APPENDIX C
CODE CHANGE PROPOSAL
NORTH CAROLINA
BUILDING CODE COUNCIL

322 Chapanoke Road, Suite 200
Raleigh, North Carolina 27603 (919)
661-5880

B-11
G

Petition for Rule Making Item Number __

Granted by BCC _____ **Adopted by BCC** _____ **Approved by RRC** _____
Denied by BCC _____ **Disapproved by BCC** _____ **Objection by RRC** _____

PROPONENT Steve Knight, PE _____ PHONE (704) 878-2996 .
REPRESENTING North Carolina Building Code Council Structural Committee _____
ADDRESS 1507 Mt. Vernon Avenue _____
CITY Statesville STATE NC ZIP 28677-3539
E-MAIL SteveKnightPE@bellsouth.net FAX (704) 878-8887 .

North Carolina State Building Code, Volume Residential__ - Sections AM106 and AM111 _____

CHECK ONE: [X] Revise section to read as follows: [I Delete section and substitute the following.
[I Add new section to read as follows: [I Delete section without substitution.

LINE THROUGH MATERIAL TO BE DELETED UNDERLINE MATERIAL TO BE ADDED

Type or print. Continue proposal or reason on plain paper attached to this form. See reverse side for instructions.

Section AM106: Delete partial reprint of Table R502.3.1(2) without substitution.

Section AM111: In Figure AM111 delete partial reprint of Table R502.5(1) without substitution.

Will this proposal change the cost of construction? Decrease [I Increase [I No [X]
Will this proposal increase the cost of a dwelling by $80 or more? Yes [I No [X]
Will this proposal affect Local or State funds? Local [I State [I No [X]
Will this proposal cause a substantial economic impact (> $500,000)? Yes [I No [X]
Non-Substantial - Provide an economic analysis including benefit/cost estimates.
Substantial - The economic analysis must also include 2-alternatives, time value of money and risk analysis.

REASON: Southern Pine design values have been revised, and the tables in Chapter 5 have been updated. However, these tables have not been updated. In order to prevent future inconsistencies, this proposal seeks to eliminate the partial table reprints in Appendix M.

Signature _____ DATE: _____

APPENDIX C
CODE CHANGE PROPOSAL
NORTH CAROLINA
BUILDING CODE COUNCIL

B-12
G

322 Chapanoke Road, Suite 200
Raleigh, North Carolina 27603 (919)
661-5880

Petition for Rule Making

Item Number __

Granted by BCC _____ **Adopted by BCC** _____ **Approved by RRC** _____
Denied by BCC _____ **Disapproved by BCC** _____ **Objection by RRC** _____

PROPONENT Steve Knight, PE _____ PHONE (704) 878-2996 .
REPRESENTING North Carolina Building Code Council Structural Committee _____
ADDRESS 1507 Mt. Vernon Avenue _____
CITY Statesville STATE NC ZIP 28677-3539
E-MAIL SteveKnightPE@bellsouth.net FAX (704) 878-8887 .

North Carolina State Building Code, Volume Residential - Sections Appendix N _____

CHECK ONE:
[Revise section to read as follows:
[I Add new section to read as follows:
[X] Delete Tables and substitute the following.
[I Delete section without substitution.

LINE THROUGH MATERIAL TO BE DELETED UNDERLINE MATERIAL TO BE ADDED

Type or print. Continue proposal or reason on plain paper attached to this form. See reverse side for instructions.

Appendix N: Delete Tables N-1 and N-2 and substitute attached tables:

Will this proposal change the cost of construction? Decrease [I Increase [I No [X]
Will this proposal increase the cost of a dwelling by $80 or more? Yes [I No [X]
Will this proposal affect Local or State funds? Local [I State [I No [X]
Will this proposal cause a substantial economic impact (> $500,000)? Yes [I No [X]
Non-Substantial - Provide an economic analysis including benefit/cost estimates.
Substantial - The economic analysis must also include 2-alternatives, time value of money and risk analysis.

REASON: Tables N-1 and N-2 have been in the Residential Code since 1990. Southern Pine design values have been revised on a national level, and the tables in Chapter 5 have been updated. However, these tables have not been updated to incorporate the revised Southern Pine design values. In addition, the Tables were not updated a number of years ago when design values for Spruce-Pine-Fir were changed. This proposal seeks to update Tables N-1 and N-2 to incorporate current design values for both Southern Pine and Spruce-Pine-Fir lumber.

Signature _____ DATE: _____

Replace Table N-1 in Appendix N with the following Table N-1:

Table N-1
WOOD BEAMS AND GIRDERS ALLOWABLE LOADS
IN POUNDS PER LINEAR FOOT [1, 2, 3, 4]

2X8 (1 ½" X 7 ¼")						
Span L [6] (feet)	Spruce-Pine-Fir [5]			Southern Pine		
	2 ply	3 ply	4 ply	2 ply	3 ply	4 ply
3	1305	1956	2610	1692	2538	3383
4	979	1468	1958	1013	1519	2026
5	736	1104	1472	648	972	1296
6	511	767	1022	450	675	900
7	375	563	751	331	496	661
8	287	431	575	253	380	506
9	227	341	454	200	300	400
10	184	276	368	162	243	324
12	114	172	228	113	169	225
14	72	108	144	72	108	144
2X10 (1 ½" X 9 ¼")						
Span L [6] (feet)	Spruce-Pine-Fir [5]			Southern Pine		
	2 ply	3 ply	4 ply	2 ply	3 ply	4 ply
3	1665	2498	3330	2158	3238	4317
4	1249	1873	2498	1426	2139	2852
5	999	1499	1998	913	1369	1825
6	763	1144	1525	634	951	1268
7	560	840	1120	466	698	931
8	429	643	858	357	535	713
9	339	508	678	282	423	563
10	275	412	549	228	342	456
12	191	286	381	158	238	317
14	140	210	280	116	175	233
2X12 (1 ½" X 11 ¼")						
Span L [6] (feet)	Spruce-Pine-Fir [5]			Southern Pine		
	2 ply	3 ply	4 ply	2 ply	3 ply	4 ply
3	2025	3038	4050	2625	3938	5250
4	1519	2278	3038	1969	2953	3938
5	1215	1823	2430	1266	1898	2531
6	1013	1519	2025	879	1318	1756
7	753	1130	1507	646	969	1291
8	577	856	1154	494	742	989
9	456	684	911	391	586	781
10	369	554	738	316	475	633
12	256	385	513	220	330	439
14	188	283	377	161	242	323

Table N-1 Notes:

1. Lumber grade is #2 intended for an in-service moisture content of 19% or less.

2. Deflection is limited to L/360.
3. Load duration factor used in calculations is 1.0.
4. Adequate bearing and lateral support for the member must be provided. Support for the member ends must provide a continuous load path from the bearing to the foundation.
5. Values tabulated are for Spruce-Pine-Fir, not Spruce-Pine-Fir (South). Values tabulated for Southern Pine are based on design values published by the American Wood Council in an addendum to NDS dated March 2013.
6. Span, L, is clear span. Effective span for bending and deflection is clear span plus 3 inches.

Replace Table N-2 (the flitch plate tables) with the following tables:

Table N-2
Flitch Plate Beam Allowable Loads
In Pounds Per Linear Foot [1,2,3, 4,5]

(2) 2x6 with Plate Indicated					
Span (ft.)[6]	**Plate Size / (Beam Weight per Foot)**				
	¼"x5" Plate (8 lb./ft.)	**3/8"x5" Plate (10 lb./ft.)**	**½"x5" Plate (13 lb./ft.)**	**5/8"x5" Plate (15 lb./ft.)**	**¾"x5" Plate (17 lb./ft.)**
6'-0"	643	825	1006	1188	1370
7'-0"	473	606	739	873	1006
8'-0"	362	464	566	668	771
9'-0"	272	348	425	502	579
10'-0"	198	254	310	366	422
11'-0"	149	191	233	275	317
12'-0"	115	147	179	212	244

(2) 2x8 with Plate Indicated					
Span(ft.)[6]	**Plate Size / (Beam Weight per Foot)**				
	¼"x7" Plate (11 lb./ft.)	**3/8"x7" Plate (14 lb./ft.)**	**½"x7" Plate (17 lb./ft.)**	**5/8"x7" Plate (20 lb./ft.)**	**¾"x7" Plate (23 lb./ft.)**
6'-0"	1150	1499	1849	2199	2549
7'-0"	845	1102	1359	1615	1872
8'-0"	647	843	1040	1237	1434
9'-0"	511	666	822	977	1133
10'-0"	414	540	666	792	917
11'-0"	342	446	550	654	758
12'-0"	287	375	462	550	637
13'-0"	230	300	369	439	509
14'-0"	184	240	296	352	408
15'-0"	150	195	240	286	331
16'-0"	123	161	198	236	273

Table Continued on next sheet

(2) 2x10 with Plate Indicated					
Span (ft.)	Plate Size / (Beam Weight per Foot)				
	¼"x9" Plate (14 lb./ft.)	3/8"x9" Plate (18 lb./ft.)	½"x9" Plate (22 lb./ft.)	5/8"x9" Plate (26 lb./ft.)	¾"x9" Plate (30 lb./ft.)
6'-0"	1642	2145	2649	3153	3657
7'-0"	1206	1576	1946	2317	2687
8'-0"	923	1207	1490	1774	2057
9'-0"	730	954	1177	1401	1625
10'-0"	591	772	954	1135	1317
11'-0"	488	638	788	938	1088
12'-0"	410	536	662	788	914
13'-0"	350	457	564	672	779
14'-0"	302	394	487	579	672
15'-0"	263	343	424	504	585
16'-0"	231	302	373	443	514
17'-0"	204	267	330	393	456
18'-0"	182	238	294	350	406
19'-0"	155	203	250	298	345
20'-0"	133	174	214	255	296

(2) 2x12 with Plate Indicated					
Span (ft.)	Plate Size / (Beam Weight per Foot)				
	¼"x11" Plate (18 lb./ft.)	3/8"x11" Plate (22 lb./ft.)	½"x11" Plate (27 lb./ft.)	5/8"x11" Plate (32 lb./ft.)	¾"x11" Plate (36 lb./ft.)
6'-0"	2297	3006	3715	4425	5134
7'-0"	1688	2209	2730	3251	3772
8'-0"	1292	1691	2090	2489	2888
9'-0"	1021	1336	1651	1966	2282
10'-0"	827	1082	1338	1593	1848
11'-0"	683	894	1105	1316	1527
12'-0"	574	752	929	1106	1283
13'-0"	489	640	791	943	1094
14'-0"	422	552	682	813	943
15'-0"	367	481	594	708	821
16'-0"	323	423	522	622	722
17'-0"	286	374	463	551	639
18'-0"	255	334	413	492	570
19'-0"	229	300	371	441	512
20'-0"	207	271	334	398	462
21'-0"	188	245	303	361	419
22'-0"	171	224	276	329	382
23'-0"	156	205	253	301	349
24'-0"	140	183	226	269	312

Table N-2 Notes

1. Lumber species and grade is #2 Southern Pine intended for an in-service moisture content of 19% or less. Design values used were published by the American Wood Council in an addendum to NDS dated March 2013. For Spruce-Pine-Fir lumber using the tabulated flitch plate allowable loads will be slightly conservative.

2. Tabulated values are based on ASTM A36 structural steel plate.

3. Deflection is limited to L/360.
4. Load duration factor used in calculations is 1.0.
5. Adequate bearing and lateral support for the member must be provided. Support for the member ends must provide a continuous load path from the bearing to the foundation.
6. Span, L, is center to center of supports. Wood side plates and steel flitch plates shall be continuous throughout the span.

INSTRUCTIONS

Each proposed Code change request shall comply with the following policies:

Rule 1: Twenty-one (21) copies of the proposed Petion for Rule-Making along with supporting documentation shall be filed with the Building Code Council Secretary.

Rule 2: The filing shall be received by the first day of the month prior to the quarterly scheduled meeting date.

Rule 3: Each request shall be legibly printed, typewritten, or copied on this form and shall contain the following:
(1)The proposed rule change must be set forth in full and contain explicit reference to the affected section or sections of the Code.
(2)The request shall state the reasons for the proposed rule change with supporting documentation.
(3) The proposed rule change shall comply with the standards set forth in GS 143-138(c) and reference to the particular standards shall be set forth in the request for the amendment.
(4)The proposed rule change shall contain an economic impact analysis as required by GS 143-138(a).

Rule 4: When a request is improperly filed or not in accordance with all the rules listed above, the BCC Secretary shall reject the submittal and notify the applicant of the proper procedure to follow.

Rule 5: Upon the proper filing of a request, the BCC Secretary shall forward one copy of said request to each council member prior to the scheduled meeting date. Persons filing proposed petitions are hereby notified of the place and time of the scheduled hearings. The BCC Secretary shall cause to be published the notice of public hearing as specified in GS 143-138(a).

Rule 6: The Council shall either Grant or Deny the proposed Petition for Rulemaking at the meeting following receipt of the proposed rule change. The Council will take no further action on items that are Denied. Granted items may be referred to Committee for review.

Rule 7: The Council will hold a public hearing on Granted items at the next quarterly scheduled meeting. The Council will take final action on Granted items at the next quarterly scheduled meeting after the public hearing.

Timeline Example

Petetion received:	**February 1**
Petition Granted:	**March BCC meeting**
Notice of Hearing published:	**April NC Register**
Committee review:	**April - May**
Hearing held:	**June BCC meeting**
Final Adoption:	**September BCC meeting**
Rules Review Meeting:	**November RRC meeting**
Approved:	**December 1**

B-13
G

APPENDIX C
CODE CHANGE PROPOSAL
NORTH CAROLINA
BUILDING CODE COUNCIL

322 Chapanoke Road, Suite 200
Raleigh, North Carolina 27603 (919)
661-5880

Petition for Rule Making

Item Number __

Granted by BCC _____ **Adopted by BCC** _____ **Approved by RRC** _____
Denied by BCC _____ **Disapproved by BCC** _____ **Objection by RRC** _____

PROPONENT Steve Knight, PE _____ PHONE (704) 878-2996 .
REPRESENTING North Carolina Building Code Council Structural Committee _____
ADDRESS 1507 Mt. Vernon Avenue _____
CITY Statesville STATE NC ZIP 28677-3539
E-MAIL SteveKnightPE@bellsouth.net FAX (704) 878-8887 .

North Carolina State Building Code, Volume Residential__ - Sections Appendix N _____

CHECK ONE:

[X] Revise section to read as follows:
[I Add new section to read as follows:
[I Delete Tables and substitute the following.
[I Delete section without substitution.

LINE THROUGH MATERIAL TO BE DELETED UNDERLINE MATERIAL TO BE ADDED

Type or print. Continue proposal or reason on plain paper attached to this form. See reverse side for instructions.

Appendix N Example at the top of Page 918 – Change as follows:

By using Table N-1, the required beam is 4 @ 2x12 ~~SYP or~~ SPF

OR

By using Table N-2, the required minimum flitch beam is 2 @ 2x8 with ~~½"~~ 5/16" x 7" steel plate bolted with ½" bolts space at 2' o.c.

Appendix N Example at the bottom of Page 918 – Change as follows:

By using Table N-1, the required beam is ~~3~~ 4 @ 2x12 Southern Pine or 4 @ 2x12 Spruce-pine-fir

OR

By using Table N-2, the required minimum flitch is 2 @ 2x8 with ~~¾"~~ ½" x 7" steel plate bolted with ½" bolts spaced at 2' o.c.

Will this proposal change the cost of construction? Decrease [I Increase [I No [X]
Will this proposal increase the cost of a dwelling by $80 or more? Yes [I No [X]
Will this proposal affect Local or State funds? Local [I State [I No [X]
Will this proposal cause a substantial economic impact (> $500,000)? Yes [I No [X]
Non-Substantial - Provide an economic analysis including benefit/cost estimates.
Substantial - The economic analysis must also include 2-alternatives, time value of money and risk analysis.

REASON: Tables N-1 and N-2 have been in the Residential Code since 1990. Southern Pine design values have been revised on a national level, and the tables in Chapter 5 have been updated. However, these tables have not been updated to incorporate the revised Southern Pine design values. In addition, the Tables were not updated a number of years ago when design values for Spruce-Pine-Fir were changed. This proposal seeks to update examples using Tables N-1 and N-2 to incorporate current design

values for both Southern Pine and Spruce-Pine-Fir lumber and make the examples consistent with the tables.

Signature _____DATE: _____

INSTRUCTIONS

Each proposed Code change request shall comply with the following policies:

Rule 1: Twenty-one (21) copies of the proposed Petion for Rule-Making along with supporting documentation shall be filed with the Building Code Council Secretary.

Rule 2: The filing shall be received by the first day of the month prior to the quarterly scheduled meeting date.

Rule 3: Each request shall be legibly printed, typewritten, or copied on this form and shall contain the following:
(1)The proposed rule change must be set forth in full and contain explicit reference to the affected section or sections of the Code.
(2)The request shall state the reasons for the proposed rule change with supporting documentation.
(3) The proposed rule change shall comply with the standards set forth in GS 143-138(c) and reference to the particular standards shall be set forth in the request for the amendment.
(4)The proposed rule change shall contain an economic impact analysis as required by GS 143-138(a).

Rule 4: When a request is improperly filed or not in accordance with all the rules listed above, the BCC Secretary shall reject the submittal and notify the applicant of the proper procedure to follow.

Rule 5: Upon the proper filing of a request, the BCC Secretary shall forward one copy of said request to each council member prior to the scheduled meeting date. Persons filing proposed petitions are hereby notified of the place and time of the scheduled hearings. The BCC Secretary shall cause to be published the notice of public hearing as specified in GS 143-138(a).

Rule 6: The Council shall either Grant or Deny the proposed Petition for Rulemaking at the meeting following receipt of the proposed rule change. The Council will take no further action on items that are Denied. Granted items may be referred to Committee for review.

Rule 7: The Council will hold a public hearing on Granted items at the next quarterly scheduled meeting. The Council will take final action on Granted items at the next quarterly scheduled meeting after the public hearing.

Timeline Example

Petetion received:	**February 1**
Petition Granted:	**March BCC meeting**
Notice of Hearing published:	**April NC Register**
Committee review:	**April - May**
Hearing held:	**June BCC meeting**
Final Adoption:	**September BCC meeting**
Rules Review Meeting:	**November RRC meeting**
Approved:	**December 1**

B-1A
G

NORTH CAROLINA BUILDING CODE COUNCIL

322 Chapanoke Road, Suite 200
Raleigh, North Carolina 27603
(919) 661-5880

Code Change Proposal
Petition for Rule Making

Item Number _____

Granted by BCC _____ Adopted by BCC _____ Approved by BCC _____
Denied by BCC _____ Disapproved by BCC _____ Objection by BCC _____

PROPONENT: Steve Knight PHONE: (704) 878-2996
REPRESENTING: NCBC Chapter 36 Ad Hoc Committee
ADDRESS: 1507 Mt. Vernon Avenue
CITY: Statesville STATE: NC ZIP: 28677
E-MAIL: steveknightpe@bellsouth.net FAX: (704) 878 -8887

North Carolina State Building Code, Volume Building - Section 1004.1.1, 1109.14, 1810.3.2.4.1, Chapter 35, Chapter 36; Residential – Section R101.2; Fire Prevention – Section 4504.1

CHECK ONE: [X] Revise section to read as follows: [ ] Delete section and substitute the following:
[ ] Add new section to read as follows: [ ] Delete section without substitution:

~~LINE THROUGH MATERIAL TO BE DELETED~~ UNDERLINE MATERIAL TO BE ADDED

Type or print. Continue proposal or reason on plain paper attached to this form. See reverse side for instructions.

See Attachment.

Will this proposal change the cost of construction?	Decrease	[ ]	Increase	[ ]	No	[X]
Will this proposal increase the cost of a dwelling by $80 or more?			Yes	[ ]	No	[X]
Will this proposal affect Local or State funds?	Local	[ ]	State	[ ]	No	[X]
Will this proposal cause a substantial economic impact (≥$500,000)?			Yes	[ ]	No	[X]

Non-Substantial – Provide an economic analysis including benefit/cost estimates.
Substantial – The economic analysis must also include 2-alternatives, time value of money and risk analysis.

REASON:
Chapter 36 of the Building Code has not been substantially revised since the original language was written. Due to changes in types of materials used for waterfront structures and updates necessary to include changes in construction innovation, the Chapter was revised to reflect current construction of these structures. The additional changes to other sections of the Building Code and changes to the Residential Code and Fire Code are to reflect changes made in Chapter 36 for cohesive information throughout the codes specific to waterfront structures.

BCC CODE CHANGES

Signature: _____ Date: _____ FORM 6/1/12

Proposed Revisions to the NC Residential Code

Proposed Revisions to Section R101.2

R101.2 Scope. The provisions of the *North Carolina Residential Code for One- and Two-family Dwellings* shall apply to the construction, *alteration*, movement, enlargement, replacement, repair, equipment, use and occupancy, location, removal and demolition of detached one- and two-family dwellings and townhouses not more than three stories above *grade plane* in height with a separate means of egress and their *accessory buildings* and *structures*.

Exception: Live/work units complying with the requirements of Section 419 of the *North Carolina Building Code* shall be permitted to be built as one- and two-family *dwellings* or townhouses. Fire suppression required by Section 419.5 of the *North Carolina Building Code* when constructed under the *North Carolina Residential Code for One- and Two-family Dwellings* shall conform to Section 903.3.1.3 of the *International Building Code*.

R101.2.1 Accessory Buildings. Accessory buildings with any dimension greater than 12 feet must meet the provisions of this code. Accessory buildings may be constructed without a masonry or concrete foundation, except in coastal high hazard or ocean hazard areas, provided all of the following conditions are met:

1. The building shall not exceed 400 sq. ft. or one story in height;
2. The building is supported on a wood foundation of a minimum 2x6 or 3x4 mud sill of approved wood in accordance with Section 317; and
3. The building is anchored to resist overturning and sliding by installing a minimum of one ground anchor at each corner of the building. The total resisting force of the anchors shall be equal to 20 psf times the plan area of the building.

R101.2.2 Accessory Structures. Accessory structures are not required to meet the provisions of this code.

Exceptions:

1. Decks, See Appendix M,
2. Gazebos,
3. Retaining walls, See Section R404.4,
4. Swimming pools and spas, See Appendix G,
5. Docks, piers, bulkheads and waterway structures, See Section R324.

Proposed Revisions to Section R202

SECTION R202
DEFINITIONS

ACCESSORY STRUCTURE. Accessory structure is any structure not roofed over and enclosed that is not considered an accessory building located on one- and two-family dwelling sites which is incidental to that of the main building. Examples of accessory structures are, but not limited to; fencing, decks, gazebos, arbors, retaining walls, barbecue pits, detached chimneys, tree houses, playground equipment, yard art, docks, piers etc.

Commentary: *The 6 foot maximum limitation on fixed pier width is intended to limit occupant load, limit storage on the pier, and prevent vehicles from operating on the pier. This limitation is consistent with the limitations for CAMA's general permitting process. See Figure 1.*

1.5 A maximum pile spacing of 8 feet, in both directions.

Commentary: *Pile spacing is limited to spans consistent with 2x8 joists or stringers at 24 inch maximum spacing and 2x10 split girders. Recommended pile size is 6 inches x 6 inches minimum. The intent is that exempted structures be capable of supporting a live load of 40 psf, even though design by a registered engineer is not required. Lateral loads on piles are also reduced by limiting the pile spacing. Wave forces due to large private or commercial vessels are not considered in these limitations and should be accommodated by the owner or contractor prior to construction. See Figure 3.*

1.6 A maximum of 576 sq. ft. for non-walkways areas.

Commentary: *Non-walkway areas include sitting areas, staging areas for vessel embarkation and disembarkation, and platforms for swimmers or fishermen. Limiting the area of these platforms is intended to limit occupancy and the potential for overload due to storage.*

1.7 A maximum boat slip length of 40 feet.

Commentary: *The boat slip size limitation is intended to limit the size of the vessels moored to the dock, which in turn limits both occupant load on the pier and lateral loads on the pier.*

1.8 A maximum roofed area of 576 sq. ft. with an additional maximum 2 foot overhang.

Commentary: *See Figure 3.*

1.9 Constructed with no enclosed or multilevel structures.

1.10 Supports a boatlift with a maximum design capacity no greater than 16,000 pounds.

2. Floating docks associated with a one or two family dwelling meeting all of the following:

2.1 A maximum of four boat slips for a single owner of a one or two family dwelling or two adjacent, riparian owners.

2.2 A maximum normal pool depth of 20 feet for docks with guide piles on lakes and ponds and a maximum mean low water of 10 feet for docks with guide piles in other locations.

Commentary: *Guide piles should be long enough to prevent the dock from floating off the piles at flood stage or during a 100 year storm surge. Pile sizes should be chosen considering forces due to moving water generated by flood stage or storm surge, waves, scour, and size of vessels moored to the dock. Wave*

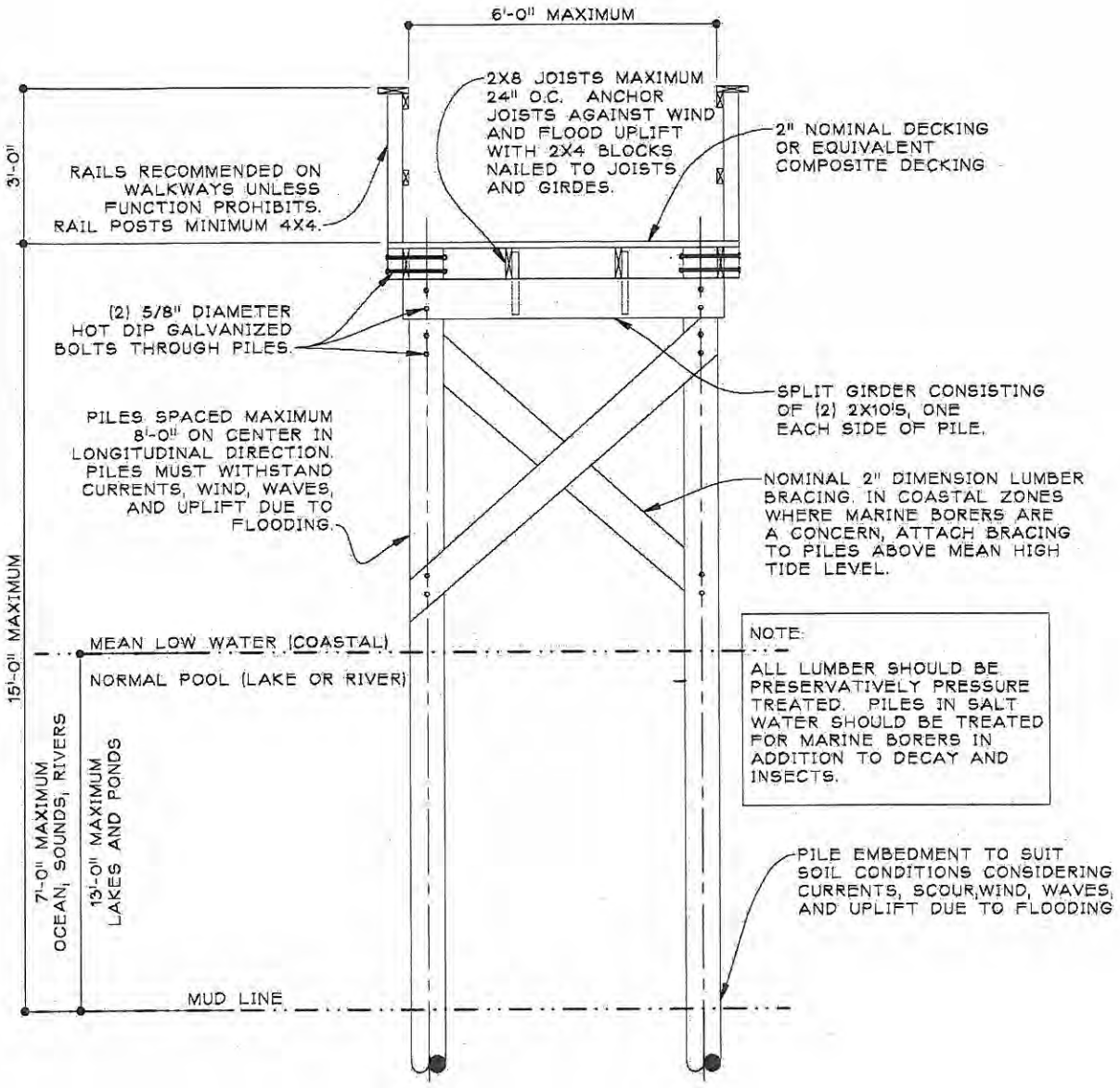
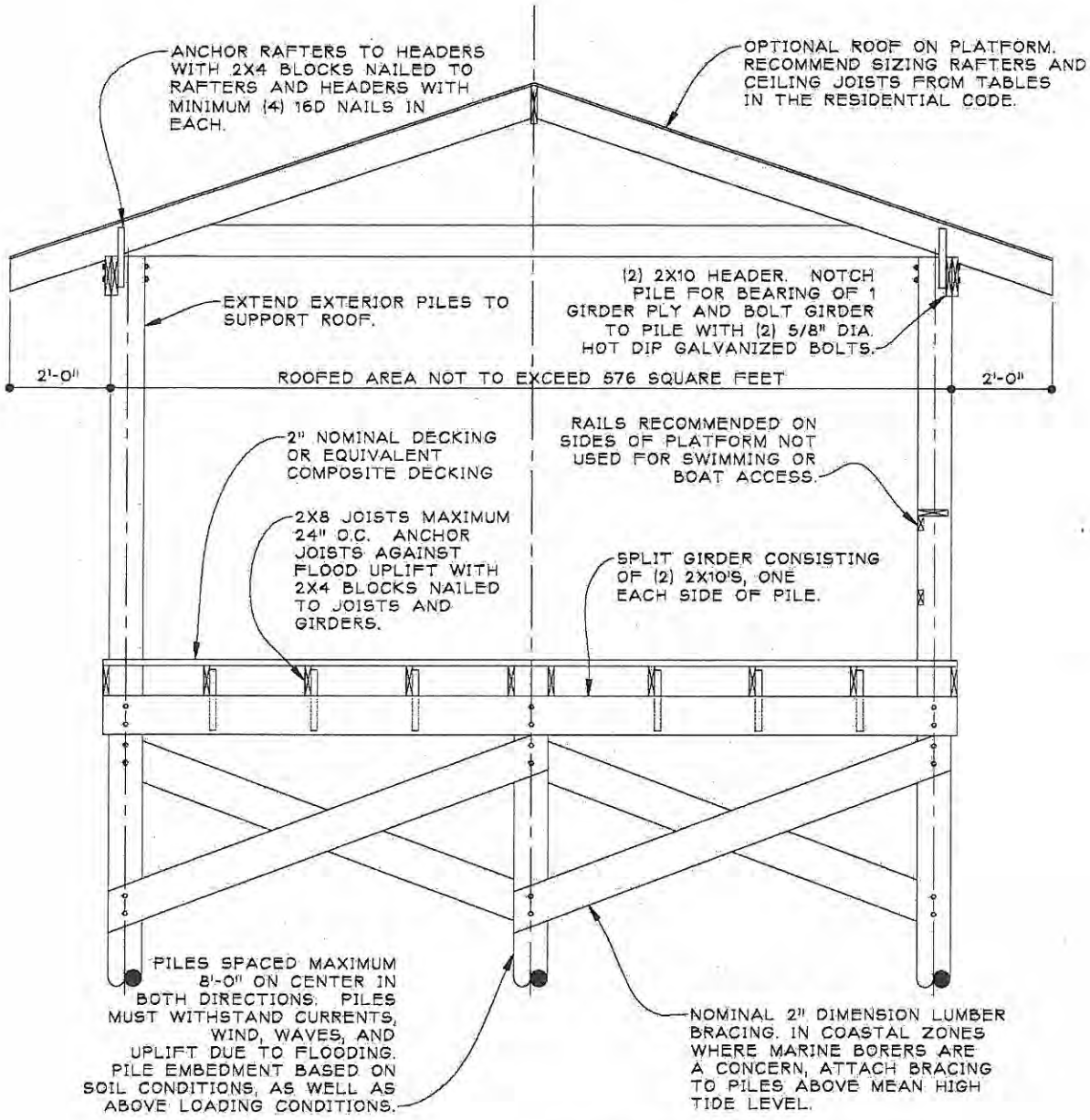


FIGURE 1: FIXED PIER WALKWAY SECTION



NOTE:

ALL LUMBER SHOULD BE PRESERVATIVELY PRESSURE TREATED. PILES IN SALT WATER SHOULD BE TREATED FOR MARINE BORERS IN ADDITION TO DECAY AND INSECTS. BOLTING SAME AS FIGURE 1.

NOTE:

PLATFORM FLOOR AREA NOT TO EXCEED 400 SQUARE FEET. MAXIMUM DECK HEIGHT ABOVE MUD LINE AND NORMAL POOL DEPTH SHOWN IN FIGURE 1 ALSO APPLY TO THIS FIGURE.

FIGURE 3: FIXED PIER PLATFORM SECTION

2. All bulkheads having an exposed height greater than 5 feet or with a superimposed load shall be designed by a registered design professional and require special inspection. Special inspection shall be waived for bulkheads of any height constructed from property line to property line of one and two family dwellings and including attachment to neighboring bulkheads.

   Commentary: *Chapters 17 and 18 require special inspection on retaining walls exceeding 5 feet in height due to failures associated with construction related deficiencies. Bulkheads are also prone to the same sort of construction deficiencies; therefore, special inspection is required for bulkheads greater than 5 feet, including common bulkheads for multi-family residential projects or subdivisions where the bulkhead services multiple single family residences. The exception is a bulkhead servicing the property of one single family residence.*

3. Oceanfront 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 registered design professional.

4. Marine terminal or port facilities for berthing, mooring, docking and servicing ships, barges or tug boats that handle cargo of all types, including bulks, containers, liquids, fuels and people, which shall be designed by a registered design professional in accordance with accepted industry standards.

   Commentary: *Wharves and piers for cargo handling facilities typically require consideration of loadings unique to each individual facility. As a result, these facilities must be designed by a registered design professional who works with the owner in the preliminary phases of the project to develop design criteria tailored to the owner's needs. Support structures, such as warehouses, office buildings, and cranes supported on these structures, are required to comply with the provisions of this code. For more information on cargo wharves and docks, the reader is referred to the Department of Defense UFC 4-152-01 Design: Piers and Wharves, UFC 4-152-07 Design: Small Craft Berthing Facilities, and the Port of Long Beach Wharf Design Criteria.*

5. Groins not exempted below, jetties, breakwaters, oceanfront seawalls, and oceanfront revetments which shall be designed by a registered design professional in accordance with accepted industry standards.

   Commentary: *These structures typically require consideration of loadings unique to each individual facility. As a result, these structures must be designed by a registered design professional who works with the owner in the preliminary phases of the project to develop design criteria tailored to the owner's needs. For more information, refer to documents such as The Coastal Engineering Manual by the U. S. Army Corps of Engineers.*

Exceptions: The following structures are exempt from the requirements of this chapter:

1. Sill structures combined with marsh plantings and certain groins in accordance with the Department of Environmental and Natural Resources general permit requirements.

FIBER ORIENTATION. Fiber orientation is the alignment of the longitudinal axis of a fiber in an FRP material with respect to the stated reference axis.

FIBER REINFORCED POLYMER (FRP). A composite material which consists of a polymer resin based matrix reinforced with fibers of glass, carbon, aramid, or hybrid combinations of these fiber types.

FIBER VOLUME FRACTION. The volume of reinforcement fiber in a cured composite divided by the volume of the composite section.

FILLER. Substance added to the matrix of a FRP material intended to alter its engineering properties, performance, and/or cost.

GANGWAY. A footway bridge extending from the dock, pier, bulkhead or shore, usually to a floating structure.

GLASS TRANSITION TEMPERATURE (T_g). Temperature at which the polymer matrix of an FRP material changes from a glassy state to a rubbery state.

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

LAMINA. A layer of fibers and resin in an FRP material.

MATERIAL LONGITUDINAL DIRECTION. Direction in an FRP material parallel to the direction of pultrusion (pulling) during the manufacture of a plate or structural shape.

MATERIAL TRANSVERSE DIRECTION. Direction in an FRP material orthogonal to the longitudinal direction.

MATRIX. Continuous constituent of an FRP material surrounding the reinforcing fibers and consisting of a polymer resin with any fillers and additives.

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

PILE. A timber, concrete, metal, or composite member embedded into the ground to support or brace a structure. "Piles" or "piling" are plural forms of "pile."

PRIVATE WATERFRONT STRUCTURES. A *dock, pier, bulkhead,* or associated structure not open to the general public and with no more than ten total boat slips and no more than ten owners.

PUBLIC WATERFRONT STRUCTURES. A *dock, pier, bulkhead,* or associated structure located on *multi-family* residential property (greater than ten *dwelling units*), public property or commercial property.

PULTRUSION. Manufacturing process whereby a material is pulled through a die to form a shape of constant cross section. FRP plates and structural shapes are generally manufactured using a pultrusion process.

RESIN. An organic polymer possessing indefinite and often high molecular weight and a softening or melting range that exhibits a tendency to flow when subjected to stress.

more than 5 degrees tilt from the horizontal under uniform live loading on one-half of the dock width or under concentrated load of 400 pounds applied within 12 inches of any side.

3. Gangways - Gangways shall be designed for a live load of for 100 psf. Flotation for gangway landing shall be designed for 50 psf, live load.

4. Bulkheads, 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. Superimposed loads shall be considered when exceeding 50 psf and located within a horizontal distance of three times the height of the bulkhead from the face of the bulkhead.

3604.4 Snow Loads. Design snow loads shall be as prescribed in Chapter 16.

3604.5 Wind loads. Design wind loads shall be as prescribed in Chapter 16 without moored vessels. In wind regions with a design wind speed greater than 90 mph, the design wind speed shall be no less than 90 mph (3 second gust). This gust wind speed shall be adjusted for duration and height (not restricted to 15 feet minimum) for wind pressures applied to vessels moored at the facility in accordance with Chapter 16.

Commentary: *During hurricanes, the intent is that vessels be removed from the water or sailed out to sea away from the storm, hence the reduced design wind speed for moored vessels. A design wind speed of 90 mph (3 second gust) is consistent with a thunderstorm.*

3604.6 Impact loads. Design impact loads shall be as prescribed in Chapter 16 but not less than 1.25 times the kinetic energy exerted by a striking vessel or vehicle.

3604.7 Seismic Loads. Design seismic loads shall be as prescribed in Chapter 16. Seismic loads are not applicable for any structure exempted from design by a registered design professional.

3604.8 Water loads. Hydrostatic and hydrodynamic loadings shall be considered as follows:

3604.8.1 Hydrostatic Pressures. Hydrostatic pressures shall be considered in conjunction with the equivalent fluid pressure of soil and any surcharge acting on the structure. For bulkheads hydrostatic pressures shall be estimated based on maximum difference between retained and offshore water surface elevations.

3604.8.2 Current Loads. Current loads for structures and vessels shall be determined from records on current velocity using accepted engineering practice.

3604.8.3 Anchorage for Uplift. Sufficient anchorage against uplift between all components, except elements specifically designed to break away shall be provided. Resisting forces shall be not less than 1.5 times the applied uplift force.

3604.8.4 Wave Forces. 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,

created with fill from dredged deposits, pockets of such clays can exist and lack of long term testing at that specific location could result in creep of the anchor.

3605.3 Wood. Wood shall be pressure treated with a preservative recommended by the American Wood Preservers' Association for the specific application. Wood species, preservative treatment, minimum lumber size, and lumber grade shall be in accordance with Table 3605.3. Handrails, guardrails, wallcaps, and decking may be constructed of naturally durable species where located above the normal high water mark.

3605.3.1 Wood Connections. All steel bolts, rods and other hardware shall be hot-dipped galvanized or protected with an equivalent system. All bolts, rods and other metal materials shall be no smaller than 5/8 inch in diameter. Beams, girders or pile caps shall be attached to the piling with a minimum of two 5/8-inch hot-dip galvanized steel bolts per beam member through bolted at each piling connection. Piling shall not be notched so that the cross-section is reduced below 50 percent. Threaded fasteners shall not be tightened directly against wood surfaces but used only in conjunction with standard ogee or flat washers. Cold formed metal connectors shall not be used in wet applications or applications subject to wetting and drying cycles. Mooring hardware, including cleats, and pile guides shall be through bolted using sizes recommended by the manufacturer.

Table 3605.3: SPECIFICATIONS FOR SOUTHERN PINE[2] LUMBER IN FRESH AND SALT WATER SERVICE

Location	Component	AWPA Use Category[1,4]		Dimensions	Lumber Grade		Moisture Content at Treatment
		Saltwater	Freshwater		Saltwater	Freshwater	
Above Normal High Water	Decking[3]	3B	3B	$^5/_4$" 2" Nominal Min.	Premium No. 2	Premium No. 2	Surfaced Dry 19%
	Guardrails	3B	3B	2" Nominal Min.	No. 2	No. 2	Surfaced Dry 19%
	Wallcaps	3B	3B	2" Nominal Min.	No. 2	No. 2	Surfaced Dry 19%
	Walers	3B	3B	4x6 Nominal	No. 2	No. 2	KD 20% or less or Dry 23%
	Cross Bracing	3B	3B	2" to 4" Nominal	No. 2	No. 2	Surfaced Dry 19%
Splash Zone	Split Pile Caps	4B	4B	2" to 4" Nominal	No. 2	No. 2	Surfaced Dry 19%
	Stringers	4B	4B	2" Nominal	No. 2	No. 2	Surfaced Dry 19%
Below Normal High Water	Sheet Piles	5B	4C	2" to 4" Nominal	Marine No. 1[7]	No. 2	Surfaced Dry 19%
	Walers	5B	4C	4x6 Nominal	Marine No. 1[7]	No. 2	KD 20% or less or Dry 23%
	Cross Bracing	5B	4C	2" to 4" Nominal	Marine No. 1[7]	No. 2	Surfaced Dry 19%
	Rectangular Timber Piles	Not Allowed[6]	4C	6x6 Nominal	Not Allowed[6]	No. 2	KD 20% or less or Dry 23%
	Round Timber Piles	5B[6]	4C	ASTM D25	ASTM D25	ASTM D25	KD 25% or Less

3605.4 Concrete. Concrete components shall comply with applicable provisions of Chapter 19 and ACI 318. Minimum concrete strength, air entrainment, maximum chloride content, and maximum water cement ratio shall be determined from ACI 318 on the basis of required structural strength, required resistance to freeze-thaw exposure, required abrasion resistance, and required resistance to water penetration and salt water intrusion. Minimum concrete cover shall be increased and reinforcing steel spacing shall be decreased in accordance with ACI 350, to reduce crack size. All steel embedments, other than reinforcing steel, shall be stainless, hot dip galvanized or coated for corrosion protection. Field welds and abrasions of coatings on embeds shall be touch coated in the field.

> ***Commentary:*** *In marine environments durability requirements dictate material selection and concrete mix designs. ACI 318 specifies maximum water cement ratios for concrete mixes to limit permeability of the concrete. Concrete strength specified by the designer should be consistent with the water cement ratio required. Higher concrete strengths than needed for strength considerations may be required to achieve the required water cement ratio. Controlling cracking of the concrete limits potential pathways of water and chloride ions to the reinforcing steel, thereby reducing corrosion potential.*

3605.5 Structural Steel. Steel components shall comply with applicable provisions of Chapter 22 and AISC 360. All structural steel members, fasteners, and fittings shall be protected from corrosion by coating or cathodic protection for the specific exposure. Steel bulkhead components and dock components shall be hot dip galvanized or coated to achieve the corrosion protection required for the degree of exposure of corrosive elements. Field welds and abrasions to coatings shall be touch coated after erection or installation is completed. Cold formed metal joists, girders, columns and studs shall not be used in applications where the members are constantly wet or subject to wetting and drying cycles.

> ***Commentary:*** *Cold formed metal structural members have very little reserve capacity when subjected to a corrosive environment.*

3605.6 Aluminum. Aluminum bulkhead sheets or aluminum bulkhead or dock components shall be of proper alloy to resist corrosive elements in the adjacent water and soil. Bulkhead components and hardware shall be aluminum or stainless steel. Aluminum shall be galvanically and physically isolated from concrete and galvanically isolated from steel. Connection hardware and fasteners for aluminum components may be stainless steel or galvanized steel if isolated from aluminum structural elements.

> ***Commentary:*** *Aluminum in contact with concrete may react with the concrete producing deleterious effects on the concrete. Aluminum in direct contact with steel precipitates a galvanic reaction resulting in accelerated corrosion of the steel.*

3605.7 Plastics and Composites. Bulkheads, structural shapes, plates, and guardrail systems manufactured from vinyl chloride based materials or fiber reinforced polymer (FRP) materials shall be designed to comply with manufacturer's published load tables or manufacturer's published mechanical properties subject to the requirements for specific materials in Sections 3605.7.1, 3605.7.2, and 3605.7.3.

Commentary: *Regardless of design method, ASD or LRFD, the USACE report recommends limiting service load stresses to 3200 psi in order to limit creep deformations.*

3605.7.1.3 Ultra Violet Light Stabilization. Vinyl chloride based materials shall be compounded with stabilizing agents. Addition of stabilizers during the extrusion process is prohibited.

Commentary: *Adding stabilizers during the extrusion process does not adequately stabilize the material against UV deterioration. Stabilizer must be added when the product is compounded.*

3605.7.1.4 Impact Resistance of Vinyl Materials. Vinyl sheet pile bulkheads shall have sufficient impact resistance, determined in accordance with ASTM D256 and ASTM D4226, to resist impact from vessels traveling at mooring speeds, resist wave impact when installed in high velocity flood zones (V-Zones on Flood Insurance Rate Maps), and to resist impact from debris likely to collide with the bulkhead at flood stage or in areas subject to storm surge.

3605.7.1.5 Fire, Smoke, and Toxicity. Vinyl materials shall be tested for the in-service thickness in accordance with ASTM D635 with a resulting burning rate of 2 ½ inches per minute or less.

Table 3605.7.1: LIMITATIONS ON MECHANICAL PROPERTIES FOR VINYL CHLORIDE BASED SHEET PILING

Mechanical Property	Test Protocol	Limitations on Property
Notch Impact Resistance	ASTM D256	2.0 ft-lb./in minimum
Drop Dart Impact Resistance, Procedure A	ASTM D4226	1.0 in-lb./mil minimum
Drop Dart Impact Resistance, Procedure B	ASTM D4226	2.0 in-lb./mil minimum
Tensile Strength	ASTM D638	6500 psi minimum
Modulus of Elasticity in Tension	ASTM D638	377,000 psi minimum
Deflection Temperature under 264 psi	ASTM D648	158 psi minimum
Linear Coefficient of Expansion	ASTM D696	4.4×10^{-5} in/in/^{0}F maximum

3605.7.2 Pultruded Fiber Reinforced Polymer (FRP) Sheet Piling, Shapes and Plates. Mechanical properties for FRP structural components shall be established in accordance with the tests specified in Table 3605.7.2. Each manufacturer shall publish the characteristic values for the

Table 3605.7.2: LIMITATIONS ON PHYSICAL AND MECHANICAL PROPERTIES FOR FIBER REINFORCED POLYMER COMPONENTS		
Property	**ASTM Test Method**	**Minimum Number of Tests**
Barcol Hardness	D2583	5
Glass Transition Temperature T_g	D4065	5
Coefficient of Thermal Expansion	D696	5
Moisture Equilibrium Content	D570	5
Longitudinal Tensile Strength	D638	10
Transverse Tensile Strength	D638	10
Longitudinal Tensile Modulus	D638	10
Transverse Tensile Modulus	D638	10
Longitudinal Compressive Strength	D6641	10
Transverse Compressive Strength	D6641	10
Longitudinal Compressive Modulus	D6641	10
Transverse Compressive Modulus	D6641	10
Longitudinal Flexural Strength	D790	10
Transverse Flexural Strength	D790	10
Longitudinal Flexural Modulus	D790	10
Transverse Flexural Modulus	D790	10

3605.7.2.1 Maximum Service Temperature. Service temperature of FRP structural components shall not exceed T_g-40^{0}F, where T_g is the glass transition temperature determined in accordance with ASTM D4065.

3605.7.2.2 FRP Constituent Materials. Fibers and matrix constituents shall comply with the following requirements:

3605.7.2.2.1 Fiber Type. Fibers shall be glass, carbon, aramid, or hybrid combinations of these fiber types. Glass fibers shall conform to ASTM D578.

3605.7.2.2.2 Fiber Architecture and Content. The fiber architecture of any pultruded element comprising the cross section of a pultruded FRP structural member shall be symmetrical and balanced. Each pultruded FRP structural element shall contain a minimum total fiber volume fraction of 30%.

3605.7.2.2.3 Fiber Orientations. Each element of a pultruded FRP structural member shall have fibers oriented in a minimum of two directions separated by a minimum of 30 degrees. In the direction of the longitudinal axis of the member the percentage of continuous fiber in each pultruded element shall be a minimum of 30% of the total fiber reinforcement by volume for shapes and a minimum of 25% of the total fiber reinforcement by volume for plates. When multiple elements share a common edge in the direction of pultrusion, at least 50% of the non-roving reinforcement in the element having the largest percentage of non-roving reinforcement shall extend through the junction connecting the elements.

3605.7.2.2.4 Minimum Fiber Tensile Strength. Determined in accordance with ASTM D7290, the characteristic value of the tensile strength of the fiber strands, yarns, and rovings shall be at least 290,000 psi. Tensile tests shall be conducted in accordance with ASTM D2343.

3605.7.2.2.5 Resin. A commercial grade thermoset resin shall be used for fabricating pultruded FRP structural members.

3605.7.2.2.6 Other Constituent Materials. Additives to the resin system that influence processing or curing, such as fillers, promoter, accelerators, inhibitors, UV resistant agent, and pigments shall be compatible with the fiber and resin system.

3605.7.2.3 Durability and Environmental Effects. Materials for FRP structural components shall be selected, designed, and manufactured to tolerate long term environmental effects anticipated during the service life of the structure.

3605.7.2.3.1 Factors Considered in Material Selection. The following factors shall be considered in selecting FRP materials for marine structures:

a. Performance criteria for the structure;
b. Intended service life of the structure;
c. Expected environmental conditions, including likelihood of exposure

3605.7.2.6 Fire, Smoke, and Toxicity. FRP materials shall be tested for the in-service thickness in accordance with ASTM D635 with a resulting burning rate of 2 ½ inches per minute or less.

Commentary: *Criteria are consistent with provisions for CC2 plastics in Section 2606.4. ASTM D4216 references D635 for burning characteristics of vinyl materials, and allusion is made to similar requirements in the ASCE Prestandard for FRP.*

3605.7.3 Carbon Fiber Reinforced Polymer Repair Products. Carbon Fiber Reinforced plate and wrap used for flexural and shear reinforcement of existing concrete structures shall be designed in accordance with the design procedures specified in ACI 440.2R. Mechanical properties of Carbon Fiber Reinforced plate and wrap shall be established in accordance with the tests specified in ACI 440.3R.

3605.8 Masonry. Masonry used in bulkheads and dock work shall comply with Chapter 21.

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

3606.1 Fixed piers. Fixed piers shall be constructed in accordance with Sections 3606.1.1 through 3606.1.4.

3606.1.1 Required depth of piles. Fixed piers shall be supported by pilings with tip penetrations dependent on the soil conditions and the total applied load. Piers support by shallow piling, legs or columns with point bearing on rock shall have provisions to resist horizontal forces and overturning, as well as flotation uplift. Piles shall be installed in accordance with the requirements of Chapter 18 and inspected in accordance with the requirements of Chapter 17.

3606.1.2 Structural steel and concrete members. Structural steel members shall be designed in accordance with AISC 360, Chapter 22 of this code, and the material requirements of this chapter. Concrete members shall be designed in accordance with ACI 318, Chapter 19 of this code, and the materials requirements of this chapter.

3606.1.3 Size of wood piles. Piles shall be sized in accordance with the American Wood Council National Design Specification. In no case shall round timber piles be less than 7 inches in diameter at the butt and have a minimum tip diameter of less than 5 ½ inches. Rectangular timber piles shall not be less than nominal 6 inches x 6 inches.

3606.1.4 Bracing of wood piles. Where required by design, bracing shall be sized to limit stresses in the piles from lateral loads in accordance with the American Wood Council National Design Specification to prevent buckling.

shall be a minimum of 42 inches high and shall prevent the passage of a 21 inch sphere except where required otherwise by Chapter 11. Edge protection shall be provided as required by other regulations.

Commentary: *Chapter 36 requirements for guardrails are a compromise intended to address as many general cases as possible. In marine applications, guardrails or deletion of rails may be determined on a case by case basis due to the diversity of activities taking place on the waterfront. In many cases, function and view are important factors in the design of a barrier system. A case in point is an urban waterfront where small to medium sized vessels are docking along a pedestrian promenade. The solution was a minimal barrier system that would allow for function and view while alerting pedestrians that there is a hazard and channeling them away from the hazard. As a compromise, the committee attempted to incorporate these concepts into the draft code provisions. The 21 inch sphere limitation is based from minimum OSHA standards. For a vertical drop less than 6 feet, the intent of omitting guardrails considers that the drop is over water or above a soft substrate. Consideration for guardrails should be made when hazardous conditions exist.*

Exception: For private waterfront piers and docks, guardrails or other safety provisions shall be provided along the edges where the vertical drop to the lesser of the mean low water level , normal low water level (sounds), normal pool (lakes and rivers) or mud line exceeds 8 feet. Guardrails shall be a minimum of 36 inches high and shall prevent the passage of a 21 inch sphere. Edge protection shall be provided as required by other regulations.

3606.7 Accessibility. Piers, docks, catwalks, gangways, and floating docks shall comply with Chapter 11 and ANSI/ICC A117.1 for accessibility.

Commentary: *Compliance with the NC Building Code does not necessarily ensure compliance with the Federal law, The Americans with Disabilities Act. The designer and the owner should investigate Federal requirements. Refer to Chapter 11 for requirements regarding the number and distribution of accessible berths. The provisions of ANSI A117.1 note the maximum running and cross slopes of the floating dock along the accessible route cannot exceed 1:20 and 1:48, respectively, under static loading (no wave loading). Therefore, the maximum cross slope should be checked with any combination of dead load, uniform dock surface live load and dock surface concentrated load as prescribed in Section 3604.3.2.For maximum running slope on a floating dock, the same loadings must be checked including where the gangway lands on the floating dock at the ends of fingers. ANSI A117.1 provides exceptions to the requirements for maximum running slope, maximum rise and changes in level for gangways serving an accessible route based on the number of boat slips at the facility. The height and location of utilities and attached utility structures must be considered based on the provisions of ANSI A117.1.*

3606.8 Egress. Piers and docks shall be provided with means of egress in accordance with Sections 3606.8.1 through 3606.8.4.

3606.8.1 Occupant Load. Occupant load for piers and docks shall be calculated as follows:

SECTION 3607 CONSTRUCTION: BULKHEADS AND REVETMENTS

3607.1 Bulkheads. Bulkheads shall be constructed in accordance with Sections 3607.1.1 through 3607.1.5.

3607.1.1 General. Bulkheads shall be constructed in a manner to be effective against erosion and provide for bank stabilization. The bulkhead system may consist of either of the following or 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 (See ASTM D 2487) through joints or cracks from the fill side to the stream side.

3607.1.2 Systems. Local site conditions and performance of bulkheads in service shall govern in selection of a system. The potential for erosion and scour at the mud line shall also be investigated, and 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 in a landward direction at an angle of not less than 45 degrees 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.

3607.1.3 Guardrails. Where designated public walkways, steps or ramps run adjacent to bulkheads within 6 feet, guardrails or other safety provisions shall be provided along the top of the wall where the vertical drop to the lesser of the mean low water level, normal low water level (sounds), normal pool (lakes and rivers) or mud line exceeds 6 feet. Guardrails shall be designed in accordance with Chapter 16 for balcony guardrails. Guardrails shall be 42 inches high and shall prevent the passage of a 21 inch sphere except where required otherwise by Chapter 11. Edge protection shall be provided as required by other regulations.

Commentary: *Chapter 36 requirements for guardrails are a compromise intended to address as many general cases as possible. In marine applications, guardrails or deletion of rails may be determined on a case by case basis due to the diversity of activities taking place on the waterfront. In many cases, function and view are important factors in the design of a barrier system. A case in point is an urban waterfront where small to medium sized vessels are docking along a pedestrian promenade. The solution was a minimal barrier system that would allow for function and view while alerting pedestrians that there is a hazard and channeling them away from the hazard. As a compromise, the committee attempted to incorporate these concepts into the draft code provisions. The 21 inch sphere limitation is based from minimum OSHA standards. For a vertical drop less than 6 feet, the intent of omitting guardrails considers that the drop is over water or above a soft substrate. Consideration for guardrails should be made when hazardous conditions exist.*

Exception: For private waterfront bulkheads with designated walkways within 6 feet, guardrails or other safety provisions shall be provided along the edges where the vertical drop to the lesser of the mean low water level , normal low water level (sounds), normal

Other Proposed Changes to the NC Building Code

Proposed Revision to Table 1004.1.1

Add footnote to the table stating the following:

Reference Section 3606.8 for occupant load of piers and docks.

Proposed Addition to Chapter 11

1109.14.3.1 Recreational boating facilities. The minimum required number of accessible berths shall be provided as per Table 1109.14.3.1.

1109.14.3.1.1 Number of boat slips not identified. Where the number of boat slips is not identified, such as along the edge of a long side-tie dock for example, each 40 feet of linear dock edge, or fraction thereof, shall be counted as one boat slip.

1109.14.3.1.2 Total number of boat slips. The total number of berths in a marina facility must include all single berths, double berths, side-tie berths, end-tie berths, open berths and covered berths, as well as berths that are components of courtesy landings, visitor docks, fuel docks, sewage pumpout docks, harbor master office docks, haul out and repair docks, etc.

Table 1109.14.3.1
Minimum Required
Number of Accessible Berths

Total Number of Boat Slips	Minimum Number
1 to 25	1
26 to 50	2
51 to 100	3
101 to 150	4
151 to 300	5
301 to 400	6
401 to 500	7
501 to 600	8
601 to 700	9
701 to 800	10
810 to 900	11
901 to 1000	12
1001 and over	12, plus 1 for each 100 or fraction thereof over 1000

ASTM D907-12a Standard Terminology of Adhesives

ASTM D953-10 Standard Test Method for Bearing Strength of Plastics

ASTM D1435-13 Practice for Outdoor Weathering of Plastics

ASTM D2343-09 Standard Test Method for Tensile Properties of Glass Fiber Strands, Yarns, and Rovings Used in Reinforced Plastics

ASTM D2344-13 Standard Test Method for Short Beam Strength of Polymer Matrix Composite Materials and Their Laminates

ASTM D2583-13a Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor

ASTM D3878-07 Standard Terminology of High-modulus Reinforcing Fibers and Their Composites

ASTM D3917-12 Standard Specification for Dimensional Tolerance of Thermosetting Glass-reinforced Plastic Pultruded Shapes

ASTM D4065-12 Standard Practice for Plastics: Dynamic Mechanical Properties: Determination and Report of Procedures

ASTM D4385-13 Standard Practice for Classifying Visual Defects in Thermosetting Reinforced Plastic Pultruded Products

ASTM D4216-13 Standard Test Methods for Impact Resistance of Rigid Poly(Vinyl Chloride) (PVC) Building Products

ASTM D4226-11 Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) and Related PVC and Chlorinated Poly(Vinyl Chloride) (CPVC) Building Products Compounds

ASTM D5379-12 Standard Test Method for Shear Properties of Composite Materials by the V-Notch Beam Method

ASTM D6641-09 Standard Test Method for Determining the Compressive Properties of Polymer Matrix Composite Laminates Using a Combined Loading Compression (CLC) Test Fixture

ASTM D7136-12 Standard Test Method for Measuring the Damage Resistance of a Fiber-reinforced Polymer Matrix Composite to a Drop-weight Impact Event

ASTM D7290-06 Standard Practice for Evaluating Material Property Characteristic Values for Polymeric Composites for Civil Engineering Applications

ASTM D7332-09 Standard Test Method for Measuring the Fastener Pull-through Resistance of a Fiber-reinforced Matrix Composite

ASTM G154-12a Standard Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials

B-15
G

APPENDIX C
CODE CHANGE PROPOSAL
NORTH CAROLINA
BUILDING CODE COUNCIL

322 Chapanoke Road, Suite 200
Raleigh, North Carolina 27603
(919) 661-5880

Petition for Rule Making

Item Number _____

Granted by BCC_____ **Adopted by BCC**_____ **Approved by RRC**_____
Denied by BCC_____ **Disapproved by BCC**_____ **Objection by RRC**_____

PROPONENT WAYNE HAMILTON PHONE (828)259-5641.
REPRESENTING NC FIRE SERVICE CODE REVISION COMMITTEE
ADDRESS POB 7148
CITY ASHEVILLE STATE NC ZIP 28801
E-MAIL whamilton@ashevillenc.gov FAX (828)259-5681.

North Carolina State Building Code, Volume FIRE - Section 319

CHECK ONE:
[ ] Revise section to read as follows:
[X] Add new section to read as follows:
[ ] Delete section and substitute the following.
[ ] Delete section without substitution.

~~LINE THROUGH MATERIAL TO BE DELETED~~ UNDERLINE MATERIAL TO BE ADDED

Type or print. Continue proposal or reason on plain paper attached to this form. See reverse side for instructions.

Add new section from 2012 IFC as our **Section 319; Rooftop Gardens and Landscaped Roofs.** Copy of the section language is attached.

Will this proposal change the cost of construction? Decrease [ ] Increase [ ] No [X]
Will this proposal increase the cost of a dwelling by $80 or more? Yes [ ] No [X]
Will this proposal affect Local or State funds? Local [ ] State [ ] No [X]
Will this proposal cause a substantial economic impact (≥ $500,000)? Yes [ ] No [X]
Non-Substantial - Provide an economic analysis including benefit/cost estimates.
Substantial - The economic analysis must also include 2-alternatives, time value of money and risk analysis.

REASON:

Rooftop gardens and landscaped roofs were added into the 2012 NC Building Code in section 1507.16. This companion change addresses the fire prevention needs of these gardens and landscaping, such as hydration, waste removal, use of fueled equipment, and fire separation from openings.

Signature Wayne Hamilton DATE: 6/9/14

SECTION 319
ROOFTOP GARDENS AND LANDSCAPED ROOFS

319.1 General. Rooftop gardens and landscaped roofs shall be installed and maintained in accordance with Sections 319.2 through 319.5 and Sections 1505.0 and 1507.16 of the *International Building Code.*

319.2 Rooftop garden or landscaped roof size. Rooftop garden or landscaped roof areas shall not exceed 15,625 square feet (1,450 m^2) in size for any single area with a maximum dimension of 125 feet (39 m) in length or width. A minimum 6-foot-wide (1.8 m) clearance consisting of a Class A-rated roof system complying with ASTM E 108 or UL 790 shall be provided between adjacent rooftop gardens or landscaped roof areas.

319.3 Rooftop structure and equipment clearance. For all vegetated roofing systems abutting combustible vertical surfaces, a Class A-rated roof system complying with ASTM E 108 or UL 790 shall be achieved for a minimum 6-foot-wide (1.8 m) continuous border placed around rooftop structures and all rooftop equipment including, but not limited to, mechanical and machine rooms, penthouses, skylights, roof vents, solar panels, antenna supports, and building service equipment.

319.4 Vegetation. Vegetation shall be maintained in accordance with Sections 319.4.1 and 319.4.2.

319.4.1 Irrigation. Supplemental irrigation shall be provided to maintain levels of hydration necessary to keep green roof plants alive and to keep dry foliage to a minimum.

319.4.2 Dead foliage. Excess biomass, such as overgrown vegetation, leaves and other dead and decaying material, shall be removed at regular intervals not less than two times per year.

319.4.3 Maintenance plan. The *fire code official* is authorized to require a maintenance plan for vegetation placed on roofs due to the size of a roof garden, materials used, or when a fire hazard exists to the building or exposures due to the lack of maintenance.

319.5 Maintenance equipment. Fueled equipment stored on roofs and used for the care and maintenance of vegetation on roofs shall be stored in accordance with Section 313.

B-16

G

APPENDIX C
CODE CHANGE PROPOSAL
NORTH CAROLINA
BUILDING CODE COUNCIL

322 Chapanoke Road, Suite 200
Raleigh, North Carolina 27603
(919) 661-5880

Petition for Rule Making

Item Number _____

Granted by BCC_____ Adopted by BCC_____ Approved by RRC_____

Denied by BCC_____ Disapproved by BCC_____ Objection by RRC_____

PROPONENT Wayne Hamilton PHONE (828) 259-5641
REPRESENTING NC Fire Service Code Revision Committee
ADDRESS POB 7148
CITY Asheville STATE NC ZIP 28801
E-MAIL whamilton@ashevillenc.gov FAX (828) 259-5681

North Carolina State Building Code, Volume FIRE - Section 509.1.1

CHECK ONE:
[ ] Revise section to read as follows:
[X] Add new section to read as follows:
[ ] Delete section and substitute the following.
[ ] Delete section without substitution.

~~LINE THROUGH MATERIAL TO BE DELETED~~ UNDERLINE MATERIAL TO BE ADDED

Type or print. Continue proposal or reason on plain paper attached to this form. See reverse side for instructions.

509.1.1 Utility identification. Gas shutoff valves, electric meters, service switches, and other utility equipment shall be clearly and legibly marked to identify the unit or space that it serves. Identification shall be made in an approve manner, readily visible and shall be maintained.

d

Will this proposal change the cost of construction? Decrease [ ] Increase [ ] No [X]
Will this proposal increase the cost of a dwelling by $80 or more? Yes [ ] No [X]
Will this proposal affect Local or State funds? Local [ ] State [ ] No [X]
Will this proposal cause a substantial economic impact (≥ $500,000)? Yes [ ] No [X]
Non-Substantial - Provide an economic analysis including benefit/cost estimates.
Substantial - The economic analysis must also include 2-alternatives, time value of money and risk analysis.

REASON:

2012 IFC language to provide emergency responders clear information on what building utility shutoffs serve what units.

Signature Wayne Hamilton DATE: 6/9/14

B-17

G

APPENDIX C
CODE CHANGE PROPOSAL
NORTH CAROLINA
BUILDING CODE COUNCIL

322 Chapanoke Road, Suite 200
Raleigh, North Carolina 27603
(919) 661-5880

Petition for Rule Making

Item Number _____

Granted by BCC_____ Adopted by BCC_____ Approved by RRC_____
Denied by BCC_____ Disapproved by BCC_____ Objection by RRC_____

PROPONENT WAYNE HAMILTON PHONE (828) 259-5641
REPRESENTING NC FIRE SERVICE CODE REVISION COMMITTEE
ADDRESS P.O. BOX 7148
CITY ASHEVILLE STATE N C ZIP 28802
E-MAIL WHAMILTON@ASHEVILLENC.GOV FAX ( ) -

North Carolina State Building Code, Volume FIRE - Section 1208.2

CHECK ONE:
[X] Revise section to read as follows:
[ ] Add new section to read as follows:
[ ] Delete section and substitute the following.
[ ] Delete section without substitution.

~~LINE THROUGH MATERIAL TO BE DELETED~~ UNDERLINE MATERIAL TO BE ADDED

Type or print. Continue proposal or reason on plain paper attached to this form. See reverse side for instructions.

SEE ATTACHMENT

Will this proposal change the cost of construction? Decrease [ ] Increase [ ] No [X]
Will this proposal increase the cost of a dwelling by $80 or more? Yes [ ] No [X]
Will this proposal affect Local or State funds? Local [ ] State [ ] No [X]
Will this proposal cause a substantial economic impact (≥ $500,000)? Yes [ ] No [X]
Non-Substantial - Provide an economic analysis including benefit/cost estimates.
Substantial - The economic analysis must also include 2-alternatives, time value of money and risk analysis.

REASON:

Signature _____ DATE: 6/10/14

1208.2. Automatic sprinkler system. An automatic sprinkler system shall be installed in accordance with Section 903.3.1.1 throughout all dry cleaning plants containing Type II, Type III-A or Type III-B dry cleaning systems.

Exceptions:

1. An automatic sprinkler system shall not be required in Type III-A dry cleaning plants where the aggregate quantity of Class III-A solvent in dry cleaning machines and storage does not exceed 330 gallons (1250L) and dry cleaning machines are equipped with a feature that will accomplish any one of the following:

   1.1. Prevent oxygen concentrations from reaching 8 percent or more by volume.

   1.2. Keep the temperature of the solvent at least 30°F (16.7°C) below the flash point.

   1.3. Maintain the solvent vapor concentration at a lower level than 25 percent of the lower explosive limit (LEL).

   1.4. Utilize equipment approved for use in Class I, Division 2 hazardous locations in accordance with NFPA 70.

   1.5. Utilize an integrated dry chemical clean agent or water mist automatic fire-extinguishing system designed in accordance with Chapter 9.

2. An automatic sprinkler system shall not be required in Type III-B dry cleaning plants where the aggregate quantity of Class III-B solvent in dry cleaning machines and storage does not exceed 3,300 gallons (12,490L).

B-18
G

APPENDIX C
CODE CHANGE PROPOSAL
NORTH CAROLINA
BUILDING CODE COUNCIL

322 Chapanoke Road, Suite 200
Raleigh, North Carolina 27603
(919) 661-5880

Petition for Rule Making

Item Number _____

Granted by BCC_____ Adopted by BCC_____ Approved by RRC_____
Denied by BCC_____ Disapproved by BCC_____ Objection by RRC_____

PROPONENT Wayne Hamilton PHONE (828) 259-5641
REPRESENTING NC Fire Service Code Revision Committee
ADDRESS POB 7148
CITY Asheville STATE NC ZIP 28801
E-MAIL whamilton@ashevillenc.gov FAX (828) 259-5681.

North Carolina State Building Code, Volume FIRE - Section Chapter 26 & 202

CHECK ONE:
[X] Revise section to read as follows: [X] Delete section and substitute the following.
[ ] Add new section to read as follows: [ ] Delete section without substitution.

~~LINE THROUGH MATERIAL TO BE DELETED~~ UNDERLINE MATERIAL TO BE ADDED

Type or print. Continue proposal or reason on plain paper attached to this form. See reverse side for instructions.

Delete the existing Chapter 26 and substitute with the 2012 IFC Chapter 26. Add the attached definitions to Section 202. Copies are attached.

Will this proposal change the cost of construction? Decrease [ ] Increase [ ] No [X]
Will this proposal increase the cost of a dwelling by $80 or more? Yes [ ] No [X]
Will this proposal affect Local or State funds? Local [ ] State [ ] No [X]
Will this proposal cause a substantial economic impact (≥ $500,000)? Yes [ ] No [X]
Non-Substantial - Provide an economic analysis including benefit/cost estimates.
Substantial - The economic analysis must also include 2-alternatives, time value of money and risk analysis.

REASON:

Industry practices and technology have changed. There are practices of toxic insecticidal fogging that are both thermally and non-heated. Our current code does not address the hazards of non-heated treatment applications. These hazards include the toxicity to occupants and the securing of possible ignition sources.

Signature Wayne Hamilton DATE: 6/9/14

NEW

CHAPTER 26

FUMIGATION AND INSECTICIDAL FOGGING

SECTION 2601 GENERAL

2601.1 Scope. Fumigation and insecticidal fogging operations within buildings, structures and spaces shall comply with this chapter.

2601.2 Permits. Permits shall be required as set forth in Section 105.6.

SECTION 2602 DEFINITIONS

2602.1 Definitions. The following terms are defined in Chapter 2:

FUMIGANT.

FUMIGATION.

INSECTICIDAL FOGGING.

SECTION 2603 FIRE SAFETY REQUIREMENTS

2603.1 General. Buildings, structures and spaces in which fumigation and insecticidal fogging operations are conducted shall comply with the fire protection and safety requirements of Sections 2603.2 through 2603.7.

2603.2 Sources of ignition. Fires, open flames and similar sources of ignition shall be eliminated from the space under fumigation or insecticidal fogging. Heating, where needed, shall be of an *approved* type.

2603.2.1 Electricity. Electricity in any part of the building, structure or space where operation of switches or electrical devices, equipment or systems could serve as a source of ignition shall be shut off.

Exception: Circulating fans that have been specifically designed for utilization in hazardous atmospheres and installed in accordance with NFPA 70.

2603.2.2 Electronic devices. Electronic devices, including portable equipment and cellular phones, shall be shut off. Telephone lines shall be disconnected from telephones.

2603.2.3 Duration. Sources of ignition shall be shut off during the fumigation activity and remain shut off until the ventilation required in Section 2603.6 is completed.

2603.3 Notification. The *fire code official* and fire chief shall be notified in writing at least 48 hours before the building, structure or space is to be closed in connection with the utilization of any toxic or flammable fumigant. Notification shall give the location of the enclosed space to be fumigated or fogged, the occupancy, the fumigants or insecticides to be utilized, the person or persons responsible for the operation, and the date and time at which the operation will begin. Written notice of any fumigation or insecticidal fogging operation shall be given to all affected occupants of the building, structure or space in which such operations are to be conducted with sufficient advance notice to allow the occupants to evacuate the building, structure or space. Such notice shall inform the occupants as to the purposes, anticipated duration and hazards associated with the fumigation or insecticidal fogging operation.

2603.3.1 Warning signs. *Approved* warning signs indicating the danger, type of chemical involved and necessary precautions shall be posted on all doors and entrances to the affected building, structure or space and upon all gangplanks and ladders from the deck, pier or land to a ship. Such notices shall be printed in red ink on a white background. Letters in the headlines shall be at least 2 inches (51 mm) in height and shall state the date and time of the operation, the name and address of the person, the name of the operator in charge, and a warning stating that the affected building, structure or space shall be vacated at least 1 hour before the operation begins and shall not be reentered until the danger signs have been removed by the proper authorities.

2603.3.2 Breathing apparatus. Persons engaged in the business of fumigation or insecticidal fogging shall maintain and have available *approved* protective breathing apparatus.

2603.3.3 Watch personnel. During the period fumigation is in progress, except when fumigation is conducted in a gas-tight vault or tank, a responsible watchperson shall remain on duty at the entrance or entrances to the enclosed fumigated space until after the fumigation is completed and the building, structure or space is properly ventilated and safe for occupancy. Sufficient watchers shall be provided to prevent persons from entering the enclosed space under fumigation without being observed.

2603.3.4 Evacuation during fumigation. Occupants of the building, structure or space to be fumigated, except the personnel conducting the fumigation, shall be evacuated from such building, structure or space prior to commencing fumigation operations.

2603.3.5 Evacuation during insecticidal fogging operations. Occupants in the building, structure or space to be fogged, except the personnel conducting the insecticidal fogging operations, shall be evacuated from such building, structure or space prior to commencing fogging operations.

2603.4 Insecticidal fogging liquids. Insecticidal fogging liquids with a *flash point* below 100°F (38°C) shall not be utilized.

2603.5 Sealing of buildings, structures and spaces. Paper and other similar materials that do not meet the flame propagation performance criteria of NFPA 701 shall not be used to

wrap or cover a building, structure or space in excess of that required for the sealing of cracks, casements and similar openings.

2603.5.1 Maintenance of openings. All openings to the building, structure or space to be fumigated or fogged shall be kept securely closed during such operation.

2603.6 Venting and cleanup. At the end of the exposure period, fumigators shall safely and properly ventilate the premises and contents; properly dispose of fumigant containers, residues, debris and other materials used for such fumigation; and clear obstructions from gas-fired appliance vents.

2603.7 Flammable fumigants restricted. The use of carbon disulfide and hydrogen cyanide shall be restricted to agricultural fumigation.

Add to section 202:

FUMIGANT. A substance which by itself or in combination with any other substance emits or liberates a gas, fume or vapor utilized for the destruction or control of insects, fungi, vermin, germs, rats or other pests, and shall be distinguished from insecticides and disinfectants which are essentially effective in the solid or liquid phases. Examples are methyl bromide, ethylene dibromide, hydrogen cyanide, carbon disulfide and sulfuryl fluoride.

FUMIGATION. The utilization within an enclosed space of a fumigant in concentrations that are hazardous or acutely toxic to humans.

INSECTICIDAL FOGGING. The utilization of insecticidal liquids passed through fog-generating units where, by means of pressure and turbulence, with or without the application of heat, such liquids are transformed and discharged in the form of fog or mist blown into an area to be treated.

APPENDIX C
CODE CHANGE PROPOSAL
NORTH CAROLINA
BUILDING CODE COUNCIL

322 Chapanoke Road, Suite 200
Raleigh, North Carolina 27603
(919) 661-5880

B-19
G

Petition for Rule Making

Item Number _____

Granted by BCC_____ **Adopted by BCC**_____ **Approved by RRC**_____
Denied by BCC_____ **Disapproved by BCC**_____ **Objection by RRC**_____

PROPONENT WAYNE HAMILTON PHONE (828) 259-5641
REPRESENTING NC FIRE SERVICE CODE REVISION COMMITTEE
ADDRESS P.O. BOX 7148
CITY ASHEVILLE STATE NC ZIP 28802
E-MAIL WHAMILTON@ASHEVILLENC.GOV FAX ( ) -

North Carolina State Building Code, Volume FIRE - Section CHAPTER 47

CHECK ONE:
[ ] Revise section to read as follows:
[ ] Add new section to read as follows:
[ ] Delete section and substitute the following.
[ ] Delete section without substitution.

~~LINE THROUGH MATERIAL TO BE DELETED~~ UNDERLINE MATERIAL TO BE ADDED

Type or print. Continue proposal or reason on plain paper attached to this form. See reverse side for instructions.

SEE ATTACHMENT

Will this proposal change the cost of construction? Decrease [ ] Increase [ ] No [X]
Will this proposal increase the cost of a dwelling by $80 or more? Yes [ ] No [X]
Will this proposal affect Local or State funds? Local [ ] State [ ] No [X]
Will this proposal cause a substantial economic impact (≥ $500,000)? Yes [ ] No [X]
Non-Substantial - Provide an economic analysis including benefit/cost estimates.
Substantial - The economic analysis must also include 2-alternatives, time value of money and risk analysis.

REASON:

Signature _____ DATE: 6/10/14

NFPA National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02169-7471

Standard Reference Number	Title	Referenced in code section number
10- ~~07~~ 13	Portable Fire Extinguishers	No Change to Section numbers
11-~~05~~ 10	Low-, Medium- and High-expansion foam	
12-~~05~~ 11	Carbon Dioxide Extinguishing Systems	
12A-~~04~~ 09	Halon 1301 Fire Extinguishing Systems	
13-~~07~~ 13	Installation of Sprinkler Systems	
13D-~~07~~ 13	Installation of Sprinkler Systems in One-and-Two family dwellings and Manufactured Homes	
13R-~~07~~ 13	Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height.	
14-~~07~~ 13	Installation of Standpipe and Hose Systems	
15-~~07~~ 12	Water Spray Fixed Systems for Fire Protection	
16-~~07~~ 11	Installation of Foam-water Sprinkler and Foam-water Spray Systems	
17-~~02~~ 13	Dry Chemical Extinguishing Systems	
17A-~~02~~ 13	Wet Chemical Extinguishing Systems	
20-~~07~~ 13	Installation of Stationary Pumps for Fire Protection	
22-~~03~~ 13	Water Tanks for Private Fire Protection	
24-~~07~~ 13	Installation of Private Fire Service Mains and Their Appurtenances	
25-~~08~~ 14	Inspection Testing and Maintenance of Water-based Fire Protection Systems	
30-~~08~~ 12	Flammable and Combustible Liquids Code	
30A-~~08~~ 12	Code for Motor Fuel-dispensing Facilities and Repair Garages	
30B-~~07~~ 11	Manufacture and Storage of Aerosol Products	
31-~~06~~ 11	Installation of Oil-burning Equipment	
32-~~07~~ 11	Dry Cleaning Plants	
33-~~07~~ 11	Spray Application Using Flammable or Combustible Materials	
34-~~07~~ 11	Dipping and Coating Processes Using Flammable or Combustible Liquids	
35-~~05~~ 11	Manufacture of Organic Coatings	
40-~~07~~ 11	Storage and Handling of Cellulose Nitrate Film	
51 -~~07~~ 13	Design and Installation of Oxygen-fuel Gas Systems for Welding, Cutting and Allied Processes	
51A-~~06~~ 12	Acetylene Cylinder Charging Plants	
52-~~06~~ 13	Vehicular Fuel System Code	
55-~~05~~ 13	Standard for the Storage, Use and Handling of Compressed Gases and Cryogenic Fluids in Portable and Stationary Containers Cylinders and Tanks	
58-~~08~~ 14	Liquefied Petroleum Gas Code	
59A-~~06~~ 13	Production, Storage and Handling of Liquefied Natural Gas (LNG)	
61-~~08~~ 13	Prevention of Fires and Dust Explosions in Agricultural and Food Processing Facilities	
69-~~08~~ 14	Explosion Prevention Systems	
70-~~08~~ 14	National Electrical Code	

72-~~07~~ 13	National Fire Alarm and Signaling Code
80-~~07~~ 13	Fire Doors and Other Opening Protectives
85-~~07~~ 11	Boiler and Combustion System Hazards Code
86-~~07~~ 11	Ovens and Furnaces
92B-~~05~~ 12	Smoke Management Systems in Malls, Atria and Large Spaces
99-~~05~~ 12	Health Care Facilities
101-~~06~~ 12	Life Safety Code
105-~~07~~ 10	Installation of Smoke Door Assemblies and Other Opening Protectives
110 -~~05~~ 10	Emergency and Standby Power Systems
111-~~05~~ 10	Stored Electrical Energy Emergency and Standby Power Systems
120-~~04~~ 10	Coal Preparation Plants
160-~~06~~ 11	Flame Effects Before an Audience
170-~~06~~ 12	Standard for Fire Safety and Emergency Symbols
211-~~06~~ 13	Chimneys, Fireplaces, Vents and Solid Fuel-burning Appliances
241-~~04~~ 13	Safeguarding Construction, Alteration and Demolition Operations
253-~~06~~ 11	Standard Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source
260-~~03~~ 13	Method of Tests and Classification System for Cigarette Ignition Resistance of Components of Upholstered Furniture
261-~~03~~ 13	Method of Test for Determining Resistance of Mock-up Upholstered Furniture Material Assemblies to Ignition by Smoldering Cigarettes
265-~~07~~ 11	Method of Fire Tests for Evaluating Room Fire Growth Contribution of Textile Wall Coverings in Full Height Panels and Walls
286-~~06~~ 11	Standard Method of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth
303-~~06~~ 11	Fire Protection Standard for Marinas and Boatyards
385-~~07~~ 12	Tank Vehicles for Flammable and Combustible Liquids
407-~~07~~ 12	Aircraft Fuel Servicing
409-~~04~~ 11	Aircraft Hangars
430-04	Storage of Liquid and Solid Oxidizers
484-~~06~~ 12	Combustible Metals
490-02	Storage of Ammonium Nitrate
495-~~06~~ 13	Explosive Materials Code
498-~~06~~ 13	Safe Havens and Interchange Lots for Vehicles Transporting Explosives
505-~~06~~ 13	Powered Industrial Trucks, Including Type Designations, Areas of Use, Maintenance and Operation
654-~~06~~ 13	Prevention of Fire and Dust Explosions from the Manufacturing, Processing and Handling of Combustible Particulate Solids
655-~~07~~ 12	Prevention of Sulfur Fires and Explosions
664-~~07~~ 12	Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities
701-~~04~~ 10	Methods of Fire Tests for Flame- propagation of Textiles and Films
703-~~06~~ 12	Fire Retardant Impregnated Wood and Fire Retardant Coatings for Building Materials
704-~~07~~ 12	Identification of the Hazards of Materials for Emergency Response
750-~~06~~ 10	Water Mist Fire Protection Systems
1122-~~08~~ 13	Model Rocketry
1123-~~10~~ 14	Fireworks Display
1124-~~06~~ 13	Manufacture, Transportation, Storage and Retail Sale of Fireworks and Pyrotechnic Articles

1125-~~07~~ 12	Manufacture of Model Rocket and High Power Rocket Motors
1126-~~10~~ 11	Use of Pyrotechnics Before a Proximate Audience
1127-~~08~~ 13	High Power Rocketry
1142-~~07~~ 12	Water Supply for Suburban and Rural Fire Fighting
2001-~~08~~ 12	Clean Agent Fire Extinguishing Systems

B-20
G

APPENDIX C
CODE CHANGE PROPOSAL
NORTH CAROLINA
BUILDING CODE COUNCIL

322 Chapanoke Road, Suite 200
Raleigh, North Carolina 27603
(919) 661-5880

Petition for Rule Making

Item Number _____

Granted by BCC_____ **Adopted by BCC**_____ **Approved by RRC**_____
Denied by BCC_____ **Disapproved by BCC**_____ **Objection by RRC**_____

PROPONENT Terry Cromer PHONE (336) 854-8354
REPRESENTING NC Association Electrical Contractors
ADDRESS 3707 Alliance Dr
CITY Greensboro STATE NC ZIP 27407
E-MAIL TCromer@NCAEC.org FAX (336) 854-7148

North Carolina State Building Code, Volume Electric - Section Art. 338.10(B)(4)(4)

CHECK ONE:
[ ] Revise section to read as follows:
[ ] Add new section to read as follows:
[ ] Delete section and substitute the following.
[ ] Delete section without substitution.

~~LINE THROUGH MATERIAL TO BE DELETED~~ UNDERLINE MATERIAL TO BE ADDED

Type or print. Continue proposal or reason on plain paper attached to this form. See reverse side for instructions.

Will this proposal change the cost of construction? Decrease [✓] Increase [ ] No [ ]
Will this proposal increase the cost of a dwelling by $80 or more? Yes [ ] No [✓]
Will this proposal affect Local or State funds? Local [ ] State [ ] No [✓]
Will this proposal cause a substantial economic impact (≥ $500,000)? Yes [ ] No [✓]
Non-Substantial - Provide an economic analysis including benefit/cost estimates.
Substantial - The economic analysis must also include 2-alternatives, time value of money and risk analysis.

REASON:

Signature Terry Cromer DATE: 6-9-2014

This is the 2002 NEC language for art. 338.10(B)(4)(a)

Feeders.
(a) Interior Installations. In addition to the provisions of this article, Type SE service-entrance cable used for interior wiring shall comply with the installation requirements of Parts I and II of Article 334, excluding 334.80.

This is the 2011 language for 338.10(B)(4)(a)

(4) Installation Methods for Branch Circuits and Feeders.
(a) *Interior Installations.* In addition to the provisions of this article, Type SE service-entrance cable used for interior wiring shall comply with the installation requirements of Part II of Article 334, excluding 334.80.
Where installed in thermal insulation the ampacity shall be in accordance with the 60°C (140°F) conductor temperature rating. The maximum conductor temperature rating shall be permitted to be used for ampacity adjustment and correction purposes, if the final derated ampacity does not exceed that for a 60°C (140°F) rated conductor.

This is the new Language that I propose

(4) Installation Methods for Branch Circuits and Feeders.
(a) *Interior Installations.* In addition to the provisions of this article, Type SE service-entrance cable used for interior wiring shall comply with the installation requirements of Part II of Article 334, excluding 334.80.
~~Where installed in thermal insulation the ampacity shall be in accordance with the 60°C (140°F) conductor temperature rating. The maximum conductor temperature rating shall be permitted to be used for ampacity adjustment and correction purposes, if the final derated ampacity does not exceed that for a 60°C (140°F) rated conductor.~~

Reason for Change:

SE Cable was changed so that you could use the 75 degree C rating in the 2002 NEC and then was changed back to the 60 degree C rating in the 2008 NEC. As you can see it was changed again in the 2011 NEC as to where it is installed at what temperature that it can be used when installed. Also there was a lot of homes wire between the 2002 NEC and when we adopted the 2008 NEC (7 years) and these homes are stilled allowed to use the 75 degree rating as they met code during that time. The conductors inside this cable are rated at 90 degrees C and the outside jacket is rated at 75 degrees C. NC DOI has made a call that if only one inch of this cable is installed where it goes through insulation then the total cable length must be rated at 60 degrees C instead of 75 degrees C. As to my knowledge there has not been any problem with the cable that was installed between the years of 2002 and 2009 at the 75 degree C rating and I have talked with a lot of inspectors about this.

B-21

G

APPENDIX C
CODE CHANGE PROPOSAL
NORTH CAROLINA
BUILDING CODE COUNCIL

322 Chapanoke Road, Suite 200
Raleigh, North Carolina 27603
(919) 661-5880

Petition for Rule Making Item Number_____

Granted by BCC_____ Adopted by BCC_____ Approved by RRC_____
Denied by BCC_____ Disapproved by BBB_____ Objection by RRC_____

PROPONENT: Ron Zemke PHONE (910) 575-3717
REPRESENTING: WindowZ, Inc
ADDRESS: 565 Meadow Summit Drive Unit 2
CITY: Ocean Isle Beach STATE: NC ZIP: 28469
E-MAIL: mzemke@atmc.net FAX_____
North Carolina State Building Code, 2012 NC Residential Code – Section **R202 DEFINITIONS;** Section **R301.2.1 Wind limitations; Table R301.2 (2);** Section **R301.2.1.2 Protection of openings; R613.3 Performance; R703.4 Attachments**

CHECK ONE: [**X**] Revise section to read as follows: [ ] Delete section and substitute the following.
[**X**] Add new section to read as follows: [ ] Delete section without substitution.

~~LINE THROUGH MATERIAL TO BE DELETED~~ UNDERLINE MATERIAL TO BE ADDED

Type or print. Continue proposal or reason on plain paper attached to this form. See reverse side for instructions.

SEE ATTACHED.

Will this proposal add to the cost of construction? Decrease [ ] Increase [ ] No [x]
Will this proposal increase the cost of a dwelling by $80 or more? Yes [ ] No [x]
Will this proposal affect Local or State funds? Local [ ] State [ ] No [x]
Will this proposal cause a substantial economic impact (≥ $500,000)? Yes [ ] No [x]
Non-Substantial – Provide an economic analysis including benefit/cost estimates.
Substantial – The economic analysis must also include 2 – alternatives, time value of money and risk analysis.

Reason: This proposal allows the installation of windbreak panels for screen enclosures which allows for the removal of a section of the screen to accommodate high-wind events.

Signature _____ DATE: 5/12/2014

TABLE R301.2(2) COMPONENT AND CLADDING LOADS FOR A BUILDING WITH A MEAN ROOF HEIGHT OF 30FEET LOCATED IN EXPOSURE B (psf) [a,b,c,d,]

TABLE R301.2(2)
COMPONENT AND CLADDING LOADS FOR A BUILDING WITH A MEAN ROOF HEIGHT OF 30 FEET LOCATED IN EXPOSURE B (psf)[a,b,c,d,e.f]

(No change to table values)

NOTES:

a. The effective wind area shall be equal to the span length multiplied by an effective width. This width shall be permitted to be not ~~be~~ less than one-third the span length. For cladding fasteners, the effective wind area shall not be greater than the area that is tributary to an individual fastener.

b. For effective areas between those given above, the load may be interpolated; otherwise, use the load associated with the lower effective area.

c. Table values shall be adjusted for height and exposure by multiplying by the adjustment coefficient in Table R301.2(3).

d. See Figure R301.2(7) for location of zones.

e. Plus and minus signs signify pressures acting toward and away from the building surfaces.

f. Openings for exterior balconies, decks or porches under existing roofs enclosed with screen or removable vinyl or acrylic wind break panels shall be exempt from the loads listed in Table R301.2(2) and the height and exposure factors listed in Table R301.2(3). Vinyl and acrylic glazed panels shall be removable. Removable panels shall be identified as removable by a decal. The identification decal shall essentially state "Removable panel SHALL be removed when wind speeds exceed 65 mph (34 m/s)." Decals shall be placed such that the decal is visible when the panel is installed.

R612.5 Performance

R613.3 Performance. Exterior windows and doors shall be designed to resist the design wind loads specified in Table R301.2(2)adjusted for height and exposure per Table R301.2(3).

Exception: Openings for exterior balconies, decks or porches under existing roofs enclosed with screen or removable vinyl or acrylic wind break panels shall be exempt from the loads listed in Table R301.2(2) and the height and exposure factors listed in Table R301.2(3). Vinyl and acrylic glazed panels shall be removable. Removable panels shall be identified as removable by a decal. The identification decal shall essentially state "Removable panel SHALL be removed when wind speeds exceed 65 mph (34 m/s)." Decals shall be placed such that the decal is visible when the panel is installed.

R703.4 Attachments

R703.4 Attachments. Unless specified otherwise, all wall coverings shall be securely fastened in accordance with Table R703.4 or with other approved aluminum, stainless steel, zinc-coated or other approved corrosion-resistive fasteners. Where the basic wind speed per FigureR301.2(4) is 110 miles per hour(49 m/s) or higher, the attachment of wall coverings shall be designed to resist the component and cladding loads specified in Table R301.2(2), adjusted for height and exposure in accordance with Table R301.2(3).

Exception: Openings for exterior balconies, decks or porches under existing roofs enclosed with screen or removable vinyl or acrylic wind break panels shall be exempt from the loads listed in Table R301.2(2) and the height and exposure factors listed in Table R301.2(3). Vinyl and acrylic glazed panels shall be removable. Removable panels shall be identified as removable by a decal. The identification decal shall essentially state "Removable panel SHALL be removed when wind speeds exceed 65 mph (34 m/s)." Decals shall be placed such that the decal is visible when the panel is installed.