

ASHRAE

presents

CAL Green



Introductions

California Building Standards Commission

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Associate Construction Analyst



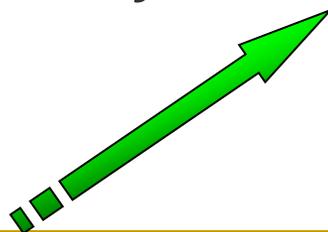
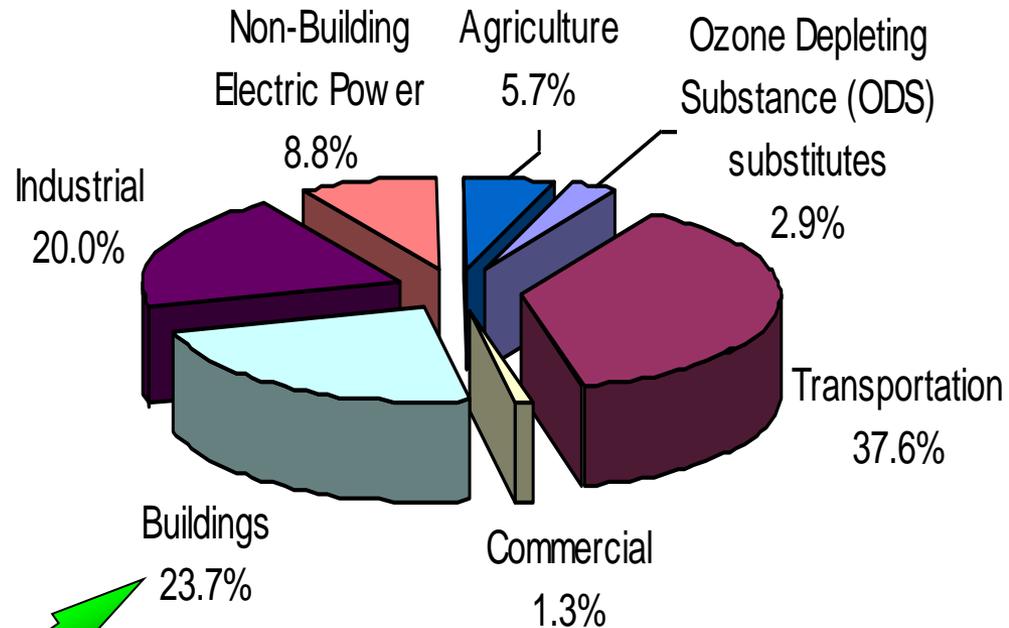
Today's Objectives

- **Why a CALGreen Code**
- **How the CALGreen Code was developed**
 - Rulemaking process
 - Transparency of process
- **Overview of Non-Residential Code Provisions**

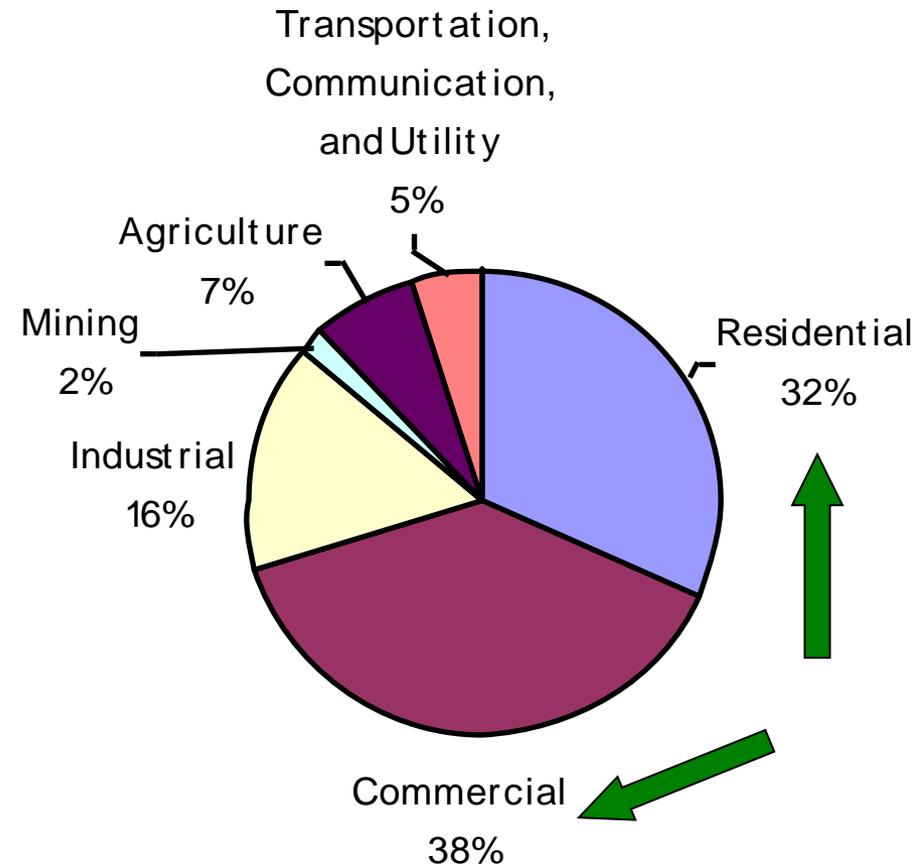
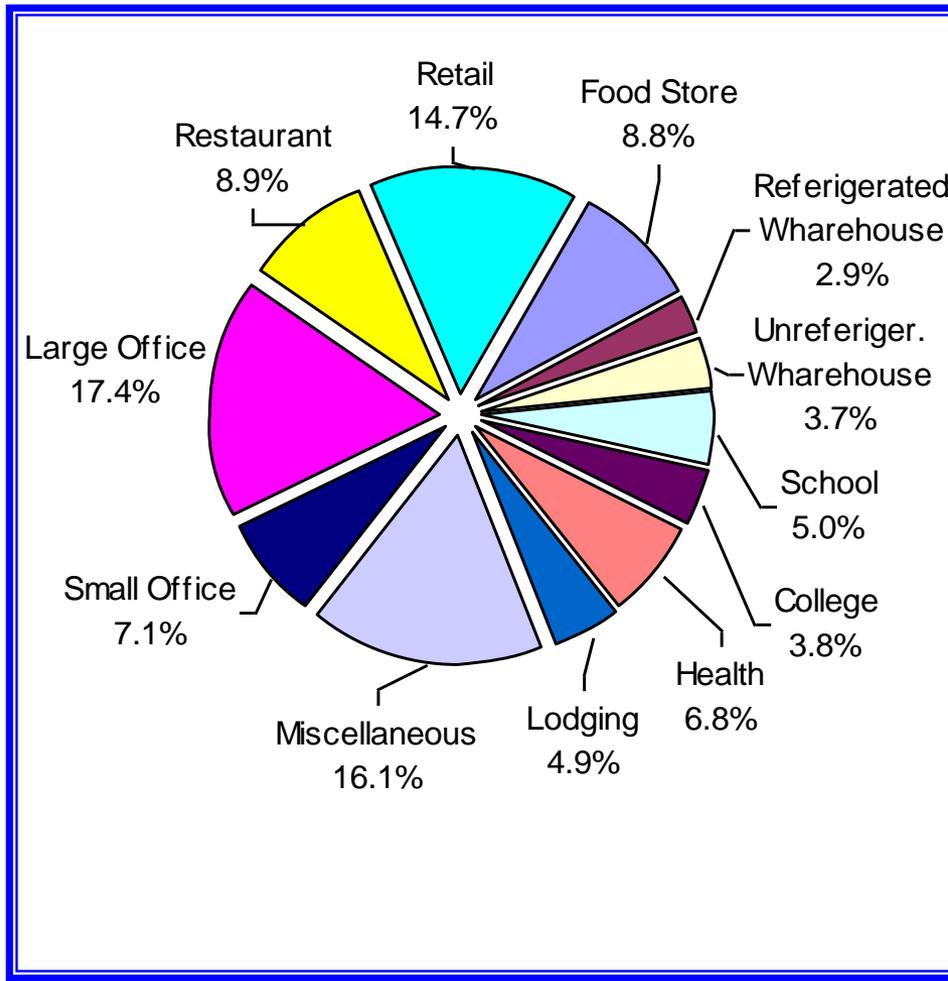
California Green Building Initiative & Global Warming Solutions Act of 2006 (EO S-20-04 & AB32)

- Buildings are 2nd largest contributor (23.7%) to GHG emissions
- EO S-20-04: Reduce grid-based electricity by 20% in state-owned buildings by 2015; reduce associated greenhouse gas emissions
- AB 32: Reduce GHG emissions to 1990 levels by 2020

California GHG Emissions



Energy Use in California



Water Use in California

Executive Order S-06-08

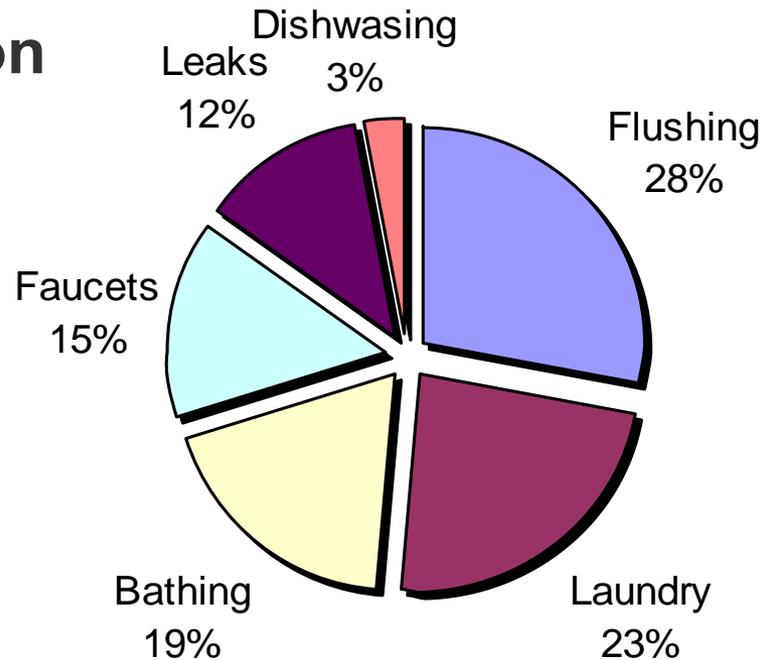
Governor's 2009 Proclamation

Water-related uses account for **19%** of California's electricity, **30%** of its natural gas and **88 billion gallons** of diesel fuel every year.

Water-efficiency measures can reduce water and sewer costs by up to **30 percent**.

Significant savings in energy, chemical and maintenance expenses typically follow.

SOURCE - USGS



Typical Residential Water Use (Indoor use)

50 to 300 gpcd - landscape 50%

Source - Water Education Foundation

Why CALGreen

Uniformity and Consistency

- ❑ Jurisdictions adopting many different programs
- ❑ Works with other California codes
- ❑ Sustainability

■ Governor's Directive

Adopting State Agencies

- ❑ The Department of Housing and Community Development (HCD)
- ❑ Division of the State Architect (DSA)
- ❑ Office of Statewide Health Planning and Development (OSHPD)
- ❑ California Building Standards Commission (CBSC)

California Building Standards Commission



- Independent Commission
- State and Consumer Services Agency

California Building Standards Commission

■ Chair

- Secretary of the State and Consumer Services Agency

■ Commissioners (10)

- Appointees specified by law
 - One architect
 - One mechanical, electrical or fire protection engineer
 - One structural engineer
 - One licensed contractor
 - Three public members, at least one must be a person with disabilities
 - One member from organized labor in the building trades
 - One local building official
 - One local fire official
- At least one member knowledgeable in barrier-free architecture
- At least one member knowledgeable in energy efficiency standards

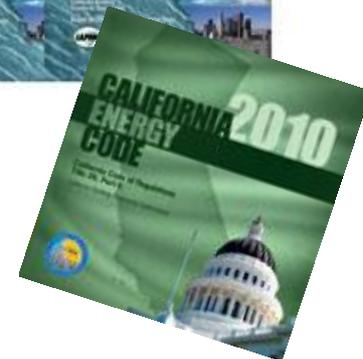
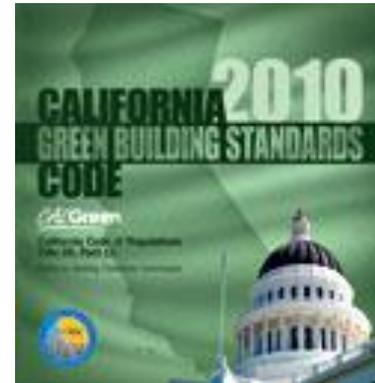
CBSC Responsibilities

- Review building standards proposed by state agencies
- Develop building standards for occupancies where no other state agency has the authority - non-residential
- Adopt and approve building standards for publication
- File approved building standards with the Secretary of State
- Codify approved building standards
- Contract to publish the California Building Standards Code
- Act as the state depository for local government modifications

2010 California Building Standards Code – Title 24

(effective January 1, 2011)

- ❑ Part 1 - California Administrative Code
- ❑ Part 2 - California Building Code
- ❑ Part 2.5 California Residential Code
- ❑ Part 3 - California Electrical Code
- ❑ Part 4 - California Mechanical Code
- ❑ Part 5 - California Plumbing Code
- ❑ Part 6 - California Energy Code
- ❑ *Part 7 - Vacant*
- ❑ Part 8 - California Historical Building Code
- ❑ Part 9 - California Fire Code
- ❑ Part 10 - California Existing Building Code
- ❑ **Part 11 - California Green Building Standards Code**
- ❑ Part 12 - California Referenced Standards Code



CALGreen

• Development of CALGreen

- CBSC's and HCD's Stakeholder Green Building Focus Group
 - Building officials
 - Representatives from the construction industry
 - Representatives from model code writing bodies
 - Representatives from the environmental community
 - Representatives from point rating programs
 - State agency representatives
 - Public members

Contributing State Agencies

- ❑ Air Resources Board
- ❑ California Integrated Waste Management Board (CalRecycle)
- ❑ Department of General Services
- ❑ Department of Water Resources
- ❑ Energy Resources Conservation and Development Commission (Energy Commission)
- ❑ Department of Public Health

Additional resources utilized in developing California Green Building Standards Code

- ❑ Collaborative for High Performance Schools (CHPS)
- ❑ California Green Builder
- ❑ Leadership in Energy and Environmental Design (LEED)
- ❑ Green Globes
- ❑ Scottsdale Arizona Checklist
- ❑ Build It Green
- ❑ UC Berkeley Green Building Baseline
- ❑ Draft ASHRAE Standard 189P

Building Standards Formal Adoption Process Administration Procedure Act

- **Code Advisory Committees**
- **Public Comment Period**
 - 45 day and 15 Day
- **Public Hearings**
 - If requested
- **Commission Meeting**
 - Public comments

California Green Building Standards Code

- **Initial Voluntary Standards**
 - Effective August 1, 2009
- **City and County Adoption**
- **2010 Mandatory Standards**
 - Effective January 1, 2011
- **Next Adoption Cycle**

Support for CALGreen

- Laborers International

LiUNA!

Feel the Power



California Building
Industry Association



- AIACC

- NRDC

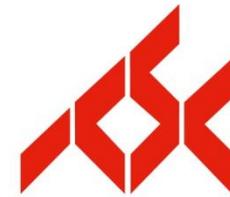
- CAL Chamber

- EDF

- CBPA



California
Business
Properties
Association



International Council of Shopping Centers

NAIOP

COMMERCIAL REAL ESTATE
DEVELOPMENT ASSOCIATION

NAIOP OF CALIFORNIA

*CAL*Green

California Green Building Standards Code

■ Chapter 1 Administration

- Purpose (101.2)
 - Environmental impact
- Scope (101.3)
 - New construction
 - Not intended to be identified as meeting the requirements of a point rated system
- Local amendments based on findings (101.7)
 - Climate
 - Topography
 - Geology
- Alternate Materials and Methods (101.8)
- Construction Documents (102)
- Application and State Agency Authorities (103 - 106)
- Effective Use of the Code (101.11)

California Green Building Standards Code

■ Chapter 1 Administration

- ❑ Effective Use of the Code (101.11)
- ❑ 1. Establish the type of occupancy.
- ❑ 2. Verify which state agency has authority
- ❑ 3. find the chapter which covers the established occupancy.
- ❑ 4. The Matrix Adoption Tables at the beginning of Chapters
- ❑ 5. Voluntary tier measures are contained in Appendix Chapters A4 and A5.
- ❑ A checklist containing each green building measure, both required and voluntary, is provided at the end of each appendix chapter.
- ❑ 6. The application checklist identifies which measures are required by the code and allows users to check off both mandatory and voluntary items.

California Green Building Standards Code

- **Matrices**

- **Chapter 2 Definitions**

- If used in more than one location in the code a defined term will be located in Chapter 2
- If only used in one chapter the defined term will be located in the definition section at the beginning of that chapter
- Banners will tell which agency adopts
 - **CONDITIONED FLOOR AREA. [BSC, HCD]**

California Green Building Standards Code

■ Chapter 3 Green Building

□ Scope

- Newly constructed buildings

□ Mixed Occupancy Buildings

- Shall comply with appropriate requirements for each separate occupancy type

□ Phased Projects

□ Voluntary Tiers

- Tier 1 and Tier 2

California Green Building Standards Code

- **Chapter 4 Residential Mandatory Measures**
- **Chapter 5 Nonresidential Mandatory Measures**
- **Chapter 6 Reference Organizations and Standards**
- **Chapter 7 Installer and Special Inspector Qualifications**
- **Chapter 8 Compliance Forms and Worksheets**

California Green Building Standards Code

- **Checklists**
- **Chapter A4**
 - Residential Tiers and Electives
- **Chapter A5**
 - Nonresidential Tiers and Electives

California Building Standards Commission

Chapter 5

Nonresidential Mandatory Measures

- Planning and Design – Division 5.1
- Energy Efficiency – Division 5.2
- Water Efficiency and Conservation – Division 5.3
- Material Conservation and Resource Efficiency – Division 5.4
- Environmental Quality – Division 5.5

PLANNING AND DESIGN –

Chapter 5-Division 5.1

Site Development

- Storm water soil loss prevention plan (previously SWPPPs)
 - New projects less than one acre
 - BMP's from SWPPPs 1998
- **2010 SWPPPs is currently required for all projects one acre or more of disturbed soil**

PLANNING AND DESIGN –

Chapter 5-Division 5.1

Site Development - Erosion and sediment control BMPs

- a. Scheduling construction activity
- b. Preservation of natural features, vegetation and soil
- c. Drainage swales or lined ditches to control stormwater flow
- d. Mulching or hydroseeding to stabilize soils Erosion control covers to protect slopes
- e. Protection of storm drain inlets (gravel bags or catch basin inserts)
- f. Perimeter sediment control (perimeter silt fence, fiber rolls)
- g. Sediment trap or sediment basin to retain sediment on site
- h. Stabilized construction exits
- i. Wind erosion control

PLANNING AND DESIGN –

Chapter 5-Division 5.1

Site Development

- Bicycle parking
 - Short-term bicycle parking
 - 5% of visitor parking capacity
 - Long-term bicycle parking
 - 5% of total parking capacity



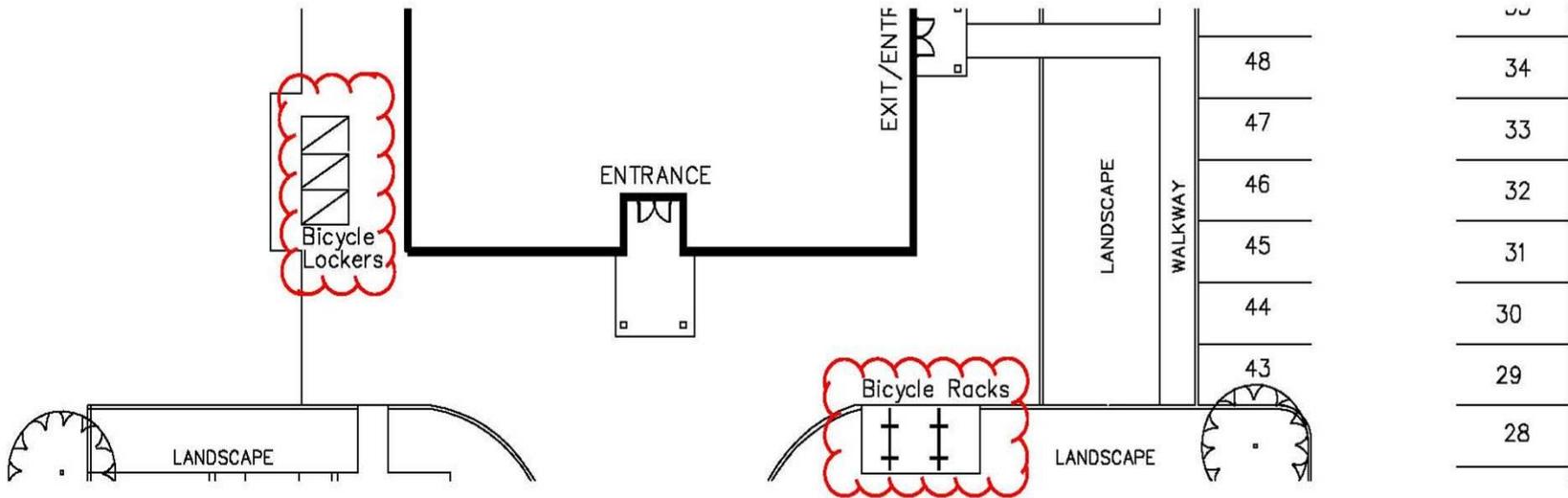
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PLANNING AND DESIGN –

Chapter 5-Division 5.1

Site Development

- Bicycle parking



PLANNING AND DESIGN –

Chapter 5-Division 5.1

Site Development

- Designated parking for clean air vehicles
 - Stall marking for 8% of total parking capacity
 - Clean air vehicles defined in Section 5.102
 - Not necessarily preferential location

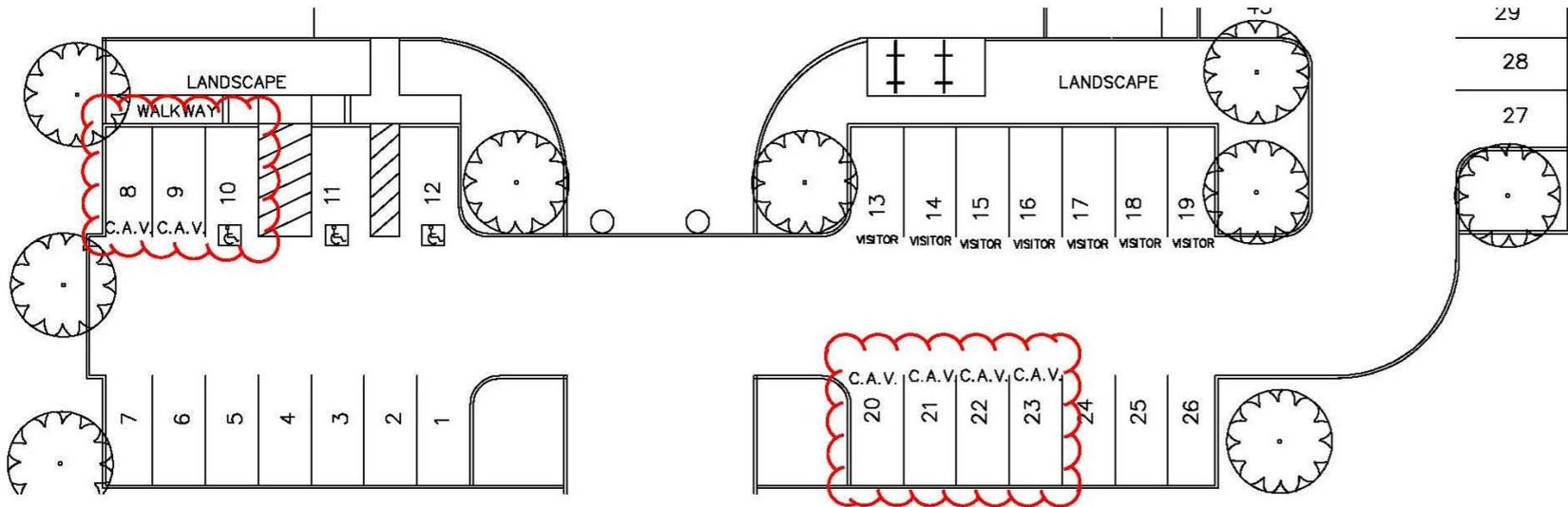


PLANNING AND DESIGN –

Chapter 5-Division 5.1

Site Development

- Designated parking for clean air vehicles



PLANNING AND DESIGN –

Chapter 5-Division 5.1

Site Development (DSA)

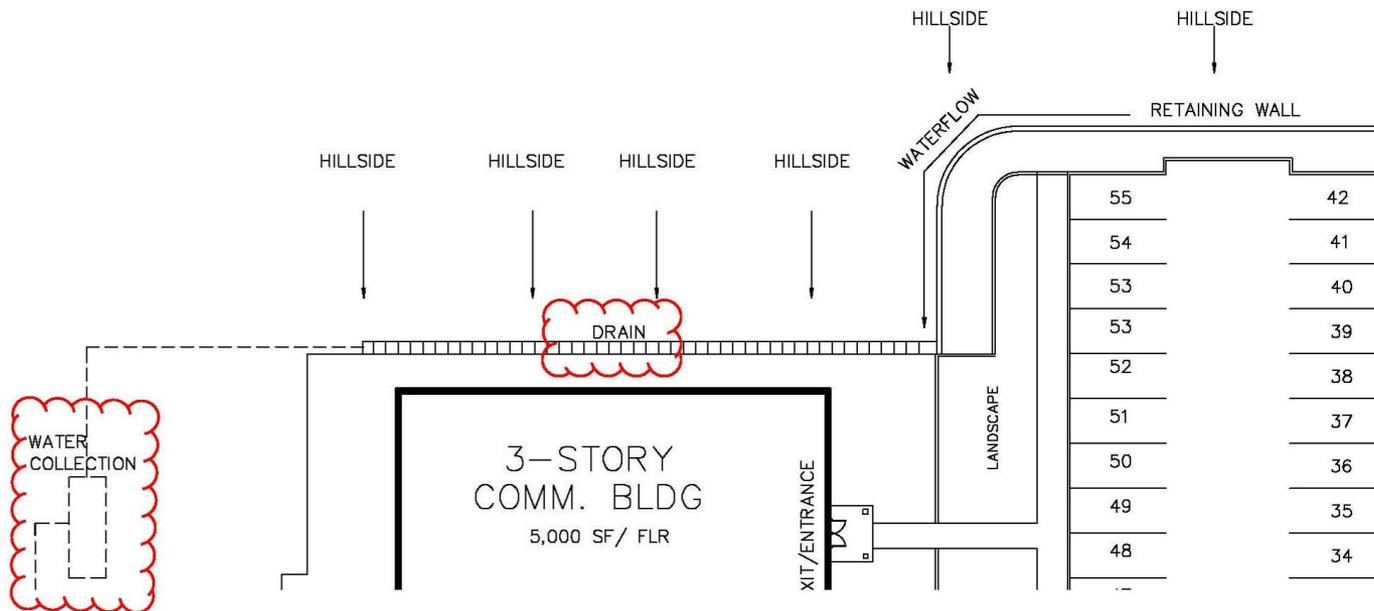
- Light pollution reduction
 - Reference the California Energy Code lighting standards
 - Strategies,
 - Shields, interior light containment within source, automatic controls, etc.
 - Exceptions for emergency lighting and security



PLANNING AND DESIGN –

Chapter 5-Division 5.1

- Grading & paving (DSA)
 - Keep surface water from entering building
 - Grading shown on construction plans



ENERGY EFFICIENCY - Chapter 5-Division 5.2

Mandatory Measures are Regulated by the California Energy Commission (DSA)

- Mandatory provisions are found in Part 6 of Title 24

WATER EFFICIENCY AND CONSERVATION

Chapter 5-Division 5.3

Indoor Water Use

- Separate water submeters
 - Buildings in excess of 50,000 square feet where:
 - Tenants spaces that are projected to use more than 100 gallons per day
 - Buildings or spaces that are projected to consume more than 1000 gallons per day



WATER EFFICIENCY AND CONSERVATION

Chapter 5-Division 5.3

Indoor Water Use (DSA)

- 20% Savings of potable water
 - Performance or prescriptive standards, using tables 5.303.2.2 or 5.303.2.3
 - Multiple showerheads serving one shower
 - Wastewater reduction of 20%
- Standards for plumbing fixtures and fittings
 - Standards referenced in Table 5.503.6

WATER EFFICIENCY AND CONSERVATION

Chapter 5-Division 5.3

Outdoor Water Use

- Develop a water budget that complies with DWR or local agency water budget for landscapes 2,500 square feet and over
- Irrigation design for landscapes between 1,000 to 2,500 square feet
 - Weather or soil moisture-based irrigation controllers
- Separate submeter for outdoor potable water use for landscape areas between 1,000 & 5,000 square feet
 - Currently required by DWR for areas over 5000 sq. ft.



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MATERIAL CONSERVATION AND RESOURCE EFFICIENCY - Chapter 5-Division 5.4

Water Resistance and Moisture Management (DSA)

- Exterior weather protection currently in Title 24 or by local ordinance
- Design for moisture control
 - Prevent spray from sprinklers on structures
 - Prevent entries and openings from water intrusion

MATERIAL CONSERVATION AND RESOURCE EFFICIENCY - Chapter 5-Division 5.4

Construction Waste Reduction, Disposal and Recycling (DSA)

- Construction waste diversion – establish a waste management plan to divert 50%
- Construction waste management plan (WMP)
 - Documentation (see sample form in Chapter 8)
 - permits alternate waste reduction method
 - Exception for areas without diversion facilities and isolated jobsites

100% of excavated soil and land clearing debris

MATERIAL CONSERVATION AND RESOURCE EFFICIENCY - Chapter 5-Division 5.4

Building Maintenance and Operation

- Recycling by occupants
 - Provide readily accessible that serve the entire building and are identified for the depositing of recyclable materials
 - Required by law since 1991
 - Sample ordinance at
CAL Recycle's website



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MATERIAL CONSERVATION AND RESOURCE EFFICIENCY - Chapter 5-Division 5.4

Building Maintenance and Operation

- Commissioning for new buildings 10,000 square feet and over including:
 - Owner's or Owners Representative's Project Requirements (OPR)
 - Basis of Design (BOD)
 - Commissioning plan
 - Functional performance testing
 - Documentation and training
 - Systems manual
 - Systems operations training
 - Commissioning report

MATERIAL CONSERVATION AND RESOURCE EFFICIENCY - Chapter 5-Division 5.4

Building Maintenance and Operation

- Testing and adjusting of systems for new buildings under 10,000 square feet
- **Balancing of HVAC systems**
 - Verification of compliance – inspection verifications and reports

ENVIRONMENTAL QUALITY –

Chapter 5-Division 5.5

Fireplaces

- Direct-vent sealed-combustion gas fireplaces
- Sealed wood-burning fireplaces
- Wood stoves and pellet stoves
 - must comply with U.S. EPA Phase II emission limits



ENVIRONMENTAL QUALITY –

Chapter 5-Division 5.5

Pollutant Control (DSA)

- Covering of duct openings
- Protection of mechanical equipment during construction



ENVIRONMENTAL QUALITY –

Chapter 5-Division 5.5

Pollutant Control (DSA)

- Finish material pollutant control – low VOC-emitting products
 - Adhesives and sealants and caulks
 - Paints and coatings – Air Resources Board standards
 - Aerosol Paints and Coatings
 - Carpet systems – 100%
 - Carpet cushion and carpet adhesives
 - Composite wood products – Air Resources Board standards
 - Resilient flooring – 50% of resilient flooring
 - Verification of compliance may be record of product data or other methods acceptable to the enforcing agency

ENVIRONMENTAL QUALITY –

Chapter 5-Division 5.5

Pollutant Control

- Air filters at least MERV 8
- Environmental tobacco smoke control
 - when plans are with designed with outdoor smoking
 - Local ordinance may apply

ENVIRONMENTAL QUALITY -

Chapter 5-Division 5.5

Indoor Moisture Control (DSA)

- Reference Title 24, Part 2, CBC Section 1203 and Chapter 14 and section 504.7

Indoor Air Quality

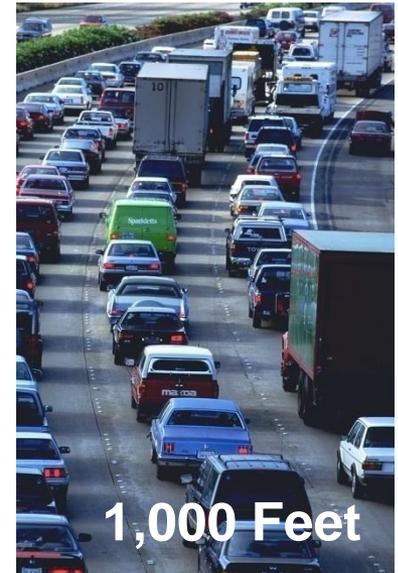
- Outside air delivery - by California Energy Code, local code, or Title 8, whichever is more restrictive
- Carbon dioxide (CO₂) monitoring – for buildings with demand control ventilation comply with per the California Energy Code

ENVIRONMENTAL QUALITY –

Chapter 5-Division 5.5

Environmental Comfort

- Acoustical Control based on ASTM E90 and ASTM E413
 - Exterior noise transmission
 - depends on project location
 - STC 50 walls/roof STC 30 windows
 - Interior sound
 - minimum STC 40 for tenent separations



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California Building Standards Commission

Appendix A5

- ❑ **Nonresidential Voluntary Measures**
- ❑ Grid Neutral (DSA)
- ❑ Energy Electives (OSHPPD)

2010 California Green Building Standards Code

NONRESIDENTIAL VOLUNTARY MEASURES

Appendix A5

The measures contained in the appendix are not mandatory unless adopted by a city, county, or city and county. CALGreen Tier 1 and Tier 2 are intended for adoption by cities, counties, and cities and counties to help California meet its goals for greenhouse gas emission reduction. Appendix provisions may also be used voluntarily by designers, builders, and property owners.

NONRESIDENTIAL VOLUNTARY MEASURES

To achieve CALGreen Tier 1 or Tier 2, one must comply with the following:

- Meet all mandatory requirements;
- Exceed 2008 Energy Efficiency Standards by 15% or 30%;
- Employ additional voluntary measures in all the following areas:
 - Parking for clean air vehicles
 - Cool roofs
 - Reduction of indoor and outdoor water use
 - Construction waste diversion
 - Use of materials with recycled content
 - Installation of low-emitting resilient flooring and thermal insulation; and

NONRESIDENTIAL VOLUNTARY MEASURES

To achieve CALGreen Tier 1 or Tier 2, one must comply with the following:

- **Comply with additional elective measures as follows:**
 - 5 electives for Tier 1
 - 15 electives for Tier 2
- **Application Checklist**
 - Mandatory provisions
 - Provisions required for compliance with tiers

Category	Tier 1	Tier 2
All	Meet all of the provisions of Chapter 5	Meet all of the provisions of Chapter 5
Planning and Design	10% of total parking spaces	12% of total parking spaces
	Cool Roof - Roof Slope < 2:12 SRI 64 Roof - Roof Slope > 2:12 SRI 16	Cool Roof - Roof Slope < 2:12 SRI 78 Roof - Roof Slope > 2:12 SRI 20
	1 additional Elective from Division A5.1	3 additional Electives from Division A5.1
Energy Efficiency	Exceed 2008 CA Energy Code by 15%	Exceed 2008 CA Energy Code by 30%
Water Efficiency and Conservation	30% Savings - Indoor	35% Savings - Indoor
	60% of ETo times the landscape area	55% of ETo times the landscape area
	1 additional Elective from Division A5.3	3 additional Electives from Division A5.3
Material Conservation and Resource Efficiency	At least 65% Const. Waste Diversion	At least 80% Const. Waste Diversion
	Utilize recycled content materials for 10% of total material cost	Utilize recycled content materials for 15% of total material cost
	1 additional Elective from Division A5.4	3 additional Electives from Division A5.4
Environmental Quality	80% of resilient flooring - VOC limits	90% of resilient flooring - VOC limits
	Thermal Insulation - Comply with CHPS VOC limits	Thermal insulation- Install no-added formaldehyde & meet CHPS VOC limits
	1 additional Elective from Division A5.5	3 additional Electives from Division A5.5
Additional Measures	1 Additional Elective from any category	3 Additional Electives from any category

Section 5.408 and A5.408

→ **5.408.3 Construction waste reduction of at least 50%.** [BSC, DSA-SS] Recycle and/or salvage for reuse a minimum of 50% of the non-hazardous construction and demolition debris, or meet a local construction and demolition waste management ordinance, whichever is more stringent. Calculate the amount of materials diverted by weight or volume, but not by both.

Exceptions:

1. Excavated soil and land-clearing debris
2. Alternate waste reduction methods developed by working with local agencies if diversion or recycle facilities capable of compliance with this item do not exist.

5.408.4 Excavated soil and land clearing debris. [BSC, DSA-SS] 100% of trees, stumps, rocks and associated vegetation and soils resulting primarily from land clearing shall be reused or recycled. For a phased project, such material may be stockpiled on site until the storage site is developed.

SECTION A5.408

CONSTRUCTION WASTE REDUCTION, DISPOSAL, AND RECYCLING

→ **A5.408.3.1 Enhanced construction waste reduction** [BSC]. Divert to recycle or salvage non-hazardous construction and demolition debris generated at the site in compliance with one of the following:

Tier 1 At least a 65% reduction.

Tier 2. At least an 80% reduction.

A5.408.3.1.1 Verification of compliance. [BSC] A copy of the completed waste management report shall be provided.

Application Checklist

DRAFT

APPLICATION CHECKLIST FOR BSC	Mandatory	Voluntary CALGreen CALGreen Tier 1 Tier 2		
CONSTRUCTION WASTE REDUCTION, DISPOSAL AND RECYCLING				
5.408.1 Construction waste diversion. Establish a construction waste management plan or meet local ordinance, whichever is more stringent.	☒			
5.408.2 Construction waste management plan. Submit plan per this section to enforcement authority. 5.408.2.1 Documentation. Provide documentation of the waste management plan that meets the requirements listed in section 5.408.2 items 1 thru 4, and the plan is accessible to the enforcement authority. 5.408.2.2 Isolated jobsites. The enforcing agency may make exceptions to the requirements of this section when jobsites are located in areas beyond the haul boundaries of the diversion facility.	☒ ☒	☐	☐	
5.408.3 Construction waste. Recycle and/or salvage for reuse a minimum of 50% of non-hazardous construction and demolition debris or meet local ordinance, whichever is more stringent. Exceptions: 1. Excavated soil and land-clearing debris. 2. Alternate waste reduction methods developed by working A5.408.3.1 Enhanced construction waste reduction. Divert to recycle or salvage non-hazardous construction and demolition debris generated at the site in compliance with one of the following: <div style="border: 1px dashed black; padding: 5px; margin: 5px 0;"> Tier 1. At least a 65% reduction. Tier 2. At least an 80% reduction. </div> A5.408.3.1.1 Verification of compliance. A copy of the completed waste management report shall be provided. Exceptions: 1. Excavated soil and land-clearing debris. 2. Alternate waste reduction methods developed by working with local agencies if diversion or recycle facilities capable of compliance with this item do not exist.	☒ ☒	 ☒	 ☒	



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California Building Standards Commission - Windows Internet Explorer

http://www.bsc.ca.gov/default.htm

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California Building Standards Commission

CA.GOV Building Standards Commission DGS

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Office of Governor Jerry Brown Visit his Website

Buildings Standards Commission Executive Director David Walls

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REPORTING TRANSPARENCY IN GOVERNMENT

CALIFORNIA BUILDING STANDARDS COMMISSION CBSC

Welcome to the California Building Standards Commission Website

Notice: All DGS websites will be down due to building power maintenance. Friday February 18th 5:00 PM - Tuesday February 22nd 7:00 AM. We apologize for any inconvenience this may cause.

Welcome to the California Building Standards Commission website. CBSC is responsible for administering California's building codes, including adopting, approving, publishing, and implementing codes and standards. This site provides information on:

- **Green California Summit Scheduled for 2011** - <http://www.green-technology.org/qcsummit/calgreenacademy.html>
- Read the **CALGreen** story (PDF)
- **2010 California Green Building Standards (CALGreen) Code** (PDF), Mandatory provisions effective **January 1, 2011**.
- *California Building Standards Commission Meetings are now webcast* - <http://www.dca.ca.gov/stream/audiocast.aspx>
Link is active five minutes prior to meeting start times.
- **Guide to Title 24** - First Edition, January 2011
- **California Building Standards Glossary of Terms**
- **Frequently Asked Questions (FAQ's)**
- **2010 Annual Code Adoption Cycle**
- **Final Commission Approval of PEX**
- **Errata**
 - Items identified by the BSC for the 2010 code standards (PDF)
 - Errata in PDF for the 2010 California Mechanical & Plumbing Code <http://www.iapmo.org/pages/default.aspx> and <http://www.iapmo.org/Pages/CodeErrata-Addendums-FormalInterpretations.aspx>
- California Green Building Standards Code serves as key source for new **International Code**.
- For the latest news regarding the **H1N1 Flu Virus**. See The California Department of Public Health web site.

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Questions?



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CAL Green
