

TRACE 700 Training

Welcome to our general TRACE 700 training course outline.
Earn 14 GBCI CE Credits and PHDs.



Introduction to TRACE 700

This introductory video briefly covers a basic definition of Trace 700, its uses and functionality. Then, we cover all of the main categories and buttons in Trace to provide a basic road map for the software, which we'll build upon in the following lessons of the course.

- Getting Oriented with Trace 700 Project Information
- Selecting Weather Information Creating Templates
- Creating Rooms
- Creating Systems
- Assigning Rooms to Systems Creating Plants
- Assigning Systems to Plants Defining Economics
- Calculating and Viewing Results

Lesson 1 - TRACE 700 Design Process

TRACE 700 Load Design Inputs

- This video provides a solid foundation in the building design process.
- Entering Project Information Selecting Weather Information Creating Template
- Internal Loads Template Airflow Template
- Thermostat Template Construction Template
- Quiz on topics covered in previous video Understanding Room Templates in TRACE 700
- Brief video covers tips on using templates for a more efficient workflow.

Details



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Architects,
Materials & Equipment
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Professionals

- Rooms and Systems in TRACE 700
- This video covers how to make rooms and systems.
- Creating Rooms Rooms Tab Partitions Tab Selecting Systems Room Assignments Reports

Exercise 1

- The student will setup a school project based on a provided layout.

Lesson 1 -Final Review

- Review of all topics covered in lesson one, with an emphasis on topics where most people make mistakes.

Exercise 1 - Solution Load Design Example

Lesson 2 - Energy

Energy Modeling and Building Simulation - The Big Picture

This video explains some of the key differences between load design and energy. New users often struggle with these two unique but related concepts.

- Load Design VS Energy Analysis
- Design Assumptions
- Analysis Assumptions

TRACE 700 Energy Input

This video starts in full TRACE 700 mode (by going to options ---> operating mode ---> TRACE 700). It introduces the additional variables required when doing an energy model as well as a load design model

- Creating Templates, Room and Systems Fans
- Coils
- Creating Plants
- The Plants Wizard
- Making changes to the plants layout
- Creating Plants Manually
- Cooling Equipment and Heating Equipment tabs
- Base Utility and Miscellaneous Accessory Tab
- Assigning Systems to Plants

Understanding Reduced Year Schedules

Up until now we've treated TRACE 700 simulation as if it was calculating every day of the year separately. While TRACE can do that, that is not what happens by default. Using default TRACE data, you are actually calculating using a

reduced year sequence of day types.

- Reduced Weather Schedules
- Importing Full Year Weather
- Creating Schedules, Efficiently

Quiz on topics covered in Load Design & Energy Analogies

Exercise 2

This exercise continues with a completed exercise 1. There will be an addition of two rooms, and two systems, as well as adjustments for energy calculations.

Exercise 2 Solution - Load Design and Energy Analysis

TRACE 700 Calculation Demo

TRACE 700 operation is discussed from beginning to end. The variables manipulation is discussed as it goes from load design, to hourly loads, to hourly energy consumption, and finally to monthly cost.

- Trace 700 Sequence of Operation Load Design Mode
- System Simulation
- Energy
- Economics

Lesson 2 - Final Review

Lesson 3 - Economic Comparison

Libraries and Sharing Files in TRACE 700

This video covers using libraries to calculate economics with custom rate structures

Libraries and Sharing Quiz

In this review your knowledge of load versus energy will be tested, as well as the inputs required for energy calculation.

- TRACE 700 Economics
- Electric Consumption
- Electric Demand
- Gas Rate
- Economics - parameters for life cycle analysis
- Economics Quiz
- TRACE 700 Alternatives Setup

This video shows how to add multiple alternatives in Trace 700. It also distinguishes the difference between ‘Use alt.’, ‘Create based on alt...’, and ‘create new...’ options when adding or copying alternatives

Alternatives Quiz

This quiz tests your understanding of alternatives and how they operate in Trace 700.

Understanding Reduced Year Schedules in TRACE 700

Using default TRACE data, you are actually calculating using a reduced year sequence of day types. This video covers common pitfalls to understanding reduced year schedules in Trace.

- Reduced Weather Schedules
- Importing Full-Year Weather
- Creating Schedules Efficiently

Exercise 3

In this exercise, continue with a completed exercise 2. There will be an addition of a rate structure, a time of day schedule, and an alternative.

Exercise 3 Rate Structure Solution

Lesson 3 -Final Review

Lesson 4 - Advanced settings in TRACE 700

TRACE 700 Plant Unloading Example

This video discusses the full details of cooling plants in Trace 700. We also walk through the calculations to determine the efficiency of a cooling plant at a given set of conditions, using the unloading curves to calculate the final efficiency.

Plant Unloading Quiz

Options and Outputs in TRACE 700

In this lesson, many options in Trace 700 are discussed, including:

- Sorting rooms/lists alphanumerically
- Changing unit systems
- Changing the load methodology
- Entered values reports
- Energy Parameters
- The Trace 700 visualizer for exporting custom outputs
- Changing the default weather location

- TRACE 700 Input Methods

Here I introduce the various view types in TRACE 700.

- Alternative Methods Review
- Std 62 in Trane TRACE 700

In this lesson, I cover how to properly calculate standard 62 in Trace 700.

- Options in TRACE 700
- In this lesson, we cover:
- Create systems Advanced
- Create systems - Options - Advanced options
- Optimum Start Optimum Stop

TRACE 700 Options Quiz

Exercise 4 TRACE 700 Custom Utilization Schedule

In this exercise, continue with a completed exercise 3. There will be an addition of a custom utilization schedule, a base utility, and a WSHP plant. In alternative two, the fan coil system will be changed to a WSHP system with Dedicated OA.

Exercise 4 Solution

Bonus - How to

TRACE 700 Thermal Storage

This short document covers Ice Storage Example and tips.

TRACE 700 Solar Panel Estimator

Here is a TRACE 700 file that can be used to estimate Solar Panel (photovoltaic) energy production by month.

Import gbXML into Trane TRACE 700

Covers common mistakes when importing gbXML files.

Move and Combine Alternatives

This TRACE 700 lesson shows the potential of combining files, alternatives, or importing alternatives in Trace 700.

TRACE 700 6.2.6 Update

In this video, the new features of TRACE 700 6.2.6 are discussed, including automatic compressor breakout, the fan prm report and the new LEED report.

Using TRACE 700 with Microsoft Excel

Only so many changes can be made in TRACE 700 using templates, and sometimes a user needs to make many changes that templates can't do. This video covers how Excel can save you some time.

Speed Boost TRACE 700

Quick trip for speeding up the calculating and reviewing results process in Trace.

Unnecessary Hours Spent on Unmet Hours

This video troubleshoots reducing unmet hours with an example.

Dedicated Outdoor Air in TRACE 700 DOAS

This video covers the general "work around" for modeling dedicated outdoor air with multiple plants.

Final Exam



DOs

- TRACE 700 File Names
- Always Create Templates
- Re-Use Thermostat and Construction Templates
- Number All Room Systems and Plants
- TRACE 700 System Schematic
- Sorting in TRACE
- TRACE 700 Plant Wizard
- F1 for Help
- Use the Component Tree View
- Building Area Under Define Economics

DONT'S

- Files on Network
- Thermostat Schedules
- Don't Change Fields
- Don't Switch to Full Year Weather
- TRACE 700 Cooling Design
- TRACE 700 Reports
- ASHRAE std 62.1 and Max Z Ratio
- Fan and Coil Schedules
- Sharing and Archiving TRACE 700 Files
- Default Economic Rates in Trane TRACE 700

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TIPS

- Design Instead of Systems
- Copying Room Types
- Templates and Red Values
- Selecting Schedules in TRACE
- TRACE 700 View Menu
- Calculating When Not Ready
- Straight to Reports
- Popular TRACE 700 Reports
- World Map
- Graph Profiles and Energy
- Climate Caveats
- TRACE 700 Climate Defaults

TRACE 700 Building Set Up & Load Design

Welcome to our fast paced course that will jump straight into creating the building in TRACE 700 for Load Design.



Building Set Up Case Study

Do you want to learn TRACE 700 Fast? Quickly get your hands dirty with this step-by-step guide. It's based on a real building and real specifications - we model an example building from the downloadable specifications. Follow along step by step as we prepare and simplify the building for energy analysis. The course is broken into chapters allowing you to easily skip the items you already know and replay your favorite segments.

- Introduction
- Create New File
- Templates
- Construction
- Airflow
- Internal Load
- Create Rooms - Setup
- Initial Setup
- Quick Run Through
- Restroom Exhaust
- Second Floor
- Component Tree View
- Create Systems
- Important Ventilation Inputs
- Create Plants
- Heat Pump Setup

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Load Design Energy Analysis

- LEED vs. Load Design Modeling
- Prep for Energy Analysis
- Weather Schedules
- Starting the Load Design File
- Setting Up TRACE 700 Schedules
- Applying Schedules to TRACE 700 Templates
- Thermal Blocks
- Creating Thermal Blocks in TRACE 700
- Resizing Dimensions after Creating Thermal Blocks
- Adding People to the Model
- Glass in TRACE
- Setting Up Equipment
- VAV Systems in TRACE
- Plant Setup
- Boiler Information
- Domestic Hot Water (DHP) in TRACE 700
- Lighting
- TRACE 700 Rate Structures
- Implementing Rates
- Heated Only Systems Std. 90.1
- TRACE 700 Simulation and Outputs
- System Checksums
- Thermodynamically Similar

TRACE 700 + LEED Training

Welcome to our LEED Specific TRACE 700 training course outline.
Earn 8 GBCI CE Credits and PDHs.



Load Design Building

This introductory video briefly covers a basic definition of Trace 700, its uses and functionality. Then, we cover all of the main categories and buttons in Trace to provide a basic road map for the software, which we'll build upon in the following lessons of the course.

- Creating a New File in Trace 700
- Templates
- Construction
- Airflow
- Internal Load
- Create Rooms- Setup
- Initial Setup
- Quick Run Through
- Restroom Exhaust
- Second Floor
- Component Tree View
- Create Systems
- Important Ventilation Inputs
- Create Plants
- Heat Pump Setup

Prepping the Proposed for LEED in Trane TRACE 700

- Crash Course in Trane TRACE 700
- Modeler's Biggest Enemy: Unmet Hours
- 5 Key Details for Trace 700 Modeling
- Feature Highlight Reel

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- Cheat Sheet
- Working Backward in Trace
- A Completed File
- Energy Savings
- Using Thermodynamically Similar Method to Model Unique Situations in Trace
- Room Template Tips
- Starting Your LEED Project in Trace 700
- Proposed Building
- Inputting Rate Structure
- Finding the Square Footage
- Finding Percent Glass
- Detailed Reports
- Simplify the File for the Proposed Building
- Thermal Blocks
- Why Thermal Blocks are Awesome

Completing the Proposed Building

- Completion of Prepping the Proposed
- Ventilation
- Construction Templates
- Schedules
- Thermal Blocks
- Setting Systems Up for Energy
- Inputs
- Optimum Start and Unmet Hours
- Fans
- Restrooms
- Setting Up Plants
- Setting Up the Heat Pump
- Backup Heat Source for a Boiler
- Assigning Plants
- Heat Pumps and LEED
- Base Utilities
- Parking Lot Lights
- Domestic Hot Water
- Fan Modelling
- Hot Water Generated By Heat Pump
- Hand Calculations and Hot Water from the Heat Pump
- Why Model the Backup Boiler
- Does TRACE 700 Calculate Heating in Warm Climates
- Who to ask for help with Trace
- Custom Equipment and Curves

- Modeling Heat Recovery
- Trane TRACE 700 LEED Baseline Building Process
- LEED Baseline Cheat Sheet

Baseline Building Process in Trane TRACE 700

- Backup Heat Pump Plant
- LEED Office
- Baseline Building Process
- LEED Process in Trace
- Starting the Baseline Building
- Glass Values for LEED
- Envelope Changes
- Slab on Grade Floors
- Unheated Slab
- Glass Questions
- Percent Glass and LEED
- Glass Types
- Interior Lights for LEED
- Internal Lights Whole Building Method
- Daylighting and Shading
- Airside Systems
- Number of Systems for a LEED Model
- Exceptions in ASHRAE 90.1 for LEED
- Starting with One System
- Standard 62 Calculations
- LEED and Ventilation
- Setting the Climate Zone
- VAV System Rules
- Demand Control Ventilation
- Temperature Differences for LEED
- Why Have a 20 degree delta-T?
- Trane TRACE 700 and CFM for LEED
- Heating and Cooling Coils
- Proposed and Heat Pumps
- Systems in the Proposed and Baseline LEED Building in Trace
- Efficiencies
- Oversizing Equipment
- Equipment and Plants
- Boiler Equipment

Building Systems and LEED Reports

- Baseline HVAC System Type and Description
- Thermodynamically Similar Clause and Thermal Blocks
- Domestic Hot Water in Trane TRACE
- Exterior Lighting in ASHRAE Standard 90.1 Section 9
- Rate Structures in Trane TRACE
- Checking Reports in Trane TRACE
- How Does TRACE Calculate Fan Power for the Baseline Building
- Why Not Use Static Pressure and then KW per CFM Inch Water Gauge in TRACE
- Why Two Fans in the Baseline Building
- LEED Summary Reports
- Receptacles in TRACE Energy Cost Budget
- Unmet Hours in Trane TRACE
- Building Temperature Profile in Trane TRACE
- COMNET XML for LEED
- Reports for LEED Reviewers
- Energy Modeling LEED Submission Flow Chart
- Less is Best for LEED

Practical Concerns with Trace 700 LEED

Trace 700 LEED Fan Calculations Demystified

- LEED Fan Calculations in TRACE 700
- What are we Modeling?
- Initialize Fan in TRACE 700
- TRACE Fan Calculation Algorithm
- Number of Baseline Fans
- Trane TRACE 700 Walkthrough
- Extreme Example in Fan Modeling
- Common Mistakes in Fan Modeling
- Exhaust Fans in TRACE 700
- Dedicated Outdoor Air System
- Garage Fans in Trane TRACE
- FAQ Fan Filter LEED Credits

Final Exam