2006 IBC Permits Wood Framing to Support Structural Concrete

By Buddy Showalter, P.E.

One important change to the *2006 International Building Code* (2006 IBC) will permit wood framing to support structural concrete. The code change initiated by the American Forest & Paper Association (AF&PA) and supported by the National Council of Structural Engineers Associations (NCSEA) was approved during the 2003/2004 code change cycle.

The new text reads as follows and replaces *2003 IBC* 2304.12 in its entirety:

2304.12 *Long-term loading. Horizontal wood members supporting concrete, masonry, glass block, brick veneer, or similar materials, shall be checked for the effects of long-term loading using the provisions of the NDS®. The total deflection, including the effects of long-term loading, shall be limited in accordance with 1604.3 for these supported materials.*

Exception: Horizontal wood members supporting masonry or concrete nonstructural floor or roof surfacing not more than 4 inches (102mrn) thick need not be checked for long-term loading.

The previous restriction on wood framing supporting structural concrete was a carry-over from the *1997 Uniform Building Code*. Neither of the other two legacy model building codes prohibited the use of wood framing supporting concrete or masonry. Apparently these provisions were in response to concerns about creep in horizontal wood members. Section 3.5.2 and Appendix F of the *National Design Specification® (NDS) for Wood Construction* contain provisions to account for time dependent deformations (creep).

Tabulated modulus of elasticity design values, E, in the *NDS* are intended for the calculation of immediate deformation under load. Under sustained loading, additional time dependent deflection (creep) occurs in wood members, which usually develops at a slow but persistent rate over long periods of time. Where dead loads or sustained live loads represent a relatively high percentage of total design load, creep is a design consideration and is handled by these provisions in the *NDS*. In such situations, the total deflection under long-term loading is estimated by increasing the initial deflection associated with the long-term load component by 1.5 for seasoned lumber, or 2.0 for unseasoned or wet lumber or glued laminated timber. This provision was introduced in the 1971 *NDS* as a general criterion to limit long-term deflection. The values were revised to 1.5 for seasoned lumber and 2.0 for unseasoned material in the 1977 *NDS*.

Photo courtesy of Swirnow Structures, LLC

Proposed changes to the existing provision clarify the intent of this section and provide a means of designing for and limiting long-term deflections using the *NDS*, rather than providing a list of prohibited applications and exceptions to the list.

Russell Boellner, Vice President of Production for Swirnow Building Systems, was very pleased with the change. Swirnow's Hambro® Composite Floor System employs a continuous one-way concrete slab that can now be used in applications where they were previously prohibited. The slab carries loads transversely to joists, and is often required to act as a diaphragm carrying lateral loads to shear walls or other elements. Boellner remarked, "A number of large national builders like to use wood framing, and recognize the advantages provided by a composite system like Hambro joists and concrete. Such a system on wood combines the benefits of wood stud walls and the sound and fire ratings of a composite concrete floor."▪

John "Buddy" Showalter, P.E., joined the American Forest & Paper Association staff in 1992, and serves as Director of Technical Media for the American Wood Council (AWC). Responsibilities at AWC include development of design tools like: the Allowable Stress Design (ASD) Manual for Engineered Wood Construction, which includes the National Design Specification® for Wood Construction (NDS®), and other technical media. ***(www.awc.org)***