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# BUILDING ENERGY MODELING STEP-BY-STEP PROCEDURES FOR LEED CERTIFICATION

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**ONLINE TRAINING BY KRISHNAJI PAWAR**

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# AutoCAD to BEM Software Importation

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# **BUILDING ENERGY MODELING : STEP-BY-STEP PROCEDURES FOR LEED CERTIFICATION**

The process of importing AutoCAD files into Building Information Modeling (BIM) and Energy Modeling (BEM) software is crucial for effective project analysis and management. The workflow from AutoCAD to BEM software can be likened to a relay race, where each runner must pass the baton without losing speed or accuracy.

# Learning Objectives

- Introduction and Course Outline
- Building Energy Modeling Checklists
- **AutoCAD to BEM Software Importation**
- ASHRAE Standards and Guidelines
- BEM software inputs for the project section, facade, systems, and zones
- Setup and Running the Building Energy Modeling Simulation
- Review BEM Software Output Reports.
- Sample Energy Modeling Report
- Summary and Resources
- BEMP Practice Test V.4.1



# INTRODUCTION

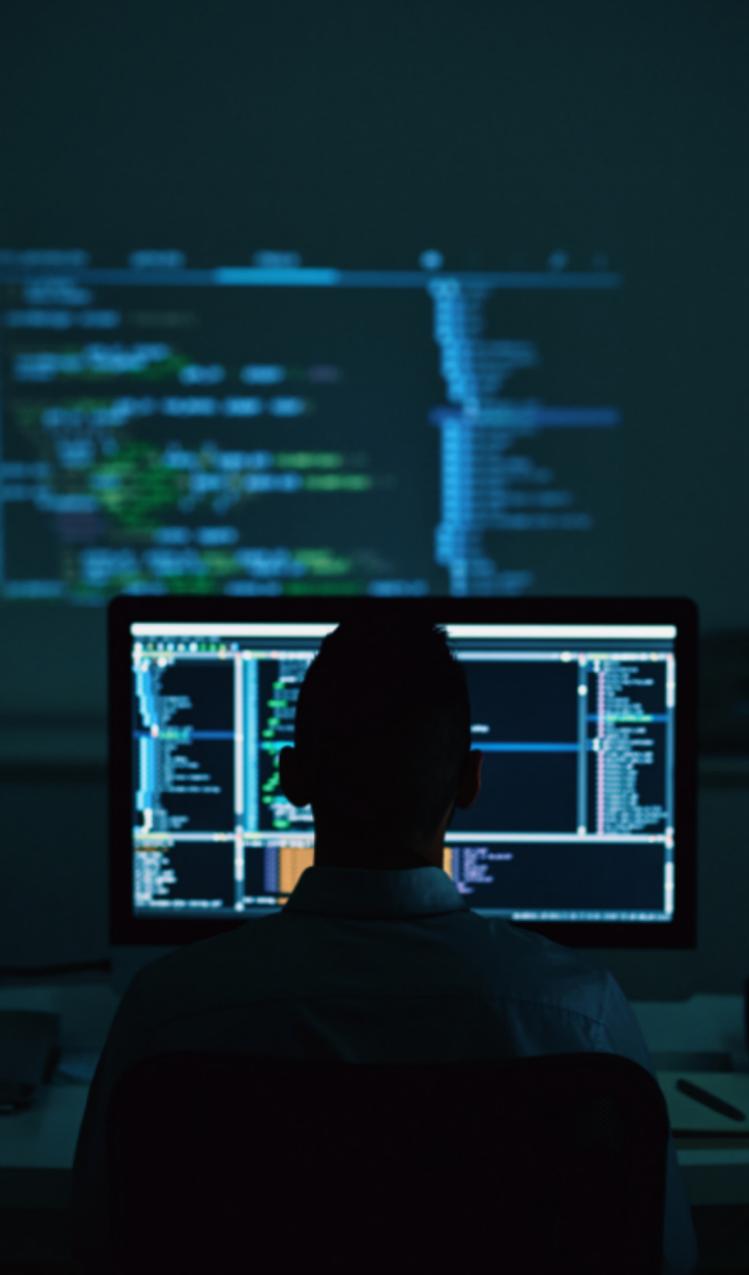
- Importing AutoCAD files into BIM and BEM software is crucial for effective project analysis and management.
- The process is akin to a relay race, with each runner passing the baton without losing speed or accuracy.
- Essential steps include cleaning the drawing, ensuring geometric accuracy, managing layers, exporting in the correct format, and validating the model.
- Cleaning involves removing unnecessary layers, purging unused objects, auditing for errors, and ensuring geometric accuracy.
- Exporting the cleaned and organized file into a compatible format is essential.
- After successful export, the file is imported into BEM software and the model is validated by reviewing the imported model in the BEM interface.

# AUTOCAD TO BEM SOFTWARE IMPORTATION: PREPARATION TECHNIQUES

- Importing design files from AutoCAD into BEM software is crucial for effective project analysis and management.
- The workflow from AutoCAD to BEM software is a relay race, with each tool passing the design data without losing speed or accuracy.
- The workflow includes design creation, optimization for export, data export, import into BEM software, and model validation.



# PREPARING AUTOCAD FILES FOR BEM IMPORTATION



- Cleaning the drawing involves removing unnecessary layers, purging unused objects, and auditing for errors.
- Ensuring geometric accuracy involves correcting overlapping lines and defining building boundaries.
- Layer management and naming conventions are critical for an effective import.
- Commonly used formats include DXF (Drawing Exchange Format) and IFC (Industry Foundation Classes).

# PREPARING AUTOCAD FILES FOR BEM IMPORTATION +

## Importing AutoCAD Files

- The exported file is converted into a format compatible with BEM software.
- The process includes finalizing the floor plan, purging unnecessary objects, and exporting.

## Importing into BEM Software

- The process includes opening the Import Function, selecting the file, mapping layers and attributes, and validating the model.
- Key validation steps include visual inspection and data checks.



# AUTOCAD TO VISUAL DOE IMPORTATION

## AutoCAD Prep

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1. Open wanted drawing.
2. “Save As” in the in the “AutoCAD” folder under the “Energy Modeling” folder, but adding “\_v1.dwg” to the original file name.
3. Check units to make sure units are set to inches.
  - a. When it asks you to rescale say yes.
4. Use the “layoff” command to hide unwanted layers
5. Create new layer named “trace” with color index number of 210.
6. Isolate this layer
7. Trace zoning using either line or pline
  - a. USE SIMPLE GEOMETRY (e.g. do not use 20 small lines to approximate a curve when you could use 3 or 4... Visual DOE likes simple!)
8. After tracing, hide all layers except the trace layer
9. Copy the trace lines that you have drawn with respect to 0,0 and paste them into a new AutoCAD file (Create new, and use Imperial Template).
10. Paste these lines with 0,0 as the base point.
11. Explode all of the pasted lines
12. Use the “overkill” command to remove any unwanted lines
  - a. Make sure the bottom three check boxes are checked.
13. Next, create a new layer named “bpoly” (if you have multiple layers use bpoly01, | bpoly02...etc) and use the “bpoly” command to create polygons in a sequence so that each polygon is adjacent to another.
  - a. Do not leave a middle zone for the last polygon, VisualDOE will not accept a “hole”.
14. “Save As”, replace “\_v1” with “\_v2” and save it as an “R12/DX2 DXF” file.

## **Importing into Visual DOE**

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1. Open Visual DOE and begin importing the wanted drawing by adding a custom block.
2. Click on the “+” sign and select DXF
3. Select “Open DXF File” Go to the AutoCAD folder under Energy Modeling and select your \_v2.dxf file.
4. Choose the “bpoly” layer and click “Add all”

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# THANK YOU

