



A SOLID FOUNDATION OF THE ENERGY STANDARDS

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“How do I know what energy regs apply to my project?”

Hint: The key is knowing how to navigate the Standards

LET’S COVER:

- How all the Parts, Articles, Sections, & Chapters differ & come into play
- Dissecting the Index
- Classifying my project
- Acid tests for my project
- Further study



Title 24/Part 1 Index

The screenshot shows a web browser window with the address bar displaying the URL: www.ecodes.biz/ecodes_support/free_resources/2013California/13Administrative/PDFs/Title24/Part1Index.pdf. The page content is a table of contents for the 2013 California Administrative Code, Title 24, Part 1. The table lists various chapters and sections, including Chapter 9 (Occupational Safety and Health Standards Board), Chapter 10 (California Energy Commission), Chapter 11 (Department of Food and Agriculture), and Chapter 15 (Auctioneer Commission, Bureau of Automotive Repair, Board of Barber Examiners, Board of Behavioral Science Examiners, Cemetery Board, Bureau of Collection and Investigative Services, and Contractors' State License Board). The page number "viii" is visible at the bottom left, and "2013 CALIFORNIA ADMINISTRATIVE CODE" is at the bottom right. A download bar at the bottom shows the file "Table of Contents.pdf" and a link to "Show all downloads..."

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Format Order (“Where am I?”)

- Title 24
 - Part 1
 - Chapter 10
 - Article 1 (this is what we’ll explore next)
 - Part 6
 - Subchapters 1 through 9 (“hey wait—how did all these section numbers get in here?”)



“What Does Part 1 Have to do with Design?”

2013 Building Energy Efficiency Standards

Page i

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Let's Go Through Part 1/Chapter 10

101 – Scope

102 – Definitions

103 – Requirements for
Designers...

104 – Exceptional Designs

105 – Enforcement

106 – Local Standards

107 – Interpretations

- 108 – Exemption
- 109 – Software & Registries
- 110 – Procedures for
Consideration
- 111 – Fenestration
- 112 – Default Tables
- 113 – Roofing Products
- 114 – Outdoor Lighting
Zones



Title 24/Part 2 Index

- **CH 2 -- DEFINITIONS**
- **CH 3 -- USE & OCCUPANCY CLASSIFICATION**
- **CH 4 -- SPECIAL DETAILED REQUIREMENTS**
- **CH 5 -- GENERAL BUILDING HEIGHTS & AREAS**
- **CH 6 -- TYPES OF CONSTRUCTION**
- **CH 7 -- FIRE & SMOKE PROTECTION**
- **CH 8 -- INTERIOR FINISHES**
- **CH 9 -- FIRE PROTECTION SYSTEMS**
- **.....etcetera**



Title 24/Part 6 Index

- **SubCh 1, §100** **ALL OCCUPANCIES—GENERAL PROVISIONS**
- **SubCh 2, §110** **ALL OCCUPANCIES—MANDATORY REQUIREMENTS FOR THE MANUFACTURE, CONSTRUCTION AND INSTALLATION OF SYSTEMS, EQUIPMENT AND BUILDING COMPONENTS**
- **SubCh 3, §120** **NONRESIDENTIAL, HIGH-RISE RESIDENTIAL, HOTEL/MOTEL OCCUPANCIES, AND COVERED PROCESSES—MANDATORY REQUIREMENTS**
- **SubCh 4, §130** **NONRESIDENTIAL, HIGH-RISE RESIDENTIAL, AND HOTEL/MOTEL OCCUPANCIES—MANDATORY REQUIREMENTS FOR LIGHTING SYSTEMS AND EQUIPMENT, AND ELECTRICAL POWER DISTRIBUTION SYSTEMS**
- **SubCh 5, §140** **NONRESIDENTIAL, HIGH-RISE RESIDENTIAL, AND HOTEL/MOTEL OCCUPANCIES—PERFORMANCE AND PRESCRIPTIVE COMPLIANCE APPROACHES FOR ACHIEVING ENERGY EFFICIENCY**
- **SubCh 6, §141** **NONRESIDENTIAL, HIGH-RISE RESIDENTIAL, AND HOTEL/MOTEL OCCUPANCIES—ADDITIONS, ALTERATIONS, AND REPAIRS**
- **SubCh 7, §150** **LOW-RISE RESIDENTIAL BUILDINGS – MANDATORY FEATURES AND DEVICES**
- **SubCh 8, §150.1** **LOW-RISE RESIDENTIAL BUILDINGS - PERFORMANCE AND PRESCRIPTIVE COMPLIANCE APPROACHES FOR NEWLY CONSTRUCTED RESIDENTIAL BUILDINGS**
- **SubCh 9, §150.2** **LOW-RISE RESIDENTIAL BUILDINGS - ADDITIONS AND ALTERATIONS IN EXISTING LOW-RISE RESIDENTIAL BUILDINGS**



An Interpretive Index

- **SubCh 1- §100 ALL OCCUPANCIES, GENERAL PROVISIONS**
- **SubCh 2- §110 ALL OCCUPANCIES, MANDATORY REQUIREMENTS
FOR THE MANUFACTURE, CONSTRUCTION AND INSTALLATION OF
SYSTEMS, EQUIPMENT AND BUILDING COMPONENTS**
- **SubCh 3- §120 NONRESIDENTIAL, MANDATORY REQUIREMENTS
NEW CONSTRUCTION**
- **SubCh 4- §130 NONRESIDENTIAL, MANDATORY REQUIREMENTS**
- **NEW CONSTRUCTION LIGHTING SYSTEMS / EQUIPMENT, AND
ELECTRICAL POWER DISTRIBUTION SYSTEMS**
- **SubCh 5- §140 NONRESIDENTIAL, PERFORMANCE & PRESCRIPTIVE
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- **NEW CONSTRUCTION**
- **SubCh 6- §141 NONRESIDENTIAL, ADDITIONS, ALTERATIONS, &
REPAIRS**
- **SubCh 7- §150 RESIDENTIAL, MANDATORY FEATURES & DEVICES**
- **SubCh 8- §150.1 RESIDENTIAL, PERFORMANCE & PRESCRIPTIVE
COMPLIANCE APPROACHES**
- **SubCh 9- §150.2 RESIDENTIAL, ADDITIONS, ALTERATIONS**



Classifying the Project: Identify the Project by Category

Part 6 — considered at once

- **Functional Use**
- **Project Actions**
- **Compliance Method**
- **Registration Potential**
- **Incidentals**

Part 2 — considered in sequence

- **Occupancy Type**
- **Area/Height**
- **Construction Type**



Identify the Project by Functional Use

- Residential
- NonResidential
- Combination of the above
 - What of the issue of “minor” & “mixed” occupancies?



Occupancy / Functional Use

Title 24/Part 2

- A
- B
- E
- F
- H
- I
- M
- C
- L
- R
- S
- U

Title 24/Part 6

- A
- B
- E
- F
- H
- M
- R
- S
- U



Occupancy / Functional Use

- How is “high-rise” residential handled?
- How is “hotel/motel” handled?
- What about “live/work” spaces?
- How do “process loads” affect spaces?



Identify the Project by Project Actions (not by construction type)

- Newly constructed
- Addition
- Alteration
- Combination of above
- Repair



“Newly Constructed” vs All Other

- What constitutes “addition”?
 - What is “CFA”?
- When does a “repair” become an “alteration”?
- When does a conversion become “new” work?



Identify the Project by Compliance Method

- Prescriptive
 - Follow a package of measures
 - Minimal amount of options/design flexibility
- Performance
 - Trade-offs & options allow great design flexibility
 - Modeling may not be as cutting edge as your design
- Not to mention the “mandatory measures”



Identify the Project by Registration Potential

- Register
 - If HERS is triggered
- Don't Register
 - If no HERS requirement

This is for Residential only

...and yes, HERS does get involved with NonRes occasionally.

What happens with NonRes projects?

...there is no registry at this time for NonRes.



Identify the Project by Incidental Factors

- Appliances
 - Interface with Title 20
 - Includes cooking appliances, water heaters, etcetera
- Equipment, components, devices
 - Interface with Title 20, but installation is controlled by Title 24 & there are added requirements
 - Includes “smart thermostats”, air economizers, etcetera



“But why does it seem to be so complicated?”

- Energy is complex to begin with
 - Runs through all things associated with buildings
 - So many climates in CA; Standards cover many disciplines
- Many options to meet compliance
 - In fairness to building owners
- Thresholds, to keep cost contained
 - Stepped actions
- So many actions we can do to a building
 - Add to, partly demolish & replace, renovate, etcetera
- So many building assembly types
 - Reference Joint Appendix JA4



How Does the Joint Appendix Affect Design?

2013 Joint Appendices Joint Appendix JA-1

Joint Appendix JA

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- The U-values are used for all project calcs.
- Organized by assembly, & type of construction.
- Use only recognized assemblies, or ...



Apply What You Know to the First Sub-Chapter

- Subchapter 1 – Section 100.0 – Scope
 - Which projects are governed & which projects are not
 - Parts of the building regulated
 - Conditioned vs unconditioned space
 - Mixing functional uses
 - The beauty of Table 100.0-A
 - Definitions are so important



“Acid Tests For My Project”

Ask these of your project, periodically

- Is it a regulated functional use (occupancy)?
- Does it have minor use?
- Is it newly built, an addition, an alteration, or a repair?
- How does it impact the 3 fundamentals?
- Is it conditioned, or unconditioned?
- What compliance method?
- Does it need registration?



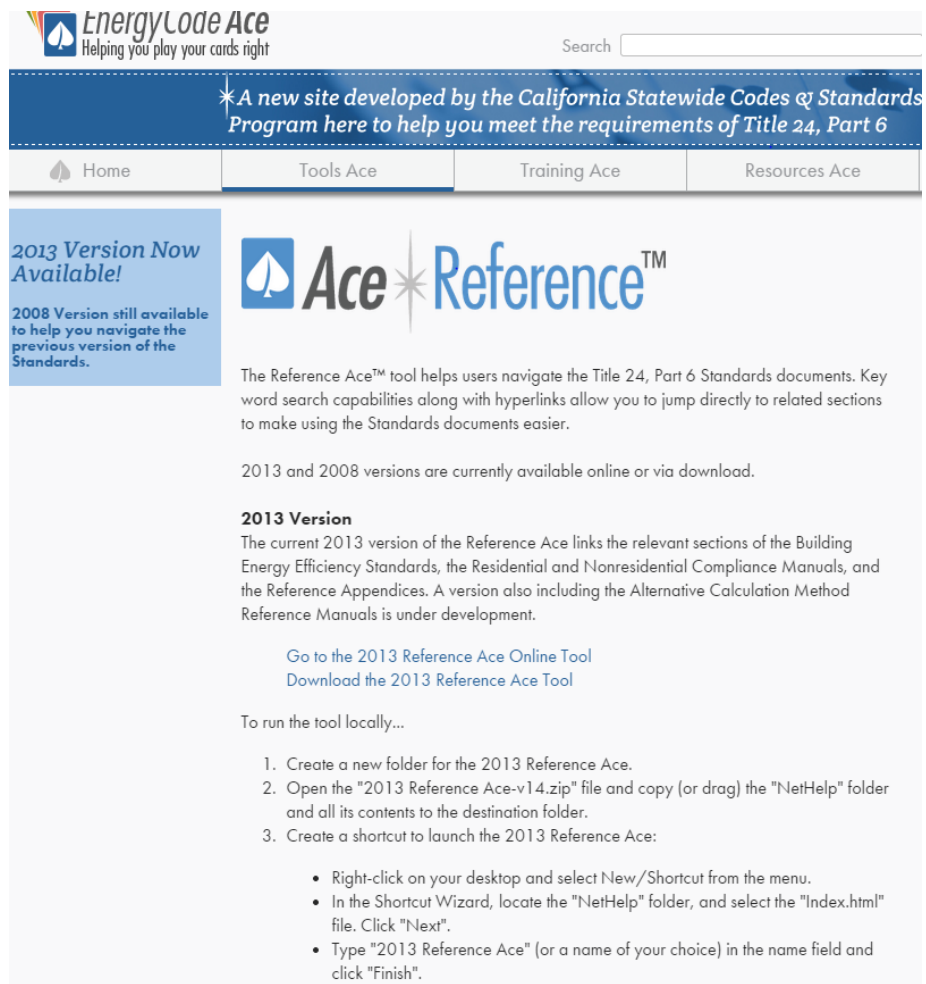
Navigating the CEC Website

- Where is everything?
 - <http://www.energy.ca.gov/title24/2013standards/>
- Where & how can I comment on the Standards?
 - <http://www.energy.ca.gov/title24/2016standards/rulemaking/documents/index.html>
 - http://www.energy.ca.gov/decisions_pending.html
 - **Docket #15-BSTD-01**



Other references

- www.energycodeace.com



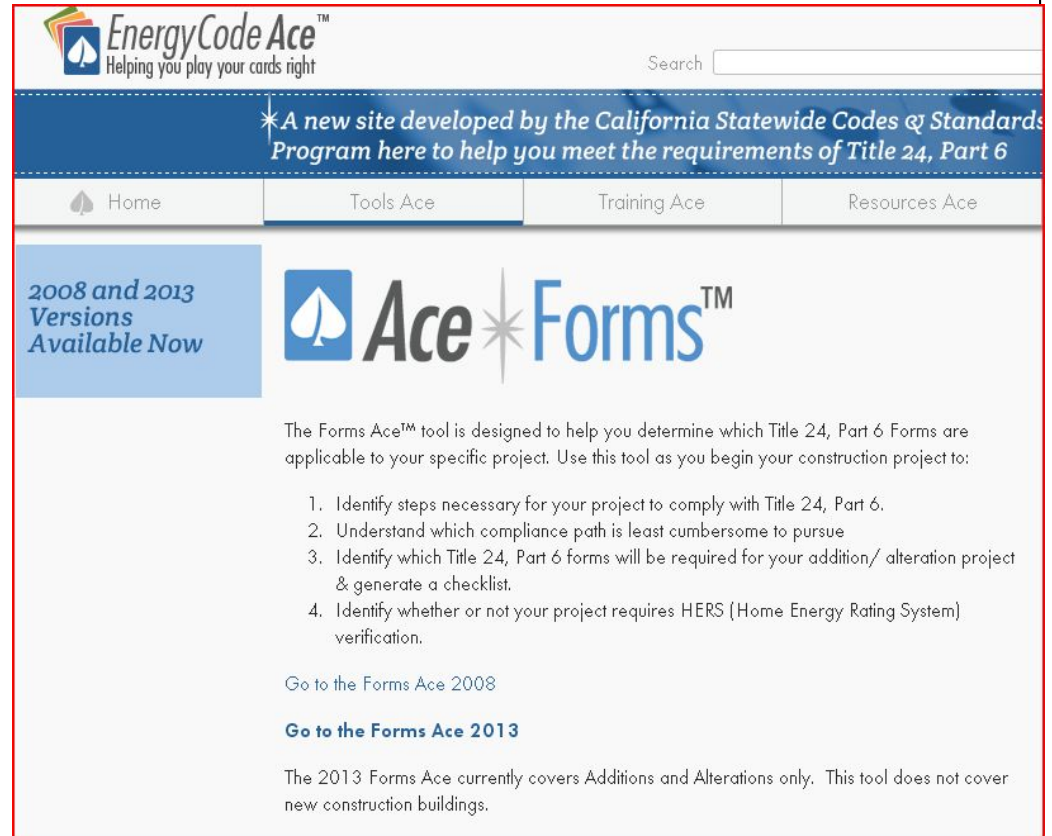
The screenshot shows the EnergyCode Ace website. At the top is the logo "EnergyCode Ace" with the tagline "Helping you play your cards right". A search bar is on the right. Below the header is a blue banner with the text: "A new site developed by the California Statewide Codes & Standards Program here to help you meet the requirements of Title 24, Part 6". A navigation bar contains links: Home, Tools Ace, Training Ace, and Resources Ace. On the left, a blue box says "2013 Version Now Available!" and "2008 Version still available to help you navigate the previous version of the Standards." The main content area features the "Ace Reference™" logo. Text describes the tool's purpose: "The Reference Ace™ tool helps users navigate the Title 24, Part 6 Standards documents. Key word search capabilities along with hyperlinks allow you to jump directly to related sections to make using the Standards documents easier." It notes that "2013 and 2008 versions are currently available online or via download." A section titled "2013 Version" explains that the current version links relevant sections of the Building Energy Efficiency Standards, the Residential and Nonresidential Compliance Manuals, and the Reference Appendices. It also mentions that a version including the Alternative Calculation Method Reference Manuals is under development. Two links are provided: "Go to the 2013 Reference Ace Online Tool" and "Download the 2013 Reference Ace Tool". A section titled "To run the tool locally..." lists three steps: 1. Create a new folder for the 2013 Reference Ace. 2. Open the "2013 Reference Ace-v14.zip" file and copy (or drag) the "NetHelp" folder and all its contents to the destination folder. 3. Create a shortcut to launch the 2013 Reference Ace:

- Right-click on your desktop and select New/Shortcut from the menu.
- In the Shortcut Wizard, locate the "NetHelp" folder, and select the "Index.html" file. Click "Next".
- Type "2013 Reference Ace" (or a name of your choice) in the name field and click "Finish".



Other references

- <http://www.energycodeace.com/content/forms-ace/>

A screenshot of the EnergyCode Ace website. The header includes the "EnergyCode Ace" logo with the tagline "Helping you play your cards right" and a search bar. A blue banner below the header reads: "A new site developed by the California Statewide Codes & Standards Program here to help you meet the requirements of Title 24, Part 6". A navigation bar contains links for "Home", "Tools Ace", "Training Ace", and "Resources Ace". The main content area features a blue box on the left stating "2008 and 2013 Versions Available Now". To the right is the "Ace Forms" logo. Below the logo, a paragraph states: "The Forms Ace™ tool is designed to help you determine which Title 24, Part 6 Forms are applicable to your specific project. Use this tool as you begin your construction project to:". This is followed by a numbered list of four steps: 1. Identify steps necessary for your project to comply with Title 24, Part 6. 2. Understand which compliance path is least cumbersome to pursue. 3. Identify which Title 24, Part 6 forms will be required for your addition/ alteration project & generate a checklist. 4. Identify whether or not your project requires HERS (Home Energy Rating System) verification. Below the list are two links: "Go to the Forms Ace 2008" and "Go to the Forms Ace 2013". A final paragraph states: "The 2013 Forms Ace currently covers Additions and Alterations only. This tool does not cover new construction buildings."



Output

Energy Code Ace - Forms-ace x

www.energycodeace.com/2013-forms-ace-tool-results/residential/2927

Your Responses to the Residential Forms Ace Tool

Report

Basic Info

Zip Code : **95821**
Climate Zone : **Zone 12**

Additional Information

AI-1 Which Energy Code Compliance Option will you use? : **Prescriptive**
Prescriptive AI-4 Are you performing an alteration, addition, or combination of the two? : **Addition**
Prescriptive AI-8 What is the Conditioned Floor Area of the addition? : **1,000 sf or less**
Prescriptive AI-10 What type of system are you adding? [Click all that apply]: :

- **Lighting**
- **Envelope**

Project Components

Prescriptive PCL-1 Will any hard-wired light fixtures be added, altered, or replaced? : **Yes**
Prescriptive PCL-2 Is your project a single family or multifamily residence? : **Single Family**
Prescriptive PCE-1 Will this project add, alter, or replace fenestration including skylights, windows, garden window, bay windows, french doors, sliding glass doors, or any door with glazed area more than 1/2 of door area? : **Yes**
Prescriptive PCE-14 Which calculation method are you using for compliance? : **Calculating SHGC with exterior shading**
Prescriptive PCE-2 Will this project add, alter, or replace insulation in a raised floor, slab floor, exterior walls, foundation walls, ceiling, or attic roof? : **Yes**
Prescriptive PCE-15 Which calculation method are you using for compliance? : **I'm using EZ frame**
Prescriptive PCE-3 Will this project have new roof area? : **Yes**
Prescriptive PCE-9 Is the addition square footage less than 300 sf? : **No**



Output

Energy Code Ace - forms-ace x

www.energycodeace.com/2013-forms-ace-tool-results/residential/2927

Download Your Documents

You can download all the required documents as a single zip here:

Download All 9 Documents

Or you can download the files individually:

PHASE 1

GENERAL

[CF1R-ADD-01-E-PrescriptiveAdditionsBuilding.pdf](#)

ENVELOPE

[CF1R-ENV-01-E-EzFrameWorksheet.pdf](#)
[CF1R-ENV-03-E-ShgcWorkSheet.pdf](#)
[CF1R-ENV-04-E-CoolRoofAndSRIWorksheet.pdf](#)

PHASE 2

LIGHTING

[CF2R-LTG-01-E-Lighting-SingleFamilyDwellings.pdf](#)

ENVELOPE

[CF2R-ENV-01-E-InsulationRoofingFenestrationSpecifications.pdf](#)
[CF2R-ENV-02-E-EnvelopeAirSealing.pdf](#)
[CF2R-ENV-03-E-InsulationInstallation.pdf](#)
[CF2R-ENV-04-E-Roofing-RadiantBarrier.pdf](#)

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Simple Design Problem

- An existing 1,000 sf vehicle service shop
 - Built in 2006
 - Existing ceiling mount unit heater, 20 kbtu
- Project objective
 - Owner wants to add another 20 kbtu heater
- Classify the project