



### BUILDING AIR BALANCE SCHEDULE

ZONE	ROOM NAME	AREA	OCCUPANTS	DURATION	SUPPLY AIR CFM	RETURN AIR CFM	EXHAUST AIR CFM	VENT AIR CFM
1	GALLERY	667	6	VARIES	1052	1040	0	70
1	STORAGE	167	0	N/A	109	90	0	0
1	R R 1	66	0	N/A	39	0	70	0
2	ENTRY	261	0	N/A	704	0	0	0
2	CONFERENCE	207	4	VARIES	163	150	0	34.02
2	OFFICE 1	122	1	> 3 HRS	108	0	0	27.2
2	OFFICE 2	120	1	> 3 HRS	107	0	0	27.2
2	DENNIS OFFICE	243	1	> 3 HRS	184	175	0	27.2
2	FILES	196	0	N/A	129	0	0	0
2	OPEN OFFICE 2	469	1	> 3 HRS	237	1305	0	27.2
2	R R 2	63	0	N/A	25	0	170	0
2	OPEN OFFICE 1	272	1	> 3 HRS	143	0	0	27.2

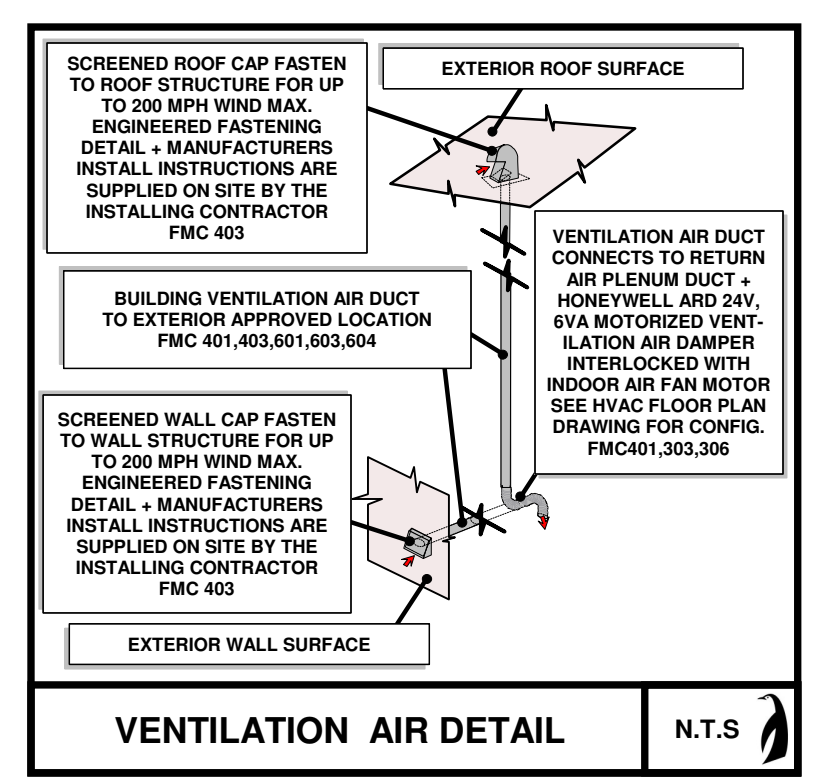
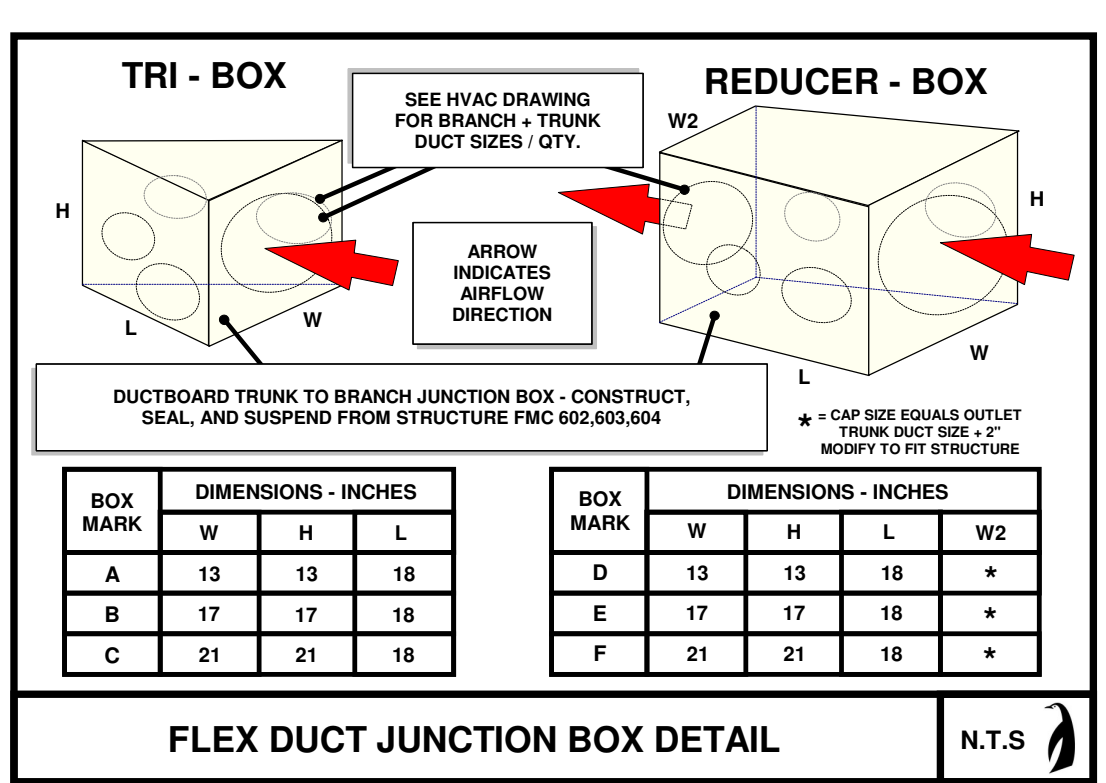
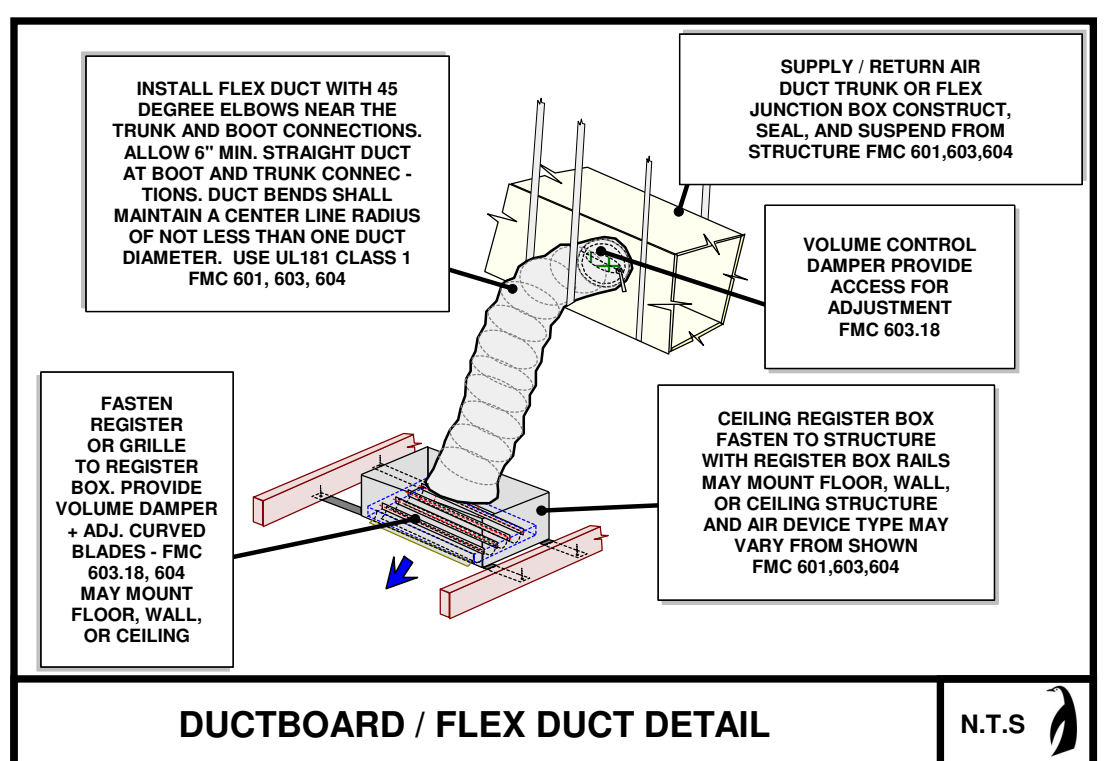
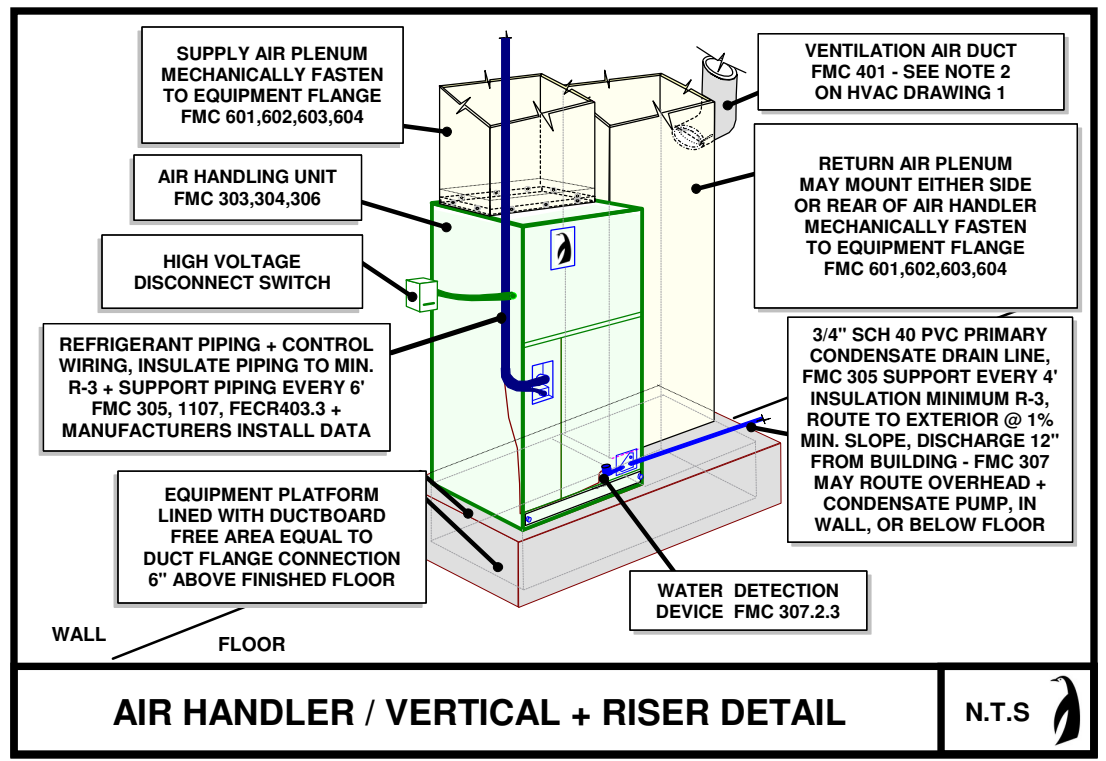
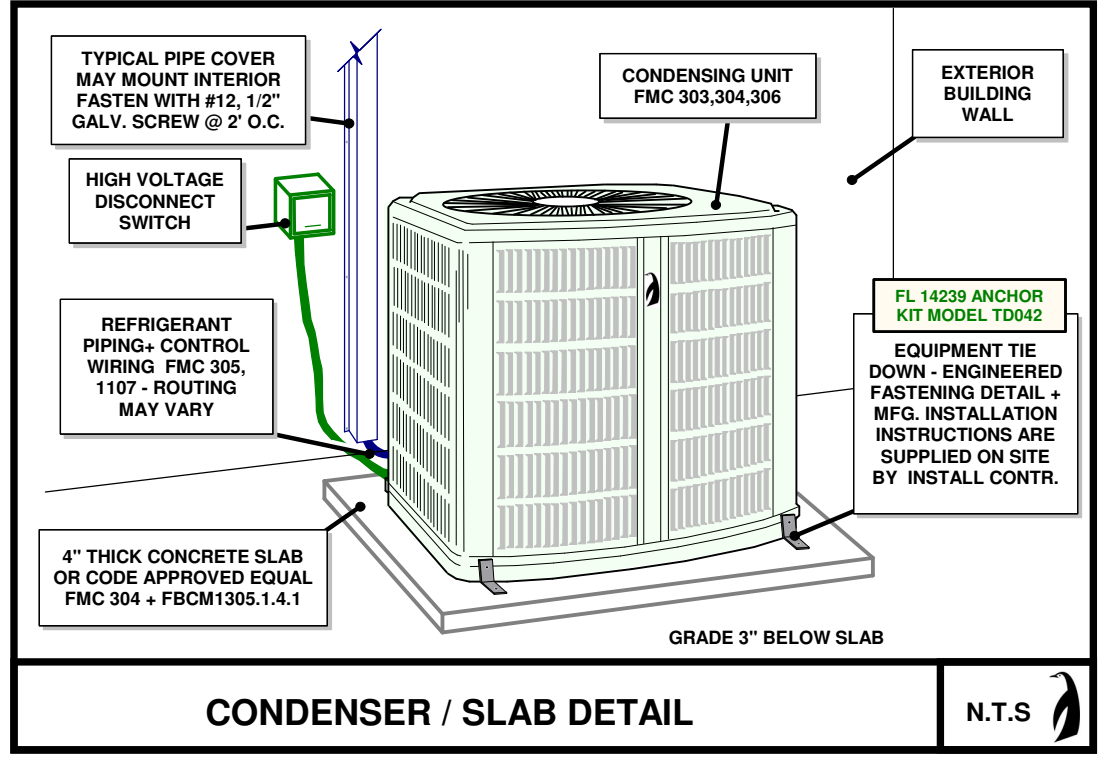
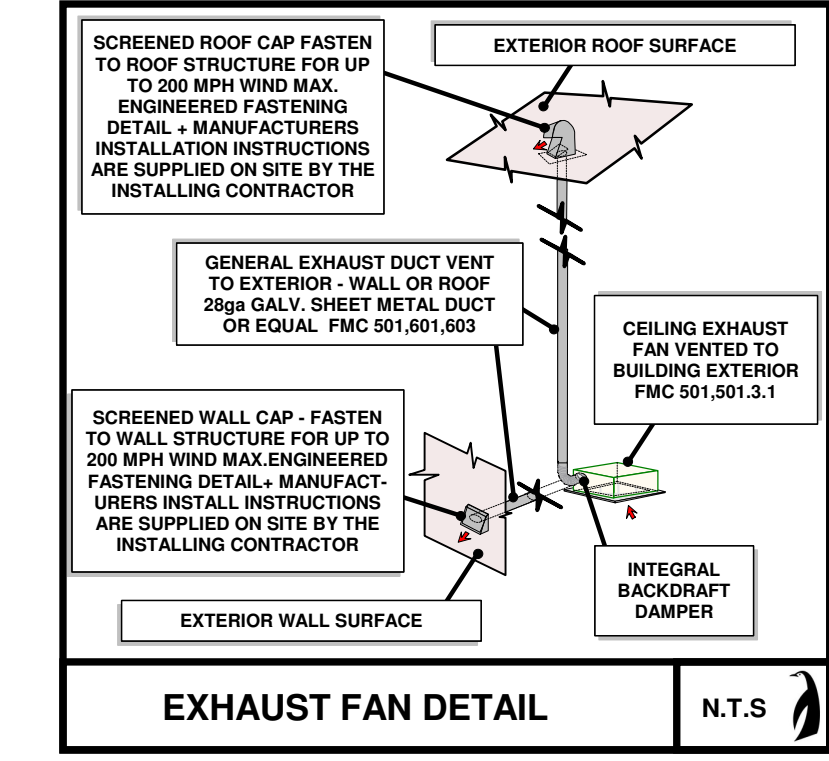
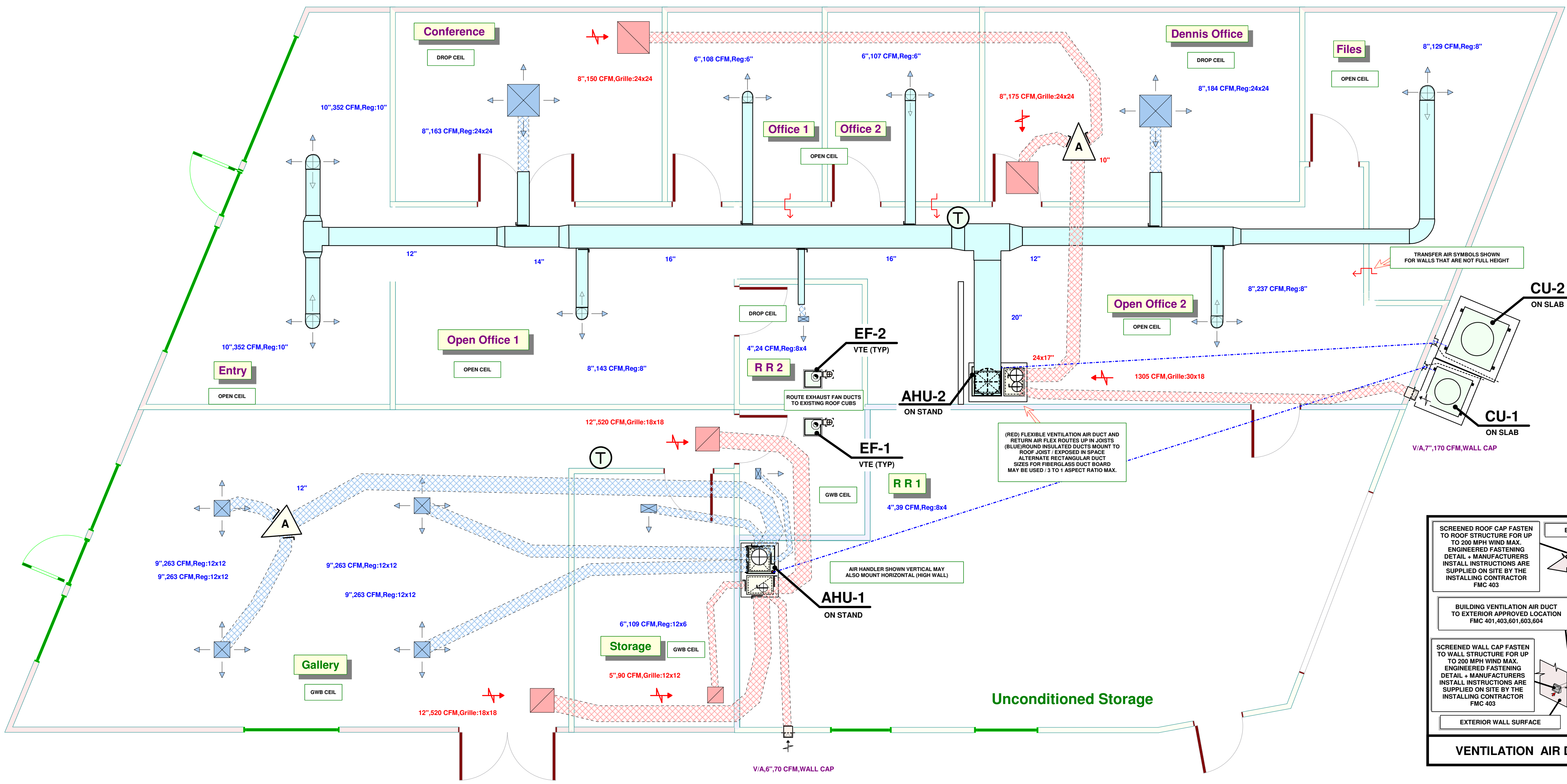
<b>BUILDING TOTALS</b>	<b>2853</b>	<b>15</b>	<b>VARIES</b>	<b>3000</b>	<b>2760</b>	<b>240</b>	<b>240</b>
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THIS BUILDING COMPLIES WITH THE 5th EDITION (2014) FLORIDA MECHANICAL CODE SECTION 403 AND TABLE 403.3  
 THE VENTILATION AIR SHOWN ON THIS SCHEDULE IS DELIVERED TO THE OCCUPANT BREATHING ZONE AND NOT THE AREA VA  
 THE OCCUPANTS SHOWN ARE ACTUAL EXPECTED OCCUPANTS AND MAY DIFFER FROM THE OCCUPANCY SHOWN FOR EGRESS / FIRE CODE (GENERALLY 1/2 OF EGRESS)  
 THE TEST AND BALANCE CONTRACTOR SHOULD ADJUST THE INTERIOR BUILDING PRESSURE SLIGHTLY POSITIVE  
 THIS AIR BALANCE SCHEDULE SHOWS NEUTRAL INTERIOR PRESSURE, THE BUILDING ENVELOPE EXFILTRATION CFMS ARE INCLUDED

### BUILDING VENTILATION CALCULATION

SQ FT	CLASSIFY	OCCUPANTS	OCCUPANT VA	AREA VA	MAX. VENT AIR	DURATION *	TOTAL AIR	CFM - PERSON
207	Conference*	4	5	0.06	32.42	1	32.42	8.11
1850	Office	5	5	0.06	136	1	136	27.20
667	Gallery*	6	5	0.06	70.02	1	70.02	11.67
<b>BUILDING TOTALS</b>		<b>15</b>			<b>VARIES</b>		<b>238</b>	<b>15.90</b>

THIS BUILDING COMPLIES WITH THE 5th EDITION (2014) FLORIDA MECHANICAL CODE SECTION 403 AND TABLE 403.3  
 THE OCCUPANTS SHOWN ARE ACTUAL EXPECTED OCCUPANTS AND MAY DIFFER FROM THE OCCUPANCY SHOWN FOR EGRESS / FIRE CODE  
 VENTILATION AIR RATES ARE ADJUSTED FOR VARIABLE OCCUPANCY BASED ON THE ACTUAL TIME THE OCCUPANT OCCUPIES THE SPACE



Comfort System Designed By:  
 Neil Fimbel  
 HVAC Designs  
 813-885-2258  
 FL BERS 884/959  
 neil@hvacsolutions.com  
 Designing HVAC in Florida 30+ Years  
 Intelligent CAD Energy Modeling  
 "Home of the complete HVAC + Energy Design"

HVAC Contractor Signature  
 State License #

SCALE 1/4"=1'-0"  
 36"x24" ARCH D

PROJECT NAME: sample Retail Remodel 2853 NW350  
 PROJECT ADDRESS: sample only  
 PROJECT CITY, ZIP: Pineellas County Florida  
 CONDITIONED SQ. FT.: CAD = 900 + 1953 = 2853  
 CLIMATE ZONE 2 CLASS: Interior Remodel

Orientation  
 North

DRAWING DATE  
 7/21/2016  
 PERMIT SET  
 HVAC  
 DRAWING  
 2 OF 2

# *Florida Building Code, Fifth Edition (2014) - Energy Conservation*

*EnergyGauge Summit® Fla/Com-2015, Effective Date: June 30, 2015*

*IECC 2012 - Total Building Performance Compliance Option*

## *Check List*

*Applications for compliance with the Florida Building Code, Energy Conservation shall include:*

- This Checklist
- An Input report generated from the software just after completing compliance calculations without any further changes
- The full compliance report generated by the software that contains the project summary, compliance summary, certifications and detailed component compliance reports
- Boxes appropriately checked in the Miscellaneous report generated by the software at the end of the compliance report

## PROJECT SUMMARY

**Short Desc:** 2801

**Description:** Retail Remodel 2853 NW350

**Owner:**

**Address1:**

**Address2:** (entry is 350 degree face NE)

sample only

**City:** Pinellas

**State:** Florida

**Zip:** 0

**Class:** Renovation to existing buildi

**Type:** Office

**Jurisdiction:** PINELLAS COUNTY, PINELLAS COUNTY, FL (621000)

**Conditioned Area:** 2853 SF

**Conditioned & UnConditioned Area:** 3543 SF

**No of Stories:** 1

**Area entered from Plans** 3543 SF

**Permit No:**

**Max Tonnage** 4.7

**If different, write in:** \_\_\_\_\_

## Compliance Summary


Component	Design	Criteria	Result
Gross Energy Cost (in \$)	1,891.0	2,031.0	<b>PASSED</b>
LIGHTING CONTROLS			<b>PASSES</b>
EXTERNAL LIGHTING			<b>PASSES</b>
HVAC SYSTEM			<b>PASSES</b>
PLANT			<b>No Entry</b>
WATER HEATING SYSTEMS			<b>No Entry</b>
PIPING SYSTEMS			<b>No Entry</b>
Met all required compliance from Check List?			<b>Yes/No/NA</b>

**IMPORTANT MESSAGE**

*Info 5009 -- -- -- An input report of this design building must be submitted along with this Compliance Report*

## CERTIFICATIONS

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

Prepared By:  BERS 959 Building Official: \_\_\_\_\_  
Date: 7/5/2016 Date: \_\_\_\_\_

*I certify that this building is in compliance with the FLorida Energy Efficiency Code*

Owner Agent: \_\_\_\_\_ Date: \_\_\_\_\_

*If Required by Florida law, I hereby certify (\*) that the system design is in compliance with the Florida Energy Efficiency Code*

Architect: _____	Reg No: _____
Electrical Designer: _____	Reg No: _____
Lighting Designer: _____	Reg No: _____
Mechanical Designer: Neil Fimbel HVAC Designs	Reg No: BERS # 959
Plumbing Designer: _____	Reg No: _____

*(\*) Signature is required where Florida Law requires design to be performed by registered design professionals. Typed names and registration numbers may be used where all relevant information is contained on signed/sealed plans.*

Project: 2801  
 Title: Retail Remodel 2853 NW350  
 Type: Office  
 (WEA File: Tampa.tmy)

**Building End Uses**

sample only	1) Proposed	2) Baseline
<b>Total</b>	<i>121.10</i>	<i>152.40</i>
	<i>\$1,891</i>	<i>\$2,390</i>
ELECTRICITY(MBtu/kWh/\$)	121.10 35485 <i>\$1,891</i>	152.40 44668 <i>\$2,390</i>
AREA LIGHTS	32.60 9555 <i>\$509</i>	36.20 10607 <i>\$567</i>
MISC EQUIPMT	37.70 11052 <i>\$589</i>	37.70 11052 <i>\$591</i>
PUMPS & MISC	0.10 40 <i>\$2</i>	0.10 38 <i>\$2</i>
SPACE COOL	33.00 9670 <i>\$515</i>	39.40 11553 <i>\$618</i>
SPACE HEAT	2.40 696 <i>\$37</i>	2.40 708 <i>\$38</i>
VENT FANS	15.30 4472 <i>\$238</i>	36.60 10710 <i>\$573</i>

Credits Applied: None

**PASSES**

Passing Criteria = 2031

Design (including any credits) = 1891

Passing requires Proposed Building cost to be at most 85% of Baseline cost. This Proposed Building is at 79.1%

Project: 2801  
 Title: Retail Remodel 2853 NW350  
 Type: Office  
 (WEA File: Tampa.tmy)

### External Lighting Compliance

Description	Category	Tradable?	Allowance (W/Unit)	Area or Length or No. of Units (Sqft or ft)	ELPA (W)	CLP (W)
Ext Light 1	Main entries	Yes	30.00	6.0	180	60
Ext Light 2	Other (doors) than main entries	Yes	20.00	3.0	60	60
Ext Light 3	Internally illuminated exit signs	No	5.00	2.0	10	9

**Tradable Surfaces: 120 (W) Allowance for Tradable: 990 (W)**

**PASSES**

**All External Lighting: 129 (W)**

**Compliance check includes a excess/Base allowance of 750.00(W)**

Project: 2801  
 Title: Retail Remodel 2853 NW350  
 Type: Office  
 (WEA File: Tampa.tmy)

### Lighting Controls Compliance

Acronym	Ashrae ID	Description	Area (sq.ft)	Design CP	Min CP	Compliance
Pr0Zo1Sp1	16	Office - Open Plan	667	2	1	PASSES
Pr0Zo1Sp2	3	Storage & Warehouse - Bulky Active Storage	167	1	1	PASSES
Pr0Zo1Sp3	6	Toilet and Washroom	66	1	1	PASSES
Pr0Zo2Sp1	12	Lobby (General) - Reception and Waiting	261	1	1	PASSES
Pr0Zo2Sp2	15	Conference/meeting (Multiple Functions)	207	1	1	PASSES
Pr0Zo2Sp3	16	Office - Open Plan	122	1	1	PASSES
Pr0Zo2Sp4	16	Office - Open Plan	120	1	1	PASSES
Pr0Zo2Sp5	17	Office - Enclosed	243	1	1	PASSES
Pr0Zo2Sp6	16	Office - Open Plan	196	1	1	PASSES
Pr0Zo2Sp7	16	Office - Open Plan	469	1	1	PASSES
Pr0Zo2Sp8	6	Toilet and Washroom	63	1	1	PASSES
Pr0Zo2Sp9	16	Office - Open Plan	272	1	1	PASSES
Pr0Zo3Sp1	3	Storage & Warehouse - Bulky Active Storage	690	1	1	PASSES

**PASSES**

Project: 2801  
 Title: Retail Remodel 2853 NW350  
 Type: Office  
 (WEA File: Tampa.tmy)

### System Report Compliance

<b>Pr0Sy1</b>	<b>System 1</b>	<b>Constant Volume Air Cooled Split System &lt; 65000 Btu/hr</b>	<b>No. of Units 1</b>
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Component	Category	Capacity	Design Eff	Eff Criteria	Design IPLV	IPLV Criteria	Compliance
Cooling System	Air Conditioners Air Cooled Split System < 65000 Btu/h Cooling Capacity	35800	14.00	13.00			<b>PASSES</b>
Heating System	Electric Furnace	26200	1.00	1.00			<b>PASSES</b>
Air Handling System -Supply	Air Handler (Supply) - Constant Volume	1200	0.13	0.82			<b>PASSES</b>
Air Handling System - Return	Air Handler (Return) - Constant Volume	1200	0.13	0.82			<b>PASSES</b>
Air Distribution System (Sup)	Not in Check list - Compliance Ignored		6.00	6.00			<b>N/A</b>
Air Distribution System (Ret)	Not in Check list - Compliance Ignored		6.00	6.00			<b>N/A</b>

<b>Pr0Sy2</b>	<b>System 2</b>	<b>Constant Volume Air Cooled Split System &lt; 65000 Btu/hr</b>	<b>No. of Units 1</b>
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Component	Category	Capacity	Design Eff	Eff Criteria	Design IPLV	IPLV Criteria	Compliance
Cooling System	Air Conditioners Air Cooled Split System < 65000 Btu/h Cooling Capacity	56000	14.00	13.00			<b>PASSES</b>
Heating System	Electric Furnace	34120	1.00	1.00			<b>PASSES</b>
Air Handling System -Supply	Air Handler (Supply) - Constant Volume	1800	0.23	0.82			<b>PASSES</b>
Air Handling System - Return	Air Handler (Return) - Constant Volume	1800	0.23	0.82			<b>PASSES</b>
Air Distribution System (Sup)	Not in Check list - Compliance Ignored		6.00	6.00			<b>N/A</b>
Air Distribution System (Ret)	Not in Check list - Compliance Ignored		6.00	6.00			<b>N/A</b>

**PASSES**



Plant Compliance								
Description	Installed No	Size	Design Eff	Min Eff	Design IPLV	Min IPLV	Category	Compliance
								None

Water Heater Compliance								
Description	Type	Category	Design Eff	Min Eff	Design Loss	Max Loss	Compliance	
								None

Piping System Compliance								
Category	Pipe Dia [inches]	Is Runout?	Operating Temp [F]	Ins Cond [Btu-in/hr .SF.F]	Ins Thick [in]	Req Ins Thick [in]	Compliance	
								None

## Mandatory Requirements (as applicable)

Mandatory requirements compiled by US Department of Energy and Pacific Northwest National Laboratory. Adopted with permission

Topic	Section	Component	Description	Yes	N/A	Ex
<b>1. To be checked by Designer or Engineer</b>						
Fenestration	C402.2.7	Envelope	U-factor of opaque doors associated with the building thermal envelope meets requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Insulation	C402.2.1.1	Envelope	High-albedo roofs satisfy one of the following: 3-year-aged solar reflectance $\geq 0.55$ and thermal emittance $\geq 0.75$ , 3-year-aged solar reflectance index $\geq 64.0$ , initial year solar reflectance $\geq 0.70$ and thermal emittance $\geq 0.75$ , or initial year solar	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wattage	C405.6	Exterior Lighting	Exterior grounds lighting over 100 W provides $>60$ lm/W unless on motion sensor or fixture is exempt from scope of code or from external LPD.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wattage	C405.4	Interior Lighting	Exit signs do not exceed 5 watts per face.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wattage	C405.2.3	Interior Lighting	Additional interior lighting power allowed for special functions per the approved lighting plans and is automatically controlled and separated from general lighting.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HVAC	C403.2.6	Mechanical	Exhaust air energy recovery on systems meeting Table C403.2.6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C403.3.1,C403.3.1.	Mechanical	Air economizers provided where required, meet the requirements for design capacity, control signal, ventilation controls, high-limit shut-off, integrated economizer control, and provide a means to relieve excess outside air during operation.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C403.3.1,C403.4.1	Mechanical	Water economizers provided where required, meet the requirements for design capacity, maximum pressure drop and integrated economizer control.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C403.4.1.4	Mechanical	Economizer operation will not increase heating energy use during normal operation.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C403.2.10.1	Mechanical	HVAC fan systems at design conditions do not exceed allowable fan system motor nameplate hp or fan system bhp.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C403.2.10.2	Mechanical	HVAC fan motors not larger than allowable limits.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C404.2	Mechanical	Service water heating equipment meets efficiency requirements.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C403.2.3	Mechanical	Centrifugal fan open-circuit cooling towers having combined rated capacity $\geq 1100$ gpm meets minimum efficiency requirement: $\geq 38.2$ gpm/hp.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>2. To be checked by Plan Reviewer</b>						
Air Leakage	C402.4.7	Envelope	Vestibules are installed on all building entrances. Doors have self-closing devices.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Insulation	C402.2.6	Envelope	Slab edge insulation depth/length. Slab insulation extending away from building is covered by pavement or $\geq 10$ inches of soil.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Plan Review	C103.2	Envelope	Plans and/or specifications provide all information with which compliance can be determined for the building envelope and document where exceptions to the standard are claimed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Plan Review	C103.2	Exterior Lighting	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the exterior lighting and electrical systems and equipment and document where exceptions to the standard are claimed. Information provided should include exterior lighting power calculations, wattage of bulbs and ballasts, transformers and control devices.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wattage	C405.6.2	Exterior Lighting	Exterior lighting power is consistent with what is shown on the approved lighting plans, demonstrating proposed watts are less than or equal to allowed watts.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Plan Review	C103.2	Interior Lighting	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the interior lighting and electrical systems and equipment and document where exceptions to the standard are claimed. Information provided should include interior lighting power calculations, wattage of bulbs and ballasts, transformers and control devices.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HVAC	C403.2.5.1	Mechanical	Demand control ventilation provided for spaces >500 ft <sup>2</sup> and >25 people/1000 ft <sup>2</sup> occupant density and served by systems with air side economizer, auto modulating outside air damper control, or design airflow >3,000 cfm.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HVAC	C403.2.4.3	Mechanical	Each zone equipped with setback controls using automatic time clock or programmable control system.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Plan Review	C103.2	Mechanical	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the mechanical systems and equipment and document where exceptions to the standard are claimed. Load calculations per acceptable engineering standards and handbooks.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Plan Review	C103.2	Mechanical	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the service water heating systems and equipment and document where exceptions to the standard are claimed. Hot water system sized per manufacturer's sizing guide.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C403.4.5	Mechanical	Zone controls can limit simultaneous heating and cooling and sequence heating and cooling to each zone.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C403.4.3.1	Mechanical	Three-pipe hydronic systems using a common return for hot and chilled water are not used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C403.4.3.2	Mechanical	Two-pipe hydronic systems using a common distribution system have controls to allow a deadband $\geq 15$ °F, allow operation in one mode for at least 4 hrs before changeover, and have reset controls to limit heating and cooling supply temperature to $\leq 30$ °F.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C403.4.3.3.1	Mechanical	Hydronic heat pump systems connected to a common water loop meet heat rejection and heat addition requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C408.2.2.2	Mechanical	HVAC hydronic heating and cooling coils have means to balance and have pressure test connections.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C403.4.2	Mechanical	VAV fan motors $\geq 7.5$ hp to be driven by variable speed drive, have a vane-axial fan with variable pitch blades, or have controls to limit fan motor demand.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C403.4.2.1	Mechanical	VAV fans have static pressure sensors positioned so setpoint $\leq 1/3$ total design pressure.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C403.4.2.2	Mechanical	Reset static pressure setpoint for DDC controlled VAV boxes reporting to central controller based on the zones requiring the most pressure.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C403.4.5.4	Mechanical	Multiple zone HVAC systems have supply air temperature reset controls.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C403.4.3.4	Mechanical	Hydronic systems greater than 300,000 Btu/h designed for variable fluid flow.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SYSTEM_SPECIFIC	C403.4.3.4	Mechanical	Temperature reset by representative building loads in pumping systems for chiller and boiler systems >300,000 Btu/h.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C403.4.4	Mechanical	Fan systems with motors >=7.5 hp associated with heat rejection equipment to have capability to operate at 2/3 of full-speed and auto speed controls to control the leaving fluid temperature or condensing temp/pressure of heat rejection device.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Plan Review	C406	Project	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the additional energy efficiency package options.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Plan Review	C402.3.2.2	Envelope	Skylights in office, storage, automotive service, manufacturing, non-refrigerated warehouse, retail store, and distribution/sorting area have a measured haze value > 90 percent unless designed to exclude direct sunlight.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>3. To be checked by Inspector</b>						
Air Leakage	C402.4.1,C402.4.2	Envelope	The building envelope contains a continuous air barrier that is sealed in an approved manner and either constructed or tested in an approved manner. Air barrier penetrations are sealed in an approved manner.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Air Leakage	C402.4.3,C402.4.4	Envelope	Factory-built fenestration and doors are labeled as meeting air leakage requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Air Leakage	C402.4.1.1	Envelope	All sources of air leakage in the building thermal envelope are sealed, caulked, gasketed, weather stripped or wrapped with moisture vapor-permeable wrapping material to minimize air leakage.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Air Leakage	C402.4.6	Envelope	Weatherseals installed on all loading dock cargo doors.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Air Leakage	C402.4.8	Envelope	Recessed luminaires in thermal envelope to limit infiltration and be IC rated and labeled. Seal between interior finish and luminaire housing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fenestration	C303.1.3	Envelope	Fenestration products rated in accordance with NFRC.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fenestration	C303.1.3	Envelope	Fenestration products are certified as to performance labels or certificates provided.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Insulation	C303.2	Envelope	Below-grade wall insulation installed per manufacturer's instructions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Insulation	C303.2	Envelope	Slab edge insulation installed per manufacturer's instructions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Insulation	C403.2.7,C408.2.8,(	Envelope	Exterior insulation protected against damage, sunlight, moisture, wind, landscaping and equipment maintenance activities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Insulation	C402.4.2.1	Envelope	Roof R-value. For some ceiling systems, verification may need to occur during Framing Inspection.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Insulation	C303.2	Envelope	Roof insulation installed per manufacturer's instructions. Blown or poured loose-fill insulation is installed only where the roof slope is <=3 in 12.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Insulation	C402.2.1	Envelope	Skylight curbs are insulated to the level of roofs with insulation above deck or R-5.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Insulation	C303.2	Envelope	Above-grade wall insulation installed per manufacturer's instructions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Insulation	C303.2	Envelope	Floor insulation installed per manufacturer's instructions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Insulation	C303.1	Envelope	Building envelope insulation is labeled with R-value or insulation certificate providing R-value and other relevant data.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Insulation	C303.2.1	Envelope	Exterior insulation is protected from damage with a protective material. Verification for exposed foundation insulation may need to occur during Foundation Inspection.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Insulation	C402.2.1	Envelope	Insulation intended to meet the roof insulation requirements cannot be installed on top of a suspended ceiling. Mark this requirement compliant if insulation is installed accordingly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Controls	C405.2.4	Exterior Lighting	Automatic lighting controls for exterior lighting installed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Controls	C405.2.2.1	Interior Lighting	Automatic controls to shut off all building lighting installed in all buildings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Controls	C405.2.1.1	Interior Lighting	Independent lighting controls installed per approved lighting plans and all manual controls readily accessible and visible to occupants.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Controls	C405.2.1.2	Interior Lighting	Lighting controls installed to uniformly reduce the lighting load by at least 50%.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Controls	C405.2.2.3	Interior Lighting	Daylight zones provided with individual controls that control the lights independent of general area lighting.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Controls	C405.2.3	Interior Lighting	Sleeping units have at least one master switch at the main entry door that controls wired luminaires and switched receptacles.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Controls	C405.2.2.2	Interior Lighting	Occupancy sensors installed in required spaces.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Controls	C405.2.2.3	Interior Lighting	Primary sidelighted areas are equipped with required lighting controls.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Controls	C405.2.2.3	Interior Lighting	Enclosed spaces with daylight area under skylights and rooftop monitors are equipped with required lighting controls.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Controls	C405.2.3	Interior Lighting	Separate lighting control devices for specific uses installed per approved lighting plans.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Controls	C405.3	Interior Lighting	Fluorescent luminaires within odd numbered lamp configurations that are with 10 feet center to center (if recess mounted) or are within 1 foot edge to edge (if pendant or surface mounted) shall be tandem wired.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wattage	C405.5.2	Interior Lighting	Interior installed lamp and fixture lighting power is consistent with what is shown on the approved lighting plans, demonstrating proposed watts are less than or equal to allowed watts.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HVAC	C403.2.4.5	Mechanical	Freeze protection and snow/ice melting system sensors for future connection to controls.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HVAC	C403.2.3	Mechanical	HVAC equipment efficiency verified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Air Leakage	C402.4.5.1	Envelope	Stair and elevator shaft vents have motorized dampers that automatically close.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Air Leakage	C402.4.5.2	Envelope	Outdoor air and exhaust systems have motorized dampers that automatically shut when not in use and meet maximum leakage rates. Check gravity dampers where allowed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HVAC	C403.2.8.1	Mechanical	Piping Insulation exposed to weather is protected from damage (due to sun, moisture, wind, etc.).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HVAC	C403.2.7	Mechanical	HVAC ducts and plenums insulated. Where ducts or plenums are installed in or under a slab, verification may need to occur during Foundation Inspection.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HVAC	C403.2.8	Mechanical	Thermally ineffective panel surfaces of sensible heating panels have insulation $\geq R-3.5$ .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HVAC	C403.2.7	Mechanical	Ducts and plenums sealed based on static pressure and location.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HVAC	C408.2.2.1	Mechanical	Air outlets and zone terminal devices have means for air balancing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HVAC	C403.2.11	Mechanical	Unenclosed spaces that are heated use only radiant heat.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HVAC	C403.2.4.1	Mechanical	Heating and cooling to each zone is controlled by a thermostat control.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HVAC	C403.2.4.2	Mechanical	Thermostatic controls have a 5 °F deadband.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

HVAC	C403.2.4.2	Mechanical	Temperature controls have setpoint overlap restrictions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HVAC	C403.2.4.3	Mechanical	Automatic Controls: Setback to 55 °F (heat) and 85 °F (cool); 7-day clock, 2-hour occupant override, 10-hour backup	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C404.3	Mechanical	Temperature controls installed on service water heating systems (110 °F for dwelling units and lavatories in public restrooms and 90 °F for other occupancies.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C404.4	Mechanical	Automatic time switches installed to automatically switch off the recirculating hot-water system or heat trace.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C404.2	Mechanical	Heat traps installed on non-circulating storage water tanks.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C403.2.3	Mechanical	PTAC and PTHP with sleeves 16 in. by 42 in. labeled for replacement only as per Footnote b to Table C403.2.3(3).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C403.4.2	Mechanical	VAV fan $\geq 7.5$ hp are driven by mechanical or electrical variable speed drive, or driven by vane-axial with variable speed blades, or operate with motor demand $\leq 30\%$ design kW at 50% design flow - calculations required	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C403.2.8	Mechanical	HVAC piping insulation thickness. Where piping is installed in or under a slab, verification may need to occur during Foundation Inspection.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C403.2.7.1.3	Mechanical	Ductwork operating $>3$ in. water column requires air leakage testing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C403.4.3.5	Mechanical	Reduce flow in pumping systems $>10$ hp to multiple chillers or boilers when others are shut down.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C403.4.3.3.3	Mechanical	Two-position automatic valve interlocked to shut off water flow when hydronic heat pump with pumping system $>10$ hp is off.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C403.4.6	Mechanical	Condenser heat recovery system that can heat water to 85 °F or provide 60% of peak heat rejection is installed for preheating of service hot water in 24/7 facility, water cooled systems reject $>6$ MMBtu, SHW load $\geq 1$ MMBtu.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C403.4.7	Mechanical	Hot gas bypass limited to: $\leq 240$ kBtu/h – 50% $>240$ kBtu/h – 25%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C403.2.4.2	Mechanical	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C403.2.4.3.3	Mechanical	Systems include optimum start controls.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C403.2.4.1.1	Mechanical	Heat pump controls prevent supplemental electric resistance heat from coming on when not needed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C404.3	Mechanical	Public lavatory faucet water temperature $\leq 110$ °F.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C404.5	Mechanical	All piping in circulating system insulated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C404.5	Mechanical	First 8 ft of outlet piping is insulated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C404.5	Mechanical	All heat traced or externally heated piping insulated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C404.6	Mechanical	Controls are installed that limit the operation of a recirculation pump installed to maintain temperature of a storage tank.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C404.7.1	Mechanical	Pool heaters are equipped with on/off switch and no continuously burning pilot light.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C404.7.3	Mechanical	Vapor retardant pool covers are provided for heated pools and permanently installed spas.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SYSTEM_SPECIFIC	C404.7.2	Mechanical	Time switches are installed on all pool heaters and pumps.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Testing	C408.2.3.2	Mechanical	HVAC control systems have been tested to ensure proper operation, calibration and adjustment of controls.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mandatory Additional	C406	Project	Efficient HVAC performance, efficient lighting system, or on-site supply of renewable energy consistent with what is shown the approved plans.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Insulation	C402.2.8	Project	Bottom surface of floor structures incorporating radiant heating insulated to $\geq R-3.5$ .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>4. To be checked by Inspector at Project Completion and Prior to Issuance of Certificate of Occupancy</b>						
Post Construction	C408.3	Exterior Lighting	Lighting systems have been tested to ensure proper calibration, adjustment, programming, and operation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Post Construction	C408.2.5.1	Interior Lighting	Furnished as-built drawings for electric power systems within 30 days of system acceptance.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Post Construction	C303.3,C408.2.5.2	Interior Lighting	Furnished O&M instructions for systems and equipment to the building owner or designated representative.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Post Construction	C408.3	Interior Lighting	Lighting systems have been tested to ensure proper calibration, adjustment, programming, and operation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Post Construction	C408.2.5.1	Mechanical	Furnished HVAC as-built drawings submitted within 90 days of system acceptance.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Post Construction	C303.3,C408.2.5.2	Mechanical	Furnished O&M manuals for HVAC systems within 90 days of system acceptance.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Post Construction	C408.2.5.3	Mechanical	An air and/or hydronic system balancing report is provided for HVAC systems.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Post Construction	C408.2.1	Mechanical	Commissioning plan developed by registered design professional or approved agency.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Post Construction	C408.2.4	Mechanical	Preliminary commissioning report completed and certified by registered design professional or approved agency.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Post Construction	C408.2.5.4	Mechanical	Final commissioning report due to building owner within 90 days of receipt of certificate of occupancy.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Post Construction	C408.2.3.1	Mechanical	HVAC equipment has been tested to ensure proper operation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Post Construction	C408.2.3.3	Mechanical	Economizers have been tested to ensure proper operation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

EnergyGauge Summit® v5.20  
**INPUT DATA REPORT**

**Project Information**

**Project Name:** 2801

**Orientation:** North

**Project Title:** Retail Remodel 2853 NW350

**Building Type:** Office

**Address:** sample only  
(entry is 350 degree face NE)

**Building Classification:** Renovation to existing building

**State:** Florida

**No.of Stories:** 1

**Zip:** 0

**GrossArea:** 3543 SF

**Owner:**

**Zones**

No	Acronym	Description	Type	Area [sf]	Multiplier	Total Area [sf]	
1	Pr0Zo1	Zone 1	CONDITIONED	900.0	1	900.0	<input type="checkbox"/>
2	Pr0Zo2	Zone 2	CONDITIONED	1953.0	1	1953.0	<input type="checkbox"/>
3	Pr0Zo3	Zone 3	UNCONDITIONED	690.0	1	690.0	<input type="checkbox"/>



## Spaces

No	Acronym	Description	Type	Depth [ft]	Width [ft]	Height [ft]	Multi plier	Total Area [sf]	Total Volume [cf]
<b>In Zone: Pr0Zo1</b>									
1	Pr0Zo1Sp1	GALLERY	Office - Open Plan	25.00	26.68	10.30	1	667.0	6870.1
2	Pr0Zo1Sp2	STORAGE	Storage & Warehouse - Bulky Active Storage	10.00	16.70	10.30	1	167.0	1720.1
3	Pr0Zo1Sp3	R R 1	Toilet and Washroom	10.00	6.60	10.30	1	66.0	679.8
<b>In Zone: Pr0Zo2</b>									
1	Pr0Zo2Sp1	ENTRY	Lobby (General) - Reception and Waiting	10.00	26.10	11.00	1	261.0	2871.0
2	Pr0Zo2Sp2	CONFERENCE	Conference/meeting (Multiple Functions)	10.00	20.70	11.00	1	207.0	2277.0
3	Pr0Zo2Sp3	OFFICE 1	Office - Open Plan	10.00	12.20	11.00	1	122.0	1342.0
4	Pr0Zo2Sp4	OFFICE 2	Office - Open Plan	10.00	12.00	11.00	1	120.0	1320.0
5	Pr0Zo2Sp5	DENNIS OFFICE	Office - Enclosed	10.00	24.30	9.00	1	243.0	2187.0
6	Pr0Zo2Sp6	FILES	Office - Open Plan	10.00	19.60	11.00	1	196.0	2156.0
7	Pr0Zo2Sp7	OPEN OFFICE 2	Office - Open Plan	25.00	18.76	11.00	1	469.0	5159.0
8	Pr0Zo2Sp8	R R 2	Toilet and Washroom	10.00	6.30	11.00	1	63.0	693.0
9	Pr0Zo2Sp9	OPEN OFFICE 1	Office - Open Plan	20.00	13.60	11.00	1	272.0	2992.0
<b>In Zone: Pr0Zo3</b>									
1	Pr0Zo3Sp1	unconditioned storage	Storage & Warehouse - Bulky Active Storage	25.00	27.60	11.00	1	690.0	7590.0

## Lighting

No	Type	Category	No. of Luminaires	Watts per Luminaire	Power [W]	Control Type	No. of Ctrl pts
<b>In Zone: Pr0Zo1</b>							
<b>In Space: Pr0Zo1Sp1</b>							

1	Recessed Fluorescent - No vent	General Lighting	8	80	640	Manual On/Off	2	<input type="checkbox"/>
<b>In Space: Pr0Zo1Sp2</b>								
1	Recessed Fluorescent - No vent	General Lighting	2	60	120	Manual On/Off	1	<input type="checkbox"/>
<b>In Space: Pr0Zo1Sp3</b>								
1	Incandescent	General Lighting	1	60	60	Manual On/Off	1	<input type="checkbox"/>
<b>In Zone: Pr0Zo2</b>								
<b>In Space: Pr0Zo2Sp1</b>								
1	Suspended Fluorescent	General Lighting	3	80	240	Manual On/Off	1	<input type="checkbox"/>
<b>In Space: Pr0Zo2Sp2</b>								
1	Suspended Fluorescent	General Lighting	3	80	240	Manual On/Off	1	<input type="checkbox"/>
<b>In Space: Pr0Zo2Sp3</b>								
1	Suspended Fluorescent	General Lighting	2	60	120	Manual On/Off	1	<input type="checkbox"/>
<b>In Space: Pr0Zo2Sp4</b>								
1	Suspended Fluorescent	General Lighting	2	60	120	Manual On/Off	1	<input type="checkbox"/>
<b>In Space: Pr0Zo2Sp5</b>								
1	Recessed Fluorescent - No vent	General Lighting	3	80	240	Manual On/Off	1	<input type="checkbox"/>
<b>In Space: Pr0Zo2Sp6</b>								
1	Suspended Fluorescent	General Lighting	2	80	160	Manual On/Off	1	<input type="checkbox"/>
<b>In Space: Pr0Zo2Sp7</b>								
1	Suspended Fluorescent	General Lighting	5	80	400	Manual On/Off	1	<input type="checkbox"/>
<b>In Space: Pr0Zo2Sp8</b>								
1	Incandescent	General Lighting	1	60	60	Manual On/Off	1	<input type="checkbox"/>
<b>In Space: Pr0Zo2Sp9</b>								
1	Suspended Fluorescent	General Lighting	3	80	240	Manual On/Off	1	<input type="checkbox"/>
<b>In Zone: Pr0Zo3</b>								
<b>In Space: Pr0Zo3Sp1</b>								
1	Recessed Fluorescent - No vent	General Lighting	6	80	480	Manual On/Off	1	<input type="checkbox"/>

## Walls

No	Description	Type	Width [ft]	H (Effec) [ft]	Multi plier	Area [sf]	Orientation	Conductance [Btu/hr. sf. F]	Heat Capacity [Btu/sf.F]	Dens. [lb/cf]	R-Value [h.sf.F/Btu]	
<b>In Zone: Pr0Zo1</b>												
1	S Exterior	Block + R-4 Insulation + GWB	45.00	11.00	1	495.0	South	0.1857	5.515	37.58	5.4	
2	NW Exterior	Block + R-4 Insulation + GWB	22.00	11.00	1	242.0	North	0.1857	5.515	37.58	5.4	
3	E Partition	Partition GWB + R-11 Insulation + GWB	20.00	11.00	1	220.0	East	0.0774	0.848	13.11	12.9	
4	S Partition	Partition GWB + R-11 Insulation + GWB	8.00	11.00	1	88.0	South	0.0774	0.848	13.11	12.9	
<b>In Zone: Pr0Zo2</b>												
1	NW Exterior	Block + R-4 Insulation + GWB	27.00	11.00	1	297.0	North	0.1857	5.515	37.58	5.4	
2	N Exterior	Block + R-4 Insulation + GWB	78.33	11.00	1	861.6	North	0.1857	5.515	37.58	5.4	
3	SE Exterior	Block + R-4 Insulation + GWB	27.00	11.00	1	297.0	East-SouthEast	0.1857	5.515	37.58	5.4	
4	S Partition	Block + R-4 Insulation + GWB	34.00	11.00	1	374.0	South	0.1857	5.515	37.58	5.4	
<b>In Zone: Pr0Zo3</b>												
1	SE Exterior	Block + R-4 Insulation + GWB	24.00	11.00	1	264.0	East-SouthEast	0.1857	5.515	37.58	5.4	
2	SE Exterior	Block + R-4 Insulation + GWB	7.00	11.00	1	77.0	South	0.1857	5.515	37.58	5.4	
3	S Exterior	Block + R-4 Insulation + GWB	26.33	11.00	1	289.6	South	0.1857	5.515	37.58	5.4	

## Windows

No	Description	Shaded	U [Btu/hr sf F]	SHGC	Vis.Tra	W [ft]	H (Effec) [ft]	Multi plier	Total Area [sf]
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<b>In Zone: Pr0Zo1</b>												
<b>In Wall: Pr0Zo1Wa1</b>												
	1	S Glass	South	No	1.0700	0.78	0.75	6.00	2.00	1	12.0	<input type="checkbox"/>
<b>In Wall: Pr0Zo1Wa2</b>												
	1	NW Glass	North	No	1.0700	0.78	0.75	4.50	6.67	2	60.0	<input type="checkbox"/>
	2	NW Glass (over)	North	No	1.0700	0.78	0.75	3.00	2.66	1	8.0	<input type="checkbox"/>
	3	NW Glass Entry	North	No	1.0700	0.78	0.75	3.00	6.67	1	20.0	<input type="checkbox"/>
<b>In Zone: Pr0Zo2</b>												
<b>In Wall: Pr0Zo2Wa1</b>												
	1	NW Glass	North	No	1.0700	0.78	0.75	8.50	6.67	2	113.4	<input type="checkbox"/>
	2	NW Glass upper	North	No	1.0700	0.78	0.75	3.00	2.66	1	8.0	<input type="checkbox"/>
	3	NW Glass Entry	North	No	1.0700	0.78	0.75	3.00	6.67	1	20.0	<input type="checkbox"/>
<b>In Zone: Pr0Zo3</b>												
<b>In Wall: Pr0Zo3Wa3</b>												
	1	S Glass	South	No	1.0700	0.78	0.75	4.00	2.00	2	16.0	<input type="checkbox"/>

## Doors

No	Description	Type	Shaded?	Width [ft]	H (Effec) [ft]	Multi plier	Area [sf]	Cond. [Btu/hr. sf. F]	Dens. [lb/cf]	Heat Cap. [Btu/sf. F]	R-Value [h.sf.F/Btu]	
<b>In Zone: Pr0Zo1</b>												
<b>In Wall: Pr0Zo1Wa1</b>												
	1	S Door	No	6.00	6.67	1	40.0	0.4982	0.00	0.00	2.01	<input type="checkbox"/>
		Polystyrene core (18 ga steel)										
<b>In Zone: Pr0Zo2</b>												
<b>In Wall: Pr0Zo2Wa4</b>												
	1	S Door	No	3.00	6.67	1	20.0	0.4982	0.00	0.00	2.01	<input type="checkbox"/>
		Polystyrene core (18 ga steel)										
<b>In Zone: Pr0Zo3</b>												
<b>In Wall: Pr0Zo3Wa1</b>												
	1	Garage door	No	12.00	9.00	1	108.0	0.1919	43.67	0.53	5.21	<input type="checkbox"/>
<b>In Wall: Pr0Zo3Wa2</b>												
	1	SE Door	No	3.00	6.67	1	20.0	0.4982	0.00	0.00	2.01	<input type="checkbox"/>
		Polystyrene core (18 ga steel)										

## Roofs

No	Description	Type	Width [ft]	H (Effec) [ft]	Multiplier	Area [sf]	Tilt [deg]	Cond. [Btu/hr. Sf. F]	Heat Cap. Dens. [Btu/sf. F]	Dens. [lb/cf]	R-Value [h.s.f.F/Btu]	
<b>In Zone: Pr0Zo1</b>												
1	Roof 1	BUR + R-19 Insulation + ACT or Open	36.00	25.00	1	900.0	0.00	0.0424	1.65	9.44	23.6	
<b>In Zone: Pr0Zo2</b>												
1	Roof 2	BUR + R-19 Insulation + ACT or Open	78.12	25.00	1	1953.0	0.00	0.0424	1.65	9.44	23.6	
<b>In Zone: Pr0Zo3</b>												
1	Roof 3	BUR + R-19 Insulation + ACT or Open	27.60	25.00	1	690.0	0.00	0.0424	1.65	9.44	23.6	

## Skylights

No	Description	Type	U [Btu/hr sf F]	SHGC	Vis.Trans	W [ft]	H (Effec) [ft]	Multiplier	Area [Sf]	Total Area [Sf]
<b>In Zone:</b>										
<b>In Roof:</b>										
										<input type="checkbox"/>

## Floors

No	Description	Type	Width [ft]	H (Effec) [ft]	Multiplier	Area [sf]	Cond. [Btu/hr. sf. F]	Heat Cap. Dens. [Btu/sf. F]	Dens. [lb/cf]	R-Value [h.s.f.F/Btu]
<b>In Zone: Pr0Zo1</b>										
1	Floor 1	Slab on Grade	36.00	25.00	1	900.0	0.2488	2.66	40.00	4.02
<b>In Zone: Pr0Zo2</b>										
1	Floor 2	Slab on Grade	78.12	25.00	1	1953.0	0.2488	2.66	40.00	4.02
<b>In Zone: Pr0Zo3</b>										

1	Floor 3	Slab on Grade	27.60	25.00	1	690.0	0.2488	2.66	40.00	4.02	<input type="checkbox"/>
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## Systems

Pr0Sy1		System 1	Constant Volume Air Cooled Split System < 65000 Btu/hr					No. Of Units	1
Component	Category	Capacity	Efficiency	IPLV					
1	Cooling System	35800.00	14.00					<input type="checkbox"/>	
2	Heating System	26200.00	1.00					<input type="checkbox"/>	
3	Air Handling System - Supply	1200.00	0.13					<input type="checkbox"/>	
4	Air Handling System - Return	1200.00	0.13					<input type="checkbox"/>	
5	Air Distribution System (Sup)		6.00					<input type="checkbox"/>	
6	Air Distribution System (Ret)		6.00					<input type="checkbox"/>	

Pr0Sy2		System 2	Constant Volume Air Cooled Split System < 65000 Btu/hr					No. Of Units	1
Component	Category	Capacity	Efficiency	IPLV					
1	Cooling System	56000.00	14.00					<input type="checkbox"/>	
2	Heating System	34120.00	1.00					<input type="checkbox"/>	
3	Air Handling System - Supply	1800.00	0.23					<input type="checkbox"/>	
4	Air Handling System - Return	1800.00	0.23					<input type="checkbox"/>	
5	Air Distribution System (Sup)		6.00					<input type="checkbox"/>	
6	Air Distribution System (Ret)		6.00					<input type="checkbox"/>	

## Plant

Equipment	Category	Size	Inst.No	Eff.	IPLV
					<input type="checkbox"/>

## Water Heaters

W-Heater Description	CapacityCap.Unit	I/P Rt.	Efficiency	Loss

--

### Ext-Lighting

Description	Category	No. of Luminaires	Watts per Luminaire	Area/Len/No. of units [sf/ft/No]	Control Type	Wattage [W]
1 Ext Light 1	Main entries	1	60	6.00	Photo Sensor control	60.00
2 Ext Light 2	Other (doors) than main entries	1	60	3.00	Photo Sensor control	60.00
3 Ext Light 3	Internally illuminated exit signs	3	3	2.00	Other Independent Cont	9.00

### Piping

No	Type	Operating Temperature [F]	Insulation Conductivity [ Btu-in/h.sf.F]	Nomonal pipe Diameter [in]	Insulation Thickness [in]	Is Runout?
						<input type="checkbox"/>

### Fenestration Used

Name	Glass Type	No. of Panes	Glass Conductance [Btu/h.sf.F]	SHGC	VLT	
ApLbWnd1	User Defined	1	1.0700	0.7800	0.7500	<input type="checkbox"/>

### Materials Used

Mat No	Acronym	Description	Only R-Value Used	RValue [h.sf.F/Btu]	Thickness [ft]	Conductivity [Btu/h.ft.F]	Density [lb/cf]	SpecificHeat [Btu/lb.F]

1003	ApLbMat1003	4 in. Lightweight concrete	No	3.3300	0.3330	0.1000	40.00	0.2000	<input type="checkbox"/>
1005	ApLbMat1005	8 in. Lightweight concrete block	No	2.0212	0.6670	0.3300	38.00	0.2000	<input type="checkbox"/>
1009	ApLbMat1009	PLYWOOD, 3/4IN	No	0.9470	0.0625	0.0660	34.00	0.2900	<input type="checkbox"/>
1014	ApLbMat1014	BUILT-UP ROOFING, 3/8IN	No	0.3366	0.0313	0.0930	70.00	0.3500	<input type="checkbox"/>
1015	ApLbMat1015	GYP OR PLAS BOARD, 1/2IN	No	0.4533	0.0417	0.0920	50.00	0.2000	<input type="checkbox"/>
1025	ApLbMat1025	ACOUSTIC TILE, 1/2IN	No	1.2636	0.0417	0.0330	18.00	0.3200	<input type="checkbox"/>
1044	ApLbMat1044	0.3 in. Insulation	No	1.0000	0.0250	0.0250	5.70	0.2000	<input type="checkbox"/>
1045	ApLbMat1045	Outside surface resistance	Yes	0.3300					<input type="checkbox"/>
1046	ApLbMat1046	Inside surface resistance	Yes	0.6900					<input type="checkbox"/>
1047	ApLbMat1047	AIR LAYER, 3/4IN TO 4IN, VERT. WALLS	Yes	0.8900					<input type="checkbox"/>
1048	ApLbMat1048	Ceiling air space	Yes	1.0000					<input type="checkbox"/>
1055	ApLbMat1055	R-11 Generic Insulation	No	11.0000	0.2401	0.0218	0.30	0.2000	<input type="checkbox"/>
1058	ApLbMat1058	R-19 Generic Insulation	No	19.0000	0.4147	0.0218	0.30	0.2000	<input type="checkbox"/>

## Constructs Used

No	Name	Simple Construct	Massless Construct	Conductance [Btu/h.sf.F]	Heat Capacity [Btu/sf.F]	Density [lb/cf]	RValue [h.sf.F/Btu]
1041	Slab on Grade	No	No	0.25	2.66	40.00	4.0

Layer	Material No.	Material	Thickness [ft]	Framing Factor
1	1003	4 in. Lightweight concrete	0.3330	0.000
2	1046	Inside surface resistance		0.000



No	Name	Simple Construct	Massless Construct	Conductance [Btu/h.sf.F]	Heat Capacity [Btu/sf.F]	Density [lb/cf]	RValue [h.sf.F/Btu]
1045	Block + R-4 Insulation + GWB	No	No	0.19	5.51	37.58	5.4
Layer	Material No.	Material	Thickness [ft]	Framing Factor			
1	1045	Outside surface resistance		0.000			<input type="checkbox"/>
2	1005	8 in. Lightweight concrete block	0.6670	0.000			<input type="checkbox"/>
3	1047	AIR LAYER, 3/4IN TO 4IN, VERT. WALLS		0.000			<input type="checkbox"/>
4	1044	0.3 in. Insulation	0.0250	0.000			<input type="checkbox"/>
5	1015	GYP OR PLAS BOARD, 1/2IN	0.0417	0.000			<input type="checkbox"/>
6	1046	Inside surface resistance		0.000			<input type="checkbox"/>
No	Name	Simple Construct	Massless Construct	Conductance [Btu/h.sf.F]	Heat Capacity [Btu/sf.F]	Density [lb/cf]	RValue [h.sf.F/Btu]
1047	Polystyrene core (18 ga steel)	No	Yes	0.50			2.0
Layer	Material No.	Material	Thickness [ft]	Framing Factor			
1	284	Polystyrene core (18 ga steel) 1		0.000			<input type="checkbox"/>

No	Name	Simple Construct	Massless Construct	Conductance [Btu/h.sf.F]	Heat Capacity [Btu/sf.F]	Density [lb/cf]	RValue [h.sf.F/Btu]
1051	BUR + R-19 Insulation + ACT or Open	No	No	0.04	1.65	9.44	23.6
							<input type="checkbox"/>
Layer	Material No.	Material	Thickness [ft]	Framing Factor			
1	1045	Outside surface resistance		0.000			<input type="checkbox"/>
2	1014	BUILT-UP ROOFING, 3/8IN	0.0313	0.000			<input type="checkbox"/>
3	1009	PLYWOOD, 3/4IN	0.0625	0.000			<input type="checkbox"/>
4	1058	R-19 Generic Insulation	0.4147	0.000			<input type="checkbox"/>
5	1048	Ceiling air space		0.000			<input type="checkbox"/>
6	1025	ACOUSTIC TILE, 1/2IN	0.0417	0.000			<input type="checkbox"/>
7	1046	Inside surface resistance		0.000			<input type="checkbox"/>
No	Name	Simple Construct	Massless Construct	Conductance [Btu/h.sf.F]	Heat Capacity [Btu/sf.F]	Density [lb/cf]	RValue [h.sf.F/Btu]
1053	Partition GWB + R-11 Insulation + GWB	No	No	0.08	0.85	13.11	12.9
							<input type="checkbox"/>
Layer	Material No.	Material	Thickness [ft]	Framing Factor			
1	1045	Outside surface resistance		0.000			<input type="checkbox"/>
2	1015	GYP OR PLAS BOARD, 1/2IN	0.0417	0.000			<input type="checkbox"/>
3	1055	R-11 Generic Insulation	0.2401	0.000			<input type="checkbox"/>
4	1015	GYP OR PLAS BOARD, 1/2IN	0.0417	0.000			<input type="checkbox"/>
5	1046	Inside surface resistance		0.000			<input type="checkbox"/>

No	Name	Simple Construct	Massless Construct	Conductance [Btu/h.sf.F]	Heat Capacity [Btu/sf.F]	Density [lb/cf]	RValue [h.sf.F/Btu]
1056	Roll Up Door	Yes	No	0.19	0.53	43.67	5.2
							<input type="checkbox"/>



## Project Report

### General Project Information

Project Title: Sample Retail Remodel 2853 NW350  
 Project Date: Thursday, July 21, 2016  
 Project Comment: Existing Envelope / Interior Remodel  
 Company Name: HVAC Designs Inc  
 Company Representative: Neil Fimbel  
 Company Address: 7701 W Hanna Ave  
 Company City: Tampa FL 33615  
 Company Phone: (813) 885-2258  
 Company E-Mail Address: neil@hvacdsgns.com  
 Company Website: http://www.hvacdsgns.com/

### Design Data

Reference City: Pinellas County, Florida  
 Building Orientation: Front Door (350) faces Northwest  
 Daily Temperature Range: Medium  
 Latitude: 28 Degrees  
 Elevation: 11 ft.  
 Altitude Factor: 1.000

	Outdoor Dry Bulb	Outdoor Wet Bulb	Outdoor Rel.Hum	Indoor Rel.Hum	Indoor Dry Bulb	Grains Difference
Winter:	47	44.1	n/a	n/a	72	n/a
Summer:	93	79	54%	55%	75	56

### Check Figures

Total Building Supply CFM:	3,000	CFM Per Square ft.:	1.051
Square ft. of Room Area:	2,853	Square ft. Per Ton:	415
Volume (ft <sup>3</sup> ) of Cond. Space:	29,729	Air Turnover Rate (per hour):	6.1

### Building Loads

Total Heating Required Including Ventilation Air:	37,465 Btuh	37.465 MBH
Total Sensible Gain:	61,810 Btuh	80 %
Total Latent Gain:	15,890 Btuh	20 %
Total Cooling Required Including Ventilation Air:	77,700 Btuh	6.87 Tons (Based On 75% Sensible Capacity)

### Notes

Rhvac is an ACCA approved Manual J and Manual D computer program.  
 Calculations are performed per ACCA Manual J 8th Edition, Version 2, and ACCA Manual D.  
 All computed results are estimates as building use and weather may vary.  
 Be sure to select a unit that meets both sensible and latent loads according to the manufacturer's performance data at your design conditions.



**Manual D Ductsize Data - Duct System 1 - Supply**

---Duct Name, etc.				
Type	Roughness	Diameter	Velocity	SPL.Duct
Upstream	Temperature	Width	Loss/100	SPL.Fit
Shape	Length	Height	Fit,Eq.Len	SPL.Tot
Sizing	CFM	Area	SP.Avail	SPL.Cumul
---Duct Name: SMT-100, Feeds Into: Unconditioned Storage, Fitting: 1-A, Effective Length: 33.3				
Trunk	0.003	16.4	758	0.006
Up: Fan	57	12	0.078	0.020
Rect	8.0	19	25.3	0.186
Schedule	1,200	41.3	0.136	0.284
---Duct Name: SR-130, Supplies: Gallery, Fittings: 11-B, 11-B, 11-B, 4-AA, 11-B, Effective Length: 27.7				
Runout	0.01	9	595	0.006
Up: ST-110	57	7	0.129	0.030
Rnd	4.4	9.8	23.3	0.036
Schedule	263	10.4	0.004	0.416
---Duct Name: SR-140, Supplies: Gallery, Fittings: 11-B, 11-B, 4-AA, 11-B, Effective Length: 30.4				
Runout	0.01	9	595	0.012
Up: ST-110	57	7	0.129	0.028
Rnd	9.0	9.8	21.4	0.039
Schedule	263	21.2	0.000	0.420
---Duct Name: SR-110, Supplies: Gallery, Fittings: 11-B, 11-B, 4-AA, Effective Length: 38.5				
Runout	0.01	9	595	0.028
Up: SMT-100	57	7	0.129	0.021
Rnd	21.9	9.8	16.6	0.050
Schedule	263	51.6	0.086	0.334
---Duct Name: SR-150, Supplies: Gallery, Fittings: 11-B, 11-B, 4-AA, 11-B, Effective Length: 46.1				
Runout	0.01	9	595	0.029
Up: SMT-100	57	7	0.129	0.030
Rnd	22.6	9.8	23.5	0.060
Schedule	263	53.1	0.076	0.343
---Duct Name: SR-120, Supplies: Storage, Fittings: 11-B, 11-B, 4-AA, Effective Length: 18.8				
Runout	0.01	6	555	0.017
Up: SMT-100	57	4.7	0.196	0.020
Rnd	8.7	6.6	10.1	0.037
Schedule	109	13.7	0.099	0.321
---Duct Name: SR-100, Supplies: R R 1, Fittings: 11-B, 11-B, 11-B, 4-AA, 11-B, Effective Length: 16.1				
Runout	0.01	4	447	0.017
Up: SMT-100	57	3.1	0.226	0.019
Rnd	7.7	4.4	8.4	0.036
Schedule	39	8.1	0.100	0.320
---Duct Name: ST-110, Feeds Into: Gallery, Fittings: 11-B, 11-B, 11-B, 11-A, Effective Length: 87.2				
Trunk	0.01	12	670	0.039
Up: SMT-100	57	8.8	0.111	0.058
Rnd	34.8	14	52.4	0.097
Schedule	526	109.4	0.039	0.381

Report Units: Pressure: in.wg, Duct lengths: feet, Duct sizes: inch, Airflow: CFM, Velocity: ft./min, Temperature: F

Notes: Static pressure available values for return ducts are at the entrance of the duct. For supply, they are at the exit. The cumulative static pressure loss value for a return trunk is with respect to the entry point of the return runout upstream with the highest static pressure available. Total and cumulative static pressure loss values for the supply main trunk include any device pressure losses entered, and the cumulative may also include the total static pressure loss of the return side.

**Summary**

Number of active trunks: 2



## Manual D Ductsize Data - Duct System 1 - Supply (cont'd)

### Summary

Number of active runouts:	6	
Total runout outlet airflow:	1,200	
Main trunk airflow:	1,200	
Largest trunk diameter:	16.4	SMT-100
Largest runout diameter:	9	SR-130
Smallest trunk diameter:	12	ST-110
Smallest runout diameter:	4	SR-100
Supply fan external static pressure:	0.420	
Supply fan device pressure losses:	0.160	
Supply fan static pressure available:	0.260	
Runout maximum cumulative static pressure loss:	0.420	SR-140
Return loss added to supply:	0.098	
Total effective length of return ( ft.):	81.4	RR-100
Total effective length of supply ( ft.):	151.0	SR-140
Overall total effective length ( ft.):	232.4	RR-100 to SR-140
Design overall friction rate per 100 ft.:	0.112	(Available SP x 100 / TEL)
System duct surface area (Scenario 1):	267.4	In Bldg Envelope (Linked to duct load)
System duct surface area (Scenario 2):	41.3	Enclosed Storage (Linked to duct load)
Total system duct surface area:	308.7	



**Manual D Ductsize Data - Duct System 2 - Supply**

---Duct Name, etc.				
Type	Roughness	Diameter	Velocity	SPL.Duct
Upstream	Temperature	Width	Loss/100	SPL.Fit
Shape	Length	Height	Fit.Eq.Len	SPL.Tot
Sizing	CFM	Area	SP.Avail	SPL.Cumul
---Duct Name: SMT-120, Feeds Into: Open Office 2, Fitting: 1-A, Effective Length: 38.9				
Trunk	0.003	19.1	841	0.006
Up: Fan	57	14	0.079	0.024
Rect	8.0	22	30.9	0.191
Schedule	1,799	48	0.189	0.329
---Duct Name: ST-140, Feeds Into: Open Office 2, Fitting: 12-J1, Effective Length: 18.1				
Trunk	0.0003	12	700	0.007
Up: ST-130	57	9.7	0.064	0.005
Rnd	10.5	12.5	7.6	0.012
Schedule	550	33	0.103	0.415
---Duct Name: SR-160, Supplies: Files, Fittings: 8-A3, 8-A3, Effective Length: 42.4				
Runout	0.0003	8	370	0.007
Up: ST-160	57	6.2	0.033	0.007
Rnd	22.2	8.7	20.3	0.014
Schedule	129	46.4	0.087	0.431
---Duct Name: SR-170, Supplies: Open Office 2, Fittings: 9-I1, 8-A3, Effective Length: 55.5				
Runout	0.0003	8	679	0.005
Up: ST-160	57	6	0.100	0.050
Rnd	5.3	9.2	50.2	0.055
Schedule	237	11.2	0.046	0.472
---Duct Name: ST-150, Feeds Into: Dennis Office, Fitting: 9-I1, Effective Length: 40.3				
Trunk	0.0003	8	527	0.002
Up: ST-140	57	6.2	0.063	0.023
Rnd	3.3	8.7	37.0	0.025
Schedule	184	7	0.077	0.441
---Duct Name: ST-160, Feeds Into: Open Office 2, Effective Length: 3.8				
Trunk	0.0003	12	466	0.001
Up: ST-140	57	9.3	0.031	0.000
Rnd	3.8	13.1	0.0	0.001
Schedule	366	12	0.101	0.417
---Duct Name: SR-180, Supplies: Dennis Office, Fittings: 4-AA, 11-B, Effective Length: 16.3				
Runout	0.01	8	527	0.005
Up: ST-150	57	6.2	0.119	0.014
Rnd	4.5	8.7	11.8	0.019
Schedule	184	9.4	0.058	0.460
---Duct Name: ST-170, Feeds Into: Open Office 2, Fitting: 12-J1, Effective Length: 16.0				
Trunk	0.0003	16	895	0.003
Up: ST-130	57	12.7	0.071	0.008
Rnd	4.8	17.1	11.2	0.011
Schedule	1,249	20.2	0.103	0.415
---Duct Name: SR-190, Supplies: Entry, Fitting: 8-A3, Effective Length: 20.2				
Runout	0.0003	10	645	0.004
Up: ST-190	57	8	0.069	0.010
Rnd	5.3	10.6	14.9	0.014
Schedule	352	14	0.000	0.518



**Manual D Ductsize Data - Duct System 2 - Supply (cont'd)**

---Duct Name, etc.					
Type	Roughness	Diameter	Velocity	SPL.Duct	
Upstream	Temperature	Width	Loss/100	SPL.Fit	
Shape	Length	Height	Fit,Eq.Len	SPL.Tot	
Sizing	CFM	Area	SP.Avail	SPL.Cumul	
---Duct Name: SR-200, Supplies: Entry, Fitting: 8-A3, Effective Length: 19.6					
Runout	0.0003	10	645	0.003	
Up: ST-190	57	8	0.069	0.010	
Rnd	4.7	10.6	14.9	0.014	
Schedule	352	12.2	0.000	0.517	
---Duct Name: ST-180, Feeds Into: Conference, Fittings: 9-I1, 8-A3, Effective Length: 50.5					
Trunk	0.0003	8	467	0.002	
Up: ST-200	57	6.2	0.051	0.024	
Rnd	3.7	8.7	46.8	0.026	
Schedule	163	7.7	0.057	0.461	
---Duct Name: ST-190, Feeds Into: Entry, Fitting: 9-P, Effective Length: 68.3					
Trunk	0.0003	12	896	0.013	
Up: ST-200	57	8.9	0.101	0.056	
Rnd	13.2	13.8	55.1	0.069	
Schedule	704	41.4	0.014	0.504	
---Duct Name: SR-210, Supplies: Conference, Fittings: 11-B, 4-AA, Effective Length: 16.6					
Runout	0.01	8	467	0.005	
Up: ST-180	57	6.2	0.094	0.011	
Rnd	4.8	8.7	11.7	0.016	
Schedule	163	10.1	0.042	0.476	
---Duct Name: SR-220, Supplies: Open Office 1, Fittings: 9-I1, 8-A3, Effective Length: 50.4					
Runout	0.0003	8	410	0.002	
Up: ST-240	57	6.2	0.040	0.018	
Rnd	4.8	8.7	45.6	0.020	
Schedule	143	10.1	0.072	0.446	
---Duct Name: ST-200, Feeds Into: Open Office 1, Fitting: 12-J1, Effective Length: 13.0					
Trunk	0.0003	14	811	0.003	
Up: ST-240	57	11.1	0.069	0.007	
Rnd	3.7	14.9	9.4	0.009	
Schedule	867	13.4	0.083	0.435	
---Duct Name: ST-210, Feeds Into: R R 2, Fitting: 9-I1, Effective Length: 14.2					
Trunk	0.003	4	275	0.002	
Up: ST-230	57	3.1	0.061	0.006	
Rnd	3.8	4.4	10.4	0.009	
Schedule	24	4	0.090	0.428	
---Duct Name: ST-220, Feeds Into: Open Office 2, Effective Length: 3.3					
Trunk	0.0003	16	801	0.002	
Up: ST-230	57	12.4	0.058	0.000	
Rnd	3.3	17.5	0.0	0.002	
Schedule	1,118	14	0.097	0.421	
---Duct Name: SR-230, Supplies: R R 2, Fittings: 4-AA, 11-B, Effective Length: 9.8					
Runout	0.01	4	275	0.004	
Up: ST-210	57	3.1	0.087	0.005	
Rnd	4.7	4.4	5.2	0.009	
Schedule	24	4.9	0.081	0.436	





**Manual D Ductsize Data - Duct System 2 - Supply (cont'd)**

---Duct Name, etc.				
Type	Roughness	Diameter	Velocity	SPL.Duct
Upstream	Temperature	Width	Loss/100	SPL.Fit
Shape	Length	Height	Fit,Eq.Len	SPL.Tot
Sizing	CFM	Area	SP.Avail	SPL.Cumul
---Duct Name: SR-240, Supplies: Office 2, Fittings: 9-I1, 8-A3, Effective Length: 42.5				
Runout	0.0003	6	545	0.008
Up: ST-170	57	4.5	0.096	0.032
Rnd	8.8	6.8	33.7	0.041
Schedule	107	13.9	0.062	0.456
---Duct Name: ST-230, Feeds Into: Open Office 2, Effective Length: 6.8				
Trunk	0.0003	16	818	0.004
Up: ST-170	57	13.1	0.060	0.000
Rnd	6.8	16.5	0.0	0.004
Schedule	1,142	28.6	0.099	0.419
---Duct Name: SR-250, Supplies: Office 1, Fittings: 9-I1, 8-A3, Effective Length: 42.4				
Runout	0.0003	6	550	0.008
Up: ST-220	57	4.5	0.097	0.033
Rnd	8.7	6.8	33.7	0.041
Schedule	108	13.6	0.055	0.462
---Duct Name: ST-240, Feeds Into: Open Office 1, Effective Length: 10.3				
Trunk	0.0003	16	723	0.005
Up: ST-220	57	12.4	0.048	0.000
Rnd	10.3	17.5	0.0	0.005
Schedule	1,010	43.3	0.092	0.426
---Duct Name: ST-130, Feeds Into: Open Office 2, Fittings: 12-L1, 8-A3, 9-P, Effective Length: 161.3				
Trunk	0.0003	20	825	0.004
Up: SMT-120	57	15.5	0.046	0.071
Rnd	9.2	21.9	152.1	0.075
Schedule	1,799	48	0.114	0.404

Report Units: Pressure: in.wg, Duct lengths: feet, Duct sizes: inch, Airflow: CFM, Velocity: ft./min, Temperature: F

Notes: Static pressure available values for return ducts are at the entrance of the duct. For supply, they are at the exit. The cumulative static pressure loss value for a return trunk is with respect to the entry point of the return runout upstream with the highest static pressure available. Total and cumulative static pressure loss values for the supply main trunk include any device pressure losses entered, and the cumulative may also include the total static pressure loss of the return side.

Summary				
Number of active trunks:	13			
Number of active runouts:	10			
Total runout outlet airflow:	1,799			
Main trunk airflow:	1,799			
Largest trunk diameter:	20	ST-130		
Largest runout diameter:	10	SR-190		
Smallest trunk diameter:	4	ST-210		
Smallest runout diameter:	4	SR-230		
Supply fan external static pressure:	0.518			
Supply fan device pressure losses:	0.160			
Supply fan static pressure available:	0.358			
Runout maximum cumulative static pressure loss:	0.518	SR-190		
Return loss added to supply:	0.138			
Total effective length of return ( ft.):	197.0	RR-150		
Total effective length of supply ( ft.):	338.2	SR-190		
Overall total effective length ( ft.):	535.2	RR-150 to SR-190		
Design overall friction rate per 100 ft.:	0.067	(Available SP x 100 / TEL)		



**Manual D Ductsize Data - Duct System 2 - Supply (cont'd)**

**Summary**

System duct surface area (Scenario 1):	418.5	In Bldg Envelope	(Linked to duct load)
System duct surface area (Scenario 4):	48	Exposed in Space	(Linked to duct load)
Total system duct surface area:	466.5		



**Manual D Ductsize Data - Duct System 1 - Return**

---Duct Name, etc.				
Type	Roughness	Diameter	Velocity	SPL.Duct
Upstream	Temperature	Width	Loss/100	SPL.Fit
Shape	Length	Height	Fit.Eq.Len	SPL.Tot
Sizing	CFM	Area	SP.Avail	SPL.Cumul
---Duct Name: RMT-100, Feeds From: Unconditioned Storage, Fitting: 5-B, Effective Length: 63.6				
Trunk	0.003	17.3	686	0.006
Up: Fan	75	18	0.057	0.031
Rect	10.0	14	53.6	0.036
Schedule	1,200	53.3	-0.061	0.098
---Duct Name: RR-100, Returns From: Storage, Fittings: 11-B, 11-B, 6-N, 11-B, Effective Length: 17.8				
Runout	0.01	5	660	0.032
Up: RMT-100	75	3.9	0.345	0.029
Rnd	9.4	5.5	8.4	0.061
Schedule	90	12.3	0.000	0.061
---Duct Name: RR-110, Returns From: Gallery, Fittings: 11-B, 11-B, 11-B, 11-B, 6-N, 11-B, Effective Length: 53.4				
Runout	0.01	12	662	0.017
Up: RMT-100	75	8.9	0.105	0.039
Rnd	16.3	13.8	37.1	0.056
Schedule	520	51.1	-0.005	0.056
---Duct Name: RR-120, Returns From: Gallery, Fittings: 11-B, 11-B, 11-B, 11-B, 6-N, 11-B, Effective Length: 49.9				
Runout	0.01	12	662	0.022
Up: RMT-100	75	8.9	0.105	0.031
Rnd	20.7	13.8	29.1	0.052
Schedule	520	65.1	-0.009	0.052
---Duct Name: V/A, Returns From: Unconditioned Storage, Fittings: 11-B, 6-N, 11-B, Effective Length: 18.3				
Runout	0.01	6	357	0.008
Up: RMT-100	75	4.7	0.079	0.007
Rnd	9.6	6.6	8.7	0.015
Schedule	70	15.1	-0.047	0.015

Report Units: Pressure: in.wg, Duct lengths: feet, Duct sizes: inch, Airflow: CFM, Velocity: ft./min, Temperature: F

Notes: Static pressure available values for return ducts are at the entrance of the duct. For supply, they are at the exit. The cumulative static pressure loss value for a return trunk is with respect to the entry point of the return runout upstream with the highest static pressure available. Total and cumulative static pressure loss values for the supply main trunk include any device pressure losses entered, and the cumulative may also include the total static pressure loss of the return side.

Summary			
Number of active trunks:	1		
Number of active runouts:	4		
Total runout outlet airflow:	1,200		
Main trunk airflow:	1,200		
Largest trunk diameter:	17.3	RMT-100	
Largest runout diameter:	12	RR-110	
Smallest trunk diameter:	17.3	RMT-100	
Smallest runout diameter:	5	RR-100	
Runout maximum cumulative static pressure loss:	0.061	RR-100	
Return loss added to supply:	0.098		
Total effective length of return ( ft.):	81.4	RR-100	
System duct surface area (Scenario 1):	143.6	In Bldg Envelope	(Linked to duct load)
System duct surface area (Scenario 2):	53.3	Enclosed Storage	(Linked to duct load)
Total system duct surface area:	196.9		



**Manual D Ductsize Data - Duct System 2 - Return**

---Duct Name, etc.				
Type	Roughness	Diameter	Velocity	SPL.Duct
Upstream	Temperature	Width	Loss/100	SPL.Fit
Shape	Length	Height	Fit,Eq.Len	SPL.Tot
Sizing	CFM	Area	SP.Avail	SPL.Cumul
---Duct Name: RMT-110, Feeds From: Open Office 2, Fitting: 5-B, Effective Length: 81.8				
Trunk	0.003	22	635	0.004
Up: Fan	75	24	0.037	0.026
Rect	10.0	17	71.8	0.030
Schedule	1,800	68.3	-0.108	0.138
---Duct Name: RR-130, Returns From: Open Office 2, Fitting: 2-D, Effective Length: 44.0				
Runout	0.003	20	598	0.000
Up: RMT-110	75	15.5	0.032	0.014
Rnd	0.5	21.9	43.5	0.014
Schedule	1,305	2.6	-0.094	0.014
---Duct Name: RR-140, Returns From: Dennis Office, Fittings: 11-B, 11-B, 11-B, 6-N, 11-B, Effective Length: 17.7				
Runout	0.01	8	501	0.006
Up: RT-120	75	6.2	0.105	0.013
Rnd	5.3	8.7	12.4	0.019
Schedule	175	11.1	-0.023	0.019
---Duct Name: RR-150, Returns From: Conference, Fittings: 11-B, 11-B, 11-B, 6-N, 11-B, Effective Length: 54.0				
Runout	0.01	8	430	0.027
Up: RT-120	75	6.2	0.077	0.015
Rnd	34.9	8.7	19.1	0.042
Schedule	150	73.2	0.000	0.042
---Duct Name: RT-120, Feeds From: Dennis Office, Fittings: 11-B, 11-B, 11-A, 11-B, Effective Length: 61.1				
Trunk	0.01	10	596	0.019
Up: RMT-110	75	7.8	0.109	0.047
Rnd	17.6	10.9	43.5	0.066
Schedule	325	46	-0.042	0.072
---Duct Name: V/A, Returns From: Open Office 2, Fittings: 11-B, 11-B, 11-B, 6-N, 11-B, Effective Length: 36.3				
Runout	0.01	7	636	0.051
Up: RMT-110	75	5.4	0.201	0.022
Rnd	25.2	7.7	11.1	0.073
Schedule	170	46.3	-0.035	0.073

Report Units: Pressure: in.wg, Duct lengths: feet, Duct sizes: inch, Airflow: CFM, Velocity: ft./min, Temperature: F

Notes: Static pressure available values for return ducts are at the entrance of the duct. For supply, they are at the exit. The cumulative static pressure loss value for a return trunk is with respect to the entry point of the return runout upstream with the highest static pressure available. Total and cumulative static pressure loss values for the supply main trunk include any device pressure losses entered, and the cumulative may also include the total static pressure loss of the return side.

Summary		
Number of active trunks:	2	
Number of active runouts:	4	
Total runout outlet airflow:	1,800	
Main trunk airflow:	1,800	
Largest trunk diameter:	22	RMT-110
Largest runout diameter:	20	RR-130
Smallest trunk diameter:	10	RT-120
Smallest runout diameter:	7	V/A
Runout maximum cumulative static pressure loss:	0.042	RR-150
Return loss added to supply:	0.138	



### Manual D Ductsize Data - Duct System 2 - Return (cont'd)

#### Summary

Total effective length of return ( ft.):	197.0	RR-150	
System duct surface area (Scenario 1):	176.5	In Bldg Envelope	(Linked to duct load)
System duct surface area (Scenario 4):	71	Exposed in Space	(Linked to duct load)
Total system duct surface area:	247.5		

#### Notes

Rhvac is an ACCA approved Manual J and Manual D computer program.

Calculations are performed per ACCA Manual J 8th Edition, Version 2, and ACCA Manual D.

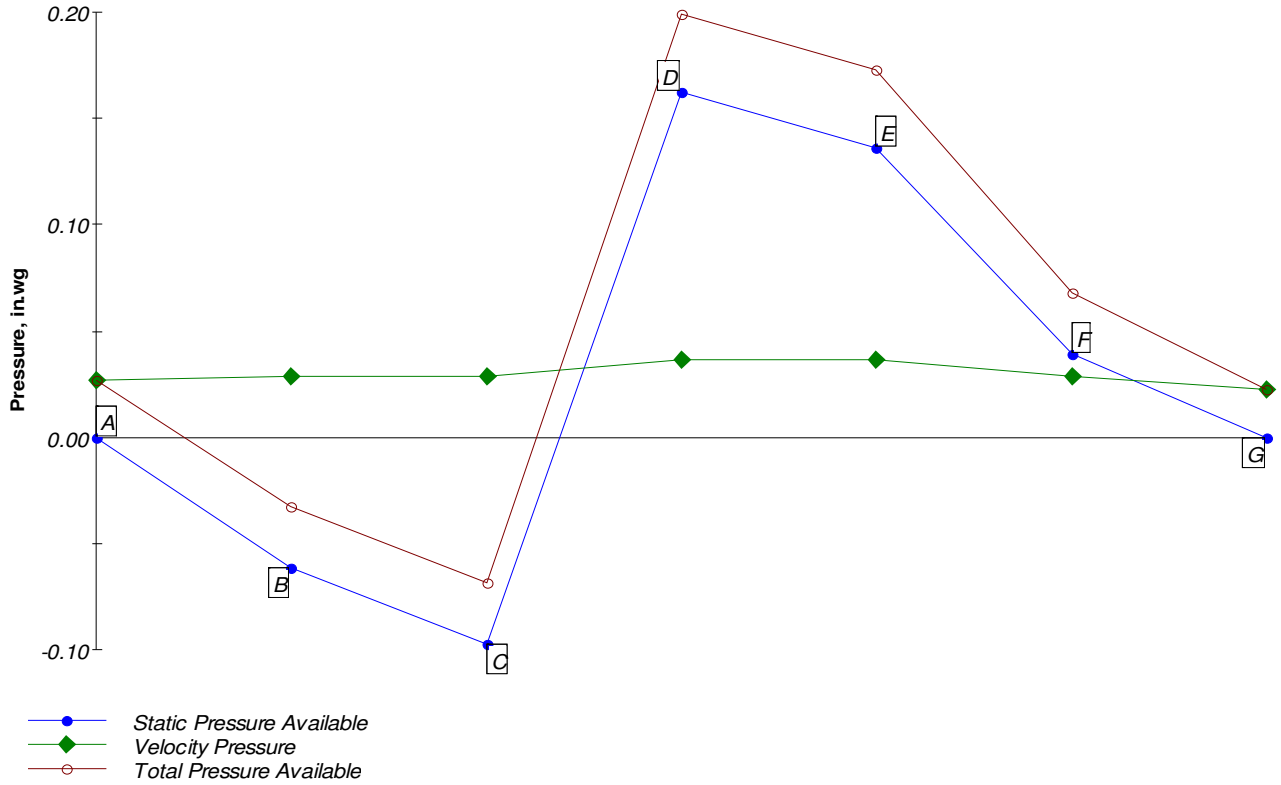
All computed results are estimates as building use and weather may vary.

Be sure to select a unit that meets both sensible and latent loads according to the manufacturer's performance data at your design conditions.



**Manual D Ductsize - Pressure Changes Graph - System 1**

**Pressure Changes Through Route with Highest Static Pressure Loss**



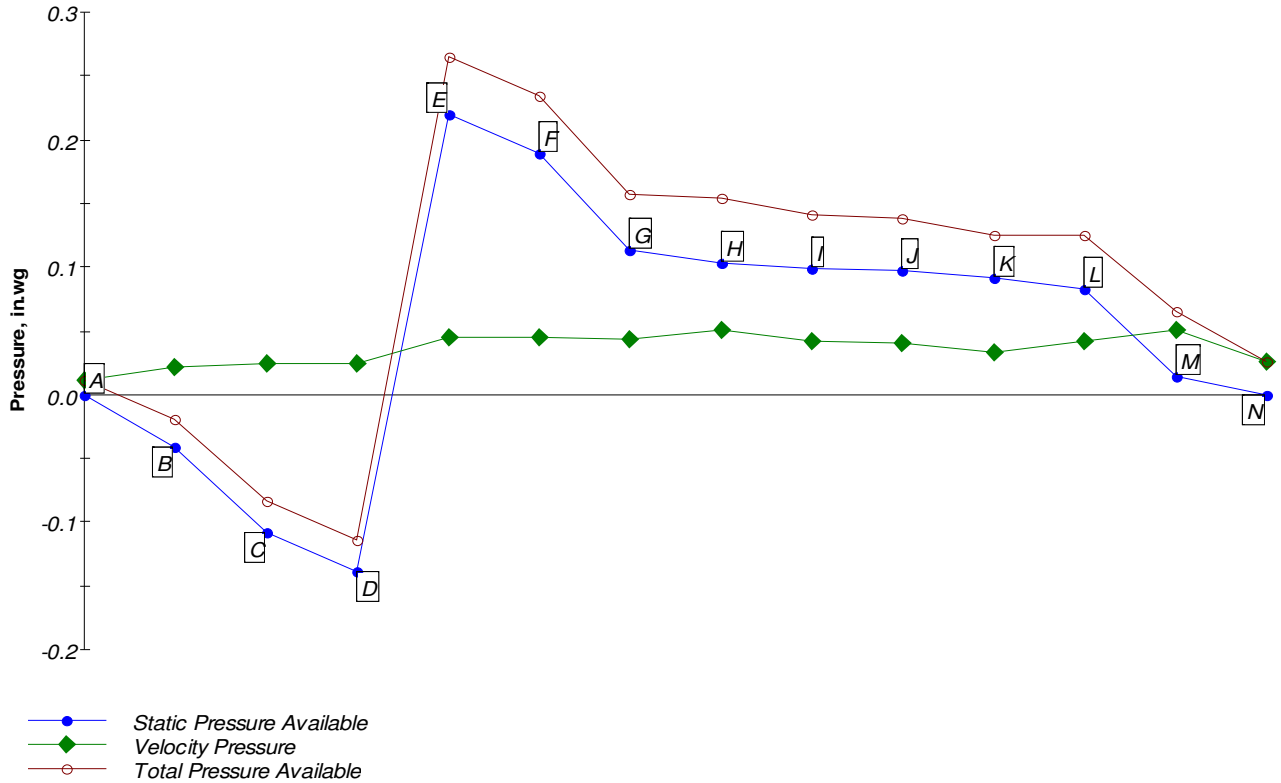
Notes: Return side point values are at entrance of duct, while supply side points are at exit. When a return system is present, an additional return side point named [Fan Entrance] is drawn in the graph to show the static pressure available at the entrance of the fan. When a supply system is present, and an additional supply side point named [Fan Exit] is drawn to show the static pressure available at the exit of the fan. Any device pressure losses entered for the supply main trunk are accounted for between the fan entry and exit points.

Point	Name	Static Pressure Available	Total Pressure Available
A	RR-100	0.000	0.027
B	RMT-100	-0.061	-0.032
C	[Fan Entrance]	-0.098	-0.069
D	[Fan Exit]	0.162	0.199
E	SMT-100	0.136	0.173
F	ST-110	0.039	0.068
G	SR-140	0.000	0.023



**Manual D Ductsize - Pressure Changes Graph - System 2**

**Pressure Changes Through Route with Highest Static Pressure Loss**



**Point**

Notes: Return side point values are at entrance of duct, while supply side points are at exit. When a return system is present, an additional return side point named [Fan Entrance] is drawn in the graph to show the static pressure available at the entrance of the fan. When a supply system is present, and an additional supply side point named [Fan Exit] is drawn to show the static pressure available at the exit of the fan. Any device pressure losses entered for the supply main trunk are accounted for between the fan entry and exit points.

Point	Name	Static Pressure Available	Total Pressure Available
A	RR-150	0.000	0.011
B	RT-120	-0.042	-0.020
C	RMT-110	-0.108	-0.083
D	[Fan Entrance]	-0.138	-0.113
E	[Fan Exit]	0.220	0.265
F	SMT-120	0.189	0.234
G	ST-130	0.114	0.157
H	ST-170	0.103	0.154
I	ST-230	0.099	0.141
J	ST-220	0.097	0.138
K	ST-240	0.092	0.125
L	ST-200	0.083	0.125
M	ST-190	0.014	0.065
N	SR-190	0.000	0.027



**Total Building Summary Loads**

Component Description	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
GSF: Glazing-Glass Storefront Single Pane Clear, ground reflectance = 0.1, u-value 1.07, SHGC 0.78	201.4	5,387	0	14,086	14,086
GED: Glazing-Glass Entry Door, ground reflectance = 0.32, u-value 1.07, SHGC 0.78	40	1,070	0	3,740	3,740
11N: Door-Metal - Polystyrene Core	60	455	0	476	476
13A-4ocs: Wall-Block, board insulation only, R-4 board insulation, open core, siding finish	1910.4	6,830	0	4,998	4,998
12B-0sw: Part-Frame, R-11 insulation in 2 x 4 stud cavity, no board insulation, siding finish, wood studs	663.8	966	0	644	644
BUR 19: Roof/Ceiling-Roof Joists Between Roof Deck and Ceiling or Foam Encapsulated Roof Joists, Custom, Existing BUR + PF + SF Insulation open or drop ceil	2853	3,751	0	6,002	6,002
22A-pm: Floor-Slab on grade, No edge insulation, no insulation below floor, any floor cover, passive, heavy dry or light wet soil	262	7,727	0	0	0
<b>Subtotals for structure:</b>		<b>26,186</b>	<b>0</b>	<b>29,946</b>	<b>29,946</b>
People:	15		3,000	3,750	6,750
Equipment:			420	3,520	3,940
Lighting:	2980			10,162	10,162
Ductwork:		4,682	3,303	1,869	5,172
Infiltration: Winter CFM: 0, Summer CFM: 0		0	0	0	0
Ventilation: Winter CFM: 240, Summer CFM: 240		6,597	9,167	4,750	13,917
AED Excursion:		0	0	7,812	7,812
<b>Total Building Load Totals:</b>		<b>37,465</b>	<b>15,890</b>	<b>61,810</b>	<b>77,700</b>

**Check Figures**

Total Building Supply CFM:	3,000	CFM Per Square ft.:	1.051
Square ft. of Room Area:	2,853	Square ft. Per Ton:	415
Volume (ft <sup>3</sup> ) of Cond. Space:	29,729	Air Turnover Rate (per hour):	6.1

**Building Loads**

Total Heating Required Including Ventilation Air:	37,465 Btuh	37.465 MBH
Total Sensible Gain:	61,810 Btuh	80 %
Total Latent Gain:	15,890 Btuh	20 %
Total Cooling Required Including Ventilation Air:	77,700 Btuh	6.87 Tons (Based On 75% Sensible Capacity)

**Notes**

Rhvac is an ACCA approved Manual J and Manual D computer program.  
 Calculations are performed per ACCA Manual J 8th Edition, Version 2, and ACCA Manual D.  
 All computed results are estimates as building use and weather may vary.  
 Be sure to select a unit that meets both sensible and latent loads according to the manufacturer's performance data at your design conditions.





### System 1 Room Load Summary

Room 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	Gallery	667	8,598	195	9,9,9,9	-	19,644	1,500	993	1,052
2	Storage	167	1,760	40	6	-	2,043	0	103	109
3	RR 1	67	965	22	4	-	728	60	37	39
	Ventilation		1,924				1,385	2,674		
	Duct Latent							201		
	Return Duct		604				236	1,294		
<b>System 1 total</b>		<b>900</b>	<b>13,851</b>	<b>257</b>			<b>24,036</b>	<b>5,729</b>	<b>1,133</b>	<b>1,200</b>

System 1 Main Trunk Size: 12x19 in.  
 Velocity: 758 ft./min  
 Loss per 100 ft.: 0.078 in.wg

Duct size results above are from Manual D Ductsize.  
 Runout duct velocities are not printed with duct size results from Manual D Ductsize since they can vary within the room. See the Manual D Ductsize report for duct velocities and other data.

### Cooling System Summary

	Cooling Tons	Sensible/Latent Split	Sensible Btuh	Latent Btuh	Total Btuh
Recommended :	2.67	75% / 25%	24,036	8,012	32,049
Actual:	2.98	75% / 25%	26,850	8,950	35,800

### Equipment Data

	Heating System	Cooling System
Type:	Electric Resistance	Standard Air Conditioner
Model:		4A7A4036L1
Indoor Model:		*AM7A0C36H31
Brand:		AMERICAN STANDARD
Efficiency:	0%	15.5 SEER
Comment :	8 KW	14 SEER ENERGY CODE MIN
Sound:	0	0
Capacity:	26,200 Btuh	35,800 Btuh
Sensible Capacity:	n/a	26,850 Btuh
Latent Capacity:	n/a	8,950 Btuh
AHRI Reference No.:	n/a	7502874

This system's equipment was selected in accordance with ACCA Manual S.  
 Manual S equipment sizing data: SODB: 93F, SOWB: 79F, WODB: 47F, SIDB: 75F, SIRH: 55%, WIDB: 72F, Sen. gain: 24,036 Btuh, Lat. gain: 5,729 Btuh, Sen. loss: 13,851 Btuh, Entering clg. coil DB: 76.3F, Entering clg. coil WB: 65.3F, Entering htg. coil DB: 70.1F, Clg. coil TD: 18F, Htg. coil TD: 40F, Req. clg. airflow: 1133 CFM, Req. htg. airflow: 257 CFM



### System 2 Room Load Summary

Room 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---										
4	Entry	261	6,551	149	10,10	-	13,463	0	680	704
5	Conference	207	1,620	37	8	-	3,112	800	157	163
6	Office 1	122	953	22	6	-	2,062	200	104	108
7	Office 2	120	943	21	6	-	2,051	200	104	107
8	Dennis Office	243	1,906	43	8	-	3,520	200	178	184
9	Files	196	3,067	70	8	-	2,474	0	125	129
10	Open Office 2	470	3,051	69	8	-	4,534	200	229	237
11	R R 2	63	92	2	4	-	462	60	23	24
12	Open Office 1	272	402	9	8	-	2,730	200	138	143
	Ventilation		4,673				3,365	6,493		
	Duct Latent							516		
	Return Duct		356				0	1,291		
<b>System 2 total</b>		<b>1,953</b>	<b>23,614</b>	<b>423</b>			<b>37,773</b>	<b>10,161</b>	<b>1,738</b>	<b>1,800</b>

System 2 Main Trunk Size: 14x22 in.  
 Velocity: 841 ft./min  
 Loss per 100 ft.: 0.079 in.wg

Duct size results above are from Manual D Ductsize.  
 Runout duct velocities are not printed with duct size results from Manual D Ductsize since they can vary within the room. See the Manual D Ductsize report for duct velocities and other data.

### Cooling System Summary

	Cooling Tons	Sensible/Latent Split	Sensible Btuh	Latent Btuh	Total Btuh
Recommended	4.20	75% / 25%	37,773	12,591	50,364
Actual:	4.67	75% / 25%	42,000	14,000	56,000

### Equipment Data

	Heating System	Cooling System
Type:	Electric Resistance	Standard Air Conditioner
Model:		4A7A4060L1
Indoor Model:		*AM7B0C60H51
Brand:		AMERICAN STANDARD
Efficiency:	0%	14.5 SEER
Comment :	10 KW 2 STAGE	14 SEER ENERGY CODE MIN
Sound:	0	0
Capacity:	34,120 Btuh	56,000 Btuh
Sensible Capacity:	n/a	42,000 Btuh
Latent Capacity:	n/a	14,000 Btuh
AHRI Reference No.:	n/a	7502929

This system's equipment was selected in accordance with ACCA Manual S.  
 Manual S equipment sizing data: SODB: 93F, SOWB: 79F, WODB: 47F, SIDB: 75F, SIRH: 55%, WIDB: 72F, Sen. gain: 37,773 Btuh, Lat. gain: 10,161 Btuh, Sen. loss: 23,614 Btuh, Entering clg. coil DB: 76.7F, Entering clg. coil WB: 65.6F, Entering htg. coil DB: 69.5F, Clg. coil TD: 18F, Htg. coil TD: 40F, Req. clg. airflow: 1738 CFM, Req. htg. airflow: 423 CFM