

Frequently Asked Questions (FAQ) about CBECC-Res

Updated April 10, 2018

NOTE: The "FAQ Posted" dates are [hyperlinked](#) to the answers.

For General Computer Questions and CBECC-Res 2013 FAQs, [click here](#).

CBECC-Res 2016

[FAQs Posted November 27, 2018](#)

1. Why am I seeing a large penalty for a roof alteration when I modeled a cool roof? How can I make up such a large deficit?
2. If I have a detached addition can I model this as existing-plus-addition (EAA), or will I get a program error?
3. Is there any benefit to modeling EAA rather than addition alone (AA) if there are no planned upgrades to the existing residence?
4. Since the workaround for wall extensions and existing walls with siding is now automated, can you explain why there are times when I do not see the pull down menu for the exceptions?
5. If I have HERS required on my CF1R (there is a watermark requiring registration), but there are no tests listed in the HERS Summary, is there anything I can do to correct this?
6. Why is the rated input no longer needed for most water heaters?
7. What criteria is required to use verified duct design credit?

[FAQs Posted April 10, 2018](#)

1. A recent *Blueprint* (Issue 122, <http://www.energy.ca.gov/efficiency/blueprint/>) said that when an existing attached or detached space (such as an existing garage) is converted to an accessory dwelling unit (ADU), all of the existing walls can be considered "wall extensions" meaning they only require R-15 (in 2x4 framing) or R-19 (in 2x6 framing) cavity and no continuous insulation. How can I model these walls in performance to take advantage of this new allowance? Is it allowed for addition alone compliance or only "existing + addition?"
2. When modeling a detached addition, using the existing + addition approach, I am getting an error. Since the program needs some connection to the existing building, is there a workaround?
3. On my addition project, one of my interior surfaces is shown as new, but it is existing. When I try to change it, there is no input for the status. Can I change this?

[FAQs Posted December 5, 2017](#)

8. Recently I noticed on an addition/alteration project that the CF1R includes HERS messages for existing HVAC equipment. I am not altering the equipment. Is this a mistake? If not what is required?
9. Are there any new features in CBECC, particularly ones that could save time?
10. As part of an addition/alteration project, the homeowner is replacing the windows. Does it matter if I set the status of the windows as "new" rather than "altered" (I am not using credit for the verified efficiency)?
11. The roof of an existing building will be altered, but not the skylight. The skylight is showing as altered. Is there a workaround?

12. If I inadvertently modeled both below deck insulation and a radiant barrier, is it possible to install this combination of features?
13. How do I model support spaces, such as a laundry room, that share a wall with a dwelling unit?
14. Since Northwest Energy Efficiency Alliance (NEEA) heat pump water heaters are modeled with a specific brand and model number, is there a list of equivalent models that can be installed without rerunning the compliance (in case the builder wants to choose a different model)?

[FAQs Posted March 17, 2017](#)

1. What are most important new features of the 2016 energy code for single family construction?
2. How do I model roof deck insulation?
3. Is it relatively easy to make up for a lack of roof deck insulation?
4. Under what conditions can I call the duct location “conditioned space”? If the ducts are in an attic with continuous insulation is that conditioned space?
5. If I have a building with metal framed roofs or floors, how can I work around the fact that the software can only model metal framed walls?
6. Does it make a difference if I specify the fuel type as “propane” but leave the box checked that natural gas is available?

[FAQs Posted December 12, 2016](#)

1. When running an existing + addition file, I am getting a “CSE simulation returned 2” error. How can I correct this?
2. Which version of software is approved beginning after January 1, 2017?
3. How do I model a variable speed central fan integrated system? (I can find fixed speed.)

[FAQs Posted September 6, 2016](#)

1. Is there a 2016 Residential Mandatory Measures Summary yet (old MF1R)?
2. Has the process of modeling/installing a heat pump water heater changed?
3. Is there an updated list of NEEA heat pump water heaters?
4. Is there a way to find the water load profiles? (I’m not your average CBECC energy consultant.)

[FAQs Posted on November 30, 2015](#)

1. Are there any known issues with Adobe Acrobat® that affect the program?

FAQS POSTED NOVEMBER 27, 2018

1. **Why am I seeing a very large penalty for an altered roof, even if I specify a cool roof product? How can I make up such a large deficit?**

At this time, when the roof surface is altered, the entire attic/roof/ceiling is assumed to be altered. This means that if the project is in Climate Zone 4 or 8-16, where roof deck insulation is part of the standard design (Table 150.1-A, Option B), when the roof is altered it includes R-13 below deck insulation and a tile roof. Depending on the roof pitch and climate zone, it may also include a cool roof—for example, steep slope in Climate Zone 10 requires 0.20 or higher aged solar reflectance and 0.75 or higher thermal emittance.

The easiest option is to complete a prescriptive alteration form to accompany the performance compliance documentation. The CF1R-ALT-05-E is an interactive form, so if you check roof replacement and mandatory measures, the form is only 4 pages. Cool roof is a prescriptive requirement for steep slope roofs (> 2:12 pitch) in climate zones 10-15, and low slope roofs ≤ 2:12). NOTE: Right-click on the CF1R-ALT-05-E and “save link as” to your desktop or other known location.

[http://www.energy.ca.gov/2015publications/CEC-400-2015-032/appendices/forms/Alterations and Additions Non HERS Verified Forms/](http://www.energy.ca.gov/2015publications/CEC-400-2015-032/appendices/forms/Alterations_and_Additions_Non_HERS_Verified_Forms/)

2. If I have a detached addition, can I model this as existing-plus-addition (EAA), or will I get a program error?

With the latest program update, you no longer need any connection between the existing house and the addition. This makes the workaround to add a hypothetical interior connection unnecessary. As long as the project is classified as an addition, you can model it as an EAA.

3. Is there any benefit to modeling EAA rather than addition alone (AA) if there are no planned upgrades to the existing residence?

For any addition (particularly if it is 700 ft² or less), there is likely a benefit to modeling the existing building. A careful reading of Energy Standards Section 150.2 shows that the prescriptive allowances given for additions are only applicable to EAA when complying using the performance approach. This means an allowance of 30% glazing for additions ≤400 ft², roof deck insulation included in the standard design only when the addition is greater than 700 ft².

What this means is that when you model an AA, the standard design is almost the same for your addition as it is for new construction (see Section 150.2(a)2A). While if you model EAA compliance can be anywhere from slightly to significantly easier.

The only deviation from this is the new interpretation regarding wall extensions and existing walls with siding that is not removed (see user manual Sections 10.8 and 10.9 for more information on these exceptions). As stated in Blueprint No. 122, these exceptions apply to both AA and EAA compliance.

4. Since the workaround for wall extensions and existing walls with siding is now automated, can you explain why there are times when I do not see the pull down menu for the exceptions?

The option for using the exceptions is dependent on having either R-15 in a 2x4 or R-19 in a 2x6 wood framed wall (Energy Code Section 150.2(a)1). If that minimum requirement is not met (e.g., it's a metal framed or mass wall) the exception will not be available for use.

5. If I have HERS required on my CF1R (there is a watermark requiring registration), but there are no tests listed in the HERS Summary, is there anything I can do to correct this?

At times, even unused systems in the CBECC library that require HERS can cause this problem. If there is an unused water heating distribution system, or HVAC system, it may be causing the CF1ER to require registration needlessly. Also, as mentioned in an FAQ a very long time ago, an existing cooling system with verified refrigerant charge will trigger a verified refrigerant charge requirement, so be sure to set it to no AC charge.

If you need assistance, send your input file (*.ribd16) to the CBECC-Res technical support email (cbecc.res@gmail.com).

6. Why is the rated input no longer needed for most water heaters?

HERS providers reported that installers were encountering problems when completing the installation certificate (CF2R) for water heating equipment. If the rated input is different than what the consultant modeled, it causes an error. Yet, with a very limited number of exceptions, rated input makes no difference other than determining the category of the water heater (e.g., ≤200,000 Btu is small or consumer instantaneous). The HERS provider requested that we simplify the user interface and remove the rated input.

7. What criteria is required to use verified duct design credit?

When the box is checked for verified duct design, it means that a mechanical contractor or engineer has prepared a duct layout. The inputs allow the user to enter the areas of supply and return ducts in place of the default values and receive a compliance credit when there is a reduced amount of duct surface area.

The enforcement agency should at least ensure that the duct design exists, and preferably approve the design as indicated by the requirements in Reference Appendix RA3.1.4.1.1. The HERS rater will verify that the installation is consistent with the duct design and matches the values reported on the CF1R.

FAQS POSTED APRIL 10, 2018

1. A recent *Blueprint* (Issue 122, <http://www.energy.ca.gov/efficiency/blueprint/>) said that when an existing attached or detached space (such as an existing garage) is converted to an accessory dwelling unit (ADU), all of the existing walls can be considered “wall extensions” meaning they only require R-15 (in 2x4 framing) or R-19 (in 2x6 framing) cavity and no continuous insulation. How can I model these walls in performance to take advantage of this new allowance? Is it allowed for addition alone compliance or only “existing + addition?”

Until a new version of software is released that can identify wall extensions, we recommend first determining the prescriptive exterior wall U-factor required for the applicable climate zone (e.g., U-0.051 in climate zones 1-5 and 8-16, or U-0.065 in climate zones 6-7). Create a wall construction and name it “Prescriptive Wall” (so it is not confused for actual construction assemblies). Use this wall construction for all of the ADU’s exterior walls. The construction details to achieve exactly these U-factors are:

U-0.051 = R-19 in 5-1/2 in. cavity (2x6 @ 16 in. O.C.), R-5 sheathing, synthetic stucco

U-0.065 = R-15 (2x4 @ 16 in. O.C.), specify R-3.8 sheathing, synthetic stucco

This provision is allowed for all compliance approaches (existing + addition and addition alone), as well as non-ADU projects. NOTE: if the project is not converting an existing space, there was some useful information for how to identify when a wall is an extension in Issue 118 of *Blueprint* (page 5). Typically, for such cases it is only one wall, not all of the walls.

To help avoid plan check comments, be sure to document your modeling assumption using either the language from the *Blueprint* or this FAQ. During construction, only R-15 or R-19 cavity insulation is required.

2. When modeling a detached addition, using the existing + addition approach, I am getting an error. Since the program needs some connection to the existing building, is there a workaround?

The workaround is to create 1 ft² of interior wall as a party wall between the existing and new buildings.

3. On my addition project, one of my interior surfaces is shown as new, but it is existing. When I try to change it, there is no input for the status. Can I change this?

If using CBECC-Res, you can edit the RIBD16 file in notepad or other text editor (you may want to make a copy of the file for safekeeping until you know nothing corrupted the file). Look for the surface that is incorrect (in this example ‘Interior Wall 3’ should be existing, but is shown as new). Change to “Existing”. Save the file. You must rerun the calculation.

Existing Text

IntWall "Interior Wall 3"
Status = "New"
IsVerified = 0
Area = 50
Construction = "R-13 Int Wall"
IsPartySurface = 0
OtherSideModeled = 0
Outside = "House"

..

Revised Text

IntWall "Interior Wall 3"
Status = "Existing"
IsVerified = 0
Area = 50
Construction = "R-13 Int Wall"
IsPartySurface = 0
OtherSideModeled = 0
Outside = "House"

..

FAQS POSTED DECEMBER 5, 2017

1. Recently I noticed on an addition/alteration project that the CF1R includes HERS messages for existing HVAC equipment. I am not altering the equipment. Is this a mistake? If not what is required?

It is intentional because Section 150.2 may require measures for a scope of work that cannot be modeled in the software. The two new HERS messages are:

- Refrigerant charge verification required if a refrigerant containing component is altered
- Duct sealing required if a duct system component, plenum, or air handling unit is altered

The messages are meant to convey that these HERS measures *may* be required once the scope of work is defined by the builder/installer.

These new messages are included for two reasons – (1) Things that occur during construction that are unknown to the consultant preparing the CF1R, and (2) Changes that CBECC is unable to model, such as replacing components of a system. These messages are a way to tell the builder that work they do may trigger a requirement, so they are not caught unaware. Examples of these situations could be moving the compressor or replacing a cooling coil.

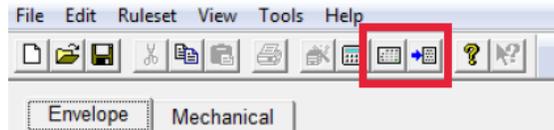
See Section 150.2(b)1.E., Altered Space-Conditioning System – Duct Sealing, for the types of alterations that require compliance with these requirements and for the list of compliance options that includes duct leakage test to limit duct losses to 15 percent at most or sealing accessible leaks at a minimum.

Additionally, Section 150.2(b)1.F., Altered Space-Conditioning System – Mechanical Cooling, requires replacing thermostats and verifying refrigerant charge (in climate zones 2 and 8-15 only) when refrigerant containing components are altered. Because something as simple as moving the equipment could trigger this requirement, which would not be something a consultant would know, we included the HERS message as what could be required.

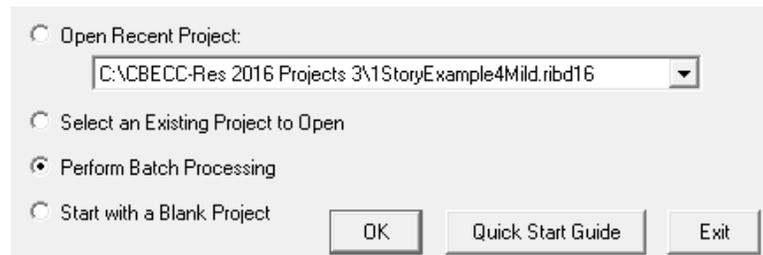
When the installation certificates for a project are prepared, identifying the scope of work being done, then the builder will know if either of these HERS messages apply.

2. Are there any new features in CBECC, particularly ones that could save time?

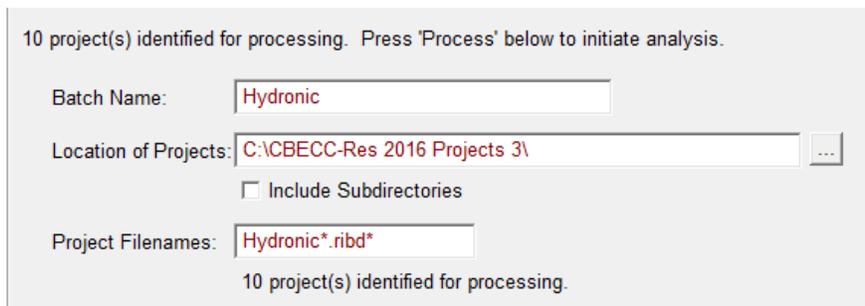
There are three new features.



- A. Two are newly activated toolbar items. They are next to the perform analysis button. One is “analysis results” (which is equivalent to tools/review analysis results) and the other is “compliance results” which will either open an existing CF1R or generate a draft CF1R.
- B. A new tool allows batch processing, which means running multiple files. It will be useful if you’re coming up with options for achieving compliance, or running comparisons. It is accessible from the start-up menu (or from tools/batch processing).



If, for example, you are figuring out options for a hydronic system, make sure your source file runs and has the options you want (XML file, CF1R), then set up the variable files. To illustrate the follow through - with files named Hydronic1.ribd16 through Hydronic10.ribd16 (the * represents a variable), set up your batch run. Notice whether the number of files seems appropriate, and if it looks right, click on “process.”



When complete, you will have a single log file, a results file, and multiple XML files and CF1Rs.

3. As part of an addition/alteration project, the homeowner is replacing the windows. Does it matter if I set the status of the windows as “new” rather than “altered” (I am not using credit for the verified efficiency)?

Yes, it matters significantly. Altered windows receive credit for values equal or better than 0.40 U-factor and 0.35 SHGC (0.50 in zones 1, 3 and 5). New windows only receive credit for values equal or better than 0.32 U-factor and 0.25 SHGC (or 0.32/0.50 in zones 1, 3, and 5).

Also, new windows potentially put the area of windows over 20 percent, which is the cap for new windows. NOTE: any windows in an addition are automatically treated as new.

4. The roof of an existing building will be altered, but not the skylight. The skylight is showing as altered. Is there a workaround?

Until this can be corrected, the workaround is to make a section of roof that is 0.1 ft² bigger than the skylight, with the status as existing. Then show the remainder of the roof as altered. At this time, the program is only recognizing the status of the roof, which means it is treating the skylight as altered as well, which can have a significant negative effect on compliance.

5. If I inadvertently modeled both below deck insulation and a radiant barrier, is it possible to install this combination of features?

As you may or may not have noticed, when the standard design roof (Table 150.1-A, Roof Option B) includes below deck insulation, it does not have a radiant barrier. The software does not enforce eligibility criteria of measures used for credit. Thus, it will account for the benefit of the radiant barrier, but it means your roof will need a 1.5" air space (see installation criteria in Reference Appendix RA4.2.1).

This stresses the importance of carefully reviewing the CF1R.

6. How do I model support spaces, such as a laundry room, that share a wall with a dwelling unit?

Model the support spaces as a dwelling unit with the number of bedrooms set to zero, checking or unchecking the washer/dryer as appropriate. The Commission is working with the HERS providers to address cases where a space is not a dwelling unit and is therefore exempt from the requirement for an IAQ fan. When that step is complete, the contractor will be able to claim and sign the C2R stating that the space is exempt from IAQ verification.

7. Since Northwest Energy Efficiency Alliance (NEEA) heat pump water heaters are modeled with a specific brand and model number, is there a list of equivalent models that can be installed without rerunning the compliance (in case the builder wants to choose a different model)?

Below are two tables with the latest 157 NEEA listed models. Because so many variables are part of the heat pump water heater simulation, they are categorized by "NEEA type." Use the Table 1 to find the brand and model number that was included on the CF1R. Using the specified NEEA type from Table 1, use Table 2 to find any equivalent water heaters.

If the NEEA type for the selected water heater matches the type for the water heater shown on the CF1R then it is an acceptable substitute.

NEEA Type	Brand	Model
13	A. O. Smith	FPTU 50 120 (50 gal)
14	A. O. Smith	FPTU 66 120 (66 gal)
15	A. O. Smith	FPTU 80 120 (80 gal)
12	A. O. Smith	HHPT 80 102 (80 gal)
13	A. O. Smith	HP10-50H45DV (50 gal)
15	A. O. Smith	HP10-80H45DV (80 gal)
13	A. O. Smith	HPTU 50 120 (50 gal)
13	A. O. Smith	HPTU 50N 120 (50 gal)
14	A. O. Smith	HPTU 66 120 (66 gal)
14	A. O. Smith	HPTU 66N 120 (66 gal)

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15	A. O. Smith	HPTU 80 120 (80 gal)
15	A. O. Smith	HPTU 80N 120 (80 gal)
11	A. O. Smith	PHPT 60 (60 gal)
12	A. O. Smith	PHPT 80 (80 gal)
11	American	HPE10260H045DV (60 gal)
12	American	HPE10280H045DV (80 gal)
12	American	HPE6280H045DV 102 (80 gal)
13	American	HPHE10250H045DV 120 (50 gal)
13	American	HPHE10250H045DVN 120 (50 gal)
14	American	HPHE10266H045DV 120 (66 gal)
14	American	HPHE10266H045DVN 120 (66 gal)
15	American	HPHE10280H045DV 120 (80 gal)
15	American	HPHE10280H045DVN 120 (80 gal)
13	American	HPHE6250H045DV (50 gal)
14	American	HPHE6266H045DV 120 (66 gal)
15	American	HPHE6280H045DV 120 (80 gal)
13	American	HPHE650H045DV 120 (50 gal)
19	Bradford White	RE2H50R10B-1NCWT (50 gal)
23	Bradford White	RE2H80R10B-1NCWT (80 gal)
21	EcoSense	HB50ES (50 gal)
19	GE	BEH50DCEJSB (50 gal)
23	GE	BEH80DCEJSB (80 gal)
19	GE	GEH50DEEJSC (50 gal)
19	GE	GEH50DEEJXXX (50 gal)
19	GE	GEH50DFEJSR (50 gal)
19	GE	GEH50DHEKSC (50 gal)
23	GE	GEH80DEEJSC (80 gal)
23	GE	GEH80DFEJSR (80 gal)
23	GE	GEH80DHEKSC (80 gal)
11	Kenmore	153.32116 (60 gal)
12	Kenmore	153.32118 (80 gal)
13	Kenmore	153.5925 (50 gal)
14	Kenmore	153.5926 (66 gal)
15	Kenmore	153.5928 (80 gal)
13	Lochinvar	HPA051KD 120 (50 gal)
13	Lochinvar	HPA052KD 120 (50 gal)
14	Lochinvar	HPA067KD 120 (66 gal)
14	Lochinvar	HPA068KD 120 (66 gal)
15	Lochinvar	HPA081KD 120 (80 gal)
15	Lochinvar	HPA082KD 120 (80 gal)
13	Reliance	10 50 DHPHT 120 (50 gal)

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13	Reliance	10 50 DHPHTNE 120 (50 gal)
11	Reliance	10 60 DHPT (60 gal)
14	Reliance	10 66 DHPHT 120 (66 gal)
14	Reliance	10 66 DHPHTN 120 (66 gal)
15	Reliance	10 80 DHPHT 120 (80 gal)
15	Reliance	10 80 DHPHTNE 120 (80 gal)
12	Reliance	10 80 DHPT (80 gal)
13	Reliance	6 50 DHPHT 120 (50 gal)
14	Reliance	6 66 DHPHT 120 (66 gal)
15	Reliance	6 80 DHPHT 120 (80 gal)
15	Reliance	6 80 DHPT 102 (80 gal)
21	Rheem	HB50RH (50 gal)
39	Rheem	HPLD50 (50 gal)
40	Rheem	HPLD65 (65 gal)
41	Rheem	HPLD80 (80 gal)
21	Rheem	PROPH50 T2 RH245 (50 gal)
39	Rheem	PROPH50 T2 RH350 D (50 gal)
42	Rheem	PROPH50 T2 RH350 D (50 gal)
39	Rheem	PROPH50 T2 RH350 DC (50 gal)
39	Rheem	PROPH50 T2 RH350 DCB (50 gal)
40	Rheem	PROPH65 T2 RH350 D (65 gal)
43	Rheem	PROPH65 T2 RH350 D15 (65 gal)
40	Rheem	PROPH65 T2 RH350 DC (65 gal)
40	Rheem	PROPH65 T2 RH350 DCB (65 gal)
34	Rheem	PROPH80 T2 RH245 (80 gal)
41	Rheem	PROPH80 T2 RH350 D (80 gal)
44	Rheem	PROPH80 T2 RH350 D15 (80 gal)
41	Rheem	PROPH80 T2 RH350 DC (80 gal)
41	Rheem	PROPH80 T2 RH350 DCB (80 gal)
42	Rheem	XE50T10HD22U0 (50 gal)
39	Rheem	XE50T10HD50U0 (50 gal)
39	Rheem	XE50T10HD50U1 (50 gal)
21	Rheem	XE50T12EH45U0 (50 gal)
21	Rheem	XE50T12EH45U0W (50 gal)
43	Rheem	XE65T10HD22U0 (65 gal)
40	Rheem	XE65T10HD50U0 (65 gal)
40	Rheem	XE65T10HD50U1 (65 gal)
44	Rheem	XE80T10HD22U0 (80 gal)
41	Rheem	XE80T10HD50U0 (80 gal)
41	Rheem	XE80T10HD50U1 (80 gal)
34	Rheem	XE80T12EH45U0 (80 gal)

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34	Rheem	XE80T12EH45U0W (80 gal)
39	Richmond	10E50-HP4D (50 gal)
42	Richmond	10E50-HP4D15 (50 gal)
40	Richmond	10E65-HP4D (65 gal)
43	Richmond	10E65-HP4D15 (65 gal)
41	Richmond	10E80-HP4D (80 gal)
44	Richmond	10E80-HP4D15 (80 gal)
21	Richmond	12E50-HP (50 gal)
34	Richmond	12E80-HP (80 gal)
21	Richmond	HB50RM (50 gal)
21	Ruud	HB50RU (50 gal)
21	Ruud	PROUH50 T2 RU245 (50 gal)
39	Ruud	PROUH50 T2 RU350 D (50 gal)
42	Ruud	PROUH50 T2 RU350 D15 (50 gal)
39	Ruud	PROUH50 T2 RU350 DCB (50 gal)
40	Ruud	PROUH65 T2 RU350 D (65 gal)
43	Ruud	PROUH65 T2 RU350 D15 (65 gal)
40	Ruud	PROUH65 T2 RU350 DCB (65 gal)
34	Ruud	PROUH80 T2 RU245 (80 gal)
41	Ruud	PROUH80 T2 RU350 D (80 gal)
44	Ruud	PROUH80 T2 RU350 D15 (80 gal)
41	Ruud	PROUH80 T2 RU350 DCB (80 gal)
16	Sanden	GS3-45HPA-US & GAUS-160QTA (43 gal)
17	Sanden	GS3-45HPA-US & GAUS-315EQTD (83 gal)
16	Sanden	GS3-45HPA-US & SAN-43SSAQA (43 gal)
17	Sanden	GS3-45HPA-US & SAN-83SSAQA (83 gal)
17	Sanden	GUS-45HPA-US & GAUS-315EQTD (83 gal)
17	Sanden	GUS-45HPA-US & SAN-83SSAQA (83 gal)
12	State	EP6 80 DHPT 102 (80 gal)
11	State	EPX 60 DHPT (60 gal)
12	State	EPX 80 DHPT (80 gal)
13	State	HP6 50 DHPT 120 (50 gal)
14	State	HP6 66 DHPT 120 (66 gal)
15	State	HP6 80 DHPT 120 (80 gal)
13	State	HPX 50 DHPT 120 (50 gal)
13	State	HPX 50 DHPTNE 120 (50 gal)
14	State	HPX 66 DHPT 120 (66 gal)
14	State	HPX 66 DHPTNE 120 (66 gal)
15	State	HPX 80 DHPT 120 (80 gal)
15	State	HPX 80 DHPTNE 120 (80 gal)
22	Stiebel Eltron	Accelera 220 E (58 gal)

12	Stiebel Eltron	Accelera 300/WHP 300 (80 gal)
12	US Craftmaster	HPE2F80HD045VU 102 (80 gal)
11	US Craftmaster	HPE2K60HD045V (60 gal)
12	US Craftmaster	HPE2K80HD045V (80 gal)
13	US Craftmaster	HPHE2F50HD045VU 120 (50 gal)
14	US Craftmaster	HPHE2F66HD045VU 120 (66 gal)
15	US Craftmaster	HPHE2F80HD045VU 120 (80 gal)
13	US Craftmaster	HPHE2K50HD045VUN 120 (50 gal)
14	US Craftmaster	HPHE2K66HD045VUN 120 (66 gal)
15	US Craftmaster	HPHE2K80HD045VUN 120 (80 gal)
11	Whirlpool	HPE2K60HD045V (60 gal)
12	Whirlpool	HPE2K80HD045V (80 gal)
13	Whirlpool	HPHE2K50HD045V 120 (50 gal)
13	Whirlpool	HPHE2K50HD045VC 120 (50 gal)
13	Whirlpool	HPHE2K50HD045VN 120 (50 gal)
14	Whirlpool	HPHE2K66HD045V 120 (66 gal)
14	Whirlpool	HPHE2K66HD045VC 120 (66 gal)
15	Whirlpool	HPHE2K80HD045V 120 (80 gal)
15	Whirlpool	HPHE2K80HD045VC 120 (80 gal)
32	Whirlpool	HPSE2K50HD045V 100 (WP) (50 gal)
32	Whirlpool	HPSE2K50HD045VC 100 (WP) (50 gal)
12	Whirlpool	HPSE2K80HD045V (80 gal)
12	Whirlpool	HPSE2K80HD045VC (80 gal)

Table 2. Equivalent Models (sorted by NEEA Type)

NEEA Type	Brand	Model
11	A. O. Smith	PHPT 60 (60 gal)
11	American	HPE10260H045DV (60 gal)
11	Kenmore	153.32116 (60 gal)
11	Reliance	10 60 DHPT (60 gal)
11	State	EPX 60 DHPT (60 gal)
11	US Craftmaster	HPE2K60HD045V (60 gal)
11	Whirlpool	HPE2K60HD045V (60 gal)
12	A. O. Smith	HHPT 80 102 (80 gal)
12	A. O. Smith	PHPT 80 (80 gal)
12	American	HPE10280H045DV (80 gal)
12	American	HPE6280H045DV 102 (80 gal)
12	Kenmore	153.32118 (80 gal)
12	Reliance	10 80 DHPT (80 gal)
12	State	EP6 80 DHPT 102 (80 gal)
12	State	EPX 80 DHPT (80 gal)
12	Stiebel Eltron	Accelera 300/WHP 300 (80 gal)
12	US Craftmaster	HPE2F80HD045VU 102 (80 gal)

FAQs for CBECC-Res

12	US Craftmaster	HPE2K80HD045V (80 gal)
12	Whirlpool	HPE2K80HD045V (80 gal)
12	Whirlpool	HPSE2K80HD045V (80 gal)
12	Whirlpool	HPSE2K80HD045VC (80 gal)
13	A. O. Smith	FPTU 50 120 (50 gal)
13	A. O. Smith	HP10-50H45DV (50 gal)
13	A. O. Smith	HPTU 50 120 (50 gal)
13	A. O. Smith	HPTU 50N 120 (50 gal)
13	American	HPHE10250H045DV 120 (50 gal)
13	American	HPHE10250H045DVN 120 (50 gal)
13	American	HPHE6250H045DV (50 gal)
13	American	HPHE650H045DV 120 (50 gal)
13	Kenmore	153.5925 (50 gal)
13	Lochinvar	HPA051KD 120 (50 gal)
13	Lochinvar	HPA052KD 120 (50 gal)
13	Reliance	10 50 DHPHT 120 (50 gal)
13	Reliance	10 50 DHPHTNE 120 (50 gal)
13	Reliance	6 50 DHPHT 120 (50 gal)
13	State	HP6 50 DHPT 120 (50 gal)
13	State	HPX 50 DHPT 120 (50 gal)
13	State	HPX 50 DHPTNE 120 (50 gal)
13	US Craftmaster	HPHE2F50HD045VU 120 (50 gal)
13	US Craftmaster	HPHE2K50HD045VUN 120 (50 gal)
13	Whirlpool	HPHE2K50HD045V 120 (50 gal)
13	Whirlpool	HPHE2K50HD045VC 120 (50 gal)
13	Whirlpool	HPHE2K50HD045VN 120 (50 gal)
14	A. O. Smith	FPTU 66 120 (66 gal)
14	A. O. Smith	HPTU 66 120 (66 gal)
14	A. O. Smith	HPTU 66N 120 (66 gal)
14	American	HPHE10266H045DV 120 (66 gal)
14	American	HPHE10266H045DVN 120 (66 gal)
14	American	HPHE6266H045DV 120 (66 gal)
14	Kenmore	153.5926 (66 gal)
14	Lochinvar	HPA067KD 120 (66 gal)
14	Lochinvar	HPA068KD 120 (66 gal)
14	Reliance	10 66 DHPHT 120 (66 gal)
14	Reliance	10 66 DHPHTN 120 (66 gal)
14	Reliance	6 66 DHPHT 120 (66 gal)
14	State	HP6 66 DHPT 120 (66 gal)
14	State	HPX 66 DHPT 120 (66 gal)
14	State	HPX 66 DHPTNE 120 (66 gal)
14	US Craftmaster	HPHE2F66HD045VU 120 (66 gal)
14	US Craftmaster	HPHE2K66HD045VUN 120 (66 gal)
14	Whirlpool	HPHE2K66HD045V 120 (66 gal)
14	Whirlpool	HPHE2K66HD045VC 120 (66 gal)
15	A. O. Smith	FPTU 80 120 (80 gal)
15	A. O. Smith	HP10-80H45DV (80 gal)
15	A. O. Smith	HPTU 80 120 (80 gal)

FAQs for CBECC-Res

15	A. O. Smith	HPTU 80N 120 (80 gal)
15	American	HPHE10280H045DV 120 (80 gal)
15	American	HPHE10280H045DVN 120 (80 gal)
15	American	HPHE6280H045DV 120 (80 gal)
15	Kenmore	153.5928 (80 gal)
15	Lochinvar	HPA081KD 120 (80 gal)
15	Lochinvar	HPA082KD 120 (80 gal)
15	Reliance	10 80 DHPHT 120 (80 gal)
15	Reliance	10 80 DHPHTNE 120 (80 gal)
15	Reliance	6 80 DHPHT 120 (80 gal)
15	Reliance	6 80 DHPT 102 (80 gal)
15	State	HP6 80 DHPT 120 (80 gal)
15	State	HPX 80 DHPT 120 (80 gal)
15	State	HPX 80 DHPTNE 120 (80 gal)
15	US Craftmaster	HPHE2F80HD045VU 120 (80 gal)
15	US Craftmaster	HPHE2K80HD045VUN 120 (80 gal)
15	Whirlpool	HPHE2K80HD045V 120 (80 gal)
15	Whirlpool	HPHE2K80HD045VC 120 (80 gal)
16	Sanden	GS3-45HPA-US & GAUS-160QTA (43 gal)
16	Sanden	GS3-45HPA-US & SAN-43SSAQA (43 gal)
17	Sanden	GS3-45HPA-US & GAUS-315EQTD (83 gal)
17	Sanden	GS3-45HPA-US & SAN-83SSAQA (83 gal)
17	Sanden	GUS-45HPA-US & GAUS-315EQTD (83 gal)
17	Sanden	GUS-45HPA-US & SAN-83SSAQA (83 gal)
19	Bradford White	RE2H50R10B-1NCWT (50 gal)
19	GE	BEH50DCEJSB (50 gal)
19	GE	GEH50DEEJSC (50 gal)
19	GE	GEH50DEEJXXX (50 gal)
19	GE	GEH50DFEJSR (50 gal)
19	GE	GEH50DHEKSC (50 gal)
21	EcoSense	HB50ES (50 gal)
21	Rheem	HB50RH (50 gal)
21	Rheem	PROPH50 T2 RH245 (50 gal)
21	Rheem	XE50T12EH45U0 (50 gal)
21	Rheem	XE50T12EH45U0W (50 gal)
21	Richmond	12E50-HP (50 gal)
21	Richmond	HB50RM (50 gal)
21	Ruud	HB50RU (50 gal)
21	Ruud	PROUH50 T2 RU245 (50 gal)
22	Stiebel Eltron	Accelera 220 E (58 gal)
23	Bradford White	RE2H80R10B-1NCWT (80 gal)
23	GE	BEH80DCEJSB (80 gal)
23	GE	GEH80DEEJSC (80 gal)
23	GE	GEH80DFEJSR (80 gal)
23	GE	GEH80DHEKSC (80 gal)
32	Whirlpool	HPSE2K50HD045V 100 (WP) (50 gal)
32	Whirlpool	HPSE2K50HD045VC 100 (WP) (50 gal)

FAQs for CBECC-Res

34	Rheem	PROPH80 T2 RH245 (80 gal)
34	Rheem	XE80T12EH45U0 (80 gal)
34	Rheem	XE80T12EH45UOW (80 gal)
34	Richmond	12E80-HP (80 gal)
34	Ruud	PROUH80 T2 RU245 (80 gal)
39	Rheem	HPLD50 (50 gal)
39	Rheem	PROPH50 T2 RH350 D (50 gal)
39	Rheem	PROPH50 T2 RH350 DC (50 gal)
39	Rheem	PROPH50 T2 RH350 DCB (50 gal)
39	Rheem	XE50T10HD50U0 (50 gal)
39	Rheem	XE50T10HD50U1 (50 gal)
39	Richmond	10E50-HP4D (50 gal)
39	Ruud	PROUH50 T2 RU350 D (50 gal)
39	Ruud	PROUH50 T2 RU350 DCB (50 gal)
40	Rheem	HPLD65 (65 gal)
40	Rheem	PROPH65 T2 RH350 D (65 gal)
40	Rheem	PROPH65 T2 RH350 DC (65 gal)
40	Rheem	PROPH65 T2 RH350 DCB (65 gal)
40	Rheem	XE65T10HD50U0 (65 gal)
40	Rheem	XE65T10HD50U1 (65 gal)
40	Richmond	10E65-HP4D (65 gal)
40	Ruud	PROUH65 T2 RU350 D (65 gal)
40	Ruud	PROUH65 T2 RU350 DCB (65 gal)
41	Rheem	HPLD80 (80 gal)
41	Rheem	PROPH80 T2 RH350 D (80 gal)
41	Rheem	PROPH80 T2 RH350 DC (80 gal)
41	Rheem	PROPH80 T2 RH350 DCB (80 gal)
41	Rheem	XE80T10HD50U0 (80 gal)
41	Rheem	XE80T10HD50U1 (80 gal)
41	Richmond	10E80-HP4D (80 gal)
41	Ruud	PROUH80 T2 RU350 D (80 gal)
41	Ruud	PROUH80 T2 RU350 DCB (80 gal)
42	Rheem	PROPH50 T2 RH350 D (50 gal)
42	Rheem	XE50T10HD22U0 (50 gal)
42	Richmond	10E50-HP4D15 (50 gal)
42	Ruud	PROUH50 T2 RU350 D15 (50 gal)
43	Rheem	PROPH65 T2 RH350 D15 (65 gal)
43	Rheem	XE65T10HD22U0 (65 gal)
43	Richmond	10E65-HP4D15 (65 gal)
43	Ruud	PROUH65 T2 RU350 D15 (65 gal)
44	Rheem	PROPH80 T2 RH350 D15 (80 gal)
44	Rheem	XE80T10HD22U0 (80 gal)
44	Richmond	10E80-HP4D15 (80 gal)
44	Ruud	PROUH80 T2 RU350 D15 (80 gal)

FAQS POSTED MARCH 17, 2017

1. What are most important new features of the 2016 energy code for single family construction?

First, because it affects every climate zone, is that the standard water heater is instantaneous/tankless. Second, in climate zones 4 and 8-16, is roof deck insulation.

2. How do I model roof deck insulation?

Above or below deck insulation is associated with the attic/roof construction (asphalt or tile), and not the ceiling below attic the R-38 insulation is modeled. The example files that come with the program, such as 1StoryExample3.ribd16, have a Tile High Performance construction, which matches the standard design in climate zones 4 and 8-16. (NOTE: To understand your climate zone's standard design, see Table 150.1-A (Package A), roofs/ceiling option B.) Also note that when using below deck insulation, because there is no room for an air space, a radiant barrier is not feasible.

3. Is it relatively easy to make up for a lack of roof deck insulation?

Most likely, no, particularly if the ducts are located in the attic. The program reflects that this added insulation can reduce the attic temperature from approximately 150 to 85 degrees, so it has a significant effect on compliance in most climate zones.

4. Under what conditions can I call the duct location "conditioned space"? If the ducts are in an attic with continuous insulation is that conditioned space?

Typically, the only time you can consider the ducts as being in conditioned space is if the ducts and air handler are installed underneath the ceiling inside the thermal and air barrier envelopes. But, as noted above, when there is roof deck insulation the attic temperature will be much closer to the conditions within the conditioned space. So there is a tremendous benefit from roof deck insulation even if the ducts are not able to be modeled as within conditioned space. (NOTE: Because a radiant barrier requires a 1-1/2" air space, when roof deck insulation is modeled uncheck the radiant barrier.) There may be other conditions that meet the definition of indirectly conditioned space.

5. If I have a building with metal framed roofs or floors, how can I work around the fact that the software can only model metal framed walls?

Our recommendation is to download a copy of the Reference Appendices (400-2015-038), and find the U-factor for your proposed construction assembly in Joint Appendix 4 (also be sure to note the maximum U-factor from Section 150.0 of the standards). With that U-factor known, model a wood-framed assembly with a similar or slightly higher U-factor. Consider naming the construction to match what the builder will be constructing rather than what you modeled (e.g., call the R-30 wood-framed roof/ceiling with 0.032 U-factor that is substituting for your R-38, 0.031 U-factor, roof "R-38 metal framed roof" in case you use the file for a different job). Lastly, document for the plan checker what you did.

R-38 Metal Framed Roof	Ceilings (below attic)	Wood Framed Ceiling	2x4 @ 16 in. O.C.	R 30	0.032	<ul style="list-style-type: none"> • Inside Finish: Gypsum Board • Cavity / Frame: R-9.1 / 2x4 • Over Ceiling Joists: R-20.9 insul.
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6. Does it make a difference if I specify the fuel type as "propane" but leave the box checked that natural gas is available?

It can make a huge difference because the TDV values, which determine how much energy is worth at a given time of day, are different for these two conditions. One says I'm using propane only because I want to use propane, while the other says I have no choice because natural gas is not even available. Joint Appendix Section JA3.1 provides a very helpful description of TDV values. But an analogy would be that I can buy this item for \$159, but I want to purchase the version that costs \$410, versus I have to purchase the \$410 version because the \$159 version is not available to me

(Joint Appendices Tables JA3-2 and 3-3 comparing average propane to natural gas in climate zone 13).

FAQs POSTED DECEMBER 12, 2016

1. When running an existing + addition file, I am getting a “CSE simulation returned 2” error. How can I correct this?

You may be encountering a rounding error in the standard design that occurs when the existing zone contains new windows. You can tell you have this error if the error message goes away by changing the status of any new windows in the existing zone to altered.

It may be that not all of the windows need to have the status changed, so start by changing them all to altered and then change them back to new one at a time. It’s also possible that small changes to the window areas, like limiting the areas to the nearest whole square foot, will also solve the problem.

As described in section 2.10.2 of the User Manual (Finding CSE Errors), if the std.err file contains the text “S0512: Area of window ‘name’ is greater than remaining area...” repeated four times, you have encountered this error.

NOTE: This error may occur in the most recent 2013 software (version 4c) as well.

2. Which version of software is approved beginning after January 1, 2017?

Checking the [Title 24 website for approved programs for 2016 energy compliance](#) shows:

- CBECC-Res 2016.2.1
- EnergyPro 7.1, and
- Right-Energy Title24 v2.1 (the approval is in process on December 12, 2016)

These are the approved versions for permit applications made on or after January 1, 2017. This website also contains a list of Approval/Expiration Dates if there is ever a question about when software approvals expire (if they expire).

3. How do I model a variable speed central fan integrated system? (I can find fixed speed.)

After setting the cooling ventilation input on the cool vent tab to central fan integrated cooling, on the mechanical tab, identify the HVAC system type as “variable outdoor air ventilation central heat/cool system.” This opens up fields at the bottom of the screen for the variable speed flow and watts/cfm for the system. The inputs for these fields are either default values (right-click, restore default) or from mechanical specifications.

These inputs are also illustrated in section 8.7.3 of the CBECC-Res User Manual.

FAQs POSTED SEPTEMBER 6, 2016

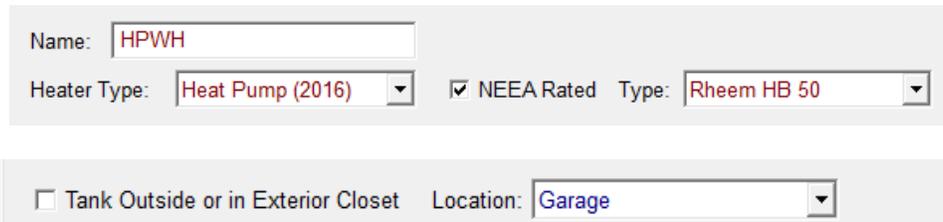
1. Is there a 2016 Residential Mandatory Measures Summary yet (old MF1R)?

Yes. You can find a 4-page PDF summary of all low-rise residential mandatory measures at www.energy.ca.gov/title24/2016standards/documents/2016_Residential_Mandatory_Measures_Summary.pdf.

2. Has the process for modeling/installing a heat pump water heater changed?

The 2016 version of CBECC-Res includes two methods for modeling heat pump water heaters. For heat pumps rated by the Northwest Energy Efficiency Alliance (NEEA), select a “type” (see next

question), which encompasses one of several make and model numbers. As NEEA updates its list of qualified products, the list initially included in the CBECC-Res User Manual will be updated in these Frequently Asked Questions.



Name:

Heater Type: NEEA Rated Type:

Tank Outside or in Exterior Closet Location:

Inspectors/plan checkers will verify the “type” modeled and compare the model specified/installed to the list below, as well as the location reported on the CF1R.

For water heaters not on the NEEA list of qualified products, the user can find the volume and energy factor in either Energy Commission or AHRI databases (see CBECC-Res User Manual, section 9.1 for more information).

3. Is there an updated list of NEEA heat pump water heaters?

[List updated 12/5/17]

4. Is there a way to find the water load profiles? (I’m not your average CBECC energy consultant.)

There are two text files in the CSE folder (C:\Program Files\CBECC-Res 2016\CSE). One is DHWUSF.txt (single family) and the other is DHWUMF.txt (multi-family). It is very detailed.

FAQS POSTED ON NOVEMBER 30, 2015

1. Are there any known issues with Adobe Acrobat® that affect the program?

Rebooting your computer should fix any issues. The CBECC software installers interfere with installations of Acrobat Reader DC on some Windows 8 and 10 computers. This issue prevents the installer, the CBECC programs, Windows Explorer and likely other software that relies on Windows file associations to launch Reader DC from successfully opening/displaying PDF files.

Frequently Asked Questions (FAQ) about CBECC-Res 2013

Updated September 6, 2016

NOTE: The “FAQ Posted” dates are [hyperlinked](#) to the answers.

For CBECC-Res 2016 FAQs, [click here](#).

General Administrative FAQs

1. What is CBECC-Res?
2. How do I install CBECC-Res on my computer?
3. What does the software cost?
4. How do I know I’m using the latest version of CBECC-Res?
5. How can I find more information about errors in my input file?
6. How can I get help or report a problem?
7. Will there be any training on using CBECC-Res?
8. Where can I find updates to the CBECC-Res software?
9. Where can I find information about CBECC-Com, the compliance software for nonresidential buildings?

General Computer FAQs

1. What should I do if I just installed the program and it doesn’t seem to run right?
2. I have a high-resolution screen and the menus and icons do not look right. Are there any adjustments I can make?
3. Can I install CBECC-Res on a network?
4. Are there any known issues with Adobe Acrobat® that affect the program?

FAQs Posted on September 6, 2016

1. I’m getting an error on a multi-family project with central water heating, specifically asking for supply and return pipe lengths. How can I fix this?
2. How can I model a small duct high velocity system with less than 350 CFM/ton?

FAQs Posted on November 30, 2015

1. Are the requirements for an addition alone more difficult than existing plus addition?
2. Why am I showing a penalty or no credit when altering HVAC equipment?
3. When I installed the latest CBECC-Res, my Acrobat program did not interact the same. Is there something I need to do?
4. Is there list of when specific versions of software were valid (my building department is asking)?
5. Rather than keeping multiple versions of CBECC on my computer, if I get plan check corrections on a project can I download older versions of CBECC?
6. What is a “party” surface? And why is the program giving me an error when modeling an interior ceiling as a party surface?

FAQs for CBECC-Res

7. The cooling equipment standards recently changed. How does this affect compliance work done in the past? Can 13 SEER equipment be installed? And do I have to re-run compliance calculations with 14 SEER?
8. Will CBECC-Res ever produce a mandatory measures form?

FAQs Posted on June 3, 2015

1. I'm having a problem getting CAHP reports in Version 4. Is there a workaround?
2. I installed (or reinstalled) the program and now I am getting permission and file errors. How can I correct this?
3. When entering my wall orientations, is it wrong to enter the actual orientation (e.g., if the front faces south, I would enter 180)?
4. What is Error Code 202, and how can I fix it?

FAQs Posted on March 6, 2015

1. My CF1R is showing "Not Useable for Compliance." I verified that I am using the latest software (I downloaded the revised version of 3c (710) following the 2/26 notification) and it is not a quick simulation analysis. What could be wrong?
2. Above the Energy Use Summary my CF1R shows that it is not valid after December 31, 2014. What do I need to change if I am applying for a permit in 2015?
3. With regard to the CAHP report, I made changes to the characteristics of a job, which I don't think will change the compliance results. Do I need to do anything more to reflect those changes on the CAHP report?
4. If I have 2 air conditioners and 1 furnace (an inconsistent number of systems), the program will not run. Should I model 2 or 1?
5. My project crashed with a CSE error. The project log file did not contain any information to narrow down the location of the error. Is there somewhere else I can look?

FAQs Posted on February 19, 2015

1. I'm modeling an addition alone with a tankless water heater. The program is not giving me any credit for this water heater. I noticed that when I try to change the system, it says "create a new EXISTING water heater." Since this is not an existing water heater, how can I get the program to recognize this is a new water heater?
2. If my garage is below grade, how should I model that in CBECC-Res?
3. When I model a ground source heat pump, it is triggering HERS tests for airflow and refrigerant charge (climate zone 10). Can this be corrected?

FAQs Posted on December 30, 2014

1. With the latest release (bug fix 3b1 (694)), should I start using Example 18 files as my starting point?
2. My CF1R is reporting slab edge insulation when I did not model any. Can I fix this?
3. The check box to "Use this EER" sticks in the checked position. How can I get it to shut off when I am specifying a default value?
4. If a building has heating only, is HERS verified fan efficacy required? How do I model the correct requirement?
5. Is there any way to get the Overhangs and Fins section of the CF1R to not print on the CF1R (since I did not model any)?

[FAQs Posted on December 2, 2014](#)

1. When I have a building with no cooling system, is it acceptable to show this as 0 systems or as “none”?
2. If I have a 2-zone single-family residence and each zone has a tankless water heater, is it appropriate to specify the same water heating system (with one tankless unit) in each zone? Will that result in two tankless units being specified?
3. Is there any limit to the number of multi-family dwelling units that can be modeled?

[FAQs Posted on November 21, 2014](#)

1. There is still a watermark on my Existing+Addition CF1R, but no HERS measures. What am I doing wrong?
2. With regard to whole house fans, the User Manual says the attic ventilation requirement is 1 square foot for every 1,000 CFM of whole house fan air flow, but the prescriptive requirement is 375. Which requirement is correct?
3. Can I model a single family residence with more than three stories in CBECC-Res?
4. When modeling multi-family buildings, are there any new details I should be aware of?
5. When I model my existing duct location it triggers a HERS requirement. Is that something that can get fixed?

[FAQs Posted on October 20, 2014](#)

1. Are there any tips to help me find what is causing a watermark on an addition that should not have a watermark?
2. The column named HERS Verification does not always say Required or Not Required. Am I misunderstanding the use of this column?
3. Are there any other ways for getting around in the CBECC-Res software that do not rely so heavily on the mouse?
4. When giving my client options for making their building comply, I like to run various scenarios. Are there any automated or semi-automated tips for doing this?
5. Can Quality Insulation Installation (QII) be modeled in an existing plus addition?

[FAQs Posted on August 29, 2014](#)

1. Will results change from Version 2c to Version 3?
2. A HERS requirement for return duct design shows up on every job I upload to the HERS provider. How can I get this feature removed?
3. My building will have no cooling. If I enter 0 for the unique number of cooling systems (or the count), my file will not run. How am I supposed to show no cooling?
4. Is there an update with regard to the HERS reporting for “no cooling”?
5. Why do I still have a watermark for an addition that should not require any HERS measures?
6. Can you explain the 2-story ventilation change in more detail? Is this related to whole house fans?
7. I am getting an error that seems to indicate a problem with the ducts in the attic. I previously had a problem with a very small attic being unable to accommodate the default ducts in the attic. But in this case the attic is over the entire house, so it should be big enough. Is there anything I can try to correct this error?
8. Will I be able to take credit for changing an existing electric resistance heating system to a central gas forced air unit (once verified existing conditions are available)?

[FAQs Posted on August 6, 2014](#)

1. I thought I installed bug fix 2c, but I am not sure. How can I tell if I am using 2c?

FAQs for CBECC-Res

2. I am still seeing HERS requirements for existing HVAC systems. Wasn't 2b/2c supposed to fix this?
3. If I have an Addition Alone, can I use the same exceptions mentioned in Question 5 from July 17 to prove to the building department that I do not need to register my CF1R?
4. I switched a file from Addition and/or Alteration to Addition Alone and now it will not run. What do I need to do?
5. Why are there HERS requirements when I modeled "No Cooling"?
6. Although I specify default values for roof reflectance, the CF1R is reporting non-standard roof reflectance and a cool roof. How can I fix this?
7. When modeling a mini-split heat pump, the compliance results are not as expected. Am I doing something wrong?
8. What is the correct way to model a duplex or townhome? Can I call this a multi-family building?
9. Has any progress been made in speeding up the software?
10. Does the software allow a PC's video card handle tasks that are separate from execution?
11. Does the software run on a Mac computer?
12. Does the compiler support multi-core processor cores or hyper-threading?

[FAQs Posted on July 17, 2014](#)

1. I used one of the sample files for an Existing + Addition + Alteration and the CF1R conditioned areas are off. Do you know why?
2. Can you explain how to use the status fields for HVAC and DHW correctly?
3. Can you explain the option to "verify" existing conditions for altered features?
4. Can you provide any more information about registering my CF1R?
5. What do I do about the watermark if I have an addition with no HERS requirements?
6. When I opened an existing input file, I am getting a message that indicates my file might not run. Is that true?
7. When I tried to run the new option for an air to water heat pump, it would not run. Am I doing something wrong?
8. I was using one of the new tool options to "Generate . . . Equipment Report Records" for HVAC, DHW, or IAQ and now I cannot run my input file. Is there any way to fix this?

[FAQs Posted on May 7, 2014](#)

1. When I opened an existing input file, I am getting a message that indicates my file might not run. Is that true?
2. When a new version of software is approved, how soon do I have to use the new version?
3. If I get a plan check correction and need to go back to an earlier version of the software, is there any way for me to retrieve an older version from the CBECC-Res web site?
4. Can I have more than one version of CBECC-Res on my computer?
5. Will my results change with the latest software release?
6. I am using Windows 8. Do you know of any issues I should be aware of?
7. Does the software run every 2 minutes? If the weather data is hourly, what is the point?
8. Is it possible to model a building with all cathedral ceilings (no attic)?
9. What are the options for the sources of U-factor and SHGCs allowed by the standards? Specifically, what is ADFP?

[FAQs Posted on March 18, 2014](#)

1. While waiting for a HERS provider to register CF1Rs, is there any harm in removing the watermark that says the CF1R is "not registered"?
2. Is the value input for the number of stories intended to be the value for the building or the zone?

FAQs for CBECC-Res

3. Can you explain azimuth and orientation as used in CBECC-Res for walls/windows?
4. Is there a limit to the length of fields?

FAQs Posted on January 21, 2014

1. Why doesn't WinType work the way I think it should?
2. Could you explain how CBECC-Res determines the default values so I can take advantage of this feature?
3. Did it get easier to get electric water heating to comply? If so, why?
4. In which zone should I model the walls between the house and the garage?
5. Am I using the latest CF1R version?
6. Can I use the EZFrame calculator in conjunction with CBECC-Res?

FAQs Posted on December 20, 2013

1. Where do I input the documentation author and the Designer/Owner information for the CF1R?
2. Why does the sample file go so far out of compliance when I change it to my climate zone?
3. Will we be able to model other shading devices soon?
4. Do I really need 6 surfaces in every zone?

FAQs Posted on November 20, 2013

1. I'm concerned about the speed of run times in CBECC. Is there a reason we cannot have an option to run CBECC-Res with reduced weather to speed up the processing time?
2. Regarding Zonal Control, if I specified the building meets zonal control criteria under the building tab, why is there also a check box on the cooling system screen?
3. What are the watermarks that could potentially appear on the CF1R and how can I get it to change?
4. Is the file needed for uploading a project to HERS generated any time I run an input file? If not, what do I need to do so that I do not have to re-run a job to get this file?
5. Can I model more than one garage in a single input file?
6. If I'm getting an error with no message, how can I try to figure out the cause?

FAQs Posted on October 23, 2013

1. Can I add materials to CBECC-Res?
2. In multi-family, how do I determine the correct number of water heaters to show in my water heating system?
3. Is 1-coat stucco shown as R-4 sheathing insulation with a 3 coat stucco exterior finish?
4. Water heater efficiencies have changed. What is the correct way to enter the various efficiencies?
5. Can we expect to see a summary of HERS measures on the CF1R?
6. Can you explain how the solar credit can be used and how much of a credit we can expect?

FAQs Posted on October 11, 2013

1. How do I use the field Window Type?
2. Can I get hour-by-hour energy results?
3. Will CBECC-Res run on an Apple computer?
4. Since I am used to seeing Specific Leakage Area (SLA) for blower door testing, can you tell me how to convert 2.8 SLA to a CFM50 for input into the program?

FAQs Posted on September 25, 2013

1. Where are my input files?
2. Are we supposed to model unconditioned garages?
3. Is this program ready for building department and HERS provider submittals?

4. Is using CBECC-Res utilizing the performance approach?
5. Can you provide tips for modeling multi-family buildings?

GENERAL ADMINISTRATIVE FAQs

1. What is CBECC-Res?

The California Building Energy Code Compliance 2013 Residential Standards compliance software (known as *CBECC-Res 2013*) is a public domain software program developed by the California Energy Commission for use in complying with the 2013 update to the *Residential Building Energy Efficiency Standards*.

2. How do I install CBECC-Res on my computer?

Go to the project website, www.bwilcox.com/BEES/BEES.html. The current version of the software is always the first link in the Downloads section. Click on the link. A Citrix ShareFile page will open in your Internet browser. Click on the Download button. (The file is 20 MB so the download may take a few minutes depending on the speed of your Internet connection.)

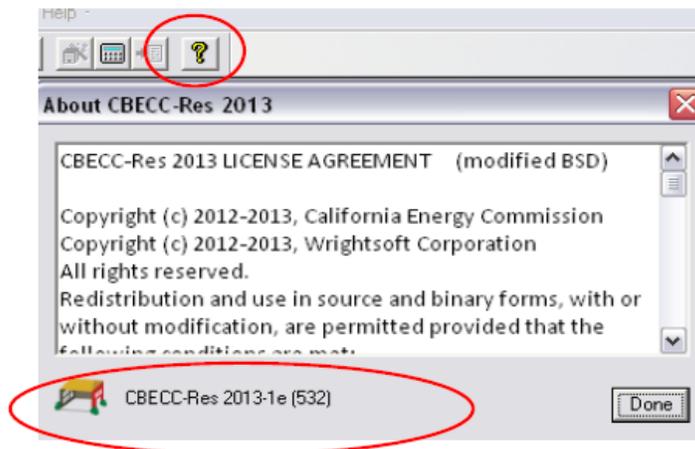
Once the CBECC-Res installation application has downloaded, double-click it. If you are asked “Do you want to allow the following program from an unknown publisher to make changes to this computer?”, click on Yes. The CBECC-Res 2013 Setup Wizard will open. Follow the wizard’s instruction to complete the installation.

3. What does the software cost?

The software is free.

4. How do I know I’m using the latest version of CBECC-Res?

Open the software on your computer and click on the icon with the yellow “?” icon (or select “Help” and then select “About...”). The version number is at the bottom of that screen. In the example below, the version number is 1e (532).



Compare this to the version number shown in the Downloads section on the project website, www.bwilcox.com/bees/bees.html. If they don’t match, you have an older version and you should download and install the current version. It is not necessary to uninstall a previous version.

5. How can I find more information about errors in my input file?

As explained in Chapter 2 of the User Manual, every file has a *.log file located in the CBECC-Res 2013 Projects directory (**NOTE: in Version 3, this is accessible from the Tools menu**). This file contains a lot of information (some of it repetitive), and you can look here for a clue. It opens in notepad. An example of a potential error is:

```
2014-Mar-18 07:50:55 - CSE callback #13, lvl= 0, msg= or: C:\My
Documents\CBECC-Res 2013 Projects\... [input file] - Prop.CSE(1180):
Error: surface 'Zone1WallRight-Frm' of zone 'Zone1-zn':
```

S0408: Wall sfTilt = 270: not 60 to 180 degrees

This example tells you that you have entered an invalid value for the wall tilt, which should be between 60 and 180 degrees (typically 90 for vertical walls) for the right wall in Zone1. [Note: [March 18 FAQ #3](#) has more information regarding orientation of walls.]

If you cannot find the source of your error, see the next question for getting help.

6. How can I get help or report a problem?

If you have questions about the software or run into a problem, there a number of resources where you can find help:

- This FAQ
- The Quick Start Guide available through the software's Help menu or the project's website at www.bwilcox.com/BEES/BEES.html
- The User Manual available through the software's Help menu
- The Residential Alternative Calculation Method (RACM) Reference Manual, which can be downloaded from www.bwilcox.com/BEES/BEES.html or www.energy.ca.gov/title24/2013standards/implementation/documents/

If you have a question that is not covered by one of these documents or if you think CBECC-Res is not operating correctly, send an email to CBECC-Res Support <cbecc.res@gmail.com> and we'll answer your question as soon as possible.

If you are reporting a CBECC-Res crash or error, please include as much of the following as possible (copy and paste this template into your email):

CBECC-Res version (Help: About): CBECC-Res 2013-??

Describe the error, using as much detail as possible.

List the steps taken to produce the error, using as much detail as possible.

- 1.
2. etc.

If there is an error message, what is the message? If possible, take a screenshot of the error message and attach it to the email as a file.

Please attach your <ProjectName>.ribd file. This is the file you open and save from inside CBECC-Res. By default, this file is located in the C:\Users\<your username>\My Documents\CBECC-Res-2013-Projects directory.

We appreciate your willingness to help us improve CBECC-Res by taking the extra time to document and report issues in a way that will help us fix them quickly. If you include your name and phone number, we may call you to clarify the problem or ask for more details. We will not share your name, phone number or email address with anyone outside the CBECC-Res development team or use it for any purpose other than responding to your report.

9. Will there be any training on using CBECC-Res?

An overview webinar was held in May 2014 and an advanced training webinar in June 2014. Future webinars are also planned. If you missed these webinars, the PowerPoint and WebEx recordings are posted on the Energy Commission's training site: www.energy.ca.gov/title24/training.

10. Where can I find updates to the CBECC-Res software?

Updates to CBECC-Res are posted on the project website: www.bwilcox.com/BEES/BEES.html. If you would like to be notified by email when a new version of the software is available, please visit the CBECC website and submit your e-mail address using the sign up option at the top of the page.

11. Where can I find information about CBECC-Com, the compliance software for nonresidential buildings?

For information about CBECC-Com, the nonresidential compliance software, go to <http://bees.archenergy.com/index.html>.

GENERAL COMPUTER FAQS

1. What should I do if I just installed the program and it doesn't seem to run right?

The most common reason for problems after installing the program is due to the user changing the install locations to point to folders that do not have the right properties for CBECC-Res to operate. Some examples that can cause problems include referencing a network drive (usually starts with \\), referencing a location where the user does not have permission (sometimes C:\) or pointing to strange locations like "Data\" that are off the root directory.

If CBECC-Res does not work, it is recommended that you reinstall the program. When you get to the "Choose Install Locations", carefully restore the folder locations as follows (Note that the <username> is your Windows user name like "Ken" or "Ken Smith").

For CBECC-Res 2013:

Program Executable Folder: C:\Program Files (x86)\CBECC-Res 2013

Program Data Folder: C:\Users\<username>\Documents\CBECC-Res 2013 Data\

User-Defined Projects Folder: C:\Users\<username>\Documents\CBECC-Res 2013 Projects\

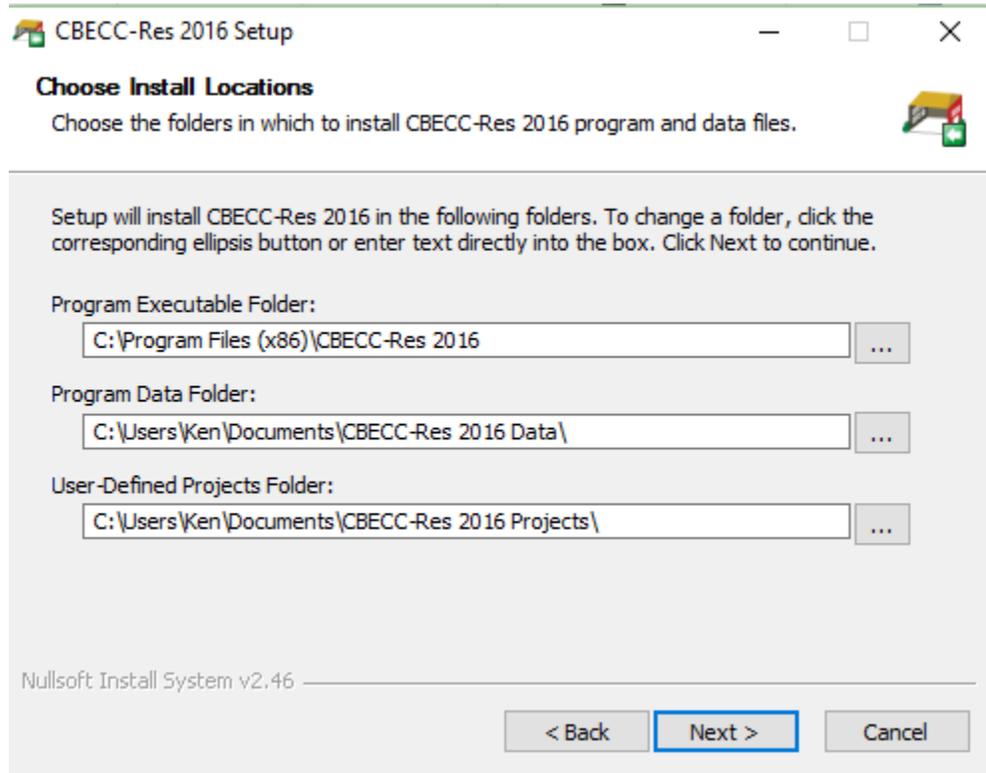
For CBECC-Res 2016:

Program Executable Folder: C:\Program Files (x86)\CBECC-Res 2016

Program Data Folder: C:\Users\<username>\Documents\CBECC-Res 2016 Data\

User-Defined Projects Folder: C:\Users\<username>\Documents\CBECC-Res 2016 Projects\

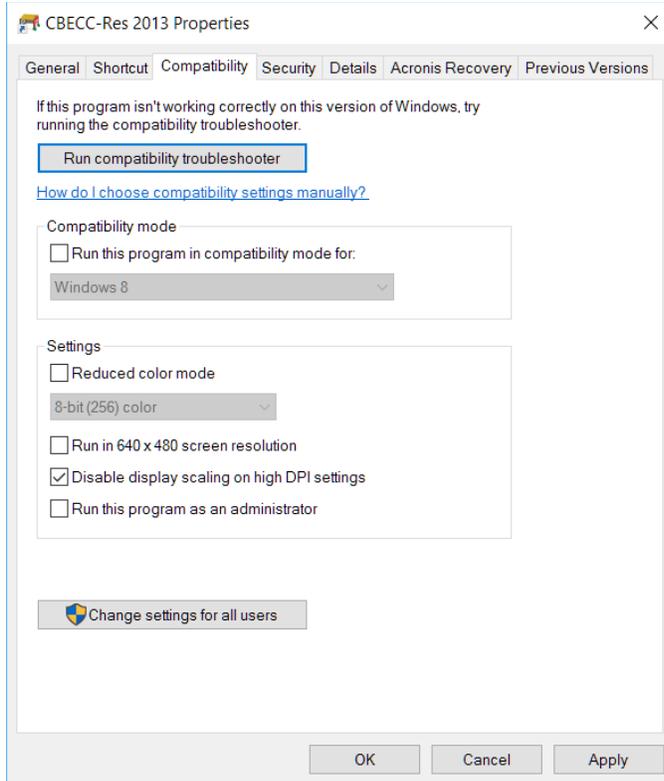
With a username of "Ken" the "Choose Install Locations" screen will look like this (for 2013 or 2016):



2. I have a high-resolution screen and the menus and icons do not look right. Are there any adjustments I can make?

- A. Right click on the icon that starts the program
- B. Select "properties" at the bottom of the menu
- C. Select "compatibility" tab
- D. Check the box to disable display scaling on high DPI settings
- E. Click apply

FAQs for CBECC-Res



3. Can I install CBECC-Res on a network?

CBECC-Res was not designed for names that begin with \\ as part of the path name. You will need to install the program on a local drive (like c: or to a mapped drive).

4. Are there any known issues with Adobe Acrobat® that affect the program?

There have been cases reported where the CBECC software installer interferes with Acrobat Reader, preventing the display of .pdf files. Rebooting your computer should fix any issues.

FAQS POSTED ON SEPTEMBER 6, 2016

1. I'm getting an error on a multi-family project with central water heating, specifically asking for supply and return pipe lengths. How can I fix this?

Close the program. Open the .ribd file in notepad and search for the word 'Loops'. Change the input for UseDefaultLoops from 0 to 1.

```
UseDefaultLoops = 1
```

Save the file, start CBECC, and run it again.

2. How can I model a small duct high velocity system with less than 350 CFM/ton?

Selecting "zonally controlled" allows modeling a CFM/ton value as low as 150 CFM/ton. This is consistent with the exception to Section 150.0(m)15.

FAQS POSTED ON NOVEMBER 30, 2015

1. Are the requirements for an addition alone more difficult than existing plus addition?

Yes, they are much more difficult and this is now being enforced by CalCERTS and CBECC-Res. Based on Section 150.2, addition alone compliance does not have the same allowances that existing + addition + alteration (E+A+A) compliance is given. For example, this means that the standard design for a small addition using E+A+A will be based on R-13 walls, while in an addition alone, it is the Package A value of R-13 cavity + R-5 continuous.

There are prescriptive forms for projects that do not require any HERS measures. These are found at http://www.energy.ca.gov/title24/2013standards/res_compliance_forms/ and pick Alterations and Additions Paper forms. It will make your job much less stressful to have a good grasp of the prescriptive requirements. For example, a 350 ft² addition is allowed 105 ft² of glass, while if you model addition alone, your budget is based on 20%.

2. Why am I showing a penalty or no credit when altering HVAC equipment?

Version 4 does not give an appropriate amount of credit to HVAC alterations. The workaround is to model altered equipment as “new.” Although new and altered HVAC (without verified existing conditions) should receive the same amount of credit, that mechanism is not working correctly in Version 4. NOTE: Without verified existing conditions, the credit is limited to the efficiency above the current minimum. This means 78 AFUE will not get any credit, but 90 AFUE will receive a credit.

3. When I installed the latest CBECC-Res, my Acrobat program did not interact the same. Is there something I need to do?

Simply rebooting your computer should fix this problem. The CBECC software installers interfere with installations of Acrobat Reader DC on some Windows 8 and 10 computers. This issue prevents the installer, the CBECC programs, Windows Explorer and likely other software that relies on Windows file associations to launch Reader DC from successfully opening/displaying PDF files.

4. Is there list of when specific versions of software were valid (my building department is asking)?

We have posted a link to approval/expiration dates on the approved computer compliance programs website, under additional information (http://www.energy.ca.gov/title24/2013standards/2013_computer_prog_list.html).

5. Rather than keeping multiple versions of CBECC on my computer, if I get plan check corrections on a project can I download older versions of CBECC?

Yes, but before going through the steps to do so, consider these steps if the corrections are minor:

- A. Make a copy of the input file and keep it somewhere safe. This step is so you can go back to an older version if that step becomes necessary.
- B. Using one of the copies of the input file and using the current version of CBECC-Res make the needed corrections. If the project still complies, you can proceed using current software.
- C. If it does not comply, and you think it might still comply in the older version, you can download previous versions of CBECC from the CBECC website. Proceed with caution going back and forth between older and newer versions, because once you open a project in a more current version, you cannot go back.
- D. When you're done with this process make sure the desktop icon is opening the correct version of software. To change it, right click on the icon, pick properties, and modify the “target” and “start in” locations as needed.

6. What is a “party” surface? And why is the program giving me an error when modeling an interior ceiling as a party surface?

A party surface separates two conditioned spaces where only one of the spaces is modeled. For example, only when modeling an addition alone is an interior surface specified as a party surface. The party wall separates the addition from the rest of the house. The program is sometimes incorrectly triggering an error. The way to correct this error is to temporarily uncheck “Is a Party Surface,” set the zone on other side to the only zone being modeled, then replace the check mark for the party surface. This will correct the error and allow the program to proceed.

7. The cooling equipment standards recently changed. How does this affect compliance work done in the past? Can 13 SEER equipment be installed? Do I have to re-run compliance calculations with 14 SEER?

In the past, anytime appliance efficiency standards change, it affected equipment manufacturers, not the compliance calculations. There is a slight change you’ll want to keep straight ONLY if you want to use equipment that met an old standard, but not the new standard (not a typical situation).

Most important, use the correct standards version as shown in General Information Section 05 of the CF1R (Compliance 2015 for anything submitted on or after January 1). The compliance version sets the standard design to the appropriate value. If that information is correct, and a 14 SEER or higher was modeled, no change is required. Now for the change . . .

For as long as there have been appliance standards, it was always the date equipment was manufactured that determined the applicable standard. That changed in January 2015 at the Federal level. For some equipment (split system and single package air conditioners) the date the equipment is installed determines the applicable standard. If a central air conditioner is installed after January 1, 2015, it must have at least 14 SEER (higher if the CF1R displays a higher efficiency).

In most cases this has no effect. It would be rare that the client has equipment for which they asked you to assume a penalty. However, for split system or package air conditioners that is no longer allowed. They would need to install equipment that meets the standard at the time of the installation. Revising the compliance is needed only if the wrong compliance version is shown on the CF1R. Any permit application made in 2015 requires Compliance 2015.

8. Will CBECC-Res ever produce a mandatory measures form?

No, instead there is a 4-page document at the Energy Commission’s website. You can either search for “2013 mandatory measures” or use this link. Save it on your computer for all of your jobs http://www.energy.ca.gov/title24/training/2013_Residential_Mandatory_Measures_Summary.pdf.

FAQS POSTED ON JUNE 3, 2015

1. I’m having a problem getting CAHP reports in Version 4. Is there a workaround?

Follow these steps:

- A. Make a copy of the ribd file for safekeeping since you will be editing the file.
- B. After performing the analysis, open the RIBD file in an editor that allows editing and storing text files (e.g., Notepad) [open Windows Explorer, right-click on the file, select “open with”].

C. Locate the first occurrence of "NatGasAvailable" [use Control-F to find] and insert on the next line one of the following.

1. For an analysis of a single orientation of the building:

```
ResultSummary[1] = "EUSummary"
```

After editing, it will appear as:

```
AllOrientations = 0  
FrontOrientation = 70  
NatGasAvailable = 1  
ResultSummary[1] = "EUSummary"
```

2. For multiple orientation (or cardinal) analysis:

```
ResultSummary[1] = "North Facing"
```

After editing, it will appear as:

```
AllOrientations = 1  
FrontOrientation = 0  
NatGasAvailable = 1  
ResultSummary[1] = "North Facing"
```

D. Save the file (as text) and close the editor.

E. Re-open the project in CBECC-Res and select: [Tools](#) > [Generate CAHP/CMFNH Report](#) from the CBECC-Res menu bar to generate the CAHP report.

2. **I installed (or reinstalled) the program and now I am getting permission and file errors. How can I correct this?**

The most likely cause of this is that the install location folder names are set incorrectly. This can happen if you changed the install locations for the program during the current or a previous install — for example, if you used a network drive or other location on your computer. The fastest solution is to uninstall the program, then reinstall the program manually. When you reach the install location screen, restore the install locations to the original values used by the software.

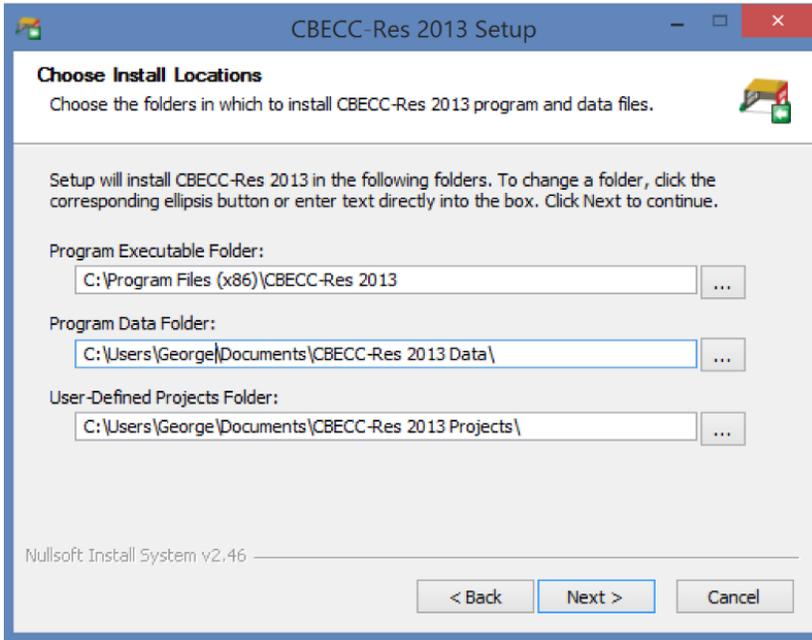
On Windows 7 and 8 computers, the original path names are:

Program Executable Folder: C:\Program Files (x86)\CBECC-Res 2013

Program Data Folder: C:\Users\Your User Name\Documents\CBECC-Res 2013 Data\

User-Defined Projects Folder: C:\Users\Your User Name\Documents\CBECC-Res 2013 Projects\

Replace the phrase "Your User Name" with your user name that you log onto your computer with. For example, if your user name was "George", the install location screen should look like:



3. When entering my wall orientations, is it wrong to enter the actual orientation (e.g., if the front faces south, I would enter 180)?

The printout will be wrong if you enter the actual orientation rather than the “plan” orientation. Fight the urge to enter a number and instead specify the direction of the wall when looking at the floor plans where the bottom of the plans is typically the front. The program assigns a number value, with front always being 0, adding that to the value input as the “Front Orientation” on the building tab. This means if you incorrectly enter 180 for the front wall and 180 for the building front, the program will set the walls and windows as facing 0 (360) degrees.

This illustrates how the output differs for a front wall entered correctly using the pull-down menu option of “front” with one entered incorrectly as facing south, once the program calculates the “actual azimuth”:

OPAQUE SURFACES									
01	02	03	04	05	06	07	08	09	10
Name	Zone	Construction	Azimuth	Orientation	Gross Area (ft ²)	Window & Door Area (ft ²)	Tilt (deg)	Status	Verified Existing Condition
Front Wall	House	Wall R0	180	Front	320	44	90	Existing	No
South Wall	House	Wall R0	0	180	320	44	90	Existing	No

This is also explained in Section 7.1 (pp. 7-1 through 7-2) of the CBECC-Res User Manual.

4. What is Error Code 202, and how can I fix it?

It is an Internet connection problem. A common cause is using a Wi-Fi connection. Because it can take a little longer to get the CF1R, the program can time out without creating the CF1R, which also means the AnalysisResults-BEES file is incomplete. If possible, try to use a more stable connection so the CF1R gets created before timing out.

FAQS POSTED ON MARCH 6, 2015

- 1. My CF1R is showing “Not Useable for Compliance.” I verified that I am using the latest software (I downloaded the revised version of 3c (710) following the 2/26 notification) and it is not a quick simulation analysis. What could be wrong?**

Some older files have an input called a “report include file” that must be removed using text editing software, such as Notepad. It is found close to the top between simulation speed and whether the project has CAHP calculations turned on:

```
SimSpeedOption = "Compliance"  
ReportIncludeFile = "report132Z.txt"  
IsCAHPProj = 0
```

Here are the detailed instructions for correcting your file.

- (a) Start Notepad, a program typically located in the Accessories folder.
- (b) Select file, open and change the file type from Text Documents to All Files (to the right of the file name).
- (c) Find and open the .ribd file in the CBECC-Res 2013 Projects folder.
- (d) Locate the row with ReportIncludeFile (about 15 lines down) and remove the entire row.
- (e) Save and exit.
- (f) Start CBECC-Res and run the file.

NOTE: A CF1R with “not useable for compliance” is never acceptable for uploading. The watermark must be “not registered.”

- 5. Above the Energy Use Summary my CF1R shows that it is not valid after December 31, 2014. What do I need to change if I am applying for a permit in 2015?**

On the Analysis tab is an input for Standards Version, which can be set to Compliance 2014 or 2015. This should be set to Compliance 2015. The only time Compliance 2014 would be valid is for plan check corrections on a job submitted prior to January 1, 2015.

- 6. With regard to the CAHP report, I made changes to the characteristics of a job, which will not change the compliance results. Do I need to do anything more to reflect those changes on the CAHP report?**

You will need to run the file so that the CAHP report can be generated with the correct results/format. This means after performing the analysis, select Tools and Generate CAHP/CMFNH report.

- 7. If I have 2 air conditioners and 1 furnace (i.e., an inconsistent number of systems), the program will not run. Should I model 2 systems or 1 system?**

Enter the smaller of the number of systems. During installation the builder can install more systems than are defined in the input file.

- 8. My project crashed with a CSE error. The project log file did not contain any information to narrow down the location of the error. Is there somewhere else I can look?**

We are aware of an error when the garage is modeled as 80% carpeted rather than exposed that is very difficult to find. However, the tools available to you are all found by selecting Tools. The first level is to View Project Log File and look for the word error, followed by details (be sure to scroll all the way to the right for all of the details. Another tool is to View Project Folder, then find a folder named “[filename] – Comp.” Inside that folder are two files that are type “ERR file.” Look in one or

both of these files for additional details to help locate the error. If you still cannot solve the error, please send your ribd file to cbecc.res@gmail.com for assistance.

FAQS POSTED ON FEBRUARY 19, 2015

- 1. I'm modeling an addition alone with a tankless water heater. The program is not giving me any credit for this water heater. I noticed that when I try to change the system, it says "create a new EXISTING water heater." Since this is not an existing water heater, how can I get the program to recognize this is a new water heater?**

This may have happened if a file was originally an Addition and/or Alteration file and the DHW status was set as existing. To fix this, go to the Analysis tab and first make note of the fraction of a dwelling unit so you can reset this value after making a change. Second, change the project type to Addition and/or Alteration. Third, go to the zone and change the DHW system status from existing to new. Fourth, go back to the analysis tab and set it to Newly Constructed plus Addition Alone (with the appropriate fraction). Lastly, in the zone define the new DHW system.

- 2. If my garage is below grade, how should I model that in CBECC-Res?**

Model it as above grade. CBECC-Res is only accounting for the effects of an attached unconditioned space. It is not necessary to model the effects of the surfaces being below grade.

- 3. When I model a ground source heat pump, it is triggering HERS tests for airflow and refrigerant charge (climate zone 10). Can this be corrected?**

Until the program can be changed so that it does not trigger HERS airflow (unless there are ducts) or refrigerant charge testing, you can advise the installer to treat the system as a package unit. A CF2R-MCH-25f will be completed, but no HERS requirements apply.

FAQS POSTED ON DECEMBER 30, 2014

- 1. With the latest release (bug fix 3b1 (694)), should I start using Example 18 files as my starting point?**

Yes. We have solved some problems (although rare) that may linger and corrupt older files, so we recommend using the newer example files when starting a new project. The example files are described in the User Manual on p. 2-2.

- 2. My CF1R is reporting slab edge insulation when I did not model any. Can I fix this?**

Yes. Check the slab has edge insulation box, set the R-value and depth to none, and then uncheck slab has edge insulation (make sure in the process of doing this it did not switch it to a heated slab).

- 3. The check box to "Use this EER" sticks in the checked position. How can I get it to shut off when I am specifying a default value?**

You have probably typed in the value, so that even if it is the default value, the program is detecting a user-defined value. With the use this EER box checked, swipe the cursor across the EER field, right-click, pick restore default, and then uncheck the box.

- 4. If a building has heating only, is HERS verified fan efficacy required? How do I model the correct requirement?**

No it is not required for most systems when there is no cooling (there may be a requirement involving certain central fan integrated systems). When correctly modeled with no cooling system

(or any system for which fan efficacy does not apply such as non-ducted systems), you can set the fan to none.

5. Is there any way to get the Overhangs and Fins section of the CF1R to not print on the CF1R (since I did not model any)?

Yes. For any windows for which you have not modeled overhangs, uncheck the Model Window Fins and/or Overhangs box on the windows input screen and this table (or the rows for any windows without overhangs/fins) will not appear.

FAQS POSTED ON DECEMBER 2, 2014

1. When I have a building with no cooling system, is it acceptable to show this as “none” or 0 systems?

Neither of these options will run. The correct way to model a dwelling with no cooling system is documented in Section 8.3.2 of the User Manual. If a file previously ran with none, your compliance results will not change due to this change. There are no HERS requirements associated with no cooling (now that all the kinks are worked out for this feature).

2. If I have a 2-zone single-family residence and each zone has a tankless water heater, is it appropriate to specify the same water heating system (with one tankless unit) in each zone? Will that result in two tankless units being specified?

No, this would only reflect one system with one water heater. Because water heating applies to a dwelling unit and not to a zone, the system should be set up to include both tankless water heaters (assuming they have the same distribution system) and associate that system with one or both zones.

Alternatively, identify two distinctly named water heating systems, each with one water heater (this entry can be the same water heater), and specify one system per zone. Either option yields the same results.

3. Is there any limit to the number of multi-family dwelling units that can be modeled?

The limits on multi-family were raised with Version 3b, however one limit remains. If dwelling units have individual water heating rather than a central DHW system, there is a limit of 100 systems.

FAQS POSTED ON NOVEMBER 21, 2014

1. There is still a watermark on my Existing+Addition CF1R, but no HERS measures. What am I doing wrong?

The first recommendation is to see if you have modeled AC charge (refrigerant charge) as “Verified”. Even when the system is existing, AC charge will generate a HERS message. Change this to “Not Verified” and this should solve the problem.

2. With regard to whole house fans, the CBECC-Res User Manual says the attic ventilation requirement is 1 square foot for every 1,000 CFM of whole house fan air flow, but the prescriptive requirement is 375. Which requirement is correct?

The requirement is 1 ft² for every 375 CFM of whole house fan air flow. The standards are a legal document. Since the standard design is based on the prescriptive requirements (including Section 150.1(c)12), if a whole house fan is modeled, the prescriptive criteria apply. The User Manual will be updated as soon as possible. [**NOTE:** Version 4b included a reduced ventilation option.]

3. Can I model a single family residence with more than three stories in CBECC-Res?

Yes, since all single family buildings regardless of height are low-rise residential, you can use CBECC-Res for compliance (the three-story limit does not apply to Occupancy Group R-3). The program input is limited to 3 stories to avoid any confusion on the part of users.

4. When modeling multi-family buildings, are there any new details I should be aware of?

Beginning with version 3b, the reporting for multi-family dwelling units is modified to accommodate the needs of HERS Raters. This means every dwelling unit is identified on the CF1R. Since the program makes associations with the HVAC system and the dwelling unit automatically, we recommend using very short names for the heating, cooling, distribution, and fan system names in the Dwelling Unit Types. Otherwise when the program combines these names it could quickly run out of available space in the fields on the CF1R (this recommendation is also noted in the User Manual, Section 5.6).

5. When I model my existing duct location it triggers a HERS requirement. Is that something that can get fixed?

It is a known issue [fixed in version 4b]. In the meantime, since the ducts are existing, put them in another location (if there is an attic, this is commonly referred to as a default location).

FAQS POSTED ON OCTOBER 20, 2014

1. Are there any tips to help me find what is causing a watermark on an addition that should not have a watermark?

We have added a HERS Features Summary to the CF1R (following Required Special Features). This will help you determine why a watermark is appearing.

2. The column named HERS Verification does not always say Required or Not Required. Am I misunderstanding the use of this column?

Most users only notice this name when HERS verification is not required. If that is the case, the “. . . HERS VERIFICATION” table that typically appears as the next section on the form will not appear.

Otherwise, this column is used as a guide to the HERS verification table that follows, which is particularly useful if different conditions apply. For example, the user has defined two distribution systems naming them Attic Ducts and Crawl Ducts. Column 08 is a software defined name that provides a guide to the next table (if included). In this case, the duct leakage was specified as 5% but only for the crawl space ducts, not the attic ducts:

HVAC - DISTRIBUTION SYSTEMS							
01	02	03	04	05	06	07	08
Name	Type	Duct Leakage	Insulation R-value	Supply Duct Location	Return Duct	Bypass Duct	HERS Verification
Attic Ducts	Ducts located in attic	Sealed and tested	6	Attic	Attic	None	Attic Ducts-hers-dist
Crawl Ducts	Ducts located in a crawl space	Specified Lower Leakage Target	6	Crawl Space	Crawl Space	None	Crawl Ducts-hers-dist

HVAC DISTRIBUTION - HERS VERIFICATION						
01	02	03	04	05	06	07
Name	Duct Leakage Verification	Duct Leakage Target (%)	Verified Duct Location	Verified Duct Design		Low-leakage Air Handler
				Return	Supply	
Attic Ducts-hers-dist	Required	6.0	Not Required	Not Required	Not Required	Required
Crawl Ducts-hers-dist	Required	5.0	Not Required	Not Required	Not Required	Required

3. Are there any other ways for getting around in the CBECC-res software that do not rely so heavily on the mouse?

You can use the following alternative procedures for getting from one field to another, or to access the right-click tools menu:

- Up/down arrow - moves up/down the tree.
- <Alt> Enter – opens data for object highlighted / then tab to the field
- <Alt>F1 – opens the right mouse quick menu. Once open:
 - a. up/down arrows to highlight a selection and <enter>, or type the letter such as “E” to edit, “R” to rename
 - b. when the bottommost "Create" item is selected - right/left arrow keys to open/close submenu of children to create
 - c. <esc> key to close right mouse menu
- Left/right arrows - when on an object with children (i.e., a wall with windows) left arrow contracts and right arrow expands (to show/hide the child objects)

4. When giving my client options for making their building comply, I like to run various scenarios. Are there any automated or semi-automated tips for doing this?

You can create multiple input files, each with a different value or set of measures, and use a batch file to run all of the files without using the CBECC-Res interface. This is a useful tool if you have a separate computer or while you take a break as it requires no interaction once it is executed. Be sure to set it to create the PDF as well for your review when all of the runs are complete.

Using notepad, create a file that will be saved in the root directory containing CBECC (e.g., c:) named something.bat. The contents of that file will be one line per file variation:

```
"C:\Program Files\CBECC-Res 2013\CBECC-Res13.exe" -pa -nogui "C:\Documents and Settings\name\  
My Documents\CBECC-Res 2013 Projects\variableA.ribd"
```

```
"C:\Program Files\CBECC-Res 2013\CBECC-Res13.exe" -pa -nogui "C:\Documents and Settings\name\My Documents\CBECC-Res 2013 Projects\variableB.ribd"  
"C:\Program Files\CBECC-Res 2013\CBECC-Res13.exe" -pa -nogui "C:\Documents and Settings\name\My Documents\CBECC-Res 2013 Projects\variableC.ribd"  
"C:\Program Files\CBECC-Res 2013\CBECC-Res13.exe" -pa -nogui "C:\Documents and Settings\name\My Documents\CBECC-Res 2013 Projects\variableD.ribd"  
"C:\Program Files\CBECC-Res 2013\CBECC-Res13.exe" -pa -nogui "C:\Documents and Settings\name\My Documents\CBECC-Res 2013 Projects\variableE.ribd"  
pause
```

Include the quotation marks and spaces which direct the batch file functions. Add or remove lines as needed. To edit or to execute the file, open Windows Explorer™ and access the c:drive. To edit, right-click on the file and select edit (which opens notepad). To execute the file, double-click on the *.bat file. When done, the command window will display “Press any key to continue . . .” and you can view the CF1Rs in the projects folder.

5. Can Quality Insulation Installation (QII) be modeled in an existing plus addition?

At this time, you can only model QII if the entire building will meet the criteria (e.g., a gut rehab) and an existing plus addition analysis is being modeled. There is no way to account for a portion of a building meeting the criteria. The requirements for this credit (from Residential Appendix RA3.5 apply to all ceilings/attics, knee walls, exterior walls and exterior floors.

FAQS POSTED ON AUGUST 29, 2014

1. Will results change from Version 2c to Version 3?

Yes, in some cases. For example, results will change in these cases:

- 2-story dwelling unit results will change due to natural ventilation assumptions (see question 6 below for more information);
- A building with electric storage water heaters was corrected to include 50% solar fraction as part of the standard design, even when natural gas is not available;
- All buildings with small water heaters; and
- Below deck roof insulation calculations were corrected to show the insulation covering the cavity and frame.

2. A HERS requirement for return duct design shows up on every job I upload to the HERS provider. How can I get this feature removed?

This is not a feature you are modeling. You are seeing this requirement because of the mandatory measure found in the Standards. Section 150(m)13 requires ≥ 350 CFM/ton and ≤ 0.58 fan efficacy (or none if there is no cooling). It is up to the builder to choose how to comply with this requirement—conduct the tests or meet the requirements from Table 150.0-C or D—so both are shown until the builder completes the installation forms.

3. My building will have no cooling. If I enter 0 for the unique number of cooling systems (or the count), my file will not run. How am I supposed to show no cooling?

The cooling system is defined as a system type “no cooling” (versus a package or split system). The number of systems is 1. The program does not allow an inconsistent number of heating and cooling systems (e.g., 1 heating unit and 2 cooling units). Enter the smaller of the number of systems (but at least 1) and during installation the builder can install more systems than are defined in the input file.

4. Is there an update with regard to the HERS reporting for “no cooling”?

Yes. With the release of version 3 of CBECC-Res, if the cooling system type is set to NoCooling, as shown in the HVAC – COOLING SYSTEMS section of the CF1R, the HERS requirements will all appear as Not Required on the CF1R.

The builder will confirm that no cooling was installed when completing the CF2R-MCH-01-H (Space Conditioning Systems, Ducts, and Fans). If a cooling system is desired, the compliance will need to be revised to reflect the appropriate system type and features (and uploaded to the HERS provider). At that point, all of the mandatory requirements will apply, as well as any HERS verified features (such as refrigerant charge or verified EER) that were included.

5. Why do I still have a watermark for an addition that should not require any HERS measures?

With the release of version 3 of CBECC-Res, if the project meets all of the exceptions (as discussed in [FAQ #5 from 07/17](#)), there will be no watermark on the performance CF1R. If you still have a watermark, look closely at the CF1R for either verified existing conditions (shown just above the signature page) or another field that shows “Required” for a HERS verified measure. The status of a feature can also affect HERS requirements (see the CBECC-Res User Manual, Chapter 10).

6. Can you explain the 2-story ventilation change in more detail? Is this related to whole house fans?

Yes, it is related to whole house fans and their benefits in a 2-story home. The principal difference is in the “stack effect,” driven by the opened window area and the height difference between the

open windows. In 1-story homes, a 2-foot height difference drives the stack effect of natural ventilation, and in 2-story homes, a 10-foot height difference drives this stack effect. This difference causes significant variance in the relative benefits of mechanical equipment that employ ventilative cooling, such as whole house fans, because CBECC-Res was assuming that natural ventilation works extremely well in 2-story homes, and only moderately well in 1-story homes.

While it may be realistic to assume this 10-foot height difference (meaning windows are opened both upstairs and downstairs), realizing this large height difference is based on all bedroom doors remaining open on both floors and an unobstructed airflow path between the downstairs and the upstairs windows. Because the airflow model does not account for these obstructions, the 10-foot height difference is not realistic. This difference between the CBECC-Res 1-story and 2-story ventilative cooling impacts was only noticed recently. The effect was to discount the impact of whole house fans (a prescriptive requirement in several climate zones).

In CBECC-Res v3 the change in window operations in 2-story homes is to assume that only the windows on the second floor are open for cooling ventilation purposes. This will allow the compliance software to implement the prescriptive baselines for each climate zone consistently for both 1 and 2-story homes.

- 7. I am getting an error that seems to indicate a problem with the ducts in the attic. I previously had a problem with a very small attic being unable to accommodate the default ducts in the attic. But in this case the attic is over the entire house, so it should be big enough. Is there anything I can try to correct this error?**

First check your duct system. Make sure to select “use defaults” (as long as you are not doing a verified duct design). Then go back to the envelope tab and delete the attic zone. The CBECC-Res program will immediately recreate it. This may be enough to clear out the duct assumptions and redefine them, which may be enough to allow the program to run.

- 8. Will I be able to take credit for changing an existing electric resistance heating system to a central gas forced air unit (once verified existing conditions are available)?**

No. There is no ability to show a change that involves different efficiency metrics (such as AFUE vs. HSPF). Because the existing system is defined when using verified existing conditions, this situation will create an error and cannot be simulated. Therefore, verified existing conditions cannot be used for this particular change.

FAQS POSTED ON AUGUST 6, 2014

- 1. I thought I installed bug fix 2c, but I am not sure. How can I tell if I am using 2c?**

Because it was a ruleset change only and there was no new executable file, it was not possible to change the “about”  screen. To verify that you installed version 2c, when you produce a CF1R with the updated software, field 07 under General Information shows the Compliance Manager version (595c).

- 2. I am still seeing HERS requirements for existing HVAC systems. Wasn't 2b/2c supposed to fix this?**

This is not fully fixed until Version 3 is approved. This was an unfortunate oversight. It is subtle but the CF1R sections that specifically list the HERS requirements are correct—no HERS requirements apply to existing systems. It is the labels in the fields that contain an overview of the system (HVAC – DISTRIBUTION SYSTEMS, HVAC - FAN SYSTEMS) that may still reference HERS requirements. The CF1R was recently changed to remove sections that do not apply. If registration is required (for

example, duct testing for greater than 40 feet of new duct), no HERS verifications are triggered for the existing HVAC system or IAQ for an addition $\leq 1,000$ ft².

3. If I have an Addition Alone, can I use the same exceptions mentioned in Question 5 from July 17 to prove to the building department that I do not need to register my CF1R?

Yes. Until staff can come up with a solution for identifying that an addition meets the conditions for not requiring registration and not producing the watermark, you will need to be prepared to prove to the building department that registration is not required. For that you can consult FAQ #5 from July 17 for more information, based on Section 150.2 of the *Building Energy Efficiency Standards*.

4. I switched a file from Addition and/or Alteration to Addition Alone and now it will not run (the error says the HVAC system is invalid). What do I need to do?

Most likely, you had an existing HVAC system defined to serve the addition zone and when you switched it to Addition Alone, the status field disappeared while it was set to “existing.” To fix this (a) switch the Run Scope (Analysis tab) back to Addition and/or Alteration, (b) go back to the zone and set the HVAC System Status to “New”, (c) switch the Run Scope back to Addition Alone, and (d) define an HVAC system status that is recognized by the program (the system that was previously defined is an “existing” system). The HVAC system, assuming it is an existing system, should look exactly like a prescriptive system—78% AFUE, split system cooling with 13 SEER and 11.3 EER (or if 2015 compliance 14 SEER and 11.7 EER), with Refrigerant Charge set to match Package A from Section 150.1.

5. Why are there HERS requirements when I modeled “No Cooling”?

No cooling is modeled in such a way as to have no effect on compliance (no credit, no penalty) by simulating a cooling system equivalent to the prescriptive requirements for the specified climate zone in both the Standard and Proposed Design. The CF1R was reporting what was modeled, including the system efficiency, mandatory requirements for airflow of ≥ 350 CFM/ton of cooling and fan efficacy of ≤ 0.58 W/CFM, in addition to the prescriptive requirement for refrigerant charge.

When the system works as desired, the HERS requirements may appear along with the system type “No Cooling” and the builder will confirm that no cooling was installed when completing the CF2R-MCH-01-H (Space Conditioning Systems, Ducts, and Fans). A HERS rater will not perform tests on a non-existent system. However, if a cooling system is installed, a new CF1R must be uploaded to the HERS provider changing the “NoCooling” system type to the appropriate system type and features, and all of the mandatory requirements will apply, as well as any HERS verified features.

6. Although I specify default values for roof reflectance, the CF1R is reporting non-standard roof reflectance and a cool roof. How can I fix this?

As of July 23, if you model 0.1 roof reflectance the CF1R will correctly report if there is or is not a cool roof. The special feature reporting of a non-standard value cannot be fixed until Version 3 of the program is approved. If the special feature message is bothersome, model a roof reflectance of 0.099 which is below the trigger point (this will have a slight effect on the cooling compliance). When corrected, a value of $>$ (greater than) 0.1 but $<$ (less than) 0.2 will be reported as a non-standard roof reflectance. A cool roof will only be set to yes when the roof reflectance is \geq (greater than or equal to) 0.2.

7. When modeling a mini-split heat pump, the compliance results are not as expected. Am I doing something wrong?

No, you are probably not doing anything wrong. The field performance of these systems has not been verified to justify the sometimes significantly more efficient SEER and HSPF ratings they are given by the appliance standards test methods. Therefore, as explained in the ACM Reference Manual, until there is a compliance option analysis of the efficiency of mini-split heat pumps, they are modeled as equivalent to a ducted split system central heat pump.

8. What is the correct way to model a duplex or townhome? Can I call this a multi-family building?

While in the past it was possible to model the building as a single-family attached or multi-family, because the duct leakage requirements are different for multi-family, these unique multi-family projects must show compliance based on each dwelling unit. To obtain the correct results, each dwelling unit will be modeled to produce its own CF1R.

9. Has any progress been made in speeding up the software?

Our programming team has reduced the run time by 50% on average by launching single-threaded processes in parallel. Dual and quad-core processors are a critical part in seeing improvement, while a single-core processor is not likely to show much improvement.

The greatest improvement is in all orientation compliance because all simulations are performed at once. A rundown on the processing times for the sample files (results vary depending on the complexity of the input file) are:

```
1StoryExample##.ribd 2:50 -->> 0:51
1StoryExample##Crawl.ribd 1:37 -->> 1:03
2Story2ZoneExample##.ribd 2:04 -->> 1:12
2StoryExample##.ribd 1:27 -->> 0:54
EAAExample##.ribd 2:05 -->> 1:13
AAExample##.ribd 0:57 -->> 0:35
MFexample##.ribd 1:25 -->> 0:45
```

10. Does the software allow a PC's video card handle tasks that are separate from execution?

Staff has received a recommendation to compile the program to allow a PC's video card processor to handle tasks that can be separated out for execution. There are three limitations:

- **Single-threaded processes.** The underlying program (CBECC/CSE) is not multi-threaded, so there is no advantage to the video card processor mechanism without fairly substantial changes to CSE and/or rules processor source.
- **Compatibility.** The solution we have implemented should work on any Windows OS system, but video card solutions are hardware-specific, so some computers with certain video cards would show an improvement while others would not.
- **Cost.** Although not ruled out completely, the cost/payout ratio is too high right now.

11. Does the software run on a Mac computer?

Some virtual machine applications such as BootCamp and Parallels enable the software to run on a Mac computer and generate reports successfully.

12. Does the compiler support multi-core processor cores or hyper-threading?

“CBECC-Res” includes two relevant components for this run-time discussion. CBECC-Res is the user interface and compliance rules processing component, and CSE (California Simulation Engine) is the building energy analysis component.

The compiler used to produce the CBECC-Res & CSE executables DOES support multi-core processors and hyper-threading, but the source code (prior to release of upcoming version 3) was not structured to support multi-threaded analysis.

In version 3, the analysis and simulation source code are not restructured to allow for multi-threaded execution at a low level, but the analysis DOES now perform the two annual (proposed & standard design) simulations in separate threads at the same time, enabling simulations to be performed approximately twice as fast (unless the user's computer does not contain a multi-core processor or support hyper-threading).

Regarding analysis run times, it would be unusual for an analysis run to take 3 to 4 minutes, even for complex models on underpowered computers. That said, we do not regularly test unduly complex models on underpowered computers, so we cannot provide expected performance in these situations.

Also in version 3, if the analysis involves multiple orientations then five CSE simulations would be performed in parallel. If five CPUs are available, then the speedup would be approximately a factor of five. The parallel simulation change introduced in version 3 uses multiple threads in CBECC-Res to monitor and report progress from each CSE run, and each CSE run is performed using a separate process. CSE itself has not been modified to use multiple threads.

Another variable is Internet connection/bandwidth. The generation of compliance reports (which is only required once a project is fairly complete), either PDF alone or 'Full' (XML w/ embedded PDF) involves transmission of the model inputs and results to the web-based report generator and receiving the files back from the report generator. In our experience this typically takes 10 to 20 seconds but we have seen unusual situations where bandwidth or report generator traffic or detailed logging resulted in this step taking 1 to 1.5 minutes.

The most complex CBECC-Res single-family sample run is 2story2zoneExample#Crawl. The following are processing times (including PDF report generation) for this model executed on a relatively powerful laptop (Core-i7 (quad) 2.4 GHz, 8GB RAM, Win7-Pro, ~2-year old system):

In version 2 (595) the analysis took **1:50** —and in (testing) version 3 (626) the same run took **1:02** to process.

FAQS POSTED ON JULY 17, 2014

1. I used one of the sample files for an Existing + Addition + Alteration and the CF1R conditioned areas are off. Do you know why?

Unfortunately, the zone status for both the existing and new zones was set to “New.” Check the zone status (across from the name on the Zone Data tab) and make sure it is set to “Existing” for the existing building zone. (NOTE: the zone is never “altered.” Only the individual components and surfaces of the existing building can be any of the three options.)

2. Can you explain how to use the status fields for HVAC and DHW correctly?

Starting with the existing zone (zone status “existing” not “altered”), the status of the HVAC system will be either existing or altered. If the intent is to model a change-out, then the status is altered (not new). For example, if the owners are installing a new tankless water heater for the whole house, that is “altered.” There will be a credit for this feature, which will vary depending on whether the existing condition is verified and on the efficiency of altered system.

In the new/addition zone, the status of the HVAC and DHW will be:

- New if new equipment is being installed to serve the addition independent of the existing,
- Altered if the system in the existing zone is also altered, or
- Existing if the existing HVAC or DHW equipment is serving the addition.

Pay special attention to the furnace fan status to be sure it matches the rest of the HVAC system. And the ducts will either be:

- Altered if the existing ducts are being replaced,
- Existing if the existing ducts will remain and the addition will have < 40 feet of new ductwork, or
- Existing + New if the existing ducts will remain and the addition will have new 40 feet or more of new ductwork.

3. Can you explain the option to “verify” existing conditions for altered features?

[NOTE: As of July 15, the option to verify existing conditions cannot be used. Check with the HERS provider for the availability of this credit.] The amount of credit for an alteration depends on whether a HERS rater verifies the existing conditions. For example, if you are altering existing metal frame, single-pane windows to vinyl frame, low-e windows, if you do not check “verify” you will only input the efficiency of the new windows and your credit is based on the difference between the new window U-factor/SHGC and 0.40/0.35 (values from Table 150.2-B of the Standards). If you pick “verify” and enter the existing conditions of 1.28 U-factor/0.80 SHGC, the credit you receive is based on the difference between these values and the U-factor/SHGC of the new windows.

4. Can you provide any more information about registering my CF1R?

CalCERTS recently began accepting projects for projects complying with the 2013 Standards. The website (www.calcerts.com) has a tutorial for CBECC users. You will upload the file <input> - AnalysisResults-BEES.xml file (a ZIP file was the 2008 file format). If you do need to contact CalCERTS, their e-mail is tech@calcerts.com, or leave a message at 916-985-3400 ext 800. You can expect a response within 24 hours.

Some tips: (1) Please be patient. CalCERTS is the only HERS provider currently approved. While uploading projects has been around for years, the volume of uploads is going to be much greater given that HERS testing is mandatory for all newly constructed buildings. (2) Make sure you have generated the file you need. As explained in the User Manual, Section 1.8, check the Full (XML) option on the Analysis tab. The file will be found in the CBECC-Res projects folder under My Documents.

5. What do I do about the watermark if I have an addition with no HERS requirements?

Staff is working to correct this so that there is no watermark if no HERS verification requirements apply. This will help building department staff to know definitively that a CF1R with a watermark

must be registered. The program and watermarks were originally set up for new construction which always requires HERS verification of the mandatory indoor air quality requirements and typically has mandatory duct leakage testing. An addition may not require HERS verification if:

- (A) It is $\leq 1,000$ ft² addition (no IAQ verification),
- (B) An existing HVAC system with < 40 linear feet of new ducts provides conditioning to the addition (no duct testing), or
- (C) A new or existing ductless HVAC system provides conditioning to the addition (no duct testing).

If you cannot delay your project, you may reference the appropriate exceptions:

EXCEPTION 1 to Section 150.2(a): Additions 1,000 square feet or less are exempt from the ASHRAE Standard 62.2 Section 4 requirements to provide whole-building ventilation airflow as referenced by Section 150.0(o), however all other applicable requirements of ASHRAE Standard 62.2 as referenced by Section 150.0(o) shall be met by the addition.

EXCEPTION 4 to Section 150.2(a): Space-Conditioning System. When heating or cooling will be extended to an addition from the existing system(s), the existing heating and cooling equipment need not comply with Part 6. The heating system capacity must be adequate to meet the minimum requirements of CBC Section 1204.1.

EXCEPTION 2 to Section 150.2(b)1E: Duct Sealing. Duct systems with less than 40 linear feet in unconditioned spaces as determined by visual inspection.

6. When I opened an existing input file, I am getting a message that indicates my file might not run. Is that true? [This answer has been expanded from the May 7 FAQ.]

Because there have been so many changes to the software inputs, maintaining the ability to run older files is a challenge. Pick "Resolve NotInput Issues," choose Yes to the option to "remove user input from all. . ." and click "Done." Make a note of where the problem area is in case the file still does not run or to check how the file was modified to get it to run. You might need to redefine one or more components.

7. When I tried to run the new option for an air to water heat pump, it would not run. Am I doing something wrong?

At the present time, the limit to this new option is that you cannot run this equipment type with multiple orientations. So until we get this bug fixed, run a single orientation.

8. I was using one of the new tool options to "Generate . . . Equipment Report Records" for HVAC, DHW, or IAQ and now I cannot run my input file. Is there any way to fix this?

Yes. Until we get this bug fix approved, proceed until you can close the program and then open the *.ribd file in notepad (the file is in the My Documents . . . Projects folder [right-click and select open with notepad]). Search for the phrase 'SysRpt' and delete the 3-5 rows associated with SysRpt, including the ". . ." and save the file. Then open the program again and it should run.

FAQS POSTED ON MAY 7, 2014

1. When I opened an existing input file, I am getting a message that indicates my file might not run. Is that true?

Because there have been so many changes to the software inputs, maintaining the ability to run older files is a challenge. Make a note of where the problem area is in case the file does not run or

to check how the file was modified to get it to run. You might need to redefine one or more components.

2. When a new version of software is approved, how soon do I have to use the new version?

It will vary from two to six months and this date will be displayed on the appropriate web sites. In the early stages of software development, when new versions are released more frequently due to errors and bug fixes, this time limit may be quite short. As time goes on and changes are the result of adding features or refinements, this time will be extended to six months. Be sure to check the 2013 approved programs web site before making a permit application, as this is the date that determines when a version is acceptable.

3. If I get a plan check correction and need to go back to an earlier version of the software, is there any way for me to retrieve an older version from the CBECC-Res web site?

You will be able to download older versions of the software from this web site.

4. Can I have more than one version of CBECC-Res on my computer?

Yes. During installation you can specify a different drive or folder location for the program files and data files (the input files can all be in one location). You will need to manually update the properties for any desktop icons to ensure you are accessing the appropriate version of software for your new projects.

NOTE: When fields get added to the program (for example, the status field to identify whether the zone is new or existing), you will not be able to go back to an older version once the file has changed. You can rename the input file after opening it to maintain the original input file.

5. Will my results change with the latest software release?

New versions may change the results for a building, depending on what was changed in the software release. See the release notes for a description of what is affected by a new version.

6. I am using Windows 8. Do you know of any issues I should be aware of?

CBECC-Res was tested and operates in Windows 8 and 8.1. Only a couple of users have reported that Adobe Acrobat does not operate as they were expecting. Specifically, CF1Rs do not automatically open once created and the User's Manual will not open from the program's Help feature. If you experience this issue, it means your computer does not have a file association between Adobe reader and PDF files. CF1Rs can be manually opened from the Projects directory (same location as your input files possibly located under the folders My Documents\CBECC-Res 2013 Projects\). The User's Manual is included with files such as the program's .exe files. Look for a CBECC-Res 2013 folder possibly in a Program Files folder. This might be a good time to change the "search" function to a more useful tool (required for Windows 7 and beyond) and then you can search for UserManual. Once you find it, you can put a shortcut on your desktop.

7. Does the software run every 2 minutes? If the weather data is hourly, what is the point?

The software runs at ~30 timesteps per hour or about once per 2 minutes. It needs to run with a smaller timestep than older software because of the new air movement and mass calculations, which are more accurate.

Increasing the speed of the processing time is a high priority for staff who hope to be able to provide some improvement soon.

8. Is it possible to model a building with all cathedral ceilings (no attic)?

Yes. However, as of this writing, if you have a garage, you will need to model the garage with a cathedral ceiling as well. No insulation in the garage ceiling is required.

9. What are the options for the sources of U-factor and SHGCs allowed by the standards? Specifically, what is ADFP?

The three valid sources are NFRC, default, or ADFP, which stands for Alternate Default Fenestration Procedure. A rarely used provision in the standards is for unrated site-built fenestration, it requires the use of Reference Appendix NA6 which is called the Alternate Default Fenestration Procedure (ADFP). The same source must be used for both U-factor and SHGC. Whichever source is used, the standards require a temporary label on every window. See References Appendices (CEC-400-2012-005), pp. NA6-1 through 6-5 for further information and responsibilities associated with this calculation procedure.

FAQS POSTED ON MARCH 18, 2014

1. While waiting for a HERS provider to register CF1Rs, is there any harm in removing the watermark that says the CF1R is “not registered”?

The CF1R that will be submitted with the application for a permit and that will be registered with a HERS Data Registry is actually embedded in the "-Analysis Results-BEES.xml" file. The Report Generator employs xml data signing, which can detect whether the contents have been changed or manipulated in any way, notifying the HERS Data Registry that the submission is not valid.

Nothing in this approach will prevent someone from manipulating a PDF and walking into the building department to obtain a permit. However, the building department can easily confirm the registration number at the HERS Data Registry.

As noted in the *Final Inspection* newsletter produced by the Standards Implementation Office of the Energy Commission, unregistered CF1R forms can be submitted to the building department as part of the Early Adopter Program. Prior to obtaining a final permit, a HERS Provider-registered CF1R form will be required as soon as one or more HERS Providers are approved (http://www.energy.ca.gov/efficiency/final_inspection/).

More information about how the xml data signing works:

The HERS Data Registry extracts and decodes the report data from the XML transfer file into the CF1R to be processed and registered. This transfer file implements xml data signing, which does two things:

- (1) The xml data includes a hash, which is a calculated value (in data bytes) based on the content processed by the Report Generator and its private key. This hash can be verified using the Report Generator's public key when verified by a data registry. Any attempt to alter the contents of the xml transfer file will result in invalidating the signature and the data registry will not allow that file to be used for document registration.
- (2) The xml data signing identifies the source as uniquely being the Report Generator using the public key and hash that is included in the data.

- 2. Is the value input for the number of stories intended to be the value for the building or the zone? I ask because I noticed the CF1R shows 3 stories, but it is only a 2-story building.**

The value is the number of stories in the zone. If the building is one zone for a two-story building, then the value is 2. If you have divided the building into one zone per floor, then the value is 1 and the software determines the number of stories in the building when you correctly identify the “bottom” or floor elevation as, for example, 10.7 for a slab on grade building with first floor ceiling heights of 9 feet (see User Manual, Section 5.4.1.7, p. 5-7).

- 3. Can you explain azimuth and orientation as used in CBECC-Res for walls/windows?**

Azimuth (or actual azimuth) is the numeric representation of the degrees the surface faces. It is calculated based on the “plan” orientation plus the front orientation, which is why you are encouraged to use front, left, back and right whenever possible and enter numeric values only for walls that are at an angle. The value entered is “*relative to the front*” or the plan view. If your front is input as 30 degrees and you input a left wall orientation as 120 rather than “left,” the output will show 210 for the windows and walls facing left (plan orientation 90 + front orientation 30 = 210). A different way of thinking of this to ignore the direction of the building except when entering the front orientation. Consider only the surfaces as they relate to the front, which is represented numerically by 0 and working clock-wise. Also, by using “front,” “left,” etc. you will assist the plan checker and inspector, since the orientation or side of the building is reported on the CF1R in addition to the actual azimuth.

If this concept is new to you, it is explained in Section 7.1, p. 7-1, of the User’s Manual.

- 4. Is there a limit to the length of fields?**

There is no set limit to the length of fields, but the program adds data to the field names to keep track of the parent/child relationships and interactions. So you might want to try limiting names to 25 characters.

FAQS POSTED ON JANUARY 21, 2014

- 1. Why doesn’t WinType work the way I think it should?**

When I tried using the Window Types library by creating windows with just the U-factor and SHGC (so that as soon as my client knew which window company they were going to use I would only need to update the three to four window types rather than each window entry), sometimes my efficiencies are updating and sometimes they are not. Am I doing something wrong?

Here is how to ensure it works consistently: (a) Make sure that the values in the window type library (the very last library on the Envelope screen) have U-factor and SHGC values that are red (retype the number rather than accepting the default), and (b) make sure that the values on the window data screen (the window entry for the dwelling added underneath the wall) are blue. Blue means the values will be updated if you happen to update the window efficiencies.

If you thought there was a connection to the window type library but the values are in red, they are not connected. To change this on an existing file, swipe your cursor across the field, right-click, and pick “Restore Default.”

- 2. Could you explain how CBECC-Res determines default values so I can take advantage of this feature?**

It is a sophisticated system that sets values based on the standard design assumption for the climate zone selected. If you wish to take advantage of this feature, you can swipe the cursor across a field,

such as Solar Heat Gain Coefficient, right-click and select “Restore Default.” The field will change to blue, indicating it may change based on the climate zone.

Alternatively, start with a new file, choose the appropriate climate zone and proceed. Once a file is saved, all fields will become user-defined (red text).

3. Did it get easier to get electric water heating to comply? If so, why?

If natural gas is not available, it is easier to show compliance with electric water heating. A comparison of propane and electricity costs showed electricity was more cost effective than propane.

4. In which zone should I model the walls between the house and the garage?

These walls are modeled in a conditioned zone as an interior wall. Because they have no solar gains, there is no associated orientation, so you may combine the areas and model a single wall. While at least R-13 insulation is required in the wall, there is no stucco or one-coat stucco exterior surface, but both the inside and outside surfaces are gypsum board. If additional surfaces are needed for the garage zone, break up one or more of the walls into two or more parts to make four walls, as well as the slab and ceiling.

5. Am I using the latest CF1R version?

In the footer of the CF1R, I notice different numbers and am concerned about whether I am getting the latest CF1R. For example, one has a 470 and another has a 504. Why is the Report Version number different and what is the latest?

The CF1R template is different depending on the building type. For new construction, the CF1R Report Version (shown in the footer) is 470 (format generally established on 10/25/13). The Report Version for an addition/alteration is 504 (established on 12/10/13). To the right of this field is when the report was generated.

Another important number is in the General Information, fields 07 and 09. As of the time of this FAQ the Software and Compliance Manager versions are 1e. Any approved software will use the same Compliance Manager version and the value is the same regardless of whether running an addition/alteration or new construction.

6. Can I use the EZFrame calculator in conjunction with CBECC-Res? The Residential Manual mentions an EZ-Fame assembly calculator (previously used for metal frame assemblies). Will we be able to use this program in conjunction with CBECC-Res?

There will be no need for EZ-Frame. CBECC-Res calculates assemblies and their performance without the need for any external calculation. The next scheduled improvement to CBECC-Res is to include many more construction types, such as metal framing, mass construction and SIPs.

FAQS POSTED ON DECEMBER 20, 2013

1. Where do I input the documentation author and the Designer/Owner information for the CF1R?

There is no software input for this information. This information will be added once the CF1R is registered with a HERS provider.

2. Why does the sample file go so far out of compliance when I change it to my climate zone?

Because it is based on Climate Zone 12 (a zone with big heating and cooling loads), it may not have the measures that match Package A's features (the standard design) for your climate zone. For example, a whole house fan, verified refrigerant charge and a cool roof may not be appropriate features in some milder climate zones and could result in a negative cooling margin.

3. Will we be able to model other shading devices soon?

Not any time soon. ASHRAE Window Attachment (used in CBECC-Res) does not use SHGCs and only has bug screens. At some future time when rules and programming can be developed, the ability to model advanced systems such as operable exterior shades may be added.

4. Do I really need 6 surfaces in every zone?

Yes. You can add interior surfaces if necessary.

In the future, we'll try to add a more detailed explanation to this FAQ, but for now here's a basic explanation: CBECC-Res uses very advanced modeling algorithms. The program sets up a radiant network without knowing the detailed geometry of every surface and object in the building by using a very clever algorithm that approximates zones as spheres. In order for the algorithm to work mathematically it needs at least 6 surfaces that can be resolved into a box (but there is no box involved in the calculation). There are also several other ways this algorithm can fail mathematically, including if the area of one surface is larger than the total area of all the other surfaces (which also cannot be resolved into a box).

When we started testing CBECC-Res (particularly when we added garages) we kept getting complaints from testers who getting generic crash message and they couldn't see anything wrong. We tried to improve things by the very simplistic 6 surfaces filter, which catches a majority of the problem cases.

FAQS POSTED ON NOVEMBER 20, 2013

1. I'm concerned about the speed of run times in CBECC. Is there a reason we cannot have an option to run CBECC-Res with reduced weather to speed up the processing time?

This could create unexpected consequences and the CEC does not have the staff resources to study any such consequences. As an alternative, CBECC-Res will soon have a "batch processing" function, which will allow users to set up a series of runs to launch without any user requirements between runs. With this option, and a global reduction in analysis run time, users should be able to be productive with their time.

2. Regarding Zonal Control, if I specified the building meets zonal control criteria under the building tab, why is there also a check box on the cooling system screen?

This check box is to enable modeling the exception for zonally controlled systems with a bypass duct to only meet 150 CFM/ton. The 150 CFM/ton (an energy penalty) does not have to be verified by a HERS Rater, however any level higher than 150 CFM/ton for a zoned system and any if you want to include a bypass duct and not meet 350 CFM/ton.

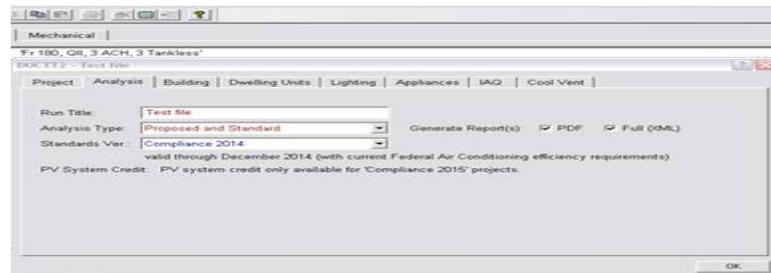
3. What are the watermarks that could potentially appear on the CF1R and how can I get it to change?

A recent change will result in one of two potential watermarks on the PDF of the CF1R. First is for certified software with a valid "signature" (security check), the watermark will read "This Certificate of Compliance is not registered" and second is for submissions using an open source ruleset that

does not provide a certified key (security check) which will read “Not useable for compliance. For example, if the authenticity of the software cannot be verified, or if the PDF was manually generated from the tools menu rather than as a part of the compliance analysis, the second watermark will appear.

4. Is the file needed for uploading a project to HERS generated any time I run an input file? If not, what do I need to do so that I do not have to re-run a job to get this file?

No, the file is not always generated. Once you are ready to move forward with a job (send a draft of the CF1R to the client, for example), you should check the two boxes shown below for the PDF and Full (XML) under the Analysis tab. This will produce a CF1R with the “not registered” watermark and create the file “[filename] - AnalysisResults-BEES.xml” that will be needed to register the program. You will find the file in the projects folder.



5. Can I model more than one garage in a single input file?

No, you can only have one garage zone. Combine the garage areas and surfaces into one garage zone to account for one or more garages.

6. If I'm getting an error with no message, how can I try to figure out the cause?

You can find clues within the file “rules.txt” file found in the Data/Documents/RulesetSource/Rules folder of your CBECC-Res installation. You can find out about all of the error trapping done in the rules by searching for the "PostError" function in the rules.txt file.

Frequently garage surfaces cause errors. There should be six surfaces defined for each zone in order for the airflow network model to accurately model the zone.

FAQS POSTED ON OCTOBER 23, 2013

1. Can I add materials to CBECC-Res?

No.

2. In multi-family, how do I determine the correct number of water heaters to show in my water heating system?

It is the number of water heaters serving the zone to which you're assigning the system. So if there are 4 dwelling units in the first floor zone, each with its own water heater, the system defined should have 4 water heaters.

3. Is 1-coat stucco shown as R-4 sheathing insulation with a 3 coat stucco exterior finish?

No, the exterior finish is set to R4 synthetic stucco to show the combination of insulation and the “paint.” The 3 coat stucco finish is not the appropriate finish for 1-coat stucco.

4. Water heater efficiencies have changed. What is the correct way to enter the various efficiencies?

Enter the values as they appear in the directory. Energy Factor is 0.60, Recovery Efficiency, Thermal Efficiency, and Standby Loss are entered as %, meaning 80.0 Recovery Efficiency, 1.31% standby loss.

5. Can we expect to see a summary of HERS measures on the CF1R?

~~In an attempt to keep the CF1R as brief as possible, since the HERS provider will summarize the measures when a project is uploaded, a summary on the CF1R will not be added. Within appropriate sections you can find the specific HERS measures and any criteria needed to be met.~~

[Updated] Initially, the Energy Commission’s position was that when the project was registered, it would be obvious which features require HERS verification. However, people often use a draft CF1R during early stages of planning and asked for a list in one location. Staff has agreed to include such a list. Expect to see that in the future.

6. Can you explain how the solar credit can be used and how much of a credit we can expect?

The solar credit is limited to a % of the amount of cooling TDV energy savings due to the jump from federal AC SEER/EER requirements in 2014 and the SEER/EER federal requirements starting in 2015. The credit percentages change by climate zone, but do not change with an increase in the size of the PV system. This PV credit was meant to provide an energy credit for builders who would suffer the extra expense of needing to increase the efficiency of AC equipment in 2015, which is why the PV credit is only available with “2015 Compliance”, and only in climate zones where there is a significant cooling load. We pre-calculated the % of cooling TDV that would be due to this change in AC efficiency for each of the climate zones where the PV Credit is available, which is listed below.

Pg. 4 of the 2013 Residential ACM Reference Manual (<http://www.energy.ca.gov/2013publications/CEC-400-2013-003/CEC-400-2013-003-CMF.pdf>) has a table for the PV Credit Calculation Factors:

Table 2-1: PV Credit Calculation Factors
Max PV Cooling Credit

Climate Zone	PV Generation Rate (kTDV/kWdc)	(% of Standard Design Cooling kTDV/ft ²)
09	30269	13%
10	30342	15%
11	29791	18%
12	29556	17%
13	29676	17%
14	31969	16%
15	29536	19%

The PV Credit is calculated as the MINIMUM of the PV Generation rate (in TDV) and the PV Cooling Credit (in TDV, calculated as explained above, as a fixed percent of the cooling energy budget). So what you are experiencing is that the PV cooling credit is the limiting factor, and that larger PV Systems are not necessarily producing larger PV Credits.

FAQS POSTED ON OCTOBER 11, 2013

1. How do I use the field Window Type?

There are two new 1-story sample files that use this field.

It works consistently only when creating new windows. Here's an example of how to use this feature. Add windows to the library with limited features such as U-factor and SHGC. For example, glass block, or typical efficiencies for the brand of windows to be used on the project for single hung, picture windows, sliding glass doors, etc., but leave all the other fields blank. As you're creating windows, specify the window type and it will complete the U-factor and SHGC for you.

It's most useful function is if the window efficiencies need to be changed, you can change the library values and all the windows that point to that name will be updated.

2. Can I get hour-by-hour energy results?

You can produce hourly export files that include all of the energy end uses in normal units along with the TDV factors (note TDV units are TDV/Btu). This capability must be activated by modifying an .ini file. To do this:

- A. Find the CBECC-Res13.ini file in the DATA directory of your program installation (not the one in the top level).
- B. Open this file in a text editor and delete the ";" at the beginning of this line:
"ExportHourlyResults_All=1"
- C. Save the file.
- D. Restart CBECC-Res and run the input file.
- E. Find a file in the PROJECTS directory called "Name - Prop - HourlyResults.csv" where is the input file name. (There is also a Standard Design file if you ran Standard and proposed. And if you run multiple orientations you will get many of these.) The contents are pretty self-explanatory.

3. Will CBECC-Res run on an Apple computer?

No, it will only operate in Windows.

4. Since I am used to seeing Specific Leakage Area (SLA) for blower door testing, can you tell me how to convert 2.8 SLA to a CFM50 for input into the program?

SLA is leakage per square foot of Conditioned Floor Area, so I can't give you the answer without knowing the CFA. The 2008 Residential ACM Manual equation:

Equation R3-16

$$SLA = 3.819 \times \frac{CFM50}{CFA}$$

So $CFM50 = (SLA \times CFA) / 3.819$

However, the input for CBECC-Res is ACH50 (Air Changes at 50 Pa.). With an 8 foot ceiling height $ACH50 = SLA \times 2$ and your 2.8 SLA = 5.6 ACH50.

FAQS POSTED ON SEPTEMBER 25, 2013

1. Where are my input files?

They are in a folder similar to this (set up during installation): C:\My documents\CBECC-Res2013 Projects\

2. Are we supposed to model unconditioned garages?

You do not have to model unconditioned garages, but you will likely find it beneficial and a more accurate representation of the building. No energy requirements apply to the garage.

[Updated 3/18/14] It became too confusing and time-consuming to think of all the ways that might be acceptable to avoid modeling the garage. Since CBECC-Res is a much more accurate modeling program, if the building includes a garage, that garage must be modeled.

3. Is this program ready for building department and HERS provider submittals?

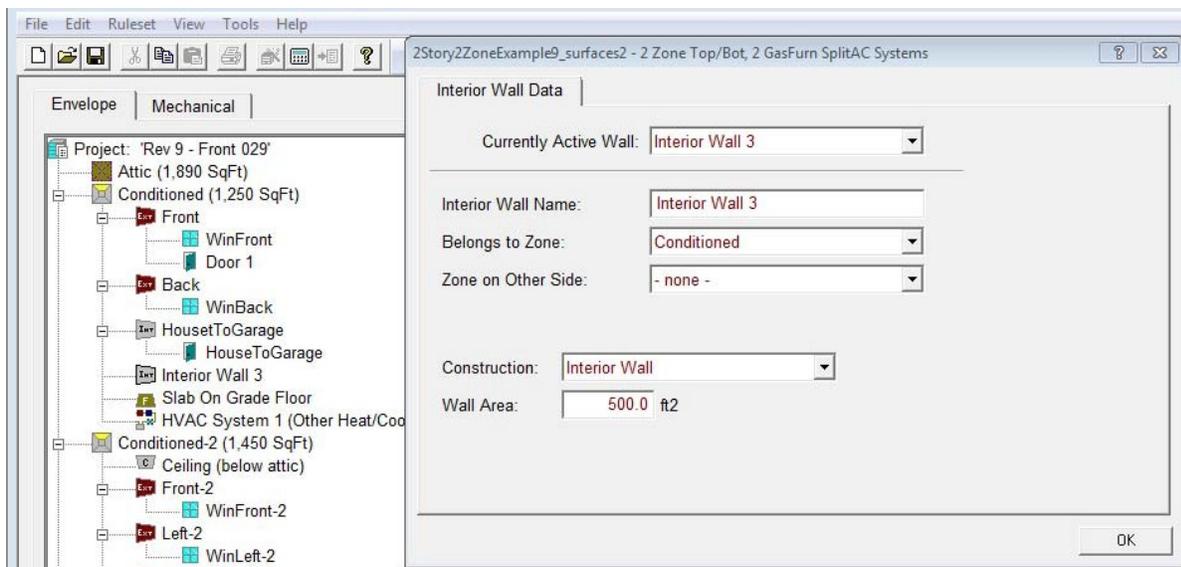
[Updated 5/7/14] Once a HERS Provider is approved and CF1Rs can be registered, then you can use the program for submittals. Another option is the “early adopter program” as explained in Blueprint March-April 2014. ~~No. The program is not ready for HERS provider or building department submittals. It can be used for determining the effect of the 2013 standards on production homes.~~

4. Is using CBECC-Res utilizing the performance approach?

Yes, CBECC-Res is the certified public domain program for demonstrating performance compliance with the 2013 Standards.

5. Can you provide tips for modeling multifamily buildings?

Multi-family row house with units on both sides where those party walls would have been left out under 2008 performance inputs. In the CBECC-Res model all the surfaces, including surfaces (party walls, floors, ceilings) between units. For the time being, if the dwelling unit adjacent to the modeled unit is not being modeled, model the surface as “interior” and specify none for the zone on the other side.



Can I model the whole building as one zone?

FAQs for CBECC-Res

No. You can model each dwelling unit as a zone, or the simplest approach is to model each floor as a zone. Each zone needs to have a separately defined HVAC system.

In MFExample12, the first floor zone consists of 4 dwelling units and is assigned HVAC System 1 and DHW System 1:

The screenshot shows the 'HVAC System Data' configuration window. It has tabs for 'HVAC System Data', 'Heating Equipment', 'Cooling Equipment', and 'Heat Pump Equipment'. The 'Currently Active HVAC System' is 'HVAC System 1'. The 'System Name' is 'HVAC System 1' and the 'System Type' is 'Other Heating and Cooling System'. The 'Area Served' is 3,480 (1 story). Under 'Heating', there is 1 'Unique Heating Unit Types' with 'GasFurn' units, 4 'CntriFurnace' unit(s), AFUE 78.0. Under 'Cooling', there is 1 'Unique Cooling Unit Types' with 'SplitAC' units, 4 'SplitAirCond' unit(s), 13.0 SEER, 11.3 EER, 350.0 CFM/ton. The 'Distribution' is 'Duct' and the 'Fan' is 'Fan1'. A note at the bottom states '(CFI cool vent available only for single family homes with ventilated attics)'.

HVAC

Even if the equipment is identical, each zone must have a separately defined HVAC system. NOTE: if they are identical, once all the details of the system are defined, use the copy and paste functions.

The screenshot shows the 'Zone Data' configuration window. The 'Currently Active Zone' is 'Conditioned'. The 'Name' is 'Conditioned' and the 'Type' is 'Conditioned'. The 'Floor Area' is 3,480.0 ft² and the 'Num of Stories' is 1. The 'Ceiling Height' is 8.0 ft, 'Floor to Floor' is 9.0 ft, 'Bottom' is 0.7 ft, and 'Win Head Height' is 6.7 ft. The 'HVAC System' is 'HVAC System 1', 'DHW System 1' is 'DHW System 1', and 'DHW System 2' is '- none -'.

FAQs for CBECC-Res

If you click on the mechanical tab and look at HVAC system 1, it is made up of 4 central heating and air conditioning units with the same efficiencies and distribution system.

HEAT PUMPS

If the systems are heat pumps first define the individual heat pump, including the capacity at 47 and 17 (from AHRI).

The screenshot shows the 'Heat Pump Data' form. At the top, 'Currently Active Heating System' is set to 'Heat Pump System 1'. The 'Name' field contains 'Heat Pump System 1' and the 'Type' is 'SplitHeatPump - Heating side of central split heat pump'. A tooltip for 'SplitHeatPump' explains it's for heating systems with ducted distribution, with HSPF as the efficiency metric. Performance metrics are split into Heating and Cooling sections. Heating performance includes HSPF (7.700 ratio), Capacity (24,000 Btuh @ 47°F, 19,000 Btuh @ 17°F), and COP (ratio). Cooling performance includes SEER (13.0 (kBtu/h)/kW), EER (11.3 kBtu/h/kW), and CFM per Ton (350 CFM/ton). Other options include AC Charge (Verified), Refrigerant (R410A), and checkboxes for Multi-Speed Compressor and Zonally Controlled.

Then go back up to the HVAC System and change the System Type to Heat Pump and indicate that there are 4 units

The screenshot shows the 'HVAC System Data' form with the 'Heat Pump Equipment' tab selected. 'Currently Active HVAC System' is 'HVAC System 1'. 'System Name' is 'HVAC System 1' and 'System Type' is 'Heat Pump Heating and Cooling System'. 'Area Served' is 3,480 (1 story). Under 'Heat Pump(s)', 1 'Unique Ht Pump Unit Types' is selected, with 'Heat Pump' set to 'Heat Pump System 1' and 'Count' set to 4. Checkboxes for 'Ducted Ht Pump(s)' and 'Autosize Cool Capacity' are checked. A summary line shows '4 'SplitHeatPump' unit(s), HSPF 7.7, Cap@47 96,000 Btuh, 13.0 SEER, 11.3 EER, 350 CFM/ton'. 'Distribution' is set to 'Duct' and 'Fan' is 'Fan1'. A note at the bottom states '(CFI cool vent available only for single family homes with ventilated attics)'.

If the units have different capacities, change the # of unique heat pump types to whatever # is correct, e.g., 2 and select the tab Heat Pump Equipment and enter the information on the screen that looks like

HVAC System Data | Heating Equipment | Cooling Equipment | Heat Pump Equipment

Currently Active HVAC System: HVAC System 1

All heat pump equipment assignments must be of the same Type.

Heat Pump Units	Counts
1: HP Larger	2
2: HP Smaller	2

MORE MULTI-FAMILY MODELING HINTS

Second Floor Zone Information

The HVAC system for the second floor zone is called HVAC System 2 and uses the same DHW System 1 (see below for DHW details).

Pay special attention to the mathematics of ceiling height, floor to floor and bottom value. If they do not add up correctly, the software will not run. Typically, the floor to floor value is the ceiling height plus 1 foot. But do not forget to add the distance from the soil to the surface of floor 1, which for our example is 0.7 for the first floor zone. So the second floor zone, the value for Bottom is 9.7. NOTE: the number of stories is 1 because it is the number of stories in the zone rather than the dwelling unit.

Zone Data

Currently Active Zone: Conditioned-2

Name: Conditioned-2

Type: Conditioned

Floor Area: 3,480.0 ft2 Num of Stories: 1

Ceiling Height: 8.0 ft

Floor to Floor: 9.0 ft HVAC System: HVAC System 2

Bottom: 9.7 ft DHW System 1: DHW System 1

Win Head Height: 6.7 ft DHW System 2: - none -

OK

DHW

The DHW “system” consists of 8 individual water heaters:

The screenshot shows a software interface for configuring a DHW system. It has three tabs: "Water Heating System Data" (selected), "Solar Water Heating Data", and "Recirculation Loops". Below the tabs, there is a dropdown menu for "Currently Active DHW System" set to "DHW System 1". Underneath, there are three more dropdown menus: "System Name" (set to "DHW System 1"), "Distribution Type" (set to "Standard"), and "Multi-Family Hot Water Distribution Type" (set to "- None -"). At the bottom, there is a section for "Water Heater(s)" with two dropdown menus. The first is set to "Water Heater 1" and the second is set to "- none -". To the right of these dropdowns is a "Count" field containing the number "8".

If it had central water heating, the field labeled “Distribution Type” is from the equipment to the dwelling unit and the field labeled “Multi-Family Hot Water Distribution Type” is for the distribution inside the dwelling unit.

Number of Stories

The number of stories in the zone – so it will almost always be 1 in a multi-family building unless multi-story dwelling units are modeled.

Garage

The garage is a special zone that is created when you check "Has attached garage" on the Building tab. There is only one garage in the project just as there is only one attic). If you want to represent a garage attached to each unit you can increase the size of the single garage zone to have the area and all the surfaces of all the garages combined.