university of oregon – school of architecture and allied arts – department of architecture
Arch4/586 Advanced Architectural Design II – Cheng Thriving through Making Studio

Week 3: ENERGY SYSTEMS

April 11-15, 2016

I. REVIEW: In pairs, students will show and discuss the following with the instructor:

- Structural system
- Living Building Challenge – low hanging fruit
- Program clustering for energy savings
- Passive solar and natural ventilation strategies

II. Moving forward: Energy Systems

- Identify system to use
- Plan and diagram Active ECS: how does the building breathe?

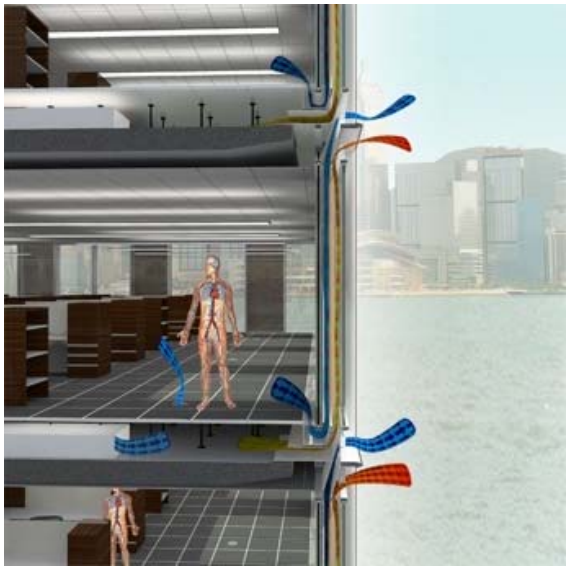
How can you verify your choices?
Energy Analysis, with massing and % glazing comparisons can be done with

- Revit or Formit 360 Pro via Green Building Studio
  http://www.autodesk.com/products/energy-analysis-revit/overview
  http://sustainabilityworkshop.autodesk.com/buildings/whole-building-energy-analysis
- Sefaira for Sketchup http://sefaira.com/sefaira-architecture
- DesignBuilder for Sketchup http://designbuilder.co.uk/
- IESVE http://iesve.com/
- Ecotect http://sustainabilityworkshop.autodesk.com/software/ecotect

Sun Shading can be done with Sketchup, Rhino, Heliotrope or Ladybug

Daylighting and Solar Radiation analysis for PV can be done with Ladybug/Honeybee and DIVA for GH, IESVE, Ecotect

Wind analysis to identify problems areas can be done with Autodesk FlowDesign (export as 3DS), , IESVE, Design Builder Engineer Pro



Airflow panels based on fishgills by Architectural Associates

REFERENCES:

- Jenny Lovell's Building Envelopes: An Integrated Approach – ONLINE *(up to date strategies, with clear diagrams)*
- Edward Allen & Joseph Iano's Architect's Studio Companion - ONLINE *(clear description of HVAC systems)*
- Kiel Moe's Thermally Active Systems in Architecture – ONLINE *(strong explanation of radiant systems w historic and contemporary examples)*
- G.Z. Brown's Natural Ventilation in Northwest buildings - TH7674 .N37 2004 (*Succinct summary of passive approaches)*

>> The pinup on Friday is a chance to show your progress on the systems above. At minimum, on a typical 1/8" section and a plan show the structural system, on another set show passive ventilation and daylighting, and a third one show active HVAC systems.