

Lesson 3 – Modify, MEP, Visualization

Modify Tools – Contextual or Modify tab. Select (TAB cycles) object first.

Moving (and copying)

Parametrically – Use offered temporary dimension lines

Drag - Move visually, not necessarily accurate. CTRL - Copy

Move [MV]/Copy [CO] - Click for start point, Second point or type distance

Align [AL] – First pick is stationary, second pick moves.

“Prefer” sets alignment preferences

Offset [OF] – Choose “Numerical” (default) or “Graphical”

1. Enter distance in option bar
2. Hover on element & side. Click on element to offset. "Copy" option

1. Graphical – Click object and drag distance and direction. “Copy” option

Mirror

Pick Axis [MM] (from existing object)

Use “Tab” to cycle through axes

“Copy” to clone.

Spacebar - flips object (i.e. Door)

Draw Axis [DM] (on screen)

For accuracy, use “Osnaps” with Overrides

Rotate [RO] - First click = base angle. Second click (or enter) for second angle

Drag Center of Rotation “dot” to relocate center point

Array [AR] – Linear or Radial

1. Select
2. Base Point
3. Second Point (click or type) – Distance/Angle defines array.
4. How many

Move to: (distance or angle) - “2nd” = increment, “Last” = total

Makes group (can "ungroup") – Can change spacing/number of elements

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Scale [RE] – Only scalable parameters (i.e wall length, not height or width)
Base point, drag or type for new point.
Scale factor is difference between the two points

Trim/Extend to Corner [TR] - Click portions to keep, (like AutoCAD's Fillet)

Trim/Extend Single/Multiple Elements

1. Click edge
2. Part(s) to keep/extend

Split [SL]

1. One pick makes two separate walls
2. Use "Delete Inner Segment" and 2 points to remove middle.

Split with Gap - Enter "Joint Gap" in options bar

Pin [PN]/Unpin [UP] – Locks an object in place. Unpin – unlocks
Type-driven objects (i.e. curtain walls) frequently default to pinned

Measure

1. Between two references – Osnap or click, distance and angle
2. Distance along an element – Click object

Group (GP) – Select object(s) and give name

Edit Group – Allows adding and removing objects

Ungroup – Breaks apart group

Cut (not clipboard command) – Command, object to cut from, then object to cut.

For example – Select toposolid then slab/slab edge

Does NOT remove cutting object, only overlap (intersection)

Join – Joins two overlapping objects (i.e. floor and wall)

May be part of a command (i.e. creating a floor against existing walls)

Can "unjoin"

Lesson 3 – Modify, MEP, Visualization (cont...)

Clipboard – Transfer information between views, levels or (open) projects

Copy – CTRL-C

Cut – CTRL-X

Paste. Click arrow in ribbon to access options. CTRL-V.

Visibility/Isolation – Local (view) control

Filter – Select elements **first**, then filter out.

Lower-right workspace bar or Modify panel

Temporary Hide/Isolate (View toolbar) or Right click - Selected:

Element(s) [HH]/[HI] – Individual objects (instances)

Category [HC]/[IC] – Everything of selected object's category (i.e. doors)

“Reveal Hidden Elements” [RH]

“Reset temporary...” [HR] – Restores view

Apply Isolate/Hide to View – Sets in Visibility/Graphics (“View” tab)

Reveal Hidden Elements toggle (RH). Shows all hidden elements.

Visibility/Graphics [VG] – “Permanent” control per (current) view

“View” tab or view's “Property” panel

Model Categories – 3D objects

Annotation Categories – 2D “paper” objects

Mechanical (MEP) Systems – “Systems” tab

If none loaded, will prompt to load family. Use “Load Family”

Plumbing (“Systems/Plumbing”).

Fixtures – Toilets, Sinks, etc...

Equipment – Water Heaters, etc...

Electrical (“Systems/Electrical”).

Lighting (“.../Lighting Fixture”).

For ceiling lights, use “Ceiling Plan” and “Place on Face”.

For wall mounts, use “Place on Vertical Face”.

Devices (“.../Devices”)

“.../Terminals” - Receptacle, Switches

“.../Distribution” – Junction boxes, Panels (breaker boxes)

Check “Properties” for heights

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Visualization – Five parts: Geometry, Materials, View, Lighting, Exposure Control

1. Geometry – Model
2. Materials – Defined by the geometry's type (i.e. Brick on Mtl Stud wall)

3. View

Orthographic – Plans, Sections, Elevations, Default 3d view “{3D}”

Perspectives – Must use camera

Camera View – “View/3D View/Camera”. 35mm lens/60 degree FOV

Click in plan (floor or site) view and drag for target.

Creates camera in “3D Views” portion of project browser

Adjust:

1. Numerically (property panel) – Eye & Target Elevation, etc...
2. Visually (browser) - Right-click camera view & “show camera”

4. Lighting

Sun - Each view has a default & independent sun. View Control Bar

Path on/off:

“Continue with the current...” – No changes

“Use the specified...” – Allows changing sun

Can drag sun to set time and date visually

Left-Right = Time of day. Up-Down = Date

Settings (numerical)

Presets or Location/Date/Time

To share between views - “Save Settings” and name

To access, Click “Still” and load from “Presets”

Shadows - View Control Bar. On or Off

Artificial – Lights added using “Lighting Fixtures” (“Systems/Electrical”)

Photometrics – Measurement of light. IES file

Intensity – Lumens (lm). 100w = 1500-1700 lumens (lm)

Color (temperature) – Kelvin.

Warm < 6500 Daylight < Cool

Distribution – Pattern of light

“Edit Type” & “Photometrics” (may need to link up IES file)

“Tilt Angle” – Rotates bulb inside fixture. May need correction.

5. Exposure Control – For renderings. “EV” Higher brighter. Lower darker.

Exterior – 14-15 & Interior – 9-10

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Render - Only in “{3D}” view or Cameras. View Control bar or “View/Presentation”

Quality – Use Presets (Draft, etc...) or “Edit” to fine tune.

NOTE: Rendering times increase dramatically for high settings

Output Settings - DPI (“dots per inch”). Pixel density

“Screen” is the number of pixels the view displays on a monitor (@72 DPI)

“Printer” - Print size (inches) = Total pixels/DPI

Can choose drop-down preset or type DPI.

Image Size (inches) controlled at the camera’s view:

Select crop region and then “Size Crop” in contextual panel

Enter desired image’s prints size

Field of view - Changes proportion

Scale - Maintains proportion.

Use “Rendering/Region” to further crop rendered area

Lighting

“Scheme” - Exposure Control Presets. Offers typical lighting situations:

Exterior/Interior

Sun, Artificial, both

“Sun Setting” – Use to access saved settings

Background – Built-in “sky” or image

Image

Adjust Exposure – Tweaks. Adjusts EV, brightness, contrast, etc...

Save to Project – Adds to “Renderings” in project browser

Export – Saves an external file (JPG, TIF, PNG).

Can further edit in Photoshop.

Will need to “Insert” to place on a sheet

Display – Toggles view between rendering and view’s current visual style

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V-Ray Rendering in Revit

Must be “Enabled”. Click on “V-Ray” tab and “Enable V-Ray”

Interface similar to V-Ray for Rhino.

Renders to V-Ray frame buffer, not a Revit “view”

View – Choose from available Revit cameras

Render

Production

Interactive

V-Ray Vision

Show/Hide Frame Buffer – Toggle

Quality – Presets

Resolution – Number of pixels. Preset or “Custom”

Lighting

Artificial Lights Off – Toggles Revit’s artificial lights

V-Ray Sun – Uses Revit sun settings (position, time of day, etc...)

Dome Light – Non-directional light

Assets

Asset Editor – Limited to materials and textures

Appearance Manager – Intermediate between V-Ray and Revit materials

Procedures:

Make materials (or get from library – left arrow) in Asset Editor

Choose a Revit material in the “Appearance Manager”

1. Right-side “V-Ray” logo – Choose V-Ray material

2. Drag and drop from Asset Editor to Revit material

To revert to Revit material, click “x” next to V-Ray name

Material will only show in V-Ray frame buffer, not in Revit view

Camera – Uses Revit camera. Used to managed Exposure Control (EV)

Settings – Infinite Plane (apply material to activate)