CA-CHPS Interim Addendum and Errata
For Use with CA-CHPS 2014

June 23, 2020

This addendum serves to bridge the time between the release of the 2019 California Code of Regulations and the release of the 2020 update to the CA-CHPS Criteria, and as a general errata sheet for all projects following CA-CHPS 2014.

A. General Addendum and Errata – applicable to all projects following CA-CHPS 2014 (v1.01 or v1.02)

1. **This addendum incorporates by reference all relevant interpretations and revisions published on https://chps.net/interpretations-and-errata.**

2. **II 1.1.3 BIM: Teams are no longer asked to provide the IFC format files. Documentation has been changed to:** Provide a short narrative from the team identifying what BIM software was used and how it informed the design of the project, specifically related to sustainability and the CHPS Criteria.

3. **EQ 1.0 ASHRAE 62.1: changed as follows:**
   Item 6. The exception for air intake distance within 25 feet is removed. ASHRAE Standard 62.1-2016 §5.5 is sufficient.
   Item 7. Text changed to: The particulate matter filters or air cleaners shall meet all requirements in ASHRAE Standard 62.1-2010, (§5.8, §6.2.1.1 and §6.2.1.2). In addition, filtration media shall have a Minimum Efficiency Reporting Value (MERV) of 13 or higher, ~~for all new HVAC systems excluding unit ventilators, which can have MERV 8, except in accordance~~ *consistent with* CALGreen section 5.504.5.3. All HVAC filtration media must be replaced immediately prior to occupancy.
   Item 10. Text changed to: The school shall be in compliance with ASHRAE 62.1-2016 §6.2.1.3*, as applicable.*
   The paragraph beginning with "The design shall ensure that…" is deleted.

4. **EQ 1.2 Dedicated Outdoor Air System: Clarification added that DOAS is primarily beneficial for classrooms and that a DOAS may be installed in only part of a building to serve classrooms, e.g. a classroom wing. Documentation has been modified to:** CDs must include the required components of the DOAS system. Provide the ASHRAE 62 MZ Calc spreadsheet or equivalent. Show that the system provides 100% fresh air without mixing with recirculated air; show integrated energy recovery strategy.

5. **The points for EQ 12.1 Views are corrected below. No other changes to this credit are made.**
   1 point for 70% compliance
   2 points for 80% compliance
   3 points for 90% compliance

6. **SS 9.0 Bicycle Parking: CALGreen reference is corrected to Section 5.106.4.2.**

7. **SS 10.1 Reduce Heat Islands, SS 12.1 Avoid Light Pollution, SS 14.1 Use Locally Native Plants for Landscape: For new buildings on an existing campus and modernizations, applicability to entire site is removed. The credit applies to the scope of work only.**

8. **EQ 8.1 Low Radon: Replace the existing credit language with the following:**

   EQ 8.1 LOW RADON

APPLICABILITY: All projects

VERIFICATION: Design Review, Construction Review

EQ 8.1 REQUIREMENTS

For new construction, institute radon reduction measures specifically, *but not limited to*: soil gas barrier, gas permeable layer, and vent pipes for fan-activated radon removal systems (should testing warrant system activation). Designs and strategies depend on the types of building foundations and other factors. See *CC-1000 Soil Gas Control Systems in New Construction of Buildings* by ANSI/AARST for radon reduction measures that work best for different construction types and scopes

Radon reduction measures are not deemed effective until testing verifies radon levels below 4 pCi/L. Test for radon according to *MALB Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*.

For renovations/modernizations, perform post-renovation radon testing and make necessary mitigations should radon levels meet or exceed 4 pCi/L. Test for radon after HVAC systems are commissioned and performing as intended prior to occupancy. If mitigation is warranted, such as HVAC manipulations or sub-slab depressurization, procedures must follow *RMS-LB Radon Mitigation Standards for Schools and Large Buildings* as soon as possible. If radon levels are near 100 pCi/L or greater, school officials should call their State Radon Contact and consider relocating from affected rooms until the levels can be reduced. All radon testing must follow the *MALB Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings.*

EQ 8.1 IMPLEMENTATION

New school buildings have a unique opportunity to prevent radon gas from entering the interior of a school at the USEPA action level of greater than or equal to 4 pCi/L. Design and construction methods for radon reduction should follow *CC-1000 Soil Gas Control Systems in New Construction of Buildings.* Additionally, the USEPA regional office or state radon program and professionals certified in radon testing and mitigation should be consulted. If hiring measurement and mitigation consultants, ensure that they are certified through the National Radon Proficiency Program (NRPP) or National Radon Safety Board (NRSB). Also ensure that projects comply with applicable codes, regulations and certification rules within the project jurisdiction.

Once measures have been incorporated into the construction of the school and HVAC systems have been commissioned and are operating as intended, then test that levels of radon are less than 4 pCi/L. Post-construction radon testing best practices are found in *MALB Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings.* Where radon testing indicates high radon (4 pCi/L or greater), the radon system can be activated with a fan and/or HVAC can be modified to reduce radon in accordance with *CC-1000 Soil Gas Control Systems in New Construction of Buildings.*

Renovations/modernizations also have opportunities to successfully mitigate radon levels in school projects. Depressurization systems which pull air from below the slab or crawl spaces or changes to ventilation are examples of proven measures that reduce radon. These changes should be made once HVAC systems have been commissioned and are operating as intended. At that point, testing can be conducted to determine presence of radon and whether airflow adjustments are needed. Projects must consult *RMS-LB Radon Mitigation Standards for Schools and Large Buildings and MALB Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings* for guidance on mitigation and testing measures and, as above, USEPA regional office or state radon program and professionals certified in radon testing and mitigation should be consulted.

To maintain low radon environments, a school should be tested at least every five years unless the school previously tested with high levels. In such schools, those rooms or buildings should be mitigated and then retested every two years. Retesting is done to ensure that the mitigation system remains effective and that common building changes are not causing a change in radon levels from previously known levels. The need for retesting is triggered by the following types of events:

- Renovation work that includes energy upgrades
- HVAC equipment that is added, removed, replaced, operated incorrectly or differently, or improperly maintained
- New additions/significant renovations

EQ 8.1 DOCUMENTATION

DESIGN REVIEW

Provide specifications and construction documents showing radon prevention measures and active mitigation systems, if necessary, that are compliant with the relevant standard.

CONSTRUCTION REVIEW

Submit a statement from the Project Team that summarizes the following: date radon testing was completed, test duration, and the radon levels detected. Indicate whether further mitigation was needed.

Statement must indicate that testing was performed in accordance with *MALB Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*, ANSI/AARST.

EQ 8.1 RESOURCES

1. CC-1000 Soil Gas Control Systems in New Construction of Buildings, ANSI/AARST
2. RMS-LB Radon Mitigation Standards for Schools and Large Buildings, ANSI/AARST
3. MALB Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings, ANSI/AARST
4. EPA Radon in Schools Webinar: https://www.epa.gov/iaq-schools/forms/webinar-radon-schools-what-you-need-know-properly-manage-radon-your-school
5. American Association of Radon Scientists and Technologists (AARST) Mitigation and Certification Courses: http://aarst-nrpp.com/wp/entry-level-courses/
6. Schools and Daycares testing: https://www.certi.us/cms/component/virtuemart/courses/continuing-education/c-16-108-addressing-radon-in-daycare-facilities,-schools-and-large-buildings-certi-323-detail?Itemid=0
7. Western Regional Radon Training Center courses: http://kansasradonprogram.org/courses
8. Eastern Regional Radon Training Center courses: http://www.cpe.rutgers.edu/programs/radon_indoor_air_quality.htmlNational Radon Proficiency Program (NRPP) http://aarst-nrpp.com/wp/certification/
9. National Radon Safety Board (NRSB) http://www.nrsb.org/

B. Specific Addendum and Errata – applicable to new or replacement school, or new building on an existing campus, and major modernization projects that are registered between January 1, 2020

and the release of new CA-CHPS (anticipated in fall 2020),

1. **EE 1.0 Energy Efficient Design: Project teams may use the draft energy efficiency prerequisite, as follows:**

EE 1.0 ENERGY EFFICIENT DESIGN (PREREQUISITE)

APPLICABILITY: New construction and major modernization projects

VERIFICATION: Design Review

EE 1.0 REQUIREMENTS

Projects shall design for energy efficiency and greenhouse gas emissions reduction by demonstrating compliance with one of the following:

Prescriptive Compliance Options

1. Prescriptive compliance with the 2019 CA Energy Code (Title 24 Part 6).
2. The prescriptive requirements of ASHRAE Standard 90.1-2016
3. The prescriptive requirements of the 2018 edition of the *International Energy Conservation Code* (IECC)
4. The base requirements of Tier 2 of the *Advanced Buildings New Construction Guide* from the New Buildings Institute (NBI).
5. The 50% ASHRAE *Advanced Energy Design Guide* for Schools

Performance Compliance Options

1. Demonstrate the project's "above code" energy performance using the standards, procedures, and approved computer programs for compliance with the 2019 CA Energy Code (Title 24 Part 6). Performance will be evaluated using the "Above Code Qualifications" process in the reporting which includes Miscellaneous Energy consumption such as receptacle and process load.
2. Demonstrate the project's energy performance is more efficient on a source energy basis than the Budget Building Design, using the procedures in ASHRAE Standard 90.1-2016, Appendix G.
3. Achieve an ENERGY STAR score of at least 75 using Target Finder or Portfolio Manager. This option may be used with any baseline, but additional points in C1.1 are not available without modeling against ASHRAE 90.1-2016 or following zEPI.

EE 1.0 IMPLEMENTATION

Performance Compliance - CA Energy Code Option

Projects shall document their performance compliance using the standards, procedures, and approved computer programs for compliance with the 2019 CA Energy Code (Title 24 Part 6). The performance metric to be used shall be TDV as mandated by the CA Energy Code procedures. Performance will be evaluated using the "Above Code Qualifications", Section C2 in the reporting, which includes Miscellaneous Energy consumption such as receptacle and process load.

Campus or multi building performance averages shall be calculated using the TDV metric and weighted among buildings on a weighted basis as outlined above.

Since the CA Energy Code may not allow full consideration of a project's energy features, design teams may elect to use the ASHRAE Compliance option presented above in lieu of this CA Energy Code Option.

Performance Compliance - ASHRAE Option

On a new site or campus, designs for a single new building shall comply on a whole-building basis, and designs for multiple new buildings shall comply based on the entire campus.

On an existing site, designs for a single new building shall comply on a whole-building basis. Multiple new buildings may comply on a whole-building or combined basis, depending on scope.

For renovation/modernization or additions, projects may comply either on the basis of the whole building or the scope of work. Projects that include a mix of new construction and renovation may calculate the performance on a combined basis or on a separate basis, depending on the nature of the scope.

Combined efficiency shall be calculated as a weighted average:

Weight of Building n
= % area of n (decimal) = total area / area n

Combined Savings
= (savings 1*weight 1)+(savings 2*weight 2)+(savings 3*weight 3)+…*100

Energy Metric

The baseline and proposed site energy predicted from the energy model simulations and renewable energy system designs shall be converted to source energy using the Source Energy Conversion factors from Table EE1-1 below. Note that the procedures in the 90.1-2016 PRM require the use of energy cost as the metric, but for CHPS purposes, source energy is required.

Table EE1-0: Source Energy Multipliers (1)

Energy Type	Source Energy Conversion
Electricity (Grid Purchased)	2.8
Exported Electricity (exported On-Site renewable)	1.00
Natural Gas	1.05
Fuel Oil	1.01
Propane & Liquid Propane	1.01
Steam	1.20
Hot Water	1.20
Chilled Water	0.91
Wood	1.00
Coal/Coke	1.00
Other	1.00

The source energy conversion factors in the table are used in the ENERGY STAR Portfolio Manager and Target Finder tools; updated August 2018 (1).

To determine source energy generally, multiply the energy consumed on site for each energy type by its source energy conversion factor. Then add together all the source energy conversions.

For example, if 100 kBtu of electricity from the grid is used in a month. The grid electricity would use a conversion factor of 2.8 and the calculation would be:

100 kBtu Grid Electricity × 2.8=280 kBtu Source

Consider that the example school also consumes 100.0 kBtu of natural gas. The conversion factor for natural gas is 1.05, so the calculation would be:

100 kBtu Grid Electricity × 2.8 + 100 kBtu Natural Gas x 1.05 = Total Source Energy

If natural gas and electricity are the only two energy types used at the school, its total source energy would be:

280 Source kBtu Grid Electricity+**105** Source kBtu Natural Gas=**385** Total Source kBtu

If the school also includes renewable energy, the total electricity consumed will need to be divided between the onsite renewable electricity consumed and the grid electricity consumed since they have different source conversion factors. For a modeled building, this would mean calculating the total production capacity of the renewable energy system and subtracting it from the total electricity consumption calculated by the building energy simulation to find the grid electricity consumed.

Take for example a school design whose energy model shows 100 kBtu total electricity consumption, and whose renewable energy system will produce 80 kBTU. 80 kBtu of the total electricity consumption will be renewable electricity and the remaining 20 kBtu would be grid electricity consumption. So, the calculation would be:

80 kBtu Renewable Electricity × 1.0 + 20 kBtu Grid Electricity x 2.8 = Total Source Energy

80 Source kBtu Renewable Electricity+**56** Source kBtu Grid Electricity

=**136** Total Source kBtu

If a school has excess renewable energy production, then that can be used to offset the source energy of other sources. So, if a school has 100 kBtu of electricity consumption, 20 kBtu of natural gas consumption, and 120 kBtu of renewable electricity production, the calculation would be:

100 kBtu Renewable Energy Consumption x 1.0 + 20 kBtu Natural Gas Consumption x 1.05-20 kBtu excess renewable energy **production** = Total Source Energy

100 Source kBtu Renewable Electricity+**21** Source kBtu Natural Gas-**20** kBtu Source Renewable Electricity = **101** Total Source kBtu

Renewable energy and natural gas do not have the same conversion factors, so the excess renewable energy production does not completely offset the source value of the same quantity on on-site natural gas consumption.

Non-Regulated Energy Use:

Under this criterion, school districts may use the procedures documented in the COMNET MGP to take credit for reductions in plug load and other components of energy use that are not regulated by Standard 90.1-2016. The magnitude of the credit depends on the length of the commitment, per COMNET procedures.

Naturally Ventilated Spaces:

School districts in appropriate climates are encouraged to design classrooms and other school spaces to use natural ventilation to control overheating of the spaces. Credit for natural ventilation is offered through the COMNET modeling rules when the school has fewer than 300 unmet cooling load hours.

Naturally Ventilated Spaces as referenced in this section are not intended to be for control of contaminants in the spaces.

Building Schedules:

Building daily operating schedules and annual operating schedules (e.g. number of vacation days) should match the actual expected schedule. Schools typically operate on very different schedules than other building stock and this should be accounted for in the energy modeling.

Performance Compliance – ENERGY STAR Option

Once minimum code compliance is established, obtain an ENERGY STAR 1–100 design score from EPA's Target Finder or Portfolio Manager online tools. The inputs to receive a score for the estimated energy use shall account for all energy associated for the school's assets, intended operations, including all process and non-process loads as well as building use characteristics. The project must create a Statement of Energy Design Intent (SEDI) and through this attain an ENERGY STAR score of at least 75. The score can also be used to establish the baseline for energy performance benchmarking in OM P3.0. Other metrics from the SEDI report from Target Finder/Portfolio Manager can be used toward baselines and monitoring too, including the GHG emissions in II C5.1 Low/Zero GHG School and water savings in OM P3.0.

For multiple buildings in a project scope, each building must achieve an ENERGY STAR score of at least 75.

Note: If a design project is saved in Portfolio Manager, the same project record can be used to add metered energy data to meet OM P3.0. The tool will show a comparison of design and operating energy data for the school.6.0

C. All projects registered between January 1, 2020 and the release of new CA-CHPS (anticipated in fall 2020) will follow the 2019 California Code of Regulations section applicable to all other relevant prerequisites and credits. Citations in the CA-CHPS Criteria are still valid, except as corrected above for SS 9.0 Bicycle Parking.