
DIVISION OF
BUILDING SAFETY
DBS

MANUAL S, J & D

State of Idaho Division of Building Safety

Overview:

When Why & What?

Submittal Procedures

Plan Review Requirements

Inspection Requirements

Summary

January 1, 2019

Manual S, J & D review for **NEW RESIDENTIAL** HVAC permits prior to HVAC Inspection

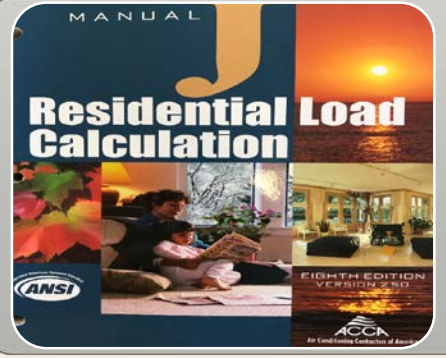
Inspectors will verify residential equipment installations in accordance with the “**APPROVED**” Manual S, J & D report

2012 IRC Part V - Mechanical

M1401.3	• Equipment Sizing: heating and cooling equipment and appliances shall be sized in accordance with ACCA Manual S based on building loads calculated in accordance with ACC Manual J or other approved heating and cooling calculation methodologies
M1601.1	• Duct Design: duct systems serving heating, cooling and ventilation equipment shall be installed in accordance with provisions of Chapter 16 and ACCA Manual D or other approved methods

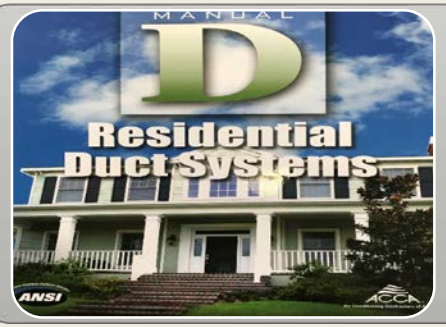
Manual S – Equipment Selection

- Design Conditions
- Equipment Capacities
- Static Pressures
- Load Sensible Heat Ratio



Manual J – Heating & Cooling Load Calculations

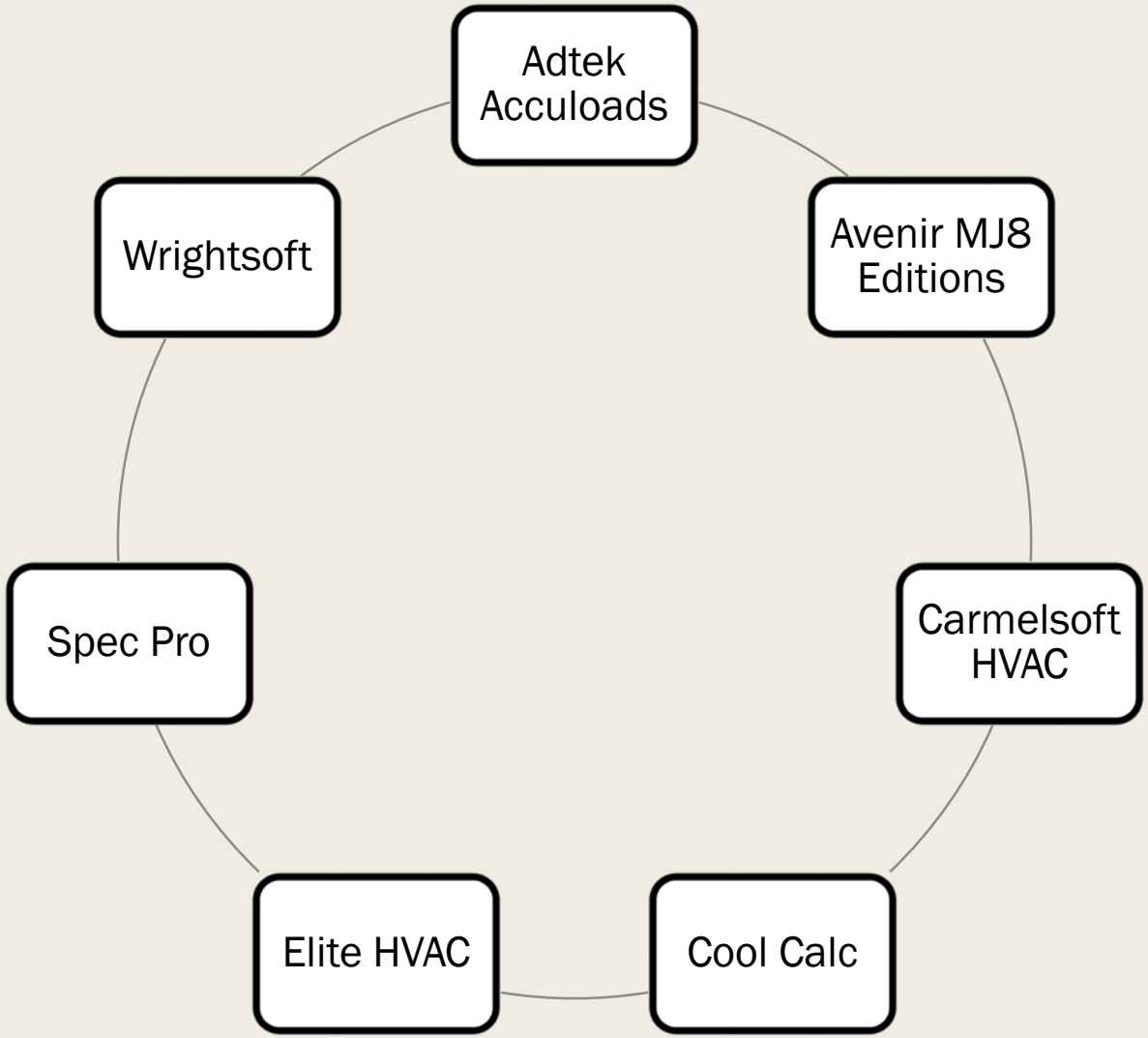
- Building Construction: component construction, orientation, insulation etc.
- Mechanical Ventilation & Infiltration
- Occupants & Appliances
- Equipment & Duct Locations



Manual D – Air Distribution System

- Room by Room CFM Delivery
- Static Pressures & Total Effective Lengths
- Mechanical Ventilation Design
- Return Air Paths

ACCA Approved Software Programs



SUBMITTAL PROCEDURES

New Residential HVAC Process

New Permit

- Apply for a New Residential HVAC Permit
- Email Notification from DBS to Permit Holder of Manual S, J & D Requirement

Plan Review

- Permit Holder emails Manual S, J & D to DBS
- Manual S, J & D Review Conducted
- Review Correspondence: Email & eTrakit

Inspection

- Inspection may be scheduled after Manual S, J & D report is APPROVED
- HVAC Inspector will have the APPROVED report through DBS Software

Email Notification After Permit Issuance

Division of Building Safety

HVAC New Residential Permitting Requirements

Our records indicate that you have recently been issued a New Residential Construction HVAC permit with the Division of Building Safety.

In order to comply with the International Residential Code upon HVAC Inspection, the new installation of the heating and cooling system shall be designed in accordance with ACCA Manual S, J & D.

The State of Idaho, Division of Building Safety requires that the Manual S, J & D report be reviewed and approved prior to HVAC Inspections [redacted] The HVAC Inspector will verify that the design reflected on the "Approved" Manual S, J & D report corresponds to what has been constructed on site.

Please submit the Manual S, J & D report with any additional documents or plans that were used to generate the report to manualjreview@dbs.idaho.gov and include the permit number HVC1804-00011 within the subject or the body of the email.

Please allow approximately **10 days** for the report to be reviewed.

The "Approved" copy of the report or any requested corrections pertaining to the report will be made available on eTRAKIT, our online permitting database, under the "Review" tab of permit number HVC1804-00011

Please feel free to visit our webpage https://dbs.idaho.gov/programs/hvac/ for Manual S, J & D information pertaining to what is reviewed during plan review and what is verified on the job site in reference to the Manual S, J & D report.

If you have any questions in regards to this requirement or processes, please feel free to contact us at manualjreview@dbs.idaho.gov or call us at 1-800-955-3044.

If you need further assistance please contact us at 1-800-955-3044.

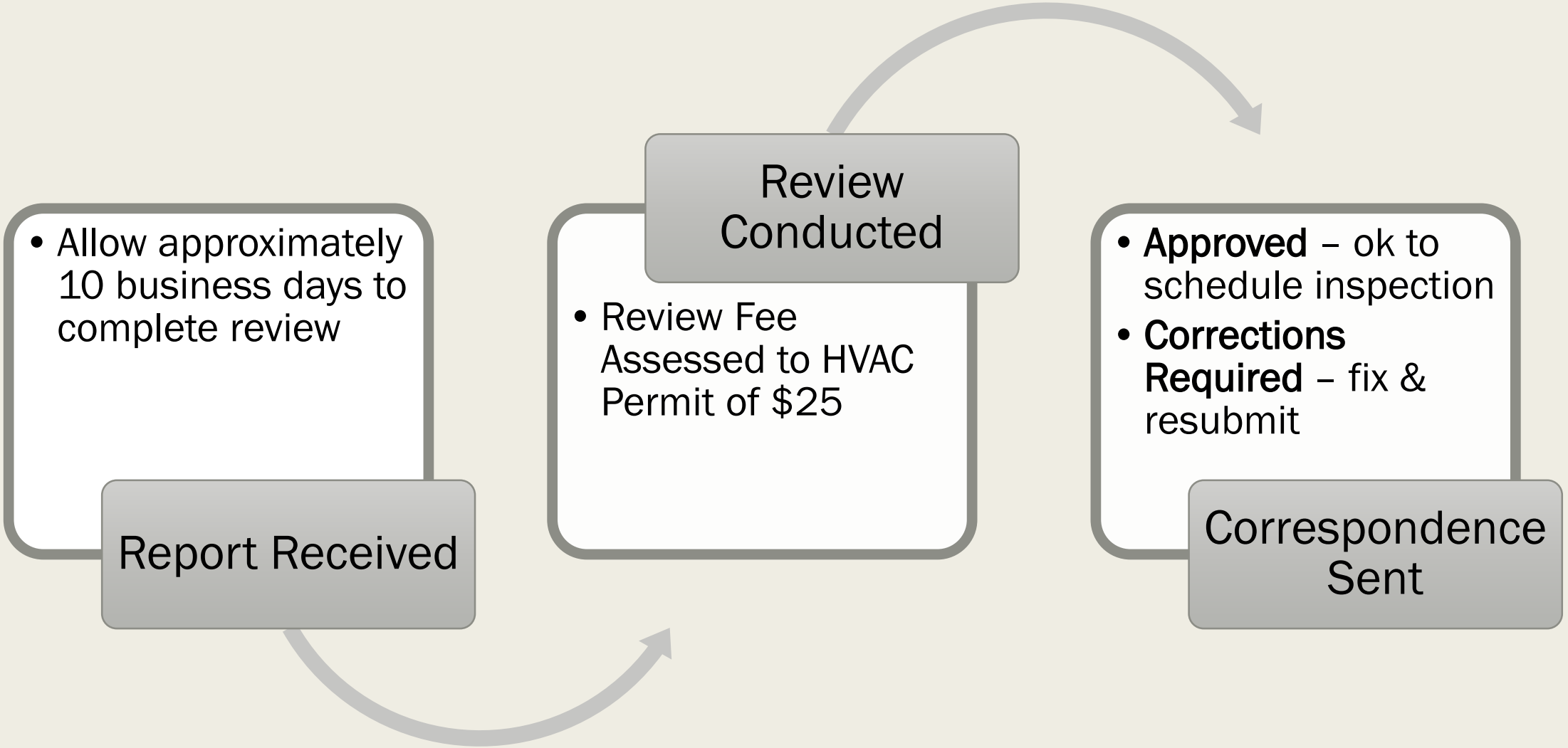
Thank You.

Submit Report to:

manualjreview@dbs.Idaho.gov

- Include in the email the HVAC Permit Number

Review Procedures



Review Status Notification

Sent to the Permit Holder

Search for Permit

Plan review status, report & comments

Status Notification via Email

Division of Building Safety

HVAC New Residential Permitting Requirements

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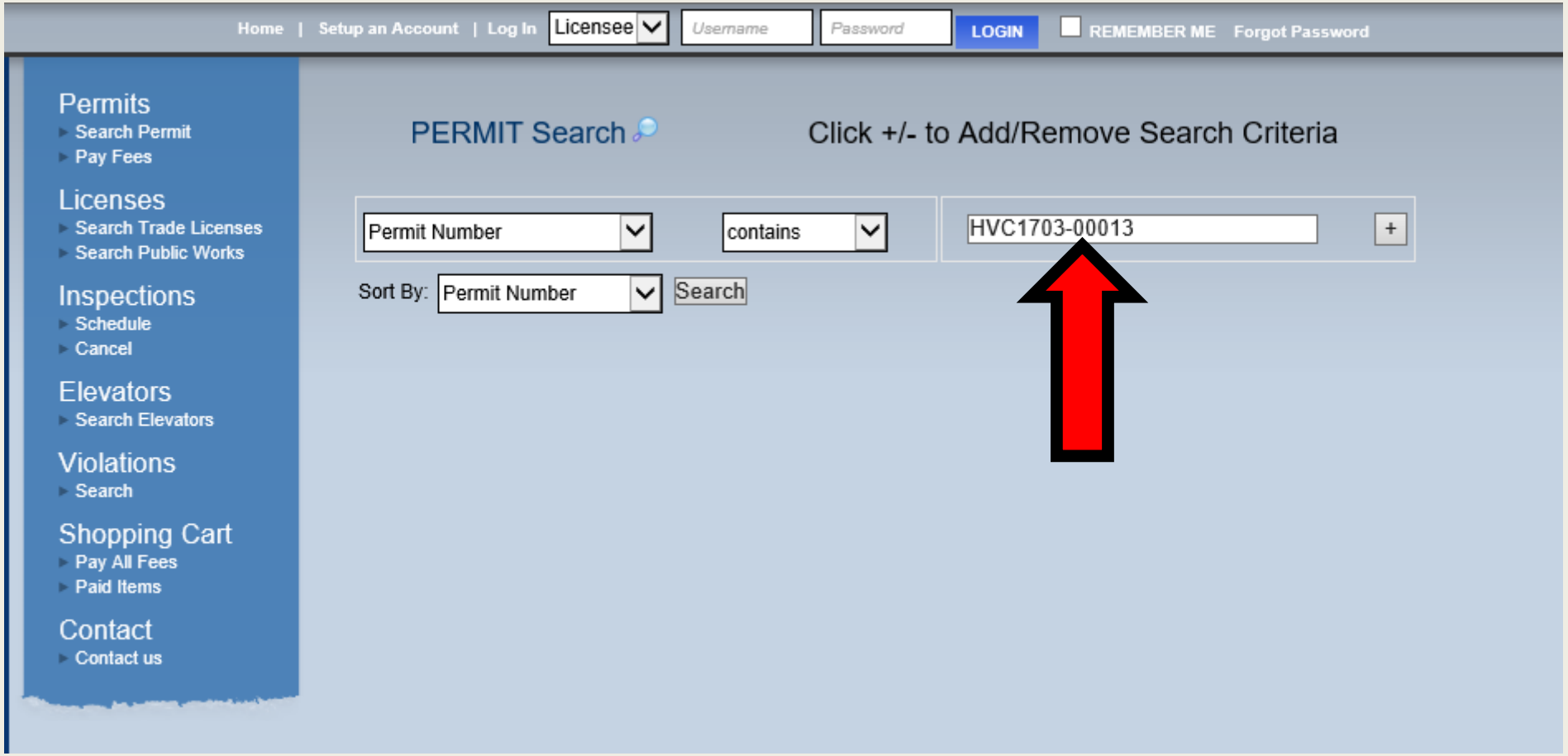
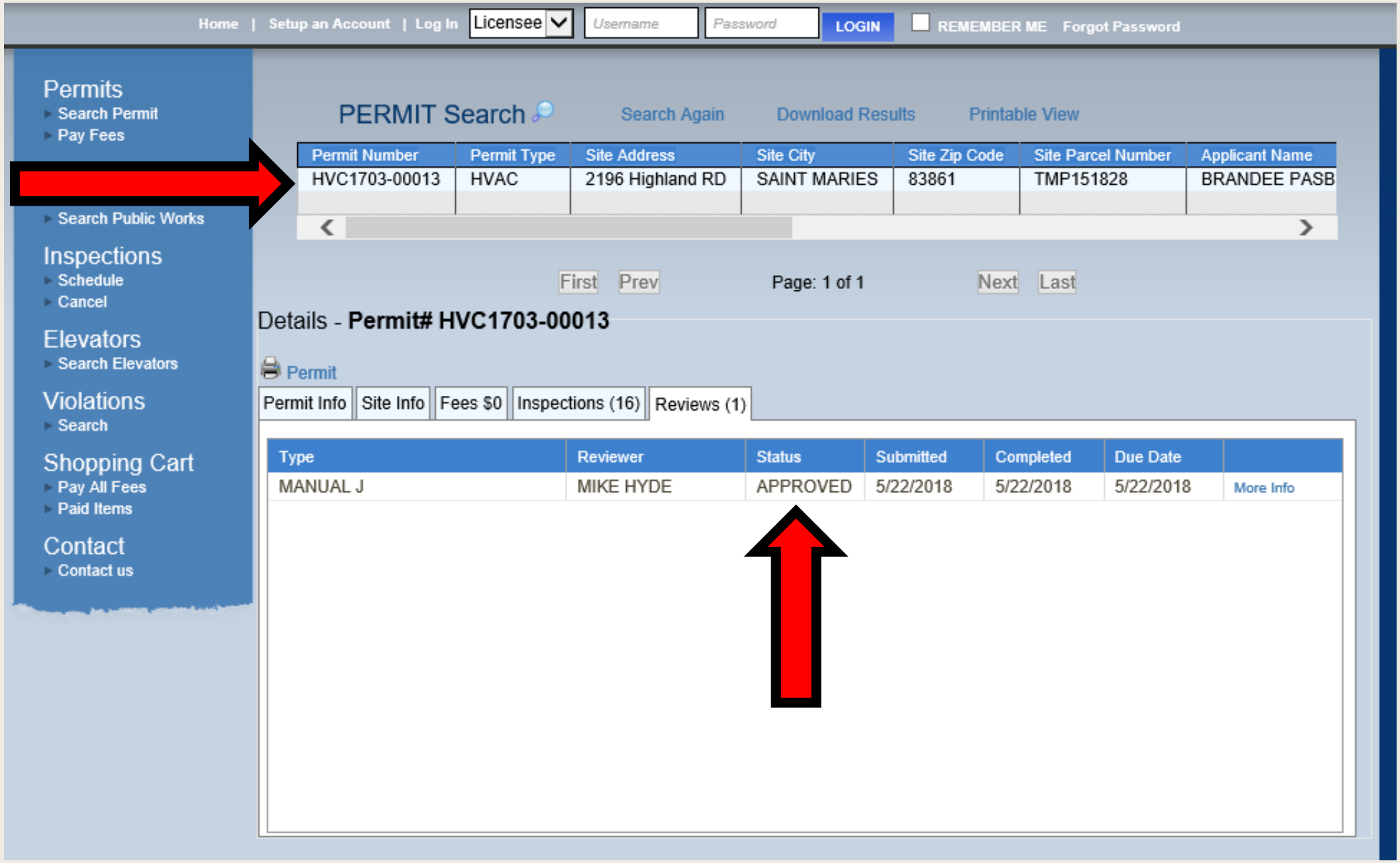
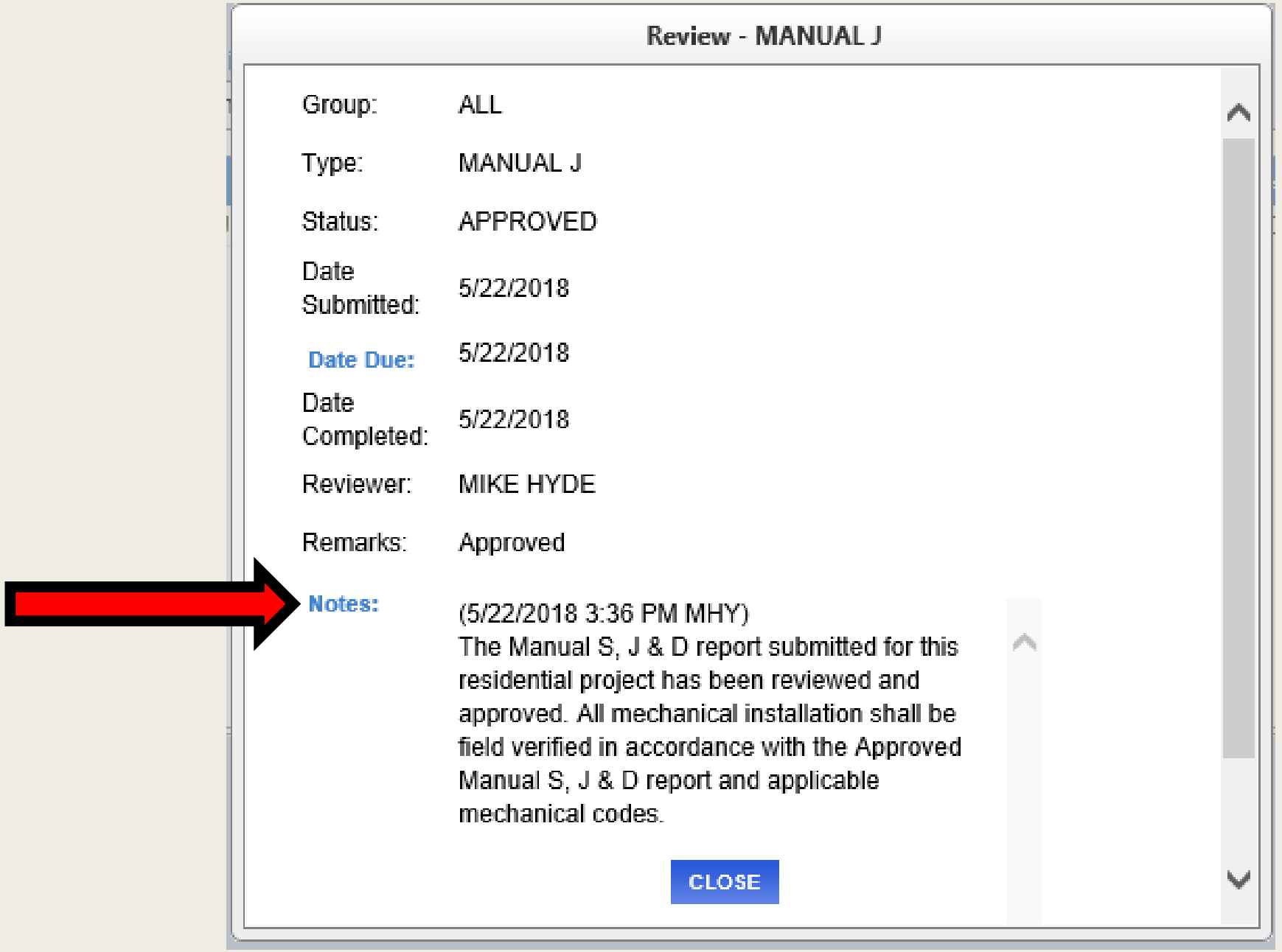
Thank You.

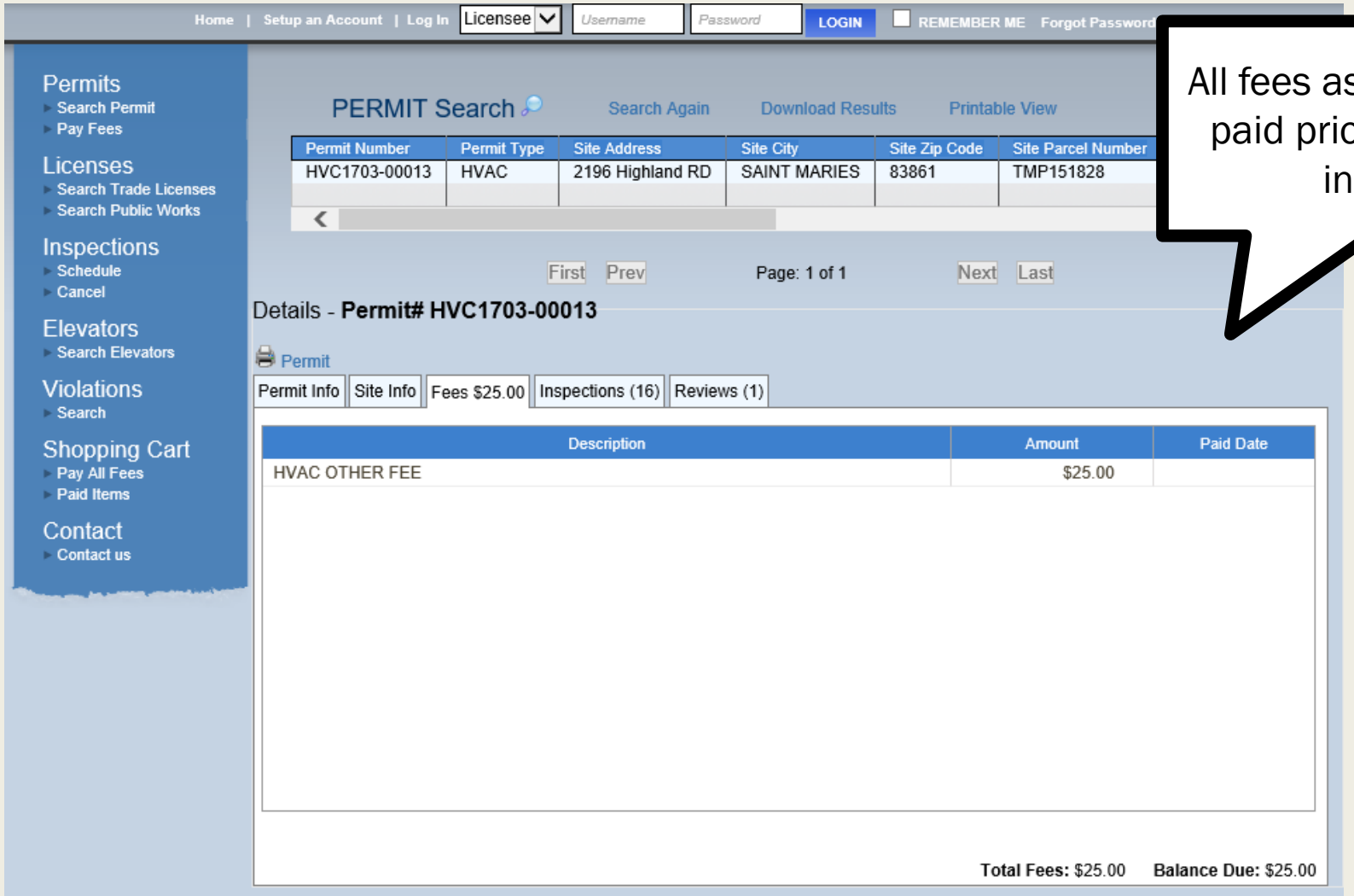
Status Notification: Look up on eTrakit




Home | Setup an Account | Log In
Licensee
Username
Password
LOGIN
REMEMBER ME
Forgot Password
Permits
Search Permit
Pay Fees
Search Public Works
Inspections
Schedule
Cancel
Elevators
Search Elevators
Violations
Search
Shopping Cart
Pay All Fees
Paid Items
Contact
Contact us
PERMIT Search
Search Again
Download Results
Printable View
Permit Number
Permit Type
Site Address
Site City
Site Zip Code
Site Parcel Number
Applicant Name
HVC1703-00013
HVAC
2196 Highland RD
SAINT MARIES
83861
TMP151828
BRANDEE PASB
First
Prev
Page: 1 of 1
Next
Last
Details - Permit# HVC1703-00013
Permit
Permit Info
Site Info
Fees $0
Inspections (16)
Reviews (1)
Type
Reviewer
Status
Submitted
Completed
Due Date
MANUAL J
MIKE HYDE
APPROVED
5/22/2018
5/22/2018
5/22/2018
More Info

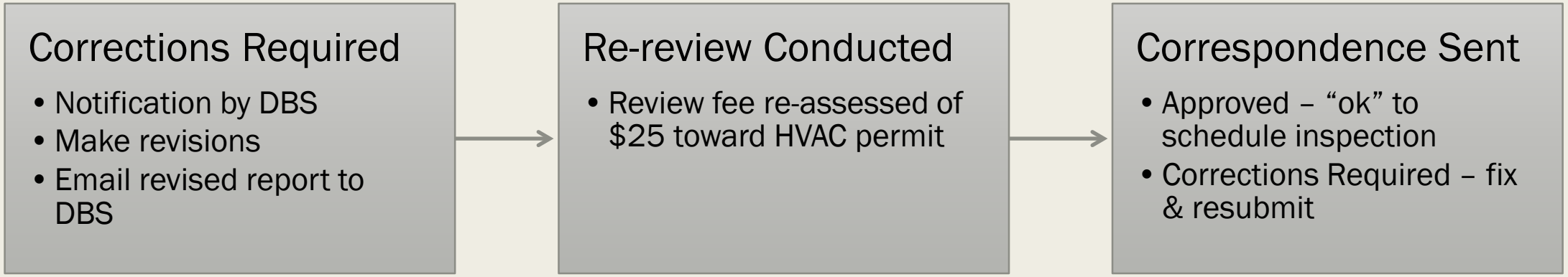

Review - MANUAL J
Group: ALL
Type: MANUAL J
Status: APPROVED
Date Submitted: 5/22/2018
Date Due: 5/22/2018
Date Completed: 5/22/2018
Reviewer: MIKE HYDE
Remarks: Approved
Notes:
(5/22/2018 3:36 PM MHY)
The Manual S, J & D report submitted for this residential project has been reviewed and approved. All mechanical installation shall be field verified in accordance with the Approved Manual S, J & D report and applicable mechanical codes.
CLOSE

Review Fee: eTrakit



All fees assessed must be paid prior to Final HVAC inspection

Resubmittals: Corrections OR Changes



Reminders…

New Residential ONLY: “Approved” Manual S, J & D

- Prior to scheduling an HVAC Inspection

HVAC Inspector will verify Installation vs. Report

- Hard copies not required on the jobsite
- Mechanical installation must match design

Review Fee Paid prior to the Final HVAC Inspection

State of Idaho

REVIEW REQUIREMENTS

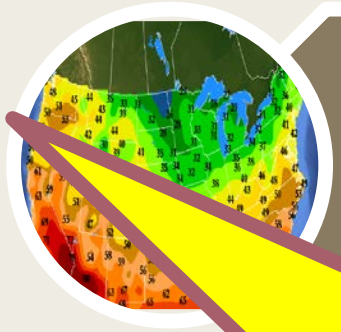
Plan Review Requirements

Design Conditions

Equipment Selection

Load Calculations

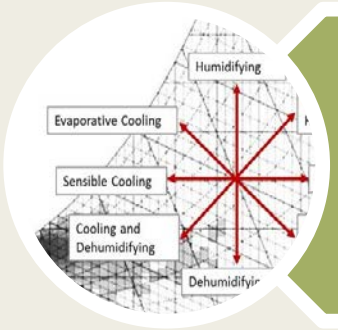
House Mechanical Design



Design Conditions

Design conditions can be found in ACCA Manual J8 or ASHRAE

Location:			**Cooling**
Boise Air Terminal, ID, US			75
Elevation: 2867		60	20
Latitude:		50	50
Outdoor:	**Heating**	b) 52.5	-26.9
Dry bulb (°F)	11		
Daily range (°F)	-)	Simplified	
Wet bulb (°F)		uction quality Semi-tight	
Wind speed (mph)	15.0	aces 0	



Equipment Selection

HEATING EQUIPMENT

Make	York		
Trade	YORK BY JOHNSON CONTROL		
Model	TM9T080C16MP11		
AHRI ref	2008687		
Efficiency	96 AFUE		
Heating input	80000		
Heating output	77000	Btuh	
Temperature rise	61	°F	
Actual air flow	1283	cfm	
Air flow factor	0.040	cfm/Btuh	
Static pressure	0.80	in H2O	
Space thermostat			

COOLING EQUIPMENT

Make	York	
Trade	JOHNSON CONTROLS	
Cond	YCD36B21	
Coil	CF48C	
AHRI ref	8487591	
Efficiency	11.0 EER, 13 SEER	
Sensible cooling	29920	Btuh
Latent cooling	5280	Btuh
Total cooling	35200	Btuh
Actual air flow	1283	cfm
Air flow factor	0.052	cfm/Btuh
Static pressure	0.80	in H2O
Load sensible heat ratio	1.00	

Use OEMs: Performance Data Specifications

COOLING PERFORMANCE DATA																
AIR CONDITIONER MODEL NO.		YCJD48S41S1(H)(E)														
INDOOR COIL MODEL NO.		FC/MC/PC48														
CONDENSING ENTERING AIR TEMPERATURE	IDCFM	1400					1600					1800				
	ID DB (°F)	80	80	75	80	80	80	80	75	80	80	80	80	75	80	80
	ID WB (°F)	57	62	62	67	72	57	62			72	57	62	62	67	72
65	T.C.	49.7	51.4	50.5	55.8	54.6	52.0	53.1				54.4	54.7	53.2	56.9	56.3
	S.C.	46.9	42.8	35.7	35.7	25.9	48.8	45.6		37.1			48.3	40.1	38.5	28.8
	KW	3.36	3.41	3.42	3.45	3.50	3.38	3.42		3.46	3.52			3.45	3.47	3.53
75	T.C.	47.5	48.6	47.7	52.8	52.3	49.8	50.		53.6	53.1	52.		50.1	54.3	53.8
	S.C.	44.6	41.7	34.7	34.6	25.2	46.6	44		36.3	26.6	48.6	47		37.9	27.9
	KW	3.65	3.68	3.68	3.74	3.82	3.67	3.		3.76	3.83	3.70	3.72			3.85
85	T.C.	45.4	45.8	44.8	49.9	50.1	47.5	47		50.8	50.7	49.7	49.4	47.1		
	S.C.	42.3	40.6	33.7	33.5	24.6	44.4	4		35.4	25.8	46.4	46.1	37.9		
	KW	3.93	3.95	3.95	4.04	4.14	3.97	3		4.06	4.15	4.00	4.01	3.99	4.08	
95	T.C.	43.2	42.9	42.0	46.9	47.9	45.3			48.0	48.4	47.3	46.7	44.1	49.1	48.9
	S.C.	40.1	39.6	32.7	32.4	23.9	42.1			34.6	25.0	44.2	45.0	36.9	36.7	26.1
	KW	4.22	4.22	4.22	4.34	4.46	4.26			4.36	4.47	4.30	4.30	4.27	4.39	4.49

Design Conditions

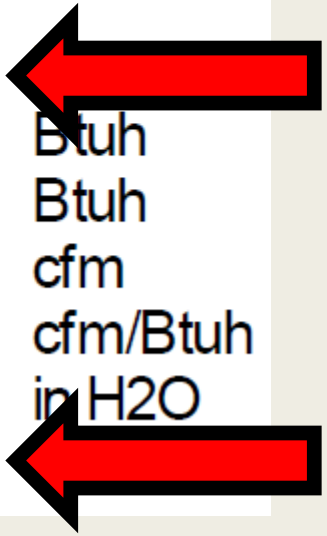
Outdoor design DB:	°F	Sensible gain:	17462	Btuh	Entering : 77.6°F
Outdoor design WB:	°F	Latent gain:	0	Btuh	Entering coil : 62.4°F
Indoor design DB:	75.0°F	Total gain:	17462	Btuh	
Indoor RH:	50%	Estimated airflow:	842	cfm	

Altitude Adjustment Factors
Cooling Evaporator with Air-Cooled Condenser

Altitude (Feet)	Total Capacity		Sensible Capacity	
	Wet-Coil	Dry-Coil	Wet-Coil	Dry-Coil
Sea Level	1.00	1.00	1.00	1.00
1,000	0.99	0.98	0.97	0.98
2,000	0.98	0.97	0.94	0.97
3,000	0.98	0.95	0.91	0.95
4,000	0.97	0.94	0.88	0.94
5,000	0.96	0.92	0.85	0.92

Manufacturer's Performance Data at Actual Design Conditions

Make	York			
Trade	JOHNSON CONTROLS			
Cond	YCD36B21			
Coil	CF48C			
AHRI ref	8487591			
Efficiency		11.0 EER, 13 SEER		
Sensible cooling			29920	
Latent cooling			5280	Btuh
Total cooling			35200	Btuh
Actual air flow			1283	cfm
Air flow factor			0.052	cfm/Btuh
Static pressure			0.80	in H2O
Load sensible heat ratio			1.00	



Heating Output Capacity Needs Adjusted

HEATING EQUIPMENT

Make	York		
Trade	YORK		
Model	TG9S080C16MP11		
AHRI ref	2008575		
Efficiency		95.5 A	
Heating input		80	
Heating output		78000	Btuh
Temperature rise		61	°F
Actual air flow		1283	cfm
Air flow factor		0.038	cfm/Btuh
Static pressure		0.80	in H2O
Space thermostat			

Calculate Design Capacities

- Equipment is NOT 100% efficient
- Equipment Data Specification Sheets are required to calculation equipment outputs for Design Conditions

- EXAMPLE: Gas Furnace

  - Many OEMs use the derating from the National Fuel Gas Code (2% to 4 % less input capacity per 1,000 Feet of elevation, depending on furnace efficiency). To determine output capacity, adjust input capacity and multiply the adjusted input capacity by the sea level steady-state efficiency (not the AFUE) of the furnace.

For example, a sea level furnace that has 100,000 Btuh of input capacity and a 86% steady-state efficiency is installed in Denver, CO, (5,000 Feet). The OEM's derating factor is 0.04 per 1,000 Feet of elevation.

Input adjustment factor = 0.04 x (5,000 / 1,000) = 0.20
Input Btuh at altitude = 100,000 x (1.00- 0.20) = 80,000
Output Btuh = 0.86 x 80,000 = 68,800

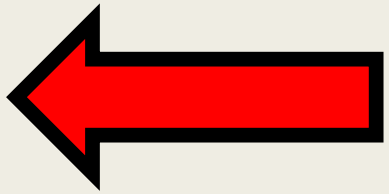
The temperature rise across the furnace heat exchanger is affected by altitude. This behavior is evaluated by applying an air density adjustment to the psychrometric equation for sensible heat (as demonstrated for an electric heating coil).

Load Calculations

ROOM NAME		Area (ft^2)	Htg load (Btuh)	Clg load (Btuh)	Htg AVF (cfm)	Clg AVF (cfm)
Level 2 AH	d	1487	22830	15976	745	842
Level 1 AH	d	1940	31834	24625	1283	1283
Entire House	d	3428	54664	40310	2028	2125
Other equip loads			8737	2937		
Equip. @ 1.00	RSM			43247		
Latent cooling				0		
TOTALS		3428	63401	43247	2028	2125

Can Equipment Accommodate the Loads?

Htg load (Btuh)
22830
31834
54664
8737
63401



HEATING EQUIPMENT

Make	York	
Trade	YORK BY JOHNSON CONTROLS	
Model	TM9T080C16MP11	
AHRI ref	2008687	
Efficiency	96 AFUE	
Heating input	80000	Btuh
Heating output	77000	Btuh

Can Equipment Accommodate the Loads?

Clg load (Btuh)
15976 24625
40310 2937 43247 0
43247

COOLING EQUIPMENT

Make	York		
Trade	JOHNSON CONTROLS		
Cond	YCD36B21		
Coil	CF48C		
AHRI ref	8487591		
Efficiency		11.0 EER, 13 SEER	
Sensible cooling		29920	Btuh
Latent cooling		5280	Btuh
Total cooling		35200	Btuh

Insulation

Construction descriptions	Or	Area ft²	U-value Btuh/ft²-°F	Insul R ft²-°F/Btuh	Htg HTM Btuh/ft²	Loss Btuh	Clg HTM Btuh/ft²	Gain Btuh
Walls								
12F-0sw: Frm wall, wd ext, 1/2" wood shth, r-21 cav ins, 1/2" gypsum board int fnsh, 2"x6" wood frm, 16" o.c. stud	ne	261	0.065	21.0				
	se	542	0.065	21.0				
	sw	130	0.065	21.0				129
	nw	422	0.065	21.0				419
	all	1354	0.065	21.0	3.83	5192	0.99	1346
Partitions								
12F-0sw: Frm wall, wd ext, 1/2" wood shth, r-21 cav ins, 1/2" gypsum board int fnsh, 2"x6" wood frm, 16" o.c. stud		350	0.065	21.0	3.83	1342	0.51	180
Windows								
2 glazing, clr low-e outr, air gas, vnl frm mat, clr innr, 1/4" gap, 1/8" thk: 2 glazing, clr low-e outr, air gas, vnl frm mat, clr innr, 1/4" gap, 1/8" thk; NFRC rated (SHGC=0.35); 6.67 ft head ht	ne	65	0.350	0	20.6	1342	28.2	1832
	se	43	0.350	0	20.6	878	35.4	1506
	se	10	0.350	0	20.6	207	13.6	136
	sw	8	0.350	0	20.6	165	35.4	284
	nw	58	0.350	0	20.6	1203	28.2	1642
	all	184	0.350	0	20.6	3794	29.4	5400
2 glazing, clr low-e outr, air gas, vnl frm mat, clr innr, 1/4" gap, 1/8" thk: 2 glazing, clr low-e outr, air gas, vnl frm mat, clr innr, 1/4" gap, 1/8" thk; NFRC rated (SHGC=0.35); 8 ft head ht	se	12	0.350	0	20.6	248	35.4	425
	sw	13	0.350	0	20.6	258	35.4	443
	all	25	0.350	0	20.6	506	35.4	868
Doors								
11D0: Door, wd sc type	ne	24	0.390	0	23.0	552	10.3	248
	se	24	0.390	0	23.0	552	10.3	248
	all	48	0.390	0	23.0	1104	10.3	496
Ceilings								
16B-50ad: Attic ceiling, asphalt shingles roof mat, r-50 ceil ins, 1/2" gypsum board int fnsh		1590	0.020	50.0				1590
Floors								
19A-30cvcp: Flr floor, frm flr, 12" thkns, carpet flr fnsh, r-30 cav ins, leaky crwl ovr		1590	0.034	30.0				907

Practical R-values

Construction Types are Realistic

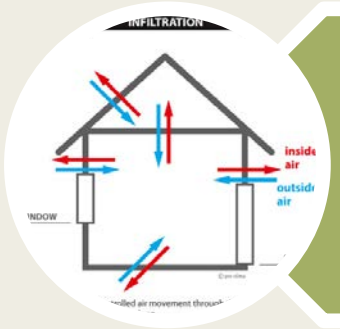
Window u-Factor & SHGC Ratings

u-Factor Indicated

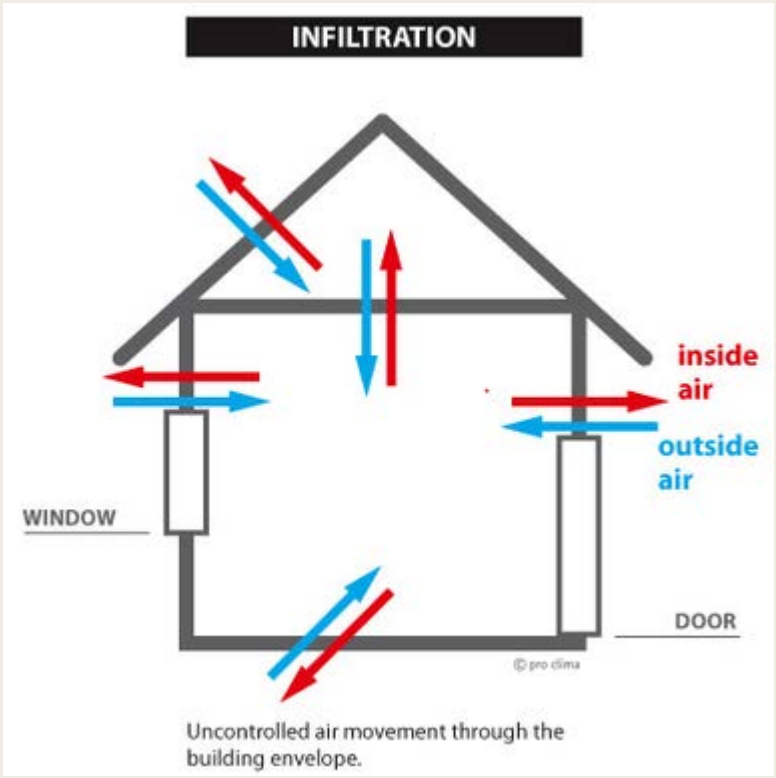
Windows

2 glazing, clr outr, air gas, wd frm mat, clr innr, 1/4" gap, 1/8" thk: 2	n	181	0.320	0
glazing, clr outr, air gas, wd frm mat, clr innr, 1/4" gap, 1/8" thk; NFRC	e	104	0.320	0
rated (SHGC=0.35); 6.67 ft head ht	s	70	0.320	0
	w	65	0.320	0
	all	420	0.320	0

SHGC Indicated



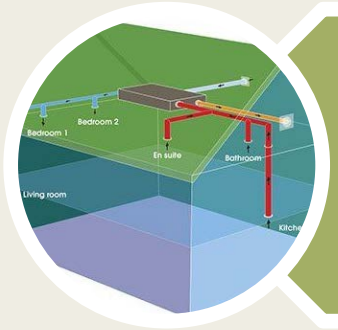
Infiltration



Uncontrolled air movement through the building envelope.

Infiltration	
Method	Simplified
Construction quality	Semi-tight
Fireplaces	0

Part IV Table 5A of the ACCA Manual J8 provides definitions for the following envelope tightness: Tight, Semi-Tight, Average, Semi-Loose, Loose



Mechanical Ventilation Load

Heating Summary		
Structure	41557	Btuh
Ducts	13107	Btuh
Central vent (148 cfm)	8737	Btuh

Sensible Cooling Equipment Load Sizing		
Structure	33076	Btuh
Ducts	7235	Btuh
Central vent (148 cfm)	2937	Btuh

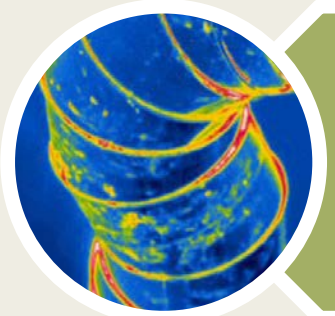
2012 IRC: Table M1507.3

Occupant/Appliance Loads

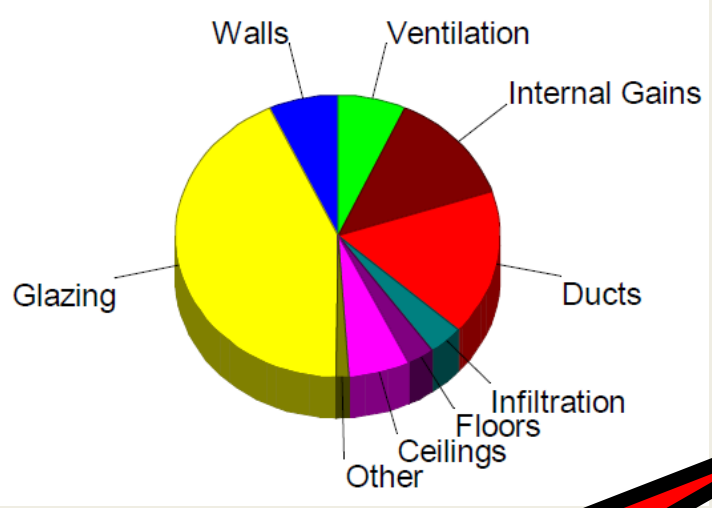
Occupants @ Appliances/other	230	5			1150 4500

Occupants = # of Bedrooms + 1 @ 230 BTUs per person

Appliance BTU Load up to Designer



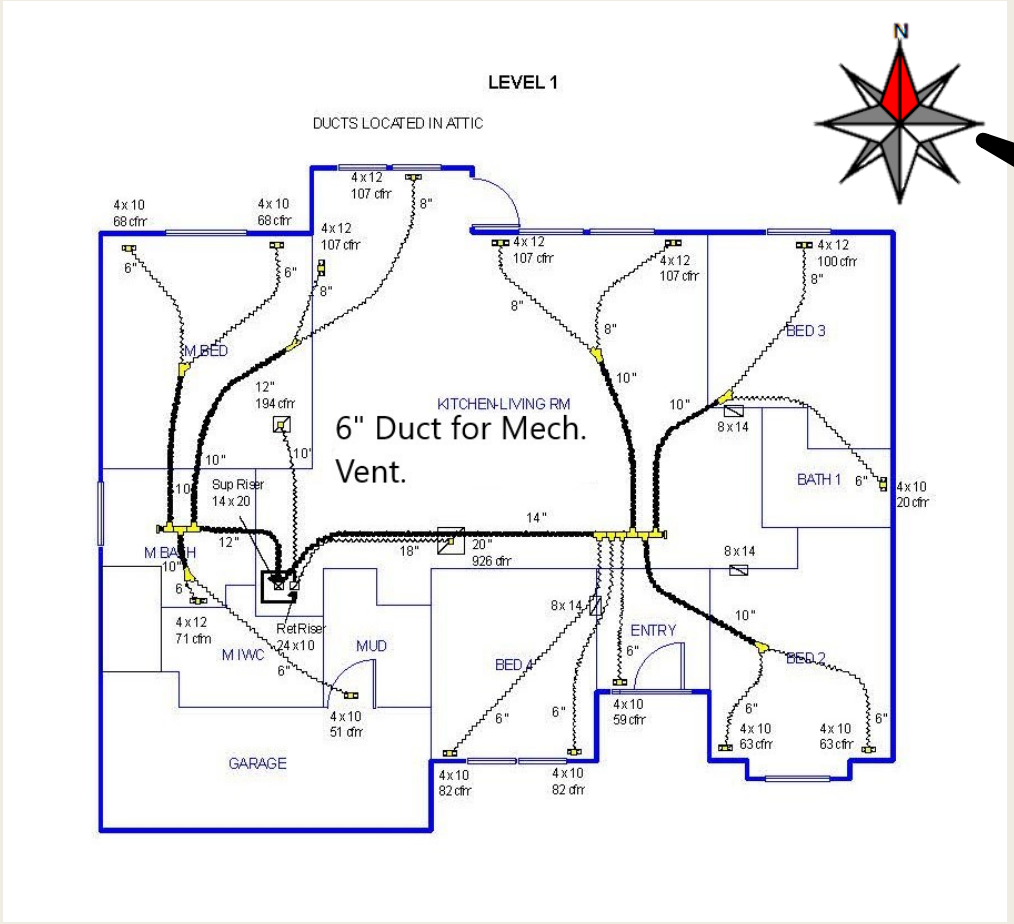
Duct Loads



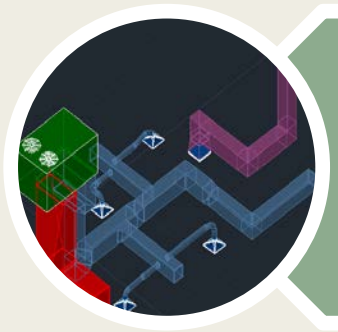
Based on Duct Design Locations

Component	Btuh/ft²	Btuh	% of load
Walls	1.0	2978	6.9
Glazing	30.0	18566	42.9
Doors	7.8	549	1.3
Ceilings	1.3	2648	6.1
Floors	0.6	1156	2.7
Infiltration	0.4	1530	3.5
Ducts		7235	16.7
Ventilation		2937	6.8
Internal gains		5650	13.1
Blower		0	0
Adjustments		0	
Total		**43247**	**100.0**

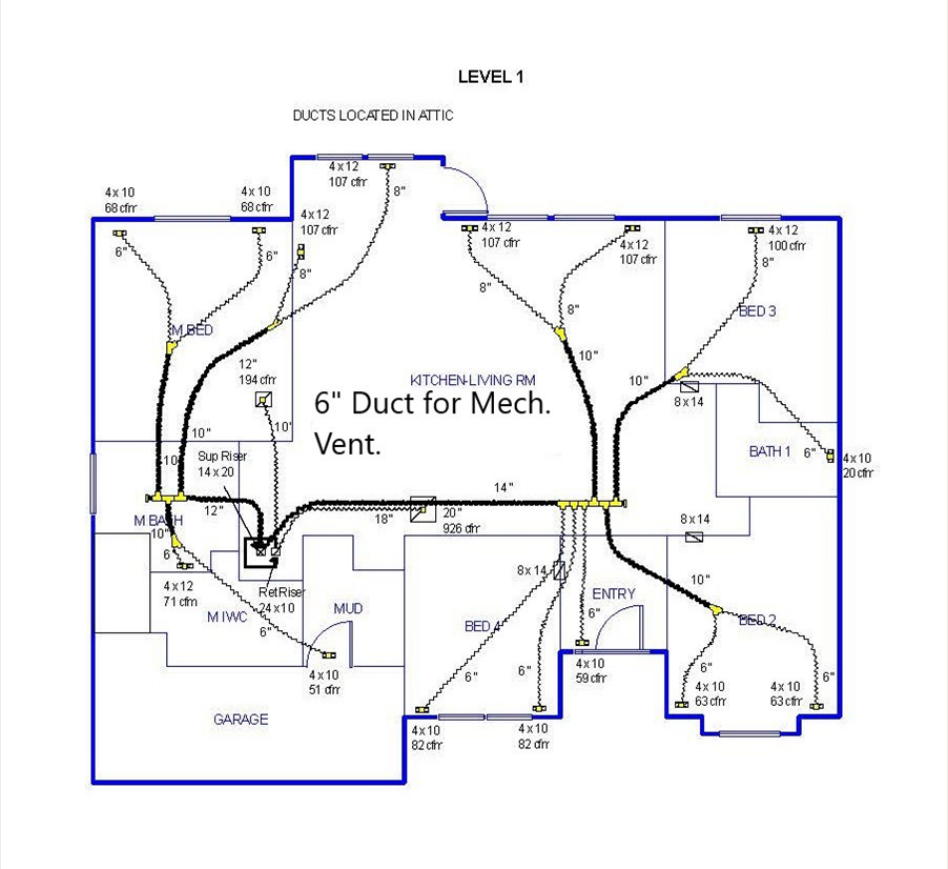
Solar Orientation

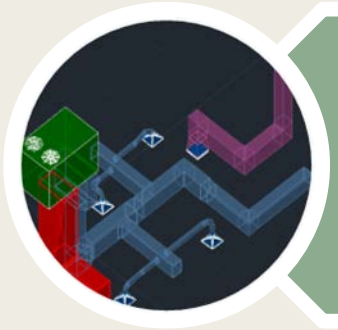


House Orientation MUST be indicated

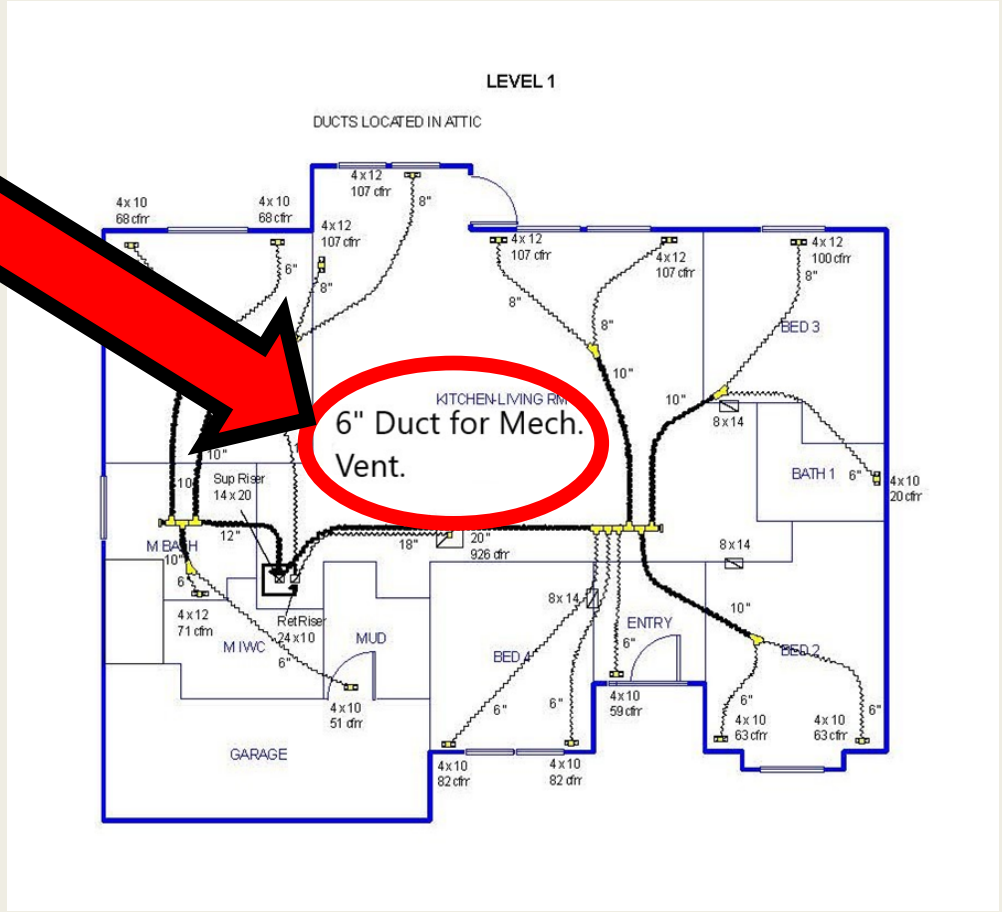


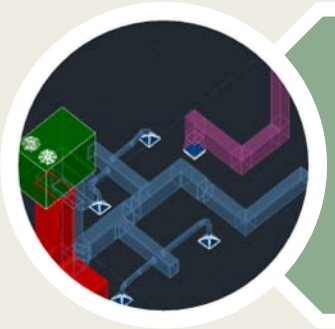
House Mechanical Design



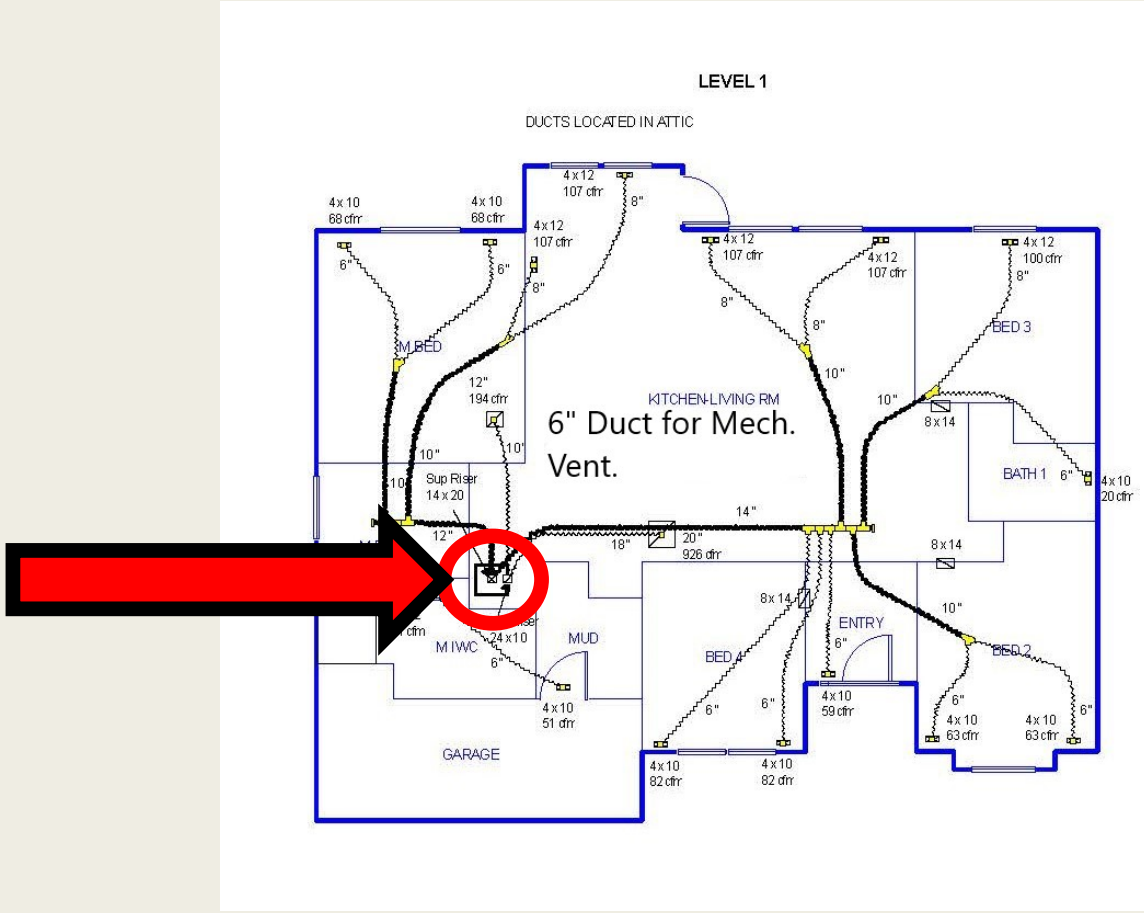


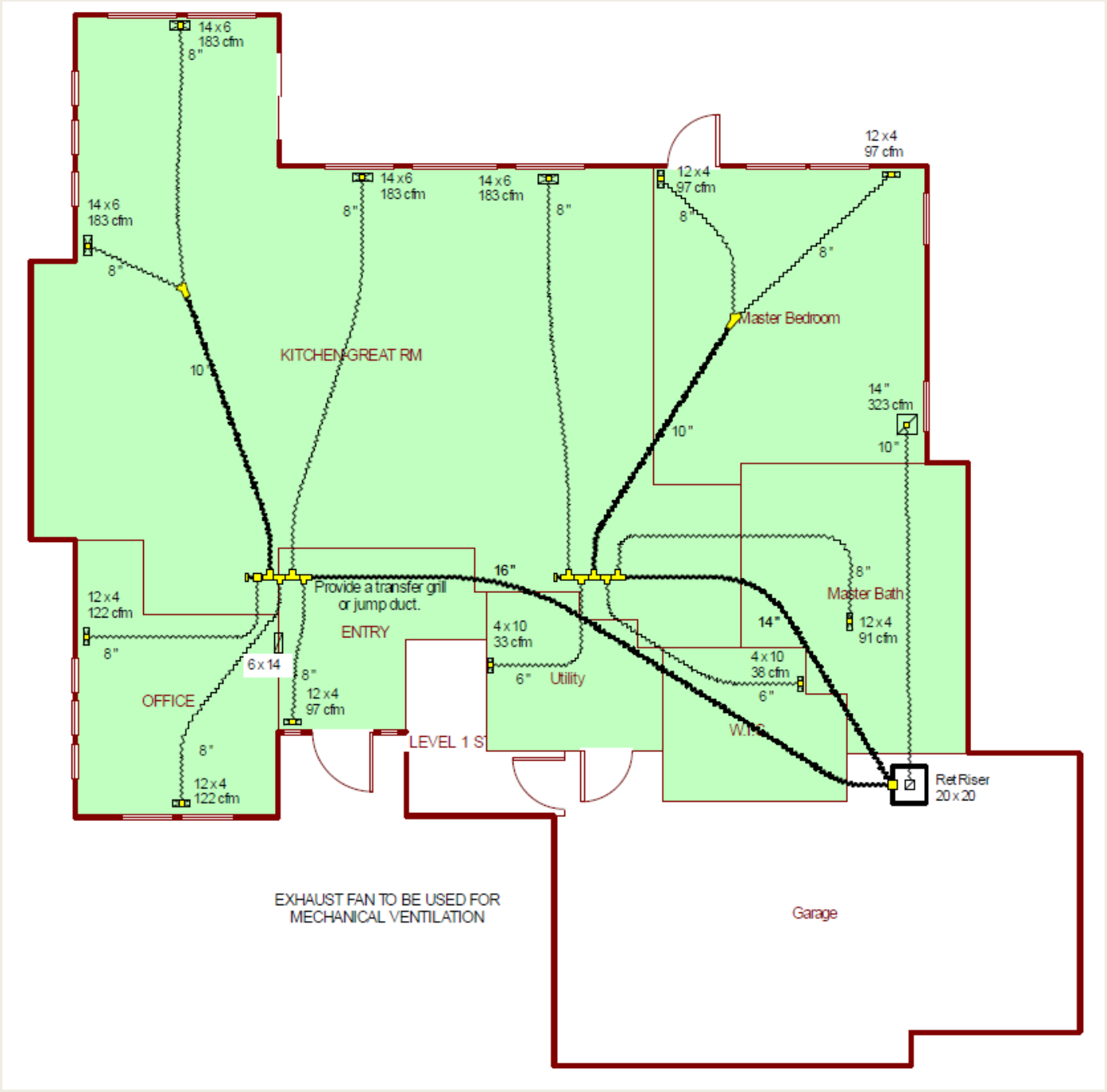
Method of Mechanical Ventilation

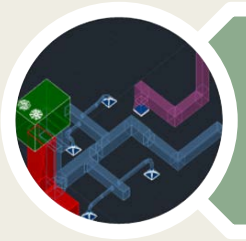




Equipment Location







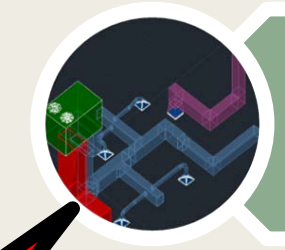
Code Compliant Duct Design

Examples:

M1601.6 – Forced air equipment serves only the living space and does not condition the garage.

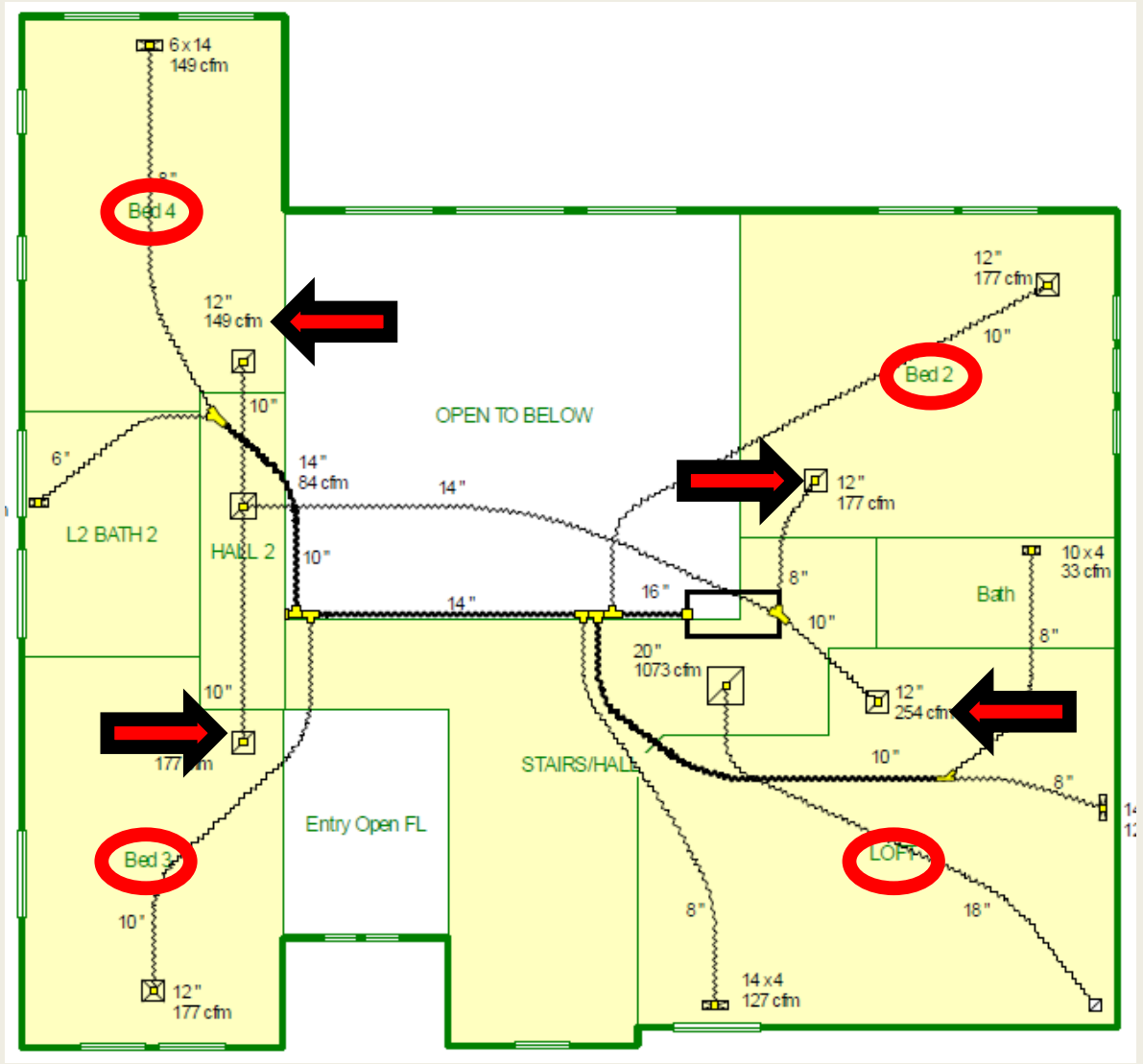
M1602.2 – Return air locations are code compliant.

M1602.2 – Return air sized not to pull more cfm than what is supplied to the room or area.



Return Air Paths

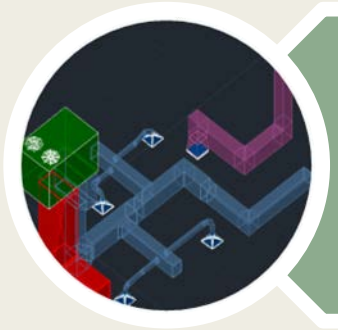
ACCA Manual D
Section 4-9



Duct Velocities

Air Velocity for Noise Control Subject to Notes 1, 2 and 8								
Component	Supply Side (Fpm)				Return Side (Fpm)			
	Conservative		Maximum		Conservative		Maximum	
	Rigid	Flex	Rigid	Flex	Rigid	Flex	Rigid	Flex
Trunk Ducts	700	700	900	900	600	600	700	700
Branch Ducts	600	700	900	900	500	600	700	700
Supply Outlet Face Velocity	Size for Throw		700 Note 7		—		—	
Return Grille Face Velocity	—		—		—		500	
Filter Grille Face Velocity	—		—		—		300	

1) The design friction rate is affected if air velocity exceeds 900 Fpm (fitting equivalent lengths are for 900 Fpm or less).
2) System resistance considerations supercede velocity considerations (minimum acceptable airway size shall be based on the local Cfm value and the design friction rate). Air way size shall be increased if the local air velocity exceeds the maximum limit.
3) This table applies to metal duct with transverse seams and metal fittings (duct runs and fittings not lined or wrapped with insulating material).
4) This table applies to flexible wire helix duct with duct board junction box fittings.
5) Maximum velocities may be exceeded when construction has less surface irregularities (no transverse seams or less irregularity at transverse seams, and very efficient fittings); and has a sound absorbing attribute (duct board or duct liner).
6) Authoritative guidance concerning velocity limits for aerodynamically efficient and/or sound absorbing designs is not available at this time.
7) The velocity limit for a supply outlet may be ignored if the noise criteria (NC) value for a grille, register or diffuser is 30 or less over the range of Cfm values that will flow through the device (or combination of devices, if a damper is involved), during any mode of system operation.
8) Air velocity limits are superceded by measured noise criteria (NC) values for low rise dwellings (Notes 1 and 2 still apply).
   - NC values measured by sound meter in middle of the room when normal human ear perceives maximum HVAC system noise.
   - Measured NC equals or exceeds 30 with comfort system off; measured NC shall not increase by more than 3 with comfort system on.
   - Measured NC less than 30 with comfort system off; measured NC shall not exceed 33 with comfort system on.



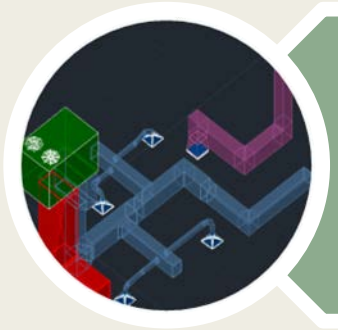
Duct Velocities

Supply Trunk Detail Table

Name	Trunk Type	Htg (cfm)	Clg (cfm)	[illegible]	Veloc (fpm)	Diam (in)	H x W (in)	Duct Material	Trunk
st6	Peak AVF	197	209	0.069	384	10.0	0 x 0	VinlFlx	st5
st5	Peak AVF	328	386	0.069	361	14.0	0 x 0	VinlFlx	st1
st4	Peak AVF	147	151	0.087	277	10.0	0 x 0	VinlFlx	st1
st1	Peak AVF	745	842	0.069	603	16.0	0 x 0	VinlFlx	

Return Branch Detail Table

Name	Grille Size (in)	Htg (cfm)	Clg (cfm)	T (ft)	[illegible]	Veloc (fpm)	Diam (in)	H x W (in)	Stud/Joist Opening (in)	Duct Matl	Trunk
rb4	0x 0	131	177	61.2	0.069	325	10.0	0x 0		VlFx	rt1
rb3	0x 0	148	149	57.0	0.075	274	10.0	0x 0		VlFx	rt1
rb11	0x 0	227	254	26.0	0.163	466	10.0	0x 0		VlFx	
rb12	0x 0	157	177	31.6	0.135	508	8.0	0x 0		VlFx	
rb2	0x 0	82	84	60.5	0.070	315	7.0	0x 0		VlFx	rt1



Static Pressures

	Heating			Cooling	
External static pressure	0.70	in H2O		0.70	in H2O
Pressure losses	0.49	in H2O		0.49	in H2O
Available static pressure	0.21	in H2O		0.21	in H2O
Supply / return available pressure	0.167 / 0.043	in H2O		0.167 / 0.043	in H2O
Lowest friction rate	0.069	in/100ft		0.069	in/100ft
Actual air flow	745	cfm		842	cfm
Total effective length (TEL)			302 ft		

Review Requirements Document

IDAHO Division of Building Safety

Home / DBS Programs / Heating, Ventilation, & Air Conditioning

Heating, Ventilation, & Air Conditioning

- A-Z Directory
- DBS Programs
- Boards
- Exams
- Forms & Applications
- Rules, Statutes, Legislation
- Public Records Requests
- News Room

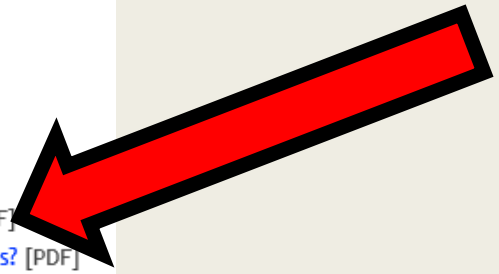
The HVAC Program was created to promote the health, safety, and welfare of Idaho's citizens through effective administration of the laws and rules governing the installation and operation of Heating, Ventilation, and Air Conditioning systems and by ensuring that those who perform installation and/or service work involving such equipment are properly trained and licensed.

FORMS & APPLICATIONS

- HVAC Forms and Applications

MANUAL S, J & D INFORMATION

- What information is required for Manual S, J & D review? [PDF]
- What will the Inspector verify at the time of HVAC Inspections? [PDF]
- RSVP to Presentation Schedules for Idaho Cities
- 2018 Statewide Manual S, J & D Locations and Dates [PDF]



Questions?

State of Idaho

INSPECTION VERIFICATION

Inspection Phases

Rough Inspection

- Inspector Verification
- Items Requiring Design Change

Final Inspection

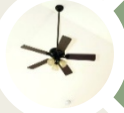
- Inspector Verification
- Items Requiring Design Change

ROUGH INSPECTION

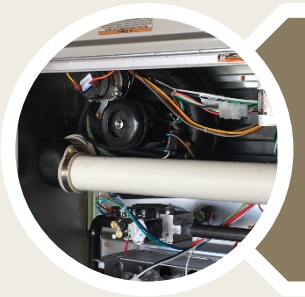

Equipment


Square Footage


Windows


Ceiling Heights


Floor Design Page



Equipment (If Installed at Rough Inspection)

HEATING EQUIPMENT

Make	Carrier
Trade	Carrier Comfort 95 Single-Stag...
Model	59SC5A080S21--20
AHRI ref	5039403

Efficiency	95.5 AFUE	
Heating input	80000	Btuh
Heating output	78000	Btuh
Temperature rise	54	°F
Actual air flow	1445	cfm
Air flow factor	0.036	cfm/Btuh
Static pressure	0.70	in H2O
Space thermostat		

COOLING EQUIPMENT

Make	Carrier
Trade	CARRIER AIR CONDITIONING
Cond	24ABB342W0N300
Coil	CNPVP4821ALA++TDR
AHRI ref	9167622

Efficiency	11.0 EER, 13 SEER	
Sensible cooling	35275	Btuh
Latent cooling	6225	Btuh
Total cooling	41500	Btuh
Actual air flow	1445	cfm
Air flow factor	0.048	cfm/Btuh
Static pressure	0.70	in H2O
Load sensible heat ratio	1.00	

(Incorrect) Square Footage

ROOM NAME	Area (ft²)
Bedroom Level AH	2417
Main Level AH	5186
Entire House	7603
Other equip loads	
Equip. @ 1.00 RSM	
Latent cooling	
TOTALS	7603

BUILDING & SITE INFO

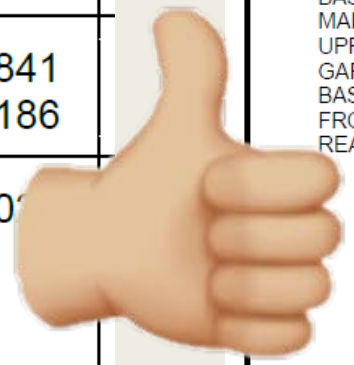
AREA

BASEMENT:	2706 SQ.FT
MAIN FLOOR:	2648 SQ.FT
UPPER FLOOR:	2844 SQ.FT
GARAGE:	1486 SQ.FT
BASKETBALL:	1082 SQ.FT
FRONT COVERED PATIO:	362 SQ.FT
REAR COVERED PATIO:	807 SQ.FT

8198

(Correct) Square Footage

ROOM NAME	Area (ft²)
Bedroom Level AH	2841
Main Level AH	5186
Entire House	80
Other equip loads	
Equip. @ 1.00 RSM	
Latent cooling	
TOTALS	8027



BUILDING & SITE INFO

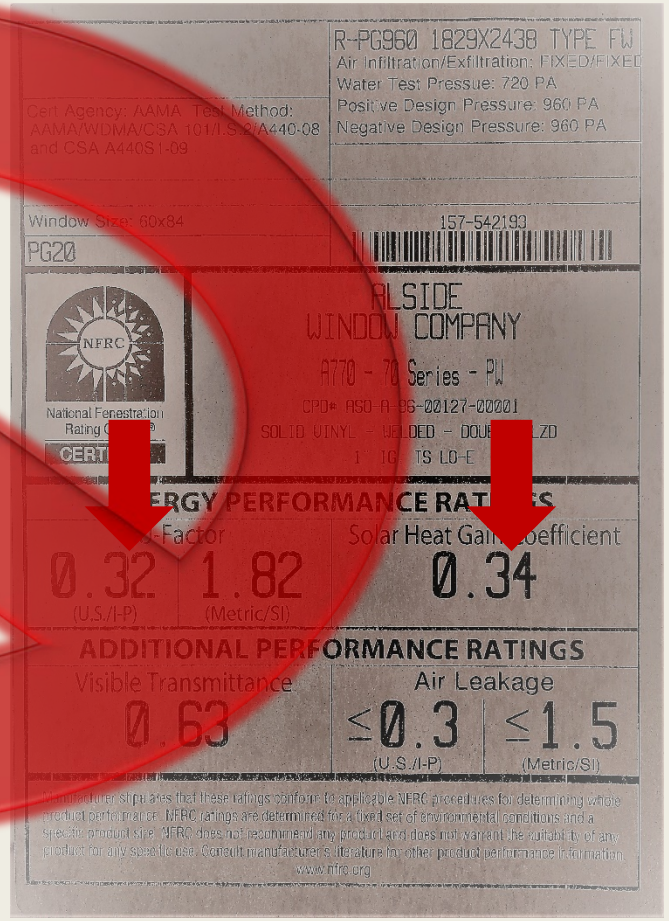
AREA

BASEMENT:	2706 SQ.FT
MAIN FLOOR:	2648 SQ.FT
UPPER FLOOR:	2844 SQ.FT
GARAGE:	1486 SQ.FT
BASKETBALL:	1082 SQ.FT
FRONT COVERED PATIO:	362 SQ.FT
REAR COVERED PATIO:	807 SQ.FT

8198

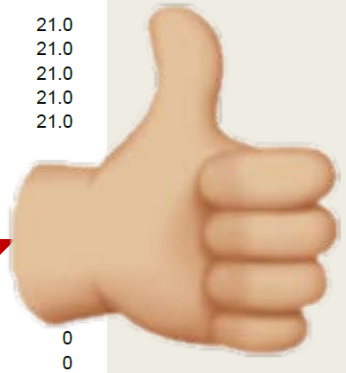
(Incorrect) Window U-Values & Solar Heat Gain Coefficient [SHGC]

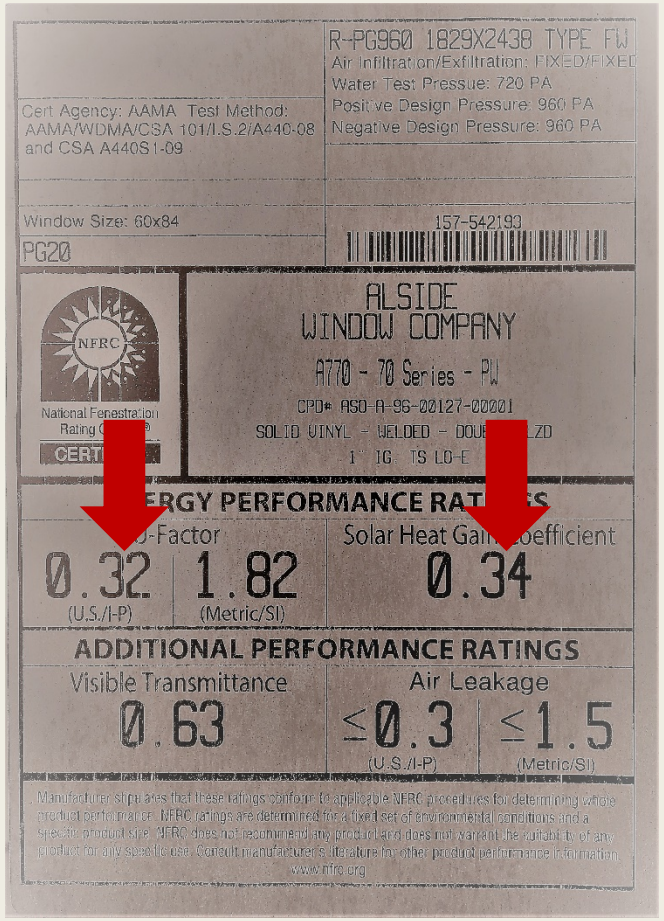
Construction descriptions	Or	Area ft²	U-value Btuh/ft²-°F
Walls			
12F-0sw: Frm wall, stucco ext, 3/8" wood shth, r-21 cav ins, 1/2" gypsum board int fnsh, 2"x6" wood frm, 16" o.c. stud	n	463	0.065
	ne	14	0.065
	e	93	0.065
	se	14	0.065
	s	640	0.065
	w	220	0.065
	all	1444	0.065
Partitions			
12F-0sw: Frm wall, r-21 cav ins, 5/8" gypsum board int fnsh, 2"x6" wood frm, 16" o.c. stud		322	0
Windows			
2 glazing, clr low-e outr, air gas, vnl frm mat, clr innr, 1/4" gap, 1/8" thk: 2 glazing, clr low-e outr, air gas, vnl frm mat, clr innr, 1/4" gap, 1/8" thk; NFRC rated (SHGC=0.32); 1.5 ft overhang (1 ft window ht, 1 ft sep.); 6.67 ft head ht	n	4	0.300
2 glazing, clr low-e outr, air gas, vnl frm mat, clr innr, 1/4" gap, 1/8" thk: 2 glazing, clr low-e outr, air gas, vnl frm mat, clr innr, 1/4" gap, 1/8" thk; NFRC rated (SHGC=0.32); 1.5 ft overhang (1.6 ft window ht, 1 ft sep.); 6.67 ft head ht	n	8	0.300
2 glazing, clr low-e outr, air gas, vnl frm mat, clr innr, 1/4" gap, 1/8" thk: 2 glazing, clr low-e outr, air gas, vnl frm mat, clr innr, 1/4" gap, 1/8" thk; NFRC rated (SHGC=0.32); 1.5 ft overhang (2 ft window ht, 1 ft sep.);	n	8	0.300



(Correct) Window U-Values & Solar Heat Gain Coefficient [SHGC]

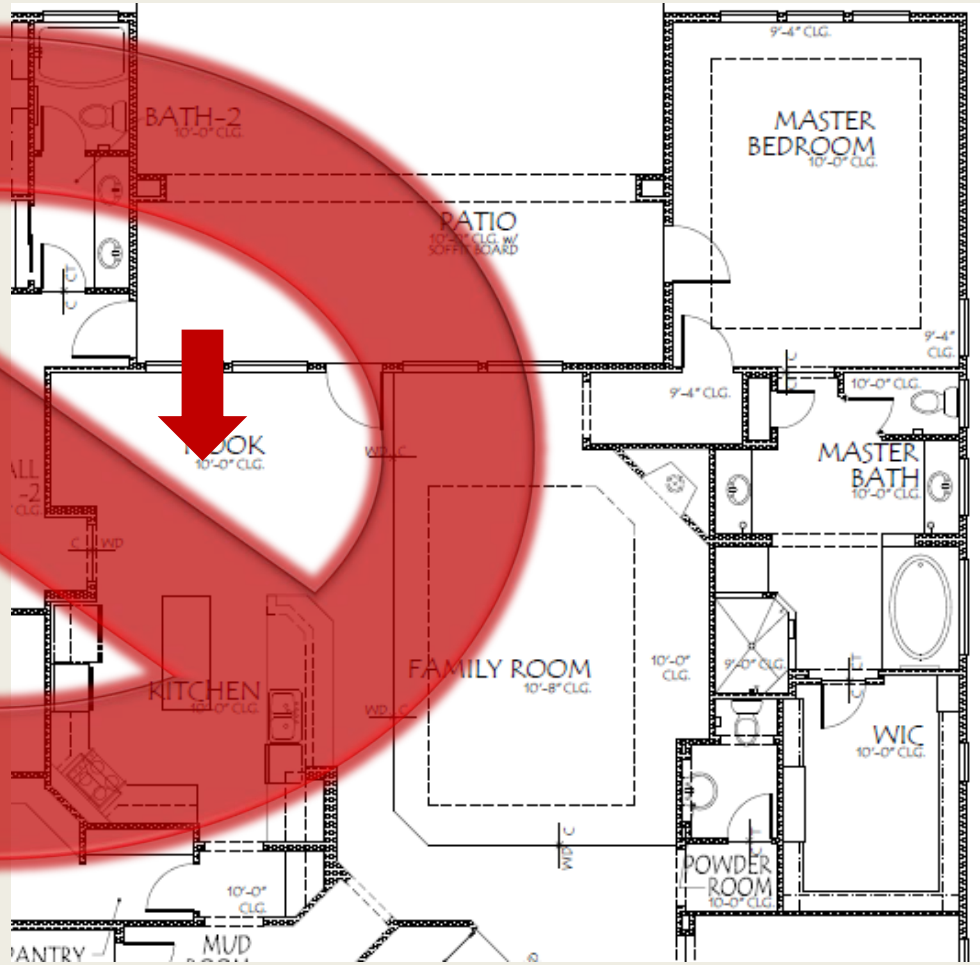
Construction descriptions	Or	Area ft²	U-value Btuh/ft²-°F	Insul R ft²-°F/Btuh
Walls				
12F-0sw: Frm wall, wd ext, 1/2" wood shth, r-21 cav ins, 1/2" gypsum board int fnsh, 2"x6" wood frm, 16" o.c. stud	n	477	0.065	21.0
	e	745	0.065	21.0
	s	259	0.065	21.0
	w	655	0.065	21.0
	all	2136	0.065	21.0
Partitions				
12F-0sw: Frm wall, wd ext, 1/2" wood shth, r-21 cav ins, 1/2" gypsum board int fnsh, wood frm, 16" o.c. stud		439		
Windows				
2 glazing, clr ou gas, wd frm mat, clr innr, 1/4" gap, 1/8" thk: 2 glazing, clr outr gas, wd frm mat, clr innr, 1/4" gap, 1/8" thk; NFRC rated (SHGC=0.35); 6.67 ft head ht	n	181	0.320	
	e	104	0.320	
	s	70	0.320	0
	w	65	0.320	0
	all	420	0.320	0
Doors				
11D0: Door, wd sc type	n	21	0.390	0
	e	21	0.390	0
	s	21	0.390	0
	n	21	0.390	0





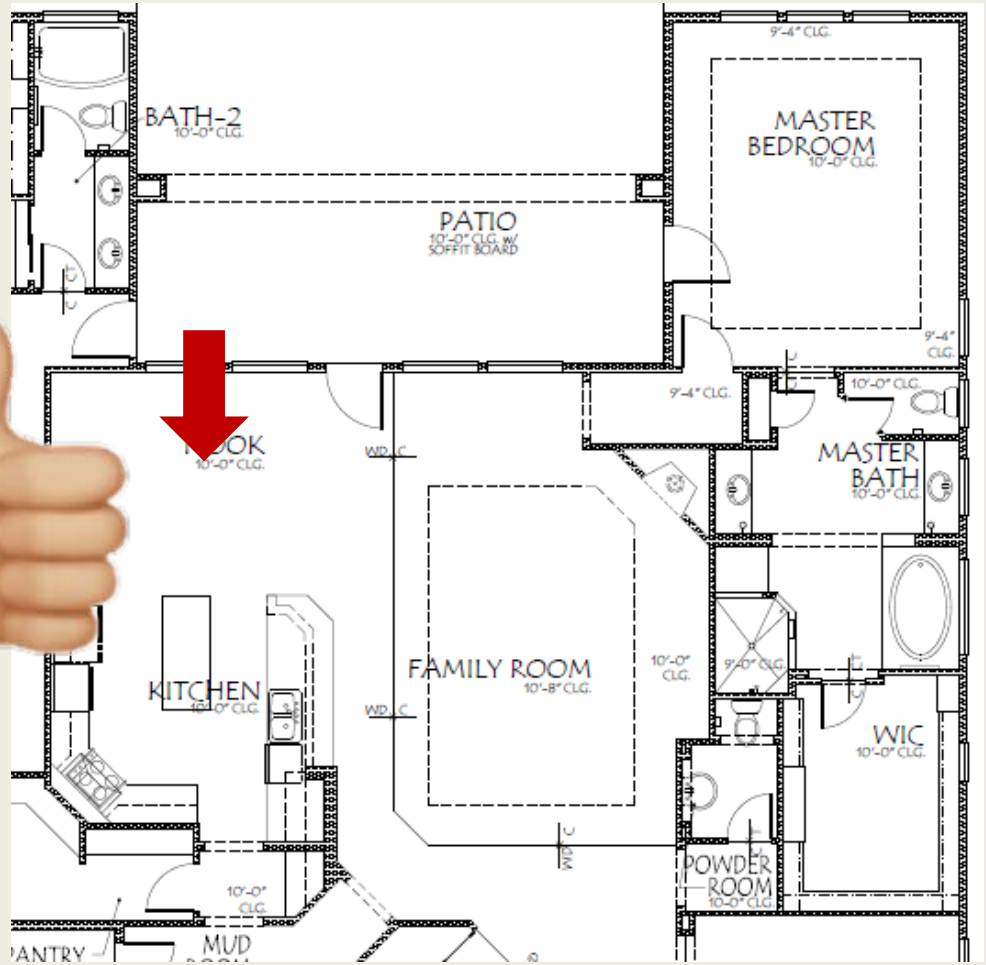
(Incorrect) Ceiling Heights

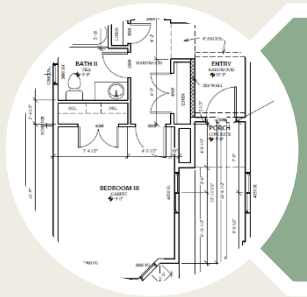
1	Room name						Entire House				
2	Exposed wall						158.2 ft				
3	Room height						8.0 ft				d
4	Room dimensions										
5	Room area						1821.7 ft²				
	Ty	Construction number	U-value (Btuh/ft²-°F)	Or	HTM (Btuh/ft²)		Area (ft²) or perimeter (ft)		Load (Btuh)		
					Heat	Cool	Gross	N/P/S	Heat	Cool	
6	W	12F-0sw	0.065	n	3.87	0.99	317	222	858	221	
.	G	2 glazing, clr low-e	0.340	n	20.23	13.06	45	0	910	588	
.	G	2 glazing, clr low-e	0.340	n	20.23	13.06	15	0	312	201	
.	G	4A5-2ovd	0.330	n	19.64	12.67	35	0	687	444	
11	W	12F-0sw	0.065	e	3.87	0.99	487	462	1785	459	
	G	2 glazing, clr low-e	0.330	e	19.64	38.41	6	0	118	230	
	G	2 glazing, clr low-e	0.340	e	20.23	37.68	4	0	81	151	
	G	2 glazing, clr low-e	0.340	e	20.23	37.68	15	0	303	565	
	W	12F-0sw	0.065	s	3.87	0.99	149	98	380	98	
	G	2 glazing, clr low-e	0.340	s	20.23	21.58	30	0	607	647	
	D	Door, wd sc type	0.390	s	8.33	10.34	21	21	175	217	
	W	12F-0sw	0.065	w	3.87	0.99	312	296	1145	294	
	G	2 glazing, clr low-e	0.330	w	19.64	38.41	16	0	314	615	
	R	12F-0sw	0.065	-	3.87	0.51	343	322	1244	165	
	D	Door, wd sc type	0.390	n	23.20	10.34	21	21	487	217	
	C	16B-38ad	0.026	-	1.55	1.30	152	152	236	198	
	C	16B-38ad	0.026	-	1.55	1.30	1669	1669	2583	2170	
	F	19D-0cscp	0.368	-	1.03	0.35	1822	1822	1885	634	



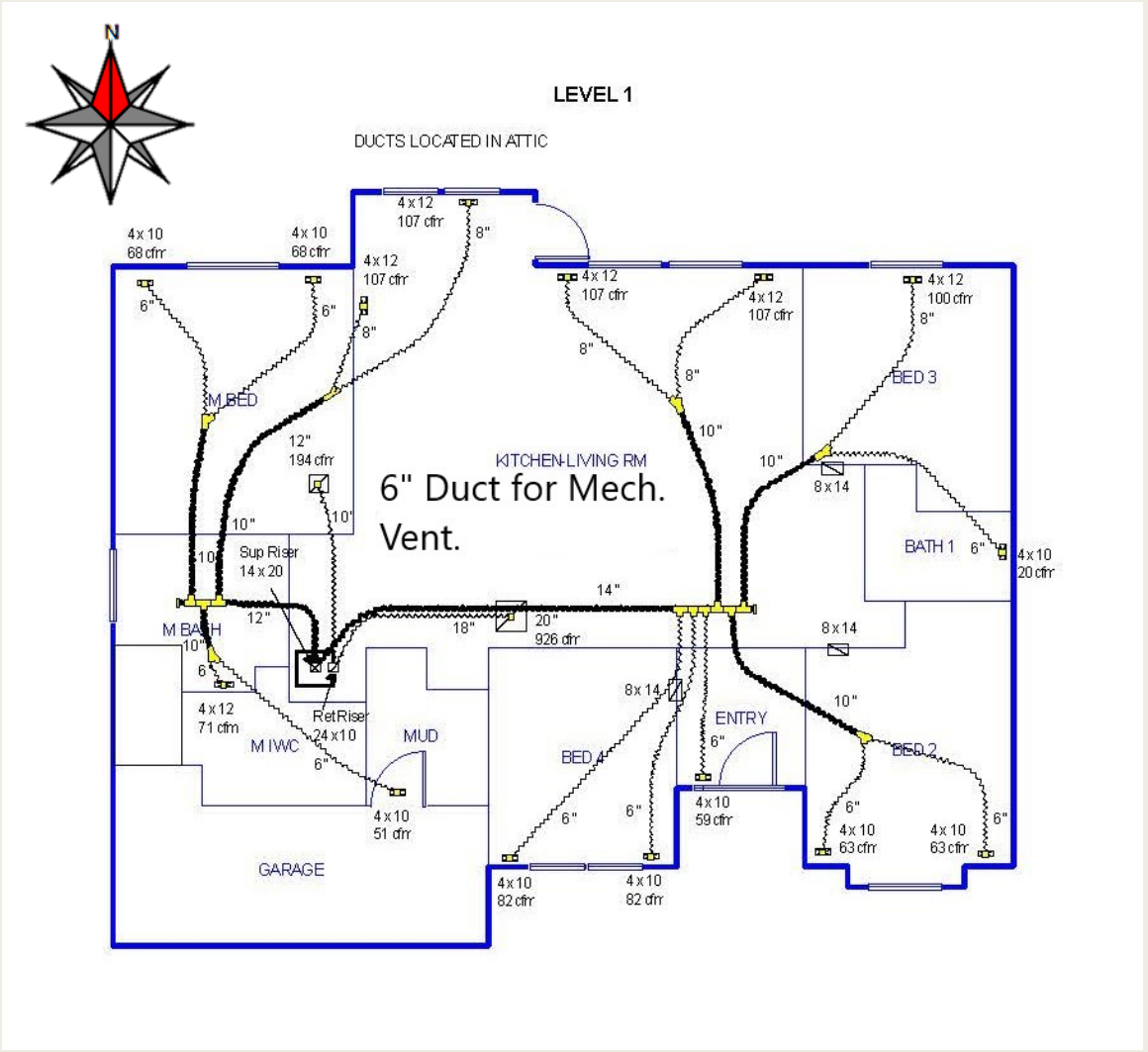
(Correct) Ceiling Heights

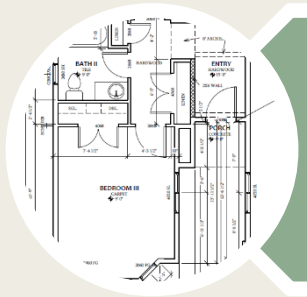
1	Room name							Entire House			
2	Exposed wall							266.5 ft			
3	Room height							10.0 ft		d	
4	Room dimensions										
5	Room area							3338.3 ft²			
	Ty	Construction number	U-value (Btuh/ft²-°F)	Or	HTM (Btuh/ft²)		Area (ft²) or perimeter (ft)		Load (Btuh)	
					Heat	Cool	Gross	N/P/S	Heat	Cool
6	W	12F-0sw	0.065	ne	3.87	0.99	335	229	886	2
.	G	B - 35-35	0.350	ne	20.82	28.25	12	0	250	3
.	G	B - 35-35	0.350	ne	20.82	25.42	70	0	1458	
.	D	11D0	0.390	ne	23.20	10.34	24	24	557	
11	W	12F-0sw	0.065	se	3.87	0.99	755	666		
	G	B - 35-35	0.350	se	20.82	31.82	89	0		
	W	12F-0sw	0.065	sw	3.87	0.99	660	455		
	G	B - 35-35	0.350	sw	20.82	31.82	205	0		
	W	12F-0sw	0.065	nw	3.87	0.99	915	805		
	G	B - 35-35	0.350	nw	20.82	28.25	9	0		
	G	B - 35-35	0.350	nw	20.82	25.42	102	0		
	P	DftPartWall-A	0.065	-	3.87	0.75	75	75	290	
	P	DftPartWall-A	0.065	-	3.87	0.51	410	392	1517	201
	D	11D0	0.390	n	23.20	10.34	18	18	415	185
	C	16B-50ad	0.020	-	1.19	1.00	3338	3338	3973	3338
	F	19A-30cvcp	0.034	-	1.70	0.57	3338	3338	5668	1905



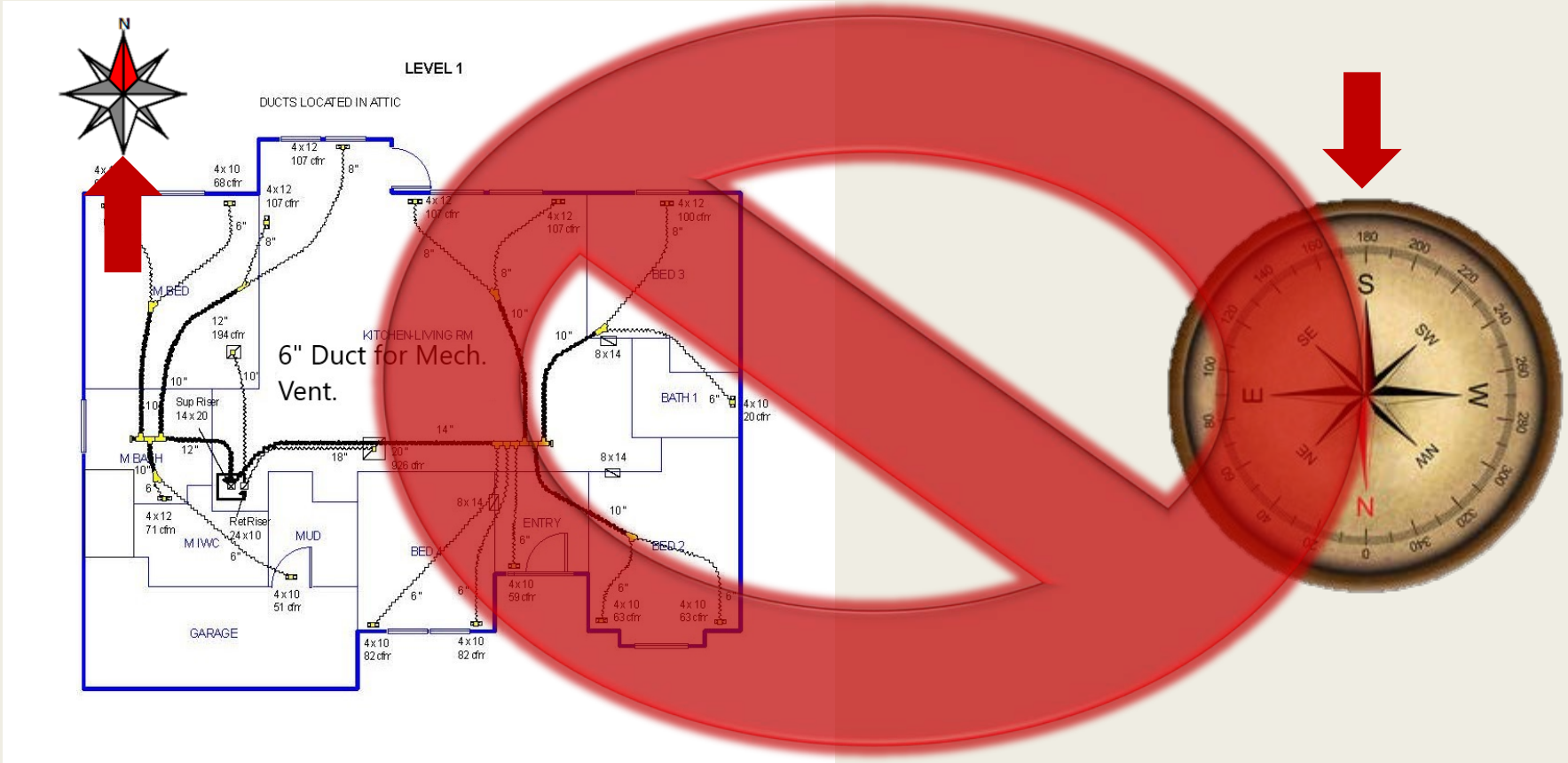


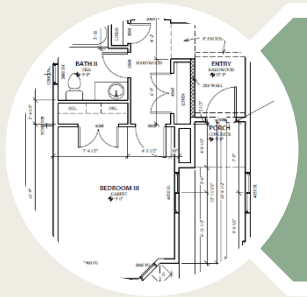
Floor Design Pages



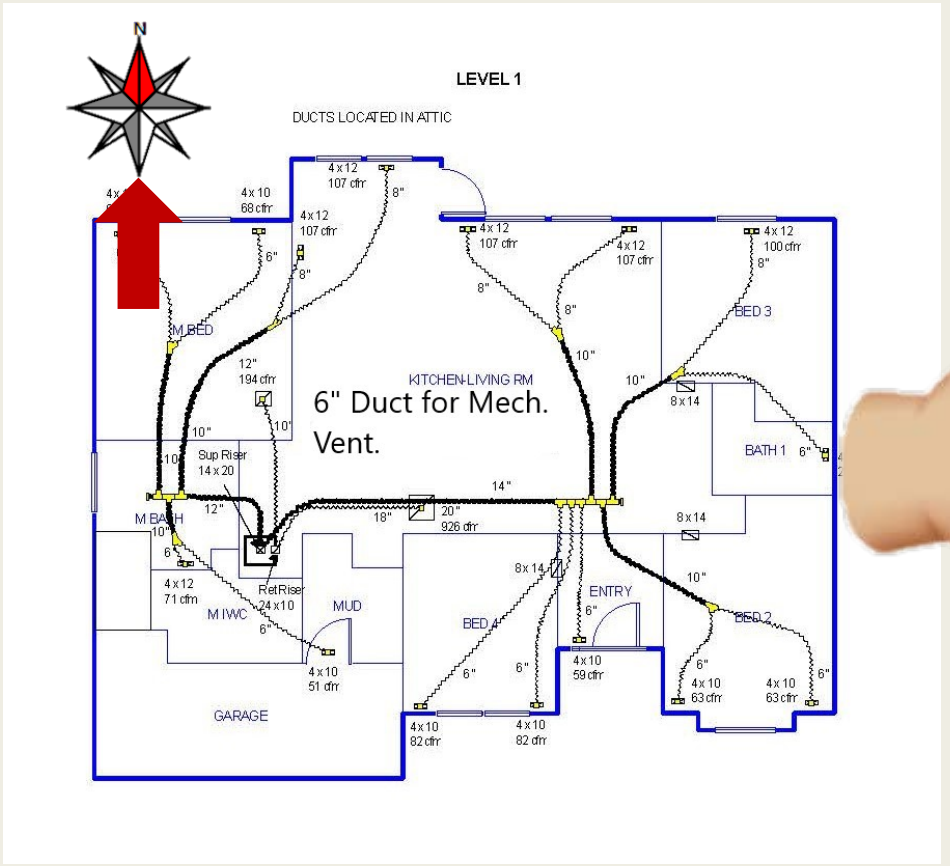


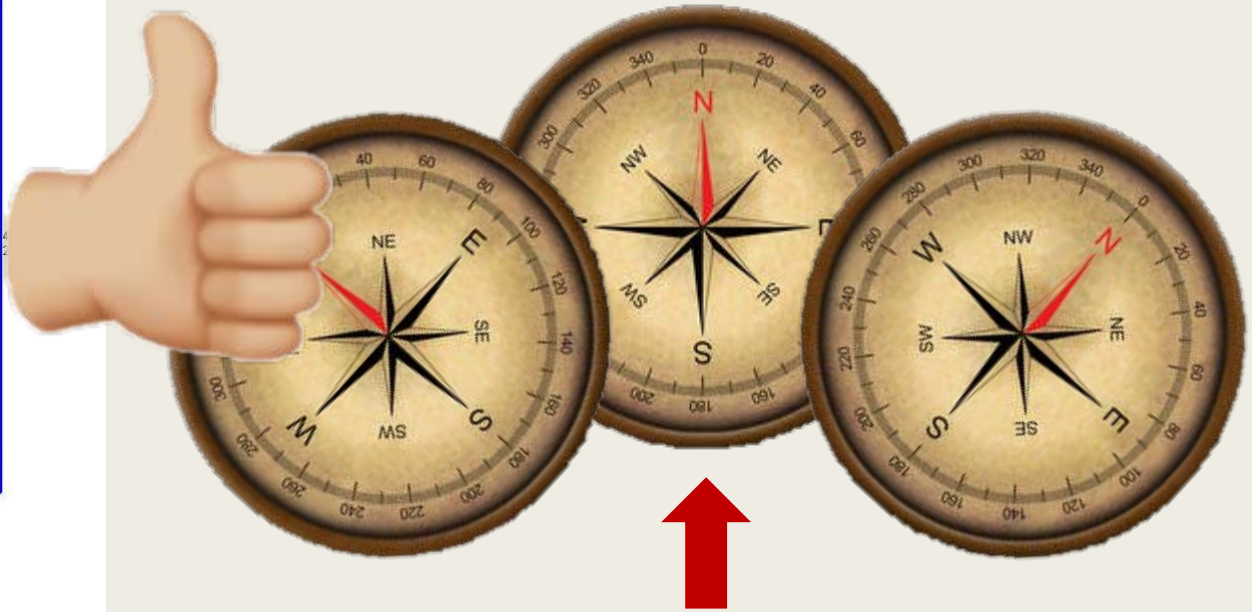
(Incorrect) Solar Orientation

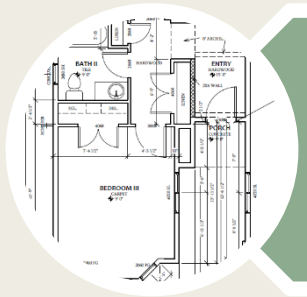




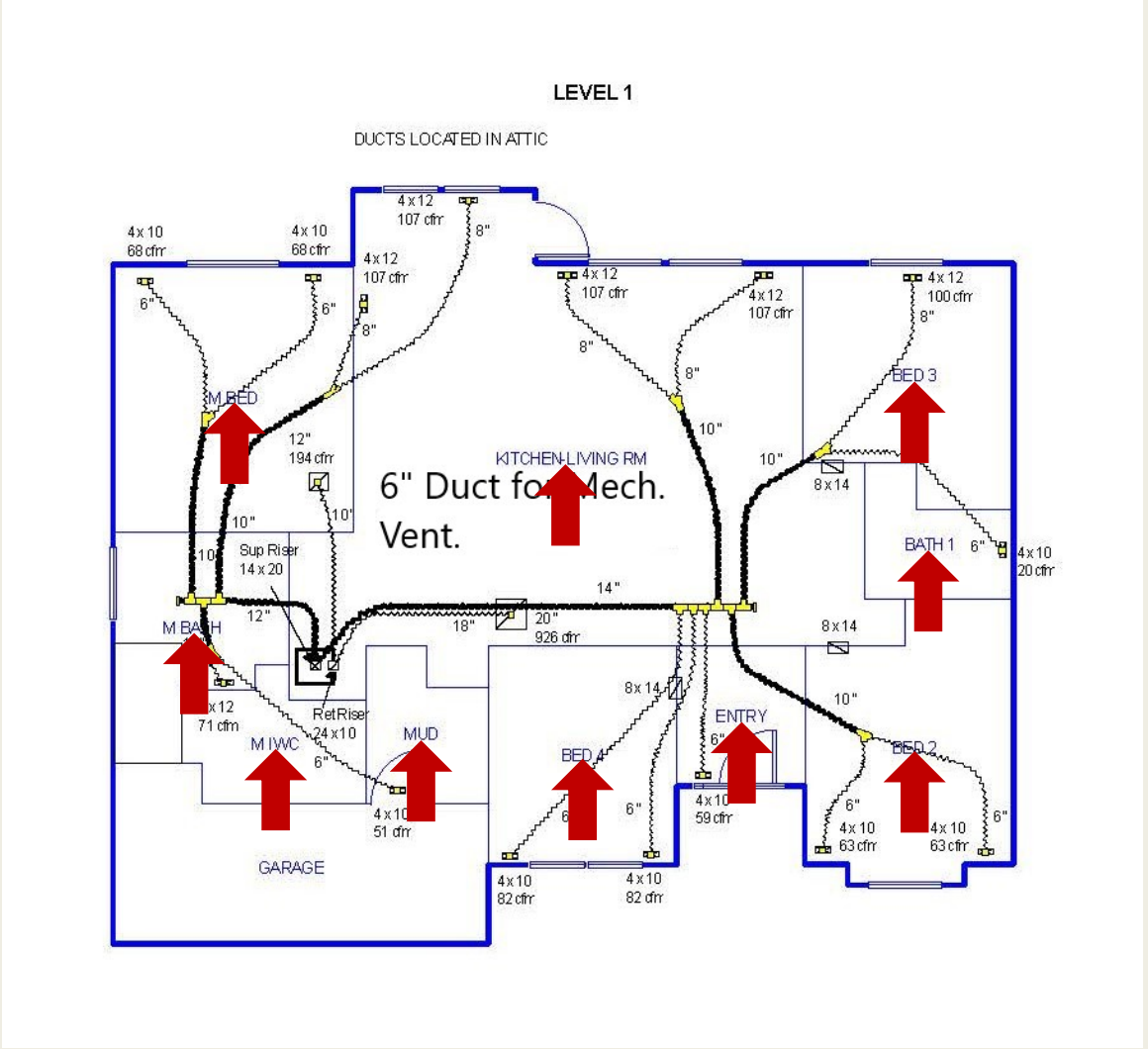
(Correct) Solar Orientation

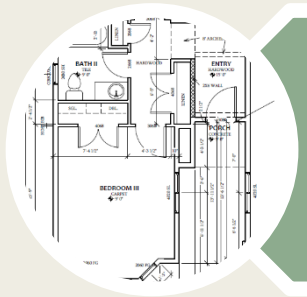




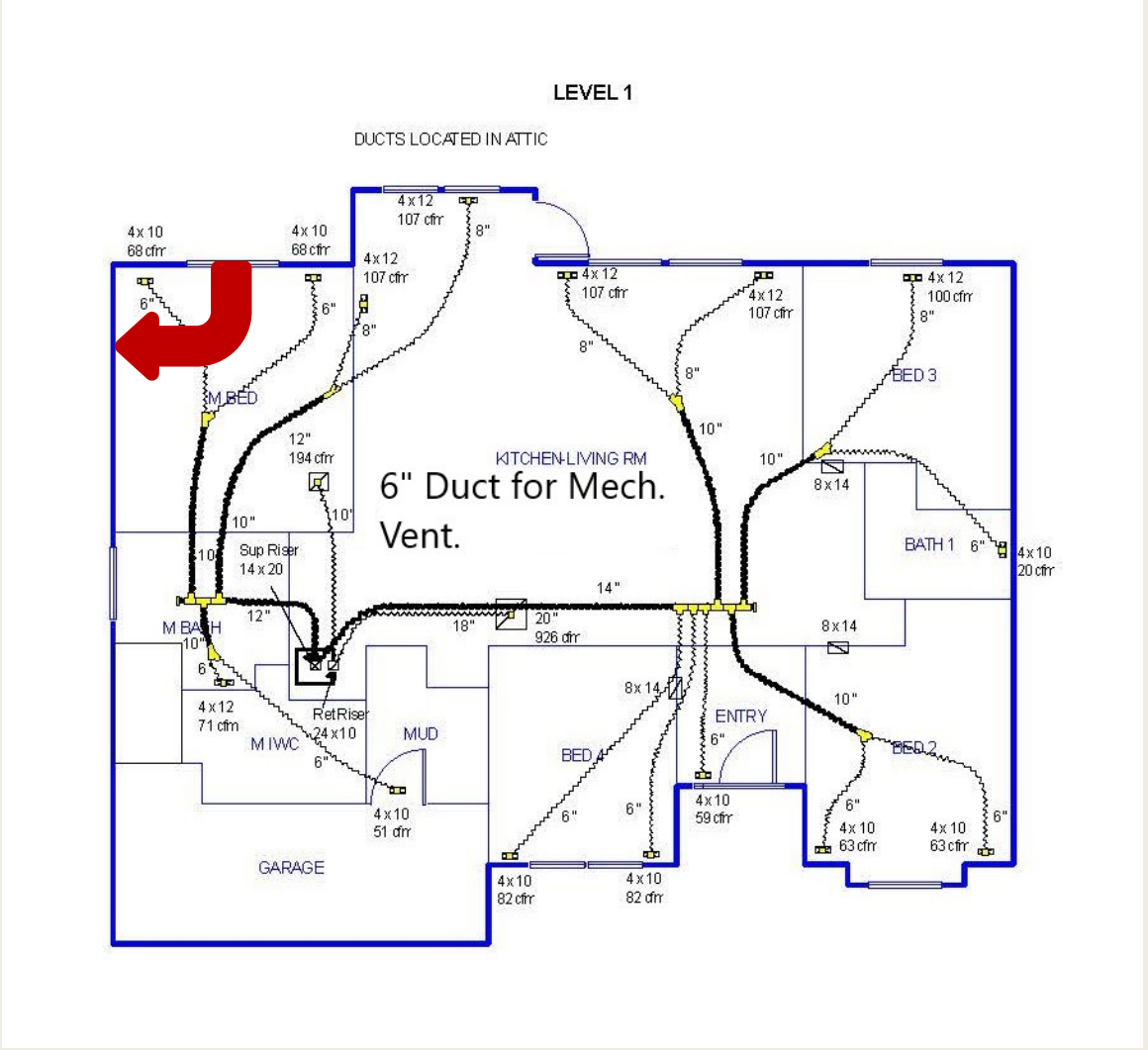


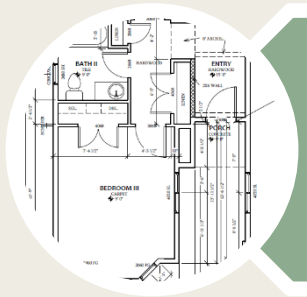
Floor Plan/Design



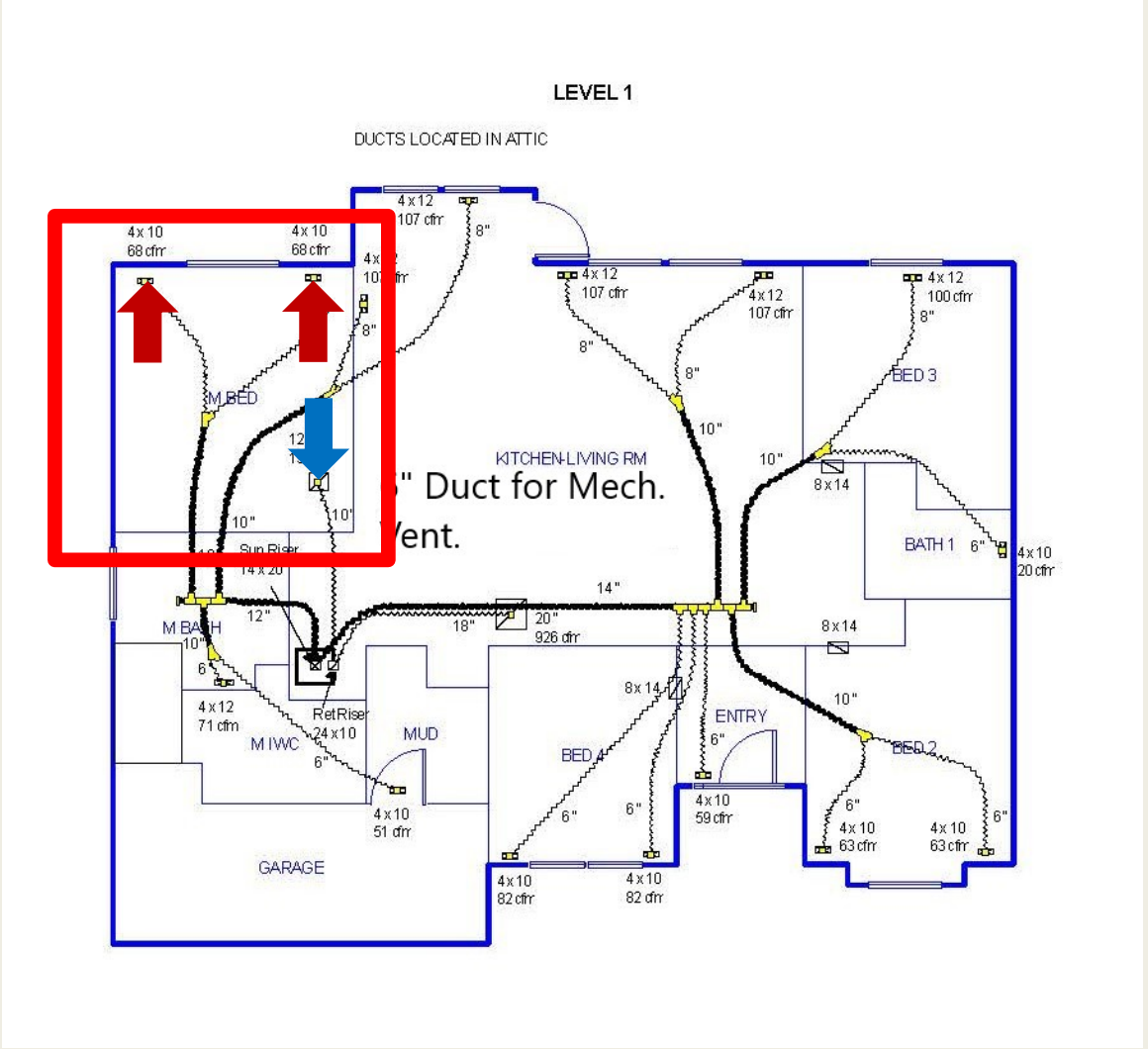


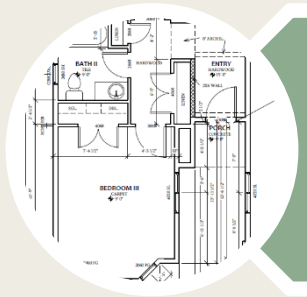
Window & Exterior Door Locations



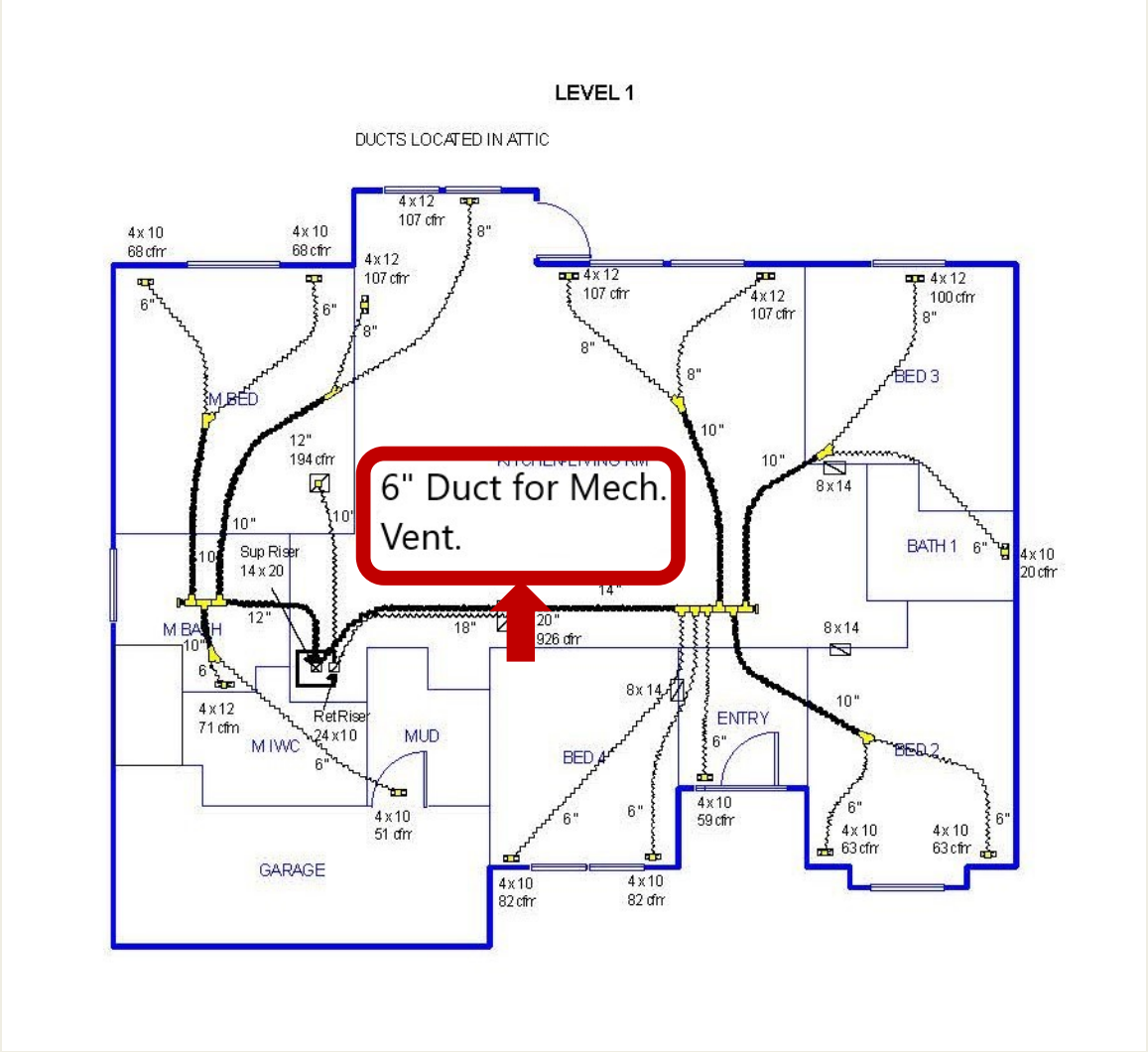


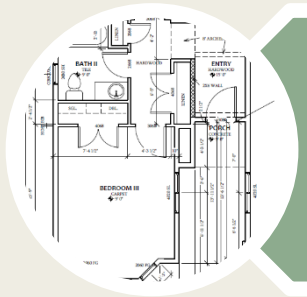
Supply & Return Air Terminations



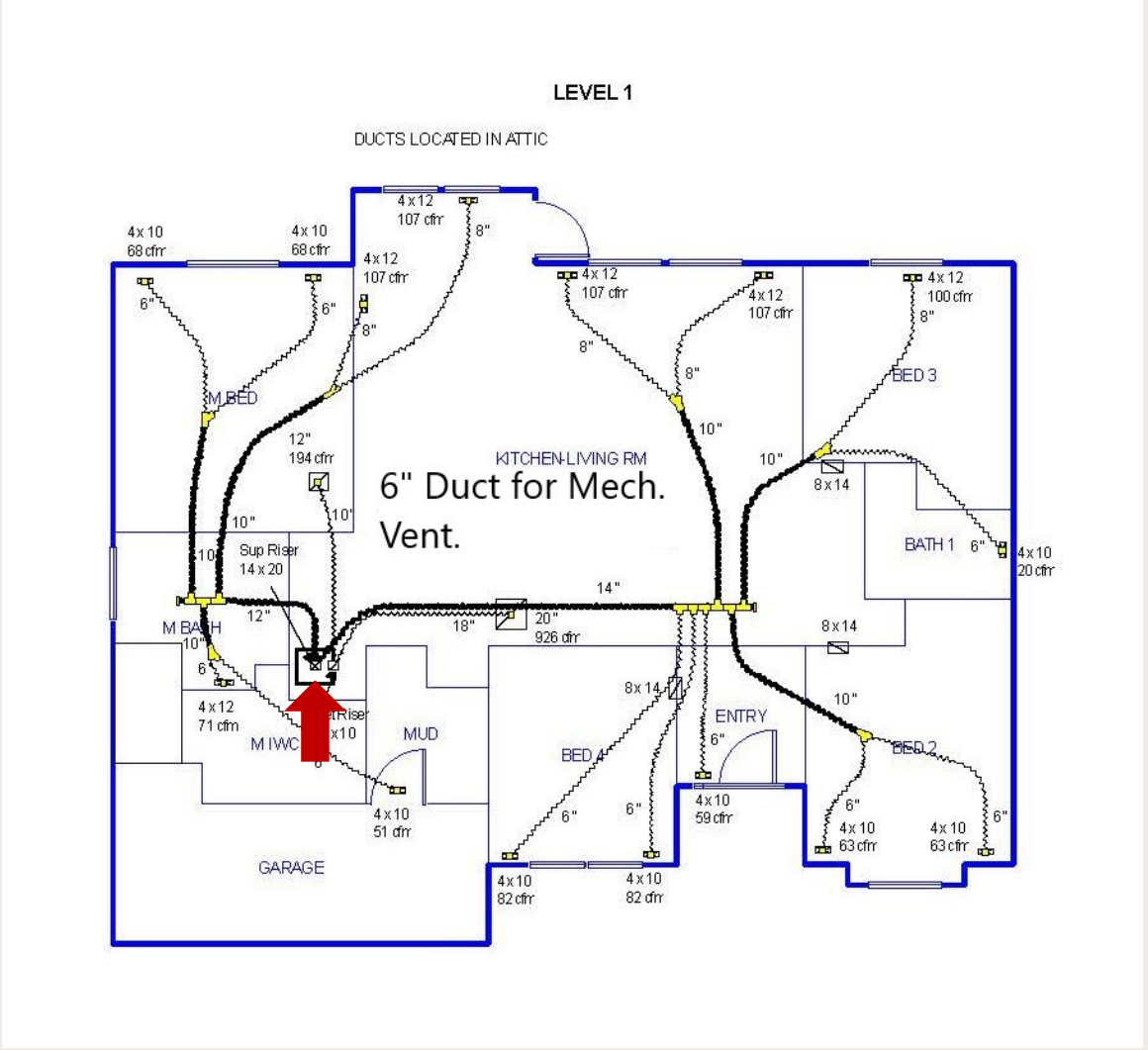


Mechanical Ventilation

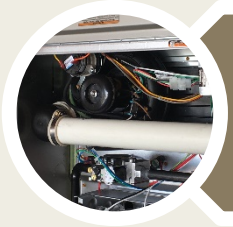




Equipment Location

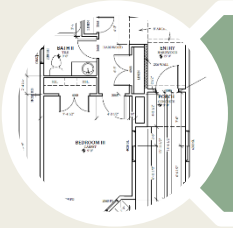


FINAL INSPECTION

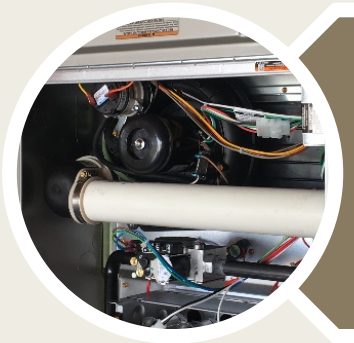


Equipment

Insulation



Floor Design Page



Equipment

HEATING EQUIPMENT

Make	Carrier
Trade	Carrier Comfort 95 Single-Stag...
Model	59SC5A080S21--20
AHRI ref	5039403

Efficiency	95.5 AFUE	
Heating input	80000	Btuh
Heating output	78000	Btuh
Temperature rise	54	°F
Actual air flow	1445	cfm
Air flow factor	0.036	cfm/Btuh
Static pressure	0.70	in H2O
Space thermostat		

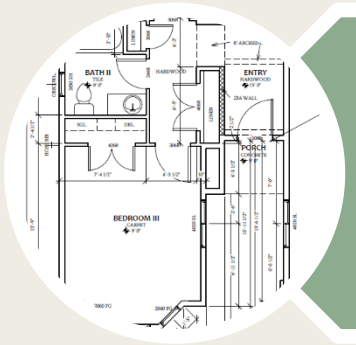
COOLING EQUIPMENT

Make	Carrier
Trade	CARRIER AIR CONDITIONING
Cond	24ABB342W0N300
Coil	CNPVP4821ALA++TDR
AHRI ref	9167622

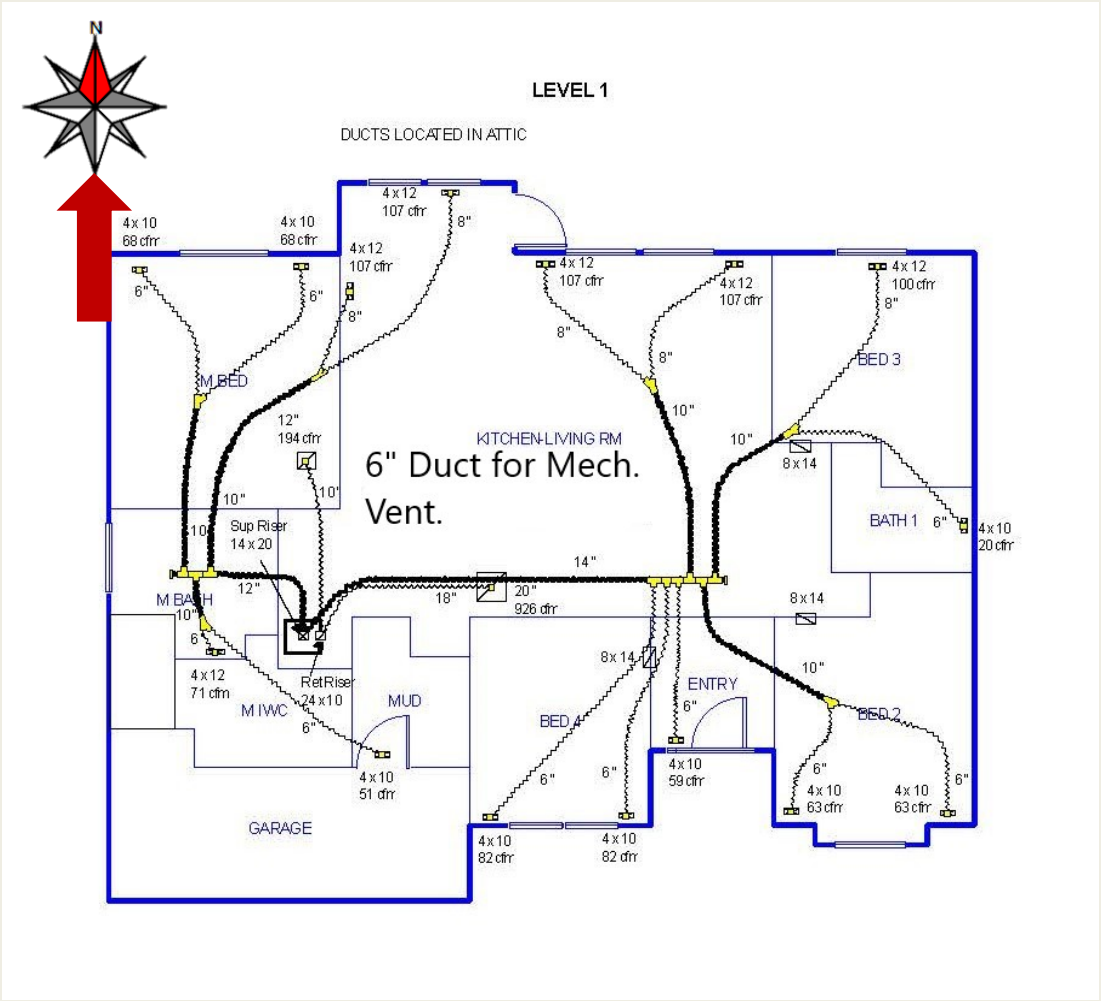
Efficiency	11.0 EER, 13 SEER	
Sensible cooling	35275	Btuh
Latent cooling	6225	Btuh
Total cooling	41500	Btuh
Actual air flow	1445	cfm
Air flow factor	0.048	cfm/Btuh
Static pressure	0.70	in H2O
Load sensible heat ratio	1.00	

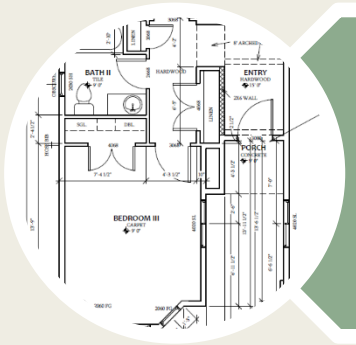
Insulation

Construction descriptions	Or	Area ft²	U-value Btuh/ft²-°F	Insul R ft²-°F/Btuh	Htg HTM Btuh/ft²	Loss Btuh	Clg HTM Btuh/ft²	Gain Btuh
Walls								
12F-0sw: Frm wall, wd ext, 1/2" wood shth, r-21 cav ins, 1/2" gypsum board int fnsh, 2"x6" wood frm, 16" o.c. stud	ne	261	0.065	21.0	3.83	1001	0.99	260
	se	542	0.065	21.0	3.83	2077	0.99	539
	sw	130	0.065	21.0	3.83	497	0.99	129
	nw	422	0.065	21.0	3.83	1617	0.99	419
	all	1354	0.065	21.0	3.83	5192	0.99	1346
Partitions								
12F-0sw: Frm wall, wd ext, 1/2" wood shth, r-21 cav ins, 1/2" gypsum board int fnsh, 2"x6" wood frm, 16" o.c. stud		350	0.065	21.0	3.83	1342	0.51	180
Windows								
2 glazing, clr low-e outr, air gas, vnl frm mat, clr innr, 1/4" gap, 1/8" thk: 2 glazing, clr low-e outr, air gas, vnl frm mat, clr innr, 1/4" gap, 1/8" thk; NFRC rated (SHGC=0.35); 6.67 ft head ht	ne	65	0.350	0	20.6	1342	28.2	1832
	se	43	0.350	0	20.6	878	35.4	1506
	se	10	0.350	0	20.6	207	13.6	136
	sw	8	0.350	0	20.6	165	35.4	284
	nw	58	0.350	0	20.6	1203	28.2	1642
	all	184	0.350	0	20.6	3794	29.4	5400
2 glazing, clr low-e outr, air gas, vnl frm mat, clr innr, 1/4" gap, 1/8" thk: 2 glazing, clr low-e outr, air gas, vnl frm mat, clr innr, 1/4" gap, 1/8" thk; NFRC rated (SHGC=0.35); 8 ft head ht	se	12	0.350	0	20.6	248	35.4	425
	sw	13	0.350	0	20.6	258	35.4	443
	all	25	0.350	0	20.6	506	35.4	868
Doors								
11D0: Door, wd sc type	ne	24	0.390	0	23.0	552	10.3	248
	se	24	0.390	0	23.0	552	10.3	248
	all	48	0.390	0	23.0	1104	10.3	496
Ceilings								
16B-50ad: Attic ceiling, asphalt shingles roof mat, r-50 ceil ins, 1/2" gypsum board int fnsh		1590	0.020	50.0	1.18	1876	1.00	1590
Floors								
19A-30cvcp: Flr floor, frm flr, 12" thkns, carpet flr fnsh, r-30 cav ins, leaky crwl ovr		1590	0.034	30.0	1.68	2677	0.57	907

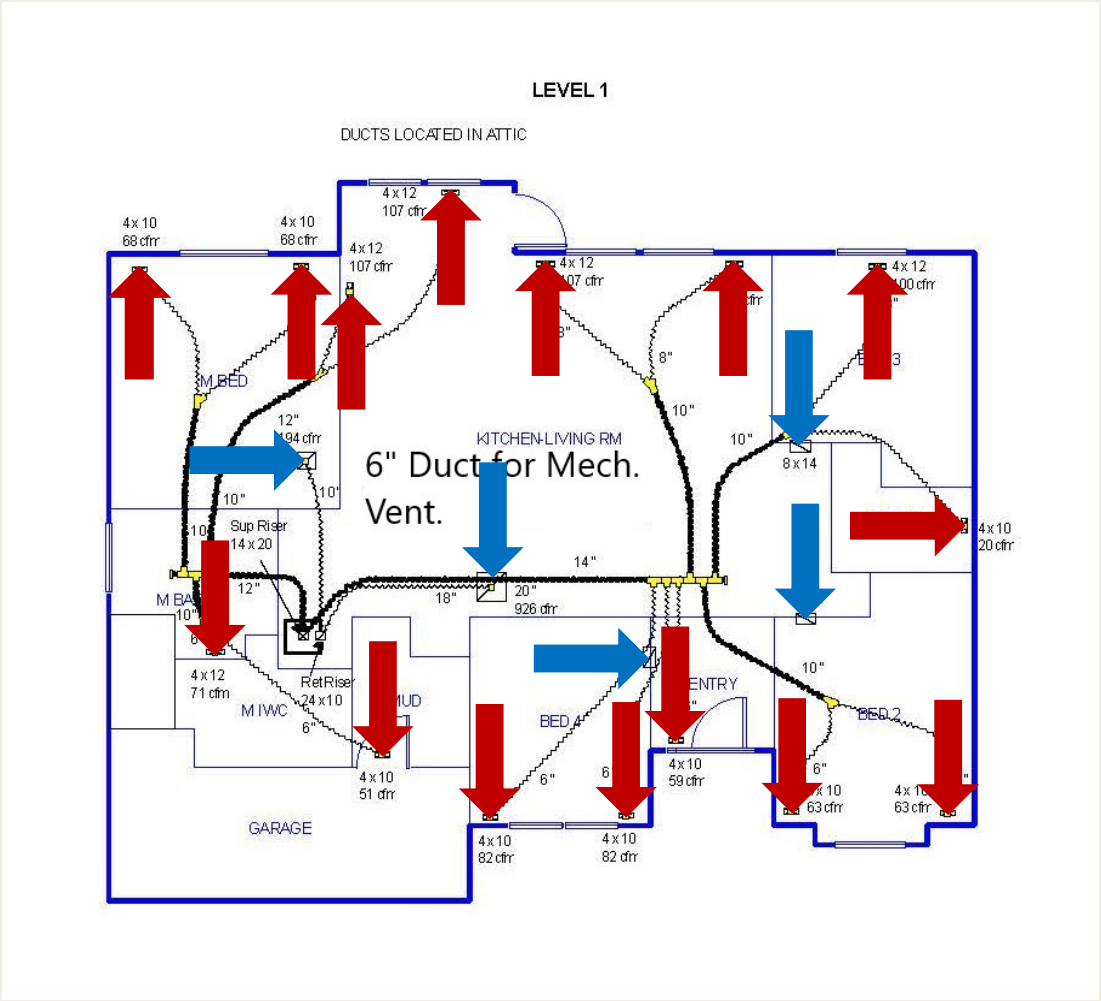


Solar Orientation





Supply & Return Air Terminations



Inspection Verification Document

IDAHO Division of Building Safety

Home / DBS Programs / Heating, Ventilation, & Air Conditioning

Heating, Ventilation, & Air Conditioning

- A-Z Directory
- DBS Programs
- Boards
- Exams
- Forms & Applications
- Rules, Statutes, Legislation
- Public Records Requests
- News Room

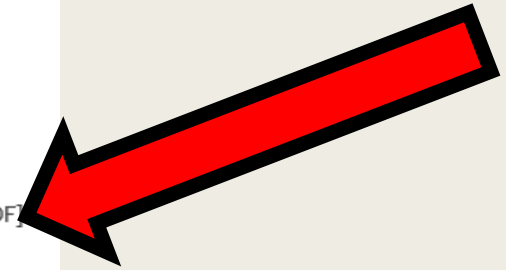
The HVAC Program was created to promote the health, safety, and welfare of Idaho's citizens through effective administration of the laws and rules governing the installation and operation of Heating, Ventilation, and Air Conditioning systems and by ensuring that those who perform installation and/or service work involving such equipment are properly trained and licensed.

FORMS & APPLICATIONS

- HVAC Forms and Applications

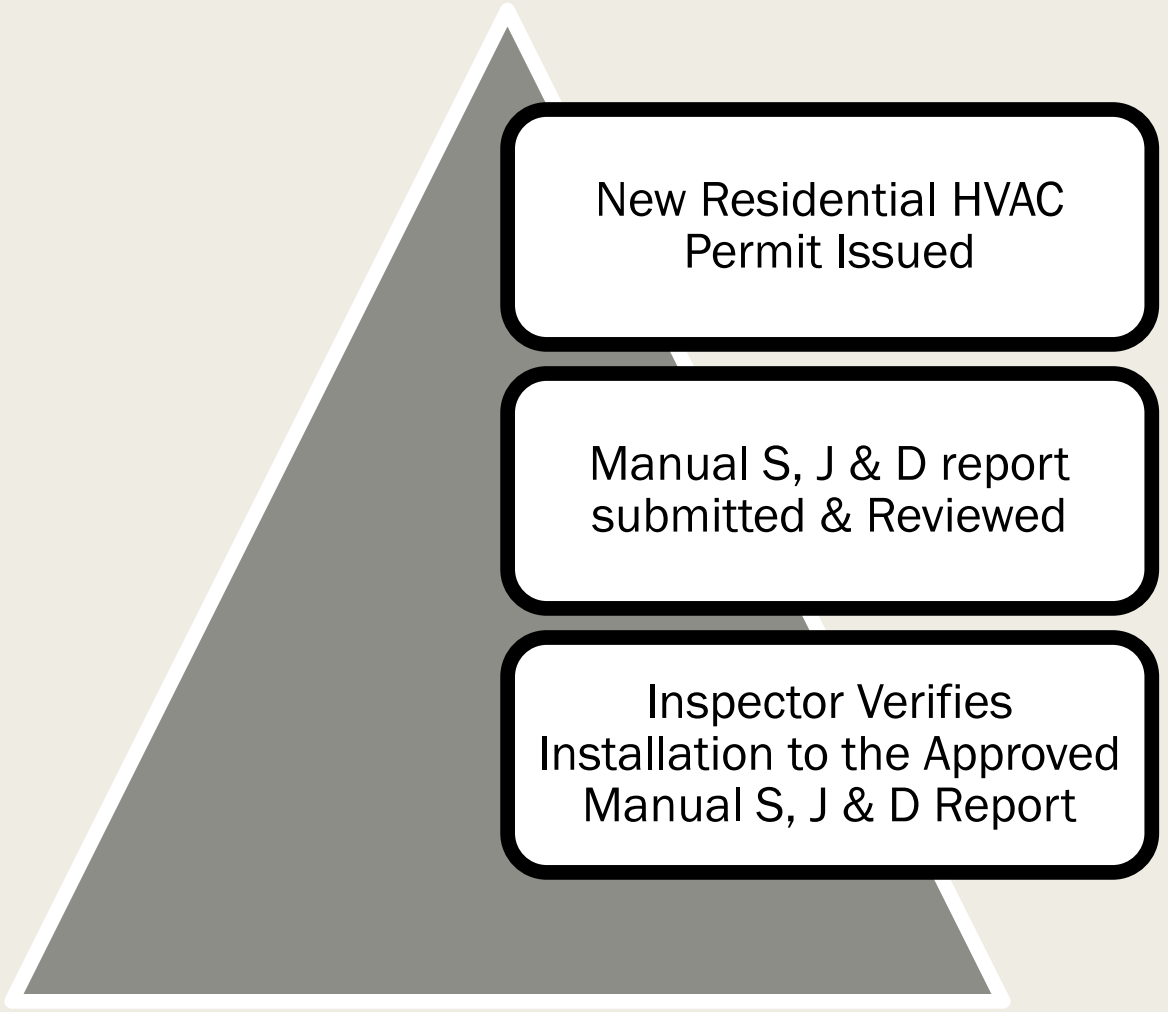
MANUAL S, J & D INFORMATION

- What information is required for Manual S, J & D review? [PDF]
- What will the Inspector verify at the time of HVAC Inspections? [PDF]
- RSVP to Presentation Schedules for Idaho Cities
- 2018 Statewide Manual S, J & D Locations and Dates [PDF]



Questions?

Conclusion: New Process 1/1/2019



Conclusion: Reminders

New Residential HVAC Permits ONLY

Updated Email Address

Review Fee $25

eTrakit

Software Providers

Inspector Verification

DBS does NOT provide training on Software Programs…

- See your software provider for training updates and video tutorials

Questions?

manualjreview@dbs.Idaho.gov