RB291-25

IRC: BL105.1, BL105.1.1 (New)

Proposed Change as Submitted

Proponents: Martin Hammer, representing Martin Hammer, Architect (mfhammer@pacbell.net); David Eisenberg, representing The Development Center for Appropriate Technology (strawnet@gmail.com); Cameron McIntosh, representing Americhanvre LLC (cameron@americhanvre.com); Tom Rossmassler, representing Hempstone, LLC (tom@hempstone.net); Timothy Callahan, representing Callahan Home Designs (t.l.callahan@icloud.com); Matthew Mead, representing Hempitecture Inc. (mattie@hempitecture.com); Anthony Dente, representing Verdant Structural Engineers (anthony@verdantstructural.com)

2024 International Residential Code

APPENDIX BL
HEMP-LIME (HEMPCRETE) CONSTRUCTION

Revise as follows:

BL105.1 Fire-resistance rating. *Hemp-lime* walls do not have a fire-resistance rating, except for walls constructed in accordance with Sections BL105.1.1, BL105.1.2 or BL105.1.3. Fire-resistance ratings for other *hemp-lime* wall assemblies shall be determined by testing in accordance with ASTM E119 or UL 263, or an analytical method in accordance with Section 703.2.2 of the International Building Code .

Add new text as follows:

BL105.1.1 One-hour rated hemp-lime wall with center stud framing. One-hour fire-resistance rated load-bearing hemp-lime center stud walls shall comply with all of the following:

1. Shall be constructed with center stud framing per Figure BL103.1(2) with 2x4 studs at 16 inches (406 mm). The framed wall height shall not exceed 10 feet (3.05 m). Staggered 2x4 blocking shall be installed at mid-height between the studs.
2. Hemp-lime complying with Sections BL106.3.1, BL106.3.2 and BL107.1 shall be spray applied in accordance with Section BL103.6.4 to a thickness of 12 inches (305 mm).
3. Exterior and interior plaster shall be lime plaster complying with Section BL104.3.5, and shall be applied with 1/4-inch (6.4 mm) coats to a thickness of 3/4 inch (19 mm) on the exterior and 1/2 inch (12.7 mm) on the interior. Fiberglass stucco lath shall be embedded in the first exterior and interior coats.

BL105.1.2 One-hour rated hemp-lime wall with exterior stud framing. One-hour fire-resistance rated load-bearing hemp-lime exterior stud walls shall comply with all of the following:

1. Shall be constructed with exterior stud framing per Figure BL103.1(3) with 2x6 studs at 16 inches (406 mm). The framed wall height shall not exceed 10 feet (3.05 m). 2x4 on-edge blocking shall be installed at 5 feet (1.52 m) and 9 feet (2.74 m) between the studs and flush with their exterior face. 2x2 anchorage at 16 inches (406 mm) shall be fastened horizontally to inside face of the studs with 16d nails, and vertically at 16 inches (406 mm) to the horizontal anchorage.
2. A *vapor permeable* combined water-resistive and air barrier shall be stapled with lapped and taped joints at the 2x4 on-edge blocking.
3. A .06 inch x 2 3/8-inch (1.5 mm x 60mm) galvanized steel strap shall be installed diagonally from top plate to bottom plate and fastened to framing members per manufacturer's specifications.

4. 1x3 wood furring shall be installed vertically to each stud with 2 3/8 inch (60 mm) screws, and horizontally at 16 inches (406 mm) to the vertical furring.
5. 3/4-inch (19 mm) x 5 ½-inch (127 mm) vertical wood siding shall be fastened at each horizontal furring member.
6. Hemp-lime complying with Sections BL106.3.1, BL106.3.2, and BL107.1 shall be spray applied in accordance with Section BL103.6.4 to a thickness of 12 inches (305 mm).
7. Interior plaster shall be lime plaster complying with Section BL104.3.5, and applied with 1/4–inch (6.4 mm) coats to a thickness of ½ inch (12.7 mm). Fiberglass stucco lath shall be embedded in the first coat.

BL105.1.3 One-hour rated hemp-lime wall with double stud framing. One-hour fire-resistance rated load-bearing hemp-lime double stud walls shall comply with all of the following:

1. Shall be constructed with double stud framing per Figure BL103.1(4), with exterior load-bearing 2x4 studs at 16 inches (406 mm) and interior nonload-bearing 2x3 studs at 24 inches (610 mm). The framed wall height shall not exceed 10 feet (3.05 m). 2x4 on-edge blocking shall be installed at 5 feet (1.52 m) and 9 feet (2.74 m) between the exterior studs and flush with their exterior face. Horizontal 2x4 anchorage shall be fastened to the interior face of the 2x4 studs at 30, 60, and 90 inches (.76, 1.52, and 2.29 m).
2. A *vapor permeable* combined water-resistive and air barrier shall be stapled with lapped and taped joints at the 2x4 on-edge blocking.
3. A .06 inch x 2 3/8-inch (1.5 mm x 60mm) galvanized steel strap shall be installed diagonally from top plate to bottom plate and fastened to framing members per manufacturer's specifications.
4. 1x3 wood furring shall be installed vertically to each stud with 2 3/8 inch (60 mm) screws, and horizontally at 16 inches (406 mm) to the vertical furring.
5. 3/4-inch (19 mm) x 5 ½-inch (127 mm) vertical wood siding shall be fastened at each horizontal furring member.
6. Hemp-lime complying with Sections BL106.3.1, BL106.3.2, and BL107.1 shall be spray applied in accordance with Section BL103.6.4 to a thickness of 12 inches (305 mm).
7. Interior plaster shall be lime plaster complying with Section BL104.3.5, and applied with 1/4–inch (6.4 mm) coats to a thickness of ½ inch (12.7 mm). Fiberglass stucco lath shall be embedded in the first coat.

Reason:

This proposal modifies the current section on fire-resistance rating of hemp-lime walls to include three assemblies tested in accordance with ASTM E119, including a hose stream test, in July 2024, Dec 2024 and Jan 2025. The test reports state that the each assembly met the Conditions of Acceptance of ASTM E119 for a fire-resistance rating of 60 minutes. Accordingly this code proposal describes the construction of these tested hemp-lime walls required to assign them a 1-hour fire-resistance rating. (See attachments or contact the primary proponent for the test reports.)

Though the test reports state the use of select structural Douglas fir framing in the test specimens, the code language does not specify the framing lumber species or grade for two reasons: 1) the attached structural calculations demonstrate that commonly used and IRC-allowed Douglas fir-larch, Southern pine, Hem-fir, and Spruce-pine-fir No. 2 framing is capable of supporting the superimposed loads in these three ASTM E119 tests, and 2) the fire that these test specimens were subjected to did not reach the load-bearing framing.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact: The ASTM E119 tested wall assemblies described in the proposed code language simply take already acceptable (per Appendix BL) hemp-lime wall assemblies and state their newly assigned one-hour fire-resistance rating. Therefore the proposal has no cost impact.

Attached Files