

Lesson 2 – Type Driven Systems – Walls and Circulation

Walls – Two types:

Structural/Load-bearing – Carries vertical building load (i.e. CMU wall, Stud wall)

Non-structural - Holds only itself up (i.e. Curtain walls, Interior partitions)

Instance vs Type

Instance - One or more wall objects of a type.

Type – **ALL** wall instances (objects) of the same “type” (i.e. all 8" generic walls)

1. Instance Properties - Selected (or to be created) Instance(s)

Visual

Resize length/height – Click & drag endpoints/arrows

Change walls orientation (double arrows) – Flips interior and exterior

Parametrically

Select Temporary Dimension line. Type in field

Make Dimension Line permanent – Displays, used to plot

Witness Line – Inside, Outside or centerline

Default, “Manage/Additional Settings/Temp Dimensions”

Property Panel – Constraints (also Structural, Dimensions, Identity, Phasing)

Location Line – Only moves line, not wall.

Base Constraint – Level wall is drawn on

Base Offset – Wall begins

Top Constraint – Height of wall (Same as option bar)

Top Offset – Distance up from connected level (can be negative)

Unconnected – Height, if unconnected

Lesson 2 – Type Driven Systems – Walls and Circulation (cont...)

2. Type Properties ("Edit Type") - All of a "type" (i.e. all 8" generic walls)

Modifying will change **ALL** wall instances of the current type

"Duplicate" copies properties/settings to a new name

New wall types are made by duplicating (and renaming) an existing type

IFC Parameters – Intl Foundation Class. Conversion between BIM software

Identity Data – Informational. Specifications, etc...

Analytical Properties/Materials & Finishes – Specifications, etc...

Graphics – "Coarse" Detail Level. Typically used in plans, Use to poche walls

Fill Pattern - Hatch pattern

Fill Color – Color of hatch pattern

Construction – How it is put together

Wrapping at:

Inserts – Openings (i.e. windows)

Ends – Open ends of wall (in plan)

Width – Determined by structure

Function – Exterior, Interior, etc...

Structure – Defines wall "sandwich" ("Edit")

Preview – View: Plan or Section (vertical)

Sample Height – Default "unconnected" height

Layers - "Sandwich" from "Exterior" to "Interior"

Core=Structure

Insert/Delete – Add/Remove selected layer

Up/Down - Reorders selected layer

1. Function – "What does it do?" (i.e. Finish, Structure, etc...)

Pre-defined. Not editable

Priority number – When intersecting another wall. "1" is highest

Lesson 2 – Type Driven Systems – Walls and Circulation (cont...)

2. Material – “What it is made out of”, Material Browser

Pick from list or define New (right-click to rename)

Identity – Product information, etc...

Graphics – Elevations/Sections/3D (non-rendered) Views

Shading – Solid color. Shaded view

Surface – Pattern & color. Elevation/3D views

Cut – Pattern & color. Medium & Fine LOD. Section.

Appearance – Rendered

Defined (i.e wood, metal, etc...). Settings depend on material

Texture map, Relief map, etc...

Generic – Color or Image (Texture map)

Reflectivity, Transparency

Cutout, Bump - Grayscale maps

Self-Illumination – Glow

Mapping - Click on Image:

Transforms

Position – Offset, Rotation

Scale – Sample Size (real-world scale)

Repeat – Tile or not

Physical/Thermal – Detailed physical properties

3. Thickness - Dimension of specific “sandwich” layer (i.e CMU – 8”)

4. Wraps - How it handles ends (corners) and openings

Lesson 2 – Type Driven Systems – Walls and Circulation (cont...)

“Modify Vertical Structure” – Must be in “Section” preview

Sweeps (adds) - Cornices, Coping, etc...

Add, then use:

Built-in profiles (click “default”)

“Load Profile” (RFA)

Material - What it's made out of

Distance - From Base or Top

Side - Exterior or Interior

Offset - How far in or out

Flip - Mirrors vertically

Reveals (subtracts)

Add, then use:

Built-in profiles (click “default”)

“Load Profile” (RFA)

Profile - Shape

Distance - From Base or Top

Side - Exterior or Interior

Offset - How far in or out

Flip - Mirrors vertically

Split Region – Allows two or more materials of equal width in a wall

1. Choose “Split Region” and then click on section of wall
2. Create additional layer of same function (i.e. Finish 1)
3. Select layer to assign
4. Click “Assign Layers” and then click region on section

Use “Modify” to change split dimension. Click on split to move

Merge Regions – Removes split. Click on split

Stacked Walls - For multiple widths. Choose from existing wall types

Lesson 2 – Type Driven Systems – Walls and Circulation (cont...)

Curtain Walls - "non-structural" wall, consisting of mullions and panels

Definitions:

Grid Line - Think "construction lines"

Necessary in order to define mullions and panels

Panels - Area between grid lines

Can be "filled" with Glazing, Solid or Empty

Mullions - Frame the panels. MUST follow grid line.

Two mechanisms in Revit - Curtain Wall System & Curtain Wall

1. Curtain Wall System - Requires existing "mass", applied by face
2. Curtain Walls - Accessed under the wall command as a "Type".
All options are the same as load bearing walls
Exception is the location line, which is always "centerline".

Choose one of the following loaded "types" (or duplicate to redefine):

1. "Curtain Wall 1" - No grid lines, panels or mullions
2. "Exterior Glazing" - Preset gridlines only
3. "Storefront" - Preset gridlines, mullions and panels

Grids, Mullions and Panels are created three ways - By Type, Manually or Both

1. "Type" - Sets parameters for all walls of a single type (globally).

Construction

Function - Exterior, Interior, etc...

Automatically Embedded ("in wall") – Mullions/panels become a "window".

Curtain Panel - Material panel is filled with

Choose from existing system panels, wall types or none

May duplicate to make a new panel type

Join Condition - If (and which) mullion is continuous at intersection

Lesson 2 – Type Driven Systems – Walls and Circulation (cont...)

1. "Type" (cont...)

Vertical/Horizontal Grid Pattern

Layout - Number/Spacing of grid lines (Default = None)

1. Fixed Distance – Spacing between of grid lines
2. Fixed Number - Set with *Instance's Properties*
3. Max Spacing - Spacing is equal to or less than entered distance
4. Min Spacing - Spacing equal to or greater than entered distance

Spacing – Active only for “Fixed Distance”

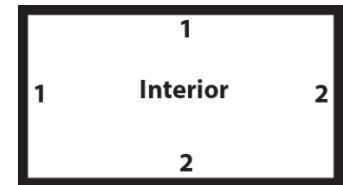
Adjust for Mullion Size – Adjusts spacing due to varying mullions sizes

Vertical/Horizontal Mullions - Default = None

Interior Type - Non-border mullions. NOTE: NOT interior/exterior

Border1 Type - Left edge and/or top mullion

Border2 Type - Right edge and/or bottom mullion



Identity Data - Manufacturer information

"Instance Properties" - Parameters for selected wall instance(s)

Vertical/Horizontal Grid Pattern

Number - Number of grid lines on an instance(s)

If type's "grid" is:

"Fixed Number" – sets # of gridlines on instance

Other – Displays # of gridlines on instance

Justification - Where grid begins. Beginning, Center, End

Angle - Angle of grid line

Offset - *Justification Point* is "offset" from previous position

Lesson 2 – Type Driven Systems – Walls and Circulation (cont...)

1. "Type" (cont...)

Visually - Configure Grid Layout (icon in center)

Justification - Clicking arrows places in preset locations

Angle - Second field along justification lines

Offset – First field along justification lines

2. Manually - "Architecture" tab. Can also supplement “type” definitions.

Curtain Grid - Click places grid line on wall

All segments - Grid line across all panels

One Segment - Grid line in highlighted panel

All Except Picked - Highlight and click line not wanted.

To move – drag or enter parameters

Mullion – Places selected mullion “type” on existing grid line

Grid Line - Selected gridline

Grid Line Segment - Selected portion of gridline in panel

All Grid Lines – All of them

Lesson 2 – Type Driven Systems – Walls and Circulation (cont...)

Modifying

Selecting

1. “Hover+Tab” to Cycle (Single object > chain > element > etc...)
2. “Click” – select desired element

Right-click over selected element(s). Choose options.

Type created elements will be pinned. Must unpin to modify/delete

Curtain Grid - Add/Remove Segments, click to remove (or add).

Mullion - Click on single mullion or right-click to "Select Mullions" (multiple)

Must unpin to modify (if “type”)

“Delete” to remove

Choose a different mullion type in properties

Panel - Choose type in properties.

Must unpin to modify (if “type”)

For Curtain Wall System panels:

Default choices - Solid, Glazed, Empty (none).

Can duplicate and then edit type to use different materials

For Curtain Walls - More choices in properties

Door - Treated like a panel, NOT a door

Must load (RFA) from “Load Family” under the “Insert” tab first.

Appears in panel properties

Mullions can be removed and panels combined by erasing gridlines

Remember to remove lower mullion

Lesson 2 – Type Driven Systems – Walls and Circulation (cont...)

Circulation

Stairs – Strictly controlled by parameters (in both Property panel and “Type”)

Terms:

“Run” is a unit of stairs

“Tread” – Horizontal portion (feet touch)

“Riser” – Vertical part (what your toe kicks)

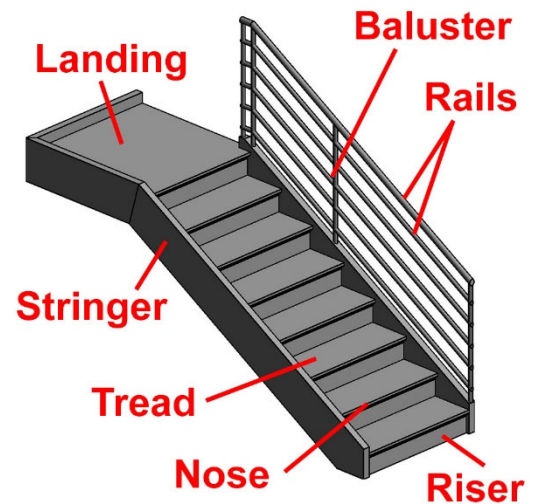
“Nose” – Front edge of the riser

“Stringer” – Supports on left &/or right.

“Rails” – Handrail. Parallel to stringer

“Baluster” – Vertical support for handrails

“Landing” – Flat surface connecting multiple runs



Rules = “Distance between levels” ÷ Number Risers ≤ Max Riser Height

Property Panel:

Base & Top Level – Determines distance between (i.e. Level 1 to Level 2)
Desired Number of Risers

Type:

Calculation Rules

Max Riser Height

Min Tread Depth, Min Run Width – Defaults in panel/option bar

Construction – Geometry

Supports – Stringers. Right &/or Left (or None), type and size

Lesson 2 – Type Driven Systems – Walls and Circulation (cont...)

Run – To create a run of stairs.

“Straight” (most common). Others (Spiral, etc...)

Click to start run, move mouse and click to end run.

Can have multiple runs.

Location Line

Run (tread) - Left/Right/Center

Exterior Support (stringer) – Left or Right

Run Width – Width of stair (default set by “Type”)

Automatic Landing – Fills any gaps between runs, with a landing

“Create Sketch” – Based on selected “Type”:

Click “Boundary”

Draw lines/arcs (stringers) on each side.

Lines can’t touch.

Click “Riser”. Draw (roughly) perpendicular lines/arcs until max # reached

Landing – Manually fills a gap between two runs

Support – Adds a stringer to a run or landing

Railing – Select type and location of railing integral to stairs

Railing – Independent of stairs. Select type and then sketch

Ramp – Similar to stairs – Sketch mode, type driven, etc...Slope (rise/run ratio).

Opening

Creates opening in surface drawn on. Select single face/object first, then sketch

Wall (only) – Horizontal (elevation) opening.

Non-Walls – Floors, Roofs, etc...

Vertical (perpendicular to ground). Draw on plan (i.e. level 1)

Face (perpendicular to face). Select face and draw. Can define work plane.

Shaft – Creates vertical opening through one or more horizontal (non-wall) surfaces