AS10688 Revit Master Class
Building Terrific Real-World Door Families

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Class summary

Even for the best Revit family modelers, door families are some of the toughest to create effectively.

With all of the moving parts, data requirements, and end-user demands, building out a comprehensive door library is always a challenge.

In this class we take a thorough step-by-step approach to building a series of door components and combining them into assemblies for use in design, documentation, and construction administration. By focusing on these 3 use cases, we explore how to capitalize on all of the tools in the Family Editor to create doors that are easy for the end user to use, look terrific in rendering and animations, and document themselves efficiently in tags, schedules, and reports.

Key learning objectives

At the end of this class, you will be able to:

- Learn how to efficiently build real-world door components in the Family Editor
- Combine components into assemblies that are flexible and information rich
- Discover the secrets to hosting components to various references to effectively position them
- Be able to best capitalize on family, shared, and project parameters to report door components in tags, schedules, and reports

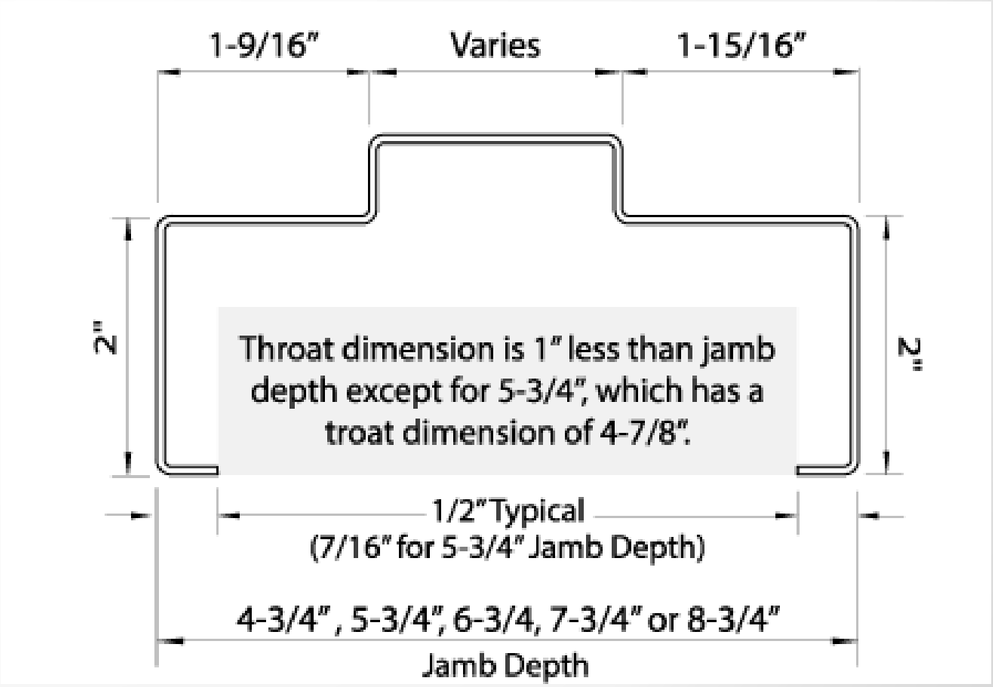
What makes a good door family?

What makes a good door family?

- Easy for users to work with on a daily basis
- Uses a “kit of parts” philosophy where the frame, panel, hardware, etc. are nested families and link values to the host family.
- Subcomponents are all Door families and belong to Subcategories
- Looks realistic in 3D as well as 2D, with good hardware, materials
- Schedules all values correctly
- Handles complex situations, such as uneven double doors or doors that have to sit outside of the host wall
- Almost nothing is nested more than once.
- **It isn’t a “SuperDoor” (warning: opinions vary)**

Design considerations

- Group doors by Assembly Characteristics → Assembly Family
  - Decides what is a Type Parameter vs. Instance Parameter
  - Example: Hollow metal frames require special consideration
  - Use Family Type to swap out standard sizes

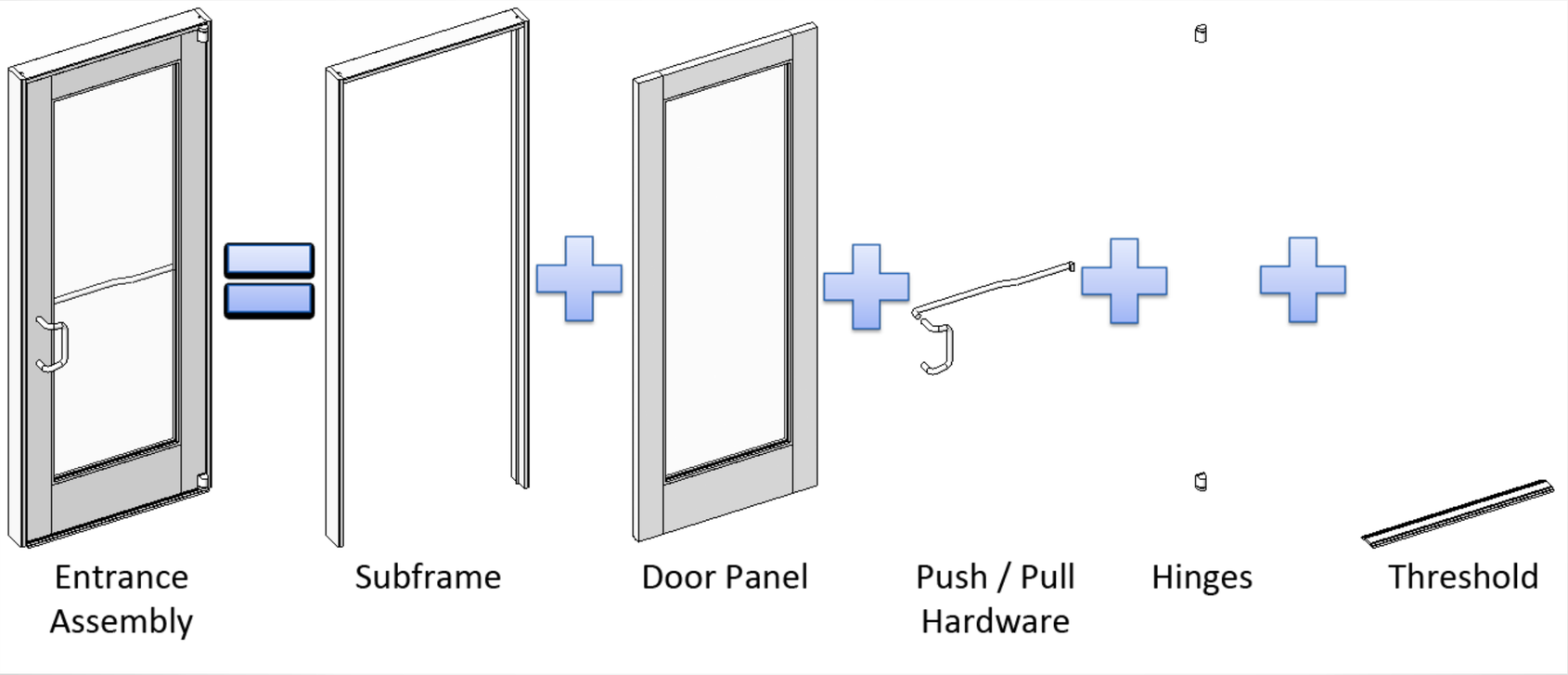


13 step program for building families

1. PLAN the family's required and requested behaviors. Think about how flexible it needs to be.
2. Choose the template (determines category / hosting condition) & initial setup (scale, units, etc.)
3. Draw Reference Planes to block out the geometry and define constraints
4. Dimension Reference Planes to sketch out geometry
5. Create Parameters: Name, Data Types (length, materials, yes/no, etc.), and Parameter Group
6. Label dimensions = Associate dimension with a family parameter. Create "on the fly"
7. Model geometry and constrain to Reference Planes using Align / Lock
8. Create Family Types and assign values to parameters
9. Create and assign Subcategories to geometry. Note: This only works on raw geometry, not on nested families. Solution: Create nested family in the same category as the parent family (e.g., frames are Doors)
10. Make nested families' parameters Instance based. Link parameters to host family parameters.
11. Leverage 2D symbolic linework, masking regions, detail components, etc.
12. Set Detail Level visibility of objects: Coarse / Medium / Fine
13. Flex in family editor and Test in project context. Tip: Don't test it in your active project.

Tips for nesting components

- One Door Assembly = 5/6 component families of frames, panels, push / pull hardware, hinges, thresholds, 2D swing
- You can mix and match component to build out assemblies
- Assembly controls nested families through parameter linking



Tips for nesting components

- Doors come with standard System Parameters:
  - Construction Type
  - Function
  - Width (can be made Instance)
  - Height (can be made Instance)
  - Thickness (can be made Instance)
  - Rough Width (can be made Instance)
  - Rough Height (can be made Instance)
  - Analytical Properties
  - IFC Parameters

Tips for building stuff

- You can build most components easily by setting up prototype families that have reference planes, shared parameters and stand-in geometry
- Use Width and Height parameters to mean ***Nominal*** Sizes
  e.g. 3’-0” x 7’-0”
  - Actual panel sizes are typically inset 3/32” on each side
  - Offset 1/8” at the head
  - Undercut on the bottom for threshold / floor finishes / air pressure

Tips for building stuff

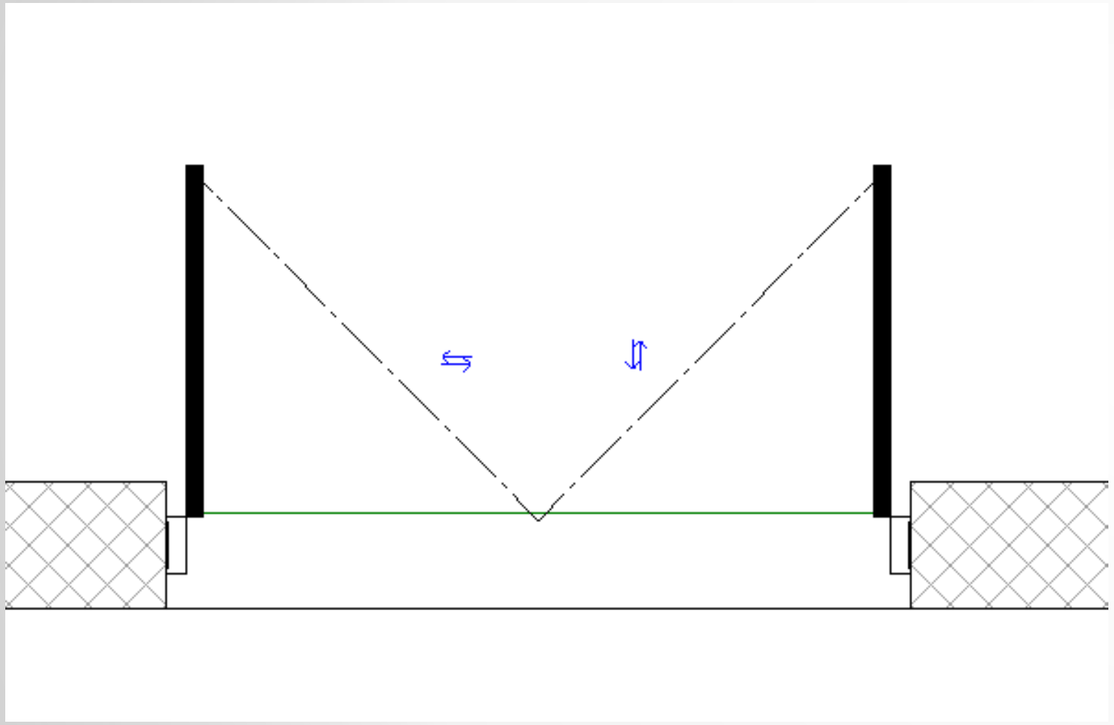
- Frames can best user Profiles to generate shape
- Profiles can have dimensions parameterized to sizes
- Make Profile Types of each HM frame size
- Swap out Types = different frames (4 ¾”, 5 ¾”, 6 ¾”, 7 ¾”, 8 ¾”)
- Note: Head frame may require 2” or 4” face width for CMU = more types
- You can embed detailing into the jamb / head profile

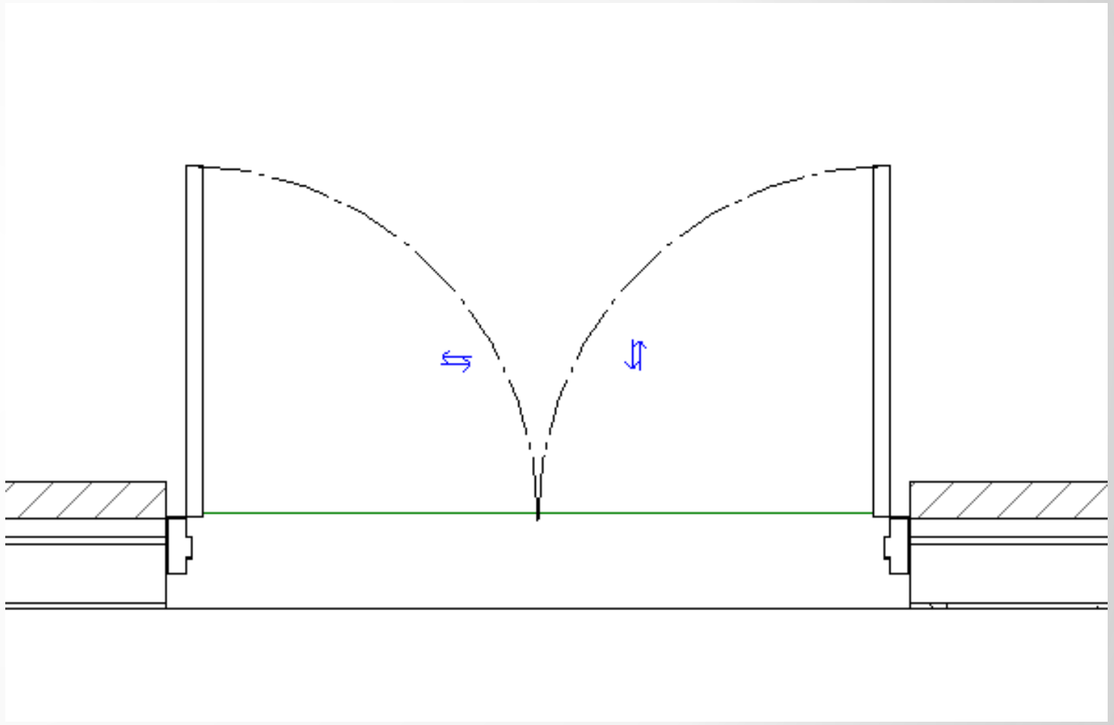
Tips for building stuff

- Panels should have a 3D swing capability
- Makes renderings look much better and more lifelike
- Ability to animate them downstream (Navisworks / 3ds Max)

Tips for building stuff

- 2D graphics: Build separate Coarse and Medium / Fine graphics





Shared Parameter Example

NAME	DATATYPE	DESCRIPTION
DETAIL HEAD	TEXT	HEAD DETAIL #/A-###
DETAIL JAMB	TEXT	JAMB DETAIL #/A-###
DETAIL SILL	TEXT	SILL DETAIL #/A-###
FRAME CENTERED IN HOST	YES / NO	CHECKED = CENTER FRAME IN HOST. UNCHECKED = USE "FRAME OFFSET" VALUE
FRAME DEPTH	LENGTH	DEPTH OF FRAME
FRAME DRYWALL SLIPON	YES / NO	IF CHECKED, FRAME USES DRYWALL SLIPON DIMENSIONS AND DECREASES THE ROUGH OPENING TO HALF OF THE FRAME FACE WIDTH
FRAME FAMILY TYPE	<FAMILY TYPE...>	FRAME FAMILY TYPE
FRAME HEAD FACE WIDTH	LENGTH	FACE WIDTH OF FRAME AT THE HEAD
FRAME JAMB FACE WIDTH	LENGTH	FACE WIDTH OF FRAME AT JAMBS
FRAME OVERALL HEIGHT	LENGTH	OUTSIDE HEIGHT DIMENSION OF FRAME
FRAME OVERALL WIDTH	LENGTH	OUTSIDE WIDTH DIMENSION OF FRAME
FRAME PULL SIDE OFFSET	LENGTH	OFFSET DISTANCE OF FRAME FROM PULL SIDE OF WALL. POSITIVE VALUES PUSH FRAME INTO THE WALL, NEGATIVE VALUES PULL FRAME OUTSIDE OF WALL. UNUSED IF 'FRAME CENTERED ON HOST' IS CHECKED.
FRAME REVIT MATERIAL	MATERIAL	REVIT MATERIAL ASSIGNED TO FRAME
FRAME SCHEDULED FINISH	TEXT	SCHEDULED FINISH OF FRAME
FRAME SCHEDULED MATERIAL	TEXT	SCHEDULED MATERIAL OF FRAME (HM, WD, ALUM, ETC.)
FRAME SCHEDULED TYPE	TEXT	SCHEDULED FRAME TYPE
FRAME SIDELIGHT SILL FACE WIDTH	LENGTH	SIDELIGHT FRAME SILL FACE WIDTH
GLAZING FRAME REVIT MATERIAL	MATERIAL	REVIT MATERIAL ASSIGNED TO THE DOOR PANEL GLAZING FRAME
GLAZING REVIT MATERIAL	MATERIAL	REVIT MATERIAL ASSIGNED TO THE GLAZING
GLAZING SCHEDULED MATERIAL	TEXT	SCHEDULED GLAZING MATERIAL
GLAZING SCHEDULED TYPE	TEXT	SCHEDULED GLAZING TYPE
HARDWARE BHMA FINISH NUMBER	TEXT	BHMA STANDARD NUMBER FOR HARDWARE FINISH
HARDWARE HINGES FAMILY TYPE	<FAMILY TYPE...>	HINGES FAMILY TYPE
HARDWARE REVIT MATERIAL	MATERIAL	REVIT MATERIAL ASSIGNED TO ALL HARDWARE EXCLUDING LOCKSET

Shared Parameter Example

HARDWARE SCHEDULED DEVICES AND SETS	TEXT	SCHEDULED DEVICE AND HARDWARE DESIGNATIONS
HARDWARE THRESHOLD FAMILY TYPE	<FAMILY TYPE...>	HARDWARE THRESHOLD FAMILY TYPE
LOCKSET BACKSET	LENGTH	LOCKSET BACKSET FROM LATCH SIDE EDGE
LOCKSET ELEVATION	LENGTH	ELEVATION OF LOCKSET CENTER FROM FLOOR
LOCKSET FAMILY TYPE	<FAMILY TYPE...>	LOCKSET FAMILY TYPE
LOCKSET REVIT MATERIAL	MATERIAL	REVIT MATERIAL ASSIGNED TO LOCKSET
PANEL 1 2D SWING ANGLE	ANGLE	2D SWING ANGLE FOR PANEL 1
PANEL 1 3D SWING ANGLE	ANGLE	3D SWING ANGLE FOR PANEL 1
PANEL 1 FAMILY TYPE	<FAMILY TYPE...>	PANEL 1 FAMILY TYPE
PANEL 1 WIDTH	LENGTH	NOMINAL WIDTH OF PANEL 1
PANEL 2 2D SWING ANGLE	ANGLE	2D SWING ANGLE FOR PANEL 2
PANEL 2 3D SWING ANGLE	ANGLE	3D SWING ANGLE FOR PANEL 2
PANEL 2 FAMILY TYPE	<FAMILY TYPE...>	PANEL 1 FAMILY TYPE
PANEL 2 WIDTH	LENGTH	NOMINAL WIDTH OF PANEL 2 IF DIFFERENT FROM PANEL 1. UNUSED IF 'PANELS EQUAL' IS CHECKED.

Shared Parameter Example

PANELS EQUAL	YES / NO	IF CHECKED, WIDTH = 2 * PANEL 1 WIDTH. IF UNCHECKED, WIDTH = PANEL 1 WIDTH + PANEL 2 WIDTH
PANELS LOUVER REVIT MATERIAL	MATERIAL	REVIT MATERIAL ASSIGNED TO PANEL LOUVERS
PANELS RAILS BOTTOM WIDTH	LENGTH	PANEL BOTTOM RAIL WIDTH
PANELS RAILS CROSS WIDTH	LENGTH	PANEL CROSS RAIL WIDTH
PANELS RAILS LOCK WIDTH	LENGTH	PANEL LOCK RAIL WIDTH
PANELS RAILS MULLION WIDTH	LENGTH	PANEL MULLION RAIL WIDTH
PANELS RAILS REVIT MATERIAL	MATERIAL	REVIT MATERIAL ASSIGNED TO PANEL RAILS
PANELS RAILS TOP WIDTH	LENGTH	PANEL TOP RAIL WIDTH
PANELS REVIT MATERIAL	MATERIAL	REVIT MATERIAL ASSIGNED TO PANEL
PANELS SCHEDULED FINISH	TEXT	SCHEDULED PANEL FINISH (STAIN, PAINT, ANOD, ETC.)
PANELS SCHEDULED MATERIAL	TEXT	SCHEDULED PANEL MATERIAL (WD, HM, ALUM, ETC.)
PANELS SCHEDULED TYPE	TEXT	SCHEDULED PANEL TYPE
PANELS STANDARD THICKNESS	YES / NO	CHECKED, PANELS ARE 1-3/4" THICK. UNCHECKED, PANELS ARE 1-3/8" THICK.
PANELS STILES REVIT MATERIAL	MATERIAL	REVIT MATERIAL ASSIGNED TO PANEL STILES
PANELS STILES WIDTH	LENGTH	PANEL STILE WIDTH
PANELS UNDERCUT	LENGTH	UNDERCUT DISTANCE BELOW PANELS. INCLUDED IN NOMINAL PANEL HEIGHT.
WALLS EXTERIOR WRAP	LENGTH	WRAP DISTANCE FOR EXTERIOR LAYERS OF WALL
WALLS INTERIOR WRAP	LENGTH	WRAP DISTANCE FOR INTERIOR LAYERS OF WALL

Let’s build some stuff!