT2				
36 FT2				

- TIE-DOWN CLIPS SHALL BE FASTENED TO MECHANICAL HOUSING UNIT WITH (2)-#14x3/4" STS GRADE 5 SHEET METAL SCREWS.
- MECHANICAL HOUSING UNIT SHALL CONFORM TO THE FOLLOWING:
 - ALUMINUM FRAME OR EXTERIOR HOUSING SHALL BE 6063-T6 MIN. ALUMINUM SHEET WITH $F_t=30$ KSI, 0.0625" MIN. THICKNESS.
 - STEEL HOUSING UNITS SHALL BE 33KSI MIN. STEEL, GRADE 33, 22GA MIN. ($t=0.0299$ ").
- MAXIMUM ALLOWABLE WIND PRESSURES MAY BE EQUIVALENT DUE TO THE LIMITING CAPACITY OF THE 1" CLIP.
- A MAXIMUM ALLOWABLE VALUE OF 200 PSF HAS BEEN UTILIZED; FOR HIGHER DEMAND CAPACITIES CONTACT THIS ENGINEER FOR SITE-SPECIFIC ENGINEERING.

RECOMMENDED FASTENERS

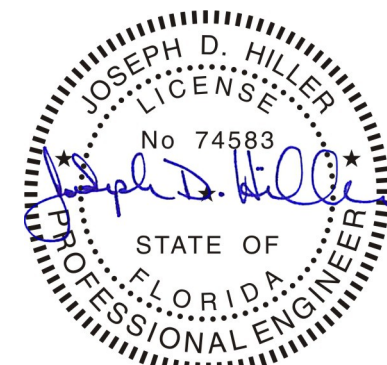
1/4" x 1 3/4" TAPCON

MAXIMUM ALLOWABLE SHEAR LOAD FOR 1/4" DIA CONCRETE FASTENERS IN 2000 PSI MINIMUM STRENGTH CONCRETE IS: 325 LBS. PULL OUT (TENSION LOAD) STRENGTH OF TAPCON IS 505 LBS WITH 1 3/4" MIN. EMBEDMENT:

SINGLE SHEAR: 325 LBS
TENSION: 505 LBS

Joseph D. Hiller P.E.

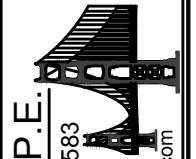
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DATE:

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DRAWN BY: J. HILLER

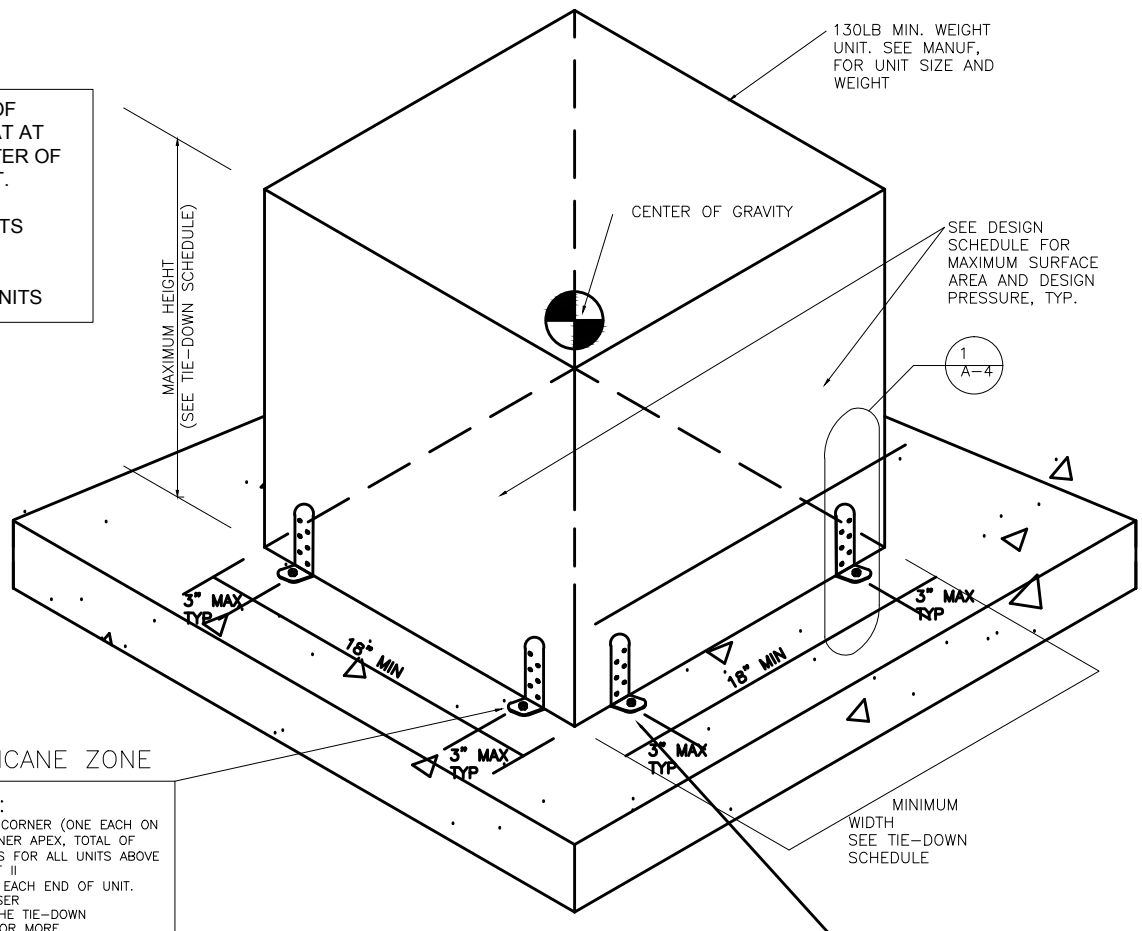
JOB NO.

SHEET

A-2

2 of 4

CENTER OF GRAVITY OF UNIT IS ASSUMED TO AT THE GEOMETRIC CENTER OF THE MECHANICAL UNIT. ANCHORING IS FOR REGULAR SHAPED UNITS I.E. SQUARE OR RECTANGULAR. NO IRREGULAR SHAPED UNITS



HIGH VELOCITY HURRICANE ZONE

DOUBLE CLIP OPTION:
 (2) TOTAL CLIPS MAY BE USED AT EACH CORNER (ONE EACH ON OPPOSING CORNER FACES, 3" FROM CORNER APEX, TOTAL OF (8) CLIPS PER UNIT. THIS INSTALLATION IS FOR ALL UNITS ABOVE 60 PSF OR ABOVE 170 MPH. EXP C, CAT II
 INSTALL ANCHOR CLIP AT 3" MAX FROM EACH END OF UNIT. DO NOT SPACE CONCRETE ANCHORS CLOSER THAN THE ALLOWED SPACING LISTED IN THE TIE-DOWN ANCHOR SCHEDULES. SEE SHEETS 2&3 FOR MORE INFORMATION.

THIS ANCHORING DETAIL WILL WITHSTAND A MAXIMUM DESIGN WINDSPEED OF: 196 MPH Exp C, Cat II STRUCTURES
Max WINDSPEED OF: 167 MPH for EXP D, Cat III or IV STRUCTURES

EXTERIOR EQUIPMENT TIE DOWN

SCALE: N.T.S.

STANDARD ANCHOR SCHEDULE

SUBSTRATE	ANCHOR
CONCRETE: (4" THICK MIN, 3192KSI MIN.)	(1)-1/4" x 1 3/4" ITW BUILDEX OR ELCO TAPCON, 1 3/4" FULL EMBED TO CONCRETE, 2-1/2" MIN. EDGE DISTANCE, 3" MIN. SPACING TO ANY ADJACENT ANCHOR.

MAXIMUM SURFACE AREA OF UNITS LARGEST FACE	UNIT HEIGHT	UNIT WIDTH	(2) CLIPS AT EACH SIDE
			TOTAL OF 8 CLIPS 1/4" TAPCON TO CONCRETE BASE
6 FT2	24" MAX	12" MIN	81 PSF
9 FT2	32" MAX	15" MIN	60 PSF
4 FT2	48" MAX	24" MIN	170 PSF
6 FT2			113 PSF
9 FT2			75 PSF
12 FT2	60" MAX	48" MIN	56 PSF
16 FT2			42 PSF
20 FT2			52 PSF
25 FT2			44 PSF
30 FT2	60" MAX	48" MIN	37 PSF
36 FT2			30 PSF

- TIE-DOWN CLIPS SHALL BE FASTENED TO MECHANICAL HOUSING UNIT WITH (2)-#14x3/4" STS GRADE 5 SHEET METAL SCREWS.
- MECHANICAL HOUSING UNIT SHALL CONFORM TO THE FOLLOWING:
 - ALUMINUM FRAME OR EXTERIOR HOUSING SHALL BE 6063-T6 MIN. ALUMINUM SHEET WITH Fty=30 KSI, 0.0625" MIN. THICKNESS.
 - STEEL HOUSING UNITS SHALL BE 33KSI MIN. STEEL, GRADE 33, 22 GAGE MIN. (t=0.030").
- MAXIMUM ALLOWABLE WIND PRESSURES MAY BE EQUIVALENT DUE TO THE LIMITING CAPACITY OF THE 1" CLIP.
- A MAXIMUM ALLOWABLE VALUE OF 200 PSF HAS BEEN UTILIZED; FOR HIGHER DEMAND CAPACITIES CONTACT THIS ENGINEER FOR SITE-SPECIFIC ENGINEERING.

GENERAL NOTES:

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- FASTENERS TO BE # 14x3/4" SELF TAPPING SHEET METAL SCREWS. UNLESS NOTED OTHERWISE.
- TAPCONS SHALL BE ITW BUILDEX OR ELCO BRAND, AND SHALL BE 1/4" WITH 1 3/4" MIN. EMBEDMENT. INSTALLED TO 2000 PSI MINIMUM COMPRESSIVE STRENGTH. SEE ANCHOR SCHEDULE FOR ANCHOR REQUIREMENTS.
- ALL STEEL CLIPS SHALL BE ASTM A283 STEEL WITH Fy = 33 KSI. ALL STEEL MEMBERS SHALL BE PROTECTED AGAINST CORROSION WITH G90-RATED GALVANIZED COATING, SUITABLE FOR ALL COASTAL INSTALLATIONS.
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RECOMMENDED FASTENERS

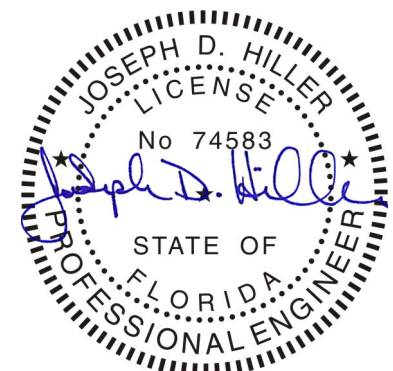
1/4" x 1 3/4" TAPCON

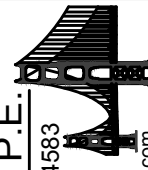
MAXIMUM ALLOWABLE SHEAR LOAD FOR 1/4" DIA CONCRETE FASTENERS IN 2000 PSI MINIMUM STRENGTH CONCRETE IS: 325 LBS. FULL OUT (TENSION LOAD) STRENGTH OF TAPCON IS 505 LBS WITH 1 3/4" MIN. EMBEDMENT:

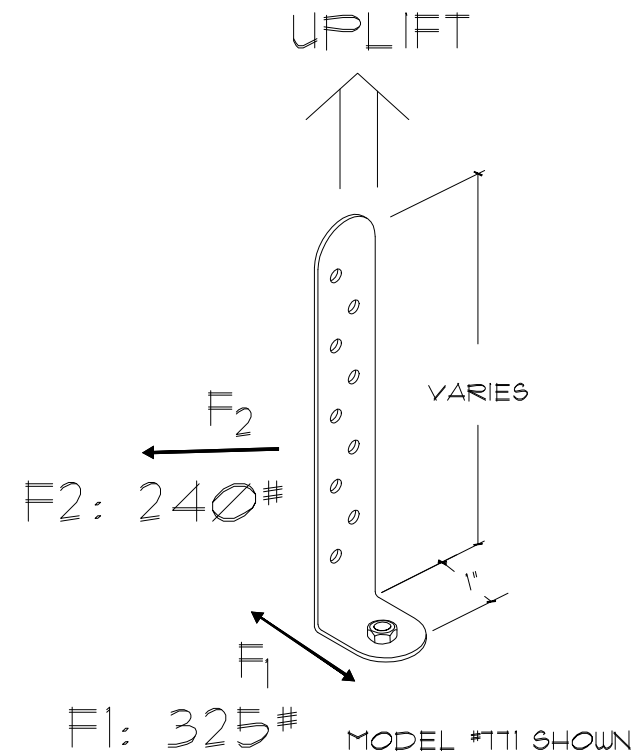
SINGLE SHEAR: 325 LBS
 TENSION: 505 LBS

Joseph D. Hiller P.E.

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DRAWN BY:	J. HILLER
JOB NO.	
SHEET	A-3
	3 of 4



USE MIN. OF 2- #14x3/4" SCREWS FOR 4" CLIP TO CONDENSER
 USE MIN. OF 2- #14x3/4" SCREWS FOR 6" CLIP TO CONDENSER
 USE MIN. OF 3- #14x3/4" SCREWS FOR 8" CLIP TO CONDENSER
 USE 1/4" x 1 3/4" TAPCON TO CONCRETE PAD

METAL SHOP # 771 - 4" ANCHOR CLIP
 METAL SHOP # 773 - 6" ANCHOR CLIP
 METAL SHOP # 883 - 8" ANCHOR CLIP

MAX UPLIFT: 505#
 WITH 2- #14x3/4" SCREWS PER CLIP

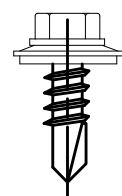
A/C ANCHOR CLIP

LOAD CAPACITIES FOR TAPCONS

	Anchor Size	Emd. Depth	2,000 psi Concrete	4,000 psi Concrete	6,000 psi Concrete	Concrete Block	Red Brick
Tension Load (lbs.)	1/4"	1"	760	930	1,140	720	940
		1-1/4"	1,090	1,540	1,690	880	1,160
		1-1/2"	1,520	1,850	2,210	1,090	1,320
		1-3/4"	2,020	2,330	2,740	1,290	1,420
Shear Load (lbs.)	1/4"	1"	725	1,420	2,140	690	1,720
		1-1/4"	1,053	2,150	2,390	925	1,840
		1-1/2"	1,270	2,270	2,580	1,125	1,930
		1-3/4"	1,305	2,390	2,840	1,305	2,130

NOTE:
 The values listed above are ultimate load capacities for TAPCONS which should be reduced by minimum safety factor of 4 or greater to determine the allowable working load. Refer to the section on product selection guidelines for details. The consistency of hollow block and brick varies greatly. The load capacities listed above for hollow block and brick should be used as guidelines only. Job site tests should be conducted to determine the actual load capacities in these materials.

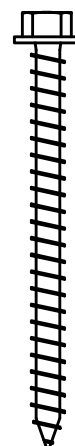
SHEET METAL SCREWS



#14x3/4"
 w/
 Neoprene washer into AC Stand and Condenser

METAL FASTENERS

Tapcon



1/4" x 1 3/4"
 INTO CONCRETE PAD

RECOMMENDED FASTENERS

1/4" x 1 3/4" TAPCON

MAXIMUM ALLOWABLE SHEAR LOAD FOR 1/4" DIA CONCRETE FASTENERS IN 2000 PSI MINIMUM STRENGTH CONCRETE IS: 325 LBS. FULL OUT (TENSION LOAD) STRENGTH OF TAPCON IS 505 LBS WITH 1 3/4" MIN. EMBEDMENT:

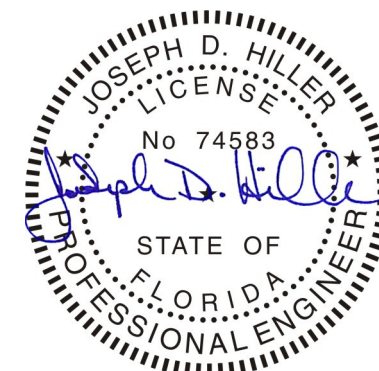
SINGLE SHEAR: 325 LBS
 TENSION: 505 LBS

Notes:

1. Alternative fasteners may be used as shown in the details. All fasteners must meet or exceed the safe working load values specified by the manufacturer, and shall be approved by the building official.

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A-4

4 of 4