

AWC Guide to Wood Construction in High Wind Areas: 110 mph Wind Zone
Massachusetts Checklist for Compliance (780 CMR 5301.2.1.1)¹

☒ Check
Compliance

1.1 SCOPE

Wind Speed (3-sec. gust) 110 mph
Wind Exposure Category B

1.2 APPLICABILITY

Number of Stories (a roof which exceeds 8 in 12 slope shall be considered a story) _____ stories ≤ 2 stories
Roof Pitch (Fig 2) ≤ 12:12
Mean Roof Height (Fig 2) ft ≤ 33'
Building Width, W (Fig 3) ft ≤ 80'
Building Length, L (Fig 3) ft ≤ 80'
Building Aspect Ratio (L/W) (Fig 4) ≤ 3:1
Nominal Height of Tallest Opening² (Fig 4) ≤ 6'8"

1.3 FRAMING CONNECTIONS

General compliance with framing connections (Table 2)

2.1 FOUNDATION

Foundation Walls meeting requirements of 780 CMR 5404.1

Concrete
Concrete Masonry

2.2 ANCHORAGE TO FOUNDATION^{1,3}

5/8" Anchor Bolts imbedded or 5/8" Proprietary Mechanical Anchors as an alternative in concrete only

Bolt Spacing – general (Table 4) in.
Bolt Spacing from end/joint of plate (Fig 5) in. ≤ 6" – 12"
Bolt Embedment – concrete (Fig 5) in. ≥ 7"
Bolt Embedment – masonry (Fig 5) in. ≥ 15"
Plate Washer (Fig 5) ≥ 3" x 3" x 1/4"

3.1 FLOORS

Floor framing member spans checked (per 780 CMR Chapter 55)
Maximum Floor Opening Dimension (Fig 6) ft ≤ 12'
Full Height Wall Studs at Floor Openings less than 2' from Exterior Wall (Fig 6)
Maximum Floor Joist Setbacks
Supporting Loadbearing Walls or Shearwall (Fig 7) ft ≤ d
Maximum Cantilevered Floor Joists
Supporting Loadbearing Walls or Shearwall (Fig 8) ft ≤ d
Floor Bracing at Endwalls (Fig 9)
Floor Sheathing Type (per 780 CMR Chapter 55)
Floor Sheathing Thickness (per 780 CMR Chapter 55) in.
Floor Sheathing Fastening (Table 2) .. d nails at _____ in edge / _____ in field

4.1 WALLS

Wall Height

Loadbearing walls (Fig 10 and Table 5) ft ≤ 10'
Non-Loadbearing walls (Fig 10 and Table 5) ft ≤ 20'
Wall Stud Spacing (Fig 10 and Table 5) in. ≤ 24" o.c.
Wall Story Offsets (Figs 7 & 8) ft ≤ d

4.2 EXTERIOR WALLS³

Wood Studs

Loadbearing walls (Table 5) 2x _____ - _____ ft _____ in.
Non-Loadbearing walls (Table 5) 2x _____ - _____ ft _____ in.

Gable End Wall Bracing¹

Full Height Endwall Studs (Fig 10)
WSP Attic Floor Length (Fig 11) ft ≥ W/3
Gypsum Ceiling Length (if WSP not used) (Fig 11) ft ≥ 0.9W
and 2 x 4 Continuous Lateral Brace @ 6 ft. o.c. ... (Fig 11)
or 1 x 3 ceiling furring strips @ 16" spacing min. with 2 x 4 blocking @ 4 ft. spacing in end joist or truss bays

Double Top Plate

Splice Length (Fig 13 and Table 6) ft
Splice Connection (no. of 16d common nails) (Table 6)

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Loadbearing Wall Connections		
Lateral (no. of 16d common nails).....	(Tables 7)	_____
Non-Loadbearing Wall Connections		
Lateral (no. of 16d common nails).....	(Table 8)	_____
Load Bearing Wall Openings (record largest opening but check all openings for compliance to Table 9)		
Header Spans	(Table 9)	_____ ft _____ in. ≤ 11'
Sill Plate Spans	(Table 9)	_____ ft _____ in. ≤ 11'
Full Height Studs (no. of studs)	(Table 9)	_____
Non-Load Bearing Wall Openings (record largest opening but check all openings for compliance to Table 9)		
Header Spans.....	(Table 9)	_____ ft _____ in. ≤ 12'
Sill Plate Spans.....	(Table 9)	_____ ft _____ in. ≤ 12'
Full Height Studs (no. of studs).....	(Table 9)	_____
Exterior Wall Sheathing to Resist Uplift and Shear Simultaneously ⁴		
Minimum Building Dimension, W		
Nominal Height of Tallest Opening ²	_____	≤ 6'8"
Sheathing Type.....	(note 4)	_____
Edge Nail Spacing	(Table 10 or note 4 if less).....	_____ in.
Field Nail Spacing.....	(Table 10)	_____ in.
Shear Connection (no. of 16d common nails) (Table 10)		_____
Percent Full-Height Sheathing	(Table 10)	_____ %
5% Additional Sheathing for Wall with Opening > 6'8" (Design Concepts).....		_____
Maximum Building Dimension, L		
Nominal Height of Tallest Opening ²	_____	≤ 6'8"
Sheathing Type.....	(note 4)	_____
Edge Nail Spacing	(Table 11 or note 4 if less).....	_____ in.
Field Nail Spacing.....	(Table 11)	_____ in.
Shear Connection (no. of 16d common nails) (Table 11)		_____
Percent Full-Height Sheathing	(Table 11)	_____ %
5% Additional Sheathing for Wall with Opening > 6'8" (Design Concepts).....		_____
Wall Cladding		
Rated for Wind Speed?.....		_____

5.1 ROOFS

Roof framing member spans checked?	(For Rafters use AWC Span Tool, see BBRS Website)	_____
Roof Overhang	(Figure 19)	_____ ft ≤ smaller of 2' or L/3
Truss or Rafter Connections at Loadbearing Walls		
Proprietary Connectors		
Uplift	(Table 12)	U= _____ plf
Lateral	(Table 12)	L= _____ plf
Shear	(Table 12)	S= _____ plf
Ridge Strap Connections, if collar ties not used per page 21... (Table 13).....		T= _____ plf
Gable Rake Outlooker	(Figure 20)	_____ ft ≤ smaller of 2' or L/2
Truss or Rafter Connections at Non-Loadbearing Walls		
Proprietary Connectors		
Uplift	(Table 14)	U= _____ lb.
Lateral (no. of 16d common nails) ... (Table 14).....		L = _____ lb.
Roof Sheathing Type	(per 780 CMR Chapters 58 and 59)	_____
Roof Sheathing Thickness	_____ in. ≥ 7/16" WSP	_____
Roof Sheathing Fastening.....	(Table 2)	_____

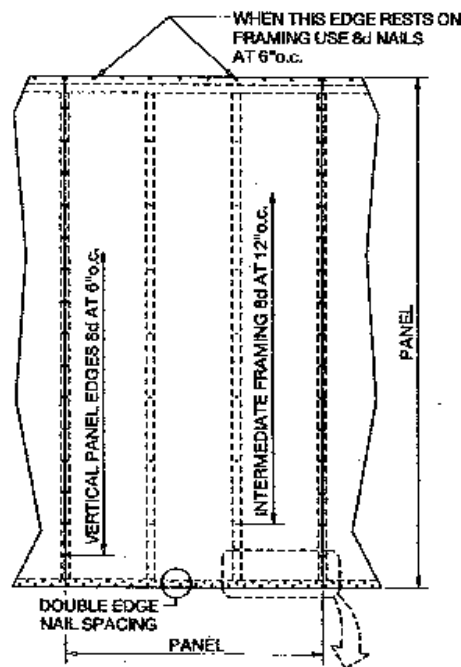
Notes:

1. This checklist shall be met in its entirety, excluding the specific exception noted in 2, to comply with the requirements of 780 CMR 5301.2.1.1 Item 1. If the checklist is met in its entirety then the following metal straps and hold downs are not required per the WFCM 110 mph Guide:
 - a. Steel Straps per Figure 5
 - b. 20 Gage Straps per Figure 11
 - c. Uplift Straps per Figure 14
 - d. All Straps per Figure 17
 - e. Corner Stud Hold Downs per Figure 18a and Figure 18b
2. Exception: Opening heights of up to 8 ft. shall be permitted when 5% is added to the percent full-height sheathing requirements shown in Tables 10 and 11.
3. The bottom sill plate in exterior walls shall be a minimum 2 in. nominal thickness pressure treated #2-grade.

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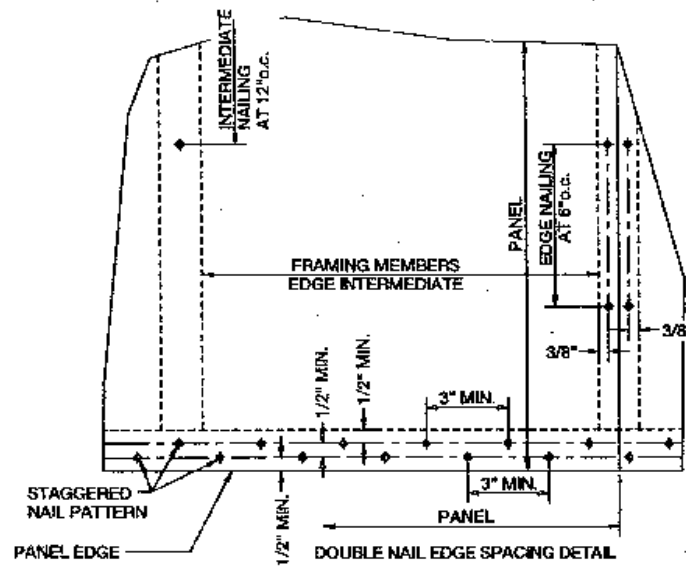
- a. From Tables 10 and 11 and location of wall sheathing and Building Aspect Ratio, determine Percent Full-Height Sheathing and Nail Spacing requirements
- b. Wood Structural Panels shall be minimum thickness of 7/16" and be installed as follows:
 - i. Panels shall be installed with strength axis parallel to studs.
 - ii. All horizontal joints shall occur over and be nailed to framing.
 - iii. On single story construction, panels shall be attached to bottom plates and top member of the double top plate.
 - iv. On two story construction, upper panels shall be attached to the top member of the upper double top plate and to band joist at bottom of panel. Upper attachment of lower panel shall be made to band joist and lower attachment made to lowest plate at first floor framing.
 - v. Horizontal nail spacing at double top plates, band joists, and girders shall be a double row of 8d staggered at 3 inches on center per figures below : Vertical and Horizontal Nailing for Panel Attachment



See Detail on Next Page

Vertical and Horizontal Nailing
for Panel Attachment

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Detail
Vertical and Horizontal Nailing
for Panel Attachment

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FAQ*: WFCM Checklist

Question: I understand if a new home is built in a town in a 110 mph wind zone then the American Forest and Paper Association (AF&PA) *Wood Frame Construction Manual* can be used to prescriptively design it. I also understand that in some cases the home can be framed per the *WFCM 100 mph Guide*, if it meets certain requirements including but not limited to aspect ratio, roof height, number of stories, and exposure category (B). I have heard that Massachusetts has a “modified” checklist that can be used instead of the checklist at the end of the Guide. Is this true and what can you tell me about this “modified” checklist?

Answer: You are correct on the items that you have noted. MA has modified the checklist in several important ways. The MA version allows a roof with a pitch up to and including 8 in 12 to not be “counted” as a story. Further it does not require steel hold downs and straps in many locations if full height sheathing is used as defined in the MA checklist. Further, if the building will have furring strips installed in the ceiling abutting the gable wall then 2 x 4s installed on top of the ceiling joists are not required. There are other changes as well that were not noted here.

The MA version of the checklist was formulated in recognition of the highly regarded framing methods used in MA for many years and wood framing that has been used in North Carolina over the past 10 to 15 years which has performed well in severe hurricane weather in that state.

* Answers to FAQs are opinions of the BBRS Staff and do not reflect official positions or code interpretations of the BBRS.

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