DEPARTMENT OF LABOR AND INDUSTRY

CODE CHANGE PROPOSAL FORM

(Must be submitted electronically)

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Date: 03/31/2025

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Model Code: 2024 IRC

Telephone number: 651-494-7320

Code or Rule Section: Appendix BL

Firm/Association affiliation, if any:

Topic of proposal: Hemp-lime (Hempcrete)

Code or rule section to be changed: Appendices

Intended for Technical Advisory Group ("TAG"):

General Information	**Yes**	**No**
A. Is the proposed change unique to the State of Minnesota?	☐	☒
B. Is the proposed change required due to climatic conditions of Minnesota?	☐	☒
C. Will the proposed change encourage more uniform enforcement?	☒	☐
D. Will the proposed change remedy a problem?	☒	☐
E. Does the proposal delete a current Minnesota Rule, chapter amendment?	☐	☒
F. Would this proposed change be appropriate through the ICC code development process?	☐	☒

Proposed Language

1. The proposed code change is meant to:

☐ change language contained the model code book? If so, list section(s).

☐ change language contained in an existing amendment in Minnesota Rule? If so, list Rule part(s).

☐ delete language contained in the model code book? If so, list section(s).

☐ delete language contained in an existing amendment in Minnesota Rule? If so, list Rule part(s).

☒ add new language that is not found in the model code book or in Minnesota Rule.
Request that the State of Minnesota adopt the 2024 IRC Appendix BL – Hemp-Lime (Hempcrete) Construction into the Minnesota Building Code

2. Is this proposed code change required by Minnesota Statute? If so, please provide the citation.

3. Provide *specific* language you would like to see changed. Indicate proposed new words with underlining and ~~strikethrough~~ words proposed for deletion. Include the entire code (sub) section or rule subpart that contains your proposed changes.
   Full adoption of the 2024 IRC Appendix BL Hemp-Lime (Hempcrete) Construction
   https://codes.iccsafe.org/content/IRC2024P1/appendix-bl-hemp-lime-hempcrete-construction

4. Will this proposed code change impact other sections of a model code book or an amendment in Minnesota Rule? If so, please list the affected sections or rule parts.
   No

Need and Reason

1. Why is the proposed code change needed? Please provide a general explanation as well as a specific explanation for any changes to numerical values (heights, area, etc.)

There is a growing interest in bio-based as well as fire-resistant building materials and systems. Hemp-Lime construction (commonly known as Hempcrete) is one such material and system, and is now included as Appendix BL in the 2024 IRC.
Currently however, Hemp-Lime wall assemblies are not permitted by code in Minnesota. The adoption of the 2024 Appendix BL would allow the use of Hemp-Lime insulation in a safe and tested manner and give code officials the tools to evaluate the design and construction of such assemblies.

Construction Method

Hemp-Lime is a non-structural insulation infill material and substrate for plaster, installed around framing members of existing or new wood-framed walls. It was first used in France in the 1980s, to insulate and protect from moisture damage historical wood-framed buildings. Its successful use then spread the UK. It then migrated to Canada after its legalization of agricultural hemp in 1998 and later to the US after it legalized hemp cultivation in 2018.

Strength and Durability

Hemp-Lime is a non-structural infill material, primarily for use in structural and non-structural wood-framed walls. However Appendix BL does require a minimum compressive strength for the hemp-lime material (Section BL107.1), so that it maintains its cohesive integrity in the wall.

In 2020 an ASTM E84 test was conducted on hemp-lime material to show its flame spread index and smoke-developed index do not exceed the IRC maximum thresholds for insulation of 25 and 450 respectively. The tested hemp-lime sample received the lowest possible score of zero for both.

Though the 2024 Appendix BL includes no fire-resistance rating for plastered Hemp-Lime walls, their resistance to fire is well known by practitioners through the ASTM E84 test, informal testing, and more recently due to three 1-hour ASTM E119 tests of plastered Hemp-Lime wall assemblies in 2024 and 2025. These successful tests (that were unavailable when Appendix BL was first approved for the 2024 IRC) justify a current code change proposal for these tested Hemp-Lime 1-hour assemblies to enter the 2027 IRC.

Moisture

The lime in Hemp-Lime gives this composite material excellent moisture management qualities, and helps protect wood from moisture damage.

Energy Performance

Hemp-Lime provides excellent thermal performance with its balance of thermal insulation and mass, as well as its hygrothermal properties (relating to a combination of moisture and heat). It has been tested for thermal resistance with ASTM tests that showed a linear correlation between density and R-value. Those thermal resistance values are given in Table BK106.2.

2. Why is the proposed code change a reasonable solution?

   This is a reasonable solution because Appendix BL has been approved through ICC's national model code development process to regulate Hemp-Lime construction as a viable and tested insulation infill material and substrate for plaster. Its development occurred with review and input from over 25 hemp-lime design and building professionals in the US, Canada and Europe.

3. What other factors should the TAG consider?

   Hemp-Lime construction is a durable solution for design professionals, builders, and homeowners interested in an insulation infill material and substrate for plaster for existing or new wood-framed buildings that creates energy-efficient, healthy,and fire-resistant homes.

Cost/Benefit Analysis

1. Will the proposed code change increase or decrease costs? Please explain and provide estimates if possible.

   Depending on installation type, the use of Hemp-Lime insulation typically increases construction costs of the exterior walls by 10-20% due to additional labor and material costs.

2. If there is an increased cost, will this cost be offset by a safety or other benefit? Please explain. If the benefit is quantifiable (for example energy savings), provide an estimate if possible.

   This cost is justified through increased durability and excellent moisture management the hemp-lime insulating material provides for existing and new wood-framed buildings, and healthier indoor air quality. The benefits also include the use of Minnesota grown agricultural products (hemp) in construction.

3. If there is a cost increase, who will bear the costs? This can include government units, businesses, and individuals.

   Residential owners and developers would bear the additional costs.

4. Are there any enforcement or compliance cost increases or decreases with the proposed code change? Please explain.

   No. The responsibility and cost for demonstrating compliance with requirements particular to Appendix BL (such as hemp-lime density and compressive strength) are borne by the homeowner or developer.

5. Will the cost of complying with the proposed code change in the first year after the rule takes effect exceed $25,000 for any one small business or small city (Minn. Stat. § 14.127)? A small business is any business that has less than 50 full-time employees. A small city is any statutory or home rule charter city that has less than ten full-time employees. Please explain.

   No

Regulatory Analysis

1. What parties or segments of industry are affected by this proposed code change?

Insulation contractors and framers may need to adjust their methodology to allow for the increased thickness of Hemp-Lime wall assemblies to meet required R-values.

2. Can you think of other means or methods to achieve the purpose of the proposed code change? What might someone opposed to this code change suggest instead? Please explain what the alternatives are and why your proposed change is the preferred method or means to achieve the desired result.

   None. Hemp-Lime construction, properly regulated by Appendix BL, has a unique combination of attributes that no other wall system possesses, as described previously in this application. It would supplement Minnesota's current Residential Code, providing a highly energy efficient wall system option for Minnesotans.

3. What are the probable costs or consequences of not adopting the code change, including those costs or consequences borne by identifiable categories of affected parties, such as separate classes of government units, businesses, or individuals?

   Hemp-Lime (Hempcrete) construction is growing in popularity. Without adoption of Appendix BL, a patchwork of code enforcement is likely for Hemp-Lime projects, adding complexity and cost to the design, plan check, permitting, construction and inspection processes. This could also cause rogue builders and homeowners to use unpermitted Hemp-Lime in their projects and build unsafe and unhealthy homes. By adopting the Appendix BL, code officials will have the proper tools to evaluate Hemp-Lime construction to ensure its safe and durable use.

4. Are you aware of any federal or state regulation or requirement related to this proposed code change? If so, please list the federal or state regulation or requirement and your assessment of any differences between the proposed code change and the federal regulation or requirement.

Yes. Appendix BL in the national model 2024 IRC, clearly defines the use of Hemp-Lime in residential construction and its proper installation techniques.

***Note: The information you provide in this code change proposal form is considered Public Data and used by the TAG to consider your proposed modification to the code. Any code change proposal form submitted to DLI may be reviewed at public TAG meetings and used by department staff and the Office of Administrative Hearings to justify the need and reasonableness of any proposed rule draft subject to administrative review and is available to the public.

****Note: Incomplete forms will be returned to the submitter with instruction to complete the form. Only completed forms will be accepted and considered by the TAG. The submitter may be asked to provide additional information in support of the proposed code change.

MN IRC Code Change Proposal: Appendix BL_Hemp-Lime (Hempcrete) Construction

Local Impact Statements

3/31/2025

Anna Koosmann AIA, CPHC

Senior Architect & Certified Phius Passive House Consultant

AWH Architects

2836 South Lyndale Ave #170

Minneapolis, MN 55409

Statement from Anna Koosmann:

As a Senior Architect and Certified Phius Passive House Consultant, I strongly advocate for the adoption of Appendix BL (Hemplime/Hempcrete) and Appendix BJ (Straw Bale) into the Minnesota IRC Building Code for this next cycle. Integrating these appendices is essential to ensuring quality performance, standardizing best practices, and advancing sustainable building methods that are increasingly in demand.

The construction industry is experiencing a growing shift toward natural building materials that support energy efficiency, carbon sequestration, and occupant health. By formally adopting these appendices, we can:

- **Standardize Building Assemblies & Best Practices** – Establishing clear, tested guidelines will ensure consistent, high-performance construction and reduce variability in execution.
- **Streamline the Permit Review Process** – Standardized requirements will help reduce delays and confusion, leading to time and cost savings for building departments, architects, contractors, and stakeholders.
- **Enhance Construction Quality** – Clear codes will minimize human error and ensure projects meet proven performance standards.
- **Meet Industry Demand** – Clients are increasingly requesting hempcrete and straw bale assemblies, making this the ideal time to establish clear regulatory standards.

Without adopting these appendices, we risk inconsistent construction practices, extended review times, and inefficiencies due to the lack of established guidelines. The construction industry has a responsibility to adapt to evolving materials and performance standards, ensuring that buildings are durable, high-performing, and built to last in Minnesota's climate.

Now is the time to act. Adopting these appendices will benefit the entire industry and set a precedent for future advancements in sustainable building practices.

Local Impact Statement

Adoption of the strawbale and hemp-lime building code appendices will allow for more straightforward approval of buildings featuring these types of construction. Streamlining the approval process will save these projects considerable amounts of money and time that would otherwise be spent on additional engineering assessments, documentation, and related discussions. This is not only beneficial for the project owners and development teams, but also for the busy code officials and code departments that will be reviewing them.

From a building science and durability standpoint, adoption of these code appendices will provide a much needed resource for these relatively unknown building systems. It is fair to say that most building professionals are unfamiliar with the materials construction issues addressed in the appendices. The code language will provide clear direction on the most salient construction and design issues, helping to ensure that both design teams and code review teams are addressing critical items, and ultimately ensuring the durability and safety of these buildings.

Finally, our climate in MN is changing rapidly. Building assemblies with strong warm-side vapor retarders could begin to pose summertime condensation risks – just as they already do in more southerly climate zones. Strawbale and hemp-lime construction are designed with a more even, symmetric and open vapor profile that – when combined with some safe moisture storage – should offer a safer and more durable approach to vapor management in the coming years.

Rolf Jacobson

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