Proposed 2012 North Carolina Amendments to the 2009 International Building Code (16-33)

(Changes only listed-all other 2009 IBC base code to remain)

Chapter 16 – Structural Design

TABLE 1604.5
OCCUPANCY CATEGORY OF BUILDINGS AND OTHER STRUCTURES

UNDER OCCUPANCY CATEGORY IV

• Water storage facilities and pump structures required to maintain water pressure for fire suppression.[b]

a. For purposes of occupant load calculation, occupancies required by Table 1004.1.1 to use gross floor area calculations shall be permitted to use net floor areas to determine the total occupant load.
b. Not intended for such uses in categories I, II, and III.

1608.2 Ground snow loads. The ground snow loads to be used in determining the design snow loads for roofs shall be determined in accordance with ASCE 7 or Figure 1608.2 for North Carolina ~~the contiguous United States and Table 1608.2 for Alaska~~. Site-specific case studies shall be made in areas designated "CS" in Figure 1608.2. Ground snow loads for sites at elevations above the limits indicated in Figure 1608.2 and for all sites within the CS areas shall be *approved*. Ground snow load determination for such sites shall be based on an extreme value statistical analysis of data available in the vicinity of the site using a value with a 2-percent annual probability of being exceeded (50-year mean recurrence interval). ~~Snow loads are zero for Hawaii, except in mountainous regions as *approved* by the *building official*.~~

Remove Table 1608.2.

Replace Figure 1608.2 with North Carolina ground snow load map.

Revise current North Carolina ground snow load map with CS numbers and add the following text:

In CS areas, site-specific Case Studies are required to establish ground snow loads. Extreme local variations in ground snow loads in these areas preclude mapping at this scale.

Numbers in parentheses represent the upper elevation limits in feet for the ground snow load values presented below. Site -specific case studies are required to establish ground snow loads at elevations not covered.

To convert lb/sq ft to kNm_2, multiply by 0.0479.

To convert feet to meters, multiply by 0.3048.

Replace the following text in Section 1609.1.2:

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 classified as Group R-3 or R-4 occupancy. 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 predrilled as required for the anchorage method and 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, with corrosion-resistant attachment hardware provided and anchors permanently installed on the building. Attachment in accordance with Table 1609.1.2 with corrosion-resistant attachment hardware provided and anchors permanently installed on the building is permitted for buildings with a mean roof height of 45 feet (13 716 mm) or less where wind speeds do not exceed 140 mph (63 m/s).~~

1. Wood structural panels with a minimum thickness of 7/16 inch (11.1mm) and maximum panel span of 8 feet (2438 mm) shall be permitted for opening protection in buildings with a mean roof height of 33 feet (10 058 mm) 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).

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 (stone ballast or gravel) roofs located within 1,500 feet (458 m) of the building shall be permitted to be unprotected.

Add text:

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.

WIND-BORNE DEBRIS REGION. Areas within hurricane-prone regions defined as that area east of the inland waterway from the North Carolina/South Carolina state line north to Beaufort Inlet and from that point to include the barrier islands to the North Carolina/Virginia state line.

Replace Figure 1609 with the existing North Carolina Figure 1609 with the following modifications:

1 – Hatch and designate the special wind zone counties as identified in the Residential Code

2 – Replace Note 4 with:

~~4. Mountainous terrain, gorges, ocean promontories and special wind regions shall be examined for unusual wind conditions.~~

4. In special wind regions the design professional shall verify the wind speed with the local *Building Official*.

Replace Figure 1611.1 with Figure 1106.1 of the proposed North Carolina Plumbing Code.

SECTION 1612
FLOOD LOADS

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~~.

Delete Section 1614 and Table 1614 of the 2009 North Carolina Building Code.

Replace pages 348-365 of the 2009 IBC with current North Carolina maps Figure 1615(1) and Figure 1615(2) to be renumbered to Figure 1613(1) and Figure 1613(2).

Chapter 17 - STRUCTURAL TESTS AND SPECIAL INSPECTIONS

***Coordinate - Definition of STRUCTURAL OBSERVATION – Section 110 in Administrative Code**

SECTION 1704
SPECIAL INSPECTIONS

~~**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 *approved agencies* to perform inspections during construction on the types of work listed under Section 1704. These inspections are in addition to the inspections identified in Section 110.~~

1704.1 General. Where application is made for construction as described in this section, the owner shall employ one or more special inspectors to provide inspections during construction on the types of work listed per Section 1704.1.2. The special inspector shall be a 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 the *North Carolina Administrative Code and Policies*.

The special inspector shall be a qualified person who shall demonstrate competence, to the satisfaction of the *building official*, for the inspection of the particular type of construction or operation requiring *special inspection*. The *registered design professional in responsible charge* and engineers of record involved in the design of the project are permitted to act as the *approved agency* and their personnel are permitted to act as the special inspector for the work designed by them, provided those personnel meet the qualification requirements of this section to the satisfaction of the *building official*. The special inspector shall provide written documentation to the *building official* demonstrating his or her competence and relevant experience or training. Experience or training shall be considered relevant when the documented experience or training is related in complexity to the same type of *special inspection* activities for projects of

similar complexity and material qualities. These qualifications are in addition to qualifications specified in other sections of this code.

~~**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 Group U occupancies 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.** The applicant shall submit a statement of *special inspections* prepared by the *registered design professional in responsible charge* in accordance with Section 107.1 as a condition for issuance.~~
~~This statement shall be in accordance with Section 1705.~~

~~**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*.~~

1704.1.1 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~~ the *North Carolina Administrative Code and Policies* as a condition for permit issuance. This statement shall include a 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: Deleted.

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:

1.1. Building height exceeds 45 feet (13.7 m) or three stories, or

1.2. The building is an underground building per Section 405.1:

2. Buildings or other structures listed in Table 1604.5 in Occupancy Categories III or IV;

3. Piles, piers and special foundations per Sections 1704.8 through 1704.11, 1810.3.5.2.4 and 1810.3.5.2.5;

4. Retaining walls exceeding 5 feet (1524 mm) height per Section ~~1806.2~~ 1807.2;

5. Smoke control and smoke exhaust systems;

6. Sprayed fire-resistant materials; or

7. Special case described in Section ~~1704.13~~ 1704.15.

~~1704.1.2~~ 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 or was not completed in conformance to *approved construction documents*. Discrepancies shall be brought to the immediate attention of the contractor for correction. If they 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 prior to the start of work by the applicant and the *building official*.

SECTION 1706
SPECIAL INSPECTIONS FOR
WIND REQUIREMENTS

1706.1 Special inspections for wind requirements. *Special inspections* itemized in Section 1704.1.2 and Sections 1706.2 through 1706.4, ~~unless exempted by the exceptions to Section 1704.1~~ are required for buildings and structures constructed in the following areas:

SECTION 1707
SPECIAL INSPECTIONS FOR
SEISMIC RESISTANCE

1707.1 Special inspections for seismic resistance. *Special inspections* itemized in Sections 1707.2 through 1707.9, and where required by Section 1704.1.2 unless exempted by the exceptions of Section ~~1704.1~~ 1705.3 or 1705.3.1, are required for the following:

SECTION 1708
STRUCTURAL TESTING FOR
SEISMIC RESISTANCE

1708.1 Testing and qualification for seismic resistance. The testing and qualification specified in Sections 1708.2 through 1708.5, and where required by Section 1704.1.2 unless exempted from *special inspections* by the exceptions of Section ~~1704.1~~ 1705.3 or 1705.3.1 are required as follows:

Chapter 18 – SOILS AND FOUNDATIONS

1805.1 General. Walls or portions thereof that retain earth and enclose interior spaces and floors below grade shall be waterproofed and dampproofed in accordance with this section~~, . with the exception of those spaces containing groups other than residential and institutional where such omission is not detrimental to the building or occupancy~~.

Section 1805.4.2

1805.4.2 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 1805.4.1, 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.

1806.2 Presumptive load-bearing values. The load-bearing values used in design for supporting soils near the surface shall not exceed the values specified in Table 1806.2 ~~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.

Where the *building official* has reason to doubt the classification, strength or compressibility of the soil, the requirements of Section 1803.5.2 shall be satisfied.

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.

1807.2.4 Retaining systems adjacent to structures. Retaining systems less than 5 feet in cumulative vertical relief and adjacent to a structure located closer than the vertical relief shall be designed under the responsible charge of a *registered design professional.*

1807.2.5 Retaining systems. Retaining systems providing a cumulative vertical relief greater than 5 feet (1524 mm) in height within a horizontal separation distance of 50 feet (15 m) or less, including retaining walls or mechanically stabilized earth walls, shall be designed under the responsible charge of a *registered design professional*. Retaining systems shall meet the requirements of Section 1610. Testing and inspection reports shall comply with Section 1704.1.2 and shall verify:

1. Foundation support system is adequate for the intended site conditions;

2. Measurement of the quality of construction materials for conformance with specifications;

3. Determination of similarity of actual soil conditions to those anticipated in design; and

4. Examination of backfill materials and any drainage systems for compliance with plans and specifications.

1809.4 Depth and width of footings. The minimum depth of footings below the undisturbed ground surface shall be 12 inches (305 mm). Where applicable, the requirements of Section 1809.5 shall also be satisfied. The minimum width of footings shall be ~~12~~ 16 inches (~~305~~ 406 mm). Minimum width of turned down slabs shall be 12 inches (305 mm) unless engineering analysis is provided.

In Table 1809.7 replace Width of Footing for number of floors 1 and 2 with 16 instead of ~~12~~ and ~~15~~ respectively.

1810.2.2 Stability. Remove the following exception

Exception:

~~2. A single row of deep foundation elements without lateral bracing is permitted for one- and two-family dwellings and lightweight construction not exceeding two *stories above grade plane* or 35 feet (10 668 mm) in *building height*, provided the centers of the elements are located within the width of the supported wall.~~

Add the following sections:

1810.3.5.2.4 Pile test. A pile load test shall be performed if 400 psi (2758 kPa) shaft stress is exceeded. The pile load test shall be in accordance with Section 1808.2.8.3.

1810.3. 5.2.5 Quality control. For piles having a shaft stress exceeding 400 psi (2758 kPa), the following quality control procedures shall be met:

1. Calibrate pile installation equipment to accurately measure grout volumes and pressure prior to test pile installation. This calibration shall be expressed in cubic feet per pump stroke.

2. Document the amount of grout injected into the test pile by recording the number of pump strokes per linear foot or number of pump strokes per 5 linear foot (1524 mm) section.

3. Subject the installation procedures to a static load test in accordance with ASTM D 1143.

4. If the load test is successful, ensure that each production pile is installed using the same procedure that installed the successful test pile.

5. A *registered design professional* shall certify to the code enforcement official that all pilings were installed in accordance with the *approved* design and tested installation procedure. The engineer shall be prepared to submit upon request a report showing the following information:

5.1. Pile identification;

5.2. Pile length;

5.3. Date;

5.4. Rate of auger withdrawal (grouting time); and

5.5. Grout volume in cubic feet per linear foot or cubic feet per 5 foot (1524 mm) section.

CHAPTER 21 – MASONRY

2101.3 Construction documents. The *construction documents* shall show all of the items required by this code including the following:

1. Specified size, grade, type and location of reinforcement, anchors and wall ties.

2. Reinforcing bars to be welded and welding procedure.

3. Size and location of structural elements.

4. Provisions for dimensional changes resulting from elastic deformation, creep, shrinkage, temperature and moisture.

~~5. Loads used in the design of masonry.~~

6. Specified compressive strength of masonry at stated ages or stages of construction for which masonry is designed, except where specifically exempted by this code.

7. Details of anchorage of masonry to structural members, frames and other construction, including the type, size and location of connectors.

~~8. Size and location of conduits, pipes and sleeves.~~

~~9. The minimum level of testing and inspection as defined in Chapter 17, or an itemized testing and inspection program that meets or exceeds the requirements of Chapter 17.~~

SECTION 2109
EMPIRICAL DESIGN OF MASONRY

Delete article **2109.1** through **2109.2.2** of the 2009 IBC.

Bring forward article **2109.1** through **2109.7.4** of the 2009 NC Building Code with the following modifications:

1. **2109.1 General.** Empirically designed masonry shall conform to this chapter ~~or Chapter 5 of ACI 530/ASCE 5/TMS 402~~.

2. The entire article **2109.1.1 Limitations** will remain the same with the exception of the last paragraph which should read:

   In buildings that exceed one or more of the above limitations, masonry shall be designed in accordance with the engineered design provisions of Section 2107 or 2108 or the foundation wall provisions of Section ~~1805.5~~ 1807.1.5.

3. **TABLE 2109.1a** and **TABLE 2109.1b** will remain the same with the exception of **footnote d.** which should read:

   d. Larger *H/t* ratios may be used if the design is done in accordance with ~~ACI 530~~ engineered design based on TMS 402/ACI 530/ASCE 5.

4. Replace **TABLE 2109.1.1** with the TABLE below:

Table 2109.1.1
EMPIRICAL WIND LIMITATIONS TABLE

	Building Height, ft(m)	Basic Wind Speed, mph (kph)				
		V_{3S}=<90	90<V_{3S}=<100	100<V_{3S}=<110	110<V_{3S}=<130	130<V_{3S}
All masonry elements that are part of the lateral force-resisting system[a]	H=<35 (H=<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 (H>55)	Not Permitted				
	60<H=<180 (18<H=<55)	Permitted	Not Permitted			
	35<H=<60 (11<H=<18)	Permitted		Not Permitted		
	H=<35 (H=<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 (H>55)	Not Permitted				
	60<H=<180 (18<H=<55)	Permitted	Not Permitted			
	35<H=<60 (11<H=<18)	Permitted		Not Permitted		
All masonry elements that are **not** part of the lateral force-resisting system[a]	H=<35 (H=<11)	Permitted				Not Permitted

a. Includes interior and exterior walls for enclosed, partially enclosed, and open buildings as defined by ASCE 7.

5. **TABLE 2109.4.1** will remain the same with the exception of the **Note:** which should read:

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

6. Replace **TABLE 2109.3.2** with TMS 402/ACI 530/ASCE 5 **TABLE 5.4.2**. Keep the article number and title as **TABLE 2109.3.2**. (make handwritten correction on handout)

7. Replace **2109.7.3.2 Steel floor joists.** With TMS 402/ACI 530/ASCE 5 **5.8.3.3** paragraph to read as follows:

   2109.7.3.2 Steel floor joists. Steel joists that are supported by masonry walls shall bear on and be connected to steel bearing plates. Maximum joist spacing shall be 6 ft (1.83 m) on center. Each bearing plate shall be anchored to the wall with a minimum of two ½ in. (12.7 mm) diameter bolts, or their equivalent. Where steel joists are parallel to the wall, anchors shall be located where joist bridging terminates at the wall and additional anchorage shall be provided to comply with Section 2109.7.3.3.

Renumber 2009 IBC article **2109.3** to **2109.8**.

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

2111.2 Footings and foundations. Footings for masonry fireplaces and their chimneys shall be constructed of concrete or solid masonry at least 12 inches (305 mm) thick and shall extend at least ~~6~~ 12 inches (~~153~~ 305 mm) beyond the face of the fireplace or foundation wall on all sides. Footings shall be founded on natural undisturbed earth or engineered fill below frost depth. In areas not subjected to freezing, footings shall be at least 12 inches (305 mm) below finished grade.

Keep Table 2111.1 SUMMARY OF REQUIREMENTS FOR MASONRY FIREPLACES AND CHIMNEYS
Letter T: ~~6~~ 12 inches each side of fireplace wall.

Keep FIGURE 2111.1 FIREPLACE AND CHIMNEY DETAILS – See attached document

CHAPTER 22 - STEEL

2210.3.1 Design. Cold-formed steel trusses and the placement diagram shall be designed and detailed by a *registered design professional* and in accordance with AISI S214, Sections 2210.3.1 through 2210.3.5 and accepted engineering practice.

2210.3.2 Truss design drawings. The truss design drawings shall conform to the requirements of Section B2.3 of AISI S214 and shall be provided with the shipment of trusses delivered to the job site. The truss design drawings shall include the details of permanent individual truss member restraint/bracing in accordance with Section B6(a) or B6(c) of AISI S214 where these methods are utilized to provide restraint/bracing. Each individual truss design drawing shall bear the seal and signature of the truss designer.

2210.3.3 ~~Deferred submittals~~ Truss submittal package. AISI Section B4.2 shall be deleted. 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.

CHAPTER 23 - WOOD

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 rafters; Those obtained in AF&PA *Design Values for Joists and Rafters*.

2. For load-bearing studs; No. 3 grade, standard grade or stud grade, utility grade may be used to support roof and ceiling loads only.

3. For nonload-bearing 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.

~~**2303.4.1.1**~~ **2303.4.1.4 Truss designer.** The individual or organization responsible for the design of trusses who is a *registered design professional*.

2303.4.1.4.1 Truss design drawings. ~~Where required by the *registered design professional*, the *building official* or the statutes of the jurisdiction in which the project is to be constructed,~~ Each individual truss design drawing shall bear the seal and signature of the truss designer.

~~**Exceptions:**~~

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

~~2. When a cover sheet and a truss index sheet are separately provided and attached to the set of truss design drawings, the cover sheet and the truss index sheet are the only documents required to be signed and sealed by the truss designer.~~

2303.4.2 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 ~~that serve only as a guide for installation and do not deviate from the *permit* submittal drawings~~ shall ~~not~~ be required to bear the seal ~~or~~ and signature of the truss designer.

2303.4.3 Truss submittal package. The truss submittal package provided by the truss manufacturer shall consist of each individual truss design drawing, the truss placement diagram, the permanent individual truss member restraint/bracing method and details and any other structural details germane to the trusses; and, as applicable, the cover/truss index sheet. The submittal package shall be submitted to the *registered design professional in responsible charge* for final approval prior to fabrication of trusses.

2303.7 Shrinkage. Deleted.

2304.10.3 Roof framing. Every roof girder and at least every alternate roof beam shall be anchored to its supporting member; and every monitor and every sawtooth construction shall be anchored to the main roof construction. Such anchors shall be ~~consist of steel or iron bolts~~ of sufficient strength to resist vertical uplift of the roof.

2304.10.5 Roof decks. Where supported by a wall, roof decks shall be anchored to walls to resist uplift forces determined in accordance with Chapter 16. Such anchors shall be ~~consist of steel or iron bolts~~ of sufficient strength to resist vertical uplift of the roof.

***Replace Table 2304.9.1 with Pages 6 and 22-25 including footnotes of ESR 1539. Please obtain copyright permission.**

Replace Section 2304.11.6 with the following:

2304.11.6 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 2304.11.6.2.

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 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 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 North Carolina 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.

*The following should be added to **Table 2306.7** and renumbered to Item 5

3. Gypsum sheathing

1/2″ x 2′ x 8′	Unblocked	4	75	No. 11 gage, 1 ¾ “ long, 7/16″ head, diamond point, galvanized
1/2″ x 4′	Blocked	4f	175	
	Unblocked	7	100	16 Ga. Galv. Staple, 1 ¾” long
5/8″ x 4′	Blocked	4″ edge/ 7″ field	200	6d galvanized 0.120″ Nail, min. 3/8″ head, 13/4″ long

2308.3.2 Braced wall line connections. Wind and seismic lateral forces shall be transferred from the roofs and floors to braced wall lines and from the braced wall lines in upper stories to the braced wall lines in the *story* below in accordance with ~~is~~ this section.

Braced wall line top plates shall be fastened to joists, rafters or full-depth blocking above in accordance with Table 2304.9.1~~, Items 11, 12, 15 or 19~~ as applicable based on the orientation of the joists or rafters to the braced wall line. Braced wall line bottom plates shall be connected to joists or blocking below in accordance with Table 2304.9.1~~, Item 6~~, or to foundations in accordance with Section 2308.3.3. At exterior gable end walls, braced wall panel sheathing in the top *story* shall be extended and fastened to roof framing where the spacing between parallel exterior braced wall lines is greater than 50 feet (15 240 mm).

Exception: Where roof trusses are used and are installed perpendicular to an exterior braced wall line, lateral forces shall be transferred from the roof diaphragm to the braced wall by blocking of the ends of the trusses or by other *approved* methods providing equivalent lateral force transfer. Blocking shall be a minimum of 2 inches (51 mm) nominal in thickness and equal to the depth of the

truss at the wall line and shall be fastened to the braced wall line top plate as specified in Table 2304.9.1~~, Item 11~~.

CHAPTER 26 - PLASTIC

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 preservative-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.

*Delete Figure 2603.8

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
~~ELECTRICAL~~ EMERGENCY AND STANDBY POWER

[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.

[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.

[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 30 - ELEVATORS AND CONVEYING SYSTEMS

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

CHAPTER 31 - SPECIAL CONSTRUCTION

3103.1 General. The provisions of this section shall apply to structures erected for a period of less than 180 days. ~~Tents and other membrane structures erected for a period of less than 180 days shall comply with the *International Fire Code*.~~ Those erected for a longer period of time shall comply with ~~the~~ all applicable sections of ~~this code~~ the Building Code.

> **Exception:** Tents and other membrane structures erected for a period of less than 180 days shall comply with the *International Fire Code.*

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.

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 or UL 723 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.

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

3108.6~~3~~ Foundations. Footings and foundations shall be designed and constructed in accordance with the provisions of Chapter 18.

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.

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 - ENCROACHMENTS INTO THE PUBLIC RIGHT-OF-WAY

3202.5 Space under public property.

3202.5.1 Space under sidewalk. Where space under the sidewalk is used for any purpose, a special permit shall be required.

3202.5.2 Sidewalk lights. When glass is set in the sidewalk to provide light for spaces underneath, the glass shall be supported by metal or reinforced concrete frames and such glass shall be not less than 1/2 inch (12.7 mm) thick. Where such glass is over 12 square inches (7742mm2), it shall have wire mesh embedded in the glass. All portions of sidewalk lights shall be of not less strength than required for the load specified.

Chapter 33 – SAFEGUARDS DURING CONSTRUCTION

Keep as printed in the 2009 International Building Code

Chapter 34 – EXISTING STRUCTURES

This is a carry over of 2009 NC Code language.

In Sections 3401.3 and 3412.3.2., remove “and International Property Maintenance Code” from end of sentence.

Chapter 35 – REFERENCED STANDARDS

Keep as printed in the 2009 International Building Code

Chapter 36 - PIERS, BULKHEADS AND WATERWAY STRUCTURES

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

SECTION 3601
GENERAL

The intent of this chapter is to provide minimum standards for the design, construction and maintenance of piers, bulkheads and waterway structures that are not covered by other existing codes or design standards. This chapter exempts farm structures not on public waters, marine terminal or port facilities for berthing, mooring, docking and servicing ships, barges or tug boats which handle cargo of all types including bulks, liquids, fuels and passengers.

The design of piers, bulkheads and waterway structures is essential for the protection of life and property without causing adverse effects to the shoreline. These structures by their very nature result in some modification of physical environment and therefore require minimum design standards. The guidelines in this chapter address minimum standards for foundations, design forces, structural integrity, material selection and utilization, and construction techniques.

SECTION 3602
PERMITS AND APPROVALS

The construction of any pier, bulkhead or waterway structure in public waters or the placement of dredged materials in waters or wetlands, generally requires the owner to obtain permits prior to construction. A permit from the United States Army Corps of Engineers is generally required for all marine construction. In addition to the permit issued by the Corps of Engineers, additional permits may be required from municipal, county or state governments and/or local marine commissions. In cases of structures to be built on lakes operated by an electric utility for the generation of power, a permit from the operating utility may also be required.

SECTION 3603
MINIMUM DESIGN LOADS

3603.1 General. Every structure shall be of sufficient strength to support the imposed dead, live, wind and impact loads without exceeding the allowable stresses prescribed for the various materials elsewhere in this code. Adequate consideration shall be made for forces imposed by earth, water, docking and mooring.

3603.2 Dead loads. The weight of the component parts of a structure shall be used in the design when it will influence the strength of the structural elements.

3603.3 Live loads. Design live loads shall be the greatest load that will probably be imposed on the structure including superimposed loads on retained material which exert horizontal loads on the structure. Where vehicles are allowed, use actual weight of vehicles and wheel loads as specified in the latest edition of *Standard Specifications for Highway Bridges* ~~of the American Association of State Highway Bridges:~~ of the American Association of State Highway and Transportation Officials. The design load shall be posed at the dock or pier approach where vehicles are allowed. Minimum live loads are:

1. FIXED PIERS, DOCKS, CATWALKS—40 pounds per square foot (psf) (1915 Pa) or 300 pounds (1335 N) concentrated load on any area 2 foot (610 mm) square.

2. FLOATING PIERS, DOCKS, FINGERS—20 psf or 300 pounds (1335 N) concentrated load on any area 2 feet (610 mm) square. Under dead load, floating piers shall have a minimum of 15 inches (381 mm) freeboard. The pier shall have not more than 6 degrees (0.11 rad) tilt from the horizontal under uniform live loading on one-half of the pier width or under concentrated load of 600 pounds (2669 N) applied on any side.

3. BULKHEADS, SEAWALLS, REVETMENTS— Design loads shall be the greatest combinations of loads exerted on the structure. Consideration shall be given to horizontal loads exerted by superimposed loads on the retained earth and by inclined surface slopes.

4. PUBLIC FISHING PIERS 4.1. Mean low water line to land–100 psf (4788 Pa). 4.2. Mean low water line to end of pier–50 psf (2304 Pa).

3603.4 Wind loads. As prescribed in Chapter 16.

3603.5 Impact loads. As prescribed in Chapter 16 but not less than 1.25 times the kinetic energy exerted by a striking vessel or vehicle.

3603.6 Water loads. Hydrostatic horizontal pressures along with the equivalent fluid pressure of soil and any surcharge thereon shall be considered. Provide sufficient anchorage against uplift between all components and between the structure and its support of not less than 1.5 times the uplift force. Wave forces shall be determined from

wave records where available. Where no wave records are available, the design wave shall be determined from probable wind speed, direction, fetch and water depth which will yield a critical wave. Forces shall then be calculated using current coastal engineering practice.

3603.7 Earth loads. Lateral earth pressures shall be determined by considering the specific soil properties and applying earth pressure theories generally accepted for soil mechanics in engineering practice. Except for simple and inexpensive structures this normally requires the services of specialists in soil mechanics and/or foundations design. Adequate consideration shall be given for the effect of probable varying levels of ground water, tide and flood water. Pressures exerted by the earth shall be checked for dry, saturated and submerged conditions as applicable.

3603.8 Erosion. The effects of reasonably predictable erosion and wave-induced scour shall be given ample consideration.

SECTION 3604
ENGINEERED DESIGNS

3604.1 Docks, piers and catwalks. Docks, piers and catwalks used by the public or are intended for use by vehicles shall be designed by a ~~professional engineer or architect~~ *registered design professional*.

3604.2 Bulkheads and other type retaining walls. Bulkheads and other types of retaining walls used by the public having an exposed face above the ground or above mean low water of 5 feet (1524 mm) or greater shall be designed by a ~~professional engineer or architect~~ *registered design professional*.

3604.3 Ocean-front retaining walls, bulkheads and retaining walls. Ocean-front retaining walls, bulkheads and other types of retaining walls used by the public on the coastline of the ocean or adjacent inlets shall be designed by a ~~professional engineer or architect~~ *registered design professional*.

SECTION 3605
MATERIALS

3605.1 General. The quality of materials and fastenings used for load-supporting purposes shall conform to good engineering practices. In areas subject to attack from wood borers such as termites, teredoes or limnoria, the wood used shall be approved wood having natural resistance or shall be pressure treated with a preservative recommended by the American Wood Preservers Association for the specific application. Piling shall comply with applicable provisions of Chapter 18. Wood components shall comply with applicable provisions of Chapter 23. Concrete components shall comply with applicable provisions of Chapter 19. Steel components shall comply with applicable provisions of Chapter 22. In areas of severe corrosion such as salty or brackish waters, all metal components shall be protected by coating, cathodic protection or be oversized accordingly to allow for the specific exposure. Aluminum bulkhead sheets or aluminum bulkhead or dock components shall be of proper alloy to resist corrosive elements in the adjacent water and soil. Galvanized bulkhead components and dock components shall be coated by the “hot dip” process to sufficient cover to provide corrosion protection equal to the degree of exposure of corrosive elements. Masonry used in bulkheads and dock work shall comply with Chapter 21.

SECTION 3606
CONSTRUCTION OF PIERS, DOCKS, CATWALKS AND FLOATING DOCKS

3606.1 Fixed piers. Fixed piers for coastal areas shall be supported by pilings with tip penetrations of not less than 8 feet (2438 mm) dependent on the total applied load. Less

penetration is approved only if other means of resisting flotation uplift is provided. Pier support by shallow piling, legs or columns with point bearing on rock shall have provisions for horizontal forces and overturn as well as flotation uplift. Connection between piling or legs to cap beams, stringers, beams and deck shall have sufficient capacity to safely support all applied loads and provide transfer of load to adjoining members. Maximum spans for pier joists shall be in accordance with the ~~*Span Table for Joists and Rafters*, as published by the National Forest Products Association~~ AF&PA joist and rafter span tables or may be designed in accordance with accepted engineering practice.

3606.2 Metal barrel flotation units. The use of metal barrels not specifically designed for use as flotation devices is prohibited.

3606.3 Decomposable flotation units. Floating docks or piers using exposed polystyrene billets (or other foam material) shall be designed for 125 percent of tabulated loads to allow for deterioration from environmental effects.

3606.4 Electrical service. All electrical service to marine structures shall be in accordance with the *North Carolina State Electrical Code*.

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 (15 240 mm) from the dispenser with a shutoff valve at the tank.

3606.6 Handrails. For walkways, access piers, steps or ranges, personnel handrails or other safety provisions shall be provided along the edges where the vertical drop to the mean low water level or mud line exceeds 6 feet (1829 mm). Edges which have a primary function other than walks or access ways, such as docking frontage and swimming access shall not require railings. Railings shall be designed in accordance with Chapter 16 for balcony railings.

3606.7 Maintenance of public structures. The building official shall have the authority to condemn and close to the public any structure which is considered unsafe, and it shall not be used by the public until the deficiencies are corrected. Before the structure is reopened to the public, a certification by a ~~professional engineer or architect~~ *registered design professional* shall be required. Each owner shall be responsible for the proper and satisfactory maintenance of any public structure covered by this section.
All such structures shall be subject to inspection at any time by the building official.

SECTION 3607
CONSTRUCTION: BULKHEADS, SEAWALLS AND REVETMENTS

3607.1 Bulkheads.

3607.1.1 Bulkheads shall be constructed in a manner to be effective against erosion and provide for adequate bank stabilization. The bulkhead system may consist of either of the following combinations thereof: braced sheet pile walls with tie backs, king piles and horizontal panels, gravity walls, cantilever and counterfort retaining walls. Bulkhead walls shall be constructed to prevent passage of fine material through joints or cracks from the fill side to the stream side.

3607.1.2 Local site conditions and performance of bulkheads in service should govern in selection of a system. The potential for erosion and scour at the mud line shall also be investigated, and appropriate compensating features shall be reflected in the construction. Bulkheads shall be terminated by either tying into adjoining structures or by extending the bulkhead line a minimum of 10 feet (3048 mm) in a landward direction at an angle of not less than 45 degrees (0.79 rad) to the shoreline in order to protect against end erosion or flanking by wave action. No structure shall be terminated without regard for end anchorage and stabilization. Sheet pile bulkheads with an exposed vertical height of 4feet (1219 mm) or greater shall be stabilized at the top by providing adequate anchorage, such as the use of batter piles or tie backs. Anchor blocks for tie backs shall be located landward of the soil wedge formed by the wall and a line projected on an angle of the material being retained. The tie back anchor shall be located no closer than twice the height of the exposed vertical surface of the wall. Sheet pile embedment shall be determined by analysis and design, but shall not be less than the length of the pile exposed above ground. Cantilever and gravity wall bulkheads shall be founded on a firm foundation with special ~~construction~~ consideration given to undermining and progressive instability.

3607.1.3 Where public walkways, steps or ramps run adjacent to bulkheads, personnel handrails or other safety provisions shall be provided along the top of the wall where the vertical drop to the mean low water line or mud line exceeds 6 feet (1829 mm). Handrails shall be designed in accordance with Chapter 16 for balcony railings.

3607.1.4 Wood members used for permanent features shall be not less than 2 inches (51 mm) in nominal thickness. All steel bolts, rods and other hardware shall be hot dipped galvanized or protected with an equivalent system. Bolts, rods and other metal materials shall be no smaller than 1/2 inch (12.7 mm) in diameter or thickness. Threaded fasteners shall not be tightened directly against wood surfaces but used only in conjunction with standard ogee or flat washers.

3607.1.5 Concrete, steel and cement asbestos bulkheads shall be constructed in a manner to assure adequate performance. Connections shall be designed to resist the full applied load. Adequate attention shall be given to material protection against corrosion and concrete cover for reinforcing steel. Concrete shall have a 28-day minimum compressive strength of 3,000 pounds per square inch (20 685 kPa) and shall be “air-entrained” type concrete.

3607.2 Seawalls. Seawalls may be constructed of concrete or stone rubble mound or other suitable materials. They shall be founded on a firm foundation and may require the use of piling or other suitable support. The face shall be shaped and supported to withstand the full force of the design wave. A provision shall be provided to prevent undermining and progressive instability by installing a sheet pile wall along the toe and/or by placing adequate stone rip rap protection.

3607.3 Revetments.

3607.3.1 Rigid revetments shall be founded on a firm foundation to prevent undermining and progressive instability. Provisions should be made to provide for adequate toe protection by extending the face a minimum of 2 feet (610 mm) below the mud line plus a depth to compensate for known or anticipated scour. Additional protection may be needed in active areas and may consist of sheet piling along the toe and/or stone rip rap. An adequate pattern of weep holes shall be provided in the face to relieve hydrostatic pressure behind the wall. Joints shall be sealed to prevent loss of fines from the protected slope.

3607.3.2 Flexible revetments may be utilized where foundations will produce minor consolidation and settlement. Adequate provisions shall be made to

prevent migration of fine materials through the wall. The face shall not be steeper than one unit horizontal to one unit vertical. Flatter slopes may be needed for stability depending on the construction materials and site conditions. The face may consist of stone rip rap or individual interlocking concrete units or poured concrete. Toe protection provisions shall be provided as discussed for the rigid type. Flexible revetments must be porous enough to allow for water passage and thereby relieve hydrostatic pressure behind the face.

SECTION 3608
CONSTRUCTION OF GROINS AND JETTIES

3608.1 Groins.

3608.1.1 Groins are designed and constructed for the purpose of building or maintaining a protection beach by trapping littoral drift (beach materials) or to retard the recession of an eroding shoreline. The planning and design of a groin/groin system shall be based on wave height, period and direction, characteristics of beach material and beach slope.

3608.1.2 Location. Groins shall extend landward a sufficient distance to prevent flanking.

3608.1.3 Types. Groins shall be either (1) very low, impermeable and nonadjustable or (2) impermeable and adjustable.

3608.1.4 General specifications. Adjustable groins shall be maintained at elevations in accord with actual beach needs and development of desirable changes of the beach profile, and so as to avoid damage to adjacent beaches. In no case shall the top of such groins be set higher than 2 feet (610 mm) above the beach profile. Impermeable, nonadjustable groins shall not extend seaward beyond the mean low water line, and their top elevation shall not be higher than 6 inches (152 mm) above the beach profile. Considerations of the degree of beach protection to be provided by proposed groins, and the acceptability of such installations, will be based primarily on the following factors: direction and volume of littoral drift; wave force and direction; wind force and direction; land usage; type of bulkhead; type of groin; and spacing and lengths of groins. A complete coastal engineering study may be required before approval is given to the number, type and length of groins. The design should account for the wave and current forces focused on the beach. The groin/groin system should not adversely modify the littoral drift to the extent to cause severe erosion on the lee side of the structure.

3608.2 Groins and jetties. There is no universal type of groin/groin system or jetty because of the wide variations in conditions at each location. It is incumbent on the owner of a groin or jetty type structure to recognize the legal implications of the coastal structure and to plan, design, construct and maintain the structure accordingly. It is thus prudent to seek the advice of a ~~professional engineer or architect~~ *registered design professional* with coastal engineering experience.

SECTION 3609
DEFINITIONS

BASIN, BOAT. A naturally or artificially enclosed or nearly enclosed harbor area for docking and securing small craft.

BULKHEAD. A vertical wall structure designed to retain shoreline material and prevent erosion due to wave activity.

BULKHEAD LINE. The line formed along the shore by the most seaward elements of the bulkhead.

CATWALK. A narrow footway platform extending alongside a structure.

DATUM, PLANE. The horizontal plane to which soundings, ground elevations water surface elevations are referenced.

DOCK. A pier, wharf or platform for the unloading of materials or living beings.

FETCH. The area in which waves are generated having a rather constant direction or speed.

GANGWAY. A narrow footway bridge extending from the shore, usually to a floating structure.

GROIN. A shore protection structure built (usually perpendicular to the shoreline) to trap littoral drift or retard erosion of the shore.

GROIN SYSTEM. A series of groins that function to protect a section of shoreline.

JETTY. A structure designed to protect and/or stabilize a navigation entrance.

KING PILE. The primary structural member that supports horizontal panels to form a vertical wall sometimes used in bulkhead or groin construction.

LITTORAL DRIFT. The sedimentary material transported along the shore by waves and currents.

LONGSHORE TRANSPORT. The movement of littoral drift (material) running parallel to the shoreline.

PIER. An elevated deck structure, usually pile supported, extending out into the water from the shore.

PIERHEAD LINE. The limiting line to which any pier or dock structure can extend into the water.

PILE. A cylindrical timber, concrete or metal member embedded into the ground to support or brace a structure.

PILE, SHEET. A pile with a generally slender flat cross section to be embedded into the ground or seabed and meshed or interlocked with like members to form a diaphragm, wall or bulkhead.

REVETMENT. A flexible structure usually constructed of stone or concrete and placed on a bank slope to protect it against erosion by wave and current action.

SEAWALL. A massive structure built along and parallel to a shoreline for the purpose of protecting and stabilizing the shore against erosion resulting from heavy wave activity.

WAVE, DESIGN. A wave that is potentially most damaging to an economically feasible structure, or wave for which a structure is designed.

Appendices

- **Appendix A** - DELETE
- **Appendix B** - DELETE
- **Appendix C**

  ~~***The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.***~~

  The provisions contained in this appendix are adopted as part of this code.
- **Appendix D**

  ~~***The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.***~~

  The provisions contained in this appendix are adopted as part of this code.
- **Appendix E**

  ~~***The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.***~~

  The provisions contained in this appendix are adopted as part of this code.
- **Appendix F**

  ~~***The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.***~~

  The provisions contained in this appendix are adopted as part of this code.
- **Appendix G**

  ~~***The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.***~~

  The provisions contained in this appendix are adopted as part of this code.
  Keep Appendix G as printed in the 2009 International Building Code except:

  G101.3 Scope. The provisions of this appendix shall apply to all proposed development in a flood hazard area established in Section 1612 of this code~~, including certain building work exempt from permit under Section 105.2~~.

  G101.4 Violations. Any violation of a provision of this appendix, or failure to comply with a permit or variance issued pursuant to this appendix or any requirement of this appendix~~, shall be handled in accordance with Section 114~~.

  G102.1 General. This appendix, in conjunction with the *International Building Code*, provides minimum requirements for development located in flood hazard areas, including the subdivision of land; installation of utilities; placement and replacement of manufactured homes; new construction and repair, reconstruction, rehabilitation or additions to new construction; substantial improvement of existing buildings and structures, including restoration after damage, temporary structures, and temporary or permanent storage, utility and miscellaneous Group U buildings and structures~~, and certain building work exempt from permit under Section 105.2~~.

  G103.1 Permit applications. The *building official* shall review all *permit* applications to determine whether proposed development sites will be reasonably safe from flooding. If a proposed development site is in a flood hazard area, all site development activities (including grading, filling, utility installation and drainage modification), all new construction and substantial improvements (including the placement of prefabricated buildings and manufactured homes)

~~and certain~~ ~~building work exempt from *permit* under Section 105.2~~ shall be designed and constructed with methods, practices and materials that minimize flood damage and that are in accordance with this code and ASCE 24.

❖ Appendix H

Keep Appendix H as printed in the 2009 International Building Code with the ~~below~~ following changes

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

~~***The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.***~~

The provisions contained in this appendix are adopted as part of this code.

❖ Appendix J

Keep Appendix J as printed in the 2009 International Building Code with the below changes

APPENDIX J
GRADING

~~***The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.***~~

The provisions contained in this appendix are 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.

J105.1 General. Inspections shall be governed by Section ~~109~~ 110 of this code.

❖ Appendix K - DELETE