



To: Attention: Thomas L. Morrison, Deputy Executive Director
California Building Standards Commission
2525 Natomas Park Drive, Suite 130
Sacramento, CA 95833

From: Gary Hambly – CEO/President - California Construction & Industrial Materials Association (CalCIMA) &
Tom Tietz – President - California Nevada Cement Association (CNCA).

Sent c/o Charley Rea, CalCIMA

Date: May 12, 2008

Re: Proposed Green Building Codes

Thank you for the opportunity to comment on the California Building Standards Commission's proposed Green Building Codes.

CalCIMA is a trade association representing aggregate and ready mixed concrete producers throughout California. The CNCA represents all the cement producers and suppliers in California.

We find these code changes helpful in promoting reuse, recycling, reduction, and substitution of materials to reduce green house gases in relation to building and construction. This includes reliance on nearby sources of materials, incorporating recycled materials, and allowing inclusion of alternate sources.

In general, we suggest the codes not limit the materials that can be used, while also ensuring that quality and performance are not compromised, particularly in regard to structural applications. We note there may be further opportunities for reusing, recycling, and reducing materials in non-structural applications.

We provide our comments and suggestions below in *italics* and blue.

SECTION 705 - MATERIAL SOURCES

705.1 Regional materials. Compared to other products in a given product category, select building materials or products for permanent installation on the project that have been harvested or manufactured in California or within 500 miles of the project site.

1. For those materials locally manufactured, select materials manufactured using low embodied energy or those that will result in net energy savings over their useful life.
2. Regional materials shall make up at least 10%, based on cost, of total materials value.
3. If regional materials make up only part of a product, their values are calculated as percentages based on weight.
4. Provide documentation of the origin, net projected energy savings, and value of regional materials.

Comment. We support use of regional materials to ensure delivery of required specified construction materials has the smallest possible carbon footprint.

705.4 Recycled content. Use materials, equivalent in performance to virgin materials, with post-consumer or preconsumer recycled content value (RCV) for a minimum of 10% of the total value, based on estimated cost of materials on the project. Provide documentation as to the respective values.

Comment: We support this, but recommend standards include appropriate safeguards regarding quality. This would include that materials meet ASTM C-33 requirements, percentages don't compromise quality, and recycled material not include contaminants affecting quality and durability.

705.5 Cement and concrete. Use cement and concrete made with recycled products complying with Sections 705.6.1 through 705.6.3.

705.5.1 Alternative fuels. Where permitted by state or local air quality standards, use alternative fuels in the manufacture of cement.

705.5.2 Cement. Meet the following standards for cement:

1. Portland Cement shall meet ASTM C 150 Specifications.
2. Blended Cement shall meet ASTM C 595 or ASTM C 1157.

705.5.3 Concrete. Use concrete manufactured in accordance with Sections 706.6.3.1 and 706.6.3.2, as approved by the enforcing agency.

705.5.3.1 Industrial byproducts. Use concrete made with *one or more* of the following materials:

1. Fly ash meeting ASTM C 618, Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.

Comment: Recommend that other pozzolans, including natural pozzolans, be allowed, too.

2. Slag cement meeting ASTM C 989, Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars, up to 70%

3. Silica fume meeting ASTM C 1240, Specification for Silica Fume Used in Cementitious Mixtures, up to 7%.

705.5.3.2 Recycled aggregates. *Depending on availability and suitability, allow project to use concrete made with one or more of the following materials:*

1. Blast furnace slag or fly ash as a lightweight aggregate per ASTM C330, Standard Specification for Lightweight Aggregates for Structural Concrete.

Note: In some areas, there is concern about availability of blast furnace slag as well as quality issues related to its specific gravity, absorption, and other performance tests.

2. Recycled concrete that meets grading requirements of ASTM C 33, Standard Specification for Concrete Aggregates.

SECTION 709
LIFE CYCLE ASSESSMENT

709.1 Materials and system assemblies. Select materials assemblies based on life cycle assessment of their embodied energy and/or green house gas emission potentials.

709.1.1 Materials and system assemblies. Software for calculating life cycle costs for materials and assemblies may be found at:

1. the Athena Institute web site at: <http://www.athenasmi.ca/tools/impactEstimator/>
2. the NIST BEES web site at: <http://www.bfrl.nist.gov/ocae/software/bees/> .
3. Life Cycle assessment may also be done in accordance with ISO Standard 14044, www.iso.ch .

709.1.2 Additional resources. More information on life cycle assessment may be found at the Sustainable Products Purchasers Coalition: www.sppcoalition.org ; at the American Center for Life Cycle Assessment: www.lcacenter.org ; at U.S. EPA Life Cycle Assessment Research: www.epa.gov.

Comments: re Life Cycle Analysis Section 709:

- *The NIST and Athena methods do not work well for concrete systems in general because they consider only one mix design and do not consider the life of the structure (and other reasons).*
- *The link to life cycle tools is incorrect. It would be helpful to get the correct link.*
- *In general, we recommend tools for life cycle cost and life cycle assessment that consider the FULL LIFE of the structure, not just part of the process for a limited part of the structure.*
 - *95% of the impacts during the life of a building are to heat and cool the building. The remaining 5% includes extraction of materials, manufacture of components, all transportation, demolition, and waste disposal.*
 - *For life cycle assessment, we need a tool that considers variations in cement content because cement content is the most significant variable during the extraction and manufacturing phases.*
 - *The life cycle assessment should also include a full list of impacts (not just CO₂, for example).*
 - *The ISO 14044 reference is good; that is what we use.*

This is a short version of our preferred language:

Perform a life cycle assessment (LCA) according to ISO Standard 14044 of a minimum of two building alternatives. The service life of the buildings shall be no less than 75 years. Compare the two building alternatives using a published third-party impact indicator method that includes, at a minimum these impact categories: land use (or habitat alteration), resource use, climate change, ozone layer depletion, human health effects, ecotoxicity, smog, acidification, and eutrophication.

1. *The LCI shall include the materials and energy consumed and the emissions to air, land, and water for each of the following stages:*
 - i. *Extracting and harvesting materials and fuel sources from nature.*

- i. *Processing building materials and manufacturing building components.*
 - ii. *Transporting materials and components.*
 - iii. *Assembly and construction.*
 - iv. *Operation including energy consumption, maintenance, repair, and replacement during the design life.*
 - v. *Demolition, disposal, recycling, and reuse of the building at the end of its life cycle.*
2. *The LCI shall account for emissions to air for the following:*
- i. *The six principle pollutants for which the USEPA has set National Ambient Air Quality Standards as required by the Clean Air Act and its amendments: carbon monoxide, nitrogen dioxide, lead, sulfur oxides, particulate matter (PM₁₀ and PM_{2.5}), and ozone.*
 - ii. *Greenhouse gases (not including water vapor and ozone) as described in the Inventory of U.S. Greenhouse Gas Emissions and Sinks: carbon dioxide, methane, nitrous oxide, chlorofluorocarbons, hydrochlorofluorocarbons, bromofluorocarbons, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, sulfur dioxide, and VOCs.*
 - iii. *Hazardous air pollutants listed in the Clean Air Act and its amendments.*

Please let Tom Tietz at the California Nevada Cement Association know if you have questions. He will likely refer you to Martha VanGeem of the CTL Group who drafted these recommendations.