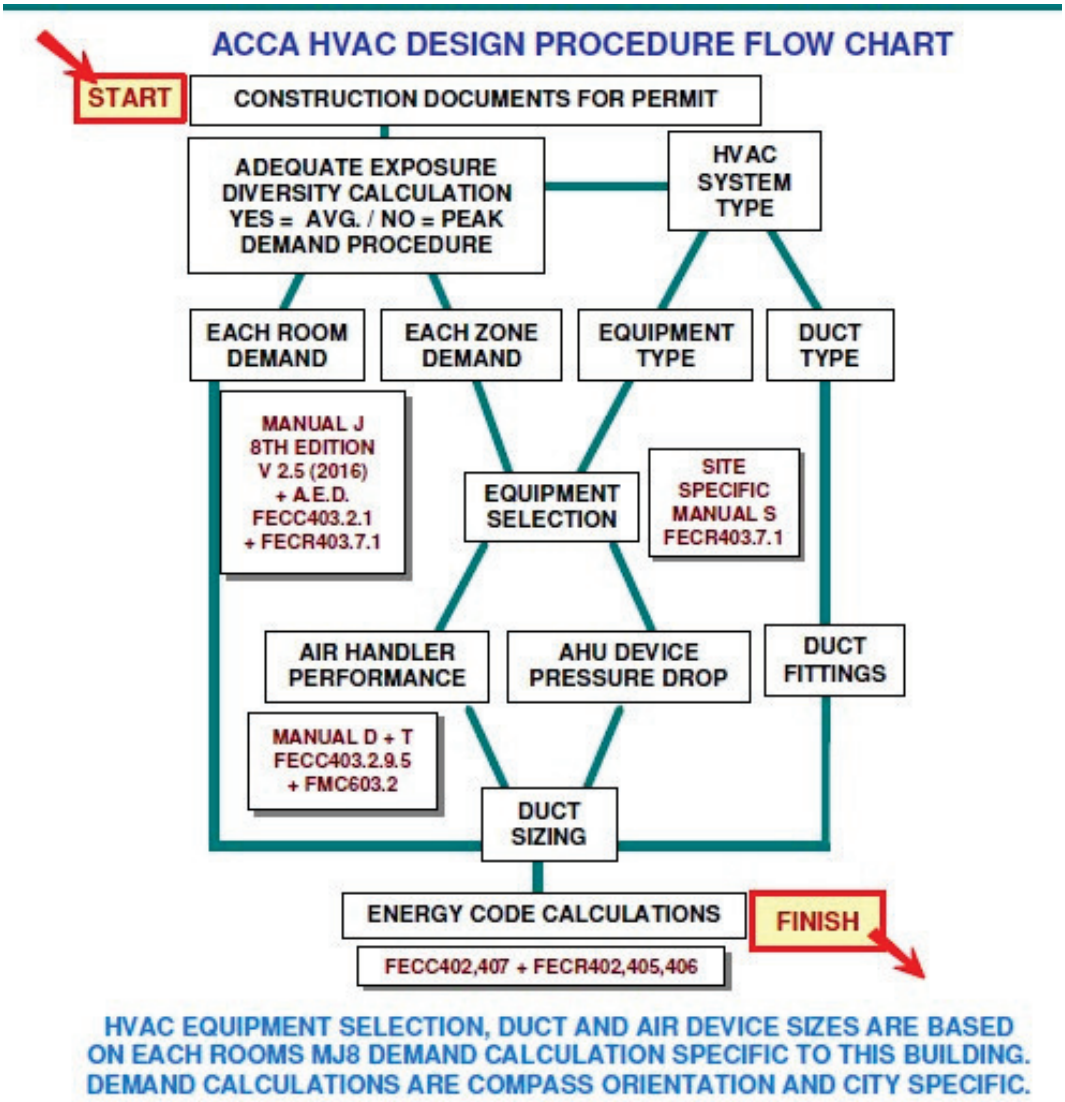
Spotting a fake HVAC design - 2026

Spotting a fake HVAC design is simple for an experienced designer by reviewing the math that makes up an accurate hvac design. Math is the only reliable method to determine each of the HVAC design procedures, the design procedure flow chart below shows the 6 ACCA hvac design manuals along with the final calculation performed – the energy code calculation.



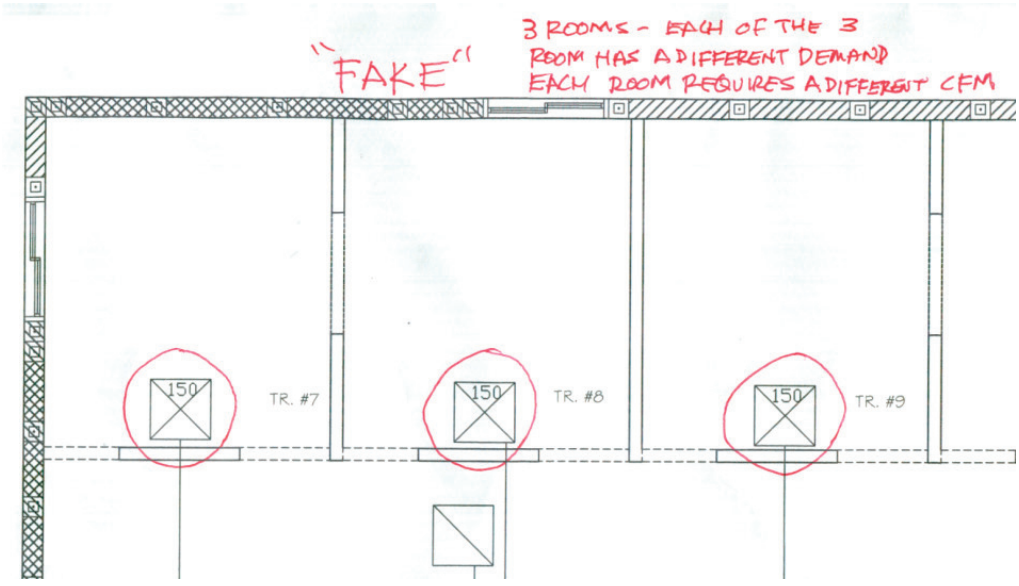
Before the 1980's few HVAC designs were based on any math at all - even though the hvac design manuals have been published since the 1960's. The days of hand held calculators and endless math forms for computing room by room heat load demand calculations are long gone – thankfully – as it could take an entire day to compute a single building.

Prior to computers, most HVAC contractors simply guessed on the hvac using a simple square feet per ton, this inaccurate "design" method of using a square foot per ton allowance had no chance of working well because no two buildings have the same demand based on a simple square foot basis. As a designer in the 1980's - the average square foot per ton, based on thousands of actual heat load demand calculations would vary from 400 to 700 depending mostly on the GFA (glass to floor area) and the glass orientation – (this was long before double pane low e glass) – today we perform 3d intelligent cad energy models that reflect the exact building geometry and building component material make up, resulting in homes that average 700 to 1300 square feet per ton. The square feet per ton for any building is established **after** the room by room heat load demand calculation is performed and not before. A correctly designed hvac system for any building requires many hours performing the 6 calculations now required by the Florida building codes. A properly designed hvac system will contain a lot of math and a scaled hvac drawing that shows this math "graphically". My standard simple home design package will contain about 20 pages of math (Manual's AED,J,D,S,T,ZR + Florida energy code forms) and the intelligent HVAC cad drawing that is data linked to the demand calculations for a precise match.

The **first** item to look at is the room airflow values listed – if the listed cfm values are **neatly rounded up to a value** like "150 cfm" – or any value that would end with a nice rounded number. Rounded values are an indication that no heat load demand calculations were performed on the room and the values were simply guessed at. Room air flow values are derived from the room by room heat load demand calculations and math prevents the values from ending up with a neatly rounded value. **Second** item is the **math documents**, Manual's AED,J,D,S,T,ZR + Florida energy code forms, be sure they are all provided together in a single package and include the room by room demand calculations.

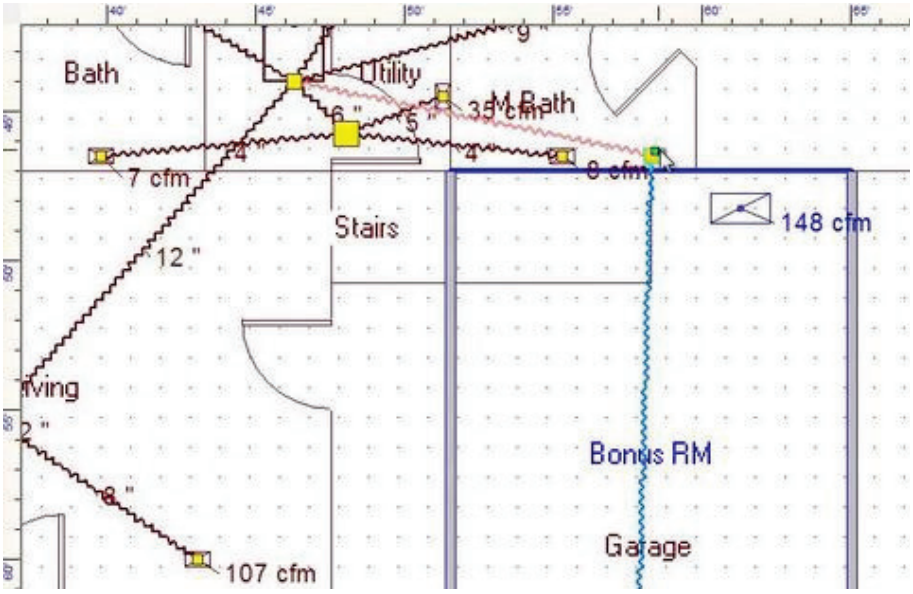
Performing the energy code forms *only* without the supporting hvac design manuals AND scaled HVAC Manual D Duct drawings is surely a fake. **Third**, look for a code compliant **scaled hvac drawing** showing every part and piece of the hvac system, energy calculations rely on math from the prerequisite hvac design manuals, a great example is the amount of duct work square feet for the building, the amount of both supply and return air ducts is required in both the energy code calculation and the heat load demand calculations. This means that a scaled duct design complying with Manual D would be required to establish the real amounts. Also Manual D duct design models every duct path and will determine the one and only "longest duct path" (aka-most restrictive path) from one intake return air grille, through the return and supply duct trunks + plenums to a single supply air discharge. Manual D determines the pressure associated with the most restrictive path and is critical for selecting the indoor air handler. I see many contractors simply guess (.5 TSP is the most common guess shown) on the duct area instead of the required effort of a duct design that truly matches the building. So be sure that your design package includes all 6 ACCA design manuals and a full set of hvac drawings, otherwise it's a fake based on several guesses!

Here is look at some **fakes – picture below** was sealed by a PE – you can see that all three rooms show the same nicely **rounded cfm value**.

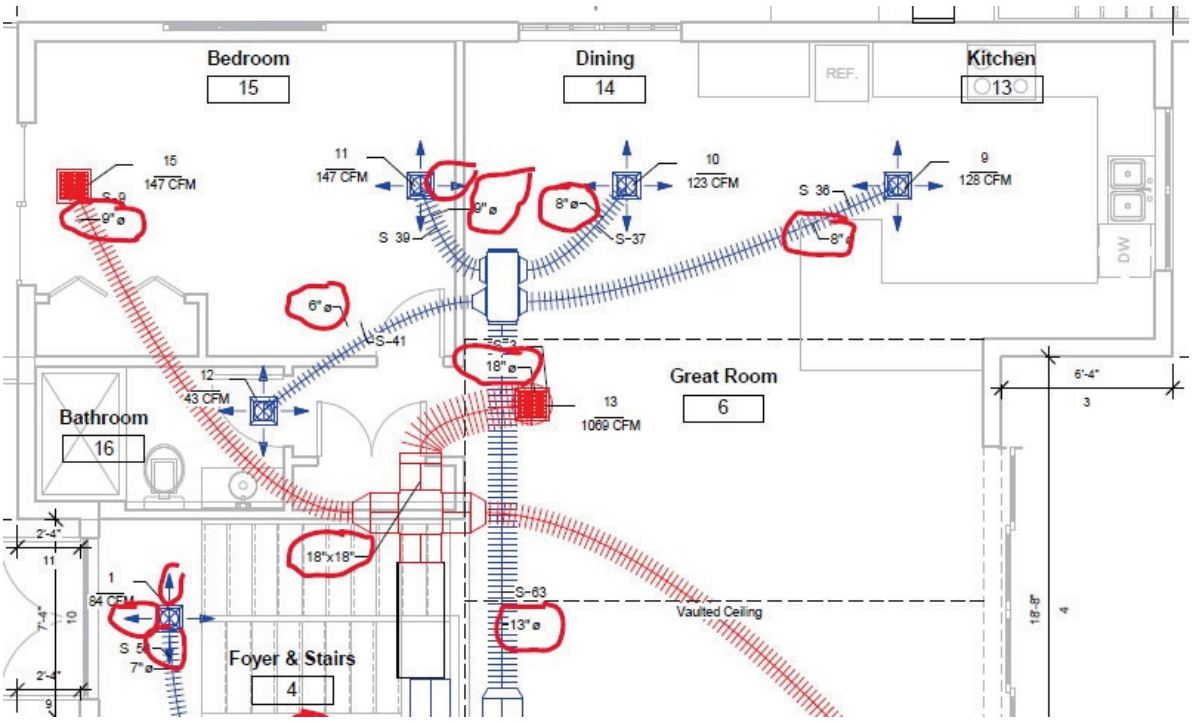


This is a mathematical impossibility because the 3 rooms do not have the same exposure even though each room usage and floor area are the same – so the heat load demand for each room will be significantly different due to the different envelope components; each room's required air flow value should match the demand calculations on a room-by-room basis. The peer reviewed heat load demand calculations for this building revealed that the corner room required more airflow than the center room with a window, and the room to the right required the least amount of airflow – this was due to the building envelope exposure differences resulting in different room demands. Placing the same air flow for each room will result in large temperature differences within each room – this violates the acca design guides and energy code.

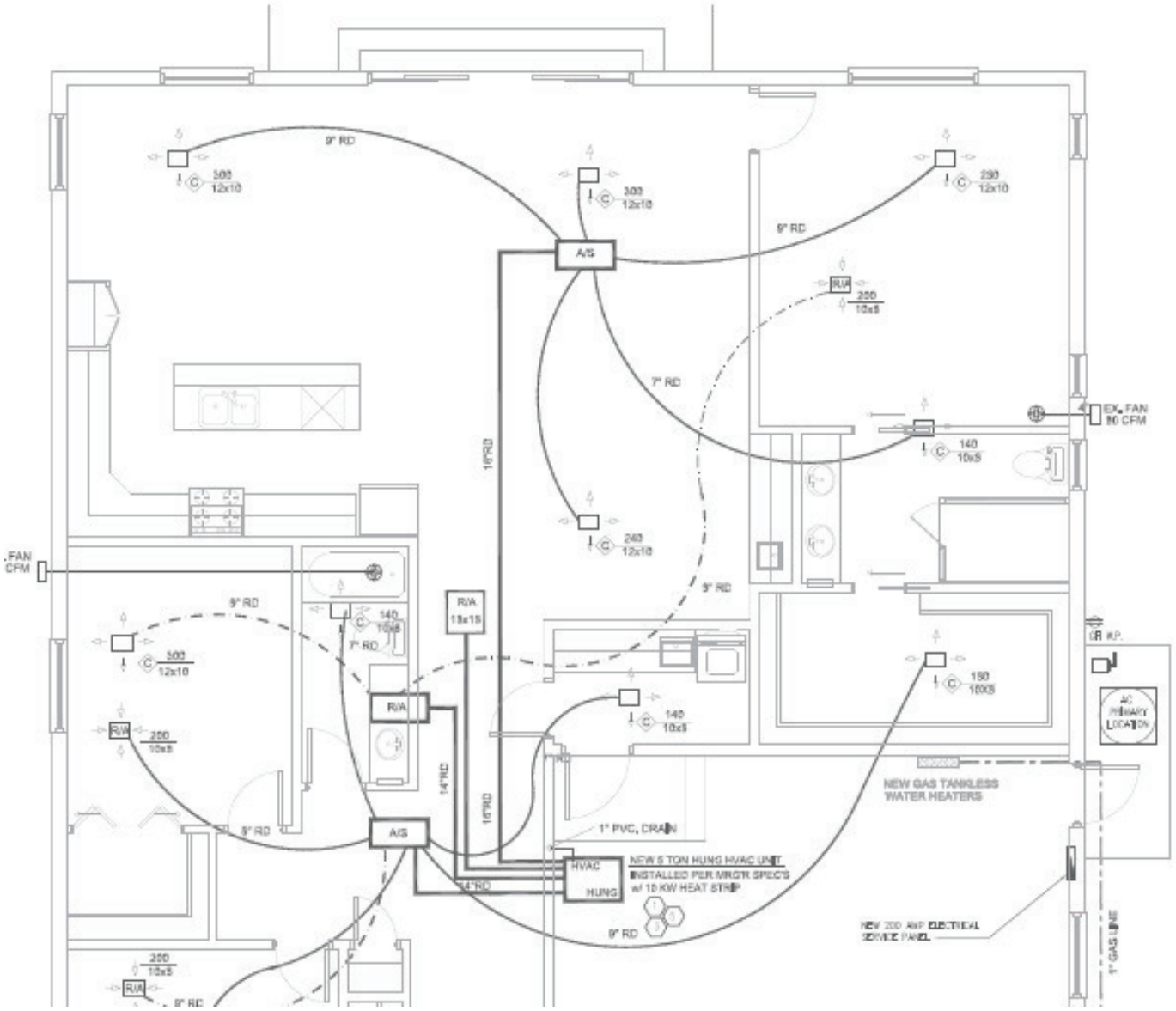
Another fake item to look for is the **"chicken scratch" drawing** – usually provided by the hvac contractor. These fake designs make no attempt to create a duct design that reflects field installation. The duct fittings shown will not account for the actual fittings being installed – meaning the manual D used for air handler selection would be inaccurate by more than 25% on total static pressure required – and the duct exposure area (for each duct mounting location) used in the duct heat load demand would be incorrect too.



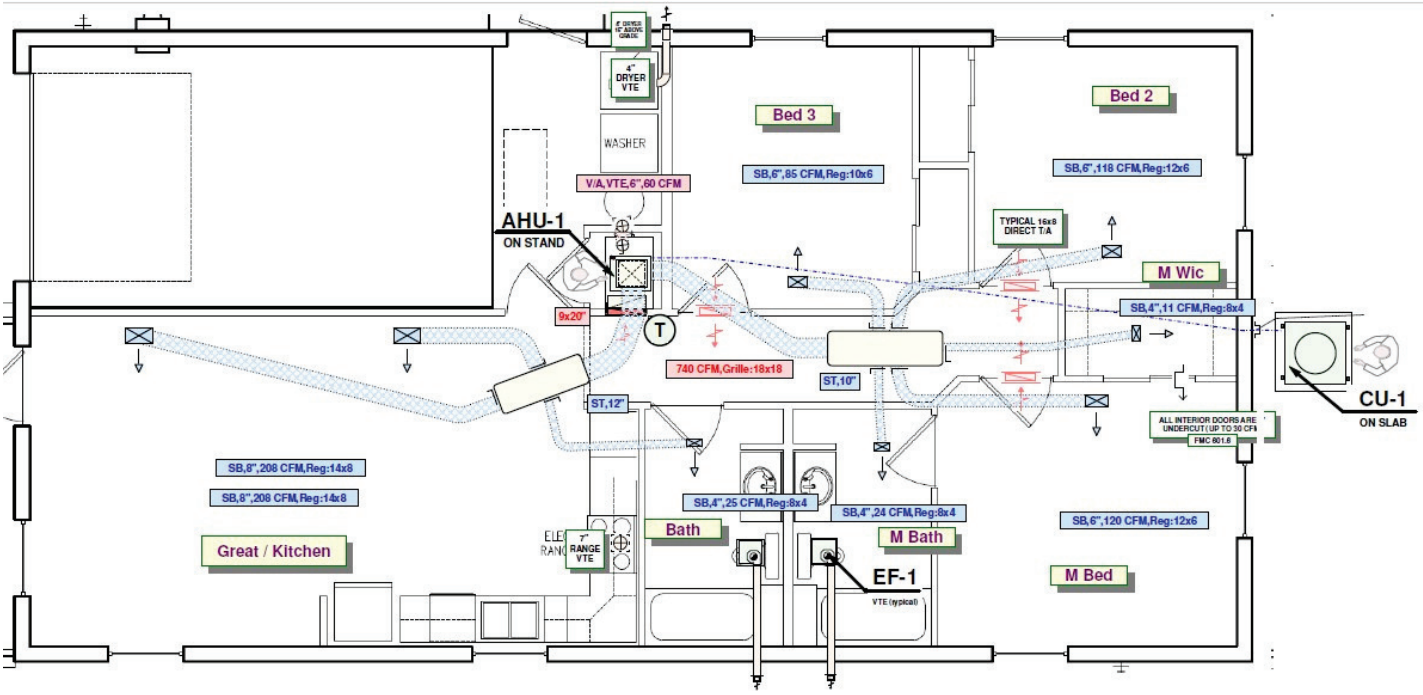
Above and below: Fake "chicken scratch" drawing above showing inaccurate allowances for duct fittings – and a "zero" cfm shown in M Bath is not possible as this room has internal heat gains and building envelope heat gains – the improper use of this popular residential hvac design tool will result in "hot spots"; the computer output is only as accurate as the designer's input! This design has no chance of working properly. Below shows improper air device locations in violation with Manual T and Manual D, this drawing is not code or acca compliant.



Below: fake hvac design showing a 5-ton hvac unit specified for this home – the home has a 2-ton heat load demand as verified by peer review calculations. Easy to see that no math was performed by looking at the room air flow values, also the duct sketch shows ducts drawn in conflict with Manual D and Manual T. The drawings do not correctly show the entire hvac system with a balanced return air system and the air device locations would be suited for a cold climate while in the heating mode (not a cooling dominant duct design as required here in Florida) This sketch is neither code or acca compliant.



A correctly designed hvac system should look like the drawing below →



Above shows a correctly designed HVAC system featuring a single high wall return air grille.

Design shown includes the room-by-room heat load demands using Manual J 8th edition, Fitting by Fitting duct design using graphic Manual D duct design, HVAC equipment selection using Manual S equipment selection procedure, air device selection using Manual T room air device selection, Manual ZR used (if duct zoning is required or desired), and energy calculations using FSEC energy gauge software tool. You can see the room air flow values exactly match the rooms actual heat load demand – no "rounded off" air flow values – each duct fitting is shown and will match the installation – this accurate cad drawing data links to each ACCA design manual using intelligent 3d cad energy modeling software. Professional hvac designers perform every ACCA design manual (required by Building codes) because these manuals provide essential data needed to produce a complete and accurate comfort system design.

Spotting fake HVAC Calculations -- Manual's AED,J,D,S,T,ZR:

Listed below are a few examples of Central Florida hvac installers or hvac designers who fell short of performing the 6 ACCA hvac design manuals that make up a code and acca compliant HVAC design. These fake calculations are provided without a full scaled Manual D duct drawing resulting in inaccurate duct heat load demand calculations, improperly selected air handlers, and incorrect Manual S capacity adjustments. In these examples you can see the various ways the "designers" have falsified the heat load demands, in every case the falsifications (aka: "padded") result in the wrong hvac equipment selection. There is no way to accurately complete a heat load demand calculation without a scaled Manual D duct design that accounts for every duct path. The fake documents shown in this study back up the data provided by the DOE and FSEC

with respect to hvac contractors who purposely falsify calculations in an attempt to install “bigger is better” hvac equipment – sadly the oversizing rate in Florida is 60% - due to the hvac industry guessing on equipment size. Ask google “why are most a/c units oversized in Florida”.

Below shows an extremely padded heat load demand claiming a modern home with a summer infiltration rate of 339 cfm (infiltration is amount of air in cfm a building envelope naturally leaks)! This of course in not possible, typically a modern home of this size has a natural infiltration rate of about 45 cfm (my home from 1964 has a verified natural infiltration leakage rate of only 27 cfm). This one falsification added about one full ton of cooling capacity to the heat load demand that really does not exist! Also note the incorrect 95-degree summer design outdoor temperature (there are no cities in Florida that use a 95-degree summer design temperature).

Location for weather data: Tampa Internati, FL - Defaults: Latitude(28) Altitude(10 ft.) Temp Range(M)
Humidity data: Interior RH (50%) Outdoor wet bulb (78F) Humidity difference(54gr.)

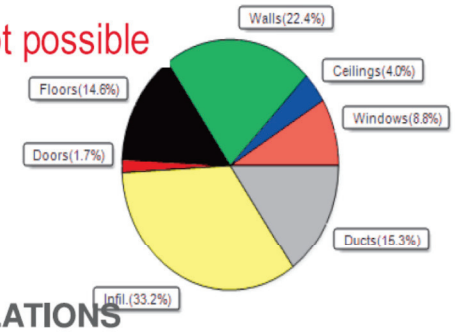
Winter design temperature(MJ8 99%)	43	F	Summer design temperature(MJ8 99%)	95	F
Winter setpoint	70	F	Summer setpoint	75	F
Winter temperature difference	27	F	Summer temperature difference	20	F
Total heating load calculation	**40382**	**Btuh**	**Total cooling load calculation**	**61434**	**Btuh**
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	163.4	66000	Sensible (SHR = 0.75)	114.9	49500
Heat Pump + Auxiliary(0.0kW)	163.4	66000	Latent	89.9	16500
			Total (Electric Heat Pump)	107.4	66000

WINTER CALCULATIONS

Winter Heating Load (for 4124 sqft)

Load component			Load	
Window total	364	sqft	3538	Btuh
Wall total	3562	sqft	9054	Btuh
Door total	64	sqft	691	Btuh
Ceiling total	2353	sqft	1612	Btuh
Floor total	See detail report		5886	Btuh
Infiltration	452	cfm	13410	Btuh
Duct loss			6190	Btuh
Subtotal			**40382**	**Btuh**
Ventilation	0	cfm	0	Btuh
TOTAL HEAT LOSS			**40382**	**Btuh**

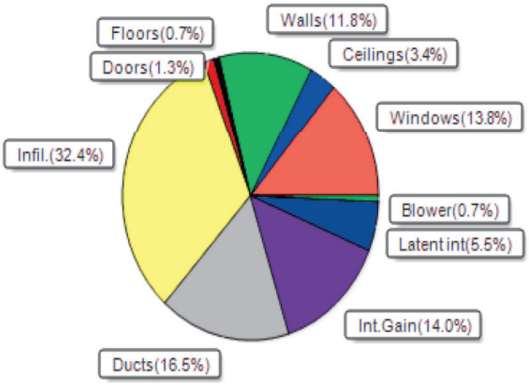
not possible



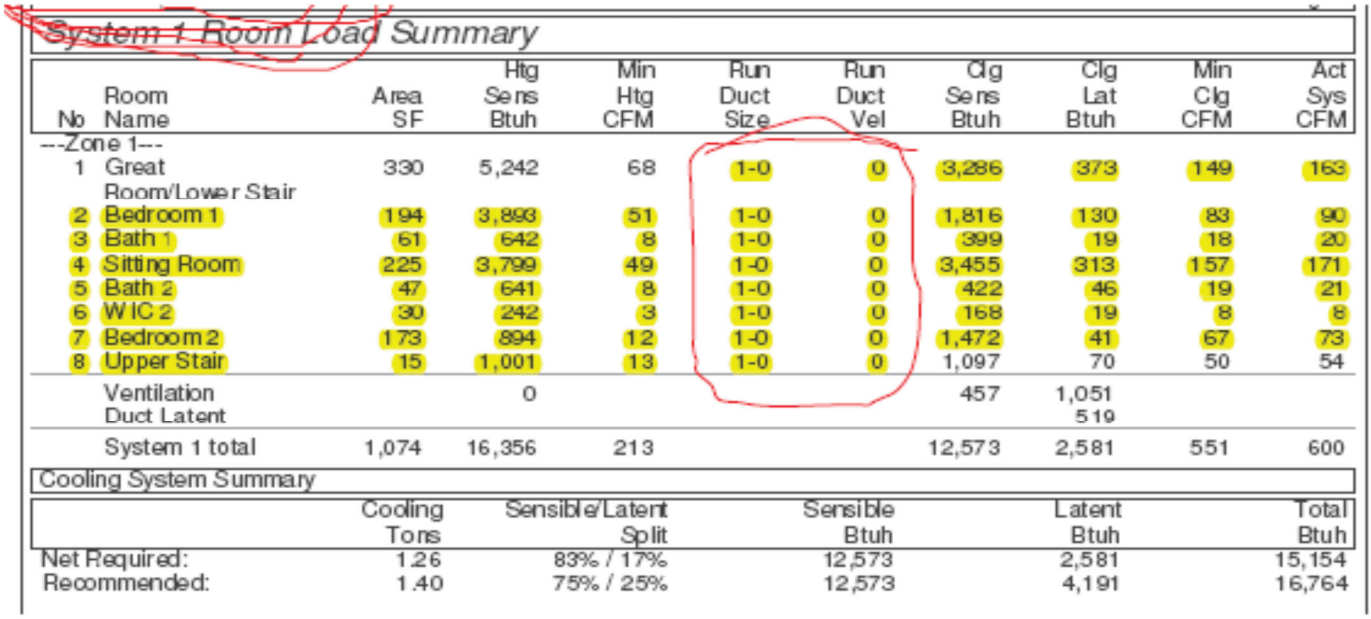
SUMMER CALCULATIONS

Summer Cooling Load (for 4124 sqft)

Load component			Load	
Window total	364	sqft	8455	Btuh
Wall total	3562	sqft	7231	Btuh
Door total	64	sqft	794	Btuh
Ceiling total	2353	sqft	2090	Btuh
Floor total			438	Btuh
Infiltration	339	cfm	7450	Btuh
Internal gain			8580	Btuh
Duct gain			7635	Btuh
Sens. Ventilation	0	cfm	0	Btuh
Blower Load			400	Btuh
Total sensible gain			**43073**	**Btuh**
Latent gain(ducts)			2527	Btuh
Latent gain(infiltration)			12435	Btuh
Latent gain(ventilation)			0	Btuh
Latent gain(internal/occupants/other)			3400	Btuh
Total latent gain			**18362**	**Btuh**
TOTAL HEAT GAIN			**61434**	**Btuh**



2 docs Below: shows another fake heat load demand calculation showing that no ducts have been drawn or even guessed at! The Manual J heat load demand would be missing the duct heat load demands and the Manual S equipment selection would be impossible without knowing the required duct pressures to overcome and return air duct temperature rise. These fakes are commonplace in Florida and are typically provided by "designers" or "hvac installers" that offer "**calculations only**" without providing the code and acca required scaled hvac duct drawings. The form below claims air flow cfm with no velocity or duct size! This is neither code or acca compliant.



System 1 Room Load Summary

No	Room Name	Area SF	Htg Sens Btuh	Min Htg CFM	Run Duct Size	Run Duct Vel	Clg Sens Btuh	Clg Lat Btuh	Min Clg CFM	Act Sys CFM
---Zone 1---										
1	Great Room/Lower Stair	330	5,242	68	1-0	0	3,286	373	149	163
2	Bedroom 1	194	3,893	51	1-0	0	1,816	130	83	90
3	Bath 1	61	642	8	1-0	0	399	19	18	20
4	Sitting Room	225	3,799	49	1-0	0	3,455	313	157	171
5	Bath 2	47	641	8	1-0	0	422	46	19	21
6	WIC 2	30	242	3	1-0	0	168	19	8	8
7	Bedroom 2	173	894	12	1-0	0	1,472	41	67	73
8	Upper Stair	15	1,001	13	1-0	0	1,097	70	50	54
	Ventilation		0				457	1,051		
	Duct Latent							519		
	System 1 total	1,074	16,356	213			12,573	2,581	551	600

Cooling System Summary

	Cooling Tons	Sensible/Latent Split	Sensible Btuh	Latent Btuh	Total Btuh
Net Required:	1.26	83% / 17%	12,573	2,581	15,154
Recommended:	1.40	75% / 25%	12,573	4,191	16,764

System 1 Room Load Summary

No	Room Name	Area SF	Htg Sens Btuh	Min Htg CFM	Run Duct Size	Run Duct Vel	Clg Sens Btuh	Clg Lat Btuh	Min Clg CFM	Act Sys CFM
---Zone 1---										
1	Living / Kitchen	348	4,770	62	1-0	0	4,978	1,976	226	226
2	Bedroom	179	2,303	30	1-0	0	1,516	288	69	69
3	Bathroom	89	1,595	21	1-0	0	536	301	24	24
	System 1 total	616	8,668	113			7,030	2,565	320	320

Cooling System Summary

	Cooling Tons	Sensible/Latent Split	Sensible Btuh	Latent Btuh	Total Btuh
Net Required:	0.80	73% / 27%	7,030	2,565	9,595
Recommended:	0.86	75% / 25%	7,695	2,565	10,260

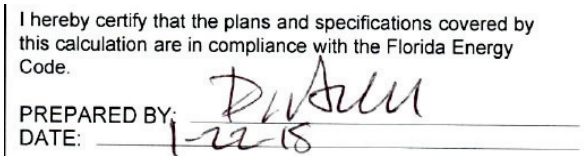
?

really, no duct size can deliver air flow? this doc shows that no duct design was attempted as required by ACCA (the code reference standard for hvac design),the mechanical,and energy codes. It would not be possible to complete the ACCA design guides (J,D,S,T,ZR,AED) without a scaled duct drawing to quantify many items.. square feet of exposed duct for each duct environment, return duct heat rise, air handler airflow setting, duct total static pressure that must be met by the air handler, indoor coil entering wet and dry bulb temps, etc...too much to list - ducts make up a large portion of the demand calculations.
so this entire design package, both the heat load and the energy code forms are incorrect for this building, ..also note that the odds of any hvac system exactly matching the required latent loads are improbable- this is a fake acca calculation.

Spotting a fake Florida Energy Code Form - 2025

Spotting a fake energy code form is simple for an experienced energy rater by reviewing the public record energy code output form that is signed by the energy rater and used for permit acquisition. I have hundreds of these fake forms accumulated over a 20-year period. Code officials (plans examiners and site inspectors) are becoming more aware of these fake forms, but not all examiners know how to perform the energy code calculations and typically could not spot the most common fakes I list here. Plans examiners do check common energy form entries like the address, living area square feet, and signatures. Each falsified example shown below was accepted for permit acquisition!

1) The energy rater signature is required on each energy form and in some jurisdictions the signature must be 3rd party verified. The many fake energy forms sent to me each year typically contain a **signature that is not legible and does not contain any contact information** for the energy rater who performed the calculations. Our energy code allows for this, FECR 103.1.1.1.1 allows any person (yes, an 8-year-old with computer skills) to perform and submit energy code forms for residential buildings! For sure energy code calculations are very complex and require the energy rater to be capable of the prerequisite ACCA hvac design including the 6 ACCA computer generated design guides – manual's AED,J,D,S,T,ZR.


I hereby certify that the plans and specifications covered by this calculation are in compliance with the Florida Energy Code.

PREPARED BY: DiAlm

DATE: 1-22-15

2) Residential occupants are based on the number of bedrooms. ACCA and Energy codes set the maximum occupancy to be one person greater than the number of bedrooms. **This 5 Bedroom home claims 16 occupants** (this was falsified in the ACCA manual j heat load in order to achieve the "bigger is better" hvac equipment size – this project has grossly oversized hvac equipment due to this incorrect occupant count. This entry is not code or ACCA compliant.

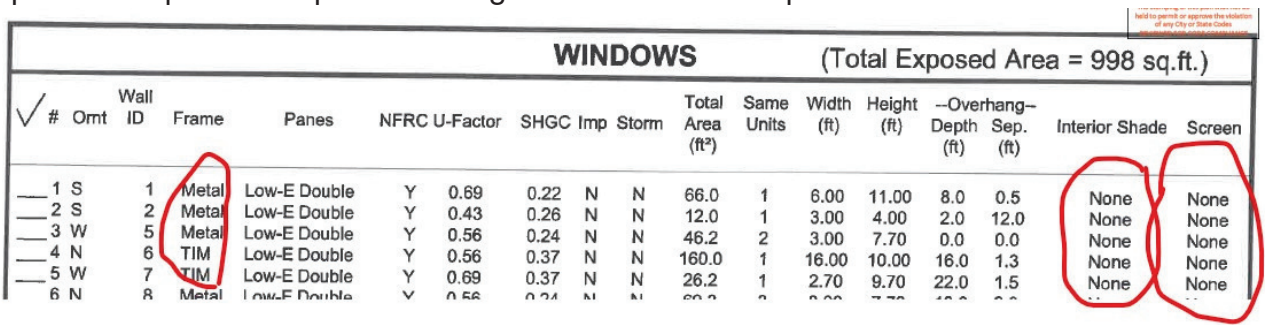
Number	Name	Area	Volume	Kitchen	Occupants	Bedrooms	Infil ID	Finished	Cooled	Heated
1	Main	2736	32832	Yes	8	3	1	Yes	Yes	Yes
2	Great Room	2688	32256	No	8	2	1	Yes	Yes	Yes

3) Exterior wall paint color is a critical item in the energy code calculations. I see many energy forms showing **a false value for paint color** (or if using a natural material like brick, the bricks natural absorptance factor is used). The energy code sets the very minimum paint color absorptance factor of .21 for lacquer white. Paint colors range from .21 to .35 for light color paint, .36 to .55 for medium color paint, and .56 to .8 for dark color paint. This entry is very important because it can sway the overall energy performance index by 8 points! Also note that interior partition walls that are not subject to direct sunlight use a .01 absorptance factor.

WALLS *(Total Exposed Area = 2512 sq.f*

✓ #	Ornt	Adjacent To	Wall Type	Space	Cavity R-Value	Width Ft	Width In	Height Ft	Height In	Area sq.ft.	U-Factor	Sheath R-Value	Frm. Frac.	Solar Absor.
1	W	Garage	Frame - Wood	Interior 1	13.0	2.6	0	10.0	0	25.7	0.084	0	0.23	0.01
2	N	Garage	Frame - Wood	Interior 1	13.0	5.5	0	10.0	0	55.0	0.084	0	0.23	0.01
3	S	Exterior	Conc. Blk - Int Ins	Interior 1	5.0	17.5	0	10.0	0	175.0	0.132	0	0	0.15
4	W	Exterior	Conc. Blk - Int Ins	Interior 1	5.0	19.5	0	10.0	0	195.0	0.132	0	0	0.15

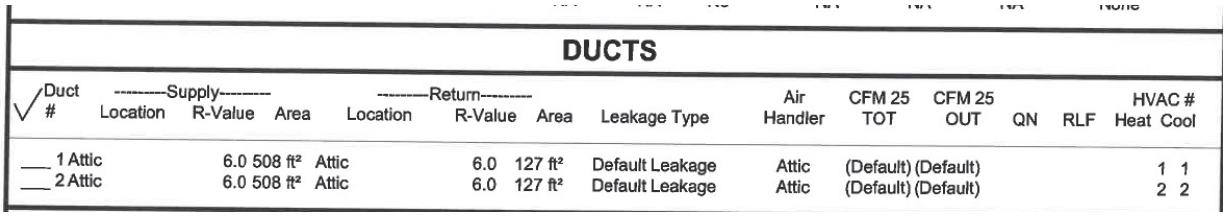
4) Glass envelope components like windows, sliding glass doors, and swinging glass doors are critical items used in the ACCA and energy code calculations. I see most energy forms show **false input data for internal and external shading devices**. Our codes require the hvac design be in compliance with the code adopted Manual J heat load calculation procedure. This procedure has mandatory requirements for glass components to include interior shading (default value for new homes is a blind set to a 45-degree angle, 100% coverage, medium color), exterior fixed shading by the building overhang (overhang projection ratio), external or internal insect screen shading based on the window type, exterior screen enclosure shading (pool cages), and ground color reflectance factor. Peer review quantified this home to have grossly oversized cooling equipment due to this false entry, also the frame type for the windows was not consistent with the u factor shown. Approved for permit despite not being code or ACCA compliant.



WINDOWS (Total Exposed Area = 998 sq.ft.)

#	Ornt	Wall ID	Frame	Panes	NFRC	U-Factor	SHGC	Imp	Storm	Total Area (ft²)	Same Units	Width (ft)	Height (ft)	--Overhang-- Depth (ft)	Sep. (ft)	Interior Shade	Screen
1	S	1	Metal	Low-E Double	Y	0.69	0.22	N	N	66.0	1	6.00	11.00	8.0	0.5	None	None
2	S	2	Metal	Low-E Double	Y	0.43	0.26	N	N	12.0	1	3.00	4.00	2.0	12.0	None	None
3	W	5	Metal	Low-E Double	Y	0.56	0.24	N	N	46.2	2	3.00	7.70	0.0	0.0	None	None
4	N	6	TIM	Low-E Double	Y	0.56	0.37	N	N	160.0	1	16.00	10.00	16.0	1.3	None	None
5	W	7	TIM	Low-E Double	Y	0.69	0.37	N	N	26.2	1	2.70	9.70	22.0	1.5	None	None
6	N	8	Metal	Low-E Double	Y	0.56	0.24	N	N	60.2	2	3.00	7.70	16.0	0.0	None	None

5) Energy forms with **fake duct values** are for sure the most common in Florida and is commonly accepted by code officials. This duct entry shows a two-story home to have only 2 duct entries and to make It super obvious that the form is a fake – both duct systems miraculously have exactly the same amount of duct exposure area in square feet! This of course is not even possible and peer review using intelligent cad duct design shows the first level had 3 different duct mounting environments (garage, hot attic, enclosed floor joists) with a total of 432 square feet of duct area and the second level had 2 different duct mounting locations (interior closet and hot attic) with a total of 382 square feet. This is a huge difference from the claimed 635 square feet for each duct system and would change the energy performance index by up to 4 points. Also note the R6 duct value shown is not ACCA compliant and the air handler locations are not correct, approved for permit!



DUCTS

Duct #	Supply Location	Supply R-Value	Supply Area	Return Location	Return R-Value	Return Area	Leakage Type	Air Handler	CFM 25 TOT	CFM 25 OUT	QN	RLF	HVAC # Heat	HVAC # Cool
1	Attic	6.0	508 ft²	Attic	6.0	127 ft²	Default Leakage	Attic	(Default)	(Default)			1	1
2	Attic	6.0	508 ft²	Attic	6.0	127 ft²	Default Leakage	Attic	(Default)	(Default)			2	2

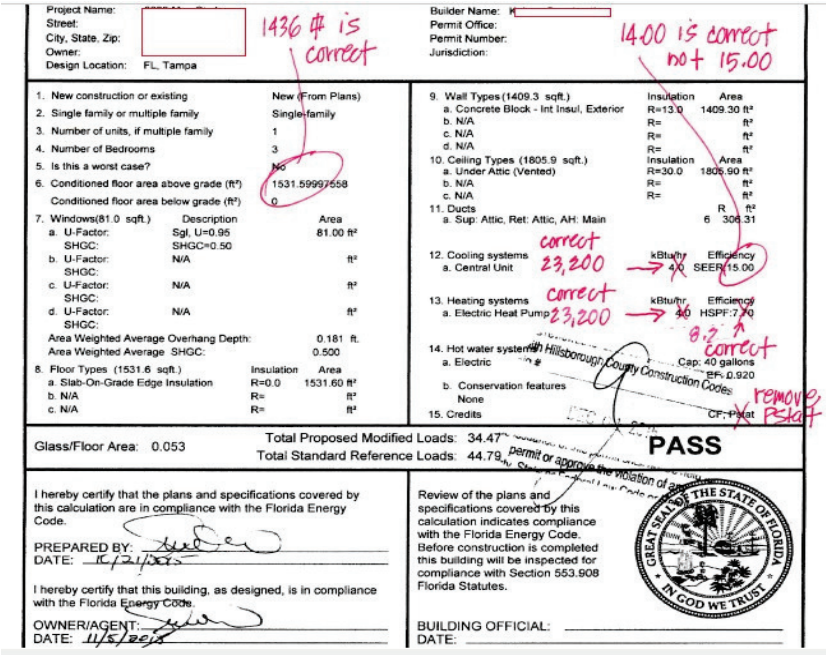
6) **No ventilation air** - as required to maintain a healthy indoor environment. Florida mechanical and energy codes require ventilation air for occupants, the minimum allowable rate is 15 cfm of ventilation air required for each occupant. The typical 3-bedroom home requires 60 cfm minimum ventilation air and the mechanical codes show this “fresh outdoor air” be introduced from an approved outdoor location. The operation of exhaust fans, opening of windows, and natural infiltration are not ACCA approved means for ventilation air required for occupant health. Since 2015 when blower door testing became mandatory in Florida, there are no new construction homes that have natural infiltration rates to satisfy the minimum ventilation air rates, opening of windows is not performed by the occupants, and operation of an exhaust fan (this places the building interior on negative pressure and slightly increases the infiltration rate) are all violations of the ACCA design guides. ACCA compliant ventilation air system design is mechanically operated and places a positive pressure on the home interior during operation. This can be accomplished with a run time ventilation air duct connected to the air handler return air plenum or by a dedicated ventilating

dehumidifier. An energy form showing only an infiltration entry is not ACCA compliant, check to see your forms contain a ventilation entry showing a run time ventilation rate to match the occupancy.

INFILTRATION

#	Scope	Method	SLA	CFM 50	ELA	EqLA	ACH	ACH 50
1	Wholehouse	Proposed ACH	.0005	7113.6	390.53	734.45	.375	6.5575

7) Sometimes the energy rater and builder signature are the same as shown on this fake form, the code officials **approved this form even though it clearly shows many errors**. This form has nearly every entry incorrect as verified by 3rd party peer review. Here are a few of the obvious errors shown: R13 insulation for the block walls did not match the R4 installed, the roof area claimed on this single story home is greater than the living area shown, the NFRC values shown for glass did not match the installed glass, the duct amounts and duct environments claimed did not match this home, the glass area amount shown is half of what is actually installed (5% GFA claimed, 10% GFA installed), and the heating and cooling capacities shown are for a 1/3 ton hvac unit (does not exist). Using this false entry data for this home "passes" the energy code! Peer revies shows this home does not pass the energy code when the correct input data is used, in fact this home required a higher efficient hvac unit in order to legally build this home in Florida.



8) This "approved for construction" permit document shows "not manual J compliant" – code requires the Manual J to be code compliant, the jurisdiction stamp is directly next to a code violation!