Case Study

→ Stack Modular / Bird Construction
→ Iqaliut Hotel & Conference center
→ Steel modular
Iqaliut

→ very far north
→ HDD (3x Ottawa)
Wrapped, ready for yard & trucking
Ship offloading
Toffino, BC... lifting
Close in ASAP to protect finishes
Note housewrap, furring

Not watertight
Your module has landed...now what
→ 6” exterior ci
Case Study

- Passive House residential housing, remote, very rainy climate
- Bella Bella British Columbia, CA
Design for modular and Passive House
Factory Assembly
Fully-adhered air-water barrier
Explicit design drawings for each phase with concern for water tightness & tolerances

- Fabrication
- Transport
- Construction
- Service
Joint Details!

2\" drain/Air Gap

Wrap Weather/air barrier over bottom
Structural Engineer to review dim

3/4\"x6 continuous plate
Wrap Weather/air barrier over plate

2 1/2\" (minimum) EPS insulation
fill all joints with foam

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fill all joints with foam

FACTORY

Scale: 3\"=1\"
The Details!

Dimensional tolerance

3/4 plywood continuous blocking

TOP AND BOTTOM: Double seal for installation and air seal

ON SITE

Scale: 6”=1’
Sticking to wet stuff is hard
1. Modular Construction (& Passive House) is a team sport.

2. Everything depends on great connection details: tolerances, sequences and control continuity (have a contingency plan)

3. Factory production lines move fast.

4. Mock-ups, In-factory and field air/water tightness testing, (i.e. QA/QC) are essential.

5. Protection against rain during yard storage, transportation, construction
Prefab

→ Prefab is a century long trend… slow + steady
→ Numerous practical challenges to get the benefits
→ Likely will see more
  → panelized enclosures
  → Modular buildings
  → Full wet room / kitchen modules / HVAC
Expect More Wood Prefabricated Panels and/or Modular Construction
The Future

- More demand for prefab
- More urban / remote modular
- More panelized systems of all types
New Ideas: Panelized ICF

→ Prefab hollow Insulated Concrete Forms
→ See more at [http://icfpanels.com/](http://icfpanels.com/)

Often precast floors
Rebar fabricated & factory installed
Easy to transport (note truck!)
Lighweight = small crane

Perhaps, one day, integrated exterior air-water barrier, cast-in place bucks, etc.
Case Study

- Net Zero, modular, wood-frame infill housing
- Oakland CA
- Zeta Homes  / DOE Building America
The lift
→ Almost 2 years of monitoring with occupancy
→ Performed at net positive level
→ Some PV removed!
Electrical Performance to Date

Malfunctioning HVAC
January-March 2010

DHW logging
lost 3 mos.

13 months: 7844 kWh produced / 6770 kWh consumed
Discussion + Questions

FOR FURTHER INFORMATION PLEASE VISIT
→ www.rdh.com
→ www.buildingsciencelabs.com

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RDH Building Engineering Ltd. and Building Science Consulting Inc. are merging. Effective November 1, 2015, we will operate as one integrated firm. The merger brings two of the leading building science firms in North America together to provide a combination of cutting-edge research with leading design and implementation capabilities. The result is a unique offering for our clients—an ability to explore new and innovative ideas based on science and our practical knowledge of what can be built. We are excited about the possibilities as we launch the new firm.