

CalGreen: Impact to Your School Projects

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For:

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Agenda

- Introduction
- Background of the Green Building Code
 - 2008 Green Building Code
- 2010 Mandatory Requirements for Schools
 - Detailed Description and Impacts Noted
- 2010 Voluntary Requirements for Schools
 - General Overview of Items
- Conclusions
- Questions & Answers

Introduction



- What is “CalGreen”?
 - Part 11 of the California Code of Regulations, Title 24
 - California Green Building Standards Code
 - 2010 - First Mandatory Green Building Code in the U.S.
 - There are both mandatory and voluntary components
 - CalGreen is the term used for some voluntary measures
 - Available for adoption from various building jurisdictions
 - Applicable to all building types
 - Currently available as a “DRAFT pending publication”
 - Effective January 1, 2011

Introduction



- How will the new code impact your **SCHOOL** projects?



- Costs (Design, Construction, & Operational)?
- Design Decisions?
- Material Selections?
- Consultant Selection?

Background of CalGreen

- Public Concern with Global Climate Change



- Link to Greenhouse Gas Emissions (GHG)
- Buildings are Second Largest Contributor (23.7%)
 - Source CARB 2004 Inventory

Background of CalGreen

- Executive Order (EO D-16-00)
 - Set goals for State buildings to be models of efficiency while providing healthy, productive, comfortable environments
 - Tasked Secretary of State to establish sustainable building task force



Background of CalGreen

- Executive Order (EO S-20-04)
 - State of California’s “Green Building Action Plan”
 - Reduce grid-based electrical consumption by 20% in State-owned buildings by 2015
 - All State facilities to be “LEED Silver” or higher
 - Energy Star building ratings and equipment required
 - Establish “Green Building Action Team”

Background of CalGreen

- Executive Order (EO S-20-04)
 - Division of the State Architect (DSA) “...*should adopt guidelines by December 31, 2005, to enable and encourage schools built with State funds to be resource and energy efficient.*”



Background of CalGreen

- Assembly Bill (AB 32) - Nunez:
 - “Global Warming Solutions Act of 2006”
 - Law to Reduce GHG emissions to 1990 levels by 2020
 - 25-30% Reduction from 2006 levels
 - 170 million tons of emissions reduction



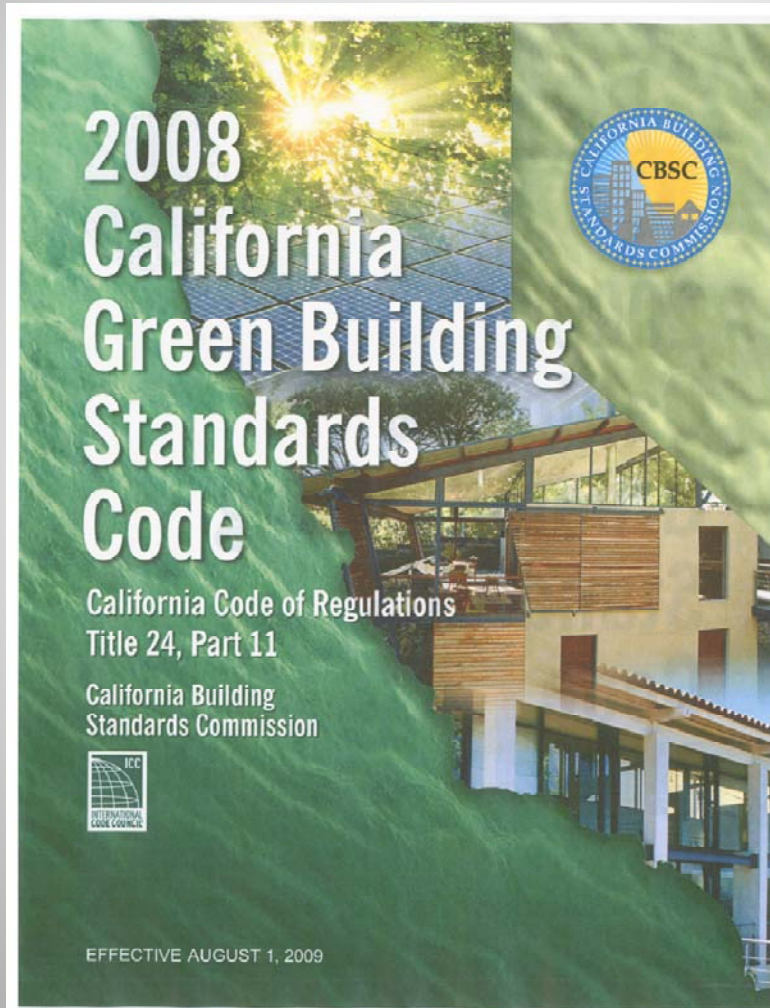
❖ California Air Resource Board (CARB) tasked with drafting action plan to achieve goals

Background of CalGreen

- California Building Standards Commission (CBSC)
 - Responsible for administering California's building codes, including adopting, approving, publishing, and implementing codes
 - 11 Commissioners appointed by law
 - Code Advisory Committee (CAC)
 - Six Committees
 - **Green Building Committee**



2008 Voluntary Green Building Code



2008 Voluntary Green Building Code

- California Building Standards Code or also known as California Code of Regulations, Title 24
 - Part 11 – California Green Building Standards Code
 - Effective date August 1, 2009
- First “Green” Building Code in United States

2008 Voluntary Green Building Code

- Contributing State Agencies
 - California Integrated Waste Management Board
 - Department of General Services
 - Department of Public Health
 - Department of Water Resources
 - Energy Resources Conservation and Development Board

2008 Voluntary Green Building Code

- Additional Resources Used
 - Collaborative for High Performance Schools (CHPS)
 - United States Green Building Council (USGBC)
 - Leadership in Energy and Environmental Design (LEED)
 - Green Globes
 - UC Berkeley Green Building Baseline
 - Draft ASHRAE Standard 189P

2008 Voluntary Green Building Code

- Purpose:

- *“ ... improve public health, safety and general welfare by enhancing the design and construction of buildings through the use of building concepts having a positive environmental impact and encouraging sustainable construction practices in the following categories:*

1. *Planning and design*
2. *Energy efficiency*
3. *Water efficiency and conservation*
4. *Material conservation and resource efficiency*
5. *Environmental air quality”*

2008 Voluntary Green Building Code

- Transitional Document:
 - *“Green building standards contained in Part 11, Title 24 are not adopted at this time for mandatory application to public schools and community colleges. DSA-SS will be proposing the adoption of green building standards into Part 11 of the 2010 edition Title 24 California Building Standards Code.”*
 - Section 105.1.3

2010 Mandatory Green Building Code

- First Mandatory Statewide “Green” Building Code in US



2010 Mandatory Green Building Code

- California Building Standards Code or also known as California Code of Regulations, Title 24
 - Part 11 – California Green Building Standards Code
 - Effective date January 1, 2010
- Draft Version Only
 - “Pending publication by the International Code Council”
- Mandatory **AND** Voluntary Tiers

2010 Mandatory Green Building Code

- Specific Mandatory Requirements for School Projects:
 - Note that the new green building code applies to many different building types and jurisdictions.
 - Only those items identified in the draft code by “[DSA-SS]” banner in the section leaders will apply to applicable school projects

2010 Mandatory Green Building Code

- Application – Public elementary and secondary schools:
 - *“New construction on new campus site or new construction on an existing site cleared of all existing structures.”* - Section 105.1.1

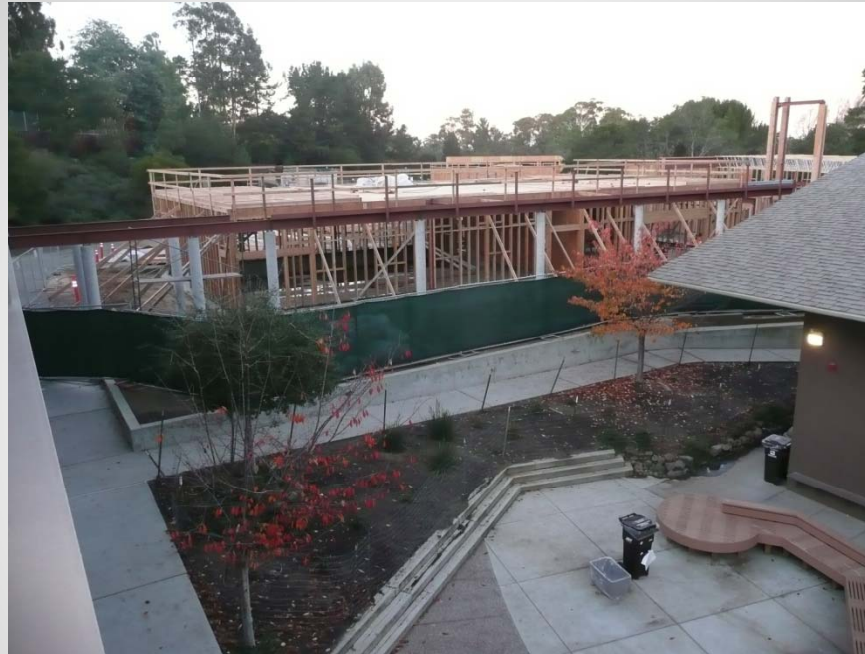


2010 Mandatory Green Building Code



- **Not** required on Renovation / Modernization projects

2010 Mandatory Green Building Code



- **Not** required for New Buildings on existing campus if any existing building remains

2010 Mandatory Green Building Code



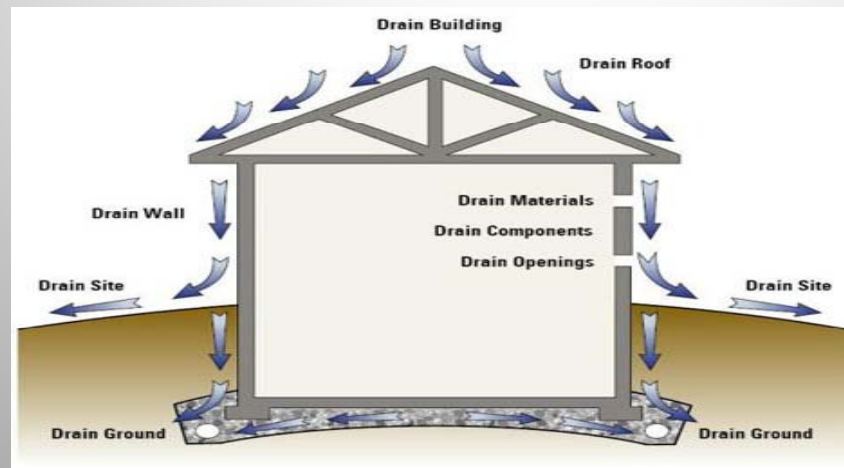
- 5.106.8 Light Pollution Reduction

2010 Mandatory Green Building Code

- 5.106.8 Light Pollution Reduction
 - Comply with California Energy Code, CCR, Part 6
 1. Shield all exterior luminaires or cutoff luminaires
 2. Contain interior lighting within each light source
 3. Allow no more than .01 horizontal foot-candles to escape 15 feet beyond site boundary
 4. Automatically control exterior lighting dusk to dawn to turn off or lower light levels during inactive periods
 - Exceptions for emergency lighting and campus security
- Currently required for schools by other code sections

2010 Mandatory Green Building Code

- 5.106.10 Grading and Paving
 - Site shall be planned and developed to keep surface water from entering buildings.
 - Construction plans shall indicate how site grading or a drainage system will manage all surface water flows.
- Currently required for schools by other code sections



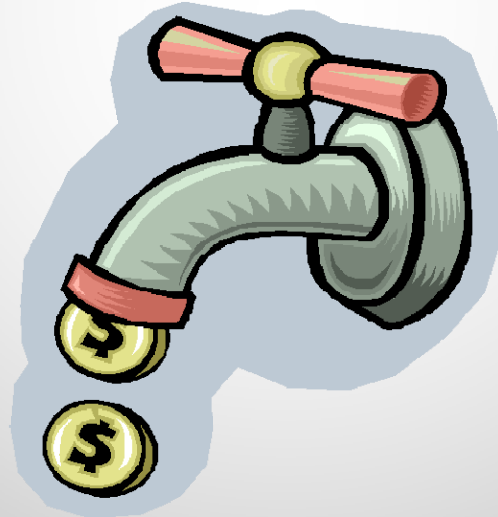
2010 Mandatory Green Building Code

- 5.201.1 Energy Efficiency
 - The California Energy Commission will continue to adopt mandatory building standards.
 - Intent of this new code is to encourage buildings to achieve exemplary performance in the area of energy efficiency.
 - Further noted that “green buildings” should achieve at least 15% reduction in energy usage from code.
- Currently required for schools by other code sections



2010 Mandatory Green Building Code

- 5.303.2 Indoor Water Use 20% Savings
 - Plumbing fixtures and fittings schedule needs to be provided that will reduce the overall potable water consumption within the building by 20%.



2010 Mandatory Green Building Code

- 5.303.2 Indoor Water Use 20% Savings
 - Reduction based on maximum allowable by California Building Standards Code.
 - Reduction must be demonstrated by one of the following:
 1. Each fixture shall meet the 20% reduced flow rate specified in Table 5.303.2.3 or
 2. A calculation demonstrating a 20% reduction in the building “water use baseline” as established in Table 5.303.2.2
- 5.303.4 Wastewater Reduction
 - Each building shall reduce by 20% wastewater by installation of water conserving fixtures meeting the criteria established in sections 5.303.2 or 5.303.3.

2010 Mandatory Green Building Code

- 5.303.6 Plumbing Fixtures and Fittings
 - Plumbing fixtures and fittings to meet standards referenced in Table 5.503.6 (ASME, USEPA, & ANSI standards)
- New Statewide Code requirement for schools
 - Currently required by some local water jurisdictions
 - Cost savings for campuses with metered water



2010 Mandatory Green Building Code

- 5.407 Water Resistance and Moisture Management
 - 5.407.1 Weather Protection
 - Provide a weather-resistant exterior envelope as required by California Building Code Section 1403.2 and California Energy Code Section 150.
- Currently required for schools by other code sections



2010 Mandatory Green Building Code

- 5.407 Water Resistance and Moisture Management
 - 5.407.2 Moisture Control
 - 5.407.2.1 Sprinklers: Design and maintain landscape irrigation to prevent spray on structures.
- New Code requirement for schools
 - Does this really need to be a code requirement?



2010 Mandatory Green Building Code

- 5.407 Water Resistance and Moisture Management
 - 5.407.2 Moisture Control
 - 5.407.2.2 Entries and Openings: Design exterior entries and / or openings subject to foot traffic or wind-driven rain to prevent water intrusion into buildings.
- New Code requirement for schools
 - Bad design no longer allowed by code



2010 Mandatory Green Building Code

- 5.408 Construction Waste Reduction, Disposal and Recycling
 - 5.408.1 Construction Waste Diversion



- Establish a construction waste management plan for the diversion of 50% of the materials, or meet local construction ordinances, whichever is more stringent.

2010 Mandatory Green Building Code

- 5.408 Construction Waste Reduction, Disposal and Recycling
 - 5.408.2 Construction Waste Management Plan
 - Where local jurisdiction does not have ordinance, submit plan to enforcement agency that will:
 1. Identify materials to be diverted
 2. Determine if materials will be sorted at site or mixed
 3. Identify diversion facilities
 4. Specify amount of materials calculated by weight or volume

2010 Mandatory Green Building Code

- 5.408 Construction Waste Reduction, Disposal and Recycling
 - 5.408.2.1 Documentation
 - Submit to enforcement agency demonstrating compliance. – Form included in appendix
 - Plan is required to be updated and available on site for examination
- New Code requirement for schools
 - Already required by most local jurisdictions
 - Typically less costly for contractor than landfill fees

2010 Mandatory Green Building Code

- 5.410 Building Maintenance and Operation
 - 5.410.1 Recycling by Occupants
 - Provide readily accessible areas that service entire building and are identified for recycling. Including at a minimum:
 - Paper, cardboard, glass, plastics, and metals.
 - 5.410.2 Sample Ordinance
 - Space allocation for recycling areas shall comply with California Solid Waste Reuse and Recycling Access Act of 1991
 - Chapter 18, part 3, Division 30 of the Public Resource Code
- New Code requirement for schools
 - Minor to no initial cost impact with operational savings
 - Educational component



2010 Mandatory Green Building Code

- 5.504 Pollutant Control
 - 5.504.3 Covering of duct openings and protection of mechanical equipment during construction
 - Requires ducts and mechanical equipment to be sealed while stored at jobsite and during installation until equipment start-up.



- New Code requirement for schools
 - Minor to no cost impact – Good practice

2010 Mandatory Green Building Code

- 5.504.4 Finish Material Pollutant Control
 - 5.504.4.1 Adhesives, Sealant, and Caulks
 - Requires compliance with local or regional air pollution control or air quality management rules or South Coast Air Quality Management District (SCAQMD) Rule 1168 VOC limits.
 - Table 5.504.4.1 provides VOC limits for adhesives
 - Table 5.504.4.2 provides VOC limits for sealants



2010 Mandatory Green Building Code

- 5.504.4 Finish Material Pollutant Control
 - 5.504.4.3 Paints and Coatings
 - Requires compliance with VOC limits in ARB's Table 1 as shown in Table 5.504.4.3 unless more stringent local limits apply.
 - 5.504.4.3.1 Aerosol Paints and Coatings requirements
 - 5.504.4.3.2 Verification of compliance shall be provided at the request of enforcing agency.



2010 Mandatory Green Building Code

- 5.504.4 Finish Material Pollutant Control
 - 5.504.4.4 Carpet Systems
 - All interior carpet shall meet the testing and product requirements of one of the following:
 - Carpet and Rug Institutes' Green Label Plus Program
 - Calif. Dept. of Public Health Standard Practice for the testing of VOC's
 - NSF/ANSI 140
 - Scientific Certifications Systems Sustainable Choice
 - 5.504.4.1 Carpet Cushion
 - Must meet Carpet and Rug Institute's Green Label Program
 - 5.504.4.2 Carpet Adhesive
 - Must meet requirements of table 5.504.4.1



2010 Mandatory Green Building Code

- 5.504.4 Finish Material Pollutant Control
 - 5.504.4.6 Resilient Flooring Systems
 - 50% of floor area receiving must be in compliance with the VOC-emission limits defined in either:
 - 2009 Collaborative for High Performance Schools (CHPS) criteria and listed on its low emitting material list, or
 - Resilient Floor Covering Institute (RFCI) FloorScore program.
 - Documentation shall be provided that verifies that the finish materials are certified to meet pollutant emissions limits



2010 Mandatory Green Building Code

- 5.504.4 Finish Material Pollutant Control



- 5.504.5.3 Filters

- Minimum Efficiency Reporting Value (MERV) of 8 required for all occupied spaces.

2010 Mandatory Green Building Code

- 5.504.4 Finish Material Pollutant Control - Summary
 - Adhesives, Sealants, and Caulks
 - Paints
 - Carpet
 - Resilient Flooring
 - Air Filters
- New Code requirements for schools
 - VOC limitations already required by many local jurisdictions
 - Resolves some industry confusion on varying requirements
 - Limits some material choices
 - Minor initial cost impact
 - Long term health benefits (increased ADA)
 - Some increased and some reduced M&O



2010 Mandatory Green Building Code

- 5.505.1 Indoor Moisture Control
 - Meet or Exceed California Building Code, CCR, Title 24, Part 2 Sections 1203 (Ventilation) and Chapter 14 (Exterior walls)
- 5.506 Indoor Air Quality
 - 5.506.1 Outside Air Delivery
 - Meet the minimum requirements of Section 121 (Ventilation) of the California Energy Code, CCR, Title 24, Part 6, or the applicable local code, whichever is more stringent, and Chapter 4 of CCR, Title 8.
- Currently required for schools by other code sections

2010 Mandatory Green Building Code

- 5.508 Outdoor Air Quality
 - 5.508.1 Ozone depletion and greenhouse gas reductions
 - Installations of HVAC, refrigeration, and fire suppression equipment shall comply with Sections 5.508.1.1
 - 5.508.1.1 Chlorofluorocarbons (CFC's)
 - No CFC's
- Currently required for schools by other code sections and regulations

2010 Mandatory Green Building Code

- Chapter 7 – Installer and Special Inspector Qualifications
 - 702.4 Special Inspectors
 - The enforcing agency may require special inspection to verify compliance with this code
 - Special inspector to demonstrate competency to the satisfaction of enforcing agency.



- Currently required for schools for other items
 - Unclear what, if any, new requirement(s)

2010 Mandatory Green Building Code

- Chapter 7 – Installer and Special Inspector Qualifications
 - 703.2 Documentation
 - Verification of compliance with this code shall include:
 - Construction documents, plans, specifications
 - Builder or installer certification
 - Inspection reports, or other methods acceptable to the enforcing agency which show substantial conformance.
 - Where specific documentation is necessary to verify compliance, that method of compliance will be specified in the appropriate section
- New code requirement
 - Ramifications unclear
 - Likely minor to no cost increase



2010 Voluntary Measures

- Appendix A5 - Site Development
 - Bicycle parking and changing rooms
 - Clean Air Vehicle parking spaces
 - Electric vehicle charging
 - Reduction of parking
 - Exterior wall shading (or SRI 25 wall finish)
 - Building orientation
 - South window shading
 - Hardscape alternatives (shade, light color, or open-grid)
 - Cool roofs



2010 Voluntary Measures

- Appendix A5 - Energy Efficiency
 - Performance Approach
 - Tier 1: Exceed Title 24 by 15%
 - Tier 2: Exceed Title 24 by 30%
 - Based on 2008 Energy Efficiency Standards
 - Energy Efficiency – Prescriptive Approach
 - ENERGY STAR equipment and appliances
 - Energy Monitoring
 - Data Storage
 - Data Access



2010 Voluntary Measures

- Appendix A5 – Renewable Energy
 - On-Site Renewable Energy
 - Grid Neutral (35%, 75% and 100%)
 - *“A site that produces at least as much electricity as it uses in a year shall be deemed grid neutral.”*
 - Location of elevators and stairs



2010 Voluntary Measures

- Appendix A5 – Water Efficiency and Conservation
 - Indoor Water Use
 - 30% savings
 - Appliances (10% below CEC standards)
 - Outdoor Water Use
 - Water budget (CDWR model)
 - Potable water reduction (50% reduction from water budget)



2010 Voluntary Measures

- Appendix A5

Material Conservation and Resource Efficiency

- Efficient Framing Techniques
- Recycled Content (10% RCV)
- Choice of Material
 - Service Life
 - Recyclability
- Construction Waste Reduction (80% diversion)
- Commissioning

2010 Voluntary Measures

- Appendix A5 – Pollutant Control
 - Temporary ventilation During Construction
 - IAQ Measures During Construction
 - IAQ Post Construction
 - Early compliance with CARB Formaldehyde limits
 - Resilient Flooring (80% to meet CHPS VOC limits)
 - Thermal insulation
 - Acoustical ceiling tiles
 - Walk-off mats
 - Isolation of pollutant sources
 - MARV 11 filters

2010 Voluntary Measures

- Appendix A5 – Environmental Comfort
 - Lighting and HVAC controls
 - Individual occupant's ability to control lighting and HVAC
 - Daylighting
 - Light Shelves and reflective surfaces
 - Glare control
 - Photo sensors
 - View preservation
 - Views
 - Direct line of sight to outdoor
 - Acoustic control
 - 45dBA max with .6 reverberation



Conclusions

- **Mandatory Requirements**
 - Not a significant impact for schools (DSA)
 - Most are already required by code or applicable local jurisdictions
 - Likely will be some confusion on interpretations
 - Not clear how DSA will enforce compliance
- **Voluntary Measures**
 - Predictive of future mandatory requirements

Questions & Answers

References Used and Useful Resources:

CalGreen Web Page:

www.bsc.ca.gov/CALGreen

Division of the State Architect (DSA)

www.dsa.dgs.ca.gov

Mike Wassermann's e-mail

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EDUCATIONAL FACILITY
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Q and A



Questions?

Meeting Adjourned

Thank you for joining us today!

5/13/2010

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