



# Off-site Codes Working Group

December 10, 2019



## Energy Efficiency in Permanent Modular Construction

National Renewable Energy Laboratory

# Goals for this Call

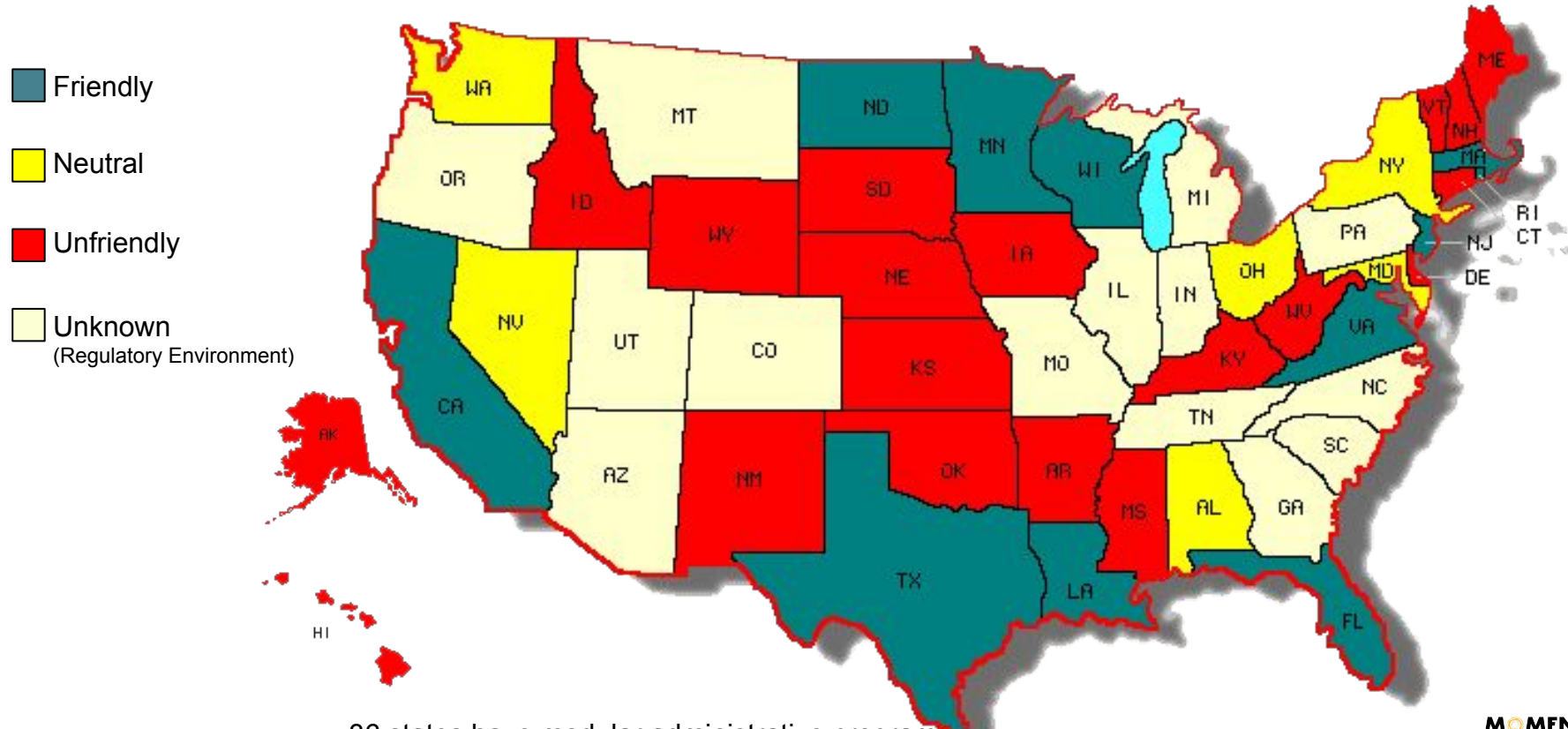
1. Introduction to ICC liaison, Karl Aittaniemi, P.E., who is guiding the off-site standards development
2. Background of ICC/MBI efforts to develop off-site specific American National Standards (ANS) to provide minimum requirements
3. Discuss how NREL Advisory Group can support ICC/MBI off-site code standards and guidelines
4. ACTION ITEMS for NREL Codes Working Group on slide 10!

# NREL Advisory Members - Codes Working Group

1. Stacey Rothgeb, NREL
2. Shanti Pless, NREL
3. Ankur Podder, NREL
4. Heather Wallace, MIG
5. Colby Swanson, MIG

1. Adam Cohen, Build SMART
2. Ryan Colker, ICC
3. Laura Dwyer, Dupont
4. Kevin Grosskopf, Univ. Nebraska
5. Michelle Knapp, Cocoon Construct
6. Amanda Lo, Skender
7. Ivan Rupnik, Northeastern Univ.

# Background on Modular Friendly States



36 states have modular administrative program.  
14 states require approval from local building code official.

# Guest Presenter: Karl Aittaniemi

[Karl Aittaniemi](#), P.E., is the Director of Standards at the International Code Council. He supervises the Standards Department staff in their roles supporting the development and support of ICC's Codes and Standards out of ICC's Central Regional Office in Country Club Hills, IL. Karl has an extensive professional background in fire protection product evaluation and has managed fire protection investigation projects in accordance with nationally and internationally recognized model codes and standards. He has experience as a forensic engineer and is a licensed professional engineer in several states.



# Off-site “Standards” Background

## CURRENT STATE OF

- No national or industry-wide standard for off-site
- Some state building codes address off-site construction
- IBC based predominantly on traditional on-site construction practices

## ROAD TO

- Council partnered w/ Modular Building Institute to “jointly advance & promote the mutual interests of streamlining the use of off-site construction”
- July 2018 ICC Board of Directors approved a proposal to develop tools to support the off-site construction industry
- **July 2019 ICC created Off-Site and Modular Construction Standards Committee (IS-OSMC)**

## PROCESS

- Oct 3, 2019 and Nov 19, 2019 first IS-OSMC [in-person meetings](#) (public allowed to attend)
- **Draft of standards to be created by ICC and posted for initial public input (date not yet given)**
- “... goal of having the standards and guidance ready in two years” (Fall 2021)

# IS-OSMC Working Groups

*This new ICC “off-site” working group has recently begun the process of developing “off-site” standards. Below are their working groups and members leading those efforts.*

- |  |                  |
|--|------------------|
| 1. <b>Definitions</b>                          | Dennis Pilarczyk |
| 2. <b>Administration</b>                       | Tom Hardiman     |
| 3. <b>1205 Plan, Compliance, Certification</b> | David Tompos     |
| 4. <b>1200 Planning, Design</b>                | Vaughan Buckley  |
| 5. <b>Fabrication, Transport, Assembly</b>     | Ryan McIntosh    |

# IS-OSMC Committee Members

- **Karl Aittaniemi, P.E.** - ICC Staff Liaison, ICC Director of Standards
- **John Barrot** - Associate Principal, Arup
- **Kenneth Bland** - Building Codes & Standards, American Wood Council
- **Jeffrey Brown** - Virginia Department of Housing & Community Development
- **Vaughan Buckley** - Owner, Volumetric Building Companies
- **Jay Daniels** - Sunbelt Modular
- **Tom Hardiman** - MBI Executive Director, Modular Building Institute - VICE CHAIRMAN
- **Brett Jones** - Jurisdiction Manager, Katterra
- **Kelly Kelly** - Texas Department of Licensing & Registration
- **Ryan McIntosh** - Director of Design Services, Silver Creek Industries
- **Chuck Michalesko** - Director of Strategic Planning & Operations, Deluxe Modular
- **Jonathon Paradine** - Administrative Manager, Building & Permits Division at State of Michigan Bureau of Construction Codes
- **Dennis Pilarczyk Jr** - Structural Steel Specialist, AISC
- **Craig Sedlacek** - Plans Examiner at State of Washington, Labor & Industries
- **Ralph Tavares** - Principal, R&S Tavares Associates
- **David Tompos Sr** - President, ICC NTA - CHAIRMAN



# How NREL Will Support IS-OSMC Off-site Standard



## 1200/1205 Development

ICC and MBI to collaborate on a series of **guidelines and standards**

### Option #1

Provide input for an **energy efficiency chapter** in ICC Off-Site & Modular Construction Standards

*How our input may be utilized in code development*

### Option #2

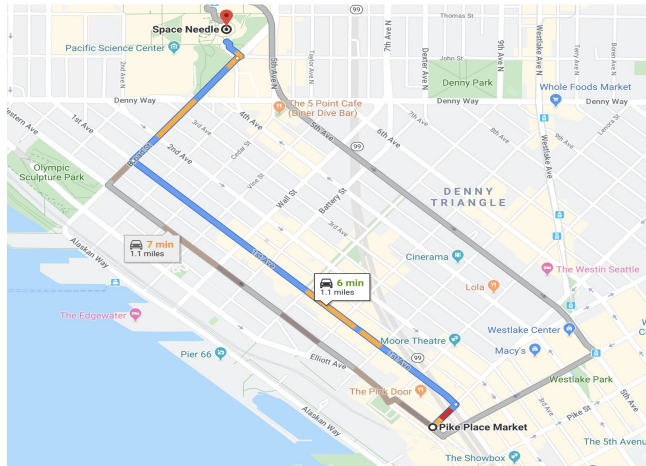
Develop/provide input for a **standalone standard** (potentially ICC 1210) surrounding energy efficiency

1. Create an initial list of ideas for “standards” (or guidelines) we believe the IS-OSMC committee should consider in the development process
  - a. Keep in mind the ICC standards include componentized, panelized and modularized elements and will not apply to HUD Manufactured Housing or tiny homes
  - b. Take into consideration how stricter energy codes may positively or adversely (especially if they are not implemented correctly) affect owners
  - c. Consider how energy codes could be implemented into the 1200 / 1205 standards the ICC and MBI are currently focusing on for off-site construction
  - d. Define issues not addressed currently in energy conservation codes

Feel free to submit your ideas via email to the group or you're welcome to set up a call with Heather who can pass on your ideas to the group - whatever works best for you!

# A Code vs. a Standard ... for clarification

Much like a Google Map, the **Code** is your destination/goal and **Standards** are the viable ways to get to (or meet) the **Code** (or destination).



The **Standard** (when referenced) becomes part of the **Code**. In rare cases of conflicts between the two (i.e. conflicting language), **Code** prevails over the **Standard**.

- ICC Codes & Standards are developed in a similar fashion by way of consensus of various interest categories within the building industry.
- Codes are minimum requirements written in mandatory language. As such, they are therefore enforceable by authorities having jurisdiction that have adopted the Codes.
- The Codes may describe a particular requirement however do not offer a means to satisfy the requirement. In cases where industry sees a need to define the means in a standardized way, a consensus Standard may be developed for reference in the Code. In order to be referenced in the code, the Standard must also be written in mandatory language so as to be enforceable.

**Standards 1200 and 1205 (off-site specific) are Administrative in nature, not Codes.** Modular still must meet all relevant **Building Codes**.

**Standards** are meant to help states who don't have existing "modular programs" by providing **Standards** to facilitate more modular acceptance within the state and **Code** community.

# 1200 Design, Fabrication, Construction and Assembly

**ICC STANDARD 1200:** Standard for Off-Site Construction: Planning, Design, Fabrication and Assembly (in development)

**ICC G5-2019 Guideline** for the Safe Use of ISO Intermodal Shipping Containers Repurposed as Buildings and Building Components

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## **DESIGN**

NTA Structural Design Services

## **FABRICATION**

IAS Accreditation for Manufactures/Fabricators

- AC472: Accreditation of Fabricator Inspection Program for Metal Building Systems
- AC157: Accreditation Criteria for Inspection Programs for Prestressed/Precast Concrete Panels
- AC172: Accreditation Criteria for Inspection Programs for Structural Steel

ICC-ES Product Evaluations

- AC04: Sandwich Panels
- AC340: Patio Covers
- AC509: 3D Automated Construction Technology for 3D Concrete Walls
- AC462: Shipping Containers
- AC14: Pre-Fab Wood I-Joists

## **CONSTRUCTION & ASSEMBLY**

IAS Accreditation of Assemblers

- AC478: Accreditation Criteria for Inspection Practices of Metal Building Assemblers

# 1205 Permitting, Plan Review and Inspection

**ICC/MBI STANDARD 1205:** Standard for Off-Site Construction: Inspection and Regulatory Compliance (in development)

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## **PLAN REVIEW & PERMITTING**

IAS Accreditation Under AC251

- Accreditation Criteria for Regulatory Agencies and Third Parties Providing Building and/or Property Code Enforcement Services

NTA Third-Party Plan Review Services

ICC Training & Certifications

## **INSPECTION**

IAS Accreditations

- AC98: Inspection Agency Accreditation
- AC291: Special Inspection Agency Accreditation

ICC Training & Certifications NTA Third-Party Inspection Services NTA Product Testing ICC-ES Product Evaluations

# NEXT IS-OSMC Working Group Meeting

The [next](#) IS-OSMC meeting will be conducted remotely via WebEx on Thursday, January 16, 2020 from 12 to 2pm ET. It is open to the public.

If you did not receive an invite from Alex Aittaniemi at the ICC, please let Heather know.

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The purpose for this meeting is for the IS-OSMC committee to consider:

- Preparation on the initial public draft with respect to:

Definitions  
Administration  
1200 chapters  
1205 chapters

