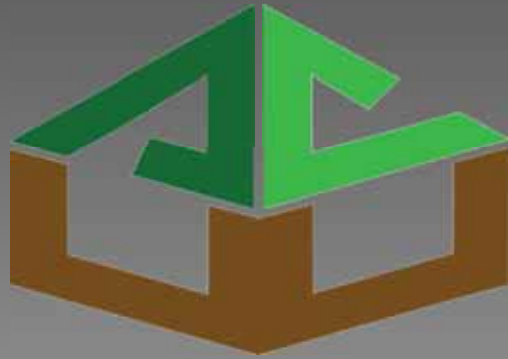


American Wood Council



Codes and Standards Update
Wood Solutions Fair, Alexandria, VA
Oct. 31, 2012



WoodWorks

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Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.

 WoodWorks



Learning Objectives

At the end of this program, participants will be able to:

- 1. Students will be able to identify building code issues which are leading to code changes.**
- 2. Students will be able to identify recent changes to wood design standards that affect the design of wood structures.**
- 3. Students will be able to identify activities, committees, and industry participants in the latest code development activities.**
- 4. Students will be able to understand reasons for the changes to the IBC and the wood design standards.**

 WoodWorks

History of AWC

- ◆ 1902 – National Lumber Manufacturers Association
- ◆ 1965 – National Forest Products Association
 - 1991 – American Wood Council – Codes & Engineering
- ◆ 1993 – American Forest & Paper Association
- ◆ 2010 – American Wood Council



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AWC Mission

- h Increase use of wood products
 - 8 Through broad regulatory acceptance
 - 8 Development of design tools/ guidelines
- h Influence public policy on use and manufacture of wood products



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AWC Issues

- ◆ Codes and Standards
- ◆ Environmental Regulations
- ◆ Green Building



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International Building Code

- ◆ The cycle just ended for the 2015 IBC – its contents are known
- ◆ 2009 IBC – most used currently



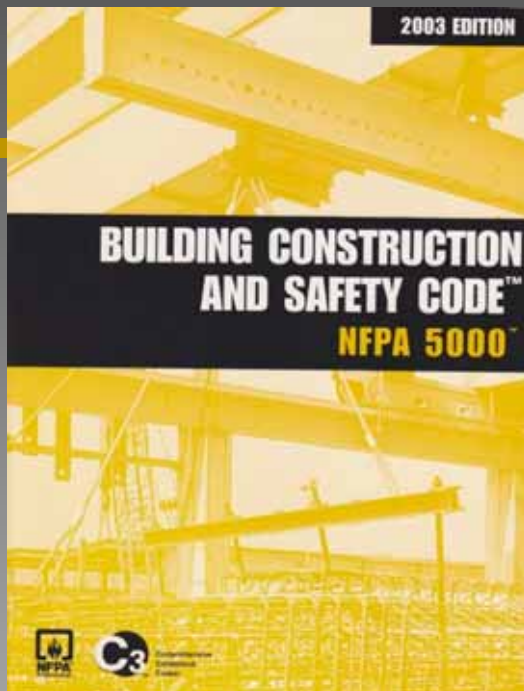
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International Building Code

- ◆ Virginia code currently based on 2009 IBC; preparing to adopt the 2012
- ◆ Maryland has gone to the 2012 already
- ◆ Washington DC code currently based on the 2006 IBC but will soon adopt the 2012



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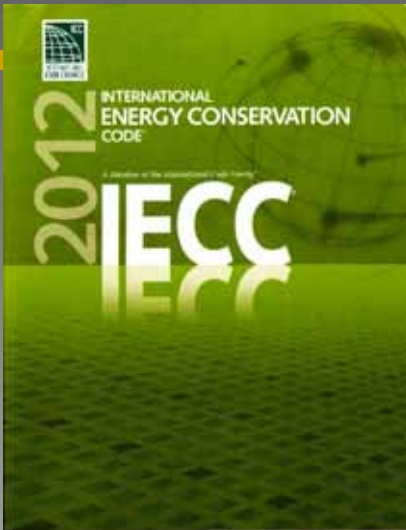
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NFPA 5000

- ◆ National Fire Protection Association's recently developed building code
- ◆ Generally not used in the U.S.
- ◆ Still being maintained
- ◆ The same people and input as the ICC codes



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IECC and IgCC

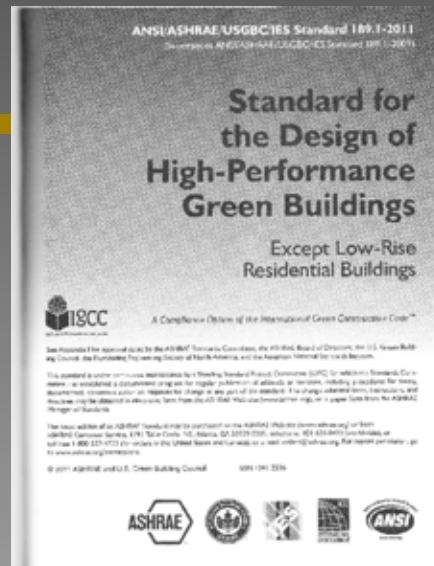
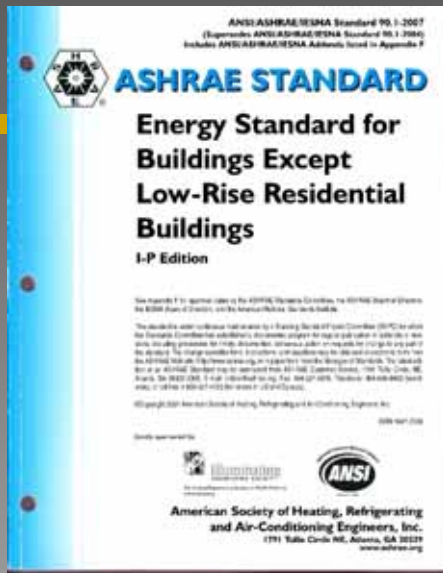
- ◆ The IECC has been around; the IgCC is new
- ◆ There is some overlap
- ◆ IECC is widely adopted



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ASHRAE 90.1 and 189.1

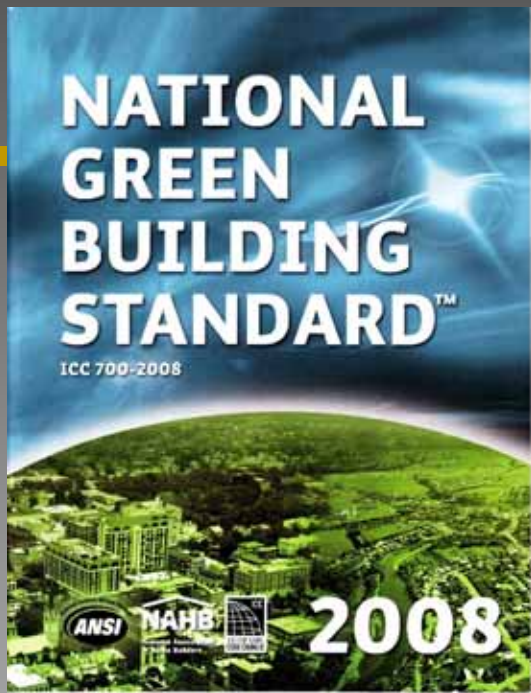
- ◆ 90.1 – ASHRAE's energy code
- ◆ 189.1 – ASHRAE's green code
- ◆ neither apply to single family, two-family, or multifamily three or fewer stories above grade



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ICC-700 National Green Building Standard

- ◆ the only low-rise residential green code
- ◆ points system approach (Bronze, Silver, Gold, Emerald)
- ◆ developed by NAHB Research Center
- ◆ ANSI standard replaced NAHB Model Green Home Building Guidelines

ICC-700 National Green Building Standard

- ◆ referenced by the IgCC

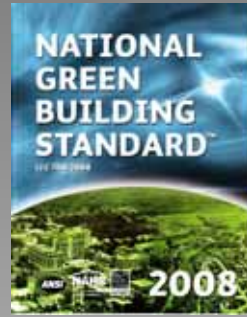


ICC-700 National Green Building Standard

- ◆ applies to R-2 (multifamily, non-transient) and R-4 (supervised residential with custodial care) of any height
- ◆ Silver level “deemed to comply” with the IgCC for the above (see IgCC 101.3.1)
- ◆ mixed use—building portion only; otherwise both building and site can comply with 700

Low-rise residential energy and green

- ◆ the only energy and green codes available for low-rise residential are the IECC and ICC-700



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Commercial energy and green

- ◆ There are lots of options for commercial buildings



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Commercial energy and green

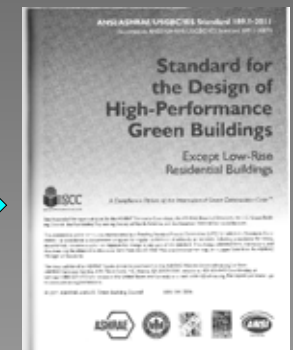
Strange bedfellows!

- ◆ Compliance with ASHRAE 189.1 is an alternative to the IgCC, within the IgCC itself (see IgCC 301.1.1)
- ◆ Compliance with ASHRAE 90.1 is an alternative to the IECC (see IECC C401.2)



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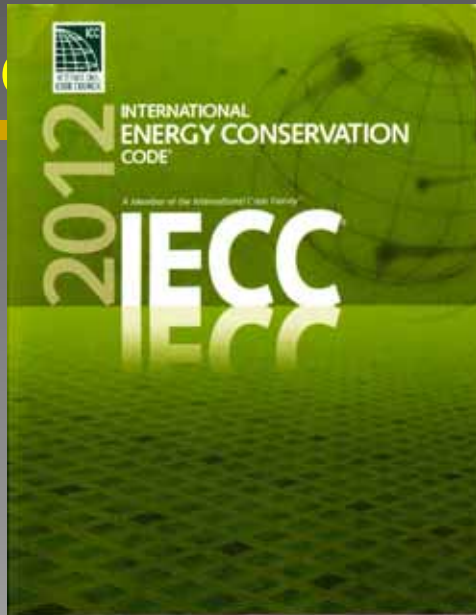
Commercial energy and green



ASHRAE 189.1



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Commercial energy and green

Commercial energy and green

Does the IgCC overlap the IECC on energy requirements?

(covers with IgCC overlapping IECC)



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Commercial energy and green

Chapter 6 of IgCC– Energy Conservation, Efficiency and CO₂e Emission Reduction

- ◆ 602: Modeled Performance Pathway Requirements (no overlap)
- ◆ 603: Energy Metering, Monitoring, and Reporting (no overlap)
- ◆ 604: Automated Demand-Response (Auto-DR) Infrastructure (no overlap)

Commercial energy and green

- ◆ 609: Specific Appliances and Equipment (no overlap)
- ◆ 610: Building Renewable Energy Systems (no overlap)



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Commercial energy and green

Chapter 6 of IgCC– Energy Conservation, Efficiency and CO₂e Emission Reduction

- ◆ 605 Building Envelope System (IECC plus)
- ◆ 606 Building Mechanical Systems (IECC plus)
- ◆ 607 Building Service Water Heating Systems (IECC plus)
- ◆ 608 Building Electrical Power and Lighting Systems (IECC plus)



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Commercial energy and green

What else does the IgCC deal with besides energy?

- ◆ life cycle assessment
- ◆ site development and use
- ◆ materials resource conservation and efficiency
- ◆ water resource conservation quality and efficiency
- ◆ indoor environmental quality and



comfort

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ICC process changes

- ◆ (picture of ICC committee here only)



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ICC process changes

- ◆ Each code now has one three-year code development cycle
- ◆ Creation and use of Code Action Committees (Building, Fire, Mechanical/Plumbing, and Sustainable/Energy/High Performance Buildings)
- ◆ cdpAccess



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ICC process changes

There is some push-back at the state and local level regarding adopting new codes every three years

- ◆ energy code adoption and the DOE
- ◆ increasing complexity of codes
- ◆ economics for construction and state agencies



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Significant changes to the IBC

- ◆ (covers of 2009 and 2012 IBC here)



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Significant changes to the IBC

- ◆ Story heights in unprotected (nonrated) construction—Types 3B and 2B—reduced for certain use groups (S-1, B, M)
- ◆ No other changes to standard heights and areas
- ◆ Watch for restructured height and area formulas and tables in 2015 (no changes)



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Significant changes to the IBC

- ◆ Can now be unlimited in area, with conditions:
 - Full open frontage of 60 feet all around
 - sprinklers
 - no stage
 - exits at grade



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Significant changes to the IBC

Pedestal Buildings:

- ◆ Requirements continue to evolve for flexibility
- ◆ Permitted use groups expanded
- ◆ Separate wood building on top of higher construction type



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Significant changes in the IBC

- ◆ Live/work units – can be R-2 and not mixed occupancies
- ◆ special requirements for size, egress, and fire protection systems



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Significant changes in the IBC

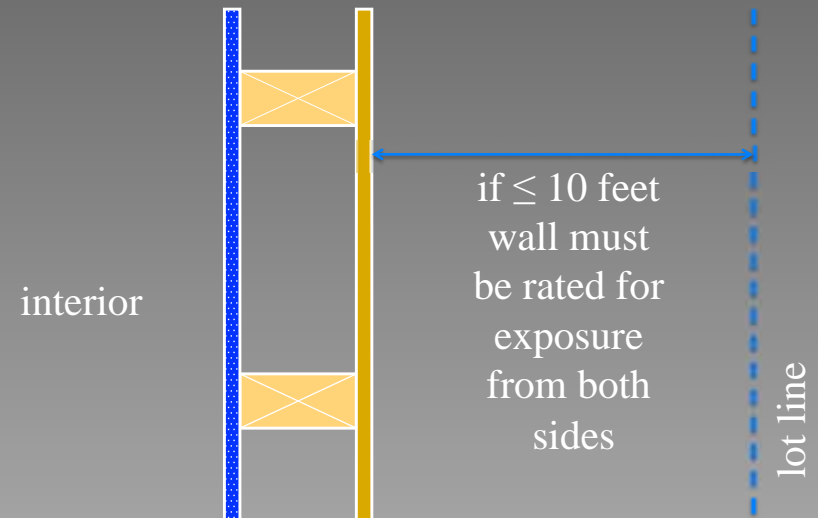
Expanded permitted use of FRTW:

- ◆ Slightly more uses in roofs of Types 1 and 2 buildings – only restriction now is Type 1A without 20 feet floor to roof
- ◆ increased applications for penthouses in all construction types



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Significant changes in the IBC

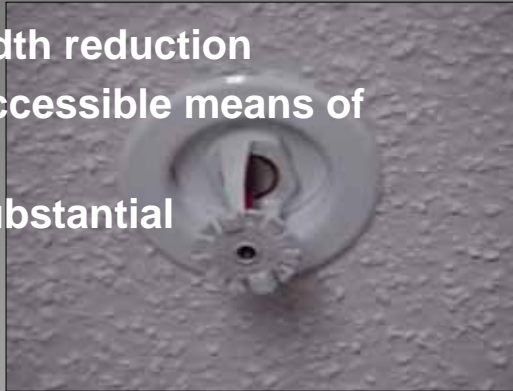


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Significant changes in the IBC

Sprinkler threshold changes:

- ◆ school and mercantile thresholds
- ◆ means of egress width reduction
- ◆ areas of refuge in accessible means of egress eliminated
- ◆ trade-offs remain substantial



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Significant changes in the IBC

- ◆ ASCE 7-10 (Minimum Design Loads for Buildings) has changes for wind design
- ◆ New “strength design”- basis maps show higher wind speeds, but effective pressures remain about the same
- ◆ Separate wind map for each Risk Category
- ◆ Exposure D will be applicable



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Significant changes in the IBC

- ◆ New paper: “ASCE 7-10 Wind Provisions and Effects on Wood Design and Construction” by Line and Coulbourne
- ◆ download for free at: <http://www.awc.org/pdf/ASCE7-10WindChanges.pdf> (or put “ASCE” in our search box, it will be the first link)



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Significant changes in the IBC

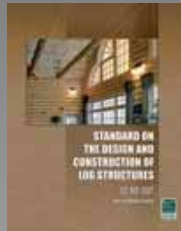
- ◆ Additional special inspections required for wood frame main wind reinforcing systems in higher wind regions (1706)
- ◆ New special inspection requirement for installation and bracing of long-span (> 60 ft.) trusses (1704)



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Significant changes in the IBC

New ICC standard ICC-400, Standard on the Design and Construction of Log Structures



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Coming in the 2015 IBC

- ◆ (cover of code change document only)



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Coming in the 2015 IBC

- ◆ Reformatted height and area provisions
- ◆ Provisions for Cross Laminated Timber
- ◆ Slightly broadened application of WFCM
- ◆ Re-organization of Conventional Wood Frame Construction Provisions (2308)
- ◆ Revised span tables based on new Southern Pine design values



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Coming in the 2015 IBC

- ◆ (photo of CLT here only)



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Coming in the 2015 IBC

- ◆ (a different photo of CLT here only, and maybe three or four)



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Coming in the 2015 IBC

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- ◆ Revised span tables based on new Southern Pine design values



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Significant changes to the IECC

- ◆ (cover of 2012 IECC only)



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Significant changes to IECC

The 2012 IECC is split into two “codes”:

- ◆ “C” chapters 1-4 for commercial
- ◆ “R” chapters 1-4 for residential (three stories and less)
- ◆ “C” contains requirements for residential —three stories or more



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Significant changes to the IECC

- ◆ Residential is reproduced in the IRC
- ◆ A new committee will be responsible for IRC energy provisions and “R” Chapters 1-4 of the IECC
- ◆ In 2009 and 2012, no more use of ASHRAE 90.1 for selective sections—it’s all or nothing



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Significant changes to the IECC

- ◆ Increased requirements for building envelope insulation, fenestration, and air tightness
- ◆ Continuous foam insulation is highly specified—controversial and possibly problematic
- ◆ Ongoing refinement of R-value and U-factor equivalents in the SEHP Code Action Committee



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Significant changes to the IECC

What has NOT changed:

- ◆ Prescriptive and performance paths for both commercial and residential
- ◆ No window/wall ratio limits
- ◆ R-value and U-factor alternatives, and total UA alternative allowing trade-offs



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Wood Standards

- ◆ (covers of 2102 NDS, WFCM, 2008 SDPWS, and ASCE 7-10)



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Wood Standards

AF&PA = AWC

(old logo and new logo)



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Wood standards

- ◆ standards become part of the code “to the prescribed extent” of the reference only
- ◆ editions are particular (e.g., the 2009 IBC references the 2005 NDS; the 2012 IBC reference the 2012 NDS)



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Wood standards

- ◆ (cover of 2012 NDS only)



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Wood standards

- ◆ (cover of 2005 NDS only)



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Wood standards

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- ◆ (cover of 2012 WFCM only)



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Wood standards

- ◆ (cover of ASCE 7-10 only)



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Significant changes—Wood Standards

For all of our standards, see “What’s Changed?” links on our website, www.awc.org



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Significant changes—NDS

- ◆ Download synopsis of changes at:
<http://www.awc.org/pdf/2012-NDS-Changes-Web.pdf>



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Significant changes—NDS

- ◆ Incorporates a new equation for intermediate calculation of members subjected to bending in combination with axial compression
- ◆ Revised design values for Southern Pine in the NDS Supplement



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Significant changes—NDS

Also changes in:

- ◆ Chapter 5 glulam provisions
- ◆ Chapter 6 poles and piles
- ◆ Chapter 12 split ring and shear plate provisions



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Significant changes—NDS

New Design Values for Southern Pine:

- ◆ ALSC approved interim design values
 - June 1, 2012
- ◆ AWC compiles them
 - NDS Supplement
- ◆ More information
 - www.southernpine.com



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Significant changes—SDPWS

- ◆ (cover of 2008 SDPWS only)



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Significant changes—SDPWS

- ◆ In 2006 IBC, use of SDPWS was optional; in 2009 IBC use of SDPWS is mandatory



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Significant changes—SDPWS

Top updates over 2005 SDPWS:

- ◆ High load diaphragms
- ◆ Combined shear and uplift with WSPs
- ◆ Unblocked shear walls
- ◆ Shear wall anchorage provisions—3x square
- ◆ WSP over gypsum shear walls



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Significant changes—SDPWS

- ◆ Shear walls sheathed on two sides
- ◆ Fiberboard shear wall aspect ratio adjustment
- ◆ Increased strength limit for PSW
- ◆ PSW shear strength equation
- ◆ Appendix for Standard Nail and Washer Sizes



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Significant changes—SDPWS

- ◆ Article: “2008 Special Design Provisions for Wind and Seismic” by Line, Douglas, and Mazikins
- ◆ download for free at: http://www.awc.org/pdf/WDF18-3_SDPWS-08.pdf



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Significant changes—SDPWS

Using WSPs for combined shear and uplift:

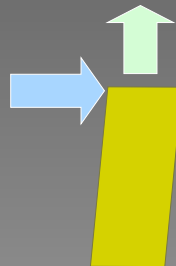


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Significant changes—SDPWS

Using WSPs for combined shear and uplift:

- ◆ Choose shear wall design
- ◆ Determine uplift forces by calculation or using the WFCM
- ◆ Enter Table 4.4.1 of SDPWS to find a wall with needed uplift capacity
- ◆ Check that nailing exceeds what is required for shear design alone

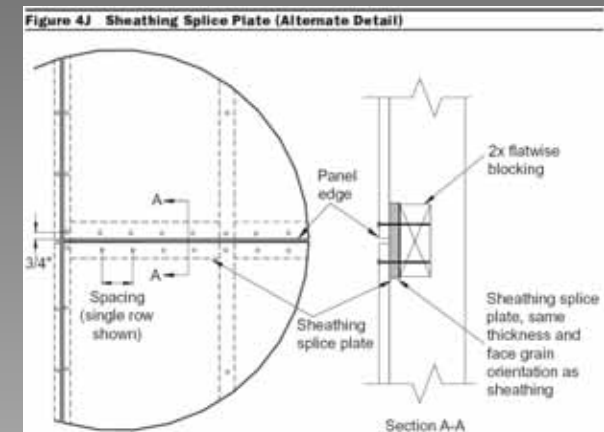


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Significant changes—SDPWS

Using WSPs for combined shear and uplift:

Diagrams included for all critical details, including mid-story height connections



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Significant changes—Wood Standards

- ◆ (show APA standard on rim boards cover, and CLT standard cover, here)



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Questions?

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Significant changes—Wood Standards

- ◆ (show APA standard on rim boards cover, and CLT standard cover, here)



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