



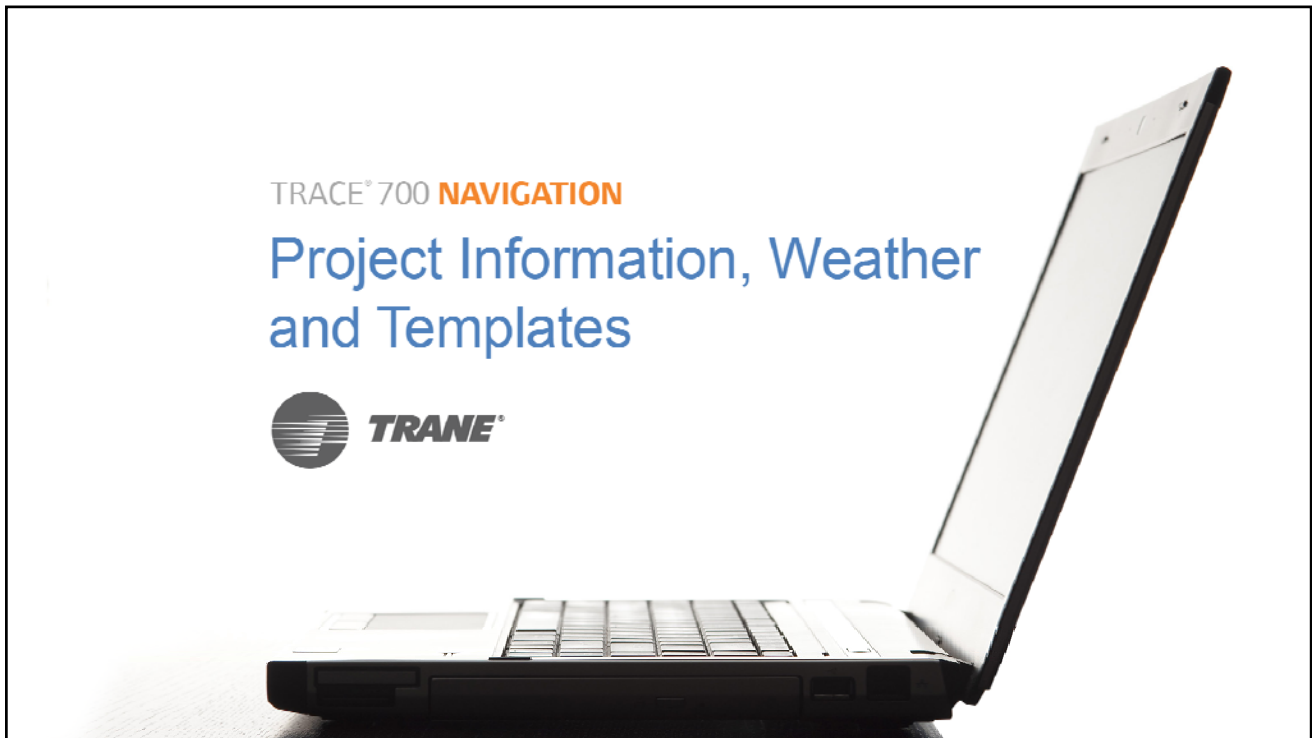
TRANE®

TRACE™ 700 Learning Series

Module 2: Navigation

Project Information, Weather & Templates
Create Rooms
Create Systems
Assigning Rooms to Systems, Zoning,
Calculate and View Results
Output Overview
Module 2 Exercise





Learning Objectives

- Know how to enter project information
- Understand how to select a weather location
- What are templates and how to effectively use them

Demo

Project Information

Alternative 1

Description: Basic Navigation Lesson

Project Information

Project: TRACE 700 Load Design Training

Location: La Crosse, WI

Building owner: Local School District

Program user: CDS

Company: Trane

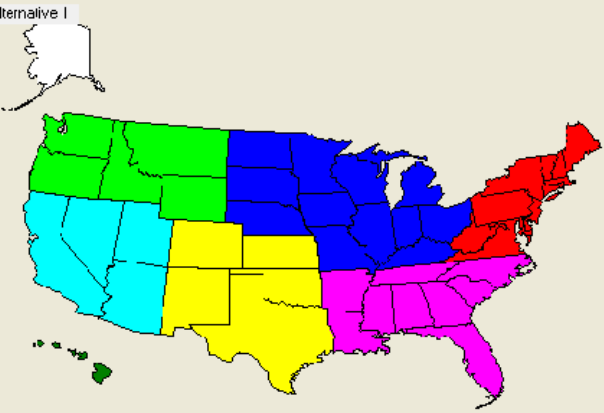
Comments: Do not use special characters.

OK Cancel

Demo

Weather

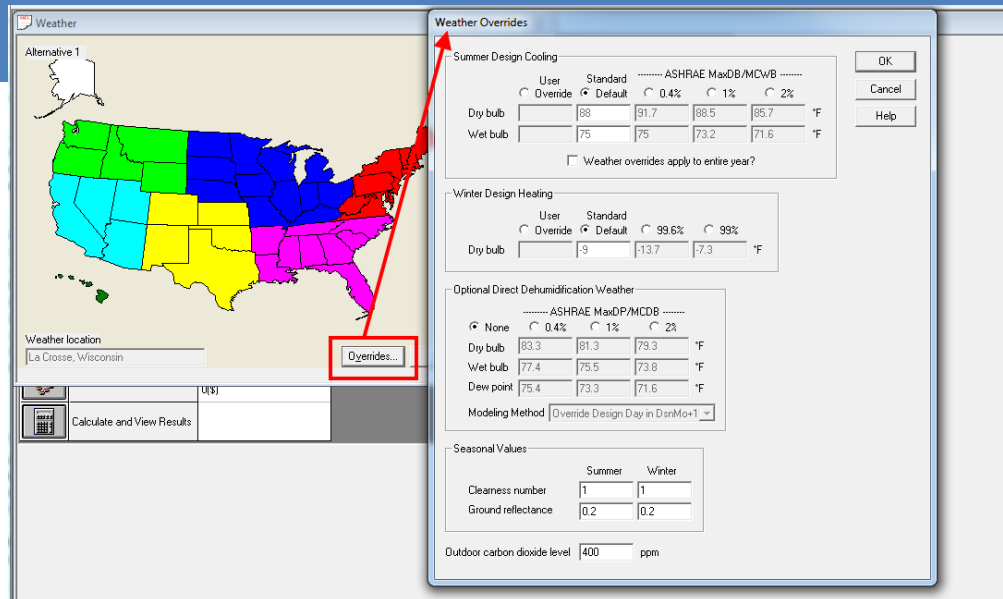
Alternative 1



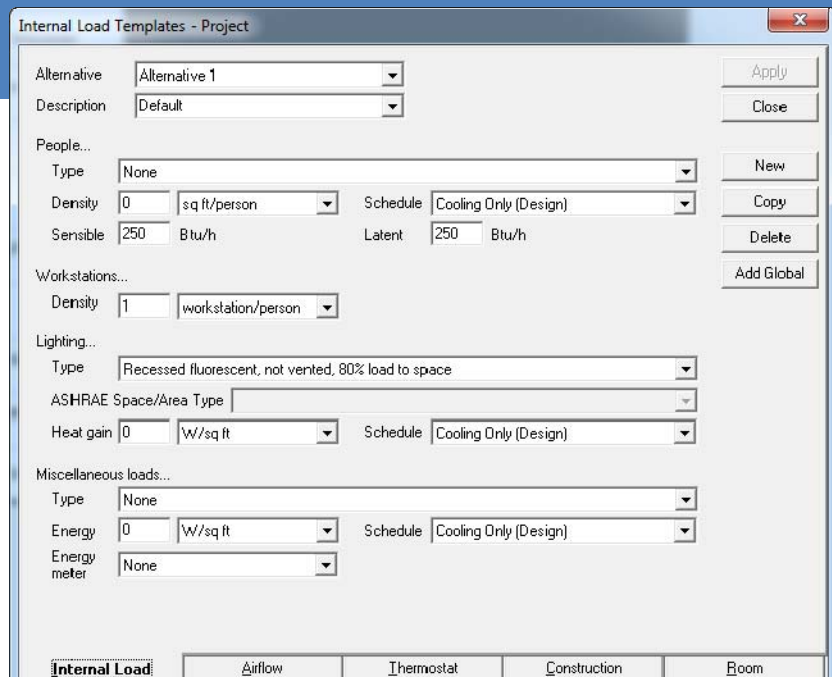
Weather location: La Crosse, Wisconsin

Overrides... OK Cancel

Demo

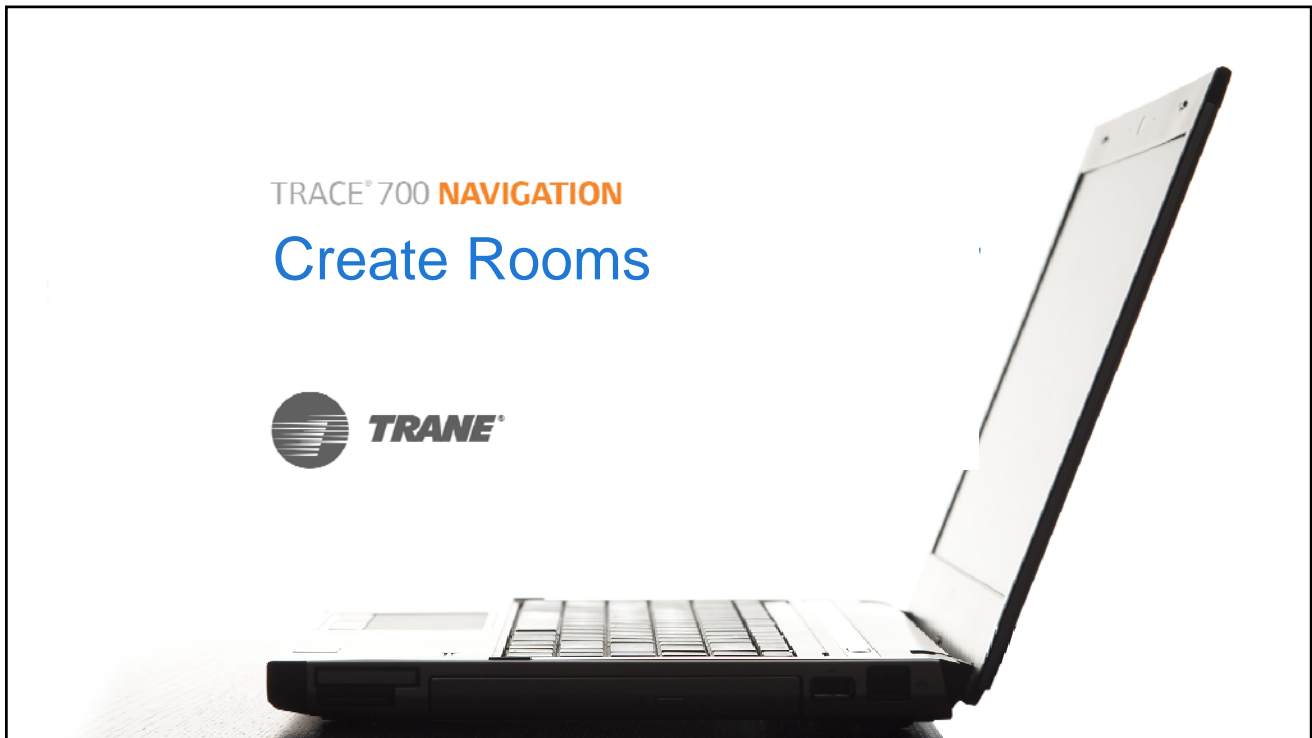


Demo



Conclusion

- **Do not** use special characters anywhere in TRACE- especially **Project Information** section
- Make sure to select the weather location for where the building will be built
- Templates are means to make mass data entry a little easier and faster
- Template values are meant to flow down and populate **Create Room** inputs



Learning Objectives

- Building aspect considerations
- Understand the Create Room input fields

Create Rooms - Single Worksheet

Alternative 1

Room description: East Office

Templates...

Room: Default

Internal: Default

Airflow: Default

Tstat: Default

Const: Default

Length: 60 ft

Width: 50 ft

Floor: 0 ft

Roof: 0 ft

Equals floor

Walls

Description	Length (ft)	Height (ft)	Direction	% Glass or Qty	Length (ft)	Height (ft)	Window
North Wall	50	12	0	30	0	0	✓
East Wall	60	12	90	30	0	0	✓
South Wall	50	12	180	30	0	0	✓

Internal Loads

People: 150 sq ft/person

Lighting: 2 W/sq ft

Misc loads: 0.5 W/sq ft

Airflows

Cooling vent: 20 cfm/person

Heating vent: 20 cfm/person

Cooling VAV min: % Clg Airflow

Heating VAV max: % Clg Airflow

Single Sheet Rooms Roofs Walls Int Loads Airflows Pairs/Floors

Create Rooms - Rooms

Alternative 1

Room description: East Office

Design...

Cooling dry bulb: 75 °F

Heating dry bulb: 70 °F

Relative humidity: 50 %

Thermostat...

Cooling driftpoint: 81 °F

Heating driftpoint: 64 °F

Cooling schedule: Ncne

Heating schedule: Ncne

Sensor Locations...

Thermostat: Rcom

CO2 sensor: Ncne

Humidity...

Moisture capacitance: Medium

Humidistat location: Rcom

Templates...

Room: Default

Internal: Default

Airflow: Default

Tstat: Default

Const: Default

Size...

Length: 60 ft

Width: 50 ft

Height...

Floor to floor: 12 ft

Element: 3 ft

Above ground: ft

Duplicate...

Floor multiplier: 1

Floors per zone: 1

Room mass/avg time lag: Time delay based on actual mass

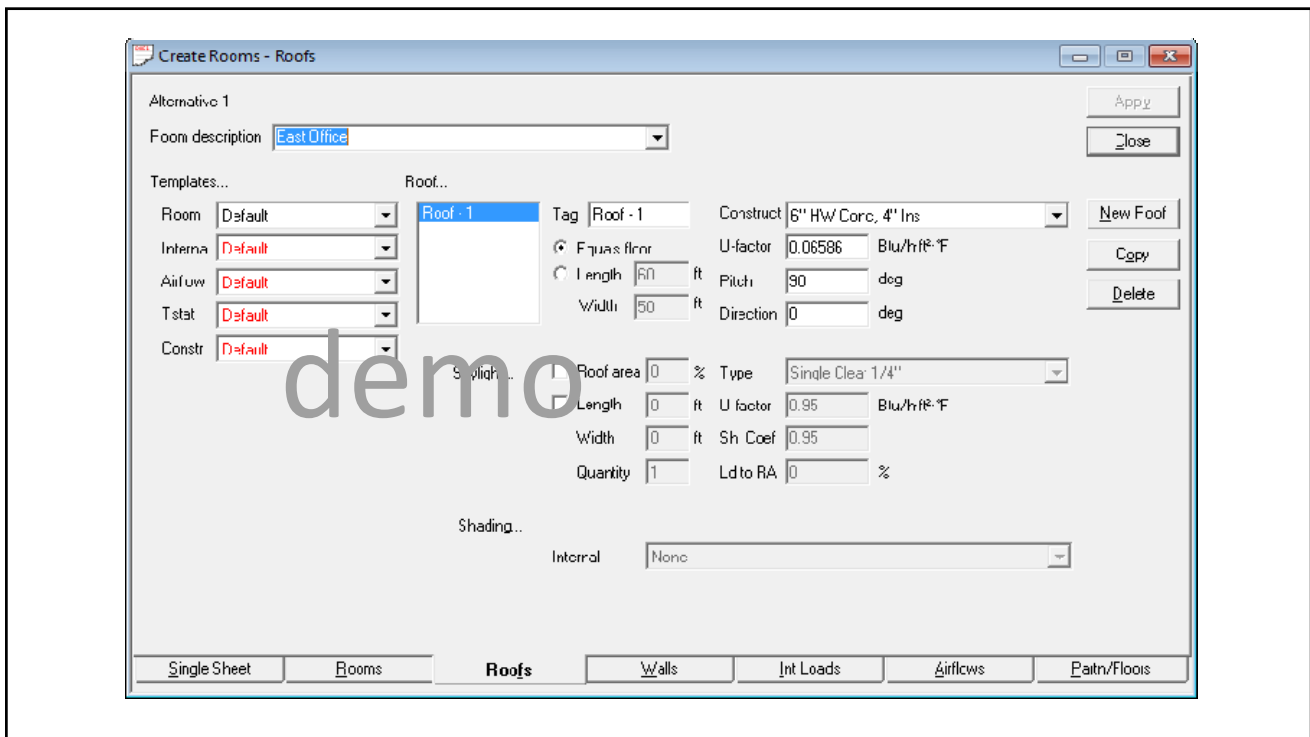
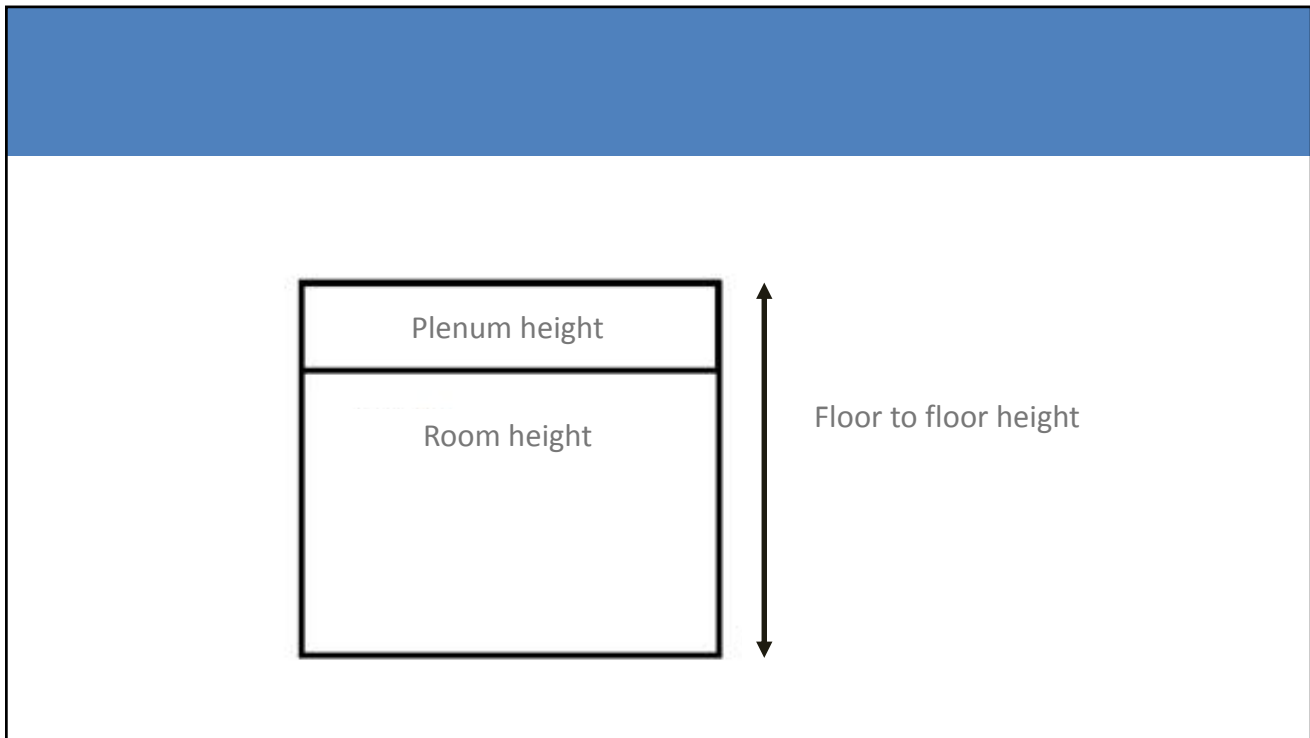
Slab construction type: 4" LW Concrete

Room type: Conditioned

Acoustic ceiling resistance: 1.78E hr-ft²·°F/Btu

Carpets: ✓

Single Sheet Rooms Roofs Walls Int Loads Airflows Pairs/Floors



Create Rooms - Walls

Alternative 1
Room description: East Office

Templates...
 Room: Default
 Intern: Default
 Airflow: Default
 Tstat: Default
 Constr: Default

Wall...
 East Wall
 North Wall
 South Wall

Tag: North Wall
 Length: 30 ft
 Height: 12 ft
 Grnd reflect multiplier: 1
 Construct: 4" LW Brk, 3" Ins
 U-factor: 0.07756 Btu/h-ft²-°F
 Tilt: 0 deg
 Direction: 0 deg
 Net wall area to underfloor plenum: %

Opening...
 Window
 Tag: Window
☒ Wall area 30 % Type: Double Clear 1/4"
☐ Length: 0 ft Height: 0 ft Quantity: 0
 U-factor: 3.6 Btu/h-ft²-°F Sh. Coef: 0.82 Ld to RA: 0 %
 Shading...
 Internal: None
 External: Overhang - None

Buttons: New Wall, Copy Wall, Delete Wall, New Opening, Copy Opening, Delete Opening

Single Sheet | Rooms | Roofs | **Walls** | Int Loads | Airflows | Patn/Floors

Create Rooms - Internal Loads

Alternative 1
Room description: East Office

Templates...
 Room: Default
 Intern: Default
 Airflow: Default
 Tstat: Default
 Constr: Default

People... Activity: General Office Space Density: 150 sq ft/person
 Schedule: Cooling Only (Design)
 Sensible: 250 Btu/h Latent: 200 Btu/h

Workstations...
 Density: 1 workstation/person

Lights
 Type: Recessed fluorescent, not vented, 50% load to space
 ASHRAE Space/Area Type:
 Heat gain: 2 W/sq ft Schedule: Cooling Only (Design)

Miscellaneous loads...
 Misc Load 1
 Tag: Misc Load 1 Type: 3rd Office Equipment
 Energy: 0.5 W/sq ft Schedule: Cooling Only (Design)
 Energy meter: Electricity

Buttons: New Load, Copy, Delete

Single Sheet | Rooms | Roofs | Walls | **Int Loads** | Airflows | Patn/Floors

Create Rooms - Airflows

Alternative 1

Room description: East Office Adjacent air transfer from room: <<No adjacent air trans>>

Templates... Main supply... Auxiliary supply...

Room: Default Cooling: ☐ To be calculated Cooling: ☐ To be calculated

Internal: Default Heating: ☐ To be calculated Heating: ☐ To be calculated

Airflow: Default Ventilation... Apply ASHRAE Std62.1-2004-2010: No

Tstat: Default Type: General Office Space

Constr: Default Cooling: 20 cfm/person

Heating: 10 cfm/person

Schedule: Available (100%)

Infiltration... Type: None

Cooling: C air changes/hr

Heating: C air changes/hr

Schedule: Available (100%)

Room exhaust... Rate: 0 air changes/hr

Schedule: Available (100%)

VAV control... Clg VAV min: % Clg Airflow

Htg VAV max: % Clg Airflow

Schedule: Available (100%)

Type: Default

Single Sheet: Rooms Roofs Walls Int Loads **Airflows** Partn/Floors

Create Rooms - Partitions and Floors

Alternative 1

Room description: W1-R1N

Templates... Partition...

Room: Wing 1

Internal: Wing 1

Airflow: Wing 1

Tstat: Wing 1

Constr: Wing 1

Partition... Taq: Length: Height: Constr: U-factor: Adj room:

Adjacent space temperature: Method: Cooling: Heating:

Floor... Taq: Exposed Slab on grade

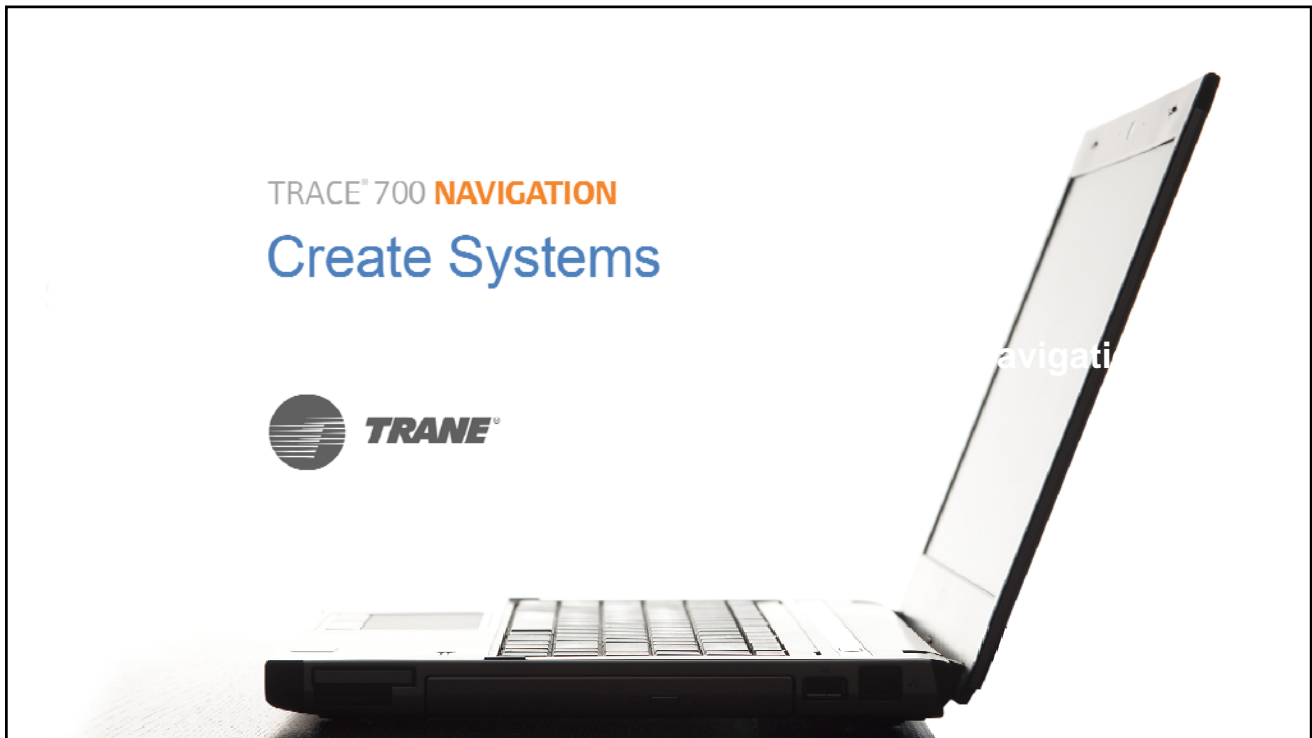
External temperature: Method: Cooling: Heating:

Area: U-factor: Perim: Loss coeff: Adj room:

Single Sheet Rooms Roofs Walls Int Loads Airflows **Partn/Floors**

Conclusion

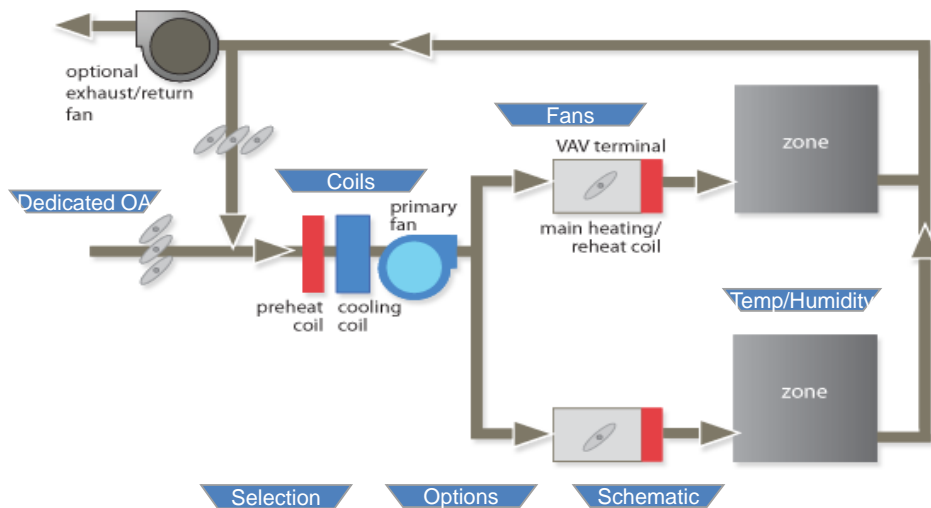
- Create Rooms is about defining geometry and building details: construction, internal loads, airflows, etc.
- TRACE 700 calculates loads based on volume of space
- gbXML can simplify the building design input process



Learning Objectives

- System aspect considerations
- Understand the associated system input fields
- Be able to define basic types of systems

Create Systems



Conclusion

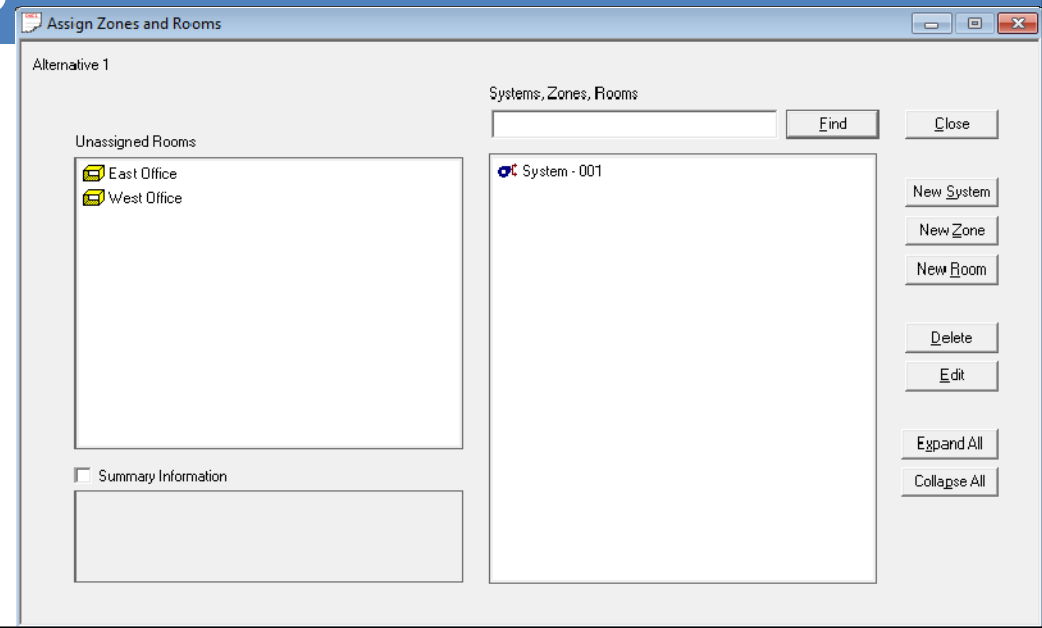
- Create Systems is about defining the air path for the system
- Understanding coil and fan location will determine how many HVAC mechanical components there will be in the building



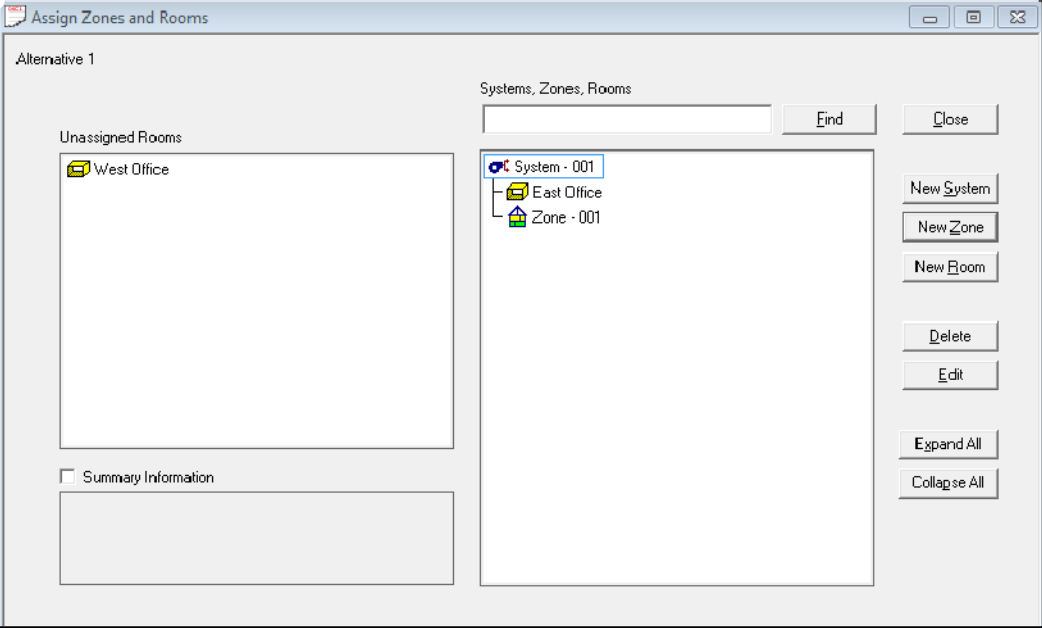
Learning Objectives

- Assigning rooms to systems
 - Tips and tricks included
- Creating zones and assign rooms to a zone
- Calculating the file and view results

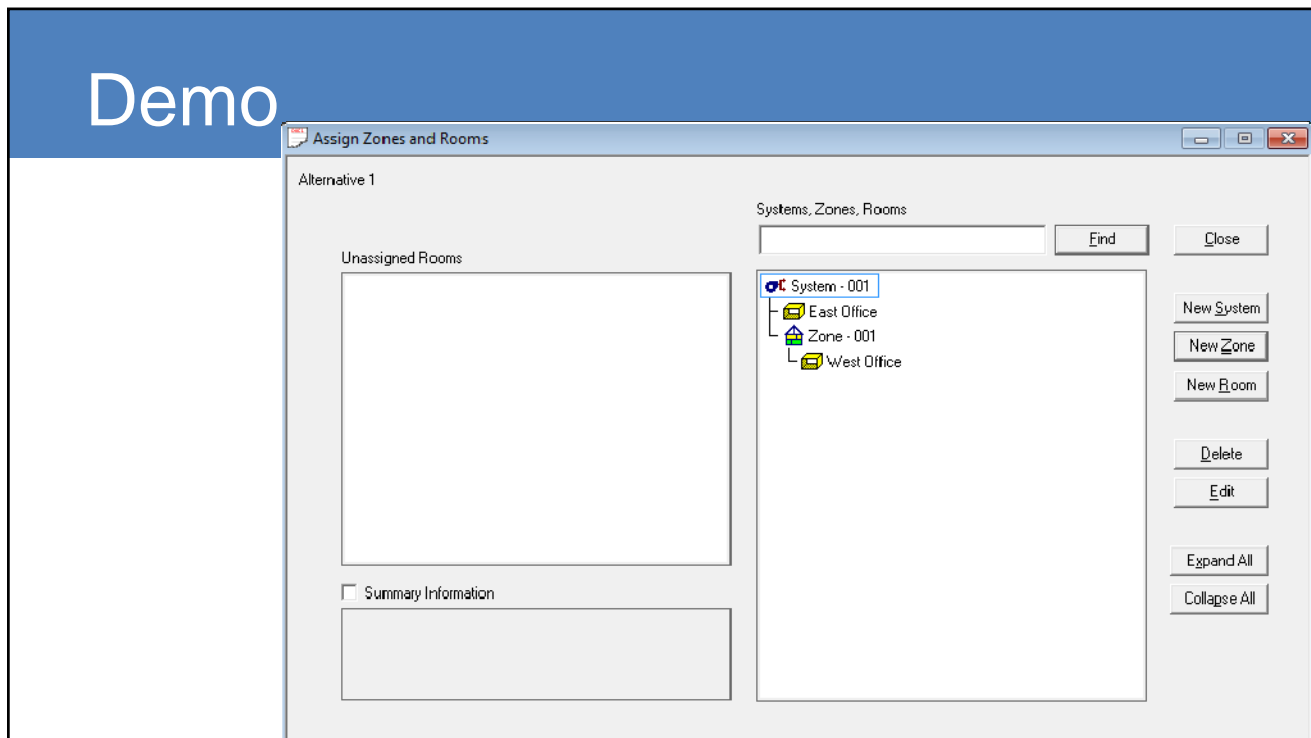
Demo



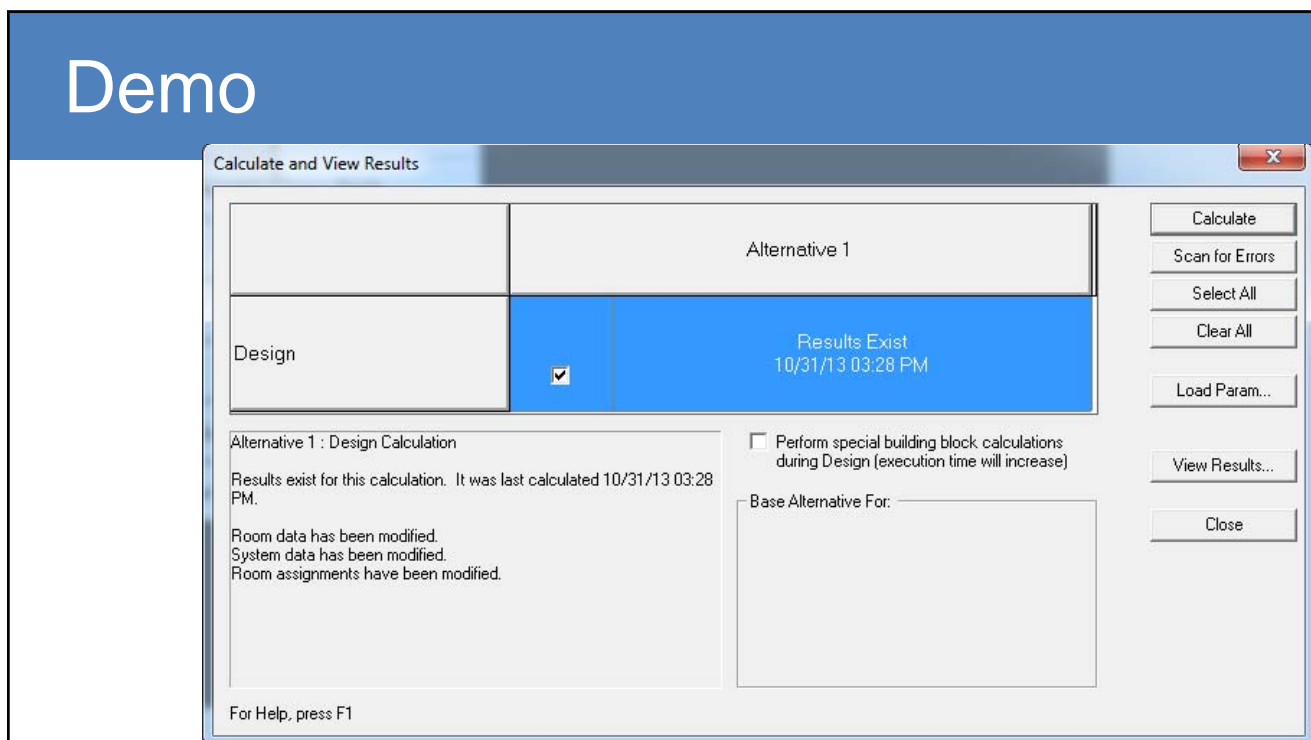
Demo



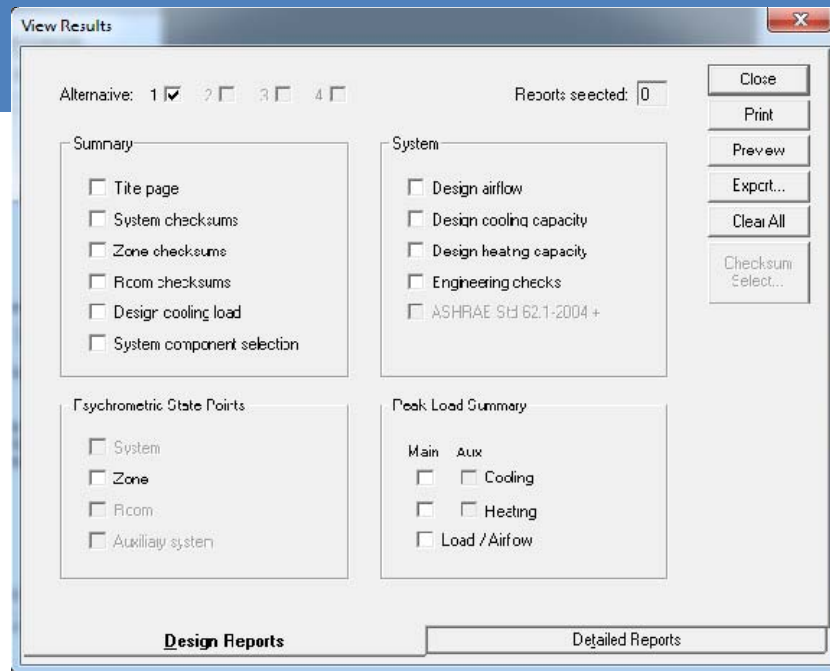
Demo



Demo



Demo



Conclusion

- To size the components of a system, TRACE must know which system each room is assigned to
- Creating zones allows for grouping of thermally similar rooms and zone level calculations
- “Scan for Errors” is a useful tool to help identify any potential issues in the file



Learning Objectives

- Quick overview of Design Reports
- Understand what information is available on Design Reports

Demo

PROJECT INFORMATION

Location	
Building owner	
Program user	
Company	
Comments	
By	TRANE
Dataset name	C:\Users\irblh\Documents\TRACE 700 Projects\Training\Ex2.trc
Calculation time	10:47 AM on 08/18/2015
TRACE® 700 version	6.3.1
Location	Memphis, Tennessee
Latitude	35.0 deg
Longitude	90.0 deg
Time Zone	6
Elevation	263 ft
Barometric pressure	29.6 in. Hg
Air density	0.0753 lb/cu ft
Air specific heat	0.2444 Btu/lb-°F
Density-specific heat product	1.1041 Btu-h-cfm-°F
Latent heat factor	4,860.2 Btu-min/h-cu ft
Enthalpy factor	4.5170 lb-min/hr-cu ft
Summer design dry bulb	95.0 °F
Summer design wet bulb	76.0 °F
Winter design dry bulb	18.0 °F
Summer clearness number	0.95
Winter clearness number	0.95
Summer ground reflectance	0.20
Winter ground reflectance	0.20
Carbon Dioxide Level	400 ppm
Design simulation period	January - December
Cooling load methodology	CI TD-CF F (ASHRAE FFM)
Heating load methodology	UATD



Demo

Design Cooling Load Summary

By Trane Commercial Systems
WSU LETC
Wichita, KS

System - 001 VAV all floors
Type - Series Fan-Powered VAV

Coil Location - System

Coil Peak Calculation Time: July, hour 16
Ambient DB/WBHR: 98 / 76 / 107

COOLING COIL LOAD INFORMATION

Load Component	Sensible Btu/h	Latent Btu/h	Total Btu/h	Percent of Total
Solar Gain	277,351		277,351	14.4%
Glass Transmission	90,151		90,151	4.7%
Wall Transmission	10,940		10,940	0.6%
Roof Transmission	0	0	0	0.0%
Floor Transmission	0	0	0	0.0%
Adj Floor Transmission	0	0	0	0.0%
Partition Transmission	0	0	0	0.0%
Net Ceiling Load	0	0	0	0.0%
Lighting	208,753		208,753	10.9%
People	177,500	168,484	345,985	18.0%
Misc. Equipment Loads	152,728	0	152,728	7.9%
Cooling Infiltration	0	0	0	0.0%
Sub-Total ==>	917,422	168,484	1,085,906	56.4%
Ventilation Load	292,631	314,353	606,984	31.5%
Exhaust Heat	-34,122	0	-34,122	-1.8%
Supply Fan Load	59,885		59,885	3.1%
Return Fan Load	0	0	0	0.0%
Net Duct Heat Pickup	0	0	0	0.0%
Wall Load to Plenum	11,154		11,154	0.6%
Roof Load to Plenum	144,799		144,799	7.5%
Adj Floor to Plenum	0	0	0	0.0%
Lighting Load to Plenum	52,188		52,188	2.7%
Misc. Equip. Load to Plenum	0	0	0	0.0%
Glass Transmission to Plenu	0	0	0	0.0%
Glass Solar to Plenum	0	0	0	0.0%
Over/Under Sizing	0	0	0	0.0%
Reheat at Design	0	0	0	0.0%
Underfloor Sup Heat Pickup	0	0	0	0.0%
Supply Air Leakage	0	0	0	0.0%
Total Cooling Loads	1,443,958	482,838	1,926,796	100.0%

COOLING COIL SELECTION

Coil Selection Parameters	
Coil Entering Air (DB / WB)	79.9 / 64.7 °F
Coil Entering Humidity Ratio	71.96 gr/lb
Coil Leaving Air (DB / WB)	53.9 / 51.9 °F
Coil Leaving Humidity Ratio	57.10 gr/lb
Coil Sensible Load	1,443.96 MBh
Coil Total Load	1,926.80 MBh
Cooling Supply Air Temperature	54.44 °F
Total Cooling Airflow	50,527.35 cfm
Resulting Room Relative Humidity	49.98 %

General Engineering Checks

Total Cooling Load	150.6 ton
Area / Load	317.44 R²/ton
Total Floor Area	60,070 ft²
Cooling Airflow	1.01 cfm/ft²
Airflow / Load	320.02 cfm/ton
Percent Outdoor Air	20.7 %
Cooling Load Methodology	TETD-TA1

Project Name: WSU LETC
Dataset Name: WSU LETC EA.TRC

TRACE® 700 v6.3.2 calculated at 09:51 AM on 11/10/2015
Alternative - 1 Design Cooling Load Report Page 1 of 65

Demo

System Checksums

By TRANE

System - 001

Variable Volume Reheat (30% Min Flow Default)

COOLING COIL PEAK					CLG SPACE PEAK					HEATING COIL PEAK					TEMPERATURES		
Peaked at Time: Mo/Hr: 7 / 16					Mo/Hr: 6 / 16					Mo/Hr: Heating Design					SADB		
Outside Air: OADB/WB/HR: 95 / 75 / 104					OADB: 94					OADB: 18					Ra Plenum		
Space	Sens. + Lat.	Plenum	Net	Percent	Space	Sens. + Lat.	Plenum	Net	Percent	Space	Sens. + Lat.	Plenum	Net	Percent	Return	Ret/OA	Fn MTD
Btu/h	Btu/h	Btu/h	Total	Of Total	Btu/h	Btu/h	Btu/h	Total	Of Total	Btu/h	Btu/h	Btu/h	Total	Of Total	Btu/h	Btu/h	Btu/h
				(%)					(%)					(%)			
Envelope Loads										Envelope Loads							
Skyline Solar	0	0	0	0	0	0	0	0	0	Skyline Solar	0	0	0	0			
Skyline Cond	0	0	0	0	0	0	0	0	0	Skyline Cond	0	0	0	0			
Roof Cond	0	333,213	333,213	56	0	0	0	0	0	Roof Cond	0	-189,678	45,87	0			
Glass Solar	29,293	0	29,293	5	28,913	11	0	0	0	Glass Solar	0	0	0	0			
GlassDoor Cond	9,497	0	9,497	2	9,385	3	0	0	0	GlassDoor Cond	-28,875	6,98	0	0			
Wall Cond	27,594	9,770	37,363	6	26,932	10	0	0	0	Wall Cond	-40,415	-56,497	13,55	0			
Partition/Door	0	0	0	0	0	0	0	0	0	Partition/Door	0	0	0	0			
Floor	0	0	0	0	0	0	0	0	0	Floor	0	0	0	0			
Adjacent Floor	0	0	0	0	0	0	0	0	0	Adjacent Floor	0	0	0	0			
Infiltration	0	0	0	0	0	0	0	0	0	Infiltration	0	0	0	0			
Sub Total ==>	66,384	342,983	409,367	67	66,236	24				Sub Total ==>	-69,290	-275,050	66,51				
Internal Loads										Internal Loads							
Lights	94,731	23,683	118,414	19	94,731	35	0	0	0	Lights	0	0	0	0			
People	7,650	0	7,650	1	4,250	2	0	0	0	People	0	0	0	0			
Misc	6,143	0	6,143	1	6,143	2	0	0	0	Misc	0	0	0	0			
Sub Total ==>	108,525	23,683	132,207	22	105,125	39				Sub Total ==>	0	0	0	0			
Ceiling Load	98,229	-98,229	0	0	99,439	37				Ceiling Load	-111,510	0	0	0			
Ventilation Load	0	0	64,074	11	0	0				Ventilation Load	0	-76,505	18,50	0			
Adj Air Trans Heat	0	0	0	0	0	0				Adj Air Trans Heat	0	0	0	0			
Dehumid. Ov Sizing	0	0	0	0	0	0				Ov/Undr Sizing	0	0	0	0			
Exhaust Heat	0	-19,124	-19,124	-3	0	0				Exhaust Heat	21,709	-5,25	0	0			
Sup. Fan Heat	0	0	22,100	4	0	0				OA Preheat Diff.	-93,703	20,24	0	0			
Ref. Fan Heat	0	0	0	0	0	0				RA Preheat Diff.	0	0	0	0			
Duct Heat PkUp	0	0	0	0	0	0				Additional Reheat	0	0	0	0			
Underfr. Sup H/PkUp	0	0	0	0	0	0				Underfr. Sup H/PkUp	0	0	0	0			
Supply Air Leakage	0	0	0	0	0	0				Supply Air Leakage	0	0	0	0			
Grand Total ==>	273,138	249,313	608,684	100.00	269,801	100.00				Grand Total ==>	-180,800	-413,549	100.00				

Project Name:
Dataset Name: Ex2.ttcTRACE700 v6.3.1 calculated at 10:47 AM on 08/18/2015
Alternative - 1 System Checksums Report Page 1 of 1

Demo

System Component Selection Summary

By TRANE

Alternative 1

System Description: System - 001

System Type: Variable Volume Reheat (30% Min Flow Default)

Number of Zones: 5

Number of Rooms: 5

Component	Sizing Method	Location	Quantity
Cooling			
Main Cig Coil	Block	System	1
Primary Cig Fan	Block	System	1
Heating			
Main Htg Coil	Peak	Zone	5
Preheat Coil	Peak	System	1
Miscellaneous			
System Exhaust Fan	Vent+Int-RmExh	System	1
Return Fan	Return Airflow	System	1
VAV Boxes	Block	Zone	5

Coil Location			Cooling Coil Selection						
System	Zone	Room	Component	Time Of Peak Mo/Hr	Total Capacity ton	Sensible Capacity MBh	Airflow cfm	Coil Peak °F	Enter DB/ WB/ HR °F °F g/rb
System - 001			Main Cig Coil	7/16	50.7	608.7	569.9	18,697	88.5 67.4 68.1 60.9 57.3 65.1

Coil Location			Heating Coil Selection				
System	Zone	Room	Component	Total Capacity MBh	Airflow cfm	Entering Dry Bulb °F	Leaving Dry Bulb °F
System - 001			Preheat Coil	-170.8	18,702	52.5	60.9
Conference 1			Main Htg Coil	-23.6	549	60.9	99.8
Conference Room 2			Main Htg Coil	-23.6	549	60.9	99.8
Corridor			Main Htg Coil	-147.1	3,818	60.9	95.7
Office 1			Main Htg Coil	-22.2	408	60.9	110.1
Office 2			Main Htg Coil	-22.7	460	60.9	105.6

Component Location			Miscellaneous Component Selection					
System	Zone	Room	Component	Design Airflow cfm	Outside Air %	SADB °F	Cig VAV °F	Htg VAV °F
System - 001			System Exhaust Fan	1,333				
System - 001			Optional Vent Fan	1,333	100			
System - 001			Return Fan	18,702				
System - 001			Primary Fan	18,702	7.1	62.0	5,785	5,785
Conference 1			VAV Box	1,832	4.4	62.0	100.0	549

Project Name:
Dataset Name: Ex2.ttcTRACE700 v6.3.1 calculated at 10:47 AM on 08/18/2015
Alternative - 1 System Component Selection Summary Page 1 of 2

Demo

SYSTEM SUMMARY
DESIGN AIRFLOW QUANTITIES
By TRANE

System Description	System Type	MAIN SYSTEM					Auxiliary System	Room
		Outside Airflow cfm	Cooling Airflow cfm	Heating Airflow cfm	Return Airflow cfm	Exhaust Airflow cfm	Supply Airflow cfm	Exhaust Airflow cfm
Alternative 1								
System - 001	Variable Volume Reheat (30% Min Flow Default)	1,333	18,702	5,785	18,702	1,333	0	0
Totals		1,333	18,702	5,785	18,702	1,333	0	0

Note: Airflows on this report are not additive because they are each taken at the time of their respective peaks. To view the balanced system design airflows, see the appropriate Checksums report (Airflows section).

Demo

SYSTEM SUMMARY
DESIGN COOLING CAPACITIES
By TRANE

Alternative 1

System Coil Capacities

	Actual Airside Capacities							Block Airside Loads At Time Of Building Peak						
	Main Coil ton	Aux Coil ton	Opt Vent Coil ton	Misc Load ton	Stg 1 Desic Cond ton	Stg 2 Desic Cond ton	Plant Peak Total ton	Main Coil ton	Aux Coil ton	Opt Vent Coil ton	Misc Load ton	Stg 1 Desic Cond ton	Stg 2 Desic Cond ton	Plant Block Total ton
System - 001	50.7	0.0	0.0	0.0	0.0	0.0	50.7	50.7	0.0	0.0	0.0	0.0	0.0	50.7
Totals	50.7	0.0	0.0	0.0	0.0	0.0	50.7	50.7	0.0	0.0	0.0	0.0	0.0	50.7

Building systems maximum block load of 50.7 tons occurs in Jul at hour 16 based on design simulation.

Demo

ENGINEERING CHECKS

By TRANE

			Floor Area ft²	COOLING					HEATING			
System	Zone	Room		Type	% OA	cfm/ft²	cfm/ton	ft³/ton	Btu/hr ft²	% OA	cfm/ft²	Btu/hr ft²
Alternative 1												
	Conference 1		Zone	900	4.37	2.04	528.0	259.4	46.25	14.56	0.61	-42.51
	Conference Room2		Zone	900	4.37	2.04	528.0	259.4	46.25	14.56	0.61	-42.51
	Corridor		Zone	20,250	7.96	0.63	3366	5366	22.40	26.52	0.19	-13.22
	Office 1		Zone	900	5.89	1.51	473.8	313.8	38.24	19.63	0.46	-37.66
	Office 2		Zone	900	5.22	1.70	483.1	283.6	42.31	17.40	0.51	-39.45
System - 001	System - Variable Volume Reheat (30% Min Flow Default)			23,850	7.13	0.78	368.7	470.2	25.52	23.03	0.24	-17.19

Demo

PEAK COOLING LOADS

MAIN SYSTEM

By Trane Commercial Systems

System	Zone	Room	Floor Area ft²	SPACE										COIL									
				Peak Time Mo/Hr	Condition DB °F	OA WB °F	Room Dry Bulb °F	Supply Dry Bulb °F	Space Air Flow cfm	Space Sensible Load Btu/h	Space Latent Load Btu/h	Peak Time Mo/Hr	Condition DB °F	OA WB °F	Supply Dry Bulb °F	Room Airflow cfm	Sensible Load Btu/h	Latent Load Btu/h					
Alternative 1																							
		001- 911 Backup/Training	Peak	2,083	9/16	81	66	72.0	54.4	4,899	91,173	4,000	7/15	98	76	54.4	4,577	113,064	16,125				
		003- WP Quarter Master	Peak	1,416	7/17	96	73	72.0	54.4	1,455	27,073	1,000	7/16	97	74	54.4	1,381	37,910	3,648				
		004- SCS Quarter Master	Peak	1,437	7/17	96	73	72.0	54.4	1,563	30,944	1,000	7/17	96	73	54.4	1,463	40,434	3,648				
		005-Crime Scene Incident Room	Peak	1,550	7/15	98	76	72.0	54.4	1,282	23,849	5,000	7/14	97	76	54.4	1,273	36,795	20,006				
		007- Stair B	Peak	318	7/11	89	72	70.0	54.4	1,857	46,374	0	7/12	93	74	54.4	1,754	46,683	563				
		008-Mock Cell Training	Peak	472	7/10	85	70	72.0	54.4	680	12,658	4,130	7/11	89	72	54.4	667	16,900	9,617				
		009- Recruit Lunch Room	Peak	2,063	7/10	85	70	72.0	54.4	7,087	131,886	15,000	7/10	85	70	54.4	7,086	151,596	13,875				
		010- Work/File and Reserve Office	Peak	532	7/10	85	70	72.0	54.4	823	11,602	532	7/10	85	70	54.4	823	13,159	1,461				
		011- Entrance Area	Peak	1,578	10/11	63	51	72.0	54.4	4,874	90,712	14,645	7/13	95	76	54.4	3,713	81,260	50,263				
		012- Stair A	Peak	318	11/15	66	47	78.0	54.4	3,275	81,763	0	9/15	82	67	54.4	2,870	77,229	14,247				
		013-Security/Custodial/Equipment	Peak	623	7/17	96	73	72.0	54.4	739	13,758	0	7/17	96	73	54.4	739	15,676	725				
		014- Small Conference Room	Peak	313	7/15	98	76	72.0	54.4	261	4,858	2,739	7/14	97	76	54.4	259	8,696	5,043				
		015-Corridor	Peak	2,933	7/15	98	76	72.0	54.4	1,067	19,854	0	7/15	98	76	54.4	1,067	25,565	5,205				
		017-Lockers	Peak	1,938	7/15	98	76	72.0	54.4	906	16,869	3,750	7/14	97	76	54.4	897	22,347	9,743				
		018- Tactical Training	Peak	4,558	10/13	70	54	72.0	54.4	3,904	72,656	13,500	7/14	97	76	54.4	3,181	81,260	50,263				
		019- Small Classroom	Peak	949	10/15	73	55	72.0	54.4	1,822	33,900	8,304	7/15	98	76	54.4	1,593	48,167	21,496				
		020- Small Classroom	Peak	1,863	7/17	96	73	72.0	54.4	3,062	56,982	16,302	7/16	97	74	54.4	2,932	89,400	37,365				
		021- Small Classroom	Peak	945	7/17	96	73	72.0	54.4	1,890	31,452	8,269	7/17	96	73	54.4	1,690	48,434	16,680				
		023-Large Conference/Polygraph Room	Peak	873	7/15	98	76	72.0	54.4	975	18,140	7,639	7/14	97	76	54.4	973	29,150	14,047				
		024- Recruit Lieutenant/FTO	Peak	920	7/11	89	72	72.0	54.4	856	15,934	920	7/11	89	72	54.4	856	16,324	2,854				
		025- Captain Office	Peak	247	7/11	89	72	72.0	54.4	571	10,620	247	7/11	89	72	54.4	571	1,872	756				
		026- East Offices	Peak	1,210	7/10	85	70	72.0	54.4	2,345	43,645	1,210	7/10	85	70	54.4	2,345	48,524	3,323				
		027- Training Sergeant	Peak	329	9/12	77	65	72.0	54.4	703	13,089	329	7/13	95	76	54.4	603	12,804	1,201				
		028- South Offices	Peak	328	7/15	98	76	72.0	54.4	296	5,510	328	7/14	97	76	54.4	296	6,615	1,201				
		029- Photo Studio/Background	Peak	1,241	7/15	98	76	72.0	54.4	649	12,070	1,241	7/15	98	76	54.4	649	17,295	6,863				
		030-Corridor	Peak	4,487	7/16	97	74	72.0	54.4	1,968	36,585	0	7/15	98	76	54.4	1,916	49,434	4,965				
		031- Future Offices	Peak	319	7/15	98	76	72.0	54.4	167	3,103	319	7/15	98	76	54.4	187	3,978	1,121				
		032- Classrooms/Storage	Peak	3,137	7/15	98	76	72.0	54.4	2,816	48,687	27,450	7/14	97	76	54.4	2,600	104,511	73,642				
		033- Classroom/Storage	Peak	1,379	11/13	55	45	72.0	54.4	2,356	43,848	12,067	7/14	97	76	54.4	1,793	59,954	32,733				
		035- Storage	Peak	1,371	7/17	96	73	72.0	54.4	889	16,537	0	7/16	97	74	54.4	859	26,760	1,951				
		036- Medium Classroom	Peak	1,353	7/17	96	73	72.0	54.4	2,376	44,221	11,839	7/16	97	74	54.4	2,274	68,000	27,151				
		037- Conference Room	Peak	320	7/10	85	70	72.0	54.4	520	9,674	2,800	7/11	89	72	54.4	520	12,510	4,865				
		038- GTARCOT Offices	Peak	929	7/16	97	74	72.0	54.4	586	10,901	1,000	7/14	97	76	54.4	579	19,791	3,529				
		039- WCJ Office	Peak	393	7/11	89	72	72.0	54.4	793	14,758	393	7/12	93	74	54.4	732	17,084	1,383				

Project Name: WSU LETC
 Dataset Name: WSU LETC EA TRC

TRACE700 v6.3.2 calculated at 09:51 AM on 11/10/2015
 Peak Ctg Loads Main System Report Page 1 of 6

Demo

Load / Airflow Summary

By Trane Commercial Systems

System Zone Room #		Floor	Area	People	Coil	Coil	Space	Air	VAV	VAV	Main Coil	Heating	Percent
		Area	FF	#	Cooling	Cooling	Design	Changes	Minimum	Minimum	Heating	Max SA	OA
		FF			Sensible	Total	Max SA	ach/hr	SA	%	Sensible	Max SA	Clg
		FF			Btuh	Btuh	cfm		cfm		Btuh	cfm	Wtg
Alternative 1													
001 - 911 Backup/Training	Rm Peak	2.083	18.0	113.064	129.189	4.899	14.11	1.470	30	-81.061	1.716	8.4	12.9
003 - WP Quarter Master	Rm Peak	1.416	5.0	37.910	41.550	1.455	6.16	436	30	-29.200	509	7.6	11.6
004 - SC5 Quarter Master	Rm Peak	1.437	6.0	43.048	48.201	1.683	6.94	499	30	-37.888	682	8.7	10.3
005 - Crime Scene Incident Room	Rm Peak	1.650	20.0	26.796	56.802	1.282	4.96	264	30	-29.507	449	37.4	57.5
007 - Stair B	Rm Peak	318	0.0	48.603	49.236	1.857	36.04	557	30	-55.075	650	1.0	1.6
008 - Mock Cell Training	Rm Peak	472	18.6	16.900	26.817	680	8.66	204	30	-12.706	238	32.8	60.2
009 - Recruit Lunch Room	Rm Peak	2.053	60.0	151.596	183.470	7.087	20.61	2.126	30	-137.469	2.400	11.6	17.8
010 - Work/Files and Reserve Office	Rm Peak	532	2.7	13.159	14.620	623	7.03	187	30	-12.543	218	7.3	11.2
011 - Entrance Area	Rm Peak	1.578	94.5	87.402	119.804	4.974	16.53	1.462	30	-99.568	1.706	11.6	17.9
012 - Stair A	Rm Peak	318	0.0	77.220	77.468	3.276	61.78	982	30	-62.369	1.146	0.6	0.9
013 - Security/Custodial/Equipment	Rm Peak	623	0.0	16.676	16.400	739	7.12	222	30	-14.067	269	5.1	7.8
014 - Small Conference Room	Rm Peak	313	11.0	8.696	13.739	261	5.00	79	30	-4.503	91	28.2	43.4
015 - Corridor	Rm Peak	2.933	0.0	26.666	30.770	1.067	2.18	320	30	-26.453	373	16.6	26.4
017 - Lockers	Rm Peak	1.836	16.0	22.347	32.090	906	2.81	272	30	-18.264	317	21.1	32.5
018 - Tactical Training	Rm Peak	4.658	45.0	91.250	141.623	3.904	6.14	1.171	30	-79.806	1.366	30.1	46.2
019 - Small Classroom	Rm Peak	940	33.2	48.167	69.664	1.822	11.52	545	30	-36.847	638	24.5	37.7
020 - Small Classroom	Rm Peak	1.053	65.2	89.400	126.765	3.062	9.86	919	30	-64.605	1.072	28.6	44.0
021 - Small Classroom	Rm Peak	945	33.1	48.434	66.313	1.690	10.73	507	30	-34.078	592	26.3	40.4
023 - Large Conference/Polygraph Room	Rm Peak	873	30.6	29.150	43.316	975	6.70	252	30	-21.541	341	21.0	32.4
024 - Recruit Lieutenants/PTO	Rm Peak	920	4.6	18.640	21.494	856	6.58	257	30	-19.054	300	9.1	14.1
025 - Captain Office	Rm Peak	247	1.2	11.872	12.838	571	13.86	171	30	-12.729	200	3.7	5.7
026 - East Offices	Rm Peak	1.210	8.1	48.624	61.847	2.346	11.83	704	30	-48.627	821	4.4	8.7
027 - Training Sergeant	Rm Peak	329	1.6	12.804	14.005	703	12.83	211	30	-15.523	248	4.0	8.1
028 - South Offices	Rm Peak	328	1.6	8.816	7.816	296	5.42	89	30	-7.945	104	9.4	14.6
029 - Photo Studio/Background	Rm Peak	1.241	8.2	17.288	23.848	649	3.14	186	30	-13.183	227	27.7	42.7
030 - Corridor	Rm Peak	4.487	0.0	45.162	53.126	1.966	2.83	690	30	-46.058	688	13.7	21.1
031 - Future Offices	Rm Peak	319	1.6	3.978	6.099	167	3.14	80	30	-3.384	68	18.3	26.0
032 - Classroom/Storage	Rm Peak	3.137	109.8	104.611	178.163	2.616	6.00	786	30	-46.128	916	66.4	86.7
033 - Classroom/Storage	Rm Peak	1.379	48.3	48.864	91.328	2.368	10.26	707	30	-42.704	826	27.6	42.3
036 - Storage	Rm Peak	1.371	0.0	28.760	28.740	889	3.89	287	30	-20.426	311	9.3	14.2
036 - Medium Classroom	Rm Peak	1.363	47.4	68.000	95.151	2.376	10.54	713	30	-45.853	832	26.8	41.2
037 - Conference Room	Rm Peak	320	11.2	12.610	17.170	820	9.78	168	30	-9.741	182	14.6	22.3
038 - GTARCOT Offices	Rm Peak	929	5.0	18.791	22.321	586	3.78	176	30	-13.477	205	13.8	21.2
039 - WQJ Office	Rm Peak	393	2.0	17.064	18.446	793	12.11	238	30	-17.731	278	4.2	6.6
040 - East Offices	Rm Peak	1.148	6.7	48.370	61.922	2.249	11.79	676	30	-44.697	787	4.3	8.7

* This report does not display heating only systems.

Project Name: WSU LETC
Dataset Name: WSU LETC EA TRC

TRACER 700 v6.3.2 calculated at 09:51 AM on 11/10/2015
Load/Airflow Summary Report Page 1 of 6

Demo

SYSTEM PSYCHROMETRIC STATE POINTS

By Trane Commercial Systems

001 VAV all floors		Series Fan-Powered VAV					
		Dry Bulb	Wet Bulb	Relative Humidity	Humidity Ratio	Enthalpy	Temperature Difference
		°F	°F	%	gr/lb	Btu/lb	°F
Space		72.6	60.3	60.0	62.6	27.2	
Main Systems							
Return Fan							0.0
Return Air		74.4	60.9	48.9	62.6	27.8	
Return Air Heat Pickup							1.9
Outdoor Air		89.0	72.4	46.0	99.7	37.0	
Entering OA precooling		89.0	72.4	46.0	99.7	37.0	
Leaving OA precooling		77.4	63.5	47.5	70.3	29.6	
Return/Outdoor Air Mix							0.0
Blow Through Fan		77.4	63.5	47.5	70.3	29.6	
Entering Coil		53.3	51.9	91.2	58.2	21.8	
Leaving Coil							0.4
Draw Through Fan							0.8
Fan Frictional Heat							0.0
Supply Duct Heat Gain							0.0
Reheat Device							0.0
Cold Deck Supply Air		54.4	52.3	87.6	58.2	22.1	
Supply Air							22.1
Percent Outside Air		20.60					
Sensible Heat Ratio (SHR)		0.86					
Coil Airflow		51.606					
				cfm			

Project Name: WSU LETC
Dataset Name: WSU LETC EA TRC

TRACER 700 v6.3.2 calculated at 09:51 AM on 11/10/2015
Alternative - 1 System Psychrometric Report Page 1 of 1

Demo	ASHRAE Standard 62.1-2004-2010
	<p>Project Name: Dataset Name:</p>

Conclusion

- If using the Checksums reports, make sure to use the correct report
- For sizing equipment, use the System Component Selection Report.
- All Design Reports provide results for the Design Peak only. There is no off peak information provided.

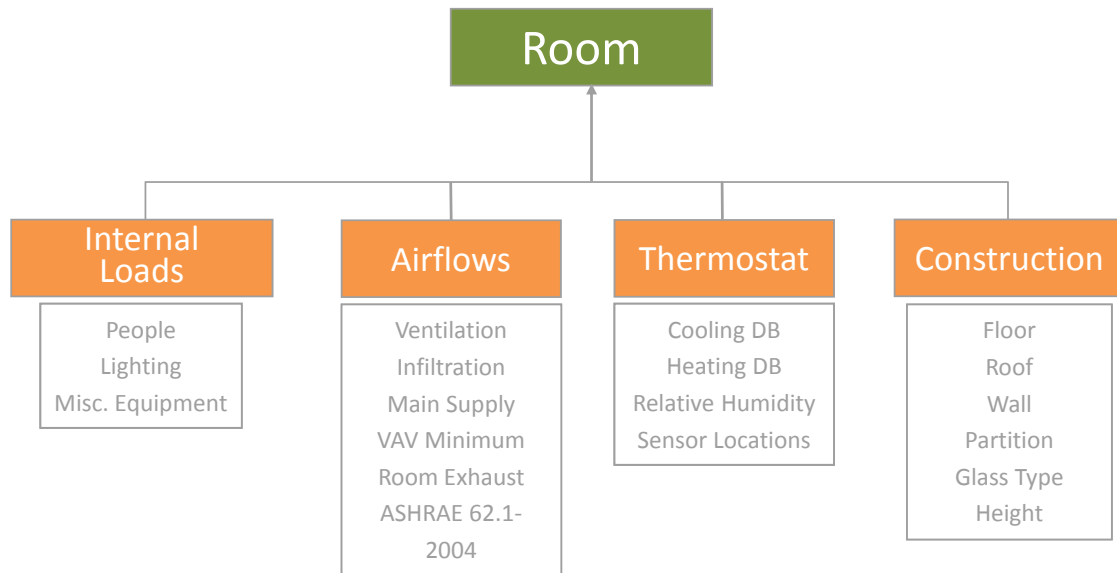
TRACE® 700 NAVIGATION Exercise: Templates



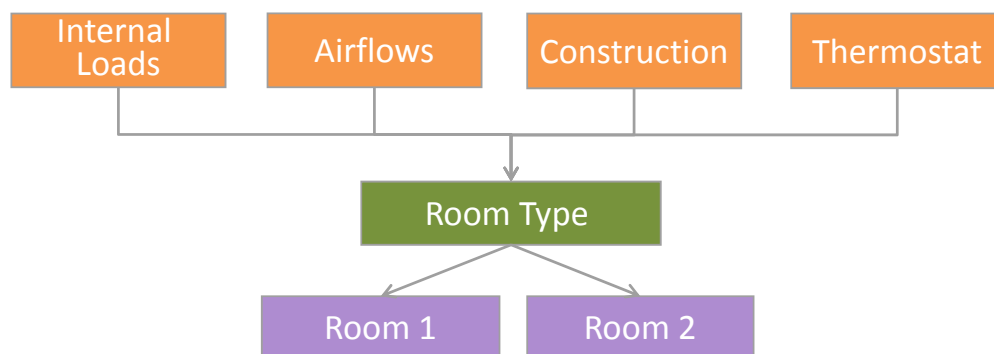
Learning Objectives

- Overview of Templates
- Understand how Templates function and benefits of using them in the project
- Know how to create Templates and apply them to rooms

Template Categories



Template Categories



Building Templates

	Office	Lab
Internal Loads	10 People LPD 1.5 W/ft ² Plug Loads 1 W/ft ²	2 People LPD 3 W/ft ² Plug Loads 2 W/ft ²
Airflow	20 cfm/person	100% OA
Thermostat	75°/70°	75°/70°
Construction	Double Clear 1/4"	Double Clear 1/4"

	Internal Load	Airflow	Thermostat	Construction	Room
Template Name	Office Internal Loads	Office Airflows	Shared between Room Types Building Thermostat		Office
	Lab Internal Loads	Lab Airflows	Building Construction		Lab

Demo

Internal Load Templates - Project

Alternative:

Description:

People...

Type:

Density:

Schedule:

Sensible: Btu/h Latent: Btu/h

Workstations...

Density:

Lighting...

Type:

ASHRAE Space/Area Type:

Heat gain: W/sq ft

Miscellaneous loads...

Type:

Energy: W/sq ft

Energy meter:

Internal Load

Demo

Airflow Templates - Project

Alternative: Apply

Description: Close

Main supply...

Cooling: ☐ To be calculated
 Heating: ☐ To be calculated

Auxiliary supply...

Cooling: ☐ To be calculated
 Heating: ☐ To be calculated

Ventilation...

Apply ASHRAE Std62.1-2004-2010:

Type:

Cooling: cfm
 Heating: cfm

Schedule:

Infiltration...

Type:

Cooling: air changes/hr
 Heating: air changes/hr

Schedule:

Std 62.1-2004-2010...

Clg Ez: %
 Htg Ez: %
 Er: %
 DCV Min OA Intake: ☐ None

Room exhaust...

Rate: air changes/hr
 Schedule:

VAV control...

Clg VAV min: % Clg Airflow
 Htg VAV max: % Clg Airflow
 Schedule:
 Type:

Internal Load **Airflow** Thermostat Construction Room

New Copy Delete Add Global

Demo

Thermostat Templates - Project

Alternative: Apply

Description: Cancel

Thermostat settings...

Cooling dry bulb: °F
 Heating dry bulb: °F
 Relative humidity: %
 Cooling driftpoint: °F
 Heating driftpoint: °F

Cooling schedule:
 Heating schedule:

Sensor Locations...

Thermostat:
 CO2 sensor:

Humidity...

Moisture capacitance:
 Humidistat location:

Internal Load Airflow **Thermostat** Construction Room

New Copy Delete Add Global

Demo

Construction Templates - Project

Alternative:

Description:

Buttons:

Construction...	U-factor Btu/h·ft²·°F
Slab: <input concrete"="" lw="" type="text" value="4"/>	0.212615
Floor: <input conc"="" lw="" type="text" value="4"/>	0.213535
Wall: <input type="text" value="Frame Wall, No Ins"/>	0.437609
Partition: <input frame"="" gyp="" type="text" value="0.75"/>	0.007955

Glass type...	U-factor Btu/h·ft²·°F	Shading coeff
Window: <input type="text" value="Double Clear 1/4"/>	0.6	0.82
Skylight: <input type="text" value="Single Clear 1/4"/>	0.95	0.95
Door: <input type="text" value="Standard Door"/>	0.2	0

Height...

Wall: ft

Floor to floor: ft

Plenum: ft

Pct wall area to underfloor plenum: %

Room type:

Buttons:

Demo

Room Templates - Project

Alternative:

Description:

Buttons:

Templates...
Internal load: <input type="text" value="Office"/>
Airflow: <input type="text" value="Office"/>
Thermostat: <input type="text" value="Building"/>
Construction: <input type="text" value="Building"/>

Buttons:

Demo

Create Rooms - Single Worksheet

Alternative 1

Room description: Office 1

Templates...

Room: Office

Internal: Office

Airflow: Office

Tstat: Building

Constr: Building

Length: 10 ft

Width: 10 ft

Floor...: 0 ft

Roof...: 0 ft

☐ Equals floor

Wall...

Description	Length (ft)	Height (ft)	Direction	% Glass or Qty	Length (ft)	Height (ft)	Window
	0	10	0	0	0	0	<input type="checkbox"/>
	0	10	0	0	0	0	<input type="checkbox"/>
	0	10	0	0	0	0	<input type="checkbox"/>

Internal loads...

People: 2 People

Lighting: 3 W/sq ft

Misc loads: 2 W/sq ft

Airflows...

Cooling vent: 20 cfm/person

Heating vent: 20 cfm/person

Cooling VAV min: % Clg Airflow

Heating VAV max: % Clg Airflow

Single Sheet Rooms Roofs Walls Int Loads Airflows Partn/Floors

Demo

Create Rooms - Single Worksheet

Alternative 1

Room description: Office 1

Templates...

Room: Office

Internal: Office

Airflow: Office

Tstat: Building

Constr: Building

Length: 10 ft

Width: 10 ft

Floor...: 0 ft

Roof...: 0 ft

☐ Equals floor

Wall...

Description	Length (ft)	Height (ft)	Direction	% Glass or Qty	Length (ft)	Height (ft)	Window
	0	10	0	0	0	0	<input type="checkbox"/>
	0	10	0	0	0	0	<input type="checkbox"/>
	0	10	0	0	0	0	<input type="checkbox"/>

Internal loads...

People: 8 People

Lighting: 3 W/sq ft

Misc loads: 2 W/sq ft

Airflows...

Cooling vent: 20 cfm/person

Heating vent: 20 cfm/person

Cooling VAV min: % Clg Airflow

Heating VAV max: % Clg Airflow

Single Sheet Rooms Roofs Walls Int Loads Airflows Partn/Floors



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