Find me the Shortest Route: Successful Piping in Revit MEP
Bill Knittle: Building Solutions Engineer

Helping you stay ahead.
For the past seven years at Synergis, I have applied my industry and technical knowledge to implement, support, and train my fellow architects, engineers, and contractors migrating to Building Information Modeling applications such as Revit and Navisworks. I have authored several articles for Cadalyst, AEC Bytes, and our new SynergisCAD blog as well as, created several Tips and Tricks videos on our own Synergis website and You Tube channel. To ensure my creditability, I have obtained my Associate and Professional User Certifications for Revit dating back to release 2008. I also achieved the Revit Implementation Expert Certification, MEP Systems Specialiation, and Fabrication Specialization. In closing, I enjoy the challenges presented by each new engagement whether it be implementing, supporting, or training our BIM customers.
Introduction

Building Information Modeling

“Allows professionals to explore a project’s key physical and functional characteristics digitally, before it’s built”

Autodesk®

- Conceptualize
- Visualize
- Analyze
- Document
- Fabricate
- Build
- Manage

Knowledge Sources

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BIM Accumulates the Answers
System Classification: defines how Revit will perform calculations such as flow and pressure drop. Pipe Connectors in Families are given a System Classification when editing them in the Family Editor. The System Classification of the Pipe Connector is how Revit’s System Browser organizes the family in the hierarchal list.
Revit - Piping / Plumbing

**Piping System Types:** represent the various Plumbing and Piping services that will be used throughout the building model. Piping System Types reference a System Classification.
**Piping System Types:** define the necessary Naming, Graphical, and Calculation Standards.

**Single Line**

**Two Line**

**Graphic Overrides:**
- **Edit:**
  - Lines Graphics:
    - **Weight:** Specifies a Line Weight override (*Manage Tab > Settings Panel > Additional Settings > Line Weights*).
    - **Color:** Specifies a Color override.
    - **Pattern:** Specifies a Line Pattern override (*Manage Tab > Settings Panel > Additional Settings > Line Patterns*).

**Fluid Type:**
- **Mechanical Settings:**
  - **Pipe Settings:**
    - **Fluids:**
      - **Fluid Name:** Specifies the Name of the Fluid.
      - **Temperature:** Specifies the Temperature of the Fluid.
      - **Fluid Viscosity:** Specifies the Viscosity of the Fluid given the specified Fluid’s Temperature.
      - **Fluid Density:** Specifies the Density of the Fluid given the specified Fluid’s Temperature.
Pipe Types: represent the various material segments and associated sizes used to model the 3D pipe in the building model. The Pipe Type also contains the Routing Preferences.
**Pipe Types:** define the necessary Segments *(Material)* and Sizes.

**Mechanical Setting (MS):**
- **Pipe Settings:**
  - Segments and Sizes:
    - **Segment:** A combination of Material and Schedule/Type definition.
    - **Roughness:** A necessary value used for Pressure Drop calculations.
    - **Segment Description:** Information used in Scheduling.
    - **Size Catalog:** Nominal, Inner, and Outer Diameters with Usage specifications.
Pipe Types: define Routing Preferences.

Pipe Type:
- Type Properties:
  - Routing Preferences:
    - Segment and Sizes button: Launches Mechanical Settings directly to Segment and Sizes settings.
    - Load Family button: Launches the Load Family dialog to insert Pipe Fitting families into the project.
    - Pipe Segment: Specifies segment and minimum and maximum sizes
    - Elbow: Specifies which loaded elbow families to use between which minimum and maximum sizes.
    - Preferred Junction Type: Specifies whether to use tee or tap junctions.
    - Junction: Specifies which loaded tee or tap families to use between which minimum and maximum sizes.
    - Cross: Specifies which loaded cross families to use between which minimum and maximum sizes.
    - Transition: Specifies which loaded transition families to use between which minimum and maximum sizes.
    - Union: Specifies which loaded union families to use between which minimum and maximum sizes.
    - Flange: Specifies which loaded flange families to use between which minimum and maximum sizes.
    - Cap: Specifies which loaded cap families to use between which minimum and maximum sizes.
**Routing:** Modeling Pipe

**Pipe Command:**
- Properties Palette
  - Type Selector: Lists all Pipe Types in Project.
  - System Type Parameter: Lists all System Types in the Project.
  - Pipe Segment Parameter: Lists each Segment defined in the selected Pipe Type’s Routing Preferences.
  - Diameter Parameter: Lists all the Used in Size Chart sizes per the Selected Pipe Segment.

*Note: The Pipe Placeholder and Flex Pipe Command follows the same concepts.*
Supply and Demand:
• Connectors and Systems in Revit go hand-in-hand. Systems are used to calculate the demand needed to supply a particular Piping distribution. Family Connectors are used to preset or calculate the demand within the System they support. In order to set up family Connectors to work properly it is important to know the architecture of how Systems they will take part in work.
• The physical flow direction dictated by Connectors of families must work in order for the logical flow of data in the Pipe network to be useful. When both are flowing properly, designers can begin to use the data to make informed decisions.
Revit - Piping / Routing

Demo Time

[Diagram of piping and routing system]

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[Synergis logo and tagline: Engineering Design Solutions]