



The New York State Weatherization Directors Association
in partnership with the New York Department of State presents this

NYS Manufactured Housing Certification Webinar Training



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Owner
MHC Consultants





Building Standards
and Codes

Manufactured Housing Mechanic Certification Training

A Division of New York Department of State

10/18/2023

Course Attendance Issues

The Division of Building Standards and Codes cannot give course attendees credit for a course without the meeting the required milestones:

Completion of polling questions,
completion of quiz following training, and
maintaining a minimum 80% *attention-to-duration ratio*.

- Webex tracks multi-tasking by attendees by recording the amount of time Webex is the active application on attendees computers. (YES, even those with multiple monitors)

This course is heavy in code content.

Why am I here?

- To complete your certification training as a mechanic.



When is certification necessary?

Why am I here?

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When is certification necessary?

- 19NYCRR1210.03(c) "no manufactured home shall be serviced...unless at least one person **certified** by the DOS as an **installer** or as a **mechanic** is present at the home site during the service. The presence of a person holding a limited certification...during the service shall be deemed to satisfy this requirement..."

SERVICE: The modification, alteration or repair of the structural systems of a manufactured home

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- 19NYCRR1210.03(c) “no manufactured home shall be serviced...unless at least one person **certified** by the DOS as an **installer** or as a **mechanic** is present at the home site during the **service**. The presence of a person holding a limited certification...during the **service** shall be deemed to satisfy this requirement...”

Open book quiz follows training

SERVICE: The modification, alteration or repair of the structural systems of a manufactured home

Structural Systems of Manufactured Home?

- The load-resisting sub-system of the structure.
 - Framing/floor/wall systems
 - Trusses/roof system
 - Drywall Panels (Polyvinyl acetate (PVA) adhesive)
 - Sheathing Panels (Polyvinyl acetate (PVA) adhesive)
 - Shear walls
 - Chassis
 - Foundation

When do I need a permit?

- A permit is required for work that must comply with the Uniform Code.
 - Removal or changes to a load bearing wall
 - Removal or changes to a load bearing beam
 - Removal, relocation or change in the exit path
 - Enlargement, alteration, replacement or relocation of any building system (electrical, mechanical, structural)

How do I get a Building Permit?

- Contact the local Code Enforcement Official for the town in which your doing the work – only one that can issue
- Insurance Certificates, plans, sketches, etc. are required to complete the application.



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NYSUFBC

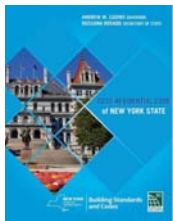


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NYSUFBC

- The Residential Code of New York State
- Appendix E 'Manufactured Housing'
 - Regulations for -
 - Installation
 - Additions
 - Alterations
 - Connection to services



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Regulation: AE RCNY

Starts with the Scope...

Provisions applicable only to a manufactured home used as a **single dwelling unit** and covers

1. Construction, alteration & repair of foundation system necessary for installation
2. Installation, alteration, repair or maintenance of building service equipment necessary (water, fuel, power & sewage systems)
3. Alterations, additions repairs or relocation of existing manufactured homes

Definitions: Manufactured Home

- A home bearing a seal signifying conformance to the design and construction requirements of Department of Housing and Urban Development (HUD), Manufactured Home Construction and Safety Standards, 24 CFR Part 3280.



Definitions: Mobile Home

- A home constructed in a factory prior to June 15, 1976, with or without a label certifying compliance with NFPA, ANSI or a specific standard... For the purpose of these provisions, a mobile home shall be considered a manufactured home.



Definitions: Modular Home

- Factory manufactured dwelling units conforming to applicable provisions of this code and bearing the insignia of approval issued by the Secretary of State of New York State.



Applicability of Part 1210 & Appendix E



Mobile and
Manufactured Homes:
YES



New York State
Modular Homes:
NO

More Definitions: Addition

- An extension or increase in floor area, number of stories or height of a building or structure.



More Definitions: Alteration

- Any construction or renovation to an existing structure other than repair or addition
Such as:

More Definitions: Alteration

- Any construction or renovation to an existing structure other than repair or addition
Such as:
 - Removal or changes to a load bearing wall
 - Removal or changes to a load bearing beam
 - Removal, relocation or change in the exit path
 - Enlargement, alteration, replacement or relocation of any building system (electrical, mechanical, structural)



More Definitions: Repair

- The restoration to good or sound condition of any part of an existing building for the purpose of its maintenance.
Such as:
 - Patching or restoration of materials, elements, equipment or fixtures for the purposes of maintaining such... in good or sound condition

An Addition or Alteration?



An Addition or Alteration? Lets look at the definitions



08/24/2010

An Addition or Alteration? Lets look at the definitions

ALTERATION [B]. Any construction or renovation to an existing structure other than repair or addition

Such as:...

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BOTH



Two More Definitions:

- **ACCESSORY BUILDING.** Any building or structure, or portion thereto, located on the same property as a manufactured home which does not qualify as a manufactured home as defined herein.

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- **ACCESSORY BUILDING.** Any building or structure, or portion thereto, located on the same property as a manufactured home which does not qualify as a manufactured home as defined herein.
- **RELOCATION.** Relocated buildings include any building or structure which is relocated from its existing foundation to a new foundation.

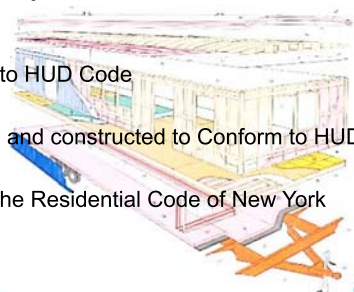
Two More Definitions:

- **ACCESSORY BUILDING.** Any building or structure, or portion thereto, located on the same property as a manufactured home which does not qualify as a manufactured home as defined herein.
- **RELOCATION.** Relocated buildings include any building or structure which is relocated from its existing foundation to a new foundation.

Do not worry, there will be more definitions. 😊

Additions Compliance AE 102.2

- Be Certified to HUD Code
- Be designed and constructed to Conform to HUD Code
- Conform to the Residential Code of New York



Additions Compliance

AE102.2.1

- Building additions and accessory structures shall not be structurally supported by the manufactured home.

Exception: Building additions and accessory structures supported by a manufactured home shall be in accordance with designs provided by the home manufacturer or with designs prepared by a registered design professional in accordance with acceptable engineering practice.

So, can you?



So, can you? **YES**

Structurally Independent



DAPIA Approval (New Home)
 Designed by licensed design professional (Existing Home)

Various concerns addressed





56 | 236

Alteration and Repair Compliance AE102.3

- Alterations and repairs may be made to any MH or its building service equipment without requiring the existing MH or its equipment to comply with all the requirements of these provisions provided that the alteration or repairs conforms to Appendix J of this code.

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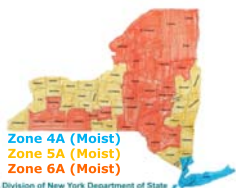
Alteration and Repair Compliance AE102.3.1

- Alterations or repairs to an existing manufactured home that are nonstructural and do not adversely affect any structural member or any part of the building or structure having required fire protection may be made with materials equivalent to those of which the manufactured home structure is constructed.

Exception: The installation and/or replacement of glass shall be in conformance with fenestration rating requirements for new installations.

Alteration and Repair Compliance AE102.3.1

Exception: ...fenestration rating requirements for new installations.



(b) Table N1102.1.2 (R402.1.2) of the 2020 RCNYS shall be:

[NY] TABLE N1102.1.2
INSULATION AND FENESTRATION RE

CLIMATE ZONE	FENESTRATION U-FACTOR ^b	SKYLIGHT ^b U-FACTOR	GLAZED FENESTRATION SHGC ^{c, *}	CEILING R-VALUE	FR ^d
4	0.32	0.55	0.40	49	20
5	0.30	0.55	NR	49	20
6 Option 1	0.30	0.55	NR	49	20+5
6 Option 2	0.28	0.55	NR	60	2

NR = Not Required.

Existing Buildings and Structures Appendix J101

- **Scope:** The provisions of this appendix shall apply to the repair, alteration, change of occupancy, addition and relocation of existing buildings.

- **Intent:** "...to encourage the continued use or reuse of legally existing buildings and structures.

...to permit work in existing building that is consistent with the purpose of the Residential Code.

AJ104 Energy Efficiency

- Additions, alterations...to an existing building, building system or portion thereof shall conform to §N1107 (Energy Efficiency, Existing Buildings – General) without requiring the unaltered portions of the existing building or system to comply with this chapter.
- Any non-conditioned space that is altered to become conditioned space shall comply with provisions for an addition

AJ105 Preliminary Meeting

- The Building Official is authorized to require the prospective applicant meet to discuss plans for the proposed work, prior to the issuance of a permit in order to establish the specific applicability of the provisions of this appendix.

AJ106 Evaluation of Existing Bldg

- The Building Official is authorized to require an existing building be evaluated by a reg. design professional based upon the circumstances agreed upon at the preliminary meeting to determine code compliance.

AJ301 Classification of work

- The work performed to an existing building shall be classified in accordance with this Sections AJ301.3 - AJ301.10
- AJ301.2 the work area shall be identified...

WORK AREA: That portion or portions of a building consisting of all reconfigured spaces as indicated on the construction documents. Work area excludes other portions of the building where incidental work entailed by the intended work must be performed and portions of the building where work not initially intended by the owner is specifically required by this appendix.

AJ301 Classification of work

- AJ301.3 Repairs
- AJ301.4 Alterations – Level 1
- AJ301.5 Alterations – Level 2
- AJ301.6 Change of occupancy

- AJ301.7 Additions
- AJ301.8 Historic Buildings
- AJ301.9 Relocated Buildings
- AJ301.10 Replacement

AJ301 Classification of work

- | | |
|---------------------------------|------------------------------|
| • AJ301.3 Repairs | §AJ401 Repairs |
| • AJ301.4 Alterations – Level 1 | §AJ501 Alterations - Level 1 |
| • AJ301.5 Alterations – Level 2 | §AJ601 Alterations - Level 2 |
| • AJ301.6 Change of occupancy | §AJ701 Change of Occupancy |
| | §AJ801 Additions |
| • AJ301.7 Additions | §AJ901 Historic Bldgs. |
| • AJ301.8 Historic Buildings | §AJ1001 Relocated Bldgs. |
| • AJ301.9 Relocated Buildings | §AJ1101 Replacement Bldgs. |
| • AJ301.10 Replacement | |

AJ401 Repairs

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- Repairs shall be done in a manner that maintains the level of fire protection provided

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- Work shall be done using materials permitted by the code for new construction or using like materials such that no hazard to life, health or property is created.
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- Repairs shall NOT reduce the structural strength or stability of the structure

AJ401 Repairs

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- Mechanical and Plumbing repairs shall be permitted in the same manner and arrangement as the existing, provided such repairs or replacement are not hazardous and are approved.

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- Mechanical and Plumbing repairs shall be permitted in the same manner and arrangement as the existing, provided such repairs or replacement are not hazardous and are approved.
- Electrical repairs shall be permitted with like materials with a few exceptions.
 - ie: replacement electrical receptacles shall comply with NFPA 70

Alterations

- §AJ501 Alterations - Level 1
- §AJ601 Alterations - Level 2



AJ501 Alterations – Level 1

- Include the removal and replacement of the covering or existing materials, elements, equipment or fixtures using new materials, elements, equipment or fixtures that serve the same purpose, without reconfiguring the space.

AJ501 Alterations – Level 1

- Include the removal and replacement or the covering of existing materials, elements, equipment or fixtures using new materials, elements, equipment or fixtures that serve the same purpose, without reconfiguring the space.
- An existing building or portion thereof shall not be altered such that the building becomes less safe than its existing condition.

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- An existing building or portion thereof shall not be altered such that the building becomes less safe than its existing condition.
- All new work shall comply with the materials and methods requirements of this code

AJ501 Alterations – Level 1

- Alterations shall be done in a manner that maintains the level of fire protection provided

AJ501 Alterations – Level 1

- Alterations shall be done in a manner that maintains the level of fire protection provided
- Smoke and CO alarms shall be provided as required for new.
 - Where interior wall or ceiling finishes are not removed to expose the structure hard wire interconnection is not required

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- Alterations shall be done in a manner that maintains the level of fire protection provided
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- Structural roof components shall be capable of supporting the roof covering system and the material loads

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- Mechanical, Plumbing and Electrical systems shall comply with the appropriate sections of this code

AJ501 Alterations – Level 1

- Reroofing shall be in accordance with §R908

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- No more than 2 layers of roofing material
- Replacement of water soaked/deteriorated support materials
- Replacement of damaged/rusted/deteriorated flashings, edges, outlets, vents or etc.

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- Installation per roofing manufacturers installation instructions

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- No more than 2 layers of roofing material
- Replacement of water soaked/deteriorated support materials
- Replacement of damaged/rusted/deteriorated flashings, edges, outlets, vents or etc.
- Installation per roofing manufacturers installation instructions
- Additional requirements based on various material types in RCNYS Chapter 9

AJ501 Alterations – Level 1

- In flood hazard area, alterations that constitute substantial improvement shall require the building comply with §R322 (Flood-Resistant Construction) of this code.

Another Definition

- In flood hazard area, alterations that constitute substantial improvement shall require the building comply with §R322 (Flood-Resistant Construction) of this code.

FLOOD HAZARD AREA: The greater of the following two areas:

1. The area within a flood plain subject to a 1% or greater chance of flooding in any year

Another Definition

- In flood hazard area, alterations that constitute substantial improvement shall require the building comply with §R322 (Flood-Resistant Construction) of this code.

FLOOD HAZARD AREA: The greater of the following two areas:

1. The area within a flood plain subject to a 1% or greater chance of flooding in any year
2. The area designated as a flood hazard area on a communities flood hazard map, or otherwise legally designated.

More Related Definitions

SUBSTANTIAL IMPROVEMENT: ...any repair, alteration, addition or improvement of a structure, the cost of which equals or exceeds 50% of the market value of the structure before the improvement or repair is started. If the structure has sustained *substantial damage*, any repairs are considered substantial improvement regardless of the actual repair work performed.

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SUBSTANTIAL DAMAGE: ...damage of any origin...cost of restoration to before-damage condition would equal or exceed 50% of market value before damage occurred

R322 Flood Resistant Construction

- R322.1.9 The bottom of the frame of new and replacement manufactured homes...shall be elevated to or above the elevations specified in R322.2 or R322.3. The anchor and tie-down requirement of the applicable state or federal requirements shall apply. The foundation and anchorage of manufactured homes to be located in identified floodways shall be designed and constructed in accordance with ASCE 24 (American Society of Civil Engineers [ASCE] 24 – Flood Resistant Design and Construction)

R322 Flood Resistant Construction

- R322.1.1. Manufactured buildings shall be elevated on permanent foundations and shall be designed in accordance with ASCE 24 (American Institute of Steel Construction, Inc., 2010) and shall be designed to resist flood forces in accordance with ASCE 24 (American Institute of Steel Construction, Inc., 2010).



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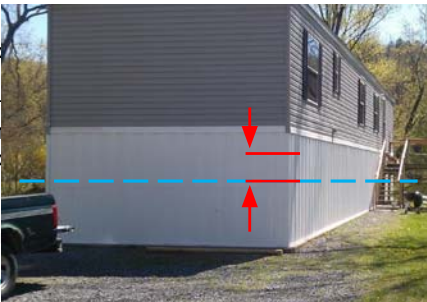
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AJ601 Alterations – Level 2

- Include the reconfiguration of space, the addition or elimination of any door or window, the reconfiguration or extension of any system, or the installation of any additional equipment.
- Comply with the requirements of this section and

AJ601 Alterations – Level 2

- Include the reconfiguration of space, the addition or elimination of any door or window, the reconfiguration or extension of any system, or the installation of any additional equipment.
- Comply with the requirements of this section and
- Additionally comply with the requirements of section AJ501

AJ601 Alterations – Level 2

- Include the reconfiguration of space, the addition or elimination of any door or window, the reconfiguration or extension of any system, or the installation of any additional equipment.
- Comply with the requirements of this section and
- Additionally comply with the requirements of section AJ501
- All newly constructed elements, components, systems and spaces shall comply with the requirements of this code

AJ601 Alterations – Level 2

- The work performed shall not increase or create a nonconformity with the code requirements

AJ601 Alterations – Level 2

- The work performed shall not increase or create a nonconformity with the code requirements
- Where the work area exceeds 50% of the area of the dwelling, the interior finish of walls and ceilings in the work area shall comply with §R302.9 (Flame spread and smoke-developed index for wall and ceiling finishes)
 - Remove and replace or treat with approved fire retardant coating

AJ601 Alterations – Level 2

- The work performed shall not increase or create a nonconformity with the code requirements
- Where the work area exceeds 50% of the area of the dwelling, the interior finish of walls and ceilings in the work area shall comply with §R302.9 (Flame spread and smoke-developed index for wall and ceiling finishes)
 - Remove and replace or treat with approved fire retardant coating
- Smoke and CO alarms shall be provided as required for new.
 - Where interior wall or ceiling finishes are not removed to expose the structure hard wire interconnection is not required

AJ601 Alterations – Level 2

- Structural components shall be capable of supporting existing structure loads and the new increased loads combined

AJ601 Alterations – Level 2

- Structural components shall be capable of supporting existing structure loads and the new increased loads combined
- No reduction in structural strength or stability of the structure

AJ601 Alterations – Level 2

- Structural components shall be capable of supporting existing structure loads and the new increased loads combined
- No reduction in structural strength or stability of the structure
- New structural members shall comply with this code
 - Inc. connections and anchorage

AJ601 Alterations – Level 2

- Structural components shall be capable of supporting existing structure loads and the new increased loads combined
- No reduction in structural strength or stability of the structure
- New structural members shall comply with this code
 - Inc. connections and anchorage
- Mechanical, Plumbing and Electrical systems shall comply with the appropriate sections of this code

This is a small snap shot of some of the code requirements for alterations.

AJ801 Additions

- Comply with the requirements of this section and appropriate sections for new construction

AJ801 Additions

- Comply with the requirements of this section and appropriate sections for new construction
- Expect where required, unaltered portions of the existing building shall not be required to comply with this code

AJ801 Additions

- Comply with the requirements of this section and appropriate sections for new construction
- Expect where required, unaltered portions of the existing building shall not be required to comply with this code
- Shall not create or extend any nonconformity in the existing building

AJ801 Additions

- Comply with the requirements of this section and appropriate sections for new construction
- Expect where required, unaltered portions of the existing building shall not be required to comply with this code
- Shall not create or extend any nonconformity in the existing building
- Smoke and CO alarms shall be provided as required for new.
 - Where interior wall or ceiling finishes are not removed to expose the structure hard wire interconnection is not required

AJ801 Additions

- If the addition and all other proposed/associated work, when combined, constitute *substantial improvement*, the existing building and the addition shall comply with §R322 of this code

AJ801 Additions

- If the addition and all other *proposed/associated* work, when combined, constitute substantial improvement, the existing building and the addition shall comply with §R322 of this code
- Remember - **SUBSTANTIAL IMPROVEMENT**: value which equals or exceeds 50% of market value of structure before the improvement

AJ801 Additions

- If the addition and all other *proposed/associated* work, when combined, constitute substantial improvement, the existing building and the addition shall comply with §R322 of this code
- Remember - **SUBSTANTIAL IMPROVEMENT**: value which equals or exceeds 50% of market value of structure before the improvement
- Additions to Mechanical, Plumbing & Electrical shall comply to with the appropriate sections of this code for new systems

Foundation Repairs

- Manufacturer's Installations Instructions
- If not available



Foundation Repairs

- Manufacturer's Installations Instructions
- If not available
 - HUD Model Installation Standard (24-CFR-3285, 2016)



Foundation Repairs

- Manufacturer's Installations Instructions
- If not available
 - HUD Model Installation Standard (24-CFR-3285, 2016)
 - NFPA 225 (2017) Manufactured Home Installation \$\$\$



Foundation Repairs

- Utilizing HUD Model Installation Standard
 - 24-CFR-3285, 2016
- <https://www.gpo.gov/fdsys/pkg/CFR-2016-title24-vol5/pdf/CFR-2016-title24-vol5-part3285.pdf>

Foundation Repairs

- Utilizing HUD Model Installation Standard
 - 24-CFR-3285, 2016

<https://www.gpo.gov/fdsys/pkg/CFR-2016-title24-vol5/pdf/CFR-2016-title24-vol5-part3285.pdf>

Foundation exercise:
HUD Model Installation Standard

Foundation Repairs

- Find the Manufacturer's Design Data!
 - Wind Zone Design
 - Replacement or Installation of Anchoring
 - Snow Load Data
 - Replacement or Installation of Piers/Footings
 - Heating/Cooling Certificate

New York State - Non-Hurricane Zone 1

Manufactured Homes are constructed and installed to prevent overturning, uplift, and lateral movements due to wind loads.

The home and anchoring equipment must resist:

Horizontal forces of 15psf

Uplift forces of 9psf



New York State Snow Zones – HUD Code

30 psf Zone by County

- St. Lawrence, Franklin
- Clinton, Essex, Hamilton
- Warren, Herkimer, Lewis
- Oswego, Jefferson, Oneida
- Fulton, Onondaga, Madison
- Cayuga, Seneca, Wayne
- Ontario, Genesee, Orleans
- Niagara, Erie, Wyoming
- Monroe, Saratoga, Yates
- Washington, Montgomery
- Schenectady, Livingston



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30 psf Zone by County

- St. Lawrence, Franklin
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- Fulton, Onondaga, Madison

Roof load zone:

- Niagara, Erie, Wyoming
- Monroe, Saratoga, Yates
- Washington, Montgomery
- Schenectady, Livingston



New York State Snow Zones – HUD Code

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Roof load zone:

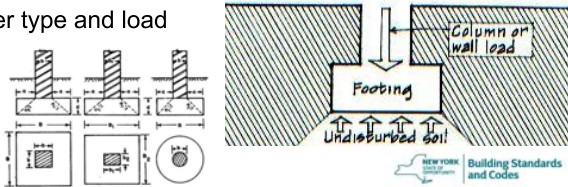
- Middle, 30 psf
- Monroe, Saratoga, Yates
- Washington, Montgomery
- Schenectady, Livingston



Foundation Repairs

Install new or replacement piers or footings

- Footing sizes depend upon two other factors
 - Soil bearing capacity
 - Pier type and load



Foundation Repairs – Soil capacity

Soil bearing capacity must be determined (§3285.202)

- Soil tests in accordance with accepted engineering practice

Foundation Repairs – Soil capacity

Soil bearing capacity must be determined (§3285.202)

- Soil tests in accordance with accepted engineering practice
- Soil records of LAHJ

Foundation Repairs – Soil capacity

Soil bearing capacity must be determined (§3285.202)

- Soil tests in accordance with accepted engineering practice
- Soil records of LAHJ
- Visual Identification, if testing cannot determine, values shown in Table §3285.202

Foundation Repairs – Soil capacity

Soil bearing capacity must be determined (§3285.202)

- Soil tests in accordance with accepted engineering practice
- Soil records of LAHJ
- Visual Identification, if testing cannot determine, values shown in Table §3285.202

TABLE TO § 3285.202

Soil classification	Soil description	Allowable soil bearing pressure (psf) ¹	Blank Chart ASTM D 1586-05	Torque probe ² value ³ (ft-cf/second)
1	Rock or hard pan	4000 +	40 +	More than 500
2	Clay, GP, SW, SP, GM, SM Sands coarse gravel (coarse) or crushed shells and coral	1500		
3	GC, SC, ML, CL Sands, silty sands, silty sand, clayey sand, clayey silty sand, medium dense coarse sand, sand/gravel and very stiff silty sand clay	1000	24-39	351-650
4A	CG, MH ⁴ Loose to medium dense sands, fine to stiff clays and silts, silty silts	1000	19-23	276-360
4B	CH, MH ⁴ Loose sandy fine clays, silty silts	1000	15-17	176-276
5	OH, CH, UF Incorporated the sand, organic clays	Refer to §3285.202(a)	5-11	Less than 176

¹The values presented in this table have not been adjusted for overburden pressure, embedment depth, water table height, or lateral spreading.

²For use of the probe as an SPT or SMT, without upper torque probe values or blow count test results, heavier anchors must be used for a 48" fall.

³The torque probe is a device for measuring the torque value of soils to assist in evaluating the bearing capacity of the soil in which the probe is driven or pushed. The soil must be of suitable depth for the full length of the probe.

Foundation Repairs – Soil capacity, continued

Soil bearing capacity must be determined

- In lieu of determining soil bearing capacity,
 - presumptive allowable capacity 1,500 psf may be used
 - Unless site-specific information requires use of a lower value

Foundation Repairs – Soil capacity, continued

Soil bearing capacity must be determined

- In lieu of determining soil bearing capacity,
 - presumptive allowable capacity 1,500 psf may be used
 - Unless site-specific information requires use of a lower value
- If the soil appears to be composed of peat, organic clays, uncompacted fill or unusual conditions, a licensed design professional shall determine soil classification and maximum allowable bearing capacity.

Foundation Repairs – Soil capacity, continued

Soil bearing capacity must be determined

- In lieu of determining soil bearing capacity,
 - presumptive allowable capacity 1,500 psf may be used
 - Unless site-specific information requires use of a lower value

What is the soil bearing capacity:

- If the soil appears to be composed of peat, organic clays, uncompacted fill or unusual conditions, a licensed design professional shall determine soil classification and maximum allowable bearing capacity.

Foundation Repairs – Soil capacity, continued

Soil bearing capacity must be determined

- In lieu of determining soil bearing capacity,
 - presumptive allowable capacity 1,500 psf may be used
 - Unless site-specific information requires use of a lower value

What is the soil bearing capacity:

- **Presumptive capacity 1500 psf** If the soil appears to be composed of peat, organic clays, uncompacted fill or unusual conditions, a licensed design professional shall determine soil classification and maximum allowable bearing capacity.

Foundation Repairs – Pier location

- Location & Spacing (§3285.310, 3285.311, 3285.312)

Location and spacing depend upon the dimension of the home, live and dead loads, type of construction (single or multi), main beam size, and other factors

Foundation Repairs – Pier location

- Location & Spacing (§3285.310, 3285.311, 3285.312)

Location and spacing depend upon the dimension of the home, live and dead loads, type of construction (single or multi), main beam size, and other factors

Pier spacing will determine pier loads

Foundation Repairs – Pier location

- Location & Spacing (§3285.310, 3285.311, 3285.312)

Location and spacing depend upon the dimension of the home, live and dead loads, type of construction (single or multi), main beam size, and other factors

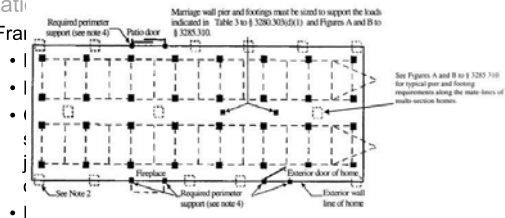
Pier spacing will determine pier loads

Support locations and spacing must be consistent with Figures contained with standard.

Foundation Repairs – Pier location

• Location

– Frame



Notes: 1. Refer to Table 1 to §3285.303 for pier and footing requirements when frame blocking only is used.
 2. In addition to blocking required by §3285.311, see Tables 2 and 3 to §3285.303 for any other sidewall openings of 48 inches or greater in width. For roof loads of 40 psf or greater, a professional engineer or registered architect must determine the maximum sidewall opening permitted without perimeter support.

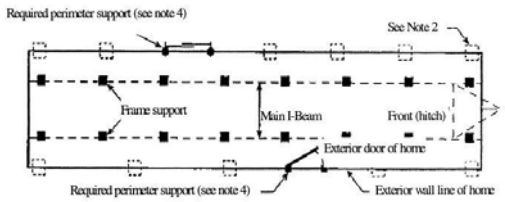
doors, all, ical,

Foundation Repairs – Pier location

• Location

Figure A to § 3285.312 Typical Blocking Diagram for Single Section Homes

– Frame



doors, all, ical,

Foundation Repairs – Pier location

- Location & Spacing (§3285.310)
 - Frame support [Figure A: §3285.312]
 - No more than 24" from both ends

Foundation Repairs – Pier location

- Location & Spacing (§3285.310)
 - Frame support [Figure A: §3285.312]
 - No more than 24" from both ends
 - Not more than 120" center to center under the main rails
 - 10" or greater main beam

Foundation Repairs – Pier location

- Location & Spacing (§3285.310)
 - Frame support [Figure A: §3285.312]
 - No more than 24" from both ends
 - Not more than 120" center to center under the main rails
 - On both sides of sidewall exterior doors, patio doors, and sliding glass doors, under porch post, fireplaces, wood stoves, jamb studs at multiple window openings, and any sidewall opening greater than 48"

Foundation Repairs – Pier location

- Location & Spacing (§3285.310)
 - Frame support [Figure A: §3285.312]
 - No more than 24" from both ends
 - Not more than 120" center to center under the main rails
 - On both sides of sidewall exterior doors, patio doors, and sliding glass doors, under porch post, fireplaces, wood stoves, jamb studs at multiple window openings, and any sidewall opening greater than 48"
 - Piers may be offset up to 6" to allow for plumbing, electrical, mechanical equipment, crawlspaces or other devices.

Foundation Repairs – Pier loads

- Pier loads must be determined (§3285.303(d))

Tabular Data

- Table 1 - §3285.303: Frame blocking only, w/ perimeter openings
- Table 2 - §3285.303: Frame plus perimeter
- Table 3 - §3285.303: Ridge beam span (mating wall openings)

Foundation Repairs – Pier I

- Pier loads must be determi

Tabular Data

- Table 1 - §3285.303: Frame

What is the pier load:
8 ft. spacing per roof load
zone

TABLE 1 TO § 3285.303—FRAME BLOCKING ONLY/PERIMETER SUPPORT NOT REQUIRED EXCEPT AT OPENINGS			
Pier spacing	Roof live load (psf)	Location	Load (lbs.)
4 ft. 0 in.	20	Frame	2,900
	30	Frame	3,300
	40	Frame	3,600
6 ft. 0 in.	20	Frame	4,200
	30	Frame	4,700
	40	Frame	5,200
8 ft. 0 in.	20	Frame	5,500
	30	Frame	6,200
	40	Frame	6,900
10 ft. 0 in.	20	Frame	6,800
	30	Frame	7,600
	40	Frame	8,500

Foundation Repairs – Pier I

- Pier loads must be determi

Tabular Data

- Table 1 - §3285.303: Frame

What is the pier load:
8 ft. spacing per roof load
zone
6200 lbs.

TABLE 1 TO § 3285.303—FRAME BLOCKING ONLY/PERIMETER SUPPORT NOT REQUIRED EXCEPT AT OPENINGS			
Pier spacing	Roof live load (psf)	Location	Load (lbs.)
4 ft. 0 in.	20	Frame	2,900
	30	Frame	3,300
	40	Frame	3,600
6 ft. 0 in.	20	Frame	4,200
	30	Frame	4,700
	40	Frame	5,200
8 ft. 0 in.	20	Frame	5,500
	30	Frame	6,200
	40	Frame	6,900
10 ft. 0 in.	20	Frame	6,800
	30	Frame	7,600
	40	Frame	8,500

Foundation Repairs – Footings

- Footing materials & placement (§3285.312)
 - Materials (§3285.312(a))
 - Must provide equal load-bearing capacity
 - Resistance to decay
 - Placed on undisturbed soil
 - or
 - Compacted fill to 90% of maximum relative density

Foundation Repairs – Footings

- Footing materials & placement (§3285.312)
 - Placement in freezing climates (§3285.312(b))
 - Conventional footings below frost line depth for site

Foundation Repairs – Footings

- Footing materials & placement (§3285.312)
 - Placement in freezing climates (§3285.312(b))
 - Conventional footings below frost line depth for site
 - or
 - **Slab options not available to a Mechanic**
 - Monolithic slab system designed by a licensed design professional in accordance with engineering practice or ASCE 32.01
 - or
 - Insulated foundation designed by a licensed design professional in accordance with engineering practice or ASCE 32.01

Foundation Repairs – Footings

- Footing size must be determined (§3285.312)

Foundation Repairs – Footings

- Footing size must be determined (§3285.312)
- Tabular Data
 - Table §3285.312: Size and Capacity for Unreinforced Cast-in-place Footings

Foundation Repairs – Footings

- Footing size must be determined (§3285.312)
- Tabular Data
 - Table §3285.312: Size and Capacity for Unreinforced Cast-in-place Footings
 - Sizes shown are for square pads

Foundation Repairs – Footings

- Footing size must be determined (§3285.312)
- Tabular Data
 - Table §3285.312: Size and Capacity for Unreinforced Cast-in-place Footings
 - Sizes shown are for square pads
 - Other configurations (rectangular or circular) are allowed
 - Area and depth shown in table must be equal to value shown
 - Distance from edge of pier to edge of footing is not less than thickness of footing

Foundation Repairs – Footings

- Footing size must be determined (§3285.312)
- TABLE TO § 3285.312—THE SIZE AND CAPACITY FOR UNREINFORCED CAST-IN-PLACE FOOTINGS

Soil capacity (psf)	Minimum footing size (in.)	8 in. x 16 in. pier		16 in. x 16 in. pier	
		Maximum footing capacity (lbs.)	Unreinforced cast-in-place minimum thickness (in.)	Maximum footing capacity (lbs.)	Unreinforced cast-in-place minimum thickness (in.)
1,000	18 x 18	1,800	6	1,800	6
	20 x 20	2,600	6	2,600	6
	24 x 24	3,700	6	3,700	6
	30 x 30	5,800	8	5,800	8
	36 x 36	7,900	10	8,100	8
	42 x 42	*10,700	10	10,700	10
1,500	48 x 48	*13,100	12	13,600	10
	16 x 16	2,500	6	2,500	6
	20 x 20	4,000	6	4,000	6
	24 x 24	5,600	8	5,700	6
	30 x 30	*8,500	10	8,900	8
	36 x 36	*12,400	10	12,800	8
A.D. 42 x 42		*16,500	12	*16,900	10
	48 x 48	*21,200	14	*21,800	12
2,000	16 x 16	3,400	6	3,400	6

Foundation Repairs – Footings

- Footing size must be determined (§3285.312)
- TABLE TO § 3285.312—THE SIZE AND CAPACITY FOR UNREINFORCED CAST-IN-PLACE FOOTINGS

Remember:
Soil bearing:
Pier load: **PLACE FOOTINGS**

Soil capacity (psf)	Minimum footing size (in.)	8 in. x 16 in. pier		16 in. x 16 in. pier	
		Maximum footing capacity (lbs.)	Unreinforced cast-in-place minimum thickness (in.)	Maximum footing capacity (lbs.)	Unreinforced cast-in-place minimum thickness (in.)
1,000	18 x 18	1,800	6	1,800	6
	20 x 20	2,600	6	2,600	6
	24 x 24	3,700	6	3,700	6
	30 x 30	5,800	8	5,800	8
	36 x 36	7,900	10	8,100	8
	42 x 42	*10,700	10	10,700	10
1,500	48 x 48	*13,100	12	13,600	10
	16 x 16	2,500	6	2,500	6
	20 x 20	4,000	6	4,000	6
	24 x 24	5,600	8	5,700	6
	30 x 30	*8,500	10	8,900	8
	36 x 36	*12,400	10	12,800	8
A.D. 42 x 42		*16,500	12	*16,900	10
	48 x 48	*21,200	14	*21,800	12
2,000	16 x 16	3,400	6	3,400	6

Foundation Repairs – Footings

- Footing size must be determined (S_u)

Remember:
Soil bearing: **1500 psf.**
Pier load: **PLACE FOOTINGS**

TABLE TO § 3285.312—THE SIZE AND CAPACITY FOR UNREINFORCED CAST-IN-PLACE CONCRETE

Soil capacity (psf)	Minimum footing size (in.)	8 in. x 16 in. pier		16 in. x 16 in. pier	
		Maximum footing capacity (lbs.)	Unreinforced cast-in-place minimum thickness (in.)	Maximum footing capacity (lbs.)	Unreinforced cast-in-place minimum thickness (in.)
1,000	18 x 18	1,800	6	1,800	6
	20 x 20	2,600	6	2,600	6
	24 x 24	3,700	6	3,700	6
	30 x 30	5,800	8	5,800	8
	36 x 36	7,900	10	8,100	8
	42 x 42	*10,700	10	10,700	10
1,500	16 x 16	2,500	6	2,500	6
	20 x 20	4,000	6	4,000	6
	24 x 24	5,800	8	5,700	6
	30 x 30	*8,500	10	8,900	8
	36 x 36	*12,400	10	12,600	8
	42 x 42	*16,500	12	*16,800	10
2,000	48 x 48	*21,200	14	*21,600	12
	16 x 16	3,400	6	3,400	6

Foundation Repairs – Footings

- Footing size must be determined (S_u)

Remember:
Soil bearing: **1500 psf.**
Pier load: **6200 lbs.**

TABLE TO § 3285.312—THE SIZE AND CAPACITY FOR UNREINFORCED CAST-IN-PLACE CONCRETE

Soil capacity (psf)	Minimum footing size (in.)	8 in. x 16 in. pier		16 in. x 16 in. pier	
		Maximum footing capacity (lbs.)	Unreinforced cast-in-place minimum thickness (in.)	Maximum footing capacity (lbs.)	Unreinforced cast-in-place minimum thickness (in.)
1,000	18 x 18	1,800	6	1,800	6
	20 x 20	2,600	6	2,600	6
	24 x 24	3,700	6	3,700	6
	30 x 30	5,800	8	5,800	8
	36 x 36	7,900	10	8,100	8
	42 x 42	*10,700	10	10,700	10
1,500	16 x 16	2,500	6	2,500	6
	20 x 20	4,000	6	4,000	6
	24 x 24	5,800	8	5,700	6
	30 x 30	*8,500	10	8,900	8
	36 x 36	*12,400	10	12,600	8
	42 x 42	*16,500	12	*16,800	10
2,000	48 x 48	*21,200	14	*21,600	12
	16 x 16	3,400	6	3,400	6

Foundation Repairs – Footings

- Footing size must be determined (S_u)

Remember:
Soil bearing: **1500 psf.**
Pier load: **6200 lbs.**

TABLE TO § 3285.312—THE SIZE AND CAPACITY FOR UNREINFORCED CAST-IN-PLACE CONCRETE

Soil capacity (psf)	Minimum footing size (in.)	8 in. x 16 in. pier		16 in. x 16 in. pier	
		Maximum footing capacity (lbs.)	Unreinforced cast-in-place minimum thickness (in.)	Maximum footing capacity (lbs.)	Unreinforced cast-in-place minimum thickness (in.)
1,000	18 x 18	1,800	6	1,800	6
	20 x 20	2,600	6	2,600	6
	24 x 24	3,700	6	3,700	6
	30 x 30	5,800	8	5,800	8
	36 x 36	7,900	10	8,100	8
	42 x 42	*10,700	10	10,700	10
1,500	16 x 16	2,500	6	2,500	6
	20 x 20	4,000	6	4,000	6
	24 x 24	5,800	8	5,700	6
	30 x 30	*8,500	10	8,900	8
	36 x 36	*12,400	10	12,600	8
	42 x 42	*16,500	12	*16,800	10
2,000	48 x 48	*21,200	14	*21,600	12
	16 x 16	3,400	6	3,400	6

Foundation Repairs – Footings

- Footing size must be determined (S)

Remember:
Soil bearing: **1500 psf.**
Pier load: **6200 lbs.**

TABLE TO § 3285.312—THE SIZE AND CAPACITY FOR UNREINFORCED CAST-IN-PLACE CONCRETE FOOTINGS

Soil capacity (psf)	Minimum footing size (in.)	8 in. x 16 in. pier		16 in. x 16 in. pier	
		Maximum footing capacity (lbs.)	Unreinforced cast-in-place minimum thickness (in.)	Maximum footing capacity (lbs.)	Unreinforced cast-in-place minimum thickness (in.)
1,000	18 x 18 20 x 20	1,800 2,600	6 6	1,800 2,600 3,700 5,300 6,100 10,700 13,200	6 6 6 8 10 10
1,500	20 x 20 24 x 24 30 x 30	3,000 4,800 6,500	8 8 10	2,500 4,000 5,700 8,900	6 6 8 8
2,000	24 x 24 30 x 30 36 x 36 42 x 42 48 x 48	4,800 7,200 9,600 12,800 16,500 21,200	10 10 12 12 14	3,400 5,100 6,800 9,000 11,800 15,600	8 8 10 10 12 12

4. Concrete block piers must not exceed their design capacity of 8,000 lbs. for 8" x 16" single stack block and 16,000 lbs. for 16" x 16" double stack block.

Foundation Repairs - Piers

- Allowable piers (§3285.303(b))
Must be capable of transmitting vertical live and dead loads to footings
- Concrete blocks

Foundation Repairs - Piers

- Allowable piers (§3285.303(b))
Must be capable of transmitting vertical live and dead loads to footings
- Concrete blocks
- PT wood (Category 4B, ground contact)

Foundation Repairs - Piers

- Allowable piers (§3285.303(b))

Must be capable of transmitting vertical live and dead loads to footings

- Concrete blocks
- PT wood (Category 4B, ground contact)
- Adjustable manufactured piers
 - Labeled w/ max load capacities

Foundation Repairs – Pier configuration

- Concrete block (§3285.304(a))
 - Load-bearing (not decorative) concrete block 8x8x16
 - Stacked with hollow cells aligned vertically
 - When double stacked each layer at 90° to the preceding layer

Foundation Repairs – Pier configuration

- Caps (§3285.304(b))
 - Solid concrete minimum 4" nominal

Foundation Repairs – Pier configuration

- Caps (§3285.304(b))
 - Solid concrete minimum 4" nominal
 - Hardwood lumber minimum 2" nominal

Foundation Repairs – Pier configuration

- Caps (§3285.304(b))
 - Solid concrete minimum 4" nominal
 - Hardwood lumber minimum 2" nominal
 - ½" thick corrosion protected steel

Foundation Repairs – Pier configuration

- Caps (§3285.304(b))
 - Solid concrete minimum 4" nominal
 - Hardwood lumber minimum 2" nominal
 - ½" thick corrosion protected steel
 - Same length and width as pier

Foundation Repairs – Pier configuration

- Gaps (§3285.304(c))

Between bottom of frame and top of pier shall be filled by:

- Shims
 - 4x6x1
 - Used in pairs, driven tightly, occupy no more than 1"

Foundation Repairs – Pier configuration

- Gaps (§3285.304(c))

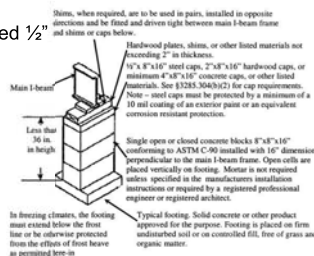
Between bottom of frame and top of pier shall be filled by:

- If the space to be filled is greater than 1", shims with
- Spacer
 - Hardwood plate no thicker than 2" nominal
 - Concrete block 2" or 4"

Foundation Repairs – Pier configuration

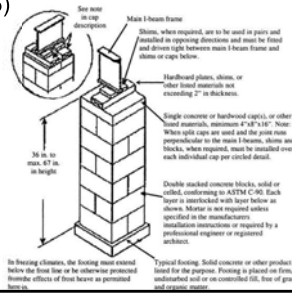
- Design procedures... (§3285.306)

- Single Stack to 36" high
 - Horizontal offset not to exceed 1/2"



Foundation Repairs – Pier configuration

- Design procedures... (§3285.306)
 - Double stack to 67” high & corner piers over 3 block high
 - Horizontal offset not to exceed 1”

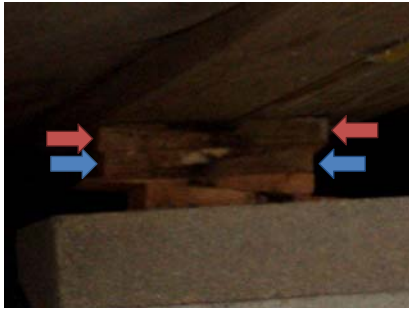


Foundation Repairs – Pier configuration

- Design procedures... (§3285.306)
 - Over 67” high
 - Designed by licensed design professional













Foundation Repairs

Install new or replacement anchors or tie-downs

- The manufactured home must be secured against the wind by use of ground anchor installations or by connection to an alternative

Foundation Repairs

Install new or replacement anchors or tie-downs

- The manufactured home must be secured against the wind by use of ground anchor installations or by connection to an alternative
- All anchoring systems must be capable of meeting the loads required by 24CFR3280, Subpart D
 - §3280.306(f) Anchoring equipment shall be capable of resisting a working load equal to 3150 lbs. and a 50% overload (4725 lbs. total) without failure of equipment or attachment point

Foundation Repairs – Ground anchors

- Specifications for tie-down straps and ground anchors (§3285.402(c))
 - Must be installed in accordance with their listing or certification
 - Must be installed to their full depth
 - Appropriate for the soil type
 - Straps shall be 1 1/4"x0.035" or larger steel strapping conforming to ASTM D3953-97

Foundation Repairs – Ground anchors

- Number and location of ground anchors (§3285.402(d))
 - No more than 24" from end of frame
 - Spacing shall be no greater than that shown in tables and figures of this section
 Or

Foundation Repairs – Ground anchors

- Number and location of ground anchors (§3285.402(d))
 - No more than 24" from end of frame
 - Spacing shall be no greater than that shown in tables and figures of this section
 Or
 Designed by licensed design professional

Foundation Repairs – Ground anchors

- Number and location of ground anchors (§3285.402(d))
 - No more than 24" from end of frame
 - Spacing shall be no greater than that shown in tables and figures of this section
- Or
- Designed by licensed design professional
- Longitudinal anchors required in all wind zones.

Foundation Repairs – Ground anchors

- Number and location of ground anchors (§3285.402(d))

Tabular data

TABLE 1 TO § 3285.402—MAXIMUM DIAGONAL TIE-DOWN STRAP SPACING, WIND ZONE I

Nominal floor width, single section/multi-section	Max. height from ground to diagonal strap attachment	I-beam spacing 82.5 in.	I-beam spacing 99.5 in.
12/24 ft. 144 in. nominal section(s)	25 in	14 ft. 2 in	N/A.
	33 in	11 ft. 9 in	N/A.
	48 in	9 ft. 1 in	N/A.
	67 in	N/A	N/A.
14/28 ft. 168 in. nominal section(s)	25 in	18 ft. 2 in	15 ft. 11 in.
	33 in	16 ft. 1 in	13 ft. 6 in.
	48 in	13 ft. 3 in	10 ft. 8 in.
	67 in	10 ft. 0 in	N/A.
16/32 ft. 180 in. to 192 in. nominal section(s)	25 in	N/A	19 ft. 5 in.
	33 in	16 ft. 0 in	17 ft. 5 in.

Foundation Repairs – Ground anchors

- Number and location of ground anchors (§3285.402(d))

What is spacing?
 28' multi-sectional
 33" max height
 99.5" I-Beam spacing

Tabular data

TABLE 1 TO § 3285.402—MAXIMUM DIAGONAL TIE-DOWN STRAP SPACING, WIND ZONE I

Nominal floor width, single section/multi-section	Max. height from ground to diagonal strap attachment	I-beam spacing 82.5 in.	I-beam spacing 99.5 in.
12/24 ft. 144 in. nominal section(s)	25 in	14 ft. 2 in	N/A.
	33 in	11 ft. 9 in	N/A.
	48 in	9 ft. 1 in	N/A.
	67 in	N/A	N/A.
14/28 ft. 168 in. nominal section(s)	25 in	18 ft. 2 in	15 ft. 11 in.
	33 in	16 ft. 1 in	13 ft. 6 in.
	48 in	13 ft. 3 in	10 ft. 8 in.
	67 in	10 ft. 0 in	N/A.
16/32 ft. 180 in. to 192 in. nominal section(s)	25 in	N/A	19 ft. 5 in.
	33 in	16 ft. 0 in	17 ft. 5 in.

Foundation Repairs – Ground anchors

- Number and location of ground anchors

What is spacing?
28' multi-sectional
33" max height
99.5" I-Beam spacing

Tabular data

TABLE 1 TO § 3285.402—MAXIMUM DIAGONAL TIE-DOWN STRAP SPACING, WIND ZONE 1

Nominal floor width, single section/multi-section	Max. height from ground to diagonal strap attachment	I-beam spacing 82.5 in.	I-beam spacing 99.5 in.
12/24 ft. 144 in. nominal section(s)	25 in	14 ft. 2 in	N/A.
	33 in	11 ft. 9 in	N/A.
	48 in	9 ft. 1 in	N/A.
14/28 ft. 168 in. nominal section(s)	25 in	18 ft. 2 in	15 ft. 11 in.
	33 in	16 ft. 1 in	13 ft. 6 in.
	48 in	13 ft. 3 in	10 ft. 8 in.
16/32 ft. 180 in. to 192 in. nominal section(s)	25 in	N/A.	19 ft. 5 in.
	33 in	16 ft. 0 in.	17 ft. 5 in.
	48 in	N/A.	N/A.

ds

Foundation Repairs – Ground anchors

- Number and location of ground anchors

What is spacing?
28' multi-sectional
33" max height
99.5" I-Beam spacing
13 ft. 6 in.

Tabular data

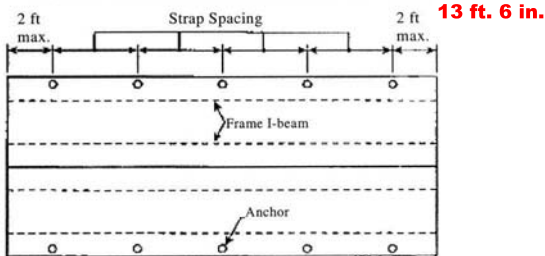
TABLE 1 TO § 3285.402—MAXIMUM DIAGONAL TIE-DOWN STRAP SPACING, WIND ZONE 1

Nominal floor width, single section/multi-section	Max. height from ground to diagonal strap attachment	I-beam spacing 82.5 in.	I-beam spacing 99.5 in.
12/24 ft. 144 in. nominal section(s)	25 in	14 ft. 2 in	N/A.
	33 in	11 ft. 9 in	N/A.
	48 in	9 ft. 1 in	N/A.
14/28 ft. 168 in. nominal section(s)	25 in	18 ft. 2 in	15 ft. 11 in.
	33 in	16 ft. 1 in	13 ft. 6 in.
	48 in	13 ft. 3 in	10 ft. 8 in.
16/32 ft. 180 in. to 192 in. nominal section(s)	25 in	N/A.	19 ft. 5 in.
	33 in	16 ft. 0 in.	17 ft. 5 in.
	48 in	N/A.	N/A.

ds

Foundation

Figure A to § 3285.402 Ground Anchor Locations and Spacing – Plan View.



Notes: 1. Refer to Tables 1, 2, and 3 to this section for maximum ground anchor spacing. 2. Longitudinal anchors not shown for clarity; refer to 3285.402(b)(2) for longitudinal anchoring requirements.

A Division of New York Building Standards and Codes

Types of Anchors

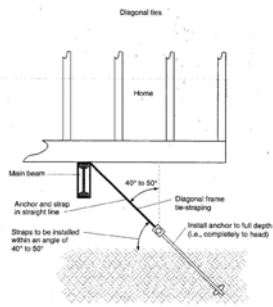


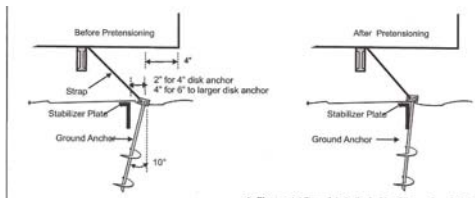
Twin Disk Anchor "For clay and other hard soils, 3/4" rod, 30" length, double 4' helix."

Wet Concrete "J Hook" Anchor for use in wet concrete. Swivel head.



Rock Anchor Complete "For use in hard/rocky soil."





Foundation Repairs – Minimum height

Clearance under the home (§3285.305)

- Minimum clearance of 12” must be maintained between the lowest member of the main frame and the grade under all areas of the home.

Ventilation and Condensation Control

- Crawlspace ventilation (§3285.402(d))

A crawlspace with skirting must be provided with ventilation

- Minimum net area of ventilation
 - Not less than 1 sq.ft. for every 150 sq.ft. of conditioned floor area

Ventilation and Condensation Control

- Crawlspace ventilation (§3285.402(d))

- Ventilation openings placed as high as possible above ground
- Be located on at least opposite sides to provide cross-ventilation
- Prevent entry of rodents
- Access opening not less than 18” in width and 24” in height must be provided and located so that any utility connection located under the home is accessible
- Dryer vents and combustion air inlets pass through skirting
- Water run-off from furnace, A/C or water heater must direct away from home

Ventilation and Condensation Control

- Calculations: Center Vent Vinyl Skirting
- 28x48 Home = 1344sqft
 - No Vapor Barrier
 - 1sqft vent per 150sqft floor space

Ventilation and Condensation Control

- Calculations: Center Vent Vinyl Skirting
- 28x48 Home = 1344sqft
 - No Vapor Barrier
 - 1sqft vent per 150sqft floor space
 - Need 9sqft of free vent (1296sqinches)

Ventilation and Condensation Control

- Calculations: Center Vent Vinyl Skirting
- 28x48 Home = 1344sqft
 - No Vapor Barrier
 - 1sqft vent per 150sqft floor space
 - Need 9sqft of free vent (1296sqinches)
 - Use 32" panel (13sqinches)

Ventilation and Condensation Control

Calculations: Center Vent Vinyl Skirting

- 28x48 Home = 1344sqft
- No Vapor Barrier
- 1sqft vent per 150sqft floor space
- Need 9sqft of free vent (1296sqinches)
- Use 32" panel (13sqinches)
- $1296 / 13 = 100$ panels

114 panels to skirt whole house

Ventilation and Condensation Control

- Ground moisture control (§3285.204)

If the space under the home is enclosed with skirting or other materials, a vapor retarder must be installed to cover the ground under the home.

Ventilation and Condensation Control

- Ground moisture control (§3285.204)

If the space under the home is enclosed with skirting or other materials, a vapor retarder must be installed to cover the ground under the home.

- 6 mil poly sheeting or equivalent under entire home
- Except under porches, decks, and recessed entries
- Placed under footings (slabs) or over footings placed at grade
- Any voids/tears must be repaired

Ventilation and Condensation Control

- Crawlspace ventilation (§3285.402(d))
- Area of ventilation may be reduced with installation of vapor retarder conforming to 3285.204, beneath entire conditioned floor area
 - Not less than 1 sq.ft. for every 1,500 sq.ft. of conditioned floor area

Ventilation and Condensation Control

Calculations: Center Vent Vinyl Skirting

- 28x48 Home = 1344sqft
- Vapor Barrier Installed
- **1sqft vent per 1500sqft floor space**

Ventilation and Condensation Control

Calculations: Center Vent Vinyl Skirting

- 28x48 Home = 1344sqft
- Vapor Barrier Installed
- 1sqft vent per 1500sqft floor space
- Need 1sqft of free vent (144sqinches)

Ventilation and Condensation Control

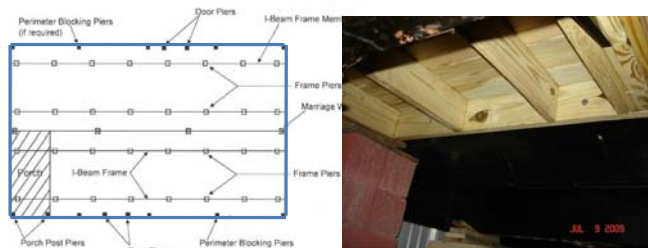
- Calculations: Center Vent Vinyl Skirting
- 28x48 Home = 1344sqft
 - Vapor Barrier Installed
 - 1sqft vent per 1500sqft floor space
 - Need 1sqft of free vent (144sqinches)
 - Use 32" panel (13sqinches)

Ventilation and Condensation Control

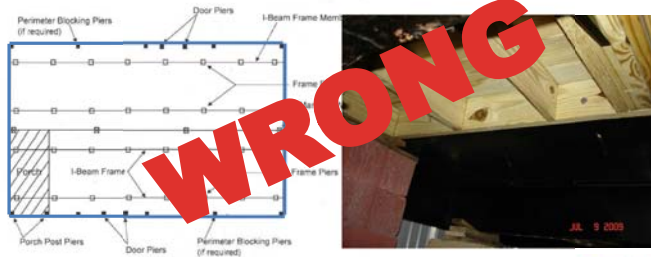
- Calculations: Center Vent Vinyl Skirting
- 28x48 Home = 1344sqft
 - Vapor Barrier Installed
 - 1sqft vent per 1500sqft floor space
 - Need 1sqft of free vent (144sqinches)
 - Use 32" panel (13sqinches)
 - $144 / 13 = 12$ panels

114 panels to skirt whole house

Skirting Installation



Skirting Installation



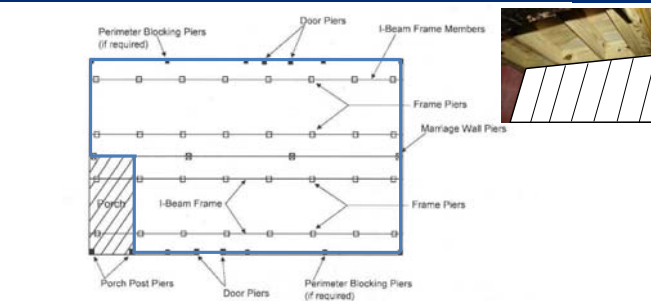
Skirting Installation

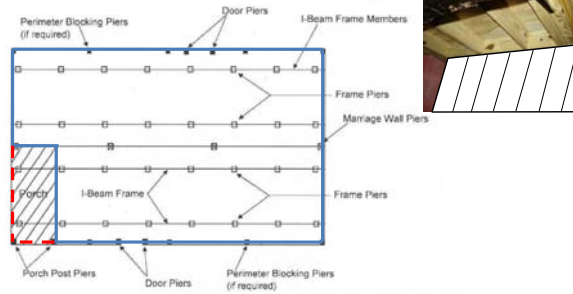
- Follow perimeter of the homes conditioned space.

Decks & Porches when part of home

Vented Panels installed to allow water to drain





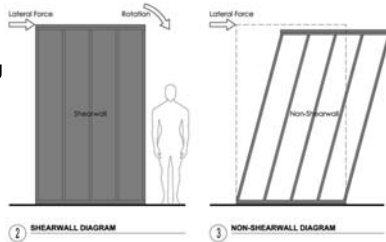


Shear Wall

- A shear wall is a structural system composed of braced panels to counter the effects of lateral loading on a structure

Wind and seismic effects are the most common loads

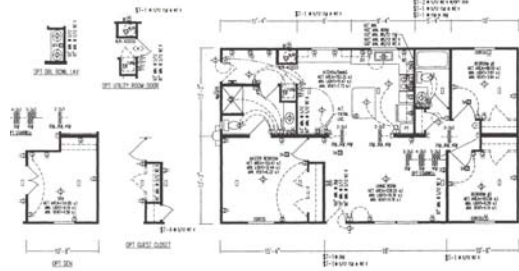
- Limitations on creating openings and other modifications



Shear Wall Identification

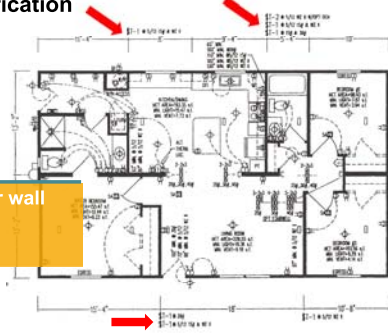
- Recognize shear wall locations by construction
- Look for transverse joist attachments to the frame (at each gable end and in the middle somewhere)
- They have a specific length and square footage requirement
- Not necessarily symmetrical side to side
- Any interior partition that is unique to other interior partitions are usually shear walls
- Get the factory construction drawings
- Manufacturer's assistance on opening limitations/modifications

Shear Wall Identification



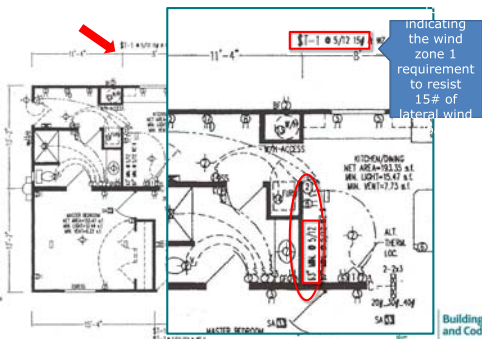
Shear Wall Identification

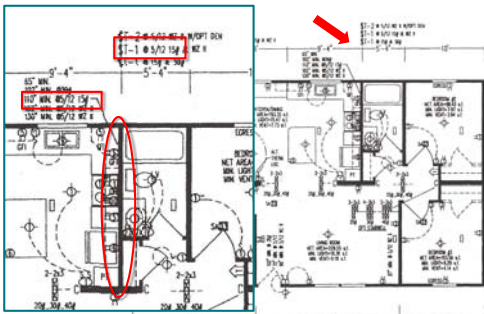
Identified by the (\$)

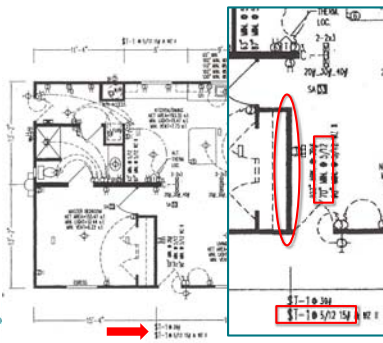


Where are the shear wall locations?
5/12 Roof pitch

Shear Wall Identification







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- Items such as roof rafter, floor joists, and window or door header sizing shall comply with 2020 RCNYS

Utilizing such chapters as:

Chapter 3: Building Planning

Chapter 5: Floors

Chapter 6: Wall Construction

Chapter 8: Roof-Ceiling Construction

And/or any other chapter necessary

NYS UFPBC

- Header sizing

Utilize Figure R301.2(6)

- To determine Ground Snow Load



NYS UFPBC

- Header sizing

Utilize Figure R301.2(6)

- To determine Ground Snow Load

Ground Snow Load:



NYS UFPBC

- Header sizing

Utilize Figure R301.2(6)

- To determine Ground Snow Load

Ground Snow Load:
50 psf



NYS UFPBC

- Header sizing

Tabular Data

- Table R602.7(1) Girder & Header Spans for Exterior Bearing Walls

NYS UFPBC

- Header sizing

Tabular Data

- Table R602.7(1) Girder & Header Spans for Exterior Bearing Walls

Other Tables include:

- Table R602.7(2) Girder & Header Spans for Interior Bearing Walls
- Table 602.7(3) Girder & Header Spans for Open Porches

NYS UFPBC

- Header sizing
 - Conversion of a Single door to double/sliding door 5' wide

NYS UFPBC

- Header sizing
 - Conversion of a Single door to double/sliding door 5' wide

Alteration Level 1 or Level 2?

NYS UFPBC

- Header sizing
 - Conversion of a Single door to double/sliding door 5' wide

Alteration Level 1 or Level 2?
Alteration - Level 2

NYS UFPBC

Remember our sample house
28' multi-sectional
50 psf ground snow load
double door

TABLE R602.7(1)
HEADER SPANS FOR EXTERIOR BEARING WALLS
for fir, Southern pine and spruce-pine-fir and required number of jack studs

SUPPORTING	GROUND SNOW LOAD (psf)																						
	50								70														
	12				24				36				12				24				36		
Span'		NJ*		Span'		NJ*		Span'		NJ*		Span'		NJ*		Span'		NJ*		Span'		NJ*	
1-2 - 6	4-0	1	3-1	2	2-7	2	3-5	1	2-8	2	2-3	2	3-0	2	2-4	2	2-0	2	2-0	2	2-0	2	
1-2 - 8	5-1	2	3-11	2	3-3	2	4-4	2	3-4	2	2-10	2	3-10	2	3-0	2	2-6	3	2-6	3	2-6	3	
1-2 - 10	6-0	2	4-8	2	3-11	2	5-2	2	4-0	2	3-4	3	4-7	2	3-6	3	3-0	3	3-0	3	3-0	3	
1-2 - 12	7-1	2	5-8	2	4-7	3	6-1	2	4-8	3	3-11	3	5-5	2	4-2	3	3-6	3	3-6	3	3-6	3	
2-2 - 4	4-0	1	3-1	1	2-7	1	3-5	1	2-7	1	2-2	1	3-0	1	2-4	1	2-0	1	2-0	1	2-0	1	
2-2 - 6	6-0	1	4-7	1	3-10	1	5-1	1	3-11	1	3-3	2	4-6	1	3-6	2	2-11	2	2-11	2	2-11	2	
2-2 - 8	7-7	1	5-9	1	4-10	2	6-5	1	5-0	2	4-2	2	5-9	1	4-5	2	3-9	2	3-9	2	3-9	2	
2-2 - 10	9-0	1	6-10	2	5-9	2	7-8	2	5-11	2	4-11	2	6-9	2	5-3	2	4-5	2	4-5	2	4-5	2	
2-2 - 12	10-7	2	8-1	2	6-10	2	9-0	2	6-11	2	5-10	2	8-0	2	6-2	2	5-2	3	5-2	3	5-2	3	
3-2 - 8	8-5	1	7-3	1	6-1	1	8-1	1	6-3	1	5-3	2	7-2	1	5-6	2	4-8	2	4-8	2	4-8	2	
3-2 - 10	11-3	1	8-7	1	7-3	2	9-7	1	7-4	2	6-2	2	8-6	1	6-7	2	5-6	2	5-6	2	5-6	2	
3-2 - 12	13-2	1	10-1	2	8-6	2	11-3	2	8-8	2	7-4	2	10-0	2	7-9	2	6-6	2	6-6	2	6-6	2	
4-2 - 8	10-11	1	8-8	1	7-0	1	9-4	1	7-2	1	6-0	1	8-3	1	6-4	1	5-4	2	5-4	2	5-4	2	
4-2 - 10	12-11	1	9-11	1	8-4	1	11-1	1	8-6	1	7-2	2	9-10	1	7-5	2	6-4	2	6-4	2	6-4	2	
4-2 - 12	15-1	1	11-8	1	9-10	2	13-0	1	10-0	2	8-5	2	11-7	1	8-11	2	7-6	2	7-6	2	7-6	2	
5-2 - 6	5-3	1	5-7	1	5-7	1	5-0	1	5-4	1	5-0	1	5-5	1	5-3	1	5-0	1	5-0	1	5-0	1	

NYS IIEPRC

Remember our sample house
28' multi-sectional
50 psf ground snow load
double d

TABLE R602.7(1)
HEADER SPANS FOR EXTERIOR BEARING WALLS
m-fr, Southern pine and spruce-pine-fr and required number of jack studs

Table with columns for Building width (feet) and Ground Snow Load (psf). Rows include span and N/P values for various wall types and heights.



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NYS IIEPRC

Remember our sample house
28' multi-sectional
50 psf ground snow load
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TABLE R602.7(1)
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m-fr, Southern pine and spruce-pine-fr and required number of jack studs

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NYS IIEPRC

Remember our sample house
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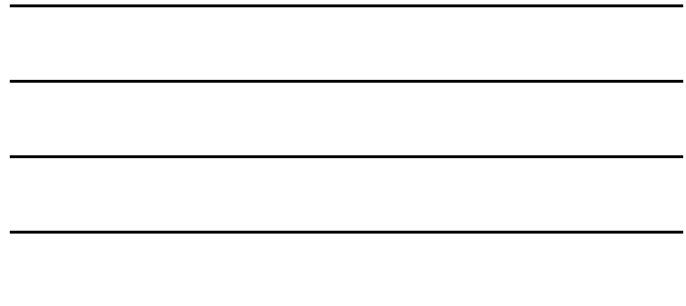
Table with columns for Ground Snow Load (50 PSF), Building Width (30), Interpolation, span, and n. Rows list various span and N/P values.

TABLE R602.7(1)
HEADER SPANS FOR EXTERIOR BEARING WALLS
m-fr, Southern pine and spruce-pine-fr and required number of jack studs

Table with columns for Building width (feet) and Ground Snow Load (psf). Rows include span and N/P values for various wall types and heights.



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NYS UFBPC

Remember our san
28' multi-sectional
50 psf ground snow
double d

Ground Snow Load	
50 PSF	
Building Width	30
Interpolation	span nj
1-2x6	2-5 2
1-2x8	3-1 2
1-2x10	3-8 3
1-2x12	4-3 3
2-2x4	2-4 1
2-2x6	3-7 2
2-2x8	4-7 2
2-2x10	5-5 2
2-2x12	6-4 2
3-2x8	5-9 2
3-2x10	6-9 2
3-2x12	8-0 2
4-2x8	6-7 1
4-2x10	7-10 2
4-2x12	9-2 2

Ground Snow Load (psf)					
50					
Building width (feet)					
30					
Building width (feet)					
70					
GROUND SNOW LOAD (psf)					
50					
Building width (feet)					
30					
Building width (feet)					
70					
12	24	36	12	24	36
span	NJF	NJF	span	NJF	NJF
5-5	1	2-5	2	2	2
6-4	2	3-4	2	3-6	2
7-2	2	4-0	2	3-4	3
8-1	2	4-6	3	3-11	3
9-1	1	5-7	1	2-2	1
10-1	1	6-11	1	3-3	2
11-1	1	6-0	2	4-2	2
12-2	2	5-11	2	4-11	2
13-2	2	6-11	2	5-10	2
14-1	1	6-3	1	5-3	2
15-1	1	7-4	2	6-2	2
16-3	2	8-8	2	7-4	2
17-4	1	7-2	1	6-0	1
18-1	1	8-6	1	7-2	2
19-0	1	10-0	2	8-5	2

NYS UFBPC

- Header sizing
 - 2 2x6 w/ 1 Jack Studs
- Wait the Manufacturers...



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NYS UFBPC

R507 Exterior Decks
Heavily Revised

- Deck Footing Sizes
- Porch/Deck Joist Span allowances

Tabular Data
- Table R507.6 Deck Joist Spans for
Common Lumber Species

Don't forget about the other tables for Floor
Joist, Roof Rafters...

Deck Footing Sizes	
Porch/Deck Joist Span allowances	
Table R507.6 Deck Joist Spans for Common Lumber Species	

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**TABLE R507.6
DECK JOIST SPANS FOR COMMON LUMBER SPECIES (ft. - in.)**

SPECIES*	SIZE	ALLOWABLE JOIST SPAN ^b			MAXIMUM CANTILEVER ^c		
		SPACING OF DECK JOISTS (inches)			SPACING OF DECK JOISTS WITH CANTILEVERS ^e (inches)		
		12	16	24	12	16	24
Southern pine	2 x 6	9-11	9-0	7-7	1-3	1-4	1-6
	2 x 8	13-1	11-10	9-8	2-1	2-3	2-5
	2 x 10	16-2	14-0	11-5	3-4	3-6	2-10
Douglas fir-larch ^f , hem-fir ^f , spruce-pine-fir ^f	2 x 6	9-6	8-8	7-2	1-2	1-3	1-5
	2 x 8	12-6	11-1	9-1	1-11	2-1	2-3
	2 x 10	15-8	13-7	11-1	3-1	3-5	2-9
Redwood, western cedar, ponderosa pine ^g , red pine ^g	2 x 6	8-10	8-0	7-0	1-0	1-1	1-2
	2 x 8	11-8	10-7	8-8	1-8	1-10	2-0
	2 x 10	14-11	13-0	10-7	2-8	2-10	2-8
2 x 12	17-5	15-1	12-4	3-10	3-9	3-1	

For S1: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg.
 a. Size 2 grade with wet service factor.
 b. Normal snow load, live load = 40 psf, dead load = 10 psf, L/A = 300.
 c. Normal snow load, live load = 40 psf, dead load = 10 psf, L/A = 300 at main span, L/A = 180 at cantilever with a 220-pound point load applied to end.
 d. Includes incising factor.
 e. Northern species with an incising factor.
 f. Cantilevered spans not exceeding the nominal depth of the joist are permitted.

New R50

A Division

Cursory in nature

Cannot cover every conceivable situation
 The intent was a broad overview of general information
 Additional research by participants may be necessary

Remember that links to online versions of the 2020 Residential Code of New York are here:

<https://codes.iccsafe.org/codes/new-york>

Exam...

Attendees sign the Class Registration List to receive credit

Registration Number	Name	Signature	Signature Date
9876	John Hancock		

Course Attendance Issues

The Division of Building Standards and Codes cannot give course attendees credit for a course without the required signatures.



What can I clear up?

Contact Information

New York, Department of State
Division of Building Standards & Codes
One Commerce Plaza
99 Washington Ave.
Albany NY 12231-0001
Phone: (518) 474-4073



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What can I clear up?

Contact Information

MHC Consultants
160 Wilkinon Rd
Fairport NY 14450
Phone: 585-794-7545
<https://consultwithmhc.com>



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Building Standards
and Codes

*Ensuring the Health, Safety and Resilience of the
built environment for all New Yorkers*
