Tech Notes SBCA

Changes in the 2007 Supplement to the 2006 International Building Code That Affect Component Manufacturers

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Introduction:

Building codes are continually evolving. They are never static. In many ways, they resemble living organisms in that they must continually change to work within their environment. As new technology is developed and research is conducted our understanding of the built environment changes. As a result, we update our building codes to reflect advances in technology and our understanding of the world around us to assure life safety and property protection.

Issue:

Component Manufacturers operate in an environment in which they are continually faced with the issue of understanding building codes as they apply to the manufacturing of building components. This *Tech Note* provides the basis for understanding the changes that have been included in the *2007 Supplement to the 2006 International Building Code* (*IBC*) (*Supplement*). The language included in the supplement will form the basis on which the *2009 IBC* will be built. Typically, the changes in the *Supplement* are presented as clarifications to the existing code that have been found by users attempting to implement the code language or there have been technological advances within the building industry that should be added to the existing code language.

Industry Recommendation:

Component Manufacturers who are familiar with these language clarifications and added technological advancements can and should use the *Supplement* to support implementation of IBC code language.

WTCA recommends that Component Manufacturers encourage state and local jurisdictions to adopt the following revisions when structural building components are designed to the *IBC* (see Appendix for the specific 2007 *Supplement* language that should be adopted and related background information):

- Table 1607.1 *(Minimum uniformly distributed live loads and minimum concentrated live loads)*: Balconies and decks, once in their own separate categories, were combined into one category and now are required to be loaded with the same load as the occupancy that they serve.
- Section 1611.1 *(Design rain loads)*: Language was added to clarify how to determine the magnitude of the rain load that needs to be applied to the structure. New contour maps (Figure 1611.1) based on the 100 year hourly rainfall rate have been added to give the user direction.
- Chapter 17 *(Special inspections)*: A phrase was added to the "Fabricated Item" definition to recognize quality control programs in accordance with a standard listed in Chapter 35 that provide requirements for 3rd party quality control inspections. *ANSI/TPI 1* is listed in Chapter 35 and *ANSI/TPI 1* chapter 3 provides the "Quality Criteria for the Manufacture of Metal Plate Connected Wood Trusses." This change helps clarify and permits the current third party quality assurance practice that has been used by the truss industry for 50 years to effectively meet any special inspection requirements provided in Section 17 of the *IBC*.
- Section 2303.4 *(Trusses)*: Most of the changes within this section were done to clarify existing requirements of the *IBC* by providing reorganized sections so that the language is clearer. The *Supplement* language intends to make the *IBC*'s intentions easier to understand and implement.

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- Section 2303.4.6 *(Metal-plate-connected trusses)*: Language was added to clarify truss job site inspections and special inspection concepts.
- Section 2304.6.1 *(Wood structural panel sheathing)*: Section was modified to include a new Table (Table 2304.6.1) which provides the maximum allowable wind speed permitted for wood structural panel wall sheathing based on stud spacing and nailing.
- Section 2306.1 *(Allowable stress design)*: Section was modified to include the American Forest and Paper Association's (AF&PA) "Special Design Provisions for Wind and Seismic" (SDPWS) as a standard for allowable stress design.

Background & Analysis:

In each code cycle there are hundreds, if not thousands of changes to the text of the code. Many of these are simply editorial to provide clarity in sections that are difficult to understand or are frequently misinterpreted. Since the intent of the proponents is not always apparent, sections of code are often interpreted in ways the writer never envisioned. Likewise, as societal norms continue to change and evolve, understanding and application of the code are subject to new interpretations. The following discussion does not intend to provide reasoning for all of the code changes in this cycle. Only those that were deemed to be of greater importance to component manufacturers are discussed here. The code sections presented here are formatted to show new or changed text that has occurred from the *2006 IBC* to the *Supplement* as underlined, and without any text that has been removed from the *2006 IBC* to the *Supplement*. For simplicity, changes that only affect the numbering of sections are not shown. The complete text of the *Supplement* is available for purchase online from the International Code Council.[1]

Issues:

Chapter 16: Loading on Balconies & Decks, Rain Loads, Flood Elevation

Table 1607.1, Minimum Uniformly Distributed Live Loads and Minimum Concentrated Live Loads, has been modified. Balconies and decks, once in their own separate categories, have been combined into one category and are now required to be loaded with the same load as the occupancy that they serve. In the *2006 IBC*, balconies with an area of less than 100 square feet located in a residential area had a 60 psf minimum load. Otherwise, the minimum was 100 psf.

TABLE 1607.1
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS AND MINIMUM CONCENTRATED LIVE LOADS

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs.)
4. Assembly areas and theaters		
Fixed seats (fastened to floor)	60	____
Follow spot, projections, and control rooms	50	
Lobbies	100	
Movable seats	100	
Stages and platforms	125	
Other assembly areas	100	
5. Balconies (exterior) and decks[h]	Same as occupancy served	____
28. Residential		
One- and two-family dwellings		
Uninhabitable attics without storage[i]	10	
Uninhabitable attics with storage[i, j, k]	20	
Habitable attics and sleeping areas	30	____
All other areas	40	
Hotels and multifamily dwellings		
Private rooms and corridors serving them	40	
Public rooms and corridors serving them	100	

h. See Section 1604.8.3 for decks attached to exterior walls.
(Portions of table and footnotes not shown remain unchanged)

Language has been added to this section shown below on design rain loads to clarify how to determine the magnitude of the rain load that needs to be applied to the structure. New contour maps based on the 100 year hourly rainfall rate have been added to this section to give the user some direction.

> 1611.1 Design rain loads. Each portion of a roof shall be designed to sustain the load of rainwater that will accumulate on it if the primary drainage system for that portion is blocked plus the uniform load caused by water that rises above the inlet of the secondary drainage system at its design flow. The design rainfall shall

[1] www.iccsafe.org

be based on the 100- year hourly rainfall rate indicated in Figure 1611.1 or on other rainfall rates determined from approved local weather data.

Chapter 17: Definitions

In the definition of the term "Fabricated Item", the addition of a phrase recognizing referenced standards that provide requirements for quality control that are done under supervision of a third party quality control agency helps clarify and permit the current practice that effectively exempts trusses from the special inspection requirements of Section 1704. The *TPI 1-2002* standard is so referenced.

FABRICATED ITEM. Structural, load-bearing or lateral load-resisting assemblies consisting of materials assembled prior to installation in a building or structure, or subjected to operations such as heat treatment, thermal cutting, cold working or reforming after manufacture and prior to installation in a building or structure. Materials produced in accordance with standard specifications referenced by this code, such as rolled structural steel shapes, steel reinforcing bars, masonry units, and wood structural panels or in accordance with a standard, listed in Chapter 35, which provides requirements for quality control done under the supervision of a third party quality control agency shall not be considered fabricated items.

Chapter 23 on Wood: Trusses and Structural Panel Sheathing

There are many changes within Section 2303.4 on Trusses. Most of them are editorial in nature, meant to clarify existing requirements of the code by providing clearer language and reorganizing the sections. Of note, Section 2303.4.6 clarifies that truss job-site inspections shall be in compliance with Section 109.4 (replacing the former reference to Section 1704.6) as applicable, which helps solidify the fact that trusses are not subject to the special inspections of Section 1704.

2303.4.1.1 Truss design drawings. The written, graphic and pictorial depiction of each individual truss shall be provided to the building official for approval prior to installation. Truss design drawings shall also be provided with the shipment of trusses delivered to the job site. Truss design drawings shall include, at a minimum, the information specified below:

1. Slope or depth, span and spacing;
2. Location of all joints;
3. Required bearing widths;
4. Design loads as applicable;
   - 4.1. Top chord live load (including snow loads);
   - 4.2. Top chord dead load;
   - 4.3. Bottom chord live load;
   - 4.4. Bottom chord dead load;
   - 4.5. Concentrated loads and their points of application as applicable; and
   - 4.6. Controlling wind and earthquake loads as applicable.
5. Adjustments to wood member and metal connector plate design value for conditions of use;
6. Each reaction force and direction;
7. Metal connector plate type, size, and thickness or gage, and the dimensioned location of each metal connector plate except where symmetrically located relative to the joint interface;
8. Size, species and grade for each wood member;
9. Specific connection capacities or connection capacities required for:
   - 9.1. Truss to truss girder;
   - 9.2. Truss ply to ply; and
   - 9.3. Field assembly of a truss when the truss shown on the individual truss design drawing is supplied in separate pieces that will be field connected.
10. Calculated deflection ratio and maximum vertical and horizontal deflection for live and total load as applicable;
11. Maximum axial tension and compression forces in the truss members; and
12. Required permanent individual truss member restraint and method per Section 2303.4.1.2, unless a specific truss member permanent bracing plan for the roof or floor structural system is provided by a registered design professional.

2303.4.1.2 Permanent individual truss member restraint. Where permanent restraint of truss members is required on the truss design drawings, it shall be accomplished by one of the following methods:
1. The trusses shall be designed so that the buckling of any individual truss member is resisted internally by the individual truss through suitable means (i.e., buckling reinforcement by T-reinforcement or L-reinforcement). The buckling reinforcement of individual members of the trusses shall be installed as shown on the truss design drawing or on supplemental truss member buckling reinforcement details provided by the truss designer.
2. Permanent individual truss member restraint and diagonal bracing shall be installed using standard industry lateral restraint and diagonal bracing details in accordance with generally accepted engineering practice. Locations for lateral restraint shall be identified on the truss design drawing.

2303.4.1.3.1 Truss design drawings. Where required by the registered design professional, the building official, or the statutes of the jurisdiction in which the project is to be constructed, each individual truss design drawing shall bear the seal and signature of the truss designer.

Exceptions:

1. Where a cover sheet and truss index sheet are combined into a single sheet and attached to the set of truss design drawings, the single cover/truss index sheet is the only document required to be signed and sealed by the truss designer.
2. When a cover sheet and a truss index sheet are separately provided and attached to the set of truss design drawings, the cover sheet and the truss index sheet are the only documents required to be signed and sealed by the truss designer.

2303.4.4 Anchorage. Transfer of loads and anchorage of each truss to the supporting structure is the responsibility of the registered design professional.

2303.4.6 Metal-plate-connected trusses. In addition to Sections 2303.4.1 through 2303.4.5, the design, manufacture and quality assurance of metal-plate-connected wood trusses shall be in accordance with TPI 1. Job-site inspections shall be in compliance with Section 109.4 as applicable.

Section 2304.6.1 has been modified to include a new table (Table 2304.6.1) which provides the maximum allowable wind speed permitted for wood structural panel wall sheathing based on stud spacing and nailing.

2304.6.1 Wood structural panel sheathing. Where wood structural panel sheathing is used as the exposed finish on the exterior of outside walls, it shall have an exterior exposure durability classification. Where wood structural panel sheathing is used elsewhere, but not as the exposed finish, it shall be of a type manufactured with exterior glue (Exposure 1 or Exterior). Wood structural panel wall sheathing or siding used as structural sheathing shall be capable of resisting wind pressures in accordance with Section 1609. Maximum wind speeds for wood structural panel buildings with a mean roof height not greater than 30 feet (9144 mm) importance factor (I) of 1.0 and topographic factor (K_{zt}) of 1.0.

TABLE 2304.6.1
MAXIMUM BASIC WIND SPEED (mph) (3 SECOND GUST) PERMITTED FOR WOOD STRUCTURAL PANEL WALL SHEATHING USED TO RESIST WIND PRESSURES[a,b,c]

MINIMUM NAIL		MINIMUM WOOD STRUCTURAL PANEL SPAN RATING	MINIMUM NOMINAL PANEL THICKNESS (INCHES)	MAXIMUM WALL STUD SPACING (INCHES)	PANEL NAIL SPACING		MAXIMUM WIND SPEED (MPH)		
							WIND EXPOSURE CATEGORY		
SIZE	PENETRATION (INCHES)				EDGES (INCHES O.C.)	FIELD (INCHES O.C.)	B	C	D
6d Common (0.113" x 2.0")	1.5	24/0	3/8	16	6	12	110	90	85
		24/16	7/16	16	6	12	110	100	90
						6	150	125	110
8d Common (0.131" x 2.5")	1.75	24/16	7/16	16	6	12	130	110	105
						6	150	125	110
				24	6	12	110	90	85
						6	110	90	85

For SI: 1 inch – 25.4 mm, 1 mile per hour = 0.447 m/s

a. Panel strength axis shall be parallel or perpendicular to supports. Three-ply plywood sheathing with studs spaced more than 16 inches on center shall be applied with panel strength axis perpendicular to supports.
b. The table is based on wind pressures acting toward and away from building surfaces in accordance with Section 6.4.2.2 of ASCE 7. Lateral requirements shall be in accordance with Section 2305 or 2308.
c. Wood structural panels with span ratings of wall-16 or wall-24 shall be permitted as an alternate to panels with a 24/0 span rating. Plywood siding rated 16 o.c. or 24 o.c. shall be permitted as an alternate to panels with a 24/16 span rating. Wall-16 and plywood siding 16 o.c. shall be used with studs spaced a maximum of 16 inches o.c.

Section 2306.1 was modified to include AF&PA's "Special Design Provisions for Wind and Seismic" (SDPWS) as one of the standards that designers must adhere to.

> 2306.1 Allowable stress design. The structural analysis and construction of wood elements in structures using allowable stress design shall be in accordance with the following applicable standards:
> American Forest & Paper Association.
> NDS National Design Specification for Wood Construction
> SDPWS Special Design Provisions for Wind and Seismic …