

Energy

EE.P1 Minimum Energy Performance

Prerequisite

Applicability	Verification Required		
All project.	<input checked="" type="radio"/> at Design Review	<input type="radio"/> at Construction Review	<input type="radio"/> at Performance Review

Intent: Reduce environmental impacts and operational costs associated with consuming energy.

Hawaii ranks #1 in the U.S. for cost of energy, over 90% of which comes from high greenhouse gas emitting petroleum based fuels. Hawaii's climate and access to great daylight provides an array of opportunities to minimize energy use. In addition, the state Hawaii Clean Energy Initiative calls for a 70% reduction in energy usage by 2030. Energy-efficient schools save money while conserving non-renewable energy resources and reducing atmospheric emissions of pollutants and greenhouse gases.

Energy modeling is an effective tool for achieving energy savings and is a critical part of an integrated design approach. Various combinations of building systems can be modeled using specialized software to show payback calculations for different energy saving measures. The most effective energy modeling is an iterative process whereby different combinations of measures, such as daylighting, HVAC systems controls, lighting systems and controls, and energy recovery equipment, are modeled to determine the best payback and to minimize operational costs.

Requirement

Prerequisite	<p>EE.P1.1 The school design shall comply with the current State Energy Code, and perform to a minimum of 15% better than the total site energy use modeled under the current version of ASHRAE 90.1.</p> <p>EE.P1.2 Establish an EPA <i>Energy Performance Rating</i> goal of at least 75 using EPA's Target Finder rating tool. Utilize the resulting <i>Site Energy Use Intensity</i> (kBtu/sf/yr) goal as a performance target for the facility design, and for projects that intend to use the CHPS Operations Report Card (ORC) throughout the life of the school.</p>
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* EE.P1 and EE.C1 shall include regulated zones only, not "plug loads". Plug loads are defined as general miscellaneous equipment, shop equipment, vending machines, computers, kitchen cooking equipment and refrigeration, appliances, and laundry washing/drying equipment.

Implementation

Demonstrating compliance with this prerequisite requires energy code compliance modeling through a method or tool approved by the Hawaii State Energy Office. If no modeling method is approved, those acceptable by the U.S. Department of Energy shall be used.

Naturally ventilated and conditioned spaces shall also follow the modeling procedures outlined for these space types under ASHRAE 90.1 Appendix G, using the Exceptional Calculation Methodology.

Verification

For projects seeking verification through the CHPS Verified Program (Pg 12), compliance documentation is required only at design review.



Design Review Requirements	
EE.P1.1	Construction drawings must include outputs of ASHRAE 90.1 energy modeling. Reports must include the Building Energy Performance Summary (BEPS), Building Energy Performance – Utility (BEPU) and Energy Cost Summary (ES-D). The reports must reflect the design of submitted project's plans.
EE.P1.2	Construction drawings must include an EPA <i>Energy Performance Rating</i> goal of at least 75 using EPA's Target Finder rating tool.

Resources

IECC and ANSI/ASHRAE/IES Standard 90.1 Energy Standard for Buildings Except Low-Rise Residential Buildings, published jointly by ICC and ASHRAE.

<http://www.iccsafe.org/Store/Pages/Product.aspx?category=7130&cat=ICCSafe&id=7802S09>

Hawaii State Energy Office: <http://energy.hawaii.gov/>

ENERGY STAR—www.energystar.gov/—ENERGY STAR is a federal government-sponsored program helping businesses and individuals protect the environment through superior energy efficiency.

Rebuild America—www.rebuild.org/sectors/ess/index.asp—Rebuild America manages the Energy Smart Schools program.

The Consortium for Energy Efficiency (CEE) provides information on high performance equipment: www.cee1.org

The International Energy Conservation Code (IECC) is developed by the International Code Council as is available for download at: <http://www.iccsafe.org/>

The ASHREA Advanced Energy Design Guide for K-12 School Buildings: <http://www.ashrae.org/publications/page/1604>



Energy

EE.P2 Commissioning

Prerequisite

Applicability	Verification Required		
All projects.	<input checked="" type="checkbox"/> at Design Review	<input checked="" type="checkbox"/> at Construction Review	<input type="checkbox"/> at Performance Review

Intent: Verify that fundamental building elements and systems are designed, installed, and calibrated to operate as intended, and provide for the ongoing accountability and optimization of building energy performance over time.

Commissioning, maintenance, and training are vitally important to the performance of the school and are key to maintaining energy efficiency. Commissioning involves a rigorous quality assurance program that ensures the building and its systems are built and operated as designed and that the school district receives the proper training and documentation needed to operate and maintain the building. No building can perform optimally without adequate maintenance. Training is critically important for maintenance staff to thoroughly understand how to maintain and operate the building systems. When staff turnover occurs, appropriate documentation must be on hand in order to train new team members.

Do not underestimate the value of commissioning. Buildings, even simple structures, are complex systems of electrical, mechanical, and structural components. High performance buildings are healthy, efficient, environmentally sensitive structures whose performance can be significantly affected if the building has not been designed following the owner's project requirements or constructed according to the designers' specifications. Commissioning is a rigorous quality assurance program administered by a knowledgeable third party that ensures the building performs as expected.



Requirement

Prerequisite	<p>EE.P2.1 All of the following fundamental best practice commissioning procedures must be implemented:</p> <p>Engage an independent, third-party commissioning agent (CA). The commissioning agent will be responsible for commissioning the following critical building systems:</p> <p><i>Electrical Systems:</i></p> <ul style="list-style-type: none">• Lighting controls (daylight, occupancy, timing switches, etc.);• On-site renewable solar electric or wind systems <p><i>Mechanical Systems:</i></p> <ul style="list-style-type: none">• HVAC systems (such as hot water systems, chilled water systems, central air systems, ventilation systems);• Domestic hot water systems;• Energy management system• Renewable energy heating systems <p><i>Plumbing Systems:</i></p> <ul style="list-style-type: none">• Flow control devices• Pumping systems• Special hazardous waste treatment systems (e.g. for lab wastes)• Domestic hot water systems• Graywater systems (if applicable) <p>The CA shall review the design intent and basis of design documentation.</p> <p>Include commissioning requirements in the construction documents.</p> <p>Develop and utilize a commissioning plan.</p> <p>Conduct a selective review of contractor submittals of commissioned equipment.</p> <p>Review the Operations & Maintenance Manual.</p> <p>Verify installation, functional performance testing (including off-season testing), training, and operations and maintenance documentation. A minimum 15% sampling strategy for testing terminal units and repetitive units is permissible. All major systems must be tested.</p> <p>Participate in training of facility staff in accordance with the training plan.</p> <p>Complete a commissioning report.</p>
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Implementation

The following list describes each of the commissioning steps listed above in greater detail.

- *Engage a commissioning agent.* The commissioning agent (CA) directs the commissioning process and should be hired in time for the design development phase. The commissioning services must be performed by an independent third party, i.e. not part of the design or construction management of the project. The CA may be hired by the owner, the owner's project manager, or the design firm as long as the CA is not an employee of the design firm and reports to both the school district and the design firm. The CA should satisfy the qualifications of, and perform in accordance with, the Building Commissioning Associations' (BCA) most current version of the Essential Attributes of Building Commissioning. The CA must have experience commissioning similar projects in accordance with this standard. Consider a commissioning agent recognized by a professional organization such as an "ACG Certified Commissioning Agent", "NEBB Qualified Commissioning Administrator", or "TABB Certified Commissioning Supervisor". It is acceptable if the CA is a qualified employee of the school district.
- *Conduct a focused review of the construction documents when close to completion.* This review should be conducted prior to issuing the construction documents for bid and captured in the commissioning report. The review should answer these questions:
 - Does the design meet the owner's design intent?
 - Does the design allow for proper maintenance access?
 - Do the construction documents clearly detail the construction requirements?
 - Do the construction documents clearly define the commissioning requirements?
- *Include commissioning requirements in the construction documents.* All commissioning requirements must be integrated into the construction documents to clearly specify the responsibilities and tasks to be performed. Of particular importance are the delineation of the contractors' responsibilities regarding documentation, functional performance testing, occupant and operator training, and the creation of the operations and maintenance manuals.
- *Develop commissioning plan.* The commissioning plan includes a list of all equipment and systems to be commissioned, delineation of roles for each of the primary commissioning participants, and details on the scope, timeline, and deliverables throughout the commissioning process.
- *Conduct a selective review of contractor submittals of commissioned equipment.* Contractor submittals for the systems and equipment included in the commissioning scope shall be reviewed by the CA in conjunction with the designer's review. The review shall focus on the ability of the submitted product to meet the owner's requirements and review comments shall be provided to the owner and the design team.
- *Review Operations & Maintenance manual.* This manual is intended to help future operating staff to understand and optimally operate and maintain the commissioned systems. The general contractor compiles the O&M manual and the commissioning agent reviews it for completeness and readability. The O&M manual must contain the following items:
 - As-built sequences of operations for all equipment as provided by the design professionals and contractors, including time-of-day schedules and schedule frequency, and detailed point listings with ranges and initial setpoints.
 - Ongoing operating instructions for all energy- and water-saving features and strategies.
 - Seasonal operational guidelines.
 - Recommendations for recalibration frequency of sensors and actuators by type and use.



- Guidelines for continuous maintenance of the owner's project requirements (operational requirements) and basis of design (basis of operation).
- *Verify installation, functional performance testing, training, and operations and maintenance documentation for each commissioned system and feature.* The CA must complete off-season functional performance testing. This is the heart of the commissioning process.
- *Participate in training of facility staff in accordance with the training plan.* The CA may be charged with reviewing the training plan, developed by the Construction Manager/General Contractor, for adequacy. The CA may additionally be charged with participating in the training itself. This task is related to prerequisite EE.P3.
- *Complete a commissioning report.* The report must show that the building's systems have met the design intent and specifications, have been properly installed, are performing as expected, and that proper O&M documentation and training have been provided. The report should include a compilation of all commissioning documentation described in this credit, including complete functional testing results and forms and should note any items that have not been resolved at the time the report is issued. Specifically the report must include:
 - An executive summary that describes issues identified during the commissioning process.
 - A final version of the design intent and basis of design.
 - Single line diagrams of each commissioned system.
 - A summary table listing, dates of tests, and results of tests.
 - A summary table listing functional performance tests results, dates of tests, and results; include blank test forms and a recommended schedule for ongoing benchmarking.
 - Corrective action log summarizing deficiencies and actions taken to correct them. Include any deficiencies that were identified but not corrected.

Testing Sampling Criteria

The contractors shall submit to the CA documentation that they have performed installation and functional performance verification in accordance with the commissioning plan for all equipment components and systems. The functional performance test may be demonstrated to the CA for a sample of systems that comply with all of the following criteria:

- There are many equipment or systems with similar components and configurations. For component testing, sampling may apply where there are many identical component types with similar applications.
- The systems or equipment have identical sequences of operation, which are implemented using identical control software programming or firmware settings.
- The components and systems to be included in the demonstrated samples shall be chosen by the commissioning authority at the time of demonstration.
- Building Automation System mapping of component to the operators graphic shall be demonstrated for all components.
- The trend logging portions of all functional performance test shall be completed for 100% of the systems or components.

Failure Testing

The Commissioning Plan must also identify retesting protocols for components and systems that fail initial testing.



Verification

For projects seeking verification through the CHPS Verified Program (Pg 12), compliance documentation is required at design review and construction review.

Design Review Requirements	
EE.P2	Provide the projects Commissioning Plan and Owners Project Requirements (OPR).
EE.P2	Construction drawings must include general notes that commissioning is required, at what stages and where the Commissioning Plan may be found for more information.
Construction Review Requirements	
EE.P2	Provide the final Commissioning Report.
EE.P2	Provide the Operations and Maintenance Manual.

Resources

CHPS *Best Practices Manual*, Volume V: Commissioning

ASHRAE Guideline 1-1996: The HVAC Commissioning Process

ASHRAE Guideline 4-1993: Preparation of Operations & Maintenance Documentation for Building Systems

The Building Commissioning Association, Essential Attributes of Building Commissioning, 1999 Edition:
<http://www.bcx.org/membership/attributes1999.htm>

ASHRAE Guideline 0 – 2005 The Commissioning Process:
<http://webstore.ansi.org/RecordDetail.aspx?sku=ASHRAE+Guideline+0-2005>

The National Clearinghouse for Educational Facilities includes a bibliography on commissioning:
<http://www.edfacilities.org/rl/commissioning.cfm>



Energy

EE.P3 Facility Staff & Occupant Training

Prerequisite

Applicability	Verification Required		
All projects.	<input type="radio"/> at Design Review	<input checked="" type="radio"/> at Construction Review	<input type="radio"/> at Performance Review

Intent: Training is the foundation of effective maintenance programs and is an essential tool to protect indoor air quality and maintain superior energy performance.

The design and construction of the school may incorporate all the latest high performance features, yet problems can occur simply because important information is not transferred from the design and construction teams to the school facilities and maintenance staff, or to the building occupants. Training the facilities and maintenance staff is essential to the performance of the building, but is often not performed or is hastily completed. Training the teachers and administration staff in how they can control their room environments provides them with an understanding that will help the facilities staff keep the building performing optimally.

Requirement

Prerequisite	EE.P3.1 <u>Facility Staff Training</u> : Facility staff must receive training on, and an Operations and Maintenance Manual on all building systems included in the commissioning scope of work under the commissioning prerequisite EE.P2.
Prerequisite	EE.P3.2 <u>Teacher/Administrative Staff Training</u> : Teachers, administrators, and support staff must be provided with training on operations of lighting, ventilation and conditioning systems in classrooms, offices, gyms, auditoriums etc. A User's Guide, explaining basic systems operations, shall be developed and available either electronically for download or in a central school location.

Implementation

EE.P3.1

Provide Operations & Maintenance training for facilities and maintenance staff on all major building systems outlined in the commissioning prerequisite EE.P2. It is typical to specify training requirements in the construction contract and subsequently, the general contractor arranges for equipment vendors, controls contractors etc. to teach building operators how to use and maintain their new equipment. The training may be overseen by the commissioning agent to ensure that the facilities staff receives the materials and hours of training stipulated in the construction contract. It is vital that facility and maintenance staff attend these training sessions.

Compile an Operations & Maintenance Manual: The manual should provide detailed operations and maintenance information for all equipment and products installed; it should be specifically written for maintenance and facility staff. The construction contractor typically furnishes the O&M manuals and the commissioning agent reviews the manual for completeness and clarity.

EE.P3.2

Create a brief and concise classroom "User's Guide" for teachers and administrative staff explaining how to operate their room lighting and HVAC systems. A User's Guide should be posted in every room of the school.



Conduct Operations & Maintenance training for staff. Provide a short introduction for all school staff explaining how classroom systems work such as lighting and temperature controls, particularly if classrooms have operable windows and air conditioning systems.

It is strongly recommended that staff are informed of what to expect in terms of temperature settings so that they do not ask the school operators to exceed the standard setting.

Cross-Category and Other Considerations

This prerequisite relates to all prerequisites and credits that involve operable building systems, including HVAC, windows, and room controls. Good training is critical for good operations, and good operations are critical for good building performance. The prerequisite also relates to the required Systems Maintenance Plan in OM.P2. The operations and maintenance manual described here will be part of the plan, along with the inventory and schedule of maintenance.

Verification

For projects seeking verification through the CHPS Verified Program (Pg 12), compliance documentation is required at only construction review.

Construction Review Requirements	
EE.P3	Provide proof of delivered trainings for both types of staff. Include agendas, attendee lists and samples of materials covered.
EE.P3	Provide the User's Guide and where it is available for staff access.

Resources

ASHRAE Guideline 16: The HVAC Commissioning Process

ASHRAE Guideline 4: Preparation of Operations & Maintenance Documentation for Building Systems

LEED™ *Reference Guide*: Energy and Atmosphere Prerequisite 1 and Credit 3: Fundamental Building Systems Commissioning and Enhanced Commissioning



Energy

EE.P4 Eliminate Ozone Depleting Refrigerants

Prerequisite

Applicability	Verification Required		
All projects.	<input checked="" type="radio"/> at Design Review	<input type="radio"/> at Construction Review	<input type="radio"/> at Performance Review

Intent: Reduce the ozone impact of refrigerants.

Because chlorofluorocarbon-based refrigerants have been found to adversely affect atmospheric ozone levels, this prerequisite requires the use of alternative refrigerants in Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC&R) systems.

Requirement

Prerequisite	<p>EE.P4.1 New Construction – Use no CFC (chlorofluorocarbon) based refrigerants in building Heating, Ventilating, Air Conditioning, & Refrigeration (HVAC&R) systems.</p> <p>Renovations – All new installation of Heating, Ventilating, Air Conditioning, & Refrigeration (HVAC&R) systems shall have no CFC-based refrigerants.</p>
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Implementation

Submit specifications demonstrating the use of non-CFC-based refrigerants in all HVAC and refrigeration systems to be installed.

Verification

For projects seeking verification through the CHPS Verified Program (Pg 12), compliance documentation is required only at design review.

Design Review Requirements	
EE.P2	Construction drawings, most likely the mechanical schedule, must include equipment specified with no CFC based refrigerants.

Resources

None.



Energy

EE.P5 Base Level Energy Management System

Prerequisite

Applicability	Verification Required		
All projects. Naturally ventilated and conditioned projects are exempt from this prerequisite.	<input checked="" type="checkbox"/> at Design Review	<input checked="" type="checkbox"/> at Construction Review	<input type="checkbox"/> at Performance Review

Intent: Provide control, accountability, and optimization of building energy performance.

Energy Management Systems (EMS), lighting control and metering, are important for controlling, monitoring, and understanding patterns of energy use in schools.



Requirement

Prerequisite	<p>EE.P5.1 Install a energy management system (EMS) to control the operating schedule of HVAC systems throughout the building including terminal units, packaged units, air handling units, make-up air units, centralized hydronic heating and cooling systems, pumps, and fans including fume hoods. Fractional horsepower fans, fractional horsepower pumps and units providing air conditioning to spaces requiring constant temperature continuous 24/7 cooling such as computer server rooms, network equipment rooms, or walk-in refrigerators and freezers are excluded. The base level EMS shall provide the following energy saving features:</p> <ul style="list-style-type: none">• Scheduled unoccupied setback temperature control for spaces that require 24/7 cooling but not constant temperature control (such as libraries) should the space temperature rise above the setback temperature. Setback temperature settings shall be no higher than 78 degrees F.• Scheduled control of all ventilation outdoor air fans, exhaust fans and outdoor air dampers so that fans are turned off and dampers are closed during unoccupied periods.• Zoning of systems so that major building areas (i.e. gymnasium, cafeteria, library, classrooms, administrative offices) can be independently scheduled during non-school hours.• An override system to temporarily index a unit or zone from unoccupied to occupied mode locally is permitted provided that it is timed and will automatically revert back to the normal operating schedule after no more than four hours. A local override switch that is not on a timer is not permitted. Ventilation outdoor air shall be set to occupied mode if the local override is used. <p>A centrally located scheduling interface shall be provided so that the operator can schedule the EMS operating mode for weekdays, weekends, and holidays. The scheduler shall be capable of independently scheduling each major building area or zone. If the facility management staff that sets the operating schedule is located at another site, the EMS shall have a web-based interface so that the schedule can be set remotely.</p>
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Implementation

While energy management systems (EMS) are typically installed with new HVAC systems, care must be taken to specify and install an appropriate system for the district and its maintenance staff. The best EMS for a school or district is the simplest system that still addresses the school's energy management needs. Increased complexity does not always mean increased value for the school or district.

Energy management systems can potentially save significant energy, but only if the staff understands how to operate them. With EMS installation, proper training of district staff is absolutely critical. The district must be prepared to budget for staff training and for training new staff when those knowledgeable about the EMS leave employment, see credit OM.C2.

This prerequisite requires a base level EMS system to be installed, whereas EE.C3 gives credit for a more advanced system.

Verification

For projects seeking verification through the CHPS Verified Program (Pg 12), compliance documentation is required at design review and construction review.

Design Review Requirements



EE.P5	Construction drawings must include specifications and plans for an Energy Management System. The specifications should include a list of all the sensors (measurements to be taken throughout the building) and actuators (devices to be controlled). It should also specify the protocol for communication between the sensors, actuators and the computer (controller).
Construction Review Requirements	
EE.P5	Provide a PDF of the manual or plan provided to staff on the EMS addressing how the operator interface works.
EE.P5	Provide proof of purchase and installation.

Resources

New Buildings Institute, Advanced Buildings, E-Benchmark October 2003, Version 1.0

CHPS *Best Practices Manual*, Volume II: Guideline TC23: Adjustable Thermostats; Guideline TC24: EMS/DDC; Guideline EL4: Lighting Controls for Classrooms.

School Facilities Manual, Washington State Office of the Superintendent of Public Instruction, 4th Edition, March 2000, available online at:

http://www.eric.ed.gov/ERICWebPortal/custom/portlets/recordDetails/detailmini.jsp?_nfpb=true&_ERICExtSearch_SearchValue_0=ED447673&ERICExtSearch_SearchType_0=no&accno=ED447673

CHPS *Best Practices Manual*, Volume V: Commissioning



Energy

EE.P6 ENERGY STAR® Equipment

Prerequisite

Applicability	Verification Required		
All projects.	<input type="radio"/> at Design Review	<input checked="" type="radio"/> at Construction Review	<input type="radio"/> at Performance Review

Intent: Reduce the electric load from plugged-in equipment where efficiencies are available and controls can be utilized.

Plug loads can contribute to a significant amount of the total school energy load. Choosing equipment and appliances carefully to ensure they are energy efficient, and understanding what the future plug loads of the school will be once opened, are important steps during school design, planning and construction to reduce these energy loads.

Requirement

Prerequisite	EE.P6.1 Require ENERGY STAR equipment and appliances, where available, for all new purchases for the school and prohibit the purchase of low efficiency products.
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Implementation

Hawaii House Bill 2175 (Act 96), signed May 12, 2006, directs agency's to purchase Energy Star equipment to the extent possible. The ENERGY STAR program, managed by the U.S. EPA, maintains a database of compliant manufacturers and products. To earn this credit, all new equipment or appliances purchased (or replaced for an existing school) for the school must be ENERGY STAR-compliant. Products not currently covered under the ENERGY STAR program are excluded from the scope of this credit. A partial list of equipment covered by ENERGY STAR includes computers, monitors, copy machines, water coolers, printers, scanners, refrigerators, and washing machines.

Prohibit purchase of low efficiency products such as halogen torchieres and portable electrical resistance heaters.

Provide an inventory list and submittals for all equipment and appliances indicating that they are Energy Star labeled products.

Verification

For projects seeking verification through the CHPS Verified Program (Pg 12), compliance documentation is required at only construction review.

Construction Review Requirements	
EE.P6	Provide a list along with proof of purchase for all equipment and appliances. The list must include the brand, product name and model number. Compliance will be verified through the ENERGY STAR website.



Resources

ENERGY STAR: www.energystar.gov/.

ENERGY STAR Low Carbon IT Campaign. This program can help reduce power used by computers and other office equipment. http://www.energystar.gov/index.cfm?c=power_mgt.pr_power_mgt_low_carbon

Hawaii House Bill 2175 (Act 96): http://hawaii.gov/dbedt/info/energy/efficiency/state/Act96_reprint.pdf



Energy

EE.C1 Superior Energy Performance

24 Points

Applicability	Verification Required		
All projects.	<input checked="" type="radio"/> at Design Review	<input type="radio"/> at Construction Review	<input type="radio"/> at Performance Review

Intent: Exceed the minimum energy performance beyond the prerequisite.

There are significant opportunities to reduce energy use beyond the ASHRAE 90.1 baseline. Providing a more energy efficient building saves money for the school district, reduces environmental impacts and has a number of other long term benefits. EE.P1 (prerequisite) requires that schools and administrative offices be a minimum 15% more efficient than minimum compliance with the ASHRAE 90.1. Up to 24 additional points are offered for design buildings that are up to 50% more energy efficient than code minimum.

Requirement

Mechanically Conditioned Projects	Naturally Conditioned Projects	EE.C1.1 Utilize the Energy Prerequisite EE.P1 for quantifying reductions in total site energy use compared to the most current adopted version of ASHRAE 90.1 by the State of Hawaii. Points are awarded according to the percentage saved over a baseline building.
2 points	3 points	17% minimum reduction
4 points	5 points	20% minimum reduction
6 points	7 points	22% minimum reduction
8 points	9 points	25% minimum reduction
9 points	10 points	27% minimum reduction
11 points	12 points	30% minimum reduction
12 points	13 points	34% minimum reduction
13 points	14 points	37% minimum reduction
15 points	16 points	40% minimum reduction
16 points	17 points	44% minimum reduction
17 points	18 points	47% minimum reduction
19 points	20 points	50% minimum reduction
21 points	22 points	55% minimum reduction
23 points	24 points	60% minimum reduction



* EE.P1 and EE.C1 shall include regulated zones only, not “plug loads”. Plug loads are defined as general miscellaneous equipment, shop equipment, vending machines, computers, kitchen cooking equipment and refrigeration, appliances, and laundry washing/drying equipment.

Implementation

Follow compliance procedures under EE.P1. No partial points are allowed.

Verification

For projects seeking verification through the CHPS Verified Program (Pg 12), compliance documentation is required only at design review.

Design Review Requirements	
EE.C1	Construction drawings must include outputs of ASHRAE 90.1 energy modeling. Reports must include the Building Energy Performance Summary (BEPS), Building Energy Performance – Utility (BEPU) and Energy Cost Summary (ES-D). The reports must reflect the design of submitted project's plans.

Resources

See resources under EE.P1.

