

*Presentation for:  
American Society of  
Plumbing Engineers*

# **CAL Green**



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# Introduction

## California Building Standards Commission

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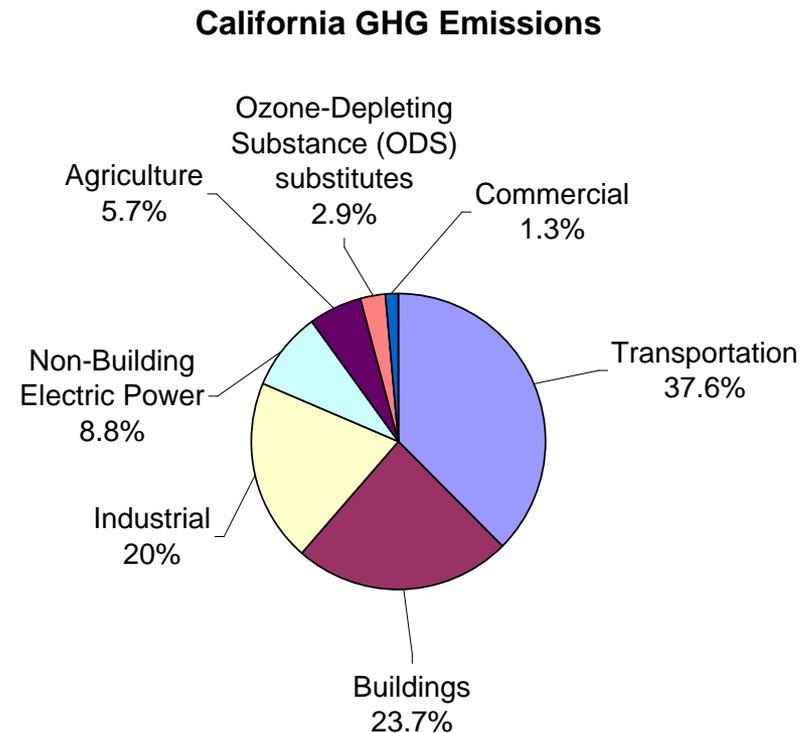
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# Today's Objectives

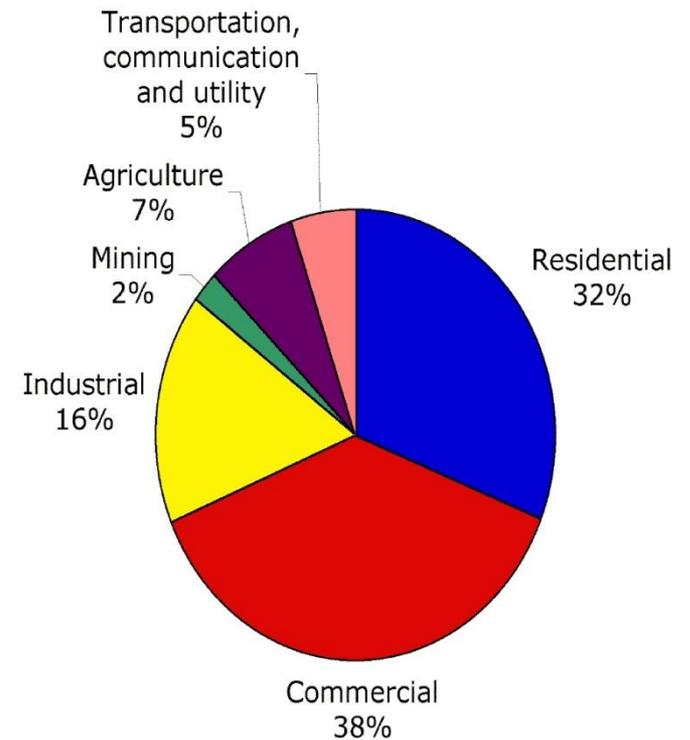
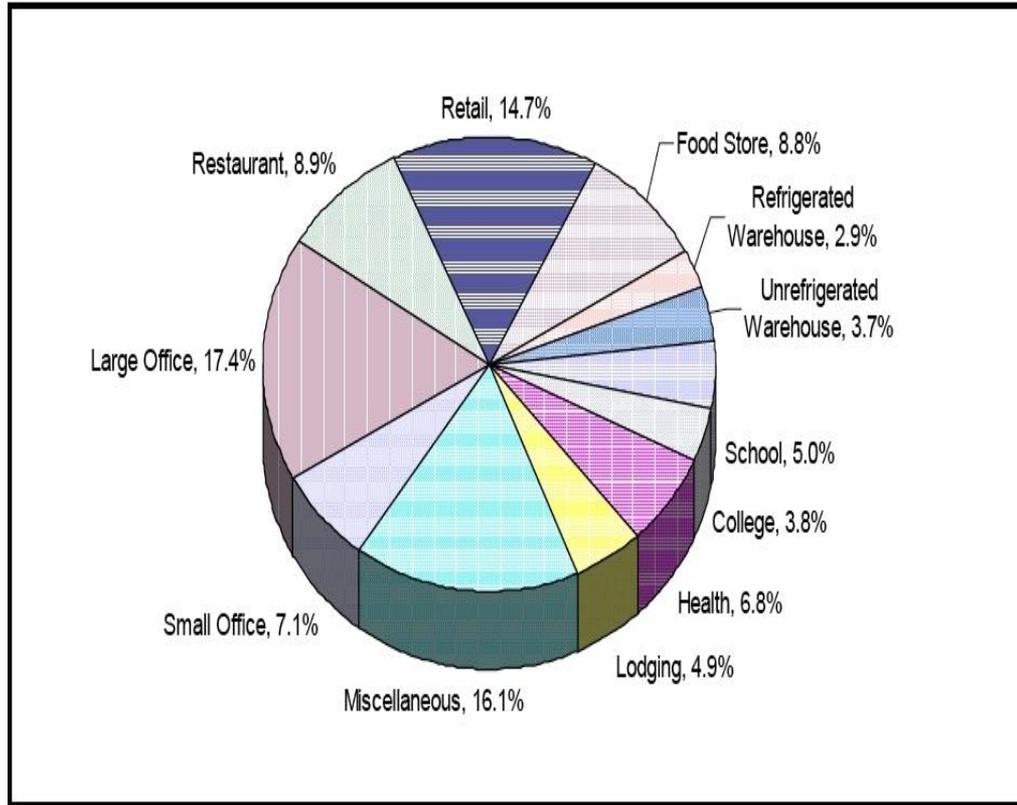
- **Why a CALGreen Code**
- **How the CALGreen Code was developed**
  - Rulemaking process
  - Transparency of process
- **Overview of Code Provisions**

# 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



# Energy Use in California



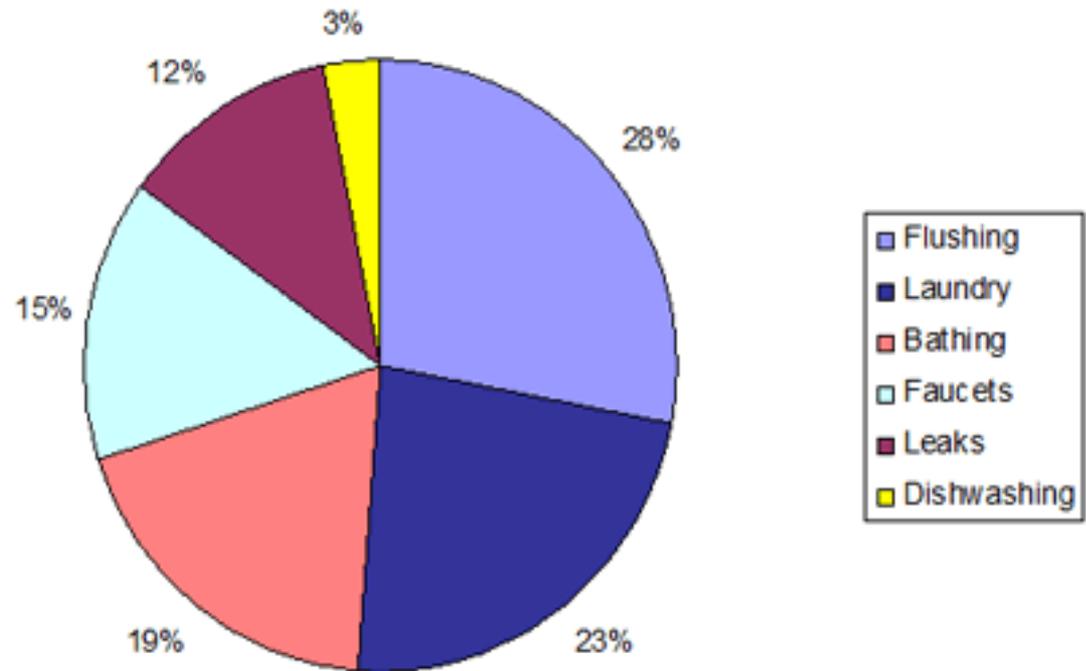
# Water Use in California

## 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 often follow.

SOURCE - USGS



Typical indoor residential water usage

50 to 300 gpcd - landscape 50%

Source - Water Education Foundation

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# Adopting State Agencies

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

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# 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

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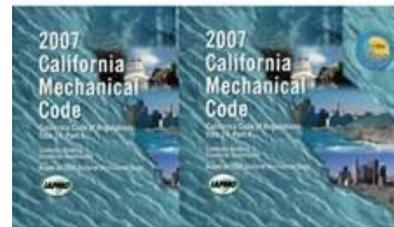
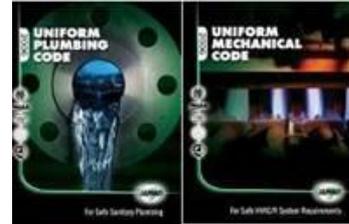
# CBSC Responsibilities

- 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**

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# Stakeholder Focus Group

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

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# Contributing State Agencies

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

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# Additional resources utilized in developing California Green Building Standards Code

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

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# Administration Procedure Act

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

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# 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**

# 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)

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# 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]**

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# 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

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# 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**

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# California Green Building Standards Code

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

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# California Building Standards Commission

## Chapter 5

### Nonresidential Mandatory Measures

- Planning and Design
- Energy Efficiency
- Water Efficiency and Conservation
- Material Conservation and Resource Efficiency
- Environmental Quality

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# PLANNING AND DESIGN –

## Chapter 5-Division 5.1

### Site Development

- Storm water pollution prevention plan (SWPPPs)
  - New projects less than one acre
  - Currently required for all projects one acre or more

# 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

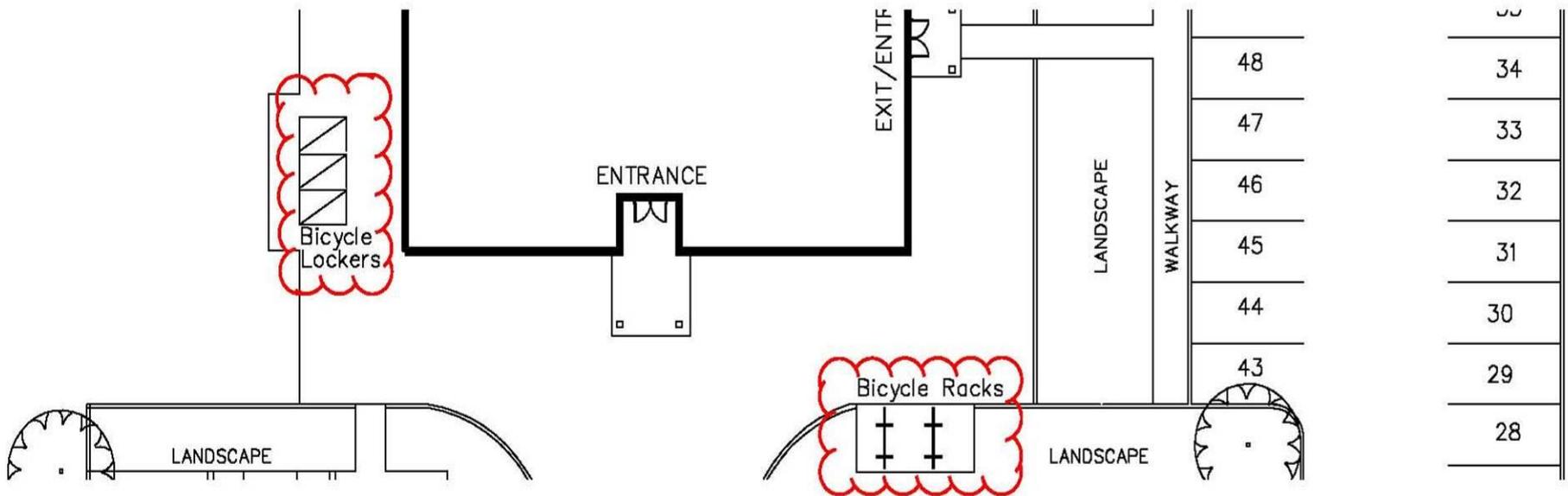


# PLANNING AND DESIGN –

## 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
  - Vehicles defined in Section 5.102
  - Not necessarily preferential location

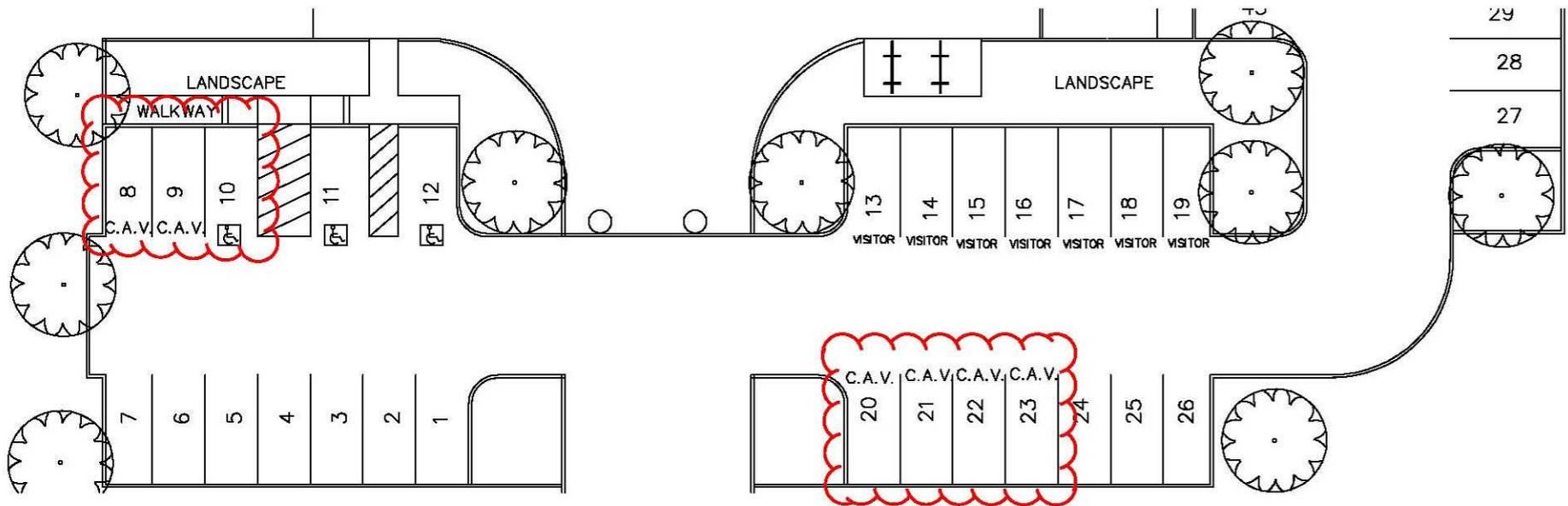


# PLANNING AND DESIGN -

## Chapter 5-Division 5.1

### Site Development

- Designated parking for clean air vehicles



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# PLANNING AND DESIGN –

## Chapter 5-Division 5.1

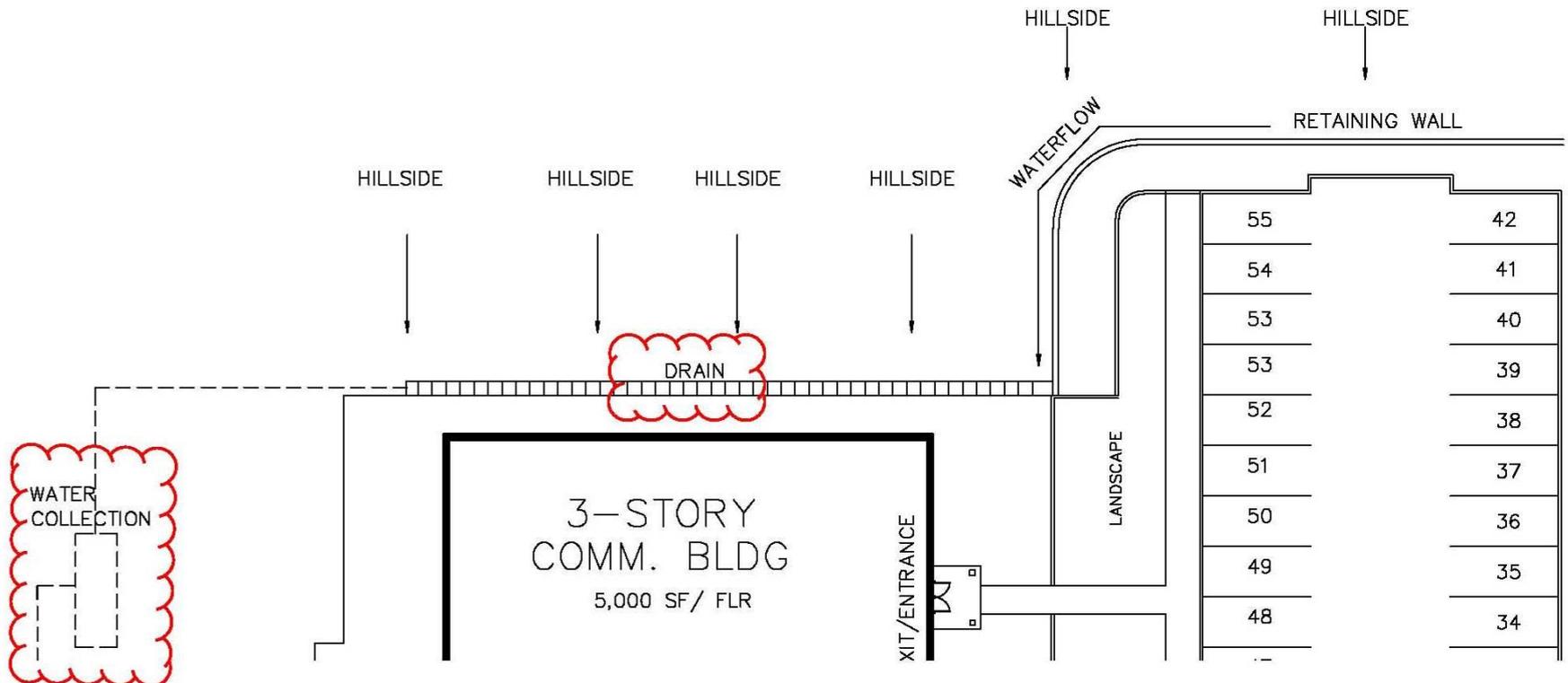
### Site Development

- Light pollution reduction (DSA)
  - Reference the California Energy Code lighting standards
  - 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



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# **ENERGY EFFICIENCY** - Chapter 5-Division 5.2

## **Mandatory Measures are Regulated by the California Energy Commission**

- Mandatory provisions are found in Part 6 of Title 24 (DSA)

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# WATER EFFICIENCY AND CONSERVATION

## Chapter 5-Division 5.3

### Indoor Water Use

- Separate water meters
  - Buildings in excess of 50,000 square feet where tenants use more than 100 gallons per day
  - Excess consumption more than 1000 gallons per day

# WATER EFFICIENCY AND CONSERVATION

## Chapter 5-Division 5.3

### Indoor Water Use

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

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# WATER EFFICIENCY AND CONSERVATION

## Chapter 5-Division 5.3

### Outdoor Water Use

- Water budget – Currently required by DWR or local agency for landscapes 2,500 square feet and over
- Separate meter for outdoor potable water use for landscape areas between 1,000 & 5,000 square feet
- Irrigation design for landscapes between 1,000 to 2,500 square feet
  - Weather or soil moisture-based irrigation controllers

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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

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# **MATERIAL CONSERVATION AND RESOURCE EFFICIENCY** - Chapter 5-Division 5.4

## **Construction Waste Reduction, Disposal and Recycling**

- Construction waste diversion – establish a waste management plan
- Construction waste management plan (WMP)
  - Documentation (see sample forms in Chapter 8)
  - Exception for isolated jobsites

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# **MATERIAL CONSERVATION AND RESOURCE EFFICIENCY** - Chapter 5-Division 5.4

## **Construction Waste Reduction, Disposal and Recycling (DSA)**

- Construction waste reduction of at least 50%
  - Exception to allow alternate waste reduction method
- 100% of excavated soil and land clearing debris

# **MATERIAL CONSERVATION AND RESOURCE EFFICIENCY** - Chapter 5-Division 5.4

## **Building Maintenance and Operation (DSA)**

- Recycling by occupants – required by law since 1991
  - Sample ordinance



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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

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# **MATERIAL CONSERVATION AND RESOURCE EFFICIENCY** - Chapter 5-Division 5.4

## **Building Maintenance and Operation**

- Verification of compliance
  - Commissioning plan, including qualifications of commissioning team
  - Results of performance tests
  - Commissioning report

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# **MATERIAL CONSERVATION AND RESOURCE EFFICIENCY** - Chapter 5-Division 5.4

## **Building Maintenance and Operation**

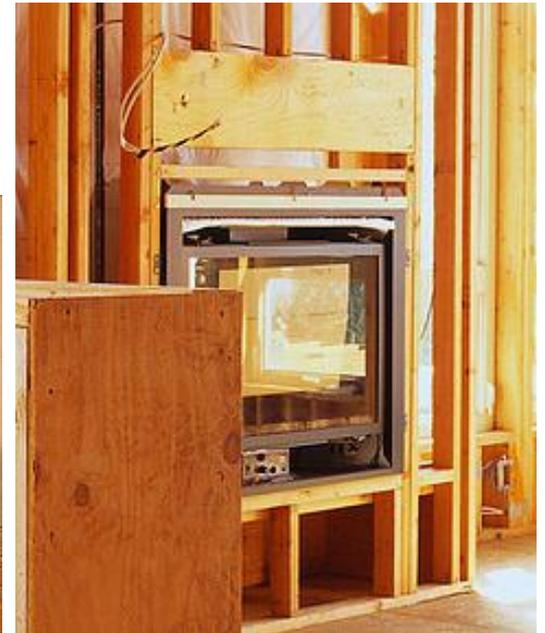
- Testing and adjusting for new buildings under 10,000 square feet
  - Balancing of HVAC systems
  - Verification of compliance – inspection verifications and reports

# ENVIRONMENTAL QUALITY -

## Chapter 5-Division 5.5

### Fireplaces

- Direct-vent sealed gas fireplaces
- Sealed wood-burning fireplaces
- Wood burning stoves



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# ENVIRONMENTAL QUALITY -

## Chapter 5-Division 5.5

### Pollutant Control

- 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

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# ENVIRONMENTAL QUALITY –

## Chapter 5-Division 5.5

### Pollutant Control (DSA)

- Air filters at least MERV 8
- Environmental tobacco smoke control – outdoor areas for 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

### Indoor Air Quality (DSA)

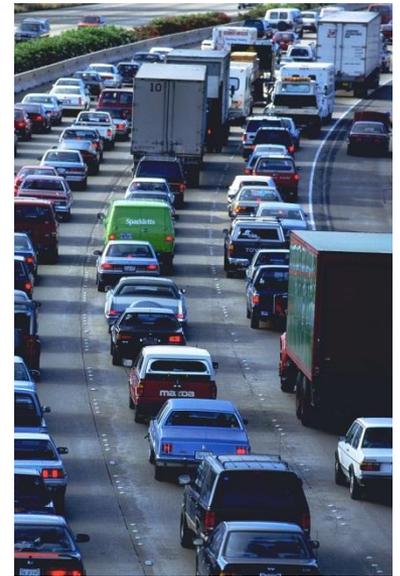
- Outside air delivery - by California Energy Code, local code, or Title 8, whichever is more restrictive
- Carbon dioxide (CO<sub>2</sub>) monitoring – for buildings with demand control ventilation per the California Energy Code

# 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
  - Interior sound
    - minimum STC 40 for separations



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# ENVIRONMENTAL QUALITY -

## Chapter 5-Division 5.5

### Outdoor Air Quality (DSA)

- Ozone depletion and greenhouse gas reductions
  - Chlorofluorocarbons (CFCs)
  - Halons

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# California Building Standards Commission

## Appendix A5

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

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# 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

# 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		
<b>CONSTRUCTION WASTE REDUCTION, DISPOSAL AND RECYCLING</b>				
<b>5.408.1 Construction waste diversion.</b> Establish a construction waste management plan or meet local ordinance, whichever is more stringent.	☒			
<b>5.408.2 Construction waste management plan.</b> Submit plan per this section to enforcement authority. <b>5.408.2.1 Documentation.</b> 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. <b>5.408.2.2 Isolated jobsites.</b> 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.	☒  ☒	☐	☐	
<b>5.408.3 Construction waste.</b> 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. <b>Exceptions:</b> 1. Excavated soil and land-clearing debris. 2. Alternate waste reduction methods developed by working <b>A5.408.3.1 Enhanced construction waste reduction.</b> 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> <b>A5.408.3.1.1 Verification of compliance.</b> A copy of the completed waste management report shall be provided. <b>Exceptions:</b> 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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FEATURED LINKS

## Welcome to the California Building Standards Commission Website

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:

- **New!** Governor Schwarzenegger announces **First-in-the-Nation Statewide Green Building Standards Code** [/abt\\_bsc/press.htm](/abt_bsc/press.htm).
- **CALGreen** Draft 2010 California Green Building Standards (CALGreen) Code. [\[PDF\]](#), or link to the [CALGreen](#) page]. Scheduled to become effective on January 1, 2011, this draft is provided for informational purposes only pending publication.

**CALGreen**

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# Questions?



# THANK YOU!