The House as a System

Building Toward the Step Code

This course will explain the concept of house as a system, while exploring industry resources to determine appropriate enclosure components and assemblies, mechanical components, and construction approaches that can be used to achieve house as a system best practices.

The House as a System Building Toward The Step Code Course Outline		
Part 9	**Step 1, 2, 3**	**Step 4, 5**
Design, construction & regulatory process	• Basic understanding of the BC Energy Step Code • Principles of performance-based codes • Schedules for testing and demonstration of compliance	**All lower step learning outcomes, and:** • improved integration of project team
Building science	• Understanding of the "envelope first" building approach • Impacts of building form and massing on energy performance	**All lower step learning, and:** • Application of building science to determine insulation, glazing and airtightness requirements • Reducing overall loads and simplified equipment
Energy modelling & metrics	• Modelling tool outputs and how to integrate them into the design process • Thermal energy demand intensity (TEDI), energy use intensity (EUI), mechanical energy intensity and power transfer limit (PTL) standards	**All lower step learning outcomes, and:** • Advanced modelling tools
Airtightness	• Design and construction of an airtight building envelope to achieve 3.5 ACH • Conducting blower door testing • Detection and control of air leakages and managing envelope penetrations	**All lower step learning outcomes, and:** • How to design and build an airtight envelope to achieve <1.5 ACH

Building envelope assemblies	• Elements of an effective building envelope • Envelope quality control and assurance	**All lower step learning outcomes, and:** • Minimizing thermal bridging • Advanced framing, alternative envelope solutions (SIPs, box truss walls, etc.)
Insulation (Building envelope & mechanical)	● Envelope insulation requirements (defined by model, climate zone, etc.) ● Temperature bearing systems required for insulation (heating and cooling)	**All lower step learning outcomes, and:** ● Thermal bridge-free design, consideration of slab edges, balconies, etc. ● Heavier and fatter walls, smaller windows, passive design, and shading
Windows, skylights & doors	● Role of fenestration in heat loss calculations ● Labels, standards, shading coefficients, and U-values	**All lower step learning outcomes, and:** ● Thermal bridge-free installation strategies ● Smaller and heavier windows, passive design, and shading
Supply chain	● Sourcing new/unfamiliar products and services required for compliance (energy model, blower door test, commissioning, etc.)	**All lower step learning outcomes, and:** ● New forms of procurement to assure accountability ● New forms of delivery methods that foster collaboration, use of digital tools and prefabrication ● New / certified products and materials, labels, and standards
Mechanical systems & equipment (heating, cooling, and ventilation)	● Metering, monitoring and controls ● Mechanical ventilation in homes, MURBs and ICIs ● Heat pumps, heat recovery/recycling, low temperature hydronic solutions, solar, etc. ● Commissioning	**All lower step learning, and:** ● Simple systems (design, layout, and equipment) to minimize run lengths ● Renewable energy solutions ● Whole building commissioning, M&V ● Basic building science and the importance of air barrier integrity
Electrical systems & equipment	● Ventilation equipment, lighting, appliances, electric HVAC equipment (fans, pumps, etc.) ● Metering / submetering, monitoring and controls ● Building commissioning	**All lower step learning, and:** ● Renewable energy solutions ● Whole building commissioning, M&V ● Basic building science and the importance of air barrier integrity

16 Points (16 hour) CPD training for Licensed Builders

Where - Prestige Harbourfront Resort Salmon

When - Tue Mar 29, 2022 & Wed Mar 30, 2022

Time - Tue 8:00 AM - 5:00 PM - Wed 8:00 AM - 5:00 PM

Price includes
Morning coffee
2 coffee breaks each day
Lunch both days
300 page manual

Price $959.00 (cost for 2 participants from same company $1335.00)

16 Points (16 hour) CPD training for Licensed Builders

Where - Prestige Hotel Vernon

When - Tue April 5, 2022 & Wed April 6, 2022

Time - Tue 8:00 AM - 5:00 PM - Wed 8:00 AM - 5:00 PM

Price includes
Morning coffee
2 coffee breaks each day
Lunch both days
300 page manual

Price $959.00 (cost for 2 participants from same company $1335.00)

Examining the step code for dwellings, aimed at reducing the energy consumption and greenhouse gases produced by houses.

- Evaluate recent local weather changes in summer and winter, exploring how local life styles affect a house as a system
- Explore the selection of newly available durable building components, assemblies, and construction approaches in the diverse local climate and market for British Columbia.
- Review five key design and construction criteria of cost efficiency, constructability, air-tightness, moisture durability,

  and sustainability in selecting an appropriate enclosure assembly with house as a system in mind.
- Explore benefits of an exterior-insulated assembly compared to an interior-insulated assembly in terms of house as a system
- Examine ventilation, indoor air and heating, building technology installations, and the adjustments with commissioning of building technology.

Evaluate window products based on key characteristics including energy, durability, and design options.

- Review methods to mitigate the potential impacts of solar heat gain on occupant comfort, including a basic understanding of the solar heat gain coefficient,
- low-e coatings, window operability, and influence of mechanical systems.

Evaluate enclosure elements and construction practices for achieving airtightness and those intended for vapour control.

- Examine pipe lead-trough's and their installation, flue ducts, and electrical installation lead-trough's.

- Review typical ranges of assembly R-values associated with wood- frame, below-grade concrete and wood-frame roof assemblies in terms of house as a system.

- Determine house as a system principles to guide the evolution of the design and construction of building enclosures with
  increased R- value in the "envelope first" approach, accounting for local climate and diverse building types and occupancies.

Evaluate Cost Benefit Analysis Tool (CBAT) updates and review how to use computer program.