DSA PR 18-02

PROCEDURE: CALGREEN/ENERGY CODE REVIEW (CGE) FOR PRE-CHECK (PC) BUILDING DESIGNS AND THE CONSTRUCTION, RELOCATION AND/OR ALTERATION OF RELOCATABLE BUILDINGS

Division of the State Architect (DSA) documents referenced within this publication are available on the DSA Forms or DSA Publications webpages.

PURPOSE

This procedure supplements Procedure (PR) 07-01: Pre-Check (PC) Approval and describes the process and the required documentation for submitting relocatable and modular school buildings for Pre-Check (PC) to DSA for Title 24 Part 11 Green Building Standards Code (CALGreen) and Title 24 Part 6 California Energy Code (Energy Code). This procedure also describes how site-specific or stockpile projects, which include an approved PC will be verified by DSA to ensure no unapproved changes are included in the submitted drawings. This procedure does not cover applications not utilizing a PC. DSA does not conduct detailed plan review for site-specific applications beyond confirming the submitted documents are complete.

BACKGROUND

Per PR 07-01 the PC program provides for DSA approval of the design of a structure in advance of submittal for construction. Relocatable school buildings, once approved in a site-specific or stockpile application may be relocated into any California climate zone listed in the approved site-specific or stockpile drawings. These buildings may also be positioned so that the building and fenestration face in any orientation. DSA began reviewing PCs for California Energy Code compliance in 2003. The California Energy Code included specific non-residential requirements for, and defined, “Relocatable Public School Buildings” in the 2005 California Energy Code, effective October 1, 2005. In 2008 the California Energy Commission published the Reference Appendix NA4 as part of the 2008 Reference Appendices which became effective January 1, 2010. The preapproval and relocatable nature of these applications requires that a special procedure be followed to ensure compliance with Energy Code.

SCOPE

This procedure is applicable to school buildings submitted for PC review as well as stockpile and site-specific project approvals, which include a PC building and applies to Energy Code and CALGreen compliance. See PR 07-01: Pre-Check Approval for general requirements, limitations, and fees for PC designs.

1. OVERVIEW OF CALGreen and ENERGY REQUIREMENTS

1.1 California Green Building Standards Code

Regulatory requirements related to green building standards for public schools and community colleges consist of the scoping provisions in CALGreen Chapter 3, Section 301.4 and the nonresidential mandatory measures adopted by DSA-SS. Site-specific requirements do not apply to a PC application.

1.2 Energy Code

School buildings must comply with the non-residential regulations in the Energy Code. In addition to complying with all applicable mandatory requirements, projects shall comply with the

Energy Code using either the prescriptive compliance approach or performance compliance approach or a combination of both approaches as permitted by the Energy Code, for each building. Refer to the Energy Code Table 100.0-A-Application of Standards for applicable sections related to occupancy/elements and compliance approach.

1.2.1 California Climate Zones

As defined in the Energy Code, California has 16 climate zones. When using the performance approach to model a PC building design, the weather station listed in appendix B must be used for the climate zones or climate zone groups for which the applicant is seeking approval.

A PC building design is submitted without known location or orientation. School buildings submitted using the PC process may submit building designs showing compliance in one of three ways:

1. All climate zones
2. Grouped climate zones
3. Specific climate zones

Refer to section 2.3 for procedures relating to each of these methods.

1.2.2 Mandatory Requirements

Mandatory requirements include but are not limited to infiltration control, lighting systems, minimum insulation levels, HVAC equipment and controls and acceptance testing. Some minimum mandatory requirements are superseded by more stringent prescriptive or performance requirements as elected.

1.2.3 Prescriptive Approach

The prescriptive approach requires each component of the proposed building to meet a prescribed minimum efficiency. The prescriptive approach offers little flexibility, but is easy to use, and may result in a faster review process.

1.2.4 Performance Approach

The performance approach allows greater flexibility than the prescriptive approach. It is based on an energy simulation model of the building. The performance approach requires an approved computer compliance program that models a proposed building. Design options such as window orientation, glazing area, lighting, plumbing, the building envelope, and HVAC systems are all considered in the performance approach. In addition to affording flexibility, the designer is able to choose building elements and systems that may result in the most cost-effective solution for compliance.

1.2.5 Covered Processes

The Energy Code includes requirements for process loads. In the Energy Code a covered process is an activity or treatment that is not related to space conditioning, water heating, lighting, or ventilating of a building and includes: Computer rooms, elevators, laboratory exhaust, kitchens, and other similar spaces or equipment. Refer to the Energy Code Section 100.0(e)2.F for more information.

1.2.6 Acceptance Testing

Acceptance testing is a process required by the Energy Code which provides the verification that the installation and operation of certain newly installed equipment or construction elements of a nonresidential buildings are installed and perform as required. A listing of certified Acceptance Testing Technicians (ATT) can be found on the California Energy Commission's

Acceptance Test Technician Certification Providers (ATTCP) webpage. For a detailed description of Acceptance Testing refer to the Nonresidential and Multifamily compliance manual published by the California Energy Commission and available on their website. Also refer to section 2.5.5 of this procedure for required documentation.

1.2.7 Solar And Battery

Refer to Energy Code Sections 110.10 and 140.10 for all energy related solar and battery requirements including solar readiness. See DSA IR N-3 Energy Code Requirements for Photovoltaic and Battery Systems relating to the California Energy Code. Refer also to DSA *IR 16-8: Solar Photovoltaic and Thermal Systems Review and Approval Requirements*, CBC Section 3111, as well as California Fire Code Sections 1206 and 1207 for information and requirements not listed in the Energy Code.

2. PROCEDURE

2.1 Required Documentation for PC Applications:

2.1.1 Completed and signed DSA 403-PC for energy compliance and a signed DSA 403-C for CALGreen compliance.

2.1.2 Design documents, incorporating and coordinating all required energy design features and related documentation including all required compliance forms. Refer to Section 2.7 of this procedure for more information.

2.1.3 When using the performance approach, the PDFs of all compliance runs for each *individual building design* (see glossary) and for all required orientations (4 total ea. building) modeled in each climate zone must be submitted. Certificates of compliance in the plans must not be reduced more than 75 percent of the intended size when printed to 8 ½" x 11" and may not be cropped or altered.

2.1.3.1 Each *individual building design* submitted must be modeled and submitted separately. Energy compliance software files associated with each *individual building design must be submitted to DSA*. DSA may require the submission of optional HVAC software files during review. Separate energy compliance software files are not required for the cardinal orientations nor climate zone or climate zone group. Software filenames must include the building size and an ability to differentiate each *individual building design* by filename if there are other unique design options. For example: <appid>24x40<mfg_design option>.ribd.

2.1.4 Product manufacturer specifications or cut sheets for CALGreen compliance and Energy Code compliance features incorporated into the design/energy model, including but not limited to mechanical, lighting, and electrical equipment and controls, CO2 monitor equipment, and plumbing equipment (e.g. water heaters) must be submitted in 8-1/2" x 11" pdf format.

2.2 Building Orientation

Building orientation of PC building designs is not known at the time of review and once approved for a site-specific application may be orientated in any direction. Building designs analyzed with a performance approach must analyze the building in the four cardinal orientations North (0 deg), East (90 deg), South (180 deg) and West (270 deg) The building and orientation with the smallest compliance margin (least energy efficient) in the California Climate Zones shall be used as the basis for design.

2.3 California Climate Zones

A single PC application shall only show compliance through one of the methods indicated in section 1.2.1. Once approved these PC designs may be submitted for construction as a site-specific, stockpile, or for relocation per Section 2.7.

2.3.1 All-Climate Zones

This method provides review and approval for the PC to be placed in any location in California. The permanent or relocatable building must show compliance with climate zones 14,15 and 16. Each *Individual building design* must show compliance in the cardinal orientations, per Section 2.5.2. Typically, the smallest *individual building designs* may be combined to make larger building designs with no change to the *individual building design*. Refer to section 2.4 Options for information regarding designs with multiple options.

2.3.1.1 The PC must be designed to meet compliance requirements for the worst case (least compliance margin) orientations in all three climate zones.

2.3.2 Climate Zone Groups

2.3.2.1 For PCs, the Climate Zone Group method is an acceptable alternate method (per CAC 4-304) to indicate compliance with the California Energy Code regulations and permits permanent and relocatable building manufacturers to submit on particular market areas. PC's may use this alternate method as described in this PR and are not required to submit a DSA 1-AMM. PCs may be submitted for the climate zone groups indicated in Appendix B, and as outlined here. Climate zone 15 is not included in any climate zone grouping. PC's intended to be sited in climate zone 15 must be submitted using either all-climate zones or specific climate zones methods. If submitting using the grouped climate zone method, specific climate zones within each group may not be excluded. Each *individual building design* and included options must be submitted to comply with the climate zone which has the highest Grouped Severity Ranking per Appendix B for each group being proposed. If more than one climate zone group is submitted, the climate zone with the highest Grouped Severity Ranking in each climate zone group must be analyzed and compliance documentation submitted.

2.3.2.2 For construction or relocation applications, the Climate Zone Groups method may be used as an alternate method to show compliance with the California Energy Code regulations. Refer to Section 2.7 for procedures relating to this alternate method.

2.3.3 Specific Climate Zones: If submitting for more than one specific climate zone only, one *individual building design* is permitted per application. Under the specific climate zone method, every climate zone for which PC manufacturer plans to request approval to place the PC must be analyzed and compliance documentation submitted. If multiple climate zones are requested the PC must be designed to meet compliance requirements for the worst case (least compliance margin) orientation in each climate zone submitted.

2.4 Options

A benefit of PC building designs is the ability of school districts to select from pre-designed and pre-checked options made available by manufacturers and reviewed for compliance by DSA. Each option must show compliance across all submitted climate zones or grouped climate zones. Common options include multiple iterations of a single module joined to form buildings of various sizes, wall framing dimension and materials, HVAC system variations, fenestration types, and quantities, insulation values, skylight or light tube options, exterior and interior finishes etc. Each additional option included in the building design may significantly affect the design analysis, complexity, number of design documents, and the review of energy compliance when considering compounding options. This section describes the required procedures and methods for submitting PC building designs which include options.

2.4.1 Options Submittal Methods

To limit extreme complexities inherent with design options, building designs must meet the requirements for options per this section. For CGE review there are two basic methods to address multiple options which can be used to show compliance with the Energy Code for all

included options:

1) Basic Model Plus Energy Upgrades

2) Modeling of Options.

2.4.2 Basic Model Plus Energy Upgrades Method

When submitting using this method, the building is designed and analyzed with basic building features that minimally meet all requirements for the Energy Code for the climate zone group(s) or climate zone(s) the building may be sited or constructed in. Compliance analysis is made on the least compliant options designed. Options that increase energy efficiency can be included in the building design, but they must clearly provide greater efficiency (higher compliance margin) than the comparable element/assembly in the basic model. HVAC options that have equivalent tonnage, equivalent or less condenser fan horsepower and equivalent or higher SEER/EER rating do not need to be modeled separately.

2.4.3 Modeling of Options Method

When this method is used, each option must be modeled separately for each climate zone(s) or climate zone group(s). Energy compliance forms shall be included in the drawings for each modeled option and each climate zone or the climate zone with the highest Grouped Severity Ranking in each climate zone group submitted. Each option must show compliance across all submitted climate zones or grouped climate zones.

Options shall be modeled as follows:

2.4.3.1 HVAC System Options: HVAC options shall be modeled separately unless they meet the requirements stated in the definition of an *individual building design* in the Glossary section.

2.4.3.2 Skylights and Tubular Skylights: *Individual building designs* containing skylights or tubular skylights shall be modeled separately from the *individual building design* without these options.

2.4.3.3 In addition to each individual option being modeled separately as indicated, PCs must also consider the combination of these options. To limit excessive complexity design options submitted by modeling every option and combination are limited in each PC application. Refer to Appendix C for limitations. Options in excess of the limitations must be submitted in a separate application.

2.5 Required Information in Design Documents

The PC drawings shall be organized in subsets by climate zone and options, or in such a way, to streamline plan review and to facilitate the removal of sheets or redaction of drawing information when resubmitted for site specific or stockpile applications. Refer to Appendix D for an example sheet organization.

2.5.1 Drawing information shall be provided in accordance with the DSA 403-PC Part 5 Mandatory Requirements and Drawing Documentation.

2.5.2 Orientation Table: Energy performance runs shall address minimum compliance of the modeled building based on the four cardinal orientations: 0º, 90º, 180º and 270º. For each climate zone, or grouped climate zone, in which the building is designed to be placed submit, in a tabular form, the compliance results of the performance runs indicating the orientation, the Long-term System Cost (LSC-E), Long-term System Cost Total (LSC-T), and Source Energy of the proposed design and the compliance margin that the proposed design exceeds the energy efficiency of the standard design (See section 1.2.4 and Appendix A.). The orientation table must graphically identify the orientations with the smallest compliance margin for each climate zone or grouped climate zone, in which the building is designed to be placed.

2.5.3 Certificates of Compliance: Signed certificates of compliance for each *individual building design* and climate zone with the smallest margin of compliance as indicated on the Orientation Table must be incorporated into the plans.

2.5.4 Options: If submitting using the modeling of options method as described in Section 2.4.3, each *individual building design* shall have individual compliance forms. Compliance forms for each *individual building design* must have the same envelope with the least compliant components modeled. The drawings must include all allowed options for the *individual building design*. Refer to Appendix C for limitations for options.

2.5.4.1 For relocatable buildings, drawings shall include detail(s) and/or plans indicating two permanent metal identification labels which indicate the climate zone(s) for which the building is approved to be sited in. Refer to IR 16-1 for additional information.

2.5.5 Acceptance Testing Notes

The following notes requiring acceptance testing shall be placed on the overall cover page and on discipline specific cover or general notes sheets:

2.5.5.1 General Acceptance Testing

Place the following in the overall cover sheet.

“Acceptance tests are required be completed on newly installed or replacement of lighting controls, mechanical systems, fenestration, and process equipment before project completion per the California Administration Code Section 10-103. Acceptance tests must be performed by a certified Acceptance Test Technician (ATT). The Acceptance Testing procedures must be repeated, and deficiencies corrected until the installation of the specified systems conform and pass the required acceptance criteria. Completed NRCA forms shall be submitted to the project inspector and the district.”

2.5.5.2 Mechanical Acceptance Testing

Place the following in the mechanical cover sheet.

“Acceptance tests are required to be completed on newly installed or replacement of mechanical systems before project completion per the California Administration Code Section 10-103. Acceptance tests must be performed by a certified Acceptance Test Technician (ATT). The Acceptance Testing procedures must be repeated, and deficiencies corrected until the installation of the specified systems conform and pass the required acceptance criteria. Completed NRCA forms shall be submitted to the project inspector and the district.”

2.5.5.3 Lighting Controls Acceptance Testing

Place the following in the electrical cover sheet.

“Acceptance tests are required to be completed on newly installed or replacement of lighting controls before project completion per the California Administration Code Section 10-103. Acceptance tests must be performed by a certified Acceptance Test Technician (ATT). The Acceptance Testing procedures must be repeated, and deficiencies corrected until the installation of the specified systems conform and pass the required acceptance criteria. Completed NRCA forms shall be submitted to the project inspector and the district.”

2.6 Revisions to the PC Design After Approval

Per PR 07-01, changes to the approved PC drawings affecting overall energy efficiency of the building voids PC approval. Examples of changes that affect the overall energy efficiency of the building are:

- Fenestration and Doors (i.e. increase in area or increase in U-Factor).

- Envelope (i.e. insulation R-values or types, wall, floor or roof framing types or assemblies).
- Occupancy or use. (i.e. from B occupancy to E occupancy, or from general classroom to science classroom).
- Mechanical systems (i.e. any change in HVAC systems, including changes to manufacturer, model, capacity, and type).
- Water heating (Any change in hot water heating systems including changes to manufacturer, model, capacity, and type).

A change in interior layout (i.e. adding or moving interior walls) is not considered to affect overall energy efficiency of the building unless it is in connection with a change in occupancy or use or also includes one of the items above.

2.7 Construction, Relocation and/or Alteration of Relocatable Buildings

Per PR 07-01, a PC approval is for design only and is not an approval for construction. A separate application must be submitted to DSA each time a PC is incorporated into plans for a construction project. A building approved as a PC must be resubmitted, and approved for construction as a site specific, or a stockpile application.

2.7.1 Once a building is approved and constructed the building may also be relocated. Relocatable buildings may be relocated either from a stockpile location to a school campus or from one campus to another campus. In some cases, relocatable buildings are relocated to a stockyard from a campus and are later relocated to another campus for placement. A relocation off of a campus to a stockyard does not require an application to DSA, however the relocation back to a campus does require an application to DSA.

2.7.2 In many cases, applications which include the construction of, and/or the relocation of PC approved buildings may utilize the over-the-counter review process. Refer to PL-07-02 for information relating to over-the-counter reviews. The following describes the DSA CGE verification procedure for applications including the construction of or relocation of a relocatable building.

2.7.3 DSA CGE Verification

For applications including the construction of, or relocation of, a PC building design, DSA staff will conduct a review of the project documents to verify that no unapproved changes are included in the project documents. The verification will occur as part of the over-the-counter and plan review processes.

DSA will not conduct a verification for the relocation of PC designs submitted for approval prior to December 31, 2010 (2007 CBC). Effective January 1, 2032 all PC relocations will require a CGE verification, regardless of initial submittal date.

2.7.3.1 If unapproved changes affecting overall energy compliance are included in a “construction of” or “relocation of” project, the project will be required to be submitted with the additional scope description of “alteration of” with updated energy compliance documents per DSA 403 and Section 2.6.

2.7.3.2 The verification for construction of projects will:

- Ensure that no unapproved changes to the PC documents affecting overall energy compliance, per Section 2.6, have been made and,
- Confirm the removal or redaction of unrelated sheets or information have been made to

the submitted documents,

- Confirm that the documents clearly indicate the climate zone(s) or climate zone group(s) being submitted, and;
- Confirm compliance with the limitations described in the following sections.
- Not conduct a re-review of the details of the compliance of the approved PC design. The verification will be limited to those items listed herein.

2.7.4 Construction of Stockpile or Site-Specific Applications Including PC Building Designs

When submitting a PC approved design, for site-specific or stockpile applications, the building may show compliance in one of the three methods described in Section 2.3 Climate Zones. If a stockpile or site-specific application is submitted for a specific climate zone(s) or grouped climate zone(s), any subsequent approved relocation will be limited as indicated in Section 2.7.5 and subsections. Option specific sheets or drawing information, included in the final design, shall be included for each size *individual building design.* Each selected option must show compliance across all submitted climate zones or grouped climate zones. Options sheets and drawing information unrelated to the site specific or stockpile application shall be removed or redacted. Redacted information shall be clear in order to streamline CGE verification during the site specific or stockpile submittal.

2.7.4.1 For stockpile or site-specific applications intended to be approved for single climate zone(s) or grouped climate zone(s), which are fewer than approved in the PC, the cover sheet shall be revised to indicate only the specific climate zone(s) or grouped climate zone(s) for which the application is intended. Mechanical and electrical systems must be specific to the design submitted and have been approved as part of the PC.

2.7.4.2 The required building tags must indicate only the climate zone(s) for which the building design is approved. If submitted using the alternate Grouped Climate Zone method in Section 2.3.2, tags shall indicate all climate zones included in the climate zone group and not the climate zone group identifier. If submitted for all climate zones the building tag may indicate “all climate zones”.

2.7.5 Stockpile, Site-Specific and Relocation Climate Zone limitations

When submitting a relocatable building for either initial placement, or a relocation from a stockpile or other school campus, the building must have been approved to meet the minimum energy compliance requirements for the climate zone it is being relocated to. It is common for school district boundaries to extend into more than one climate zone. In order to provide the greatest flexibility for relocation it is recommended that a PC and subsequent applications to construct is submitted using the All Climate Zones method per Section 2.3.1. However, constructing a relocatable or modular building that complies with the minimum requirements of all climate zones may not be the most economical solution for some school districts. When submitting a PC approved design, for site-specific or stockpile applications, the building may show compliance in one of the three methods described in Section 2.3 Climate Zones. The following sections describe the limitations for various applications including a PC approved building design.

2.7.6 Limitations in Applications for the Construction of a PC

2.7.6.1 If the PC was approved for one or more grouped climate zone(s), a stockpile or site-specific application for the construction of the building may be submitted for any, or all, of the grouped climate zones that the PC was approved for. Future relocations of the constructed relocatable will be limited to only those climate zones within the grouped climate zone(s) approved in the application for the construction of the building.

2.7.6.2 If the PC was approved for one or more specific climate zones, a stockpile or site-specific application for the construction of the building may only be submitted for those climate zones for which the PC was approved, or climate zones within the same climate zone group that have a lower Grouped Climate Zone Severity Ranking per Appendix B.

2.7.7 Limitations in Applications to Relocate a PC

Per California Energy Code definition of ALTERATION, and supported by Section 141.0 Note 2, the relocation of a relocatable building is not an alteration. A relocatable building must comply with the Energy code effective when it was approved for construction. A relocatable building may not be relocated to a climate zone for which it does not meet the minimum requirements in the Energy Code effective at the time of construction. If a building was approved for other than all climate zones it may only be relocated to climate zones with a lower Grouped Severity Ranking (Per Appendix B) and which are in the same climate zone group, the relocatable is currently sited in or was approved for. Buildings which are proposed to be relocated to a climate zone with a higher Grouped Severity Ranking, or into a climate zone group other than the climate zone group(s) the building was approved for are required to meet Energy Code requirements effective at the time of original construction for the proposed climate zone. Climate zone groups may be applied to buildings approved in previous code cycles whether the building was approved using the alternate Climate Zone Group Method or not. The design professional in general responsible charge shall ensure that relocated buildings meet applicable Energy Code requirements effective at the time of original construction.

DSA will not conduct a verification for the relocation of PC designs submitted for approval prior to December 31, 2010 (2007 CBC). Effective January 1, 2032 all PC relocations will require a CGE verification, regardless of initial submittal date.

2.7.7.1 Buildings approved for All-Climate Zones

A building which was approved for construction using the All-Climate Zones method, per Section 2.3.1, may be relocated anywhere in the State

2.7.7.2 Buildings approved for Specific Climate Zone(s)

Buildings approved for Specific Climate Zones may be relocated within the same climate zone, or a climate zone which has lower Grouped Severity Ranking within the same climate zone group of the current location (per appendix B).

2.7.7.3 Buildings approved for Grouped Climate Zones

Buildings which have been approved using the grouped climate zones method may be relocated to any climate zone within the group(s) which the building was approved to be constructed for.

2.7.7.4 Buildings without climate zones indicated on the building identification labels or approved drawings

A relocatable building without climate zones indicated on the building identification labels or the approved drawings, may be relocated within the same climate zone, or a climate zone which has lower severity ranking within the same climate zone group of the current, or last approved, location (per appendix B).

2.7.7.5 Alterations to relocatable buildings must comply with the Energy Code, effective at the time of alteration per Energy Code Section 141.0. The design professional in general responsible charge shall ensure that relocated buildings meet applicable Energy Code requirements.

2.7.7.6 Applications to relocate a building which was approved for a site-specific application and that was analyzed with a single climate zone and single orientation must substantiate that the building complies with the Energy Code using the prescriptive requirements effective at the time of original construction for the proposed location. The design professional in general

responsible charge shall ensure that relocated buildings meet applicable Energy Code requirements for the climate zone, the building is being located to effective at the time of original construction or as approved for construction for the new location.

GLOSSARY

The following term applies to this procedure only and is not intended to relate to other publications unless explicitly indicated. When used in this document this term is italicized.

Individual Building Design

A PC building design which has a unique use, envelope design (walls, roof, floor), size, plan configuration (internal and exterior) and fenestration allowance. To be considered a unique envelope design, the walls, roof and floor systems individually must have the same U-factor (i.e. Wall: U-factor = .065, Concrete Slab: U-factor = .15, Roof U-factor = .034). Building designs combined to make a larger building (such as in modular building design) may still be considered *individual building designs* when a different HVAC system option is used for the individual building or larger combined building, HVAC options that have equivalent tonnage, equivalent or less fan power and equivalent or higher SEER/EER rating are permitted. An accessory use such as a restroom is permitted to be included or excluded and still be considered an *individual building design*.

RELATED PUBLICATIONS

- *PR 07-01: Pre-Check (PC) Approval*
- *PR 07-03: Project Submittal Appointment Process*
- *PR 18-04: Electronic Plan Review for Design Professionals.*
- *PR 24-01: Back-Check Procedure for Design Professionals*
- *PL 07-02: Over-the-Counter Review of Projects using Pre-Check (PC) Approved Designs.*

ENERGY CODE COMPLIANCE REFERENCE MATERIAL

- **Title 24 Part 6 California Energy Code:** Current adopted version.
- **Nonresidential Compliance Manual:** Published by the California Energy Commission, current version.
- **Reference Appendices:** Joint Appendices and Nonresidential Appendices, including Nonresidential (NR) Appendix NA4 Compliance Procedures for Relocatable Public School Buildings current version published by the California Energy Commission.

CALGreen/Energy Code Review (CGE) for Pre-Check (PC) Building Designs and the Construction, Relocation and/or Alteration of Relocatable Buildings

APPENDIX A: SAMPLE PERFORMANCE RUNS AND ORIENTATION TABLE

For each *individual building design*, provide the compliance margins for all cardinal orientations and **highlight the smallest compliance margin** for each climate zone for easy reference. This table must be created by the designer and is not generated by energy compliance software.

**If there are equivalent compliance margins, highlight one.*

Climate Zone 14		**LSC Energy**		
Azimuth (Front Orientation)		**Standard Design**	**Proposed Design**	**Compliance Margin %**
0	LSC			
	SOURCE			
90	LSC			
	SOURCE			
180°	LSC			
	SOURCE			
270°	LSC			
	SOURCE			

CALGreen/Energy Code Review (CGE) for Pre-Check (PC) Building Designs and the Construction, Relocation and/or Alteration of Relocatable Buildings

APPENDIX B: CLIMATE ZONE GROUPS (CZG) AND REFERENCED WEATHER STATIONS TABLE

Climate Zone Group	Climate Zone	Grouped Severity Ranking*	Referenced Weather Station
A	16	A2	Blue Canyon Nyack Airport
	1	A1	California Redwood Coast Humboldt County Airport
B	4	B4	Paso Robles Airport
	2	B3	Sonoma County Airport
	3	B2	Metro Oakland International Airport
	5	B1	Santa Maria Airport
C	10	C5	Riverside Municipal Airport
	9	C4	Hollywood Burbank Airport
	8	C3	Fullerton Municipal Airport
	6	C2	Los Angeles International Airport
	7	C1	San Diego International Airport
D	14	D4	Palmdale Regional Airport
	11	D3	Red Bluff Airport
	13	D2	Fresno Yosemite International Airport
	12	D1	Sacramento Executive Airport
Not in a group	15	N/A	Palm Springs International Airport

**The highest (most severe) climate zone within each Climate Zone Group is listed in descending numeric order within each group. The Highest Grouped Severity Ranking in each group shall be used to show compliance across the entire climate zone group The weather station indicated shall be used to show compliance across the entire climate zone group*

APPENDIX C: OPTION LIMITATIONS TABLE

Option Description	Maximum number of options per Individual Building Design	Notes
HVAC Systems	3	
Envelopes	1	
Fenestration	1	
Lighting	1	
Plumbing	1	

CALGreen/Energy Code Review (CGE) for Pre-Check (PC) Building Designs and the Construction, Relocation and/or Alteration of Relocatable Buildings

APPENDIX D: EXAMPLE DRAWING ORGANIZATION TABLE

To streamline CGE review, sheet organization may combine similar *individual building designs* and climate zone groupings but shall be organized to ensure efficient review and CGE verification prior to an over-the counter review. Sheet titles should include an indication of building size and climate zone or climate zone group (CZG) to facilitate removal of sheets or redaction of drawing information when resubmitted for site specific or stockpile applications. Changes affecting overall energy compliance other than removal or redaction of unrelated options are not permitted and voids PC approval (See Section 2.7). Not all disciplines are shown.

SHEET TYPE	SELECTION BOX	SHEET TITLE
Mfg. or industry standard, discipline specific organization.	For stockpile or site specific application indicating sheets included	Sheet title should include building description including size and major options as well as CZG that the individual building design(s) included on the sheet. Not all sheets indicated in this list may be applicable. Other sheets may be required adjust as necessary for scope of submittal.
COVER SHEET		**TITLE SHEET**
GENERAL NOTES & SPECIFICATIONS		GENERAL NOTES & SPECIFICATIONS
ARCHITECTURAL		FLOOR PLAN - 24'x40' OPT 1 - CZG A
		FLOOR PLAN - 24'x40' OPT 2 - CZG A
		FLOOR PLAN - 24'x40' OPT 1 - CZG B
		FLOOR PLAN - 24'x40' OPT 2 - CZG B
		FLOOR PLAN - 36'x40' OPT 1 - CZG A
		FLOOR PLAN - 36'x40' OPT 2 - CZG A
		FLOOR PLAN - 36'x40' OPT 1 - CZG B
		FLOOR PLAN - 36'x40' OPT 2 - CZG B
		ROOF PLAN - 24'x40' OPT 1 CZG A, B
		ROOF PLAN - 24'x40' OPT 2 CZG A, B
		ROOF PLAN - 36'x40' OPT. 1 CZG A, B
		ROOF PLAN - 36'x40' OPT. 2 CZG A, B
		EXTERIOR ELEVATIONS 24'x40'
		EXTERIOR ELEVATIONS 36'x40'
		BUILDING SECTIONS
[Architectural sheets continued on next page]		

SHEET TYPE		SHEET TITLE
		WALL SECTIONS - CZG A, B,
		INTERIOR ELEVATIONS - TYPICAL
		BUILDING DETAILS - CZG A
		BUILDING DETAILS - CZG B
MECHANICAL		MECHANICAL COVER SHEET
		MECHANICAL NOTES & SCHEDULES
		MECHANICAL PLAN 24'x40' OPT.1 – CZG A
		MECHANICAL PLAN 24'x40' OPT. 2 - CZG A
		MECHANICAL PLAN - 24'x40' OPT. 1 - CZG B
		MECHANICAL PLAN 24'x40' OPT. 2 - CZG B
		MECHANICAL PLAN 36'x40' OPT.1 – CZG A
		MECHANICAL PLAN 36'x40' OPT. 2 - CZG A
		MECHANICAL PLAN - 36'x40' OPT. 1 - CZG B
		MECHANICAL PLAN 36'x40' OPT. 2 - CZG B
		TYPICAL MECHANICAL DETAILS - CZG A
		TYPICAL MECHANICAL DETAILS - CZG B
ELECTRICAL		ELECTRICAL COVER SHEET
		ELECTRICAL NOTES & SCHEDULES
		LIGHTING PLAN - 24'x40' OPT 1 - CZG A, B
		LIGHTING PLAN - 24'x40' OPT 2 - CZG A, B
		LIGHTING PLAN - 36'x40' OPT 1 - CZG A, B
		LIGHTING PLAN - 36'x40' OPT 2 - CZG A, B
		POWER PLAN - 24'x40' OPT 1 - CZG A, B
		POWER PLAN - 24'x40' OPT 2 - CZG A, B
		POWER PLAN - 36'x40' OPT 1 - CZG A, B
		POWER PLAN - 36'x40' OPT 2 - CZG A, B
		TYPICAL ELECTRICAL DETAILS - CZG A, B
Note: The following example sheets presume that the lighting and power options do not affect overall energy compliance.		
ENERGY		SUMMATION SHEETS
		ENERGY CALCS - 24'x40' ENV OPT 1 / MECH OPT 1 - CZG A
		ENERGY CALCS - 24'x40' ENV OPT 1 / MECH OPT 2 - CZG A
		ENERGY CALCS - 24'x40' ENV OPT 2 / MECH OPT 1 - CZG B
		ENERGY CALCS - 24'x40' ENV OPT 2 / MECH OPT 2 - CZG B