

## Summary of Residential ACM Tests (kTDV/ft2)

Comparison Date: 7/21/2017  
 Comparison Author: Ken Nittler  
 Candidate Software: CBECC-Res SVN 916  
 Reference Software: CBECC-Res SVN 916  
 Type of Software: Reference  
 Type of Construction: Both  
 Units for Summary: kTDV/ft2  
 Tolerance: 0.04

| Test | Pass/<br>Fail | Average<br>Proposed<br>kTDV/ft2 | Average<br>Standard<br>kTDV/ft2 | Description   |
|------|---------------|---------------------------------|---------------------------------|---|
| U01  | Pass          | 40.90                           | 40.90                           | Standard Design in All Zones for Prototype S2100ft2             |
| U02  | Pass          | 38.79                           | 38.79                           | Standard Design in All Zones for Prototype S2700ft2             |
| U03  | Pass          | 46.79                           | 46.79                           | Standard Design in All Zones for Prototype S6960ft2             |
| U04  | Pass          | 37.54                           | 40.90                           | Proposed Design in All Zones for Prototype P2100ft2             |
| U05  | Pass          | 35.09                           | 38.79                           | Proposed Design in All Zones for Prototype P2700ft2             |
| U06  | Pass          | 43.06                           | 46.79                           | Proposed Design in All Zones for Prototype P6960ft2             |
| U07  | Pass          | 37.28                           | 41.01                           | Common Measures in Zone 12 for Prototype P2100ft2               |
| U08  | Pass          | 40.93                           | 41.01                           | Water Heating in Zone 12 for Prototype P2100ft2                 |
| U09  | Pass          | 40.90                           | 41.01                           | Multiple Orientation in Zone 12 for Prototype S2100ft2/P2100ft2 |
| U10  | Pass          | 58.78                           | 59.85                           | Multi Family Water Heating in Zone 12 for Prototype P6960ft2    |
| U11  | Pass          | 47.30                           | 50.03                           | Source Energy in Zone 12 for Prototype P2100ft2                 |
| U12  | Pass          | 178.09                          | 181.45                          | E+A+A Base & Windows in Zone 12 for Prototype P1665ft2          |
| U13  | Pass          | 132.82                          | 166.49                          | E+A+A Walls & HVAC in Zone 12 for Prototype P1665ft2            |

# Comparison between Reference & Candidate Software (kTDV/ft2)

Comparison Date: 7/21/2017  
 Comparison Author: Ken Nittler  
 Candidate Software: CBECC-Res SVN 916

| Test  | Run | Description | Pass/Fail | Reference | Candidate | Percent    | Within    | Standard | Reference | Candidate | Percent    | Within    | Standard                          | Margin                  |  |
|---|-----|-------------|-----------|-----------|-----------|------------|-----------|----------|-----------|-----------|------------|-----------|-----------------------------------|-------------------------|--|
|   |     |             |           | Proposed  | Proposed  | Difference | Tolerance | Equals   | Standard  | Standard  | Difference | Tolerance | Looks Up                          |                         |  |
| Standard Design in All Zones for Prototype S2100ft2 |     |             |           |           |           |            |           |          |           |           |            |           | Standard = Proposed for this test |                         |  |
| U01   | R01 | Zone 01     | Pass      | 44.68     | 44.68     | 0.00%      | Yes       | 44.68    | 44.68     | 44.68     | 0.00%      | Yes       | U01R01                            | 0.00                    |  |
| U01   | R02 | Zone 02     | Pass      | 33.99     | 33.99     | 0.00%      | Yes       | 33.99    | 33.99     | 33.99     | 0.00%      | Yes       | U01R02                            | 0.00                    |  |
| U01   | R03 | Zone 03     | Pass      | 24.78     | 24.78     | 0.00%      | Yes       | 24.78    | 24.78     | 24.78     | 0.00%      | Yes       | U01R03                            | 0.00                    |  |
| U01   | R04 | Zone 04     | Pass      | 28.07     | 28.07     | 0.00%      | Yes       | 28.07    | 28.07     | 28.07     | 0.00%      | Yes       | U01R04                            | 0.00                    |  |
| U01   | R05 | Zone 05     | Pass      | 22.40     | 22.40     | 0.00%      | Yes       | 22.40    | 22.40     | 22.40     | 0.00%      | Yes       | U01R05                            | 0.00                    |  |
| U01   | R06 | Zone 06     | Pass      | 19.18     | 19.18     | 0.00%      | Yes       | 19.18    | 19.18     | 19.18     | 0.00%      | Yes       | U01R06                            | 0.00                    |  |
| U01   | R07 | Zone 07     | Pass      | 12.24     | 12.24     | 0.00%      | Yes       | 12.24    | 12.24     | 12.24     | 0.00%      | Yes       | U01R07                            | 0.00                    |  |
| U01   | R08 | Zone 08     | Pass      | 19.40     | 19.40     | 0.00%      | Yes       | 19.40    | 19.40     | 19.40     | 0.00%      | Yes       | U01R08                            | 0.00                    |  |
| U01   | R09 | Zone 09     | Pass      | 32.18     | 32.18     | 0.00%      | Yes       | 32.18    | 32.18     | 32.18     | 0.00%      | Yes       | U01R09                            | 0.00                    |  |
| U01   | R10 | Zone 10     | Pass      | 32.55     | 32.55     | 0.00%      | Yes       | 32.55    | 32.55     | 32.55     | 0.00%      | Yes       | U01R10                            | 0.00                    |  |
| U01   | R11 | Zone 11     | Pass      | 63.84     | 63.84     | 0.00%      | Yes       | 63.84    | 63.84     | 63.84     | 0.00%      | Yes       | U01R11                            | 0.00                    |  |
| U01   | R12 | Zone 12     | Pass      | 41.01     | 41.01     | 0.00%      | Yes       | 41.01    | 41.01     | 41.01     | 0.00%      | Yes       | U01R12                            | 0.00                    |  |
| U01   | R13 | Zone 13     | Pass      | 65.16     | 65.16     | 0.00%      | Yes       | 65.16    | 65.16     | 65.16     | 0.00%      | Yes       | U01R13                            | 0.00                    |  |
| U01   | R14 | Zone 14     | Pass      | 61.08     | 61.08     | 0.00%      | Yes       | 61.08    | 61.08     | 61.08     | 0.00%      | Yes       | U01R14                            | 0.00                    |  |
| U01   | R15 | Zone 15     | Pass      | 96.23     | 96.23     | 0.00%      | Yes       | 96.23    | 96.23     | 96.23     | 0.00%      | Yes       | U01R15                            | 0.00                    |  |
| U01   | R16 | Zone 16     | Pass      | 57.53     | 57.53     | 0.00%      | Yes       | 57.53    | 57.53     | 57.53     | 0.00%      | Yes       | U01R16                            | 0.00                    |  |
| Result U01  |     |             | Pass      | 40.90     | 40.90     | 0.00%      |           | 40.90    | 40.90     | 40.90     | 0.00%      |           | Min<br>Ave<br>Max                 | 0.00%<br>0.00%<br>0.00% |  |
| Standard Design in All Zones for Prototype S2700ft2 |     |             |           |           |           |            |           |          |           |           |            |           | Standard = Proposed for this test |                         |  |
| U02   | R01 | Zone 01     | Pass      | 35.21     | 35.21     | 0.00%      | Yes       | 35.21    | 35.21     | 35.21     | 0.00%      | Yes       | U02R01                            | 0.00                    |  |
| U02   | R02 | Zone 02     | Pass      | 30.64     | 30.64     | 0.00%      | Yes       | 30.64    | 30.64     | 30.64     | 0.00%      | Yes       | U02R02                            | 0.00                    |  |
| U02   | R03 | Zone 03     | Pass      | 20.21     | 20.21     | 0.00%      | Yes       | 20.21    | 20.21     | 20.21     | 0.00%      | Yes       | U02R03                            | 0.00                    |  |
| U02   | R04 | Zone 04     | Pass      | 26.16     | 26.16     | 0.00%      | Yes       | 26.16    | 26.16     | 26.16     | 0.00%      | Yes       | U02R04                            | 0.00                    |  |
| U02   | R05 | Zone 05     | Pass      | 17.79     | 17.79     | 0.00%      | Yes       | 17.79    | 17.79     | 17.79     | 0.00%      | Yes       | U02R05                            | 0.00                    |  |
| U02   | R06 | Zone 06     | Pass      | 18.06     | 18.06     | 0.00%      | Yes       | 18.06    | 18.06     | 18.06     | 0.00%      | Yes       | U02R06                            | 0.00                    |  |
| U02   | R07 | Zone 07     | Pass      | 11.07     | 11.07     | 0.00%      | Yes       | 11.07    | 11.07     | 11.07     | 0.00%      | Yes       | U02R07                            | 0.00                    |  |
| U02   | R08 | Zone 08     | Pass      | 20.01     | 20.01     | 0.00%      | Yes       | 20.01    | 20.01     | 20.01     | 0.00%      | Yes       | U02R08                            | 0.00                    |  |
| U02   | R09 | Zone 09     | Pass      | 32.59     | 32.59     | 0.00%      | Yes       | 32.59    | 32.59     | 32.59     | 0.00%      | Yes       | U02R09                            | 0.00                    |  |
| U02   | R10 | Zone 10     | Pass      | 33.47     | 33.47     | 0.00%      | Yes       | 33.47    | 33.47     | 33.47     | 0.00%      | Yes       | U02R10                            | 0.00                    |  |
| U02   | R11 | Zone 11     | Pass      | 63.20     | 63.20     | 0.00%      | Yes       | 63.20    | 63.20     | 63.20     | 0.00%      | Yes       | U02R11                            | 0.00                    |  |
| U02   | R12 | Zone 12     | Pass      | 42.19     | 42.19     | 0.00%      | Yes       | 42.19    | 42.19     | 42.19     | 0.00%      | Yes       | U02R12                            | 0.00                    |  |
| U02   | R13 | Zone 13     | Pass      | 64.46     | 64.46     | 0.00%      | Yes       | 64.46    | 64.46     | 64.46     | 0.00%      | Yes       | U02R13                            | 0.00                    |  |
| U02   | R14 | Zone 14     | Pass      | 60.55     | 60.55     | 0.00%      | Yes       | 60.55    | 60.55     | 60.55     | 0.00%      | Yes       | U02R14                            | 0.00                    |  |
| U02   | R15 | Zone 15     | Pass      | 90.57     | 90.57     | 0.00%      | Yes       | 90.57    | 90.57     | 90.57     | 0.00%      | Yes       | U02R15                            | 0.00                    |  |
| U02   | R16 | Zone 16     | Pass      | 54.48     | 54.48     | 0.00%      | Yes       | 54.48    | 54.48     | 54.48     | 0.00%      | Yes       | U02R16                            | 0.00                    |  |
| Result U02  |     |             | Pass      | 38.79     | 38.79     | 0.00%      |           | 38.79    | 38.79     | 38.79     | 0.00%      |           | Min<br>Ave<br>Max                 | 0.00%<br>0.00%<br>0.00% |  |

# Comparison between Reference & Candidate Software (kTDV/ft2)

Comparison Date: 7/21/2017  
 Comparison Author: Ken Nittler  
 Candidate Software: CBECC-Res SVN 916

| Test       | Run   | Description | Pass/Fail | Reference Proposed | Candidate Proposed | Percent Difference | Within Tolerance | Standard Equals                       | Reference Standard | Candidate Standard | Percent Difference | Within Tolerance | Standard Equals Lookup | Margin         |
|------------|---|-------------|-----------|--------------------|--------------------|--------------------|------------------|---------------------------------------|--------------------|--------------------|--------------------|------------------|------------------------|----------------|
|            |   |             |           |                    |                    |                    |                  | Standard = Proposed for this test     |                    |                    |                    |                  |                        |                |
| U03        | Standard Design in All Zones for Prototype S6960ft2 |             |           |                    |                    |                    |                  |                                       |                    |                    |                    |                  |                        |                |
| U03        | R01   | Zone 01     | Pass      | 34.73              | 34.73              | 0.00%              | Yes              | 34.73                                 | 34.73              | 34.73              | 0.00%              | Yes              | U03R01                 | 0.00           |
| U03        | R02   | Zone 02     | Pass      | 36.27              | 36.27              | 0.00%              | Yes              | 36.27                                 | 36.27              | 36.27              | 0.00%              | Yes              | U03R02                 | 0.00           |
| U03        | R03   | Zone 03     | Pass      | 25.14              | 25.14              | 0.00%              | Yes              | 25.14                                 | 25.14              | 25.14              | 0.00%              | Yes              | U03R03                 | 0.00           |
| U03        | R04   | Zone 04     | Pass      | 33.52              | 33.52              | 0.00%              | Yes              | 33.52                                 | 33.52              | 33.52              | 0.00%              | Yes              | U03R04                 | 0.00           |
| U03        | R05   | Zone 05     | Pass      | 24.13              | 24.13              | 0.00%              | Yes              | 24.13                                 | 24.13              | 24.13              | 0.00%              | Yes              | U03R05                 | 0.00           |
| U03        | R06   | Zone 06     | Pass      | 26.15              | 26.15              | 0.00%              | Yes              | 26.15                                 | 26.15              | 26.15              | 0.00%              | Yes              | U03R06                 | 0.00           |
| U03        | R07   | Zone 07     | Pass      | 23.37              | 23.37              | 0.00%              | Yes              | 23.37                                 | 23.37              | 23.37              | 0.00%              | Yes              | U03R07                 | 0.00           |
| U03        | R08   | Zone 08     | Pass      | 34.31              | 34.31              | 0.00%              | Yes              | 34.31                                 | 34.31              | 34.31              | 0.00%              | Yes              | U03R08                 | 0.00           |
| U03        | R09   | Zone 09     | Pass      | 44.63              | 44.63              | 0.00%              | Yes              | 44.63                                 | 44.63              | 44.63              | 0.00%              | Yes              | U03R09                 | 0.00           |
| U03        | R10   | Zone 10     | Pass      | 45.22              | 45.22              | 0.00%              | Yes              | 45.22                                 | 45.22              | 45.22              | 0.00%              | Yes              | U03R10                 | 0.00           |
| U03        | R11   | Zone 11     | Pass      | 70.21              | 70.21              | 0.00%              | Yes              | 70.21                                 | 70.21              | 70.21              | 0.00%              | Yes              | U03R11                 | 0.00           |
| U03        | R12   | Zone 12     | Pass      | 54.37              | 54.37              | 0.00%              | Yes              | 54.37                                 | 54.37              | 54.37              | 0.00%              | Yes              | U03R12                 | 0.00           |
| U03        | R13   | Zone 13     | Pass      | 71.77              | 71.77              | 0.00%              | Yes              | 71.77                                 | 71.77              | 71.77              | 0.00%              | Yes              | U03R13                 | 0.00           |
| U03        | R14   | Zone 14     | Pass      | 66.50              | 66.50              | 0.00%              | Yes              | 66.50                                 | 66.50              | 66.50              | 0.00%              | Yes              | U03R14                 | 0.00           |
| U03        | R15   | Zone 15     | Pass      | 102.02             | 102.02             | 0.00%              | Yes              | 102.02                                | 102.02             | 102.02             | 0.00%              | Yes              | U03R15                 | 0.00           |
| U03        | R16   | Zone 16     | Pass      | 56.23              | 56.23              | 0.00%              | Yes              | 56.23                                 | 56.23              | 56.23              | 0.00%              | Yes              | U03R16                 | 0.00           |
| Result U03 |   |             |           | Pass               | 46.79              | 46.79              | 0.00%            | 46.79                                 | 46.79              | 46.79              | 0.00%              | Ave              | Min<br>Max             | 0.00%<br>0.00% |
|            |   |             |           |                    |                    |                    |                  | Standard = T01 Standard for this test |                    |                    |                    |                  |                        |                |
| U04        | Proposed Design in All Zones for Prototype P2100ft2 |             |           |                    |                    |                    |                  |                                       |                    |                    |                    |                  |                        |                |
| U04        | R01   | Zone 01     | Pass      | 43.35              | 43.35              | 0.00%              | Yes              | 44.68                                 | 44.68              | 44.68              | 0.00%              | Yes              | U01R01                 | 1.33           |
| U04        | R02   | Zone 02     | Pass      | 32.50              | 32.50              | 0.00%              | Yes              | 33.99                                 | 33.99              | 33.99              | 0.00%              | Yes              | U01R02                 | 1.49           |
| U04        | R03   | Zone 03     | Pass      | 22.82              | 22.82              | 0.00%              | Yes              | 24.78                                 | 24.78              | 24.78              | 0.00%              | Yes              | U01R03                 | 1.96           |
| U04        | R04   | Zone 04     | Pass      | 25.42              | 25.42              | 0.00%              | Yes              | 28.07                                 | 28.07              | 28.07              | 0.00%              | Yes              | U01R04                 | 2.65           |
| U04        | R05   | Zone 05     | Pass      | 20.33              | 20.33              | 0.00%              | Yes              | 22.40                                 | 22.40              | 22.40              | 0.00%              | Yes              | U01R05                 | 2.07           |
| U04        | R06   | Zone 06     | Pass      | 17.54              | 17.54              | 0.00%              | Yes              | 19.18                                 | 19.18              | 19.18              | 0.00%              | Yes              | U01R06                 | 1.64           |
| U04        | R07   | Zone 07     | Pass      | 11.43              | 11.43              | 0.00%              | Yes              | 12.24                                 | 12.24              | 12.24              | 0.00%              | Yes              | U01R07                 | 0.81           |
| U04        | R08   | Zone 08     | Pass      | 17.35              | 17.35              | 0.00%              | Yes              | 19.40                                 | 19.40              | 19.40              | 0.00%              | Yes              | U01R08                 | 2.05           |
| U04        | R09   | Zone 09     | Pass      | 28.15              | 28.15              | 0.00%              | Yes              | 32.18                                 | 32.18              | 32.18              | 0.00%              | Yes              | U01R09                 | 4.03           |
| U04        | R10   | Zone 10     | Pass      | 28.81              | 28.81              | 0.00%              | Yes              | 32.55                                 | 32.55              | 32.55              | 0.00%              | Yes              | U01R10                 | 3.74           |
| U04        | R11   | Zone 11     | Pass      | 58.31              | 58.31              | 0.00%              | Yes              | 63.84                                 | 63.84              | 63.84              | 0.00%              | Yes              | U01R11                 | 5.53           |
| U04        | R12   | Zone 12     | Pass      | 36.96              | 36.96              | 0.00%              | Yes              | 41.01                                 | 41.01              | 41.01              | 0.00%              | Yes              | U01R12                 | 4.05           |
| U04        | R13   | Zone 13     | Pass      | 59.46              | 59.46              | 0.00%              | Yes              | 65.16                                 | 65.16              | 65.16              | 0.00%              | Yes              | U01R13                 | 5.70           |
| U04        | R14   | Zone 14     | Pass      | 54.23              | 54.23              | 0.00%              | Yes              | 61.08                                 | 61.08              | 61.08              | 0.00%              | Yes              | U01R14                 | 6.85           |
| U04        | R15   | Zone 15     | Pass      | 89.53              | 89.53              | 0.00%              | Yes              | 96.23                                 | 96.23              | 96.23              | 0.00%              | Yes              | U01R15                 | 6.70           |
| U04        | R16   | Zone 16     | Pass      | 54.39              | 54.39              | 0.00%              | Yes              | 57.53                                 | 57.53              | 57.53              | 0.00%              | Yes              | U01R16                 | 3.14           |
| Result U04 |   |             |           | Pass               | 37.54              | 37.54              | 0.00%            | 40.90                                 | 40.90              | 40.90              | 0.00%              | Ave              | Min<br>Max             | 0.00%<br>0.00% |

# Comparison between Reference & Candidate Software (kTDV/ft2)

Comparison Date: 7/21/2017  
 Comparison Author: Ken Nittler  
 Candidate Software: CBECC-Res SVN 916

| Test       | Run   | Description | Pass/Fail | Reference Proposed | Candidate Proposed | Percent Difference | Within Tolerance | Standard Equals                       | Reference Standard | Candidate Standard | Percent Difference | Within Tolerance | Standard Equals Lookup | Margin |
|------------|---|-------------|-----------|--------------------|--------------------|--------------------|------------------|---------------------------------------|--------------------|--------------------|--------------------|------------------|------------------------|--------|
|            |   |             |           |                    |                    |                    |                  | Standard = T02 Standard for this test |                    |                    |                    |                  |                        |        |
| U05        | Proposed Design in All Zones for Prototype P2700ft2 |             |           |                    |                    |                    |                  |                                       |                    |                    |                    |                  |                        |        |
| U05        | R01   | Zone 01     | Pass      | 33.68              | 33.68              | 0.00%              | Yes              | 35.21                                 | 35.21              | 35.21              | 0.00%              | Yes              | U02R01                 | 1.53   |
| U05        | R02   | Zone 02     | Pass      | 28.31              | 28.31              | 0.00%              | Yes              | 30.64                                 | 30.64              | 30.64              | 0.00%              | Yes              | U02R02                 | 2.33   |
| U05        | R03   | Zone 03     | Pass      | 18.21              | 18.21              | 0.00%              | Yes              | 20.21                                 | 20.21              | 20.21              | 0.00%              | Yes              | U02R03                 | 2.00   |
| U05        | R04   | Zone 04     | Pass      | 23.89              | 23.89              | 0.00%              | Yes              | 26.16                                 | 26.16              | 26.16              | 0.00%              | Yes              | U02R04                 | 2.27   |
| U05        | R05   | Zone 05     | Pass      | 15.80              | 15.80              | 0.00%              | Yes              | 17.79                                 | 17.79              | 17.79              | 0.00%              | Yes              | U02R05                 | 1.99   |
| U05        | R06   | Zone 06     | Pass      | 16.33              | 16.33              | 0.00%              | Yes              | 18.06                                 | 18.06              | 18.06              | 0.00%              | Yes              | U02R06                 | 1.73   |
| U05        | R07   | Zone 07     | Pass      | 10.30              | 10.30              | 0.00%              | Yes              | 11.07                                 | 11.07              | 11.07              | 0.00%              | Yes              | U02R07                 | 0.77   |
| U05        | R08   | Zone 08     | Pass      | 17.75              | 17.75              | 0.00%              | Yes              | 20.01                                 | 20.01              | 20.01              | 0.00%              | Yes              | U02R08                 | 2.26   |
| U05        | R09   | Zone 09     | Pass      | 28.67              | 28.67              | 0.00%              | Yes              | 32.59                                 | 32.59              | 32.59              | 0.00%              | Yes              | U02R09                 | 3.92   |
| U05        | R10   | Zone 10     | Pass      | 29.31              | 29.31              | 0.00%              | Yes              | 33.47                                 | 33.47              | 33.47              | 0.00%              | Yes              | U02R10                 | 4.16   |
| U05        | R11   | Zone 11     | Pass      | 56.88              | 56.88              | 0.00%              | Yes              | 63.20                                 | 63.20              | 63.20              | 0.00%              | Yes              | U02R11                 | 6.32   |
| U05        | R12   | Zone 12     | Pass      | 37.31              | 37.31              | 0.00%              | Yes              | 42.19                                 | 42.19              | 42.19              | 0.00%              | Yes              | U02R12                 | 4.88   |
| U05        | R13   | Zone 13     | Pass      | 58.07              | 58.07              | 0.00%              | Yes              | 64.46                                 | 64.46              | 64.46              | 0.00%              | Yes              | U02R13                 | 6.39   |
| U05        | R14   | Zone 14     | Pass      | 53.15              | 53.15              | 0.00%              | Yes              | 60.55                                 | 60.55              | 60.55              | 0.00%              | Yes              | U02R14                 | 7.40   |
| U05        | R15   | Zone 15     | Pass      | 83.46              | 83.46              | 0.00%              | Yes              | 90.57                                 | 90.57              | 90.57              | 0.00%              | Yes              | U02R15                 | 7.11   |
| U05        | R16   | Zone 16     | Pass      | 50.33              | 50.33              | 0.00%              | Yes              | 54.48                                 | 54.48              | 54.48              | 0.00%              | Yes              | U02R16                 | 4.15   |
| Result U05 |   |             | Pass      | 35.09              | 35.09              | 0.00%              |                  | 38.79                                 | 38.79              | 38.79              | 0.00%              | Ave              | Min<br>Max<br>0.00%    | 3.70   |
|            |   |             |           |                    |                    |                    |                  | Standard = T03 Standard for this test |                    |                    |                    |                  |                        |        |
| U06        | Proposed Design in All Zones for Prototype P6960ft2 |             |           |                    |                    |                    |                  |                                       |                    |                    |                    |                  |                        |        |
| U06        | R01   | Zone 01     | Pass      | 35.28              | 35.28              | 0.00%              | Yes              | 34.73                                 | 34.73              | 34.73              | 0.00%              | Yes              | U03R01                 | -0.55  |
| U06        | R02   | Zone 02     | Pass      | 33.98              | 33.98              | 0.00%              | Yes              | 36.27                                 | 36.27              | 36.27              | 0.00%              | Yes              | U03R02                 | 2.29   |
| U06        | R03   | Zone 03     | Pass      | 24.05              | 24.05              | 0.00%              | Yes              | 25.14                                 | 25.14              | 25.14              | 0.00%              | Yes              | U03R03                 | 1.09   |
| U06        | R04   | Zone 04     | Pass      | 30.26              | 30.26              | 0.00%              | Yes              | 33.52                                 | 33.52              | 33.52              | 0.00%              | Yes              | U03R04                 | 3.26   |
| U06        | R05   | Zone 05     | Pass      | 22.99              | 22.99              | 0.00%              | Yes              | 24.13                                 | 24.13              | 24.13              | 0.00%              | Yes              | U03R05                 | 1.14   |
| U06        | R06   | Zone 06     | Pass      | 24.18              | 24.18              | 0.00%              | Yes              | 26.15                                 | 26.15              | 26.15              | 0.00%              | Yes              | U03R06                 | 1.97   |
| U06        | R07   | Zone 07     | Pass      | 21.02              | 21.02              | 0.00%              | Yes              | 23.37                                 | 23.37              | 23.37              | 0.00%              | Yes              | U03R07                 | 2.35   |
| U06        | R08   | Zone 08     | Pass      | 31.21              | 31.21              | 0.00%              | Yes              | 34.31                                 | 34.31              | 34.31              | 0.00%              | Yes              | U03R08                 | 3.10   |
| U06        | R09   | Zone 09     | Pass      | 39.73              | 39.73              | 0.00%              | Yes              | 44.63                                 | 44.63              | 44.63              | 0.00%              | Yes              | U03R09                 | 4.90   |
| U06        | R10   | Zone 10     | Pass      | 40.49              | 40.49              | 0.00%              | Yes              | 45.22                                 | 45.22              | 45.22              | 0.00%              | Yes              | U03R10                 | 4.73   |
| U06        | R11   | Zone 11     | Pass      | 64.39              | 64.39              | 0.00%              | Yes              | 70.21                                 | 70.21              | 70.21              | 0.00%              | Yes              | U03R11                 | 5.82   |
| U06        | R12   | Zone 12     | Pass      | 48.94              | 48.94              | 0.00%              | Yes              | 54.37                                 | 54.37              | 54.37              | 0.00%              | Yes              | U03R12                 | 5.43   |
| U06        | R13   | Zone 13     | Pass      | 65.20              | 65.20              | 0.00%              | Yes              | 71.77                                 | 71.77              | 71.77              | 0.00%              | Yes              | U03R13                 | 6.57   |
| U06        | R14   | Zone 14     | Pass      | 60.26              | 60.26              | 0.00%              | Yes              | 66.50                                 | 66.50              | 66.50              | 0.00%              | Yes              | U03R14                 | 6.24   |
| U06        | R15   | Zone 15     | Pass      | 93.70              | 93.70              | 0.00%              | Yes              | 102.02                                | 102.02             | 102.02             | 0.00%              | Yes              | U03R15                 | 8.32   |
| U06        | R16   | Zone 16     | Pass      | 53.24              | 53.24              | 0.00%              | Yes              | 56.23                                 | 56.23              | 56.23              | 0.00%              | Yes              | U03R16                 | 2.99   |
| Result U06 |   |             | Pass      | 43.06              | 43.06              | 0.00%              |                  | 46.79                                 | 46.79              | 46.79              | 0.00%              | Ave              | Min<br>Max<br>0.00%    | 3.73   |

# Comparison between Reference & Candidate Software (kTDV/ft2)

Comparison Date: 7/21/2017  
 Comparison Author: Ken Nittler  
 Candidate Software: CBECC-Res SVN 916

| Test       | Run   | Description  | Pass/Fail | Reference Proposed | Candidate Proposed | Percent Difference | Within Tolerance | Standard Equals                       | Reference Standard | Candidate Standard | Percent Difference | Within Tolerance | Standard Equals Lookup        | Margin |
|------------|---|--|-----------|--------------------|--------------------|--------------------|------------------|---------------------------------------|--------------------|--------------------|--------------------|------------------|-------------------------------|--------|
|            |   |  |           |                    |                    |                    |                  | Standard = T01 Standard for this test |                    |                    |                    |                  |                               |        |
| U07        | Common Measures in Zone 12 for Prototype P2100ft2               |  |           |                    |                    |                    |                  |                                       |                    |                    |                    |                  |                               |        |
| U07        | R01   | Package  | Pass      | 36.96              | 36.96              | 0.00%              | Yes              | 41.01                                 | 41.01              | 41.01              | 0.00%              | Yes              | U01R12                        | 4.05   |
| U07        | R02   | Fenestration U 0.40/S 0.40                         | Pass      | 42.44              | 42.44              | 0.00%              | Yes              | 41.01                                 | 41.01              | 41.01              | 0.00%              | Yes              | U01R12                        | -1.43  |
| U07        | R03   | Wall R13/Roof Deck Above R6                        | Pass      | 35.77              | 35.77              | 0.00%              | Yes              | 41.01                                 | 41.01              | 41.01              | 0.00%              | Yes              | U01R12                        | 5.24   |
| U07        | R04   | Ceiling R49 /Roof Deck Below R0/Radiant Barrier    | Pass      | 41.21              | 41.21              | 0.00%              | Yes              | 41.01                                 | 41.01              | 41.01              | 0.00%              | Yes              | U01R12                        | -0.20  |
| U07        | R05   | Furnace AFUE 92                                    | Pass      | 34.58              | 34.58              | 0.00%              | Yes              | 41.01                                 | 41.01              | 41.01              | 0.00%              | Yes              | U01R12                        | 6.43   |
| U07        | R06   | Air Conditioner SEER 16/EER 14                     | Pass      | 35.97              | 35.97              | 0.00%              | Yes              | 41.01                                 | 41.01              | 41.01              | 0.00%              | Yes              | U01R12                        | 5.04   |
| U07        | R07   | No Cool Vent                                       | Pass      | 41.38              | 41.38              | 0.00%              | Yes              | 41.01                                 | 41.01              | 41.01              | 0.00%              | Yes              | U01R12                        | -0.37  |
| U07        | R08   | Ducts 2% Leakage                                   | Pass      | 36.39              | 36.39              | 0.00%              | Yes              | 41.01                                 | 41.01              | 41.01              | 0.00%              | Yes              | U01R12                        | 4.62   |
| U07        | R09   | Insulation Construction Quality Improved           | Pass      | 32.63              | 32.63              | 0.00%              | Yes              | 41.01                                 | 41.01              | 41.01              | 0.00%              | Yes              | U01R12                        | 8.38   |
| U07        | R10   | Air Leakage ACH50 2.0                              | Pass      | 35.45              | 35.45              | 0.00%              | Yes              | 41.01                                 | 41.01              | 41.01              | 0.00%              | Yes              | U01R12                        | 5.56   |
| Result U07 |   |  | Pass      | 37.28              | 37.28              | 0.00%              |                  | 41.01                                 | 41.01              | 41.01              | 0.00%              |                  | Min 0.00%<br>Ave<br>Max 0.00% | 3.73   |
|            |   |  |           |                    |                    |                    |                  | Standard = T01 Standard for this test |                    |                    |                    |                  |                               |        |
| U08        | Water Heating in Zone 12 for Prototype P2100ft2                 |  |           |                    |                    |                    |                  |                                       |                    |                    |                    |                  |                               |        |
| U08        | R01   | Package  | Pass      | 36.96              | 36.96              | 0.00%              | Yes              | 41.01                                 | 41.01              | 41.01              | 0.00%              | Yes              | U01R12                        | 4.05   |
| U08        | R02   | Parallel Piping                                    | Pass      | 37.07              | 37.07              | 0.00%              | Yes              | 41.01                                 | 41.01              | 41.01              | 0.00%              | Yes              | U01R12                        | 3.94   |
| U08        | R03   | Small Tankless EF 0.80/Input 195000/0 gal          | Pass      | 37.17              | 37.17              | 0.00%              | Yes              | 41.01                                 | 41.01              | 41.01              | 0.00%              | Yes              | U01R12                        | 3.84   |
| U08        | R04   | Large Tankless RE 0.76/Input 300000/0 gal          | Pass      | 37.64              | 37.64              | 0.00%              | Yes              | 41.01                                 | 41.01              | 41.01              | 0.00%              | Yes              | U01R12                        | 3.37   |
| U08        | R05   | Large Storage RE 0.77/Input 100000/75gal/Stby 0.01 | Pass      | 39.77              | 39.77              | 0.00%              | Yes              | 41.01                                 | 41.01              | 41.01              | 0.00%              | Yes              | U01R12                        | 1.24   |
| U08        | R06   | Large Storage RE 0.77/Input 100000/75gal/Stby 0.03 | Pass      | 45.73              | 45.73              | 0.00%              | Yes              | 41.01                                 | 41.01              | 41.01              | 0.00%              | Yes              | U01R12                        | -4.72  |
| U08        | R07   | Electric Resistance EF 0.92/Input 4500             | Pass      | 57.68              | 57.68              | 0.00%              | Yes              | 41.01                                 | 41.01              | 41.01              | 0.00%              | Yes              | U01R12                        | -16.67 |
| U08        | R08   | Heat Pump EF 2.4/Input 4500                        | Pass      | 43.33              | 43.33              | 0.00%              | Yes              | 41.01                                 | 41.01              | 41.01              | 0.00%              | Yes              | U01R12                        | -2.32  |
| U08        | R09   | 2 Water Heaters using Multiplier                   | Pass      | 36.96              | 36.96              | 0.00%              | Yes              | 41.01                                 | 41.01              | 41.01              | 0.00%              | Yes              | U01R12                        | 4.05   |
| U08        | R10   | 2 Water Heaters Using 2 entries                    | Pass      | 36.96              | 36.96              | 0.00%              | Yes              | 41.01                                 | 41.01              | 41.01              | 0.00%              | Yes              | U01R12                        | 4.05   |
| Result U08 |   |  | Pass      | 40.93              | 40.93              | 0.00%              |                  | 41.01                                 | 41.01              | 41.01              | 0.00%              |                  | Min 0.00%<br>Ave<br>Max 0.00% | 0.08   |
|            |   |  |           |                    |                    |                    |                  | Standard = T01 Standard for this test |                    |                    |                    |                  |                               |        |
| U09        | Multiple Orientation in Zone 12 for Prototype S2100ft2/P2100ft2 |  |           |                    |                    |                    |                  |                                       |                    |                    |                    |                  |                               |        |
| U09        | R01   | Single Standard Front 45                           | Pass      | 42.20              | 42.20              | 0.00%              | Yes              | 41.01                                 | 41.01              | 41.01              | 0.00%              | Yes              | U01R12                        | -1.19  |
| U09        | R02   | East Standard                                      | Pass      | 41.01              | 41.01              | 0.00%              | Yes              | 41.01                                 | 41.01              | 41.01              | 0.00%              | Yes              | U01R12                        | 0.00   |
| U09        | R03   | South Standard                                     | Pass      | 41.01              | 41.01              | 0.00%              | Yes              | 41.01                                 | 41.01              | 41.01              | 0.00%              | Yes              | U01R12                        | 0.00   |
| U09        | R04   | West Standard                                      | Pass      | 41.01              | 41.01              | 0.00%              | Yes              | 41.01                                 | 41.01              | 41.01              | 0.00%              | Yes              | U01R12                        | 0.00   |
| U09        | R05   | North Standard                                     | Pass      | 41.01              | 41.01              | 0.00%              | Yes              | 41.01                                 | 41.01              | 41.01              | 0.00%              | Yes              | U01R12                        | 0.00   |
| U09        | R06   | Single Proposed front 45                           | Pass      | 42.04              | 42.04              | 0.00%              | Yes              | 41.01                                 | 41.01              | 41.01              | 0.00%              | Yes              | U01R12                        | -1.03  |
| U09        | R07   | East Proposed                                      | Pass      | 43.63              | 43.63              | 0.00%              | Yes              | 41.01                                 | 41.01              | 41.01              | 0.00%              | Yes              | U01R12                        | -2.62  |
| U09        | R08   | South Proposed                                     | Pass      | 37.56              | 37.56              | 0.00%              | Yes              | 41.01                                 | 41.01              | 41.01              | 0.00%              | Yes              | U01R12                        | 3.45   |
| U09        | R09   | West Proposed                                      | Pass      | 42.55              | 42.55              | 0.00%              | Yes              | 41.01                                 | 41.01              | 41.01              | 0.00%              | Yes              | U01R12                        | -1.54  |
| U09        | R10   | North Proposed                                     | Pass      | 36.96              | 36.96              | 0.00%              | Yes              | 41.01                                 | 41.01              | 41.01              | 0.00%              | Yes              | U01R12                        | 4.05   |
| Result U09 |   |  | Pass      | 40.90              | 40.90              | 0.00%              |                  | 41.01                                 | 41.01              | 41.01              | 0.00%              |                  | Min 0.00%<br>Ave<br>Max 0.00% | 0.11   |

# Comparison between Reference & Candidate Software (kTDV/ft2)

Comparison Date: 7/21/2017  
 Comparison Author: Ken Nittler  
 Candidate Software: CBECC-Res SVN 916

| Test       | Run  | Description  | Pass/Fail | Reference Proposed | Candidate Proposed | Percent Difference | Within Tolerance | Standard Equals                 | Reference Standard | Candidate Standard | Percent Difference | Within Tolerance | Standard Equals Lookup | Margin                 |
|------------|--|--|-----------|--------------------|--------------------|--------------------|------------------|---------------------------------|--------------------|--------------------|--------------------|------------------|------------------------|------------------------|
|            |  |  |           |                    |                    |                    |                  | Standard = Varies for this test |                    |                    |                    |                  |                        |                        |
| U10        | Multi Family Water Heating in Zone 12 for Prototype P6960ft2 |  |           |                    |                    |                    |                  |                                 |                    |                    |                    |                  |                        |                        |
| U10        | R01  | 8 Storage  | Pass      | 59.22              | 59.22              | 0.00%              | Yes              | 54.37                           | 54.37              | 54.37              | 0.00%              | Yes              | U06R12                 | -4.85                  |
| U10        | R02  | 8 Storage 2 Systems                                | Pass      | 59.22              | 59.22              | 0.00%              | Yes              | 54.37                           | 54.37              | 54.37              | 0.00%              | Yes              | U06R12                 | -4.85                  |
| U10        | R03  | 8 LgStor   | Pass      | 65.97              | 65.97              | 0.00%              | Yes              | 54.37                           | 54.37              | 54.37              | 0.00%              | Yes              | U06R12                 | -11.60                 |
| U10        | R04  | 2 LgStor Central Solar                             | Pass      | 53.27              | 53.27              | 0.00%              | Yes              | 58.70                           | 58.70              | 58.70              | 0.00%              | Yes              | U10R04                 | 5.43                   |
| U10        | R05  | 2 LgStor Central Solar Recirc                      | Pass      | 59.93              | 59.93              | 0.00%              | Yes              | 65.36                           | 65.36              | 65.36              | 0.00%              | Yes              | U10R05                 | 5.43                   |
| U10        | R06  | 2 LgStor Central Recirc                            | Pass      | 64.68              | 64.68              | 0.00%              | Yes              | 65.36                           | 65.36              | 65.36              | 0.00%              | Yes              | U10R05                 | 0.68                   |
| U10        | R07  | 2 SmlInstantant Central Solar                      | Pass      | 49.72              | 49.72              | 0.00%              | Yes              | 55.15                           | 55.15              | 55.15              | 0.00%              | Yes              | U10R07                 | 5.43                   |
| U10        | R08  | 2 SmlInstantant Central Solar Recirc               | Pass      | 56.67              | 56.67              | 0.00%              | Yes              | 62.10                           | 62.10              | 62.10              | 0.00%              | Yes              | U10R08                 | 5.43                   |
| U10        | R09  | 1 Indirect Central Solar                           | Pass      | 56.04              | 56.04              | 0.00%              | Yes              | 60.80                           | 60.80              | 60.80              | 0.00%              | Yes              | U10R09                 | 4.76                   |
| U10        | R10  | 1 Indirect Central Solar Recirc                    | Pass      | 63.12              | 63.12              | 0.00%              | Yes              | 67.87                           | 67.87              | 67.87              | 0.00%              | Yes              | U10R10                 | 4.75                   |
| Result U10 |  |  | Pass      | 58.78              | 58.78              | 0.00%              |                  | 59.85                           | 59.85              | 59.85              | 0.00%              |                  | Min<br>Ave<br>Max      | 0.00%<br>0.00%<br>1.06 |
|            |  |  |           |                    |                    |                    |                  | Standard = Varies for this test |                    |                    |                    |                  |                        |                        |
| U11        | Source Energy in Zone 12 for Prototype P2100ft2              |  |           |                    |                    |                    |                  |                                 |                    |                    |                    |                  |                        |                        |
| U11        | R01  | Package  | Pass      | 36.96              | 36.96              | 0.00%              | Yes              | 41.01                           | 41.01              | 41.01              | 0.00%              | Yes              | U04R12                 | 4.05                   |
| U11        | R02  | Package No Natural Gas                             | Pass      | 62.10              | 62.10              | 0.00%              | Yes              | 66.92                           | 66.92              | 66.92              | 0.00%              | Yes              | U11R02                 | 4.82                   |
| U11        | R03  | Electric DHW                                       | Pass      | 54.73              | 54.73              | 0.00%              | Yes              | 41.01                           | 41.01              | 41.01              | 0.00%              | Yes              | U04R12                 | -13.72                 |
| U11        | R04  | Electric DHW no Natural Gas                        | Pass      | 71.65              | 71.65              | 0.00%              | Yes              | 66.92                           | 66.92              | 66.92              | 0.00%              | Yes              | U11R02                 | -4.73                  |
| U11        | R05  | Heatpump DHW                                       | Pass      | 38.34              | 38.34              | 0.00%              | Yes              | 41.01                           | 41.01              | 41.01              | 0.00%              | Yes              | U04R12                 | 2.67                   |
| U11        | R06  | Heatpump DHW no Natural Gas                        | Pass      | 55.49              | 55.49              | 0.00%              | Yes              | 66.92                           | 66.92              | 66.92              | 0.00%              | Yes              | U11R02                 | 11.43                  |
| U11        | R07  | Heatpump HVAC                                      | Pass      | 35.76              | 35.76              | 0.00%              | Yes              | 40.08                           | 40.08              | 40.08              | 0.00%              | Yes              | U11R07                 | 4.32                   |
| U11        | R08  | Heatpump HVAC no Natural Gas                       | Pass      | 43.86              | 43.86              | 0.00%              | Yes              | 48.16                           | 48.16              | 48.16              | 0.00%              | Yes              | U11R08                 | 4.30                   |
| U11        | R09  | Heatpump HVAC & DHW                                | Pass      | 37.11              | 37.11              | 0.00%              | Yes              | 40.08                           | 40.08              | 40.08              | 0.00%              | Yes              | U11R07                 | 2.97                   |
| U11        | R10  | Heatpump HVAC & DHW no Natural Gas                 | Pass      | 37.02              | 37.02              | 0.00%              | Yes              | 48.16                           | 48.16              | 48.16              | 0.00%              | Yes              | U11R08                 | 11.14                  |
| Result U11 |  |  | Pass      | 47.30              | 47.30              | 0.00%              |                  | 50.03                           | 50.03              | 50.03              | 0.00%              |                  | Min<br>Ave<br>Max      | 0.00%<br>0.00%<br>2.73 |
|            |  |  |           |                    |                    |                    |                  | Standard = Varies for this test |                    |                    |                    |                  |                        |                        |
| U12        | E+A+A Base & Windows in Zone 12 for Prototype P1665ft2       |  |           |                    |                    |                    |                  |                                 |                    |                    |                    |                  |                        |                        |
| U12        | R01  | E 1440ft2 as New Construction                      | Pass      | 238.18             | 238.18             | 0.00%              | Yes              | 42.95                           | 42.95              | 42.95              | 0.00%              | Yes              | U12R01                 | -195.23                |
| U12        | R02  | E 1440ft2 as Addition/Alteration                   | Pass      | 240.87             | 240.87             | 0.00%              | Yes              | 240.87                          | 240.87             | 240.87             | 0.00%              | Yes              | U12R02                 | 0.00                   |
| U12        | R03  | EA 1665ft2   | Pass      | 211.74             | 211.74             | 0.00%              | Yes              | 207.93                          | 207.93             | 207.93             | 0.00%              | Yes              | U12R03                 | -3.81                  |
| U12        | R04  | EAA Ceiling R38 Verified                           | Pass      | 185.88             | 185.88             | 0.00%              | Yes              | 207.93                          | 207.93             | 207.93             | 0.00%              | Yes              | U12R03                 | 22.05                  |
| U12        | R05  | EAA Ceiling R38 Verified Wind U0.41/S0.36          | Pass      | 151.45             | 151.45             | 0.00%              | Yes              | 174.74                          | 174.74             | 174.74             | 0.00%              | Yes              | U12R05                 | 23.29                  |
| U12        | R06  | EAA Ceiling R38 Verified Wind U0.41/S0.36 Verified | Pass      | 151.45             | 151.45             | 0.00%              | Yes              | 174.74                          | 174.74             | 174.74             | 0.00%              | Yes              | U12R05                 | 23.29                  |
| U12        | R07  | EAA Ceiling R38 Verified Wind U0.40/S0.35          | Pass      | 150.67             | 150.67             | 0.00%              | Yes              | 174.74                          | 174.74             | 174.74             | 0.00%              | Yes              | U12R05                 | 24.07                  |
| U12        | R08  | EAA Ceiling R38 Verified Wind U0.40/S0.35 Verified | Pass      | 150.67             | 150.67             | 0.00%              | Yes              | 207.93                          | 207.93             | 207.93             | 0.00%              | Yes              | U12R03                 | 57.26                  |
| U12        | R09  | EAA Ceiling R38 Verified Wind U0.39/S0.34          | Pass      | 149.99             | 149.99             | 0.00%              | Yes              | 174.74                          | 174.74             | 174.74             | 0.00%              | Yes              | U12R05                 | 24.75                  |
| U12        | R10  | EAA Ceiling R38 Verified Wind U0.39/S0.34 Verified | Pass      | 149.99             | 149.99             | 0.00%              | Yes              | 207.93                          | 207.93             | 207.93             | 0.00%              | Yes              | U12R03                 | 57.94                  |
| Result U12 |  |  | Pass      | 178.09             | 178.09             | 0.00%              |                  | 181.45                          | 181.45             | 181.45             | 0.00%              |                  | Min<br>Ave<br>Max      | 0.00%<br>0.00%<br>3.36 |

## Comparison between Reference & Candidate Software (kTDV/ft2)

Comparison Date: 7/21/2017  
 Comparison Author: Ken Nittler  
 Candidate Software: CBECC-Res SVN 916

| Test       | Run  | Description                                   | Pass/Fail | Reference<br>Proposed | Candidate<br>Proposed | Percent<br>Difference | Within<br>Tolerance | Standard<br>Equals              | Reference<br>Standard | Candidate<br>Standard | Percent<br>Difference | Within<br>Tolerance | Standard<br>Equals<br>Lookup | Margin         |
|------------|--|---|-----------|-----------------------|-----------------------|-----------------------|---------------------|---------------------------------|-----------------------|-----------------------|-----------------------|---------------------|------------------------------|----------------|
| U13        | E+A+A Walls & HVAC in Zone 12 for Prototype P1665ft2 |   |           |                       |                       |                       |                     | Standard = Varies for this test |                       |                       |                       |                     |                              |                |
| U13        | R01  | EAA Ceiling R38 Verified Wall R11             | Pass      | 149.01                | 149.01                | 0.00%                 | Yes                 | 171.02                          | 171.02                | 171.02                | 0.00%                 | Yes                 | U13R01                       | 22.01          |
| U13        | R02  | EAA Ceiling R38 Verified Wall R11 Verified    | Pass      | 149.01                | 149.01                | 0.00%                 | Yes                 | 171.02                          | 171.02                | 171.02                | 0.00%                 | Yes                 | U13R01                       | 22.01          |
| U13        | R03  | EAA Ceiling R38 Verified Wall R13             | Pass      | 146.58                | 146.58                | 0.00%                 | Yes                 | 171.02                          | 171.02                | 171.02                | 0.00%                 | Yes                 | U13R01                       | 24.44          |
| U13        | R04  | EAA Ceiling R38 Verified Wall R13 Verified    | Pass      | 146.58                | 146.58                | 0.00%                 | Yes                 | 207.93                          | 207.93                | 207.93                | 0.00%                 | Yes                 | U12R03                       | 61.35          |
| U13        | R05  | EAA Ceiling R38 Verified HVAC Worse           | Pass      | 147.34                | 147.34                | 0.00%                 | Yes                 | 132.02                          | 132.02                | 132.02                | 0.00%                 | Yes                 | U13R05                       | -15.32         |
| U13        | R06  | EAA Ceiling R38 Verified HVAC Worse Verified  | Pass      | 147.34                | 147.34                | 0.00%                 | Yes                 | 132.02                          | 132.02                | 132.02                | 0.00%                 | Yes                 | U13R05                       | -15.32         |
| U13        | R07  | EAA Ceiling R38 Verified HVAC Equal           | Pass      | 119.66                | 119.66                | 0.00%                 | Yes                 | 132.02                          | 132.02                | 132.02                | 0.00%                 | Yes                 | U13R05                       | 12.36          |
| U13        | R08  | EAA Ceiling R38 Verified HVAC Equal Verified  | Pass      | 119.66                | 119.66                | 0.00%                 | Yes                 | 207.93                          | 207.93                | 207.93                | 0.00%                 | Yes                 | U12R03                       | 88.27          |
| U13        | R09  | EAA Ceiling R38 Verified HVAC Better          | Pass      | 101.52                | 101.52                | 0.00%                 | Yes                 | 132.02                          | 132.02                | 132.02                | 0.00%                 | Yes                 | U13R05                       | 30.50          |
| U13        | R10  | EAA Ceiling R38 Verified HVAC Better Verified | Pass      | 101.52                | 101.52                | 0.00%                 | Yes                 | 207.93                          | 207.93                | 207.93                | 0.00%                 | Yes                 | U12R03                       | 106.41         |
| Result U13 |  |   | Pass      | 132.82                | 132.82                | 0.00%                 |                     | 166.49                          | 166.49                | 166.49                | 0.00%                 |                     | Min<br>Max                   | 0.00%<br>0.00% |
|            |  |   |           |                       |                       |                       |                     |                                 |                       |                       |                       | Ave                 |                              |                |

## Summary of Residential ACM Tests (EDR)

Comparison Date: 7/21/2017  
 Comparison Author: Ken Nittler  
 Candidate Software: CBECC-Res SVN 916  
 Reference Software: CBECC-Res SVN 916  
 Type of Software: Reference  
 Type of Construction: Both  
 Units for Summary: EDR  
 Tolerance: 0.04

| Test | Pass/<br>Fail | Average         | Average         | Description   |
|------|---------------|-----------------|-----------------|---|
|      |               | Proposed<br>EDR | Standard<br>EDR |   |
| U01  | Pass          | 51.92           | 51.92           | Standard Design in All Zones for Prototype S2100ft2             |
| U02  | Pass          | 49.21           | 49.21           | Standard Design in All Zones for Prototype S2700ft2             |
| U03  | Pass          | 59.78           | 59.78           | Standard Design in All Zones for Prototype S6960ft2             |
| U04  | Pass          | 49.91           | 51.92           | Proposed Design in All Zones for Prototype P2100ft2             |
| U05  | Pass          | 46.94           | 49.21           | Proposed Design in All Zones for Prototype P2700ft2             |
| U06  | Pass          | 57.96           | 59.78           | Proposed Design in All Zones for Prototype P6960ft2             |
| U07  | Pass          | 45.03           | 47.20           | Common Measures in Zone 12 for Prototype P2100ft2               |
| U08  | Pass          | 47.08           | 47.22           | Water Heating in Zone 12 for Prototype P2100ft2                 |
| U09  | Pass          | 47.87           | 47.20           | Multiple Orientation in Zone 12 for Prototype S2100ft2/P2100ft2 |
| U10  | Pass          | 58.70           | 59.19           | Multi Family Water Heating in Zone 12 for Prototype P6960ft2    |
| U11  | Pass          | 48.66           | 50.10           | Source Energy in Zone 12 for Prototype P2100ft2                 |
| U12  | Pass          | n/a             | n/a             | E+A+A Base & Windows in Zone 12 for Prototype P1665ft2          |
| U13  | Pass          | n/a             | n/a             | E+A+A Walls & HVAC in Zone 12 for Prototype P1665ft2            |



# Comparison between Reference & Candidate Software (EDR)

Comparison Date: 7/21/2017  
 Comparison Author: Ken Nittler  
 Candidate Software: CBECC-Res SVN 916

| Test       | Run | Description   | Pass/Fail | Reference Proposed | Candidate Proposed | Percent Difference | Within Tolerance | Standard Equals                   | Reference Standard | Candidate Standard | Percent Difference | Within Tolerance | Standard Equals Lookup | Margin         |
|------------|-----|---|-----------|--------------------|--------------------|--------------------|------------------|-----------------------------------|--------------------|--------------------|--------------------|------------------|------------------------|----------------|
| U01        |     | Standard Design in All Zones for Prototype S2100ft2 |           |                    |                    |                    |                  | Standard = Proposed for this test |                    |                    |                    |                  |                        |                |
| U01        | R01 | Zone 01   | Pass      | 61.40              | 61.40              | 0.00%              | Yes              | 61.40                             | 61.40              | 61.40              | 0.00%              | Yes              | U01R01                 | 0.00           |
| U01        | R02 | Zone 02   | Pass      | 52.80              | 52.80              | 0.00%              | Yes              | 52.80                             | 52.80              | 52.80              | 0.00%              | Yes              | U01R02                 | 0.00           |
| U01        | R03 | Zone 03   | Pass      | 50.80              | 50.80              | 0.00%              | Yes              | 50.80                             | 50.80              | 50.80              | 0.00%              | Yes              | U01R03                 | 0.00           |
| U01        | R04 | Zone 04   | Pass      | 50.60              | 50.60              | 0.00%              | Yes              | 50.60                             | 50.60              | 50.60              | 0.00%              | Yes              | U01R04                 | 0.00           |
| U01        | R05 | Zone 05   | Pass      | 47.40              | 47.40              | 0.00%              | Yes              | 47.40                             | 47.40              | 47.40              | 0.00%              | Yes              | U01R05                 | 0.00           |
| U01        | R06 | Zone 06   | Pass      | 53.00              | 53.00              | 0.00%              | Yes              | 53.00                             | 53.00              | 53.00              | 0.00%              | Yes              | U01R06                 | 0.00           |
| U01        | R07 | Zone 07   | Pass      | 50.90              | 50.90              | 0.00%              | Yes              | 50.90                             | 50.90              | 50.90              | 0.00%              | Yes              | U01R07                 | 0.00           |
| U01        | R08 | Zone 08   | Pass      | 47.70              | 47.70              | 0.00%              | Yes              | 47.70                             | 47.70              | 47.70              | 0.00%              | Yes              | U01R08                 | 0.00           |
| U01        | R09 | Zone 09   | Pass      | 48.50              | 48.50              | 0.00%              | Yes              | 48.50                             | 48.50              | 48.50              | 0.00%              | Yes              | U01R09                 | 0.00           |
| U01        | R10 | Zone 10   | Pass      | 46.70              | 46.70              | 0.00%              | Yes              | 46.70                             | 46.70              | 46.70              | 0.00%              | Yes              | U01R10                 | 0.00           |
| U01        | R11 | Zone 11   | Pass      | 50.70              | 50.70              | 0.00%              | Yes              | 50.70                             | 50.70              | 50.70              | 0.00%              | Yes              | U01R11                 | 0.00           |
| U01        | R12 | Zone 12   | Pass      | 47.20              | 47.20              | 0.00%              | Yes              | 47.20                             | 47.20              | 47.20              | 0.00%              | Yes              | U01R12                 | 0.00           |
| U01        | R13 | Zone 13   | Pass      | 52.50              | 52.50              | 0.00%              | Yes              | 52.50                             | 52.50              | 52.50              | 0.00%              | Yes              | U01R13                 | 0.00           |
| U01        | R14 | Zone 14   | Pass      | 51.50              | 51.50              | 0.00%              | Yes              | 51.50                             | 51.50              | 51.50              | 0.00%              | Yes              | U01R14                 | 0.00           |
| U01        | R15 | Zone 15   | Pass      | 57.00              | 57.00              | 0.00%              | Yes              | 57.00                             | 57.00              | 57.00              | 0.00%              | Yes              | U01R15                 | 0.00           |
| U01        | R16 | Zone 16   | Pass      | 62.00              | 62.00              | 0.00%              | Yes              | 62.00                             | 62.00              | 62.00              | 0.00%              | Yes              | U01R16                 | 0.00           |
| Result U01 |     |   | Pass      | 51.92              | 51.92              | 0.00%              |                  | 51.92                             | 51.92              | 51.92              | 0.00%              | Ave              | Min<br>Max             | 0.00%<br>0.00% |
| U02        |     | Standard Design in All Zones for Prototype S2700ft2 |           |                    |                    |                    |                  | Standard = Proposed for this test |                    |                    |                    |                  |                        |                |
| U02        | R01 | Zone 01   | Pass      | 56.60              | 56.60              | 0.00%              | Yes              | 56.60                             | 56.60              | 56.60              | 0.00%              | Yes              | U02R01                 | 0.00           |
| U02        | R02 | Zone 02   | Pass      | 49.10              | 49.10              | 0.00%              | Yes              | 49.10                             | 49.10              | 49.10              | 0.00%              | Yes              | U02R02                 | 0.00           |
| U02        | R03 | Zone 03   | Pass      | 47.50              | 47.50              | 0.00%              | Yes              | 47.50                             | 47.50              | 47.50              | 0.00%              | Yes              | U02R03                 | 0.00           |
| U02        | R04 | Zone 04   | Pass      | 47.60              | 47.60              | 0.00%              | Yes              | 47.60                             | 47.60              | 47.60              | 0.00%              | Yes              | U02R04                 | 0.00           |
| U02        | R05 | Zone 05   | Pass      | 44.20              | 44.20              | 0.00%              | Yes              | 44.20                             | 44.20              | 44.20              | 0.00%              | Yes              | U02R05                 | 0.00           |
| U02        | R06 | Zone 06   | Pass      | 51.00              | 51.00              | 0.00%              | Yes              | 51.00                             | 51.00              | 51.00              | 0.00%              | Yes              | U02R06                 | 0.00           |
| U02        | R07 | Zone 07   | Pass      | 48.80              | 48.80              | 0.00%              | Yes              | 48.80                             | 48.80              | 48.80              | 0.00%              | Yes              | U02R07                 | 0.00           |
| U02        | R08 | Zone 08   | Pass      | 46.40              | 46.40              | 0.00%              | Yes              | 46.40                             | 46.40              | 46.40              | 0.00%              | Yes              | U02R08                 | 0.00           |
| U02        | R09 | Zone 09   | Pass      | 46.60              | 46.60              | 0.00%              | Yes              | 46.60                             | 46.60              | 46.60              | 0.00%              | Yes              | U02R09                 | 0.00           |
| U02        | R10 | Zone 10   | Pass      | 44.80              | 44.80              | 0.00%              | Yes              | 44.80                             | 44.80              | 44.80              | 0.00%              | Yes              | U02R10                 | 0.00           |
| U02        | R11 | Zone 11   | Pass      | 48.20              | 48.20              | 0.00%              | Yes              | 48.20                             | 48.20              | 48.20              | 0.00%              | Yes              | U02R11                 | 0.00           |
| U02        | R12 | Zone 12   | Pass      | 45.50              | 45.50              | 0.00%              | Yes              | 45.50                             | 45.50              | 45.50              | 0.00%              | Yes              | U02R12                 | 0.00           |
| U02        | R13 | Zone 13   | Pass      | 50.00              | 50.00              | 0.00%              | Yes              | 50.00                             | 50.00              | 50.00              | 0.00%              | Yes              | U02R13                 | 0.00           |
| U02        | R14 | Zone 14   | Pass      | 49.20              | 49.20              | 0.00%              | Yes              | 49.20                             | 49.20              | 49.20              | 0.00%              | Yes              | U02R14                 | 0.00           |
| U02        | R15 | Zone 15   | Pass      | 53.40              | 53.40              | 0.00%              | Yes              | 53.40                             | 53.40              | 53.40              | 0.00%              | Yes              | U02R15                 | 0.00           |
| U02        | R16 | Zone 16   | Pass      | 58.50              | 58.50              | 0.00%              | Yes              | 58.50                             | 58.50              | 58.50              | 0.00%              | Yes              | U02R16                 | 0.00           |
| Result U02 |     |   | Pass      | 49.21              | 49.21              | 0.00%              |                  | 49.21                             | 49.21              | 49.21              | 0.00%              | Ave              | Min<br>Max             | 0.00%<br>0.00% |

# Comparison between Reference & Candidate Software (EDR)

Comparison Date: 7/21/2017  
 Comparison Author: Ken Nittler  
 Candidate Software: CBECC-Res SVN 916

| Test       | Run | Description   | Pass/Fail | Reference Proposed | Candidate Proposed | Percent Difference | Within Tolerance | Standard Equals                       | Reference Standard | Candidate Standard | Percent Difference | Within Tolerance | Standard Equals Lookup | Margin |
|------------|-----|---|-----------|--------------------|--------------------|--------------------|------------------|---------------------------------------|--------------------|--------------------|--------------------|------------------|------------------------|--------|
| U03        |     | Standard Design in All Zones for Prototype S6960ft2 |           |                    |                    |                    |                  | Standard = Proposed for this test     |                    |                    |                    |                  |                        |        |
| U03        | R01 | Zone 01   | Pass      | 62.10              | 62.10              | 0.00%              | Yes              | 62.10                                 | 62.10              | 62.10              | 0.00%              | Yes              | U03R01                 | 0.00   |
| U03        | R02 | Zone 02   | Pass      | 58.40              | 58.40              | 0.00%              | Yes              | 58.40                                 | 58.40              | 58.40              | 0.00%              | Yes              | U03R02                 | 0.00   |
| U03        | R03 | Zone 03   | Pass      | 58.70              | 58.70              | 0.00%              | Yes              | 58.70                                 | 58.70              | 58.70              | 0.00%              | Yes              | U03R03                 | 0.00   |
| U03        | R04 | Zone 04   | Pass      | 57.70              | 57.70              | 0.00%              | Yes              | 57.70                                 | 57.70              | 57.70              | 0.00%              | Yes              | U03R04                 | 0.00   |
| U03        | R05 | Zone 05   | Pass      | 58.30              | 58.30              | 0.00%              | Yes              | 58.30                                 | 58.30              | 58.30              | 0.00%              | Yes              | U03R05                 | 0.00   |
| U03        | R06 | Zone 06   | Pass      | 62.00              | 62.00              | 0.00%              | Yes              | 62.00                                 | 62.00              | 62.00              | 0.00%              | Yes              | U03R06                 | 0.00   |
| U03        | R07 | Zone 07   | Pass      | 62.20              | 62.20              | 0.00%              | Yes              | 62.20                                 | 62.20              | 62.20              | 0.00%              | Yes              | U03R07                 | 0.00   |
| U03        | R08 | Zone 08   | Pass      | 60.80              | 60.80              | 0.00%              | Yes              | 60.80                                 | 60.80              | 60.80              | 0.00%              | Yes              | U03R08                 | 0.00   |
| U03        | R09 | Zone 09   | Pass      | 59.30              | 59.30              | 0.00%              | Yes              | 59.30                                 | 59.30              | 59.30              | 0.00%              | Yes              | U03R09                 | 0.00   |
| U03        | R10 | Zone 10   | Pass      | 57.60              | 57.60              | 0.00%              | Yes              | 57.60                                 | 57.60              | 57.60              | 0.00%              | Yes              | U03R10                 | 0.00   |
| U03        | R11 | Zone 11   | Pass      | 57.80              | 57.80              | 0.00%              | Yes              | 57.80                                 | 57.80              | 57.80              | 0.00%              | Yes              | U03R11                 | 0.00   |
| U03        | R12 | Zone 12   | Pass      | 57.90              | 57.90              | 0.00%              | Yes              | 57.90                                 | 57.90              | 57.90              | 0.00%              | Yes              | U03R12                 | 0.00   |
| U03        | R13 | Zone 13   | Pass      | 59.20              | 59.20              | 0.00%              | Yes              | 59.20                                 | 59.20              | 59.20              | 0.00%              | Yes              | U03R13                 | 0.00   |
| U03        | R14 | Zone 14   | Pass      | 58.60              | 58.60              | 0.00%              | Yes              | 58.60                                 | 58.60              | 58.60              | 0.00%              | Yes              | U03R14                 | 0.00   |
| U03        | R15 | Zone 15   | Pass      | 62.90              | 62.90              | 0.00%              | Yes              | 62.90                                 | 62.90              | 62.90              | 0.00%              | Yes              | U03R15                 | 0.00   |
| U03        | R16 | Zone 16   | Pass      | 62.90              | 62.90              | 0.00%              | Yes              | 62.90                                 | 62.90              | 62.90              | 0.00%              | Yes              | U03R16                 | 0.00   |
| Result U03 |     |   | Pass      | 59.78              | 59.78              | 0.00%              |                  | 59.78                                 | 59.78              | 59.78              | 0.00%              |                  | Min Ave                | 0.00%  |
|            |     |   |           |                    |                    |                    |                  |                                       |                    |                    |                    |                  | Max                    | 0.00%  |
| U04        |     | Proposed Design in All Zones for Prototype P2100ft2 |           |                    |                    |                    |                  | Standard = T01 Standard for this test |                    |                    |                    |                  |                        |        |
| U04        | R01 | Zone 01   | Pass      | 60.40              | 60.40              | 0.00%              | Yes              | 61.40                                 | 61.40              | 61.40              | 0.00%              | Yes              | U01R01                 | 1.00   |
| U04        | R02 | Zone 02   | Pass      | 51.70              | 51.70              | 0.00%              | Yes              | 52.80                                 | 52.80              | 52.80              | 0.00%              | Yes              | U01R02                 | 1.10   |
| U04        | R03 | Zone 03   | Pass      | 49.20              | 49.20              | 0.00%              | Yes              | 50.80                                 | 50.80              | 50.80              | 0.00%              | Yes              | U01R03                 | 1.60   |
| U04        | R04 | Zone 04   | Pass      | 48.70              | 48.70              | 0.00%              | Yes              | 50.60                                 | 50.60              | 50.60              | 0.00%              | Yes              | U01R04                 | 1.90   |
| U04        | R05 | Zone 05   | Pass      | 45.90              | 45.90              | 0.00%              | Yes              | 47.40                                 | 47.40              | 47.40              | 0.00%              | Yes              | U01R05                 | 1.50   |
| U04        | R06 | Zone 06   | Pass      | 51.50              | 51.50              | 0.00%              | Yes              | 53.00                                 | 53.00              | 53.00              | 0.00%              | Yes              | U01R06                 | 1.50   |
| U04        | R07 | Zone 07   | Pass      | 50.10              | 50.10              | 0.00%              | Yes              | 50.90                                 | 50.90              | 50.90              | 0.00%              | Yes              | U01R07                 | 0.80   |
| U04        | R08 | Zone 08   | Pass      | 46.10              | 46.10              | 0.00%              | Yes              | 47.70                                 | 47.70              | 47.70              | 0.00%              | Yes              | U01R08                 | 1.60   |
| U04        | R09 | Zone 09   | Pass      | 45.80              | 45.80              | 0.00%              | Yes              | 48.50                                 | 48.50              | 48.50              | 0.00%              | Yes              | U01R09                 | 2.70   |
| U04        | R10 | Zone 10   | Pass      | 44.20              | 44.20              | 0.00%              | Yes              | 46.70                                 | 46.70              | 46.70              | 0.00%              | Yes              | U01R10                 | 2.50   |
| U04        | R11 | Zone 11   | Pass      | 48.00              | 48.00              | 0.00%              | Yes              | 50.70                                 | 50.70              | 50.70              | 0.00%              | Yes              | U01R11                 | 2.70   |
| U04        | R12 | Zone 12   | Pass      | 44.80              | 44.80              | 0.00%              | Yes              | 47.20                                 | 47.20              | 47.20              | 0.00%              | Yes              | U01R12                 | 2.40   |
| U04        | R13 | Zone 13   | Pass      | 49.70              | 49.70              | 0.00%              | Yes              | 52.50                                 | 52.50              | 52.50              | 0.00%              | Yes              | U01R13                 | 2.80   |
| U04        | R14 | Zone 14   | Pass      | 48.10              | 48.10              | 0.00%              | Yes              | 51.50                                 | 51.50              | 51.50              | 0.00%              | Yes              | U01R14                 | 3.40   |
| U04        | R15 | Zone 15   | Pass      | 54.30              | 54.30              | 0.00%              | Yes              | 57.00                                 | 57.00              | 57.00              | 0.00%              | Yes              | U01R15                 | 2.70   |
| U04        | R16 | Zone 16   | Pass      | 60.00              | 60.00              | 0.00%              | Yes              | 62.00                                 | 62.00              | 62.00              | 0.00%              | Yes              | U01R16                 | 2.00   |
| Result U04 |     |   | Pass      | 49.91              | 49.91              | 0.00%              |                  | 51.92                                 | 51.92              | 51.92              | 0.00%              |                  | Min Ave                | 0.00%  |
|            |     |   |           |                    |                    |                    |                  |                                       |                    |                    |                    |                  | Max                    | 0.00%  |

# Comparison between Reference & Candidate Software (EDR)

Comparison Date: 7/21/2017  
 Comparison Author: Ken Nittler  
 Candidate Software: CBECC-Res SVN 916

| Test       | Run   | Description | Pass/Fail | Reference Proposed | Candidate Proposed | Percent Difference | Within Tolerance | Standard Equals                       | Reference Standard | Candidate Standard | Percent Difference | Within Tolerance | Standard Equals Lookup | Margin         |
|------------|---|-------------|-----------|--------------------|--------------------|--------------------|------------------|---------------------------------------|--------------------|--------------------|--------------------|------------------|------------------------|----------------|
|            |   |             |           |                    |                    |                    |                  | Standard = T02 Standard for this test |                    |                    |                    |                  |                        |                |
| U05        | Proposed Design in All Zones for Prototype P2700ft2 |             |           |                    |                    |                    |                  |                                       |                    |                    |                    |                  |                        |                |
| U05        | R01   | Zone 01     | Pass      | 55.40              | 55.40              | 0.00%              | Yes              | 56.60                                 | 56.60              | 56.60              | 0.00%              | Yes              | U02R01                 | 1.20           |
| U05        | R02   | Zone 02     | Pass      | 47.30              | 47.30              | 0.00%              | Yes              | 49.10                                 | 49.10              | 49.10              | 0.00%              | Yes              | U02R02                 | 1.80           |
| U05        | R03   | Zone 03     | Pass      | 45.80              | 45.80              | 0.00%              | Yes              | 47.50                                 | 47.50              | 47.50              | 0.00%              | Yes              | U02R03                 | 1.70           |
| U05        | R04   | Zone 04     | Pass      | 45.90              | 45.90              | 0.00%              | Yes              | 47.60                                 | 47.60              | 47.60              | 0.00%              | Yes              | U02R04                 | 1.70           |
| U05        | R05   | Zone 05     | Pass      | 42.50              | 42.50              | 0.00%              | Yes              | 44.20                                 | 44.20              | 44.20              | 0.00%              | Yes              | U02R05                 | 1.70           |
| U05        | R06   | Zone 06     | Pass      | 49.30              | 49.30              | 0.00%              | Yes              | 51.00                                 | 51.00              | 51.00              | 0.00%              | Yes              | U02R06                 | 1.70           |
| U05        | R07   | Zone 07     | Pass      | 48.00              | 48.00              | 0.00%              | Yes              | 48.80                                 | 48.80              | 48.80              | 0.00%              | Yes              | U02R07                 | 0.80           |
| U05        | R08   | Zone 08     | Pass      | 44.50              | 44.50              | 0.00%              | Yes              | 46.40                                 | 46.40              | 46.40              | 0.00%              | Yes              | U02R08                 | 1.90           |
| U05        | R09   | Zone 09     | Pass      | 43.90              | 43.90              | 0.00%              | Yes              | 46.60                                 | 46.60              | 46.60              | 0.00%              | Yes              | U02R09                 | 2.70           |
| U05        | R10   | Zone 10     | Pass      | 42.10              | 42.10              | 0.00%              | Yes              | 44.80                                 | 44.80              | 44.80              | 0.00%              | Yes              | U02R10                 | 2.70           |
| U05        | R11   | Zone 11     | Pass      | 45.20              | 45.20              | 0.00%              | Yes              | 48.20                                 | 48.20              | 48.20              | 0.00%              | Yes              | U02R11                 | 3.00           |
| U05        | R12   | Zone 12     | Pass      | 42.70              | 42.70              | 0.00%              | Yes              | 45.50                                 | 45.50              | 45.50              | 0.00%              | Yes              | U02R12                 | 2.80           |
| U05        | R13   | Zone 13     | Pass      | 46.90              | 46.90              | 0.00%              | Yes              | 50.00                                 | 50.00              | 50.00              | 0.00%              | Yes              | U02R13                 | 3.10           |
| U05        | R14   | Zone 14     | Pass      | 45.40              | 45.40              | 0.00%              | Yes              | 49.20                                 | 49.20              | 49.20              | 0.00%              | Yes              | U02R14                 | 3.80           |
| U05        | R15   | Zone 15     | Pass      | 50.40              | 50.40              | 0.00%              | Yes              | 53.40                                 | 53.40              | 53.40              | 0.00%              | Yes              | U02R15                 | 3.00           |
| U05        | R16   | Zone 16     | Pass      | 55.70              | 55.70              | 0.00%              | Yes              | 58.50                                 | 58.50              | 58.50              | 0.00%              | Yes              | U02R16                 | 2.80           |
| Result U05 |   |             |           | Pass               | 46.94              | 46.94              | 0.00%            | 49.21                                 | 49.21              | 49.21              | 0.00%              | Ave              | Min<br>Max             | 0.00%<br>0.00% |
|            |   |             |           |                    |                    |                    |                  | Standard = T03 Standard for this test |                    |                    |                    |                  |                        |                |
| U06        | Proposed Design in All Zones for Prototype P6960ft2 |             |           |                    |                    |                    |                  |                                       |                    |                    |                    |                  |                        |                |
| U06        | R01   | Zone 01     | Pass      | 62.40              | 62.40              | 0.00%              | Yes              | 62.10                                 | 62.10              | 62.10              | 0.00%              | Yes              | U03R01                 | -0.30          |
| U06        | R02   | Zone 02     | Pass      | 57.10              | 57.10              | 0.00%              | Yes              | 58.40                                 | 58.40              | 58.40              | 0.00%              | Yes              | U03R02                 | 1.30           |
| U06        | R03   | Zone 03     | Pass      | 58.00              | 58.00              | 0.00%              | Yes              | 58.70                                 | 58.70              | 58.70              | 0.00%              | Yes              | U03R03                 | 0.70           |
| U06        | R04   | Zone 04     | Pass      | 55.80              | 55.80              | 0.00%              | Yes              | 57.70                                 | 57.70              | 57.70              | 0.00%              | Yes              | U03R04                 | 1.90           |
| U06        | R05   | Zone 05     | Pass      | 57.50              | 57.50              | 0.00%              | Yes              | 58.30                                 | 58.30              | 58.30              | 0.00%              | Yes              | U03R05                 | 0.80           |
| U06        | R06   | Zone 06     | Pass      | 60.70              | 60.70              | 0.00%              | Yes              | 62.00                                 | 62.00              | 62.00              | 0.00%              | Yes              | U03R06                 | 1.30           |
| U06        | R07   | Zone 07     | Pass      | 60.70              | 60.70              | 0.00%              | Yes              | 62.20                                 | 62.20              | 62.20              | 0.00%              | Yes              | U03R07                 | 1.50           |
| U06        | R08   | Zone 08     | Pass      | 58.90              | 58.90              | 0.00%              | Yes              | 60.80                                 | 60.80              | 60.80              | 0.00%              | Yes              | U03R08                 | 1.90           |
| U06        | R09   | Zone 09     | Pass      | 56.70              | 56.70              | 0.00%              | Yes              | 59.30                                 | 59.30              | 59.30              | 0.00%              | Yes              | U03R09                 | 2.60           |
| U06        | R10   | Zone 10     | Pass      | 55.20              | 55.20              | 0.00%              | Yes              | 57.60                                 | 57.60              | 57.60              | 0.00%              | Yes              | U03R10                 | 2.40           |
| U06        | R11   | Zone 11     | Pass      | 55.40              | 55.40              | 0.00%              | Yes              | 57.80                                 | 57.80              | 57.80              | 0.00%              | Yes              | U03R11                 | 2.40           |
| U06        | R12   | Zone 12     | Pass      | 55.40              | 55.40              | 0.00%              | Yes              | 57.90                                 | 57.90              | 57.90              | 0.00%              | Yes              | U03R12                 | 2.50           |
| U06        | R13   | Zone 13     | Pass      | 56.50              | 56.50              | 0.00%              | Yes              | 59.20                                 | 59.20              | 59.20              | 0.00%              | Yes              | U03R13                 | 2.70           |
| U06        | R14   | Zone 14     | Pass      | 55.80              | 55.80              | 0.00%              | Yes              | 58.60                                 | 58.60              | 58.60              | 0.00%              | Yes              | U03R14                 | 2.80           |
| U06        | R15   | Zone 15     | Pass      | 59.90              | 59.90              | 0.00%              | Yes              | 62.90                                 | 62.90              | 62.90              | 0.00%              | Yes              | U03R15                 | 3.00           |
| U06        | R16   | Zone 16     | Pass      | 61.40              | 61.40              | 0.00%              | Yes              | 62.90                                 | 62.90              | 62.90              | 0.00%              | Yes              | U03R16                 | 1.50           |
| Result U06 |   |             |           | Pass               | 57.96              | 57.96              | 0.00%            | 59.78                                 | 59.78              | 59.78              | 0.00%              | Ave              | Min<br>Max             | 0.00%<br>0.00% |

# Comparison between Reference & Candidate Software (EDR)

Comparison Date: 7/21/2017  
 Comparison Author: Ken Nittler  
 Candidate Software: CBECC-Res SVN 916

| Test       | Run   | Description  | Pass/Fail | Reference Proposed | Candidate Proposed | Percent Difference | Within Tolerance | Standard Equals                       | Reference Standard | Candidate Standard | Percent Difference | Within Tolerance | Standard Equals Lookup | Margin                  |
|------------|---|--|-----------|--------------------|--------------------|--------------------|------------------|---------------------------------------|--------------------|--------------------|--------------------|------------------|------------------------|-------------------------|
|            |   |  |           |                    |                    |                    |                  | Standard = T01 Standard for this test |                    |                    |                    |                  |                        |                         |
| U07        | Common Measures in Zone 12 for Prototype P2100ft2               |  |           |                    |                    |                    |                  |                                       |                    |                    |                    |                  |                        |                         |
| U07        | R01   | Package  | Pass      | 44.80              | 44.80              | 0.00%              | Yes              | 47.20                                 | 47.20              | 47.20              | 0.00%              | Yes              | U01R12                 | 2.40                    |
| U07        | R02   | Fenestration U 0.40/S 0.40                         | Pass      | 48.00              | 48.00              | 0.00%              | Yes              | 47.20                                 | 47.20              | 47.20              | 0.00%              | Yes              | U01R12                 | -0.80                   |
| U07        | R03   | Wall R13/Roof Deck Above R6                        | Pass      | 44.20              | 44.20              | 0.00%              | Yes              | 47.20                                 | 47.20              | 47.20              | 0.00%              | Yes              | U01R12                 | 3.00                    |
| U07        | R04   | Ceiling R49 /Roof Deck Below R0/Radiant Barrier    | Pass      | 47.20              | 47.20              | 0.00%              | Yes              | 47.20                                 | 47.20              | 47.20              | 0.00%              | Yes              | U01R12                 | 0.00                    |
| U07        | R05   | Furnace AFUE 92                                    | Pass      | 43.50              | 43.50              | 0.00%              | Yes              | 47.20                                 | 47.20              | 47.20              | 0.00%              | Yes              | U01R12                 | 3.70                    |
| U07        | R06   | Air Conditioner SEER 16/EER 14                     | Pass      | 44.30              | 44.30              | 0.00%              | Yes              | 47.20                                 | 47.20              | 47.20              | 0.00%              | Yes              | U01R12                 | 2.90                    |
| U07        | R07   | No Cool Vent                                       | Pass      | 47.40              | 47.40              | 0.00%              | Yes              | 47.20                                 | 47.20              | 47.20              | 0.00%              | Yes              | U01R12                 | -0.20                   |
| U07        | R08   | Ducts 2% Leakage                                   | Pass      | 44.50              | 44.50              | 0.00%              | Yes              | 47.20                                 | 47.20              | 47.20              | 0.00%              | Yes              | U01R12                 | 2.70                    |
| U07        | R09   | Insulation Construction Quality Improved           | Pass      | 42.40              | 42.40              | 0.00%              | Yes              | 47.20                                 | 47.20              | 47.20              | 0.00%              | Yes              | U01R12                 | 4.80                    |
| U07        | R10   | Air Leakage ACH50 2.0                              | Pass      | 44.00              | 44.00              | 0.00%              | Yes              | 47.20                                 | 47.20              | 47.20              | 0.00%              | Yes              | U01R12                 | 3.20                    |
| Result U07 |   |  | Pass      | 45.03              | 45.03              | 0.00%              |                  | 47.20                                 | 47.20              | 47.20              | 0.00%              |                  | Min<br>Ave<br>Max      | 0.00%<br>0.00%<br>2.17  |
|            |   |  |           |                    |                    |                    |                  | Standard = T01 Standard for this test |                    |                    |                    |                  |                        |                         |
| U08        | Water Heating in Zone 12 for Prototype P2100ft2                 |  |           |                    |                    |                    |                  |                                       |                    |                    |                    |                  |                        |                         |
| U08        | R01   | Package  | Pass      | 44.80              | 44.80              | 0.00%              | Yes              | 47.20                                 | 47.20              | 47.20              | 0.00%              | Yes              | U01R12                 | 2.40                    |
| U08        | R02   | Parallel Piping                                    | Pass      | 44.90              | 44.90              | 0.00%              | Yes              | 47.20                                 | 47.20              | 47.20              | 0.00%              | Yes              | U01R12                 | 2.30                    |
| U08        | R03   | Small Tankless EF 0.80/Input 195000/0 gal          | Pass      | 44.90              | 44.90              | 0.00%              | Yes              | 47.20                                 | 47.20              | 47.20              | 0.00%              | Yes              | U01R12                 | 2.30                    |
| U08        | R04   | Large Tankless RE 0.76/Input 300000/0 gal          | Pass      | 45.20              | 45.20              | 0.00%              | Yes              | 47.20                                 | 47.20              | 47.20              | 0.00%              | Yes              | U01R12                 | 2.00                    |
| U08        | R05   | Large Storage RE 0.77/Input 100000/75gal/Stby 0.01 | Pass      | 46.40              | 46.40              | 0.00%              | Yes              | 47.20                                 | 47.20              | 47.20              | 0.00%              | Yes              | U01R12                 | 0.80                    |
| U08        | R06   | Large Storage RE 0.77/Input 100000/75gal/Stby 0.03 | Pass      | 49.80              | 49.80              | 0.00%              | Yes              | 47.20                                 | 47.20              | 47.20              | 0.00%              | Yes              | U01R12                 | -2.60                   |
| U08        | R07   | Electric Resistance EF 0.92/Input 4500             | Pass      | 56.70              | 56.70              | 0.00%              | Yes              | 47.30                                 | 47.30              | 47.30              | 0.00%              | Yes              | U01R12                 | -9.40                   |
| U08        | R08   | Heat Pump EF 2.4/Input 4500                        | Pass      | 48.50              | 48.50              | 0.00%              | Yes              | 47.30                                 | 47.30              | 47.30              | 0.00%              | Yes              | U01R12                 | -1.20                   |
| U08        | R09   | 2 Water Heaters using Multiplier                   | Pass      | 44.80              | 44.80              | 0.00%              | Yes              | 47.20                                 | 47.20              | 47.20              | 0.00%              | Yes              | U01R12                 | 2.40                    |
| U08        | R10   | 2 Water Heaters Using 2 entries                    | Pass      | 44.80              | 44.80              | 0.00%              | Yes              | 47.20                                 | 47.20              | 47.20              | 0.00%              | Yes              | U01R12                 | 2.40                    |
| Result U08 |   |  | Pass      | 47.08              | 47.08              | 0.00%              |                  | 47.22                                 | 47.22              | 47.22              | 0.00%              |                  | Min<br>Ave<br>Max      | 0.00%<br>0.00%<br>0.14  |
|            |   |  |           |                    |                    |                    |                  | Standard = T01 Standard for this test |                    |                    |                    |                  |                        |                         |
| U09        | Multiple Orientation in Zone 12 for Prototype S2100ft2/P2100ft2 |  |           |                    |                    |                    |                  |                                       |                    |                    |                    |                  |                        |                         |
| U09        | R01   | Single Standard Front 45                           | Pass      | 47.80              | 47.80              | 0.00%              | Yes              | 47.20                                 | 47.20              | 47.20              | 0.00%              | Yes              | U01R12                 | -0.60                   |
| U09        | R02   | East Standard                                      | Pass      | 47.20              | 47.20              | 0.00%              | Yes              | 47.20                                 | 47.20              | 47.20              | 0.00%              | Yes              | U01R12                 | 0.00                    |
| U09        | R03   | South Standard                                     | Pass      | 47.20              | 47.20              | 0.00%              | Yes              | 47.20                                 | 47.20              | 47.20              | 0.00%              | Yes              | U01R12                 | 0.00                    |
| U09        | R04   | West Standard                                      | Pass      | 47.20              | 47.20              | 0.00%              | Yes              | 47.20                                 | 47.20              | 47.20              | 0.00%              | Yes              | U01R12                 | 0.00                    |
| U09        | R05   | North Standard                                     | Pass      | 47.20              | 47.20              | 0.00%              | Yes              | 47.20                                 | 47.20              | 47.20              | 0.00%              | Yes              | U01R12                 | 0.00                    |
| U09        | R06   | Single Proposed front 45                           | Pass      | 47.70              | 47.70              | 0.00%              | Yes              | 47.20                                 | 47.20              | 47.20              | 0.00%              | Yes              | U01R12                 | -0.50                   |
| U09        | R07   | East Proposed                                      | Pass      | 48.60              | 48.60              | 0.00%              | Yes              | 47.20                                 | 47.20              | 47.20              | 0.00%              | Yes              | U01R12                 | -1.40                   |
| U09        | R08   | South Proposed                                     | Pass      | 48.60              | 48.60              | 0.00%              | Yes              | 47.20                                 | 47.20              | 47.20              | 0.00%              | Yes              | U01R12                 | -1.40                   |
| U09        | R09   | West Proposed                                      | Pass      | 48.60              | 48.60              | 0.00%              | Yes              | 47.20                                 | 47.20              | 47.20              | 0.00%              | Yes              | U01R12                 | -1.40                   |
| U09        | R10   | North Proposed                                     | Pass      | 48.60              | 48.60              | 0.00%              | Yes              | 47.20                                 | 47.20              | 47.20              | 0.00%              | Yes              | U01R12                 | -1.40                   |
| Result U09 |   |  | Pass      | 47.87              | 47.87              | 0.00%              |                  | 47.20                                 | 47.20              | 47.20              | 0.00%              |                  | Min<br>Ave<br>Max      | 0.00%<br>0.00%<br>-0.67 |

# Comparison between Reference & Candidate Software (EDR)

Comparison Date: 7/21/2017  
 Comparison Author: Ken Nittler  
 Candidate Software: CBECC-Res SVN 916

| Test       | Run | Description  | Pass/Fail | Reference Proposed | Candidate Proposed | Percent Difference | Within Tolerance | Standard Equals                 | Reference Standard | Candidate Standard | Percent Difference | Within Tolerance | Standard Equals Lookup | Margin                 |
|------------|-----|--|-----------|--------------------|--------------------|--------------------|------------------|---------------------------------|--------------------|--------------------|--------------------|------------------|------------------------|------------------------|
| U10        |     | Multi Family Water Heating in Zone 12 for Prototype P6960ft2 |           |                    |                    |                    |                  | Standard = Varies for this test |                    |                    |                    |                  |                        |                        |
| U10        | R01 | 8 Storage  | Pass      | 60.10              | 60.10              | 0.00%              | Yes              | 57.90                           | 57.90              | 57.90              | 0.00%              | Yes              | U06R12                 | -2.20                  |
| U10        | R02 | 8 Storage 2 Systems  | Pass      | 60.10              | 60.10              | 0.00%              | Yes              | 57.90                           | 57.90              | 57.90              | 0.00%              | Yes              | U06R12                 | -2.20                  |
| U10        | R03 | 8 LgStor   | Pass      | 63.20              | 63.20              | 0.00%              | Yes              | 57.90                           | 57.90              | 57.90              | 0.00%              | Yes              | U06R12                 | -5.30                  |
| U10        | R04 | 2 LgStor Central Solar                                       | Pass      | 57.90              | 57.90              | 0.00%              | Yes              | 60.40                           | 60.40              | 60.40              | 0.00%              | Yes              | U10R04                 | 2.50                   |
| U10        | R05 | 2 LgStor Central Solar Recirc                                | Pass      | 57.30              | 57.30              | 0.00%              | Yes              | 59.70                           | 59.70              | 59.70              | 0.00%              | Yes              | U10R05                 | 2.40                   |
| U10        | R06 | 2 LgStor Central Recirc                                      | Pass      | 59.30              | 59.30              | 0.00%              | Yes              | 59.70                           | 59.70              | 59.70              | 0.00%              | Yes              | U10R05                 | 0.40                   |
| U10        | R07 | 2 SmInstantant Central Solar                                 | Pass      | 57.60              | 57.60              | 0.00%              | Yes              | 60.20                           | 60.20              | 60.20              | 0.00%              | Yes              | U10R07                 | 2.60                   |
| U10        | R08 | 2 SmInstantant Central Solar Recirc                          | Pass      | 56.80              | 56.80              | 0.00%              | Yes              | 59.30                           | 59.30              | 59.30              | 0.00%              | Yes              | U10R08                 | 2.50                   |
| U10        | R09 | 1 Indirect Central Solar                                     | Pass      | 57.70              | 57.70              | 0.00%              | Yes              | 59.90                           | 59.90              | 59.90              | 0.00%              | Yes              | U10R09                 | 2.20                   |
| U10        | R10 | 1 Indirect Central Solar Recirc                              | Pass      | 57.00              | 57.00              | 0.00%              | Yes              | 59.00                           | 59.00              | 59.00              | 0.00%              | Yes              | U10R10                 | 2.00                   |
| Result U10 |     |  | Pass      | 58.70              | 58.70              | 0.00%              |                  | 59.19                           | 59.19              | 59.19              | 0.00%              |                  | Min<br>Ave<br>Max      | 0.00%<br>0.00%<br>0.49 |
| U11        |     | Source Energy in Zone 12 for Prototype P2100ft2              |           |                    |                    |                    |                  | Standard = Varies for this test |                    |                    |                    |                  |                        |                        |
| U11        | R01 | Package  | Pass      | 44.80              | 44.80              | 0.00%              | Yes              | 47.20                           | 47.20              | 47.20              | 0.00%              | Yes              | U04R12                 | 2.40                   |
| U11        | R02 | Package No Natural Gas                                       | Pass      | 47.90              | 47.90              | 0.00%              | Yes              | 50.00                           | 50.00              | 50.00              | 0.00%              | Yes              | U11R02                 | 2.10                   |
| U11        | R03 | Electric DHW   | Pass      | 55.00              | 55.00              | 0.00%              | Yes              | 47.30                           | 47.30              | 47.30              | 0.00%              | Yes              | U04R12                 | -7.70                  |
| U11        | R04 | Electric DHW no Natural Gas                                  | Pass      | 58.60              | 58.60              | 0.00%              | Yes              | 56.40                           | 56.40              | 56.40              | 0.00%              | Yes              | U11R02                 | -2.20                  |
| U11        | R05 | Heatpump DHW   | Pass      | 45.70              | 45.70              | 0.00%              | Yes              | 47.30                           | 47.30              | 47.30              | 0.00%              | Yes              | U04R12                 | 1.60                   |
| U11        | R06 | Heatpump DHW no Natural Gas                                  | Pass      | 50.90              | 50.90              | 0.00%              | Yes              | 56.40                           | 56.40              | 56.40              | 0.00%              | Yes              | U11R02                 | 5.50                   |
| U11        | R07 | Heatpump HVAC  | Pass      | 44.30              | 44.30              | 0.00%              | Yes              | 46.80                           | 46.80              | 46.80              | 0.00%              | Yes              | U11R07                 | 2.50                   |
| U11        | R08 | Heatpump HVAC no Natural Gas                                 | Pass      | 45.70              | 45.70              | 0.00%              | Yes              | 47.80                           | 47.80              | 47.80              | 0.00%              | Yes              | U11R08                 | 2.10                   |
| U11        | R09 | Heatpump HVAC & DHW  | Pass      | 45.10              | 45.10              | 0.00%              | Yes              | 46.90                           | 46.90              | 46.90              | 0.00%              | Yes              | U11R07                 | 1.80                   |
| U11        | R10 | Heatpump HVAC & DHW no Natural Gas                           | Pass      | 48.60              | 48.60              | 0.00%              | Yes              | 54.90                           | 54.90              | 54.90              | 0.00%              | Yes              | U11R08                 | 6.30                   |
| Result U11 |     |  | Pass      | 48.66              | 48.66              | 0.00%              |                  | 50.10                           | 50.10              | 50.10              | 0.00%              |                  | Min<br>Ave<br>Max      | 0.00%<br>0.00%<br>1.44 |
| U12        |     | E+A+A Base & Windows in Zone 12 for Prototype P1665ft2       |           |                    |                    |                    |                  | Standard = Varies for this test |                    |                    |                    |                  |                        |                        |
| U12        | R01 | E 1440ft2 as New Construction                                | Pass      | 0.00               | 0.00               | 0.00%              | Yes              | 0.00                            | 0.00               | 0.00               | 0.00%              | Yes              | U12R01                 | 0.00                   |
| U12        | R02 | E 1440ft2 as Addition/Alteration                             | Pass      | 0.00               | 0.00               | 0.00%              | Yes              | 0.00                            | 0.00               | 0.00               | 0.00%              | Yes              | U12R02                 | 0.00                   |
| U12        | R03 | EA 1665ft2   | Pass      | 0.00               | 0.00               | 0.00%              | Yes              | 0.00                            | 0.00               | 0.00               | 0.00%              | Yes              | U12R03                 | 0.00                   |
| U12        | R04 | EAA Ceiling R38 Verified                                     | Pass      | 0.00               | 0.00               | 0.00%              | Yes              | 0.00                            | 0.00               | 0.00               | 0.00%              | Yes              | U12R03                 | 0.00                   |
| U12        | R05 | EAA Ceiling R38 Verified Wind U0.41/S0.36                    | Pass      | 0.00               | 0.00               | 0.00%              | Yes              | 0.00                            | 0.00               | 0.00               | 0.00%              | Yes              | U12R05                 | 0.00                   |
| U12        | R06 | EAA Ceiling R38 Verified Wind U0.41/S0.36 Verified           | Pass      | 0.00               | 0.00               | 0.00%              | Yes              | 0.00                            | 0.00               | 0.00               | 0.00%              | Yes              | U12R05                 | 0.00                   |
| U12        | R07 | EAA Ceiling R38 Verified Wind U0.40/S0.35                    | Pass      | 0.00               | 0.00               | 0.00%              | Yes              | 0.00                            | 0.00               | 0.00               | 0.00%              | Yes              | U12R05                 | 0.00                   |
| U12        | R08 | EAA Ceiling R38 Verified Wind U0.40/S0.35 Verified           | Pass      | 0.00               | 0.00               | 0.00%              | Yes              | 0.00                            | 0.00               | 0.00               | 0.00%              | Yes              | U12R03                 | 0.00                   |
| U12        | R09 | EAA Ceiling R38 Verified Wind U0.39/S0.34                    | Pass      | 0.00               | 0.00               | 0.00%              | Yes              | 0.00                            | 0.00               | 0.00               | 0.00%              | Yes              | U12R05                 | 0.00                   |
| U12        | R10 | EAA Ceiling R38 Verified Wind U0.39/S0.34 Verified           | Pass      | 0.00               | 0.00               | 0.00%              | Yes              | 0.00                            | 0.00               | 0.00               | 0.00%              | Yes              | U12R03                 | 0.00                   |
| Result U12 |     |  | Pass      | n/a                | n/a                | n/a                |                  | n/a                             | n/a                | n/a                | n/a                |                  | Min<br>Ave<br>Max      | 0.00%<br>0.00%<br>0.00 |

## Comparison between Reference & Candidate Software (EDR)

Comparison Date: 7/21/2017  
 Comparison Author: Ken Nittler  
 Candidate Software: CBECC-Res SVN 916

| Test   | Run  | Description                                   | Pass/Fail | Reference<br>Proposed | Candidate<br>Proposed | Percent<br>Difference | Within<br>Tolerance | Standard<br>Equals              | Reference<br>Standard | Candidate<br>Standard | Percent<br>Difference | Within<br>Tolerance | Standard<br>Equals<br>Lookup | Margin         |
|--------|--|---|-----------|-----------------------|-----------------------|-----------------------|---------------------|---------------------------------|-----------------------|-----------------------|-----------------------|---------------------|------------------------------|----------------|
| U13    | E+A+A Walls & HVAC in Zone 12 for Prototype P1665ft2 |   |           |                       |                       |                       |                     | Standard = Varies for this test |                       |                       |                       |                     |                              |                |
| U13    | R01  | EAA Ceiling R38 Verified Wall R11             | Pass      | 0.00                  | 0.00                  | 0.00%                 | Yes                 | 0.00                            | 0.00                  | 0.00                  | 0.00%                 | Yes                 | U13R01                       | 0.00           |
| U13    | R02  | EAA Ceiling R38 Verified Wall R11 Verified    | Pass      | 0.00                  | 0.00                  | 0.00%                 | Yes                 | 0.00                            | 0.00                  | 0.00                  | 0.00%                 | Yes                 | U13R01                       | 0.00           |
| U13    | R03  | EAA Ceiling R38 Verified Wall R13             | Pass      | 0.00                  | 0.00                  | 0.00%                 | Yes                 | 0.00                            | 0.00                  | 0.00                  | 0.00%                 | Yes                 | U13R01                       | 0.00           |
| U13    | R04  | EAA Ceiling R38 Verified Wall R13 Verified    | Pass      | 0.00                  | 0.00                  | 0.00%                 | Yes                 | 0.00                            | 0.00                  | 0.00                  | 0.00%                 | Yes                 | U12R03                       | 0.00           |
| U13    | R05  | EAA Ceiling R38 Verified HVAC Worse           | Pass      | 0.00                  | 0.00                  | 0.00%                 | Yes                 | 0.00                            | 0.00                  | 0.00                  | 0.00%                 | Yes                 | U13R05                       | 0.00           |
| U13    | R06  | EAA Ceiling R38 Verified HVAC Worse Verified  | Pass      | 0.00                  | 0.00                  | 0.00%                 | Yes                 | 0.00                            | 0.00                  | 0.00                  | 0.00%                 | Yes                 | U13R05                       | 0.00           |
| U13    | R07  | EAA Ceiling R38 Verified HVAC Equal           | Pass      | 0.00                  | 0.00                  | 0.00%                 | Yes                 | 0.00                            | 0.00                  | 0.00                  | 0.00%                 | Yes                 | U13R05                       | 0.00           |
| U13    | R08  | EAA Ceiling R38 Verified HVAC Equal Verified  | Pass      | 0.00                  | 0.00                  | 0.00%                 | Yes                 | 0.00                            | 0.00                  | 0.00                  | 0.00%                 | Yes                 | U12R03                       | 0.00           |
| U13    | R09  | EAA Ceiling R38 Verified HVAC Better          | Pass      | 0.00                  | 0.00                  | 0.00%                 | Yes                 | 0.00                            | 0.00                  | 0.00                  | 0.00%                 | Yes                 | U13R05                       | 0.00           |
| U13    | R10  | EAA Ceiling R38 Verified HVAC Better Verified | Pass      | 0.00                  | 0.00                  | 0.00%                 | Yes                 | 0.00                            | 0.00                  | 0.00                  | 0.00%                 | Yes                 | U12R03                       | 0.00           |
| Result | U13  |   | Pass      | n/a                   | n/a                   | n/a                   |                     | n/a                             | n/a                   | n/a                   |                       | n/a                 | Min<br>Max                   | 0.00%<br>0.00% |