If you are designing a gymnasium, big-box retail, or one of several other building types, you can still utilize integral-insulated exposed single-wythe concrete masonry (CMU) walls for code compliance (Figure 1). This cost-effective wall system remains a prescriptive path design option in the latest Washington and Oregon energy codes.

Washington State is moving towards adoption of the 2018 energy code which will become effective on July 1, 2020. Both the mass wall U-factor requirement of 0.104 and the single-wythe concrete masonry exception will remain in the updated state energy code. This exception is listed as a footnote to prescriptive path tables C402.1.3 (R-value method) and C402.1.4 (U-factor method). When designing a building in accordance with the U-factor method or when utilizing the single-wythe CMU exception, continuous insulation is not required.

The concrete masonry exception applies to 15 commercial building types/uses where it is not cost-effective to add excessive amounts of insulation to concrete masonry wall surfaces. The masonry wall must be insulated integrally (in the unit cores) with at least 50 percent of the cores filled with insulation. The remaining cores can be grouted. As an example, a horizontal grout spacing of 32” on center combined with a vertical grout spacing of 24” on center equates to a grout area of 50 percent, leaving the remaining cores open for insulation.
The state of Oregon is planning to adopt ASHRAE standard 90.1 as the new 2019 Oregon Energy Code to become effective October 1, 2019. This standard has a mass wall U-factor requirement of 0.104 but does not contain the CMU exception discussed above. However, it does permit the use of a whole-building modeling option in Appendix G and the COMcheck software program. This will provide increased design flexibility and the ability to accurately account for thermal mass impacts upon building energy usage.

Additionally, a Statewide Alternate Method (SAM) No. 19-01 will be available in Oregon. It will allow designers to voluntarily use the 2018 IECC as an additional design option. **SAM No. 19-01 does include the single-wythe concrete masonry wall exception.**

The masonry (mass) wall provisions of current and upcoming northwest energy codes offer several design options and properly recognize the benefits of thermal mass. Most common masonry wall systems will qualify as “mass walls” meeting the wall weight or heat capacity requirements. They are eligible to comply with the codes using the using the lower mass wall insulation requirements in the prescriptive compliance tables. They are not required to have continuous insulation.

**SAM No. 19-01 does include the single-wythe concrete masonry wall exception.**

Other code compliance paths for mass walls include component performance (envelope trade-off) and total building performance/whole building analysis. The whole building analysis method can accurately model thermal mass effects and allows the greatest design flexibility. It is recommended to use a comprehensive energy analysis program with hour-by-hour simulation and options for inputting custom mass wall properties. Appendix G of ASHRAE 90.1 has the potential to lower the cost of whole-building modeling. As part of a national standard it is expected new automated compliance programs will be developed.

For additional information regarding energy-efficient masonry wall systems:

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