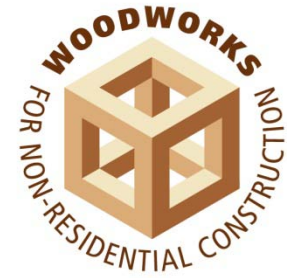


March 2010



Errata to the WoodWorks Design Example: Four-story Wood-frame Structure over Podium Slab

Readers of the WoodWorks design example, Four-story Wood-frame Structure over Podium Slab, should be aware of the following errors and/or comments related to the original text.

Content Errors

1. **Page 8 of the design example states:**

The American Forest & Paper Association (AF&PA) has tested a number of wood-frame fire-rated assemblies. There is a disparity between the IBC and publications such as AF&PA's *Fire-Rated Wood-Frame Wall and Floor/Ceiling Assemblies*, which does not require the reduction in allowable stress. The building's architect and/or engineer should check with the local jurisdiction to determine the accepted approach. The AF&PA procedure is detailed at:

<http://www.awc.org/pdf/CalculatingtheSuperimposedLoadonWoodFrameWalls.pdf>.

The corrected information is as follows:

Fire-rated assemblies can be found in a number of sources including the IBC, the Underwriters Laboratories (UL) *Fire-resistance-rated Systems and Products*, the UL *Fire Resistance Directory*, the Gypsum Association's *Fire Resistance Design Manual*, and the American Forest & Paper Association's (AF&PA) *DCA 3: Fire-Rated Wood-Frame Wall and Floor/Ceiling Assemblies*.

Table 720.1(2) of the IBC lists fire ratings for various wall construction types. Both the architect and engineer should be aware that some of the wall construction types using wood construction reference footnote 'm.' Footnote 'm' of the table requires the reduction of $F'c$ to be 78 percent of the allowable when the slenderness ratio $le/d > 33$.

The American Forest & Paper Association (AF&PA) has tested a number of wood-frame fire rated assemblies that do not require the reduction and are included in IBC Table 720.1(2). A description of these wall assemblies is contained in DCA 3. Loads were calculated per ASTM D6513 and discussed in a paper located at:

<http://www.awc.org/pdf/CalculatingtheSuperimposedLoadonWoodFrameWalls.pdf>.

2. **Page 27 of the design example states:**

A 2x4 sole plate (sill plate) will be used at the base of the shear wall. There is a discrepancy between the IBC and the SDPWS on 3x nominal framing requirements:

Footnote e in IBC Table 2306.4.1 reads:

Framing at adjoining panel edges shall be 3 inches nominal or wider, and nails shall be staggered where nails are 2 inches o.c.

SDPWS section 4.3.7.1, item 3c, states that:

3x nominal framing is required when the required nominal shear capacity exceeds 700 plf in Seismic Design Category (SDC) D, E or F.

The corrected information is as follows:

A 2x4 sole plate (bottom plate) will be used at the base of the shear wall. There is a discrepancy between the IBC and the American Wood Council's *Special Design Provisions for Wood and Seismic* (SDPWS) on 3x nominal framing requirements:

Footnote i in IBC Table 2306.4.1 reads:

In Seismic Design Category D, E or F, where shear design values exceed 350 pounds per linear foot, all members receiving edge nailing from abutting panels shall not be less than a single 3-inch nominal member, or two 2-inch nominal members fastened together in accordance with Section 2306.1 to transfer the design shear value between framing members. Wood structural panel joint and sill plate nailing shall be staggered in all cases. See Section 2305.3.11 for sill plate size and anchorage requirements.

SDPWS section 4.3.7.1, item 3c, states that:

3x nominal framing is required when the required nominal shear capacity exceeds 700 plf in Seismic Design Category (SDC) D, E or F.

For a foundation sill plate, a 3x nominal framing member is required when:

ASD Design:

IBC 2305.3.11: 350 plf

SDPWS section 4.3.7.1: $700 \text{ plf} / 2.0 = 350 \text{ plf}$

The discrepancy is when LRFD design is used:

LRFD Design:

IBC 2305.3.11: 490 plf

The above discrepancy is based on code reference to an outdated standard, ASCE 16-95. Design values for shear walls and diaphragms in ASCE 16-95 are based on a "soft-conversion" tied to seismic loads per ASCE 7-93, not the newer ASCE 7 load combinations.

SDPWS section 4.3.7.1.: $700 \text{ plf}(0.8) = 560 \text{ plf}$

Another discrepancy is for a sole plate on a framed floor:

IBC Table 2306.4.1 footnotes e, f, and i pertain to members receiving edge nailing from abutting panels, therefore do not apply and hence a 2x nominal member is acceptable.

SDPWS section 4.3.7.1 applies to all boundaries, panel edges and intermediate supports, leaving the question—Does the sill plate and all intermediate supports need to be 3x nominal members when the nominal unit shear capacity exceeds 700 plf in seismic Design Category D, E or F?

A Note about Reference Documents

Please note that the design example is based on the *2006 International Building Code* and related documents such as the American Wood Council's *2005 National Design Specification® (NDS®) for Wood Construction* and the *2005 Special Design Provisions for Wind and Seismic (SDPWS)*. Certain discrepancies have arisen with regard to later documents, and readers are advised to check with their local jurisdictions when completing similar work.

Typographical Errors

The following errors have been corrected on the electronic version of the design example, but not on the printed copies.

Page 1, Codes and Reference Documents Used – the *2005 Special Design Provisions for Wind and Seismic (SDPWS)* was added.

Page 5, Species of Lumber – the correct acronym for Southern Yellow Pine is SYP.

Page 34, under 6h – the two equations related to the members' span between the top of the 2x4 sill plate and the underside of the 4x4 top plate should begin with l_e .

Page 35 – the third equation should include an asterisk after the subscript c as follows:

$$F_c E / F_c^* = \frac{478.4}{2,520} = 0.1898$$

Page 35 – the equation under “FOR A 4x8 POST” should be as follows:

$$P_{allow} = A \times F'_c = 25.375 \times 458 = 11,620 \text{ lbs}$$

Page 36, Table 11 – the first number under Allow Rod Capacity should be .75.