

November 21, 2012

California Energy Commission
Dockets Office, MS-4
1516 Ninth Street
Sacramento CA 95814-5512
Via email: [docket@energy.state.ca.us]

California Energy Commission

DOCKETED

12-BSTD-6

TN # 68649

NOV 21 2012

To: Mazi Shirakh

SUBJECT: Docket number: 12-BTSD-06

Proposed Wall Assemblies

ConSol proposes the following additional assemblies to be added to the Joint Appendix 4 and the residential manual in order to increase diversity of wall assembly practice, give builders choices in the field, and encourage advanced construction techniques in the market as California moves toward zero energy homes.

ASSEMBLY 1

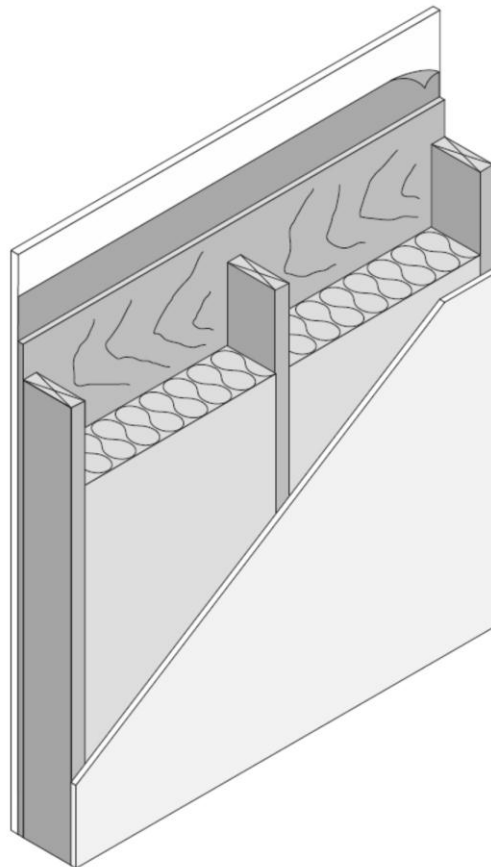


Figure 4.x.x - Wood Framed Wall 2x6 24" o.c.

| Assembly Type: Wall 2x6 24 in. o.c. | | R-Value | |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------|-------------------------------|------------------------------|
| | Framing Material: Wood | Framing Factor: | 22 |
| | <u>Assembly Components</u> | Cavity (R_c) | Frame (R_f) |
| | Outside air film | 0.17 | 0.17 |
| 1 | 7/8 inch 3-coat stucco | 0.18 | 0.18 |
| 2 | 3/8" Sheathing | 0.47 | 0.47 |
| 3 | Building paper (felt) | 0.06 | 0.06 |
| 4 | R-21 insulation | 21 | -- |
| 5 | 2x6 inch doug fir framing at@ R-1.086 per inch | -- | 5.973 |
| 6 | 0.50 inch gypsum board | 0.45 | 0.45 |
| | Inside air film | 0.68 | 0.68 |
| | Subtotal | 23.01 | 7.983 |
| | $\frac{1}{R_c} \times (1 - (\text{Frame\%} / 100)) + [(1/R_f) \times (\text{Frame\%} / 100)] = \text{Assembly U-Factor}$ | Assembly U-Factor: | 0.061 |

Assumptions: Values in this table were calculated using the parallel heat flow calculation method, documented in the 2009 ASHRAE Handbook of Fundamentals. The construction assembly assumes an exterior air film of R-0.17, a 7/8 inch layer of stucco of R-0.18 (SC01), building paper of R-0.06 (BP01), a sheathing or continuous insulation layer if present, the cavity insulation / framing layer, ½ inch gypsum board of R-0.45 (GP01), and an interior air film 0.68. The framing factor is assumed to be 25 percent for 16 inch stud spacing, 22 percent for 24 inch spacing, and 17 percent for Advanced Wall Framing (AWF). Foam plastic and cellulose are assumed to entirely fill the cavity and have a thermal resistance of R-3.6 per inch. Actual cavity depth is 3.5 inch for 2x4, 5.5 inch for 2x6. The thickness of the stucco is assumed to be reduced to 3/8 inch (R-0.08) when continuous insulation is applied.

ASSEMBLY 2

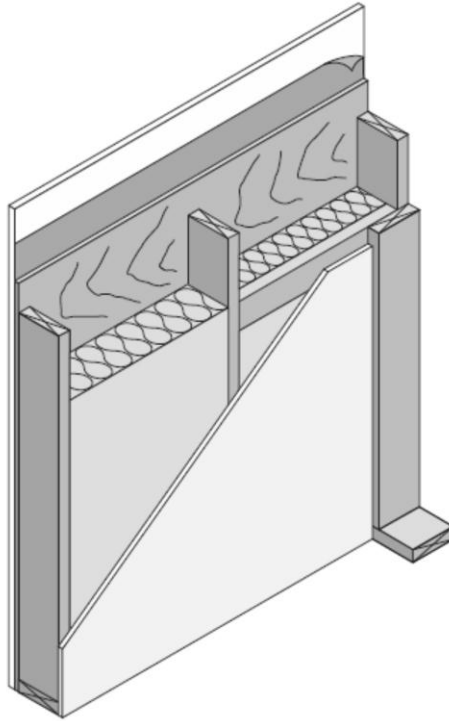


Figure 4.x.x - Wood Framed Wall 2x6 24" o.c., AWF, 2 stud corner

| Assembly Type: Wall 2x6 24 in. o.c AWS | | R-Value | |
|----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|--------------------------|-------------------------|
| Framing Material: Wood | | Framing Factor: | 17 |
| Assembly Components | | Cavity (R _c) | Frame (R _f) |
| Outside air film | | 0.17 | 0.17 |
| 1 | 7/8 inch 3-coat stucco | 0.18 | 0.18 |
| 2 | 3/8" Sheathing | 0.47 | 0.47 |
| 3 | Building paper (felt) | 0.06 | 0.06 |
| 4 | R-21 insulation | 21 | -- |
| 5 | 2x6 inch doug fir framing at@ R-1.086 per inch | -- | 5.973 |
| 6 | 0.50 inch gypsum board | 0.45 | 0.45 |
| Inside air film | | 0.68 | 0.68 |
| Subtotal | | 23.01 | 7.983 |
| $\frac{1}{R_c} \times (1 - (\text{Frame\%} / 100)) + [(1/R_f) \times (\text{Frame\%} / 100)] = \text{Assembly U-Factor}$ | | Assembly U-Factor: | 0.057 |

Assumptions: Values in this table were calculated using the parallel heat flow calculation method, documented in the 2009 ASHRAE Handbook of Fundamentals. The construction assembly assumes an exterior air film of R-0.17, a 7/8 inch layer of stucco of R-0.18 (SC01), building paper of R-0.06 (BP01), a sheathing or continuous insulation layer if present, the cavity insulation / framing layer, ½ inch gypsum board of R-0.45 (GP01), and an interior air film 0.68. The framing factor is assumed to be 25 percent for 16 inch stud spacing, 22 percent for 24 inch spacing, and 17 percent for Advanced Wall Framing (AWF). Foam plastic and cellulose are assumed to entirely fill the cavity and have a thermal resistance of R-3.6

per inch. Actual cavity depth is 3.5 inch for 2x4, 5.5 inch for 2x6. The thickness of the stucco is assumed to be reduced to 3/8 inch (R-0.08) when continuous insulation is applied.

ASSEMBLY 3

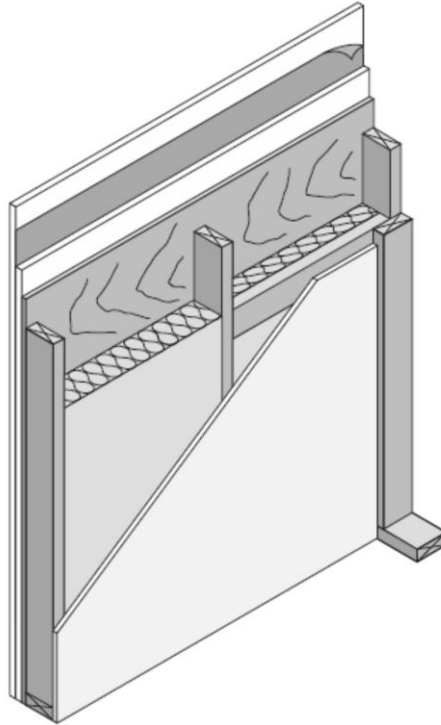


Figure 4.x.x - Wood Framed Wall 2x4 24" o.c. AWF

| Assembly Type: Wall 2x4 24 in. o.c. AWS | | R-Value | |
|------------------------------------------------------------------------------------------------------|------------------------------------------------|-------------------------------|------------------------------|
| Framing Material: Wood | | Framing Factor: | 17 |
| <u>Assembly Components</u> | | Cavity (R_c) | Frame (R_f) |
| Outside air film | | 0.17 | 0.17 |
| 1 | 1-coat stucco | 0.08 | 0.08 |
| | 1/2" EPS | 2 | 2 |
| 2 | 7/16" Wood structural panels | 0.62 | 0.62 |
| 3 | Building paper (felt) | 0.06 | 0.06 |
| 4 | R-15 insulation | 15 | -- |
| 5 | 2x4 inch doug fir framing at@ R-1.086 per inch | -- | 3.801 |
| 6 | 0.50 inch gypsum board | 0.45 | 0.45 |
| Inside air film | | 0.68 | 0.68 |
| <i>Subtotal</i> | | 19.06 | 7.861 |
| 1/R _c X (1-(Frame% / 100))] + [(1/R _f) X (Frame% / 100)] = Assembly U-Factor | | Assembly U-Factor: | 0.065 |

Assumptions: Values in this table were calculated using the parallel heat flow calculation method,

documented in the 2009 ASHRAE Handbook of Fundamentals. The construction assembly assumes an exterior air film of R-0.17, a 7/8 inch layer of stucco of R-0.18 (SC01), building paper of R-0.06 (BP01), a sheathing or continuous insulation layer if present, the cavity insulation / framing layer, ½ inch gypsum board of R-0.45 (GP01), and an interior air film 0.68. The framing factor is assumed to be 25 percent for 16 inch stud spacing, 22 percent for 24 inch spacing, and 17 percent for Advanced Wall Framing (AWF). Foam plastic and cellulose are assumed to entirely fill the cavity and have a thermal resistance of R-3.6 per inch. Actual cavity depth is 3.5 inch for 2x4, 5.5 inch for 2x6. The thickness of the stucco is assumed to be reduced to 3/8 inch (R-0.08) when continuous insulation is applied.

ConSol looks forward to continuing to work with the CEC regarding these and other building assemblies to improve the Standards and Manuals and to improve building practices in California.

Regards,

A handwritten signature in black ink, reading "Deborah Stanescu". The signature is written in a cursive, flowing style.

Deborah Stanescu

CC: Andrew McAllister, Presiding Member, Energy Committee
Karen Douglas, CEC Commissioner
Robert Oglesby, CEC Executive Director
Mazi Shirakh, Staff Lead, 2013 Residential Building Efficiency Standards