Design Master HVAC User Manual

©2012-2023 Design Master Software, Inc



Table of Contents

esign Master HVAC	
Command Reference	2
Project Explorer	
Calculations	4
Dustwark Colouisticas	
Ductwork Calculations	÷
Remove Pressure Drop Report	
Duct Contorlings	9
Insert Duct	
Query Duct	
Edit Duct Branch	
Erase Ducts	
Insert Drawing to Drawing Connection	
Fillet Ducts	21
Break Duct	
Move Duct Node	22
Straighton Next Ducto	22
Straighten Provious Ducts	23
Offset Vertical Duct	23
Beverse One Duct	24
Reverse Duct Branch	
Force Ducts Together	
Fdit Duct Node Flevation	
Diffusers	
nisert Diruser	29
Query Dilluser	30
Match Diffusors	31
Match Diffuser (2 Point)	32
Array Diffuser (Distance / Angle)	32
Insert or Move Callout	
Remove Callout	
Insert Throw Arrow	
Remove Throw Arrow	
Match Throw Arrow	
Insert Diffuser Schedule	
Diffuser Project Schedule	
Diffuser Master Schedule	
Coordinate Diffusers and Light Fixtures	
Erase Coordination Light Fixtures	
Diffuser Connections	
Change Connection Type	
Change Connection	
Single 90 Connection	

Single 45 Connection	45
End Connection	45
Bottom Connection	46
Transparent Connection	46
Vertical Transparent Connection	46
Disconnect Diffuser	47
Set CFM Total	47
In a Room	
In a Duct	
In Multiple Diffusers	50
Mechanical Equipment	51
Insert Equipment	
2D Drafting	54
Draw Double Line (Branch)	54
Draw Double Line (Window)	54
Erase Double Line (Branch)	55
Erase Double Line (Window)	55
Move Label	55
Rotate Label to Angle 0	56
Reset Label to Default Location	56
Remove Label	57
Fittings	57
Radius Elbow	57
Square Elbow	58
End Cap	59
Transition	60
Offset	61
Adjust Transition Length	62
Fire / Smoke Damper	62
Flex Connection	64
Boot Tee	65
Conical Tee	66
Straight Tee	67
Transition Tee	68
Variable Angle Branch	69
Wye / Bullnose Tee	70
Pair of Pants	71
Split Fitting	72
Shaded Vertical	73
Reset to Automatic Fitting	74
No Fitting	75
Balancing Dampers	75
Insert Balancing Damper	75
Move Balancing Damper	75
Remove Balancing Damper	
Layer Management	76
Turn Duct Centerlines On	77
Turn Duct Centerlines Off	77
Turn Double Line and 3D Lavers On	77
Turn Double Line and 3D Layers Off	
Turn Double Line Layers On (and 3D Layers Off)	
Turn 3D Layers On (and Double Line Layers Off)	

Turn Room Layers On	
Turn Room Layers Off	
Sections	79
Create Sections	80
3D-BIM	82
	82
Draw 3D Ductwork (Mindow)	
Draw 3D Ductwork (Window)	
Erase 3D Ductwork (Window)	84
Insert Hanger	
Move Hanger	
Remove Hanger	
Insert Top Elevation Label	
Insert Bottom Elevation Label	
Insert Top and Bottom Elevation Label	
Insert Centerline Elevation Label	87
Move Elevation Label	88
Export Entire Project to IFC File	88
Export Drawing to IFC File	89
Export One Area to IFC File	90
Export Entire Project to DWG File	
Export Drawing to DWG File	93
Export One Area to DWG File	
Drafting Tools	
Eevations	
Move Entity Above Ductwork	
Move Entity Below Ductwork	
Move Entity Up	
Move Entity Dow n	
Insert Thermostat	
Insert 3-point Thermostat Control Wire	
Insert Multiple Point Thermostat Control Wire	98
Insert Supply Arrow	
Insert Return Arrow	99
Erase Part of Grouped Entities	
Building Definition	100
Project Info	100
Zones	103
Zone Tree	103
Zone List	105
Floors & Roofs	111
Floor Tree	111
Floor List	113
Roof Project Schedule	114
Roof Master Schedule	115
Rooms	
Create Room	
Edit Rooms	
Query Room	
Update Room Labels	
Snow or Hide Label Leaders	
Kearaw Koom	
Insert Room Outlines on this Drawing	
	120

Room Master Schedule	127
Walls	129
Query Wall	129
Match Wall Properties	133
Insert Wall Point	133
Remove Wall Point	134
Wall Project Schedule	134
Wall Master Schedule	135
Door Project Schedule	137
Door Master Schedule	138
Glass Project Schedule	139
Glass Master Schedule	
Schedules	141
City Definitions	142
Reports	
Export Building Information	144
Export Room Air Balance Report	144
Transfer Building Information from Electrical	145
Load Calculations	148
View Room Load	
Display Load Calculation Map	
Lindate Load Calculation Map	
Erase Load Calculation Map	
Print Load Calculations	
Print Project Info	
Print Building Definition	158
Print Supply Air Requirements	165
Print Ventilation Schedule	
Minimum Information	
2006 International Mechanical Code	
A SHRAE 62 1-20## and 2009 IMC	
Print Cooling Detail	
Print Heating Detail	
Print I oad Summary	
Print Psychrometrics	
Calculate Building Load Totals	
Takeoffs	107
	407
Insert Takeoff Area	
Query Takeoff Area	
Print Takeoff Area	
Utilities	201
Coordinate Drawings and Database	201
Erase Coordination Lines	202
Check for Drawings to Update	203
Delete Extra Devices from Database	203
Rename Database	204
Delete DM Backups Over 30 Days Old	204
Find Lost Toolbars	205
Reload Ribbons	205
Delete Drawing	206
Rename Drawing	207
Copy Drawing	207
Copy Drawing and Remove Links to Database	208
Copy Drawing and Remove All DM Entities	209

	Disconnect HVAC Database from Drawing	210
	Merge Project	210
	Copy or Back Up Project	213
	Check In Floating License	214
Help	p	214
	User Manual	214
	Tutorial	215
	Knowledge Base	215
	Remote Support	215
	Send Project to Design Master Support	215
	Go to Design Master Support Website	217
	Send Email to Design Master Support	217
	Send Master and Standards Databases to Design Master Support	218
	Set Email Address	219
	Installation Settings	220
		221
	Network Install	222
	Network Laptop Install	223
	Update Local Install from Network	224
	Check for Updates	225
	Install Patch	226
	Install License	227
	About	228
Cus	tomization	228
ouo		220
	User Options	230
	User Support Information	231
	Drawing Options	232
	HVAC	233
	Options	234
	Derault Fittings	230
	Fittings	231
		230
	Diffuser Connections	241
	Diffuser Connections	243
		240
		240 250
		250
	Onen Plack from Drawing	252
	Padafina Plack in this Drawing	253
	Diffusor Blocks	254
		255
	Layers	260
	I abels and Schedules	261
	Edit Room abal ist	262
	Edit Room Air Balance Report List	263
	Edit Diffuser Schedule List	265
	Edit Duct Pressure Drop Report	200
	Text Styles	269
	Recreate Missing Customization	270
	Update Laptop Customization	272
	Manage Standards Databases	272
۵lia	Inment Points	272
Airy		213
	Insert Alignment Point	2/6

Query Alignment Point	276
Move Alignment Point	277
Rotate Alignment Point	. 278
Offset Alignment Point for 3D Export	. 278
Remove Alignment Points from non-DM Drawing	. 279
Start New HVAC Project	279

Concepts and Procedures

Project Drawing and Database Management	282
Master and Standards Databases	283
Common Schedule Dialog Box Features	285
Import from Another Database Import from Master Schedule Import from Broinst Schedule	285 288 289
Common Settings	291
Elevation	291 291
Common Groups Dialog Box Features	291
Inserting Notes and Leaders on the Drawing	293
Previous and Next Ducts	293
Technical Support	295
System Requirements	296
Purchasing	297

Design Master HVAC

You are reading the user manual for Design Master HVAC 7.3.

You can download a PDF version of the user manual for printing and offline documentation purposes.

Technical Support

M - F, 9am - 5pm Eastern support@designmaster.biz 1-866-516-9497 x2

Copyright 2012-2023, Design Master Software, Inc.

Overview

Design Master HVAC is a complete ductwork drafting and calculation software program that works directly inside AutoCAD or BricsCAD.

Duct Layout: Lay out your ductwork easily. You can focus on the "big picture" as you design your HVAC system without getting bogged down with constant data entry.

CFM and Sizing Calculations: Duct sizing calculations are integrated directly into the drafting of the ductwork. You set the CFM values at the diffusers, define a sizing method, and the software takes care of the rest.

Pressure Loss Calculations: Pressure drop is automatically calculated based upon the CFM in the ducts, the duct shape and lengths, and the particular fittings used in the duct section.

3D Drafting and BIM Compatibility: Generate a full 3D-BIM model of the ductwork and equipment. Export to an IFC or DWG file, which can then be imported into Revit, Navisworks, and Sketchup for 3D collision detection.

Building Setup: Heating and cooling load calculations function entirely within your CAD program. Your building is defined over the top of your architect's backgrounds.

Reports: Load, ventilation, and psychrometrics calculations can be displayed within your CAD program, previewed in your web browser, or printed on paper.

Command Reference

This section describes all of the commands available in Design Master HVAC. It is a direct listing of all of the commands and what they do. More complete discussions about how to apply the commands are found in the <u>Concepts and Procedures</u> section.

The commands in this section are in the same order as the Design Master HVAC pulldown menu:



Project Explorer

The Project Explorer command lists all of the items included in the current project, organized by item type and by drawing.

To view a list of all items included in the current project, or to find a specific item, go to

Pulldown Menu: DM HVAC->Project Explorer

Project Explorer Dialog Box

Project Explorer ×
Sort Order: Sort by callout, then drawing \checkmark Find < Query
ID
📮 Diffusers
= General
■ R-1
™ M1.DWG
= R-2
■ M1.DWG
= S-1
M1.DWG
= 5-2
M1.DWG
= 5-3
= 5-4
E Ducts
= Supply
+ M1.DWG
= Return
■ M1.DWG
- Outside Air
None on drawing
= Exhaust
None on drawing
< > >
Exit

Sort Order: How the list is sorted.

- Sort by callout, then drawing: Under each device type, all of the callouts are listed. Under each callout, all of the drawings containing devices using that callout are listed. Callouts that do not have devices inserted on a drawing are listed, but no drawings are listed under them.
- Sort by drawing, then callout: Under each device type, all of the drawings containing devices of that type are listed. Under each drawing, all of the callouts on that drawing are listed. Callouts that do not have

devices inserted on a drawing are not listed.

ID: This tree lists all of the items in the current project. The main item types are listed first, followed by each callout or drawing depending upon the specified *Sort Order*.

A number is displayed for each individual device. This number is the unique internal identifier used in the project database for the device. The specific value does not have any meaning other than the fact that it is different for each device. In general, devices inserted later in the project will have higher values than devices that are inserted earlier.

Finding an Item Using the Project Explorer Dialog Box

Find: Press this button to display the selected device on the drawing. If the device is located on another drawing, the other drawing will be opened and the device highlighted. A line will be displayed between the cursor and the device on the drawing to help you locate it.

You will be prompted at the command line regarding what to do next.

[Query device/Next device/Previous device/<Return to dialog>]:

Query device: The device is queried as if the corresponding Query command had been used on it. See the <u>Query Duct</u> and <u>Query Diffuser</u> sections for more information.

Next device: Locate the next item of the current type.

Previous device: Locate the previous item of the current type.

Return to dialog: Return to the Project Explorer dialog box.

Querying an Item Using the Project Explorer Dialog Box

Query: Press this button to query a callout or individual device.

Devices are queried as if the corresponding Query command had been used on it. See the <u>Query Duct</u> and <u>Query</u> <u>Diffuser</u> sections for more information.

Diffuser callouts are queried as if the Diffuser Project Schedule command had been used. See the <u>Diffuser</u> <u>Project Schedule</u> section for more information.

Calculations

This section describes the commands used to calculate duct sizes, airflow in ducts, and pressure drop in ducts.

Training Videos

<u>Pressure Drop Calculations</u>

Ductwork Calculations

The Ductwork Calculations command is used to calculate the airflow in ducts, size the ducts, and calculate the pressure loss in ducts.

To calculate these values in ducts, go to

Ribbon: DM HVAC->Ducts-> IND Ductwork Calculations

 $Pulldown \ Menu: \ {\tt DM \ HVAC->Calculations->Ductwork \ Calculations}$

Duct Calculations Dialog Box

Duct Calculations X	
Ducts to Use	
O All Ducts	
O Ducts in a Branch	
Oucts in a System	
Calculate CFM	
Calculate CFM and Size Ducts	
Calculate CFM, Size Ducts, and Calculate Pressure	
Exit	

Ducts to Use: Controls the ducts on which the selected calculation will be performed.

- All Ducts: Perform the selected calculation for all of the ducts in the project, including those on other drawings. This selection takes the most time.
- **Ducts in a Branch:** Perform the selected calculation on the selected duct and all connected ducts leading to the diffusers. Connected ducts leading to the fan will not be included.
- Ducts in a System: Performs the selected calculation on the selected duct and all connected ducts.

Calculate CFM: Press this button to calculate the airflow in the selected ducts. The total airflow in CFM in all ducts will be updated. You can query the duct to view the airflow in each section. Nothing else is changed or calculated.

Calculate CFM and Size Ducts: Press this button to calculate the airflow in the selected ducts and size them based upon the newly calculated airflow. The total airflow in CFM in all ducts will be updated. You can query the duct to view the airflow in each section. The duct size and shape will be updated in the database and on the drawing.

Calculate CFM, Size Ducts, and Calculate Pressure: Press this button to calculate the airflow in the selected ducts, size them based upon the newly calculated airflow, and calculate the pressure in the ducts. The total airflow in CFM in all ducts will be updated. The duct size and shape will be updated in the database and on the drawing. The pressure drop in each section and the total pressure drop in the duct system will be calculated. You can query the duct to view the airflow and the pressure drop in each section.

Calculating Values

After you select a calculation, the dialog box will close. You will be prompted based upon your *Ducts to Use* selection.

All Ducts

The selected calculations will start immediately. All of the ducts in the project will be included.

Ducts in a Branch

You will be prompted to select the duct at the start of the run to be calculated.

Select duct or label at the start of the branch:

The calculation will be performed on the selected duct and all of the ducts between it and the diffusers.

Ducts in a System

You will be prompted to select a duct in the system to be calculated.

Select duct or label in the system:

The calculation will be performed on the selected duct and all of the ducts connected to it.

Related Options

You can customize the fittings used when sizing ducts with this command. See the **Default Fittings Options** and **Fittings Options** sections for more information.

There are several options that affect default values, labels, and behaviors when sizing ductwork. See the **Ductwork Options** section for more information.

Insert Pressure Drop Report

The Insert Pressure Drop Report command is used to insert a report on the drawing that documents the pressure drop in the critical run of the ductwork.

Each duct section in the critical run will be listed in the report. An ID tag will be placed next to each duct in the critical run that corresponds to a row in the report. The ID tags can be moved on the drawing to an appropriate location using standard CAD commands. When the report is updated, the ID tags will stay in their current location.

The layer of the duct centerlines in the critical run is changed to make it easier to find on the drawing.

To insert a duct pressure drop report onto the current drawing, go to

Ribbon: DM HVAC->Ducts-> == Insert Pressure Drop Report

Pulldown Menu: DM HVAC->Calculations->Insert Pressure Drop Report

You will be prompted to select a duct in the run for which the report will be inserted.

Select duct or label in run to generate a pressure drop report for:

Insert Duct Pressure Drop Report Dialog Box

Insert Duct Pressure Drop Report
Schedule Notes: Edit
Edit Title, Column Labels, and Column Order
Calculate Pressure Drop
Draw Ductwork
Zoom to Schedule After Insertion
OK Cancel

Schedule Notes: A note that will appear below the schedule when inserted on the drawing.

Edit Title, Column Labels, and Column Order: Press this button to modify the layout of the duct pressure drop report on the drawing. See the Edit Duct Pressure Drop Report section for more information.

Calculate Pressure Drop: Whether the pressure drop in the ductwork will be calculated before the report is inserted on the drawing. Calculating the pressure drop can take a long time. If you have calculated the pressure drop in the system and have not made any changes to the ductwork since the calculation, you can uncheck this box to save time.

Draw Ductwork: Whether the ductwork is redrawn after the pressure drop calculations are performed.

Zoom to Schedule After Insertion: Whether the display will be moved to the schedule location after it has been inserted or updated. Check this box if you are having difficulty locating your schedule on a busy drawing.

Inserting or Updating the Report on the Drawing

To insert or update the report, press the **OK** button.

Inserting the Report the First Time

If the report is not currently inserted on the drawing, you will be prompted for the insertion location of the report.

Specify insertion point for pressure drop report:

The location you specify will be used as the top-left corner for the report.

Updating the Report Already on the Drawing

If the report is already inserted on the drawing, it will be updated in its current location.

You must update the report on the drawing when you make changes to the duct layout. The report will not update automatically.

If you have manually inserted graphics, such as revision clouds, over the report graphic, be sure to check their

location after updating the report.

Related Options

Pressure drop report duct ID block: Sets the block used for duct ID tags.

<u>Schedule title justification:</u> Sets the justification for the schedule title.

Schedule column label justification: Sets the justification for column headings.

Schedule title continued label: Sets the label added to the schedule title for continued sections.

Remove Pressure Drop Report

The Remove Pressure Drop Report command is used to remove a report inserted on the drawing with the <u>Insert Pressure Drop Report</u> command. This will also remove the highlighting and ID tags on ducts that correspond to the report.

To remove a duct pressure drop report from the drawing, go to

Ribbon: DM HVAC->Ducts-> 🎽 Remove Pressure Drop Report

Pulldown Menu: DM HVAC->Calculations->Remove Pressure Drop Report

You will be prompted to select a duct in the run that corresponds to the report you want to remove.

Select duct or label in run to remove pressure drop report from:

The specified pressure drop report will be removed from the drawing.

Duct Centerlines

This section describes the commands used to draw duct centerlines.

Common Duct Information

The values that can be specified for a duct are listed below.

Starting Elevation: The starting elevation of the duct. The reference point for the starting elevation of the duct is set by the *Vertical Alignment*. See the **Devation** section for more information.

Ending Elevation: The ending elevation of the duct. The reference point for the ending elevation of the duct is set by the *Vertical Alignment*. See the **Elevation** section for more information.

Vertical Alignment: Specifies the reference point used for the *Starting Elevation* and *Ending Elevation*.

- **Center of Duct:** The elevations refer to the centerline of the duct. The duct will extend both above and below these elevations.
- **Top of Duct:** The elevations refer to the top of the duct. The duct will extend below these elevations.
- Bottom of Duct: The elevations refer to the bottom of the duct. The duct will extend above these

elevations. If the duct has hangers, they will extend below this elevation.

• **Bottom of Hanger:** The elevations refer to the bottom of the hanger for the duct. The hangers and the duct will extend above these elevations. If there is no hanger, the bottom of the duct will be at these elevations.

Width (in): The width of the duct in inches. For round ducts, this value is used as the diameter. This value is the inside clear width of the duct. It does not include the width of the interior or exterior lining.

Depth (in): The depth of the duct in inches. This field is disabled if the *Shape* field is set to **Round**. This value is the inside clear depth of the duct. It does not include the width of the interior or exterior lining.

Shape: The shape of the duct. The fields that are available for specifying the size of the duct are based upon the selected shape.

- Round: The duct will be round. The *Width* field is used as the diameter. The *Depth* field is disabled.
- Rectangular: The duct will be rectangular.
- Flat Oval: The duct will be ovoid.

Lock: There are *Lock* checkboxes next to the *Width*, *Depth*, and *Shape* fields. Check the box to lock the corresponding value. When the ducts are resized, locked values will not be changed.

Maximum Depth: When the ducts are resized, the duct will change to the shape specified in the *Shapes* field if it exceeds this value.

Sizing Method: How the size of the duct is calculated.

- **Constant Velocity:** The duct is sized to maintain a constant velocity. A duct centerline set to use this sizing method has a circle with a V at the start of the duct.
 - **Maximum Velocity:** The maximum velocity allowed in the ductwork. Ducts will be sized as small as possible without exceeding this value.

Minimum Velocity: The minimum velocity allowed in the ductwork. The duct size will not change until the velocity drops below this value. If this value is set to 0, it will not be used during the calculation.

• **Constant Pressure Drop:** The duct is sized to maintain a constant pressure drop. A duct centerline set to use this sizing method has a circle with a P at the start of the duct.

Maximum Pressure Drop: The maximum pressure drop allowed in the ductwork. Ducts will be sized as small as possible without exceeding this value.

Maximum Velocity: The maximum velocity allowed in the ductwork. The ductwork will be sized using the *Maximum Pressure Drop* value first. If the velocity exceeds the *Maximum Velocity*, the size will be increased. This setting is primarily used when sizing ducts with large airflow values. If this value is set to 0, it will not be used during the calculation.

• Static Regain: The duct is sized using the static regain method. A duct centerline set to use this sizing method has a circle with an R at the start of the duct.

Starting Velocity: The first duct in the run is sized using this value as the maximum velocity. **Minimum Velocity:** The minimum velocity allowed in the ductwork. If the *Starting Velocity* is not high enough, ducts at the end of the run can become very large. Setting this value limits how large the ducts can be.

• Same as **Previous**: The duct is sized based upon the *Sizing Method* setting of the previous duct. A duct centerline set to use this sizing method does not have a circle at the start of the duct.

Typically, you will set the *Sizing Method* for the first duct in a run and set all of the other ducts in the run to **Same as Previous**.

If you need to change the *Sizing Method* in the middle of a duct run, do so at the single duct where the sizing method changes. Set all of the other ducts to **Same as Previous**.

Setting the *Sizing Method* in a limited number of locations makes it easier to determine and modify how ducts are being sized.

Shapes: The shapes used when sizing the duct. The first shape listed is used when the duct size is less than the *Maximum Depth*. The second shape listed is used when the duct size is greater than the *Maximum Depth*.

- **Round to Rectangular:** The duct will first be sized round, then rectangular if the diameter exceeds the *Maximum Depth*.
- **Round to Flat Oval:** The duct will first be sized round, then flat oval if the diameter exceeds the *Maximum Depth*.
- Square to Rectangular: The duct will be rectangular throughout. Square ducts will be used if the size is less than the *Maximum Depth*.

Airflow: The type of air flowing through the duct. The duct layers and pressure drop calculations are affected by this setting.

- Exhaust: Exhaust ductwork. Vertical ducts are drawn with a full slash and a half slash.
- **Outside Air:** Outside air ductwork. Vertical ducts are drawn with two half slashes.
- **Return:** Return ductwork. Vertical ducts are drawn with a single full slash.
- Supply: Supply ductwork. Vertical ducts are drawn with two full slashes.

Graphics: How the ductwork is drawn in 2D.

- Automatic: The ductwork is drawn double-line or single-line based upon the *Width* and the setting of the *Maximum Single Line Width* option. See the <u>Ductwork</u> options section for more information.
- **Double:** The ductwork is drawn double-line.
- **Single:** The ductwork is drawn single-line.
- **Transparent:** The ductwork is not drawn. The air is carried through the duct to the next section. This setting is useful when you need to draw a custom fitting or piece of equipment in your duct system. A transparent duct inserted through the custom graphic keeps the airflow connected and allows you to draw the graphics necessary for your design.

Horizontal Alignment: Specifies the reference point for the duct construction line.

- **Centered:** The construction line is the centerline of the duct. The duct extends to both sides of the construction line. Any transitions in the duct are concentric.
- Flat on Left: The construction line is the left edge of the duct. The duct extends to the right of the construction line. Any transitions in the duct will be eccentric, with the flat edge on the left.
- Flat on Right: The construction line is the right edge of the duct. The duct extends to the left of the construction line. Any transitions in the duct will be eccentric, with the flat edge on the right.

Interior Lining Width: Whether the duct has interior lining. Check this box to specify the width of the lining. The ductwork size will include the interior lining when drawn in 2D and 3D.

Exterior Lining Width: Whether the duct has exterior lining. Check this box to specify the width of the lining. The ductwork size will include the exterior lining when drawn in 3D.

Material: The material used for the duct. The material is used to adjust pressure drop calculations and the appearance of the ductwork.

- Hard: The duct is a hard duct. The specific type of material is not specified. The pressure drop calculations assume galvanized steel.
- Flex: The duct is a flex duct.

Layer System: See the Layer System section for more information.

Same as **Previous**: Whether the duct settings are based upon the previous duct.

This box is typically checked to reduce the number of times the ductwork in a run changes size. The sizing criteria for the ducts will often change the size at every takeoff. Check this box on select ducts to eliminate some of the transitions.

The previous duct is in the direction of the fan or air handler from the current duct. If the *Return and Exhaust Arrow Direction* option is set to *Toward Diffusers*, the previous duct points to the current duct. See the **Ductwork** options section for more information.



The following values will be set to match the value of the previous duct:

- Vertical Alignment
- Width
- Depth
- Shape
- Airflow
- Graphics
- Horizontal Alignment
- Interior Lining Width
- Exterior Lining Width
- Material
- Layer System

Hanger Type: The type of hanger. Controls whether hangers and their graphics are included.

- None: No hangers are included. The other hanger fields will be disabled.
- Wrap: The hanger will wrap around the item. A single support rod will be inserted in the middle of the item.
- **Trapeze:** The hanger will be a support underneath the item with two support rods on either side.

Size: The size of the hanger, in inches. The size is used to control most of the dimensions of the hanger graphic. The support rod diameter will be equal to this size. Other dimensions will be scaled based upon this size.

Hanger Depth: The distance the hanger extends below the item, in inches.

Starting Offset: The distance from the start of the centerline to the location of the first hanger, in inches.

Ending Offset: The distance from the end of the centerline to the location of the last hanger, in inches.

Spacing: The distance between each hanger, in inches.

Left Width: The distance the hanger extends to the left side of the centerline, in inches.

If this value is 0, the hanger will be wide enough to support the item.

If it is greater than 0, the hanger will extend exactly that distance to the left of the centerline. It is possible this distance will be less than the width of the item the hanger is supporting. In that case, you need to increase the width. A width greater than necessary to support the specific item can be used to support a rack of items or to allow for future expansion.

Right Width: The distance the hanger extends to the right side of the centerline, in inches.

If this value is 0, the hanger will be wide enough to support the item.

If it is greater than 0, the hanger will extend exactly that distance to the right of the centerline. It is possible this distance will be less than the width of the item the hanger is supporting. In that case, you need to increase the width. A width greater than necessary to support the specific item can be used to support a rack of items or to allow for future expansion.

Ending Elevation: The elevation where the support rods end. The support rods will be drawn from the item up to this elevation. See the **<u>Elevation</u>** section for more information.

Insert Duct

To insert ducts on the drawing, go to

Ribbon: DM HVAC->Ducts-> 🎢 Insert Duct

Pulldown Menu: DM HVAC->Duct Centerlines->Insert Duct

You will be prompted to identify the starting point of the duct to be inserted.

Specify first point for duct or [Set duct information/Away from diffusers]: Specify first point for duct or [Set duct information/Toward diffusers]:

Specify first point: Specify the location of the first point for the duct. You will be prompted to specify the next point of the duct. The prompt that is displayed depends upon whether you are inserting ducts toward diffusers or away from diffusers.

Specify next point for duct or [Set duct information/Vertical/Away from diffusers/start New run]: Specify next point for duct or [Set duct information/Vertical/Toward/start New run]:

Specify next point: Specify the location for the next point of the duct.

If the duct is not connected to another duct, the **Duct Information** dialog box will appear, described below.

If the duct is connected to another duct, the duct information will be based upon the connected duct.

You will be prompted again to specify the next point, allowing you to continue inserting ducts.

Set duct information: Type s to change the settings for the next duct that will be inserted. The Duct

Information dialog box will appear, described below.

Vertical: Insert a vertical duct at the location of the first point.

If the duct is not connected to another duct, the **Duct Information** dialog box will appear, described below.

If the duct is connected to another duct, you will be prompted to enter an elevation for the duct. If you are inserting ducts toward diffusers, you will be prompted for the *Ending Elevation*. If you are inserting ducts away from diffusers, you will be prompted for the *Starting Elevation*.

Away from diffusers: Type \mathbf{A} to change the current direction of drawing ducts from toward diffusers to away from diffusers. The first point of a duct will be located closer to the diffusers and the second point of the duct will be located closer to the fan.

Toward diffusers: Type \mathbf{T} to change the current direction of drawing ducts from away from diffusers to toward diffusers. The first point of a duct will be located closer to the fan and the second point of the duct will be located closer to the diffusers.

start New run: Type \mathbf{N} to finish the current run of duct. You will be returned to the first prompt of the command and asked to specify the first point for a duct.

Duct Information Dialog Box

Duct Information		×
Starting Elevation (ft-in): 10	Airflow: Supply ~	Hangers
Ending Elevation (ft-in): 10	Graphics: Automatic ~	Hanger Type: None ~
Vertical Alignment: Center of Duct \sim	Horizonal Alignment: Centered 🗸	Size (in): 1
Width (in): 12	Interior Lining Width: 3	Depth (in): 1
Depth (in): 12 Lock	Exterior Lining Width: 3	Starting Offset (in): 36
Shape: Round V Lock	Material: Hard 🗸	Ending Offset (in): 36
Maximum Depth: 24	Layer System: New 🗸	Spacing (in): 36
Sizing Criteria	Same as Previous	Left Width (in): 0
Sizing Method: Constant Pressure Dro, ~		Right Width (in): 0
Maximum Pressure Drop: 0.08		Ending Elevation (ft-in): 10
Maximum Velocity (0=No 0		
Shapes: Round to Rectangular ~		
	OK Cancel	

The **Duct Information** dialog box appears when you need to specify information for the duct you are about to insert.

See the Common Duct Centerline Information section for more information about the values that can be

specified for ducts.

Related Options

There are several options that affect default values, labels, and behaviors when inserting ductwork. See the **Ductwork Options** section for more information.

Query Duct

To modify a duct on the drawing, go to

Ribbon: DM HVAC->Ducts->

Pulldown Menu: DM HVAC->Duct Centerlines->Query Duct

Select the duct on the drawing to be queried.

Duct Information Dialog Box

Duct Information		×		
Starting Elevation (ft-in): 10	Airflow: Supply ~	Hangers		
Ending Elevation (ft-in): 10	Graphice	Hanger Type: None ~		
Vertical Alignment: Center of Duct	Automatic V	Size (in): 1		
	Horizontal Alignment: Centered ~	Depth (in): 1		
Width (in): 12		Charlies Officer (in)		
Depth (in): 12 Lock	Interior Lining Width: 3	Starting Offset (in): 30		
Shape: Round V Lock	Exterior Lining Width: 3	Ending Offset (in): 36		
Maximum Depth: 24	Material	Spacing (in): 36		
	Hard V	Left Width (in): 0		
	Layer System: New	Right Width (in): 0		
		Ending Elevation (ft-in): 10		
	Same as Previous			
	CEM			
	CFM.	0 Lock		
	CFM Diversity Factor:	1		
	Pressure Drop in this Section:	0 Lock		
	Pressure Data in Previous Citings	0		
	Pressure Drop in Previous Fitting.			
	Static Pressure at end of Previous Duct (or Fan):			
	Total Pressure at end of Previous Duct (or Fan):	0		
	Total / Static Pressure at Start of this Duct (From Start):	0 / 0		
Sizing Criteria	Total / Static Pressure at Start of this Duct (To End):	0/0		
Cising Methods	Total / Static Pressure at End of this Duct (From Start):	0/0		
Sizing Method: Same as Previous V	Total / Static Pressure at End of this Duct (To End):	0/0		
	Velocity Pressure in this Section:	0		
	Estimated Brake Horsepower (70% efficiency):	0		
	Velocity:	0		
Shapes: Round to Rectangular 🗸 🗸	Pressure Drop per 100':	0		
Recalculate Size	Recalculate Velocity	/		
	OK			

Changes can be made to the duct in the same way as when it was inserted. See the <u>Common Duct Information</u> section for more information.

The airflow information in the dialog box is specific to the Query Duct command.

Recalculate Size: Press this button to recalculate the size of this duct. The current settings in the dialog box will be used.

CFM: The volume of air traveling through this duct.

Check the *Lock* box to lock the *CFM* at a specified value. If this box is unchecked, the *CFM* value is calculated based upon the airflow through the diffusers connected to the ductwork.

CFM Diversity Factor: A diversity factor applied to the CFM value in this duct. The diversified CFM value is displayed in the *CFM* field and used for ductwork calculations. The full CFM value is passed to the next duct

when the CFM values are calculated.

Pressure Drop in this Section: The pressure drop through this duct. This is the pressure drop in the straight section of duct between the fittings. It is not a total pressure drop for the system and it does not include the fitting pressure drop.

Check the Lock box to lock the Pressure Drop in this Section at a specified value.

Pressure Drop in Previous Fitting: The pressure drop through the previous fitting. See the <u>Previous and Next</u> <u>Ducts</u> sections for more information about identifying the previous fitting.

Static Pressure at end of Previous Duct (or Fan): The static pressure at the end of the previous duct just before the fitting or, if there is no previous duct, at the fan connected to this duct.

Check the Lock box to lock the Static Pressure at end of Previous Duct (or Fan) at a specified value.

Total Pressure at end of Previous Duct (or Fan): The total pressure at the end of the previous duct or, if there is no previous duct, at the fan connected to this duct.

Total / Static Pressure at Start of this Duct (From Start): The total and static pressure at the start of this duct, as calculated from the fan.

Total / Static Pressure at Start of this Duct (To End): The total and static pressure at the start of this duct, as calculated from the diffusers.

Total / Static Pressure at End of this Duct (From Start): The total and static pressure at the end of this duct, as calculated from the fan.

Total / Static Pressure at End of this Duct (To End): The total and static pressure at the end of this duct, as calculated from the diffusers.

Velocity Pressure in this Section: The velocity pressure in this duct.

Estimate Brake Horsepower (70% efficiency): The fan size required based upon the total pressure in the duct.

Velocity: The velocity of the air flowing through this duct.

Pressure Drop per 100': The pressure drop per 100 feet in this duct.

Recalculate Velocity: Press this button to recalculate the velocity and velocity pressure in this duct. The duct size and airflow will not be recalculated.

Edit Multiple Ducts

To edit multiple ducts, go to

Ribbon: DM HVAC->Ducts-> Edit Multiple Ducts

Pulldown Menu: DM HVAC->Duct Centerlines->Edit Multiple Ducts

You will be prompted to select the ducts to be edited.

Select ducts to edit:

Duct Settings	Dialog Bo	X
----------------------	------------------	---

Duct Settings		×
Starting Elevation (ft-in): <a>	Airflow: <varies> ~</varies>	Hangers
Ending Elevation (ft-in): <a>Varies>	Graphics: Horizontal Alignment:	Hanger Type: None Size (in): 1
Vertical Alignment: Center of Duct \lor	Interior Lining: No \sim	Depth (in): 1
Width (in): Varies> Locked: No Depth (in): Varies> Locked: No Shape: Varies>	Interior Lining Width: 3 Exterior Lining: No ~ Exterior Lining Width: 3 Material:	Starting Offset (in): 36 Ending Offset (in): 36 Spacing (in): 36 Left Width (in): 0 Right Width (in): 0
Maximum Depth: <a>Varies>	Same as Previous: No V	Ending Elevation (ft-in): 10
Sizing Criteria Sizing Method: <td>CFM: CFM: CFM Diversity: 1 Pressure Drop in this Section: 0</td> <td>Locked: No ~</td>	CFM: CFM: CFM Diversity: 1 Pressure Drop in this Section: 0	Locked: No ~
Shapes: <varies></varies>	Ending Static Pressure: 0 OK Cancel	Locked: No ~

Changes can be made to the ducts in the same way as when they were inserted or queried. See the <u>Query Duct</u> section for more information.

Edit Duct Branch

The Edit Duct Branch command is used to edit a run of connected ducts. All of the ducts that are connected to the selected duct will be modified.

To edit all of the ducts in a selected branch, go to

Ribbon: DM HVAC->Ducts->

 $Pulldown \ Menu: \ \texttt{DM HVAC->Duct Centerlines->Edit Duct Branch}$

You will be prompted to select a single duct.

Select duct or label to edit:

Duct Settings Dialog Box

Duct Settings		×
Starting Elevation (ft-in): <a>	Airflow: <varies> ~</varies>	Hangers
Ending Elevation (ft-in): <a>Varies>	Graphics: Horizontal Alignment:	Hanger Type: None V
Vertical Alignment: Center of Duct \lor	Interior Lining: No ~	Depth (in): 1
Width (in): <varies> Locked: No ~ Depth (in): <varies> Locked: No ~ Shape: <varies> Locked: No ~ Maximum Depth: <varies></varies></varies></varies></varies>	Interior Lining Width: 3 Exterior Lining: No ~ Exterior Lining Width: 3 Material: <varies> ~ Layer System: New ~ Same as Previous: New ~</varies>	Starting Uffset (in): 36 Ending Offset (in): 36 Spacing (in): 36 Left Width (in): 0 Right Width (in): 0 Ending Elevation (ft-in): 10
Sizing Criteria Sizing Method:	CFM: CFM: CFM Diversity: 1 Pressure Drop in this Section: 0	Locked: No V
Shapes:	Ending Static Pressure: 0 OK Cancel	Locked: No V

Changes can be made to the ducts in the same way as when they were inserted or queried. See the <u>Query Duct</u> section for more information.

The modified values will be applied to the selected duct and all of the next ducts. See the <u>Previous and Next</u> <u>Ducts</u> section for more information about identifying next ducts.

Match Ducts

The Match Ducts command is used to copy the properties of an existing duct on the drawing to one or more other ducts. The *Starting Elevation* and *Ending Elevation* will not be changed.

To match duct properties, go to

Ribbon: DM HVAC->Ducts-> 🚊 Match Ducts

Pulldown Menu: DM HVAC->Duct Centerlines->Match Ducts

You will be prompted to select a duct from which the properties will be copied.

Select duct or label to copy properties from:

You will then be prompted to select one or more ducts to change.

Select ducts to copy properties to:

Press ENTER to change the properties of the selected ducts.

Erase Ducts

The Erase Duct command is used to erase ducts from the drawing. All entities from the selected area are filtered out except for duct centerlines, making it easier to select the ducts to erase. Other than the filter, it works exactly the same as the standard CAD **ERASE** command. Whether you use this command or the **ERASE** command is strictly user preference.

Select objects:

The selected ducts will be erased from the drawing and database.

Insert Drawing to Drawing Connection

The Insert Drawing to Drawing Connection command is used to insert a duct that connects one drawing to another. The duct calculations go between the drawings through this duct. It is most often used to create vertical ducts that span multiple floors in your project.

A drawing-to-drawing connection duct is inserted as a duct centerline on the two drawings that are being connected. Both centerlines refer to the same duct in the database.

A label is inserted with the centerline. The end of the centerline that does not have a label is where the duct starts or ends on the current drawing. The location of the end without the label is used to establish connections to other ducts on the drawing. The end of the centerline with the label is for display purposes only. The specific location of this end is not used for calculation purposes. The label lists the other drawing that the duct connects to and the duct ID number.

The duct ID is the number used to represent the duct in the database. The duct ID will match on the two drawings and can be used to verify that you are viewing the same drawing-to-drawing connection on both drawings. The specific value is automatically generated by the database and cannot be changed.

To insert a drawing-to-drawing connection duct, go to

Ribbon: DM HVAC->Ducts-> UIIL ->Insert Drawing to Drawing Connection

Pulldown Menu: DM HVAC->Duct Centerlines->Insert Drawing to Drawing Connection

The drawing-to-drawing connection will start on the drawing that is currently active. The active drawing should be the drawing where the duct is closer to the fan.

You will be prompted to select the drawing to which the duct will connect. The selected drawing should be closer to the diffusers.

A Select drawing to connect to ×				
Look in:	HVAC	~	G 🤌 📂 🛄 -	
-	Name	^	Date modified	Туре
	DMBackup		2/27/2019 10:25 AM	File folder
Quick access	NEW		1/9/2019 5:33 PM	File folder
	OLD		11/29/2018 1:44 PM	File folder
	🚰 M-0.1.dwg		11/26/2018 1:56 PM	AutoCAD
Desktop	🚰 M-1.0 (1st F	loor).dwg	2/26/2019 8:21 AM	AutoCAD
-	🚰 M-1.1 (2nd	Floor).dwg	11/21/2018 1:37 PM	AutoCAD
-	🚰 M-1.3 (Roo	f).dwg	11/28/2018 10:43	AutoCAD
Libraries	🔄 🚰 xr-floor1.dv	vg	11/20/2018 9:00 AM	AutoCAD
	📥 xr-floor2.dwg		11/20/2018 9:00 AM	AutoCAD
	🔄 xr-site.dwg		11/20/2018 9:00 AM	AutoCAD
This PC				
	<			>
- -	-			0
Network	File name:		<u> </u>	Open
	Files of type:	DWG Files (*.DWG)	~	Cancel
		Open as read-only		
		,,,,,,		

Select drawing to connect to Dialog Box

You will then be prompted to select the duct that is to be connected to another drawing.

Select duct or label to connect to another drawing:

The **Duct Elevation** dialog box will appear.

Duct Elevation	×		
Duct elevation on other drawing (ft-in):			
ОК	Cancel		

Duct elevation on other drawing: The elevation of the duct on the other drawing. This elevation will be relative to the elevation of the alignment point on the other drawing. If the drawing-to-drawing connection duct is going up, set this value to 0. If the drawing-to-drawing connection duct is going down, set this value to the wall height on the floor below.

Press the OK button to insert the drawing-to-drawing connection.

The drawing you are connecting to will open. If the other drawing cannot be opened automatically, you will be prompted to open it manually. Once the drawing is open, the command will continue.

If there are multiple alignment point areas on the drawing, you will be prompted to specify the area in which to insert the duct.

Specify point in alignment point area to use:

The drawing-to-drawing connection will be inserted on the drawing, either in the selected alignment point area or in the only area on the drawing. The insertion location will be in the same location relative to the alignment point as on the first drawing.

You will then be prompted to insert additional ducts connected to the new drawing-to-drawing connection duct. See the <u>Insert Duct</u> section for more information about inserting the additional ducts.

Fillet Ducts

The Fillet Ducts command is used to join two ducts together. The command works similar to the standard CAD FILLET command.

To fillet two ducts, go to

Ribbon: DM HVAC->Ducts-> 🤾 Fillet Ducts

Pulldown Menu: DM HVAC->Duct Centerlines->Fillet Ducts

You will be prompted to select the first duct to fillet.

Select duct or label to fillet:

The selected centerline will be highlighted. You will then be prompted to select the second duct.

Select duct or label to fillet:

The two ducts will be extended to each other and connected. If the ducts are at different elevations, a vertical piece will be inserted at the elbow to complete the connection.

Break Duct

The Break Duct command will break a single duct centerline into two ducts.

To break a duct, go to

Ribbon: DM HVAC->Ducts-> 🎤 Break Duct

Pulldown Menu: DM HVAC->Duct Centerlines->Break Duct

You will be prompted to specify the location of the break on the duct centerline.

Select duct at break point:

The centerline will be broken into two segments. Both segments will point in the same direction as the original centerline.

Remove Duct Node

To remove a node and combine two ducts into one duct, go to

Ribbon: DM HVAC->Ducts-> 🄀 Remove Duct Node

Pulldown Menu: DM HVAC->Duct Centerlines->Remove Duct Node

You will be prompted to identify the duct node to be removed.

Select duct or label node to remove:

The two ducts will be combined into one. The sizing criteria and duct specifications will be matched to those of the duct that was closest to the fan.

Move Duct Run

The Move Duct Run command is used to move part of a duct run. This command is often used to move a single duct with several ducts connected to it without needing to adjust the other ducts.

To move a duct run, go to

Ribbon: DM HVAC->Ducts-> 🎾 Move Duct Run

Pulldown Menu: DM HVAC->Duct Centerlines->Move Duct Run

You will be prompted to select a duct to move.

Select duct or label on run to move:

You can then move the selected duct in the same way as with the standard CAD MOVE command.

Any ducts connected to the selected duct will have their starting or ending points moved to stay connected.

Straighten Next Ducts

The Straighten Next Ducts command is used to make duct centerlines straight relative to the other centerlines to which they are connected. The first centerline you select will be treated as straight by the command. All of the centerlines that the selected centerline points to will be moved so they are either parallel or perpendicular to the selected centerline.

Any centerlines connected to the centerlines that are moved will have their starting points moved to stay connected. Their ending points will not be moved, which can result in centerlines that are no longer straight. Continue using the Straighten Next Ducts command until all of the centerlines are straight.

To straighten ducts, go to

Ribbon: DM HVAC->Ducts-> NEXT Straighten Next Ducts

Pulldown Menu: DM HVAC->Duct Centerlines->Straighten Next Ducts

You will be prompted to select the duct centerline that is straight.

Select the duct or label that is currently straight:

The next centerlines of the selected duct will be made straight.

See the **Previous and Next Ducts** section for more information about identifying the next ducts.

Straighten Previous Ducts

The Straighten Previous Ducts command is used to make duct centerlines straight relative to the other centerlines to which they are connected. The first centerline you select will be treated as straight by the command. All of the centerlines that point to the selected centerline will be moved so that they are either parallel or perpendicular to the selected centerline.

Any centerlines connected to the centerlines that are moved will have their ending points moved to stay connected. Their starting points will not be moved, which can result in centerlines that are no longer straight. Continue using the Straighten Previous Ducts command until all of the centerlines are straight.

To straighten ducts, go to

Ribbon: DM HVAC->Ducts-> PREV Straighten Previous Ducts

Pulldown Menu: DM HVAC->Duct Centerlines->Straighten Previous Ducts

You will be prompted to select the duct centerline that is straight.

Select the duct or label that is currently straight:

The previous centerlines of the selected duct will be made straight.

See the **Previous and Next Ducts** section for more information about identifying the previous ducts.

Offset Vertical Duct

The Offset Vertical Duct command is used to insert a vertical duct connected to a horizontal duct that has its *Horizontal Alignment* set to **Left** or **Right**. See the <u>Common Duct Centerline Information</u> section for more information about this setting.

To insert an offset vertical duct, go to

Ribbon: DM HVAC->Ducts-> I Offset Vertical Duct

Pulldown Menu: DM HVAC->Duct Centerlines->Offset Vertical Duct

You will be prompted to select the horizontal duct to which the vertical duct will connect.

Select duct or label to connect vertical duct to:

You will then be prompted to specify the location of the vertical duct.

Specify insertion point for vertical duct:

The **Offset Vertical Duct** dialog box will appear.

Offset Vertical Duct			×
End	ding Elevati	on (ft-in): 11-3	
	OK	Cancel	

Ending Elevation: The elevation of the end of the vertical duct. See the Elevation section for more information.

Enter the desired ending elevation and press the **OK** button. A duct centerline representing the vertical duct will be inserted perpendicular to the selected horizontal duct. The vertical duct will be drawn at the end of the newly inserted duct.

Reverse One Duct

The Reverse One Duct command is used to swap the starting and ending points of a selected duct centerline.

To reverse the direction of a single duct, go to

Ribbon: DM HVAC->Ducts-> 🏸 Reverse One Duct

Pulldown Menu: DM HVAC->Duct Centerlines->Reverse One Duct

You will be prompted to specify the duct for which the direction is to be reversed.

Select duct or label to reverse:

The selected duct will be reversed.

Reverse Duct Branch

The Reverse Duct Branch command is used to reverse a series of ducts in a branch.

The starting and ending points of the selected duct will be swapped. The duct that is previous to the selected duct will also be reversed. The previous ducts will continue to be reversed until no previous duct is found. See the <u>Previous and Next Ducts</u> section for more information about identifying the previous ducts.

To reverse the direction of a duct branch, go to

Ribbon: DM HVAC->Ducts-> 🎤 Reverse Duct Branch

Pulldown Menu: DM HVAC->Duct Centerlines->Reverse Duct Branch

You will be prompted to select the first duct in the branch to reverse.

Select duct or label at start of branch to reverse:

The selected duct and all of the previous ducts will be reversed.

Force Ducts Together

The Force Ducts Together command is used to connect two separate duct centerlines on the drawing and in the database. This will adjust the angle for one of the ducts. Use the <u>Fillet Ducts</u> command to connect ducts without adjusting their angles.

To connect two ducts that are on the drawing but not currently connected, go to

Ribbon: DM HVAC->Ducts-> UTIL ->Force Ducts Together

Pulldown Menu: DM HVAC->Duct Centerlines->Force Ducts Together

You will be prompted to specify the duct that is closer to the fan.

Select duct or label that is toward the air handler or fan:

Then you will be prompted to specify the duct that is closer to the diffusers.

Select duct or label that is away from the air handler or fan:

The end points of the ducts will be moved so that they are connected.

Edit Duct Node Elevation

The Edit Duct Node Elevation command is used to change the elevation of all of the ducts at an intersection.

To edit a duct node elevation, go to

Ribbon: DM HVAC->Ducts-> UTL ->Edit Duct Node Elevation

Pulldown Menu: DM HVAC->Duct Centerlines->Edit Duct Node Elevation

Edit Duct Node Elevation Dialog Box

Edit Duct Node Elevation $ imes$		
New Elevation (ft-in):		
ОК	Cancel	

New Elevation: The elevation to use for the selected duct node.

Enter the new elevation and press the **OK** button. You will be prompted to select the duct intersection for which the elevation will be changed.

Select duct or label:

All of the ducts at the intersection will be updated with the new elevation.

You will be prompted to select more ducts. Continue to select duct nodes to be set at the new elevation, or press **ENTER** to finish the command.

Diffusers

This section describes the commands used to create, modify, and use diffusers.

Training Videos

<u>Diffusers Overview</u>

Common Diffuser Information

The values that can be specified for a diffuser are listed below.

Callout: The name of the diffuser.

Include in Schedule: Whether the diffuser type is displayed in the diffuser schedule that is inserted on the drawing. Most diffuser types will have this box checked. It is commonly unchecked for existing diffuser types.

Block Number: An identifier that corresponds to the block used to represent the diffuser. See the <u>Diffuser</u> <u>Blocks</u> section for more information.

Block Type: The type of block used to represent the diffuser. See the <u>Diffuser Blocks</u> section for more information.

Description: A description of the diffuser that will appear on the diffuser schedule on the drawing.

MFR/Model: A description of the model and manufacturer of the diffuser that will appear on the diffuser schedule on the drawing.

Notes: Notes that will appear on the diffuser schedule on the drawing.

CFM Range, Min: The minimum airflow for the diffuser.

CFM Range, Max: The maximum airflow for the diffuser.

Noise at Maximum: The noise level of the diffuser when the maximum amount of air is flowing through it. This value is displayed on the diffuser schedule on the drawing.

Airflow: The type of air flowing through the diffuser. The diffuser layers and block are based upon the airflow.

- Exhaust: Exhaust diffuser. The diffuser block typically has a full slash and a half slash.
- Outside Air: Outside air diffuser.

- **Return:** Return diffuser. The diffuser block typically has a single full slash.
- Supply: Supply diffuser. The diffuser block typically has two slashes.

Throw Range, Min: The minimum distance that the diffuser will throw air. This value is displayed on the diffuser schedule on the drawing.

Throw Range, Max: The maximum distance that the diffuser will throw air. This value is displayed on the diffuser schedule on the drawing.

Pressure Drop Through Diffuser: The pressure drop through the diffuser. This value is displayed on the diffuser schedule on the drawing. This value is provided by the manufacturer.

Face Width (in): For rectangular, sidewall, and slot diffusers, the width of the diffuser. For round diffusers, this value is the diameter.

Face Depth (in): For rectangular, sidewall, and slot diffusers, the depth of the diffuser. For round diffusers, this value is ignored.

Nominal Size (in): The nominal size of the diffuser. This value is displayed on the diffuser schedule on the drawing

Neck Width: The size of the diffuser neck. This value is either the width or the diameter, depending upon the value of the *Neck Depth* field.

Neck Depth: The depth of the diffuser neck. If this value is 0, the neck is round.

Connection Type: How ducts connect to the diffuser. This value can be changed on individual diffusers.

- **Top** / **Bottom:** Ducts connect to the top or bottom of the diffuser, depending upon whether it is located on the ceiling or the floor.
- Side: Ducts connect to the side of the diffuser.

Default Location: Where the diffuser is located. This setting controls whether ductwork connects to the diffuser from above or below. This value can be changed on individual diffusers.

- On Ceiling: The diffuser is located in the ceiling. The ductwork connecting to the diffuser comes from above.
- **On Floor:** The diffuser is located on the floor. The ductwork connecting to the diffuser comes from below.

Insert Diffuser

To insert a diffuser on a drawing, go to

Insert	Diffuser
	Insert

Pulldown Menu: DM HVAC->Diffusers->Insert Diffuser

Insert Diffuser Dialog Box

Insert Diffuser		×
Group: General		~
Callout: R-1 R-2 S-1 S-2 S-3 S-4	Type: RETURN Diffuser Size: 24x24 Neck Size: 8 Round	SQUARE CEILING
	CFM: 0 CFM Range: 0 - 400	
	Elevation (ft-in): C C = Ceiling Height Location	
	On Ceiling	◯ On Floor
	Connection Type	0
	Top / Bottom Throw Range: 0 - 0 Throw Distance: 0.0	() Side
Edit	Layer System: New	~
OK Cancel		

Group: The active diffuser group. See the Common Groups Dialog Box Features section for more information.

Callout: The type of diffuser to be inserted. The list of diffusers available is defined in the **<u>Diffuser Project</u>** <u>Schedule</u> command.

The selected callout controls the set values displayed in the dialog box, such as *CFM Range*. See the <u>Common</u> <u>Diffuser Information</u> section for more information about these values. To change these values, you must change the definition of the diffuser type in the project schedule.

Edit: Press this button to open the Diffuser Project Schedule with the selected diffuser active.

CFM: The airflow through the diffuser.

Elevation: The elevation of the diffuser. See the **<u>Elevation</u>** section for more information.

Enter **C** to indicate the elevation is the same as the ceiling height of the room in which the diffuser is inserted. You must have rooms inserted on the drawing to use this value. See the <u>Create Room</u> section for more information.

Location: Where the diffuser is located. This setting controls whether ductwork connects to the diffuser from above or below.

- **On Ceiling:** The diffuser is located in the ceiling. The ductwork connecting to the diffuser comes from above.
- **On Floor:** The diffuser is located on the floor. The ductwork connecting to the diffuser comes from below.

Connection Type: How ducts connect to the diffuser.

- **Top** / **Bottom:** Ducts connect to the top or bottom of the diffuser, depending upon whether it is located on the ceiling or the floor.
- Side: Ducts connect to the side of the diffuser.

Layer System: See the Layer System section for more information.

Inserting the Diffuser on the Drawing

To insert a diffuser on the drawing, press the **OK** button. The settings specified in the dialog box will be used for the inserted diffuser. You will be prompted to identify where on the drawing the diffuser is to be inserted.

Specify insertion point or [Corner/Middle]:

Specify insertion point: Specify the location on the drawing where the diffuser is to be inserted.

Corner: Type c to change the insertion point of the diffuser to a corner on the diffuser block. Type c again to select a different corner. This option is only available for rectangular diffusers.

Middle: Type \mathbf{M} to change the insertion point of the diffuser to the middle of the diffuser block. This option is only available for rectangular diffusers.

You then will be prompted for the rotation angle.

Specify rotation:

You will then be prompted to insert another diffuser of the same type. Continue to insert diffusers, or press **ENTER** to finish the command.

Related Options

You can customize diffuser callouts and whether throw arrows are shown when diffusers are inserted on the drawing. See the **<u>Diffusers Options</u>** section for more information.

Query Diffuser

To modify a diffuser that is inserted on the drawing, go to

Ribbon: DM HVAC->Diffusers->

```
Pulldown Menu: DM HVAC->Diffusers->Query Diffuser
```

Select a diffuser on the drawing. The information in the database regarding the selected diffuser will be displayed in the **Query Diffuser** dialog box.

Query Diffuser Dialog Box
Query Diffuser	×
Group: General	~
Callout: R- 1 R- 2 S- 1 S- 2 S- 3 S- 4	Type: SUPPLY Diffuser Size: 24x24 Neck Size: 8 Round ROUND CEILING
	CFM: 350 CFM Range: 0 - 250 Elevation (ft-in): 8 C = Ceiling Height Location
	On Ceiling On Floor
	Top / Bottom O Side Throw Range: 0 - 0
	Throw Distance: 0.0
Edit	Layer System: New ~

Changes can be made to the diffuser in the same way as when it was inserted. See the <u>Insert Diffuser</u> section for more information.

Edit Multiple Diffusers

To edit multiple diffusers, go to

Ribbon: DM HVAC->Diffusers->

Pulldown Menu: DM HVAC->Diffusers->Edit Multiple Diffusers

You will be prompted to select the diffusers to be edited.

Select diffusers to edit:

The Edit Multiple Diffusers dialog box will appear.

Edit Multiple Diffusers Dialog Box

Edit Multiple Diffusers X
Group: General ~
<varies> V Edit</varies>
Type: <varies> Diffuser Size: 24x24 Neck Size: 8 Round</varies>
CFM
Range: <varies></varies>
<varies></varies>
Elevation (ft-in)
C = Ceiling Height
8
Location On Ceiling ~
Connection Type Top/Bottom ~
Layer System: New 🗸
OK Cancel

Changes can be made to the diffusers in the same way as when they were inserted. See the <u>Insert Diffuser</u> section for more information.

Match Diffusers

The Match Diffusers command is used to copy the properties of an existing diffuser on the drawing to one or more other diffusers.

To match diffuser properties, go to

Ribbon: DM HVAC->Diffusers-> 💄 Match Diffusers

```
Pulldown Menu: DM HVAC->Diffusers->Match Diffusers
```

You will be prompted to select a diffuser from which the properties will be copied.

Select diffuser to copy properties from:

You will then be prompted to select one or more diffusers to change.

Select diffusers to copy properties to:

Press ENTER to change the properties of the selected diffusers.

Array Diffuser (2 Point)

The Array Diffuser (2 Point) command is used to array diffusers on the drawing in a straight line from the first diffuser to a second point.

Use this command instead of the standard CAD ARRAY command.

To array diffusers using the 2-point method, go to

Ribbon: DM HVAC->Diffusers-> 📅 Array Diffuser (2 Point)

Pulldown Menu: DM HVAC->Diffusers->Array Diffuser (2 Point)

You will be prompted to select the diffusers to array.

Select diffusers to array:

You will then be prompted to specify a second point for the array. The distance between the specified point and the first diffuser will be divided evenly among the diffusers in the array.

End point of array:

You will then be prompted to specify the number of diffusers in the array, including the selected diffuser.

Number of diffusers in array (including selected diffuser):

The diffusers in the array will be generated in the space between the selected diffuser and the end point.

Array Diffuser (Distance / Angle)

The Array Diffuser (Distance/Angle) command is used to array devices on the drawing in a straight line from the first diffuser in a set direction with a set distance between each diffuser.

Use this command instead of the standard CAD ARRAY command.

To array a diffuser using the distance/angle method, go to

Ribbon: DM HVAC->Diffusers->

Pulldown Menu: DM HVAC->Modify Diffusers->Array Diffuser (Distance/Angle)

You will be prompted to select the diffusers to array.

Select diffusers to array:

You will then be prompted to set an offset distance and angle. The distance between each diffuser in the array is based upon the distance from the specified point to the first diffuser.

Offset distance and angle:

You will then be prompted to specify the number of diffusers in the array, including the selected diffuser.

Number of diffusers in array (including selected diffuser):

The diffusers in the array will be generated in the direction of the specified point from the selected diffuser.

Insert or Move Callout

The Insert or Move Callout command can be used to either insert a callout on a diffuser that does not have one, or move a callout that already exists on the drawing.

To insert or move a diffuser callout, go to

Ribbon: DM HVAC->Diffusers-> → Insert or Move Callout

Pulldown Menu: DM HVAC->Diffusers->Insert or Move Callout

You will be prompted to select a diffuser or diffuser callout. If you are inserting a diffuser callout, select the diffuser. If you are moving a diffuser callout, you can select either the diffuser or the diffuser callout.

Select diffuser or diffuser callout:

Specify a location for the diffuser callout. See the <u>Inserting Notes and Leaders on the Drawing</u> section for more information about inserting or moving the diffuser callout.

Related Options

Diffuser callout insertion: Sets whether a diffuser callout is inserted along with the diffuser.

Remove Callout

To remove a diffuser callout, go to

Ribbon: DM HVAC->Diffusers-> Kemove Callout

Pulldown Menu: DM HVAC->Diffusers->Remove Callout

You will be prompted to select the diffuser callout to be removed. You can also select the diffuser itself.

Select diffuser callout to remove:

The diffuser callout will be removed.

Related Options

Diffuser callout insertion: Sets whether a diffuser callout is inserted along with the diffuser.

Insert Throw Arrow

To insert a diffuser throw arrow, go to

Ribbon: DM HVAC->Diffusers-> -> Insert Throw Arrow

Pulldown Menu: DM HVAC->Diffusers->Insert Throw Arrow

You will be prompted to select the side of the diffuser on which the throw arrow should be inserted.

Select side of diffuser to which to add throw arrow:

A throw arrow will be inserted on the drawing.

Related Options

Show arrows on 4 way throw patterns: Sets whether throw arrows are inserted along with diffusers.

Remove Throw Arrow

To remove a throw arrow, go to

Pulldown Menu: DM HVAC->Diffusers->Remove Throw Arrow

. **.**

You will be prompted to select a throw arrow to remove.

Select throw arrow to remove:

The selected throw arrow will be removed from the drawing.

Related Options

Show arrows on 4 way throw patterns: Sets whether throw arrows are inserted along with diffusers.

Match Throw Arrow

The Match Throw Arrow command is used to copy the throw arrow configuration on an existing diffuser to one or more other diffusers.

To match throw arrows, go to

Ribbon: DM HVAC->Diffusers-> 🕏 Match Throw Arrow

Pulldown Menu: DM HVAC->Diffusers->Match Throw Arrow

You will be prompted to select the diffuser with the throw arrow configuration to be copied.

Select diffuser to use as throw arrow source:

You will then be prompted to select one or more diffusers to which the throw arrow configuration will be copied.

Select objects:

Press ENTER to change the throw arrow configuration of the selected diffusers.

Insert Diffuser Schedule

The Insert Diffuser Schedule command can be used to insert a diffuser schedule on the drawing that lists all of the diffusers used in the current project.

To insert the diffuser schedule, go to

Ribbon: DM HVAC->Diffusers->

Pulldown Menu: DM HVAC->Diffusers->Insert Diffuser Schedule

Edit Diffuser Project Schedule Dialog Box

Edit Diffuser Project Schedule X
Schedule Notes: Edit
Maximum Schedule Height: Specify On Drawing <
Show Unused Diffusers
Edit Title, Column Labels, and Column Order
OK Cancel

Schedule Notes: A note that will appear below the schedule when inserted on the drawing.

Maximum Schedule Height: Whether the schedule has a maximum height. This height corresponds to inches on the printed page.

If this is not checked, the schedule will be in a single schedule.

If this is checked, you can specify the maximum height of the schedule. When the schedule exceeds this height, it will be continued in a second schedule next to the first. The label of the second schedule will have the *Schedule Title Continued Label* option added to it to indicate that it is a continuation of the first schedule. See the Miscellaneous options section for more information.

Specify on Drawing: Press this button to specify the *Maximum Schedule Height* on the drawing. The dialog box will be closed and you will be prompted to specify the height.

Specify maximum schedule height:

The distance that you enter on the drawing will be used as the maximum height. It is simplest to draw a line

straight down to where the bottom of the schedule should be located.

Show Unused Diffusers: Whether diffusers in the schedule that have not been inserted on a drawing will be displayed in the schedule.

Edit Title, Column Labels, and Column Order: Press this button to modify the layout of the diffuser schedule on the drawing. See the Edit Diffuser Schedule List section for more information.

Inserting or Updating the Schedule On the Drawing

To insert or update the schedule, press the **OK** button.

Inserting the Schedule the First Time

If the diffuser schedule is not currently inserted on the drawing, you will be prompted for the insertion location of the schedule.

Specify insertion point for diffuser schedule:

The location you specify will be used as the top-left corner for the diffuser schedule.

Updating the Schedule Already on the Drawing

If the diffuser schedule is already inserted on the drawing, it will be updated in its current location.

You must update the schedule on the drawing when changes are made to the project schedule. The schedule will not update automatically.

If additional graphics, such as revision clouds, have been inserted over the schedule graphic, be sure to check their location after updating the schedule.

Related Options

<u>Schedule title justification:</u> Sets the justification for the schedule title.

<u>Schedule column label justification:</u> Sets the justification for column headings.

Schedule title continued label: Sets the label added to the schedule title for continued sections.

Diffuser Project Schedule

The diffuser project schedule contains the diffuser types used in the current project.

To create and modify diffuser types, go to

Ribbon: DM HVAC->Diffusers-> P Diffuser Project Schedule

Pulldown Menu: DM HVAC->Diffusers->Diffuser Project Schedule

Diffuser Project Schedule Dialog Box

Diffuser Project Schedule		×
Current Group: General Move to Another Group	Copy to	Select Group
Callout: R-2 Callout: R-2 Cellout: R-2 Cellout: R-2 Cellout: R-2 Cellout: R-2 Cellout: Rename Find Find	CFM Range Min: 401 Max: 1000 Noise at Maximum: 0 Airflow: Return Throw Range Min: 0 Max: 0	Face Dimensions Face Width (in): Pace Depth (in): Question Nominal Size (in): Neck Dimensions Neck Width (in): Neck Width (in): Neck Depth (in): O For Round Neck, Set Depth = 0 Connection Type Top / Bottom Default Location (a) On Ceiling
Block Type: RECTANGULAR	Pressure Drop Through Diffuser: 0.1	On Floor
WFR/Model: Note 1: Note 2:		Edit Edit Edit Edit
New Copy	Save	Delete
Import from Another Database	Import from Diffe	user Master Schedule

See the <u>Common Schedule Dialog Box Features</u> section for more information about how this dialog box works. This section describes the **Rename**, **Find**, **Previous**, **Next**, **New**, **Copy**, **Save**, and **Delete** buttons.

See the <u>Common Diffuser Information</u> section for more information about the other values that can be specified for diffusers using this dialog box.

See the <u>Import from the Another Database</u> and <u>Import from the Master Schedule</u> sections for more information about importing diffusers to the current project from other locations.

Current Group: The active group is listed here. All of the diffusers that are created and modified will be associated with this group.

Select Group: Press this button to open the **Diffuser Schedule Groups** dialog box. The group selected will become the *Current Group*. See the <u>Common Groups Dialog Box Features</u> section for more information.

Move to Another Group: Press this button to move the current diffuser to another group. A dialog box will prompt

you to select the other group to which the diffuser will be moved. The *Current Group* will be changed to the selected group. This button is disabled if only one group exists.

Copy to Another Group: Press this button to copy the current diffuser to another group. A dialog box will prompt you to select the other group to which the diffuser will be copied. A copy of the diffuser will be created in the other group. This button is disabled if only one group exists.

Select Block: Press this button to open the **Select Diffuser Block** dialog box. This dialog box allows you to choose the block used to represent the diffuser on the drawing.

Select Diffuser Block	×
Diffuser Description Rectangular Ceiling Round Ceiling Sidewall 1 Slot 2 Slot 3 Slot 4 Slot	SQUARE CEILING Diffuser Description: Rectangular Ceiling Diffuser Block: DM_HVAC-XXX1 Diffuser Type: RECTANGULAR
ОК	Cancel

You can add more blocks to this list using the **Diffuser Blocks->Edit Project List** command.

Diffuser Master Schedule

The diffuser master schedule contains the diffuser types that could be used by a company on a project. See the Master and Standards Databases section for more information about using master databases.

To create and modify diffuser types in the master schedule, go to

Ribbon: DM HVAC->Diffusers-> M Diffuser Master Schedule

Pulldown Menu: DM HVAC->Diffusers->Diffuser Master Schedule

Diffuser Master Schedule Dialog Box

Diffuser Master Schedule		×
Current Group: General Move to Another Group	Copy to Anoth	Select Group
Callout: R-1 Rename Find < Previous ,	CFM Range Min: 0 Max: 400 Noise at Maximum: 0 Airflow: Return ~ Throw Range Min: 0 Max: 0	Face Dimensions Face Width (in): 24 Face Depth (in): 24 Nominal Size (in):
Block Type: RECTANGULAR	Pressure Drop Through Diffuser: 0.1	On Floor
Description:		Edit
MFR/Model:		Edit
Note 1:		Edit
Note 2:		Edit
Note 3:		Edit
New Copy	Save	Delete
Import fro	om Diffuser Project Schedule	
	Exit	

See the <u>Common Schedule Dialog Box Features</u> section for more information about how this dialog box works. This section describes the **Rename**, **Find**, **Previous**, **Next**, **New**, **Copy**, **Save**, and **Delete** buttons.

See the <u>Common Diffuser Information</u> section for more information about the other values that can be specified for diffusers using this dialog box.

See the <u>Import from the Project Schedule</u> section for more information about importing diffusers from a project to the master database.

Current Group: The active diffuser group is listed here. All of the diffuser types that are created and modified will be associated with this group.

Select Group: Press this button to open the Diffuser Master Schedule Groups dialog box. The group selected will become the current group. See the <u>Common Groups Dialog Box Features</u> section for more information.

Move to Another Group: Press this button to move the current diffuser to another group. A dialog box will prompt you to select the other group to which the diffuser will be moved. The *Current Group* will be changed to the selected group. This button is disabled if only one group exists.

Copy to Another Group: Press this button to copy the current diffuser to another group. A dialog box will prompt you to select the other group to which the diffuser will be copied. A copy of the diffuser will be created in the other group. This button is disabled if only one group exists.

Select Block: Press this button to open the **Select Diffuser Block** dialog box. This dialog box allows you to choose the block used to represent the diffuser on the drawing.



You can add more blocks to this list using the **Diffuser Blocks->Edit Master List** command.

Coordinate Diffusers and Light Fixtures

If your company is using both Design Master HVAC and Design Master Electrical, it is possible to insert the light fixtures from Design Master Electrical on your HVAC drawings for coordination with your diffuser plan.

To coordinate the diffusers on an HVAC drawing with the light fixtures in a Design Master Electrical project, go to

Ribbon: DM HVAC->Diffusers-> 🚣 Coordinate Diffusers and Light Fixtures

Pulldown Menu: DM HVAC->Diffusers->Coordinate Diffusers and Light Fixtures

Select Electrical Database to Transfer Light Fixtures From Dialog Box

A Select Electri	cal Database to Tra	ansfer Light Fixtures From		×
Look in:	ELEC	~	G 🌶 📂 🖽 -	
Quick access Desktop Libraries	Name DMBackup dm_elec.dm	^ 1	Date modified 2/27/2019 9:19 AM 2/27/2019 10:00 AM 11/20/2018 9:58 AM	Type File folder DM File DM File
Network	< File name: Files of type:	dm_elec.dm DM Files (*.dm) Open as read-only	~	> Open Cancel

Select the electrical database from the project you are working on and press the **Open** button.

The database file name will start with "dm_elec". The extension will be ".dm". There may be a project name included at the end of the file name, depending upon how the project was originally set up.

The database file will be in the same folder as the drawings with the light fixtures on them. The specific location of the database will vary depending upon how your company arranges its project folders.

After you press the **Open** button, the **Light Fixture Coordination** dialog box will appear.

Light Fixture Coordina $ imes$
Drawing to coordinate with: E-1.1 (1ST FLOOR LIGHTING). E-3.1 (OUTDOOR PHOTOMET
OK Cancel

Select the drawing with which you would like to coordinate and press the **OK** button. The light fixtures from the selected database will be inserted on the current drawing.

Erase Coordination Light Fixtures

To erase the diffusers that were placed on the HVAC drawing using the <u>Coordinate Diffusers and Light Fixtures</u> command, go to

Ribbon: DM HVAC->Diffusers-> 🗙 Erase Coordination Light Fixtures

Pulldown Menu: DM HVAC->Diffusers->Erase Coordination Light Fixtures

Light fixtures imported from any electrical drawing will be erased from the drawing.

Diffuser Connections

This section describes the commands used to connect ducts to diffusers.

Training Videos

<u>Diffusers Overview</u>

Related Options

Size diffuser runout to match diffuser neck size: Sets whether the runout to a diffuser is sized based upon the airflow in the system or the diffuser neck size.

Default flex length: Sets the maximum length of flex duct used to make a diffuser connection.

Damper far from diffuser: Sets where balancing dampers are placed along ductwork.

Ceiling Connection: Fitting graphics: Sets how ceiling diffuser connections are displayed in 2D.

Connection Graphics: Sets how flex duct and hard duct diffuser connections are displayed in 2D.

Change Connection Type

The Change Connection Type command is used to change the settings used when a diffuser connection is made. These settings only affect newly inserted diffuser connections. Diffuser connections made before the changes must be modified manually using the <u>Query Duct</u> or <u>Edit Multiple Ducts</u> commands.

These values can also be set in the **<u>Diffuser Connections</u>** options section.

To change the default settings for diffuser connections, go to

Ribbon: DM HVAC->Diffuser Connections-> TYPE Change Connection Type

Pulldown Menu: DM HVAC->Diffuser Connections->Change Connection Type

Default Diffuser Connection Settings Dialog Box

Default Diffuser Connection Settings	×
Supply	
Ceiling Connection Type: Rexible	~
Lock Ceiling Connection Shape:	No ~
Sidewall Connection Type: Hard	~
Balancing Dampers: Yes	~
-	
Return	
Ceiling Connection Type: Rexible	~
Lock Ceiling Connection Shape:	Round ~
Sidewall Connection Type: Flexible	~
Balancing Dampers: No	~
Exhaust	
Ceiling Connection Type: Hard	~
Lock Ceiling Connection Shape:	Flat Oval 🗸
Sidewall Connection Type: Hard	~
Balancing Dampers: Yes	~
Outside Air	
Ceiling Connection Type: Hard	~
Lock Ceiling Connection Shape:	Rectangular ~
Sidewall Connection Type: Hard	~
Balancing Dampers: N-	
No	~
These values are defaults values for new o	connections only.
Use the "Query Duct" command to change connect	ctions that currently exist.
OK Cancel]
Carloci	

The following options can be set for different types of diffusers based upon the Airflow setting of the diffuser.

Ceiling Connection Type: The material type used for the duct when connecting to a floor or ceiling diffuser.

- **Flexible:** Flexible ducts are used to connect to the diffuser. The length of flexible duct is limited by the *Default flex length* option. If the connection exceeds that length, hard duct is used for part of the connection. See the **Diffuser Connections** options section for more information.
- Hard: Hard ducts are used to connect to the diffuser.

Lock Ceiling Connection Shape: Whether the ducts that are inserted as part of the diffuser connection have their shape locked.

- No: The duct shapes are not locked. The duct shape will be set when the duct is sized.
- Round: The duct shapes are locked as round.
- Rectangular: The duct shapes are locked as rectangular.
- Flat Oval: The duct shapes are locked as flat oval.

Sidewall Connection Type: The material type used for the duct when connecting to a sidewall diffuser.

- **Flexible:** Flexible ducts are used to connect to the diffuser. The length of flexible duct is limited by the *Default flex length* option. If the connection exceeds that length, hard duct is used for part of the connection. See the **Diffuser Connections** options section for more information.
- Hard: Hard ducts are used to connect to the diffuser.

Balancing Dampers: Whether a balancing damper is inserted in the duct connected to the diffuser.

- Yes: A balancing damper is inserted.
- No: A balancing damper is not inserted.

Related Options

Supply, Return, Exhaust, and Outside: Sets the defaults for each setting in this dialog box.

Perpendicular Connection

The Perpendicular Connection command is used to make a perpendicular connection between a duct and one or more diffusers.

To connect diffusers to a duct with a perpendicular connection, go to

```
Ribbon: DM HVAC->Diffuser Connections-> 🎴 Perpendicular Connection
```

Pulldown Menu: DM HVAC->Diffuser Connections->Perpendicular Connection

You will be prompted to specify the diffusers to be connected.

Select diffusers to connect:

You will then be prompted to specify the duct to which the diffusers will be connected.

Select duct or label to connect:

The diffusers will be connected to the ductwork with a perpendicular connection.

Single 90 Connection

The Single 90 Connection command inserts a diffuser connection that extends perpendicular to the selected duct, then turns 45 degrees to connect to the selected diffuser.

To insert a single 90 connection, go to

Ribbon: DM HVAC->Diffuser Connections-> 💾 Single 90 Connection

Pulldown Menu: DM HVAC->Diffuser Connections->Single 90 Connection

You will be prompted to specify the diffuser to be connected.

Select diffuser to connect:

You will then be prompted to specify the duct to which the diffuser will be connected.

Select duct or label at connection point:

Select the duct at the location where the connection will be made. The duct will be broken at the selected point. A duct that is perpendicular to the selected duct will be inserted and connected to the selected diffuser.

Single 45 Connection

The Single 45 Connection command inserts a diffuser connection that extends at a 45-degree angle to the selected duct, then turns 45 degrees to connect to the selected diffuser.

To insert a single 45 connection, go to

Ribbon: DM HVAC->Diffuser Connections-> 🚄 Single 45 Connection

Pulldown Menu: DM HVAC->Diffuser Connections->Single 45 Connection

You will be prompted to specify the diffuser to be connected.

Select diffuser to connect:

You will then be prompted to specify the duct to which the diffuser will be connected.

Select duct or label at connection point:

Select the duct at the location where the connection will be made. The duct will be broken at the selected point. A duct that is 45 degrees to the selected duct will be inserted and connected to the selected diffuser.

End Connection

The End Connection command inserts a diffuser connection that extends from the end of a duct directly to a diffuser. The connection is inserted as a straight line. No additional turns or adjustments to the duct path are inserted.

To insert an end connection, go to

Ribbon: DM HVAC->Diffuser Connections->

 $Pulldown \ Menu: \ {\tt DM \ HVAC->Diffuser \ Connections->End \ Connection}$

You will be prompted to specify the diffuser to be connected.

Select diffuser to connect:

You will then be prompted to specify the duct to which the diffuser will be connected.

Select duct or label to connect:

A connection will be inserted from the end of the selected duct to the diffuser.

Bottom Connection

The Bottom Connection command inserts a diffuser connection between a duct and a diffuser directly below it.

To connect a diffuser to the bottom of a duct, go to

Ribbon: DM HVAC->Diffuser Connections->

Pulldown Menu: DM HVAC->Diffuser Connections->Bottom Connection

You will be prompted to specify the diffuser to be connected.

Select diffuser to connect:

You will then be prompted to specify the duct to which the diffuser will be connected.

Select duct or label to connect:

A connection between the duct and the diffuser will be inserted.

Transparent Connection

The Transparent Connection command inserts a connection between a duct and a diffuser for which the graphics will not be drawn. Airflow will be transferred from the diffuser to the duct.

To insert a transparent connection, go to

Ribbon: DM HVAC->Diffuser Connections-> Transparent Connection

Pulldown Menu: DM HVAC->Diffuser Connections->Transparent Connection

You will be prompted to specify the diffuser to be connected.

Select diffuser to connect:

You will then be prompted to specify the duct to which the diffuser will be connected.

Select duct or label to connect:

A duct centerline will be inserted between the selected duct and diffuser. The *Graphics* for the centerline will be set to **Transparent**.

Vertical Transparent Connection

The Vertical Transparent Connection command inserts a connection between a duct and a diffuser for which the graphics will not be drawn. A vertical duct will be displayed at the diffuser. Airflow will be transferred

from the diffuser to the duct.

To insert a vertical transparent connection, go to

Ribbon: DM HVAC->Diffuser Connections->

Pulldown Menu: DM HVAC->Diffuser Connections->Vertical Transparent Connection

You will be prompted to specify the diffuser to be connected.

Select diffuser to connect:

You will then be prompted to specify the duct to which the diffuser will be connected.

Select duct or label to connect:

A duct centerline will be inserted between the selected duct and diffuser. The *Graphics* for the centerline will be set to **Transparent**.

A vertical duct will be inserted at the diffuser. The *Graphics* for the vertical centerline will be set to **Automatic**.

Disconnect Diffuser

The Disconnect Diffuser command is used to remove a connection between a duct and a diffuser on the drawing. A duct that is connected to a diffuser has its end point fixed to the diffuser insertion location. The duct cannot be moved away from the diffuser, and moving the diffuser moves the duct as well. This command will disassociate the diffuser and duct so they can be moved independently.

You do not need to use this command prior to erasing a duct. When a duct is erased, it is automatically disconnected from the diffuser.

To disconnect a diffuser, go to

Ribbon: DM HVAC->Diffuser Connections->

Pulldown Menu: DM HVAC->Diffuser Connections->Disconnect Diffuser

You will be prompted to specify the diffuser to be disconnected.

Select diffuser to disconnect:

The selected diffuser will be disconnected from the duct. The duct and diffuser can be moved independently.

Set CFM Total

This section describes the commands used to set the total airflow for a room, a duct, or multiple diffusers.

CFM Setting Adjustment Methods

The methods by which airflow values can be adjusted for existing diffusers are described below.

Average CFM in Diffusers: The total airflow is divided evenly between all of the diffusers. Each diffuser will have the same airflow.

Prorate CFM in Diffusers: The total airflow is prorated among the diffusers based upon their current airflow. The relative airflows will remain the same between the diffusers. Different diffusers will have a different airflow.

Example: You have selected two diffusers for which the CFM total will be set. The first currently has 100 CFM, and the second has 200 CFM. You set the new total for the two diffusers to 450 CFM. The first diffuser will have 150 CFM, and the second diffuser will have 300 CFM.

In a Room

The Set CFM Total In a Room command is used to set the airflow values for all of the diffusers in a room. The recommended airflow values are based upon the heating and cooling loads specified in the room.

To set the total airflow in a room, go to

Ribbon: DM HVAC->Diffusers-> CFM Set CFM Total In a Room

Pulldown Menu: DM HVAC->Set CFM Total->In a Room

You will be prompted to select the room in which to set the total airflow.

Specify point inside room:

The Set CFM Total in a Room dialog box will appear.

Set CFM Total in a Room Dialog Box

Set CFM Total in a Ro	om				Х
Room: 105 Type: Office Supply Air Room Minimum CFM: Cooling CFM: Heating CFM:	0 199 80		Return / Exhaust Air Current Return CFM: New Return CFM:	200 199	
Required CFM:	199		New Exhaust CFM:		
Current CFM:	200				
New CFM:	199				
O Average CFM in Diffu	users				
Prorate CFM in Diffus	sers				
		ОК	Cancel		

Room: The name of the selected room.

Type: The room type of the selected room.

See the <u>CFM Setting Adjustment Methods</u> section for more information about the Average CFM in Diffusers and Prorate CFM in Diffusers settings.

Supply Air

Room Minimum CFM: The *Minimum Supply Air* for room specified in the room itself or the schedule. See the **Rooms** section for more information.

Cooling CFM: The airflow required to cool the room based upon the cooling load. See the *Cooling, Supply CFM* value in the **Print Supply Air Requirements** section for more information.

Heating CFM: The airflow required to heat the room based upon the heating load. See the *Heating, Supply CFM* value in the **Print Supply Air Requirements** section for more information.

Required CFM: The airflow required in the room. This value is the largest of the *Room Minimum CFM*, *Cooling CFM*, and *Heating CFM* values.

Current CFM: The current supply airflow in the room. This value is based upon the CFM values of the supply diffusers in the room on the drawing.

New CFM: The new supply airflow to be set in the room. This value will be distributed among the supply diffusers based upon whether *Average CFM in Diffusers* or *Prorate CFM in Diffusers* is selected.

Return / Exhaust Air

Current Return CFM: The current return airflow in the room. This value is based upon the CFM values of the return diffusers in the room on the drawing.

New Return CFM: The new return airflow to be set in the room. This value will be distributed among the return diffusers based upon whether Average CFM in Diffusers or Prorate CFM in Diffusers is selected.

Current Exhaust CFM: The current exhaust airflow in the room. This value is based upon the CFM values of the exhaust diffusers in the room on the drawing.

New Exhaust CFM: The new exhaust airflow to be set in the room. This value will be distributed among the exhaust diffusers based upon whether Average CFM in Diffusers or Prorate CFM in Diffusers is selected.

Setting the Total Airflow in a Room

When the values in the dialog box are set correctly, press the **OK** button. The new CFM values will be set in the diffusers in the room.

In a Duct

The Set CFM Total In a Duct command is used to set the total airflow in a duct. The airflow is distributed to all of the diffusers connected to the selected duct.

To set the total airflow of diffusers connected to a single duct, go to

Ribbon: DM HVAC->Diffusers-> CFM Set CFM Total In a Duct

Pulldown Menu: DM HVAC->Set CFM Total->In a Duct

You will be prompted to select the duct for which the total airflow for all connected diffusers is to be set.

Select duct or label:

The Adjust Duct CFM Total dialog box will appear.

Adjust Duct CFM Total Dialog Box

Adjust Duct CFM To $$		
Old CFM: 600		
New CFM: 600		
O Average CFM in Diffusers		
Prorate CFM in Diffusers		
OK		

Old CFM: The current airflow through the duct.

New CFM: The new airflow for the duct.

See the <u>CFM Setting Adjustment Methods</u> section for more information about the Average CFM in Diffusers and Prorate CFM in Diffusers fields.

Setting the Total Airflow in a Duct

When the values in the dialog box are set correctly, press the **OK** button. The new CFM value will be set in the diffusers connected to the duct.

In Multiple Diffusers

The Set CFM Total In Multiple Diffusers command is used to set the total airflow through a selected set of diffusers.

To set the total airflow of multiple diffusers on the drawing, go to

Ribbon: DM HVAC->Diffusers-> DIFF Set CFM Total In Multiple Diffusers

Pulldown Menu: DM HVAC->Set CFM Total->In Multiple Diffusers

You will be prompted to select the diffusers for which the total airflow is to be set.

Select objects:

The Set CFM Total in Multiple Diffusers dialog box will appear.

Set CFM Total in Multiple Diffusers Dialog Box

Set CFM Total in Multiple Diffu \times		
Old CFM: 200		
New CFM: 200		
O Average CFM in Diffusers		
Prorate CFM in Diffusers		
OK Cancel		

Old CFM: The current airflow through the diffusers.

New CFM: The new airflow for the diffusers.

See the <u>CFM Setting Methods</u> section for more information about the Average CFM in Diffusers and Prorate CFM in Diffusers fields.

Setting the Total Airflow in Multiple Diffusers

When the values in the dialog box are set correctly, press the **OK** button. The new CFM value will be set in the selected diffusers.

Mechanical Equipment

This section describes the commands used to create and modify mechanical equipment. Mechanical equipment that is inserted on the drawing is for 2D and 3D display purposes only. It is mainly useful for collision detection when your project is using 3D-BIM.

There is no schedule for mechanical equipment. There is no link between mechanical equipment and load calculations or the ductwork.

Insert Equipment

To insert a piece of mechanical equipment on the drawing, go to

Ribbon: DM HVAC->MEQ-> MEQ Insert Equipment

Pulldown Menu: DM HVAC->Mechanical Equipment->Insert Equipment

Insert MEQ Dialog Box

Insert MEQ	×
Description:	
Shape: Rectangular / Box	\sim
Width (in): 24 Length (in): 24	
Diameter (in): 24	
Height (in): 24	
Elevation (ft-in): 10	
Elevation Location: Bottom of Equipment	\sim
Layer System: New	\sim
OK Cancel	

Description: The name of the equipment. This description is not displayed anywhere on the drawing.

Shape: How the equipment is drawn in 2D and 3D views. The shape controls the dimension fields that are enabled.

- **Rectangular/Box:** The equipment is modeled as a box. In 2D, it will be displayed as a rectangle. In 3D, it will be displayed as a box.
- **Round/Cylinder:** The equipment is modeled as a cylinder. In 2D, it will be displayed as a circle. In 3D, it will be displayed as a cylinder.

Width (in): The width of the equipment, in inches. Enabled when Shape is set to Rectangular/Box.

Length (in): The length of the equipment, in inches. Enabled when Shape is set to Rectangular/Box.

Diameter (in): The diameter of the equipment, in inches. Enabled when *Shape* is set to Round/Cylinder.

Height (in): The height of the equipment, in inches. The height is used when the equipment is drawn in 3D.

Elevation (ft-in): The elevation of the equipment, in feet and inches. The reference point for the elevation is set by the *Elevation Location*. See the <u>Elevation</u> section for more information.

Elevation Location: Specifies the reference point used for the *Elevation*.

- **Top of Equipment:** The elevation refers to the top of the equipment. The equipment will extend below this elevation.
- Center of Equipment: The elevation refers to the center of the equipment. The equipment will extend both above and below this elevation.
- **Bottom of Equipment:** The elevation refers to the bottom of the equipment. The equipment will extend above this elevation.

Layer System: See the Layer System section for more information.

Inserting Equipment on the Drawing

Enter the mechanical equipment settings into the dialog box and press the OK button. You will be prompted to

specify the insertion location for the equipment on the drawing.

Specify insertion point [Corner/Middle]:

Specify insertion point: Specify the location of the equipment on the drawing. The equipment will be inserted on the drawing.

Corner: Type c to change the insertion point that is being specified to be the top-left corner of the equipment. This option will only be displayed when the *Shape* field is set to **Rectangular/Box**.

Middle: Type \mathbf{M} to change the insertion point that is being specified to be the middle of the equipment. This option will only be displayed when the *Shape* field is set to **Rectangular/Box**.

Query Equipment

To query or edit a piece of mechanical equipment on the drawing, go to

Ribbon: DM HVAC->MEQ->

Pulldown Menu: DM HVAC->Mechanical Equipment->Query Equipment

You will be prompted to select the mechanical equipment to be queried.

Select mechanical equipment to query:

The Query MEQ dialog box will appear.

Query MEQ Dialog Box

Query MEQ	\times	
Description: VAV		
Shape: Rectangular / Box	\sim	
Width (in): 36 Length (in): 42		
Diameter (in): 36		
Height (in): 20		
Elevation (ft-in): 11-3		
Elevation Location: Center of Equipment	\sim	
Layer System: New	\sim	
OK Cancel		

Changes can be made to the mechanical equipment in the same way as when it was inserted. See the <u>Insert</u> <u>Equipment</u> section for more information.

2D Drafting

This section describes the commands used to draw the ductwork in 2D and modify the duct size labels that are inserted.

Draw Double Line (Branch)

The Draw Double Line (Branch) command is used to draw the 2D ductwork for all of the ducts in a system.

To draw ductwork in 2D, go to

Ribbon: DM HVAC->Ducts-> 2D Draw Double Line (Branch)

Pulldown Menu: DM HVAC->2D Drawing->Draw Double Line (Branch)

You will be prompted to select a duct in the system to be drawn in 2D.

Select duct on branch to draw:

The selected duct and any connected ducts will be drawn in 2D.

Related Options

Duct label format: Sets how the size of the duct is displayed in the duct label depending upon its shape and lining.

Draw hangers in 2D: Sets whether hangers are drawn.

Draw Double Line (Window)

The Draw Double Line (Window) command is used to draw the 2D ductwork for all of the ducts in a windowed area.

To draw ductwork in 2D, go to

Ribbon: DM HVAC->Ducts-> 20 Draw Double Line (Window)

Pulldown Menu: DM HVAC->2D Drawing->Draw Double Line (Window)

You will be prompted to specify the first point of the window around the ducts to draw in 2D.

Draw double line:>> Select ducts: First corner of window:

You will then be prompted to specify the second point of the window.

Draw double line:>> Select ducts: Second corner of window:

Any existing 2D ductwork that is crossed by the window will be erased. All of the duct nodes that are inside the window will have their fittings drawn in 2D. All of the duct centerlines that are inside or crossed by the window will have their ductwork drawn in 2D.

Related Options

Duct label format: Sets how the size of the duct is displayed in the duct label depending upon its shape and lining.

Draw hangers in 2D: Sets whether hangers are drawn.

Erase Double Line (Branch)

The Erase Double Line (Branch) command is used to erase the 2D ductwork for all of the ducts in a system.

To erase the 2D graphics for ducts, go to

Ribbon: DM HVAC->Ducts-> 💥 Erase Double Line (Branch)

Pulldown Menu: DM HVAC->2D Drafting->Erase Double Line (Branch)

You will be prompted to select a duct in the system from which to erase the 2D ductwork.

Select duct on branch to erase:

The 2D graphics for the selected duct and any connected ducts will be erased.

Erase Double Line (Window)

The Erase Double Line (Window) command is used to erase the 2D ductwork for all of the ducts in a windowed area.

To erase the 2D graphics for ducts, go to

Ribbon: DM HVAC->Ducts-> 🚺 Erase Double Line (Window)

Pulldown Menu: DM HVAC->2D Drafting->Erase Double Line (Window)

You will be prompted to specify the first point of the window around the 2D ductwork to erase.

First crossing point around double line to erase:

You will then be prompted to specify the second point of the window.

Second crossing point:

All of the 2D ductwork that is inside or crossed by the window will be erased.

Move Label

The Move Label command is used to move 2D ductwork labels. If you manually move the label without using this command, the label will be moved back to its original position when the 2D ductwork is redrawn.

To permanently move a duct label, go to

Ribbon: DM HVAC->Ducts->

Pulldown Menu: DM HVAC->2D Drafting->Move Label

You will be prompted to select the duct label to be moved.

Select label to move:

You will then be prompted to specify a new location for the label.

Specify new location for label:

The duct label will be moved and retain this location when the 2D ductwork is redrawn.

Rotate Label to Angle 0

The Rotate Label to Angle 0 command is used to rotate 2D ductwork labels. If you manually rotate the label without using this command, the label will be rotated back to match the duct angle when the 2D ductwork is redrawn.

To permanently rotate a duct label, go to

Ribbon: DM HVAC->Ducts-> 🖸 Rotate Label to Angle 0

Pulldown Menu: DM HVAC->2D Drafting->Rotate Label to Angle 0

You will be prompted to select the duct label to be rotated.

Select duct or label to rotate:

The duct label will be rotated to a 0-degree angle. The label will remain rotated when the 2D ductwork is redrawn.

Reset Label to Default Location

The Reset Label to Default Location command is used to undo any changes to duct labels moved by the <u>Move Label</u> command, rotated by the <u>Rotate Label to Angle 0</u> command, or removed by the <u>Remove Label</u> command.

To reset a duct label to the default location, go to

Ribbon: DM HVAC->Ducts-> Label to Default Location

Pulldown Menu: DM HVAC->2D Drafting->Reset Label to Default Location

You will be prompted to identify the duct label to be reset.

Select duct or label to reset:

The label will be reset to its original location and orientation.

Remove Label

The Remove Label command is used to remove a duct label from the drawing. If you use the standard CAD **ERASE** command, the label will be reinserted when the 2D ductwork is redrawn.

To remove a duct label, go to

Ribbon: DM HVAC->Ducts-> X Remove Label

Pulldown Menu: DM HVAC->2D Drafting->Remove Label

You will be prompted to specify the duct label to be removed.

Select label to remove:

The duct label will be removed from the drawing and will not be reinserted when the 2D ductwork is redrawn.

Fittings

This section describes the commands used to modify duct fittings.

Related Options

You can customize the default fittings used during duct sizing. See the **<u>Default Fittings Options</u>** and <u>Fittings</u> **<u>Options</u>** sections for more information.

Radius Elbow

To insert a radius elbow fitting, go to

Ribbon: DM HVAC->Ducts-> 🦵 Radius Elbow

Pulldown Menu: DM HVAC->Fittings->Radius Elbow

You will be prompted to specify the duct on which a radius elbow is to be inserted.

Select duct or label to insert fitting at:

The Fitting Radius dialog box will appear.

Fitting Radius	×
Radius: 1.5	
ОК	Cancel

Radius: The radius multiplier for the fitting. This value will be multiplied by the width of the duct to determine the

radius of the fitting.

Enter the radius of the elbow to be inserted and press the **OK** button. A radius elbow with the specified radius will be inserted on the drawing, as shown below.



Related Options

Radius for elbows: Sets the default value for the Radius field.

Square Elbow

To insert a square elbow fitting, go to

Ribbon: DM HVAC->Ducts->

Pulldown Menu: DM HVAC->Fittings->Square Elbow

You will be prompted to specify the duct on which a square elbow is to be inserted.

Select duct or label to insert fitting at:

The Turning Vanes? dialog box will appear.



Yes: Turning vanes will be inserted in the square elbow. Turning vanes will only be shown if the ductwork is rectangular.

No: Turning vanes will not be inserted in the square elbow.

A square elbow will be inserted on the drawing, as shown below.



Related Options

Turning vanes on square elbows and wyes: Sets whether turning vanes are inserted on square elbows when sizing ducts.

End Cap

To insert an end cap, go to

Ribbon: DM HVAC->Ducts-> 🔲 End Cap

```
Pulldown Menu: DM HVAC->Fittings->End Cap
```

You will be prompted to specify the duct on which an end cap is to be inserted.

Select duct or label to insert fitting at:

An end cap will be inserted on the drawing, as shown below.



Transition

To insert a transition fitting, go to

Ribbon: DM HVAC->Ducts-> ኮ Transition

 $Pulldown \ Menu: \ {\tt DM \ HVAC->Fittings->Transition}$

You will be prompted to specify the duct on which a transition fitting is to be inserted.

Select duct or label to insert fitting at:

A transition fitting will be inserted on the drawing, as shown below.



Related Options

Angle of transitions: Sets the default angle of duct transitions.

Offset

To insert an offset fitting, go to

Ribbon: DM HVAC->Ducts->

Pulldown Menu: DM HVAC->Fittings->Offset

You will be prompted to specify the duct on which an offset fitting is to be inserted.

Select duct or label to insert fitting at:

An offset fitting will be inserted on the drawing, as shown below.



Adjust Transition Length

To adjust the length of a transition fitting, go to

Ribbon: DM HVAC->Ducts-> 🄛 Adjust Transition Length

 $Pulldown \ Menu: \ \texttt{DM HVAC->Fittings->Adjust Transition Length}$

You will be prompted to specify a new end point for a transition on the drawing.

Select duct or label at end of transition:

The transition will extend from the duct intersection toward the next duct. See the <u>Previous and Next Ducts</u> section for information about determining which duct is the next duct.

The end of the transition will be adjusted to the specified location.

Related Options

Angle of transitions: Sets the default angle of duct transitions.

Fire / Smoke Damper

To insert a fire or smoke damper, go to

Ribbon: DM HVAC->Ducts-> 🍎 Fire/Smoke Damper

Pulldown Menu: DM HVAC->Fittings->Fire/Smoke Damper

You will be prompted to specify the duct on which a fire/smoke damper is to be inserted.

Select duct or label to insert fitting at:

The **Damper Type** dialog box will appear.



Inserting a Vertical Damper

Press the **Vertical Damper** button to insert a vertical damper on the duct. The vertical damper will be inserted on the selected duct as shown below.



Inserting a Horizontal Damper

Press the **Horizontal Damper** button to insert a horizontal damper on the duct. The horizontal damper will be inserted on the selected duct as shown below.



Flex Connection

To insert a flex connection fitting, go to

Ribbon: DM HVAC->Ducts-> 🇰 Flex Connection

Pulldown Menu: DM HVAC->Fittings->Flex Connection

You will be prompted to specify the duct on which a flex connection fitting is to be inserted.

Select duct or label to insert fitting at:

A flex connection fitting will be inserted on the drawing, as shown below.



Boot Tee

To insert a boot tee fitting, go to

Ribbon: DM HVAC->Ducts-> 🖵 Boot Tee

Pulldown Menu: DM HVAC->Fittings->Boot Tee

You will be prompted to specify the duct on which a boot tee is to be inserted.

Select duct or label to insert fitting at:

A boot tee will be inserted on the drawing, as shown below.


Conical Tee

To insert a conical tee fitting, go to

Ribbon: DM HVAC->Ducts-> 🗗 Conical Tee

Pulldown Menu: DM HVAC->Fittings->Conical Tee

You will be prompted to specify the duct on which a conical tee is to be inserted.

Select duct or label to insert fitting at:

A conical tee will be inserted on the drawing, as shown below.



Straight Tee

To insert a straight tee fitting, go to

Ribbon: DM HVAC->Ducts-> 📮 Straight Tee

Pulldown Menu: DM HVAC->Fittings->Straight Tee

You will be prompted to specify the duct on which a straight tee is to be inserted.

Select duct or label to insert fitting at:

A straight tee fitting will be inserted on the drawing, as shown below.



Transition Tee

To insert a transition tee fitting, go to

Ribbon: DM HVAC->Ducts-> 🍟 Transition Tee

Pulldown Menu: DM HVAC->Fittings->Transition Tee

You will be prompted to specify the duct on which a transition tee is to be inserted.

Select duct or label to insert fitting at:

A transition tee fitting will be inserted on the drawing, as shown below.

Ľ,		
-/	\ \	

Related Options

Angle of transitions: Sets the default angle of duct transitions.

Variable Angle Branch

To insert a variable angle branch fitting, go to

Ribbon: DM HVAC->Ducts-> 🚩 Variable Angle Branch

 $Pulldown \ Menu: \ {\tt DM \ HVAC->Fittings->Variable \ Angle \ Branch}$

You will be prompted to specify the duct on which a variable angle branch is to be inserted.

Select duct or label to insert fitting at:

A variable angle branch fitting will be inserted on the drawing, as shown below.



Wye / Bullnose Tee

To insert a wye or bullnose tee fitting, go to

Ribbon: DM HVAC->Ducts-> >> Wye/Bullnose Tee

Pulldown Menu: DM HVAC->Fittings->Wye/Bullnose Tee

You will be prompted to specify the duct on which a wye or bullnose tee is to be inserted.

Select duct or label to insert fitting at:

The **Turning Vanes?** dialog box will appear.



Yes: Turning vanes will be inserted in the wye. Turning vanes will only be shown if the ductwork is rectangular.

No: Turning vanes will not be inserted in the wye.

A wye or bullnose tee fitting will be inserted on the drawing, as shown below. The specific fitting that is inserted depends upon the configuration of the duct centerlines. If the centerlines form right-angles, a bullnose tee will be inserted. Otherwise, a wye will be inserted.



Related Options

Turning vanes on square elbows and wyes: Sets whether turning vanes are inserted on wyes when sizing ducts.

Pair of Pants

To insert a pair of pants fitting, go to

Ribbon: DM HVAC->Ducts-> T Pair of Pants

Pulldown Menu: DM HVAC->Fittings->Pair of Pants

You will be prompted to specify the duct on which a pair of pants is to be inserted.

Select duct or label to insert fitting at:

The Fitting Radius dialog box will appear.

Fitting Radius	×
Radius: 1.5	
OK	Cancel

Radius: The radius multiplier for the fitting. This value will be multiplied by the width of the duct to determine the radius of the fitting.

Enter the radius of the elbows in the pair of pants fitting and press the **OK** button. A pair of pants fitting with the specified radius will be inserted on the drawing, as shown below.



Related Options

Radius for elbows: Sets the default value for the Radius field.

Split Fitting

To insert a split fitting, go to

Ribbon: DM HVAC->Ducts->

Pulldown Menu: DM HVAC->Fittings->Split Fitting

You will be prompted to specify the duct on which a split fitting is to be inserted.

Select duct or label to insert fitting at:

The **Split Fitting Radius** dialog box will appear.

Split Fitting Radius	×
◯ Square Elbow with Turning Vanes	
O Square Elbow without Turning Vanes	
Radius Elbow: 1.5	
OK Cancel	

Square Elbow with Turning Vanes: Select this option to insert square elbows in the fitting with turning vanes included in them. Turning vanes will only be shown if the ductwork is rectangular.

Square Elbow without Turning Vanes: Select this option to insert square elbows in the fitting without turning vanes included in them.

Radius Elbow: Select this option to insert radius elbows in the fitting. Specify the radius multiplier for the fitting. This value will be multiplied by the width of the duct to determine the radius of the fitting.

Select the elbow type for the fitting and press the **OK** button. A split fitting with the specified type of elbows will be inserted on the drawing, as shown below.



Related Options

Radius for elbows: Sets the default value for the Radius Elbow field.

Shaded Vertical

To insert a shaded vertical fitting, go to

Ribbon: DM HVAC->Ducts->

Pulldown Menu: DM HVAC->Fittings->Shaded Vertical

You will be prompted to specify the duct on which a shaded vertical fitting is to be inserted.

Select duct or label to insert fitting at:

A shaded vertical fitting will be inserted on the drawing, as shown below.



Reset to Automatic Fitting

The Reset to Automatic Fitting command is used to change a fitting that has been manually set using one of the other fitting commands back to being automatically set based upon the default fitting options.

To reset a duct fitting to the preset fitting type, go to

Ribbon: DM HVAC->Ducts->

Pulldown Menu: DM HVAC->Fittings->Reset to Automatic Fitting

You will be prompted to specify the duct for which the fitting is to be reset to the automatic fitting.

Select duct or label:

The fitting shown on the drawing will be replaced with the default fitting.

Related Options

You can customize the default fittings to which fittings are reset with this command. See the **Default Fittings Options** and **Fittings Options** sections for more information.

No Fitting

The No Fitting command is used to remove a fitting from a duct.

To remove a fitting, go to

Ribbon: DM HVAC->Ducts-> T No Fitting

Pulldown Menu: DM HVAC->Fittings->No Fitting

You will be prompted to specify the duct from which the fitting is to be removed.

Select duct or label:

The fitting will be removed.

Balancing Dampers

This section describes the commands used to insert, move, and remove balancing dampers.

Insert Balancing Damper

To insert a balancing damper, go to

Ribbon: DM HVAC->Ducts-> Insert Balancing Damper

Pulldown Menu: DM HVAC->Balancing Dampers->Insert Balancing Damper

You will be prompted to specify the duct on which the balancing damper will be inserted.

Select damper or duct to put balancing dampers on:

A damper will be inserted on the duct.

Related Options

Damper far from diffuser: Sets where balancing dampers are placed along ductwork.

Move Balancing Damper

To move a balancing damper, go to

Ribbon: DM HVAC->Ducts-> **P** Move Balancing Damper

Pulldown Menu: DM HVAC->Balancing Dampers->Move Balancing Damper

You will be prompted to specify the balancing damper to be moved. You can select the balancing damper or the duct centerline with which the damper is associated.

Select damper or duct to move damper on:

You will then be prompted to specify a new location for the balancing damper.

Select new location for damper:

The balancing damper will be moved to the new location.

Related Options

Damper far from diffuser: Sets where balancing dampers are placed along ductwork.

Remove Balancing Damper

To remove a balancing damper from the drawing, go to

Ribbon: DM HVAC->Ducts-> ื Remove Balancing Damper

Pulldown Menu: DM HVAC->Balancing Dampers->Remove Balancing Damper

You will be prompted to specify the balancing damper to remove. You can select the balancing damper or the duct centerline with which the damper is associated.

Select damper or duct to remove dampers from:

The balancing damper will be removed from the drawing.

Layer Management

This section describes the commands available to help you manage your layers. All of the layers created and used are standard CAD layers and can be managed using standard CAD commands. These commands are included for your convenience, but are not necessary. Everything you can do with these commands can be done with standard CAD commands.

These commands specifically change the *On* setting for the layers, toggling them between **On** and **Off**. The *Freeze* setting for the layers is not changed.

If you run these commands while in a paper space viewport, the *VP Freeze* setting will be changed as well. This can be helpful when setting up drawings to display only the 2D or 3D layers in a specific viewport. You can use the **Turn Double Line Layers On (and 3D Layers Off)** command in the viewport that should display the 2D ductwork and the **Turn 3D Layers on (and Double Line Layers Off)** command in the viewport that should display the 3D ductwork. You can then return to model space and use the **Turn Double Line and 3D Layers On** command to display both the 2D and 3D ductwork. You can continue to update both the 2D and 3D drafting while you design, but only have the desired view shown in each viewport.

Turn Duct Centerlines On

The Turn Duct Centerlines On command turns duct centerline layers on. These layers are typically on a non-plotting layer that will not appear on your printed drawings. It is often helpful during the design to turn these centerlines on and off to see what your final drawing will look like.

To turn the centerlines on, go to

Ribbon: DM HVAC->Layers-> Z Turn Duct Centerlines On

Pulldown Menu: DM HVAC->Layer Management->Turn Duct Centerlines On

The centerline layers will be turned on and will be visible on the drawing.

Turn Duct Centerlines Off

The Turn Duct Centerlines Off command turns duct centerline layers off. These layers are typically on a non-plotting layer that will not appear on your printed drawings. It is often helpful during the design to turn these centerlines on and off to see what your final drawing will look like.

To turn the centerlines off, go to

Ribbon: DM HVAC->Layers-> 🗡 Turn Duct Centerlines Off

 $\label{eq:point} Pulldown \ Menu: \ \texttt{DM HVAC->Layer Management->Turn Duct Centerlines Off}$

The centerline layers will be turned off and will not be visible on the drawing.

Turn Double Line and 3D Layers On

The Turn Double Line and 3D Layers On command turns the double line and 3D ductwork layers on.

To turn the double line and 3D ductwork layers on, go to

Ribbon: DM HVAC->Layers-> 💹 Turn Double Line and 3D Layers On

Pulldown Menu: DM HVAC->Layer Management->Turn Double Line and 3D Layers On

The double line and 3D ductwork layers will be turned on and visible on the drawing.

If this command is run while in a paper space viewport, the VP Freeze setting for the layers will be changed to **Thawed**.

Turn Double Line and 3D Layers Off

The Turn Double Line and 3D Layers Off command turns the double line and 3D ductwork layers off.

To turn double lines and 3D ductwork layers off, go to

Ribbon: DM HVAC->Layers-> ² Turn Double Line and 3D Layers Off

Pulldown Menu: DM HVAC->Layer Management->Turn Double Line and 3D Layers Off

The double line and 3D ductwork layers will be turned off and not visible on the drawing.

If this command is run while in a paper space viewport, the VP Freeze setting for the layers will be changed to **Frozen**.

Turn Double Line Layers On (and 3D Layers Off)

The Turn Double Line Layers On (and 3D Layers Off) command turns the double line ductwork layers on and turns the 3D ductwork layers off.

The double line and 3D ductwork are drawn slightly different. Viewing both of them at the same time can make it difficult to see what is drawn. Turning one on and the other off makes it easier to see the design.

Use this command to view the ductwork while in plan view.

To turn the double line layers on and the 3D ductwork layers off, go to

Ribbon: DM HVAC->Layers-> 🙎 Turn Double Line Layers On (and 3D Layers Off)

Pulldown Menu: DM HVAC->Layer Management->Turn Double Line Layers On (and 3D Layers Off)

The double line ductwork layers will be turned on and visible on the drawing.

If this command is run while in a paper space viewport, the VP Freeze setting for the double line layers will be changed to **Thawed**.

The 3D ductwork layers will be turned off and not visible on the drawing.

If this command is run while in a paper space viewport, the *VP Freeze* setting for the 3D layers will be changed to **Frozen**.

Turn 3D Layers On (and Double Line Layers Off)

The Turn 3D Layers On (and Double Line Layers Off) command turns the double line ductwork layers off and turns the 3D ductwork layers on.

The double line and 3D ductwork are drawn slightly different. Viewing both of them at the same time can make it difficult to see what is drawn. Turning one on and the other off makes it easier to see the design.

Use this command to view the ductwork while in an isometric or other 3D view.

To turn the 3D layers on and the double line ductwork layers off, go to

Ribbon: DM HVAC->Layers-> 🙋 Turn 3D Layers On (and Double Line Layers Off)

Pulldown Menu: DM HVAC->Layer Management->Turn 3D Layers On (and Double Line Layers Off)

The 3D ductwork layers will be turned on and visible on the drawing.

If this command is run while in a paper space viewport, the VP Freeze setting for the 3D layers will be changed to **Thawed**.

The double line ductwork layers will be turned off and not visible on the drawing.

If this command is run while in a paper space viewport, the VP Freeze setting for the double line layers will be changed to **Frozen**.

Turn Room Layers On

The Turn Room Layers On command turns the room outline and room label layers on. These layers are typically on a non-plotting layer that will not appear on your printed drawings. It is often helpful during the design to turn these layers on and off to see what your final drawing will look like.

To turn the room outline and room label layers on, go to

Ribbon: DM HVAC->Rooms and Walls-> 🗾 Turn Room Layers On

 $\label{eq:pulldown Menu: DM HVAC->Layer Management->Turn Room Layers On$

The room outline and room label layers will be turned on and will be visible on the drawing.

Turn Room Layers Off

The Turn Room Layers Off command turns the room outline and room label layers off. These layers are typically on a non-plotting layer that will not appear on your printed drawings. It is often helpful during the design to turn these layers on and off to see what your final drawing will look like.

To turn the room outline and room label layers off, go to

Ribbon: DM HVAC->Rooms and Walls-> 🞵 Turn Room Layers Off

Pulldown Menu: DM HVAC->Layer Management->Turn Room Layers Off

The room outline and room label layers will be turned off and will not be visible on the drawing.

Sections

This section describes the command used to generate sections.

Sections can be inserted on any drawing in the project, regardless of whether the entities shown in the section are inserted on that drawing. To change the ductwork or mechanical equipment shown in a section, you must change the entities themselves rather than make the changes in the section.

Sections are drawn using 3D entities. If you view the drawing in an isometric view, you will see the 3D section entities. They are rotated so that they appear correctly as 2D ducts when viewed from the top.

Sections are inserted on the 2D layers. Their appearance is controlled with the other 2D ductwork and not with the 3D ductwork.

Create Sections

The Create Sections command is used to create, modify, and display sections.

To work with sections, go to

Ribbon: DM HVAC->Ducts-> 🍄 Create Sections

Pulldown Menu: DM HVAC->Sections->Create Sections

Duct Sections Dialog Box

Duct Sections	×
Section Names	Add Ducts <
	Remove Ducts <
	Add MEQ <
	Remove MEQ <
	Draw Cutline <
	Set Insertion Point <
	Generate Section <
New Section < Edit Section <	Delete Section
Exit	

Section Name: The names of the sections that have been created in the project.

New Section: Press this button to create a new section. The New Section dialog box will appear.

New Section			×
Section Name:			
	OK	Cancel	

Section Name: The name of the section to be created.

Edit Section: Press this button to change the name of the selected section. The Edit Section dialog box will appear.

Edit Section		×
Old Name:	A	
Section Name:	A	
	OK	4

Old Name: The current name of the section.

Section Name: The new name of the section.

Delete Section: Press this button to delete the selected section.

Add Ducts: Press this button to add ducts to the selected section. You will be prompted to select the ducts on the drawing to be added. Ducts already in the section will be highlighted.

Select the ducts to add to the section / <Cancel>:

Press ENTER to add the selected ducts to the section. The Duct Sections dialog box will appear.

Remove Ducts: Press this button to remove ducts from the selected section. You will be prompted to select the ducts on the drawing to be removed. Ducts not in the section will be highlighted.

Select the ducts to remove from the section / <Cancel>:

Press ENTER to remove the selected ducts from the section. The Duct Sections dialog box will appear.

Add MEQ: Press this button to add mechanical equipment to the selected section. You will be prompted to select the mechanical equipment on the drawing to be added. Mechanical equipment already in the section will be highlighted.

Select the mechanical equipment to add to the section:

Press ENTER to add the selected mechanical equipment to the section. The Duct Sections dialog box will appear.

Remove MEQ: Press this button to remove mechanical equipment from the selected section. You will be prompted to select the mechanical equipment on the drawing to be removed. Mechanical equipment not in the section will be highlighted.

Select the mechanical equipment to remove from the section:

Press ENTER to remove the selected mechanical equipment from the section. The **Duct Sections** dialog box will appear.

Draw Cutline: Press this button to draw the cutline for the selected section. You will be prompted to specify the location for the cutline on the drawing.

First point for section cutline:

You will then be prompted to specify the end of the cutline.

Second point:

You will then be prompted to specify which direction the cutline will face.

Pick point on side to face:

Specify a point on the side of the cutline with the ducts you want to have displayed. The **Duct Sections** dialog box will appear.

Set Insertion Point: Press this button to insert the selected section on the drawing. You will be prompted to specify the insertion point for the section.

New insertion point for section / <Cancel>:

The section will be inserted at the specified location. The Duct Sections dialog box will appear.

Generate Section: Press this button to update the selected section. The section will be redrawn in its current location, referencing the ducts and mechanical equipment you have selected. If the section has not been inserted on the drawing, you will be prompted to specify an insertion point as if you had pressed the **Set Insertion Point** button.

3D-BIM

This section describes the commands available to perform 3D-BIM modeling and analysis.

Training Videos

• <u>3D Coordination</u>

Draw 3D Ductwork (Branch)

The Draw 3D Ductwork (Branch) command is used to draw the 3D ductwork for all of the ducts in a system.

To draw ductwork in 3D, go to

Ribbon: DM HVAC->3D-BIM-> 3D Draw 3D Ductwork (Branch)

Pulldown Menu: DM HVAC->3D-BIM->Draw 3D Ductwork (Branch)

You will be prompted to select a duct in the system to be drawn in 3D.

Select duct on branch to draw:

The selected duct and any connected ducts will be drawn in 3D.

Related Options

Show background below ductwork: Sets whether entities below the ductwork are hidden.

3D circle approximation: Sets the number of sides on polygons used to approximate circles in the 3D model.

Draw hangers in 3D: Sets whether hangers are drawn.

Draw mechanical equipment in 3D: Sets whether pieces of mechanical equipment are drawn.

Draw 3D Ductwork (Window)

The Draw 3D Ductwork (Window) command is used to draw the 3D ductwork for all of the ducts in a windowed area.

To draw ductwork in 3D, go to

Ribbon: DM HVAC->3D-BIM-> 🗓 Draw 3D Ductwork (Window)

Pulldown Menu: DM HVAC->3D-BIM->Draw 3D Ductwork (Window)

You will be prompted to specify the first point of the window around the ducts to draw in 3D.

Draw triple line:>> Select ducts: First corner of window:

You will then be prompted to specify the second point of the window.

Draw triple line:>> Select ducts: Second corner of window:

Any existing 3D ductwork that is crossed by the window will be erased. All of the duct nodes that are inside the window will have their fittings drawn in 3D. All of the duct centerlines that are inside or crossed by the window will have their ductwork drawn in 3D.

Related Options

Show background below ductwork: Sets whether entities below the ductwork are hidden.

3D circle approximation: Sets the number of sides on polygons used to approximate circles in the 3D model.

Draw hangers in 3D: Sets whether hangers are drawn.

Draw mechanical equipment in 3D: Sets whether pieces of mechanical equipment are drawn.

Erase 3D Ductwork (Branch)

The Erase 3D Ductwork (Branch) command is used to erase the 3D ductwork for all of the ducts in a system.

To erase the 3D graphics for ducts, go to

Ribbon: DM HVAC->3D-BIM-> 🎇 Erase 3D Ductwork (Branch)

Pulldown Menu: DM HVAC->3D-BIM->Erase 3D Ductwork (Branch)

You will be prompted to select a duct in the system from which to erase the 3D ductwork.

Select duct on branch to erase:

The 3D graphics for the selected duct and any connected ducts will be erased.

Erase 3D Ductwork (Window)

The Erase Double Line (Window) command is used to erase the 3D ductwork for all of the ducts in a windowed area.

To erase the 3D graphics for a duct, go to

Ribbon: DM HVAC->3D-BIM-> 🔃 Erase 3D Ductwork (Window)

Pulldown Menu: DM HVAC->3D-BIM->Erase 3D Ductwork (Window)

You will be prompted to specify the first point of the window around the 3D ductwork to erase.

Draw triple line:>> Select ducts: First corner of window:

You will then be prompted to specify the second point of the window.

Draw triple line:>> Select ducts: Second corner of window:

All of the 3D ductwork that is inside or crossed by the window will be erased.

Insert Hanger

To insert a hanger on a duct, go to

Ribbon: DM HVAC->3D-BIM-> 👌 Insert Hanger

Pulldown Menu: DM HVAC->3D-BIM->Insert Hanger

You will be prompted to select a point on the duct where a hanger is to be inserted.

Select duct or label at location to insert hanger:

A hanger will be inserted at the specified point. The location of other hangers will be adjusted based upon the newly inserted hanger.

Move Hanger

To move a hanger to a new location on a duct, go to

Ribbon: DM HVAC->3D-BIM-> 材 Move Hanger

Pulldown Menu: DM HVAC->3D-BIM->Move Hanger

You will be prompted to identify which hanger is to be moved.

Select hanger on duct to move:

You will then be prompted to identify where the hanger is to be placed.

Select the new location

The hanger will be moved to the new location. The location of other hangers will be adjusted based upon the new location of the hanger.

Remove Hanger

To remove a hanger from a duct, go to

Ribbon: DM HVAC->3D-BIM-> 🕉 Remove Hanger

Pulldown Menu: DM HVAC->3D-BIM->Remove Hanger

You will be prompted to identify which hanger is to be removed.

Select hanger on duct to remove:

Not all hangers can be removed. If the selected hanger is necessary based upon the spacing requirements set for the duct, you will not be able to remove it and the dialog box shown below will appear.



Insert Top Elevation Label

The Insert Top Elevation Label command is used to insert an elevation label on a duct that displays the elevation of the top of the duct.

To insert a top elevation label on a duct, go to

Ribbon: DM HVAC->3D-BIM-> ELEV Insert Top Elevation Label

Pulldown Menu: DM HVAC->3D-BIM->Insert Top Elevation Label

You will be prompted to identify which section of duct is to be labeled.

Select duct to insert elevation label on:

You will then be prompted to specify the location of the top elevation label on the drawing. See the <u>Inserting</u> <u>Notes and Leaders on the Drawing</u> section for more information about inserting the label.

Related Options

Leader graphic: Sets the block used for elevation label leaders.

Leader location: Sets whether leaders snap to the edge or center of ducts.

Top block: Sets the block used for the top elevation label.

Top label: Sets how the top elevation is displayed on the label.

Include exterior insulation thickness in elevation: Sets whether the top elevation accounts for exterior insulation.

Insert Bottom Elevation Label

The Insert Bottom Elevation Label command is used to insert an elevation label on a duct that displays the elevation of the bottom of the duct.

To insert a bottom elevation label on a duct, go to

Ribbon: DM HVAC->3D-BIM-> ELEV Insert Bottom Elevation Label

Pulldown Menu: DM HVAC->3D-BIM->Insert Bottom Elevation Label

You will be prompted to identify which section of duct is to be labeled.

Select duct to insert elevation label on:

You will then be prompted to specify the location of the bottom elevation label on the drawing. See the <u>Inserting</u> <u>Notes and Leaders on the Drawing</u> section for more information about inserting the label.

Related Options

Leader graphic: Sets the block used for elevation label leaders.

Leader location: Sets whether leaders snap to the edge or center of ducts.

Bottom block: Sets the block used for the bottom elevation label.

Bottom label: Sets how the bottom elevation is displayed on the label.

Include exterior insulation thickness in elevation: Sets whether the bottom elevation accounts for exterior insulation.

Insert Top and Bottom Elevation Label

The Insert Top and Bottom Elevation Label command is used to insert an elevation label on a duct that displays the elevation of the top and the bottom of the duct.

To insert a top and bottom elevation label on a duct, go to

Ribbon: DM HVAC->3D-BIM-> Insert Top and Bottom Elevation Label

 $Pulldown \ Menu: \ {\tt DM \ HVAC->3D-BIM->Insert \ Top \ and \ Bottom \ Elevation \ Label}$

You will be prompted to identify which section of duct is to be labeled.

Select duct to insert elevation label on:

You will then be prompted to specify the location of the top and bottom elevation label on the drawing. See the **Inserting Notes and Leaders on the Drawing** section for more information about inserting the label.

Related Options

Leader graphic: Sets the block used for elevation label leaders.

Leader location: Sets whether leaders snap to the edge or center of ducts.

Both block: Sets the block used for the top and bottom elevation label.

Top label: Sets how the top elevation is displayed on the label.

Bottom label: Sets how the bottom elevation is displayed on the label.

Include exterior insulation thickness in elevation: Sets whether the top and bottom elevations account for exterior insulation.

Insert Centerline Elevation Label

The Insert Centerline Label command is used to insert an elevation label on a pipe that displays the elevation of the center of the duct.

To insert a center elevation label on a duct, go to

Ribbon: DM HVAC->3D-BIM->

Pulldown Menu: DM HVAC->3D-BIM->Insert Centerline Elevation Label

You will be prompted to identify which section of duct is to be labeled.

Select duct to insert elevation label on:

You will then be prompted to specify the location of the centerline elevation label on the drawing. See the **Inserting Notes and Leaders on the Drawing** section for more information about inserting the label.

Related Options

Leader graphic: Sets the block used for elevation label leaders.

Leader location: Sets whether leaders snap to the edge or center of ducts.

Centerline block: Sets the block used for the centerline elevation label.

<u>Centerline label</u>: Sets how the centerline elevation is displayed on the label.

Move Elevation Label

The Move Elevation Label command is used to move an elevation label on a duct.

To move a duct elevation label, go to

Ribbon: DM HVAC->3D-BIM-> → Move Elevation Label

Pulldown Menu: DM HVAC->3D-BIM->Move Elevation Label

You will be prompted to identify which elevation label is to be moved.

Select elevation label to move:

You will then be prompted to specify the new location of the elevation label on the drawing. See the <u>Inserting</u> <u>Notes and Leaders on the Drawing</u> section for more information about moving the label.

Export Entire Project to IFC File

The Export Entire Project to IFC File command is used to export all of the 3D-BIM elements from a project to a single IFC file. The IFC file format is recommended for 3D collision detection in Revit.

To export the entire project to an IFC file, go to

Ribbon: DM HVAC->3D-BIM-> IFC Export Entire HVAC Project to IFC File

Pulldown Menu: DM HVAC->3D-BIM->Export Entire Project to IFC File

Save IFC File As Dialog Box

A Save IFC File	As			×
Save in:	HVAC	~	G 🌶 🖻 🛄 🗸	
Quick access	Name	^	Date modified 2/27/2019 10:25 AM	Type File folder
Desktop				
Libraries				
This PC				
٢	<			>
Network	File name:	dm_hvac.ifc	~	Save
	Save as type:	IFC Files (*.ifc)	~	Cancel

Enter a name and location for the IFC file, then press the **Save** button. The entire project will be saved to the IFC file.

Related Options

<u>3D circle approximation:</u> Sets the number of sides on polygons used to approximate circles in the 3D model.

Export flex duct: Sets whether flex ducts are exported.

Export diffusers: Sets which diffusers are exported.

Export Drawing to IFC File

The Export Drawing to IFC File command is used to export all of the 3D-BIM elements from the current drawing to an IFC file. The IFC file format is recommended for 3D collision detection in Revit.

If you export to an IFC file that does not exist, it will be created with the 3D-BIM elements from the current drawing.

If you export to an IFC file that exists but does not contain any 3D-BIM elements from the current drawing, the 3D-BIM elements from the current drawing will be appended to the end of the IFC file.

If you export to an IFC file that exists and contains 3D-BIM elements from the current drawing, the existing 3D-BIM elements in the IFC file will be removed and replaced with the current 3D-BIM elements on the drawing.

To export the current drawing to an IFC file, go to

Ribbon: DM HVAC->3D-BIM-> IFC Export HVAC Drawing to IFC File

Pulldown Menu: DM HVAC->3D-BIM->Export Drawing to IFC File

× A Save IFC File As G 🤌 📂 🛄 🗸 Save in: HVAC \sim Name Date modified Type DMBackup 2/27/2019 10:25 AM File folder Quick access Desktop Libraries This PC < > Network File name: dm_hvac.ifc Save Save as type: IFC Files (*.ifc) Cancel

Save IFC File As Dialog Box

Enter a name and location for the IFC file, then press the **Save** button. The current drawing will be saved to the IFC file.

Related Options

3D circle approximation: Sets the number of sides on polygons used to approximate circles in the 3D model.

Export flex duct: Sets whether flex ducts are exported.

Export diffusers: Sets which diffusers are exported.

Export One Area to IFC File

The Export One Area to IFC File command is used to export all of the 3D-BIM elements from a single alignment point area to an IFC file. The IFC file format is recommended for 3D collision detection in Revit.

If you export to an IFC file that does not exist, it will be created with the 3D-BIM elements from the current drawing.

If you export to an IFC file that exists, but does not contain any 3D-BIM elements from the selected alignment point area, the 3D-BIM elements from the selected alignment point area will be appended to the end of the IFC file.

If you export to an IFC file that exists, and contains 3D-BIM elements from the selected alignment point area, the existing 3D-BIM elements in the IFC file will be removed and replaced with the current 3D-BIM elements in the selected alignment point area.

To export a single alignment point area to an IFC file, go to

Ribbon: DM HVAC->3D-BIM-> IFC Export One HVAC Area to IFC File

```
Pulldown Menu: DM HVAC->3D-BIM->Export One Area to IFC File
```

You will be prompted to identify the alignment point area to be exported.

Select point inside area to export:

The Save IFC File As dialog box will appear.

Save IFC File As Dialog Box

🛕 Save IFC File	As			×
Save in:	HVAC	~	G 🌶 📂 🖽 -	
Quick access	Name <mark></mark> DMBackup	^	Date modified 2/27/2019 10:25 AM	Type File folder
Desktop				
Libraries				
This PC				
Setwork	<		_	>
	File name:	dm_hvac.ifc	~	Save
	Save as type:	IFC Files (*.ifc)	~	Cancel

Enter a name and location for the IFC file, then press the **Save** button. The selected alignment point area will be saved to the IFC file.

Related Options

3D circle approximation: Sets the number of sides on polygons used to approximate circles in the 3D model.

Export flex duct: Sets whether flex ducts are exported.

Export diffusers: Sets which diffusers are exported.

Export Entire Project to DWG File

The Export Entire Project to DWG File command is used to export all of the 3D-BIM elements from a project to a single DWG file. The DWG file format is recommended for 3D collision detection in Navisworks.

To export the entire project to a DWG file, go to

Ribbon: DM HVAC->3D-BIM-> DWG Export Entire HVAC Project to DWG File

Pulldown Menu: DM HVAC->3D-BIM->Export Entire Project to DWG File

Select Filename to Export 3D Blocks to Dialog Box

A Select filename to export 3D blocks to X				×
Save in:	HVAC	~	G 🌶 📂 🖽 -	
Quick access Desktop Libraries	Name DMBackup M0.dwg M1.dwg M2.dwg kbk.dwg	^	Date modified 9/25/2018 2:29 PM 8/8/2018 10:43 AM 9/25/2018 10:36 AM 9/24/2018 9:17 AM 8/7/2018 6:26 AM	Type File folder AutoCAD AutoCAD AutoCAD
Network	< File name: Save as type:	M1-3D.dwg DWG Files (*.dwg)	~	> Save Cancel

Enter a name and location for the DWG file, then press the **Save** button. The entire project will be saved to the DWG file.

Related Options

<u>3D circle approximation:</u> Sets the number of sides on polygons used to approximate circles in the 3D model.

Export flex duct: Sets whether flex ducts are exported.

Export diffusers: Sets which diffusers are exported.

Export Drawing to DWG File

The Export Drawing to DWG File command is used to export all of the 3D-BIM elements from the current drawing to a DWG file. The DWG file format is recommended for 3D collision detection in Navisworks.

To export the current drawing to a DWG file, go to

Ribbon: DM HVAC->3D-BIM->

Pulldown Menu: DM HVAC->3D-BIM->Export Drawing to DWG File

Select Filename to Export 3D Blocks to Dialog Box

A Select filename to export 3D blocks to				×
Save in:	HVAC	~	G 🤌 📂 🛄 -	
Quick access Desktop Libraries This PC	Name DMBackup M0.dwg M1.dwg M2.dwg	^	Date modified 9/25/2018 2:29 PM 8/8/2018 10:43 AM 9/25/2018 10:36 AM 9/24/2018 9:17 AM 8/7/2018 6:26 AM	Type File folder AutoCAD AutoCAD AutoCAD
Network	<			>
	File name:	M1-3D.dwg	~	Save
	Save as type:	DWG Files (*.dwg)	~	Cancel

Enter a name and location for the DWG file, then press the **Save** button. The current drawing will be saved to the DWG file.

Related Options

3D circle approximation: Sets the number of sides on polygons used to approximate circles in the 3D model.

Export flex duct: Sets whether flex ducts are exported.

Export diffusers: Sets which diffusers are exported.

Export One Area to DWG File

The Export One Area to DWG File command is used to export all of the 3D-BIM elements from a single alignment point area to a DWG file. The DWG file format is recommended for 3D collision detection in Navisworks.

To export a single alignment point area to a DWG file, go to

Ribbon: DM HVAC->3D-BIM->

Pulldown Menu: DM HVAC->3D-BIM->Export One Area to DWG File

You will be prompted to identify the alignment point area to be exported.

Select point inside area to export:

The Select Filename to Export 3D Blocks to dialog box will appear.

Select Filename to Export 3D Blocks to Dialog Box

A Select filename to export 3D blocks to X				
Save in:	HVAC	~	G 🤌 📂 🛄 -	
Quick access Desktop Libraries This PC	Name DMBackup M0.dwg M1.dwg M2.dwg Xbk.dwg	^	Date modified 9/25/2018 2:29 PM 8/8/2018 10:43 AM 9/25/2018 10:36 AM 9/24/2018 9:17 AM 8/7/2018 6:26 AM	Type File folder AutoCAD AutoCAD AutoCAD
Network	<			>
	File name:	M1-3D.dwg	L	Save
	Save as type:	DWG Files (*.dwg)	~	Cancel

Enter a name and location for the DWG file, then press the **Save** button. The selected alignment point area will be saved to the DWG file.

Related Options

<u>3D circle approximation:</u> Sets the number of sides on polygons used to approximate circles in the 3D model.

Export flex duct: Sets whether flex ducts are exported.

Export diffusers: Sets which diffusers are exported.

Drafting Tools

This section describes the commands available to assist with your drafting. These commands are intended for use on standard CAD entities only. Do not use these commands on ducts or diffusers. These commands will not affect the database.

Elevations

The commands in this section are used to modify the elevation of standard CAD entities on the drawing. Do not use these commands to modify the elevation of ducts, diffusers, or mechanical equipment. Use the appropriate query commands instead.

Move Entity Above Ductwork

The Move Entity Above Ductwork command is used to move an entity on the drawing above the 2D ductwork. The elevation will be set high enough that the entity will be visible when you run the **HIDE** command. If the elevation of the entity is not set with this command, it may end up below the 2D ductwork and not be displayed.

To move an entity above the ductwork, go to

Ribbon: DM HVAC->Drafting-> 🗕 Move Entity Above Ductwork

Pulldown Menu: DM HVAC->Drafting Tools->Elevations->Move Entity Above Ductwork

You will be prompted to select the objects to be moved above the ductwork.

Select objects to move above ductwork:

The elevations of the selected objects will be set so they are above all of the 2D ductwork on the drawing.

Move Entity Below Ductwork

The Move Entity Below Ductwork command is used to move an entity on the drawing below the 2D ductwork. The elevation will be set to 0. When you run the **HIDE** command, the entity will be hidden by any ductwork drawn over it.

To move an entity below the ductwork, go to

Ribbon: DM HVAC->Drafting-> 🚽 Move Entity Below Ductwork

Pulldown Menu: DM HVAC->Drafting Tools->Elevations->Move Entity Below Ductwork

You will be prompted to select the objects to be moved below the ductwork.

Select objects to move below ductwork:

The elevations of the selected objects will be set so they are below all of the 2D ductwork on the drawing.

Move Entity Up

The Move Entity Up command is used to increase the elevation of an entity on the drawing.

To move an entity up, go to

Ribbon: DM HVAC->Drafting-> 1 Move Entity Up

Pulldown Menu: DM HVAC->Drafting Tools->Elevations->Move Entity Up

You will be prompted to select the entities to be moved up.

Select entities to move:

You will then be prompted to specify the distance the entities are to be moved.

Enter distance to move up:

Their elevation will be increased by the specified distance.

Move Entity Down

The Move Entity Down command is used to decrease the elevation of an entity on the drawing.

To move an entity down, go to

Ribbon: DM HVAC->Drafting-> ↓ Move Entity Down

Pulldown Menu: DM HVAC->Drafting Tools->Elevations->Move Entity Down

You will be prompted to select the entities to be moved down.

```
Select entities to move:
```

You will then be prompted to specify the distance the entities are to be moved.

Enter distance to move up:

Their elevation will be decreased by the specified distance.

Insert Thermostat

The Insert Thermostat command is used to insert a thermostat graphic on the drawing. Thermostats are for drafting purposes only and are not linked to the database. The thermostat is inserted as a standard CAD block and can be modified using standard CAD commands.

To insert a thermostat graphic, go to

Ribbon: DM HVAC->Drafting-> ① Insert Thermostat

 $Pulldown \ Menu: \ {\tt DM \ HVAC->Drafting \ Tools->Insert \ Thermostat}$

You will be prompted to specify the insertion point for the thermostat.

Specify insertion point:

The thermostat graphic will be inserted on the drawing.

Insert 3-point Thermostat Control Wire

The Insert 3-point Thermostat Control Wire command is used to insert a thermostat control wire on the drawing using three points to define an arc. Thermostat control wires are for drafting purposes only and are not linked to the database. The thermostat control wire is inserted as a standard CAD polyline and can be modified using standard CAD commands.

To insert a 3-point thermostat control wire, go to

Ribbon: DM HVAC->Drafting-> ³/³ Insert 3-point Thermostat Control Wire

Pulldown Menu: DM HVAC->Drafting Tools->Insert 3-point Thermostat Control Wire

You will be prompted to specify the starting point of the thermostat control wire.

Start point:

You then will be prompted to specify the second point of the thermostat control wire.

To point:

You will then be prompted to specify the end point of the thermostat control wire.

To point:

A polyline will be inserted on the drawing using the three specified points.

Insert Multiple Point Thermostat Control Wire

The Insert Multiple Point Thermostat Control Wire command is used to insert a thermostat control wire on the drawing using multiple points to define a polyline. Thermostat control wires are for drafting purposes only and are not linked to the database. The thermostat control wire is inserted as a standard CAD polyline and can be modified using standard CAD commands.

To insert a mulliple point thermostat control wire, go to

Ribbon: DM HVAC->Drafting-> 🏴 Insert Multiple Point Thermostat Control Wire

Pulldown Menu: DM HVAC->Drafting Tools->Insert Multiple Point Thermostat Control Wire

You will be prompted to specify the starting point of the thermostat control wire.

Start point:

You will then be prompted to specify additional points of the thermostat control wire.

To point:

Press ENTER to finish the command. A multiple point polyline will be inserted on the drawing.

Insert Supply Arrow

To insert a supply arrow, go to

Ribbon: DM HVAC->Drafting-> → Insert Supply Arrow

Pulldown Menu: DM HVAC->Drafting Tools->Insert Supply Arrow

You will be prompted to specify the insertion point for the tail of the supply arrow on the drawing.

Specify insertion point:

You will then be prompted to specify the rotation angle for the supply arrow.

Specify rotation angle:

The supply arrow will be inserted on the drawing.

Insert Return Arrow

To insert a return arrow, go to

Ribbon: DM HVAC->Drafting-> * Insert Return Arrow

Pulldown Menu: DM HVAC->Drafting Tools->Insert Return Arrow

You will be prompted to specify the insertion point for the head of the return arrow on the drawing.

Specify insertion point:

You will then be prompted to specify the rotation angle for the return arrow.

Specify rotation angle:

The return arrow will be inserted on the drawing.

Erase Part of Grouped Entities

Some Design Master items are created by grouping multiple standard CAD entities. There are times when entities that are part of the item are not properly removed. Using the standard CAD **ERASE** command will erase the entire item. Use the Erase Part of Grouped Entities command instead to remove the entity that is no longer needed.

To erase part of an item, go to

Ribbon: DM HVAC->Drafting-> × Erase Part of Grouped Entities

Pulldown Menu: DM HVAC->Drafting Tools->Erase Part of Grouped Entities

You will be prompted to specify the part of an item to be erased.

Select entity in group to erase:

The entity will be erased.

Building Definition

This section describes the commands available to define rooms, floors, and zones.

Training Videos

• Ventilation Calculations

Project Info

The Project Info command is used to set the main information used during load calculations for the project.

To set the project information, go to

Ribbon: DM HVAC->Building Definition-> PR0J Project Info

Pulldown Menu: DM HVAC->Building Definition->Project Info

Project Information Dialog Box

Project Information X				
Project Name:				
Ventilation Calculation Method: Minimum	Location Information			
Maximum Room Ventilation Percentage:	City: SEATTLE, INT'L A	IRPORT, WA		
Use Actual Supplied Airflow in Ventilation and Psychrometric Calculations	Select City			
Allow Fractional People	Latitude: 48 N		~	
Print System Loads for Rooms	Elevation (ft): 446			
Floor Heat Loss Coefficient (per linear foot): 0.54	OSA Low Temperature Dr	y Bulb: 28		
Select Floor Heat Loss Coefficient		OSA High Dry	OSA High Wet	
Safety Factors	January:	54	49	
Heating Safety FactorRoom (%): 0	February:	60	50	
Heating Safety FactorVentilation (%): 0	March:	62	50	
Cooling Safety FactorRoom (%): 0	April:	70	55	
Cooling Safety FactorVentilation (%): 0	May:	79	61	
Edit Default Zone Information	June:	84	64	
	July:	87	66	
	August:	87	66	
	September:	82	63	
	October:	70	59	
	November:	59	52	
	December:	54	51	
	OSA High Daily Range:	18		
	Calculation time can be re	duced by selecting fewer	months.	
ОК	Cancel			

Project Name: The name of the project.

Ventilation Calculation Method: The method used to calculate the ventilation required in zones. Setting this value does not change the ventilation rates in rooms. Those values must be properly specified in the <u>Room</u> <u>Project Schedule</u>.

- **Minimum:** No adjustment is made to the ventilation rate in the zones. The ventilation rate is the sum of the ventilation in the rooms that make up the zone.
- **2006 International Mechanical Code:** The ventilation rate is adjusted based upon 2006 International Mechanical Code.
- **2009 International Mechanical Code:** The ventilation rate is adjusted based upon 2009 International Mechanical Code.
- ASHRAE 62.1-2004: The ventilation rate is adjusted based upon ASHRAE 62.1-2004.
- ASHRAE 62.1-2007: The ventilation rate is adjusted based upon ASHRAE 62.1-2007.
- ASHRAE 62.1-2010: The ventilation rate is adjusted based upon ASHRAE 62.1-2010.

Maximum Room Ventilation Percentage: Whether ventilation as a percentage of supply airflow is capped during calculations. If this is checked, rooms with a ventilation percentage higher than the specified value will have their supply airflow increased to meet that percentage.

Use Actual Supplied Airflow in Ventilation and Psychrometric Calculations: Whether ventilation and psychrometric calculations use the supplied airflow specified in the design. If this is unchecked, the supplied airflow is calculated and that value will be used. If this is checked, the supplied airflow will be based upon the values set for the diffusers on the drawing.

Allow Fractional People: Whether fractional people are used when calculating loads. If this is unchecked, the number of people in a room will be rounded up to the nearest whole person.

Print System Loads for Rooms: Whether system loads will be printed for rooms. This value can also be set when printing the loads. See the <u>Print Load Calculations</u> section for more information.

Floor Heat Loss Coefficient: The heat loss coefficient of the floor. This value is used to calculate the heat loss through an unheated concrete slab floor. See *Table 18* in the *Residential Cooling and Heating Load Calculations* chapter of the 2005 ASHRAE Fundamentals Handbook.

Select Floor Heat Loss Coefficient: Press this button to set how the *Floor Heat Loss Coefficient* is calculated. The **Select Floor Heat Loss Coefficient** dialog box will appear.
Select Floor Heat Loss Coefficient X
Construction
8" block wall, brick facing
○ 4" block wall, brick facing
O Metal stud wall, stucco
\bigcirc Poured concrete wall with duct near perimeter
Insulation
Uninsulated
◯ R-5.4 from edge to footer
Degree-Days (65 F Base)
② 2950
○ 5350
○ 7433
Coefficient: 0.62
From Table 18, page 29.13,
2005 ASHRAE Fundamentals Handbook
OK Cancel

The options available are based upon *Table 18* in the *Residential Cooling and Heating Load Calculations* chapter of the 2005 ASHRAE Fundamentals Handbook.

Press the OK button to save changes. The Floor Heat Loss Coefficient will be updated.

Safety Factors

Heating Safety Factor--Room (%): A safety factor for heating loads in rooms, as an additional percentage. All of the room heating loads will be increased by this percentage.

Heating Safety Factor--Ventilation (%): A safety factor for heating ventilation loads in the project, as an additional percentage. The heating ventilation loads will be increased by this percentage.

Cooling Safety Factor--Room (%): A safety factor for cooling loads in rooms, as an additional percentage. All of the room cooling loads will be increased by this percentage.

Cooling Safety Factor--Ventilation (%): A safety factor for cooling ventilation loads in the project, as an additional percentage. The cooling ventilation loads will be increased by this percentage.

Edit Default Zone Information: Press this button to edit the top zone in the project. The Zone List dialog box will appear with the top zone active. If multiple top zones exist in the project, the zone that was created first will be selected.

The top zone in a project sets default values for many load calculation settings. See the <u>Zone Above</u> section for more information.

Location Information

City: The city where the project is located. Changing this value does not change any of the other locationdependent values in the dialog box. Press the **Select City** button to set this value.

Select City: Press this button to select the city where the project is located. When a city is selected, the *City*, *Latitude*, *Elevation*, and *Outside Air Temperature* values are set. See the <u>City Definitions</u> section for more information about setting city-related values.

Latitude: The latitude where the project is located. Choose the latitude closest to the actual location of the city. Only north latitudes are available. Press the **Select City** button to set this value based upon the city.

Elevation: The elevation where the project is located. Press the **Select City** button to set this value based upon the city.

OSA Low Temperature Dry Bulb: The outside air temperature on the coldest night of the year. Press the **Select City** button to set this value based upon the city.

January, February, March, April, May, June, July, August, September, October, November, December: Whether cooling loads are calculated for the selected month. Calculating loads in more months allows you to find peaks that happen outside of the normal summer months. Calculating loads in more months will take longer.

OSA High Dry: The outside air dry-bulb temperature for the specified month used when calculating cooling loads. Press the **Select City** button to set this value based upon the city.

OSA High Wet: The outside air wet-bulb temperature for the specified month used when calculating cooling loads. Press the **Select City** button to set this value based upon the city.

OSA High Daily Range: The outside air temperature range used to adjust the temperature when calculating cooling loads. Press the **Select City** button to set this value based upon the city.

Related Options

You can customize the defaults for many of the settings and fields in this dialog box. See the **<u>Building Project</u> <u>Information Options</u>** section for more information.

Zones

This section describes the commands used to create zones for building load calculations.

Zones contain rooms and other zones. The load in a zone is the sum of the loads of all of the rooms contained in the zone.

Zone Tree

The zone Tree command is used to view and modify the zone and room hierarchy in a project.

To view and edit the zone and room organizational tree, go to

Ribbon: DM HVAC->Building Definition->

Pulldown Menu: DM HVAC->Building Definition->Zones->Zone Tree

Zone Tree Dialog Box

😥 Zone Tree	×
Design Master Software (SEATTLE, INT'L AIRPORT, WA) Cone Default Room Bait and Switch Room Room Mgr Office Cone AHU Room Lobby Cone VAV-1 Room Concession Room Kitchen Cone VAV-2 Room Corridor	Edit View Load Rename Edit Zones Edit Rooms Create Room
OK Cancel	

Zone and Room Tree: The tree on the left side of the dialog box lists all of the zones and rooms in the project.

The first item in the tree represents the whole project. The label is based upon the *Project Name* and *City* set in the **Project Information** command.

Below the project information are all of the zones. Zones that are not part of any other zone are listed directly under the project information. Other zones are listed below the zone they occupy.

All of the rooms in the project are listed in the zone they occupy.

Zones and rooms can be rearranged by dragging and dropping them in the tree. You can select multiple rooms or zones using the **SHIFT** and **CTRL** keys to move them all at once.

Edit: Press this button to edit the selected item.

If the project name is selected, the **Project Information** dialog box will appear.

If a zone is selected, the **Zones** dialog box will appear with the selected zone active.

If a room is selected, the <u>Room List</u> dialog box will appear with the selected room active.

View Load: Press this button to view the load for the selected item. The **Load Detail** dialog box will appear. See the <u>View Room Load</u> section for more information.

Rename: Press this button to rename the selected item.

Edit Zones: Press this button to create and edit zones. The <u>Zones</u> dialog box will appear. If a zone is selected, it will be the active zone in the dialog box.

Edit Rooms: Press this button to edit rooms. The <u>Room List</u> dialog box will appear. If a room is selected, it will be the active room in the dialog box.

Create Room: Press this button to create a room. See the Create Room section for more information.

Zone List

To create or modify a zone, go to

Ribbon: DM HVAC->Building Definition-> ^{ZONE} Zone List

Pulldown Menu: DM HVAC->Building Definition->Zones->Zone List

Zones Dialog Box

Zones			×
Zone: Defau	ılt	Rename Find.	
< Previo	us ,	. Next>	
Zone Above: <none></none>			\sim
System Type: Variable Air Volume			~
Room Supply Airflow Basis: Use calcu	lated room loads		~
Fixed Supply Airflow (CFM): 3533			
Room Ventilation Airflow Basis: Use ro	om settings		~
Fixed Ventilation Airflow (CFM): 2125			
Indoor Air Defaults		Tempered Air	
Heating Temperature: 70 Cooling Temperature: 75 Relative Humidity (%): 50		OSA is Tempered Tempered Low Temperature: Tempered High Dry Bulb Temperature: Tempered High Wet Bulb Temperature:	
ASHRAE 62			
Ep: 1	Show Definition Show Definition Show Definition Show Definition	AHU and Coil Settings Heating Temperature Difference: 20 Cooling Temperature: 55 Coil Bypass Factor (%): 15 Fan Position: Draw Through Fan Position: 2	
People Diversity		Motor Position:	
SF / Person:		Motor Efficiency (%): 70	~
O People:		Duct Settings	
Plenum Plenum Retum Percentage of Lighting Load to F	Plenum: 50	Supply Duct Temperature Gain: 0 Supply Duct Air Leakage (%): 0 Return Duct Temperature Gain: 0 Return Duct Air Leakage (%): 0	
New	Сору	Save Delete	
	Exit		

See the <u>Common Schedule Dialog Box Features</u> section for more information about how this dialog box works. This section describes the **Rename**, **Find**, **Previous**, **Next**, **New**, **Copy**, **Save**, and **Delete** buttons.

Zone Above: The zone that is above this zone in the zone hierarchy.

- <None>: No zone is above this zone. All of the other sections in this dialog box will be available to be set.
- **Other Zone:** There is a zone above this zone. By default, most of the settings for the current zone are based upon the selected *Zone Above*.

System Type: The type of system that is modeled by the zone.

- Variable Air Volume: The system is a variable air volume system. The peak zone values will be coincident peaks, sometimes referred to as the block load.
- **Constant Volume:** The system is a constant volume system. The peak zone values will be a sum of the room peak values.

Room Supply Airflow Basis: How the room supply airflow is calculated.

- Use calculated room loads: The room supply airflow is based upon the calculated room load.
- **Prorate using fixed supply airflow:** The room supply airflow is prorated based upon the *Fixed Supply Airflow*. The supply airflow based upon the calculated room load is compared with the fixed supply airflow. Each room is then adjusted up or down based upon this ratio. The total supply air for all of the rooms will equal the *Fixed Supply Airflow*.

Fixed Supply Airflow: The total airflow to be supplied to the zone when *Room Supply Airflow Basis* is set to **Prorate using fixed supply airflow**. This field is disabled if *Room Supply Airflow Basis* is set to **Use calculated room loads**.

Room Ventilation Airflow Basis: How the room ventilation airflow is calculated.

- Use room settings: The room ventilation airflow is based upon the room settings.
- Use fixed ventilation airflow: The room ventilation airflow is based upon the *Fixed Ventilation Airflow*. The total ventilation for all of the rooms will equal the *Fixed Ventilation Airflow*.

Fixed Ventilation Airflow: The total ventilation for the zone when *Room Ventilation Airflow Basis* is set to **Use fixed ventilation airflow**. This field is disabled if *Room Ventilation Airflow Basis* is set to **Use room settings**.

Indoor Air Defaults

The *Indoor Air Defaults* section sets the default temperature and humidity values for rooms in the zone. These values can be overridden for specific room types or individual rooms.

If *Zone Above* is set to **<None>**, these values must be entered manually.

If *Zone Above* has a zone selected, these values are set based upon the above zone. Check the first box beside this section to specify a different *Heating Temperature* and/or *Cooling Temperature* for this zone. Check the second box beside this section to specify a different *Relative Humidity* for this zone.

Heating Temperature: The goal temperature when heating rooms in the zone.

Cooling Temperature: The goal temperature when cooling rooms in the zone.

Relative Humidity (%): The goal relative humidity when cooling rooms in the zone.

ASHRAE 62

The ASHRAE 62 section sets values that are used when performing the ASHRAE 62.1 zone ventilation calculation.

If *Zone Above* is set to **<None>**, these values must be entered manually.

If *Zone Above* has a zone selected, these values are set based upon the above zone. Check the box beside this section to specify different values for this zone.

The descriptions for these values are based upon their definitions in ASHRAE 62.1-2004, Appendix A:

Definitions.

Show Definition: Press this button next to each value to display the ASHRAE 62.1 definition for the value.

Ep: Primary air fraction to the zone. Set *Ep* to 1.0 for single-duct and single-zone systems.

Er: In systems with secondary recirculation of return air, fraction of secondary recirculated air to the zone that is representative of average system return air rather than air directly recirculated from the zone.

For plenum return systems with local secondary recirculation (e.g., fan-powered VAV with plenum return), set *Er* less than or equal to 1.0.

For ducted return systems with local secondary recirculation (e.g., fan-powered VAV with ducted return), typically *Er* is equal 0.0.

Ez: A measure of how effectively the zone air distribution uses its supply air to maintain acceptable air quality in the breathing zone.

- Ceiling supply of cool air, set *Ez* to 1.0.
- Ceiling supply of warm air and floor return, set *Ez* to 1.0.
- Ceiling supply of warm air 15°F or more above space temperature and ceiling return, set Ez to 0.8.
- Ceiling supply of warm air less than 15°F above space temperature and ceiling return, provided that the 150 fpm supply air jet reaches to within 4.5 ft of floor level, set *Ez* to 1.0. For lower velocity supply air, set *Ez* to 0.8.
- Floor supply of cool air and ceiling return, provided that the 150 fpm supply jet reaches 4.5 ft or more above the floor (Note: most underfloor air distribution systems comply with this provision), set *Ez* to 1.0.
- Floor supply of cool air and ceiling return, provided low-velocity displacement ventilation achieves unidirectional flow and thermal stratification, set *Ez* to 1.2.
- Floor supply of warm air and floor return, set *Ez* to 1.0.
- Floor supply of warm air and ceiling return, set *Ez* to 0.7.
- Makeup supply drawn in on the opposite side of the room from the exhaust and return, set Ez to 0.8.
- Makeup supply drawn in near to the exhaust and return location, set Ez to 0.5.

Minimum Zd: The minimum discharge outdoor air fraction for the zone.

The formal definition is Zd = Voz/Vdz. Voz is the zone outdoor airflow. Vdz is the zone discharge airflow.

For non-VAV systems, this value should be set to 0.

For VAV systems, Vdz is the minimum expected discharge airflow for design purposes. You must determine what the minimum discharge outdoor air fraction for the system will be. The minimum Zd that you specify implicitly defines the minimum Vdz for the zone.

People Diversity

The *People Diversity* section sets whether the number of people in the zone is diversified compared to the number of people in the rooms in the zone.

If the checkbox is unchecked, the number of people in the zone is the sum of the number of people in the rooms in the zone.

If the checkbox is checked, the number of people in the zone is based upon the SF/Person or People setting. The people load in the zone will be adjusted accordingly. SF/Person: Select this option to set the number of people in the zone based upon the zone area.

People: Select this option to set the total number of people in the zone.

Plenum

The *Plenum* section controls whether the zone has a plenum return. When a zone has a plenum return, some of the room loads are moved to the system load instead. These include the roof load, the portion of the wall load that is above the plenum, and a percentage of the lighting load.

If *Zone Above* is set to **<None>**, these values can be entered manually.

If *Zone Above* has a zone selected, these values are set based upon the above zone. Check the box beside this section to specify different values for this zone.

Plenum Return: Whether the zone has a plenum return.

Percentage of Lighting Load to Plenum: For zones with a plenum return, the percentage of the lighting load that is transferred to the plenum. The lighting load in the plenum is included in the system load but not the room load.

Tempered Air

The *Tempered Air* section controls whether the zone has tempered air and the settings of the tempered air if it does.

If *Zone Above* is set to **<None>**, these values can be entered manually.

If *Zone Above* has a zone selected, these values are set based upon the above zone. Check the box beside this section to specify different values for this zone.

OSA is Tempered: Whether the outside air is tempered before it reaches the air handler.

Tempered Low Temperature: If *OSA is Tempered* is checked, this temperature is used instead of the <u>OSA Low</u> <u>Temperature Dry Bulb</u> temperature when calculating heating loads.

Tempered High Dry Bulb Temperature: If OSA is Tempered is checked, this temperature is used instead of the OSA High Dry temperature when calculating cooling loads.

Tempered High Wet Bulb Temperature: Whether the web bulb temperature is tempered in addition to the dry bulb temperature. If this is checked, this temperature is used instead of the <u>OSA High Wet</u> temperature when calculating cooling loads..

AHU and Coil Settings

The AHU and Coil Settings section controls values that are used in the supply air requirements calculations and the psychrometric calculations.

If *Zone Above* is set to **<None>**, these values must be entered manually.

If Zone Above has a zone selected, these values are set based upon the above zone. Check the box beside this

section to specify different values for this zone.

Heating Temperature Difference: The difference between the heating temperature in the room or zone and the temperature of the air at the supply diffusers. This temperature difference is used as an input in the heating supply air requirement calculations.

Cooling Temperature: The temperature of the air at the supply diffusers. This temperature is used as the desired end condition for the psychrometric calculations and as an input in the cooling supply air requirements calculations.

Coil Bypass Factor (%): The percentage of air that is not conditioned by the coil.

Fan Position: Where the fan is positioned relative to the coil.

- **Blow Through:** The fan is positioned before the coil. This location requires a higher coil dew point temperature.
- **Draw Through:** The fan is positioned after the coil. This location requires a lower coil dew point temperature.

Fan Brake Horsepower: The horsepower of the fan brake.

Motor Position: Where the motor is positioned relative to the ductwork.

- In Airstream: The motor is positioned in the ductwork. The temperature gain from the motor is included in the psychrometric calculations.
- Out of Airstream: The motor is positioned outside the ductwork. The temperature gain from the motor is not included in the psychrometric calculations.

Motor Efficiency (%): The efficiency of the motor. Higher valued result in lower temperature gains from the motor.

Duct Settings

The Duct Settings section controls values in the ductwork that are used in the psychrometric calculations.

If *Zone Above* is set to **<None>**, these values must be entered manually.

If *Zone Above* has a zone selected, these values are set based upon the above zone. Check the box beside this section to specify different values for this zone.

Supply Duct Temperature Gain: The change in temperature of the air traveling through the supply ductwork. This temperature gain is often caused by ductwork in unconditioned spaces, typically outside.

An increase in this value results in a lower coil dew point temperature.

Supply Duct Air Leakage (%): The percentage of supply air that is leaked out of the ductwork. This air is leaked outside the building. Do not include air that is leaked out of the ductwork but remains inside the building.

An increase in this value results in an increase in the mixed air volume. If the amount of air leaked exceeds the outside air volume, it will increase the volume of outside air required.

Return Duct Temperature Gain: The change in temperature of the air traveling through the return ductwork. The temperature gain is often caused by ductwork in unconditioned spaces, typically outside.

An increase in this value results in a higher mixed air temperature and a higher coil dew point temperature.

Return Duct Air Leakage (%): The percentage of return air that is leaked out of the ductwork. This air is leaked outside the building. Do not include air that is leaked out of the ductwork but remains inside the building.

An increase in this value results in an increase in the outside air volume.

Floors & Roofs

This section describes the commands used to create floors for building load calculations.

Floors contain rooms. Some default values for rooms are based upon the floor they occupy.

Floor Tree

The Floor Tree command is used to view and modify the floor and room hierarchy in a project.

To view and edit the floor organizational tree, go to

Ribbon: DM HVAC->Building Definition-> 🌴 Floor Tree

Pulldown Menu: DM HVAC->Building Definition->Floors & Roofs->Floor Tree

Floor Tree Dialog Box



Floor and Room Tree: The tree on the left side of the dialog box lists all of the floors and rooms in the project.

The first item in the tree represents the whole project. The label is based upon the *Project Name* and *City* set in the **Project Information** command.

Below the project information are all of the floors. Below each floor are all of the rooms on that floor.

Rooms can be moved to new floors by dragging and dropping them in the tree. You can select multiple rooms using the **SHIFT** and **CTRL** keys to move them all at once.

Edit: Press this button to edit the selected item.

If the project name is selected, the **Project Information** dialog box will appear.

If a floor is selected, the **Floor List** dialog box will appear with the selected floor active.

If a room is selected, the **Room List** dialog box will appear with the selected room active.

Rename: Press this button to rename the selected item.

Edit Floors: Press this button to create and edit floors. The <u>Floor List</u> dialog box will appear. If a floor is selected, it will be the active floor in the dialog box.

Edit Rooms: Press this button to edit rooms. The <u>Room List</u> dialog box will appear. If a room is selected, it will be the active room in the dialog box.

Create Room: Press this button to create a room. See the Create Room section for more information.

Floor List

To create or modify a floor, go to

Ribbon: DM HVAC->Building Definition-> ^{FUR} Floor List

Pulldown Menu: DM HVAC->Building Definition->Floors & Roofs->Floor List

Floor Information Dialog Box

Floor Information X
Floor Name: One Rename Find
< Previous , . Next>
Default Ceiling Height (ft-in): 8
Floor-to-Floor Height (ft-in): 10
Roof
Roof Type: R19 in Attic V Edit
Description: Insulation on attic floor, R19
U-Value: 0.0526 Type: 2 Color: Dark
Floor / Ceiling Partition
U-Value: 0
Use OSA Temperatures for Other Side
Other Side High Temperature: 87
Other Side Low Temperature: 28
New Copy Save Delete
Exit

See the <u>Common Schedule Dialog Box Features</u> section for more information about how this dialog box works. This section describes the **Rename**, **Find**, **Previous**, **Next**, **New**, **Copy**, **Save**, and **Delete** buttons.

Default Ceiling Height: The height of the ceiling relative to the elevation of the floor, in feet and inches. This is used when calculating the room volume. Room volume is used to calculate air changes per hour.

Floor-to-Floor Height: The height of the outside walls relative to the elevation of the floor, in feet and inches.

Roof

Roof: Whether the floor has a roof. If this box is checked, the rooms in the floor will include a roof by default.

Roof Type: The type of roof for the floor. If *Roof* is unchecked, this field is disabled.

The list of roof types available is defined in the <u>Roof Project Schedule</u> command. The other values in this section are based upon the selected *Roof Type*.

Edit: Press this button to open the <u>Roof Project Schedule</u> dialog box with the selected *Roof Type* active.

Floor / Ceiling Partition

Floor / Ceiling Partition: Whether the floor has a floor or ceiling partition. If this box is checked, the rooms in the floor will include a floor or ceiling partition by default.

Check this box when there is an unconditioned space either above or below the floor. There will be heat transfer through the area based upon the temperature difference, but there will be no solar load. If you need a solar load, use the *Roof* section instead.

U-Value: The heat transfer coefficient of the floor or ceiling partition.

To model a floor and a ceiling partition, enter the sum of their u-values in the U-Value field.

Use OSA Temperatures for Other Side: What temperatures are used for air on the other side of the partition.

Check this box to use the outside air temperatures set in the <u>Project Information</u> dialog box. The high temperature used for the cooling load will change during the day.

Uncheck this box to manually enter values for the *Other Side High Temperature* and *Other Side Low Temperature* fields. The high temperature will not change during the day.

Other Side High Temperature: The high temperature on the other side of the partition used during cooling load calculations. If *Use OSA Temperatures for Other Side* checked, this field is disabled.

Other Side Low Temperature: The low temperature on the other side of the partition used during heating load calculations. If *Use OSA Temperatures for Other Side* checked, this field is disabled.

Roof Project Schedule

The roof project schedule contains the roof types available to be used in the current project.

To create and modify roof types, go to

```
Ribbon: DMH: Customization->Project Customization->
```

Pulldown Menu: DM HVAC->Building Definition->Floors & Roofs->Roof Project Schedule

Roof Project Schedule Dialog Box

Roof Project Schedule	×			
Roof Type: R19 in Attic	Rename Find			
< Previous , U-Value: 0.0526	. Next> Color O Light (Not Recommended)			
Description: Insulation on attic floor, R19	Oark			
New Copy	Save Delete			
Import from Another Database Import from Roof Master Schedule				
Exit				

See the <u>Common Schedule Dialog Box Features</u> section for more information about how this dialog box works. This section describes the **Rename**, **Find**, **Previous**, **Next**, **New**, **Copy**, **Save**, and **Delete** buttons.

See the <u>Import from Another Database</u> and <u>Import from Master Schedule</u> sections for more information about importing roof types to the current project from other locations.

Type: The name of the surface type.

U-Value: The heat transfer coefficient of the surface.

ASHRAE Type: The surface type as defined in the *1997 ASHRAE Fundamentals Handbook*. This value is used to determine the rate of solar heat transfer through the surface. See the <u>ASHRAE Glass Zone, Roof, & Wall</u> Types and Roof, Wall, and Glass Zone Type Tables articles in the knowledge base for more information.

Color: The color of the surface. The CLTD method recommends that you select **Dark** and not adjust the surface load based upon the color.

- Light: The surface is a light color. The cooling load will be reduced by 50% when this color is selected.
- **Dark:** The surface is a dark color. The cooling load will be taken directly from the CLTD table with no scaling.

Description: A longer description of the surface type. Displayed when selecting the surface type and in the **Export Building Information** printout.

Roof Master Schedule

The roof master schedule contains the roof types that may be used by a company on a project. See the <u>Master</u> and <u>Standards Databases</u> section for more information about using master databases.

To create and modify roof types in the master schedule, go to

Ribbon: DMH: Customization->Master & Standards Customization->

Pulldown Menu: DM HVAC->Building Definition->Floors & Roofs->Roof Master Schedule

Roof Master Schedule Dialog Box

Roof Master Schedule			×
Current Group: General Move to Anot	her Group	Copy to Anothe	Select Group
Roof Type: R19	in Attic	Rename	. Find
< Pre	vious,	. Nex	t>
U-Value: 0.0526 ASHRAE Roof Type: 2	~	Color O Light (Not Recommen Dark	ided)
Description: Insulation on a	attic floor, R19		
New	Сору	Save	Delete
Import from Roof Project Schedule			
	Exit		

See the <u>Common Schedule Dialog Box Features</u> section for more information about how this dialog box works. This section describes the **Rename**, **Find**, **Previous**, **Next**, **New**, **Copy**, **Save**, and **Delete** buttons.

See the **Import from Project Schedule** section for more information about importing roof types from a project to the master database.

Current Group: The active roof type group is listed here. All of the roof types that are created and modified will be associated with this group.

Select Group: Press this button to open the Roof Master Schedule Groups dialog box. The group selected will become the current group. See the <u>Common Groups Dialog Box Features</u> section for more information.

Move to Another Group: Press this button to move the current roof type to another group. A dialog box will prompt you to select the other group to which the roof type will be moved. The *Current Group* will be changed to the selected group. This button is disabled if only one group exists.

Copy to Another Group: Press this button to copy the current roof type to another group. A dialog box will prompt you to select the other group to which the roof type will be copied. A copy of the roof type will be created in the other group. This button is disabled if only one group exists.

Type: The name of the surface type.

U-Value: The heat transfer coefficient of the surface.

ASHRAE Type: The surface type as defined in the *1997 ASHRAE Fundamentals Handbook*. This value is used to determine the rate of solar heat transfer through the surface. See the <u>ASHRAE Glass Zone, Roof, & Wall</u> <u>Types</u> and <u>Roof, Wall, and Glass Zone Type Tables</u> articles in the knowledge base for more information.

Color: The color of the surface. The CLTD method recommends that you select **Dark** and not adjust the surface load based upon the color.

- Light: The surface is a light color. The cooling load will be reduced by 50% when this color is selected.
- **Dark:** The surface is a dark color. The cooling load will be taken directly from the CLTD table with no scaling.

Description: A longer description of the surface type. Displayed when selecting the surface type and in the **Export Building Information** printout.

Rooms

This section describes the commands used to create and modify rooms.

Common Room Information

The values that can be specified for rooms are listed below.

Glass Zone Type: The floor covering type and partition type in the room as defined in *Table 35B* in the *1997 ASHRAE Fundamentals Handbook*, page 28.49. See the <u>ASHRAE Glass Zone, Roof, & Wall Types</u> and <u>Roof,</u> <u>Wall, and Glass Zone Type Tables</u> articles in the knowledge base for more information.

Include in Heating Load Calculation: Whether the room is included in the heating load calculations.

Include in Cooling Load Calculation: Whether the room is included in the cooling load calculations.

Minimum Supply Air: The minimum amount of supply air required for the room. If the supply air for the room based upon the heating or cooling load is less than this value, the required supply air volume for the room will be set to this value.

- Air Changes / Hour: The Minimum Supply Air is set based upon the number of air changes per hour.
- CFM / Person: The Minimum Supply Air is set based upon the number of people.
- CFM / SF: The Minimum Supply Air is set based upon the area of the room.
- **CFM:** The *Minimum Supply Air* is set to a specific airflow value.

Design Temperatures

Use the *Design Temperatures* section to set the goal temperatures and relative humidity for the room, and whether those values are based upon the zone the room occupies.

Override Default Temperatures: Whether the heating and cooling temperatures are based upon the zone the room occupies. Check this box to enter values for the room type manually.

Heating Temperature: The goal temperature used when heating the room. If *Override Default Temperatures* is unchecked, this field is disabled.

Cooling Temperature: The goal temperature used when cooling the room. If Override Default Temperatures is

unchecked, this field is disabled.

Override Default Relative Humidity: Whether the relative humidity is based upon the zone the room occupies. Check this box to enter values for the room type manually.

Relative Humidity (%): The goal relative humidity used when cooling the rooms in the zone. If *Override Default Relative Humidity* is unchecked, this field is disabled.

Lighting

Use the Lighting section to set the cooling load from lighting in the room.

Watts / SF: Select this option to set the lighting load based upon the room area.

Watts: Select this option to enter a specific value for the lighting load.

Equipment

Use the *Equipment* section to set the cooling load from equipment in the room.

Watts / SF: Select this option to set the equipment load based upon the room area.

Watts: Select this option to enter a specific value for the equipment load.

Latent Gain: The latent equipment load in the room. Enter a specific value.

Ventilation (OSA)

Use the *Ventilation* section to set the ventilation rates for the room. All of the ventilation values use the same set of options for determining the ventilation rate:

- Air Changes / Hour: The ventilation rate is set based upon the number of air changes per hour.
- CFM / Person: The ventilation rate is set based upon the number of people.
- CFM / SF: The ventilation rate is set based upon the area of the room.
- **CFM:** The ventilation rate is set to a specific airflow value.

Cooling 1: The ventilation rate for the room when cooling.

Cooling 2: The second ventilation rate for the room when cooling. The total ventilation in the room when cooling is the sum of *Cooling 1* and *Cooling 2*.

Heating 1: The ventilation rate for the room when heating.

• Same as Cooling: The heating ventilation rate is the same as *Cooling 1*.

Heating 2: The second ventilation rate for the room when heating. The total ventilation in the room when heating is the sum of *Heating 1* and *Heating 2*.

• Same as Cooling: The heating ventilation rate is the same as *Cooling 2*.

Infiltration

Use the *Infiltration* section to set the infiltration rates for the room. All of the infiltration values use the same set of options for determining the infiltration rate:

- Air Changes / Hour: The infiltration rate is set based upon the number of air changes per hour.
- **CFM / SF of Wall:** The infiltration rate is set based upon the area of the walls in the room that are set to **Heat Transfer and Solar Gain (Wall)**. See the **Query Wall** section for more information about this setting.
- **CFM:** The infiltration rate is set to a specific airflow value.

Cooling: The infiltration rate for the room when cooling.

Heating: The infiltration rate for the room when heating.

• Same as Cooling: The heating infiltration rate is the same as *Cooling*.

People

Use the *People* section to set the number of people in the room.

SF/Person: Select this option to set the number of people in the room based upon the room area.

People: Select this option to enter a specific value for the number of people in the room.

Activity Level: The sensible and latent load for each person in the room. Higher levels of activity result in higher loads. The values in this list are taken from 1997 ASHRAE Handbook, Fundamentals, Table 3, page 28.8.

- Custom: The load for each person is entered manually using the Sensible Btu/h / Person and Latent Btu/h / Person fields.
- Seated at theater: Sensible load is 225 Btu/h per person, latent load is 105 Btu/h per person.
- Seated at theater, night: Sensible load is 245 Btu/h per person, latent load is 105 Btu/h per person.
- Seated, very light work: Sensible load is 245 Btu/h per person, latent load is 155 Btu/h per person.
- Moderate office work: Sensible load is 250 Btu/h per person, latent load is 200 Btu/h per person.
- Standing: Sensible load is 250 Btu/h per person, latent load is 250 Btu/h per person.
- **Eating (including food):** Sensible load is 275 Btu/h per person, latent load is 275 Btu/h per person. Includes 30 Btu/h sensible and 30 Btu/h latent for food per person.
- Light bench work: Sensible load is 275 Btu/h per person, latent load is 475 Btu/h per person.
- Moderate dance: Sensible load is 305 Btu/h per person, latent load is 545 Btu/h per person.
- Walking; light machine work: Sensible load is 375 Btu/h per person, latent load is 625 Btu/h per person.
- Bowling; heavy work: Sensible load is 580 Btu/h per person, latent load is 870 Btu/h per person.
- Heavy machine work; lifting: Sensible load is 635 Btu/h per person, latent load is 965 Btu/h per person.
- Athletics: Sensible load is 710 Btu/h per person, latent load is 1090 Btu/h per person.

Sensible Btu/h / Person: The sensible load for each person in the room. If *Activity Level* is set to Custom, this value can be entered manually.

Latent Btu/h / Person: The latent load for each person in the room. If *Activity Level* is set to Custom, this value can be entered manually.

Create Room

To create a room on the drawing, go to

Ribbon: DM HVAC->Rooms and Walls-> 🔽 Create Room

Pulldown Menu: DM HVAC->Building Definition->Rooms->Create Room

Create New Room Dialog Box

Create New Room	×			
Room Number:				
Room Type: Correctional-Booking/Waiting ~	Edit			
Floor: One ~	Edit			
Zone: AHU-1 (1st Floor)	Edit			
Create Room <				
Exit				

Room Number: The name of the room.

Room Type: The room type taken from the room project schedule. This value determines the default settings for the room. See the **Room Project Schedule** section for more information.

Floor: The floor the room occupies. See the <u>Floor List</u> section for more information.

Zone: The zone the room occupies. See the <u>Zone List</u> section for more information.

Create Room: Press this button to create the room on the drawing.

You will be prompted to identify the location of the room on the drawing.

Specify first room point:

You will then be prompted to specify additional room points.

Specify next room point / <Finish>:

Press ENTER to complete the room outline.

The room will be displayed on the drawing. You will be prompted to select the location for the room information label.

Specify room info location:

The room label will be inserted on the drawing with a leader pointing to the room.

Edit Rooms

To edit a room's definition, go to

Ribbon: DM HVAC->Rooms and Walls->

Pulldown Menu: DM HVAC->Building Definition->Rooms->Edit Rooms

Room List Dialog Box

Room List				X
Room Name: 101 Rename < Previous , . Nex	. Find t>	Roof Image: Roof Roof Type:	R19 in Attic	✓ Edit
Select from Drawing <		Percent:		100
Room Type: Lobby-Main Entry	 ✓ Edit 	Area (sf):		1290
Floor: One	✓ Edit	Skylight Type:	AI, DG, 1/2", F	✓ Edit
Zone: Z2	✓ Edit	Skylight Area (sf):		
Area: 1290 sf 8 Ceiling Height (ft-in): 8 Glass Zone Type: C (Heavy Construction) Image: Construction in the sting Load Calculation Image: Construction in the sting Load Calculation Image: Construction intervention in the sting Temperatures Image: Construction intervention in the sting Temperature: Image: Construction intervention interve	Minimum Supply Ventilation (OSA) Cooling 1: Cooling 2: Heating 1: Heating 2: Infiltration Cooling: Heating:	Air: 0 CF 15 CFM 0 CFM 0 CFM Air Ch 0.25 Air Ch CFM /	M V Person V hanges / Hour V SF of Wall V	Floor / Ceiling Partition Include Partition Include Partition Percent: 100 Area (sf): 1290 U-Value: 0 U-Value: 0 Use OSA Temperatures for Other Side 0 Other Side High Temperature: 87 Other Side Low Temperature: 28
Lighting	Equipment	1		SF / Person: 50 People: Activity Level: Custom
				Sensible Btu/h / Person: 250
Percentage to Plenum	Latent Gain (Btu/ł	n): 0		Latent Btu/h / Person: 200
Save		Exit		Delete

See the <u>Common Schedule Dialog Box Features</u> section for more information about how this dialog box works. This section describes the **Rename**, **Find**, **Previous**, **Next**, **Save**, and **Delete** buttons.

There is no **Copy** button in this dialog. To copy a room, use the standard CAD **COPY** command to copy it on the drawing.

See the **Common Room Information** section for more information about the room settings.

Most of the values in a room are based upon the *Room Type*, *Floor*, and *Zone*. To override a value in the specific room, check the box beside the corresponding field. You can then enter a value for the setting that will be used only in the selected room.

Room Type: The room type taken from the room project schedule. See the <u>Room Project Schedule</u> section for more information. The following fields and sections are based upon the *Room Type*:

- Glass Zone Type
- Include in Heating Load Calculation
- Including in Cooling Load Calculation

- Lighting
- Minimum Supply Air
- Ventilation
- Infiltration
- Equipment
- People

Floor: The floor the room occupies. See the <u>Floor List</u> section for more information. The following fields and sections are based upon the *Floor*:

- Ceiling Height
- Roof
- Floor / Ceiling Partition

Zone: The zone the room occupies. See the **Zone List** section for more information. The *Design Temperatures* section is based upon the *Zone*:

Select from Drawing: Press this button to select the room from the drawing. You will be prompted to select a point inside the room.

Specify point inside room:

The dialog box will reopen with the selected room displayed.

Lighting

Percentage to Plenum: For rooms in a zone with a plenum return, the percentage of the lighting load that is transferred to the plenum. The lighting load in the plenum is included in the system load but not the room load.

If the room is in a zone that does not have a plenum return, this value is ignored.

Roof

Roof Percent: Select this option to set the roof area to be based upon a percentage of the total room area.

Roof Area: Select this option to enter a specific value for the roof area.

Skylight Type: Whether the room has a skylight. If the room does not have a roof, this checkbox is disabled. If the room has a skylight, you can set the type of glass used for the skylight.

Press the Edit button to open the Glass Project Schedule dialog box with the selected glass type active.

Skylight Area: The area of the skylight.

Query Room

To view and edit a specific room, go to

Ribbon: DM HVAC->Rooms and Walls-> Query Room

 $\label{eq:point} Pulldown \ Menu: \ \texttt{DM HVAC->Building Definition->Rooms->Query Room}$

You will be prompted to identify which room on the drawing to be queried.

Specify point inside room to query:

The Room List dialog box will appear.

Changes can be made to the room in the same way as when using the Edit Rooms command.

Update Room Labels

To update the information displayed in room labels, go to

Ribbon: DM HVAC->Rooms and Walls-> 🕏 Update Room Labels

Pulldown Menu: DM HVAC->Building Definition->Rooms->Update Room Labels

All of the room labels on the drawing will be updated.

Show or Hide Label Leaders

To show or hide room label leaders, go to

Ribbon: DM HVAC->Rooms and Walls-> Show or Hide Label Leaders

Pulldown Menu: DM HVAC->Building Definition->Rooms->Show or Hide Label Leaders

You will be prompted to select one or more room outlines or room labels for which the leaders will be shown or hidden.

Select objects:

Label leaders will be shown if they were not displayed previously or hidden if they were shown previously.

Redraw Room

The Redraw Room command is used to draw a room that already exists in the database. If the room is inserted on the drawing, this command will erase and reinsert the room.

Do not use this command to create a new room. Use the Create Room command instead.

To draw a room, go to

Pulldown Menu: DM HVAC->Building Definition->Rooms->Redraw Room

Redraw Room Dialog Box

Redraw Room X	(
Bait and Switch Room Call Center Concession Corridor Dog and Pony Showroom Theater Downstairs Toilets Electrical Room Elevator Mechanical Room Janitorial Kitchen Lobby Long Copy Room Mgr Office Smoke and Mirror Room Storage Supplies Upstairs Lobby Upstairs Toilets Warranty Stretching Room	
Select from Drawing <	
OK Cancel	

Room List: Select the room to draw from the list. The list displays all of the rooms in the project.

Select from Drawing: Press this button to select the room to draw from the drawing. You will be prompted to select a point inside the room.

Specify point inside room:

The dialog box will reopen with the specified room selected in the room list.

Drawing the Room

Select the room to draw and press the **OK** button. If the room was previously inserted on the drawing, it will be removed. You will be prompted to identify the location of the room on the drawing.

Specify first room point:

You will then be prompted to specify additional room points.

Specify next room point / <Finish>:

Press ENTER to complete the room outline.

The room will be displayed on the drawing. You will be prompted to select the location for the room label.

Specify room info location:

The room label will be inserted on the drawing with a leader pointing to the room.

Insert Room Outlines on this Drawing

The Insert Room Outlines on this Drawing command is used to insert room outlines that have already been inserted on another drawing or in another alignment point area in the project. When a room is changed in any area, the room will be updated in all of the other areas at the same time.

To insert rooms in another area or drawing, go to

Ribbon: DM HVAC->Rooms and Walls->

Pulldown Menu: DM HVAC->Building Definition->Rooms->Insert Room Outlines on this Drawing

Insert Room Outlines Dialog Box

Insert Room Outlines	×
Select Floors to Insert	
Two	
OK Cancel	

Select the floor to be inserted onto the drawing and press the **OK** button.

If there is only one alignment point on the drawing, it will be selected automatically. If there are multiple alignment points on the drawing, you will be prompted to select the alignment point area to draw the rooms in.

Specify point in alignment point area to use:

All of the rooms on the selected floor will be drawn in the selected alignment point area. The room locations will be based upon the location of the alignment point in the area.

Room Project Schedule

The room project schedule contains the types of rooms used in the current project. To create and modify room types, go to

Ribbon: DMH: Customization->Project Customization->

Pulldown Menu: DM HVAC->Building Definition->Rooms->Room Project Schedule

Room Project Schedule Dialog Box

Room Project Schedule			×
Type: Auditorium	Rename Find	Minimum Supply Air: 0	CFM ~
< Previous ,	. Next>	Ventilation (OSA)	
Glass Zone Type: C (Heavy Constru	uction) ~	Cooling 1: 15	CFM / Person ~
Include in Heating Load Calculation	n	Cooling 2: 0	CFM ~
Include in Cooling Load Calculatio	n	Heating 1:	Same As Cooling \sim
Design Temperatures		Heating 2:	Same As Cooling 🗸 🗸
Override Default Temperatures		Infiltration	
Cooling Temperature:		Cooling: 0.25	Air Changes / Hour 🗸 🗸
Override Default Relative Humid	lity	Heating:	Same As Cooling V
Relative Humidity (%):		People	
Lighting	Equipment	SF / Person:	6.6
Watts / SF: 2	O Watts / SF:	O People:	
O Watts:	Watts:	Activity Level:	Seated at theater, night \sim
	Latent Gain (Btu/h): 0	Sensible Btu/h / Person:	245
		Latent Btu/h / Person: 10)5
New	Сору	Save	Delete
Import from Another Database Import from Room Master Schedule			
	Exit		

See the <u>Common Schedule Dialog Box Features</u> section for more information about how this dialog box works. This section describes the **Rename**, **Find**, **Previous**, **Next**, **New**, **Copy**, **Save**, and **Delete** buttons.

See the <u>Common Room Information</u> section for more information about the other values that can be specified for rooms using this dialog box.

See the <u>Import from Another Database</u> and <u>Import from Master Schedule</u> sections for more information about importing rooms to the current project from other locations.

Room Master Schedule

The room master schedule contains all of the room types that might be used on a project. To create and modify rooms in the master schedule, go to

Ribbon: DMH: Customization->Master & Standards Customization->

Pulldown Menu: DM HVAC->Building Definition->Rooms->Room Master Schedule

Room Master Schedule Dialog Box

Room Master Sch	edule			×
Current Group:_G	eneral Move to Anoth	er Group	Copy to	Select Group Another Group
Type: Auditorium		Rename Find	Minimum Supply Air:	0 CFM ~
< Pre	evious ,	. Next>	Ventilation (OSA)	
Glass Zone Type:	C (Heavy Constru	ction)	Cooling 1: 15	CFM / Person 🗸
Include in Heatin	ng Load Calculation	n	Cooling 2: 0	CFM ~
Include in Cooling	g Load Calculatior	1	Heating 1:	Same As Cooling \sim
Design Temperatu	ires		Heating 2:	Same As Cooling 🗸 🗸
Override Defau	lt Temperatures			
Heating Temperat	ure:			
Cooling Temperate	ure:		Cooling: 0.25	Air Changes / Hour \checkmark
Override Defau	ult Relative Humidi	ty	Heating:	Same As Cooling \sim
Relative Humidity	(%):		People	
Lighting		Equipment	• SF / Person:	6.6
Watts / SF:	2	O Watts / SF:	O People:	
◯ Watts:		Watts:	Activity Level:	Seated at theater, night \sim
		Latent Gain (Btu/h): 0	Sensible Btu/h / Pe	rson: 245
			Latent Btu/h / Perso	on: 105
New		Сору	Save	Delete
		Import from Room Pro	oject Schedule	
		Exit	1	

See the <u>Common Schedule Dialog Box Features</u> section for more information about how this dialog box works. This section describes the **Rename**, **Find**, **Previous**, **Next**, **New**, **Copy**, **Save**, and **Delete** buttons.

See the Common Room Information section for more information about the room setting fields in this dialog box.

See the <u>Import from Project Schedule</u> section for more information about importing rooms from a project to the master database.

Current Group: The active room group is listed here. All of the room types that are created and modified will be associated with this group.

Select Group: Press this button to open the Room Master Schedule Groups dialog box. The group selected will become the current group. See the <u>Common Groups Dialog Box Features</u> section for more information.

Move to Another Group: Press this button to move the current room type to another group. A dialog box will prompt you to select the other group to which the room type will be moved. The *Current Group* will be changed to the selected group. This button is disabled if only one group exists.

Copy to Another Group: Press this button to copy the current room type to another group. A dialog box will prompt you to select the other group to which the room type will be copied. A copy of the room type will be created in the other group. This button is disabled if only one group exists.

Walls

This section describes the commands used to modify the boundaries of rooms, including setting boundaries as exterior walls and adding and removing points on the rooms.

Query Wall

The Query Wall command is used to view and modify the settings on individual edges of a room.

To view and modify the settings of a wall, go to

Ribbon: DM HVAC->Rooms and Walls->

Pulldown Menu: DM HVAC->Building Definition->Walls->Query Wall

You will be prompted select the wall to be queried.

Select wall to query:

The Specific Wall Information dialog box will appear.

Specific Wall Information Dialog Box

Specific Wall Information Room Number: 102 ○ No Heat Transfer ○ Heat Transfer but no Solar Gain (Partition) ④ Heat Transfer and Solar Gain (Wall) Wall Wall Wall Type: STCO - BK - R11 Description: Stucco - Brick - R11 ASHRAE Type: 11 U-Value: 0.091 ✓ Wall Height (ft-in): Image: Description: Brick - GWB - R11 ASHRAE Type: Image: Description: Brick - GWB - R11 ASHRAE Type: Image: Description: Brick - GWB - R11 ASHRAE Type: Door Description: Steel, Ins Image: Description: Steel, insulated ASHRAE Type: Ashraa (sf): 0 O O Omage: Description: <th>Partition Temperatures ✓ Use OSA Temperatures for Other Side Other Side High Temperature: 87 Other Side Low Temperature: 28</th>	Partition Temperatures ✓ Use OSA Temperatures for Other Side Other Side High Temperature: 87 Other Side Low Temperature: 28
Room Number: 102 ○ No Heat Transfer ○ Heat Transfer but no Solar Gain (Patition) ● Heat Transfer and Solar Gain (Wall) Wall ASHRAE Type: 11 U-Value: 0.091 ✓ Wall Height = Floorto-Floor Height Wall Height (ft-in): 10 ✓ Lower Wall Type: BRK - GWB - R11 ASHRAE Type: 10 U-Value: 0.091 Lower Wall Height (ft-in): Door Door Door Door Door Door Door Steel, insulated ASHRAE Type: 2 U-Value: 0 O Area (sf): 0 O Complex: Quantity: Width (ft-in): 0	Partition Temperatures ✓ Use OSA Temperatures for Other Side Other Side High Temperature: 87 Other Side Low Temperature: 28
 No Heat Transfer Heat Transfer but no Solar Gain (Partition) Heat Transfer and Solar Gain (Wall) Wall Wall Wall Type: STCO - BK - R11 Description: Stucco - Brick - R11 ASHRAE Type: 11 U-Value: 0.091 Wall Height = Roorto-Roor Height Wall Height (ft-in): 10 Lower Wall Type: BRK - GWB - R11 Description: Brick - GWB - R11 ASHRAE Type: 10 U-Value: 0.091 Lower Wall Height (ft-in): Edit Description: Brick - GWB - R11 ASHRAE Type: 10 U-Value: 0.091 Lower Wall Height (ft-in): Edit Door Door Door Type: Steel, Ins Edit Description: Steel, insulated ASHRAE Type: 2 U-Value: 0.3 Percentage: 0 Area (sf): 0 Complex: Quantity: 0 Width (ft-in): 0 	Partition Temperatures Use OSA Temperatures for Other Side Other Side High Temperature: 87 Other Side Low Temperature: 28
 ○ Heat Transfer but no Solar Gain (Partition) ④ Heat Transfer and Solar Gain (Wall) Wall Wall Type: STCO - BK - R11 Description: Stucco - Brick - R11 ASHRAE Type: 11 U-Value: 0.091 ☑ Wall Height = Floorto-Floor Height Wall Height (ft-in): 10 ☑ Lower Wall Type: BRK - GWB - R11 ☑ Lower Wall Type: 0.091 Lower Wall Height (ft-in): 0 ☑ Door Door Door Type: Steel, Ins ☑ Edit Description: Steel, insulated ASHRAE Type: 2 ○ Complex: 0 ○ Complex: 0 ○ Width (ft-in): 0 	Partition Temperatures Use OSA Temperatures for Other Side Other Side High Temperature: 87 Other Side Low Temperature: 28 Other Side Low Temperature:
 Heat Transfer and Solar Gain (Wall) Wall Wall Type: STCO - BK - R11 Description: Stucco - Brick - R11 ASHRAE Type: 11 U-Value: 0.091 Wall Height = Roorto-Roor Height Wall Height (t-in): 10 Lower Wall Type: BRK - GWB - R11 Description: Brick - GWB - R11 ASHRAE Type: 10 U-Value: 0.091 Lower Wall Height (t-in): Door Door Door Type: Steel, Ins Edit Description: Steel, insulated ASHRAE Type: 2 U-Value: 0.3 Percentage: 0 Area (sf): 0 Complex: Quantity: 0 Width (t-in): 0 	Partition Temperatures Use OSA Temperatures for Other Side Other Side High Temperature: 87 Other Side Low Temperature: 28
Wall Wall Type: STCO - BK - R11 Edit Description: Stucco - Brick - R11 U-Value: 0.091 ASHRAE Type: 11 U-Value: 0.091 Wall Height = Roorto-Roor Height Wall Height (ft-in): 10 Lower Wall Type: BRK - GWB - R11 Edit Description: Brick - GWB - R11 Edit ASHRAE Type: 10 U-Value: 0.091 Lower Wall Height (ft-in):	Partition Temperatures Use OSA Temperatures for Other Side Other Side High Temperature: 87 Other Side Low Temperature: 28 Other Side Low Temperature:
Wall Type: STCO - BK - R11 ✓ Edit Description: Stucco - Brick - R11 ✓ Edit ASHRAE Type: 11 U-Value: 0.091 ✓ Wall Height = Roor-to-Floor Height ✓ ✓ Wall Height (ft-in): 10 ✓ ✓ Lower Wall Type: BRK - GWB - R11 ✓ Edit Description: Brick - GWB - R11 ✓ Edit Description: Edit Description: Brick - GWB - R11 ✓ Edit Edit Description: Brick - GWB - R11 ✓ Edit Description: Brick - GWB - R11 ✓ Edit Door U-Value: 0.091 Edit Door Door Type: Steel, Ins ✓ Edit Description: Steel, insulated ASHRAE Type: 2 U-Value: 0.3 ④ Percentage: 0	Use OSA Temperatures for Other Side Other Side High Temperature: 87 Other Side Low Temperature: 28 Other Side Low Temperature:
Description: Stucco - Brick - R11 ASHRAE Type: 11 U-Value: 0.091 Wall Height = Roor-to-Floor Height Wall Height (t-in): 10 ✓ Lower Wall Type: BRK - GWB - R11 ✓ Edit Description: Brick - GWB - R11 ✓ Edit Description: Brick - GWB - R11 ✓ Edit Description: Brick - GWB - R11 ✓ Edit Description: Brick - GWB - R11 ✓ Edit Description: Brick - GWB - R11 ✓ Edit Description: Brick - GWB - R11 ✓ Edit Door Door U-Value: 0.091 Door Type: Steel, Ins ✓ Edit Description: Steel, insulated ✓ ASHRAE Type: 2 U-Value: 0.3 @ Percentage: 0 O Complex: Quantity: 0 </td <td>Other Side High Temperature: 87 Other Side Low Temperature: 28</td>	Other Side High Temperature: 87 Other Side Low Temperature: 28
ASHRAE Type: 11 U-Value: 0.091	Other Side Low Temperature: 28
ASHRAE Type: 11 U-Value: 0.091 Wall Height = Floor-to-Floor Height Wall Height (ft-in): Image: Description: Brick - GWB - R11 ASHRAE Type: 10 U-Value: 0.091 Edit Description: Brick - GWB - R11 ASHRAE Type: 10 U-Value: 0.091 Lower Wall Height (ft-in): Door Door Door Type: Steel, Ins Description: Steel, insulated ASHRAE Type: ASHRAE Type: Quantity: 0 O Complex: Quantity: 0 Width (ft-in):	Class
Wall Height (ft-in): 10 Image: Wall Type: BRK - GWB - R11 Description: Brick - GWB - R11 ASHRAE Type: 10 Lower Wall Height (ft-in): U-Value: Door Door Door Type: Steel, Ins Description: Steel, insulated ASHRAE Type: 2 U-Value: 0.3 Image: Organization of the structure	Glass
Wain Height (tern): Edit Description: Bick - GWB - R11 ASHRAE Type: 10 Lower Wall Height (trin): U-Value: Door Door Door Type: Steel, Ins Description: Steel, insulated ASHRAE Type: 2 U-Value: 0.3 Percentage: O Complex: Quantity: Width (trin): Image: Steel 	1 <>
Description: Brick - GWB - R11 ASHRAE Type: 10 Lower Wall Height (ft-in): Door Door Door Type: Steel, Ins Description: Steel, insulated ASHRAE Type: 2 U-Value: 0.3 • Percentage: 0 O Complex: Quantity: 0 Vidth (ft-in):	
ASHRAE Type: 10 U-Value: 0.091 Lower Wall Height (ft-in): Door Door Type: Steel, Ins V Edit Description: Steel, insulated ASHRAE Type: 2 U-Value: 0.3 (a) Percentage: (b) Complex: Quantity: Width (ft-in): (c) Complex: (c) Compl	Remove this class from wall
ASHRAE Type: 10 U-Value: 0.091 Lower Wall Height (ft-in): Door Door Type: Steel, Ins Description: Steel, insulated ASHRAE Type: 2 U-Value: 0.3 (a) Percentage: (b) Area (sf): (c) Complex: Quantity: (c) Complex: (c) C	Description: Aluminum Double alazing, 1/2" air
Lower Wall Height (ft-in): Door Door Type: Steel, Ins Description: Steel, insulated ASHRAE Type: 2 U-Value: 0.3 Percentage: O Area (sf): O Complex: Quantity: Width (ft-in): O	space, with thermal break, low E = .1, operable
Door Door Type: Steel, Ins Edit Description: Steel, insulated Image: Complex: Image: Complex: Complex: Image: Complex:	
Door Type: Steel, Ins Description: Steel, insulated ASHRAE Type: 2 U-Value: 0.3 (a) Percentage: (b) Complex: (c) Com	U-Value: 0.49 SHGC: 0.5
Door type: Steel, Ins Edit Description: Steel, insulated ASHRAE Type: 2 U-Value: 0.3 Percentage: O Complex: Quantity: Width (ft-in): O O 	
Description: Steel, insulated ASHRAE Type: 2 U-Value: 0.3 Percentage: O Area (sf): O Complex: Quantity: O Width (ft-in): O 	
ASHRAE Type: 2 U-Value: 0.3 Percentage: Area (sf): Complex: Quantity: Width (ft-in): Image: Complex: 	
Percentage:	Complex: Quantity: 0
Area (sf): 0 Complex: Quantity: 0 Width (ft-in): 0	Width (tt-in): 0
Complex: Quantity: 0 Width (ft-in): 0	Height (ft-in): 0
Width (ft-in):	Overhang Extension from Wall (ft-in): 0
wider (rein).	
Li = i = lat (ft in)	Overhang Height Above Glass (ft+in):
neigriu (rein). V	Overhang Height Above Glass (ft-in): 0 Left Fin Extension from Wall (ft-in): 0
Exposed Floor Slab	Overhang Height Above Glass (ft-in): 0 Left Fin Extension from Wall (ft-in): 0 Left Fin Distance from Glass (ft-in): 0
Shading Percentage: 0	Overhang Height Above Glass (ft-in): 0 Left Fin Extension from Wall (ft-in): 0 Left Fin Distance from Glass (ft-in): 0 Right Fin Extension from Wall (ft-in): 0
ОК	Overhang Height Above Glass (ft-in): 0 Left Fin Extension from Wall (ft-in): 0 Left Fin Distance from Glass (ft-in): 0 Right Fin Extension from Wall (ft-in): 0 Right Fin Distance from Glass (ft-in): 0

No Heat Transfer: Select this option to indicate the wall will not transfer heat. The wall represents an interior partition and will be displayed as a thin line on the drawing. The settings below will be disabled.

Height Transfer but no Solar Gain (Partition): Select this option to indicate there will be heat transfer on the wall but there will not be solar gain. The wall represents a partition between the conditioned space and an unconditioned space and will be displayed as a thick line on the drawing.

Heat Transfer and Solar Gain (Wall): Select this option to indicate there will be heat transfer and solar gain on the wall. The wall represents an exterior wall and will be displayed as a thick line on the drawing.

Exposed Floor Slab: Whether the wall includes a slab load. Check this box for walls on the ground floor. The heat loss through the perimeter is set in the *Floor Heat Loss Coefficient* field in the <u>Project Info</u> command. If *Heat Transfer but no Solar Gain* is selected, this checkbox is disabled.

Shading Percentage: The percentage of the wall that is shaded. The solar gain on shaded walls is calculated as if they are north facing walls. The percentage is applied to the area of wall, glass, and door on the wall. The percentage is fixed and does not change during the day. Use this setting to model trees or other buildings that shade the wall. If *Heat Transfer but no Solar Gain* is selected, this field is disabled.

Wall

Wall Type: The wall type taken from the wall project schedule.

Press the Edit button to open the Wall Project Schedule dialog box with the selected wall type active.

Wall Height = Floor-to-Floor Height: Whether the wall height is based upon the *Floor-to-Floor Height* value for the floor the room occupies. See the <u>Floor List</u> section for more information about setting the *Floor-to-Floor Height* value.

Wall Height: The height of the wall. If Wall Height = Floor-to-Floor Height is checked, this field is disabled.

Lower Wall Type: Whether the wall has a second wall type. The wall type is taken from the wall project schedule.

Press the **Edit** button to open the <u>Wall Project Schedule</u> dialog box with the selected wall type active.

Lower Wall Height: The height of the lower wall type. If *Lower Wall Type* checkbox is unchecked, this field is disabled.

Door

Door Type: The door type taken from the door project schedule.

Press the Edit button to open the **Door Project Schedule** dialog box with the selected door type active.

Percentage: Select this option to set the door area to be based upon a percentage of the total wall area.

Area: Select this option to enter a specific value for the door area.

Complex: Select this option to set the door area to be based on the size and number of doors in the wall.

Quantity: The number of doors in the wall.

Width: The width of the doors.

Height: The height of the doors.

Partition Temperatures

The Partition Temperatures settings are disabled if Heat Transfer and Solar Gain is selected.

Use OSA Temperatures for Other Side: What temperatures are used for air on the other side of the partition.

Check this box to use the outside air temperatures set in the **Project Information** dialog box. The high temperature

used for the cooling load will change during the day.

Uncheck this box to manually enter values for the *Other Side High Temperature* and *Other Side Low Temperature* fields. The high temperature will not change during the day.

Other Side High Temperature: The high temperature on the other side of the partition used during cooling load calculations. If *Use OSA Temperatures for Other Side* checked, this field is disabled.

Other Side Low Temperature: The low temperature on the other side of the partition used during heating load calculations. If *Use OSA Temperatures for Other Side* checked, this field is disabled.

Glass

Walls can contain multiple types of glass. Each glass type in the wall is assigned a separate numerical glass ID, shown in the top left of the *Glass* section, in ascending order.

<--: Press this button to display the previous glass ID. This button is disabled if glass ID "1" is currently displayed.

-->: Press this button to display the next glass ID. If the next glass ID has not already been defined, it will be created.

Glass Type: The glass type taken from the glass project schedule. See the <u>Glass Project Schedule</u> section for more information.

Press the Edit button to open the Glass Project Schedule dialog box with the selected glass type active.

Remove this glass from wall: Check this box to delete the glass ID from the wall. When you display another glass ID using the <-- or --> buttons, the glass ID will be removed from the database.

Subtract Area from Upper Wall Type: Whether the glass area is subtracted from the upper or lower wall area. If this box is checked, the glass area is subtracted from the upper wall type area. If this box is unchecked, the glass area is subtracted from the lower wall type area. If *Lower Wall Type* checkbox is unchecked, this box is disabled.

Percentage: Select this option to set the glass area to be based upon a percentage of the total wall area.

Area: Select this option to enter a specific value for the glass area.

Complex: Select this option to set the glass area to be based on the size and number of windows in the wall. This option also allows you to set overhangs and fins for the glass that will be used for shading. The shading from these items will vary as the sun changes position during the day.

An overhang is a horizontal surface above the window that provides shade. It is assumed to be as wide as the glass.

A fin is a vertical surface to the side of the window that provides shade. Left and right is based upon facing the wall from outside the building. They are assumed to be as tall as the glass.

Quantity: The number of pieces of glass on the wall.

Width (ft-in): The width of each piece of glass.

Height (ft-in): The height of each piece of glass.

Overhang Extension from Wall (ft-in): The distance the overhang extends from the wall.

Overhang Height Above Glass (ft-in): The distance from the top of the glass to the overhang.

Left Fin Extension from Wall (ft-in): The distance the left fin extends from the wall.

Left Fin Distance from Glass (ft-in): The distance from the left edge of the window to the left fin.

Right Fin Extension from Wall (ft-in): The distance the right fin extends from the wall.

Right Fin Distance from Glass (ft-in): The distance from the right edge of the window to the right fin.

Match Wall Properties

The Match Wall Properties command is used to copy the wall properties from one wall in a room to another. All of the values set using the <u>Query Wall</u> command will be copied.

This command allows you to define one exterior wall with the correct wall type, glass type, and other information set, then copy that definition to all of the other exterior walls in the project. You may need to make some changes on each wall afterward, but most of the values will be set.

To copy the properties from one wall to another, go to

Ribbon: DM HVAC->Rooms and Walls-> 📕 Match Wall Properties

```
Pulldown Menu: DM HVAC->Building Definition->Walls->Match Wall Properties
```

You will be prompted to select the wall to be copied.

Select source wall:

You will then be prompted to select a wall to which the properties will be copied.

Select target wall:

You will then be prompted to select another wall to which the properties will be copied. Continue to copy wall properties, or press **ENTER** to finish the command.

Insert Wall Point

The Insert Wall Point command will break a wall in a room into two pieces. The two walls can be given different definitions for loads. The break point can be moved to define a new outline for the room.

To add a point to a room outline, go to

Ribbon: DM HVAC->Rooms and Walls->

Pulldown Menu: DM HVAC->Building Definition->Walls->Insert Wall Point

You will be prompted to specify the location of the break on the room outline.

Select wall at break point:

A new vertex will be inserted at the selected point.

To move the new wall point, select the room and use grips.

Remove Wall Point

The Remove Wall Point command will remove a point from a room outline. The two walls connected at that point will be joined into one wall.

To remove a wall point, go to

Ribbon: DM HVAC->Rooms and Walls-> 🎽 Remove Wall Point

Pulldown Menu: DM HVAC->Building Definition->Walls->Remove Wall Point

You will be prompted to specify the wall point to be removed.

Select wall near point to remove:

The point will be removed.

Wall Project Schedule

The wall project schedule contains the wall types available to be used in the current project.

To create and modify wall types, go to

Ribbon: DMH: Customization->Project Customization->

Pulldown Menu: DM HVAC->Building Definition->Walls->Wall Project Schedule

Wall Project Schedule Dialog Box

Wall Project Schedule	×	
Wall Type: BRK - GWB - R11	Rename Find	
< Previous ,	. Next>	
U-Value: 0.091 ASHRAE Wall Type: 10 ~	Color O Light (Not Recommended)	
Description: Brick - GWB - R11		
New Copy	Save Delete	
Import from Another Database	Import from Wall Master Schedule	
Exit		

See the <u>Common Schedule Dialog Box Features</u> section for more information about how this dialog box works. This section describes the **Rename**, **Find**, **Previous**, **Next**, **New**, **Copy**, **Save**, and **Delete** buttons.

See the <u>Import from Another Database</u> and <u>Import from Master Schedule</u> sections for more information about importing wall types to the current project from other locations.

Type: The name of the surface type.

U-Value: The heat transfer coefficient of the surface.

ASHRAE Type: The surface type as defined in the *1997 ASHRAE Fundamentals Handbook*. This value is used to determine the rate of solar heat transfer through the surface. See the <u>ASHRAE Glass Zone, Roof, & Wall</u> <u>Types</u> and <u>Roof, Wall, and Glass Zone Type Tables</u> articles in the knowledge base for more information.

Color: The color of the surface. The CLTD method recommends that you select **Dark** and not adjust the surface load based upon the color.

- Light: The surface is a light color. The cooling load will be reduced by 50% when this color is selected.
- **Dark:** The surface is a dark color. The cooling load will be taken directly from the CLTD table with no scaling.

Description: A longer description of the surface type. Displayed when selecting the surface type and in the **Export Building Information** printout.

Wall Master Schedule

The wall master schedule contains the wall types that may be used by a company on a project. See the <u>Master</u> and <u>Standards Databases</u> section for more information about using master databases.

To create and modify wall types in the master schedule, go to

Ribbon: DMH: Customization->Master & Standards Customization->

Pulldown Menu: DM HVAC->Building Definition->Walls->Wall Master Schedule

Wall Master Schedule Dialog Box

Wall Master Schedule	×	
Current Group: General Move to Another Group	Select Group Copy to Another Group	
Wall Type: BRK - GWB - R11	Rename Find	
< Previous ,	. Next>	
U-Value: 0.091 ASHRAE Wall Type: 10	Color Cight (Not Recommended) O Light (Not Recommended) O Dark	
Description: Brick - GWB - R11		
New Copy.	Save Delete	
Import from Wall Project Schedule		
Exit		

See the <u>Common Schedule Dialog Box Features</u> section for more information about how this dialog box works. This section describes the **Rename**, **Find**, **Previous**, **Next**, **New**, **Copy**, **Save**, and **Delete** buttons.

See the <u>Import from Project Schedule</u> section for more information about importing walls from a project to the master database.

Current Group: The active wall type group is listed here. All the wall types that are created and modified will be associated with this group.

Select Group: Press this button to open the Wall Master Schedule Groups dialog box. The group selected will become the current group. See the <u>Common Groups Dialog Box Features</u> section for more information.

Move to Another Group: Press this button to move the current wall type to another group. A dialog box will prompt you to select the other group to which the wall type will be moved. The *Current Group* will be changed to the selected group. This button is disabled if only one group exists.

Copy to Another Group: Press this button to copy the current wall type to another group. A dialog box will prompt you to select the other group to which the wall type will be copied. A copy of the wall type will be created in the other group. This button is disabled if only one group exists.

Type: The name of the surface type.

U-Value: The heat transfer coefficient of the surface.

ASHRAE Type: The surface type as defined in the *1997 ASHRAE Fundamentals Handbook*. This value is used to determine the rate of solar heat transfer through the surface. See the <u>ASHRAE Glass Zone, Roof, & Wall</u> <u>Types</u> and <u>Roof, Wall, and Glass Zone Type Tables</u> articles in the knowledge base for more information.

Color: The color of the surface. The CLTD method recommends that you select **Dark** and not adjust the surface load based upon the color.

- Light: The surface is a light color. The cooling load will be reduced by 50% when this color is selected.
- **Dark:** The surface is a dark color. The cooling load will be taken directly from the CLTD table with no scaling.

Description: A longer description of the surface type. Displayed when selecting the surface type and in the **Export Building Information** printout.

Door Project Schedule

The door project schedule contains the door types available to be used in the current project.

To create and modify door types, go to

Ribbon: DMH: Customization->Project Customization->

Pulldown Menu: DM HVAC->Building Definition->Walls->Door Project Schedule

Door Project Schedule Dialog Box

Door Project Schedule	×	
Door Type: Steel, Ins	Rename Find	
< Previous , U-Value: 0.3 ASHRAE Wall Type: 2	. Next> Color O Light (Not Recommended) O Dark	
Description: Steel, insulated		
New Copy	Save Delete	
Import from Another Database Import from Door Master Schedule Exit		

See the <u>Common Schedule Dialog Box Features</u> section for more information about how this dialog box works. This section describes the **Rename**, **Find**, **Previous**, **Next**, **New**, **Copy**, **Save**, and **Delete** buttons.

See the <u>Import from Another Database</u> and <u>Import from Master Schedule</u> sections for more information about importing door types to the current project from other locations.

Type: The name of the surface type.

U-Value: The heat transfer coefficient of the surface.

ASHRAE Type: The surface type as defined in the *1997 ASHRAE Fundamentals Handbook*. This value is used to determine the rate of solar heat transfer through the surface. See the <u>ASHRAE Glass Zone, Roof, & Wall</u> Types and <u>Roof, Wall, and Glass Zone Type Tables</u> articles in the knowledge base for more information.
Color: The color of the surface. The CLTD method recommends that you select **Dark** and not adjust the surface load based upon the color.

- Light: The surface is a light color. The cooling load will be reduced by 50% when this color is selected.
- **Dark:** The surface is a dark color. The cooling load will be taken directly from the CLTD table with no scaling.

Description: A longer description of the surface type. Displayed when selecting the surface type and in the **Export Building Information** printout.

Door Master Schedule

The door master schedule contains the door types that might be used by a company on a project. See the <u>Master</u> and <u>Standards Databases</u> section for more information about using master databases.

To create and modify door types in the master schedule, go to

Ribbon: DMH: Customization->Master & Standards Customization->

Pulldown Menu: DM HVAC->Building Definition->Walls->Door Master Schedule

Door Master Schedule Dialog Box

Door Master Schedule			×
Current Group:General Move to Anoth	ner Group	Copy to Another Gro	Select Group
Door Type: Steel	, Ins vious ,	Rename	Find
U-Value: 0.3 ASHRAE Wall Type: 2	~	Color Cuight (Not Recommended) Dark)
Description: Steel, insulate	d		
New	Сору	Save	Delete
	Import from Door Pro	ject Schedule	
	Exit	1	

See the <u>Common Schedule Dialog Box Features</u> section for more information about how this dialog box works. This section describes the **Rename**, **Find**, **Previous**, **Next**, **New**, **Copy**, **Save**, and **Delete** buttons.

See the <u>Import from Project Schedule</u> section for more information about importing doors from a project to the master database.

Current Group: The active door type group is listed here. All the door types that are created and modified will be associated with this group.

Select Group: Press this button to open the Door Master Schedule Groups dialog box. The group selected will become the current group. See the <u>Common Groups Dialog Box Features</u> section for more information.

Move to Another Group: Press this button to move the current door type to another group. A dialog box will prompt you to select the other group to which the door type will be moved. The *Current Group* will be changed to the selected group. This button is disabled if only one group exists.

Copy to Another Group: Press this button to copy the current door type to another group. A dialog box will prompt you to select the other group to which the door type will be copied. A copy of the door type will be created in the other group. This button is disabled if only one group exists.

Type: The name of the surface type.

U-Value: The heat transfer coefficient of the surface.

ASHRAE Type: The surface type as defined in the *1997 ASHRAE Fundamentals Handbook*. This value is used to determine the rate of solar heat transfer through the surface. See the <u>ASHRAE Glass Zone, Roof, & Wall</u> <u>Types</u> and <u>Roof, Wall, and Glass Zone Type Tables</u> articles in the knowledge base for more information.

Color: The color of the surface. The CLTD method recommends that you select **Dark** and not adjust the surface load based upon the color.

- Light: The surface is a light color. The cooling load will be reduced by 50% when this color is selected.
- **Dark:** The surface is a dark color. The cooling load will be taken directly from the CLTD table with no scaling.

Description: A longer description of the surface type. Displayed when selecting the surface type and in the **Export Building Information** printout.

Glass Project Schedule

The glass project schedule contains the glass types available to be used in the current project.

To create and modify glass types, go to

Ribbon: DMH: Customization->Project Customization->

Pulldown Menu: DM HVAC->Building Definition->Walls->Glass Project Schedule

Glass Project Schedule Dialog Box

Glass Project Schedule	×			
Glass Type: Al, DG, 1/2", F	Rename Find			
< Previous ,	. Next>			
U-Value: 0.64 SHGC: 0.63				
Description: Auminum Double glazing, 1/2" air space, w/o thermal break, fixed				
New Copy	Save Delete			
Import from Another Database	Import from Glass Master Schedule			
Exit				

See the <u>Common Schedule Dialog Box Features</u> section for more information about how this dialog box works. This section describes the **Rename**, **Find**, **Previous**, **Next**, **New**, **Copy**, **Save**, and **Delete** buttons.

See the <u>Import from Another Database</u> and <u>Import from Master Schedule</u> sections for more information about importing glass types to the current project from other locations.

Glass Type: The name of the glass type.

U-Value: The heat transfer coefficient of the glass.

SHGC: The solar heat gain coefficient. This value is the fraction of solar radiation admitted through the window.

Description: A longer description of the glass type. Displayed when selecting the glass type and in the *Glass Types* table of the **Export Building Information** printout.

Glass Master Schedule

The glass master schedule contains the glass types that might be used by a company on a project. See the Master and Standards Databases section for more information about using master databases.

To create and modify glass types in the master schedule, go to

Ribbon: DMH: Customization->Master & Standards Customization->

Pulldown Menu: DM HVAC->Building Definition->Walls->Glass Master Schedule

Glass Master Schedule Dialog Box

Glass Master Schedule			×	
Current Group: General			Select Group	
Move to Anoth	ner Group	Copy to Anothe	r Group	
Glass Type: AI, D	G, 1/2", F	Rename	. Find	
< Previous ,		. Next>		
U-Value: 0.64	0.64 SHGC: 0.63			
Description: Auminum Double glazing, 1/2" air space, w/o thermal break, fixed				
New	Сору	Save	Delete	
Import from Glass Project Schedule				
Exit				

See the <u>Common Schedule Dialog Box Features</u> section for more information about how this dialog box works. This section describes the **Rename**, **Find**, **Previous**, **Next**, **New**, **Copy**, **Save**, and **Delete** buttons.

See the <u>Import from Project Schedule</u> section for more information about importing glass from a project to the master database.

Current Group: The active glass type group is listed here. All the glass types that are created and modified will be associated with this group.

Select Group: Press this button to open the Glass Master Schedule Groups dialog box. The group selected will become the current group. See the <u>Common Groups Dialog Box Features</u> section for more information.

Move to Another Group: Press this button to move the current glass type to another group. A dialog box will prompt you to select the other group to which the glass type will be moved. The *Current Group* will be changed to the selected group. This button is disabled if only one group exists.

Copy to Another Group: Press this button to copy the current glass type to another group. A dialog box will prompt you to select the other group to which the glass type will be copied. A copy of the glass type will be created in the other group. This button is disabled if only one group exists.

Glass Type: The name of the glass type.

U-Value: The heat transfer coefficient of the glass.

SHGC: The solar heat gain coefficient. This value is the fraction of solar radiation admitted through the window.

Description: A longer description of the glass type. Displayed when selecting the glass type and in the *Glass Types* table of the **Export Building Information** printout.

Schedules

This section describes the commands used to modify the schedules used in your building definition.

The following commands are also available in other places on the pulldown menu, closer to where they are used:

- <u>Room Project Schedule</u>
- <u>Roof Project Schedule</u>
- <u>Wall Project Schedule</u>
- Door Project Schedule
- Glass Project Schedule
- <u>Room Master Schedule</u>
- <u>Roof Master Schedule</u>
- <u>Wall Master Schedule</u>
- Door Master Schedule
- Glass Master Schedule

The commands are included here so that you have one convenient location where you can make changes to all of your schedules.

City Definitions

The City Definitions command is used to create and define environmental conditions for cities that can be used in projects. A default list of US cities, grouped by state, is included. The temperature numbers are the 1% numbers taken from ASHRAE Weather Data Viewer 2.1.

To view and modify the city list, go to

Ribbon: DMH: Customization->Master & Standards Customization-> ^{℃IIY} City Definitions

Pulldown Menu: DM HVAC->Building Definition->Schedules->City Definitions

City List Dialog Box

City List		×
Current City Group: AK		Select City Group
City: ADAK, NAS		Rename Find
< Previous ,		. Next>
Latitude: 52		
Elevation (ft): 4000		
Outside Air Temperatures		
OSA Low Temperature Dry Bulb: 23		
OSA Daily Range: 10		
	OSA High Dry	OSA High Wet
January:	43	40
February:	43	39
March:	45	41
April:	46	42
May:	49	43
June:	53	47
July:	60	54
August:	63	57
September:	58	53
October:	52	47
November:	48	44
December:	45	41
New	Copy Save	e Delete
	Exit	

See the <u>Common Schedule Dialog Box Features</u> section for more information about how this dialog box works. This section describes the **Rename**, **Find**, **Previous**, **Next**, **New**, **Copy**, **Save**, and **Delete** buttons.

Current City Group: The active city group is listed here. All of the glass types that are created and modified will be associated with this group. The default customization defines each state as a separate group.

Select City Group: Press this button to open the City Groups dialog box. The group selected will become the current group. See the <u>Common Groups Dialog Box Features</u> section for more information.

City: The name of the city.

Latitude: The latitude at which the city is located.

Elevation: The elevation at which the city is located.

Outside Air Temperatures

All temperatures are in degrees Fahrenheit.

OSA Low Temperature Dry Bulb: The temperature used when calculating heating loads.

OSA Daily Range: The temperature range during the day used when calculating cooling loads.

January, February, March, April, May, June, July, August, September, October, November, December: The outside air high temperatures used when calculating cooling loads for each month.

OSA High Dry: The outside air dry-bulb temperature for the specified month used when calculating cooling loads.

OSA High Wet: The outside air wet-bulb temperature for the specified month used when calculating cooling loads.

Reports

This section describes the commands used to generate two miscellaneous building-related reports. These reports include information based solely upon the building definition settings.

Export Building Information

The Export Building Information command is used to export the building envelope area in a tab-delimited text file. This report lists the total areas of roofs, walls, doors, and glass broken down by type and by facing.

To export the building information, go to

Ribbon: DM HVAC->Load Calculations-> UIL ->Export Building Information

Pulldown Menu: DM HVAC->Building Definition->Reports->Export Building Information

The information will be exported to a file named **dm_bldg-areas.txt** in your project folder. This file can be opened using a spreadsheet program such as Microsoft Excel.

Running the command again will overwrite the file. If you need to save any changes to the file, save it under a new filename. Otherwise, the changes will be lost if you run the command again.

Export Room Air Balance Report

The Export Room Air Balance Report command is used to create a report listing the air balance for each room in the project. This report can be exported to a tab-delimited text file or to a schedule on the drawing.

The following information will be displayed for each room:

- The supply, return, and exhaust airflow values, based on the diffusers that have been inserted on the drawing.
- The outside air airflow value, based upon the outside air requirement set in the room definition.

• The outside air percentage required. This value is based upon the outside air airflow value divided by the supply airflow, and indicates the minimum percentage of supply that must be outside air.

To create the air balance report, go to

```
Ribbon: DM HVAC->Load Calculations-> UTL ->Export Room Air Balance Report
```

Pulldown Menu: DM HVAC->Building Definition->Reports->Export Room Air Balance Report

Air Balance Report Dialog Box

Air Balance Report			
Export to File	Export to Drawing		
Cancel			

Export to File: Press this button to export the air balance report to a file. The information will be exported to a file named **dm_hvac-airbalance.txt** in your project folder. This file can be opened using a spreadsheet program such as Microsoft Excel.

Running the command again will overwrite the file. If you need to save any changes to the file, save it under a new filename. Otherwise, the changes will be lost if you run the command again.

Export to Drawing: Press this button to insert the air balance report as a schedule on the drawing. You will be prompted to specify the insertion point for the report.

Specify insertion point for room air balance report:

The report will be inserted on the drawing. The layout of the report can be modified using the **Edit Room Air Balance Report List** command.

Transfer Building Information from Electrical

The Transfer Building Information from Electrical command is used to copy floor and room definitions from a Design Master Electrical project. Using this command allows you to define the building once and use it in both the HVAC and electrical project.

To transfer building information from a Design Master Electrical project, go to

```
Pulldown Menu: DM HVAC->Building Definition->Transfer Building Information from Electrical
```

The dialog box that appears depends upon whether you have previously run this command in this project.

Select Electrical Database to Transfer Rooms From Dialog Box

The first time you run the command, you will be prompted to choose the Electrical database from which the building information will be transferred.

A Select Electrical Database to Transfer Rooms From				
Look in:	ELEC	~	G 🌶 📂 🛄 🗸	
Quick access Desktop Libraries	Name DMBackup dm_elec.dm	2	Date modified 2/27/2019 9:19 AM 2/27/2019 10:48 AM 11/20/2018 9:58 AM	Type File folder DM File DM File
	<			>
Network	File name: Files of type:	dm_elec.dm DM Files (*.dm) Open as read-only	~	Open Cancel

Select the desired electrical project from which to copy room definitions and press the **Open** button. The **Transfer Rooms** dialog box will appear.

Transfer Rooms Dialog Box

Transfer Rooms	×
Room Type Other Project> Room Type This Project Office> Kitchen> Kitchen Auditorium> OK Cancel	Room Types in This Project Correctional-Booking/Waiting Correctional-Cell Correctional-Quard Stations Educational-Guard Stations Educational-Art Classroom Educational-Classroom (age 9 plus) Educational-Classroom (ages 5-8) Educational-Computer Lab Educational-Daycare (through age 4) Educational-Lecture Classroom Educational-Media Center Educational-Multi-Use Assembly Educational-Multi-Use Assembly Educational-Science Laboratories Educational-Wood/Metal Shop Food-Bar, Cocktail Lounges Food-Cafeteria/Fast Food Dining Food Preparation

This dialog box is used to match room types between the HVAC project and the electrical project.

Room Type Other Project --> Room Type This Project: Lists all of the room types in the electrical project and the room type that will be used in the HVAC project.

Room Types in This Project: Lists the room types available in the HVAC project.

<--: Press this button to assign the room type selected in the *Room Types in This Project* list to the room type selected in the *Room Type Other Project* --> *Room Type This Project* list.

Press the **OK** button to copy the rooms and floors from the electrical project.

Design Master Dialog Box

After you run the command the first time, you will be prompted to transfer building information from the previously selected electrical database.

Design N	1aster	\times
?	Do you want to transfer from this database? C:\Users\Kane\Desktop\DM Projects\dm_elec.dm	
	Yes No	

Yes: Press this button to import the building information again from the previously selected electrical database.

No: Press this button to import the building information from a different electrical database. The **Select Electrical Database to Transfer Rooms From** dialog box, described above, will appear.

Load Calculations

This section describes the commands available for viewing the calculated heating and cooling loads for the project.

View Room Load

The View Room Load command is used to view the load calculation information for a room on the drawing. This command can also be used through the <u>Zone Tree</u> dialog box to view load calculation information for a zone.

To view the load calculation information for a room, go to

```
Ribbon: DM HVAC->Load Calculations->
```

```
Pulldown Menu: DM HVAC->Load Calculations->View Room Load
```

You will be prompted to identify the room for which the load calculations will be displayed.

Specify point inside room:

The **Load Detail** dialog box will appear.

Load Detail Dialog Box

Load Detail							
oom 102							
··· Area (sf)	921						
People	46						
Supply Air Requirements							
Current Supply CFM	1.400						
Required Supply CFM	1.380						
Time	July	3 pm					
Supply Temperature	55° F						
Load (btuh)	33,300						
Supply CFM	1.380						
OSA CEM	1,380	100%					
	.,						
Heating Temperature Difference	20° dT						
Load (btuh)	3.650						
Supply CFM	1,380						
OSA CEM	1,380	100%					
Heating Load	btub						
- Room Total	3.650	100%					
	1.07 kW						
···· Roof	0	0%					
···· Wall	1 420	39%					
Glass	0	0%					
- Slab	842	23%					
	0	0%					
···· Vertical Partitions	0	0%					
	1 380	38%					
	Total btub	5070	Sensible btub		Latent btub		
···· Time	luly	3.000	Sensible brun				
Room Total	33,300	100%	24 200	73%	9 170	27%	
	2 78 Tons	10070	2.01 Tons	1370	0.76 Tons	2170	
Boof	0		2.01 1013		0.10 10113		
··· Wall	946	3%	946	3%			
Glass	0	570	540	570			
- Horizontal Partitions	0						
··· Vertical Partitions	0						
··· Lighting	5.030	15%	5.030	15%		-	
- Equipment	6 290	10%	6 290	10%		-	
- Deople	20.700	62%	11 500	25%	9 210	28%	
- copie	20,700	19/	205	19/	3,210	20 /6	
militration	301	176	292	176	-45	-0%	

The load for a room or zone will be displayed. The room or zone will be listed in the first row in the grid.

Area: The area of the room or zone.

For rooms, this is based upon the room boundary inserted on the drawing.

For zones, this is the sum of the areas of the rooms in the zone.

People: The total number of people in the room or zone. If *Allow Fractional People* is unchecked in the **Project Info** command, this value will be rounded to the nearest whole person.

For rooms, this is set using the SF / Person or People fields in the People section of the Edit Rooms command or Room Project Schedule command

For zones, the number of people is the sum of the people in the rooms in the zone. If *People Diversity* is checked in the Zone List command, the number of people is based upon the SF/Person or *People* in that command.

Supply Air Requirements: See the <u>Print Supply Air Requirements</u> section for more information about these values.

Heating Load: See the <u>Print Heating Detail</u> section for more information about these values.

Cooling Load: See the **Print Cooling Detail** section for more information about these values.

Psychrometrics: See the **Print Psychrometrics** section for more information about these values.

Time: There is a time associated with the *Supply Air Requirements, Cooling* section and the *Cooling Load* section. You can change the month or the hour of the day to see the load at the specified time. The default time displayed is the time when the peak load occurs.

Calculate This Load: Press this button to recalculate the load for the room or zone.

Print: Press this button to print the information.

Display Load Calculation Map

The Display Load Calculation Map command is used to shade each room on the drawing based upon their relative values in the load calculations.

To display a load calculation map on the drawing, go to

Ribbon: DM HVAC->Load Calculations->

Pulldown Menu: DM HVAC->Load Calculations->Display Load Calculation Map

Load Calculation Map Dialog Box

Load Calculation Map		×
Load Calculation Map Area Type Room Zone Level 1 Zone Level 2 Zone Level 3	Category Room Attributes Heating System Load Cooling System Load Cooling Room Load	Value Percentage of Required CFM Supplied
		Btu/h / SF Percentage of Total
	Display Map Calculate and Display Map Cancel	O Btu/h

Three lists are used to select what value is used for the map. The *Area Type* list is used to select the type of area. Change this value to change the values available in *Category*. The *Category* list is used to select the main type of value. Change this value to change the values available in *Value*. The *Value* list is used to select the specific value that will be mapped.

Area Type

Room: Displays values for the rooms on the drawing.

Zone: Displays values for the zones on the drawing.

Category

Room Attributes: Maps characteristics of the rooms themselves.

Heating System Load: Maps heating system loads of the rooms.

Heating Room Load: Maps heating room loads of the rooms.

Cooling System Load: Maps cooling system loads of the rooms.

Cooling Room Load: Maps cooling room loads of the rooms.

Zone Attributes: Maps characteristics of the zones themselves.

Value

The units for the map are based upon the options below the *Value* list. If **Room Attributes** or **Zone Attributes** is selected, these options are disabled.

Bth/h / SF: Display the load divided by the area of the room.

Percentage of Total: Display the load divided by the total load of the room.

Btu/h: Display the load of the room.

Inserting the Load Calculation Map

Display Map: Press this button to insert or update the load calculation map on the drawing. If you have recently calculated the loads and not made any changes to your design, you can use this button to save time. Otherwise, use the **Calculate and Display Map** button.

Calculate and Display Map: Press this button to run the <u>Calculate Building Load Totals</u> command, then insert or update the load calculation map on the drawing. Use this button when you have made changes to your design since the last time you ran a calculation.

If the map scale is not currently inserted on the drawing, you will be prompted for the scale insertion location.

Specify scale location:

The location you specify will be used as the top-left corner for the scale.

If the map scale is already inserted on the drawing, it will be updated in its current location.

All of the rooms on the drawing will be shaded according to the scale based upon the value of the room.

Update Load Calculation Map

The Update Load Calculation Map command is used to update the load calculation map inserted using the **Display Load Calculation Map** command. The shading for each room and the scale will be updated to reflect any changes to the design.

To update a load calculation map, go to

Ribbon: DM HVAC->Load Calculations-> 👶 Update Load Calculation Map

Pulldown Menu: DM HVAC->Load Calculations->Update Load Calculation Map

Design Master HVAC Dialog Box



Press the Yes button to calculate the loads before updating the map.

Press the No button to update the map without recalculating the loads.

The room shading and scale will be updated.

Erase Load Calculation Map

The Erase Load Calculation Map command is used to erase the load calculation map shading and scale inserted using the **Display Load Calculation Map** command

To erase a load calculation map, go to

Ribbon: DM HVAC->Load Calculations-> × Erase Load Calculation Map

 $\label{eq:pulldown Menu: DM HVAC->Load Calculations->Erase Load Calculation Map}$

The shading on each room and the scale will be erased from the drawing.

Print Load Calculations

To print the load calculations, go to

Ribbon: DM HVAC->Load Calculations->

 $Pulldown \ Menu: \ {\tt DM \ HVAC->Load \ Calculations->Print \ Load \ Calculations}$

Print Load Calculations Dialog Box

Print Load Calculations	×
Select Sections to Print Print Project Info Print Building Definition Print Supply Air Requirements Print Ventilation Schedule Print Ventilation Detail Print Heating Detail Print Load Summary Print Psychrometrics Select All Unselect All Print System Loads for Rooms Insert Page Break After Each Section	Zone or Room to Print Design Master Software (SEATTLE, INT'L AIRPO) Zone Default Room Bait and Switch Room Room Mgr Office Zone AHU Room Concession Room Kitchen Zone VAV-2 Room Corridor
Print Loads Calcula	ate and Print Loads Cancel

Zone or Room to Print: Select the zones and rooms to print here. Use the **SHIFT** and **CTRL** keys to select multiple items. If you select a zone, all of the zones and rooms contained within that zone will be printed.

Print Project Info: Check this box to print general information about the project. See the <u>Print Project Info</u> section for more information about what is printed.

Print Building Definition: Check this box to print information about the definition of the building, including envelope settings and internal load settings. See the <u>Print Building Definition</u> section for more information about what is printed.

Print Supply Air Requirements: Check this box to print supply air requirements for the zones and rooms in the project. See the **Print Supply Air Requirements** section for more information about what is printed.

Print Ventilation Schedule: Check this box to print a ventilation calculation schedule for zones in the project. See the **Print Ventilation Schedule** section for more information about what is printed.

Print Cooling Detail: Check this box to print details about the cooling load for the zones and rooms in the project. See the <u>Print Cooling Detail</u> section for more information about what is printed.

Print Heating Detail: Check this box to print details about the heating load for the zones and rooms in the project. See the **Print Heating Detail** section for more information about what is printed.

Print Load Summary: Check this box to print a summary of the heating and cooling loads for the zones and

rooms in the project. See the **Print Load Summary** section for more information about what is printed.

Print Psychrometrics: Check this box to print a pyschrometric calculation schedule for zones in the project. See the **Print Psychrometrics** section for more information about what is printed.

Select All: Press this button to set all of the sections to be printed.

Unselect All: Press this button to set none of the sections to be printed.

Print System Loads for Rooms: Whether system loads are printed for rooms in addition to room loads. System loads include the ventilation and plenum load, while room loads do not.

If this option is unchecked, the system loads sections will include zones only. It will not display the system load for the rooms in the project.

If this option is checked, the system loads sections will include rooms and zones. This option is often checked when each room corresponds to a complete zone.

Insert Page Break After Each Section: Check this box to insert a page break between each section of the load calculation printouts.

Printing the Load Calculations

Print Loads: Press this button to print the loads. If you have recently calculated the loads and not made any changes to your design, you can use this button to save time during the printing process. Otherwise, use the **Calculate and Print Loads** button.

Calculate and Print Loads: Press this button to run the <u>Calculate Building Load Totals</u> command, then print the loads. Use this button when you have made changes to your design since the last time you ran a calculation.

Both **Print** buttons will create an HTML file and display it in your default web browser. You can then print the load calculations using the standard print function of your web browser.

Some of the pages are very wide. You may need to change the page setup to print in **Landscape** mode for everything to fit on the page.

Print Project Info

The section describes what is printed when *Print Project Info* is checked in the **Print Load Calculations** dialog box.

Print Load Calculations	×	
Select Sections to Print	Zone or Room to Print	
	Design Master Software (LOUISVILLE KY)	
Print Project Info	Zone Default	
Print Building Definition	Zone AHU-1 (1st Floor)	
Dist Carely Air Demission	Room Concession	
Print Supply Air Requirements	Room Supplies	
Print Ventilation Schedule	Zone VAV-1 (South)	
— Drint Casline Datail	Room Comidor	
Print Cooling Detail	Room Electrical Room	
Print Heating Detail	Room Storage	
Drint Load Summany	Zone VAV-2 (Lobby)	
	Boom Lobby	
Print Psychrometrics	Zone VAV-3 (Cooridor)	
	Zone VAV-4 (Kitchen & Bathrooms)	
	Room Downstairs Toilets	
	Room Elevator Mechanical Room	
	Room Janitorial	
	Room Kitchen	
	Zone AHU-2 (2nd Hoor)	
	Room Bait and Switch Room	
	Room Call Center	
	Room Myr Onice Room Smoke and Mirror Room	
	Boom Upstairs Lobby	
	Boom Upstairs Toilets	
	Room Warranty Stretching Room	
Dist Castern Londo for Dooms	Zone AHU-3 (Showroom)	
Print System Loads for Rooms	Room Dog and Pony Showroom Theater	
✓ Insert Page Break After Each Section		
Print Loads Ca	alculate and Print Loads Cancel	

Project Information

The **Project Information** table lists general information about the project. The values are based upon values set in the **Project Info** command.

	Project l	nfor	mation			
Project Name:	Demo Building					
Project Location:	Seattle, WA					
Default Heating Termerature	750 E		Heating Safety Factor (Room):	0%		
Delauti neamig Temperature:	15 F		Heating Safety Factor (Ventilation):	0%		
Default Cooling Temperature	750 E		Cooling Safety Factor (Room):	0%		
Deraum Cooming Temperature:	77 77		Cooling Safety Factor (Ventilation):	0%		
Default Relative Humidity:	50%	Floor Slab Heat Loss Coefficient:				
Calculation Date:	January 24, 2013, 4:5	4 p.m.				
	Design	Condi	itions			
OSA Low:		28° F	Latitude:	48° N		
OSA Daily Range:		18° F	Elevation:	446'		
	OSA High Dry Bulk	,	OSA High Wet Bulb			
June		84° F	64° F	,		
July		87° F	66° F	1		
August		87° F	66° F	7		

Project Name: Set using the Project Name field.

Project Location: Set using the *City* field.

Default Heating Temperature: The heating temperature in the default zone in the project.

To set this value, press the **Edit Default Zone Information** button in the **Project Information** dialog box, then set the *Heating Temperature* for the zone that is displayed.

Default Cooling Temperatures: The cooling temperature in the default zone in the project.

To set this value, press the **Edit Default Zone Information** button in the **Project Information** dialog box, then set the *Cooling Temperature* for the zone that is displayed.

Default Relative Humidity: The relative humidity in the default zone in the project.

To set this value, press the **Edit Default Zone Information** button in the **Project Information** dialog box, then set the *Relative Humidity* for the zone that is displayed.

Calculation Date: The date and time that the report was printed.

Heating Safety Factor (Room): Set using the *Heating Safety Factor--Room* field.

Heating Safety Factor (Ventilation): Set using the Heating Safety Factor--Ventilation field.

Cooling Safety Factor (Room): Set using the Cooling Safety Factor--Room field.

Cooling Safety Factor (Ventilation): Set using the Cooling Safety Factor--Ventilation field.

Floor Slab Heat Loss Coefficient: Set using the Floor Heat Loss Coefficient field.

Design Conditions

OSA Low: Set using the OSA Low Temperature Dry Bulb field.

OSA Daily Range: Set using the OSA Daily Range field.

Latitude: Set using the Latitude field.

Elevation: Set using the *Elevation* field.

OSA High Dry Bulb: A row is listed for each month selected in the **Project Information** dialog box. Set using the *OSA High Dry* field.

OSA High Wet Bulb: A row is listed for each month selected in the **Project Information** dialog box. Set using the *OSA High Wet* field.

Print Building Definition

The section describes what is printed when *Print Building Definition* is checked in the **Print Load Calculations** dialog box.

Print Load Calculations	×
Print Load Calculations Select Sections to Print Print Project Info Print Building Definition Print Supply Air Requirements Print Ventilation Schedule Print Ventilation Schedule Print Cooling Detail Print Heating Detail Print Load Summary Print Psychrometrics	X Zone or Room to Print Design Master Software (LOUISVILLE, KY) Zone Default Zone AHU-1 (1st Floor) Room Concession Room Supplies Zone VAV-1 (South) Room Corridor Room Electrical Room Room Long Copy Room Room Storage Zone VAV-2 (Lobby) Room Lobby Zone VAV-2 (Lobby) Room Lobby Zone VAV-2 (Lobby) Room Lobby Zone VAV-3 (Cooridor) Zone VAV-4 (Kitchen & Bathrooms) Room Downstairs Toilets Room Elevator Mechanical Room Room Janitorial Room Kitchen Zone AHU-2 (2nd Floor) Room Bait and Switch Room Room Call Center Room Mgr Office
	Room Call Center Room Mgr Office Room Smoke and Mirror Room Boom Listaire Lobby
	Room Upstairs Toilets Room Warranty Stretching Room
✓ Print System Loads for Rooms ✓ Insert Page Break After Each Section	Zone AHU-3 (Showroom) Room Dog and Pony Showroom Theater
Print Loads Ca	alculate and Print Loads Cancel

Roof Types

The Roof Types table lists information about the roof types that are used in the project. Each roof type is listed in

a row. Only roof types that are used in a floor or a room are displayed in the table.

Roof Types								
Roof Type	U-Value	ASHRAE Type	Color	Description				
R19 in Attic	0.0526		2 Dark	Insulation on attic floor, R19				

These values are set in the **<u>Roof Project Schedule</u>** command.

Roof Type: Set using the *Roof Type* field. If are not sure where a particular roof type is used in your project, the **Roofs** table, shown below, lists the location where each roof type is used.

U-Value: Set using the U-Value field.

ASHRAE Type: Set using the *ASHRAE Roof Type* field.

Color: Set using the *Color* field.

Description: Set using the *Description* field.

Roofs

The **Roofs** table lists each individual roof in the project. Each floor that has a roof is listed. Each room that has a different roof type than the floor it occupies is listed.

Roofs							
Location	Туре	Area					
Floor Ground	R19 in Attic	3,010 ft ²					

Location: The floor or room where the roof is located.

Floors that have the *Roof* box checked in the **Floor List** command will be listed.

Rooms that have the *Roof* override box checked in the Edit Rooms command will be listed.

Type: The roof type assigned to the floor or room.

For a floor, this is set using the *Roof Type* field in the **Floor List** command.

For a room, this is set using the *Roof Type* field in the **Edit Rooms** command.

Area: The area of the roof.

For a floor, the area is the sum of the areas of the rooms in the floor. The area of some rooms may not be included depending upon the settings in the *Roof* section in the <u>Edit Rooms</u> command.

For a room, the area is based upon the settings in the *Roof* section in the *Edit Rooms* command.

Wall Types

The Wall Types table lists information about the wall types that are used in the project. Each wall type is listed in

a row. Only wall types that are used are displayed in the table.

Wall Types								
Wall Type	U-Value	ASHRAE Type	Color	Description				
BRK - GWB - R19	0.053		14 Dark	Brick - GWB - R19				

These values are set in the Wall Project Schedule command.

Wall Type: Set using the *Wall Type* field. If are not sure where a particular wall type is used in your project, the **Walls** table, shown below, lists the location where each wall type is used.

U-Value: Set using the U-Value field.

ASHRAE Type: Set using the *ASHRAE Wall Type* field.

Color: Set using the *Color* field.

Description: Set using the *Description* field.

Walls

The Walls table lists each individual wall in the project.

	Walls									
Room Number	Length	Height	Area (Minus Doors and Glass)	Туре	Facing Direction	On Perimeter				
101	25'-8"	10'-0"	192 ft ²	2 BRK - GWB - R19	W					
101	9'-8"	10'-0"	73 ft ²	2 BRK - GWB - R19	S					
101	9'-8"	10'-0"	73 ft ²	BRK - GWB - R19	Е					
101	41'-6"	10'-0"	263 ft ²	BRK - GWB - R19	N					
102	37'-2"	10'-0"	279 ft ²	BRK - GWB - R19	W					
103	15'-5"	10'-0"	146 ft ²	BRK - GWB - R19	Е					
103	17'-7"	10'-0"	132 ft ²	BRK - GWB - R19	N					
105	5'-2"	10'-0"	39 ft ²	2 BRK - GWB - R19	S					
105	15'-5"	10'-0"	116 ft ²	2 BRK - GWB - R19	Е					
107	21'-2"	10'-0"	159 ft ²	2 BRK - GWB - R19	Е					

Room Number: Rooms containing walls that have the *Heat Transfer and Solar Gain (Wall)* option selected in the <u>Query Wall</u> command will be listed.

Walls that have the *Lower Wall Type* box checked in the <u>Query Wall</u> command will have two lines in the table: one for the upper wall type and one for the lower wall type.

Length: The length of the wall, based upon the length of the wall on the drawing.

Height: The default wall height is set using the *Floor-to-floor Height* field in the <u>Floor List</u> command. It can also be set using the *Wall Height* field in the <u>Query Wall</u> command.

Walls that have the *Lower Wall Type* box checked in the **Query Wall** command will have the height of the upper and lower wall listed. The height of the lower wall is set using the *Lower Wall Height* field. The height of the upper wall is the height of the wall minus the *Lower Wall Height*.

Area (Minus Doors and Glass): The area of the wall minus the area of any doors or glass in the wall.

Type: Set using the Wall Type and Lower Wall Type fields in the Query Wall command.

Facing Direction: The orientation of the wall (north, south, east, or west). The orientation is based upon the location of the wall on the drawing and the rotation of the alignment point. See the <u>Alignment Points</u> section for more information.

On Perimeter: Set using the *Exposed Floor Slab* field in the **Query Wall** command. If the field is checked, an **X** is displayed in the table. If it is unchecked, the cell is empty.

Partitions

The **Partitions** table lists each individual partition in the project.

Partitions									
Location	Туре	Area	Low Temperature	High Temperature	U-Value				
Floor Ground	Horizontal	3,010 ft ² OS	SA Low	OSA High	0.053				

Location: The floor or room that has a partition.

Floors that have the *Floor / Ceiling Partition* box checked in the <u>Floor List</u> command will have a horizontal partition listed.

Rooms that have the *Floor / Ceiling Partition* override box checked in the <u>Edit Rooms</u> command will have a horizontal partition listed.

Rooms containing walls that have the *Heat Transfer but no Solar Gain (Partition)* option selected in the <u>Query</u> <u>Wall</u> command will have a vertical partition listed.

Type: Whether the partition is **Horizontal** or **Vertical**. Horizontal partitions are contained in floors and rooms. Vertical partitions are contained in walls.

Area: The area of the partition. In vertical partitions, the areas of any doors or glass are subtracted from the partition area.

Low Temperature: The temperature used for the heating load on the partition.

If the Use OSA Temperatures for Other Side box is checked in the Floor List, Query Room, or Query Wall commands, then OSA Low is listed.

Otherwise, set using the Other Side Low Temperature field.

High Temperature: The temperature used for the cooling load on the partition.

If the Use OSA Temperatures for Other Side box is checked in the Floor List, Query Room, or Query Wall commands, then OSA High is listed.

Otherwise, set using the Other Side High Temperature field.

U-Value: For horizontal partitions, set using the *U-Value* field in the *Floor / Ceiling Partition* section of the **Floor List** or **Query Room** commands.

For vertical partitions, set using the u-value of the Wall Type selected in the Query Wall command.

Door Types

The **Door Types** table lists information about the door types that are used in the project. Each door type is listed in a row. Only door types that are used are displayed in the table.

Door Types								
Door Type	U-Value	ASHRAE Type	Color	Description				
Steel, Ins	0.3		2 Dark	Steel, insulated				

These values are set in the **Door Project Schedule** command.

Door Type: Set using the *Door Type* field. If are not sure where a particular door type is used in your project, the **Door** table, shown below, lists the location where each door type is used.

U-Value: Set using the *U*-Value field.

ASHRAE Type: Set using the ASHRAE Door Type field.

Color: Set using the *Color* field.

Description: Set using the *Description* field.

Doors

The Doors table lists each individual door in the project.

Doors								
Room Number	Area	Туре		Facing Direction				
101	48 ft ² St	eel, Ins	N					

Room Number: The room that contains the wall where the door is defined. Set using the Query Wall command.

Area: Set using the Percentage, Area, or Complex fields in the Door section of the Query Wall Command.

Type: Set using the *Door Type* field in the <u>Query Wall</u> command.

Facing Direction: The orientation of the door (north, south, east, or west). The orientation is based upon the location of the wall the door is part of on the drawing and the rotation of the alignment point. See the <u>Alignment</u> <u>Points</u> section for more information.

Glass Types

The **Glass Types** table lists information about the glass types that are used in the project. Each glass type is listed in a row. Only glass types that are used are displayed in the table.

Glass Types							
Glass Type	U-Value	SHGC	Description				
Al, DG, 1/2", LE, F	0.47	1	Aluminum Double glazing, 1/2" air space, w/o thermal break, low E = .1, fixed				

These values are set in the **<u>Glass Project Schedule</u>** command.

Glass Type: Set using the *Glass Type* field. If are not sure where a particular glass type is used in your project, the **Glass** table, shown below, lists the location where each glass type is used.

U-Value: Set using the *U-Value* field.

SHGC: Set using the SHGC field.

Description: Set using the *Description* field.

Glass

The Glass table lists each individual window in the project.

Glass									
Room Number	Area	Туре	Facing Direction	Shaded					
101	64 ft ² A	al, DG, 1/2", LE, F	W						
101	24 ft ² 4	Al, DG, 1/2", LE, F	S						
101	24 ft ² 4	Al, DG, 1/2", LE, F	E						
101	104 ft ² A	Al, DG, 1/2", LE, F	N						
102	93 ft ² A	Al, DG, 1/2", LE, F	W						
103	9 ft ² 4	Al, DG, 1/2", LE, F	Е	X					
103	44 ft ² 4	Al, DG, 1/2", LE, F	N						
105	13 ft ² #	Al, DG, 1/2", LE, F	S						
105	39 ft ² A	Al, DG, 1/2", LE, F	Е						
107	53 ft ² A	Al, DG, 1/2", LE, F	E						

Room Number: The room that contains the wall where the glass is defined. Set using the Query Wall command.

Area: Set using the Percentage, Area, or Complex fields in the Glass section of the Query Wall Command.

Type: Set using the *Glass Type* field in the **Query Wall** command.

Facing Direction: The orientation of the glass (north, south, east, or west). The orientation is based upon the location of the wall the glass is part of on the drawing and the rotation of the alignment point. See the <u>Alignment</u> <u>Points</u> section for more information.

Shaded: Set using the *Shading Percentage* field in the <u>Query Wall</u> command. If the value is 0, the cell is left blank. If it is greater than 0, an **X** is displayed.

Room Information

The **Room Information** tables list each room in the project. There are two tables in order to show all of the settings for each room.

Values that are based upon the *Room Type* are displayed using standard text. Values that are overridden in the specific room are displayed using italic text.

	Room Information, Part 1 Values in italics have been changed from the default																			
Maranhan	Marrie		Ceiling	V	entilatio	n		Infiltra	tion	Cooling	Heating	Relative								
Number	Name	маше	маше	Area	Area	Area	Area	une Area	Name Area	Area Heigh		Cooling	s	Heating	Cooli	ng	Heating	Temperature	Temperature	Humidity
101	Auditorium	1,290 ft ²	8'-0"	15 CFM / person	195 CFM	Same as cooling	0.25 AC / hou	r 43 CFM	i Same as cooling	75° F	75° F	50%								
102	Meeting	921 ft ²	8'-0"	0.5 CPM / H	461 CPM	Same as cooling	DAC/hou	r O CPM	Same as cooling	75° F	75° F	50%								
103	Office	271 ft ²	8'-0"	15 CFM / person	45 CFM	Same as cooling	0.25 AC / hou	r 10 CFM	í Same as cooling	75° F	75° F	50%								
105	Office	271 ft ²	8'-0"	15 CFM / person	30 CFM	Same as cooling	0.25 AC / hou	r 10 CFM	i Same as cooling	75° F	75° F	50%								
107	Office	253 ft ²	8'-0"	15 CFM / person	45 CFM	Same as cooling	0.25 AC / hou	r 9 CFM	í Same as cooling	75° F	75° F	50%								

Room Information, Part 2											
				Va	lues ia ii	talics have been	a changed	from the default			
Manage In such	Lighting Load		Equipme	ent Lo	ad	People					
Number			a Sensible Latent		Latent			Sensible btuh / Person	Latent btuh / Person	Zone Type	
101	2 watts / ft ²	8,800	0.5 watts / if	2,200	0	100 ft ² / person	13 people	230	230	В	
102	2.2 watts / if	6,920		0	0	10 ft ² / person	93 people	230	230	В	
103	1 watts / if	926	0.5 watts / if	463	0	100 ft ² / person	3 people	230	230	В	
105	1 watts / if	926	0.5 watts / if	463	0		2 people	230	230	В	
107	1 watts / ft	862	0.5 watts / if	431	0	100 ft ² / person	3 people	230	230	В	

These values are set in the Edit Rooms or Room Project Schedule command unless otherwise indicated.

Number: Set using the *Room Name* field.

Name: Set using the Room Type field.

Area: The area of the room. Set based upon the room boundary inserted on the drawing.

Ceiling Height: Set using the *Ceiling Height* field in the <u>Edit Rooms</u> command or the *Default Ceiling Height* field in the <u>Floor List</u> command.

Ventilation, Cooling: The first column is set using the *Cooling 1* and *Cooling 2* fields in the *Ventilation* section.

The second column is the total cooling ventilation airflow for the room calculated using the criteria specified in the first column.

Ventilation, Heating: The first column is set using the *Heating 1* and *Heating 2* fields in the *Ventilation* section.

The second column is the total heating ventilation airflow for the room calculated using the criteria specified in the first column.

Infiltration, Cooling: The first column is set using the *Cooling* field in the *Infiltration* section of the **Edit Rooms** or **Zone List** command.

The second column is the total cooling infiltration airflow for the room calculated using the criteria specified in the first column.

Infiltration, Heating: The first column is set using the *Heating* field in the *Infiltration* section of the <u>Edit Rooms</u> or <u>Zone List</u> command.

The second column is the total heating infiltration airflow for the room calculated using the criteria specified in the first column.

Cooling Temperature: Set using the *Cooling Temperature* field in the **Edit Rooms**, **Room Project Schedule**, or **Zone List** command.

Heating Temperature: Set using the Heating Temperature field in the Edit Rooms, Room Project Schedule, or

Zone List command.

Relative Humidity: Set using the *Relative Humidity* field in the <u>Edit Rooms</u>, <u>Room Project Schedule</u>, or <u>Zone List</u> command.

Lighting Load: The first column is set using the Watts / SF or Watts fields in the Lighting section.

The second column is the total equipment load in btu/h for the room calculated using the criteria specified in the first column.

Equipment Load, Sensible: The first column is set using the Watts / SF or Watts fields in the Equipment section.

The second column is the total sensible equipment load in btu/h for the room calculated using the criteria specified in the first column.

Equipment Load, Latent: Set using the *Latent Gain* field in the *Equipment* section.

People: The first column is set using the *SF* / *Person* or *People* fields in the *People* section.

The second column is the total number of people in the room calculated using the criteria specified in the first column. If *Allow Fractional People* is unchecked in the **Project Info** command, this value will be rounded to the nearest whole person.

People, Sensible btu/h / person: Set using the *Sensible Btu/h / Person* field.

People, Latent btu/h / person: Set using the Latent Btu/h / Person field.

Glass Zone Type: Set using the Glass Zone Type field.

Print Supply Air Requirements

This section describes what is printed when *Print Supply Air Requirements* is checked in the **Print Load Calculations** dialog box.

Print Load Calculations	×
Select Sections to Print	Zone or Room to Print
Print Project Info	Design Master Software (LOUISVILLE, KY)
	Zone Default
Print Building Definition	Zone AHU-1 (Ist Hoor)
Print Supply Air Requirements	Room Concession
	Zone VAV-1 (South)
Print Ventilation Schedule	Room Corridor
Print Cooling Detail	Room Electrical Room
Print Heating Datail	Room Long Copy Room
	Room Storage
Print Load Summary	Zone VAV-2 (Lobby)
Print Psychrometrics	Room Lobby
	Zone VAV-3 (Coolidor) Zone VAV-4 (Kitchen & Bathrooms)
	Room Downstairs Toilets
	Room Elevator Mechanical Room
	Room Janitorial
	Room Kitchen
	Zone AHU-2 (2nd Floor)
	Room Bait and Switch Room
	Room Call Center
	Room Mgr Office
	Room Smoke and Millfor Room
	Room Upstairs Toilets
	Room Warranty Stretching Room
Dist Curtan Lands for Desire	Zone AHU-3 (Showroom)
Print System Loads for Rooms	Room Dog and Pony Showroom Theater
✓ Insert Page Break After Each Section	
Print Loads Ca	alculate and Print Loads Cancel

Supply Air Requirements

The **Supply Air Requirements** table lists each room and zone in the project and the amount of air required to condition the space.

	Supply Air Requirements													
	Current	Pegnined			C	ooling					Heating			
Location	Supply CFM	Supply CFM	Peak		Supply Temperature	Sensible Load (btuh)	Supply CFM	OSA CFM	OSA %	Heating Temperature Difference	Load (btuh)	Supply CFM	OSA CFM	OSA %
Zone Default	2,020	3,520	July	8:00 p.m.	55° F	68,200	3,520	2,130	60%	20° F dT	22,800	2,380	2,130	89%
Zone Z1	615	1,230	July	8:00 p.m.		24,700	1,230	356	29%		12,000	615	356	58%
Room 103	220	219	August	8:00 p.m.		4,750	219	41	19%		2,460	116	41	35%
Room 104	0	483	July	8:00 p.m.		10,500	483	102	21%		4,370	205	102	50%
Room 105	200	199	July	9:00 p.m.		4,330	199	41	21%		1,700	80	41	51%
Room 106	0	134	July	6:00 p.m.		1,040	134	134	100%		1,800	134	134	100%
Room 107	195	193	July	9:00 p.m.		4,180	193	38	20%		1,690	80	38	48%
Zone Z2	1,400	2,310	August	6:00 p.m.		44,000	2,310	1,770	77%		10,800	1,770	1,770	100%
Room 101	0	923	August	6:00 p.m.		20,000	923	387	42%		7,190	387	387	100%
Room 102	1,400	1,380	July	3:00 p.m.		24,200	1,380	1,380	100%		3,650	1,380	1,380	100%
Zone Z3	0	0			Excluded	l from cooling				Exc	luded from heating	3		

Location: All of the zones and rooms in the project. Rooms and zones that are part of a zone are indented and listed below the parent zone.

Current Supply CFM: For rooms, this value is the total airflow for all of the supply diffusers inserted in the room on the drawing. For zones, this value is the sum of the airflow of all of the rooms in the zone.

Required Supply CFM: The supply airflow required to condition the room or zone.

This value is the greater of the *Cooling, Supply CFM* and *Heating, Supply CFM* values, except in the situations indicated below.

For a zone, if *System Type* is set to **Constant Volume** or the *Room Supply Airflow Basis* is set to **Prorate using fixed supply airflow** in the **Zone List** command, the airflow is the sum of the peak room airflows. If *System Type* is set to **Variable Air Volume** and the *Room Supply Airflow Basis* is set to **Use calculated room loads**, the airflow is based upon the coincident peak for the zone. The sum of the peak room airflows is always equal to or greater than the coincident peak airflow.

If *Room Supply Airflow Basis* is set to **Prorate using fixed supply airflow** in the <u>Zone List</u> command, then two values are listed. The first is the calculated value. For a zone, the second is a fixed value taken from the *Fixed Supply Airflow* field for the zone. For a room, the second value is calculated at the same ratio with the *Fixed Supply Airflow* field for the zone as the ratio between the calculated values for the room and zone.

Cooling, Peak: The month and hour when the peak room cooling load occurs. This is the same time as the peak display in the **Cooling Load Details - Room** table in the **Print Cooling Detail** section.

This peak is the time of the peak room load for both zones and rooms. It is not the time of the peak system load for zones.

If *System Type* is set to **Constant Volume** in the **Zone List** command, then **CV** - **Sum of Peaks** is listed. Constant volume zones do not have a peak time.

Cooling, Supply Temperature: Set using the *Cooling Temperature* field in the *AHU and Coil Settings* section of the <u>Zone List</u> command. If the temperature is based upon the zone that is above the zone or room, this value is left blank.

Cooling, Sensible Load (btu/h): The total sensible cooling load. This value is the sum of the loads in the **Cooling Load Details - Room** table in the **Print Cooling Detail** section. It is also the same as the *Cooling, Btu/h, Sensible* value in the **Load Total Summary - Room** table from the **Print Load Summary** section.

For a zone, if *System Type* is set to **Constant Volume** in the <u>Zone List</u> command, the load is the sum of the peak room loads. Otherwise, the load is the coincident peak for the zone. The sum of the peak rooms loads is always equal to or greater than the coincident peak load.

Cooling, Supply CFM: The airflow required to cool the room or zone. Calculated using the following formula:

Cooling Supply CFM = Room Cooling Sensible Load / (1.1 * Altitude Factor * (Cooling Temperature - Supply Air Temperature))

Room Cooling Sensible Load is the same as the *Cooling, Btu/h, Sensible* column in the **Load Total Summary - Room** table. See the **Print Load Summary** section for more information.

Altitude Factor = $(1 - (0.0000068753 * Elevation))^{5.2559}$

Elevation is set using the *Elevation* field in the **Project Info** command.

Cooling Temperature is set using the *Indoor Air Defaults, Cooling Temperature* field in the **Zone List** command.

Supply Air Temperature is set using the *AHU and Coil Settings, Cooling Temperature* field in the **Zone List** command.

For rooms, if the *Minimum Supply Air* field is set in the **Edit Rooms** or **Room Project Schedule** command, this value will be at least as much as the specified minimum.

For rooms, if the *Minimum Room Ventilation Percentage* field is set in the <u>Project Info</u> command, this value may be increased to maintain the specified ventilation percentage.

Cooling, OSA CFM: The ventilation airflow for the room or zone.

For rooms, set using the *Cooling 1* and *Cooling 2* fields in the *Ventilation* section of the <u>Edit Rooms</u> or <u>Room</u> <u>Project Schedule</u> command.

For zones, calculated based upon the value of the *Ventilation Calculation Method* field in the **Project Info** command.

Cooling, OSA %: The percentage of cooling supply air that is outside air.

Heating, Heating Temperature Difference: Set using the *Heating Temperature Difference* field in the *AHU and Coil Settings* section of the <u>Zone List</u> command. If the temperature is based upon the zone that is above the zone or room, this value is left blank.

Heating, Load (btu/h): The total cooling load. This value is the sum of the loads in the Heating Load Details table in the <u>Print Heating Detail</u> section. It is also the same as the *Heating*, *Btu/h* value in the Load Total Summary -System and Load Total Summary - Room table from the <u>Print Load Summary</u> section.

Heating, Supply CFM: The airflow required to heat the room or zone. Calculated using the following formula:

Heating Supply CFM = Room Heating Load / (1.08 * Altitude Factor * Heating Temperature Difference)

Room Heating Load is the same as the *Heating*, *Btu/h* column in the **Load Total Summary - Room** table. See the **Print Load Summary** section for more information.

Altitude Factor = $(1 - (0.0000068753 * Elevation))^{5.2559}$

Elevation is set using the *Elevation* field in the **Project Info** command.

Heating Temperature Difference is set using the *AHU and Coil Settings, Heating Temperature Difference* field in the <u>Zone List</u> command.

For rooms, if the *Minimum Supply Air* field is set in the <u>Edit Rooms</u> or <u>Room Project Schedule</u> command, this value will be at least as much as the specified minimum.

For rooms, if the *Minimum Room Ventilation Percentage* field is set in the <u>Project Info</u> command, this value may be increased to maintain the specified ventilation percentage.

Heating, OSA CFM: The ventilation airflow for the room or zone.

For rooms, set using the *Heating 1* and *Heating 2* fields in the *Ventilation* section of the <u>Edit Rooms</u> or <u>Room</u> <u>Project Schedule</u> command.

For zones, calculated based upon the value of the *Ventilation Calculation Method* field in the **Project Info** command.

Heating, OSA %: The percentage of heating supply air that is outside air.

Print Ventilation Schedule

The section describes what is printed when *Print Ventilation Schedule* is checked in the **Print Load Calculations** dialog box.

Print Load Calculations		×
Print Load Calculations Select Sections to Print Print Project Info Print Building Definition Print Supply Air Requirements Print Ventilation Schedule Print Ventilation Schedule Print Cooling Detail Print Heating Detail Print Load Summary Print Psychrometrics	Zone or Room to Print Design Master Software (LOUISVILLE, KY) Zone Default Zone AHU-1 (1st Floor) Room Concession Room Supplies Zone VAV-1 (South) Room Corridor Room Electrical Room Room Long Copy Room Room Long Copy Room Room Storage Zone VAV-2 (Lobby) Room Lobby Zone VAV-2 (Lobby) Room Lobby Zone VAV-3 (Cooridor) Zone VAV-3 (Cooridor) Zone VAV-4 (Kitchen & Bathrooms) Room Downstairs Toilets Room Elevator Mechanical Room Room Janitorial Room Kitchen Zone AHU-2 (2nd Floor) Room Bait and Switch Room Room Call Center Room Mgr Office Room Smoke and Mirror Room Boom Libetaire Lobby	×
Print System Loads for Rooms	Room Upstairs Toilets Room Warranty Stretching Room Zone AHU-3 (Showroom)	
☐ Insert Page Break After Each Section	Room Dog and Pony Showroom Theater	
Print Loads Ca	alculate and Print Loads Cancel	

A different table is printed depending upon the value of the *Ventilation Calculation Method* field in the **Project Info** command.

- <u>Minimum</u>
- 2006 International Mechanical Code
- 2009 International Mechanical Code
- <u>ASHRAE62.1-2004</u>
- <u>ASHRAE62.1-2007</u>
- <u>ASHRAE62.1-2010</u>

Minimum Information

This section describes the ventilation schedule that is printed when the *Ventilation Calculation Method* field in the **Project Info** command is set to **Minimum**.

Ventilation Schedule

The **Ventilation Schedule** table lists each room and zone in the project and the ventilation requirements for the space.

Ventilation Schedule										
Location	Room Type	Ventilation Requirements	Area (ft ²)	People	Ventilation CFM	Supply CFM	Ventilation %			
Zone Main	1	13	3,010	114	776	5,090	15%			
Zone BLDG			3,010	114	776	5,090	15%			
Room 101	Auditorium	15 CFM / person	1,290	13	195	1,890	10%			
Room 102	Meeting	0.5 CFM / ft ²	921	93	461	2,380	19%			
Room 103	Office	15 CFM / person	271	3	45	288	16%			
Room 105	Office	15 CFM / person	271	2	30	465	6%			
Room 107	Office	15 CFM / person	253	3	45	561	8%			

Location: All of the zones and rooms in the project. Rooms and zones that are part of a zone are indented and listed below the parent zone.

Room Type: Only used for rooms. Set using the *Room Type* field in the Edit Rooms command.

For zones, the cell is blank.

Ventilation Requirements: Set using the *Cooling 1*, *Cooling 2*, *Heating 1* and *Heating 2* fields in the *Ventilation* section of the Edit Rooms or Room Project Schedule command.

Area: The area of the room. Set based upon the room boundary inserted on the drawing.

People: The total number of people in the room or zone. If *Allow Fractional People* is unchecked in the **Project Info** command, this value will be rounded to the nearest whole person.

For rooms, set using the SF / Person or People fields in the People section of the Edit Rooms or Room Project Schedule command

For zones, set using the *SF* / *Person* or *People field* in the Zone List command. If a value is not specified in these fields, the number of people is the sum of the people in the rooms in the zone.

Ventilation CFM: The ventilation airflow for the room or zone.

For rooms, set using the *Cooling 1* and *Cooling 2* fields in the *Ventilation* section of the <u>Edit Rooms</u> or <u>Room</u> <u>Project Schedule</u> command.

For zones, the ventilation airflow is the sum of the airflows of the rooms in the zone.

Supply CFM: The supply airflow required to condition the room or zone. This value is the same as the *Required Supply CFM* column in the **Supply Air Requirements** table. See the **Print Supply Air Requirements** section for more information.

Ventilation %: The percentage of supply air that is outside air. Equal to the *Ventilation CFM* column divided by the *Supply CFM* column.

2006 International Mechanical Code

This section describes the ventilation schedule that is printed when the *Ventilation Calculation Method* field in the **Project Info** command is set to **2006 International Mechanical Code**.

Ventilation Schedule

The **Ventilation Schedule** table contains sections for the zones in the project. If the whole building is selected to be printed in the *Zone or Room to Print* list, then every zone will be listed. If specific zones are selected, then only the selected zones are displayed and no sections are displayed.

The labels in parentheses for the columns are the names of the variables used in the 2006 IMC calculations.

The room with the highest Uncorrected OSA, Fraction is highlighted in bold.

Each zone is displayed as a separate section in the table. A header with the name of the zone is displayed at the top of each section.

			Ve	entila	tion Sche	dule		
			2006	Internat	ional Mechanic	al Code		
Location	Room Type	Ventilation Requirements	Area (ft ²)	People	Supply CFM (V _{st})	Uncorrected OSA CFM (V _{on}) Fraction (X)	Critical Space OSA Fraction (Z)	Corrected OSA CFM (V _{ot}) Fraction (Y)
				Z	one Main		1	
Zone Main			3,010	114	5,090	776 0.152	0.197	812 0.159
Room 101	Auditorium	15 CFM / person	1,290	13	1,890	195 0.103		
Room 102	Meeting	0.5 CFM / ft ²	921	93	2,340	461 0.197		
Room 103	Office	15 CFM / person	271	. 3	274	45 0.164		
Room 105	Office	15 CFM / person	271	. 2	295	30 0.102		
Room 107	Office	15 CFM / person	253	3	287	45 0.157		
				Ze	one BLDG			
Zone BLDG			3,010	114	5,090	776 0.152	0.197	812 0.159
Room 101	Auditorium	15 CFM / person	1,290	13	1,890	195 0.103		
Room 102	Meeting	0.5 CFM / ft ²	921	93	2,340	461 0.197		
Room 103	Office	15 CFM / person	271	. 3	274	45 0.164		
Room 105	Office	15 CFM / person	271	2	295	30 0.102		
Room 107	Office	15 CFM / person	253	3	287	45 0.157		

Location: The zone and the rooms in the zone. Rooms are indented below the zone.

Room Type: Only used for rooms. Set using the *Room Type* field in the Edit Rooms command.

For zones, the cell is blank.

Ventilation Requirements: Set using the *Cooling 1*, *Cooling 2*, *Heating 1* and *Heating 2* fields in the *Ventilation* section of the <u>Edit Rooms</u> or <u>Room Project Schedule</u> command.

Area: The area of the room. Set based upon the room boundary inserted on the drawing.

People: The total number of people in the room or zone. If *Allow Fractional People* is unchecked in the **Project Info** command, this value will be rounded to the nearest whole person.

For rooms, set using the SF/Person or *People* fields in the *People* section of the <u>Edit Rooms</u> or <u>Room Project</u> <u>Schedule</u> command

For zones, set using the *SF* / *Person* or *People field* in the Zone List command. If a value is not specified in these fields, the number of people is the sum of the people in the rooms in the zone.

Supply CFM (V_{st}): The supply airflow required to condition the room or zone. This value is the same as the *Required Supply CFM* column in the **Supply Air Requirements** table. See the <u>Print Supply Air Requirements</u> section for more information.

Uncorrected OSA, CFM (V_{on}) : The ventilation airflow for the room or zone based upon the settings in the rooms and room schedule.

For rooms, set using the *Cooling 1* and *Cooling 2* fields in the *Ventilation* section of the <u>Edit Rooms</u> or <u>Room</u> <u>Project Schedule</u> command.

For zones, the ventilation airflow is the sum of the airflows of the rooms in the zone.

Uncorrected OSA, Fraction (X): The fraction of supply air that is outside air. Equal to *Uncorrected OSA, CFM* divided by *Supply CFM*. The room with the highest *Uncorrected OSA, Fraction* is highlighted in bold.

Critical Space OSA, Fraction (Z): The largest Uncorrected OSA, Fraction for the zone. This value is only listed on the zone row.

Corrected OSA, CFM (V_{ot}): The ventilation airflow volume calculated by the 2006 *IMC* calculation. This value is used to determine the ventilation load for the zone.

Corrected OSA, Fraction (Y): The fraction of supply air that is outside air. Equal to *Corrected OSA, CFM* divided by *Supply CFM*.

ASHRAE 62.1-20## and 2009 IMC

This section describes the ventilation schedule that is printed when the *Ventilation Calculation Method* field in the <u>Project Info</u> command is set to 2009 International Mechanical Code, ASHRAE 62.1-2004, ASHRAE 62.1-2007, or ASHRAE 62.1-2010. The calculations are the same for each method.

For complete information about how this calculation works and what these values mean, refer to ASHRAE 62.1.

Ventilation Schedule

The **Ventilation Schedule** table contains sections for the zones in the project. If the whole building is selected to be printed in the *Zone or Room to Print* field, then every zone is listed. If specific zones are selected, then only the selected zones are displayed and no sections are displayed.

The labels in italics are the names of the variables used in the ASHRAE 62.1-2004, ASHRAE 62.1-2007, and ASHRAE 62.1-2010 calculations.

Each zone is displayed as a separate section in the table. A header with the name of the zone is displayed at the top of each section. The information about the zone is displayed first in the section, followed by information about each room in the zone.

	Zone Default Ventilation													
System Primary Airflow: 3,520 CFM V_{ps}						3,520 C	FM	Zone Air Distribution Ef Ez	Zone Air Distribution Effectiveness: E_{π}					
Avera X _s	ge Outdoor Air Fra	iction:			C	0.604		Primary Air Fraction to 2 E _p	Primary Air Fraction to Zone: Ep					
Occup D	ant Diversity:				1	I		Secondary Air Fraction t E _p	o Zone:			1		
Uncorrected Air Intake: V _{au}					2	2,130 C	FM	Fraction of Supply Air to F_{α}	action of Supply Air to Zone from Outside Zone: F_{α}					
Syster E _v	n Ventilation Effic	iency:			C	0.601		Fraction of Supply Air to Zone from Fully Mixed Primary Air: F_{b}				1		
Outdo Vot	or Air Intake:				1	3,530 C 1								
	Room Information													
Room	Room Type	People Ou Rate (CFM/person) R _p	rtdoor / People P _z	Air Total (CFM) R _p *P _z	Area C Rate (CFM/ft ²) R _a	Area (ft ²) (ft2)	r Air Total (CFM) R _a *A _z	Breathing Zone Outside Airflow (CFM) V _{bz}	Zone Outdoor Airflow (CFM) V _{oz}	Zone Discharge Airflow (CFM) V _{dz}	Discharge Outdoor Air Fraction Z_d	Zone Ventilation Efficiency E_{vz}		
101	Lobby-Main Entry	15	25.8	387	(0 1,290	0	387	387	923	0.419	1.58		
102	102 Conference 30 46.1 1,380				(921	0	1,380	1,380	1,380	1	0.601		
103	Office	15	2.7	41	(271	0	41	41	219	0.187	1.81		
104	Office	15	6.8	102	(676	0	102	102	483	0.211	1.79		
105	Office	15	2.7	41	(271	0	41	41	199	0.206	1.79		
106	Storage	0	0.7	0]	1 133	134	134	134	134	1	0.601		
107	Office	15	2.5	38	(0 253	0	38	38	193	0.197	1.8		

System Primary Airflow V_{ps}: The supply airflow required to condition the zone. This value is the same as the *Required Supply CFM* column in the **Supply Air Requirements** table. See the <u>Print Supply Air Requirements</u> section for more information. Defined in the *Definitions* section of *ASHRAE 62.1-2004* on page 22.

Average Outdoor Air Fraction X_s : A calculated value equal to Uncorrected Air Intake divided by System Primary Airflow. Defined in the Definitions section of ASHRAE 62.1-2004 on page 22.

Occupant Diversity D: A diversity factor based upon the number of people in the zone. Equal to the *People Diversity* value set in the <u>Zone List</u> command divided by the total number of people in the rooms in the zone. Defined in equation 6-7 in *ASHRAE 62.1-2004* on page 11.

Uncorrected Air Intake V_{ou} : The sum of the *Zone Outdoor Airflow* values for all of the rooms in the zone. Defined in the *Definitions* section of *ASHRAE 62.1-2004* on page 22.

System Ventilation Efficiency E_v : The minimum *Zone Ventilation Efficiency* value used to calculate the ventilation airflow required in the zone. Defined in equation A-3 in *ASHRAE 62.1-2004* on page 20.

Outdoor Air Intake V_{ot}: The total ventilation airflow required for the zone. Equal to *Uncorrected Air Intake* divided by *System Ventilation Efficiency*. Defined in equation 6-8 in *ASHRAE 62.1-2004* on page 11.

Zone Air Distribution Effectiveness $\mathbf{E}_{\mathbf{z}}$: Set using the E_z field in the **Zone List** command. A value less than 1 will increase the ventilation required in the zone. Defined in table 6-2 in ASHRAE 62.1-2004 on page 15.

Primary Air Fraction to Zone E_p: Set using the *Ep* field in the <u>Zone List</u> command. Defined in the *Definitions* section of *ASHRAE 62.1-2004* on page 22.

Secondary Air Fraction to Zone E_r: Set using the *Er* field in the <u>Zone List</u> command. Defined in the *Definitions* section of *ASHRAE 62.1-2004* on page 22.

Fraction of Supply Air to Zone from Outside Zone F_a: Defined in the *Definitions* section of ASHRAE 62.1-2004 on page 22.

Fraction of Supply Air to Zone from Fully Mixed Primary Air F_b: Defined in the Definitions section of ASHRAE
62.1-2004 on page 22.

Fraction of Outdoor Air to Zone from Outside Zone F_c: Defined in the *Definitions* section of *ASHRAE* 62.1-2004 on page 22.

Room Information

The Room Information section lists each room in the zone.

The room with the lowest Zone Ventilation Efficiency is highlighted in bold.

Room: The rooms in the zone.

Room Type: Set using the *Room Type* field in the Edit Rooms command.

People Outdoor Air, Rate R_p: The ventilation rate for the room based upon the number of people. A value is displayed if one of the values in the *Ventilation* section of the <u>Edit Rooms</u> or <u>Room Project Schedule</u> command is set to **CFM / Person**. Defined in the *Definitions* section of *ASHRAE 62.1-2004* on page 22.

People Outdoor Air, People P_z: The total number of people in the room or zone. If *Allow Fractional People* is unchecked in the <u>Project Info</u> command, this value will be rounded to the nearest whole person. Set using the SF/Person or *People* fields in the *People* section of the <u>Edit Rooms</u> or <u>Room Project Schedule</u> command. Defined in the *Definitions* section of *ASHRAE 62.1-2004* on page 22.

People Outdoor Air, Total R_p*P_z **:** The ventilation airflow for the room based upon the number of people. Equal to *People Outdoor Air, Rate* times *People Outdoor Air, People*.

Area Outdoor Air, Rate R_a: The ventilation rate for the room based upon the area of the room. A value is displayed if one of the values in the *Ventilation* section of the <u>Edit Rooms</u> or <u>Room Project Schedule</u> command is set to CFM/SF. Defined in the *Definitions* section of *ASHRAE 62.1-2004* on page 22.

Area Outdoor Air, Area A_z : The area of the room. Set based upon the room boundary inserted on the drawing. Defined in the *Definitions* section of *ASHRAE 62.1-2004* on page 22.

Area Outdoor Air, Total $R_a * A_z$ **:** The ventilation airflow for the room based upon the area of the room. Equal to *Area Outdoor Air, Rate* times *Area Outdoor Air, Area*.

Breathing Zone Outside Airflow V_{bz}: The ventilation airflow for the room in the breathing zone based upon the number of people and area of the room. Equal to *People Outdoor Air, Total* plus *Area Outdoor Air, Total*. Defined in the *Definitions* section of *ASHRAE 62.1-2004* on page 22.

Zone Outdoor Airflow V_{oz}: The total ventilation airflow required for the room. Equal to *Breathing Zone Outside Airflow* divided by *Zone Air Distribution Effectiveness*. Defined in the *Definitions* section of *ASHRAE 62.1-2004* on page 22.

Zone Discharge Airflow V_{dz}: The supply airflow required to condition the room or zone. This value is the same as the *Required Supply CFM* column in the **Supply Air Requirements** table. See the <u>Print Supply Air</u> <u>Requirements</u> section for more information. Defined in the *Definitions* section of *ASHRAE 62.1-2004* on page 22. **Discharge Outdoor Air Fraction Z**_d: The fraction of supply air that is outside air. Equal to *Zone Outdoor Airflow* divided by *Zone Discharge Airflow*. Defined in the *Definitions* section of *ASHRAE 62.1-2004* on page 22.

Zone Ventilation Efficiency E_{vz} : "The efficiency with which the system distributes air from the outdoor air intake to the breathing zone in a particular zone." Calculated based upon the other values in the **Room Information** section. The room with the lowest *Zone Ventilation Efficiency* is highlighted in bold. Defined in equation A-2-8n ASHRAE 62.1-2004 on page 20.

Print Cooling Detail

The section describes what is printed when *Print Cooling Detail* is checked in the **Print Load Calculations** dialog box.



Cooling Load Details - System

The **Cooling Loads Details - System** table lists each zone in the project and a breakdown of the system cooling loads by type.

The load values are based upon the listed system peak value. The system peak includes the ventilation and plenum loads.

Lighting, equipment, and people loads are not dependent upon the time of day. They are listed in the Cooling

Loads Details - Room table to save space.

Each load lists two values. The first is the load in Btu/h, the second is the load as a percentage of the total system cooling load.

					(0 10	Coo	ling]		d] u/h	Det:	ails -	Syst	tem									
Location		Peak	Plenun	n	(See "Co Roof	oling Lo	ad Details Wal	l Roon	n" fi G	or light lass	ing, equip Vertic Partiti	al ons	nd people I Horizor Partitic	oads) ital ns	Sensib	Ventila le	tion Laten	t] Sensib	Infiltra le	tion Later	nt
Zone Default	July	3:00 p.m.	10,300	7%	9,070	6%	3,810	3%	0	0%	315	0%	4,490	3%	48,100	33%	-5,400	-4%	1,670	1%	-187	0%
Zone Z1	July	3:00 p.m.	10,300	23%	Plenum	0%	1,310	3%	0	0%	315	1%	0	0%	13,200	30%	-1,490	-3%	727	2%	-82	0%
Room 103	July	4:00 p.m.	1,820	28%	Plenum	0%	463	7%	0	0%	0	0%	0	0%	499	8%	-59	-1%	122	2%	-14	0%
Room 104	July	3:00 p.m.	4,310	28%	Plenum	0%	164	1%	0	0%	315	2%	0	0%	1,300	8%	-146	-1%	293	2%	-33	0%
Room 105	July	4:00 p.m.	1,750	28%	Plenum	0%	206	3%	0	0%	0	0%	0	0%	499	8%	-59	-1%	122	2%	-14	0%
Room 106	July	3:00 p.m.	789	24%	Plenum	0%	423	13%	0	0%	0	0%	0	0%	1,710	52%	-192	-6%	64	2%	-7	0%
Room 107	July	4:00 p.m.	1,640	28%	Plenum	0%	231	4%	0	0%	0	0%	0	0%	463	8%	-54	-1%	110	2%	-13	0%
Zone Z2	July	3:00 p.m.	0	0%	9,070	9%	2,490	2%	0	0%	0	0%	4,490	4%	34,900	34%	-3,920	-4%	944	1%	-106	0%
Room 101	July	3:00 p.m.	0	0%	5,290	14%	1,550	4%	0	0%	0	0%	4,490	12%	4,940	13%	-554	-1%	548	1%	-62	0%
Room 102	July	3:00 p.m.	0	0%	3,780	7%	946	2%	0	0%	0	0%	0	0%	17,600	33%	-1,980	-4%	395	1%	-44	0%
Zone Z3						E	xcluded fr	om cool	ing													

Location: All of the zones in the project. Zones that are part of a zone are indented and listed below the parent zone. If *Print System Loads for Rooms* is checked in the <u>Print Load Calculations</u> command, the rooms in the project will also be listed.

Peak: The month and hour when the peak system cooling load occurs.

Plenum: The plenum cooling load.

Based upon the following fields in the **Query Wall** command:

- Wall Type
- Wall Height

Based upon the following fields in the Edit Rooms and Room Project Schedule commands:

- Ceiling Height
- Cooling Temperature

Based upon the following fields in the **Zone List** command:

- Cooling Temperature
- Plenum
- Plenum Return
- Percentage of Lighting Load to Plenum

Based upon the following fields in the **Floor List** command:

- Default Ceiling Height
- Floor-to-Floor Height

Based upon the following fields in the **Project Info** command:

- Latitude
- OSA High Dry
- OSA High Daily Range

Roof: The roof cooling load.

Based upon the following fields in the Edit Rooms and Room Project Schedule commands:

• Roof

- Include Roof
- Roof Type
- Roof Percent / Area
- Cooling Temperature

Based upon the following fields in the **Zone List** command:

- Cooling Temperature
- Plenum

Based upon the following fields in the **Floor List** command:

- Roof
- Roof Type

Based upon the following fields in the **Project Info** command:

- Latitude
- OSA High Dry
- OSA High Daily Range

Wall: The wall cooling load.

Based upon the following fields in the **Query Wall** command:

- Heat Transfer and Solar Gain (Wall)
- Wall Type
- Wall Height
- Lower Wall Type
- Lower Wall Height
- Door Type
- Door Percentage / Area / Complex
- Shading Percentage

Based upon the following fields in the Edit Rooms and Room Project Schedule commands:

• Cooling Temperature

Based upon the following fields in the **Zone List** command:

• Cooling Temperature

Based upon the following fields in the **Project Info** command:

- Latitude
- OSA High Dry
- OSA High Daily Range

Glass: The glass cooling load.

Based upon the following fields in the **Query Wall** command:

- Heat Transfer but no Solar Gain (Partition) / Heat Transfer and Solar Gain (Wall)
- Glass
- Glass Type
- Glass Percentage / Area / Complex
- Shading Percentage

Based upon the following fields in the Edit Rooms and Room Project Schedule commands:

- Glass Zone Type
- Cooling Temperature

- Skylight Type
- Skylight Area

Based upon the following fields in the **Zone List** command:

• Cooling Temperature

Based upon the following fields in the **Project Info** command:

- Latitude
- OSA High Dry
- OSA High Daily Range

Vertical Partitions: The cooling load from wall partitions.

Based upon the following fields in the **<u>Query Wall</u>** command:

- Heat Transfer but no Solar Gain (Partition)
- Wall Type
- Wall Height
- Partition Temperatures

Based upon the following fields in the Edit Rooms and Room Project Schedule commands:

- Ceiling Height
- Cooling Temperature

Based upon the following fields in the **Zone List** command:

• Cooling Temperature

Based upon the following fields in the **<u>Floor List</u>** command:

• Default Ceiling Height

Based upon the following fields in the **Project Info** command:

- Latitude
- OSA High Dry
- OSA High Daily Range

Horizontal Partitions: The cooling load from floor and ceiling partitions.

Based upon the following fields in the Edit Rooms and Room Project Schedule commands:

- Floor / Ceiling Partition
- Cooling Temperature

Based upon the following fields in the **Zone List** command:

• Cooling Temperature

Based upon the following fields in the **Floor List** command:

• Floor / Ceiling Partition

Based upon the following fields in the **<u>Project Info</u>** command:

- Latitude
- OSA High Dry
- OSA High Daily Range

Ventilation, Sensible: The sensible ventilation cooling load.

Based upon the following fields in the Edit Rooms and Room Project Schedule commands:

- Ventilation, Cooling 1
- Ventilation, Cooling 2
- Cooling Temperature

Based upon the following fields in the **Zone List** command:

- Cooling Temperature
- OSA is Tempered
- Tempered High Dry Bulb Temperature

Based upon the following fields in the **Project Info** command:

- Ventilation Calculation Method
- Maximum Room Ventilation Percentage
- OSA High Dry
- OSA High Daily Range

Ventilation, Latent: The latent ventilation cooling load.

Based upon the following fields in the Edit Rooms and Room Project Schedule commands:

- Ventilation, Cooling 1
- Ventilation, Cooling 2
- Cooling Temperature

Based upon the following fields in the **Zone List** command:

- Cooling Temperature
- OSA is Tempered
- Tempered High Dry Bulb Temperature
- Tempered High Wet Bulb Temperature

Based upon the following fields in the **<u>Project Info</u>** command:

- Ventilation Calculation Method
- Maximum Room Ventilation Percentage
- OSA High Dry
- OSA High Wet
- OSA High Daily Range

Infiltration, Sensible: The sensible infiltration cooling load.

Based upon the following fields in the Edit Rooms and Room Project Schedule commands:

- Infiltration, Cooling
- Cooling Temperature

Based upon the following fields in the **Zone List** command:

• Cooling Temperature

Based upon the following fields in the **Project Info** command:

- OSA High Dry
- OSA High Daily Range

Infiltration, Latent: The latent infiltration cooling load.

Based upon the following fields in the Edit Rooms and Room Project Schedule commands:

- Infiltration, Cooling
- Cooling Temperature

Based upon the following fields in the **Zone List** command:

• Cooling Temperature

Based upon the following fields in the **Project Info** command:

- OSA High Dry
- OSA High Wet
- OSA High Daily Range

Cooling Load Details - Room

The **Cooling Loads Details - Room** table lists each room and zone in the project and a breakdown of the room cooling loads by type.

The load values are based upon the listed room peak value. The room peak does not include the ventilation and plenum loads.

Each load lists two values. The first is the load in Btu/h, the second is the load as a percentage of the total room cooling load.

								Co	olin	g L	oad (Btu/h /	Det % of To	t ails -	Ro	om											
Location		Peak	Roof		Wal	11	Gla	ss	Verti	cal	Horizo	ntal	Lighti	ng	Eq	uipme	ıt			Peo	ple		I	nfiltr	ation	
									Partiti	ons	Partit	ions			Sensil	ole	Late	ent	Sensib	le	Laten	t	Sensit	ole	Later	nt
Zone Default	July	4:00 p.m.	8,950	10%	4,230	4%	0 (0%	301	0%	4,290	5%	15,000	16%	20,700	22%	0	0%	21,800	23%	17,400	19%	1,600	2%	-187	0%
Zone Z1	July	8:00 p.m.	Plenum	0%	2,610	11%	0 (0%	93	0%	0	0%	3,400	15%	10,000	43%	0	0%	3,850	17%	3,080	13%	214	1%	-82	0%
Room 103	August	8:00 p.m.	Plenum	0%	782	17%	0 (0%	0	0%	0	0%	602	13%	1,850	41%	0	0%	679	15%	543	12%	38	1%	-14	0%
Room 104	July	4:00 p.m.	Plenum	0%	205	2%	0 (0%	301	3%	0	0%	1,500	15%	4,620	47%	0	0%	1,690	17%	1,350	14%	280	3%	-33	0%
Room 105	July	9:00 p.m.	Plenum	0%	461	11%	0 (0%	0	0%	0	0%	602	15%	1,850	45%	0	0%	679	16%	543	13%	17	0%	-14	0%
Room 106	July	4:00 p.m.	Plenum	0%	434	47%	0 (0%	0	0%	0	0%	137	15%	0	0%	0	0%	167	18%	133	14%	61	7%	-7	-1%
Room 107	July	9:00 p.m.	Plenum	0%	555	14%	0 (0%	0	0%	0	0%	560	14%	1,720	43%	0	0%	631	16%	505	13%	15	0%	-13	0%
Zone Z2	July	3:00 p.m.	9,070	13%	2,490	3%	0 (0%	0	0%	4,490	6%	11,600	16%	10,700	15%	0	0%	18,000	25%	14,400	20%	944	1%	-106	0%
Room 101	July	3:00 p.m.	5,290	15%	1,550	4%	0 (0%	0	0%	4,490	13%	6,600	19%	4,400	13%	0	0%	6,450	19%	5,160	15%	548	2%	-62	0%
Room 102	July	3:00 p.m.	3,780	10%	946	3%	0 (0%	0	0%	0	0%	5,030	14%	6,290	17%	0	0%	11,500	31%	9,210	25%	395	1%	-44	0%
Zone Z3									Exclud	ed fron	1 cooling															

Location: All of the zones and rooms in the project. Rooms and zones that are part of a zone are indented and listed below the parent zone.

Peak: The month and hour when the peak room cooling load occurs.

If *System Type* is set to **Constant Volume** in the <u>Zone List</u> command, then **CV** - **Sum of Peaks** is listed. Constant volume zones do not have a peak time.

Roof: The roof cooling load. Based upon the same fields as in the **Cooling Loads Details - System** table described above.

Wall: The wall cooling load. Based upon the same fields as in the Cooling Loads Details - System table described above.

Glass: The glass cooling load. Based upon the same fields as in the **Cooling Loads Details - System** table described above.

Vertical Partitions: The cooling load from wall partitions. Based upon the same fields as in the Cooling Loads Details - System table described above.

Horizontal Partitions: The cooling load from floor and ceiling partitions. Based upon the same fields as in the Cooling Loads Details - System table described above.

Lighting: The lighting cooling load.

Based upon the following fields in the Edit Rooms and Room Project Schedule commands:

- Lighting
- Lighting, Watts / SF / Watts
- Percentage to Plenum

Based upon the following fields in the **Zone List** command:

- Plenum
- Plenum Return
- Percentage of Lighting Load to Plenum

Based upon the following fields in the **Floor List** command:

• Default Ceiling Height

Equipment, Sensible: The sensible equipment cooling load.

Based upon the following fields in the Edit Rooms and Room Project Schedule commands:

- Equipment
- Equipment, Watts / SF / Watts

Equipment, Latent: The latent equipment cooling load.

Based upon the following fields in the Edit Rooms and Room Project Schedule commands:

• Equipment Latent Gain

People, Sensible: The sensible people cooling load.

Based upon the following fields in the Edit Rooms and Room Project Schedule commands:

- People
- People, SF / Person / People
- Activity Level
- People, Sensible Btu/h / Person

Based upon the following fields in the **Zone List** command:

- People Diversity
- People Diversity, SF / Person / People

Based upon the following fields in the **Project Info** command:

• Allow Fractional People

People, Latent: The latent people cooling load.

Based upon the following fields in the Edit Rooms and Room Project Schedule commands:

- People
- People, SF / Person / People
- Activity Level
- People, Latent Btu/h / Person

Based upon the following fields in the **Zone List** command:

- People Diversity
- People Diversity, SF / Person / People

Based upon the following fields in the **Project Info** command:

• Allow Fractional People

Infiltration, Sensible: The sensible infiltration cooling load. Based upon the same fields as in the **Cooling Loads Details - System** table described above.

Infiltration, Latent: The latent infiltration cooling load. Based upon the same fields as in the **Cooling Loads Details - System** table described above.

Print Heating Detail

The section describes what is printed when *Print Heating Detail* is checked in the **Print Load Calculations** dialog box.

Print Load Calculations	×
Select Sections to Print	Zone or Room to Print
Print Project Info	Design Master Software (LOUISVILLE, KY)
	Zone Default
Print Building Definition	Zone AHU-1 (1st Floor)
Print Supply Air Requirements	Room Concession
	Room Supplies
Print Ventilation Schedule	Zone VAV-I (South)
Print Cooling Detail	Room Electrical Room
	Boom Long Copy Boom
✓ Print Heating Detail	Room Storage
Print Load Summary	Zone VAV-2 (Lobby)
	Room Lobby
Print Psychrometrics	Zone VAV-3 (Cooridor)
	Zone VAV-4 (Kitchen & Bathrooms)
	Room Downstairs Toilets
	Room Elevator Mechanical Room
	Room Jantonal
	Room Kitchen
	Zone AHU-2 (Zha Hoor)
	Room Call Center
	Room Mar Office
	Boom Smoke and Mirror Boom
	Room Upstairs Lobby
	Room Upstairs Toilets
	Room Warranty Stretching Room
Print System Loads for Booms	Zone AHU-3 (Showroom)
	Room Dog and Pony Showroom Theater
✓ Insert Page Break After Each Section	
Print Loads Ca	alculate and Print Loads Cancel

Heating Load Details - System and Room

The **Heating Loads Details - System and Room** table lists each room and zone in the project and a breakdown of the heating loads by type.

Each load lists two values. The first is the load in Btu/h, the second is the load as a percentage of the total heating load.

				I	Ieating	g Loa	ad	Deta (Btu/h / %	tils - S 6 of System	yste Total)	m and	Rooi	n					
Location	Plenu	m	Roo	f	Wal	1	(Glass	Slab		Vertica Partitio	ıl ns	Horizonta Partition:	1	Ventilation		Infiltrat	ion
Zone Default	4,460	2%	4,8	30 2%	8,380	4%	0	0%	5,510	3%	1,100	1%	15,700	7%	168,000	79%	5,850	3%
Zone Z1	4,460	7%	Plenum	0%	3,650	6%	0	0%	2,710	4%	1,100	2%	0	0%	46,400	76%	2,540	4%
Room 103	852	17%	Plenum	0%	1,010	21%	0	0%	749	15%	0	0%	0	0%	1,830	37%	446	9%
Room 104	1,640	18%	Plenum	0%	573	6%	0	0%	425	5%	1,100	12%	0	0%	4,550	49%	1,030	11%
Room 105	757	18%	Plenum	0%	630	15%	0	0%	467	11%	0	0%	0	0%	1,830	44%	446	11%
Room 106	492	6%	Plenum	0%	790	10%	0	0%	586	7%	0	0%	0	0%	5,980	74%	223	3%
Room 107	720	18%	Plenum	0%	648	16%	0	0%	481	12%	0	0%	0	0%	1,700	43%	402	10%
Zone Z2	0	0%	4,8	3%	4,730	3%	0	0%	2,810	2%	0	0%	15,700	10%	122,000	80%	3,300	2%
Room 101	0	0%	2,8	50 7%	3,310	8%	0	0%	1,960	5%	0	0%	15,700	37%	17,300	40%	1,920	4%
Room 102	0	0%	2,0	30 3%	1,420	2%	0	0%	842	1%	0	0%	0	0%	61,700	92%	1,380	2%
Zone Z3					Exclud	ed from h	eatii	ng										

Location: All of the zones and rooms in the project. Rooms and zones that are part of a zone are indented and listed below the parent zone.

Plenum: The plenum cooling load.

Based upon the following fields in the **Query Wall** command:

- Wall Type
- Wall Height

Based upon the following fields in the Edit Rooms and Room Project Schedule commands:

- Ceiling Height
- Heating Temperature

Based upon the following fields in the **Zone List** command:

- Heating Temperature
- Plenum
- Plenum Return

Based upon the following fields in the **Floor List** command:

- Default Ceiling Height
- Floor-to-Floor Height

Based upon the following fields in the **Project Info** command:

• OSA Low Temperature Dry Bulb

Roof: The roof cooling load.

Based upon the following fields in the Edit Rooms and Room Project Schedule commands:

- Roof
- Include Roof
- Roof Type
- Roof Percent / Area
- Heating Temperature

Based upon the following fields in the **<u>Zone List</u>** command:

- Heating Temperature
- Plenum

Based upon the following fields in the **Floor List** command:

- Roof
- Roof Type

Based upon the following fields in the **Project Info** command:

• OSA Low Temperature Dry Bulb

Wall: The wall cooling load.

Based upon the following fields in the **Query Wall** command:

- Heat Transfer and Solar Gain (Wall)
- Wall Type
- Wall Height
- Lower Wall Type
- Lower Wall Height
- Door Type
- Door Percentage / Area / Complex

Based upon the following fields in the Edit Rooms and Room Project Schedule commands:

• Heating Temperature

Based upon the following fields in the **Zone List** command:

• Heating Temperature

Based upon the following fields in the **Project Info** command:

OSA Low Temperature Dry Bulb

Glass: The glass cooling load.

Based upon the following fields in the **Query Wall** command:

- Heat Transfer but no Solar Gain (Partition) / Heat Transfer and Solar Gain (Wall)
- Glass
- Glass Type
- Glass Percentage / Area / Complex

Based upon the following fields in the Edit Rooms and Room Project Schedule commands:

- Heating Temperature
- Skylight Type
- Skylight Area

Based upon the following fields in the **Zone List** command:

• Heating Temperature

Based upon the following fields in the **Project Info** command:

• OSA Low Temperature Dry Bulb

Slab: The slab cooling load.

Based upon the following fields in the **Query Wall** command:

• Exposed Floor Slab

Based upon the following fields in the **Project Info** command:

• Floor Heat Loss Coefficient

Horizontal Partitions: The cooling load from floor and ceiling partitions.

Based upon the following fields in the Edit Rooms and Room Project Schedule commands:

- Floor / Ceiling Partition
- Heating Temperature

Based upon the following fields in the **Zone List** command:

• Heating Temperature

Based upon the following fields in the **Floor List** command:

• Floor / Ceiling Partition

Based upon the following fields in the **Project Info** command:

• OSA Low Temperature Dry Bulb

Vertical Partitions: The cooling load from wall partitions.

Based upon the following fields in the **Query Wall** command:

- *Heat Transfer but no Solar Gain (Partition)*
- Wall Type
- Wall Height
- Partition Temperatures

Based upon the following fields in the Edit Rooms and Room Project Schedule commands:

- Ceiling Height
- Heating Temperature

Based upon the following fields in the **Zone List** command:

• Heating Temperature

Based upon the following fields in the **Floor List** command:

• Default Ceiling Height

Based upon the following fields in the **Project Info** command:

• OSA Low Temperature Dry Bulb

Ventilation: The sensible ventilation cooling load.

Based upon the following fields in the Edit Rooms and Room Project Schedule commands:

- Ventilation, Heating 1
- Ventilation, Heating 2
- Heating Temperature

Based upon the following fields in the **Zone List** command:

- Heating Temperature
- OSA is Tempered
- Tempered Low Temperature

Based upon the following fields in the **Project Info** command:

- Ventilation Calculation Method
- Maximum Room Ventilation Percentage
- OSA Low Temperature Dry Bulb

Infiltration: The sensible infiltration cooling load.

Based upon the following fields in the Edit Rooms and Room Project Schedule commands:

- Infiltration, Cooling
- Heating Temperature

Based upon the following fields in the **Zone List** command:

• Heating Temperature

Based upon the following fields in the **Project Info** command:

• OSA Low Temperature Dry Bulb

Print Load Summary

The section describes what is printed when *Print Load Summary* is checked in the **Print Load Calculations** dialog box.



Load Total Summary - System

The **Cooling Loads Details - System** table lists each zone in the project and a summary of the calculated load values.

The load values are based upon the listed system peak value. The system peak includes the ventilation and plenum loads.

Lo	bad T	`otal	Sum	nary	r − S y	stem	n (In	clude	s Ve	entilat	ion an	d Plen	um	Loa	ıds)
107 015311		~		A			Coo	oling			A			He	atin	g
Location	Area	OFM	Deek		btuh			Tons		c12	CEN / tam	0011 1 412	OFM	htmh	1-107	AP11 1 412
		Сгы	Fear	Total	Sensible	Latent	Total	Sensible	Latent	It- / ton	CPM / ton	CPM / IT-	CPM	Dun	R 17	CPM / IT-
Zone Main	3,010 ft ²	5,090 Jul	y 4:00 p.m.	145,000	120,000	25,000	12.1	10	2.1	249	421	1.69	1,870	132,000	38.6	0.62
Zone BLDG	3,010 ft ²	5,090 Jul	y 4:00 p.m.	145,000	120,000	25,000	12.1	10	2.1	249	421	1.69	1,870	132,000	38.6	0.62

Location: All of the zones in the project. Zones that are part of a zone are indented and listed below the parent zone. If *Print System Loads for Rooms* is checked in the **Print Load Calculations** command, the rooms in the project will also be listed.

Area: The area of the room or zone.

For rooms, it is set based upon the room boundary inserted on the drawing.

For zones, it is the sum of the areas of the rooms in the zone.

Cooling, CFM: The cooling supply airflow required to condition the room or zone. This value is the same as the *Cooling, Supply CFM* column in the **Supply Air Requirements** table. See the **Print Supply Air Requirements** section for more information.

Cooling, **Peak**: The month and hour when the peak system cooling load occurs.

Cooling, Btu/h, Total: The total cooling load. It is the sum of the sensible and latent cooling loads.

Cooling, Btu/h, Sensible: The sensible cooling load. It is the sum of the sensible ventilation, plenum, roof, wall, glass, horizontal partitions, vertical partitions and sensible infiltration loads from the **Cooling Load Details - System** table. See the **Print Cooling Detail** section for more information.

Cooling, Btu/h, Latent: The latent cooling load. It is the sum of the latent ventilation, infiltration, equipment, and people loads from the **Cooling Load Details - System** table. See the **Print Cooling Detail** section for more information.

Cooling, Tons, Total: The total cooling load converted to tons. It is equal to *Cooling, Btuh/h, Total* divided by 12,000.

Cooling, Tons, Sensible: The sensible cooling load converted to tons. It is equal to *Cooling, Btuh/h, Sensible* divided by 12,000.

Cooling, Tons, Latent: The latent cooling load converted to tons. It is equal to *Cooling, Btuh/h, Latent* divided by 12,000.

Cooling, ft^2 / ton: A check value equal to *Area* divided by *Cooling*, *Tons*, *Total*.

Cooling, CFM / ton: A check value equal to *Cooling, CFM* divided by *Cooling, Tons, Total*. If this value is less than the value provided by the equipment you have available to you, you need to increase the supply airflow for the room or zone using the *Fixed Supply Airflow* field in the <u>Zone List</u> command.

Cooling, CFM / ft²: A check value equal to *Cooling, CFM* divided by *Area*.

Heating, CFM: The heating supply airflow required to condition the room or zone. This value is the same as the *Heating, Supply CFM* column in the **Supply Air Requirements** table. See the <u>Print Supply Air Requirements</u> section for more information.

Heating, Btu/h: The heating load. It is the sum of the values in the **Heating Loads Details - System and Room** table in the **Print Heating Detail** command.

Heating, kW: The heating load converted to kW. It is equal to *Heating*, *Btu/h* divided by 3413.

Heating, CFM / sqft: A check value equal to *Heating*, CFM divided by Area.

Load Total Summary - Room

The **Load Total Summary - Room** table lists each room and zone in the project and a summary of the calculated load values.

The load values are based upon the listed room peak value. The room peak does not include the ventilation and plenum loads.

L	oad (Γot	al	Sum	mary	y – Ro	om	(Ex	cludes	s Ve	ntilati	on and	l Plenu	m	Loa	ıds)
								Co	oling						H	eati	ng
Location	Area	OFM	1	Deek	-	btuh			Tons	10	an ²	CEM / tam	0011 1 412	OFM	htmh	1-107	AP14 442
		Сгм	3	reak	Total	Sensible	Latent	Total	Sensible	Latent	It" / ton	CPM / ton	CPM / It-	CPM	btun	R 17	СРМ / П*
Zone Main	3,010 ft ²	5,090	July	4:00 p.m.	136,000	110,000	26,100	11.4	9.2	2.2	264	448	1.69	1,870	38,200	11.2	0.62
Zone BLDG	3,010 ft ²	5,090	July	4:00 p.m.	136,000	110,000	26,100	11.4	9.2	2.2	264	448	1.69	1,870	38,200	11.2	0.62
Room 101	1,290 ft ²	1,890	July	4:00 p.m.	43,900	41,000	2,930	3.7	3.4	0.2	353	517	1.47	833	17,700	5.2	0.65
Room 102	921 ft ²	2,380	July	5:00 p.m.	72,900	51,500	21,400	6.1	4.3	1.8	152	392	2.58	461	8,260	2.4	0.5
Room 103	271 ft ²	288	July	2:00 p.m.	6,920	6,250	676	0.6	0.5	0.1	470	499	1.06	214	4,540	1.3	0.79
Room 105	271 ft ²	465	July	9:00 a.m.	10,500	10,100	446	0.9	0.8	0	309	530	1.71	183	3,890	1.1	0.67
Room 107	253 ft ²	561	July	9:00 a.m.	12,800	12,200	677	1.1	1	0.1	236	525	2.22	179	3,810	1.1	0.71

Location: All of the zones and rooms in the project. Rooms and zones that are part of a zone are indented and listed below the parent zone.

Area: The area of the room or zone.

For rooms, it is set based upon the room boundary inserted on the drawing.

For zones, it is the sum of the areas of the rooms in the zone.

Cooling, CFM: The cooling supply airflow required to condition the room or zone. This value is the same as the *Cooling, Supply CFM* column in the **Supply Air Requirements** table. See the **Print Supply Air Requirements** section for more information.

Cooling, Peak: The month and hour when the peak room cooling load occurs.

Cooling, Btu/h, Total: The total cooling load. It is the sum of the sensible and latent cooling loads.

Cooling, Btu/h, Sensible: The sensible cooling load. It is the sum of the roof, wall, glass, horizontal partitions, vertical partitions and sensible infiltration loads from the **Cooling Load Details - Room** table. See the **Print Cooling Detail** section for more information.

Cooling, Btu/h, Latent: The latent cooling load. It is the sum of the latent infiltration, equipment, and people loads from the **Cooling Load Details - Room** table. See the **Print Cooling Detail** section for more information.

Cooling, Tons, Total: The total cooling load converted to tons. It is equal to *Cooling, Btuh/h, Total* divided by 12,000.

Cooling, Tons, Sensible: The sensible cooling load converted to tons. It is equal to *Cooling, Btuh/h, Sensible* divided by 12,000.

Cooling, Tons, Latent: The latent cooling load converted to tons. It is equal to *Cooling, Btuh/h, Latent* divided by 12,000.

Cooling, ft² / ton: A check value equal to *Area* divided by *Cooling*, *Tons*, *Total*.

Cooling, CFM / ton: A check value equal to *Cooling, CFM* divided by *Cooling, Tons, Total*. If this value is less than the value provided by the equipment you have available to you, you need to increase the supply airflow for the room or zone using the *Fixed Supply Airflow* field in the <u>Zone List</u> command.

Cooling, CFM / ft²: A check value equal to *Cooling*, *CFM* divided by *Area*.

Heating, CFM: The heating supply airflow required to condition the room or zone. This value is the same as the *Heating, Supply CFM* column in the **Supply Air Requirements** table. See the **Print Supply Air Requirements** section for more information.

Heating, Btu/h: The heating load. It is the sum of the values in the **Heating Loads Details - System and Room** table in the **Print Heating Detail** command.

Heating, kW: The heating load converted to kW. It is equal to *Heating*, *Btu/h* divided by 3413.

Heating, CFM / sqft: A check value equal to *Heating*, CFM divided by Area.

Print Psychrometrics

The section describes what is printed when *Print Psychrometrics* is checked in the **Print Load Calculations** dialog box.

Print Load Calculation Dialog Box

Print Load Calculations	×
Select Sections to Print	Zone or Room to Print
	Design Master Software (LOUISVILLE KY)
Print Project Info	Zone Default
Print Building Definition	Zone AHU-1 (1st Floor)
	Room Concession
Print Supply Air Requirements	Room Supplies
Print Ventilation Schedule	Zone VAV-1 (South)
	Room Comidor
Print Cooling Detail	Room Electrical Room
Print Heating Detail	Room Long Copy Room
Disting and Community	Zone VAV-2 (Lobby)
Print Load Summary	Boom Lobby
Print Psychrometrics	Zone VAV-3 (Cooridor)
	Zone VAV-4 (Kitchen & Bathrooms)
	Room Downstairs Toilets
	Room Elevator Mechanical Room
	Room Janitorial
	Room Kitchen
	Zone AHU-2 (2nd Floor)
	Room Bait and Switch Room
	Room Call Center
	Room Mgr Office
	Room Smoke and Millfor Room
	Room Upstairs Lobby
	Room Warranty Stretching Room
	Zone AHU-3 (Showroom)
Print System Loads for Rooms	Room Dog and Pony Showroom Theater
☑ Insert Page Break After Each Section	
Print Loads Ca	Iculate and Print Loads Cancel

Psychrometrics

An individual **Psychrometrics** table is printed for each zone selected in the *Zone or Room to Print* list. If the whole building is selected, a table will be printed for every zone.

The values in this table are taken directly from or calculated based upon values in the various **<u>Building Definition</u>** commands. The key values are *Coil Dew Point*, *Reheat*, and *Humidification*.

	Psycl	nrometrics - Z	lone Default				
Calculation Month:	July	(alculation Hour:			4:00 p.m.	
			Air Conditions			Loads (Btu/h)	
	Airflow (CFM)	Dry Bulb Temperature	Wet Bulb Temperature	Humidity Ratio (lbs of moisture / lb of dry air)	Total	Sensible	Latent
Outside Air	3,780	87° F	65.93° F	0.00913	42,700	48,100	-5,400
Return Air at Diffusers	-33	75° F	62.4° F	0.00943			
Plenum Load		+-293.29° F			10,300	10,300	0
Return Duct Leakage	(0%) 0						
Return Duct Temperature Gain		+0° F			0	0	0
Return Air at Aparatus	-33	-218.29° F	-218.29° F	0.00943			
Mixed Air	3,740	89.69° F	66.92° F	0.00912			
Coil Dew Point	3,180	46.73° F	46.73° F	0.00688			
Coil Bypass Air	(15%) 561	89.69° F	66.92° F	0.00912			
Coil Leaving Air	3,740	53.17° F	50.26° F	0.00721			
System Load					145,000	133,000	11,900
Reheat		+0° F					
Humidification				0.00124			
Fan (Draw Through, 2 HP)		+1.28° F			5,090	5,090	0
Motor (In Airstream, 70% Efficient)		+0.55° F			2,180	2,180	0
Supply Duct Leakage	(0%) 0						
Supply Duct Temperature Gain		+0° F			0	0	0
Supply Air at Diffusers	3,740	55° F	53.28° F	0.00846			
Room Load				0.00097	94,200	76,900	17,300
Final Room Conditions		75° F	62.4° F	0.00943			

Calculation Month: The month with the highest humidity that is used in the calculation.

Calculation Hour: It is assumed that the highest humidity happens at 4pm. This row is for informational purposes only.

Outside Air

Airflow: The total ventilation airflow for the zone. Includes additional air to account for any air lost due to *Return Duct Leakage* set in the <u>Zone List</u> command.

Dry Bulb Temperature: Set using the OSA High Dry field for the Calculation Month in the **Project Info** command.

Wet Bulb Temperature: Set using the OSA High Wet field for the Calculation Month in the Project Info command.

Humidity Ratio: Calculated based upon the Dry Bulb Temperature and Wet Bulb Temperature.

Total Load: The sum of the Sensible Load and Latent Load.

Sensible Load: The sensible ventilation load.

Latent Load: The latent ventilation load.

Return Air at Diffusers

Airflow: The airflow at the return diffusers.

Dry Bulb Temperature: The return air temperature at the diffusers. Set using the *Cooling Temperature* field in the **Zone List** command.

Wet Bulb Temperature: The return air wet bulb temperature at the diffusers. Calculated using the *Cooling Temperature* and *Relative Humidity* fields in the <u>Zone List</u> command.

Humidity Ratio: The return air humidity ratio at the diffusers. Calculated using the *Cooling Temperature* and *Relative Humidity* fields in the <u>Zone List</u> command.

Plenum Load

The plenum row is included if the *Plenum Return* field is checked in the **Zone List** command.

Dry Bulb Temperature: The temperature gain in the airflow based upon the *Total Load*.

Total Load: The load in the plenum. See the **Print Cooling Detail** section for more information.

Sensible Load: The sensible load in the plenum. There is no latent load, so this value will be the same as *Total Load*.

Return Duct Leakage

Airflow: The volume of air leaked out of the return ducts. It is replaced with outside air. Set using the *Return Duct Air Leakage* field in the **Zone List** command.

Return Duct Temperature Gain

Dry Bulb Temperature: The change in temperature in the air in the return ducts. Set using the *Return Duct Temperature Gain* field in the **Zone List** command.

Total Load: The temperature gain converted to Btu/h based upon the return duct airflow.

Sensible Load: The sensible temperature gain converted to Btu/h. There is no latent temperature gain, so this value will be the same as *Total Load*.

Return Air at Apparatus

Airflow: The return airflow at the piece of mechanical equipment. Includes any loss due to *Return Duct Leakage* set in the <u>Zone List</u> command.

Dry Bulb Temperature: The return air temperature at the mechanical equipment. Equal to the sum of *Return Air* at Diffusers: Dry Bulb Temperature, Plenum Load: Dry Bulb Temperature, and *Return Duct Temperature Gain:* Dry Bulb Temperature.

Wet Bulb Temperature: The return air wet bulb temperature based upon the calculated Dry Bulb Temperature and the Return Air at Diffusers: Humidity Ratio.

Humidity Ratio: The return air humidity ratio at the piece of mechanical equipment. The dry bulb temperature change does not affect the amount of moisture in the return air, so this value will be the same as *Return Air at Diffusers Humidity Ratio*.

Mixed Air

Airflow: The sum of the Outside Air: Airflow and Return Air at Apparatus: Airflow.

Dry Bulb Temperature: The average of the *Outside Air: Dry Bulb Temperature* and *Return Air at Apparatus: Dry Bulb Temperature*, weighted by their relative airflow volumes.

Wet Bulb Temperature: Calculated based upon the Dry Bulb Temperature and Humidity Ratio.

Humidity Ratio: The average of the *Outside Air: Humidity Ratio* and *Return Air at Apparatus: Humidity Ratio*, weighted by their relative airflow volumes.

Fan (Blow Through)

This row is included if the *Fan Position* field is set to **Blow Through** in the **Zone List** command.

The Fan Brake Horsepower set in the **Zone List** command is displayed in the row label.

Dry Bulb Temperature: The rise in temperature based upon the Mixed Air: Airflow and Total Load.

Total Load: The load from the fan based upon the *Fan Brake Horsepower* set in the <u>Zone List</u> command.

Sensible Load: The sensible load from the fan. There is no latent load, so this value will be the same as *Total Load*.

Motor (In Airstream)

This row is included if the *Motor Position* field is set to **In Airstream** and *Fan Position* field is set to **Blow Through** in the **Zone List** command.

The *Motor Efficiency* set in the **Zone List** command is displayed in the row label.

Dry Bulb Temperature: The rise in temperature based upon the *Motor Efficiency* and *Fan Brake Horsepower* set in the **Zone List** command.

Total Load: The temperature gain converted to Btu/h based upon the Mixed Air: Airflow.

Sensible Load: The sensible temperature gain converted to Btu/h. There is no latent temperature gain, so this value will be the same as *Total Load*.

Motor (Out of Airstream)

This row is included if the *Motor Position* field is set to **Out of Airstream** and *Fan Position* field is set to **Blow Through** in the **Zone List** command.

Coil Entering Air

This row is included if the *Fan Position* field is set to **Blow Through** in the **Zone List** command.

Airflow: The same value as the Mixed Air: Airflow.

Dry Bulb Temperature: The air temperature right before it enters the coil. The sum of the *Mixed Air: Dry Bulb Temperature, Fan: Dry Bulb Temperature, and Motor: Dry Bulb Temperature.*

Wet Bulb Temperature: Calculated based upon the Dry Bulb Temperature and Humidity Ratio.

Humidity Ratio: The same value as the Mixed Air: Humidity Ratio.

Coil Dew Point

Airflow: The volume of air that passes over the coil. Equal to Mixed Air: Airflow minus Coil Bypass Air: Airflow.

Dry Bulb Temperature: The dew point temperature that corresponds to the Humidity Ratio.

Wet Bulb Temperature: The same value as the Dry Bulb Temperature.

Humidity Ratio: The humidity ratio needed for the design conditions of the rooms in the zone. Calculated based upon the *Airflow*, *Coil Bypass Air* values, and *Supply Air at Diffusers* values.

Coil Bypass Air

Airflow: The volume of air that is not conditioned by the coil. Equal to *Mixed Air: Airflow* multiplied by *Coil Bypass Factor* set in the <u>Zone List</u> command.

Dry Bulb Temperature: The temperature is the same as the *Mixed Air: Dry Bulb Temperature* or *Coil Entering Air: Dry Bulb Temperature*, depending upon the *Fan Position* setting.

Wet Bulb Temperature: The wet bulb temperature is the same as the *Mixed Air: Wet Bulb Temperature* or *Coil Entering Air: Wet Bulb Temperature*, depending upon the *Fan Position* setting.

Humidity Ratio: The humidity ratio is the same as the *Mixed Air: Humidity Ratio* or *Coil Entering Air: Humidity Ratio*, depending upon the *Fan Position* setting.

Coil Leaving Air

Airflow: The volume of air that leaves the coil. Equal to Mixed Air: Airflow.

Dry Bulb Temperature: The average of the *Coil Dew Point: Dry Bulb Temperature* and *Coil Bypass Air: Dry Bulb Temperature*, weighted by their relative airflow volumes.

Wet Bulb Temperature: Calculated based upon the Dry Bulb Temperature and Humidity Ratio.

Humidity Ratio: The average of the *Coil Dew Point: Humidity Ratio* and *Coil Bypass Air: Humidity Ratio*, weighted by their relative airflow volumes.

System Load

Total Load: The total system cooling load for the zone.

Sensible Load: The sensible system cooling load for the zone.

Latent Load: The latent system cooling load for the zone.

Reheat

Dry Bulb Temperature: Equal to the *AHU and Coil Settings, Cooling Temperature* field set in the **Zone List** command minus the *Coil Leaving Air: Dry Bulb Temperature*.

Humidification

Humidity Ratio: Equal to Supply Air at Diffusers: Humidity Ratio minus Coil Leaving Air: Humidity Ratio.

Fan (Draw Through)

This row is included if the *Fan Position* field is set to **Draw Through** in the **Zone List** command.

The Fan Brake Horsepower set in the Zone List command is displayed in the row label.

Dry Bulb Temperature: The rise in temperature based upon the Coil Leaving Air: Airflow and Total Load.

Total Load: The load from the fan based upon the Fan Brake Horsepower set in the Zone List command.

Sensible Load: The sensible load from the fan. There is no latent load, so this value will be the same as *Total Load*.

Motor (In Airstream)

This row is included if the *Motor Position* field is set to **In Airstream** and *Fan Position* field is set to **Draw Through** in the **Zone List** command.

The Motor Efficiency set in the Zone List command is displayed in the row label.

Dry Bulb Temperature: The rise in temperature based upon the *Motor Efficiency* and *Fan Brake Horsepower* set in the **Zone List** command.

Total Load: The temperature gain converted to Btu/h based upon the Coil Leaving Air: Airflow.

Sensible Load: The sensible temperature gain converted to Btu/h. There is no latent temperature gain, so this value will be the same as *Total Load*.

Motor (Out of Airstream)

This row is included if the *Motor Position* field is set to **Out of Airstream** and *Fan Position* field is set to **Draw Through** in the **Zone List** command.

Supply Duct Leakage

Airflow: The volume of air leaked out of the supply ducts. Set using the *Supply Duct Air Leakage* field in the **Zone List** command.

Supply Duct Temperature Gain

Dry Bulb Temperature: The change in temperature in the air in the return ducts. Set using the *Return Duct Temperature Gain* field in the **Zone List** command.

Total Load: The temperature gain converted to Btu/h based upon the return duct airflow.

Sensible Load: The sensible temperature gain converted to Btu/h. There is no latent temperature gain, so this value will be the same as *Total Load*.

Supply Air at Diffusers

Airflow: The supply airflow required to condition the zone. This value is the same as the *Required Supply CFM* column in the **Supply Air Requirements** table. See the **Print Supply Air Requirements** section for more information.

Dry Bulb Temperature: Set using the *AHU and Coil Settings, Cooling Temperature* field in the **Zone List** command.

Wet Bulb Temperature: Calculated based upon the Dry Bulb Temperature and Humidity Ratio.

Humidity Ratio: The humidity ratio is the same as the Coil Leaving Air: Humidity Ratio.

Room Load

Humidity Ratio: Calculated based upon the Latent Load and Supply Air at Diffusers Airflow.

Total Load: The total room cooling load for the zone.

Sensible Load: The sensible room cooling load for the zone.

Latent Load: The latent system room load for the zone.

Final Room Conditions

Dry Bulb Temperature: Set using the Indoor Air Defaults, Cooling Temperature field in the Zone List command.

Wet Bulb Temperature: Calculated based upon *Indoor Air Defaults, Cooling Temperature* and *Indoor Air Defaults, Relative Humidity* fields in the <u>Zone List</u> command.

Humidity Ratio: Calculated based upon *Indoor Air Defaults, Cooling Temperature* and *Indoor Air Defaults, Relative Humidity* fields in the **Zone List** command.

Calculate Building Load Totals

The Calculate Building Load Totals command will calculate all of the HVAC heating and cooling loads for the project. Typically, you will have the option to calculate loads for commands where a calculation is needed, and will not need to run this command during the normal course of a project.

To calculate the loads, go to

```
Ribbon: DM HVAC->Load Calculations-> 🏛 Calculate Building Load Totals
```

Pulldown Menu: DM HVAC->Load Calculations->Calculate Building Load Totals

Design Master HVAC Dialog Box

Design Master HVAC	\times
Do you want to calculate HVAC building loads now?	
Yes No	

Press the Yes button to calculate the loads.

Press the No button to cancel the command and return to the drawing.

Takeoffs

This section describes how to generate a quantity takeoff directly from the diffuser and fitting counts and duct measurements stored in the project database. Takeoffs may also be performed at any time during the design process and can be quickly redone as a design changes. Each takeoff is generated as an HTML file and will automatically be opened in your web browser. It can also be opened in Microsoft Excel.

This feature is not intended to be used as a complete estimating tool. It is intended to provide the starting point for creating an estimate that can then be finished using a complete HVAC estimating program.

Follow the links below to learn more about the takeoff tools available using the Takeoff commands:

- To perform a takeoff on an area on a drawing, you must first <u>Insert a Takeoff Area</u>. These takeoff areas will remain on the drawing until erased and can be used again for future takeoffs. The definition of the takeoff area can be modified using the <u>Query Takeoff Area</u> command.
- Once you have created a takeoff area, use the **Print Takeoff Area** command to perform the takeoff.

Common Takeoff Information

Takeoff Area Name: The name of the takeoff area. The name is displayed when the takeoff for the area is printed.

Layer Systems to Count: Which layers are included when the takeoff for the area is printed. See the **Layers** section for more information about layers.

Insert Takeoff Area

To create a takeoff area, go to

Ribbon: DM HVAC->Takeoffs-> 🗰 Insert Takeoff Area

Pulldown Menu: DM HVAC->Takeoffs->Insert Takeoff Area

Insert Takeoff Area Dialog Box

Insert Takeoff Area X
Takeoff Area Name: Layer Systems to Count: New Existing
OK Cancel

See the <u>Common Takeoff Information</u> section for more information about how this dialog box works.

Enter a name for the takeoff area and press the **OK** button.

You will be prompted to specify the first point of the takeoff area.

First point of takeoff area:

You will then be prompted to specify the next point.

Specify next point:

Continue inserting points until the takeoff area outline is defined. Press ENTER to complete the takeoff area outline.

A polyline will appear representing your takeoff area. The polyline is on a non-plotting layer and will not display on printed drawing files.

When a takeoff is performed in the area, all of the ducts, diffusers, and fittings in the area will be included.

Query Takeoff Area

To query a takeoff and verify the area in which you are working, go to

Ribbon: DM HVAC->Takeoffs-> Query Takeoff Area

Pulldown Menu: DM HVAC->Takeoffs->Query Takeoff Area

You will be prompted to identify a takeoff area.

Select point inside takeoff area:

The **Query Takeoff Area** dialog box will appear.

Query Takeoff Area Dialog Box

Query Takeoff Area	I		×
Takeoff Area Name:	Ground Floor		
New Existing	n n		
	OK	Cancel	

Changes can be made to the takeoff area in the same way as when it was inserted. See the <u>Common Takeoff</u> <u>Information</u> section for more information about how this dialog box works.

If you specify a point inside multiple takeoff areas, the Select Takeoff Area dialog box will appear.

Select Takeoff Area $ imes$
Select Takeoff Area to Use Kitchen Ground Floor
OK Cancel

Select the desired takeoff area and press the **OK** button.

Print Takeoff Area

To perform a takeoff, go to

Ribbon: DM HVAC->Takeoffs-> Print Takeoff Area

Pulldown Menu: DM HVAC->Takeoffs->Print Takeoff Area

You will be prompted to identify which takeoff area is to be used for the takeoff calculations.

Specify point inside takeoff area:

If you specify a point inside multiple takeoff areas, the Select Takeoff Area dialog box will appear.



Select the takeoff area you want to use and press the **OK** button. The takeoff will be generated as an HTML file and displayed in your web browser. An example takeoff is shown below.

HVAC Takeoff: Ground Floor							
	Diffusers						
Callout	Cou	nt					
R-1	3						
R- 2	2						
S- 1	4						
S- 2	3						
	Flex Ducts						
Size	Length	Length without fittings					
8"ø	21'	12'-2"					
10"ø	10'-6"	8'-2"					
12"@	32'-3"	23'-10"					
	Round Ducts						
Size	Length	Length without fittings					
8"ø	88'-2"	78'-9"					
10"ø	17'-10"	15'-8"					
12"@	135'-8"	113'-1"					
14"ø	5'-10"	4'-6"					
	Flat Oval Ducts						
Size	Length	Length without fittings					
14"x12"ø	11'-9"	11'-9"					
	Asymetric Branch Fitting						
Size	Cou	nt					
	Tee						
Main: 8"ø							
Branch: 8"ø	1						
Branch: 8"ø							
Main: 8"ø							

Utilities

This section describes the utility commands that are available to assist in maintaining the integrity of your project database and drawings.

Coordinate Drawings and Database

The Coordinate Drawings and Database command is used to compare the project database with one or more drawings and confirm that the information matches.

To coordinate a set of selected drawings with the database, go to

 $Ribbon: \, \mbox{DM HVAC->Utilities-> ->Coordinate Drawings and Database \,$

Pulldown Menu: DM HVAC->Utilities->Coordinate Drawings and Database

Select Drawings Dialog Box

Select Drawings ×			
Press CTRL or SHIFT to Select Multiple Drawings M-0.1.DWG M-1.0 (1ST FLOOR).DWG M-1.1 (2ND FLOOR).DWG XR-FLOOR1.DWG XR-FLOOR1.DWG XR-FLOOR2.DWG XR-SITE.DWG			
Select Currently Open Drawing			
OK Cancel			

Drawing List: Select the drawings you want to coordinate with the database. The current drawing is selected when the command is first run. Use the **SHIFT** and **CTRL** keys to select multiple drawings in the list. All of the selected drawings will be coordinated with the database.

Select Currently Open Drawing: Press this button to select the current drawing.

Press the **OK** button to coordinate the selected drawings with the database.

The following actions will be performed:

- Devices on the drawing will be added to the database.
- Devices in the database will be added to the drawing. If the command causes a device to be inserted directly on top of another device, the new device will be inserted at the edge of the drawing. Any devices inserted from the database will have a line drawn to them. Review the newly inserted devices and move, delete, or otherwise modify them as appropriate. Once they are on the drawing, you can treat them like standard devices.
- Devices in both the drawing and the database will be reviewed to ensure their locations and settings match.
- Any changes to scheduled devices, such as new graphics for a device type, will be made on the drawing.

When this command is finished, the drawing and the database will match. All devices on the drawing will accurately reflect the information stored in the database.

Devices reinserted on the drawing from the database will be highlighted with lines from the origin to their insertion point. Review these devices to determine whether they should be kept. Use the standard CAD **ERASE** command to remove excess devices from the drawing.

The coordination lines can be removed either by using the standard CAD **ERASE** command and selecting the coordination lines, or by using the **Erase Coordination Lines** command.

When to Use the Coordinate Drawings and Database Command

When you make changes to a drawing, these changes are immediately recorded in the database. Changes are not recorded on the drawing until it is saved. If your CAD program crashes before the drawing is saved, the database will have newer and better information than the drawing. Use the Coordinate Drawings and Database command to match the drawing and database, and you can often recover information that was lost.

Changes to customization settings are not immediately reflected on the drawings. If you change your customization settings in the middle of a project, use the Coordinate Drawings and Database command to update the drawings.

There are other times when this command can fix errors in your project. A backup of the current drawing and database is made before the command is run in case something unexpected happens during the command.

Erase Coordination Lines

To erase coordination lines generated when using the Coordinate Drawings and Database command, go to

Ribbon: DM HVAC->Utilities-> ->Erase Coordination Lines

Pulldown Menu: DM HVAC->Utilities->Erase Coordination Lines

The coordination lines will be erased from the current drawing.

Coordination lines may also be erased using the standard CAD ERASE command.

Check for Drawings to Update

The Check for Drawings to Update command is used to check for and update any drawings that need to have changes made to them. Certain changes made on one drawing in a project will require changes to be made to other drawings in the project. Typically, these changes happen automatically.

This command will check for any drawings that need to have changes made and give you a chance to update them all.

To check if any drawings in the current project need to be updated, go to

```
Ribbon: DM HVAC->Utilities-> ->Check for Drawings to Update
```

Pulldown Menu: DM HVAC->Utilities->Check for Drawings to Update

The drawings that need to be updated will be identified. You will be given a chance to update them automatically if there are any.

Delete Extra Devices from Database

The Delete Extra Devices From Database command is used to delete devices from the database that are on drawings that no longer exist in the project.

Normally, you would use the standard CAD **ERASE** command to erase devices. They will be erased from the drawing and database.

If a drawing is moved or deleted before all of the devices are erased, the records still exist in the database. You cannot erase the device from the drawing because it no longer exists. Using this command, these devices can be deleted from the database.

To delete any devices that exist in the database that either do not have an associated drawing or are on a drawing that no longer exists, go to

Ribbon: DM HVAC->Utilities-> ->Delete Extra Devices From Database

Pulldown Menu: DM HVAC->Utilities->Delete Extra Devices From Database

The drawing that each device is on will be compared with the list of drawings in the project. If a drawing in the database does not exist, the **Delete devices?** dialog box will appear.

Delete device	s?	\times
Devices	were found in the database on drawing M1.DW0	G.
Th	is drawing does not appear to exist anymore.	
Would you like	to permanently delete these devices from the da	tabase?
Ye	es Yes to All No to All	

Yes: Press this button to delete the devices from the listed drawing.

Yes to All: Press this button to delete the devices from all of the drawings that are not found.

No: Press this button to not delete the devices from the listed drawing. Use this button if the drawing should exist and you plan to recreate it.

No to All: Press this button to not delete the devices from all of the drawings that are not found.

Rename Database

The Rename Database command is used to change the name of the database file associated with the current drawing. It will change the suffix of the file when viewed in Windows Explorer. Nothing else in the project will be changed.

To rename the database, go to

```
Ribbon: DM HVAC->Utilities-> ->Rename Database
```

Pulldown Menu: DM HVAC->Utilities->Rename Database

Rename HVAC Database Dialog Box

Rename HVAC Database	×
Project Name: Leave field empty to use default.	
OK Cancel	

Project Name: The new name of the database.

Enter the new *Project Name* and press the **OK** button. The suffix of the database file associated with the current drawing will be changed. No other changes will be made in the project.

Delete DM Backups Over 30 Days Old

The Delete DM Backups Over 30 Days Old command is used to delete files from the DMBackup folder. Backups are made on a regular basis for projects and when certain utility commands are run. When a project is opened, any backups over 30 days old are automatically deleted. However, if a project is not opened, backups over 30 days old will not be deleted.

This command will erase all of the backups that it finds in any subfolders of the selected folder. If you have a folder that contains all your projects, you can select the main folder and have all backups from all projects deleted.

Backups less than 30 days old will not be deleted. You must use Windows Explorer to delete these folders.

To delete backup files that are over 30 days old, go to

Ribbon: DM HVAC->Utilities-> ->Delete DM Backups Over 30 Days Old

Pulldown Menu: DM HVAC->Utilities->Delete DM Backups Over 30 Days Old

Select Folder Dialog Box

A Select Folder			×
Look in:	HVAC ~	G 🌶 📂 🛄 -	
_	Name	Date modified	Туре
		2/27/2019 1:19 PM	File folder
Quick access	NEW	1/9/2019 5:33 PM	File folder
	OLD	11/29/2018 1:44 PM	File folder
Desktop			
Libraries			
This PC			
	<		>
Network	Folder name: C:\Users\Kane\Desktop\Tutorial\HVAC\	DMBackup 🗸	OK
			Cancel

Select the folder to delete backups from. All backups over 30 days old will be deleted.

Find Lost Toolbars

The Find Lost Toolbars command is used to move all of the toolbars to a visible location on the screen. If your CAD program moves the toolbars to a location that cannot be seen, the toolbars are made unusable. Moving all of the toolbars is the simplest solution to this problem.

To find lost toolbars, go to

Ribbon: DM HVAC->Utilities-> ->Find Lost Toolbars

Pulldown Menu: DM HVAC->Utilities->Find Lost Toolbars

Once this command is entered, all of the toolbars will be displayed. Move any toolbars you want visible to the correct location. Close any toolbars that you do not use.

Reload Ribbons

The Reload Ribbons command is used to reload the Design Master HVAC ribbon tabs. Use this command if the tabs have disappeared from your ribbon.

To reload the ribbon tabs, go to

Pulldown Menu: DM HVAC->Utilities->Reload Ribbons

Once this command is run, the ribbon tabs should be reloaded and visible on your ribbon.

Delete Drawing

The Delete Drawing command is used to delete a drawing that contains Design Master HVAC devices and remove all of the associated information from the database.

If you delete a drawing using Windows Explorer, the database will not be updated. Any devices that existed on the drawing will still exist in the database. It is possible to delete these devices using the <u>Delete Extra Devices</u> from Database command, but this method can easily create larger problems.

Deleting the drawing using this command will make sure that the necessary changes to the database are made.

You do not need to use this command if the drawing does not contain Design Master HVAC devices, though there is no harm if you do.

To delete a drawing, go to

Ribbon: DM HVAC->Utilities-> ->Delete Drawing

Pulldown Menu: DM HVAC->Utilities->Delete Drawing

A Select Drawing To Delete ×				
Look in:	HVAC ~	🌀 🤌 📂 🛄 🕇		
Quick access Desktop	Name DMBackup NEW OLD M-0.1.dwg M-1.0 (1st Floor).dwg M-1.1 (2nd Floor).dwg	Date modified 2/27/2019 1:19 PM 1/9/2019 5:33 PM 11/29/2018 1:44 PM 11/26/2018 1:56 PM 2/27/2019 11:26 AM 11/21/2018 1:37 PM	Type File folder File folder AutoCAD AutoCAD AutoCAD	
Libraries	M-1.3 (Roof).dwg xr-floor1.dwg xr-floor2.dwg xr-site.dwg	11/28/2018 10:43 11/20/2018 9:00 AM 11/20/2018 9:00 AM 11/20/2018 9:00 AM	AutoCAD AutoCAD AutoCAD AutoCAD	
Network	< File name: Files of type: DWG Files (*.dwg) Open as read-only	~	> Open Cancel	

Select Drawing to Delete Dialog Box

Select the drawing to delete and press the **Open** button.

The drawing will be deleted. All of the devices on the drawing will be deleted from the database.

A backup of the drawing and the database will be made before the command is run in case a drawing is deleted accidentally.

Rename Drawing

The Rename Drawing command is used to rename the current drawing. The database will be updated so that any devices associated with the drawing will have their drawing location information changed.

If you rename a drawing using Windows Explorer or the standard CAD **SAVEAS** command, the database does not know if you intend to copy or rename the drawing. It is very easy to create significant errors in your drawings and database if you choose the wrong option.

Renaming the drawing using this command will prevent these errors from happening.

To rename the current drawing, go to

Ribbon: DM HVAC->Utilities-> ->Rename Drawing

Pulldown Menu: DM HVAC->Utilities->Rename Drawing

Rename Drawing Dialog Box

Rename Drawing			×
New Drawing Name:	ОК	Cancel	

New Drawing Name: The name of the new drawing.

Enter the *New Drawing Name* into the dialog box and press the **OK** button. The name of the current drawing will be changed.

Copy Drawing

The Copy Drawing command is used to copy the current drawing. Copies of all of the devices on the drawing will be created in the database.

If you copy a drawing using Windows Explorer or the standard CAD **SAVEAS** command, the database does not know if you intend to copy or rename the drawing. It is very easy to create significant errors in your drawings and database if you choose the wrong option.

Copying the drawing using this command will prevent these errors from happening.

To copy the current drawing, go to

Ribbon: DM HVAC->Utilities-> ->Copy Drawing

Pulldown Menu: DM HVAC->Utilities->Copy Drawing

Copy Drawing Dialog Box

Copy Drawing			×
New Drawing Name:			
	OK	Cancel	

New Drawing Name: The name of the new drawing.

Enter the *New Drawing Name* into the dialog box and press the **OK** button. A copy of the current drawing will be made using the new name.

Copy Drawing and Remove Links to Database

The Copy Drawing and Remove Links to Database command is used to make a copy of a drawing and remove all of the links between the Design Master HVAC entities on the drawing and the database. The appearance of the drawing will not change. All entities on the drawing will remain. However, they will be converted to standard CAD entities and their connection to the database will be removed.

To copy a drawing and remove all of the links to the database, go to

Ribbon: DM HVAC->Utilities-> ->Copy Drawing and Remove Links to Database

Pulldown Menu: DM HVAC->Utilities->Copy Drawing and Remove Links to Database

Save Drawing as Dialog Box

A Save drawing as				
Save in:	HVAC	~	G 🤌 📂 🛄 -	
Quick access Desktop Libraries This PC	Name DMBackup M0.dwg M1.dwg M1_recover. M2.dwg M2_recover. xbk.dwg	dwg dwg	Date modified 9/27/2018 1:28 PM 8/8/2018 10:43 AM 9/27/2018 1:29 PM 9/26/2018 4:21 PM 9/24/2018 9:17 AM 9/26/2018 4:21 PM 8/7/2018 6:26 AM	Type File folder AutoCAD AutoCAD AutoCAD AutoCAD AutoCAD
Network	< File name: Save as type:	DWG Files (*.dwa)	~	> Save Cancel

Select a location for the copy, enter a file name, and press the **OK** button. A copy of the current drawing will be made using the new name. All of the Design Master HVAC links to the project database will be removed.

The project database will not be modified during this command.

Copy Drawing and Remove All DM Entities

The Copy Drawing and Remove All DM Entities command is used to make a copy of a drawing with all of the Design Master HVAC entities on it erased.

This command is useful when you want to create a new drawing with the same settings as an existing drawing in the project. Using other methods, the copied drawing will copy the Design Master HVAC entities. Cleaning up these extra devices can cause problems if not done correctly. This command will remove all of the devices for you, leaving you with a new drawing that you can immediately start using.

To copy a drawing and remove all of the Design Master HVAC entities, go to

Ribbon: DM HVAC->Utilities-> ->Copy Drawing and Remove All DM Entities

Pulldown Menu: DM HVAC->Utilities->Copy Drawing and Remove All DM Entities

Save Drawing as Dialog Box


Select a location for the copy, enter a file name, and press the **OK** button. A copy of the current drawing will be made using the new name. All of the Design Master HVAC entities on the new drawing will be erased.

The project database will not be modified during this command.

Disconnect HVAC Database from Drawing

The Disconnect HVAC Database from Drawing command is used to remove all of the links between the Design Master HVAC entities on the drawing and the database. The appearance of the drawing will not change. All entities on the drawing will remain. However, they will be converted to standard CAD entities and their connection to the database will be removed.

To disconnect the database from the drawing, go to

Ribbon: DM HVAC->Utilities-> ->Disconnect HVAC Database from Drawing

Pulldown Menu: DM HVAC->Utilities->Disconnect HVAC Database from Drawing

The project database will not be modified during this command.

Merge Project

The Merge Project command is used to merge drawings and rooms from another project into the current project.

To merge another project with the current project, go to

Ribbon: DM HVAC->Utilities-> UIIL ->Merge Project

Pulldown Menu: DM HVAC->Utilities->Merge Project

Select HVAC Project to Merge Box Dialog Box

A Select HVAC	Project to Merge			×
Look in:	DM Manual	~	G 🤌 📂 🛄 🗸	
Quick access Desktop Libraries	Name DMBackup dm_elec.dm	1	Date modified 9/27/2018 2:38 PM 9/6/2018 11:00 AM 9/27/2018 2:52 PM	Type File folder DM File DM File
	<			>
Network	File name: Files of type:	DM Files (*.DM)	~	Open Cancel

Browse to the project you want to merge with the current project, select the "dm_hvac.dm" file and press the **Open** button.

Merge Projects Dialog Box

Merge Projects			×	
Merge Projects Drawings to MergeNONE M1.DWG		Rooms to Merge NONE Room 101	×	
OK Cancel				

Drawings to Merge: Select the drawings from the other project to merge with the current project. Use the **SHIFT** and **CTRL** keys to select multiple drawings. The selected drawings will be copied from the other project to the current project. All of the devices on the drawing will be updated to work correctly with the new project.

Schedule entries will be created for devices as appropriate. If a schedule entry with the same name exists in both projects, the two definitions will be compared. If any part of the definitions is different, a copy of the schedule entry will be created in the current project. The copied schedule entry will be used for devices that are merged from the other project.

If you select a drawing with the same name as a drawing already in the project, you will be asked what to do with the drawing from the other project.

Drawing Name Conflict		
Drawings with these names alread M1.DWG	y exist in the project:	
Overwrite Existing Drawings	Create Drawings with New Names	Cancel

Overwrite Existing Drawings: Press this button to erase the drawing from the current project and replace it with the drawing from the other project. All of the devices on the drawing in the current project will be removed from the database.

Create Drawings with New Names: Press this button to create a drawing with a new name in the current project.

Rooms to Merge: Select the rooms from the other project to merge with the current project. Use the **SHIFT** and **CTRL** keys to select multiple rooms. Rooms that exist on the drawings selected in the *Drawings to Merge* list will be included in the merge even if they are not selected in this list.

Copy or Back Up Project

The Copy or Back Up Project command is used to make a complete copy or backup of the current project. When you copy or back up a project, it is important to copy all of the drawings and the Design Master database files. This command will copy all of the necessary files. Use this command if you want to make a backup of the current state of the project or if you want to make a copy to try a different design approach.

To copy or back up a project, go to

Ribbon: DM HVAC->Utilities-> ->Copy or Back Up Project

Pulldown Menu: DM HVAC->Utilities->Copy or Back Up Project

Select Folder to Copy or Back Up Project To Dialog Box

🙆 Select Folder	r to Copy or Back Up Project To		×
Look in:	HVAC ~	G 🤌 📂 🛄 -	
Quick access Desktop Libraries This PC	Name DMBackup	Date modified 1/3/2022 1:31 PM	Type File fo
Network	<		>
	Folder name:	~	OK
		(Cancel

Select the folder to copy or back up the project to and press the **OK** button. All files associated with the project will be copied and saved to the folder.

Check In Floating License

The Check In Floating License command is used with floating licenses to immediately check in the license so that another person can use the software. Floating licenses are checked out in 10-minute intervals. If no commands are run for 10 minutes, the license is automatically released and another person can use the software.

If another person attempts to use the software before the license is released, a warning message will be displayed for the new user, stating that no license is available. The new user can choose to ignore the warning and immediately start using the software. However, a license overuse exception will be recorded on the license server. If there are too many overuse exceptions, you will need to purchase another license.

Using this command, the original user can check in the floating license when they are done with it. The new user can then use the software immediately without causing a license overuse exception to be recorded.

To check in the floating license, go to

Ribbon: DM HVAC->Utilities-> ->Check In Floating License

Pulldown Menu: DM HVAC->Utilities->Check In Floating License

The floating license will be checked in and will be available for another person to use.

Help

This section describes the commands available for obtaining support, maintaining current licenses, and installing software updates.

Common Help Information

You are prompted to provide the following information when sending us a support request. We use this information to respond to your support request.

Name: Your name.

Email Address: Your email address. If possible, we will respond to your support request by email.

Phone Number: Your phone number. If we need additional information beyond what we can gather by email, we will call you.

Additional Information: A description of the problem you are having. The more information you can provide about your problem, the more likely we will be able to solve it for you. For example, specific devices that exhibit the problem you are having.

Your Design Master HVAC version, CAD program version, and Windows version will be sent automatically with the support request. You do not need to include that information here.

User Manual

To open the Design Master HVAC User Manual (which you are currently viewing), go to

Ribbon: DM HVAC->Utilities-> ->User Manual

Pulldown Menu: DM HVAC->Help->User Manual

The user manual will be opened in your web browser.

Tutorial

To open the Design Master HVAC Tutorial, go to

Ribbon: DM HVAC->Utilities-> ->Tutorial

Pulldown Menu: DM HVAC->Help->Tutorial

The tutorial will be opened in your web browser. The tutorial provides instructions for and examples of common tasks that can be performed using our software.

Knowledge Base

To open the Design Master HVAC Knowledge Base, go to

Ribbon: DM HVAC->Utilities-> ->Knowledge Base

Pulldown Menu: DM HVAC->Help->Knowledge Base

The knowledge base will be opened in your web browser. This page has useful links and information to help you when you have trouble with our software.

Remote Support

The Remote Support command allows us to connect to your computer over the internet. We will be able to see your screen and perform actions on your computer.

To allow us to connect to your computer, go to

Ribbon: DM HVAC->Utilities-> ->Remote Support

Pulldown Menu: DM HVAC->Help->Remote Support

The remote support program will run and allow us to connect to your computer.

An ID number will be displayed, which you will need to read aloud to us.

We use TeamViewer for our remote support. You can visit their website at <u>http://www.teamviewer.com</u>. Information about security is available at <u>http://www.teamviewer.com/en/products/security.aspx</u>.

Send Project to Design Master Support

The Send Project to Design Master Support command is used to send us the current drawing and the associated Design Master HVAC database. Providing us with your project helps us recreate the problem you are having and find a solution to it. It is our preferred way for you to report a problem or ask a question. Many problems are specific to a project and having that immediately helps us assist you.

To send a copy of your project's current drawing and database to us, go to

 ${\bf Ribbon:}\ {\tt DM}\ {\tt HVAC->Utilities->}\ {\tt ->Send}\ {\tt Project}\ {\tt to}\ {\tt Design}\ {\tt Master}\ {\tt Support}$

 $\label{eq:point} Pulldown \ Menu: \ \texttt{DM HVAC->Help->Send Project to Design Master Support}$

Send Project to Design Master Support Dialog Box

😥 Send Project to Design Master Support	×
To: Design Master Support (support@designmaster.biz)	
From:	
Name:	
Email Address (required):	
Re-enter Email Address:	
Phone Number:	
Additional Information:	7
Attachments (2 files)	
Save to desktop (check if sending fails or crashes)	

See the <u>Common Help Information</u> section for more information about the *Name*, *Email Address*, *Phone Number* and *Additional Information* fields.

Attachments: Press this button to change the files that will be sent with the support request.

The Design Master Attachments dialog box will appear.

Design Master Attachments	×
C: \Users\Kane\Desktop\Tutorial\HVAC\dm_hvac Tutorial.dm C: \Users\Kane\Desktop\Tutorial\HVAC\M1.dwg	
	Add
	Remove
OK Cancel	

By default, the current drawing and associated Design Master HVAC database will be included in the list of files to send.

Add: Press this button to select additional files to send.

Remove: Press this button to remove the selected file from the list to send.

Save to desk top: Whether the support request is sent directly to us or saved to your desktop for you to email.

By default, this box is not checked. Support requests are automatically sent with no further input from you.

Some companies block outgoing messages from programs other than your email client. When this happens, you will be given a chance to save a ZIP file to your desktop that you can send to us manually. Detecting this configuration can take a long time.

When this box is checked, the attempt to send the message directly is skipped and you are immediately prompted to save a ZIP file to your desktop. Skipping the attempt to send saves time.

Go to Design Master Support Website

To open the Design Master Support Website, go to

Ribbon: DM HVAC->Utilities-> ->Go to Design Master Support Website

 $\label{eq:point} Pulldown \ Menu: \ \texttt{DM HVAC->Help->Go to Design Master Support Website}$

The support page will be opened in your web browser. This page has useful links and information to help you when you have trouble with our software.

Send Email to Design Master Support

To send an email to us, go to

Ribbon: DM HVAC->Utilities-> ->Send Email to Design Master Support

Pulldown Menu: DM HVAC->Help->Send Email to Design Master Support

A draft email addressed to <u>support@designmaster.biz</u> will be opened in your preferred email client. Enter your message and send the email.

Send Master and Standards Databases to Design Master Support

The Send Master and Standards Databases to Design Master Support command is used to send us your master and standards customization database files. We will occasionally ask for these files when helping you solve problems related to your customization.

To send a copy of your master and standards databases to us, go to

Ribbon: DM HVAC->Utilities-> ->Send Master and Standards Databases to Design Master Support

Pulldown Menu: DM HVAC->Help->Send Master and Standards Databases to Design Master Support

Send Master and Standards Databases to Design Master Support Dialog Box

😥 Send Master and Standards Databases to Design Master Support	×			
To: Design Master Support (support@designmaster.biz)				
From:	_			
Name:				
Email Address (required):				
Re-enter Email Address:				
Phone Number:				
	^			
	~			
Attachments (2 files)				
Save to desktop (check if sending fails or crashes)				
OK Cancel				

See the <u>Common Help Information</u> section for more information about the *Name, Email Address, Phone Number* and *Additional Information* fields.

Your master database and all of your standards databases will be sent.

Save to desk top: Whether the support request is sent directly to us or saved to your desktop for you to email.

By default, this box is not checked. Support requests are automatically sent with no further input from you.

Some companies block outgoing messages from programs other than your email client. When this happens, you will be given a chance to save a ZIP file to your desktop that you can send to us manually. Detecting this configuration can take a long time.

When this box is checked, the attempt to send the message directly is skipped and you are immediately prompted to save a ZIP file to your desktop. Skipping the attempt to send saves time.

Set Email Address

The Set Email Address command is used to set your default email address and other contact information used when sending support cases to us.

To set your default contact information, go to

Ribbon: DM HVAC->Utilities-> ->Set Email Address

Pulldown Menu: DM HVAC->Help->Set Email Address

Update Contact Information Dialog Box

Update Contact Information		
Name:		
Email Address:		
Phone Number:		
OK		

See the <u>Common Help Information</u> section for more information about the *Name*, *Email Address* and *Phone Number* fields.

Installation Settings

The Installation Settings command is used to display the current installation settings. It can be used to verify the installation settings are correct, and modify them if necessary.

To view and modify the installation settings, go to

Ribbon: DM HVAC->Utilities-> ->Installation Settings

 $Pulldown \ Menu: \ {\tt DM \ HVAC->Help->Installation \ Settings}$

There are three different installation types.

Local

A local install should be used when there is only one person using Design Master HVAC in your office. All program and customization files are stored directly on the computer. This install type should be used even if the one person is installing the software on a laptop.

See the Local Install section for more information about this install type.

Network

A network install should be used when there are multiple people using Design Master HVAC in your office. The program files are stored on the computer and are automatically updated from the network. The customization files are stored on the network and are shared between users.

See the **<u>Network Install</u>** section for more information about this install type.

Network Laptop

A network laptop install should be used if the computer is a laptop and multiple people are using Design Master HVAC in your office. The program files are stored on the laptop and are automatically updated from the network. The customization files are stored on both the network and the laptop. The network customization files will be used when the laptop is connected to the network. The local customization files will be used when the laptop is away from the office and disconnected from the network.

See the Network Laptop Install section for more information about this install type.

The local customization will automatically be updated with any changes to the network customization once a day. Use the Update Laptop Customization command to manually update the customization stored on the computer. See the Update Laptop Customization section for more information.

Local Install

This section describes configuring Design Master HVAC for a local install. A local install should be used when there is only one person using Design Master HVAC in your office. All program and customization files are stored directly on the computer. This install type should be used even if the person is installing the software on a laptop.

If you have floating licenses, this install type should not be used.

Configuring an Installation on a Local Computer

Design Master HVAC Install Configuration			×
Install Type			
Local	◯ Network		O Network Laptop
Folder Locations			
Install Folder:			Open
Customization Folder:		Select Customization Folder	Reset Open
Alert me when updates are available			
	OK Cancel		

Install Type: The type of installation. The dialog box will change depending upon the type selected.

- Local: The installation type described in this section.
- Network: See the <u>Network Install</u> section for more information about this install type.
- Network Laptop: See the <u>Network Laptop Install</u> section for more information about this install type.

Install Folder: The folder where Design Master HVAC is installed. This folder is forced to be located in your Application Data folder.

Customization Folder: The folder where the customization files are stored.

Select Customization Folder: Press this button to select a new location for the customization folder.

Reset: Press this button to reset the customization to the default location, located in your Application Data folder.

Open: There are two **Open** buttons in the dialog box. Press this button to open Windows Explorer to one of the folders listed in the dialog box. The first button opens the install folder. The second button opens the customization folder.

Alert me when updates are available: Whether updates are checked for automatically. If this is checked, an update check will occur the first time you run a command each day. An alert will appear if an update is available.

Network Install

This section describes configuring Design Master HVAC for a network install. A network install should be used when there are multiple people using Design Master HVAC in your office. The program files are stored on the computer and are automatically updated from the network. The customization files are stored on the network and are shared between users.

Configuring an Installation on a Network

Design Master HVAC Install Configuration			×
Install Type			
⊖ Local	Network		O Network Laptop
Folder Locations			
Local Install Folder:			Open
Network Install Folder:		Select Network Install Folder	Open
Customization Folder:		Select Customization Folder	Open
Alert me when updates are available			
	OK	Cancel	

Install Type: The type of installation. The dialog box will change depending upon the type selected.

- Local: See the Local Install section for more information about this install type.
- Network: The installation type described in this section.
- Network Laptop: See the <u>Network Laptop Install</u> section for more information about this install type.

Local Install Folder: The folder on the local computer where Design Master HVAC is installed. This folder is forced to be located in your Application Data folder.

Network Install Folder: The folder on the network where Design Master HVAC is installed. This folder should be on the network. All computers in your office should use the same network install folder.

Updates should be installed to this folder. Updates to this folder will automatically be copied to the local install folder.

Customization Folder: The folder where the customization files are stored. This folder should be on the network. All computers in your office should use the same customization folder.

Select Customization Folder: Press this button to select a new location for the customization folder.

Open: There are three **Open** buttons in the dialog box. Press this button to open Windows Explorer to one of the folders listed in the dialog box. The first button opens the local install folder. The second button opens the local install folder. The third button opens the customization folder.

Alert me when updates are available: Whether updates are checked for automatically. If this is checked, an update check will occur the first time you run a command each day. An alert will appear if an update is available.

Network Laptop Install

This section describes configuring Design Master HVAC for a network laptop install. A network laptop install should be used if the computer is a laptop and multiple people are using Design Master HVAC in your office. The program files are stored on the laptop and are automatically updated from the network. The customization files are stored on both the network and the laptop. The network customization files will be used when the laptop is connected to the network. The local customization files will be used when the laptop is away from the office and disconnected from the network.

Design Master HVAC Install Configuration		×
Install Type		
⊖ Local	◯ Network	Network Laptop
Folder Locations		
Local Install Folder:		Open
Network Install Folder:	Select Network Install Folder	Open
Level Customization Folders	Colored Local Contaction Folder	0
	Select Local Customization Folder Reset	Open
Network Customization Folder:	Select Network Customization Folder	Open
Men me when updates are available	OK Creat	
	UK Cancei	

Install Type: The type of installation. The dialog box will change depending upon the type selected.

• Local: See the Local Install section for more information about this install type.

- Network: See the Network Install section for more information about this install type.
- Network Laptop: The installation type described in this section.

Local Install Folder: The folder on the local computer where Design Master HVAC is installed. This folder is forced to be located in your Application Data folder.

Network Install Folder: The folder on the network where Design Master HVAC is installed. This folder should be on the network. All computers in your office should use the same network install folder.

Updates should be installed to this folder. Updates to this folder will automatically be copied to the local install folder.

Local Customization Folder: The folder where the local customization files are stored. This customization folder is used if a network connection is not available.

Select Local Customization Folder: Press this button to select a new location for the customization folder.

Reset: Press this button to reset the customization to the default location, located in your Application Data folder.

Network Customization Folder: The folder where the customization files are stored. This folder should be on the network. All computers in your office should use the same customization folder.

This folder is used when the computer is connected to the network. The files in this folder are copied to the local customization folder once each day.

Select Network Customization Folder: Press this button to select a new location for the customization folder.

Open: There are four **Open** buttons in the dialog box. Press this button to open Windows Explorer to one of the folders listed in the dialog box. The first button opens the local install folder. The second button opens the local install folder. The third button opens the local customization folder. The fourth button opens the network customization folder.

Alert me when updates are available: Whether updates are checked for automatically. If this is checked, an update check will occur the first time you run a command each day. An alert will appear if an update is available.

Update Local Install from Network

The Update Local Install from Network command is used to update the program files on your computer from the program files on the network if you have a <u>network install</u> or <u>network laptop install</u>.

This process should take place automatically. Only use this command if there is a problem.

To update the local install from the network, go to

Ribbon: DM HVAC->Utilities-> ->Update Local Install from Network

Pulldown Menu: DM HVAC->Help->Update Local Install from Network

The program files on your computer will be updated.

Check for Updates

The Check for Updates command compares the version of Design Master HVAC you have installed with the latest version that is available on our website. You will be given instructions for installing a newer version if one is available.

To check for updates, go to **Ribbon:** DM HVAC->Utilities-> ->Check for Updates

Pulldown Menu: DM HVAC->Help->Check for Updates

The dialog box that appears depends upon whether an update is available from our website.

Update Not Available

If an update is not available on our website, the following dialog box will appear.

Design Master HVAC X	
You are using the most current version of Design Master HVAC. Current Version: ABC (DEF)	
ОК	
Alert me when updates are available	

Current Version: The current version of the software. **ABC** will be replaced with the release number. **DEF** will be replaced with the build number.

Alert me when updates are available: Whether updates are checked for automatically. If this is checked, an update check will occur the first time you run a command each day. An alert will appear if an update is available.

Update Available

If the versions are different, you will be prompted to install the latest version.

Design Master HVAC	Х
A newer version of Design Master HVAC is available.	
New Version: JKL (MNO) P/Q/R Current Version: ABC (DEF), released G/H/I Go to update web page.	
Remind me again in a week. Remind me tomorrow. Don't remind me about this update again Alert me when updates are available Alert me when updates are available	iin.

New Version: The new version of the software available from our website. **JKL** will be replaced with the new release number. **MNO** will be replaced with the new build number. **P/Q/R** is the date the new version was released.

Current Version: The current version of the software. **ABC** will be replaced with the currently installed release number. **DEF** will be replaced with the currently installed build number. **G/H/I** is the date the currently installed version was released.

Go to update web page: Press this button to go to a page on our website about the new release. The page will include a list of new features, install instructions, and a download link.

Remind me again in a week: Press this button to close the dialog box. You will be reminded about the new version again in one week.

Remind me tomorrow: Press this button to close the dialog box. You will be reminded about the new version again tomorrow.

Don't remind me about this update again: Press this button to close the dialog box. You will not be reminded about the new version again.

Alert me when updates are available: Whether updates are checked for automatically. If this is checked, an update check will occur the first time you run a command each day. An alert will appear if an update is available.

Install Patch

The Install Patch command is used to install patches we send to you. These patches will be ZIP files sent in response to crash reports or support requests. We send patches to specific users to solve problems they are currently having. They are not posted to our website.

We regularly release updated versions of Design Master HVAC that include all of the patches we sent to customers. These updates are available from our website. You do not need to use this command to install these updates.

Once you have installed a patch, you will not need to install it again. All future patches or updates you receive will include the patch.

To install a software patch, go to

Ribbon: DM HVAC->Utilities-> ->Install Patch

Pulldown Menu: DM HVAC->Help->Install Patch

Select Patch File Dialog Box

A Select Patch	File			×
Look in:	E Desktop	~	G 🌶 🖻 🛄 -	
Quick access	Name	^	Date modified	Туре
Desktop				
Libraries				
Lange Contract This PC				
S	<	Г		>
Network	File name:		L	Open
	Hiles of type:	ZIP Files (*.zip)	~	Cancel

Select the patch ZIP file and press the **Open** button. The patch will be installed on your computer. If you have a <u>network install</u>, it will also be installed on the network. Installing it to the network will update all of the other computers in your office.

The patch file will be erased after it is installed. It is erased to discourage you from installing it again in the future.

Restart your CAD program after installing the patch. The error you were seeing should now be resolved.

Install License

The Install License command is used to activate the license for Design Master HVAC.

To activate a license, go to

Ribbon: DM HVAC->Utilities-> ->Install License

Pulldown Menu: DM HVAC->Help->Install License

Install Design Master HVAC License Dialog Box

😥 Install Design Master HVAC License	×
License expires on Enter your license ID in the box below and press the "Activate" button. Name:	
Email Address:	
License ID:	
Activation Password (Leave blank if you do not have one):	
Activate Cancel	

Enter your *Name*, *Email Address*, *License ID*, and *Activation Password* in the fields provided. If you did not receive a password, leave the *Activation Password* field blank.

Press the Activate button to activate your license.

About

To view general information about the Design Master HVAC software, go to

```
Ribbon: DM HVAC->Utilities-> ->About
```

```
Pulldown Menu: DM HVAC->Help->About
```

A dialog box will appear that includes the version of software you are running and your current license status.

Customization

Enter topic text here. This section describes the commands available to customize the software. A wide variety of customization options are included to allow you to match the drawings that are created to your existing company standards.

General Customization Commands

Most of the customization sections include four commands:

- Edit Project List
- Edit Master List Or Edit Standards List
- Copy Project List to Master Or Copy Project List to Standards
- $\ensuremath{^\circ}$ Copy Master List to Project $Or\,Copy$ Standards List to Project

The command name and how it functions varies slightly depending upon whether the default settings are stored in the master database or a standards database.

This section describes these general commands and how they work for the customization commands.

Edit Project List

The Edit Project List command is the first command listed in each customization section. It is used to modify the customization settings in the current project database. It allows you to make changes to a specific project without affecting other projects.

Edit Master List

The Edit Master List command is one of the commands that may be listed second in each customization section. It is used to modify the customization settings in the master database. These settings will be used when you start a new project. Changes here do not affect any projects already created.

Edit Standards List

The Edit Standards List command is one of the commands that may be listed second in each customization section. It is used to modify the customization settings in a standards database. These settings can be used when you start a new project. Changes here do not affect any projects already created.

If only one standards database exists, the command will immediately start editing that database using the appropriate dialog box.

If more than one standards database exists, you will be prompted to select the standards database to edit. After you select the standards database to edit, the appropriate dialog box will appear with the settings from that standards database displayed.

Copy Project List to Master

The Copy Project List to Master command will copy the settings from the project database to the master database. Often, it is simplest to start your first project and customize it as you go. When you are finished, you can use this command to copy the settings for use with future projects.



Copy Project to Master	×
Do you want to copy the diffuser blocks from this project to the master database? Type MASTER in the box below and press OK to continue.	
OK Cancel	

To copy the settings, type **MASTER** and press the **OK** button. This step helps prevent you from accidentally overwriting the settings in your master database.

Copy Project List to Standards

The Copy Project List to Standards command will copy the settings from the project database to a standards database. Often, it is simplest to start your first project and customize it as you go. When you are finished, you can use this command to copy the settings for use with future projects.

If only one standards database exists, the settings will be copied to that standards database. The **Copy Project to Standards** dialog box will appear immediately.

If more than one standards database exists, you will be prompted to select a standards database to which the settings will be copied. After you make your selection, the **Copy Project to Standards** dialog box will appear.

Copy Project to Standards	\times
Do you want to copy the options from this project to the standards database? Type STANDARD in the box below and press OK to continue.	
OK Cancel	

To copy the settings, type **STANDARD** and press the **OK** button. This step helps prevent you from accidentally overwriting the settings in your standards database.

Copy Master List to Project

The Copy Master List to Project command will copy the settings from the master database to the project database. You can use this to update projects you have already started with new settings you have set in your master database.

Copy Standards List to Project

The Copy Standards List to Project command will copy the settings from a standards database to the project database. You can use this to update projects you have already started with new settings you have set in your standards database.

If only one standards database exists, the settings will be copied from that standards database.

If more than one standards database exists, you will be prompted to select the standards database from which the settings will be copied.

User Options

The User Options command allows you to customize settings that are specific to you. These settings are stored on your computer. They are not stored in the project, master, or standards database. Some of these settings are shared with other Design Master programs you have installed on your computer.

To update your user settings, go to

Ribbon: DMH: Customization->User Customization-> USER User Options

Pulldown Menu: DM HVAC->Customization->User Options

Design Master User Settings Dialog Box

😥 Design Master User Settings	×
Name	Value
User Support Information	
Name	
Email	
Phone	
Save support emails to the desktop (set to "Yes" if sending fails or crashes)	No
Drawing Options	
Zoom to schedule after insertion	No
Automatically open drawings that need to be updated	No
F HVAC	
Alert me when updates are available	Yes
OK Cancel	

The **Design Master User Options** dialog box contains a list of all of the user options and their current settings. The options are arranged in groups in the list. The groups are described in the sections below:

- <u>User Support Information</u>
- Drawing Options
- HVAC

Editing a Setting

To edit an option setting, select the Value in the list and enter a new value.

Press the **OK** button to save your changes.

User Support Information

This section describes the options available in the User Support Information group in the Design Master User Settings dialog box.

😥 Design Master User Settings	×
Name	Value
User Support Information	
Name	
Email	
Phone	
Save support emails to the desktop (set to "Yes" if sending fails or crashes)	No
Drawing Options	
+ HVAC	
OK Cancel	

Name: Your name.

Email: Your email address. This is the email address we will use when replying to support requests from you.

Phone: Your phone number. This phone number will be sent with any support requests you send. It is not a required field, but having it in the support requests helps us call you if we need additional information.

Save support emails to the desk top (set to "Yes" if sending fails or crashes): Support requests and bug reports can be emailed directly from Design Master HVAC. Some company's networks disable this ability, causing the send to fail or crash. When this happens, the information is saved to a file on your desktop that you can email to us manually.

- Yes: Design Master HVAC does not attempt to send the email directly to us. Instead, it saves it to the desktop. Choose this setting if you consistently have trouble sending us support emails through our software. Determining that the send step will fail can take time. When you know it will fail, skipping it will save you time.
- No: Design Master HVAC will attempt to send the email directly to us. When possible, this is the setting you should use.

Drawing Options

This section describes the options available in the **Drawing Options** group in the **Design Master User Settings** dialog box.

🕺 Design Master User Settings	×
Name	Value
User Support Information	
Zoom to schedule after insertion	No
Automatically open drawings that need to be updated	No
HVAC	
OK Cancel	

Zoom to schedule after insertion: After you insert a schedule on the drawing, you can specify whether the drawing should zoom to the schedule or remain at the same location.

- Yes: The drawing will zoom to the schedule after it has been inserted.
- No: The drawing will remain at the same location after a schedule is inserted.

Automatically open drawings that need to be updated: Design Master HVAC projects can span multiple drawings. Changes in one drawing can require that changes be made in another drawing. In order to make the changes in the other drawing, it must be opened.

- Yes: When a change in another drawing is required, the other drawing will be opened. This will take a moment, but when it is finished, the current drawing will remain active. If the other drawing is already open, nothing will happen.
- No: When a change in another drawing is required, you will be alerted at the command line, but it will not automatically be opened. The alert will continue to appear at the command line until you manually open the drawing and it is updated.

HVAC

This section describes the options available in the HVAC group in the Design Master User Settings dialog box.

😥 Design Master User Settings	×
Name	Value
User Support Information	
HVAC	
Alert me when updates are available	Yes
OK Cancel	

Alert me when updates are available: Whether updates are checked for automatically. If this is checked, an update check will occur the first time you run a command each day. An alert will appear if an update is available.

Options

The Options commands allow you to customize a variety of settings that affect the calculations in your project and appearance of your drawings.

See the <u>General Customization Commands</u> section for more information about how the Edit Project List, Edit Standards List, Copy Project List to Standards, and Copy Standards List to Project commands work.

To edit the options project list, go to



Design Master HVAC Options Dialog Box

	Value
Default Fittings	
Rectangular elbow	Square elbow
Rectangular branch	Boot tee
Rectangular cross	Boot tee
Round elbow	Radius elbow
Round branch	Boot tee
Round cross	Boot tee
Transparent ducts	None
ittings	
Radius for elbows	1.5
Angle of transitions	15
Turning vanes on square elbows and wyes	Yes
Juctwork	
Rectangular duct label format	WxD
Lined rectangular duct label format	Same as non-lined duct label format
Round duct label format	D%%C
Lined round duct label format	Same as non-lined duct label format
Oval duct label format	WxD%%C
Lined oval duct label format	Same as non-lined duct label format
Maximum single line width (in)	2
Default interior lining width (in)	3
Default exterior lining width (in)	3
Show background below ductwork	Yes
Return and exhaust arrow direction	Toward diffusers
Draw double line after inserting ducts	No
Minimum duct size (in)	0
Use odd rectangular duct sizes below this size (in)	0
Use odd round duct sizes below this size (in)	0
Use odd flat oval duct sizes below this size (in)	0
Diffusers	
Show arrows on 4 way throw patterns	No
· · ·	

The **Design Master HVAC Options** dialog box contains a list of all of the options and their current settings. The options are arranged in groups in the list.

Editing a Setting

To edit an option setting, select the *Value* in the list and enter a new value.

Press the **OK** button to save your changes.

If the change you made to the options does not immediately appear on the drawing, run the <u>Coordinate Drawings</u> <u>and Database</u> command. This command will update the drawing to use the new settings you have specified.

Default Fittings

This section describes the options available in the **Default Fittings** group in the **Design Master HVAC Options** dialog box.

😥 Design Master HVAC Options	×
Key	Value
Default Fittings	
Rectangular elbow	Square elbow
Rectangular branch	Boot tee
Rectangular cross	Boot tee
Round elbow	Radius elbow
Round branch	Boot tee
Round cross	Boot tee
Transparent ducts	None
Ductwork	
Diffusers	
Diffuser Connections	
Building Project Information	
Elevation Labels	
■ 3D-BIM	
Miscellaneous	
	OK Cancel

Rectangular elbow: The default fitting used for elbows in rectangular ducts.

- Square elbow: A <u>Square Elbow</u> fitting is used. See *Turning Vanes on Square Elbows and Wyes* in the <u>Fittings</u> options section for whether the elbow includes turning vanes.
- Radius elbow: A <u>Radius Elbow</u> fitting is used. See *Radius for Elbows* in the <u>Fittings</u> options section for the radius used for the elbows.

Rectangular branch: The default fitting used for a single takeoff in a rectangular duct.

- Any angle tee: A Variable Angle Branch fitting is used.
- Boot tee: A <u>Boot Tee</u> fitting is used.
- Conical tee: A <u>Conical Tee</u> fitting is used.
- Straight takeoff: A Straight Tee fitting is used.
- Wye: A Wye / Bullnose Tee fitting is used.
- Transition tee: A <u>Transition Tee</u> fitting is used.

Rectangular cross: The default fitting used for a cross in a rectangular duct.

- Boot tee: A <u>Boot Tee</u> fitting is used.
- Conical tee: A <u>Conical Tee</u> fitting is used.
- Straight takeoff: A Straight Tee fitting is used.

• Transition tee: A <u>Transition Tee</u> fitting is used.

Round elbow: The default fitting used for elbows in round and flat oval ducts.

- Square elbow: A <u>Square Elbow</u> fitting is used. See *Turning Vanes on Square Elbows and Wyes* in the <u>Fittings</u> options section for whether the elbow includes turning vanes.
- Radius elbow: A <u>Radius Elbow</u> fitting is used. See *Radius for Elbows* in the <u>Fittings</u> options section for the radius used for the elbows.

Round branch: The default fitting used for a single takeoff in a round or flat oval duct.

- Any angle tee: A <u>Variable Angle Branch</u> fitting is used.
- Boot tee: A <u>Boot Tee</u> fitting is used.
- Conical tee: A <u>Conical Tee</u> fitting is used.
- Straight takeoff: A <u>Straight Tee</u> fitting is used.
- Wye: A <u>Wye / Bullnose Tee</u> fitting is used.
- Transition tee: A <u>Transition Tee</u> fitting is used.

Round cross: The default fitting used for a cross in a round or flat oval duct.

- Boot tee: A <u>Boot Tee</u> fitting is used.
- Conical tee: A <u>Conical Tee</u> fitting is used.
- Straight takeoff: A <u>Straight Tee</u> fitting is used.
- Transition tee: A <u>Transition Tee</u> fitting is used.

Transparent Ducts: The fitting inserted in the previous duct before a transparent duct. See the <u>Previous and Next</u> <u>Ducts</u> section for information about determining which duct is the previous duct.

- End Cap: An End Cap fitting is inserted at the end of the previous duct.
- None: No fitting is inserted at the end of the previous duct.

Fittings

This section describes the options available in the **Fittings** group in the **Design Master HVAC Options** dialog box.

🕺 Design Master HVAC Options	×
Key	Value
Default Fittings	
Fittings	1.5
Radius for elbows	1.5
Angle of transitions	15
I urning vanes on square elbows and wyes	Yes
Ductwork	
+ Diffusers	
Diffuser Connections	
Building Project Information	
Elevation Labels	
+ Miscellaneous	
QK Cancel	
- Concer	

Radius for elbows: The default radius of radius elbow fittings. The radius can be set for individual fittings by manually inserting the fitting using the **Radius Elbow** command.

Angle of transitions: The angle of duct transitions.

Turning vanes on square elbows and wyes: Whether square elbows and wyes include turning vanes by default. Turning vanes can be toggled for individual fittings by manually inserting the fitting using the **Square Elbow** or **Wye / Bullnose Tee** commands.

Ductwork

This section describes the options available in the **Ductwork** group in the **Design Master HVAC Options** dialog box.

y	Value
Default Fittings	
Fittings	
Ductwork	
Rectangular duct label format	WxD
Lined rectangular duct label format	Same as non-lined duct label format
Round duct label format	D%%C
Lined round duct label format	Same as non-lined duct label format
Oval duct label format	WxD%%C
Lined oval duct label format	Same as non-lined duct label format
Maximum single line width (in)	2
Default interior lining width (in)	3
Default exterior lining width (in)	3
Show background below ductwork	No
Return and exhaust arrow direction	Toward diffusers
Minimum duct size (in)	0
Use odd rectangular duct sizes below this size (in)	0
Use odd round duct sizes below this size (in)	0
Use odd flat oval duct sizes below this size (in)	0
Diffusers	
Diffuser Connections	
Building Project Information	
Elevation Labels	
3D-BIM	
Miscellaneous	

Rectangular duct label format: The duct label used on rectangular ducts. See the **Duct Label Format Codes** section below for more information about the values that can be automatically inserted in the label.

Lined rectangular duct label format: The duct label used on lined rectangular ducts. See the **Duct Label Format Codes** section below for more information about the values that can be automatically inserted in the label.

• Same as non-lined duct label format: The duct label for lined rectangular ducts will use the *Rectangular duct label format* option.

Round duct label format: The duct label used on round ducts. See the **Duct Label Format Codes** section below for more information about the values that can be automatically inserted in the label.

Lined round duct label format: The duct label used on lined round ducts. See the **Duct Label Format Codes** section below for more information about the values that can be automatically inserted in the label.

• Same as non-lined duct label format: The duct label for lined round ducts will use the *Round duct label format* option.

Oval duct label format: The duct label used on flat oval ducts. See the **Duct Label Format Codes** section below for more information about the values that can be automatically inserted in the label.

Lined oval duct label format: The duct label used on lined flat oval ducts. See the **Duct Label Format Codes** section below for more information about the values that can be automatically inserted in the label.

• Same as non-lined duct label format: The duct label for lined flat oval ducts will use the Oval duct label

format option.

Maximum single line width (in): The maximum width that ducts with their *Graphics* set to **Automatic** will be drawn single-line. All ducts larger than this value will be drawn with double-line.

Default interior lining width (in): The default Interior Lining Width when creating or modifying ducts.

Default exterior lining width (in): The default *Exterior Lining Width* when creating or modifying ducts.

Show background below ductwork: Whether the background and other entities below ductwork are visible.

- Yes: The background and other entities are visible. The ductwork entities are inserted significantly below their proper elevation. The ducts will hide each other but nothing else on the drawing.
- No: The background and other entities are not visible. The ductwork entities are inserted at their proper elevation. Anything below that elevation will be hidden.

Return and exhaust arrow direction: The direction that centerline arrows point for return and exhaust ductwork.

- **Toward diffusers:** Arrowheads point toward diffusers. The centerlines point in the opposite direction from the flow of the duct. Determining the next and previous duct is the same as with supply ducts.
- Flow direction: Arrowheads point in the direction of flow, away from diffusers. Determining the next and previous duct depends upon the type of duct.

Minimum duct size (in): The minimum size to which ducts will be resized.

Use odd rectangular duct sizes below this size (in): By default, ducts are resized to even sizes. Rectangular ducts resized below this value will be sized to even or odd sizes.

Use odd round duct sizes below this size (in): By default, ducts are resized to even sizes. Round ducts resized below this value will be sized to even or odd sizes.

Use odd flat oval duct sizes below this size (in): By default, ducts are resized to even sizes. Flat oval ducts resized below this value will be sized to even or odd sizes.

Duct Label Format Codes

The *Duct Label Format* options use special codes to insert duct dimensions in the duct label. These codes are replaced with dimension values from the database when the labels are shown on the drawing.

Multiple codes can be included in a duct label, allowing you to label both interior and exterior dimensions, or provide the dimension in both imperial and metric units.

Interior dimensions are the specified width and depth for the duct.

Exterior dimensions are the interior dimensions plus two times the interior lining (once for the lining on each side of the duct). Exterior dimensions do not include exterior lining width.

Standard Dimensions: Duct dimensions in inches.

- W: Interior width in inches.
- **D:** Interior depth or diameter in inches.
- WE: Exterior width in inches.
- **DE:** Exterior depth in inches.

Metric Centimeter Dimensions: Duct dimensions converted from inches to centimeters.

- WM: Interior width in centimeters.
- **DM:** Interior depth or diameter in centimeters.
- WME: Exterior width in centimeters.
- **DME:** Exterior depth in centimeters.

Metric Millimeter Dimensions: Duct dimensions converted from inches to millimeters.

- WMM: Interior width in millimeters.
- **DMM:** Interior depth or diameter in millimeters.
- WMME: Exterior width in millimeters.
- **DMME:** Exterior depth in millimeters.

Soft Metric Millimeter Dimensions: Duct dimensions converted from inches to millimeters using 25 millimeters per inch (rather than 25.4 millimeters per inch).

- WMMS: Interior width in soft millimeters.
- DMMS: Interior depth or diameter in soft millimeters.
- WMMSE: Exterior width in soft millimeters.
- **DMMSE:** Exterior depth in soft millimeters.

Diffusers

This section describes the options available in the **Diffusers** group in the **Design Master HVAC Options** dialog box.

<u>0</u> 0	Design Master HVAC Options	×
K	ev	Value
Ŧ	Default Fittings	
÷	Fittings	
÷	Ductwork	
Ē	Diffusers	
	Show arrows on 4 way throw patterns	No
	Diffuser callout	Two line (callout, CFM)
	Custom diffuser callout format line 1	
	Custom diffuser callout format line 2	
	Custom diffuser callout format (supply)	
	Custom diffuser callout format (return)	
	Custom Diffuser callout format (exhaust)	
	Diffuser callout insertion	Automatic
<u> </u>	Diffuser CFM label format	\$CFM
Ð	Diffuser Connections	
Ŧ	Building Project Information	
÷	Elevation Labels	
÷	3D-BIM	
÷	Miscellaneous	
	OK Cancel	

Show arrows on 4 way throw patterns: Whether throw arrows are shown on diffusers when they are first inserted on the drawing. Once a diffuser is inserted on the drawing, use the <u>Insert Throw Arrow</u> and <u>Remove Throw</u> <u>Arrow</u> commands to modify the throw arrows that are displayed. Changing this option will not affect throw arrows on diffusers already on the drawing.

Diffuser callout: The format of diffuser callouts.

- Single line (callout-CFM): A single line listing the diffuser callout and the airflow.
- **Two line (callout, CFM):** Two lines of text separated by a line listing the callout on the first line and the airflow on the second.
- **Two line (callout, CFM, neck size):** Two lines of text separated by a line listing the callout on the first line and the airflow and neck size on the second.
- **Three line box:** A box with three lines of text listing the callout on the first line, the neck size on the second, and the airflow on the third.
- **Three line box (rounded):** A box with round corners with three lines of text listing the callout on the first line, the neck size on the second, and the airflow on the third.
- Circle: A circle with two lines of text listing the callout on the first line and the airflow on the second.
- Square with neck dimension: A box with a single line listing the neck size, the callout, and the airflow.
- Hexagon: A hexagon with two lines of text listing the callout on the first line and the airflow on the second.
- **Triangle:** A triangle with the callout listed inside it and the airflow listed below.
- **CFM only:** The airflow is listed. No callout or neck size is displayed.
- Show neck, face, and throw: Two lines of text separated by a line listing the neck size, face size, and callout on the first line and the airflow and throw pattern on the second.
- Dome: A dome with two lines of text listing the callout on the first line and the airflow on the second.
- Flow arrow underline: Two lines of text separated by a line listing the callout on the first line and the airflow on the second. The line between the two lines of text connects to the leader and points in the direction of the airflow into or out of the diffuser.
- **Custom block:** The callout is inserted using a custom block. See the <u>Creating a Custom Diffuser Callout</u> <u>Block</u> article in the knowledge base for more information about how to create a custom block.
- **Custom single line:** A single line of with custom text. The text is set using the *Custom diffuser callout format* options below.
- Custom two line: Two lines of text separated by a line. The text in the two lines is set using the *Custom diffuser callout form line 1* and *Custom diffuser callout form line 2* options below.

Custom diffuser callout format line 1: The format used for the top line of the diffuser callout when the *Diffuser callout* option is set to **Custom two line**. See the <u>Custom Diffuser Callout Codes</u> section below for more information about the values that can be automatically inserted in the label.

Custom diffuser callout format line 2: The format used for the bottom line of the diffuser callout when the *Diffuser callout* option is set to **Custom two line**. See the <u>Custom Diffuser Callout Codes</u> section below for more information about the values that can be automatically inserted in the label.

Custom diffuser callout format (supply): The format used for supply diffuser callouts when the *Diffuser callout* option is set to **Custom single line**. See the <u>Custom Diffuser Callout Codes</u> section below for more information about the values that can be automatically inserted in the label.

Custom diffuser callout format (return): The format used for return diffuser callouts when the *Diffuser callout* option is set to **Custom single line**. See the <u>Custom Diffuser Callout Codes</u> section below for more information about the values that can be automatically inserted in the label.

• Same as supply: Return diffuser callouts will use the *Custom diffuser callout format (Supply)* option value.

Custom diffuser callout format (exhaust): The format used for exhaust diffuser callouts when the *Diffuser callout* option is set to **Custom single line**. See the <u>Custom Diffuser Callout Codes</u> section below for more information about the values that can be automatically inserted in the label.

• Same as supply: Exhaust diffuser callouts will use the *Custom diffuser callout format (Supply)* option value.

Diffuser callout insertion: How diffuser callouts are inserted when a new diffuser is inserted on the drawing. Once the diffuser and diffuser callout are inserted on the drawing, use the <u>Insert or Move Callout</u> and <u>Remove Callout</u> commands to modify the callouts. Changing this option will not affect diffusers and diffuser callouts already on the drawing.

- Automatic: The diffuser callout is automatically inserted to the right of the diffuser.
- Manual: You are prompted to specify the location of the diffuser callout after the diffuser is inserted.
- Not inserted: Diffusers are inserted without diffuser callouts.

Diffuser CFM label format: How the airflow value for a diffuser is displayed in the callout. The **\$CFM** code will be replaced with the actual CFM value of the diffuser. The **\$LPS** code will be replaced with the airflow in liters per second. Other text will be displayed exactly as it is entered.

The default value for this option is **\$CFM**, which displays only the CFM value for the diffuser.

The most common change to this option is to set it to **\$CFM CFM**, which displays the CFM value with a "CFM" label.

Another common change is to include the **\$LPS** code to display the airflow in metric units.

Custom Diffuser Callout Codes

The Custom diffuser callout options use special codes to insert information about the diffuser in the callout text.

The **\$CALLOUT** code will be replaced with the diffuser callout.

The **\$CFM** code will be replaced with the diffuser airflow. The format for the replacement string is based upon the *Diffuser CFM Label format* option.

The **\$NECK** code will be replaced with the neck size of the diffuser.

The **\$FACE** code will be replaced with the face size of the diffuser.

Diffuser Connections

This section describes the options available in the **Diffuser Connections** group in the **Design Master HVAC Options** dialog box.

	Value	
Default Fittings	Torac	
ittings		
Ductwork		
Diffusers		
Diffuser Connections		
Size diffuser runout to match diffuser neck size	No	
Default flex length (in)	36	
Damper far from diffuser	Yes	
Ceiling Connection: Fitting graphics	Flex / elbow	
Connection Graphics: Flex	Single & double	
Connection Graphics: Hard	Single & double	
Supply		
Ceiling Connection: Duct type	Flexible	
Ceiling Connection: Lock duct shape	No	
Sidewall Connection: Duct type	Hard	
Insert balancing dampers	No	
Return		
Exhaust		
Outside		
Building Project Information		
levation Labels		
D-BIM		
Aiscellaneous		

Size diffuser runout to match diffuser neck size: Whether the runout to a diffuser is sized to match the diffuser neck size or based upon the airflow in the duct. The runout is defined as all of the ducts from the diffuser to the first branch.

- Yes: The runouts ignore the sizing criteria and are sized to match the diffuser neck size.
- No: The runouts are sized using the sizing criteria like the other ducts in the system.

In the example below, the ducts on the left side have been sized with this option set to **No**. The ducts on the right side have been sized with this option set to **Yes**. The ducts in red have been sized to match the neck size of the connected diffusers.



Default flex length (in): The maximum length of flex duct inserted during diffuser connection commands. If the diffuser connection length exceeds this distance, hard duct is inserted to make up the rest of the distance.

Once the diffuser connection is inserted, this value is no longer used. Changing this value will not change the length of flex duct of diffuser connections that were previously inserted. Moving the diffuser or modifying the duct layout can result in situations where the flex length exceeds this value.

Damper far from diffuser: Where balancing dampers are inserted in the duct system.

- Yes: Balancing dampers are inserted as far from the diffuser as possible. They will be inserted at the start of the duct that begins the branch leading to the diffuser.
- No: Balancing dampers are inserted as close to the diffuser as possible. If there is flex duct leading to the diffuser, the balancing damper will be inserted just before the flex duct. Otherwise, they will be inserted just before the diffuser.

Ceiling Connection: Fitting graphics: The graphics used when drawing ceiling diffuser connections in 2D.

- Flex / Ebow: For connected flex ducts, flex duct is drawn connecting to the diffuser. For connected hard ducts, an elbow is drawn connecting to the diffuser.
- Elbow: An elbow is drawn connecting to the diffuser.
- **Tee:** An vertical tee is drawn connecting to the diffuser.

Connection Graphics: Flex: The graphics used when drawing flexible connections to ductwork in 2D.

- **Single:** The flex ductwork is drawn single-line, regardless of the size of the flex duct. The ducts in the diffuser connection are inserted with their *Graphics* field set to **Single**.
- **Double:** The flex ductwork is drawn double-line, regardless of the size of the flex duct. The ducts in the diffuser connection are inserted with their *Graphics* field set to **Double**.
- Single & double: The flex ductwork is drawn single-line and double-line, depending upon the width of the flex duct and the *Maximum single line width* option in the <u>Ductwork</u> options section. The ducts in the diffuser connection are inserted with their *Graphics* field set to Automatic.

Connection Graphics: Hard: The graphics used when drawing hard connections to ductwork in 2D.
- **Single:** The ductwork is drawn single-line, regardless of the size of the duct. The ducts in the diffuser connection are inserted with their *Graphics* field set to **Single**.
- **Double:** The ductwork is drawn double-line, regardless of the size of the duct. The ducts in the diffuser connection are inserted with their *Graphics* field set to **Double**.
- Single & double: The ductwork is drawn single-line and double-line, depending upon the width of the duct and the *Maximum single line width* option in the <u>Ductwork</u> options section. The ducts in the diffuser connection are inserted with their *Graphics* field set to Automatic.

Supply, Return, Exhaust, Outside: Sets the default options for each section in the <u>Change Connection Type</u> command.

Ceiling Connection: Duct type: The material type used for the duct when connecting to a floor or ceiling diffuser.

- **Flexible:** Flexible ducts are used to connect to the diffuser. The length of flexible duct is limited by the *Default flex length* option. If the connection is longer than that length, hard duct is used for part of the connection.
- Hard: Hard ducts are used to connect to the diffuser.

Ceiling Connection: Lock duct shape: Whether ducts that are inserted as part of the diffuser connection have their shapes locked.

- No: The duct shapes are not locked. The duct shape will be set when the duct is sized.
- **Round:** The duct shapes are locked as round.
- **Rectangular:** The duct shapes are locked as rectangular.
- Flat oval: The duct shapes are locked as flat oval.

Sidewall Connection: Duct type: The material type used for the duct when connecting to a sidewall diffuser.

- **Flexible:** Flexible ducts are used to connect to the diffuser. The length of flexible duct is limited by the *Default flex length* option. If the connection is longer than that length, hard duct is used for part of the connection.
- Hard: Hard ducts are used to connect to the diffuser.

Insert balancing dampers: Whether a balancing damper is inserted in the duct connected to the diffuser.

Building Project Information

This section describes the options available in the **Building Project Information** group in the **Design Master HVAC Options** dialog box.

All of the options in this section can be set for a project using the **Project Information** dialog box. These options are provided so that you can specify the values in the standards database. The values in the standards database will be used as the default values on new projects. See the **Project Info** section for more information.

(ey 🛛		Value	
Build	ling Project Information	·	
···· He	ating safety factor (room)	0	
··· He	ating safety factor (ventilation)	0	
- Co	oling safety factor (room)	0	
··· Co	oling safety factor (ventilation)	0	
··· Flo	or heat loss coefficient	0.54	
··· Ver	ntilation calculation method	ASHRAE 62.1-2010	
- Use	e actual supplied airflow in ventilation and psychrometric calculations	No	
··· Set	maximum room ventilation percentage	No	
··· Ma	iximum room ventilation percentage	0	
- All	ow fractional people	Yes	
- Pri	nt system loads for rooms	Yes	
Ca	Iculate cooling in January	No	
Ca	Iculate cooling in February	No	
Ca	Iculate cooling in March	No	
- Ca	Iculate cooling in April	No	
Ca	Iculate cooling in May	No	
Ca	Iculate cooling in June	Yes	
Ca	Iculate cooling in July	Yes	
Ca	Iculate cooling in August	Yes	
- Ca	Iculate cooling in September	No	
- Ca	Iculate cooling in October	No	
- Ca	Iculate cooling in November	No	
Ca	Iculate cooling in December	No	

Heating safety factor (room): This value is the same as the Heating Safety Factor--Room field.

Heating safety factor (ventilation): This value is the same as the Heating Safety Factor--Ventilation field.

Cooling safety factor (room): This value is the same as the Cooling Safety Factor--Room field.

Cooling safety factor (ventilation): This value is the same as the *Heating Safety Factor--Ventilation* field.

Floor heat loss coefficient: This value is the same as the Floor Heat Loss Coefficient field.

Ventilation calculation method: This value is the same as the Ventilation Calculation Method field.

Use actual supplied airflow in ventilation and psychrometric calculations: This value is the same as the *Use Actual Supplied Airflow in Ventilation and Psychrometric Calculations* checkbox.

Set maximum room ventilation percentage: This value is the same as the *Maximum Room Ventilation Percentage* checkbox.

Maximum room ventilation percentage: This value is the same as the *Maximum Room Ventilation Percentage* field. If *Set maximum room ventilation percentage* is set to **No**, this option is disabled.

Allow fractional people: This value is the same as the Allow Fractional People checkbox.

Print system loads for rooms: This value is the same as the *Print System Loads* checkbox.
Calculate cooling in January: This value is the same as the *January* checkbox.
Calculate cooling in February: This value is the same as the *February* checkbox.
Calculate cooling in March: This value is the same as the *March* checkbox.
Calculate cooling in April: This value is the same as the *April* checkbox.
Calculate cooling in May: This value is the same as the *May* checkbox.
Calculate cooling in June: This value is the same as the *June* checkbox.
Calculate cooling in June: This value is the same as the *June* checkbox.
Calculate cooling in July: This value is the same as the *July* checkbox.
Calculate cooling in August: This value is the same as the *August* checkbox.
Calculate cooling in September: This value is the same as the *September* checkbox.
Calculate cooling in October: This value is the same as the *November* checkbox.
Calculate cooling in November: This value is the same as the *December* checkbox.

Elevation Labels

This section describes the options available in the **Elevation Labels** group in the **Design Master HVAC Options** dialog box.

	Value
Default Fittings	
fittings	
Ductwork	
Diffusers	
Diffuser Connections	
Building Project Information	
levation Labels	
Leader graphic	DM_DM-ARROWHEAD
Leader location	Center
Top block	dm_hvac-elevationLabel-top
Bottom block	dm_hvac-elevationLabel-bottom
Both block	dm_hvac-elevationLabel-both
Centerline block	dm_hvac-elevationLabel-centerline
Top label	T+\$ELEV
Bottom label	B+\$ELEV
Centerline label	CL+\$ELEV
Include exterior insulation thickness in elevation	Yes
BD-BIM	
Aiscellaneous	

Leader graphic: The block used for elevation label leaders. You can set the block name by typing a new name or selecting **Browse...** and selecting the new name.

Leader Location: Where the leader points on the duct.

• Edge: The leader points to the edge of the duct.

	T+10'-6"
-	

• **Center:** The leader points to the center of the duct.

T+10'-6"
B+9'-6"

Top block: The block used for the elevation label when the Insert Top Elevation Label command is used.

Bottom block: The block used for the elevation label when the Insert Bottom Elevation Label command is used.

Both block: The block used for the elevation label when the <u>Insert Top and Bottom Elevation Label</u> command is used.

Centerline block: The block used for the elevation label when the **Insert Centerline Elevation Label** command is used.

Top label: The text used to display the top elevation in the label. The keyword **\$ELEV** is replaced with the elevation.

Bottom label: The text used to display the bottom elevation in the label. The keyword **\$ELEV** is replaced with the elevation.

Centerline label: The text used to display the centerline elevation in the label. The keyword **\$ELEV** is replaced with the elevation.

Include exterior insulation thickness in elevation: Whether the top and bottom elevations include the exterior insulation thickness.

3D-BIM

This section describes the options available in the **3D-BIM** group in the **Design Master HVAC Options** dialog box.

😥 Design Master HVAC Options	×
V	Malua
Ney	value
Ductwork	
 Diffusers 	
Diffuser Connections	
Building Project Information	
Elevation Labels	
■ 3D-BIM	
3D circle approximation	8
Draw hangers in 3D	Yes
Draw mechanical equipment in 3D	Yes
Export flex duct	Yes
Export diffusers	All
Miscellaneous	
OK Cancel	

3D circle approximation: Circles are approximated in the 3D model as polygons. This option sets the number of sides of a polygon used to represent a circle. Higher numbers more closely approximate a circle, but greatly increase file size. The minimum number value for this option is 8.

Draw hangers in 3D: Whether hangers are drawn in 3D. This setting has no impact on exporting hangers to an IFC file. It only affects whether they are visible in your CAD program.

Draw mechanical equipment in 3D: Whether mechanical equipment is drawn in 3D. This setting has no impact on exporting mechanical equipment to an IFC file. It only affects whether they are visible in your CAD program.

Export flex duct: Whether flex ducts are exported.

Export diffusers: Which diffusers are exported.

- All: All diffusers will be exported.
- Ceiling only: Only ceiling diffusers will be exported.
- Sidewall only: Only sidewall diffusers will be exported.
- Connected to hard ducts: Only diffusers connected using hard ducts will be exported. See the <u>Change</u> <u>Connection Type</u> section for more information.
- None: No diffusers will be exported.

Miscellaneous

This section describes the options available in the Miscellaneous group in the Design Master HVAC Options dialog box.

😥 Design Master HVAC Options	×
Key	Value
Default Fittings	
+ Fittings	
Ductwork	
Diffusers	
Diffuser Connections	
Building Project Information	
Elevation Labels	
■ 3D-BIM	
Miscellaneous	
Leader arrow block	DM_DM-ARROWHEAD
Leader arrow length	0.18
Draw hangers in 2D	Yes
Pressure drop report duct ID block	dm_hvac-ductTag-hex
Schedule title justification	Left
Schedule column label justification	Center
Schedule title continued label	(CONT.)
OK Cancel	

Leader arrow block: The block used for leader arrowheads.

Leader arrow length: The length of the leader arrowhead.

Draw hangers in 2D: Whether hangers are drawn in 2D.

Pressure drop report duct ID block: The block used to label ducts in the pressure drop report and on the drawing. See the <u>Insert Pressure Drop Report</u> section for more information.

Schedule title justification: The justification for the title at the top of all of the schedules.

- Left: The schedule title is justified to the left.
- **Center:** The schedule title is centered.

Schedule column label justification: The justification for the label at the top of each column in all of the schedules.

- Left: The column labels are justified to the left.
- Center: The column labels are centered.

Schedule title continued label: The text in this option is added to the schedule title when the schedule is broken into multiple sections.

When inserting schedules, there is an option to set a maximum height for the schedule. If the schedule exceeds this height, the schedule is continued in a second section next to the first. The title of the second and following sections is the schedule title plus the text in the *Schedule title continued label* option.

Open Block from Drawing

The Open Block from Drawing command is used to select a block on the drawing and open it in your CAD program. This command is useful when making changes to your customization. To make a change to a block that appears on your drawing, you can select it using this command.

To open a block from the current drawing, go to

Ribbon: DMH: Customization->Customization Utilities->Open Block from Drawing

Pulldown Menu: DM HVAC->Customization->Open Block from Drawing

You will be prompted to select the block to be opened.

Select block to open:

The drawing that the selected block is based upon will be opened. Use standard CAD commands to make changes to the block.

After changes are made to the block, use the <u>Redefine Block in this Drawing</u> command to update the block definition on the current drawing. Otherwise, none of the changes you made will appear on your drawing.

Redefine Block in this Drawing

The Redefine Block in this Drawing command is used to update a block definition on a drawing after changes have been made to the drawing the block is based upon.

When a block is inserted on the drawing, the definition for that block is stored on the drawing. If the drawing that the block is based upon is later changed, the definition on the drawings where it has been inserted is not updated. You must update the block definition manually. It is possible to do this using the standard CAD **INSERT** command, but the Redefine Block in this Drawing command simplifies the process.

To update a block on your drawing, go to

Ribbon: DMH: Customization->Customization Utilities->Open Block from Drawing

 $Pulldown \ Menu: \ {\tt DM \ HVAC->Customization->Redefine \ Block \ in \ this \ Drawing}$

You will be prompted to select the block to be updated.

Select block to redefine:

The definition for the selected block will be updated to match the drawing that it is based upon.

Diffuser Blocks

The Diffuser Blocks commands allow you to customize the list of blocks available to be used for diffusers in the project and master schedules.

See the <u>General Customization Commands</u> section for more information about how the Edit Project List, Edit Master List, Copy Project List to Master, and Copy Master List to Project commands work.

To edit the diffuser blocks project list, go to

Ribbon: DMH: Customization->Project Customization->

Pulldown Menu: DM HVAC->Customization->Diffuser Blocks->Edit Project List

To edit the diffuser blocks master list, go to

Ribbon: DMH: Customization->Master & Standards Customization->

Pulldown Menu: DM HVAC->Customization->Diffuser Blocks->Edit Master List

Diffuser Blocks Dialog Box

😥 Diffuser Blocks X							
	Move Up	Move Down New Delete					
Description	Block Number	Туре					
Rectangular Ceiling	1	Rectangular					
Round Ceiling	3	Round					
Sidewall	2	Sidewall					
1 Slot	4	Slot					
2 Slot	5	Slot					
3 Slot	6	Slot					
4 Slot	7	Slot					
	OK	Cancel					

Move Up: Press this button to move the selected block up in the list of blocks.

Move Down: Press this button to move the selected block down in the list of blocks.

New: Press this button to create a new block.

Delete: Press this button to delete the selected block. If the block is currently used by a record in the schedule, you will be asked if you want to replace the block in the schedule with another block.

Description: The name of the block that is displayed when you select the block in the diffuser schedule dialog box.

Block Number: The block number used to identify the set of diffuser blocks to be used.

Diffuser blocks are stored as four separate blocks, one for each type of airflow. A common number at the end of each block name is used to group the blocks together. The *Block Number* corresponds to that common number.

Type: The type of diffuser.

- Rectangular: Rectangular diffuser. The width and length are set in the diffuser schedule.
- Round: Round diffuser. The diameter is set in the diffuser schedule.
- Sidewall: Sidewall diffuser. The width and height are set in the diffuser schedule. The width is used when drawing the diffuser in 2D. The height is used when drawing the diffuser in 3D.
- Slot: Slot diffuser. The width and length are set in the diffuser schedule.

Layers

The Layers command is used to customize the layers used when inserting items on the drawing.

See the <u>General Customization Commands</u> section for more information about how the Edit Project List, Edit Standards List, Copy Project List to Standards, and Copy Standards List to Project commands work.

To customize the layers project list, go to

Ribbon: DMH: Customization->Project Customization->

Pulldown Menu: DM HVAC->Customization->Layers->Edit Project List

To customize the layers standards list, go to

Ribbon: DMH: Customization->Master & Standards Customization-> 5 Layers

Pulldown Menu: DM HVAC->Customization->Layers->Edit Standards List

Layers Dialog Box

😥 Layers								×
Move	Up M	ove Down					Undo Layer Key Ch	anges
New System Edit System	Dele	te System	Layer Key			Layer Name		~
			ALIGNME	NT POINT		DM DM-ALIGI	IMENTPOINT	
Import Layers from Excel Export	t Layers to	Excel	DEFAULT I	DM LAYER		М		
			LIGHTING	COORDIN	ATION	M-COORD-LTC	3	
Layer System			PRESSURE	DROP SC	HEDULE TAG	M-SCHEDULE-	TEXT	
General			ROOM LA	BELS		M-ROOM-ANI	10	
New Fristing			ROOM LE	ADER		M-ROOM-ARC	W	
Existing		- 10 C	ROOM OL	JTLINES		M-ROOM		
			ROOM SH	ADING		M-ROOM-MA	Р	
			SCHEDUL	E-HEAVY		M-SCHEDULE-	HEAVY	
			SCHEDUL	E-LIGHT		M-SCHEDULE-	LIGHT	
			SCHEDUL	E-MEDIUN	1	M-SCHEDULE-	MEDIUM	
			SCHEDUL	E-TEXT		M-SCHEDULE-	TEXT	
			SECTION	ARROW		M-SECTION-A	RROW	
	_		Letetion	011001.0		M CECTION D		*
Delete All Unused Layers					New Lay	er Delete Lay	er Undo Layer Ch	nanges
Layer Name	Color	Linetype		Plot	Lineweight	Plot Style		^
DM_DM-ALIGNMENTPOINT	2	CONTINU	JOUS		Default			
M	7	CONTINU	JOUS	✓	Default			_
M-COORD-LTG	10	CONTINU	IOUS		Default			
M-DUCT-CENTERLINE-MAXPRESSUREDROP	6	CONTINU	IOUS	✓	Default			_
ME-EQU	10	CONTINU	IOUS	✓	Default			
ME-EQU-3D	10	CONTINU	IOUS	✓	Default			
ME-EQU-HIDE	10	DM_DM-I	HIDDEN	✓	Default			
ME-EXH-CENTERLINE	43	CONTINU	IOUS		Default			_
ME-EXH-DIFF	10	CONTINU	IOUS	✓	Default			_
ME-EXH-DIFF-ANNO	10	CONTINU	IOUS		Default			
ME-EXH-DIFF-AROW	10	CONTINU	IOUS	✓	Default			
ME-EXH-DIFF-HIDE	10	DM_DM-I	HIDDEN	✓	Default			
ME-EXH-DIFF-THRW	10	CONTINU	IOUS		Default			
ME-EXH-DUCT	10	CONTINU	IOUS		Default			
ME-EXH-DUCT-3D	10	CONTINU	IOUS	✓	Default			
ME-EXH-DUCT-3D-FLEX	10	CONTINU	IOUS	✓	Default			
I ME EVE DUCT ANNO	10	CONTINU			Dofault			*
		OK	С	ancel				

Layer Systems

Move Up: Press this button to move the selected row up in the Layer System list.

Move Down: Press this button to move the selected row down in the Layer System list.

New System: Press this button to create a new layer system.

Edit System: Press this button to open the Layer System Options dialog box for the selected layer system.

🕺 Layer System Options 🛛 🗙										
Layer Syste	Layer System: New									
☑ Ducts are solid										
Label Prefix:										
Label Suffix:	:									
Hatch Settin	igs:									
	Display Hatch	Туре	Pattern	Angle	Scale					
Supply		Predefined	SOLID	0	0.1					
Return		Predefined	SOLID	0	0.1					
Exhaust		Predefined	SOLID	0	0.1					
Outside		Predefined	SOLID	0	0.1					
Hatch Flex Ductwork										
Hatch Overh	Hatch Overhang: 0									
OK Cancel										

Layer System: The name of the layer system.

Ducts are solid: Whether ducts on the layer system are drawn with solid lines. If you want ducts on the layer system to be drawn with dashed lines, uncheck this. See the <u>How to Make Dashed Ductwork</u> article in the knowledge base for more information.

Label Prefix: Text that is added before the label on ductwork in the layer system.

Label Suffix: Text that is added after the label on ductwork in the layer system.

Hatch Settings: The following options can be set for different types of duct hatching in the layer system. The hatching that is displayed is based upon the *Airflow* setting of the duct.

Display Hatch: Whether hatching is displayed on the duct.

Type: The type of hatching pattern that is displayed.

- Predefined: Displays the standard CAD hatching set in the Pattern column.
- Custom: Displays a custom hatching specified in the *Pattern* column.

Pattern: The hatching pattern to be displayed.

Angle: The angle at which the hatching pattern is displayed.

Scale: The scale of the hatching pattern.

Hatch Flex Ductwork: Whether hatching is displayed on flex ductwork.

Hatch Overhang: How far the hatching extends past the sides of the duct, in inches on the printed page.

Delete System: Press this button to delete the selected layer system.

See the <u>Common Drawing Schedule Dialog Box Features</u> section for more information about the **Move Up** and **Move Down** buttons.

Layer System: The list of layer systems currently defined.

General: This layer system is used to store all of the layers not associated with devices, such as schedules. Devices cannot be assigned to this layer system. It cannot be deleted or moved.

Layer Keys

Undo Layer Key Changes: Press this button to revert the layer key settings to their values when the dialog box was opened.

Layer Key: This column lists all of the different items that can be inserted using the software. The names in this column are fixed. Each layer key can be mapped to a layer that will be used when that type of item is inserted on the drawing. Multiple layer keys can use the same layer.

Layer Name: This column lists the layer that will be used when inserting items of the corresponding *Layer Key* type on the drawing. The layers you can choose from are defined in the lower section of the dialog box.

Layers

The layer list displays all of the layers that can be assigned to layer keys. The settings for each layer can be set in the list.

Layer Name: The name of the layer.

Color: The color number of the layer.

Linetype: The linetype of the layer.

Plot: Whether the layer will be plotted.

Lineweight: The lineweight of the layer. Only used when plotting with STBs.

Plot Style: The plot style of the layer. Only used when plotting with STBs.

Managing Layers

The following buttons in the Layers dialog box can be used to manage the layers in the dialog box.

Delete All Unused Layers: Press this button to delete all layers that are not associated with a layer key.

New Layer: Press this button to add a new layer.

Delete Layer: Press this button to delete the selected layer.

Undo Layer Changes: Press this button to revert the layer settings to their values when the dialog box was opened.

Using Excel to Modify Layer Settings

The **Import Layers from Excel** and **Export Layers to Excel** buttons are used to import and export the layer settings to Excel. Using Excel is recommended when modifying large numbers of layer settings.

Import Layers from Excel: Press this button to load the layer setting information entered in Excel into the dialog box. The layer settings will be applied to the selected layer system.

Export Layers to Excel: Press this button to export the layer settings to a CSV file that can be opened in Excel. The **Save Layer File As** dialog box will appear.

🛕 Save Layer F	ile As			×
Save in:	HVAC	~	G 🤌 📂 🛄 -	
Quick access Desktop Libraries	Name	^	Date modified 10/1/2018 7:44 AM	Type File folder
This PC				
Network	<			>
	File name:	HVAC Layers - General.CSV		Save
	Save as type:	CSV Files (*.CSV)	~	Cancel

The selected layer system will be saved to the file you specify. The file will be opened for immediate editing. When modifying the file, do not change the header rows, the first column, or the last column. Restrict your changes to the *Layer Name*, *Color*, *Linetype*, *Plot*, *Lineweight*, and *Plot Style* columns.

1	ج- 1	,⇒ - ⊽		н	IVAC Layers ·	- General.CS	V - Excel		Ē	- [×
F	ïle Hon	ne Insei	t Page Lay	out Form	ulas Data	Review	View Ac	ld-ins Hel	p Q	Tell me	$\mathcal{Q}_{\!$	e
		[~ /	6								
A	L	* : L	XV	J _x DN	1 HVAC							~
	А	В	С	D	E	F	G	н	I.	J	К	
1	DM HVAC	Version	L General L	ayer Syster	m							
2	Don't mod	ify anyth	ing above t	his								
3	Layer Key	Layer Na	n Color	Linetype	Plot	Lineweigh	Plot Style	DO NOT E	DIT			
4	ALIGNME	DM_DM-	A 2	CONTINU	No	Default		ALIGNME	NT POINT	T I		
5	DEFAULT	М	7	CONTINU	Yes	Default		DEFAULT	DM LAYEF	2		
6	LIGHTING	M-COOR	D 10	CONTINU	No	Default		LIGHTING	COORDI	NATION		
7	PRESSURE	M-SCHEE)L 4	CONTINU	Yes	Default		PRESSURE	DROP SC	CHEDULE TA	G	
8	ROOM LAI	M-ROON	1- 4	CONTINU	No	Default		ROOM LA	BELS			
9	ROOM LEA	M-ROON	1- 1	CONTINU	No	Default		ROOM LEA	ADER			
10	ROOM OU	M-ROON	1 3	CONTINU	No	Default		ROOM OU	TLINES			
11	ROOM SH	M-ROON	1- 1	CONTINU	No	Default		ROOM SH	ADING			
12	SCHEDULE	M-SCHEE)L 2	CONTINU	Yes	Default		SCHEDULE	-HEAVY			
13	SCHEDULE	M-SCHEE	ม 1	CONTINU	Yes	Default		SCHEDULE	-LIGHT			
14	SCHEDULE	M-SCHEE)L 3	CONTINU	Yes	Default		SCHEDULE	-MEDIUN	Λ		
15	SCHEDULE	M-SCHEE	ot 4	CONTINU	Yes	Default		SCHEDULE	-TEXT			
16	SECTION A	M-SECTI	D 4	CONTINU	Yes	Default		SECTION A	ARROW			
17	SECTION E	M-SECTI	7 כ	CONTINU	Yes	Default		SECTION E	BUBBLE			
18	SECTION E	M-SECTI	0 4	CONTINU	Yes	Default		SECTION E	BUBBLE TI	EXT		
19	SECTION C	M-SECTI	2 2	CONTINU	Yes	Default		SECTION O	UTLINE			
20	SECTION T	M-SECTI	D 4	CONTINU	Yes	Default		SECTION T	TITLE			
21	SECTION T	M-SECTI	D 4	CONTINU	Yes	Default		SECTION T	TITLE TEXT	Т		
22	TAKEOFF /	M-TAKE	DI 7	CONTINU	No	Default		TAKEOFF /	AREA			
23	THERMOS	M-THERM	/ 7	CONTINU	Yes	Default		THERMOS	TATS			
24	THERMOS	M-THERM	/ 3	CONTINU	Yes	Default		THERMOS	TATS-CO	NTROL WIR	E	
25												-
	<	HVAG	Layers - G	eneral	÷	1	:	î	i	1		
Rea	dy	-					=		-	-	+ 100	196

Update Drawing Layers to Match Project List

The Update Drawing Layers to Match Project List command is used to update the layer definitions on the drawing. Once a layer is created on a drawing, it is not modified. Changes you make to the color, lineweight, or other attributes are not overwritten. This command is the only way to modify layers that already exist.

To update existing layers on a drawing to match new definitions in the project list, go to

Ribbon: DMH: Customization->Project Customization-> 🕻 Update Drawing Layers to Match Project List

 $\label{eq:pulldown Menu: DM HVAC->Customization->Layers->Update Drawing Layers to Match Project List$

The layer definitions on the drawing will be updated to match the definitions in the project list.

Labels and Schedules

This section describes how to customize the layout of labels, reports, and schedules on the drawing.

Common Schedule Dialog Box Information

Buttons

Move Up: Move the selected row up in the list. For schedule dialog boxes, this moves the corresponding column to the left. For labels, this moves the corresponding row up.

Move Down: Move the selected row down in the list. For schedule dialog boxes, this moves the corresponding column to the right. For labels, this moves the corresponding row down.

Grid Rows

For schedules, the first row is the schedule title. It cannot be moved. The schedule title always appears at the top of the schedule. The other rows correspond to a column in the schedule. The rows at the top of the list will be displayed on the left of the schedule.

For labels, there is no schedule title. The rows correspond to the rows of information in the label. The order of the rows in the list is used as the order of the rows on the drawing.

Grid Columns

Key: The identifier for the column, describing what value it will display. The value in this column is fixed and cannot be changed.

The **Schedule Title** key is a special key that exists for schedules. The *Label* of this key is the title of the schedule. The *Width* and *Display* values of this key are ignored. The width of the title is based upon the width of the columns in the schedule. The title is always displayed with the schedule.

Label: The name that will be displayed. For schedules, this is the column label. For labels, this is the row label.

You can define a second header for a column by separating the two headers with a | character. The first header will be merged across multiple columns with the same first header. See the <u>Column Subheadings in Schedules</u> article in the knowledge base for more information.

Width: The width in inches on the printed drawing. For schedules, each column has a separate width value that controls the value of the specific column. For labels, all of the rows share a common width.

Justification: The justification of the text values in the column. The justification of the title for the schedule and of the column headers are set using the *Schedule title justification* options and the *Schedule column label justification* option in the <u>Options</u> command.

- Left: The text is left-justified.
- **Center:** The text is center-justified.
- **Right:** The text is right-justified.

Display: Whether the column is shown on the schedule or the row is shown on the label. If this is not checked, the value will not be displayed.

Related Options

Schedule title justification: Sets the justification for the schedule title.

Schedule column label justification: Sets the justification for column headings.

Schedule title continued label: Sets the label added to the schedule title for continued sections.

Edit Room Label List

The Edit Room Label commands are used to modify the labels that appear on rooms on the drawing. Each row that is displayed is included in the label in the order listed in the table.

To edit room label project settings, go to

Ribbon: DMH: Customization->Project Customization->

Pulldown Menu: DM HVAC->Customization->Labels and Schedules->Project Lists->Edit Room Label Project List

To edit room label standards settings, go to

Ribbon: DMH: Customization->Master & Standards Customization->

Pulldown Menu: DM HVAC->Customization->Labels and Schedules->Standards Lists->Edit Room Label Standards List

Room Label Display and Order Dialog Box

🕺 Room Label Display and Order 🛛 🕹							
				Move Up Mo	ve Down		
Key		Label	Width	Display			
Num	ber	Room Number:		✓			
Туре		Room Type:		✓			
Area		Area:		✓			
				OK Cancel			

See the <u>Common Label and Schedule Information</u> section for more information about using the Move Up and Move Down buttons and the *Key*, *Label*, *Width*, and *Display* fields.

Run the <u>Update Room Labels</u> command after changing the room label settings to update room labels already inserted on the drawing.

Values in the Key column are listed alphabetically below.

Area: The area of the room based upon the room outline inserted on the drawing, in square feet.

Number: The room number for the room. See the Edit Rooms section for more information.

Type: The type of the room, taken from the room project schedule. See the **<u>Edit Rooms</u>** and **<u>Room Project</u>** <u>Schedule</u> sections for more information.

Edit Room Air Balance Report List

To edit the room air balance report project list, go to

Ribbon: DMH: Customization->Project Customization-> LABEL Room Air Balance Report Project List

Pulldown Menu: DM HVAC->Customization->Labels and Schedules->Project Lists->Edit Room Air Balance Report Project List

To edit the room air balance report standards list, go to

Ribbon: DMH: Customization->Master & Standards Customization->

Pulldown Menu: DM HVAC->Customization->Labels and Schedules->Standards Lists->Edit Room Air Balance Report Standards List

Room Air Balance Report Label Display and Order Dialog Box

m Room Air Balance Repon	Laber Display and Order		Move Lip	Move Down	
			Hove op	Piore Domi	
Кеу	Label	Width	Justification	Display	
Schedule Title	ROOM AIR BALANCE REPORT				
Room Number	ROOM NUMBER	1	Left		
Room Name	ROOM NAME	1	Left		
Area	AREA	1	Left	\checkmark	
Ceiling Height	CEILING HEIGHT	1	Left	~	
Volume	VOLUME	1	Left	V	
Supply CFM	SUPPLY CFM	1	Left	V	
Return CFM	RETURN CFM	1	Left	~	
Exhaust CFM	EXHAUST CFM	1	Left	~	
OSA CFM Required	OSA CFM REQUIRED	1	Left	~	
OSA Percentage Required	OSA PERCENTAGE REQUIRED	1	Left	~	1
Pressurization	PRESSURIZATION	1	Left	I	1
OSA Air Changes / Hour	OSA AC / HOUR	1	Left	I	1
Overall AC / Hour	OVERALL AC / HOUR	1	Left	I	1
	OK Canc	el			

See the <u>Common Label and Schedule Information</u> section for more information about using the Move Up and Move Down buttons and the *Key*, *Label*, *Width*, and *Display* fields.

Values in the Key column are listed alphabetically below.

Area: The area of the room based upon the room outline inserted on the drawing, in square feet.

Ceiling Height: The height of the ceiling in the room.

Exhaust CFM: The volume of air exhausted from the room. Based upon the airflow of the exhaust diffusers in the room.

OSA Air Changes / Hour: The ventilation air changes per hour required in the room.

OSA CFM Required: The total ventilation airflow required in the room.

OSA Percentage Required: The percentage of supply air that needs to be ventilation air.

Overall AC / Hour: The total number of air changes per hour required in the room.

Pressurization: The pressurization in the room. Equal to the supply airflow minus the return airflow and exhaust airflow.

Return CFM: The volume of air return from the room. Based upon the airflow of the return diffusers in the room.

Room Number: The room number for the room. See the Edit Rooms section for more information.

Room Name: The type of the room, taken from the room project schedule. See the <u>Edit Rooms</u> and <u>Room Project</u> <u>Schedule</u> sections for more information.

Supply CFM: The volume of air supplied to the room. Based upon the airflow of the supply diffusers in the room.

Volume: The volume of the room.

Edit Diffuser Schedule List

To edit the diffuser schedule project list, go to

Ribbon: DMH: Customization->Project Customization->

Pulldown Menu: DM HVAC->Customization->Labels and Schedules->Project Lists->Edit Diffuser Schedule Project List

To edit the diffuser schedule standards list, go to

Ribbon: DMH: Customization->Master & Standards Customization->

Pulldown Menu: DM HVAC->Customization->Labels and Schedules->Standards Lists->Edit Diffuser Schedule Standards List

Diffuser Schedule Label Display and Order Dialog Box

Diffuser Schedule (Group General) Label Display and Order					×
			Move Up	Move Down	
Key	Label	Width	Justification	Display]
Schedule Title	DIFFUSER, GRILLE, AND REGISTER SCHEDULE			✓	
Callout	CALLOUT	1	Left	✓	
Description	DESCRIPTION	3	Left		
CFM Range	AIRFLOW RANGE (CFM)	1	Left	✓	
Face Size	FACE SIZE (IN)	1	Left	✓	
Nominal Size	NOMINAL SIZE (IN)	1	Left	✓	
Neck Size	INLET SIZE (IN)	1	Left	✓	
Throw	THROW (FT) @ MIN/MAX CFM	1	Left	✓	
Noise Criteria	NOISE CRITERIA @ MAX CFM	1	Left	✓	
Model	MODEL	3	Left		
Note 1	NOTES	3	Left		
Note 2	NOTE 2	3	Left		
Note 3	NOTE 3	3	Left		
Quantity	QUANTITY	1	Left	✓	
Pressure Drop	PRESSURE DROP	1	Left		
	OK Cancel				

See the <u>Common Label and Schedule Information</u> section for more information about using the Move Up and Move Down buttons and the *Key*, *Label*, *Width*, and *Display* fields.

Values in the Key column are listed alphabetically below.

Callout: The name of the diffuser as defined in the diffuser schedule.

CFM Range: The minimum and maximum CFM values taken from the diffuser schedule.

Description: The description taken from the diffuser schedule.

Face Size: The face dimensions taken from the diffuser schedule. For rectangular, sidewall, and slot diffusers, this is the *Face Width* and *Face Depth*. For round diffusers, this is the *Face Width*.

Model: The model taken from the diffuser schedule.

Neck Size: The neck dimensions taken from the diffuser schedule.

Noise Criteria: The Noise at Maximum value taken from the diffuser schedule.

Nominal Size: The Nominal Size value taken from the diffuser schedule.

Note 1: Note taken from the diffuser schedule.

Note 2: Note taken from the diffuser schedule.

Note 3: Note taken from the diffuser schedule.

Pressure Drop: The pressure drop taken from the diffuser schedule.

Quantity: The number of diffusers inserted in the project. If a diffuser type is not inserted, "NOT USED" will be displayed.

Throw: The throw range taken from the diffuser schedule.

Edit Duct Pressure Drop Report

To edit the duct pressure drop report project list, go to

Ribbon: DMH: Customization->Project Customization->

Pulldown Menu: DM HVAC->Customization->Labels and Schedules->Project Lists->Edit Duct Pressure Drop Report Project List

To edit the duct pressure drop report standards list, go to

Ribbon: DMH: Customization->Master & Standards Customization->

Pulldown Menu: DM HVAC->Customization->Labels and Schedules->Standards Lists->Edit Duct Pressure Drop Report Standards List

Duct Pressure Drop Report Label Display and Order Dialog Box

Duct Pressure Drop Report Label Display and Order				
			Move Up	Move Down
Кеу	Label	Width	Justification	Display
Schedule Title	DUCT PRESSURE DROP REPORT			
Duct ID	ID	1	Left	
Total Pressure at Start of Duct	PRESSURE AT START OF DUCT TOTAL	1	Left	
Static Pressure at Start of Duct	PRESSURE AT START OF DUCTISTATIC	1	Left	
Presure Drop in Section	PRESSURE DROP IN SECTION	1	Left	
Pressure Drop in Fitting	FITTING/PRESSURE DROP	1	Left	
Fitting C-Value	FITTING[C-VALUE	1	Left	v
Fitting Table	FITTING TABLE \P(A) = ASHRAE \P(S) = SMACNA	1.5	Left	✓
Velocity	VELOCITY	1	Left	v
Velocity Pressure	VELOCITY PRESSURE	1	Left	
Airflow Volume	AIRFLOW VOLUME	1	Left	v
Total Pressure at End of Duct	PRESSURE AT END OF DUCT TOTAL	1	Left	v
Static Pressure at End of Duct	PRESSURE AT END OF DUCT STATIC	1	Left	v
Duct Length	DUCT LENGTH	1	Left	
	OK Cancel			

See the <u>Common Label and Schedule Information</u> section for more information about using the Move Up and Move Down buttons and the *Key*, *Label*, *Width*, and *Display* fields.

Values in the Key column are listed alphabetically below.

Airflow Volume: The volume of air flowing through the duct section.

Duct ID: The label and number identifying the duct. The ID is matched to a label on the drawing. Use the *Pressure Drop Report Duct ID Block* option in the <u>Miscellaneous</u> options section to set the block used for the duct ID.

Duct Length: The length of the duct section.

Fitting C-Value: The c-value used to calculate the pressure drop through the previous fitting.

Fitting Table: The fitting table used to calculate the c-value for the fitting. The fitting tables used are a combination of tables taken from ASHRAE and SMACNA.

Pressure Drop in Section: The pressure drop through the straight run of ductwork.

Pressure Drop in Fitting: The pressure drop through the fitting previous to the duct section. Equal to the c-value times the velocity pressure.

Static Pressure at End of Duct: The static pressure at the end of the duct section.

Static Pressure at Start of Duct: The static pressure at the start of the duct section.

Total Pressure at End of Duct: The total pressure at the end of the duct section.

Total Pressure at Start of Duct: The total pressure at the start of the duct section.

Velocity: The air velocity in the duct section.

Velocity Pressure: The velocity pressure in the duct section.

Text Styles

The Text Styles commands allow you to customize the text heights and fonts used for labels and schedules.

See the <u>General Customization Commands</u> section for more information about how the Edit Project List, Edit Standards List, Copy Project List to Standards, and Copy Standards List to Project commands work.

To customize text styles in the current project, go to

Ribbon: DMH: Customization->Project Customization->

 $Pulldown \ Menu: \ \texttt{DM HVAC->Customization->Text Styles->Edit Project \ \texttt{List}$

To customize standard text styles, go to

Ribbon: DMH: Customization->Master & Standards Customization->

Pulldown Menu: DM HVAC->Customization->Text Styles->Edit Standards List

Text Styles Dialog Box

💮 Text Styles			>	×
Values left blank will use the default				
Text Style Key	Text Style	Height	Scale Factor	1
DEFAULT	SIMPLEX	0.1	0.8	
DIFFUSER CALLOUTS				
DUCT LABELS				
ROOM LABELS				
SCHEDULE CELL				
SCHEDULE COLUMN HEADER				
SCHEDULE HEADER	ITALIC	0.2		
				L
				L
				L
				L
				L
				L
				L
OK Cancel				

Text Style Key: This list indicates where the text style is used. These values cannot be edited.

Text Style: Sets the text style in your CAD program to be associated with the corresponding *Text Style Key*. The **Default** key must have a text style defined. The text style in other keys may be left blank. Blank keys will use the text style defined for the **Default** key.

If the text style currently exists on the drawing, it will be used as defined.

If the text style does not exist, it will be created using an SHX file of the same name. If an SHX file cannot be found, the **Standard** text style will be used.

To use a TrueType font, create the text style and associate it with the desired font.

Height: Sets the text height for the key. The **Default** key must have a height defined. The height in other keys may be left blank. Blank keys will use the height defined for the **Default** key.

The units for the height are inches on the printed page. To set $1/10^{"}$ text for the drawing, use the value **0.1**. To set $1/8^{"}$ text, use **0.125**. When text is inserted, this value will be multiplied by **DIMSCALE** to determine the height of the text on the drawing.

Scale Factor: Sets the character spacing for the text. Enter a value between **0** and **1.0** to condense the text. Enter a value greater than **1.0** to expand the text. Only the **Diffuser Callouts** and **Duct Labels** *Text Style Keys* use this value.

Recreate Missing Customization

To recreate customization that is missing in the project or standards database, go to

Ribbon: DMH: Customization->Customization Utilities->Recreate Missing Customization

Pulldown Menu: DM HVAC->Customization->Recreate Missing Customization

Design Master HVAC	×
Select the database to recreate the customization in. You can select either a project database or a standards database.	
ОК	

Press the OK button. The Select Standards or Project Database dialog box will appear.

A Select Stand	ards or Project Da	tabase		×
Look in:	HVAC	~	G 🤌 📂 🛄 -	
Quick access Desktop Libraries This PC	Name DMBackup NEW OLD	m	Date modified 2/27/2019 1:19 PM 1/9/2019 5:33 PM 11/29/2018 1:44 PM 2/27/2019 1:43 PM	Type File folder File folder File folder DM File
Network	< File name: Files of type:	DM Files (*.dm)	~	> Open Cancel

Select the standards or project database and press the **Open** button. Any missing customization records will be added to the database. It will not change any existing customization values.

The **Select Standards or Project Database** dialog box will open the current project folder by default. To update your standards database, you must browse to your customization folder.

The default location for the customization folder is C:\Users\<User Name>\AppData\Roaming\Design Master Software\HVAC Customization where <User Name> is the name you use to log in to your computer.

Update Laptop Customization

The Update Laptop Customization command is used to update the local customization on a laptop to match the customization stored on the network. The local customization is automatically updated once a day when you open your CAD program. This command is used to manually update the local customization. It is only necessary to use this command if the customization on your network has changed during the day.

To update the local customization on a laptop, go to

Ribbon: DMH: Customization->Customization Utilities->Update Laptop Customization

Pulldown Menu: DM HVAC->Customization->Update Laptop Customization

The customization will be copied from the network to the local drive.

See the Installation Settings section for more information about configuring your computer as a laptop.

Manage Standards Databases

The Manage Standards Databases command is used to create, modify, and delete standards databases. Each standards database has its own set of customization settings. Multiple standards databases are used when more than one set of standards is used in a company.

To manage your standards databases, go to

Ribbon: DMH: Customization->Customization Utilities->Manage Standards Databases

Pulldown Menu: DM HVAC->Customization->Manage Standards Databases

If only one standards database exists, you will be prompted to create a new one. If you do not create another database, the command will end. If you do create another database, the **Select Standards Database** dialog box will then appear.

If more than one standards database exists, the **Select Standards Database** dialog box will appear.

Select Standards Database Dialog Box

Select Standards Datab	oase	×
Commercial (Default) Residential		
	Rename <	
	Set Default	
New <	Copy <	Delete
	UK Cancel	

Each standards database is a separate file stored in your customization folder. The file name will be "dm_hvac-standards<Name>.dm", where <Name> is the name of the standards database as displayed in the dialog box. If a standards database is named "dm_hvac-standards.dm", it will display as "Default".

The default location for the customization folder is C:\Users\<User Name>\AppData\Roaming\Design Master Software\HVAC Customization where <User Name> is the name you use to log in to your computer.

Rename: Press this button to rename the selected standards database. The name that is displayed and the name of the file will be changed.

Rename: Press this button to set the selected standards database as the default when starting a new project.

New: Press this button to create a new standards database. A new standards database file will be created in the customization folder.

Copy: Press this button to copy the selected standards database. A new standards database file with the same settings will be created in the customization folder.

Delete: Press this button to delete the selected standards database.

Alignment Points

This section describes how to use alignment points and alignment point areas.

The alignment point is the origin of the coordinate system used for the devices inserted on the drawings. The location relative to the alignment point is used when exporting 3D-BIM elements or calculating distances between devices.

Make sure you set a location for the alignment point that will be easy to locate on all of the floors of the building and that will not move during the course of the project. A corner of the building, a column, or the intersection of

two architectural grids lines are all examples of good alignment point locations.

Multiple Alignment Points

A drawing can have more than one alignment point. The first alignment point inserted is used for all devices on the drawing. Additional alignment points are inserted with boxes, called alignment point areas, around them. All devices in the alignment point area are associated with the corresponding alignment point. Any devices not inside an alignment point area are associated with the first alignment point.

The following example shows a drawing file with multiple alignment point areas and floor plans. Notice how an alignment point area is drawn around the second alignment point.



Common Alignment Point Information

The values that can be specified for alignment points are listed below.

Elevation: The elevation of the alignment point. Typically, this is the height of the floor. Device elevations are relative to this elevation. See the **Elevation** section for more information.

For example, consider a second floor area with diffusers. The elevation of the alignment point is set to the height of the floor, 14'. The elevation of each diffuser is set to the elevation relative to the floor they are on, 8'. The

height of the diffusers when exported or used for distance calculations would be the sum of the two heights: 14' + 8' = 22'.

Insert Alignment Point

The Insert Alignment Point command is used to insert alignment points and alignment point areas on the drawing. Multiple alignment points can be inserted on a drawing.

To insert an alignment point on the current drawing, go to

Ribbon: DM HVAC->Alignment Points-> 闷 Insert Alignment Point

Pulldown Menu: DM HVAC->Alignment Points->Insert Alignment Point

Alignment Point Elevation Dialog Box

Alignment Point Eleva \times		
Elevation (ft-in): 0		
ОК	Cancel	

See the **Common Alignment Point Information** section for more information about the *Elevation* field.

Enter the *Elevation* and press the **OK** button. You will be prompted to identify the location of the alignment point on the drawing.

Specify insertion point:

The alignment point will be used to coordinate the current drawing with other drawings. The alignment point should be set in the same place on every drawing in the project folder. You will then be prompted to identify the direction of north on the drawing.

Specify rotation angle:

If this is the first alignment point inserted on the drawing, the command will end.

If there are other alignment points on the drawing, you will be prompted to specify the boundaries of the alignment point area.

First corner of alignment point area:

Second corner of alignment point area:

The alignment point area must surround its respective alignment point.

Query Alignment Point

To query and edit an existing alignment point, go to

Ribbon: DM HVAC->Alignment Points->

Pulldown Menu: DM HVAC->Alignment Points->Query Alignment Point

If there is only one alignment point on the drawing, the Alignment Point Elevation dialog box will appear.

If there is more than one alignment point on the drawing, you will be prompted to indicate which alignment point you want to query.

Specify point in alignment point area to use:

Select a point inside the alignment point area that corresponds to the alignment point you want to query.

The Alignment Point Elevation dialog box will appear.

Alignment Point Elevation Dialog Box

Alignment Point Eleva $$			
Elevation (ft-in): 0			
OK			

Changes can be made to the alignment point in the same way as when it was inserted. See the <u>Common</u> <u>Alignment Point Information</u> section for more information.

Move Alignment Point

The Move Alignment Point command can be used to move an alignment point on the drawing. You can also use standard CAD commands to move the alignment point.

To move an alignment point, go to

Ribbon: DM HVAC->Alignment Points->

 $Pulldown \ Menu: \ {\tt DM \ HVAC->Alignment \ Points->Move \ Alignment \ Point}$

If there is only one alignment point on the drawing, you will be prompted for the new location.

If there is more than one alignment point on the drawing, you will be prompted to indicate which alignment point you want to move.

Specify point in area to move alignment point in:

Select a point inside the alignment point area that corresponds to the alignment point you want to move.

You will then be prompted to indicate the new location for the alignment point.

Specify second point or <use first point as displacement>:

After the alignment point is moved, the location of all of the devices in the database will be updated to reflect the new location.

You cannot move an alignment point outside of its alignment point area.

Rotate Alignment Point

The Rotate Alignment Point command can be used to rotate an alignment point on the drawing. You can also use standard CAD commands to rotate the alignment point.

To rotate an alignment point, go to

Ribbon: DM HVAC->Alignment Points-> 🌮 Rotate Alignment Point

Pulldown Menu: DM HVAC->Alignment Points->Rotate Alignment Point

If there is only one alignment point on the drawing, you will be prompted for the new rotation angle.

If there is more than one alignment point on the drawing, you will be prompted to indicate which alignment point you want to rotate.

Specify point in area to rotate alignment point in:

Select a point inside the alignment point area that corresponds to the alignment point you want to rotate.

You will then be prompted to indicate the new rotation for the alignment point.

Specify rotation angle or [Copy/Reference] <0>:

After the alignment point is rotated, the location of all of the devices in the database will be updated to reflect the new rotation angle.

Offset Alignment Point for 3D Export

The offset Alignment Point for 3D Export command can be used to specify the origin when exporting a drawing to 3D for collision detection. By default, the alignment point acts as the origin. Use this command if having the alignment point as the origin causes problems in the 3D export.

To offset the origin from an alignment point, go to

Ribbon: DM HVAC->Alignment Points-> 💉 Offset Alignment Point for 3D Export

```
Pulldown Menu: DM HVAC->Alignment Points->Offset Alignment Point for 3D Export
```

You will be prompted to specify the offset relative to the first alignment point inserted on the drawing.

Specify origin for 3D export / <Reset origin to alignment point location>:

Specify a point on the drawing to act as the origin when the drawing is exported. Press **ENTER** to reset the origin to the location of the alignment point.

Remove Alignment Points from non-DM Drawing

The Remove Alignment Points from non-DM Drawing command is used to remove all alignment points from a drawing that does not use Design Master features. This command is the only way to fully remove alignment points from a drawing.

To remove all alignment points from a drawing, go to

Ribbon: DM HVAC->Alignment Points-> 🎇 Remove Alignment Points from non-DM Drawing

Pulldown Menu: DM HVAC->Alignment Points->Remove Alignment Points from non-DM Drawing

Remove Alignment Points from non-DM Drawing Dialog Box

Remove Alignment Points from non-DM Drawing	×
This command will remove all alignment points from the current drawing. Use this command when alignment points are appearing on a drawing that should not be linked to Design Master. Type REMOVE in the box below and press OK to continue.	
OK Cancel	

To remove the alignment points, type **REMOVE** and press the **OK** button. This step helps prevent you from removing the alignment points accidentally.

Start New HVAC Project

This section describes how to start a new project.

When you start a new project, a database file will be created in the same folder as the current drawing. The file name will be "dm_hvac<Name>.dm", where <Name> is the name of the project. This is the database file where all of the information about your project is stored.

To create a new database file, go to

Ribbon: DM HVAC->Utilities-> PRJ Start New HVAC Project

Pulldown Menu: DM HVAC->Start New HVAC Project

Start New HVAC Project Dialog Box

Start New HVAC Project	×		
Project Name: City Data for Loads: ADAK, NAS			
Select City			
Project Directory: C:\Users\Kane\Desktop\Tuto	orial\DM Manual\		
Standards Database: Default	~		
Groups to Import			
Diffusers (Hold down <ctrl> to select multiple groups) <default schedule="" settings=""> General</default></ctrl>			
Rooms:	_General ~		
Walls:	General ~		
Doors:	General ~		
Glass:	General \checkmark		
Roofs:	General \checkmark		
ОК	Cancel		

Project Name: The name of the project. The project name is used in two places.

The project name is added to the end of the database file name. If you leave this field blank, the project database name will be "dm_hvac.dm".

The project name is also displayed when the building load calculations are printed. See the <u>Print Project</u> <u>Information</u> section for more information.

City Data for Loads: The city where the project is located. The selected city sets the default temperature and location values in the **Project Information** dialog box. These values are used during building load calculations.

Select City: Press the button to select the city. See the <u>City Definitions</u> section for information about modifying the list of cities available to choose from.

Project Directory: The folder in which the database will be created. The folder displayed and used is the folder that contains the current drawing.

Standards Database: The standards database from which to copy project options and settings. See the <u>Master</u> and <u>Standards Databases</u> section for more information about the standards database and which settings are stored in it.

Groups to Import

This section is used to select groups of items to automatically import from their respective master databases to the new project. See the <u>Master Database Groups</u> section for more information.

Diffuser Schedule Group: Select one or more diffuser groups from the master database to import to the new project. You can select multiple groups using the **SHIFT** and **CTRL** keys.

Room Design Schedule Group: Check this box to import a complete room design group from the master database to the new project.

Wall Schedule Group: Check this box to import a complete wall group from the master database to the new project.

Door Schedule Group: Check this box to import a complete door group from the master database to the new project.

Glass Schedule Group: Check this box to import a complete glass group from the master database to the new project.

Roof Schedule Group: Check this box to import a complete roof group from the master database to the new project.
Concepts and Procedures

This section describes concepts and procedures you will use with Design Master HVAC. It describes how to apply the commands in the <u>Command Reference</u> section to create your HVAC project.

Project Drawing and Database Management

When you create a new project, a database file will be created in the same folder as the current drawing. The file name will be "dm_hvac<Name>.dm", where <Name> is the name of the project. This is the database file where all of the information about your project is stored. Your project drawings are now connected to this database file, and the information contained in the drawings and the database must match.

You must consider how changes to your drawings will affect the database. Recommendations for common scenarios when working on a Design Master HVAC project are listed below. You can also visit the **Project and Database Management Webinar** in the knowledge base.

Project Folders

Each project needs to be in a separate folder that contains one dm_hvac.dm database file. All of the drawing files for the project need to be in the same folder as the database. You should not copy drawings from one project to another.

Saving Your Changes

Always save your changes to a drawing with Design Master HVAC devices in it. Never close a drawing without saving your changes.

Any changes you make to the drawing are saved to the database immediately. If you close the drawing without saving, the database and drawing will no longer match. This can result in missing or extra devices, incorrect calculations, and other problems.

If you close a drawing without saving, or your CAD program crashes, use the <u>Coordinate Drawings and Database</u> command to make the drawing and database match again.

Creating a Backup

To back up your project, you must copy both the drawings and the database file. Copying just the drawings is not enough.

The two simplest methods are copying the entire folder to a new location, or using the **Copy or Backup Project** command.

Alternative Designs

To try an alternative design in your project, do not copy drawings inside the same project folder. This will result in duplicate devices and inaccurate calculations. Instead, make a copy of the project in its own folder. Treat the alternative design as a separate project. Copy the entire folder to a new location, or use the **Copy or Backup Project** command.

Copying a Drawing

To copy a drawing that contains Design Master devices, use the <u>Copy Drawing</u> command. This will create an exact copy of the drawing in the project folder. Copies of all of the devices on the drawing will be created in the database.

(You can use Windows Explorer or the standard CAD **SAVEAS** command to copy a drawing, but these methods add some complications so we do not recommend them.)

Renaming a Drawing

To rename a drawing that contains Design Master devices, use the <u>Rename Drawing</u> command. This will rename the drawing. The original drawing will no longer exist.

(You can use Windows Explorer or the standard CAD **SAVEAS** command to rename a drawing, but these methods add some complications so we do not recommend them.)

CAD Program Crashes

CAD program crashes can leave your drawing and your database in an inconsistent state. This is a special situation that needs to be handled carefully to prevent your database from being corrupted.

Your CAD Program Created a Recover Drawing

If your CAD program created a recovery drawing, try to open that file. If it opens, compare it with the original drawing file. Decide which you want to use. If you want to use the recovery drawing, rename the original drawing something different using Windows Explorer, then rename the recovery drawing to the original drawing name using Windows Explorer. Run the <u>Coordinate Drawings and Database</u> command on the drawing to make the drawing and database match, then continue working.

If you choose to work in the original drawing, delete any recovery drawings that were created. Run the <u>Coordinate Drawings and Database</u> command on the original drawing to make the drawing and database match, then continue working.

Your CAD Program Did Not Create a Recover Drawing

If your CAD program did not create a recover drawing, then you must open your original drawing. Run the <u>Coordinate Drawings and Database</u> command on the drawing to make the drawing and database match, then continue working.

Master and Standards Databases

The master and standards databases are used to store default settings for new projects. You can make changes to the customization settings, store them in these files, and reuse them.

These databases are stored in your HVAC customization folder. For companies with more than one user, we recommend that the HVAC customization folder be on your network. This allows you to share the customization between all of your users. Otherwise, synchronizing the customization on all of the different computers is

complicated.

When you create a project, the settings from the master and standards databases are copied to its project database. Once it is created, the project database is no longer associated with the master or standards database. Changes to the project database will not affect the master or standards database, and changes to the master and standards databases will not affect the project database.

Master Database

There is only one master database. All of the diffuser blocks, the diffuser master schedule, and all of the build master schedules are stored there.

When a project is created, all of the diffuser block records are copied from the master to the project database. You can choose to copy specific groups from each of the master schedules to the project database.

The master database stores the following information:

- Diffuser Block Master List
- Diffuser Master Schedule
- Door Type Master Schedule
- Glass Type Master Schedule
- Roof Type Master Schedule
- Room Type Master Schedule
- Wall Type Master Schedule
- City Definitions

Master Database Groups

Groups allow you to organize the records in your master schedule.

When you create a project, all of the records from a group can be copied to the project. Copying a group is helpful when you have a common type of project with similar schedules. You can set up the schedule once in the master as a group, then reuse it in new projects.

While working on a project, you can import records from a group into the project. You can create multiple groups for different types of schedule entries or different manufacturers. The organization of the groups makes it easier to find the record you want to import.

Standards Databases

Multiple standards databases can be created. Each standards database has its own set of customization settings.

When a project is created, the customization settings are copied from a selected standards database. Everything from the standards database is copied to the project and used as the default settings.

The standards database stores the following information:

- Label group settings
- Layer systems
- Layer definitions
- Options settings
- Text styles

Common Schedule Dialog Box Features

All of the schedule dialog boxes work in a similar way. The buttons available that you use to create and modify records in the schedule are all the same.

New: Press this button to create a new record in the schedule. The record will be created with default information.

Copy: Press this button to copy the displayed record in the schedule. The new record will be created with the same information as the displayed record.

Save: Press this button to save any changes made to the displayed record in the schedule. If you make changes and do not press this button, you will be prompted to save your changes before selecting a new record or closing the schedule dialog box.

Delete: Press this button to delete the displayed record from the schedule. If there are any devices inserted on a drawing in the project that use the record, you will not be able to delete it. You must first delete all of the devices from the drawings before you can delete the record.

Rename: Press this button to rename the displayed record in the schedule. Any labels on the drawing will be updated.

Find: Press this button to select a schedule record from a list of all of the items in the schedule. The record you select will be displayed in the dialog box, allowing you to view and modify it.

Next: Press this button to display the next record in the schedule. The next record is determined by sorting the entries in the schedule alphabetically. If you press this button when viewing the last record, it will wrap back to the beginning and display the first record.

Previous: Press this button to display the previous record in the schedule. The previous record is determined by sorting the entries in the schedule alphabetically. If you press this button when viewing the first record, it will wrap to the end and display the last record.

Import from Another Database

The **Import from Another Database** button is used to import records from a schedule in another project to the current project. This button can be used to copy an entire schedule or a single record. This button allows you to reuse schedules in new projects.

When you press this button, the **Select Database to Import From** dialog box will appear and prompt you to select the project from which the schedule records will be imported.

A Select Database to Import From				
Look in:	DM Manual	~	G 👂 📂 🛄 -	
Quick access Desktop Libraries	Name DMBackup dm_elec.dn	^ m	Date modified 9/27/2018 2:38 PM 9/6/2018 11:00 AM 9/27/2018 2:52 PM	Type File folder DM File DM File
Network	< File name: Files of type:	DM Files (*.dm)	~	> Open Cancel

Select the database from which to import. You must select a Design Master HVAC database. The database must be updated to the most current version. If it is not, you will be prompted to open a drawing in the project to convert the database. After it is updated, you will then be able to import from it.

After you select the database, the **Import Record from Another Project** dialog box will appear and prompt you to select the records to import.

Import Record from Another Project X			
Current Group: General Select Group			
Import Entire Group			
R-1 R-2 S-1 S-2 S-3 S-4			
Create New Record in Schedule			
O Update Current Record in Schedule			
OK Cancel			

Current Group: The group in the other project schedule from which the records will be imported.

Select Group: Press this button to select a new group from which to import records.

Import Entire Group: Press this button to import all of the records from the Current Group to the project.

New records will be created in the project for each record being imported. If a record with the same name already exists in the current schedule, a new record will be created with (**Copy**) appended to the record name. The existing record will not be modified.

You will be prompted if you want to delete existing records in the project schedule. If you delete the existing records, any records that have devices associated with them will not be deleted.

Record List: The list of records in the *Current Group*. Select the records to import from this list. You can select multiple records using the **SHIFT** and **CTRL** keys.

Create New Record in Schedule: Select this option to create a new record in the project schedule for each record being imported. The record will be created with the same name as the record in the other project. If a record with the same name already exists in the current schedule, a new record will be created with (**Copy**) appended to the record name. The existing record will not be modified.

Update Current Record in Schedule: Select this option to update the current record in the project schedule with

the information from the imported record. All of the information in the project schedule will be overwritten.

Import from Master Schedule

The **Import from Master Schedule** button is used to import records from the master schedule to the project schedule after the project has been created. This button allows you to import an entire group or individual records.

When you press this button, the Import Master Record dialog box will appear.

Import Master Record	×	
Current Group: General Select Group.		
Import Entire Group		
Steel, Ins Steel, No Ins Wood, No Ins		
Create New Record in Schedule		
O Update Current Record in Schedule		
OK Cancel		

Current Group: The group in the master schedule from which the records will be imported.

Select Group: Press this button to select a new group from which to import records.

Import Entire Group: Press this button to import all of the records from the Current Group to the project.

New records will be created in the project for each record being imported. If a record with the same name already exists in the current database, a new record will be created with (**Copy**) appended to the record name. The existing record will not be modified.

You will be prompted if you want to delete existing records in the project schedule. If you delete the existing records, any records that have devices associated with them will not be deleted.

Record List: The list of records in the *Current Group*. Select the record to import from this list. You can select multiple records using the **SHIFT** and **CTRL** keys.

Create New Record in Schedule: Select this option to create a new record in the project schedule for each record being imported. The record will be created with the same name as the record in the master schedule. If a record with the same name already exists in the current database, a new record will be created with (**Copy**) appended to the record name. The existing record will not be modified.

Update Current Record in Schedule: Select this option to update the current record in the project schedule with the information from the imported record. All of the information in the project schedule will be overwritten.

Import from Project Schedule

The **Import from Project Schedule** button is used to import records from a project schedule to the master schedule. This button can be used to copy an entire project schedule or a single record. This button allows you to create your master schedule from a project schedule.

When you press this button, the **Select Database to Import From** dialog box will appear and prompt you to select the project from which the schedule records will be imported.

A Select Database to Import From				
Look in:	DM Manual	~	G 🤌 📂 🖽 🗸	
Quick access Desktop Libraries This PC	Name DMBackup dm_elec.dm	n	Date modified 9/27/2018 2:38 PM 9/6/2018 11:00 AM 9/27/2018 2:52 PM	Type File folder DM File DM File
Network	< File name: Files of type:	DM Files (*.dm)	~	> Open Cancel

Select the database from which to import. You must select a Design Master HVAC database. The database must be updated to the most current version. If it is not, you will be prompted to open a drawing in the project to convert the database. After it is updated, you will then be able to import from it.

After you select the database, the Import Record from Another Project dialog box will appear and prompt you to

select the records to import.

Import Record from Another Project X			
Current Group: General	Select Group		
Import Entire Group			
R-1 R-2 S-1 S-2 S-3 S-4			
Create New Record in Schedule			
O Update Current Record in Schedule			
OK Ca	ncel		

Current Group: The group in the project schedule from which the records will be imported.

Select Group: Press this button to select a new group from which to import records.

Import Entire Group: Press this button to import all of the records from the *Current Group* to the master schedule.

New records will be created in the master schedule for each record being imported. If a record with the same name already exists in the master schedule, a new record will be created with (**Copy**) appended to the record name. The existing record will not be modified.

You will be prompted if you want to delete existing records in the master schedule.

Record List: The list of records in the *Current Group*. Select the records to import from this list. You can select multiple records using the **SHIFT** and **CTRL** keys.

Create New Record in Schedule: Select this option to create a new record in the master schedule for each record being imported. The record will be created with the same name as the record in the project schedule. If a record with the same name already exists in the master schedule, a new record will be created with (**Copy**) appended to the record name. The existing record will not be modified.

Update Current Record in Schedule: Select this option to update the current record in the master schedule with the information from the imported record. All of the information in the master schedule will be overwritten.

Common Settings

This section describes settings that are common to diffusers, ducts, and mechanical equipment.

Elevation

Diffusers, ductwork, and mechanical equipment can all be assigned an elevation. The 2D and 3D blocks for the device will be inserted at the specified elevation.

For ceiling diffusers, the elevation is relative to the bottom of the diffuser.

For sidewall diffusers, the relative point for the elevation is based upon the duct to which it is connected.

For ductwork, the elevation is based upon the Vertical Alignment field.

For mechanical equipment, the elevation is based upon the *Elevation Location* field.

If the elevation is not set, a default value of **10** will be used. This will not create any errors, but some features will not be useful if you do not provide elevations. The 3D model will not be correct.

The elevation is relative to the current floor or alignment point area. If the device is inserted inside of a room, the elevation is based upon the elevation of the floor the room occupies. If the device is not inside of a room, the elevation is based upon the elevation of the alignment point area. In both cases, the elevation entered is added to the other elevation to give the true elevation of the device. Do not enter the elevation relative to ground or sea level.

Elevations are specified as **feet-inches**. For example, an elevation of 5 feet 6 inches should be entered as "5-6". A single number without a dash is interpreted as an elevation in feet.

Layer System

All devices that can be inserted on a drawing are assigned a layer system. The layer system controls the layers that are used when the device is inserted.

Layer systems can be created using the Layers command. See the Layers section for more information.

To change the layer of a device, change the layer system. Do not change the layer directly in your CAD program; if you do, it will likely be changed back at some point in the future.

Common Groups Dialog Box Features

All schedules in the project and master database can be organized into groups. Groups allow you to organize the records in your schedule.

Each group is a separate set of types within each device type. Each group has its own schedule. When you insert a device, you first select the group, then select the type of device.

The **Select Group** button on project and master schedule dialog boxes opens the **Schedule Groups** dialog box. This dialog box is used to create and modify schedule groups. The specific labels will vary based upon the type of schedule you are modifying, but the functionality is the same for all types.

When you create a project, all of the records from a group can be copied to the project. Copying a group is helpful when you have a common type of project with similar schedules. You can set up the schedule once in the master as a group, then reuse it in new projects.

While working on a project, you can import records from a group into the project. You can create multiple groups for different types of schedule entries or different manufacturers. The organization of the groups makes it easier to find the record you want to import.

In a project, groups are used to organize the devices. Each group has a separate schedule that can be inserted on the drawing. The layout of each schedule can be different for each group.

<Schedule Type> Schedule Groups Dialog Box

Diffuser Schedule Groups X	Diffuser Master Schedule G 🛛 🗙
General	<default schedule="" settings=""> General</default>
Edit Group Settings	Edit Group Settings
Rename	Rename
New Copy Delete	New Copy Delete
Import from Another Database Import from Master Schedule	Import Project Group
OK Cancel	OK Cancel

New: Press this button to create a new group. The group that is created will be empty and have no schedule entries in it. Any group settings will be set to default values.

Copy: Press this button to copy the selected group. The group that is created will be empty and have no schedule entries in it. Any group settings will be copied from the selected group.

Delete: Press this button to delete the selected group. You cannot delete a group that still has schedule entries in it.

Import from Another Database: See the **Import from Another Database** section for more information about this button.

Import from Master Schedule: See the <u>Import from Master Schedule</u> section for more information about this button.

Import Project Group: See the Import from Project Schedule section for more information about this button.

Press the **OK** button to return to the previous dialog box with the selected group active.

Inserting Notes and Leaders on the Drawing

All notes are inserted using a common user interface. You will be prompted to specify the location of the note on the drawing by dragging the text to the proper location.

When locating the note, a leader will automatically be inserted if the note is located far enough away from the item. When the note is too close the the item, the leader line will be removed.

You can toggle the leader on and off by right-clicking or pressing SPACE.

Related Options

You can customize the block used for the leader arrow and its length. See the <u>Miscellaneous Options</u> section for more information.

Previous and Next Ducts

The commands in Design Master HVAC sometimes reference next and previous ducts. This section describes how to identify those ducts in your system.

These terms are used when discussing ducts that are connected to a specific duct. The duct you are working with is labeled "Reference duct" in the image below.

The previous duct is the duct that runs toward the equipment from the reference duct. It is typically larger than the reference duct. For supply ducts, previous ducts are upstream from the reference duct. For return ducts, previous ducts are downstream from the reference duct. Ducts only have a single previous duct.

Next ducts refer to the ducts that run toward the diffusers from the reference duct. They are typically smaller than the reference duct. For supply ducts, next ducts are downstream from the reference duct. For return ducts, next ducts are upstream from the reference duct. Ducts can have multiple next ducts.



If <u>Return and Exhaust Arrow Direction</u> is set to **Flow direction**, the previous duct always points to the reference duct. The next ducts point away from the reference duct.

Technical Support

Technical support is available by phone, email, or live chat on our website. We are available Monday through Friday, 9am to 5pm Eastern time.

Limited support by email is available evenings, weekends, and holidays.

Email: support@designmaster.biz

Phone: 1-866-516-9497 x2

Live Chat: http://www.designmaster.biz/chat/

System Requirements

To run Design Master HVAC, you need AutoCAD 2007 or later or BricsCAD within the last 3 years, and a computer capable of running your specific version of AutoCAD or BricsCAD.

Complete system requirements are available on our website.

Purchasing

Pricing information and purchase links are available on our website.