

Title 24 2013 Compliance Software: CBECC-Com

**“California Building Energy Code Compliance
for Commercial Buildings”**

**Creating Building Geometry
using the Simplified Geometry Approach**

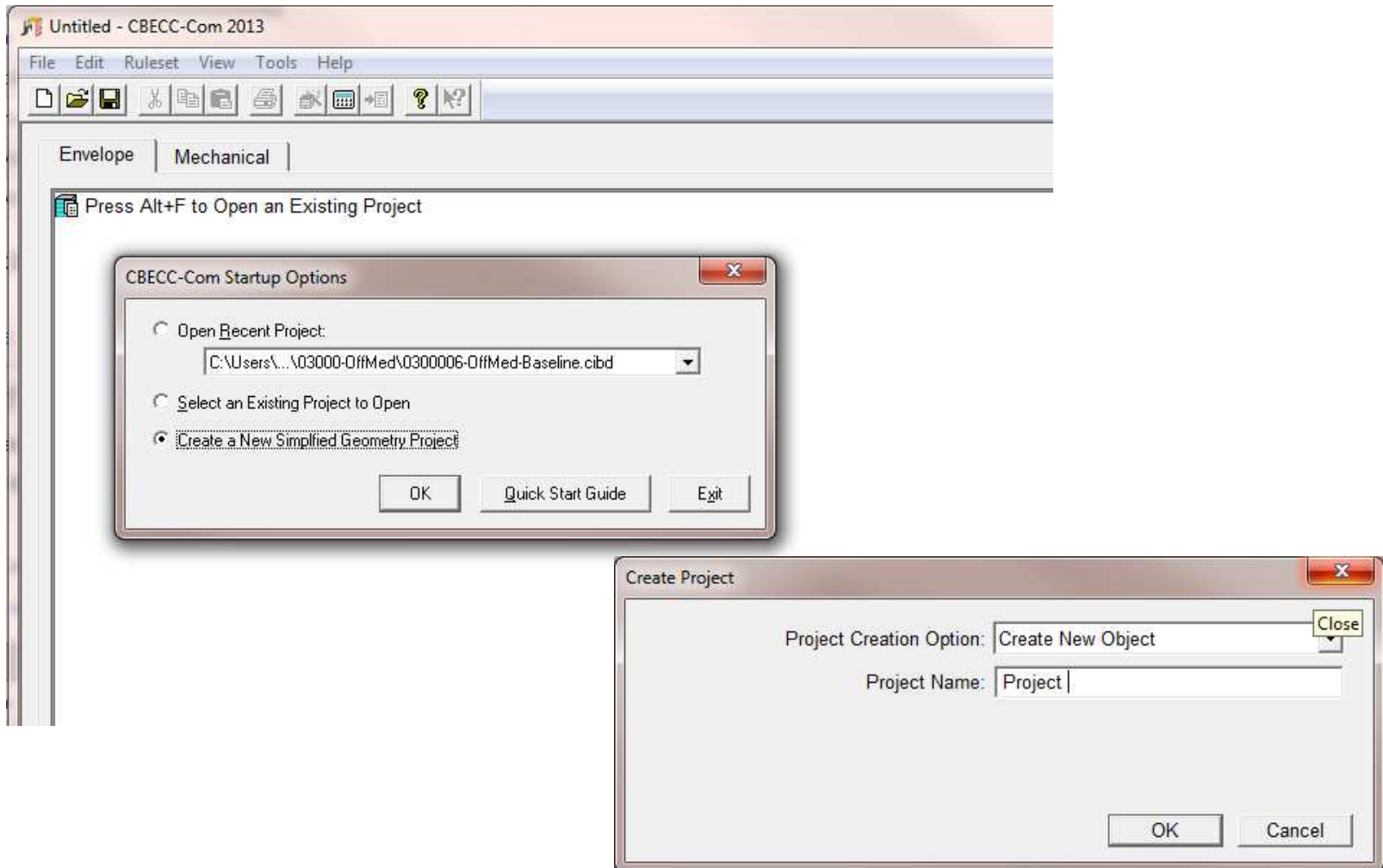
Required Software: CBECC-Com v3

■ Objective: **Create a new Simplified Geometry Project and Provide High Level Inputs**

1. Create a Simplified Geometry Project
2. Selecting Compliance type
3. Enter other Simulation Parameters
4. Create a Building
5. Create a Building story

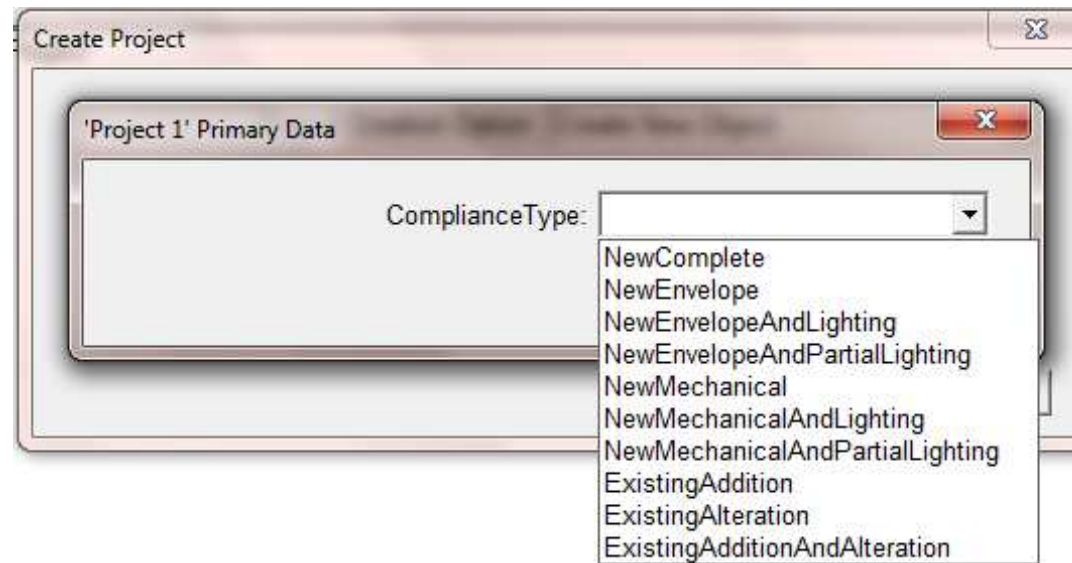
Training Module 1: Create a new Project

- ❖ Open CBECC-Com. Select “Create a New Simplified Geometry Project” from the available Startup options in the dialog box.
- ❖ A new dialog box will appear. Enter a name for the Project and Click ok.



Training Module 1: Choose Compliance type

- ❖ A dialog box with list of options for Compliance Type will appear. Choose appropriate compliance type. Click ok.



Training Module 1: Enter Location

- ❖ ***“Building Model Data”*** dialog box will appear.
- ❖ **Enter the location of the project.**

The screenshot shows the 'Building Model Data' dialog box with the following fields and values:

- Project Data:**
 - Project Name: Acme Project
 - Analysis Type: Title24Compliance
 - Run Title: (empty)
- Generate Report(s):** ☐ PDF ☐ Full (XML)
- Compliance Type:** NewComplete
- Geometry Input:** Simplified
- Owner Info:**
 - Organization: - specify -
 - Contact Name: - specify -
 - Email: - specify -
 - Title: - specify -
 - Phone: - specify -
- Location (highlighted with a red box):**
 - St. Address: - specify -
 - City: - specify -
 - State: CA
 - Zip Code: 94103
 - Climate Zone: ClimateZone3
 - Weather Station: SAN-FRANCISCO-INTL_724940
- File Management:**
 - Creation: 10:15, Tue, Sep 16, 2014
 - Last Mod: (empty)
 - Last Run: (empty)

An arrow points from a yellow box labeled 'Location data' to the 'Location' section of the dialog box.

Training Module 1: Enter other Simulation Parameters

- ❖ Enter the Simulation Parameters as required on the various tabs – Design Team, Exceptional Conditions and Non-Compliance Analysis.

The screenshot shows the 'Building Model Data' dialog box with the following sections and fields:

- Project Data:** Includes tabs for 'Project Data', 'Design Team' (selected), 'Exceptional Conditions', and 'Non-Compliance Analysis'. Fields include 'Project Name' (Acme Project), 'Analysis Type' (Title24Compliance), 'Run Title', 'Generate Report(s)' (PDF and Full (XML) checkboxes), 'Compliance Type' (NewComplete), and 'Geometry Input' (Simplified).
- Owner Info:** Includes fields for 'Organization', 'Contact Name', 'Email', 'Title', and 'Phone', all with '- specify -' placeholders.
- Location:** Includes fields for 'St. Address', 'City', 'State' (CA), 'Zip Code' (94103), 'Climate Zone' (ClimateZone3), and 'Weather Station' (SAN-FRANCISCO-INTL_724940).
- File Management:** Includes fields for 'Creation' (10:15, Tue, Sep 16, 2014), 'Last Mod', and 'Last Run'.

An 'OK' button is located at the bottom right of the dialog box.

Training Module 1: Building Story

- ❖ A new dialog box will appear. Enter Building Name and click ok.
- ❖ “Building Data” dialog box will appear. Enter number of stories as required.

Building Model Data

Building Data

Building Name: Building Azimuth: deg

Function Classification Method: ☐ Relocatable Public School Building?

Stories (Above Only, #): Total

Stories (Above + Below, #):

Floor Area (ft2):

Conditioned Space

Living Units (#):

Nonresidential Floor Area (ft2):

Residential Floor Area (ft2):

Nonres + Res Floor Area (ft2):

Space Volume (ft3):

HVAC Capacity

Coil Cooling Capacity (Btu/h):

Coil Heating Capacity (Btu/h):

Plant Cooling Capacity (Btu/h):

Plant Heating Capacity (Btu/h):

Create Building

Building Creation Option:

Building Name:

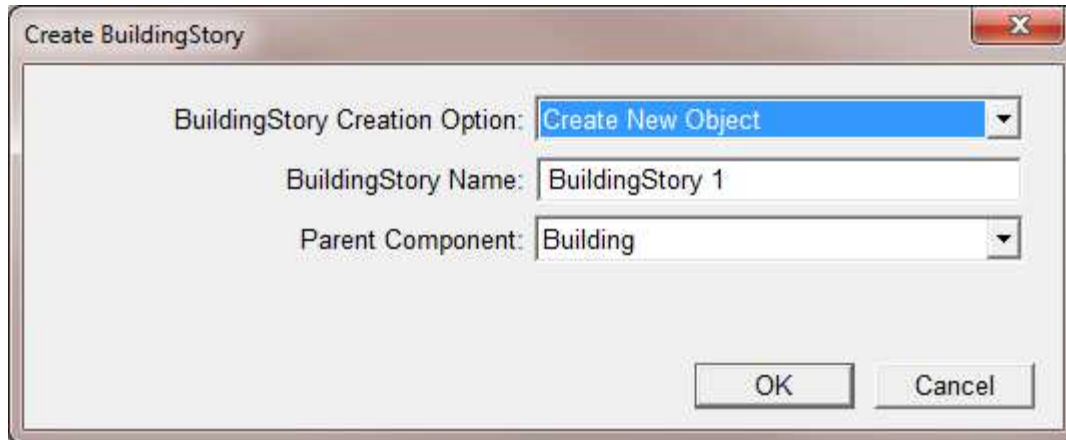
Parent Component:

OK Cancel

OK

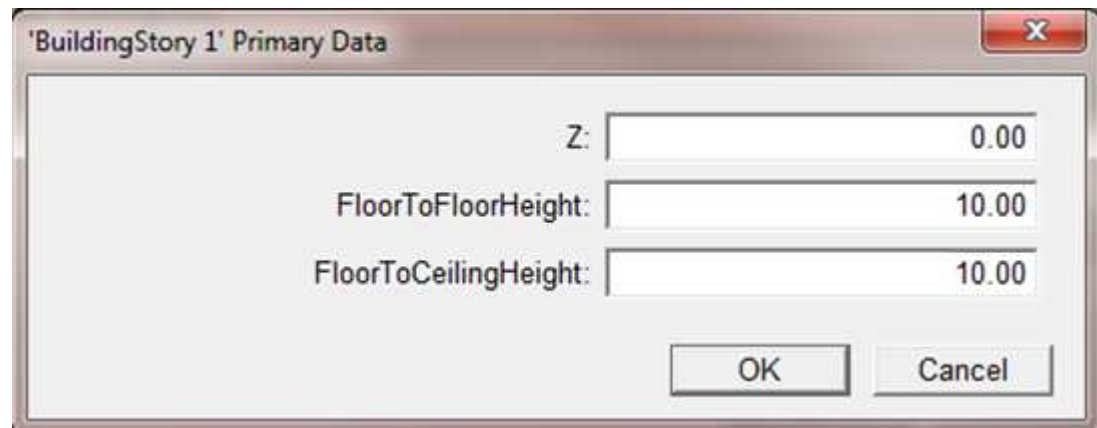
Training Module 1: Building Story

- ❖ Create BuildingStory dialog box will appear. Enter a Building Story Name and click ok.
- ❖ A new dialog box will appear. Enter the Z coordinate for the building story, floor to floor height and floor to ceiling height in feet. Click ok



The 'Create BuildingStory' dialog box contains the following fields and controls:

- BuildingStory Creation Option:** A dropdown menu with 'Create New Object' selected.
- BuildingStory Name:** A text input field containing 'BuildingStory 1'.
- Parent Component:** A dropdown menu with 'Building' selected.
- Buttons:** 'OK' and 'Cancel' buttons at the bottom right.



The ''BuildingStory 1' Primary Data' dialog box contains the following fields and controls:

- Z:** A text input field with '0.00'.
- FloorToFloorHeight:** A text input field with '10.00'.
- FloorToCeilingHeight:** A text input field with '10.00'.
- Buttons:** 'OK' and 'Cancel' buttons at the bottom right.

Training Module 1: Building Story

- ❖ Building Story Data screen will appear. Click ok.

Building Model Data - A New Simplified Geometry Project

Building Story Data

Currently Active Building Story:

Building Story Name:

Story Multiplier:

Elevation (Z): ft

Flr-to-Flr Ht: ft

Flr-to-Ceiling Ht: ft

	Total (cfm)	For Balance (cfm)
Design Ventilation Flow:	<input type="text" value="0"/>	<input type="text" value="0"/>
Minimum Ventilation Flow:	<input type="text" value="0"/>	<input type="text" value="0"/>
Design Exhaust Flow:	<input type="text" value="0"/>	<input type="text" value="0"/>

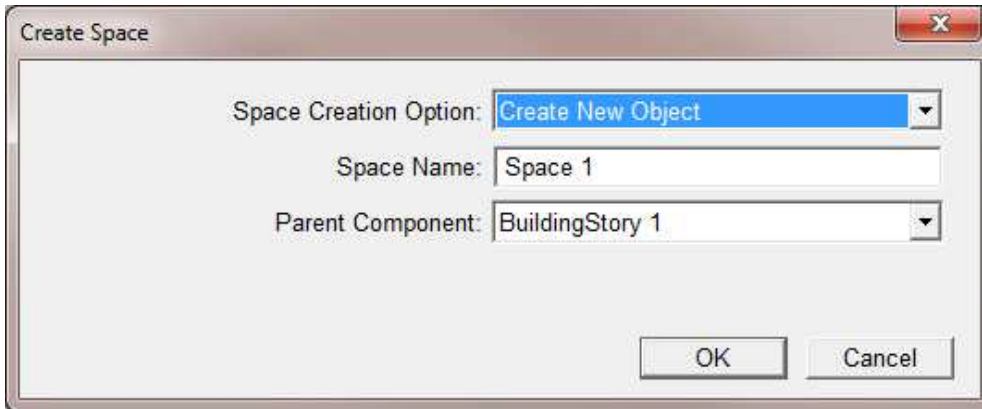
OK

■ Objective: **Create Spaces**

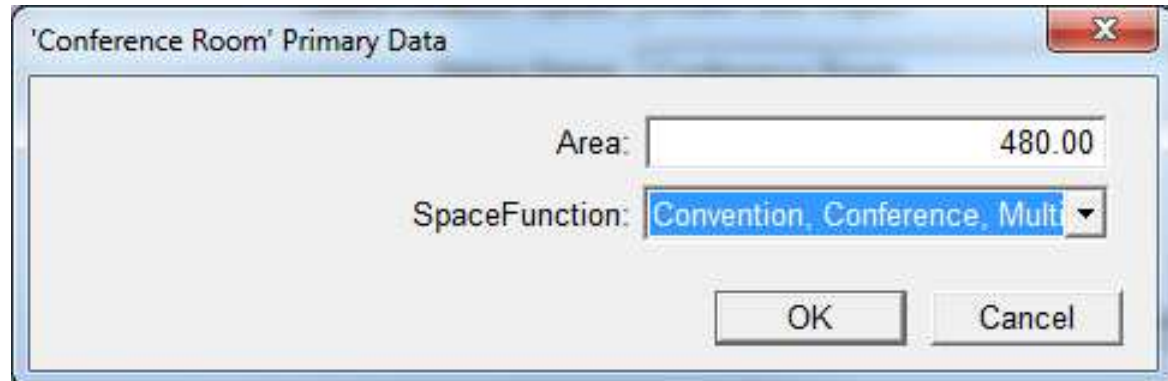
1. Create spaces in the building story

Training Module 2: Create Spaces

- ❖ Create Space dialog box will appear. Enter a Space Name and click ok.
- ❖ A new dialog box will appear. Enter area for the space. Select Space Function type from the dropdown.



The 'Create Space' dialog box is shown. It has a title bar with a close button (X). Inside, there are three fields: 'Space Creation Option' with a dropdown menu set to 'Create New Object', 'Space Name' with a text box containing 'Space 1', and 'Parent Component' with a dropdown menu set to 'BuildingStory 1'. At the bottom right are 'OK' and 'Cancel' buttons.



The ''Conference Room' Primary Data' dialog box is shown. It has a title bar with a close button (X). Inside, there are two fields: 'Area' with a text box containing '480.00' and 'SpaceFunction' with a dropdown menu set to 'Convention, Conference, Multi'. At the bottom right are 'OK' and 'Cancel' buttons.

Training Module 2: Create Spaces

- ❖ Space Data dialog box will appear. Click ok.

Building Model Data Creating a New Simplified Geometry Project

Space Data | Ventilation and Exhaust | Daylighting | Process Loads

Currently Active Space: **Conference Room** (daylighting not available w/ simplified geometry)

Space Name: **Conference Room** Multiplier: **1** Space Status: **New**

Conditioning Type: **DirectlyConditioned** Flr-to-Clg Ht: **12.0** ft Envelope: **New**

Thermal Zone Ref: **- none -** Space Area: **480.0** ft² Lighting: **New**

Supply Plenum Space: **- none -** Volume: **5,760** ft³ Overall: **New**

Return Plenum Space: **- none -**

Occupancy Class: **Nonresidential**

Function Defaults: **- none -**

Function: **Convention, Conference, Multipurpose and Meeting Center Areas** Schedule Group: **Assembly**

Occupancy: **67.00** people/1,000 ft² Sensible: **245.0** Btu/h-person Latent: **155.0** Btu/h-person Schedule Name*: **- none -**

Hot Water Use: **0.09** gal/h-person SHW FluidSeg Ref: **- none -** Schedule Name*: **- none -**

Electric Use DHW RecircSys Ref: **- none -**

Ltg. Specification: **AreaCategoryMethod**

Regulated Lighting: **1.40** W/ft² Fraction to Space: **1.00** Radiant Fraction: **0.58** Schedule Name*: **- none -**

NonReg. Lighting: **-** W/ft² Schedule Name*: **- none -**

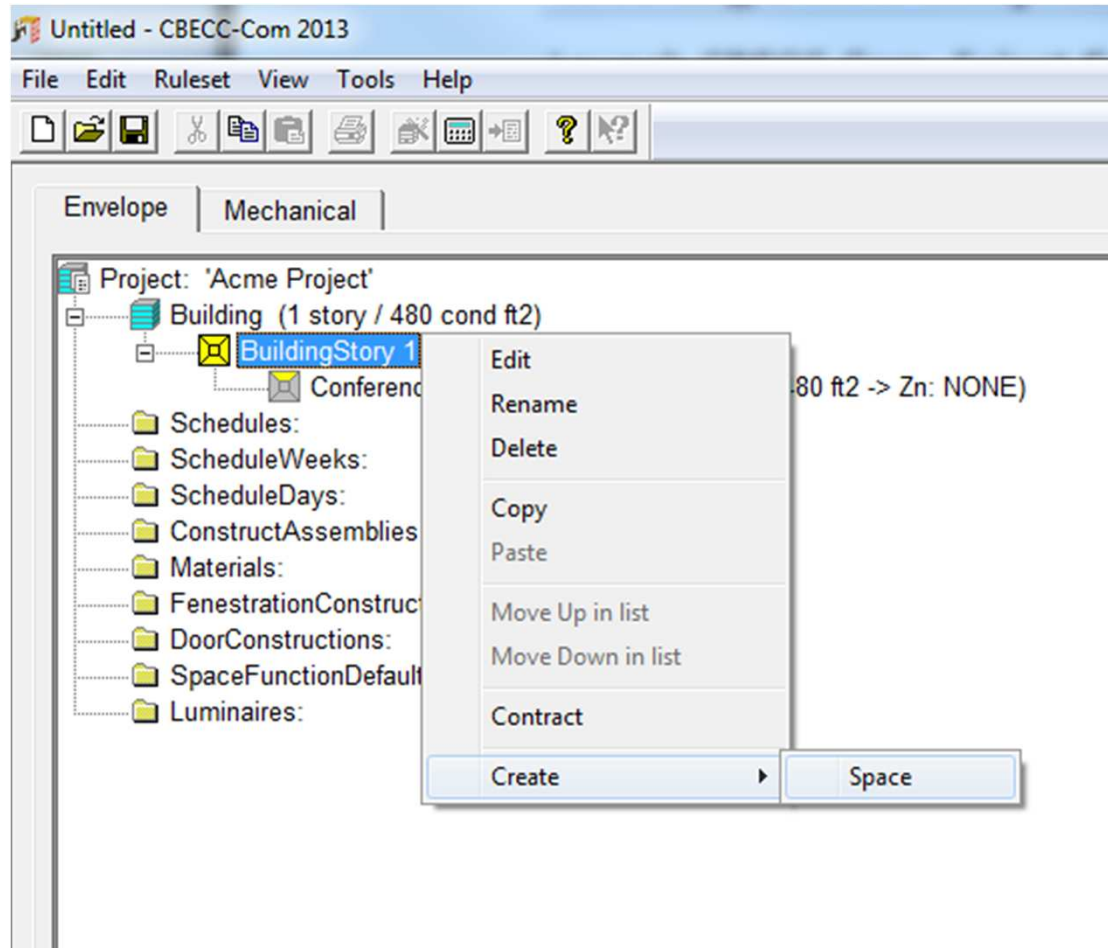
Plug Loads: **1.00** W/ft² Schedule Name*: **- none -**

* Schedules will be defaulted for compliance analysis

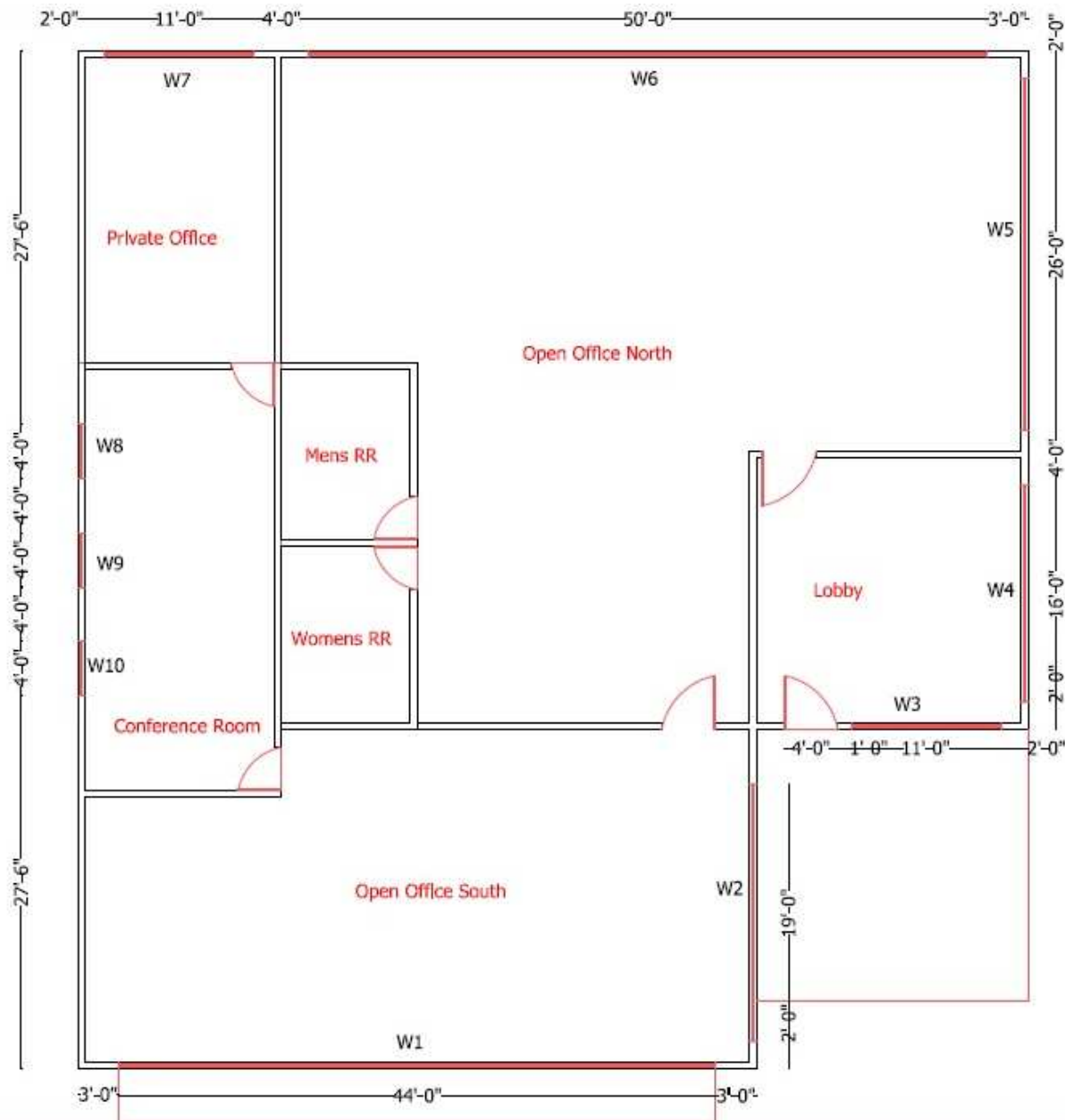
OK

Training Module 2: Create Spaces

- ❖ To create more Space dialog right click on *Building Story*, Click on Create then Space.
- ❖ A new dialog box will appear. Enter area for the space. Select Space Function type from the dropdown.



Training Module 2: Floor Plan for Creating Spaces



Training Module 2: Space Areas

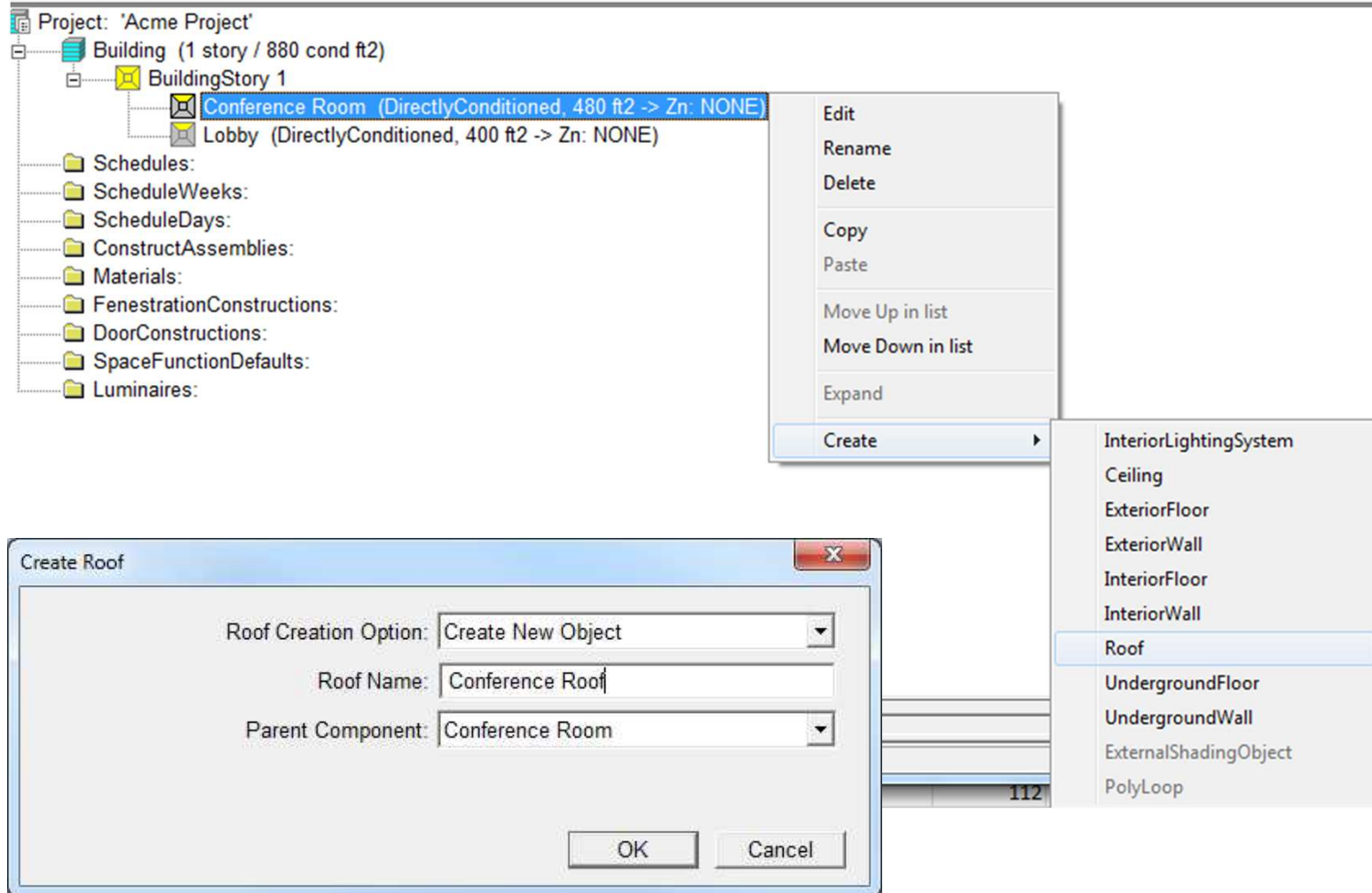
Space Name	Area (sq ft)
Conference	480
Lobby	400
Mens RestRm	135
Open Office North	2080
Open Office South	1175
Private Office North	345
Womens RestRm	135

■ Objective: **Create Space Envelope**

1. Create Roofs
2. Create Floors
3. Create Exterior Walls
4. Create Interior Walls
5. Create Windows
6. Create Door

Training Module 3: Create Roof

- ❖ Right-click on Space Name (Conference) then select **Create > Roof**
- ❖ A new dialog box opens – fill in the Roof name and click OK



Training Module 3: Create Roof

- ❖ Fill area, azimuth and tilt for the roof and then click OK.
- ❖ Roof Data Screen will appear. Click OK.

The screenshot displays the 'Building Model Data' window with the 'Roof Data' tab selected. The 'Currently Active Roof' dropdown is set to 'Conference Roof'. The 'Roof Name' field contains 'Conference Roof', and the 'Status' dropdown is set to 'New'. The 'Construction Assm' dropdown is set to '- none -'.

Under 'Roof Surface Geometry', the following values are entered:

- Roof Area: 480 ft2
- Local Azimuth: 270 deg - relative to bldg. azimuth
- True Azimuth: 270 Deg - relative to true north
- Tilt: 0 deg

Under 'Roof Surface Properties', the 'Exterior Roughness' dropdown is set to 'MediumRough', and the 'Field Applied Coating' checkbox is unchecked.

Under 'CRRC Properties', the following values are entered:

	Initial	Aged
Solar Reflectance:	0.000	0.000
Thermal Emittance:	0.000	0.000

The 'Product ID' field is empty.

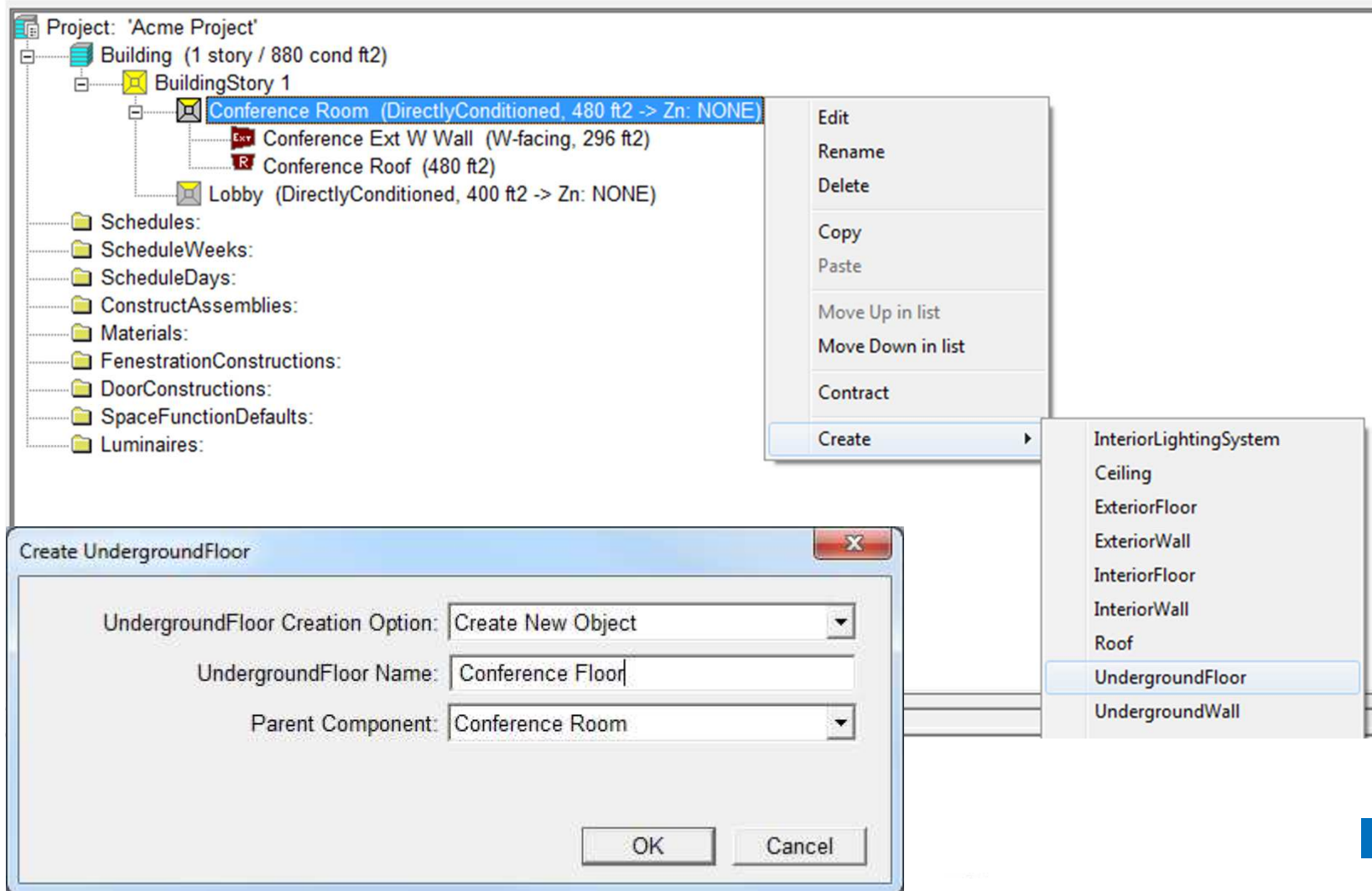
A secondary dialog box titled 'Conference Roof Primary Data' is overlaid on the main window. It contains the following values:

- Area: 480.00
- Azimuth: 270
- Tilt: 0.00

The 'OK' and 'Cancel' buttons are visible at the bottom of the dialog box.

Training Module 3: Create Floor

- ❖ Right-click on Space Name (Conference) then select **Create > UndergroundFloor**
- ❖ A new dialog box opens – fill in the Floor name and click OK



Training Module 3: Create Floor

- ❖ Fill area for the floor and then click OK.
- ❖ Underground Floor Data Screen will appear. Click OK.

The image shows two overlapping software dialog boxes. The background box is titled 'Building Model Data' and has a tab labeled 'Underground Floor Data'. It contains the following fields:

- 'Currently Active Underground Floor:' with a dropdown menu showing 'Conference Floor'.
- 'Underground Floor Name:' with a text field containing 'Conference Floor'.
- 'Status:' with a dropdown menu showing 'New'.
- 'Construction Assembly:' with a dropdown menu showing '- none -'.
- 'Floor Area:' with a text field containing '480' followed by 'ft2'.
- 'Exposed Perimeter:' with a text field followed by 'ft'.

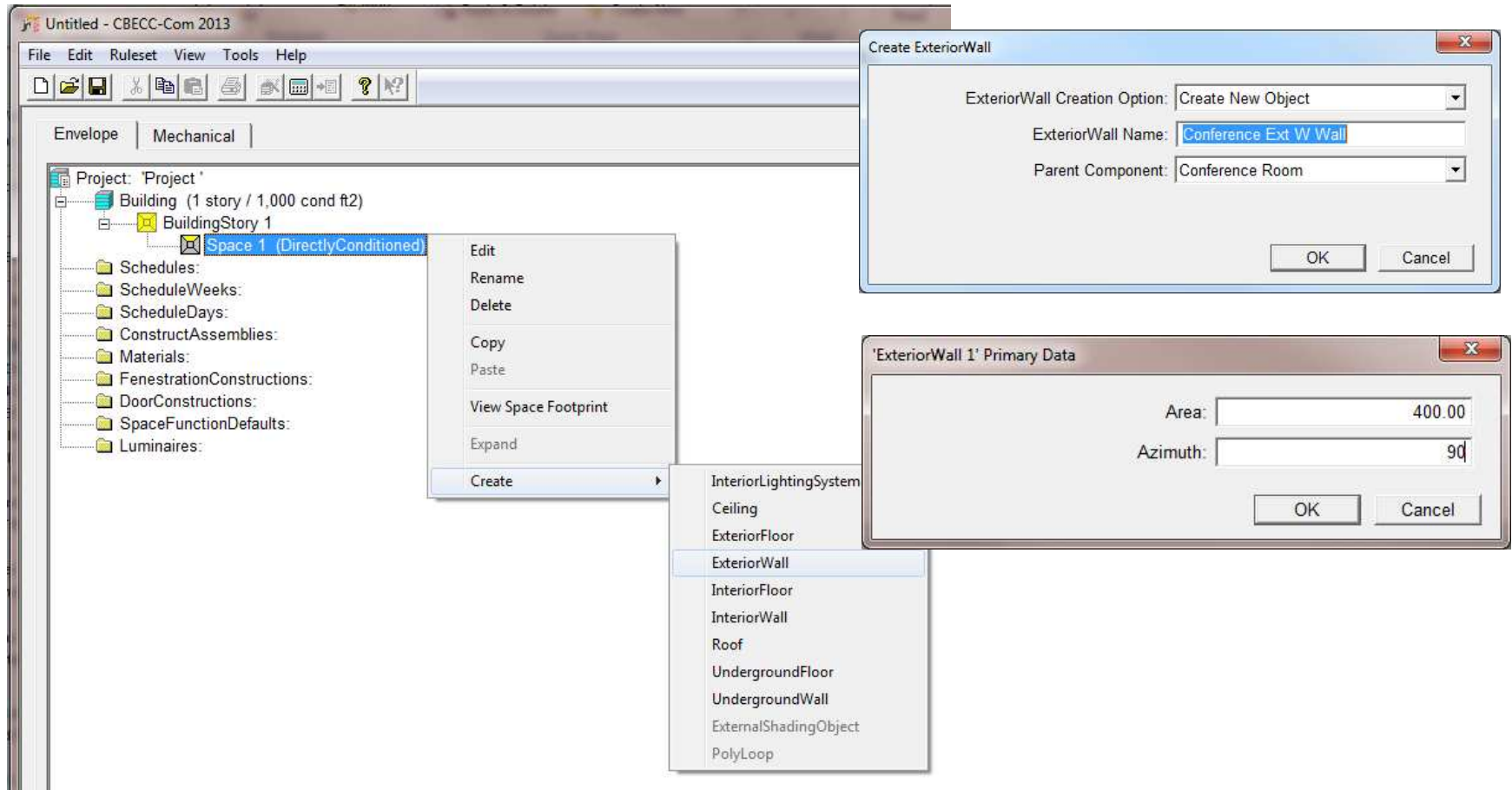
The foreground box is titled ''Conference Floor' Primary Data' and contains:

- 'Area:' with a text field containing '480'.
- 'OK' and 'Cancel' buttons at the bottom right.

An 'OK' button is also visible at the bottom right of the 'Building Model Data' dialog.

Training Module 3: Create Exterior Wall

- ❖ Right-click on Space Name (Conference) then select **Create > Exterior Wall**
- ❖ A new dialog box opens – fill in the name of the Exterior Wall and click OK.
- ❖ Enter area and azimuth for the exterior wall and then click OK



Training Module 3: Create Exterior Wall

- ❖ Exterior Wall Data Screen will appear. Click OK.

Building Model Data

Exterior Wall Data

Currently Active Exterior Wall:

Exterior Wall Name: W-facing, 296 ft2 Status:

Construction Assm:

Wall Surface Geometry:

Area: ft2 Display Perimeter: ft

Local Azimuth: deg - relative to bldg. azimuth

True Azimuth: Deg - relative to true north

Tilt: deg

Wall Surface Properties:

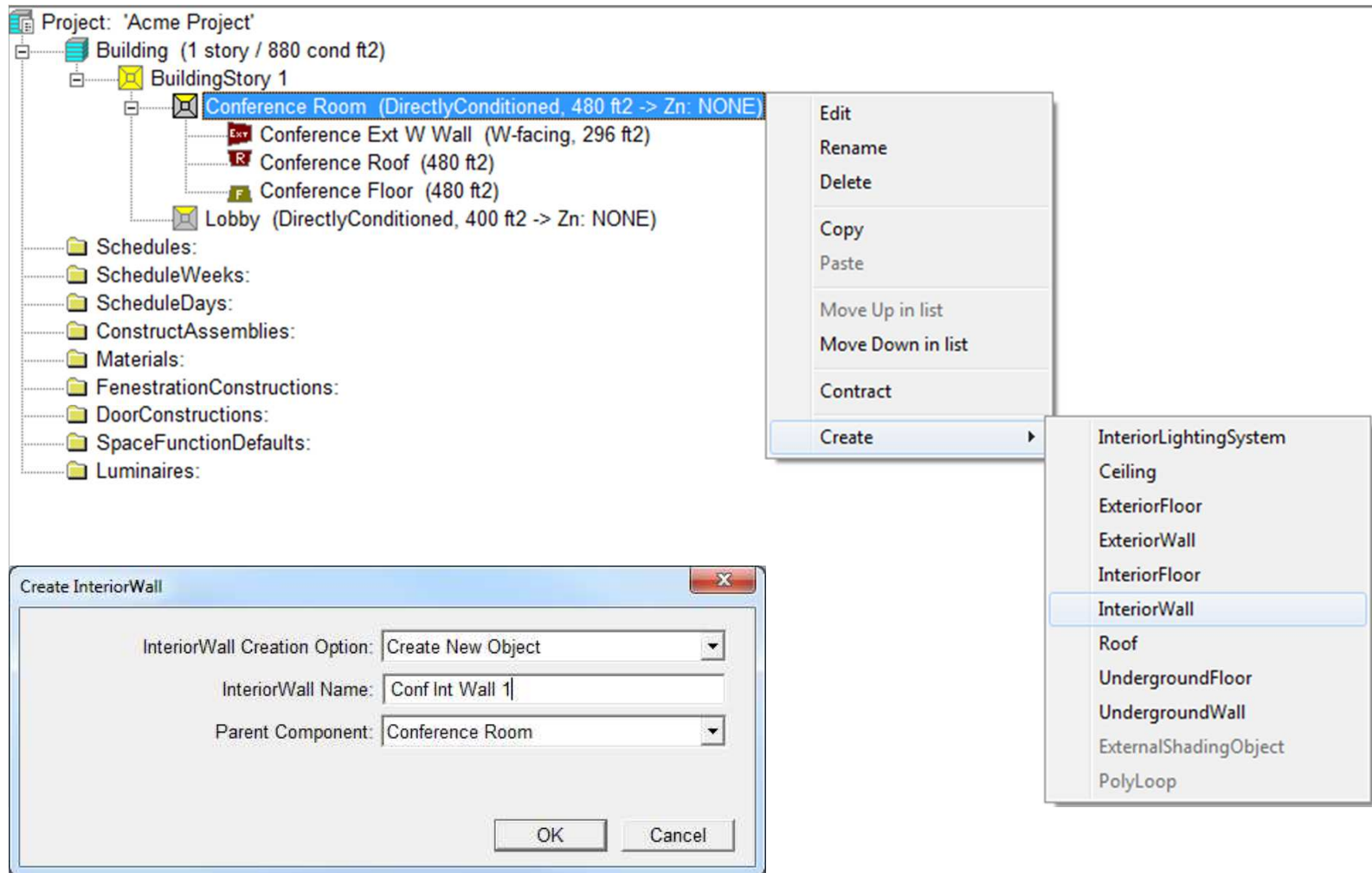
Exterior Roughness:

	Interior	Exterior
Solar Absorptance:	<input type="text" value="0.700"/>	<input type="text" value="0.700"/>
Thermal Absorptance:	<input type="text" value="0.900"/>	<input type="text" value="0.900"/>
Visible Absorptance:	<input type="text" value="0.800"/>	<input type="text" value="0.800"/>

OK

Training Module 3: Create Interior Wall

- ❖ Right-click on Space Name (Conference) then select **Create > Interior Wall**
- ❖ A new dialog box opens – fill in the name of the Interior Wall and click OK.



Training Module 3: Create Interior Wall

- ❖ Enter area for the interior wall and then click OK.
- ❖ Assign adjacent space.

Building Model Data

Interior Wall Data

Currently Active Interior Wall: Conf Int Wall 1

Interior Wall Name: Conf Int Wall 1

Construction Assm: - none -

Status: New

Adjacent Space: - none -

Wall Area: 180 ft2

Solar Absorptance: 0.700

Thermal Absorptance: 0.900

Visible Absorptance: 0.800

'Conf nteriorWall 2' Primary Data

Area: 180

OK Cancel

OK

Training Module 3: Envelope Schedule

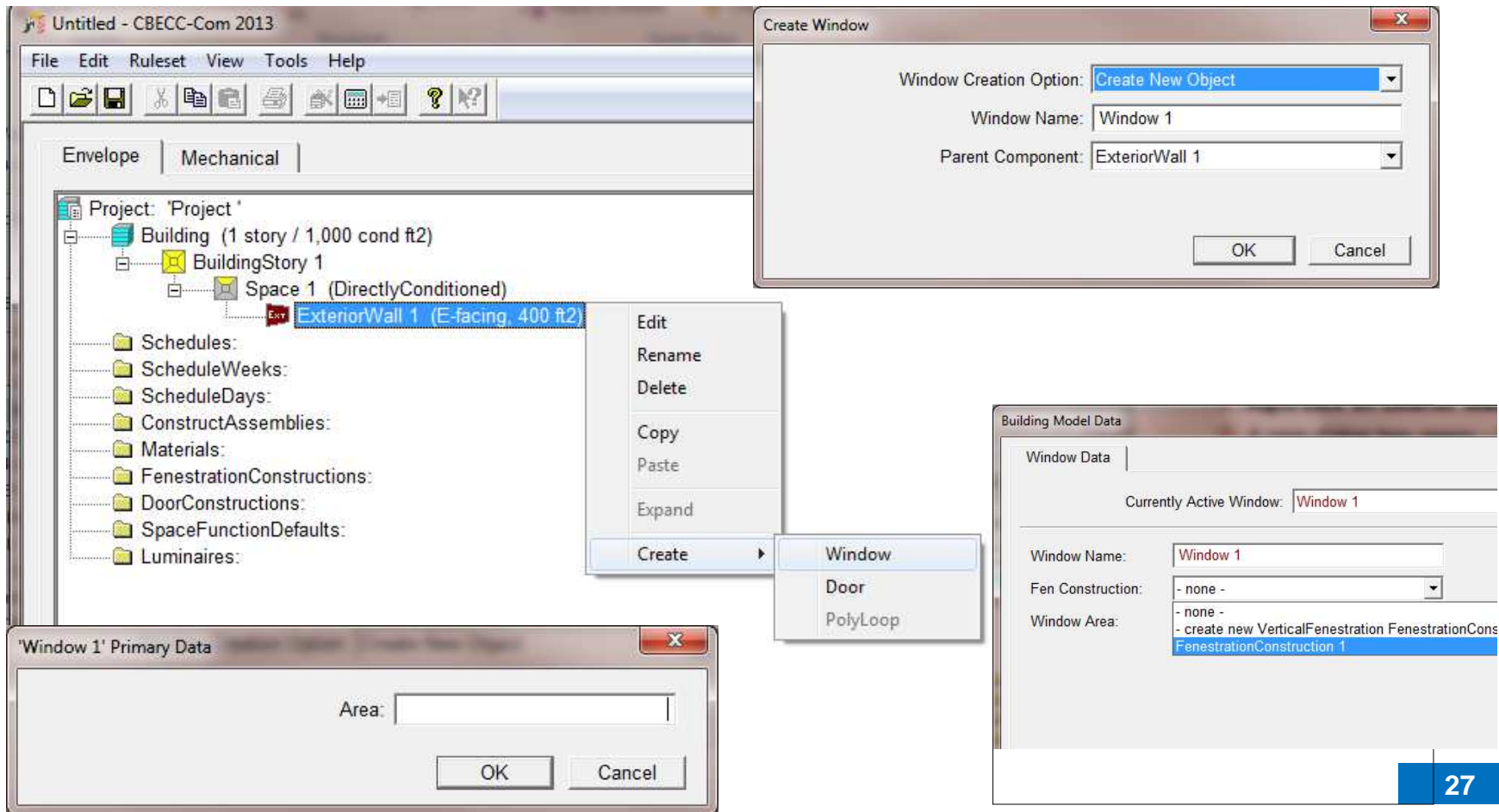
Space Name	Surface Type	Surface Name	Adjacent Space	Area	Azimuth
Conference	Roof	Conf Roof		480	270
	Exterior Wall	Below Window Wall		88	270
	Exterior Wall	Conference Ext WWall		296	270
	Underground Floor	Conf Floor		480	
	Interior Wall	Conf Int Wall 1	Private Office	180	
	Interior Wall	Conf Int Wall 2	Mens RestRm	162	
	Interior Wall	Conf Int Wall 3	Womens RestRm	162	
	Interior Wall	Conf Int Wall 4	Open Office South	60	
	Interior Wall	Conf Int Wall 5	Open Office South	180	
Lobby	Roof	Lobby Roof		400	270
	Exterior Wall	Lobby Ext SWall		240	180
	Exterior Wall	Lobby Ext EWall		240	90
	Underground Floor	Lobby Floor		400	
	Interior Wall	Lobby Int Wall 1	Open Office North	240	
	Interior Wall	Lobby Int Wall 2	Open Office North	240	
Men's Rest Room	Roof	Mens RestRm Roof		135	270
	Underground Floor	Mens RestRm Floor		135	
	Interior Wall	Mens RestRm Int Wall 1	Open Office North	120	
	Interior Wall	Mens RestRm Int Wall 2	Open Office North	162	
	Interior Wall	Mens RestRm Int Wall 3	Womens RestRm	120	

Training Module 3: Envelope Schedule

Space Name	Surface Type	Surface Name	Adjacent Space	Area	Azimuth
Open Office North	Roof	Open Office North Roof		2080	270
	Exterior Wall	Open Office North Ext NWall		660	0
	Exterior Wall	Open Office North Ext EWall		360	90
	Underground Floor	Open Office Floor		2080	
	Interior Wall	Open Office North IntWall 1	Open Office South	300	
	Interior Wall	Open Office North IntWall 2	Womens RestRm	162	
	Interior Wall	Open Office North IntWall 3	Private Office	276	
Open Office South	Roof	Open Office South Roof		1175	270
	Exterior Wall	Open Office South Ext EWall		300	90
	Exterior Wall	Open Office South Ext SWall		600	180
	Exterior Wall	Open Office South Ext WWall		240	270
	Underground Floor	Open Office South Floor		1175	
	Interior Wall	Open Office South IntWall	Womens RestRm	120	
Private Office	Roof	Private Office Roof		345	270
	Exterior Wall	Private Office Ext WWall		276	270
	Exterior Wall	Private Office Ext NWall		180	0
	Underground Floor	Private Office Floor		345	
Women's Rest Room	Roof	Womens RestRm Roof		135	270
	Underground Floor	Womens RestRm Floor		135	

Training Module 3: Create Window

- ❖ Right-click on Exterior Wall Name (Exterior Wall 1) then select **Create > Window**
- ❖ A new dialog box opens – fill window name then click OK.
- ❖ Fill window area in the next dialog box and click ok.



Training Module 3: Door & Window Schedule

Space Name	External Wall Name	Window Name	Area
Open Office South	Open Office South Ext EWall	Open Office South E Window	76
	Open Office South Ext SWall	Open Office South S Window	176
Lobby	Lobby Ext SWall	Lobby SWindow	77
	Lobby Ext EWall	Lobby EWindow	112
	Lobby Ext SWall	Lobby SDoor	32
Open Office North	Open Office North Ext NWall	Open Office North N Window	200
	Open Office North Ext EWall	Open Office North E Window	104
Private Office	Private Office Ext NWall	Private Office Window	44
Conference	Conference Ext WWall	Conf Window 1	16
	Conference Ext WWall	Conf Window 2	16
	Conference Ext WWall	Conf Window 3	16