Chapter 16

1. The committee decided to leave Figure 1608.2 as it was in the 2006 International Building Code and add in Figure 1608.2 from the 2006 NC Building Code.
   (Note: verify NE contour line)

2. Delete the lined through wording and add the underlined wording to 1609.1.2.

   1609.1.2 Protection of openings. In wind-borne debris regions, glazing in buildings shall be impact-resistant or protected with an impact-resistant covering meeting the requirements of an approved impact-resisting standard or ASTM E 1996 and ASTM E 1886 referenced therein as follows:

   1. Glazed openings located within 30 feet (9144 mm) of grade shall meet the requirements of the Large Missile Test of ASTM E 1996.
   2. Glazed openings located more than 30 feet (9144 mm) above grade shall meet the provisions of the Small Missile Test of ASTM E 1996.

   Exceptions:
   1. Wood structural panels with a minimum thickness of $^{7}/_{16}$ inch (11.1 mm) and maximum panel span of 8 feet (2438 mm) shall be permitted for opening protection in ~~one- and two-story~~ buildings with a mean roof height of 33 feet or less. Panels shall be precut so that they shall be attached to the framing surrounding the opening containing the product with the glazed opening. Panels shall be secured with the attachment hardware provided. Attachments shall be designed to resist the components and cladding loads determined in accordance with the provisions of ASCE 7. Attachment in accordance with Table 1609.1.2 is permitted for buildings with a mean roof height of 33 feet (10 058 mm) or less where wind speeds do not exceed 130 mph (57.2 m/s).
   2. Glazing in Occupancy Category I buildings as defined in Section 1604.5, including greenhouses that are occupied for growing plants on a production or research basis, without public access shall be permitted to be unprotected.
   3. Glazing in Occupancy Category II, III or IV buildings located over 60 feet (18 288 mm) above the ground and over 30 feet (9144 mm) above aggregate surfaced roofs (gravel, stone ballast) located within 1,500 feet (458 m) of the building shall be permitted to be unprotected.

   (Note: windborne debris region will either remain at 1500-feet or be as approved under separate rule making)

3. Add the underlined wording to 1609.1.2.1

   1609.1.2.1 Louvers. Operable louvers protecting intake and exhaust ventilation ducts not assumed to be open that are located within 30 feet (9144 mm) of grade shall meet requirements of an approved impact-resisting standard or the Large Missile Test of ASTM E 1996.

4. The committee decided to take out the figures on page 294 (leave the figure on page 295) of the 2006 International Building Code and replace with Figure 1609 from the 2006 NC Building Code.

5. Add the underlined wording to 1612.1

   1612.1 General. Within flood hazard areas as established in Section 1612.3, all new construction of buildings, structures and portions of buildings and structures, including substantial improvement and restoration of substantial damage to

buildings and structures, shall be designed and constructed to resist the effects of flood hazards and flood loads. For buildings that are located in more than one flood hazard area, the provisions associated with the most restrictive flood hazard area shall apply. For construction in coastal high hazard areas and ocean high hazard areas see Section 1614.

5A. Revise Section 1613.6.1 item 4 as follows:

4. Portions of wood structural panel diaphragms that cantilever beyond the vertical elements of the lateral-force-resisting system are designed in accordance with ~~Section 2305.2.5~~ 4.2.5.2 of AF&PA SDPWS ~~the International Building Code~~.

6. Add the underlined wording and Table below as Section 1614

SECTION 1614
COASTAL HIGH HAZARD AREAS
ANDOCEAN HIGH HAZARD AREAS

Construction in coastal high hazard areas and ocean high hazard areas shall comply with ASCE-24 and Table 1614.

Table 1614
CORROSION RESISTANCE
(applies only to structures located in coastal high hazard areas and ocean hazard areas)

EXPOSURE LEVEL	OPEN (exterior, porches and underhouse)	VENTED/ENCLOSED (attic, floor trusses and enclosed	CONDITIONED (heated/cooled living areas)
Nails, staples, screws	Hot dipped galvanized	Hot dipped galvanized	.....
Nuts, bolts, washers, tie rods	Hot dipped galvanized	Hot dipped galvanized	.....
Steel connection plates & straps (3/16" minimum thickness)	Hot dipped galvanized after fabrication	Hot dipped galvanized	.....
Sheet metal connectors, wind anchors, joists, hangers, steel joists and beams	Stainless steel or hot dipped galvanized after fabrication	Hot dipped galvanized after plate fabrication	Hot dipped galvanized
Truss plates	Stainless steel or hot dipped galvanized after fabrication	Hot dipped galvanized after fabrication or stainless steel within 6'-0" of a gable louver or soffit vent. Otherwise in accordance with TPI 1-~~02~~ of the Truss Plate Institute	Standard galvanized

Chapter 17

7. **1704.1 General.** Where application is made for construction as described in this section, the owner ~~or the registered design professional in responsible charge acting as the owner's agent~~ shall employ one or more special inspectors to provide inspections during construction on the types of work listed ~~under Section 1704~~ per Section 1704.1.2. The special inspector shall be a ~~qualified~~ person who shall demonstrate competence, to the satisfaction of the building official, for inspection of the particular type of construction or operation requiring special inspection. These inspections are in addition to the inspections specified in ~~Section 109~~ *the North Carolina Administrative Code and Policies*.

~~Exceptions:~~

~~1. Special inspections are not required for work of a minor nature or as warranted by conditions in the jurisdiction as approved by the building official.~~

~~2. Special inspections are not required for building components unless the design involves the practice of professional engineering or architecture as defined by~~

~~applicable state statutes and regulations governing the professional registration and certification of engineers or architects.~~

~~3. Unless otherwise required by the building official, special inspections are not required for occupancies in Group R-3 as applicable in Section 101.2 and occupancies in Group U that are accessory to a residential occupancy including, but not limited to, those listed in Section 312.1.~~

1704.1.1 ~~Statement of special inspections.~~ Building permit requirement. The permit applicant shall submit a statement of special inspections prepared by the registered design professional in responsible charge in accordance with Section 106.1 as a condition for permit issuance. ~~This statement shall be in accordance with Section 1705.~~ This statement shall include a complete list of materials and work requiring special inspections by this section, the inspections to be performed and a list of the individuals, approved agencies or firms intended to be retained for conducting such inspections.

~~Exceptions:~~

~~1. A statement of special inspections is not required for structures designed and constructed in accordance with the conventional construction provisions of Section 2308.~~

~~2. The statement of special inspections is permitted to be prepared by a qualified person approved by the building official for construction not designed by a registered design professional.~~

1704.1.2 Special Inspections requirement. Special inspections per Section 1704 are required for building, building components or other structures per the following:

1. Buildings or other structures listed in Table 1604.5 in occupancy category II if:
    a. Building height exceeds 45 feet or three stories, or
    b. The building is an Underground building per 405.1:
2. Buildings or other structures listed in table 1604.5 in occupancy categories III or IV;
3. Piles, piers and special foundations;
4. Retaining walls exceeding 5 feet height per 1806.2
5. Smoke control and smoke exhaust systems;
6. Sprayed fire-resistant materials; or
7. Special case described in 1704.13.

1704.1.3 Report requirement. Special inspectors shall keep records of inspections. The special inspector shall furnish inspection reports to the building official, and to the registered design professional in responsible charge. Reports shall indicate that work inspected was done in conformance to approved construction documents. Discrepancies shall be brought to the immediate attention of the contractor for correction. If the discrepancies are not corrected, the discrepancies shall be brought to the attention of the building official and to the registered design professional in responsible charge prior to the completion of that phase of the work. A final report documenting required special inspections and correction of any discrepancies noted in the inspections shall be submitted at a point in time agreed upon by the permit applicant and the building official prior to the start of work.

Chapter 18

7A. 1804.2 Presumptive load-bearing values. The maximum allow-able foundation pressure, lateral pressure or lateral sliding-resistance values for supporting soils near the surface shall not exceed the values specified in Table 1804.2 ~~unless data to substantiate the use of a higher value are submitted and approved~~, provided that all of the following criteria are satisfied.

1. Presumptive bearing pressures are acceptable only for structures where column loads are less than 50 kips per column and wall loads do not exceed
3.0 kips per linear foot.

2. Finished grades, including cut or fill operations, do not differ from the natural grades by more than 5 feet.
3. Histories of favorable foundation performance are available from adjoining sites for similar loading conditions.

Presumptive load-bearing values shall apply to materials with similar physical characteristics and dispositions.

Mud, organic silt, organic clays, peat or unprepared fill shall not be assumed to have a presumptive load-bearing capacity unless data to substantiate the use of such a value are submitted.

Exception: A presumptive load-bearing capacity is permitted to be used where the building official deems the load-bearing capacity of mud, organic silt or unprepared fill is adequate for the support of lightweight and temporary structures.

8. **1805.4.1 Design.** Footings shall be so designed that the allowable bearing capacity of the soil is not exceeded, and that differential settlement is minimized. The minimum width of footings shall be ~~12~~ 16 inches (~~305~~ 406 mm).

   Footings in areas with expansive soils shall be designed in accordance with the provisions of Section 1805.8. Minimum width of turned down slabs shall be 12 inches (305 mm) unless engineering analysis is provided.

(Note: Tables 1805.5(1) thru (4) add MH as a soil type to the last column of these tables)
(Note: Table 1805.5(5), all soil classifications are missing)

9. **Section 1806**
   Add new section: {1806.2 "Retaining System"} carry over from the 2006 NCBC

10. **Section 1807**
    Remove: last part of last sentence ["~~with the exception …….or occupancy~~."]
    This is a carry over of 2006 NC Code language.

11. **Section 1807.4.2**
    1807.4.2 Foundation drain. A drain shall be placed around the perimeter of a foundation that consists of gravel or crushed stone containing not more than 10-percent material that passes through a No. 4 (4.75 mm) sieve. The drain shall extend a minimum of 12 inches (305 mm) beyond the out-side edge of the footing. The thickness shall be such that the bottom of the drain is not higher than the bottom of the base under the floor, and that the top of the drain is not less than 6 inches (152 mm) above the top of the footing. ~~The top of the drain shall be covered with an approved filter membrane material.~~ Where a drain tile or perforated pipe is used, the invert of the pipe or tile shall not be higher than the floor elevation. The top of joints or the top of perforations shall be protected with an approved filter membrane material. The pipe or tile shall be placed on not less than 2 inches (51 mm) of gravel or crushed stone complying with Section 1807.4.1, and shall be covered with not less than 6 inches (152 mm) of the same material. The gravel or crushed stone shall be wrapped with an approved geotextile fabric.

12. **Section 1808.2.5**
    Remove: last sentence ["~~A single row of piles without …….foundation wall~~."]

13. **Section 1808.2.17**
    No change to 2006 IBC language dropping 2006 NCBC language for the section.

14. **Section 1810**
    In Section 1810.1.1 change: [~~2500 psi~~] to {3000 psi}

Add new section {1810.3.6 "Pile Test"} carry over from the 2006 NCBC

Add new section {1810.3.7 "Quality Control"} carry over from the 2006 NCBC

15. **Section 1812.3**
Change: [~~2500 psi~~] to {3000 psi}

Chapter 19
Keep as printed in 2006 International Building Code

Chapter 20
Keep as printed in 2006 International Building Code

Chapter 21

16. SECTION 2109
EMPIRICAL DESIGN OF MASONRY

2109.1 General. Empirically designed masonry shall conform to this chapter or Chapter 5 of ACI 530/ASCE 5/TMS 402.

2109.1.1 Limitations. The use of empirical design of masonry shall be limited as follows: (see Table 2109.1.1for clarification)

1. Empirical design shall not be used for buildings assigned to Seismic Design Category D, E, or F as specified in Section 1613, nor for the design of the seismic-force-resisting system for buildings assigned to Seismic Design Category B or C.
2. Empirical design shall not be used for masonry elements ~~that are part of the lateral-force-resisting system~~ where the basic wind speed exceeds ~~110 mph (79 m/s)~~ 130 mph (58 m/s).
3. Empirical design ~~shall not~~ shall be permitted to be used for interior masonry elements that are not part of the lateral-force-resisting system in buildings other than enclosed buildings as defined in Chapter 6 of ASCE 7 ~~in~~ and the buildings meet the following conditions:
   ~~3.1. Buildings over 180 feet (55 100 mm) in height.~~
   ~~3.2. Buildings over 60 feet (18 400 mm) in height where the basic wind speed exceeds 90 mph (40 m/s).~~
   ~~3.3. Buildings over 35 feet (10 700 mm) in height where the basic wind speed exceeds 100 mph (45 m/s).~~
   ~~3.4. Where the basic wind speed exceeds 110 mph (79 m/s).~~
   3.1. Buildings 60 feet (18 400mm) or more but equal to or less than 180 ~~ft.~~ feet (55 100 mm) in height where the basic wind speed is 90 mph (40m/s) or less.
   3.2. Buildings 35 feet (10 700mm) or more but less than 60 ~~ft.~~ feet (18 400 mm) in height where the basic wind speed is 100 mph (45 m/s) or less.

4. Empirical design ~~shall not~~ shall be permitted to be used for exterior masonry elements that are not part of the lateral-force-resisting system in buildings and the buildings meet the following conditions
   ~~4.1. Buildings over 180 feet (55 100 mm) in height~~
   ~~4.2. Buildings over 60 feet (18 400 mm) in height where the basic wind speed exceeds 90 mph (40 m/s).~~
   ~~4.3. Buildings over 35 feet (10 700 mm) in height where the basic wind speed exceeds 100 mph (45 m/s).~~
   4.1. Buildings 60 feet (18 400mm) or more but equal to or less than 180 ~~ft.~~ feet (55 100 mm) in height where the basic wind speed is 90 mph (40m/s) or less.
   4.2. Buildings 35 feet (10 700mm) or more but less than 60 ~~ft.~~ feet (18 400 mm) in height where the basic wind speed is 100 mph (45 m/s) or less.
5. ~~Empirical design shall not be used for exterior masonry elements that are less than or equal to 35 feet (10 700mm) above ground where the basic wind speed exceeds 110 mph (79 m/s).~~

Carry over Table 2109.1a and Table 2109.1b from the NC code.
Delete note “c” from both tables.
Change note “d” by replacing 1.2 with 1.15 in both tables.

Table 2109.1.1

EMPIRICAL WIND LIMITATIONS TABLE

	Building Height, ft(m)	Basic Wind Speed, mph (m/s)				
		V3S=<90(40)	90(40)<V3S=<100(45)	100(45)<V3S=<110(49)	110(49)<V3S=<130(58)	130(58)<V3S
All masonry elements that are part of the lateral force-resisting system and exterior masonry elements located 35 ft(11m) or less above ground	H=<35(11)	Permitted			Not Permitted	
Interior masonry elements that are not part of the lateral force-resisting system in buildings other than enclosed as defined by ASCE 7	H>180(55)	Not Permitted				
	60(18)<H=<180(55)	Permitted	Not Permitted			
	35(11)<H=<60(18)	Permitted		Not Permitted		
	H=<35(11)	Permitted				Not Permitted
Exterior masonry elements that are not part of the lateral force-resisting system that are more than 35 ft (11 m) above ground	H>180(55)	Not Permitted				
	60(18)<H=<180(55)	Permitted	Not Permitted			
	35(11)<H=<60(18)	Permitted		Not Permitted		

17. Delete Table 2109.4.1 from the 2006 International Building Code and pick-up Table 2109.4.1 from the 2006 NC Building Code with minor changes below.

The data for this section has changed. See June 21 minutes.

TABLE 2109.4.1
INTERIOR WALLS LATERAL SUPPORT REQUIREMENTS
IN WIND SPEEDS 110 MPH OR LESS

CONSTRUCTION	MAXIMUM WALL LENGTH TO THICKNESS OR WALL HEIGHT TO THICKNESS
Bearing walls	
Solid units or fully grouted	20
All others	18
Nonbearing walls	
Interior	36

Footnote: Interior walls in windspeeds greater than 110 mph may be designed as exterior walls using Table 2109.1a.

18. **2111.1 Definition.** A masonry fireplace is a fireplace constructed of concrete or masonry. Masonry fireplaces shall be constructed in accordance with this section this section, Table 2111.1 and Figure 2111.1.

19. (Note: Carryover and insert {Table 2111.1 "Summary Of requirements For Masonry Fireplaces and Chimneys" and Figure 2111.1 "Fireplace And Chimney Details" from 2006 NCBC}. Check Table 2111.1 and Figure 2111.1 section references with 2006 IBC to make sure they collate.)

20. In Section 2111.2 change [~~6 inches~~] to {12 inches} were 2006 IBC reads {"…..shall extend at least ~~6 inches~~ {12 inches} beyond the face ……"}

Chapter 22
Keep as printed in 2006 International Building Code

Chapter 23

21. **2301.1 Scope.** The provisions of this chapter shall govern the materials, design, construction and quality of wood members and their fasteners. Refer to Chapter 7 for fireblocking, draftstopping and fire-resistance requirements.

2301.1.1 Minimum lumber grades. The minimum grade of lumber used for light-frame construction shall be:

1. For joists and rafter; Those obtained in AF&PA *Design Values for Joists and Rafters.*
2. For loadbearing studs; No. 3 grade, standard grade or stud grade, utility grade may be used to support roof and ceiling loads only.
3. For nonloadbearing studs; utility grade.
4. For wall top plates; utility grade.

2301.1.2 Moisture content. All lumber shall have a maximum moisture content of 19 percent at time of grading.

22. **2303.4.1 Design.** Wood trusses shall be designed in accordance with the provisions of this code and accepted engineering practice. Members are permitted to be joined by nails, glue, bolts, timber connectors, metal connector plates or other approved framing devices.

2303.4.1.1 Truss designer. The individual or organization responsible for the design of trusses who is a registered design professional.

2303.4.1.2 Truss design drawings. The written, graphic and pictorial depiction of each individual truss shall be provided to the building official and approved 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 joints;
3. Required bearing widths;
4. Design loads as applicable;
5. Top chord live load (including snow loads);
6. Top chord dead load;
7. Bottom chord live load;
8. Bottom chord dead load;
9. Concentrated loads and their points of application as applicable;
10. Controlling wind and earthquake loads as applicable;
11. Adjustments to lumber and metal connector plate design value for conditions of use;
12. Each reaction force and direction;
13. Metal connector plate type, size, thickness or gage, and the dimensioned location of each metal connector plate except where symmetrically located relative to the joint interface;
14. Lumber size, species and grade for each member;
15. Connection requirements for:
    15.1. Truss to truss;
    15.2. Truss ply to ply; and
    15.3. Field splices.
16. Calculated deflection ratio and maximum vertical and horizontal deflection for live and total load as applicable;
17. Maximum axial tensile and compression forces in the truss members; and

18. Required permanent individual truss member bracing and method per Section 2303.4.1.5, unless a specific truss member permanent bracing plan for the roof or floor structural system is provided by a registered design professional.

~~Where required by one of the following,~~ Each individual truss design drawing shall bear the seal and signature of the truss designer~~:~~.

~~1. Registered design professional; or~~

~~2. Building official; or~~

~~3. Statutes of the jurisdiction in which the project is to be constructed.~~

~~Exceptions:~~

~~1.When a cover sheet/truss index sheet combined into a single cover sheet is attached to the set of truss design drawings for the project, the single sheet/truss index sheet is the only document that needs to be signed and sealed within the truss submittal package.~~

~~2.When a cover sheet and a truss index sheet are separately provided and attached to the set of truss design drawings for the project, both the cover sheet and the truss index sheet are the only documents that need to be signed and sealed within the truss submittal package.~~

2303.4.1.3 Truss placement diagram. The truss manufacturer shall provide a truss placement diagram that identifies the proposed location for each individually designated truss and references the corresponding truss design drawing. The truss placement diagram shall be provided as part of the truss submittal package, and with the shipment of trusses delivered to the job site. Truss placement diagrams shall ~~not~~ be required to bear the seal ~~or~~ and signature of the truss designer.

~~**Exception:** When the truss placement diagram is prepared under the direct supervision of a registered design professional, it is required to be signed and sealed.~~

2303.4.1.4 Truss submittal package. The truss submittal package shall consist of each individual truss design drawing, the truss placement diagram for the project, the truss member permanent bracing specification and, as applicable, the cover sheet/truss index sheet. The submittal package shall be submitted to the project registered design professional for final approval prior to fabrication of trusses.

23. **2303.7 Shrinkage.** ~~Consideration shall be given in design to the possible effect of cross-grain dimensional changes considered vertically which may occur in lumber fabricated in a green condition.~~ Deleted.

24. **2303.8 Construction practices.**

2303.8.1 Preparation of building site and removal of debris.

2303.8.1.1 All building sites shall be graded so as to provide drainage under all portions of the building not occupied by basements.

2303.8.1.2 The foundation and the area encompassed therein shall have all vegetation, stumps, roots and foreign material removed and the fill material shall be free of vegetation and foreign material. The fill shall be compacted to assure adequate support of the foundation.

2303.8.1.3 After all the work is completed, loose wood and debris shall be completely removed. Wood shall not be stored in contact with ground under any building.

24A. (Note: keep the 2006 NC language for 2304.10.3 and 2304.10.5)

24B. (Note: table 2304.9.1, item 30 "Ledger Strips" under the "Location" column: Add "@ 2 inches oc centered under the joists" after "face nail")

25. **2304.11.6 ~~Termite protection.~~** ~~In geographical areas where hazard of termite damage is known to be very heavy, wood floor framing shall be of naturally durable species (termite resistant) or preservative treated in accordance with AWPA U1 for the species, product preservative and end use or provided with approved methods of termite protection.~~ **Termite Control Methods.** Protection shall be one of the following methods or a combination of these methods:

    1. Chemical termiticide treatment, as provided in Section R320.2.
    2. Termite baiting system installed and maintained according to the label.
    3. Pressure-preservative-treated wood in accordance with the AWPA standards listed in Section 2303.
    4. Naturally termite-resistant wood as provided in Section 2304.11.6.3.
    5. Physical barriers as provided in Section 2304.11.6.4.

    2304.11.6.1.2 Field Treatment. Field-cut ends, notches, and drilled holes of pressure-preservative-treated wood shall be retreated in the field in accordance with AWPA M4.

    2304.11.6.2 Chemical termiticide treatment. Chemical termiticide treatment shall include soil treatment and/or field applied wood treatment. The concentration, rate of application and method of treatment of the chemical termiticide shall be in strict accordance with the termiticide label and applied according to the standards of the NC Department of Agriculture.

    2304.11.6.3 Naturally resistant wood. Heartwood of redwood and eastern red cedar shall be considered termite resistant.

    2304.11.6.4 Barriers. Approved physical barriers, such as metal or plastic sheeting or collars specifically designed for termite prevention, shall be installed in a manner to prevent termites from entering the structure. Shields placed on top of an exterior foundation wall are permitted to be used only if in combination with another method of protection.

25A. (Note: insert Frank's work for 2305 here from 2007 ICC supplement)

26. **2308.2.1 Basic wind speed greater than 100 mph (3-second gust).** Where the basic wind speed exceeds 100 mph (3-second gust), the provisions of either AF&PA WFCM, or the SBCCI SSTD 10 are permitted to be used. When using SSTD 10-99, convert 3-second design wind to fastest mile design wind using Table 1609.3.1.

Chapter 24
Keep as printed in 2006 International Building Code

Chapter 25

27. add Table 2508.2

TABLE 2508.2
ALLOWABLE NONBEARING PARTITION HEIGHTS
BASED ON WALLBOARD AND NO. 25 GAGE STUDS
ACTING AS A COMPOSITE SECTION[a,b]

STUD SPACING (in.)	FACING EACH SIDE	STUD DEPTH (in.)					
		1 5/8	2 ½	3 ¼	3 5/8	4	6

16	½″-one ply	11′0″	14′8″	17′10″	19′5″	20′8″	18′10″
24	½″-one ply	10′0″	13′5″	16′0″	17′3″	18′5″	17′8″
24	½″-two ply	12′4″	15′10″	18′3″	19′5″	20′8″	19′0″

a. The tabulated stud heights are based on 0.0179-inch uncoated thickness (25 ga) steel studs manufactured in compliance with ASTM C 754 for installation of screw-type steel framing members to receive gypsum boards.

b. Gypsum board product must be ½-inch minimum thickness and may be applied vertically or horizontally.

Chapter 26

28. **2603.5.2 Thermal barrier.** Any foam plastic insulation shall be separated from the building interior by a thermal barrier meeting the provisions of Section 2603.4, unless special approval is obtained on the basis of Section 2603.~~8~~9.

    Exception: One-story buildings complying with Section 2603.4.1.4.

29. **2603.8 Protection against termites.** ~~In areas where the probability of termite infestation is very heavy in accordance with Figure 2603.8,~~ Extruded and expanded polystyrene, polyisocyanurate and other foam plastics shall not be installed on the exterior face or under interior or exterior foundation walls or slab foundations located below grade. The clearance between foam plastics installed above grade and exposed earth shall be at least ~~6~~ 8 inches (~~152~~ 203 mm).

    Exceptions:

    1. Buildings where the structural members of walls, floors, ceilings and roofs are entirely of noncombustible materials or preservatively treated wood.

    2. An approved method of protecting the foam plastic and structure from subterranean termite damage is provided.

    3. On the interior side of basement walls.

    4. Foam plastic less than 8 inches (203 mm) above or in contact with grade shall be installed in accordance with Section 2603.8.1.

    (Note: delete Figure 2603.8)

30. **2603.8.1 Chemical treatment.** When foam plastic is in contact with the ground, the soil area shall be chemically treated in accordance with the North Carolina Department of Agriculture and Consumer Services rules.

Chapter 27

31.

Chapter 27
~~ELECTRICAL~~ EMERGENCY AND STANDBY POWER

32. **[F] 2702.2.5 Accessible means of egress elevators.** ~~Standby power shall be provided for elevators that are part of an accessible means of egress in accordance with Section 1007.4.~~ Deleted.

30. [F] 2702.2.6 Accessible means of egress platform lifts. ~~Standby power in accordance with this section or ASME A18.1 shall be provided for platform lifts that are~~

~~part of an accessible means of egress in accordance with Section 1007.5.~~ Deleted.

31. **[F] 2702.2.11 Highly toxic and toxic materials.** Emergency power shall be provided for occupancies with highly toxic or toxic materials in accordance with Section 414 and the International Fire Code.

32. **[F] 2702.2.12 Organic peroxides.** Standby power shall be provided for occupancies with silane gas in accordance with Section 414 and the International Fire Code.

33. **[F] 2702.2.13 Pyrophoric materials.** Emergency power shall be provided for occupancies with silane gas in accordance with Section 414 and the International Fire Code.

Chapter 28
Keep as printed in 2006 International Building Code

Chapter 29
Keep as printed in the 2006 International Building Code
(Note: coordinate with the NC Plumbing Code)

Chapter 30 These are a carry over of 2006 NC Code language.

34. **3001.3 Accessibility.** Passenger elevators required to be accessible by Chapter 11 shall conform to ICC A117.1.

35. **3002.9 Pits.** For dampproofing and waterproofing requirements refer to Section 1807.

Chapter 31 These are a carry over of 2006 NC Code language.

36. **3105.1 General.** Awnings or canopies shall comply with the requirements of this section and other applicable sections of this code. For awnings or canopies that encroach into public right-of-ways refer to Chapter 32.

37. **3105.5 Permanent canopies.** Permanent canopies are permitted to extend over adjacent open spaces provided:

    1. The canopy and its supports shall be of noncombustible material, fire retardant-treated wood, Type IV construction, or of 1-hour fire resistance rated construction.

    Exception: Any textile covering for the canopy shall be flame resistant as determined by tests conducted in accordance with NFPA 701 after both accelerated water leaching and accelerating weathering.

    2. Any canopy covering, other than textiles, shall have a flame spread index not greater than 25 when tested in accordance with ASTM E 84 in the form intended for use.

    3. The canopy shall have at least one long side open.

    4. The maximum horizontal width of the canopy shall not exceed 15 feet (4572 mm).

    5. The fire resistance of exterior walls shall not be reduced.

41. **3107.1 General.** Signs shall be designed, constructed, and maintained in accordance with Appendix H of this code.

42.
    This is a carry over of 2006 NC Code language.

43. **3108.6 Foundations.** Footings and foundations shall be designed and constructed in accordance with the provisions of Chapter 18.

44. **3109.3 Public swimming pools.** Public swimming pools (all occupancies except R-3) shall be completely enclosed by a fence or barrier at least 4 feet (1290 mm) in height or a screen enclosure. Openings in the fence shall not permit the passage of a 4-inch-diameter (102 mm) sphere. The fence or screen enclosure shall be equipped with self-closing and self-latching gates.

45. **3109.4 Residential swimming pools (R-3).** Residential swimming pools shall comply with Sections 3109.4.1 through 3109.4.3.

    Exception (R-3): A swimming pool with a power safety cover or a spa with a safety cover complying with ASTM F 1346.

Chapter 32
Keep as printed in the 2006 International Building Code.
(Note: carry over 3202.5 from 2006 NC code)

Chapter 33
Keep as printed in the 2006 International Building Code

Chapter 34 This is a carry over of 2006 NC Code language.

46. **3407.1 Historic buildings.** The provisions of this code relating to the construction, repair, alteration, addition, restoration and movement of structures, and change of occupancy shall not be mandatory for historic buildings where such buildings are judged by the building official to not constitute a distinct life safety hazard.

3410.3.2. (Note: Remove "and International Property Maintenance Code" from end of sentence)

Chapter 35
Keep as printed in the 2006 International Building Code

Chapter 36
The committee decided to adopt Chapter 36 from the 2006 North Carolina Building Code as is with the following changes.

47. **3606.4 Electrical service.** All electrical service to marine structures shall be in accordance with the North Carolina State ~~Building~~ Electrical Code~~, Volume IV-Electrical~~.

48. **3606.5 Fuel docks.** Fuel docks and other marine facilities handling flammable liquids shall comply with the *Flammable and Combustible Liquids Code*, NFPA 30 and the North Carolina Fire Code. All fuel installations shall be designed to prevent fuel spillage from entering the water. The fuel docks or floats shall be a separate structure form berths and shall be isolated to the extent that fire or explosion would have minimal opportunity to spread to or from the fuel dock to the berths. Storage tanks for public facilities shall be located a minimum distance of 50 feet (15240 mm) from the dispenser with a shutoff valve at the tank.

Appendices

- Appendix A
  Adopt Appendix A as it is in the 2006 North Carolina Building Code (deleted)

- Appendix B
  Adopt Appendix B as it is in the 2006 North Carolina Building Code (deleted)

- Appendix C
  Keep Appendix C as printed in the 2006 International Building Code (adopted)

- Appendix D
  Keep Appendix D as printed in the 2006 International Building Code (adopted)

- Appendix E
  Keep Appendix E as printed in the 2006 International Building Code (adopted)

- Appendix F
  Keep Appendix F as printed in the 2006 International Building Code (adopted)

- Appendix G
  Keep Appendix G as printed in the 2006 International Building Code but do not accept the changes in G101.3, G102.1 or G103.1. (adopted)

- Appendix H
  Keep Appendix H as printed in the 2006 International Building Code with the following changes (adopted)

APPENDIX H
SIGNS

The provisions contained in this appendix are ~~not mandatory unless specifically referenced in the adopting ordinance~~ adopted as part of this code.

H101.2 Signs exempt from permits. The following signs are exempt from the requirements to obtain a permit before erection:

1. ~~Painted~~ Nonilluminated wall signs.
2. Temporary signs ~~announcing the sale or rent of property.~~
3. Signs erected by transportation authorities.
4. Projecting signs not exceeding ~~2.5~~ 6 square feet (~~0.23~~ 0.56 m^2).
5. The changing of moveable parts of an approved sign that is designed for such changes, or the repainting or repositioning of display matter shall not be deemed an alteration.

- Appendix I
  Keep Appendix I as printed in the 2006 International Building Code (adopted)

- Appendix J
  Keep Appendix J as printed in the 2006 International Building Code with the below changes (adopted)

APPENDIX J
GRADING

The provisions contained in this appendix are ~~not mandatory unless specifically referenced in the adopting ordinance~~ adopted as part of this code.

J104.1 Submittal requirements. ~~In addition to the provisions of Section 105.3,~~ The applicant shall state the estimated quantities of excavation and fill.

- Appendix K
  The committee recommended deleting Appendix K in its entirety unless the Electrical committee decided it was needed. (deleted)

Exceptions:

1. One-half-inch (12.7 mm) diameter or larger steel bolts.
2. ~~Fasteners other than nails and timber rivets shall be permitted to be of mechanically deposited zinc-coated steel with coating weights in accordance with ASTM B 695, Class 55, minimum.~~

Reason: The purpose of this proposal is to remove blanket inclusion of mechanically galvanized fasteners. For galvanized fasteners, the code should only include fasteners galvanized using the hot-dip galvanizing process. Fasteners galvanized by other processes should be approved based on specific evaluation.

The hot-dip galvanizing process enjoys the relative advantage of being a process very insensitive to process variables. Though mechanically galvanized fasteners can perform equally to hot-dip galvanized fasteners, the mechanical galvanizing process, if not performed properly, may produce fasteners whose corrosion resistance does not equal that of hot-dip galvanized fasteners.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC
Committee Action: **Disapproved**

Committee Reason: Removal of the exception is not justified since there does not appear to be any consensus on whether mechanically galvanized fasteners are a problem in preservative-treated wood.

Assembly Action: **None**

PART II — IRC
Committee Action: **Disapproved**

Committee Reason: Further industry coordination in needed. The code change was disapproved at the proponent's request.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

David Rochester, Plating Systems & Technologies, Inc, representing Mechanical Galvanizers, requests Approval as Modified for Part I.

Modify proposal as follows:

2304.9.5 Fasteners in preservative-treated and fire-retardant-treated wood. Fasteners for preservative- treated and fire-retardant-treated wood shall be of hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper. The coating weights for zinc-coated fasteners shall be in accordance with ASTM A153.

Exception: Fasteners ~~other than nails, timber rivets, wood screws, and lag screws~~ shall be permitted to be of mechanically deposited zinc coated steel with coating weights in accordance with ASTM B 695, Class 55 minimum. Fastenings for wood foundations shall be as required in AF&PA Technical Report No.7.

Commenter's Reason: The IRC (R319.3) only excludes nails and timber rivets, at a minimum that is all that should be excluded by the IBC. Since many of the powder actuated pins being used in preservative treated lumbers are mechanically galvanized (Example: Remington), and Desa has done a significant amount of work getting approved by the ICC-ES, the restriction should be deleted. After all, one (1) ounce per square foot of zinc coating is a weighted coating and when it is applied by either the mechanical galvanizing process or the hot-dip galvanizing process, yields the same amount of zinc coating. In theory, both should provide equal amounts of corrosion protection, but in actuality, mechanical galvanizing provides significantly more corrosion protection in neutral salt spray testing. A true measure of a coating's viability should be the coating thickness followed by the corrosion protection given from such coating. Since mechanical galvanizing can equal hot-dip galvanizing in coating weight, and can exceed it in corrosion protection, the restriction on nails, timber rivets, wood screws and lag screws should be removed.

Final Action: AS AM AMPC____ D

S82-06/07
2305, 1613.6.1, Table 2306.4.5

Proposed Change as Submitted:

Proponent: Jeffrey B. Stone, American Forest & Paper Association

Revise as follows:

SECTION 2305
GENERAL DESIGN REQUIREMENTS FOR LATERAL-FORCE-RESISTING SYSTEMS

2305.1 General. Structures using wood shear walls and diaphragms to resist wind, seismic and other lateral loads shall be designed and constructed in accordance with AF&PA SDPWS and the provisions of Section 2305, 2306, and 2307. ~~the provisions of this section. Alternatively, compliance with the AF&PA SDPWS shall be permitted subject to the limitations therein and the limitations of this code.~~

~~**2305.1.1 Shear resistance based on principles of mechanics.** Shear resistance of diaphragms and shear walls are permitted to be calculated by principles of mechanics using values of fastener strength and sheathing shear resistance.~~

~~**2305.1.2 Framing.** Boundary elements shall be provided to transmit tension and compression forces. Perimeter members at openings shall be provided and shall be detailed to distribute the shearing stresses. Diaphragm and shear wall sheathing shall not be used to splice boundary elements. Diaphragm chords and collectors shall be placed in, or tangent to, the plane of the diaphragm framing unless it can be demonstrated that the moments, shears and deformations, considering eccentricities resulting from other configurations can be tolerated without exceeding the adjusted resistance and drift limits.~~

~~**2305.1.2.1 Framing members.** Framing members shall be at least 2 inch (51 mm) nominal width. In general, adjoining panel edges shall bear and be attached to the framing members and butt along their centerlines. Nails shall be placed not less than 3/8 inch (9.5 mm) from the panel edge, not more than 12 inches (305 mm) apart along intermediate supports, and 6 inches (152 mm) along panel edge bearings, and shall be firmly driven into the framing members.~~

~~**2305.1.3**~~ **2305.1.1 Openings in shear panels.** Openings in shear panels that materially affect their strength shall be fully detailed on the plans, and shall have their edges adequately reinforced to transfer all shearing stresses.

~~**2305.1.4 Shear panel connections.** Positive connections and anchorages capable of resisting the design forces shall be provided between the shear panel and the attached components. In Seismic Design Category D, E or F, the capacity of toenail connections shall not be used when calculating lateral load resistance to transfer lateral earthquake forces in excess of 150 pounds per foot (2189 N/m) from diaphragms to shear walls, drag struts (collectors) or other elements, or from shear walls to other elements.~~

~~**2305.1.5 Wood members resisting horizontal seismic forces contributed by masonry and concrete walls.** Wood shear walls, diaphragms, horizontal trusses and other members shall not be used to resist horizontal seismic forces contributed by masonry or concrete walls in structures over one story in height.~~

~~**Exceptions:**~~

1. ~~Wood floor and roof members are permitted to be used in horizontal trusses and diaphragms to resist horizontal seismic forces contributed by masonry or concrete walls, provided such forces do not result in torsional force distribution through the truss or diaphragm.~~
2. ~~Wood structural panel sheathed shear walls are permitted to be used to provide resistance to seismic forces contributed by masonry or concrete walls in two-story structures of masonry or concrete walls, provided the following requirements are met:~~
   - ~~2.1. Story-to-story wall heights shall not exceed 12 feet (3658 mm).~~
   - ~~2.2. Diaphragms shall not be designed to transmit lateral forces by rotation and shall not cantilever past the outermost supporting shear wall.~~
   - ~~2.3. Combined deflections of diaphragms and shear walls shall not permit story drift of supported masonry or concrete walls to exceed the limit of Section 12.12.1 in ASCE 7.~~
   - ~~2.4. Wood structural panel sheathing in diaphragms shall have unsupported edges blocked. Wood structural panel sheathing for both stories of shear walls shall have **2** unsupported edges blocked and, for the lower story, shall have a minimum thickness of 15/32 inch (11.9 mm).~~
   - ~~2.5. There shall be no out of plane horizontal offsets between the first and second stories of wood structural panel shear walls.~~

~~**2305.1.6 Wood members resisting seismic forces from nonstructural concrete or masonry.** Wood members shall be permitted to resist horizontal seismic forces from nonstructural concrete, masonry veneer or concrete floors.~~

~~**2305.2 Design of wood diaphragms.**~~

~~**2305.2.1 General.** Wood diaphragms are permitted to be used to resist horizontal forces provided the deflection in the plane of the diaphragm, as determined by calculations, tests or analogies drawn therefrom, does not exceed the permissible deflection of attached distributing or resisting elements. Connections shall extend into the diaphragm a sufficient distance to develop the force transferred into the diaphragm.~~

~~**2305.2.2**~~ **2305.2 Diaphragm Deflection.** ~~Permissible deflection shall be that deflection up to which the diaphragm and any attached distributing or resisting element will maintain its structural integrity under design load conditions, such that the resisting element will continue to support design loads without danger to occupants of the structure. Calculations for diaphragm deflection shall account for the usual bending and shear components as well as any other factors, such as nail deformation, which will contribute to deflection.~~ The deflection (Δ) of a blocked wood structural panel diaphragm uniformly ~~nailed~~ fastened throughout is permitted to be calculated by using the following equation. If not uniformly ~~nailed~~ fastened, the constant 0.188 (For SI: 1/1627) in the third term must be modified accordingly.

$$\Delta = \frac{5vL^3}{8EAb} + \frac{vL}{4Gt} + 0.188Le_n + \frac{\sum(\Delta_c X)}{2b} \qquad \textbf{(Equation 23-1)}$$

For SI: $$\Delta = \frac{0.052vL^3}{EAb} + \frac{vL}{4Gt} + \frac{Le_n}{1627} + \frac{\sum(\Delta_c X)}{2b}$$

Where:

A = Area of chord cross section, in square inches (mm^2).
B = Diaphragm width, in feet (mm).
E = Elastic modulus of chords, in pounds per square inch (N/mm^2).
e_n = ~~Nail or staple~~ Staple deformation, in inches (mm) [see Table 2305.2.2(1)].
Gt = Panel rigidity through the thickness, in pounds per inch (N/mm) of panel width or depth [see Table 2305.2.2(2)].
L = Diaphragm length, in feet (mm).
v = Maximum shear due to design loads in the direction under consideration, in pounds per linear foot (plf) (N/mm).
Δ = The calculated deflection, in inches (mm).
$\Sigma(\Delta_c X)$ = Sum of individual chord-splice slip values on both sides of the diaphragm, each multiplied by its distance to the nearest support.

TABLE ~~2305.2.2(1)~~ 2305.2(1)
e_n VALUES (inches) FOR USE IN CALCULATING DIAPHRAGM DEFLECTION DUE TO FASTENER SLIP (Structural I)[ad]

LOAD PER FASTENER[c] (pounds)	FASTENER DESIGNATIONS[b]			
	~~6d~~	~~8d~~	~~10d~~	14-Ga staple x 2 inches long
60	~~0.01~~	~~0.00~~	~~0.00~~	0.011
80	~~0.02~~	~~0.01~~	~~0.01~~	0.018
100	~~0.03~~	~~0.01~~	~~0.01~~	0.028
120	~~0.04~~	~~0.02~~	~~0.01~~	0.04
140	~~0.06~~	~~0.03~~	~~0.02~~	0.053
160	~~0.10~~	~~0.04~~	~~0.02~~	0.068
180	~~-~~	~~0.05~~	~~0.03~~	-
200	-	~~0.07~~	~~0.47~~	-
220	~~-~~	~~0.09~~	~~0.06~~	-
240	~~-~~	~~-~~	~~0.07~~	-

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound = 4.448 N.

a. Increase e_n values 20 percent for plywood grades other than Structural I.
~~b. Nail values apply to common wire nails or staples identified.~~

c. Load per fastener = maximum shear per foot divided by the number of fasteners per foot at interior panel edges.
d. Decrease e_n values 50 percent for seasoned lumber (moisture content < 19 percent).

TABLE ~~2305.2.2(2)~~ 2305.2(2)
VALUES OF Gt FOR USE IN CALCULATING DEFLECTION OF WOOD STRUCTURAL PANEL SHEAR WALLS AND DIAPHRAGMS

(No change to table entries)

~~**2305.2.3 Diaphragm aspect ratios.** Size and shape of diaphragms shall be limited as set forth in Table 2305.2.3.~~

~~**TABLE 2305.2.3**~~
~~**MAXIMUM DIAPHRAGM DIMENSION RATIOS**~~
~~**HORIZONTAL AND SLOPED DIAPHRAGM**~~

~~**2305.2.4 Construction.** Wood diaphragms shall be constructed of wood structural panels manufactured with exterior glue and not less than 4 feet by 8 feet (1219mmby 2438 mm), except at boundaries and changes in framing where minimum sheet dimension shall be 24 inches (610 mm) unless all edges of the undersized sheets are supported by and fastened to framing members or blocking. Wood structural panel thickness for horizontal diaphragms shall not be less than the valves set forth in Tables 2304.7(3), 2304.7(4) and 2304.7(5) for corresponding joist spacing and loads.~~

~~**2305.2.4.1 Seismic Design Category F.** Structures assigned to Seismic Design Category F shall conform to the additional requirements of this section. Wood structural panel sheathing used for diaphragms and shear walls that are part of the seismic-force-resisting system shall be applied directly to the framing members.~~

~~**Exception:** Wood structural panel sheathing in a diaphragm is permitted to be fastened over solid lumber planking or laminated decking, provided the panel joints and lumber planking or laminated decking joints do not coincide.~~

~~**2305.2.5 Rigid diaphragms.** Design of structures with rigid diaphragms shall conform to the structure configuration requirements of Section 12.3.2 of ASCE 7 and the horizontal shear distribution requirements of Section 12.8.4 of ASCE 7. Open-front structures with rigid wood diaphragms resulting in torsional force distribution are permitted, provided the length, *l*, of the diaphragm normal to the open side does not exceed 25 feet (7620 mm), the diaphragm sheathing conforms to Section 2305.2.4 and the *l/w* ratio [as shown in Figure Figure 2305.2.5(1)] is less than 1 for one-story structures or 0.67 for structures over one story in height.~~
~~**Exception:** Where calculations show that diaphragm deflections can be tolerated, the length, *l*, normal to the open end is permitted to be increased to a l/w ratio not greater than 1.5 where sheathed in compliance with Section 2305.2.4 or to 1 where sheathed in compliance with Section 2306.3.4 or 2306.3.5.~~
~~Rigid wood diaphragms are permitted to cantilever past the outermost supporting shearwall (or other vertical resisting element) a length, *l*, of not more than 25 feet (7620 mm) or two-thirds of the diaphragm width, *w*, whichever is smaller. Figure 2305.2.5(2) illustrates the dimensions of *l* and *w* for a cantilevered diaphragm.~~
~~Structures with rigid wood diaphragms having a torsional irregularity in accordance with Table 12.3-1, Item 1, of ASCE 7 shall meet the following requirements: the *l/w* ratio shall not exceed 1 for one-story structures or 0.67 for structures over one story in height, where *l* is the dimension parallel to the load direction for which the irregularity exists.~~

~~**Exception:** Where calculations demonstrate that the diaphragm deflections can be tolerated, the width is permitted to be increased and the *l/w* ratio is permitted to be increased to 1.5 where sheathed in compliance with Section 2305.2.4 or 1 where sheathed in compliance with Section 2306.3.4 or 2306.3.5.~~

~~**FIGURE 2305.2.5(1)**~~
~~**DIAPHRAGM LENGTH AND WIDTH FOR PLAN VIEW OF OPEN FRONT BUILDING**~~

~~**FIGURE 2305.2.5(2)**~~
~~**DIAPHRAGM LENGTH AND WIDTH FOR PLAN VIEW OF CANTILEVERED DIAPHRAGM**~~

~~**2305.3 Design of wood shear walls.**~~

~~**2305.3.1 General.** Wood shear walls are permitted to resist horizontal forces in vertical distributing or resisting elements, provided the deflection in the plane of the shear wall, as determined by calculations, tests or analogies drawn there from, does not exceed the more restrictive of the permissible deflection of attached distributing or resisting elements or the drift limits of Section 12.12.1 ofASCE7. Shear wall sheathing other than wood structural panels shall not be permitted in Seismic Design Category E or F (see Section 1613).~~

~~**2305.3.2**~~ **2305.3 Shear wall Deflection.** ~~Permissible deflection shall be that deflection up to which the shear wall and any attached distributing or resisting element will maintain its structural integrity under design load conditions, i.e., continue to support design loads without danger to occupants of the structure.~~ The deflection (Δ) of a blocked wood structural panel shear wall uniformly fastened throughout is permitted to be calculated by the use of the following equation:

$$\Delta = \frac{8vh^3}{EAb} + \frac{vh}{Gt} + 0.75he_n + d_a\frac{h}{b} \qquad \textbf{(Equation 23-2)}$$

For SI: $\Delta = \frac{vh^3}{3EAb} + \frac{vh}{Gt} + \frac{he_n}{407.6} + d_a\frac{h}{b}$

where:

A = Area of boundary element cross section in square inches (mm^2) (vertical member at shear wall boundary).
b = Wall width, in feet (mm).
d_a = Vertical elongation of overturning anchorage (including fastener slip, device elongation, anchor rod elongation, etc.) at the design shear load (v).
E = Elastic modulus of boundary element (vertical member at shear wall boundary), in pounds per square inch (N/mm^2).
e_n = ~~Nail or staple~~ Staple deformation, in inches (mm) [see Table 2305.2.2(2)].
Gt = Panel rigidity through the thickness, in pounds per inch (N/mm) of panel width or depth [see Table 2305.2.2(2)].
H = Wall height, in feet (mm).
v = Maximum shear due to design loads at the top of the wall, in pounds per linear foot (N/mm).
Δ = The calculated deflection, in inches (mm).

~~**2305.3.3 Construction.** Wood shear walls shall be constructed of wood structural panels manufactured with exterior glue and not less than 4 feet by 8 feet (1219mmby 2438 mm), except at boundaries and at changes in framing. All edges of all panels shall be supported by and fastened to framing members or blocking.Wood structural panel thickness for shear walls shall not be less than set forth in Table 2304.6.1 for corresponding framing spacing and loads, except that 1/4 inch (6.4 mm) is permitted to be used where perpendicular loads permit.~~

~~**2305.3.4 Shear wall aspect ratios.** Size and shape of shear walls, perforated shear wall segments within perforated shear walls and wall piers within shear walls that are designed for force transfer around openings shall be limited as set forth in Table 2305.3.4. The height, *h*, and the width, *w*, shall be determined in accordance with Sections 2305.3.5 through 2305.3.5.2 and 2305.3.6 through 2305.3.6.2, respectively.~~

~~**TABLE 2305.3.4**~~
~~**MAXIMUM SHEAR WALL DIMENSION RATIOS**~~

~~**2305.3.5 Shear wall height definition.** The height of a shear wall, *h*, shall be defined as:~~

1. ~~The maximum clear height from the top of the foundation to the bottom of the diaphragm framing above; or~~
2. ~~The maximum clear height from the top of the diaphragm to the bottom of the diaphragm framing above [see Figure 2305.3.5(a)].~~

~~**2305.3.5.1 Perforated shear wall segment height definition.** The height of a perforated shear wall segment, *h*, shall be defined as specified in Section 2305.3.5 for shear walls.~~

2305.3.5.2 Force transfer shear wall pier height definition. The height, *h*, of a wall pier in a shear wall with openings designed for force transfer around openings shall be defined as the clear height of the pier at the side of an opening [see Figure 2305.3.5(b)].

2305.3.6 Shear wall width definition. The width of a shear wall, *w*, shall be defined as the sheathed dimension of the shear wall in the direction of application of force [see Figure 2305.3.5(a)].

2305.3.6.1 Perforated shear wall segment width definition. The width of a perforated shear wall segment, *w*, shall be defined as the width of full-height sheathing adjacent to openings in the perforated shear wall [see Figure 2305.3.5(a)].

2305.3.6.2 Force transfer shear wall pier width definition. The width, *w*, of a wall pier in a shear wall with openings designed for force transfer around openings shall be defined as the sheathed width of the pier at the side of an opening [see Figure 2305.3.5(b)].

2305.3.7 Overturning restraint. Where the dead load stabilizing moment in accordance with Chapter 16 allowable stress design load combinations is not sufficient to prevent uplift due to overturning moments on the wall, an anchoring device shall be provided. Anchoring devices shall maintain a continuous load path to the foundation.

2305.3.8 Shear walls with openings. The provisions of this section shall apply to the design of shear walls with openings. Where framing and connections around the openings are designed for force transfer around the openings, the provisions of Section 2305.3.8.1 shall apply. Where framing and connections around the openings are not designed for force transfer around the openings, the provisions of Section 2305.3.8.2 shall apply.

2305.3.8.1 Force transfer around openings. Where shear walls with openings are designed for force transfer around the openings, the limitations of Table 2305.3.4 shall apply to the overall shear wall, including openings, and to each wall pier at the side of an opening. Design for force transfer shall be based on a rational analysis. Detailing of boundary elements around the opening shall be provided in accordance with the provisions of this section [see Figure 2305.3.5(b)].

2305.3.8.2 Perforated shear walls. The provisions of Section 2305.3.8.2 shall be permitted to be used for the design of perforated shear walls. For the determination of the height and width of perforated shear wall segments, see Sections 2305.3.5.1 and 2305.3.6.1, respectively.

2305.3.8.2.1 Limitations. The following limitations shall apply to the use of Section 2305.3.8.2:

1. A perforated shear wall segment shall be located at each end of a perforated shear wall. Openings shall be permitted to occur beyond the ends of the perforated shear wall, provided the width of such openings is not be included in the width of the perforated shear wall.
2. The allowable shear set forth in Table 2306.4.1 shall not exceed 490 plf (7150 N/m).
3. Where out-of-plane offsets occur, portions of the wall on each side of the offset shall be considered as separate perforated shear walls.
4. Collectors for shear transfer shall be provided through the full length of the perforated shear wall.
5. A perforated shear wall shall have uniform top of wall and bottom of wall elevations. Perforated shear walls not having uniform elevations shall be designed by other methods.
6. Perforated shear wall height, *h*, shall not exceed 20 feet (6096 mm).

2305.3.8.2.2 Perforated shear wall resistance. The resistance of a perforated shear wall shall be calculated in accordance with the following:

1. The percentage of full-height sheathing shall be calculated as the sum of the widths of perforated shear wall segments divided by the total width of the perforated shear wall, including openings.
2. The maximum opening height shall be taken as the maximum opening clear height. Where areas above and below an opening remain unsheathed, the height of the opening shall be defined as the height of the wall.
3. The unadjusted shear resistance shall be the allowable shear set forth in Table 2306.4.1 for height to width ratios of perforated shear wall segments that do not exceed 2:1 for seismic forces and 31/2:1 for other than seismic forces. For seismic forces, where the height to width ratio of any perforated shear

wall segment used in the calculation of the sum of the widths of perforated shear wall segments, $\sum Li$, is greater than 2:1 but does not exceed 31/2:1, the unadjusted shear resistance shall be multiplied by 2 *w/h*.

4. The adjusted shear resistance shall be calculated by multiplying the unadjusted shear resistance by the shear resistance adjustment factors of Table 2305.3.8.2. For intermediate percentages of full-height sheathing, the values in Table 2305.3.8.2 are permitted to be interpolated.
5. The perforated shear wall resistance shall be equal to the adjusted shear resistance times the sum of the widths of the perforated shear wall segments.

2305.3.8.2.3 Anchorage and load path. Design of perforated shear wall anchorage and load path shall conform to the requirements of Sections 2305.3.8.2.4 through 2305.3.8.2.8, or shall be calculated using principles of mechanics. Except as modified by these sections, wall framing, sheathing, sheathing attachment and fastener schedules shall conform to the requirements of Section 2305.2.4 and Table 2306.4.1.

2305.3.8.2.4 Uplift anchorage at perforated shear wall ends. Anchorage for uplift forces due to overturning shall be provided at each end of the perforated shear wall. The uplift anchorage shall conform to the requirements of Section 2305.3.7, except that for each story the minimum tension chord uplift force, *T*, shall be calculated in accordance with the following:

(Equation 23-3)

TABLE 2305.3.8.2
SHEAR RESISTANCE ADJUSTMENT FACTOR, Co
WALL HEIGHT, H

FIGURE 2305.3.5
GENERAL DEFINITION OF SHEAR WALL HEIGHT, WIDTH AND HEIGHT-TO-WIDTH RATIO

2305.3.8.2.5 Anchorage for in-plane shear. The unit shear force, *v*, transmitted into the top of a perforated shear wall, out of the base of the perforated shear wall at full height sheathing and into collectors connecting shear wall segments shall be calculated in accordance with the following:

(Equation 23-4)

2305.3.8.2.6 Uplift anchorage between perforated shear wall ends. In addition to the requirements of Section 2305.3.8.2.4, perforated shear wall bottom plates at full-height sheathing shall be anchored for a uniform uplift force, *t*, equal to the unit shear force, *v*, determined in Section 2305.3.8.2.5.

2305.3.8.2.7 Compression chords. Each end of each perforated shear wall segment shall be designed for acompression chord force, *C*, equal to the tension chord uplift force, *T*, calculated in Section 2305.3.8.2.4.

2305.3.8.2.8 Load path. Load path. A load path to the foundation shall be provided for each uplift force, T and t, for each shear force, V and v, and for each compression chord force, *C*. Elements resisting shearwall forces contributed by multiple stories shall be designed for the sum of forces contributed by each story.

2305.3.8.2.9 Deflection of shear walls with openings. The controlling deflection of a blocked shearwall with openings uniformly fastened throughout shall be taken as the maximum individual deflectionof the shear wall segments calculated in accordance with Section 2305.3.2, divided by the appropriateshear resistance adjustment factors of Table 2305.3.8.2.

2305.3.9 Summing shear capacities. The shear values for shear panels of different capacities applied to the same side of the wall are not cumulative except as allowed in Table 2306.4.1.

The shear values for material of the same type and capacity applied to both faces of the same wall are cumulative. Where the material capacities are not equal, the allowable shear shall be either two times the smaller shear capacity or the capacity of the stronger side, whichever is greater.

Summing shear capacities of dissimilar materials applied to opposite faces or to the same wall line is not allowed.

Exception: For wind design, the allowable shear capacity of shear wall segments sheathed with a combination of wood structural panels and gypsum wallboard on opposite faces, fiberboard structural sheathing and gypsum wallboard on opposite faces or hardboard panel siding and gypsum wallboard on opposite faces shall equal the sum of the sheathing capacities of each face separately.

~~**2305.3.10 Adhesives.** Adhesive attachment of shear wall sheathing is not permitted as a substitute for mechanical fasteners, and shall not be used in shear wall strength calculations alone, or in combination with mechanical fasteners in Seismic Design Category D, E or F.~~

~~**2305.3.11 Sill plate size and anchorage in Seismic Design Category D, E or F.** Anchor bolts for shear walls shall include steel plate washers, a minimum of 0.229 inch by 3 inches by 3 inches (5.82 mm by 76 mm by 76 mm) in size, between the sill plate and nut. The hole in the plate washer is permitted to be diagonally slotted with a width of up to 3/16 inch (4.76 mm) larger than the bolt diameter and a slot length not to exceed 13/4 inches (44 mm), provided a standard cut washer is placed between the plate washer and the nut. Sill plates resisting a design load greater than 490 plf (7154 N/m) using load and resistance factor design or 350 plf (5110 N/m) using allowable stress design shall not be less than a 3-inch (76 mm) nominal member. Where a single 3- inch (76 mm) nominal sill plate is used, 2- 20d box end nails shall be substituted for 2-16d common end nails found in line 8 of Table 2304.9.1.~~

~~**Exception:** In shear walls where the design load is greater than 490 plf (7151 N/m) but less than 840 plf (12264 N/m) using load and resistance factor design or greater than 350 plf (5110 N/m) but less than 600 plf (8760 N/m) using allowable stress design, the sill plate is permitted to be a 2-inch (51 mm) nominal member if the sill plate is anchored by two times the number of bolts required by design and 0.229-inch by 3-inch by 3-inch (5.82mm by 76mm by 76mm) plate washers are used.~~

1613.6.1 Assumption of flexible diaphragm. Add the following text at the end of Section 12.3.1.1 of ASCE 7: Diaphragms constructed of wood structural panels or untopped steel decking shall also be permitted to be idealized as flexible, provided all of the following conditions are met:

1. Toppings of concrete or similar materials are not placed over wood structural panel diaphragms except for nonstructural toppings no greater than 11/2 inches (38 mm) thick.
2. Each line of vertical elements of the lateral-force-resisting system complies with the allowable story drift of Table 12.12-1.
3. Vertical elements of the lateral-force-resisting system are light-framed walls sheathed with wood structural anels rated for shear resistance or steel sheets.
4. Portions of wood structural panel diaphragms that cantilever beyond the vertical elements of the lateral-force-resisting system are designed in accordance with Section ~~2305.2.5~~ 4.2.5.2 of AF & PA SDPWS ~~the International Building Code~~.

TABLE 2306.4.5
ALLOWABLE SHEAR FOR WIND OR SEISMIC FORCES FOR SHEAR WALLS OF LATH AND PLASTER OR GYPSUM BOARD WOOD FRAMED WALL ASSEMBLIES
(No change to table entries)

a. These shear walls shall not be used to resist loads imposed by masonry or concrete ~~construction (see Section 2305.1.5)~~ walls (see Section 4.1.5 of AF & PA SDPWS). Values shown are for short-term loading due to wind or seismic loading. Walls resisting seismic loads shall be subject to the limitations in Section 12.2.1 of ASCE 7. Values shown shall be reduced 25 percent for normal loading.

b. through k. (No change to current text)

Reason: Revision of Section 2305: Provisions being deleted from Section 2305 of the IBC are contained in *ANSI/AF&PA NDS Supplement* "*Special Design Provisions for Wind and Seismic" (SDPWS)* which is currently adopted by reference. These provisions are primarily for the building designer and duplication of the provisions not only is unnecessary, but duplication causes confusion. It is proper that all the design provisions be contained in a single document. Provisions of IBC-2006 Section 2305 are covered in the SDPWS-05 as shown in the following Table 2305.

Table 2305. Comparison of IBC-2006 Section 2305 and SDPWS-05

IBC-2006	SDPWS-05	Comment
2305.1.1	4.1.2	Same
2305.1.2	4.1.4	Same
2305.1.2.1	3.1.1, 4.2.7, 4.3.7	Same
2305.1.3	4.3.5	This sentence is retained because a specific requirement to detail on plans the reinforcing of holes in shear panels is not included in SDPWS. Requirements for force transfer for shear walls with openings are covered in SDPWS 4.3.5 and SDPWS includes general criteria by reference to NDS for ASD and LRFD which addresses effect of net section on design.
2305.1.4	4.1.7	Same
2305.1.5	4.1.5	Same
2305.1.6	4.1.6	Same
2305.2.1	4.2.1	Same
2305.2.2	4.2.2	Same in substance, however, SDPWS does not address deflection calculations for stapled

		diaphragms. Therefore, the diaphragm deflection equation and staple slip values are being retained. For nailed diaphragms, the SDPWS Simplified deflection equation has the same basis as Eq. 23-1. Use of Eq. 23-1 is permitted as an alternative and necessary equation inputs are provided in SDPWS Commentary. Stiffness properties for diaphragm construction other than wood structural panel are given in SDPWS for purposes of complying with drift and diaphragm flexibility requirements specified elsewhere in the building code.
2305.2.3	4.2.4	Same
Table 2305.2.3	Table 4.2.4	Same
2305.2.4	4.2.7	Same
2305.2.4.1	4.2.7.1	Same except attachment of sheathing directly to framing is generally required in SDPWS and not a special detail for SDC F. Expanded criteria are provided in SDPWS for wood structural panel over lumber decking.
2305.2.5	4.2.5	Same
2305.3.1	4.3.1	Same
2305.3.2	4.3.1, 4.3.2	Same in substance, however, SDPWS does not address deflection calculations for stapled shear walls. Therefore, the shear wall deflection equation and staple slip values are being retained. The SDPWS simplified deflection equation has the same basis as Eq. 23-2. Use of Eq. 23-2 is permitted as an alternative and necessary equation inputs are provided in SDPWS Commentary. Stiffness properties for shear wall construction other than wood structural panel are given in SDPWS for purposes of complying with drift and stiffness compatibility requirements specified elsewhere in the building code.
2305.3.3	4.3.7	Same
2305.3.4	4.3.4, 4.3.5	Same
Table 2305.3.4	Table 4.3.4	Same
2305.3.5	2.3	Same
2305.3.5.1	2.3	Same
2305.3.5.2	4.3.5.2	Same
2305.3.6	2.3	Same
2305.3.6.1	2.3	Same
2305.3.6.2	4.3.5.2	Same
2305.3.7	4.3.6.4.2	Same in substance except SDPWS language is applicable to designs in accordance with both ASD and LRFD methods.
2305.3.8	4.3.5	Same
2305.3.8.1	4.3.5.2	Same
2305.3.8.2	4.3.5.3	Same
2305.3.8.2.1	4.3.5.3	Same in substance except SDPWS language is applicable to designs in accordance with both ASD and LRFD methods. SDPWS language clarifies perforated shear wall sheathing limitations for one-sided and two-sided walls and for walls resisting wind and seismic.
2305.3.8.2.2	4.3.3.4, 4.3.4.1	Same
2305.3.8.2.3	4.3.6	Same
2305.3.8.2.4	4.3.6.1.2	Same
Table 2305.3.8.2	Table 4.3.2.1	Same
Figure 2305.3.5	Figure C4.3.5.1 and C4.3.5.2	Same
2305.3.8.2.5	4.3.6.4.1.1	Same
2305.3.8.2.6	4.3.6.4.2.1	Same
2305.3.8.2.7	4.3.6.1.2	Same
2305.3.8.2.8	4.3.6.4.4	Same
2305.3.8.2.9	4.3.2.1	Same in substance except SDPWS clarifies calculation method for perforated shear wall deflection.
2305.3.9	4.3.3.2,	Same in substance except SDPWS clarifies criteria for both ASD and LRFD methods. SDPWS also clarifies criteria for combination of materials on opposite sides of a two-sided wall for seismic. Currently, IBC states that they should not be summed.
2305.3.10	4.3.6.3.1	SDPWS limits use of adhesive shear wall systems to SDC A, B, and C and specifies R=1.5. In IBC, a reduced R is not specified for a system with adhesive.
2305.3.11	4.3.6.4.3	Same intent which is to minimize sill plate or bottom plate splitting; however, SDPWS specifies a minimum 2-1/2" square by ¼" washer for anchor bolts in all seismic design categories. To account for different bottom plate width and potential for cross-grain bending, SDPWS also requires the plate washer to extend to within ½" of the sheathed edge of the bottom plate. For SDC D, E and F only, IBC specifies 3x nominal sill plate with 3" square x 0.229" unless twice the number of anchor bolts are used. Where twice the number of anchor bolts are used, a 2x nominal sill plate is permitted provided the ASD design load is less than 600 plf.

Revision of Section 1613.6.1: The reference to Section 2305.2.5 of the IBC is replaced by reference to Section 4.2.5.2 of SDPWS containing the same limitations for cantilever diaphragms.

Revision of Table 2306.4.5 footnote a: The reference to Section 2305.1.5 of the IBC is replaced by reference to Section 4.1.5 of SDPWS containing the same limitations for wood members and systems resisting seismic forces contributed by masonry and concrete walls. The word "construction" is changed to "walls" to match language in both IBC and SDPWS.

Cost Impact: The cost change proposal will not increase the cost of construction. Provisions being deleted from Section 2305 of the IBC are contained in ANSI/AF&PA NDS Supplement "Special Design Provisions for Wind and Seismic" (SDPWS) which is currently adopted by reference.

Committee Action: **Approved as Modified**

Modify proposal as follows:

SECTION 2305
GENERAL DESIGN REQUIREMENTS FOR LATERAL-FORCE-RESISTING SYSTEMS

2305.1 General. Structures using wood shear walls and diaphragms to resist wind, seismic and other lateral loads shall be designed and constructed in accordance with AF&PA SDPWS and the provisions of Section 2305, 2306, and 2307.

2305.1.1 Openings in shear panels. Openings in shear panels that materially affect their strength shall be fully detailed on the plans, and shall have their edges adequately reinforced to transfer all shearing stresses.

2305.2 Diaphragm deflection. The deflection (Δ) of a blocked wood structural panel diaphragm uniformly fastened throughout with staples is permitted to be calculated by using the following equation. If not uniformly fastened, the constant 0.188 (For SI: 1/1627) in the third term ~~must~~ shall be modified accordingly.

$$\Delta = \frac{5vL^3}{8EAb} + \frac{vL}{4Gt} + 0.188Le_n + \frac{\Sigma\left(\Delta_c X\right)}{2b} \qquad \textbf{(Equation 23-1)}$$

For SI:

$$\Delta = \frac{.052vL^3}{EAb} + \frac{vL}{4Gt} + \frac{Le_n}{1627} + \frac{\Sigma\left(\Delta_c X\right)}{2b} \qquad \textbf{(Equation 23-2)}$$

Where:

A = Area of chord cross section, in square inches (mm^2).
b = Diaphragm width, in feet (mm).
E = Elastic modulus of chords, in pounds per square inch (N/mm^2).
e_n = Staple deformation, in inches (mm) [see Table ~~2305.2.2(1)~~ 2305.2(1)].
Gt = Panel rigidity through the thickness, in pounds per inch (N/mm) of panel width or depth [see Table ~~2305.2.2(2)~~ 2305.2(2)].
L = Diaphragm length, in feet (mm).
v = Maximum shear due to design loads in the direction under consideration, in pounds per linear foot (plf) (N/mm).
Δ = The calculated deflection, in inches (mm).
$\Sigma(\Delta_c X)$ = Sum of individual chord-splice slip values on both sides of the diaphragm, each multiplied by its distance to the nearest support.

TABLE 2305.2(1)
e_n VALUES (inches) FOR USE IN CALCULATING DIAPHRAGM AND SHEAR WALL DEFLECTION DUE TO FASTENER SLIP (Structural I)[ac]

LOAD PER FASTENER[b] (pounds)	FASTENER DESIGNATIONS
	14-Ga staple x 2 inches long
60	0.011
80	0.018
100	0.028
120	0.04
140	0.053
160	0.068
180	-
200	-
220	-
240	-

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound = 4.448 N.
a. Increase e_n values 20 percent for plywood grades other than Structural I.
b. Load per fastener = maximum shear per foot divided by the number of fasteners per foot at interior panel edges.
c. Decrease e_n values 50 percent for seasoned lumber (moisture content < 19 percent).

TABLE 2305.2(2)
VALUES OF Gt FOR USE IN CALCULATING DEFLECTION OF WOOD STRUCTURAL PANEL SHEAR WALLS AND DIAPHRAGMS
(No change to table contents)

2305.3 Shear wall deflection. The deflection (Δ) of a blocked wood structural panel shear wall uniformly fastened throughout with staples is permitted to be calculated by the use of the following equation:

$$\Delta = \frac{8vh^3}{EAb} + \frac{vh}{Gt} + 0.75he_n + d_a\frac{h}{b}$$ (Equation 23-2)

For SI:

$$\Delta = \frac{vh^3}{3EAb} + \frac{vh}{Gt} + \frac{he_n}{407.6} + d_a\frac{h}{b}$$

Where:

A = Area of boundary element cross section in square inches (mm^2) (vertical member at shear wall boundary).
b = Wall width, in feet (mm).
d_a = Vertical elongation of overturning anchorage (including fastener slip, device elongation, anchor rod elongation, etc.) at the design shear load (v).
E = Elastic modulus of boundary element (vertical member at shear wall boundary), in pounds per square inch (N/mm^2).
e_n = Staple deformation, in inches (mm) [see Table ~~2305.2.2(1)~~ 2305.2(1)].
Gt = Panel rigidity through the thickness, in pounds per inch (N/mm) of panel width or depth [see Table ~~2305.2.2(2)~~ 2305.2(2)].
h = Wall height, in feet (mm).
v = Maximum shear due to design loads at the top of the wall, in pounds per linear foot (N/mm).
Δ = The calculated deflection, in inches (mm).

1613.6.1 Assumption of flexible diaphragm. Add the following text at the end of Section 12.3.1.1 of ASCE 7: Diaphragms constructed of wood structural panels or untopped steel decking shall also be permitted to be idealized as flexible, provided all of the following conditions are met:

1. Toppings of concrete or similar materials are not placed over wood structural panel diaphragms except for nonstructural toppings no greater than 11/2 inches (38 mm) thick.
2. Each line of vertical elements of the lateral-force-resisting system complies with the allowable story drift of Table 12.12-1.
3. Vertical elements of the lateral-force-resisting system are light-framed walls sheathed with wood structural panels rated for shear resistance or steel sheets.
4. Portions of wood structural panel diaphragms that cantilever beyond the vertical elements of the lateral-force-resisting system are designed in accordance with Section 4.2.5.2 of AF & PA SDPWS.

TABLE 2306.4.5
ALLOWABLE SHEAR FOR WIND OR SEISMIC FORCES FOR SHEAR WALLS OF LATH AND PLASTER OR GYPSUM BOARD WOOD FRAMED WALL ASSEMBLIES
(No change to table contents)

a. These shear walls shall not be used to resist loads imposed by masonry or concrete walls (see Section 4.1.5 of AF & PA SDPWS). Values shown are for short-term loading due to wind or seismic loading. Walls resisting seismic loads shall be subject to the limitations in Section 12.2.1 of ASCE 7. Values shown shall be reduced 25 percent for normal loading.
b. through k. (No change to current text)

Committee Reason: This proposal substitutes a referenced standard for the provisions of Section 2305. The modification helps achieve the intent of the code change to retain IBC provisions pertaining to staple fasteners.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Richard vonWeller, Park City Municipal Corporation, representing Utah Chapter ICC, requests Disapproval.

Commenter's Reason: S82 is a prime example of a disturbing trend in the IBC to eliminate basic construction code requirements from the IBC. There has been a wholesale effort to take critical elements out of our base code and move them to reference standards where the voting members of ICC have little or no control over the outcome of any changes.

How many code officials have the time or resource to participate in the various and numerous industry standard development processes? Even if they did have the resource, what effect can a governmental member have in such a process? Once a requirement moves out of ICC's system what hope is there we will regain our opportunity to effect positive change in the public interest?