

Session Descriptions—Tuesday, February 26

Asbestos – Yes, It’s Still Around. Harborside 204

Our interactive display involves establishing a bedroom cut-away 12 feet wide and 6 feet deep within which we will show several locations and applications where asbestos can be found in residential remodeling and reconstruction. There are several developments that may significantly affect the residential and commercial construction industries. We will provide an overview of the applicability to residential situations.

Bob Rogalla and Nate Cox, Lake States Environmental, Ltd.

Houses That Work for Existing Homes: Remodeling for Energy Efficiency—Part 1: The Basics. Harborside 204

In this segment, participants learn how each change in existing homes over the years impacts other parts of a home and affects overall performance. These effects are very important as more and more houses will undergo significant energy efficiency improvements. This segment outlines the basic building science physics of air, heat and moisture flow that everyone involved in remodeling needs to know to avoid risks and take advantage of opportunities presented by energy-efficient remodeling projects.

Gord Cooke, EEBA

Advancements In Solar Electric Design and Equipment Harborside 302

This session continues the review of the current state of development of solar electric design and the equipment changes that affect it. Each year the solar field evolves rapidly and with the changes comes additional design challenges. Understanding the best designs and what advantages each design brings to your clients keeps you in the game with the fast moving solar world. Keeping you up-to-date is the essence of this session so you can participate in this growing sector of the electrical design and construction field. Join us for an exciting time updating your knowledge base.

Christopher LaForge, Great Northern Solar

Houses That Work for Existing Homes: Remodeling for Energy Efficiency—Part 2: Common Remodel Projects & Opportunities for Energy Efficiency Upgrades. Harborside 204

In this segment, building science principles will be applied to the most common remodel projects that houses of various ages undergo. Specific remodel projects will be covered, and the instructor will outline the building science principles that apply and the important elements needed to ensure the project enhances safety, durability, health, comfort and efficiency of the home. Performance measures will be identified that can be applied to each project to ensure success, and the instructor will help identify technologies, products and strategies that are most appropriate for each remodel project and how they can be integrated into the process.

Gord Cooke, EEBA

Renewable Energy (RE) Systems and the National Electrical Code (NEC)—Critical Changes in 2019. Harborside 302

The changes in the NEC for renewable energy and energy storage systems in 2019 require important and dramatic changes in RE system design. These changes will affect PV and other renewable energy systems design and require significant adjustments to how we approach systems. This session will review the changes for 2019 and present options for making designs compliant with these unusual developments in the 2017 code. Understanding these changes will be vital for all contractors and designers in the renewable energy and energy storage field. In addition to the NEC update by Christopher LaForge, a brief summary of the new Minnesota Interconnection Standards will be presented by David Shaffer and Laura Hannah. Time will be allotted for questions.

Christopher LaForge, Great Northern Solar; David Shaffer, MnSEIA; Laura Hannah, Fresh

Introduction to Solar Energy. Harborside 302

This session will introduce solar technologies with a concentration on solar electric (photovoltaics). We will introduce the basics of various solar technologies and applications, the policies that are encouraging growth in the solar industry, and programs from around the region that are incentivizing deployment. Complementary technologies such as storage will be introduced, while current events affecting markets will also be explored.

Paul Helstrom, Minnesota Power

What is Green Building? (And Why Should I Care?) French River

“Natural,” “eco-friendly,” “environmentally sustainable,” “green.” What do these terms have in common? Do any of these terms actually define a way to build better? This session looks at the concept of “green building,” past and present, and offers some perspective on what might truly constitute green building and why it matters. Critical thinking figures prominently in this introduction to the theory and practice of ecological design and building practice in the residential sector.

Rachel Wagner, through design

Ventilation: Best Practices for Tight Houses in Cold Climates Harborside 304

The formula is very simple: high-performance (comfortable, efficient, durable, resilient, and healthy) homes are all about air management. First, the building enclosure must be airtight to control the unwanted movement of energy, moisture, and pollutants. Second, you must have a thoughtfully designed and properly installed mechanical system to take care of the air inside the home. This session focuses on the second part of the formula, including how much, when, and where you need to circulate, condition, filter, replace, and make up the air in your homes. A heavy emphasis will be placed on best practices for very airtight buildings.

Patrick Huelman, University of Minnesota

Afton Passive House, An ICF Super Efficient Home: A Case Study French River

This is a case study of an ICF passive house designed to meet Passive House Institute US (PHIUS) certification. The owners, architect, and builder will present their experiences. Discussion will include: why ICF was selected; how WUFI software predicted meeting PHIUS certification; material selection, how commercial construction techniques reduce moisture penetration in concrete; how geofoam affected WUFI; rain screen design; use of air to glycol heat pump technology; issues with HRVs/ERVs; indoor air quality issues. The owners will reflect on their experience with the house to date. The panel will take questions from the audience near the end of the session.

Barb and Michael Morehead, homeowners; Jay Roettger, Bluff City Builders Inc.; Samuel Bontrager, Building Foundry

Whole House, Balanced Ventilation: Providing Healthy, Comfortable and Energy Efficient Solutions. Harborside 304

As building codes require more airtight building envelopes, balanced ventilation with heat recovery and thoughtful solutions to its seamless integration in our buildings become a priority. HRV/ERVs not only take the place of bathroom exhaust fans, they also provide fresh, filtered air to bedrooms and living spaces, promoting better sleep, better cognitive functioning and better IAQ. The higher their efficiency, the less your heating and cooling systems must work to maintain comfort. Architect and passionate building science nerd John Rockwell will de-mystify how HRVs and ERVs work, and how they are an essential component of any high performance building.

John Rockwell, Zehnder America

Session Descriptions—Tuesday, February 26

Houses That Work for Existing Homes: Remodeling for Energy Efficiency—Part 3: Common Remodel Projects Continued & Avoiding Pitfalls & Unintended Consequences. Harborside 204

The discussion of energy upgrades for specific remodeling projects will continue in this segment. Participants will also review the important risks to avoid when remodeling that could compromise health, safety or durability of buildings. This segment will also highlight “house as a system” issues that lead to unintended consequences.

Gord Cooke, EEBA

The Many Scales of Solar Electricity and Energy Storage—301 Harborside 302

Energy storage was the holy grail of renewable energy for decades. Storage is here now and here to stay. Its use will change business, utilities and energy systems greatly. With the advent of many new players in the field, the ability to build storage into a wide range of electrical systems and retrofit existing systems becomes the design challenge. This session will review the current state of the technology and available equipment and show how introducing storage into systems creates a wide range of profit and advantage to buildings, along with a new level of resiliency to our systems.

Christopher LaForge, Great Northern Solar

Houses That Work for Existing Homes: Remodeling for Energy Efficiency—Part 4: Evaluating Energy Efficiency Opportunities & the Economics of Energy Efficiency Upgrades Harborside 204

This segment will outline the three major technologies that can be used to meet the heating, cooling and ventilation comfort expectations of homebuyers in high performance homes. The session will also identify high efficiency hot water heating technologies that are now available to the industry.

Gord Cooke, EEBA

Electric Cars are coming! What Should Real Estate Owners and Building Industry Professionals Know About Charging? Harborside 302

There are over a million plug-in vehicles (PEVs) driving on U.S. roads every day and, according to the latest survey from AAA, one in five Americans say they are likely to buy an electric car for their next new vehicle. Owners will charge their PEVs mainly at home, but PEV charging infrastructure will also be needed in other locations like workplaces. New areas of interest are corridor charging that enables long trips with EVs and destination charging that hotels, parks and other destinations can offer to attract more customers and visitors.

Jukka Kukkonen, PlugInConnect

Zero Energy Ready Home: Are You On Board? Why or Why Not? French River

By now you’ve likely heard of the DOE’s Zero Energy Ready Home build standard. Have you considered building to meet the standard? Have you looked at the dollars and cents of making it work? Do your customers understand what it means and what it costs, and how they will save money? What do you see as the advantages, as a builder? The roadblocks?

Brian Wimmer, Rochester Area Habitat for Humanity

Designing with Heat Pumps in Cold Climates Harborside 304

For decades people have been hesitant to trust air-source heat pumps in cold climates, based on lessons learned from 1980s technology and dismal installation practices. With a current focus on low-load homes/buildings and increasing interest in strategic electrification to meet carbon reduction goals, heat pumps can be a powerful tool that delivers in both categories. This half-day session will focus on design and application of cold climate heat pumps to maximize comfort, efficiency and value to the customer and the environment, focusing both on proactive approaches and pitfalls to avoid. Bring your questions and experiences.

Bruce Harley, Bruce Harley Energy Consulting
(This is a double session that runs until 4:30 pm)

Resilient Adaptation of Sustainable Buildings. French River

There is an emerging need for research into the design and construction of communities and buildings that are not only sustainable, but also resilient in responding to dynamic situations. To test the resilience potential of buildings, this research project examined the response of sustainable building prototypes during infrastructure disruptions that disconnected the buildings from grid power, water connections, and vehicle transport for 10 days. The outcomes explore the intersections of resilient and sustainable development through regenerative design. This study also identifies future research opportunities to incorporate resilience into sustainability and energy efficiency guidelines, such as Minnesota’s sustainable building program.

Richard Graves and Liz Kutschke, University of Minnesota, Center For Sustainable Building Research

7:00–8:15 am

8:30–10:00 am

10:30–12:00 pm

1:00–2:30 pm

3:00–4:30 pm

Practical Methods of Conducting Lead-Safe Remodeling, Repair and Painting Activities. Harborside 204

The Minnesota Department of Health is actively developing its own rules that will apply to these activities and affect those contractors that are involved with renovating buildings constructed before 1978. Also, many contractors may still be developing proficiency in their compliance methods since special considerations are only required in structures built prior to 1978. If such situations are not a contractor's regular type of activity, many have not had an opportunity to explore or develop strategies that are efficient ways in time, equipment and materials to conduct their project in a lead-safe manner.

Bob Rogalla, Grant Grassle and Nate Cox, Lake States Environmental, Ltd.

Recommended Window Installation in High Performance Walls French River

The hands-on demonstration will feature a mock-up wall with a rough opening and weather resistive barrier. Various high-performance wall types will be compared and contrasted to

a standard detail. Recommendations for sealants and flashing products will be discussed. Recommended procedures to cut the weather resistive barrier (WRB) and apply sill pan flash will be demonstrated. The five types of flashings will be introduced, including an explanation of their importance to water management. Current general installation guidelines will be followed.

Erick Filby and Eric Klein, Marvin Windows and Doors

State of MN—Energy Code HVAC Review: Findings from the Field Harborside 304

This session will discuss how the energy codes affect overall design, installation and operation of equipment. Findings on HVAC, comfort, and moisture service calls will be explored. This is geared more toward builders, but would be great for both HVAC and inspection groups.

Mike Wilson, Dakota Supply Group

Advanced Houses That Work—Part 1: Advanced Building Science Harborside 204

This segment will cover the physics and building science of the latest IECC and beyond. Participants will gain an understanding of the compelling code changes and the cost-effective methods of reaching it without compromising durability and safety.

Gord Cooke, EEBA

Foundations: Failures and Successes. Harborside 302

There are so many methods of installing foundations under a new home that it boggles the mind. In this session, we will cover the process of proper selection and installation of residential foundation systems. We will focus on our failures and what we learned from them, as well as successes, so we can provide a safe, durable, and healthy home.

Bill McAnally, McAnally Consulting

6 Layers: A Framework for More Sustainable Building French River

You're familiar with or practicing integrated design (the house as a system) in your work. You want to design or build in a more ecologically responsible way. This session presents a paradigm

that can be used to guide and inform an integrated, systems-oriented approach to more sustainable design and construction. The theory of shearing layers was created by British architect Frank Duffy, and described in Stewart Brand's book "How Buildings Learn: What Happens After They're Built." Come learn about the 6 layers, why they matter, and how this theory can provide a meaningful framework for designing and building more sustainably.

Rachel Wagner, through design

Residential Energy Code Mechanical Provisions. Harborside 304

This session will provide a plan review of a residential building and how to meet the mechanical provisions of a home in Minnesota. This seminar will provide cost savings information on mechanical systems for the builder's initial costs, and long-term cost savings for homeowners. It will include things such as heat loss, make-up air, equipment sizing, combustion air, ventilation requirements, as well as provisions for service water heating piping insulation, and electrical lighting requirements. A great class to get hands-on experience on mechanical provisions of the energy codes.

Donald Sivigny, State of MN Dept. Of Labor & Industry
(This is a double session that runs until 12:00 pm)

Advanced Houses That Work—Part 2: Foundations and Windows Harborside 204

This session will address how both foundations and windows have changed and how these two areas are important when trying to optimize performance and cost. A look at where technology is headed for windows and basements with respect to advanced comfort and moisture control will be discussed.

Gord Cooke, EEBA

Achieving Superior Energy Efficiency in Commercial and Multi-Family Buildings through Passive House Harborside 302

This presentation will examine two projects, a school and a multi-family apartment building, that pursued Passive House certification (PHIUS+ 2015) in order to achieve high performance energy efficiency and thermal comfort goals. In both case studies, Passive House was used as a framework to inspire higher levels of efficiency than typical code compliance. Energy modeling tools were used for design feedback throughout the design process. Close coordination between architectural, engineering, and

sustainability consulting team members was essential. Attendees of the session will walk away with actionable steps to successfully pursue Passive House.

Chloe Benditis, The Sheward Partnership, LLC,
Elizabeth Turner, Precipitate

Zeroing In: The Path to Net Zero Energy May Not Be What You Think! French River

This session will focus on building enclosure and mechanical strategies and systems for high-performance Zero Energy Ready Homes. While solar systems can be added later, it is not as easy to change the efficiency of the building enclosure or equipment. It is critical to find cost-effective approaches to get the loads low and efficiencies high. This will keep the cost of a renewable energy system—today or in the future—more affordable, too. But beware, approaching "zero" is not simply adding more of the same, it requires new approaches for many things, including design, ventilation, make-up air, and humidity control.

Patrick Huelman, University of Minnesota

Advanced Houses That Work—Part 3: Walls and Roofs Harborside 204

This segment will provide an understanding of how future codes are trending toward a total thermal effectiveness of wall and attic assemblies, including the role and options for exterior insulation.

Gord Cooke, EEBA

Performance Glazing and Building Envelope Optimization Harborside 302

Learn about performance glazing and building envelope optimization through descriptions of Low E coating, the Low E coatings manufacturing processes, and the benefits of Low E coatings.

Ken Modeen, Marvin Windows and Doors

Advanced Houses That Work—Part 4: Mechanical Systems Harborside 204

This segment will outline the three major technologies that can be used to meet the heating, cooling and ventilation comfort expectations of homebuyers in high performance homes. The session will also identify high efficiency hot water heating technologies that are now available to the industry.

Gord Cooke, EEBA

Healthy Housing: Building and Remodeling for Wellness and Efficiency. Harborside 302

Buildings affect the health and safety of their occupants. Contractors are key players in communicating and applying energy efficiency, air quality, and healthy housing knowledge for the benefit of their clients. This session will provide a healthy housing framework that can be applied when building or remodeling homes. Participants will learn about opportunities to improve home performance and reduce potential acute and chronic housing hazards faced by residents of all ages and understand where they can provide value-added resources.

Jodi Slick, Ecolibrium3

The Passive House Building Energy Standard in a Very Cold Climate. French River

Learn from examples from over a decade of new construction and retrofit projects showcasing assemblies, materials and systems, and how they are put together to meet the Passive House building energy standard in our very cold climate zones.

Tim Eian, TE Studio, Ltd.

Energy Code Compliance and Update. Harborside 304

This session will start out with an explanation of what the MN Energy Code Compliance Collaborative has accomplished over the last four years. The collaborative is composed of builders, contractors, code officials, state agencies, energy raters and companies, and energy advocates. To fulfill its mission statement, the collaborative has formed subcommittees dedicated to addressing specific issues related to energy code compliance. Next, it will cover the ongoing energy code update process led by the Department of Labor and Industry.

Ben Rabe, Fresh Energy

Moisture and Water Control—3 Methods to Evaluate the Risk of Your Wall Assemblies. French River

As insulation and airtightness levels continue to increase, the importance of good moisture management and design in our building assemblies has become an imperative. This session will provide a crash course on the building science principles of moisture and heat flow in above grade wall and roof assemblies. It will then dive into a discussion and evaluation of some of the key methods commonly used to investigate moisture risk: a qualitative moisture assessment, a static Glaser analysis, and a dynamic WUFI hygrothermal simulation. We will discuss when these assessments are appropriate and how they can be used to greatest benefit.

Rolf Jacobson, Center for Sustainable Building Research, University of Minnesota

Q&A with the Experts. Harborside 304

Join three experts in an opinionated exchange on the status quo, and where we need to take high-performance buildings to suit the needs of our changing climate. Participate in the conversation and make this session your own. No slides, just us talking about high-performance building in our market in the last 15 years—and the next!

Tim Eian (TE Studio, Passive House architecture), Dough Manthey (Energy Plus Conservation Technologies, Home Program Coordinator), Bill McAnally (Builder)