
Code Section #  TABLE R402.1.1

Brief Description: Upgrade log wall standards to the national IRC requirements.

Proposed code change text

Chapter 2 Definitions

Log Structure. A type of construction whose primary structural elements are formed by a system of logs.

Log Wall. An assembly of individual structural logs for use as an exterior or interior load bearing wall, shear wall or non-load bearing wall.

TABLE R402.1.1

INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT

- Log and solid timber walls with a minimum average thickness of 3.5 inches are exempt from this insulation requirement.
- For log structures developed in compliance with standard ICC 400, log walls shall meet the requirements for climate zone 5 of ICC 400.

Chapter 6 Referenced Standards


Appendix A

A103.3.4 Log wall. See Table A103.3.4—U-factors for log walls shall be determined using-ICC 400 Table 305.3.1.1, U-Factor of Log Wall (U_W) By Log Thickness (W_L) and Specific Gravity.

(Delete existing table A103.3.4)
Purpose of code change: Upgrade log wall standards to the national IRC requirements. This will require a 5” to 7” inch wall depending on the wood species and specific gravity of the source wood.

Your amendment must meet one of the following criteria. Select at least one:

- [ ] Addresses a critical life/safety need.
- [ ] The amendment clarifies the intent or application of the code.
- [x] Addresses a specific state policy or statute.
  
  (Note that energy conservation is a state policy)

Check the building types that would be impacted by your code change:

- [x] Single family/duplex/townhome
- [x] Multi-family 1 – 3 stories
- [ ] Multi-family 4 + stories
- [ ] Commercial / Retail
- [ ] Institutional
- [ ] Industrial

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**Economic Impact Data Sheet**

Briefly summarize your proposal’s primary economic impacts and benefits to building owners, tenants and businesses.

**See the assessment below.**

Provide your best estimate of the construction cost (or cost savings) of your code change proposal? (See OFM Life Cycle Cost Analysis tool and Instructions; use these Inputs. Webinars on the tool can be found Here and Here)

$5.55 /square foot (For residential projects, also provide $ 5272 / dwelling unit)

Show calculations here, and list sources for costs/savings, or attach backup data pages

Provide your best estimate of the annual energy savings (or additional energy use) for your code change proposal?

Click here to enter text.KWH/ square foot (or) 7.5 KBTU/ square foot

(For residential projects, also provide 107 therms KWH/KBTU / dwelling unit) per year.

Show calculations here, and list sources for energy savings estimates, or attach backup data pages
Energy Consumption:
The energy use of log walls was compared to the energy use of a R-21 int wall using Beopt energy simulation program. Beopt provides modeling using the energyplus engine and provides full hourly analysis, including the benefits of mass construction. Presented below is the space heating energy use only for a 1344 SF home meeting the 2015 WSEC.

![Energy Consumption Chart]

First Cost:
For the life cycle cost model, we assumed the following first cost for construction.

- **Baseline** 3.5 inch solid wood - $14.00 - Based on internet cost of kit home. Labor component added.
- **Alt 1.** 8 Inch log Wall - $19.55 – Source RSmeans derived from whole building cost comparison.
- **Alt 2.** R-21 int. – $11.50 SF – Source RSmeans.
### Key Analysis Variables

<table>
<thead>
<tr>
<th>Study Period (years)</th>
<th>50</th>
<th>Gross (Sq.Ft)</th>
<th>1,344</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Discount Rate</td>
<td>5.00%</td>
<td>Useable (Sq.Ft)</td>
<td>1,344</td>
</tr>
<tr>
<td>Maintenance Escalation</td>
<td>1.00%</td>
<td>Space Efficiency</td>
<td>100.0%</td>
</tr>
<tr>
<td>Zero Year (Current Year)</td>
<td>2020</td>
<td>Project Phase</td>
<td>0</td>
</tr>
<tr>
<td>Construction Years</td>
<td>0</td>
<td>Building Type</td>
<td>0</td>
</tr>
</tbody>
</table>

### Life Cycle Cost Analysis

#### Energy Use Cost Intensity (kBtu/sq.ft)

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Baseline</th>
<th>Alt. 1</th>
<th>Alt. 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Use Intensity</td>
<td>25.3</td>
<td>17.7</td>
<td>9.4</td>
</tr>
<tr>
<td>1st Construction Costs</td>
<td>$13,300</td>
<td>$18,573</td>
<td>$10,450</td>
</tr>
<tr>
<td>PV of Capital Costs</td>
<td>$12,667</td>
<td>$17,689</td>
<td>$9,953</td>
</tr>
<tr>
<td>PV of Maintenance Costs</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PV of Utility Costs</td>
<td>$13,858</td>
<td>$9,700</td>
<td>$5,157</td>
</tr>
<tr>
<td>Total Life Cycle Cost (LCC)</td>
<td>$26,525</td>
<td>$27,389</td>
<td>$15,110</td>
</tr>
<tr>
<td>Net Present Savings (NPS)</td>
<td>N/A</td>
<td>$(864)</td>
<td>$11,415</td>
</tr>
</tbody>
</table>

### GHG Social Life Cycle Cost

#### GHG Impact from Utility Consumption

<table>
<thead>
<tr>
<th>Tons of CO2e over Study Period</th>
<th>Baseline</th>
<th>Alt. 1</th>
<th>Alt. 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>% CO2e Reduction vs. Baseline</td>
<td>N/A</td>
<td>30%</td>
<td>63%</td>
</tr>
<tr>
<td>Present Social Cost of Carbon (SCC)</td>
<td>$5,731</td>
<td>$4,012</td>
<td>$2,133</td>
</tr>
<tr>
<td>Total LCC with SCC</td>
<td>$32,256</td>
<td>$31,401</td>
<td>$17,243</td>
</tr>
<tr>
<td>NPS with SCC</td>
<td>N/A</td>
<td>$855</td>
<td>$15,014</td>
</tr>
</tbody>
</table>

### Warning: OFM Assigned Variables Not Used

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All questions must be answered to be considered complete. Incomplete proposals will not be accepted.
All questions must be answered to be considered complete. Incomplete proposals will not be accepted.
List any code enforcement time for additional plan review or inspections that your proposal will require, in hours per permit application:

**Enforcement will be more consistent with national and state IRC requirements.**