Walk-in Slide: AU 2014 Social Media Feed

1. Click on the link below, this will open your web browser

http://aucache.autodesk.com/social/visualization.html

2. Use “Extended Display” to project the website on screen if you plan to work on your computer. Use “Duplicate” to display same image on screen and computer.

M/E/P/E Design process

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www.hvacsolution.com

Class summary

M/E/P/F engineering from concept to completion using schematic design software and Revit.

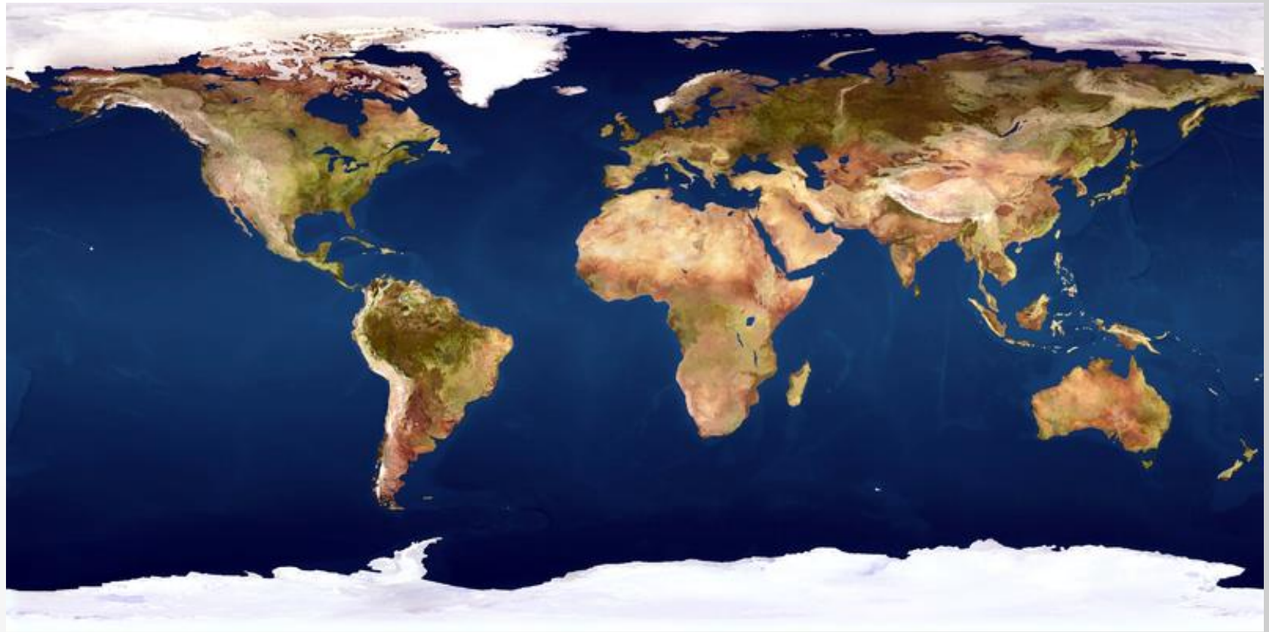
Key learning objectives

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

- Understand one possible M/P/E/F design workflow process.
- Share data between schematic design software and Revit.

Introduction

- VBFA Consulting engineers:
  - 100+ personnel.
  - (4) offices, Utah and Arizona
- Local projects:
  - Hospitals, laboratories, schools…
- International projects:
  - Argentina, Chile, Italy, Fiji, Columbia, DR Congo…



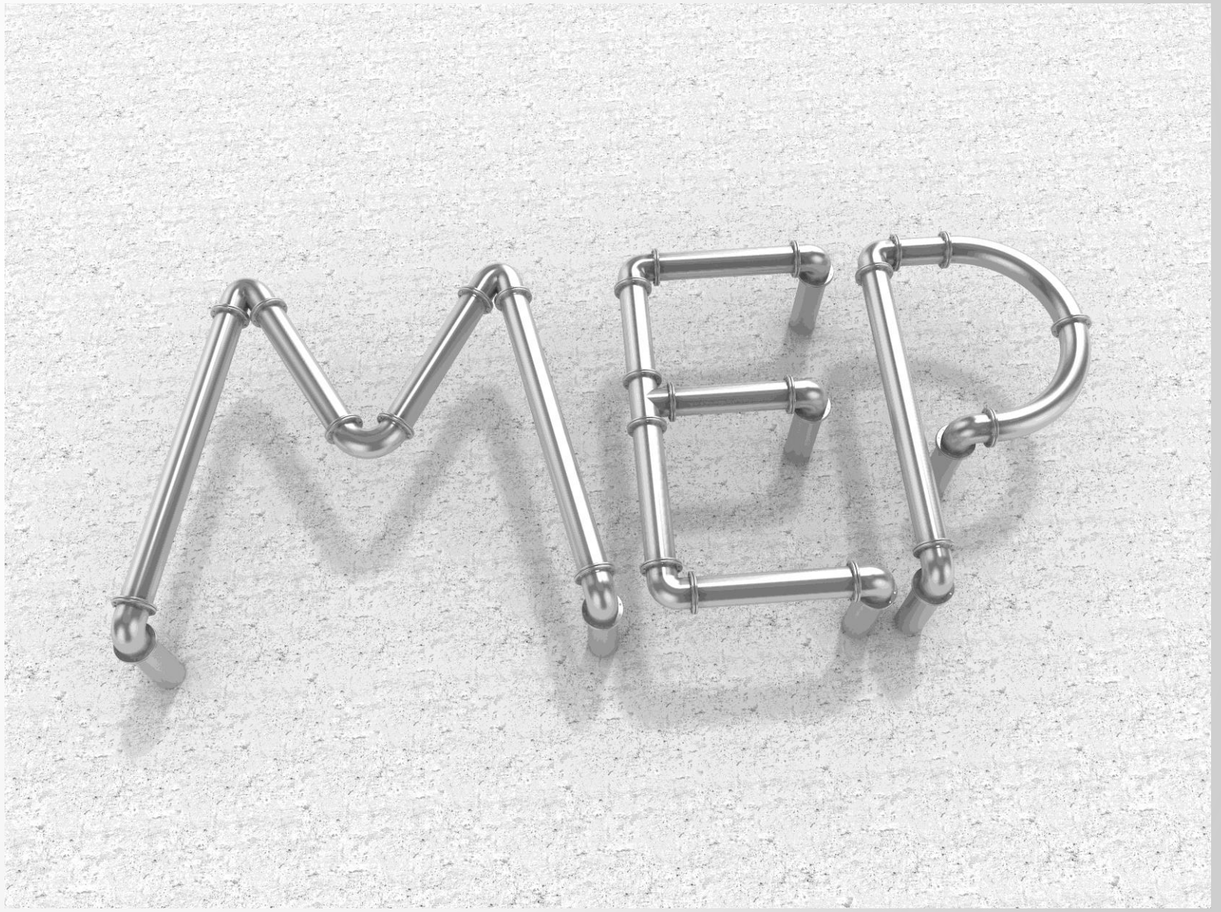
Presentation: Goal

- Sociological studies show: You can actually die from boredom.
- My goal: An un-boring presentation.

M/E/P/F Engineering

M/E/P/F engineering: What is it?

- Mechanical
- Electrical
- Plumbing
- Fire protection



M/E/P/F engineering: Where is it?

- Homes
- Schools
- Universities
- Hospitals
- Office buildings
- Sports facilities
- Hotels

M/E/P/E engineering: Success defined

- Integration without irritation
  - See no mechanical
  - Hear no mechanical
  - Feel no mechanical

M/E/P/E engineering: ~~Easy~~

- Every project is custom.
- Hard.
  - “Rocket science is easy.”
- Fast paced.
- Decisions = $$$.
- Diverse:
  - Boilers, chillers, ductwork, piping, humidity, dehumidification, pressurization, heat exchangers, pumps, controls, fire protection…

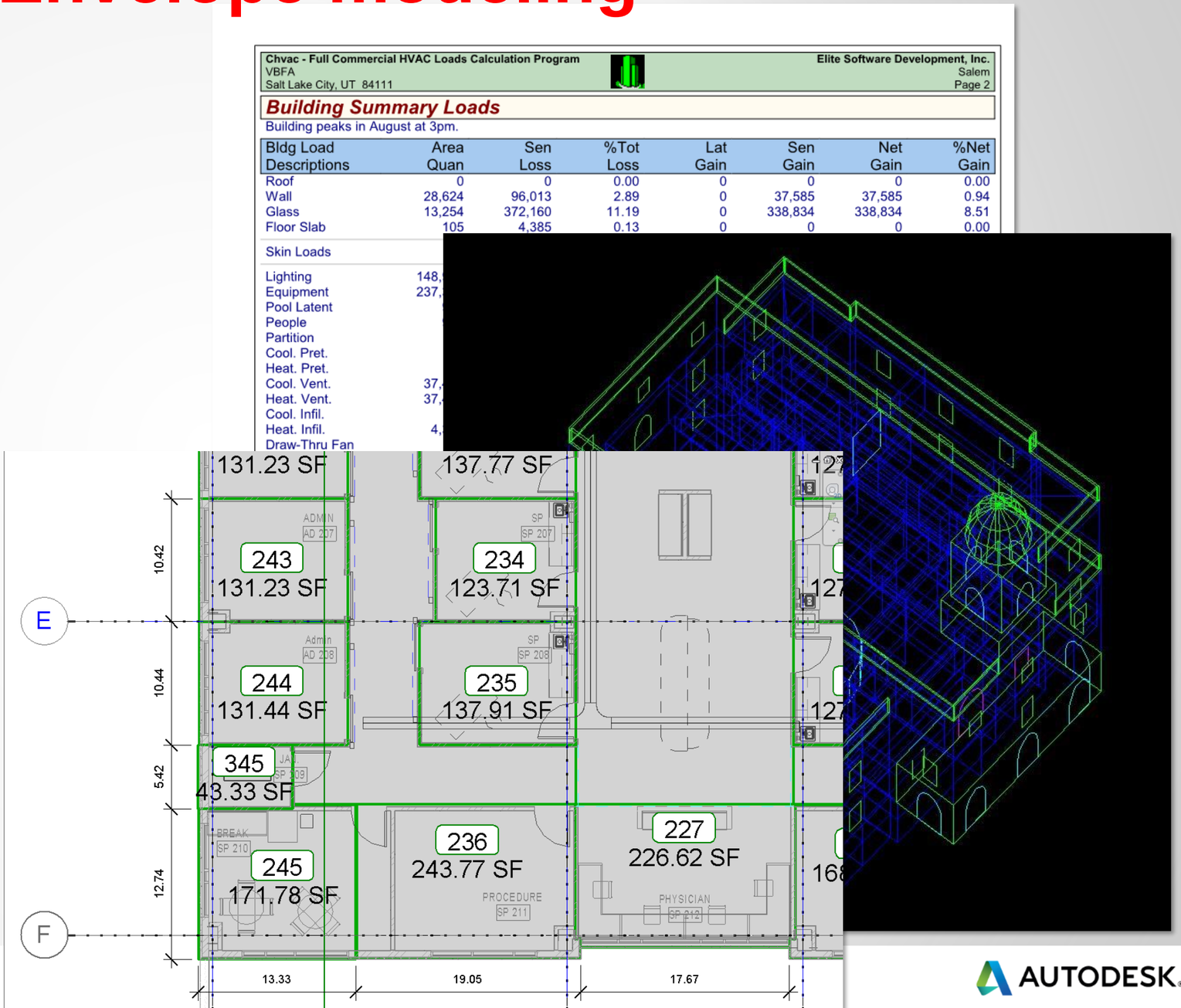
M/E/P/F software

M/E/P/F software: Steps

- Idea/modeling.
- Modeling/idea.
  - Idea or model first?
- Detail.

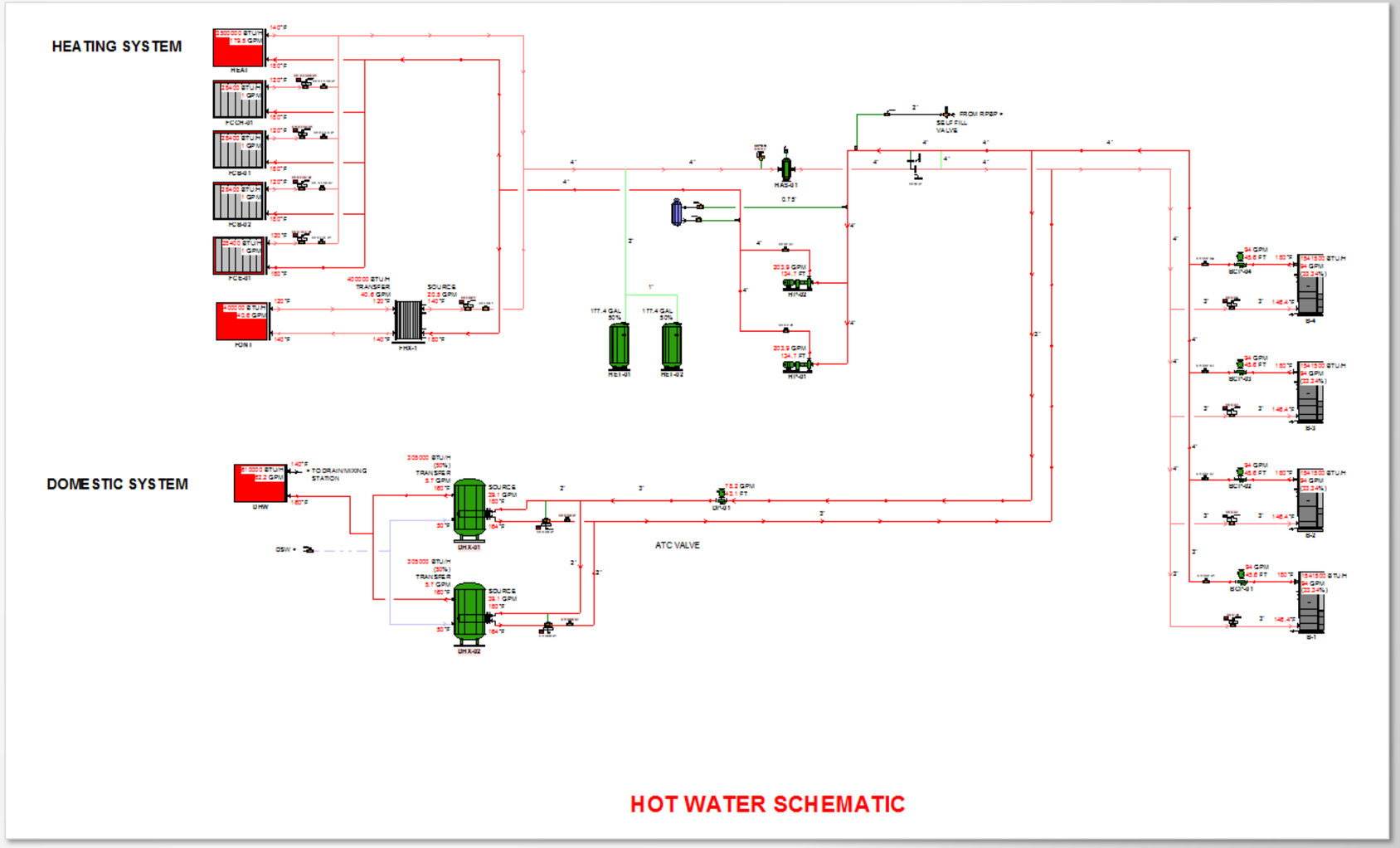
M/E/P/F software: 1. Envelope modeling

1. Automatic take-off (Revit).
2. Semi-automatic perimeter take-off.
3. Non-automatic hand take-off.



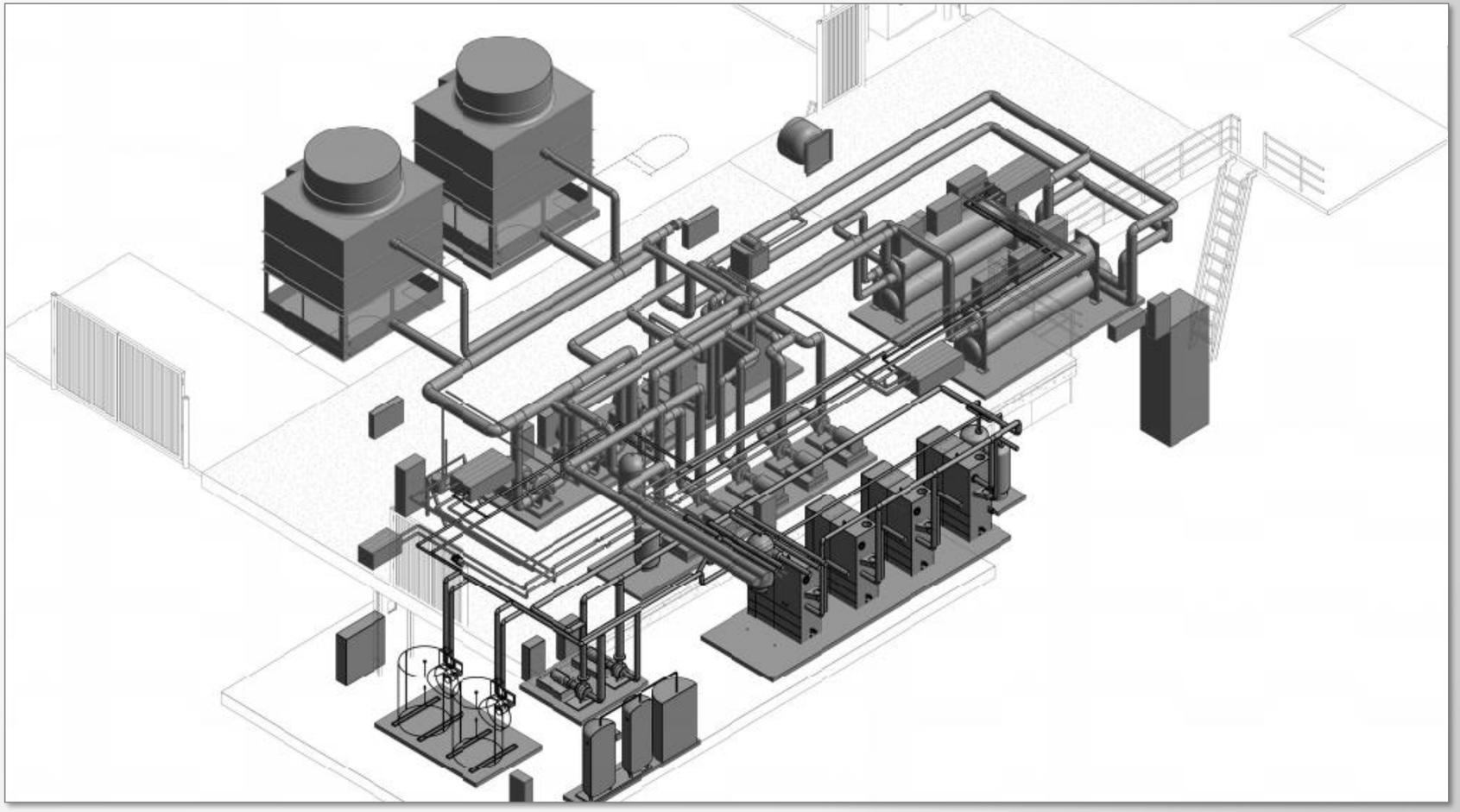
M/E/P/F software: 2. Systems modeling = schematics

- Idea modeling = schematic drawing.
  - 10% of project effort.
  - 40% of project cost.



M/E/P/F software: 3. Add detail = Revit

- Revit provides project detail.
  - 90% of project effort.
  - 60% of project cost.



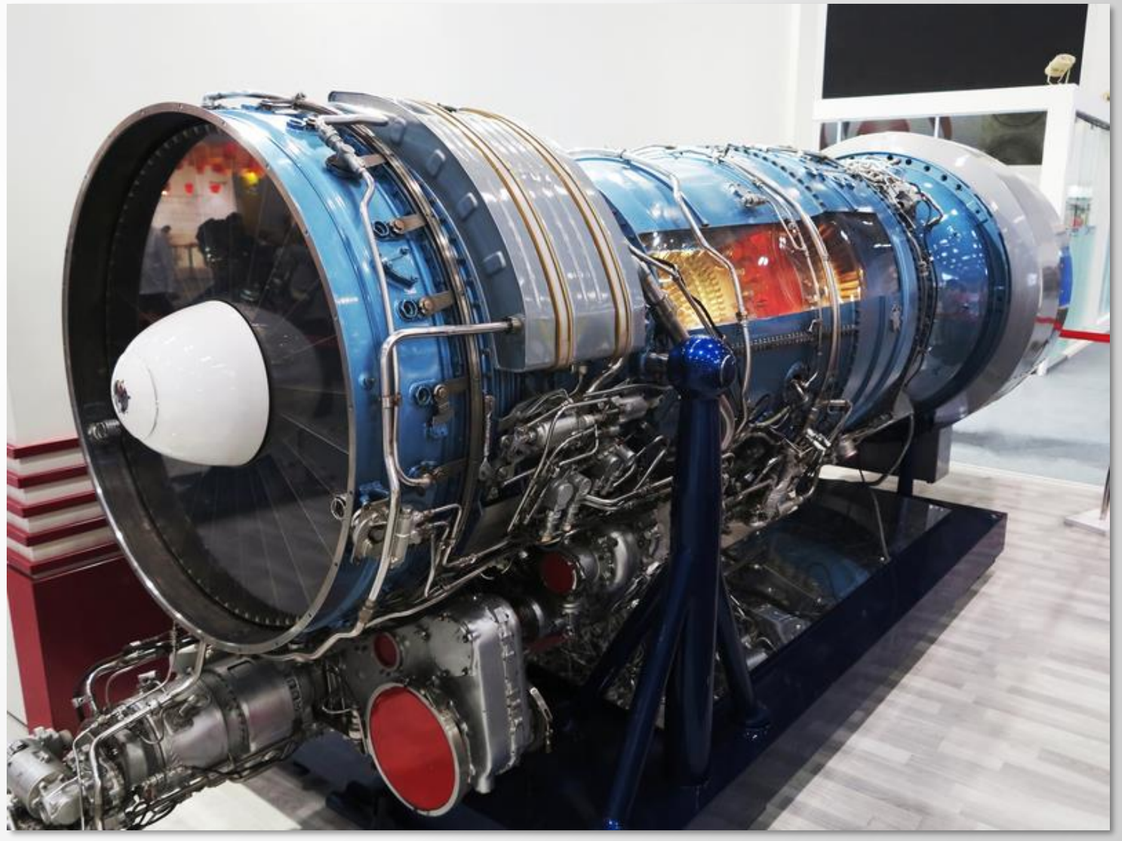
M/E/P/F software: Workflow process

1. Revit – envelope and element modeling, energy, loads.
2. Schematic software – concept design.
3. Schematic software – equipment selection.
4. Revit – schematic & equipment connection.
5. Revit – equipment and systems design.
6. Revit – final drawings.

Simple to complex

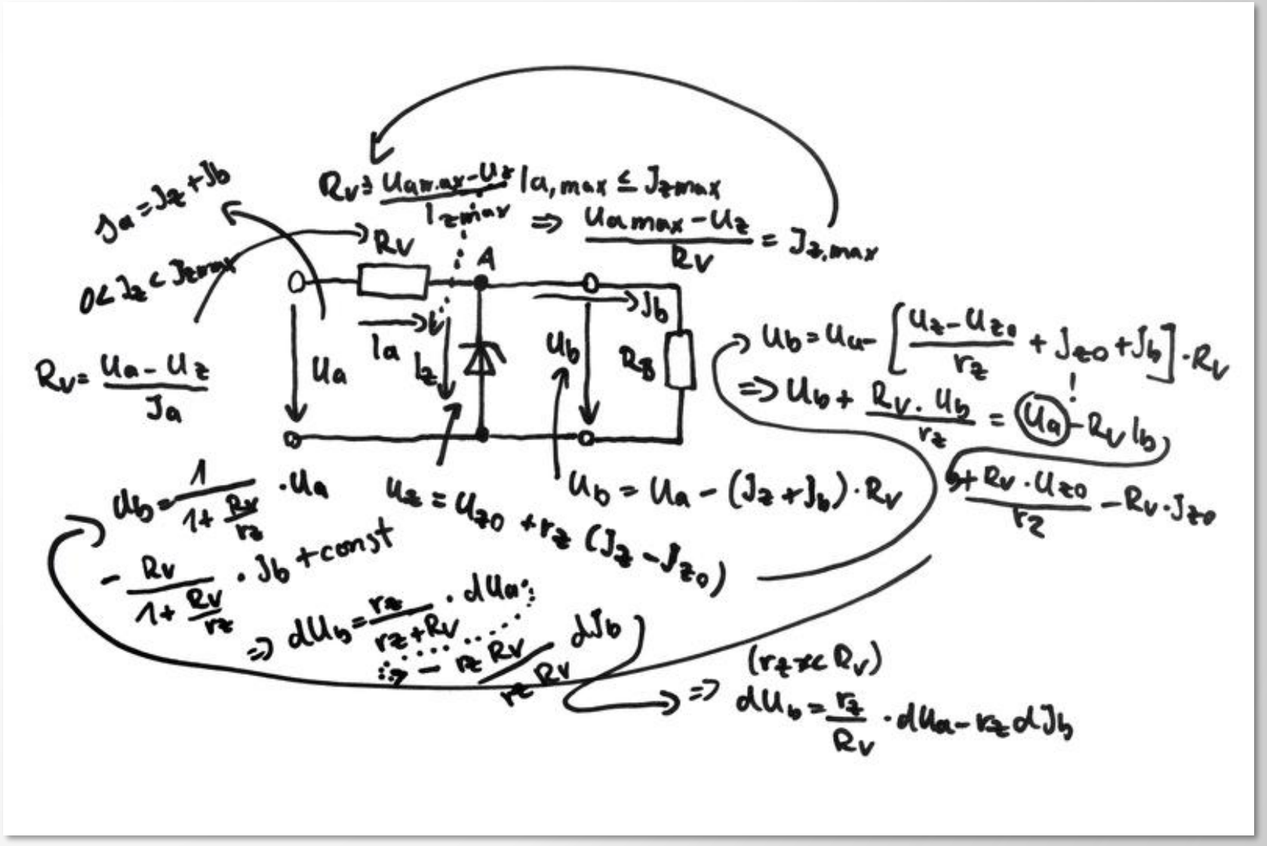
Simple to complex: Only simple stuff works

- Only simple stuff works:
  - “Jet engines are simple.”
- Ideas build on each other.
- Simple allows the complex to exist.



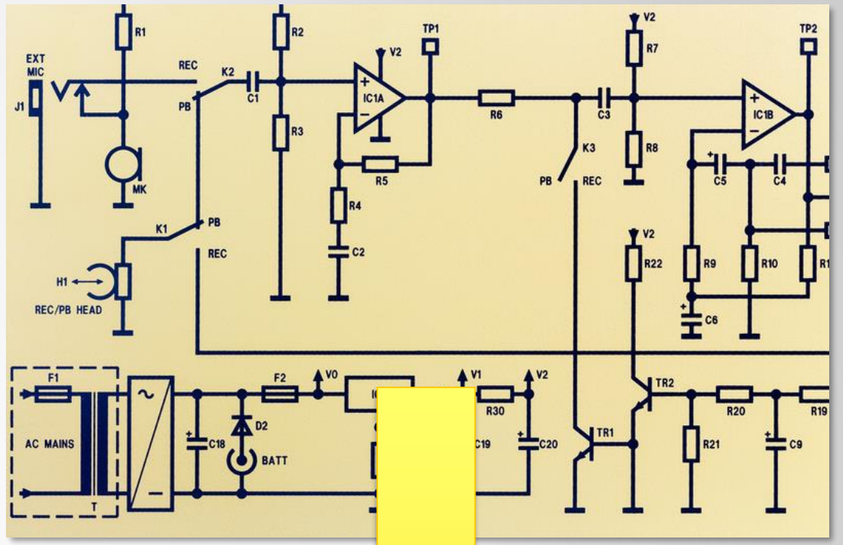
Simple to complex: What is complex?

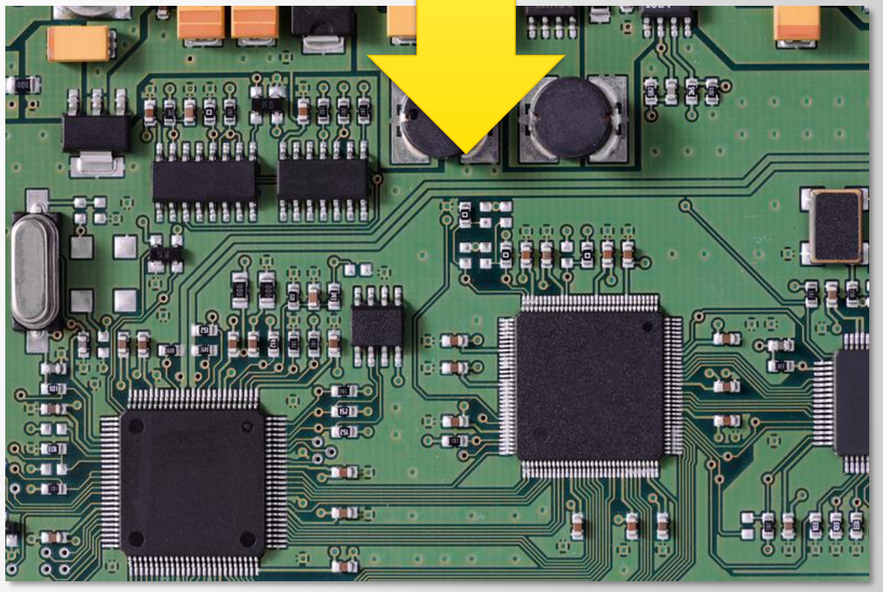
- Complex is:
  - Anything which requires discussion.
  - A load of stuff you can't keep in you head all at once.



Simple to complex: Move along

- A schematic is quick way to express complex ideas.
- Schematics allow the simple to move to the more complex.



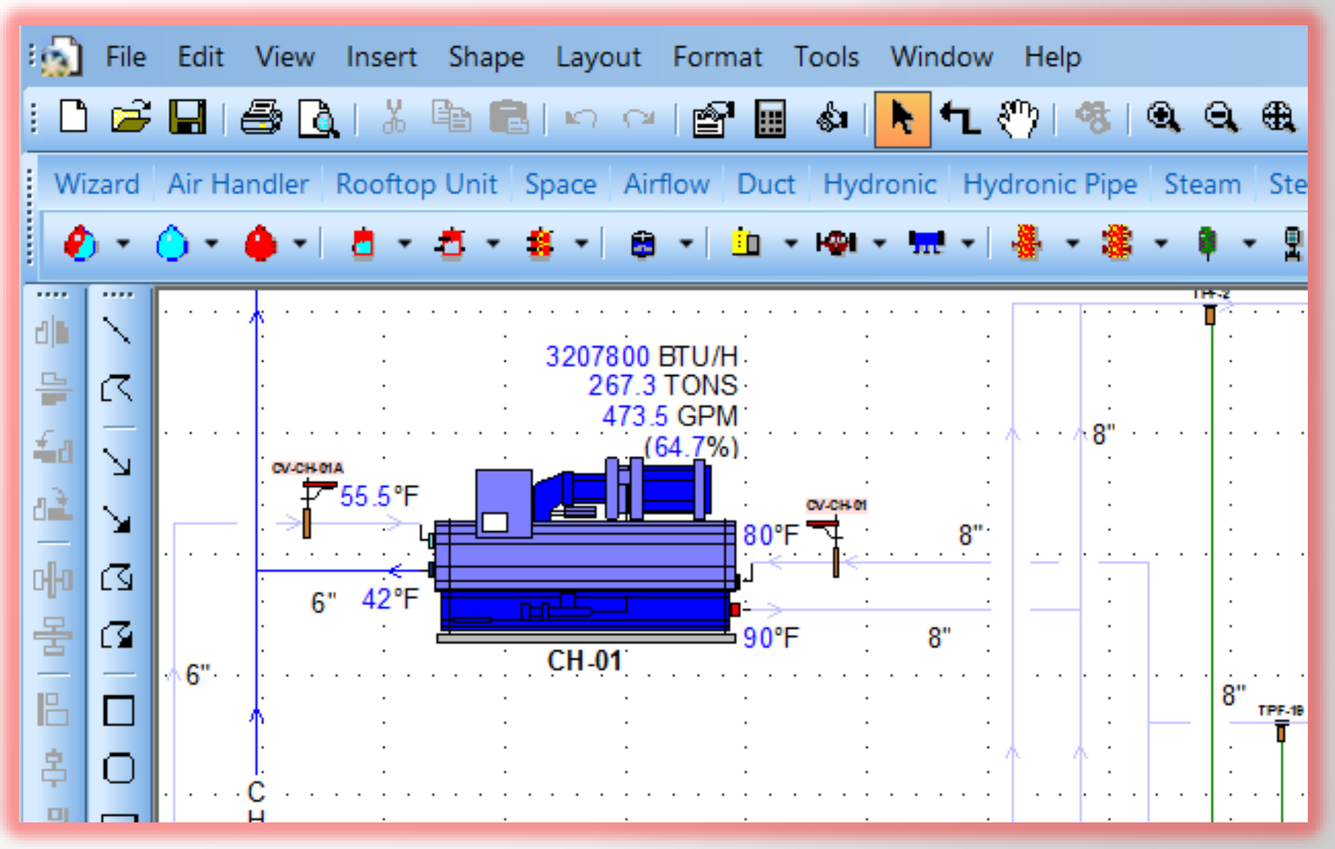


Simple to complex: Communication

- Schematics help with clear communication.
  - Quick.
  - Clear.

Simple to complex: Intelligent schematic software demonstration

- Steps:
  1. Build a schematic.
  2. Data is passed from component to component.
  3. Equipment is sized.
  4. Controls schematics are produced.
  5. Schematics and schedules are exported.



Efficiency

Efficiency: My product

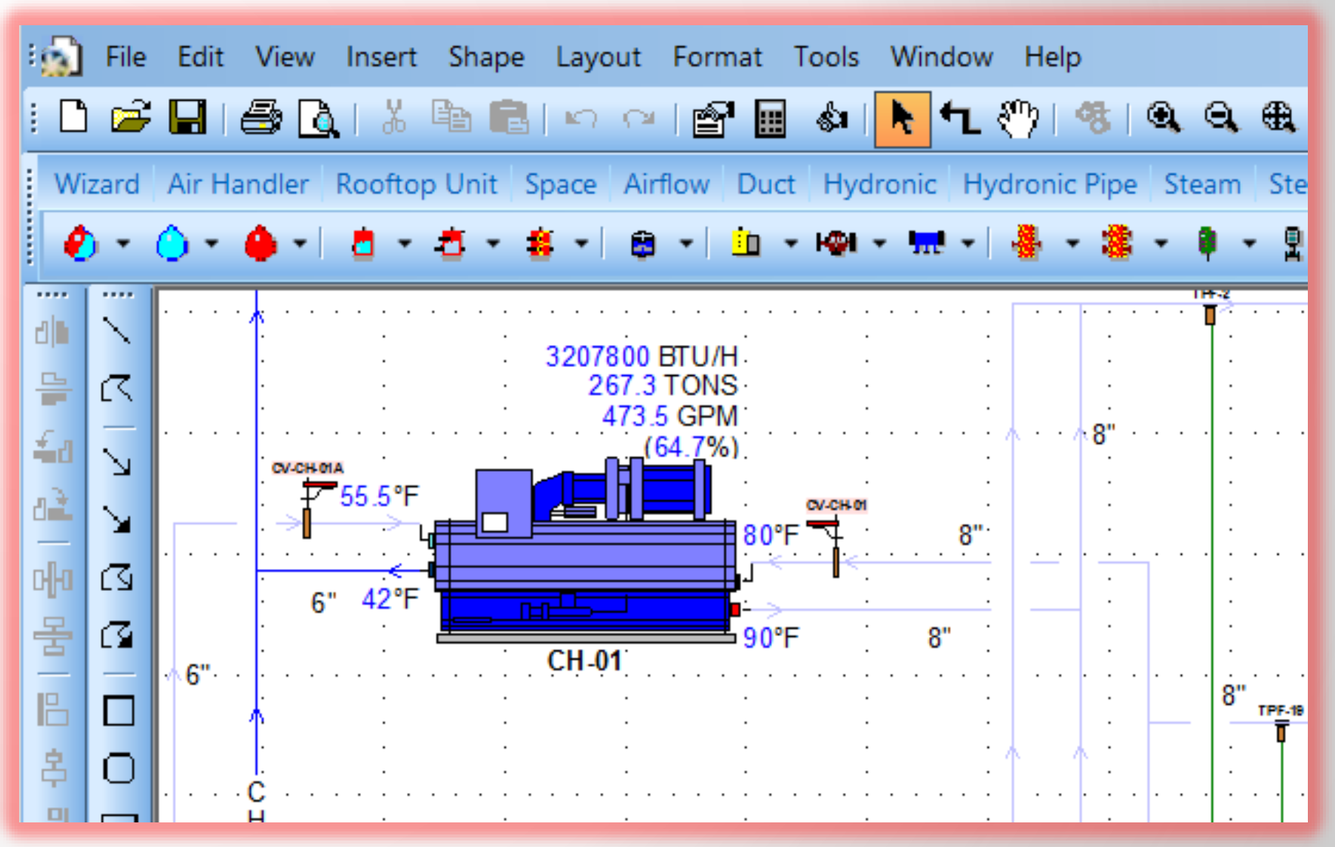
- I sell:
  - Time.
  - Ideas.

Efficiency: Smart?

- No real tangible product.
- I am paid to be smart.
  - I have to be better than my competition can lie.
  - Lack of planning by others does constitute an emergency for me.
  - There is no mercy when you are paid to be smart.

Efficiency: Demonstration

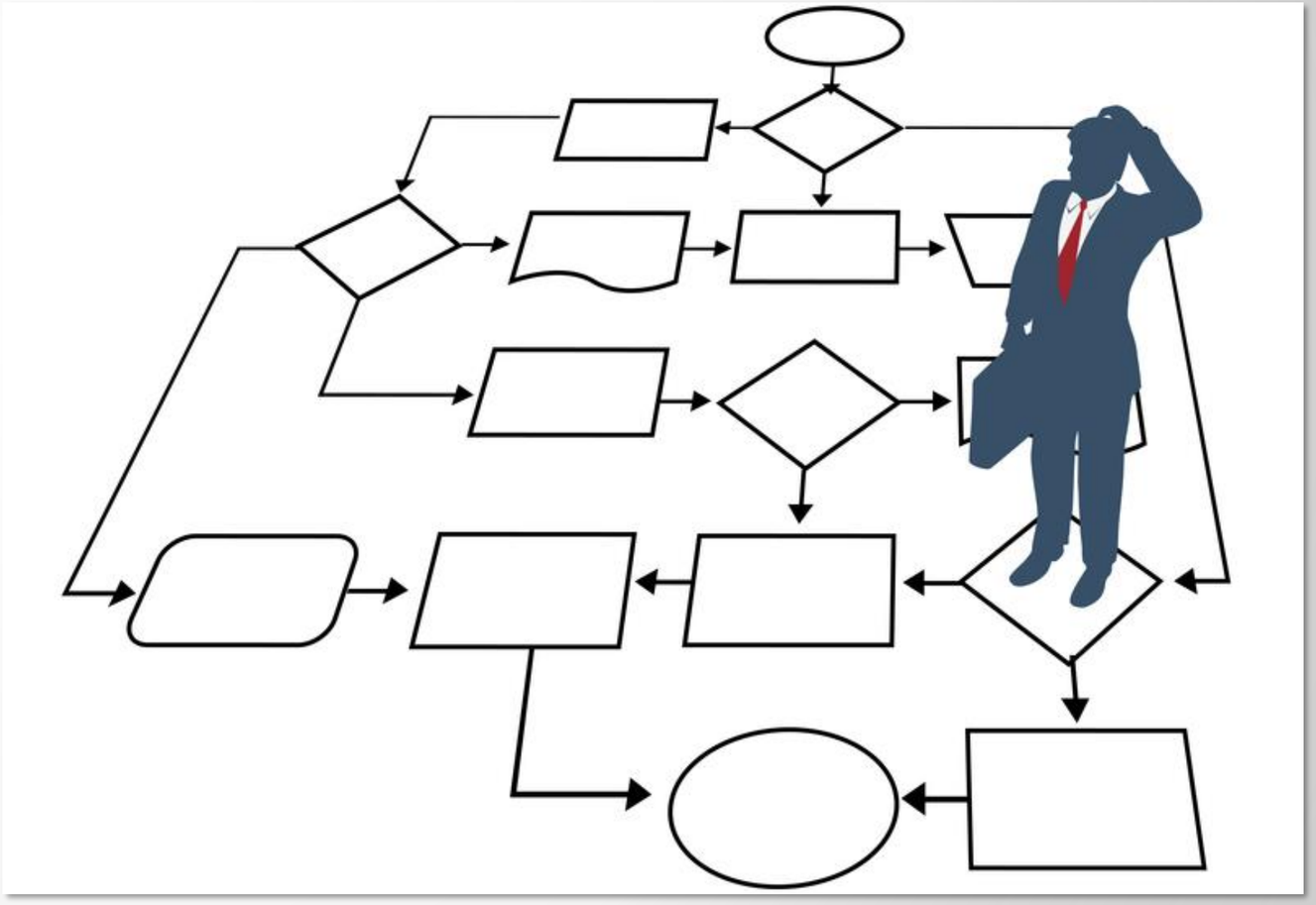
- Work smarter:
  - Workflow continuance.
    - Stop the “eye-wash” cycle.
  - Central data storage.
  - Fully formed ideas = inherent error checking.
  - Project repetition.
  - Clear communication of design intent.



Engineering process

Engineering: The process

- A need for a building.
- **Ideas sold.**
- **Ideas handed-off.**
- **Ideas detailed.**
- Construction.



Engineering: Idea staff

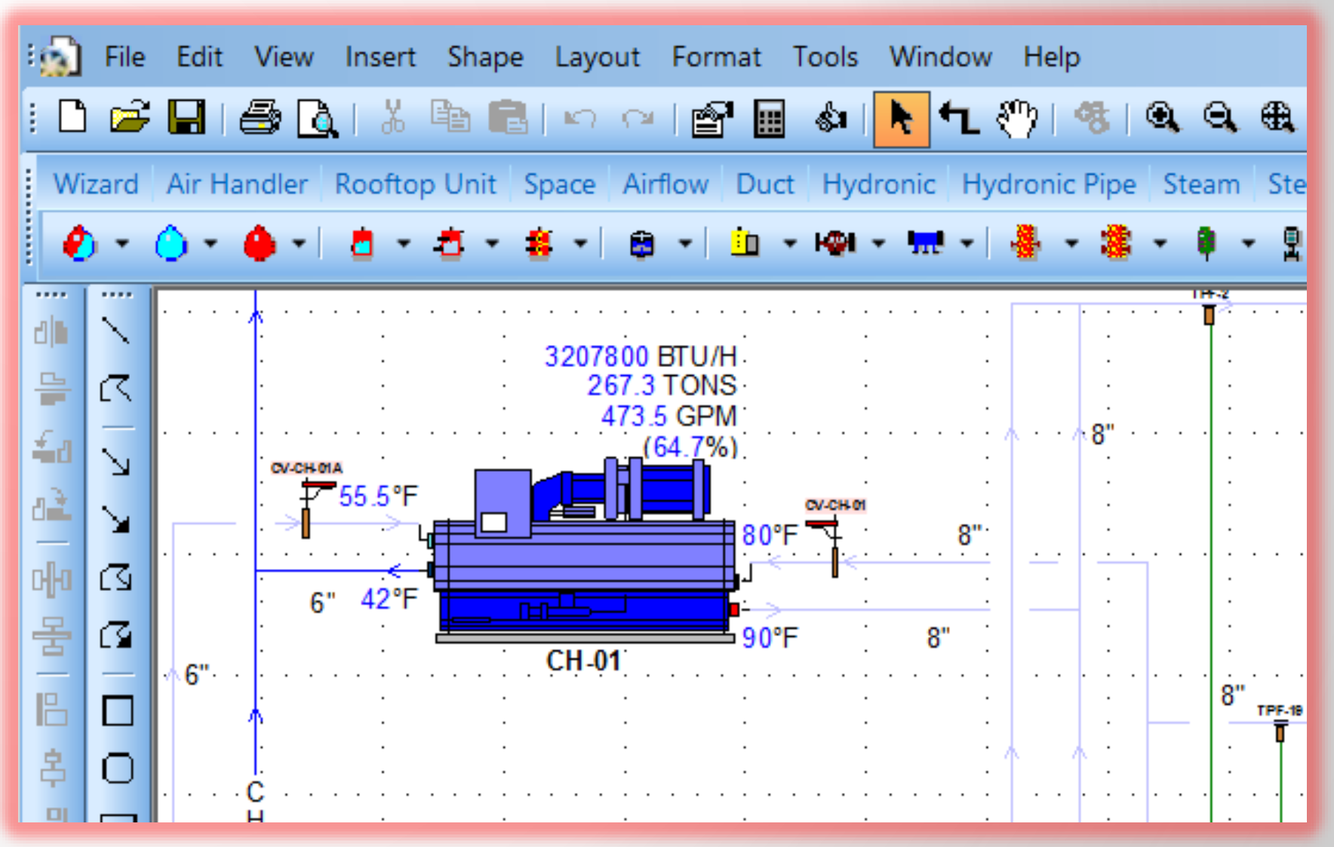
- Management:
  - Sells ideas.
  - Short attention.

Engineering: Management needs

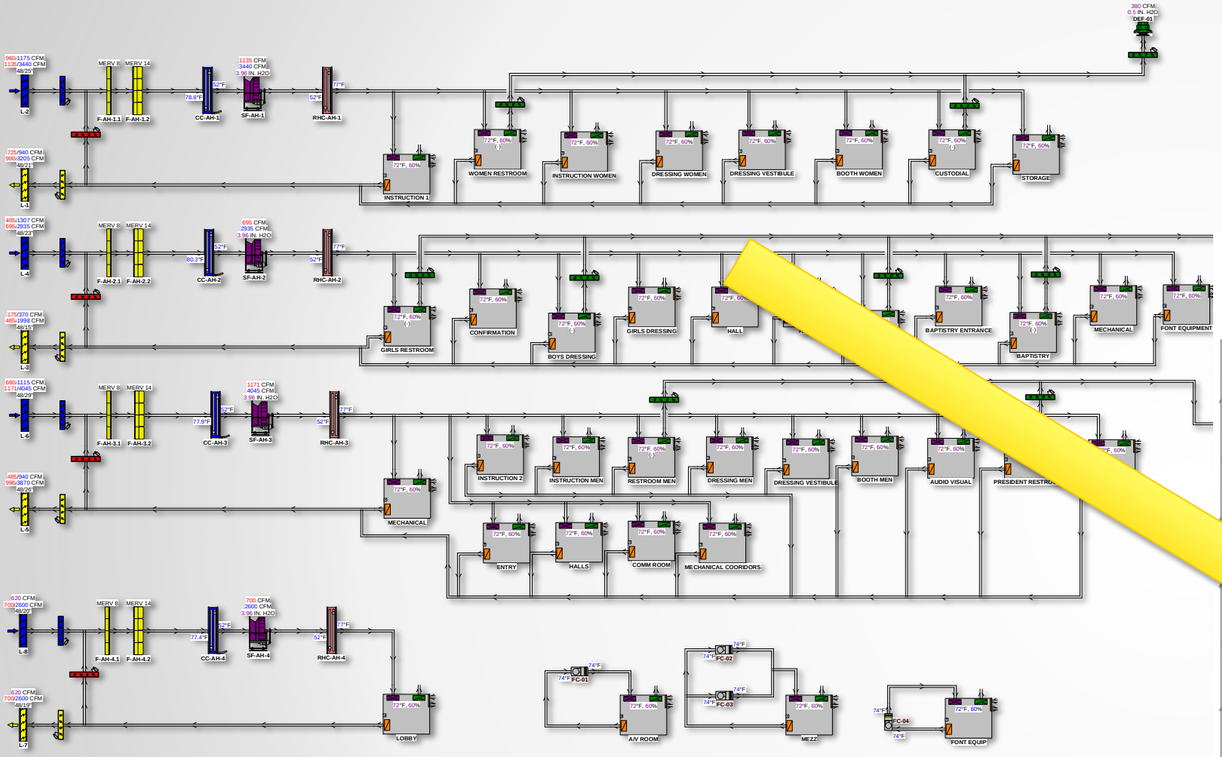
- Need to produce concept fast.
  - The first concept often sticks.
- Need intuitive tools.
  - Short attention.
- Need to clearly communicate design intent.
- Need efficiency gain.

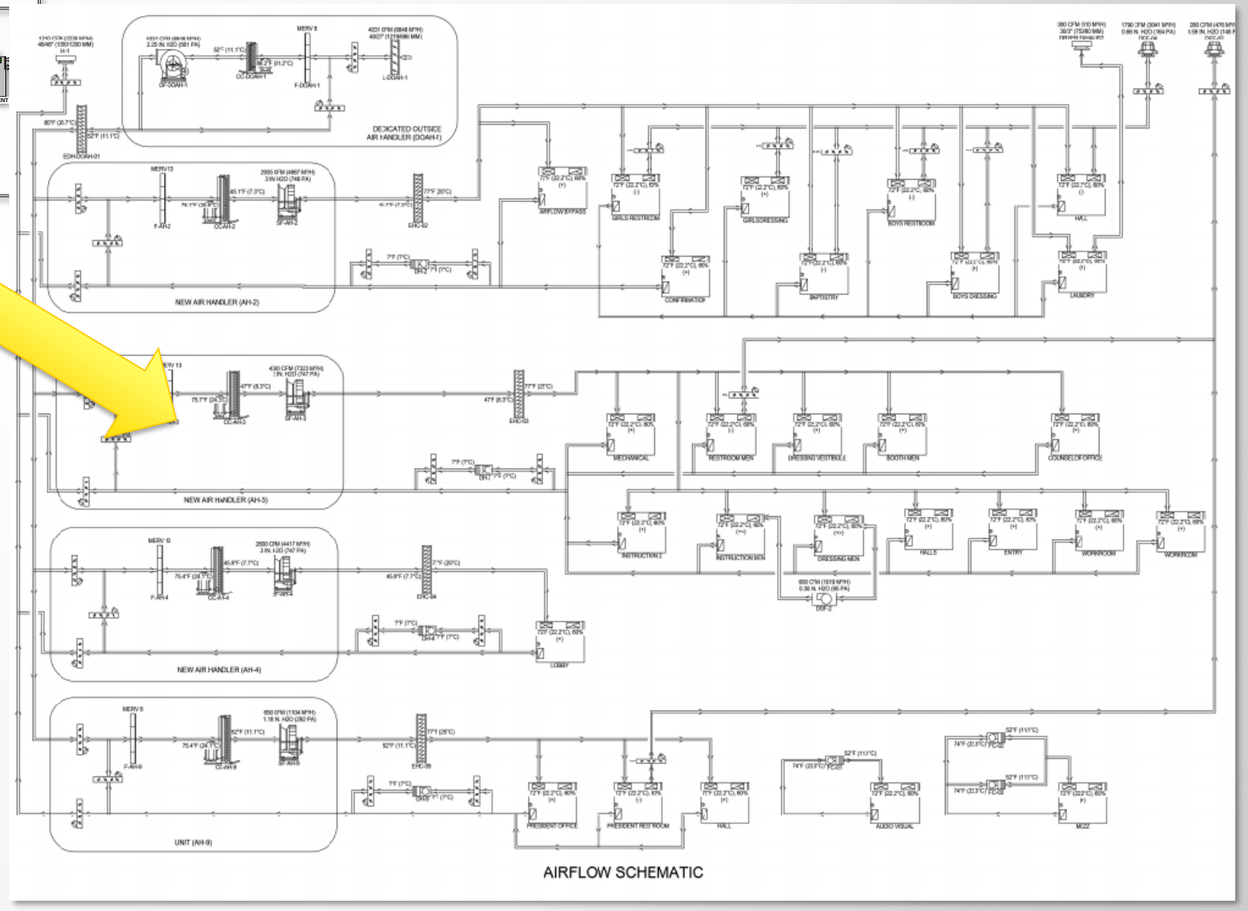
Engineering: Revit connection demonstration

- Schematic transfer:
  - Dxf link.
- Schedule transfer:
  - Dxf link.
  - Revit schedules.

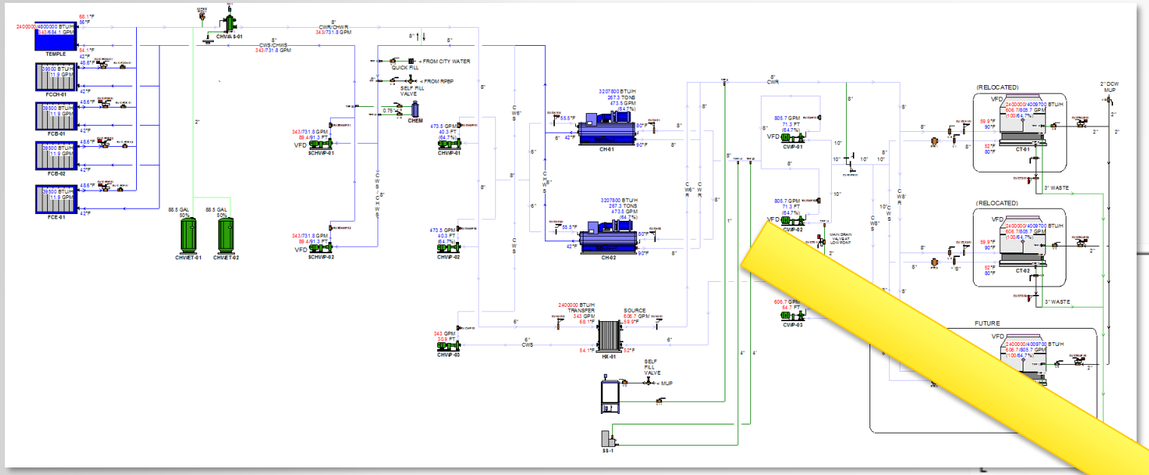


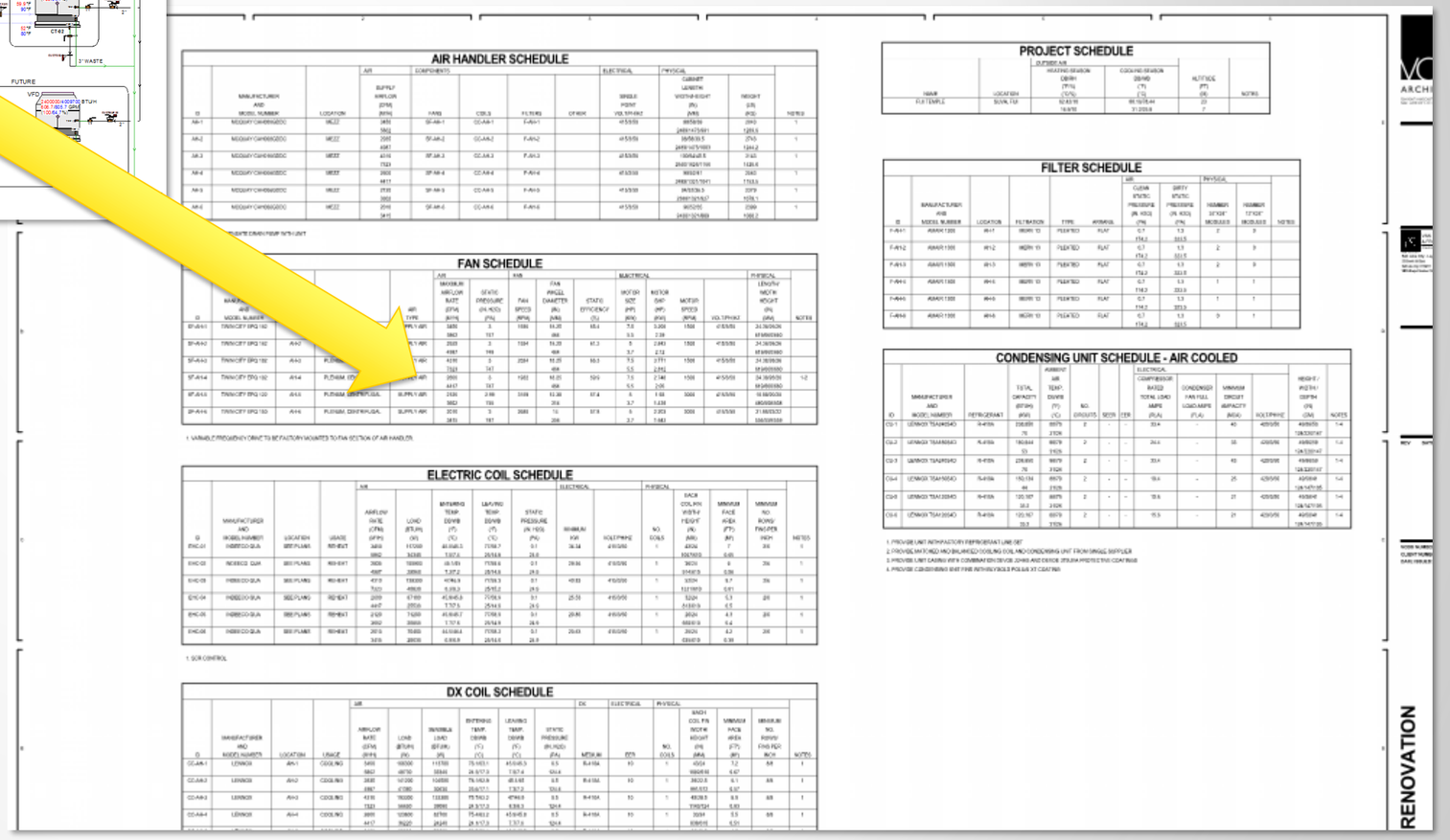
Egineering: Schematics and Revit in concert





Engineering: Schedules and Revit in concert





AIR HANDLER SCHEDULE

FAN SCHEDULE

ELECTRIC COIL SCHEDULE

DX COIL SCHEDULE

PROJECT SCHEDULE

FILTER SCHEDULE

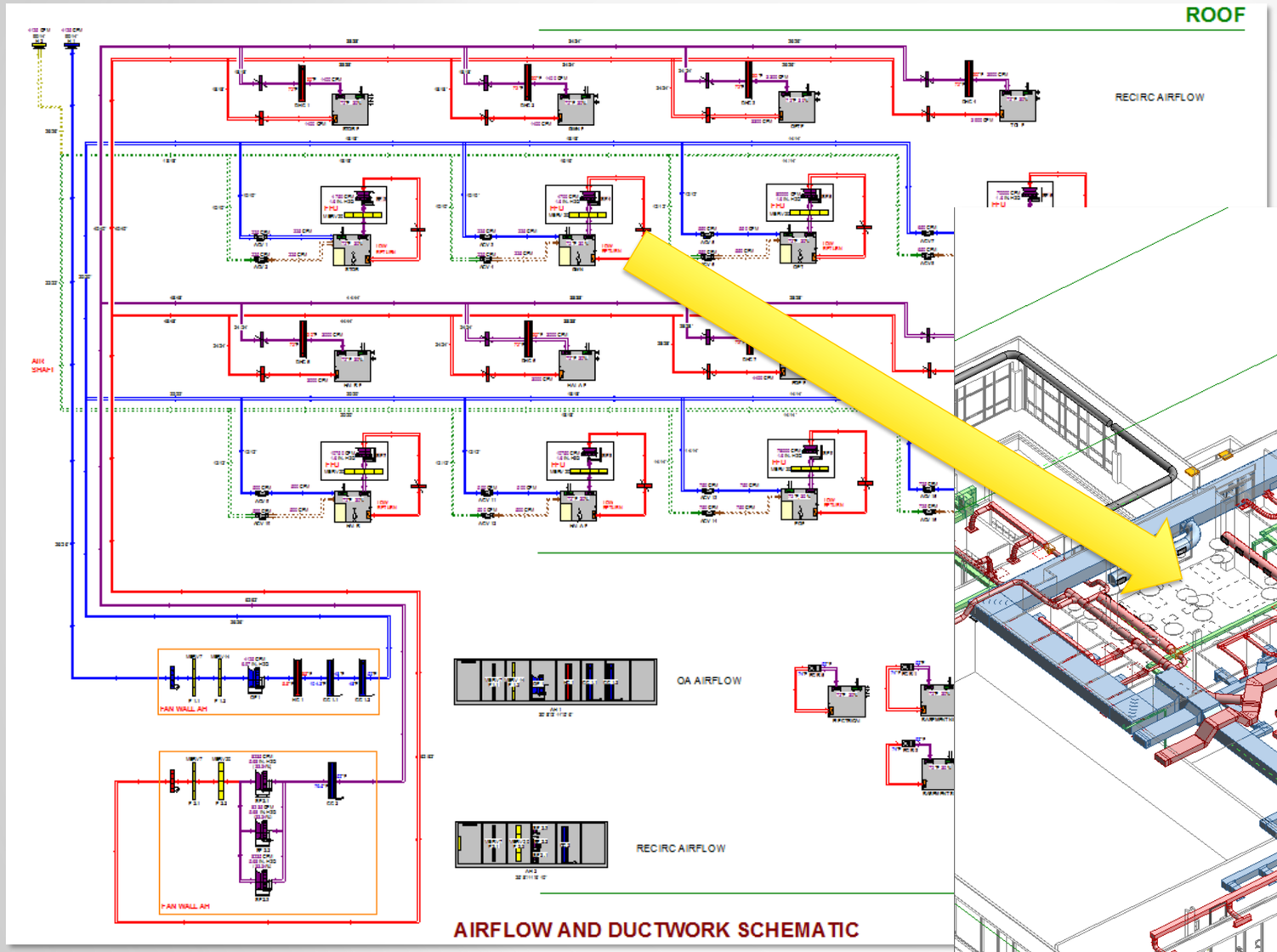
CONDENSING UNIT SCHEDULE - AIR COOLED

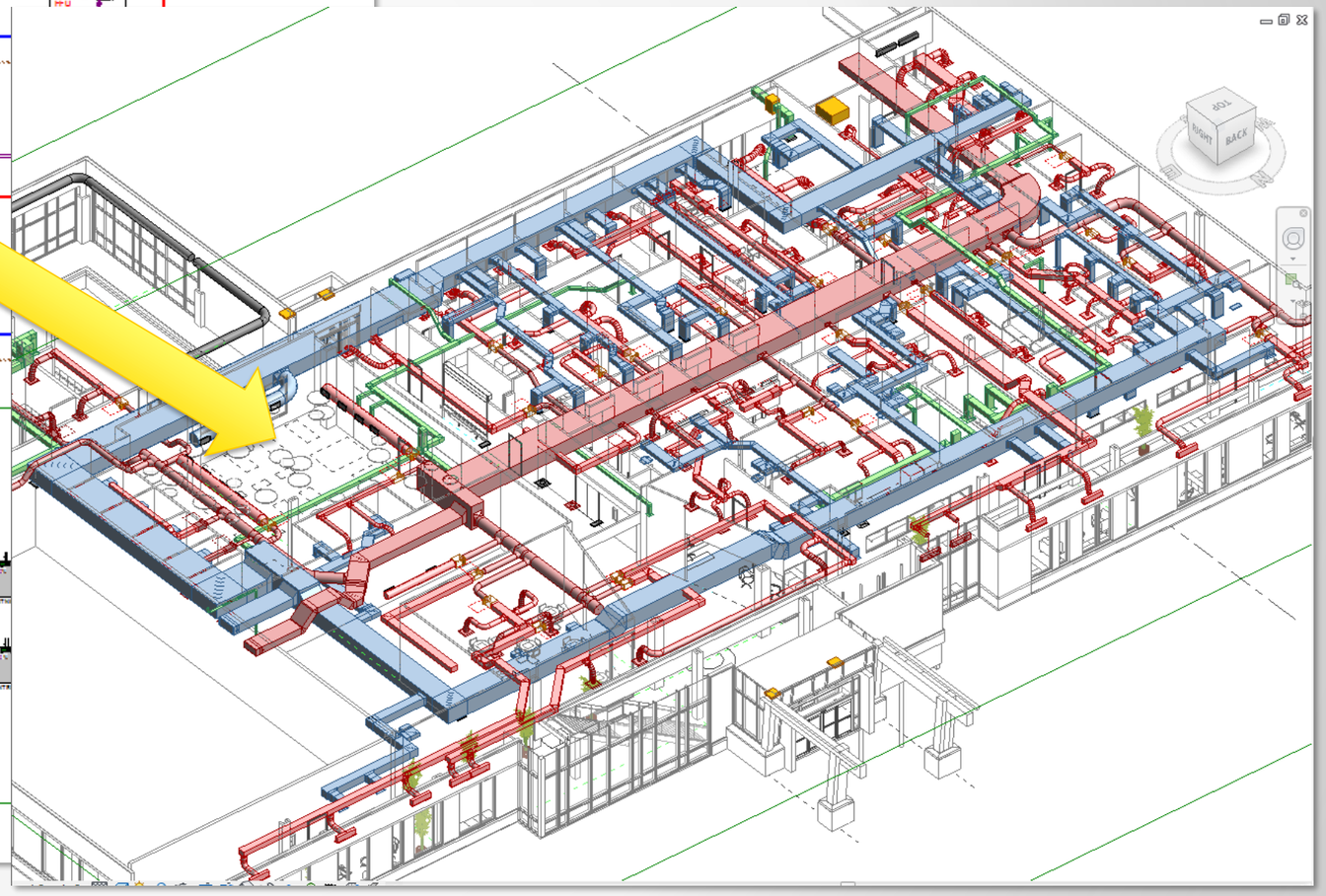
RENOVATION

Engineering: What do you need?

- What schematics are needed:
  - Hot water system.
  - Steam system.
  - Chilled water system.
  - Controls.
  - Plumbing.

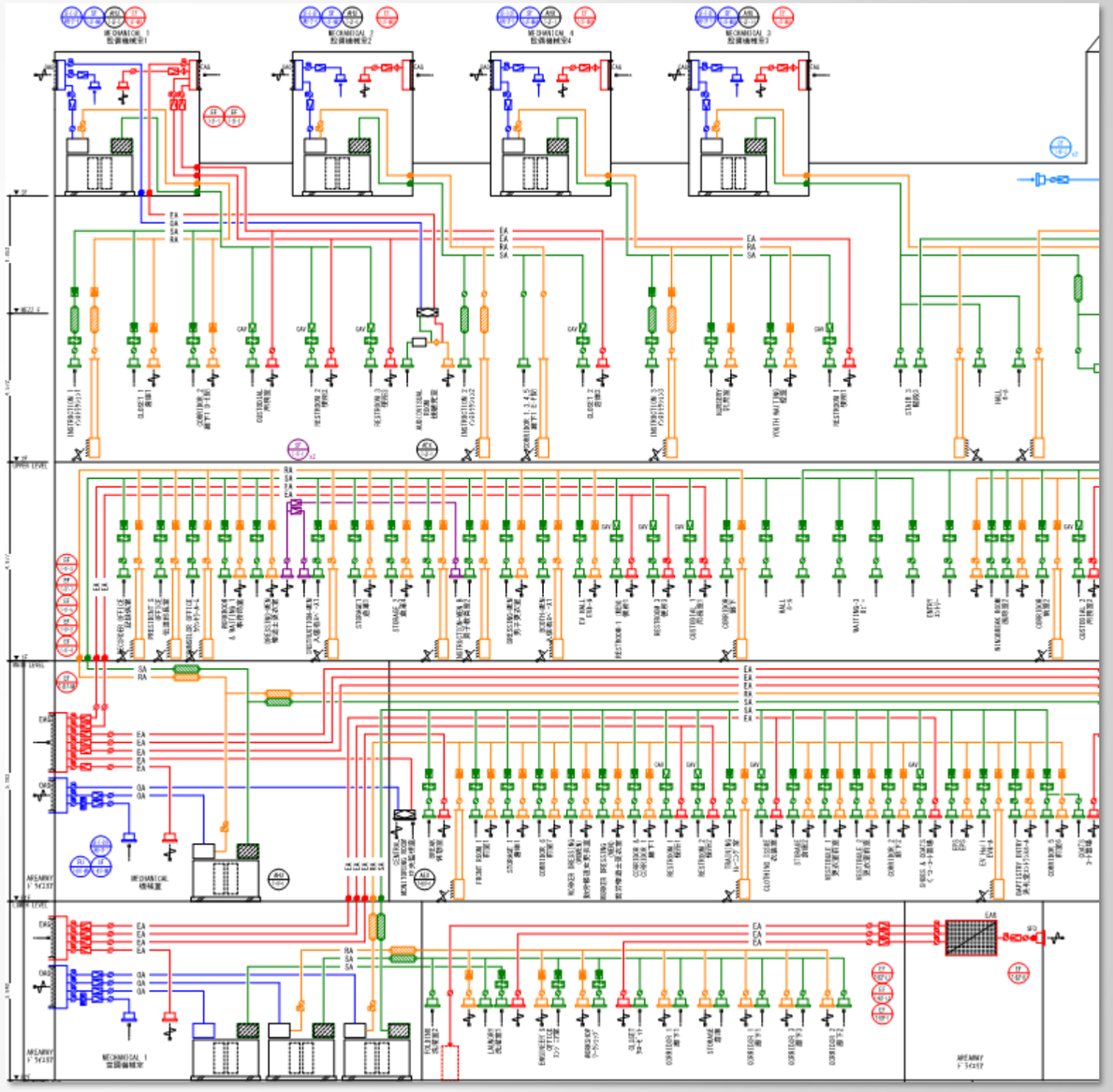
Engineering: Don’t forget the air





Engineering: Airflow schematics

- Most complex system
- Usually omitted in the US.
- More present outside the US.



Summary

Summary: Workflow process

1. Revit – envelope and element modeling, energy, loads.
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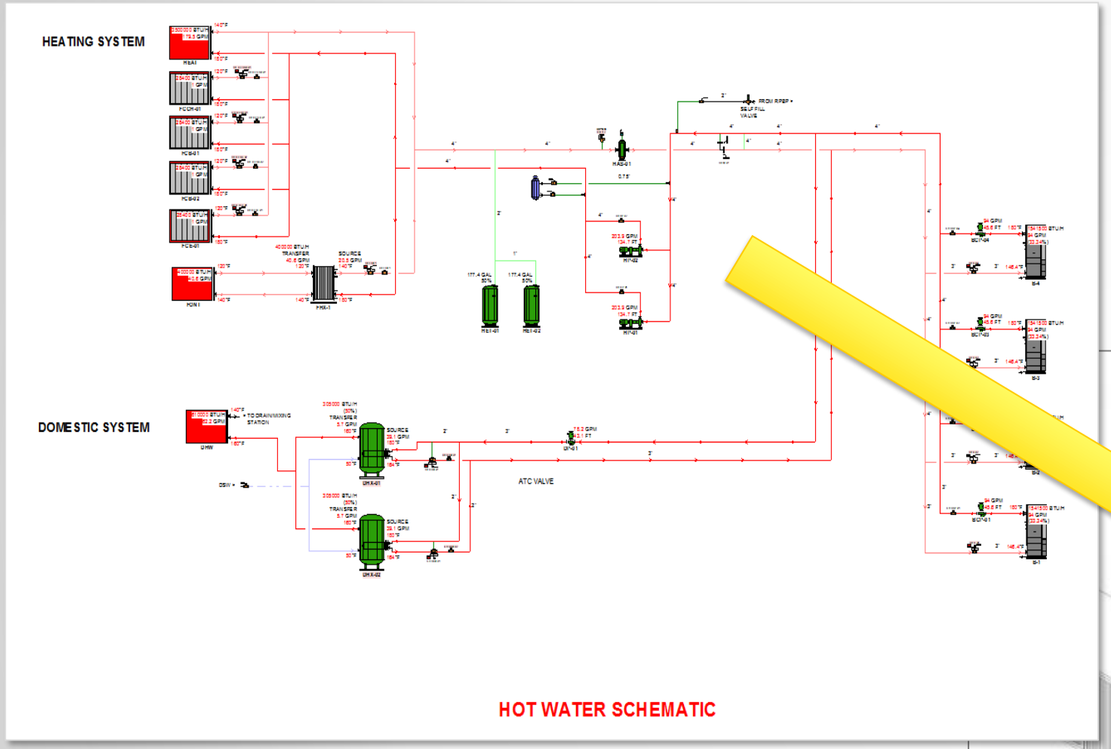
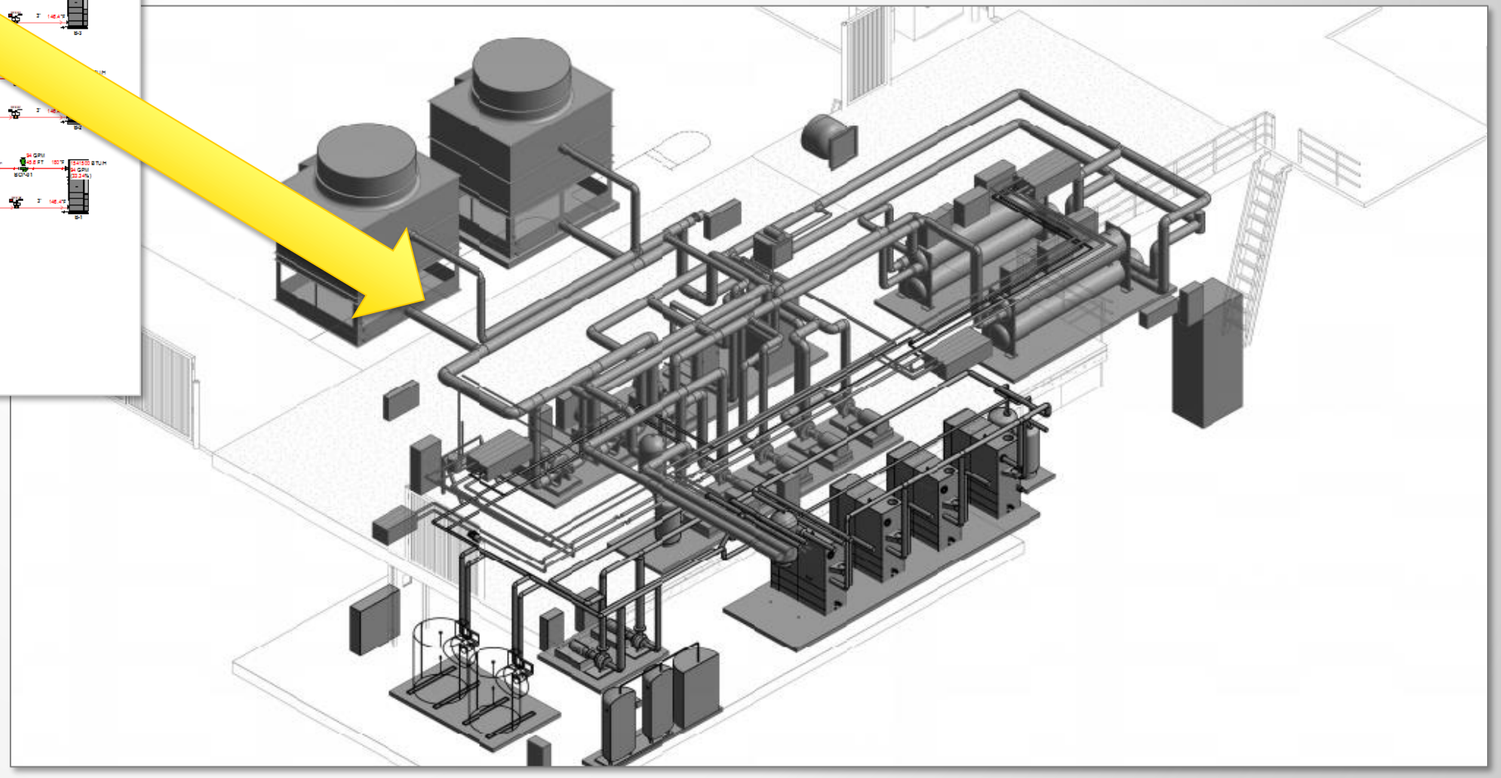
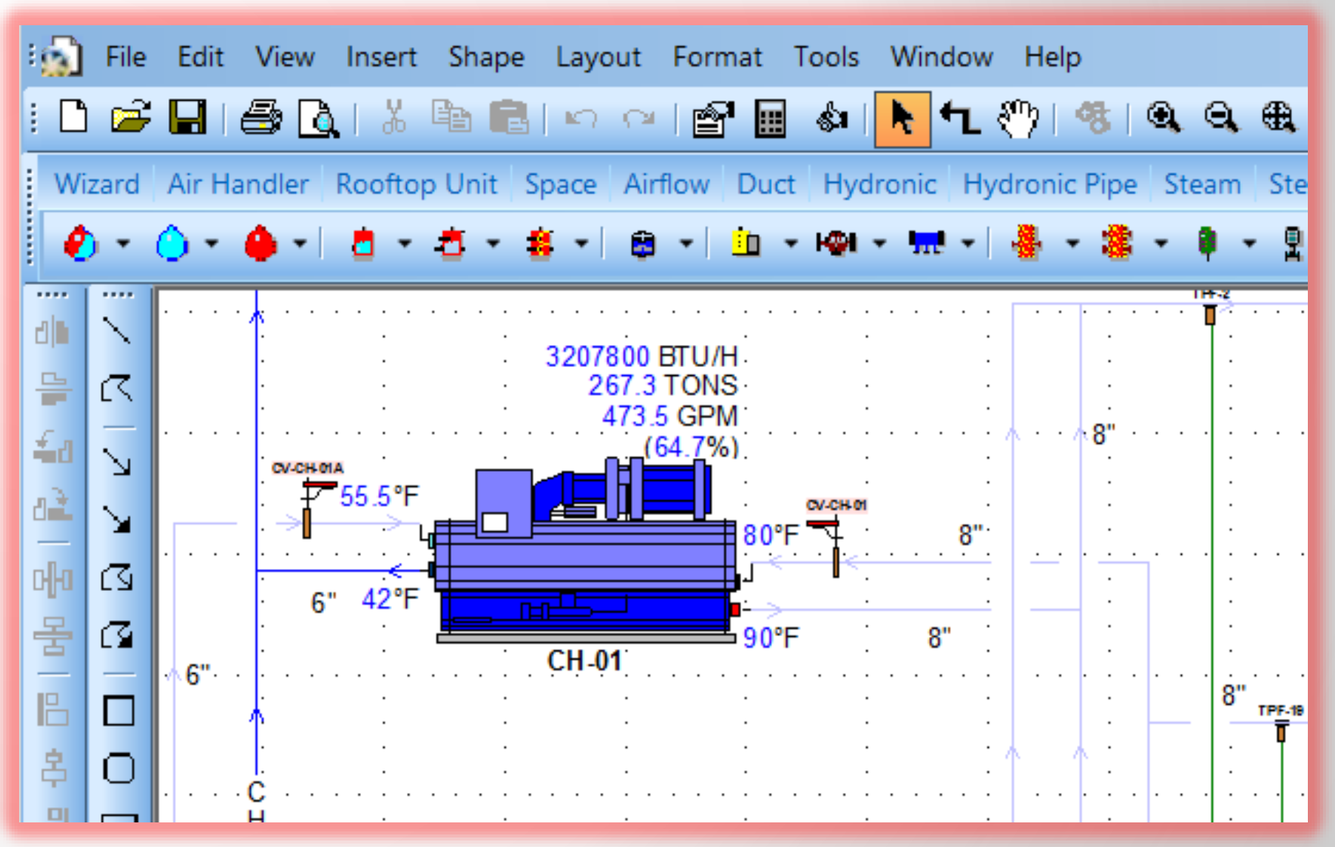
Summary: Simple to complex = schematic to Revit





Summary: Sample project



Session Feedback

- Via the Survey Stations, email or mobile device
- AU 2015 passes given out each day!
- Best to do it right after the session
- Instructors see results in real-time

Questions

***Students, educators,* and *schools* now have**

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