

MANUFACTURED HOMES

INSTALLATION+ TRAINING



Kathy Hochul

Governor

Rossana Rosado

Secretary of State

Contact Information

New York State Department of State
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Manufactured Homes Installation+

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September 2, 2021

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Trainer:

Hon. William Sherman
Administrator – Manufactured Housing
(State Administrative Agent)

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Course Information

This course has been approved by the Department of State for In-Service Training credit as follows:

2 hours, Topic 2 – Uniform Code

Course number: T02-07-2919
Course name: Manufactured Home Installation

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Attendees must meet the following to receive credit

Arrival – No more than 15 minutes after the scheduled start time.

Departure – Not before the instructor designating end time or the scheduled end time

Outside of the above time frames will prohibit attendees from receiving course credit.

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Course Attendance Issues

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

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Her: "babe, I want a castle in the sky"
Me: "say no more"

This course is cursory in nature.



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The reason behind the course

Vast majority of people are unfamiliar with manufactured homes.


And a major problem: Appendix E says little and what it does say sometimes is not very useful.

This course focus: Installation

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Residential Code


[NY] Chapter 1 Scope and Administration

[NY] R101.7 Manufactured homes. *Manufactured homes* shall be constructed in accordance with the requirements of the applicable US Department of Housing and Urban Development Manufactured Home Construction and Safety Standards (24 CFR 3280); and ...

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[NY] R101.7. continued


...and

...and assembled and installed in accordance with the requirements of this code and in accordance with the 19 NYCRR Part 1210 (entitled "Manufactured Homes"), as currently in effect and as hereafter amended from time to time.

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[NY] Appendix E "Manufactured housing used as dwellings"

[NY] AE101.1 General. These provisions shall be applicable only to a *manufactured home* used as a single *dwelling unit* and shall apply to the following:

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[NY] AE101.1 General. continued


...shall apply to the following:

1. Construction, alteration and repair of any foundation system which is necessary to provide for the installation of a manufactured home unit.

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[NY] AE101.1 General. continued


...shall apply to the following:

1. ...foundation system...
2. Construction, installation, addition, alteration, repair or maintenance of the building service equipment which is necessary for connecting manufactured homes to water, fuel, or power supplies and sewage systems

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[NY] AE101.1 General. continued
...shall apply to the following:

1. ...foundation system...
2. ...building service equipment...
3. Alterations, additions or repairs to existing manufactured homes. The construction, alteration, moving, demolition repair and use of accessory buildings and structures and their building service equipment shall comply with the requirements of this code.

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[NY] AE101.1 General. continued

These provisions shall not be applicable to the design and construction of *manufactured homes* and shall not be deemed to authorize modifications or *additions* to *manufactured homes* where otherwise prohibited. The design and construction criteria of *manufactured homes* shall be in accordance with those defined in the "Manufactured Home Construction and Safety Standards" (24 CFR 3280).

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[NY] AE101.2 Flood hazard areas

New and replacement manufactured homes to be installed in flood hazard areas as established by Table R301.2(1) shall meet the applicable requirements of Section R322.

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TABLE R301.2(1) CLIMATIC AND GEOGRAPHIC DESIGN CRITERIA

CLIMATE DESIGN CATEGORY	WIND DESIGN	SHEAR TO DEMAND FROM			WINTER WIND TEMP.	ICE BARRIER UNDISPLACEMENT REQUIRED	FLOOD HAZARD	FBI FREEZING INDEX	MEAN ANNUAL TEMP.
		Windborne	Pressure	Winter					
1	Special region	---	---	---	---	---	---	---	---
2	Special region	---	---	---	---	---	---	---	---
3	Special region	---	---	---	---	---	---	---	---
4	Special region	---	---	---	---	---	---	---	---
5	Special region	---	---	---	---	---	---	---	---
6	Special region	---	---	---	---	---	---	---	---
7	Special region	---	---	---	---	---	---	---	---
8	Special region	---	---	---	---	---	---	---	---

FIG. 502.1 Ground snow load = 0.6479 kPa, 1.4 lbs per sq foot = 0.647 kPa.

a. Where a weathering requires higher strength concrete or grade of masonry than necessary to satisfy the structural requirements of this code, the first floor depth strength required for weathering shall govern. The weathering values shall be listed in the weathering index, "negative", "positive" or "none" for concrete as determined from Figure R301.2(1). The grade of masonry shall be determined.

b. **MANUFACTURED HOMES WITH WINDBORNE PRESSURE DEMANDS:**

1. Where the first floor requires deeper design than indicated by Figure R301.2(1), the first floor depth strength required for weathering shall govern. The joint shall be in the first floor depth column with the maximum depth of footing below finish grade.

2. The minimum depth shall be in accordance with the provisions of Section R301.2(1).

3. The minimum depth shall be in accordance with the provisions of Section R301.2(1).

4. The minimum depth shall be in accordance with the provisions of Section R301.2(1).

5. [NY] To establish flood hazard areas, each community regulated under Title 19, Part 1229 of the Official Compilation of Codes, Rules and Regulations of the State of New York (NYCRR) shall adopt a flood hazard map and supporting data. The flood hazard map shall include, at a minimum, special flood hazard areas as identified by the Federal Emergency Management Agency on the Flood Insurance Study for the community, as amended or revised with:

- a. The accompanying Flood Insurance Risk Map (FIRM);
- b. Flood Boundary and Floodway Map (FBFM); and
- c. Related supporting data along with any revision thereto.

The adopted flood hazard map and supporting data are hereby adopted by reference and declared to be part of this section.

6. The minimum depth shall be in accordance with the provisions of Section R301.2(1).

7. The minimum depth shall be in accordance with the provisions of Section R301.2(1).

8. The minimum depth shall be in accordance with the provisions of Section R301.2(1).

The provisions shall be in accordance with the provisions of Section R301.2(1).

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Skipping ahead

[NY] AE102 Existing Manufactured Homes & Service Equipment


[NY] AE103 Permits and Inspections

[NY] AE103.1 Permit required.
[NY] AE103.2 Application for permit.
[NY] AE103.3 Inspections.

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[NY] AE103.1 Permit required.

A permit shall be obtained to install, alter, remodel, repair or add accessory buildings or structures to a manufactured home as required by R105.2 of this code.

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[NY] AE103.2 Application for permit.

To obtain a permit for the work described in AE103.1, the applicant shall first file an application...in accordance with R105.2.2 of this code. Such application shall include the identity of the person or entity certified pursuant to [19 NYCRR] Part 1210 (Manufactured Housing)...

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[NY] AE103.3 Inspections.

All work subject to permit shall be inspected in accordance with R105.3 of this code. Inspections shall include, and not be limited to, the foundation, support, anchorage, connection of multi-sectional homes, and building service equipment.

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Moving along – blah blah blah


[NY] AE201 Definitions
[NY] AE301 Occupancy Classification
 “limited in use – single dwelling unit”
[NY] AE302 Location on property
 “in accordance with R302 of this code”

R302 Fire-Resistant Construction

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Moving along...
[NY] AE401.1 New manufactured homes.

New *manufactured homes* shall be installed on a foundation system in accordance with the *installation instructions* provided by the manufacturer.

Exception: When a foundation or anchoring system is provided that is an alternative to that which is provided in the installation instruction, the alternative shall be in accordance with Section AE402.4

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[NY] AE401.2 Relocated manufactured homes.

Relocated manufactured homes shall be installed on a foundation system constructed in accordance with the installation instructions provided by the manufacturer. Where the installation instructions are not available, foundation and anchorage systems which are constructed in accordance with the provisions of 24 CFR 3285 “Model Manufactured Home Installation Standards” [2016] or provisions of NFPA 225 [2017] shall be deemed to meet the requirements of this code.

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[NY] AE401.3 Installation instructions.

The installation instructions and any amendments or addendums as provided by the manufacturer of the *manufactured home* shall be used to determine permissible points of support for vertical loads and points of attachment for anchorage systems used to resist horizontal and uplift forces, completion and assembly of all systems necessary to make the manufactured home habitable, and attachment or completion of any special or optional features of the *manufactured home*. ...

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[NY] AE401.3 Installation instructions. continued

... When an existing manufactured home is relocated and where installation instructions are not available, foundation and anchorage systems that are constructed in accordance with the provisions of 24 CFR 3285 "Model Manufactured Home Installation Standard [2016]" or provisions of [NFPA 225 \[2017\]](#) shall be deemed to meet the requirements of this code.




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NOTE: You Are Leaving the Uniform Code...

[Click HERE to continue](#)



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Federal Preemption the beginning

The manufactured housing yellow brick road starts with preemption.

"The Federal Manufactured Home Construction and Safety Standards of the US Department of Housing and Urban Development (24 CFR Part 3280 "HUD Code") takes the place of (preempts) the" NYS Uniform Fire Prevention and Building Code






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What does this mean for the local code official

Asked to issue a permit for a MH without doing inspections you would normally do for any stick built house...

Who's done the plan review



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What does this mean for the local code official

Asked to issue a permit for a MH without doing inspections you would normally do for any stick-built house...

Who's done the plan review **DAPIA**

Design Approval Primary Inspection Agency


- evaluate MH designs for compliance with HUD Code
- issue deviation report / approve design
- evaluate QA plan & processes
- evaluate installation manual



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Who's done construction inspections



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Who's done construction inspections **IPIA**

Production Inspection Primary Inspection Agency
ensuring approved designs and QA manual followed
production surveillance
label control

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Who's done construction inspections **IPIA**

Production Inspection Primary Inspection Agency
ensuring approved designs and QA manual followed
production surveillance
label control

No need to worry about rough framing,
plumbing, electrical, and other
construction inspections.
Done on your behalf

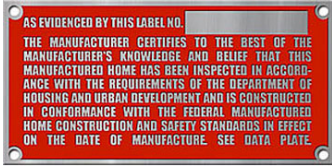
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Metal label
affixed to each section
certification of construction & inspection to HUD Code



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Who watches the watchers – ensuring all this is done in
conformance to the requirements of the MHCSS **SAA**

State Administrative Agency

NY Department of State, Division of Building Standards & Codes

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Course Development
Utilized Installation Instruction Manual for



Special thank you to: John Campbell, General Manager; Bob West, Quality Assurance Manager; and the late Bill Wagner, Sales Manager with CMH - Lewiston, PA

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Federal Preemption further


This MH was engineered, constructed and inspected in conformance with the Federal Manufactured Home Construction and Safety Standards of the US Department of Housing and Urban Development (24 CFR Part 3280 "HUD Code") in effect on the date of construction.

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Installation of a MH and any alterations made shall conform to the HUD Construction Code and the HUD Model Manufactured Home Installation Standards.


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Installation of a MH and any alterations made shall conform to the HUD Construction Code and the HUD Model Manufactured Home Installation Standards.

Installation instructions manuals are written to conform to these standards.




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Engineer's stamp

Certain pages within manual display seal of PE
Federal guidelines only require seal from one state
details apply to ALL states




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24 CFR 3282.11

Individual states, counties and cities shall have no authority to establish standards regarding the construction or safety of a manufactured home.

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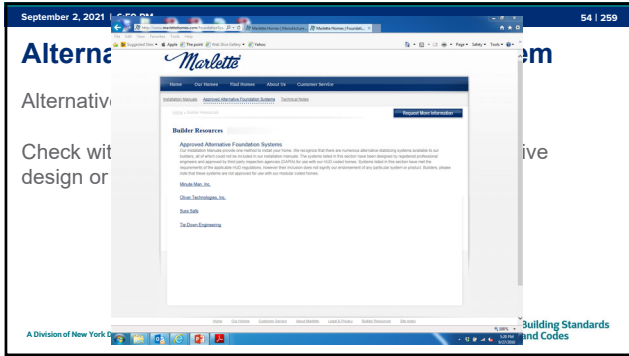
Alternative Foundation/Tie-down System

Alternative systems or designs are permitted...

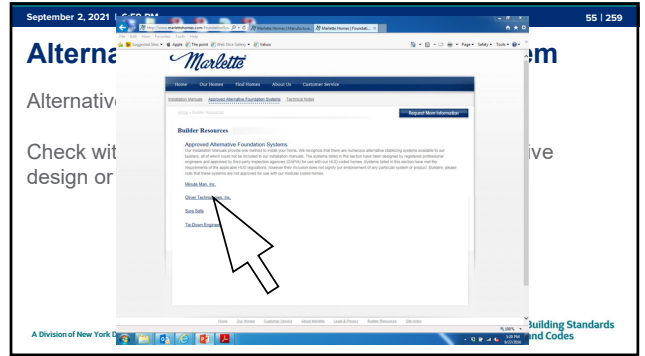
Check with manufacturer for DAPIA approved alternative design or instructions

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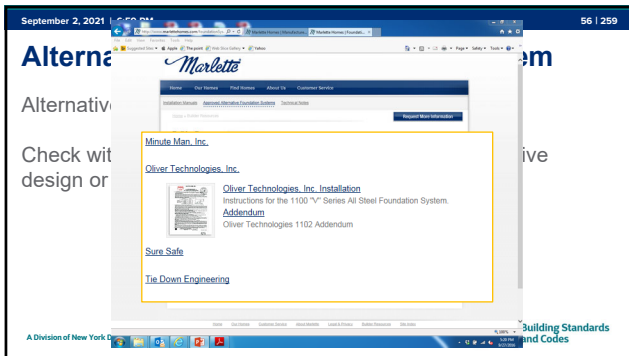
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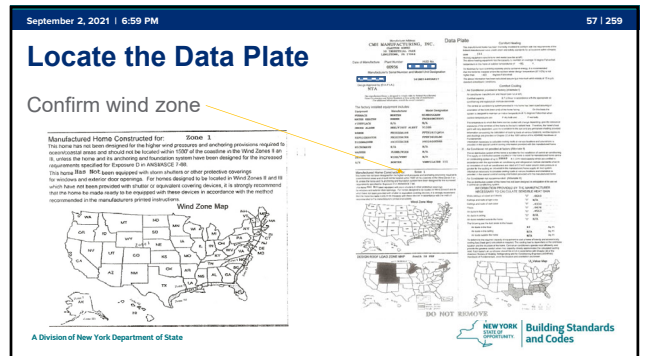
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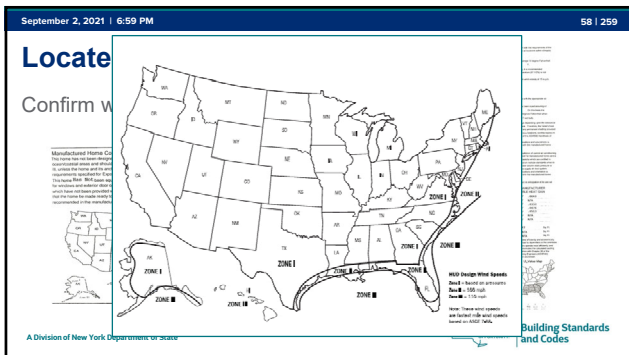
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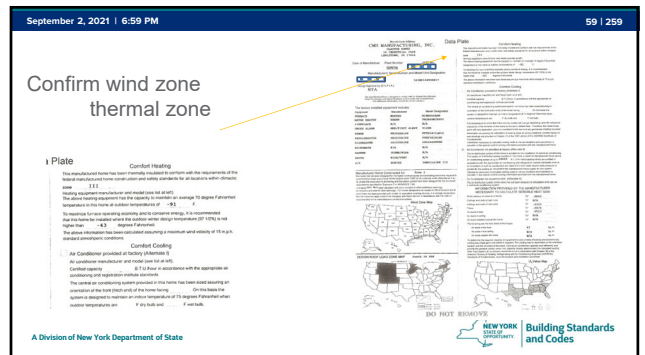
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Confirm wind zone thermal zone

ALL INFORMATION HAS BEEN PROVIDED BY THE MANUFACTURER. THE USER SHALL BE RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION PROVIDED BY THE MANUFACTURER. NECESSARY TO CALCULATE SENSIBLE HEAT GAIN.

Wind speed and direction

Wind speed	N/A
Wind direction	N/A

Ceiling and roof of light color

Color	N/A
-------	-----

Ceiling and roof of dark color

Color	N/A
-------	-----

Floors

Color	N/A
-------	-----

Air ducts in room

Color	N/A
-------	-----

Air ducts in ceiling

Color	N/A
-------	-----

Air ducts installed in the room

Color	N/A
-------	-----

The following are the duct areas in the room

Area	43	Sq. Ft.
Air ducts in the room	N/A	Sq. Ft.
Air ducts in the ceiling	N/A	Sq. Ft.
Air ducts outside the room	N/A	Sq. Ft.

To determine the required capacity of equipment to cool a home efficiently and economically, cooling load (heat gain) calculation is required. The cooling load is dependent on the exterior climate and the insulation of the home. Cooling load conditions depend on efficiency and the amount of glass (windows) in the building. Refer to the manufacturer's instructions for the equipment to be used in accordance with Chapter 28 of the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) Handbook of Fundamentals, under the location and construction of the home.

U-Value Map

DO NOT REMOVE

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Confirm wind zone thermal zone

Plate

Confirm the plate manufacturer's name, model and series. The plate manufacturer's name, model and series is listed on the plate. The plate manufacturer's name, model and series is listed on the plate. The plate manufacturer's name, model and series is listed on the plate.

Confirm the plate manufacturer's name, model and series. The plate manufacturer's name, model and series is listed on the plate. The plate manufacturer's name, model and series is listed on the plate. The plate manufacturer's name, model and series is listed on the plate.

U-Values

Zone 1	0.118
Zone 2	0.096
Zone 3	0.079

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Confirm wind zone thermal zone roof load zone

DESIGN ROOF LOAD ZONE MAP

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Confirm wind zone thermal zone roof load

DESIGN ROOF LOAD ZONE MAP

North 40 PSF (Snow)

Middle 30 PSF (Snow)

South 20 PSF (Minimum)

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Confirm wind thermal roof load

DESIGN ROOF LOAD ZONE MAP

30 # ROOF LOAD

20 # ROOF LOAD

NEW YORK STATE COUNTIES

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But wait – Alexandria Bay...

50PSF Ground Snow Load...

HUD specifies – 30PSF ROOF Snow Load?

Different measurement standards

Conversion: $50 \times .7 = 35\text{PSF}$

Per ASCE 7-16

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Proper wind, thermal and roof load zones?

YES. Issue permits
NO. Stop installation and notify appropriate parties

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No manual can cover all circumstances
contact the manufacturer.

Supplemental addendum pages may be included
cover items not in manual
or supersede items in manual

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Prepare the Site

Site Construction Manual

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Clear and grade site
1/2" per foot for first 10'

If the home skirted start
grading 2' IN from the edge

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Determine soil bearing capacity

- Soil test by licensed design professional
- Soil records
- Visual examination – Tabular values

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Determine soil bearing capacity

Soil test
Soil records
Visual examination

Soil Description	Allowable Soil Bearing Pressure (psf)
Rock or hard pan	4,000+
Sandy gravel and gravel; very dense and/or cemented sands; coarse gravel/cobbles, pre-loaded silts, clays and coral	2,000
Sand; silty sand; clayey sand; silty gravel; medium dense course sands; sandy gravel; and very stiff silt, sand clays	1,500
Loose to medium dense sands; firm to stiff clays and silts; alluvial fills	1,000
Loose sands; firm clays; alluvial fills	1,000
Uncompacted fill, peat, organic clays	Refer to 3285.202(e)

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Determine soil bearing capacity

Soil test	Soil Description	Allowable Soil Bearing Pressure (psf)
Visual e	Rock or hard pan	4,000+
	Sandy gravel and gravel; very dense and/or compacted sand; coarse gravel; cobble; congl.	2,000
	Loose to medium dense sands; firm to stiff clays and silts; alluvial fills	1,000
	Loose sands; firm clays; alluvial fills	1,000
	Uncompacted fill; peat; organic clays	Refer to 3285.202(e)

- Use default capacity. Use an allowable pressure of 1,500 psf, unless site-specific information requires the use of lower values based on soil classification and type according to Table 4.

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Determine frost line depth

Consult the LAHJ – Table R301.2(1)

GROUND SNOW LOAD ¹	WIND DESIGN CATEGORY ²	WIND DESIGN REGION ³	WINDBORNE DEBRIS ZONE ⁴	SEISMIC DESIGN CATEGORY ⁵	SUBJECT TO DAMAGE FROM FROST LINE DEPTH ⁶		WINTER DESIGN TEMP ⁷	ICE DAMBER UNDERLAYMENT REQUIRED ⁸	FLOOD HAZARD ⁹	AIR FREEZING INDEX ¹⁰	MEAN ANNUAL TEMP ¹¹
					Residential	Proactor					

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Install Footings

SAMPLE

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Determine Support Locations

All homes will need supports under

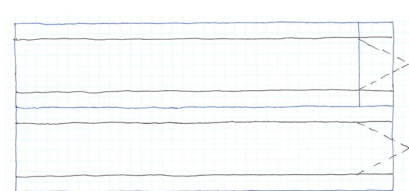
- the frame
- marriage line
- exterior wall openings
- other heavy point loads (Point Loads)

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Create a sketch of the home that includes the exterior walls, the frame I-beams and the marriage line(s), if a multi-section home. The sketch will be used in this chapter to locate each support, and note the size of the corresponding footing.



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Additional Point Load Locations

- Side wall exterior doors – hinge & latch sides
- Other side wall openings, 4' and greater – both sides
- Marriage line openings 4' and greater – both sides
- Through the rim crossover ducts
- Marriage line columns
- Load bearing porch posts
- Fireplaces (side wall or marriage wall only)

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Examine the floor plan

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Mark the required point load support locations on the sketch. Supports are not required where the manufacturer has reinforced the floor (such as with additional outriggers or floor joists) and so noted in the documentation provided with the home.

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Determine Point Loads

Tabular Data

TABLE 5. POINT LOAD ON FOOTINGS AT MARRIAGE LINE OPENINGS (LBS)
20 ft Max. Home Width

TABLE 5a. POINT LOAD ON FOOTINGS AT MARRIAGE LINE OPENINGS (LBS)
24 ft Double Section /36 ft Triple Section Max. Home Width

TABLE 5b. POINT LOAD ON FOOTINGS AT MARRIAGE LINE OPENINGS (LBS)
28 ft Double Section /42 ft Triple Section Max. Home Width

Roof Live Load (PSF)	4	8	12	14	16	18	20	24	28	32	36	40	44	48
20	1240	2080	2920	3340	3760	4180	4600	5440	6280	7120	7960	8800	9640	10480
30	2640	3760	4880	5440	6000	6560	7120	8240	9360	10480	11600	12720	13840	14960
40	3200	4600	6000	6700	7400	8100	8800	10200	11600	13000	14400	15800	17200	18600

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Determine Point Loads

Tabular Data

TABLE 5. POINT LOAD

If the support pier is shared by both sides, add the loads together to arrive at total for that location

TABLE 5a. POINT LOAD
24 ft Double Section /36 ft Triple Section Max. Home Width

TABLE 5b. POINT LOAD ON FOOTINGS AT MARRIAGE LINE OPENINGS (LBS)
28 ft Double Section /42 ft Triple Section Max. Home Width

Roof Live Load (PSF)	4	8	12	14	16	18	20	24	28	32	36	40	44	48
20	1240	2080	2920	3340	3760	4180	4600	5440	6280	7120	7960	8800	9640	10480
30	2640	3760	4880	5440	6000	6560	7120	8240	9360	10480	11600	12720	13840	14960
40	3200	4600	6000	6700	7400	8100	8800	10200	11600	13000	14400	15800	17200	18600

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28' Double Section 30# Roof Live Load

Tabular Data

TABLE 5b. POINT LOAD ON FOOTINGS AT MARRIAGE LINE OPENINGS (LBS)
28 ft Double Section /42 ft Triple Section Max. Home Width

Roof Live Load (PSF)	4	8	12	14	16	18	20	24	28	32	36	40	44	48
20	1240	2080	2920	3340	3760	4180	4600	5440	6280	7120	7960	8800	9640	10480
30	2640	3760	4880	5440	6000	6560	7120	8240	9360	10480	11600	12720	13840	14960
40	3200	4600	6000	6700	7400	8100	8800	10200	11600	13000	14400	15800	17200	18600

18' Marriage Opening Point Load – 6560 + 6560 = 13120#
4' Marriage Opening Point Load – 2640 + 2640 = 7920#

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Frame Support Locations

No more than 24" from outside edge to center of pier

- 8" Main I-beam
8' max spacing
- 10" or greater Main I-beam
10' max spacing

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PERIMETER BLOCKING

All homes require regularly spaced supports along all main frame I-beams. Select spacing between supports and sketch them on the support plan. Keep in mind that frame supports

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Determine Frame Support Loads

Tabular Data

TABLE 6a. LOAD ON FRAME PIER FOOTINGS FOR HOMES NOT REQUIRING PERIMETER BLOCKING EXCEPT AT OPENINGS (LBS)
Roof Load Zone and Max. Home Width (1-1/2" Max. Sidewall Eave Overhang)

TABLE 6b. LOAD ON FRAME PIER FOOTINGS FOR HOMES NOT REQUIRING PERIMETER BLOCKING EXCEPT AT OPENINGS (LBS)
Roof Load Zone and Max. Home Width (6" Max. Sidewall Eave Overhang)

TABLE 6c. LOAD ON FRAME PIER FOOTINGS FOR HOMES NOT REQUIRING PERIMETER BLOCKING EXCEPT AT OPENINGS (LBS)
Roof Load Zone and Max. Home Width (12" Max. Sidewall Eave Overhang)

TABLE 6d. LOAD ON FRAME PIER FOOTINGS FOR HOMES NOT REQUIRING PERIMETER BLOCKING EXCEPT AT OPENINGS (LBS)
Roof Load Zone and Max. Home Width (24" Max. Sidewall Eave Overhang)

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Tabular Data

28' Double Section 30# Roof Live Load
6" Overhang 8' Spacing

TABLE 6e. LOAD ON FRAME PIER FOOTINGS FOR HOMES NOT REQUIRING PERIMETER BLOCKING EXCEPT AT OPENINGS (LBS)
Roof Load Zone and Max. Home Width (6" Max. Sidewall Eave Overhang)

Pier Spacing	South (20 psf)					Middle (30 psf)					North (40 psf)				
	10 ft	12 ft	14 ft	16 ft	18 ft	10 ft	12 ft	14 ft	16 ft	18 ft	10 ft	12 ft	14 ft	16 ft	18 ft
Up to 4'	2240	2564	2888	3185	3455	2460	2824	3188	3522	3825	2680	3084	3488	3858	4195
> 4' to 6'	3160	3646	4132	4578	4983	3490	4036	4582	5083	5538	3820	4426	5032	5588	6093
> 6' to 8'	4080	4728	5376	5750	6510	4520	5248	5976	6643	7250	4990	5768	6576	7317	7990
> 8' to 10'	5000	5810	6620	7368	8038	5550	6460	7370	8204	8963	6100	7110	8120	9046	9888

Main Support Loads – 5976#

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Tabular Data

28' Double Section 30# Roof Live Load

TABLE 6d. LOAD ON PIER FOOTINGS AT OPENINGS ALONG THE SIDEWALL (LBS)
Roof Load Zone and Max. Home Width (24" Max. Sidewall Eave Overhang)

Pier Spacing	South (20 psf)					Middle (30 psf)					North (40 psf)				
	10/20 ft	12/24 ft	14/28/42 ft	16/32/48 ft	18 ft	10/20 ft	12/24 ft	14/28/42 ft	16/32/48 ft	18 ft	10/20 ft	12/24 ft	14/28/42 ft	16/32/48 ft	18 ft
Up to 3'	1025	1100	1175	1244	1306	1400	1520	1640	1750	1850	1960	2160	2360	2543	2710
> 3' to 4'	1150	1240	1330	1413	1488	1650	1800	1950	2088	2213	2350	2600	2850	3079	3288
> 4' to 5'	1275	1380	1485	1581	1669	1820	2000	2180	2320	2450	2620	2900	3180	3479	3788
> 5' to 6'	1400	1500	1600	1692	1775	1980	2160	2340	2480	2610	2840	3140	3440	3749	4068
> 6' to 8'	1680	1840	2000	2147	2280	2400	2600	2800	3000	3200	3400	3700	4000	4300	4600
> 8' to 10'	2320	2560	2800	3000	3200	3400	3600	3800	4000	4200	4400	4600	4800	5000	5200

Side wall 3' exterior door – 1400#
Side wall 6' sliding door – 2400#

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Begin to put it together...

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Perimeter Support Locations


If necessary

Indicated by labels or white paint

Notation on Data Plate requiring sidewall supports

8' max spacing

Bearing walls only

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Tabular Data

TABLE 7. LOAD ON FRAME AND PERIMETER PIER FOOTINGS FOR HOMES REQUIRING PERIMETER BLOCKING (LB)

Roof Load Zone and Max. Home Width (1-1/2" Max. Sidewall Eave Overhang)

TABLE 7A. LOAD ON FRAME AND PERIMETER PIER FOOTINGS FOR HOMES REQUIRING PERIMETER BLOCKING (LB)

Roof Load Zone and Max. Home Width (6" Max. Sidewall Eave Overhang)

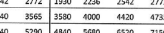
TABLE 7B. LOAD ON FRAME AND PERIMETER PIER FOOTINGS FOR HOMES REQUIRING PERIMETER BLOCKING (LB)

Roof Load Zone and Max. Home Width (12" Max. Sidewall Eave Overhang)

TABLE 7C. LOAD ON FRAME AND PERIMETER PIER FOOTINGS FOR HOMES REQUIRING PERIMETER BLOCKING (LB)

Roof Load Zone and Max. Home Width (24" Max. Sidewall Eave Overhang)

Pier Specifying Location	South (30 psf)				Middle (60 psf)				North (40 psf)			
	20 ft. 24/25 ft. 28/28 ft. 32/32 ft.	20 ft. 24/25 ft. 28/28 ft. 32/32 ft.	20 ft. 24/25 ft. 28/28 ft. 32/32 ft.	20 ft. 24/25 ft. 28/28 ft. 32/32 ft.	20 ft. 24/25 ft. 28/28 ft. 32/32 ft.	20 ft. 24/25 ft. 28/28 ft. 32/32 ft.	20 ft. 24/25 ft. 28/28 ft. 32/32 ft.	20 ft. 24/25 ft. 28/28 ft. 32/32 ft.	20 ft. 24/25 ft. 28/28 ft. 32/32 ft.	20 ft. 24/25 ft. 28/28 ft. 32/32 ft.	20 ft. 24/25 ft. 28/28 ft. 32/32 ft.	20 ft. 24/25 ft. 28/28 ft. 32/32 ft.
Up to 4' Frame	1420	1628	1828	2091	1420	1624	1828	1981	1420	1624	1828	1981
Up to 4' Sidewall	1420	1520	1640	1730	1680	1840	2000	2120	1800	2160	2360	2510
Up to 4' Marriage wall	1760	2000	2240	2420	2160	2480	2800	3040	2560	2960	3360	3600
> 4' to 6' Frame	1930	2236	2542	2772	1930	2236	2542	2772	1930	2236	2542	2772
> 4' to 6' Sidewall	1800	2080	2260	2395	2320	2550	2800	2980	2740	3040	3340	3560
> 4' to 6' Marriage wall	2440	2900	3160	3430	3040	3520	4000	4360	3640	4240	4840	5290

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Size Footings

Loads

Soil Bearing Capacity

Size to distribute load evenly

At or below frost line

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Tabular Data

Side wall 3' exterior door – 1400#

Side wall 6' sliding door – 2400#


1500PSF Soil Bearing Capacity

TABLE 10. FOOTING DIMENSIONS

Pier Capacity (lbs)	Soil Bearing Capacity (PSF)						Round Footer Diameter
	1000	1500	2000	2500	3000	4000	
1000	144	128	128	128	128	128	18"
1200	173	128	128	128	128	128	
1400	202	134	128	128	128	128	
1600	230	154	128	128	128	128	
1800	250	173	130	128	128	128	
2000	288	192	144	128	128	128	
2200	317	211	158	128	128	128	
2400	346	230	173	128	128	128	
2600	374	250	187	128	128	128	
2800	403	269	202	128	128	128	
3000	432	288	216	128	128	128	
3100	446	298	223	128	128	128	

Side wall 3' ext. door – 134sqin

Side wall 6' sliding door – 230sqin or 18" round

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Minimum Footing Size

1500PSF Soil Bearing Capacity

3' Sidewall exterior door	1400#	134sqin	18"
6' Sidewall sliding door	2400#	230sqin	18"
4' Marriage line pier	7920# (8000)	768sqin	32"
18' Marriage line pier	13120# (13500)	1296sqin	42"
8' OC Frame piers	5976# (6000)	576sqin	30"


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Set the Home

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Pier Materials


Concrete Block: 8"x8"x16" Nominal

Cap Block: 4"x8"x16" SOLID Masonry; 2x8 Lumber; ½" steel

Spacers: 2" Lumber; 2" or 4" Solid Masonry

Shims: 4"x6"x1" used in PAIRS

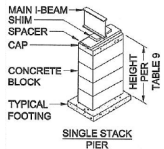
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Main Frame Pier Configuration



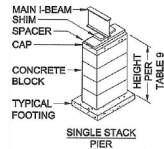
Pier Configuration	Height	Configuration	Maximum load (lbs)	
			Without Mortar	With Mortar
Single Stack	Less than 36 in *	Single stack blocks with long side perpendicular to frame I-beam or parallel to perimeter rail (rim joist)	5,760	7,680

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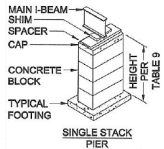
Pier Configuration	Height	Configuration	Maximum load (lbs)	
			Without Mortar	With Mortar
Single Stack	Less than 36 in *	Single stack blocks with long side perpendicular to frame I-beam or parallel to perimeter rail (rim joist)	5,760	7,680

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Pier Configuration	Height	Configuration	Maximum load (lbs)	
			Without Mortar	With Mortar
Single Stack	Less than 36 in *	Single stack blocks with long side perpendicular to frame I-beam or parallel to perimeter rail (rim joist)	5,760	7,680

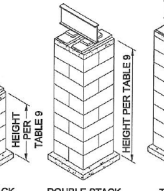
* Single stack piers may be constructed up to 54" max ONLY when installed as perimeter and marriage line piers

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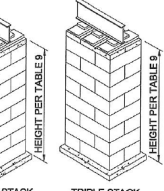
Pier Configuration	Height	Configuration	Maximum load (lbs)	
			Without Mortar	With Mortar
Single Stack	Less than 36 in *	Single stack blocks with long side perpendicular to frame I-beam or parallel to perimeter rail (rim joist)	5,760	7,680
Double Stack	67" Max.	Double, interlocked blocks	11,520	15,360

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Pier Configuration	Height	Configuration	Maximum load (lbs)	
			Without Mortar	With Mortar
Single Stack	Less than 36 in *	Single stack blocks with long side perpendicular to frame I-beam or parallel to perimeter rail (rim joist)	5,760	7,680
Double Stack	67" Max.	Double, interlocked blocks	11,520	15,360
Triple Stack	67" Max.	Triple, interlocked blocks	17,280	23,040
Double Reinforced	108" Max. **	Double, interlocked blocks	NA	39,500

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Maximum offset top to bottom

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Marriage Line Pier Configuration

Single Stack blocks*

Long side perpendicular to the marriage line

Caps: 4" solid, 2" lumber, 1/2" thick steel

Spacer: 2" hardwood or 2" concrete block

Shims: 4"x6" by 1" max

*8000# Maximum weight capacity

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Commercial Steel Piers

Range in height from 8" to 30" (2" increments)

Constructed of 1" wide angle steel

0.13 inch thickness

Steel conforms to ASTM A-36

Working load of 6000# (3:1 safety factor)

Labeled with listing & load capacity

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Remember

Do not exceed capacity with Pier Loads

MINUTE MAN ANCHORS
RADCO # 1350
 RATED 6,000 POUNDS/2" MAX PIER HEAD EXTENSION
WARNING! DO NOT SET PIER DIRECTLY ON SOIL.
DO NOT USE PIER AS AN AUTOMOTIVE JACK STAND.

Pier Spacing	Roof Load Zone and Max. Home Width (6" Max. Sillwall Eave Overhang)																	
	South (20 psf)						Middle (30 psf)						North (40 psf)					
	10 ft	12 ft	14 ft	16 ft	18 ft	10 ft	12 ft	14 ft	16 ft	18 ft	10 ft	12 ft	14 ft	16 ft	18 ft			
Up to 4'	2240	2564	2888	3185	3455	2460	2824	3188	3522	3825	2680	3084	3488	3858	4195			
> 4' to 6'	3160	3646	4132	4578	4983	3490	4036	4582	5083	5538	3820	4426	5032	5588	6093			
> 6' to 8'	4080	4728	5376	5790	6510	4520	5248	5976	6643	7250	4960	5768	6576	7317	7990			
> 8' to 10'	5000	5810	6620	7368	8038	5550	6460	7370	8204	8963	6100	7110	8120	9046	9888			

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Center of "T" beam must line up with center of threaded rod on pier head.

MAX 2" EXTENSION

Pier must be supported underneath the base with a footing pad designed for the load required by the home or building manufacturer.

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Center of "T" beam must line up with center of threaded rod on pier head.

MAX 2" EXTENSION

Bend one side of pier head over the bottom of the "T" beam flange.


STANDARD PIER HEAD

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Complete Multi-Section Set

Site Construction Manual

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Marriage Line Components

Marriage Line Gasket
Free of gaps or tears

Through the rim joist HVAC ducts
Additional support pier required
Fasteners at each side
Free of obstructions (shipping covers, etc)
Gasket free of gaps or tears

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Marriage Line Components

Marriage Line Gasket
Free of gaps or tears

Through the rim ducts
Additional support pier required
Fasteners at each side
Free of obstructions (shipping covers, etc)
Gasket free of gaps or tears

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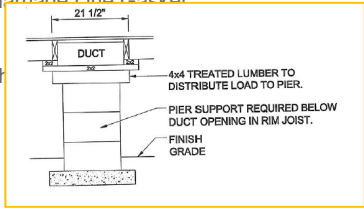


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Marriage Line Components

Marriage Line Gasket



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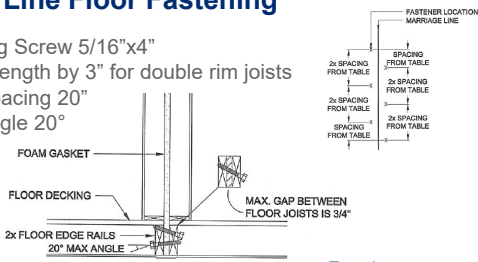


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Marriage Line Floor Fastening

Fastener: Lag Screw 5/16"x4"
Increase length by 3" for double rim joists
Maximum Spacing 20"
Maximum Angle 20°



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End Wall Connections

Many methods specified in manual
Utilize appropriate method

Example
Through exterior sheathing
#10 x 4 1/2" Wood screw 16" OC
3/8" x 6" Lag bolt 28" OC

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Interior Wall Connections

Through framing members
 #10 x 4 1/2" Wood screw 24" OC
 3/8" x 6" Lag bolt 48" OC

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Roof Connections

26ga 1 1/2" wide Metal strap 48" OC
 fastened with (9) 7/16" 16ga staples or
 (9) 1 1/2" roofing nails 2" OC

#10 x 4 1/2" Wood Screw 11" OC

#10 x 4-1/2" WOOD SCREWS (TOE SCREWED) INTO ROOF EDGE RAILS OR RIDGE BEAMS PER CHART

2x CONT. ROOF EDGE RAIL OR RIDGE BEAM.

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Inspection...

Marriage Line Components
 Marriage Line Floor Fastening
 End Wall Connections
 Interior Wall Connections
 Roof Connections

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Stabilizing Systems

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Determine Locations

TABLE 17. ANCHOR LOCATION TYPES

Location	Type	Wind Zone I	Wind Zones II and III	See page
SideWall	Frame	Yes	Yes	76
	Vertical	No	Yes	87
Longitudinal	Frame	Yes	Yes	87
	Vertical	No	No	-
Marriage line	Vertical	No	Yes	89
	Frame	Yes	Yes	89
Tag Unit	Vertical	No	Yes	-
	Vertical	Yes	Yes	89
Porch Post	Vertical	Yes	Yes	89
	Vertical	Yes	Yes	89

¹ Install marriage line anchors prior to moving the home over the top of the anchor locations and then return to Set the Home or Complete Multi Section Set respectively.

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Tabular Data

TABLE 18. SINGLE SECTION - WIND ZONE I FRAME TIEDOWN SPACING

Max. Wall Height	Max. Floor Height	10 ft Max. Width I-Beam Spacing	12 ft Max. Width I-Beam Spacing	14 ft Max. Width I-Beam Spacing
79.5"	95.5"	95.5"	99.5"	95.5" 99.5" 112"

TABLE 18a. MULTI SECTION - WIND ZONE I FRAME TIEDOWN SPACING

Max. Wall Height	Max. Floor Height	20 ft Max. Width I-Beam Spacing	24 ft Max. Width I-Beam Spacing	28 ft Max. Width I-Beam Spacing	32 ft Max. Width I-Beam Spacing
79.5"	95.5"-99.5"	79.5"	95.5"-99.5"	112"	95.5"-99.5" 112"

TABLE 18b. MULTI SECTION - WIND ZONE I FRAME TIEDOWN SPACING (FT) - MAX. ROOF PITCH 5/12

Max. Wall Height	Max. Floor Height	20 ft Max. Width I-Beam Spacing	24 ft Max. Width I-Beam Spacing	28 ft Max. Width I-Beam Spacing	32 ft Max. Width I-Beam Spacing
79.5"	95.5"-99.5"	79.5"	95.5"-99.5"	112"	95.5"-99.5" 112"

Type of home (single, multi)
 Roof pitch
 Section width
 Sidewall height
 I-beam spacing
 Height from ground

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Tabular Data 28' Multi Section 99 1/2" Beam
Side wall height 8' Floor height 48'
5/12 Roof pitch

Max. Wall Height	Max. Floor Height	20 ft Max. Width I-Beam Spacing				24 ft Max. Width I-Beam Spacing				28 ft Max. Width I-Beam Spacing				32 ft Max. Width I-Beam Spacing			
		79.5"	95.5"-99.5"	79.5"	95.5"-99.5"	112"	95.5"-99.5"	112"	95.5"-99.5"	112"	95.5"-99.5"	112"	95.5"-99.5"	112"	95.5"-99.5"	112"	
8 ft	25'	12'-0"	12'-0"	11'-0"	12'-0"	12'-0"	10'-4"	8'-0"	11'-8"	11'-4"	10'-8"	11'-4"	11'-4"	11'-4"	11'-4"	11'-4"	
9 ft	48'	10'-8"	10'-0"	11'-6"	11'-0"	10'-8"	11'-8"	11'-8"	8'-4"	12'-0"	11'-8"	11'-8"	11'-8"	11'-8"	11'-8"	11'-8"	
10 ft	67'	5'-8"	5'-0"	6'-0"	5'-8"	5'-6"	6'-4"	6'-0"	6'-6"	6'-6"	6'-6"	6'-6"	6'-6"	6'-6"	6'-6"	6'-6"	
9 ft	25'	5'-0"	4'-6"	5'-6"	5'-0"	4'-8"	5'-6"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	
9 ft	48'	11'-4"	12'-0"	10'-0"	11'-0"	12'-0"	9'-0"	11'-8"	11'-8"	11'-8"	11'-8"	11'-8"	11'-8"	11'-8"	11'-8"	11'-8"	
9 ft	67'	9'-8"	9'-0"	10'-4"	10'-0"	12'-0"	9'-0"	9'-8"	9'-8"	9'-8"	9'-8"	9'-8"	9'-8"	9'-8"	9'-8"	9'-8"	
10 ft	25'	5'-4"	4'-8"	5'-8"	5'-6"	5'-0"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	
10 ft	48'	4'-8"	4'-0"	5'-0"	4'-8"	4'-6"	5'-4"	5'-0"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	
10 ft	67'	9'-0"	11'-0"	9'-0"	9'-0"	9'-8"	8'-4"	6'-8"	9'-8"	9'-8"	9'-8"	9'-8"	9'-8"	9'-8"	9'-8"	9'-8"	
	80'	8'-8"	8'-4"	9'-6"	9'-0"	8'-8"	9'-4"	9'-6"	6'-8"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	
	80'	5'-0"	4'-6"	5'-4"	5'-0"	4'-8"	5'-4"	5'-4"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	

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Tabular Data 28' Multi Section 99 1/2" Beam
Side wall height 8' Floor height 48'
5/12 Roof pitch

Max. Wall Height	Max. Floor Height	20 ft Max. Width I-Beam Spacing				24 ft Max. Width I-Beam Spacing				28 ft Max. Width I-Beam Spacing				32 ft Max. Width I-Beam Spacing			
		79.5"	95.5"-99.5"	79.5"	95.5"-99.5"	112"	95.5"-99.5"	112"	95.5"-99.5"	112"	95.5"-99.5"	112"	95.5"-99.5"	112"	95.5"-99.5"	112"	
8 ft	25'	12'-0"	12'-0"	11'-0"	12'-0"	12'-0"	10'-4"	8'-0"	11'-8"	11'-4"	10'-8"	11'-4"	11'-4"	11'-4"	11'-4"	11'-4"	
9 ft	48'	10'-8"	10'-0"	11'-6"	11'-0"	10'-8"	11'-8"	11'-8"	8'-4"	12'-0"	11'-8"	11'-8"	11'-8"	11'-8"	11'-8"	11'-8"	
10 ft	67'	5'-8"	5'-0"	6'-0"	5'-8"	5'-6"	6'-4"	6'-0"	6'-6"	6'-6"	6'-6"	6'-6"	6'-6"	6'-6"	6'-6"	6'-6"	
9 ft	25'	5'-0"	4'-6"	5'-6"	5'-0"	4'-8"	5'-6"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	
9 ft	48'	11'-4"	12'-0"	10'-0"	11'-0"	12'-0"	9'-0"	11'-8"	11'-8"	11'-8"	11'-8"	11'-8"	11'-8"	11'-8"	11'-8"	11'-8"	
9 ft	67'	9'-8"	9'-0"	10'-4"	10'-0"	12'-0"	9'-0"	9'-8"	9'-8"	9'-8"	9'-8"	9'-8"	9'-8"	9'-8"	9'-8"	9'-8"	
10 ft	25'	5'-4"	4'-8"	5'-8"	5'-6"	5'-0"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	
10 ft	48'	4'-8"	4'-0"	5'-0"	4'-8"	4'-6"	5'-4"	5'-0"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	
10 ft	67'	9'-0"	11'-0"	9'-0"	9'-0"	9'-8"	8'-4"	6'-8"	9'-8"	9'-8"	9'-8"	9'-8"	9'-8"	9'-8"	9'-8"	9'-8"	
	80'	8'-8"	8'-4"	9'-6"	9'-0"	8'-8"	9'-4"	9'-6"	6'-8"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	
	80'	5'-0"	4'-6"	5'-4"	5'-0"	4'-8"	5'-4"	5'-4"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	

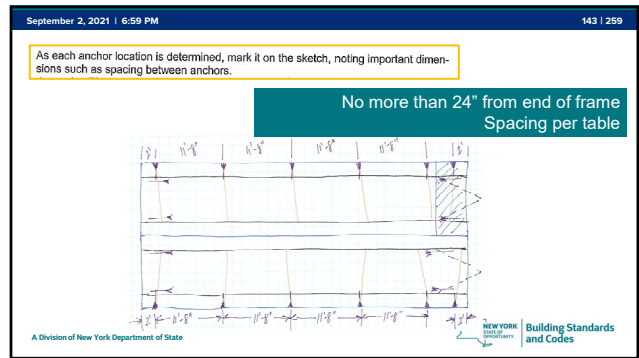
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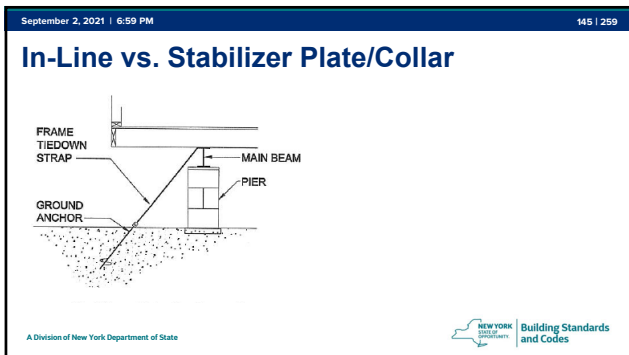
Tabular Data 28' Multi Section 99 1/2" Beam
Side wall height 8' Floor height 48'
5/12 Roof pitch

Max. Wall Height	Max. Floor Height	20 ft Max. Width I-Beam Spacing				24 ft Max. Width I-Beam Spacing				28 ft Max. Width I-Beam Spacing				32 ft Max. Width I-Beam Spacing			
		79.5"	95.5"-99.5"	79.5"	95.5"-99.5"	112"	95.5"-99.5"	112"	95.5"-99.5"	112"	95.5"-99.5"	112"	95.5"-99.5"	112"	95.5"-99.5"	112"	
8 ft	25'	12'-0"	12'-0"	11'-0"	12'-0"	12'-0"	10'-4"	8'-0"	11'-8"	11'-4"	10'-8"	11'-4"	11'-4"	11'-4"	11'-4"	11'-4"	
9 ft	48'	10'-8"	10'-0"	11'-6"	11'-0"	10'-8"	11'-8"	11'-8"	8'-4"	12'-0"	11'-8"	11'-8"	11'-8"	11'-8"	11'-8"	11'-8"	
10 ft	67'	5'-8"	5'-0"	6'-0"	5'-8"	5'-6"	6'-4"	6'-0"	6'-6"	6'-6"	6'-6"	6'-6"	6'-6"	6'-6"	6'-6"	6'-6"	
9 ft	25'	5'-0"	4'-6"	5'-6"	5'-0"	4'-8"	5'-6"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	
9 ft	48'	11'-4"	12'-0"	10'-0"	11'-0"	12'-0"	9'-0"	11'-8"	11'-8"	11'-8"	11'-8"	11'-8"	11'-8"	11'-8"	11'-8"	11'-8"	
9 ft	67'	9'-8"	9'-0"	10'-4"	10'-0"	12'-0"	9'-0"	9'-8"	9'-8"	9'-8"	9'-8"	9'-8"	9'-8"	9'-8"	9'-8"	9'-8"	
10 ft	25'	5'-4"	4'-8"	5'-8"	5'-6"	5'-0"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	
10 ft	48'	4'-8"	4'-0"	5'-0"	4'-8"	4'-6"	5'-4"	5'-0"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	
10 ft	67'	9'-0"	11'-0"	9'-0"	9'-0"	9'-8"	8'-4"	6'-8"	9'-8"	9'-8"	9'-8"	9'-8"	9'-8"	9'-8"	9'-8"	9'-8"	
	80'	8'-8"	8'-4"	9'-6"	9'-0"	8'-8"	9'-4"	9'-6"	6'-8"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	
	80'	5'-0"	4'-6"	5'-4"	5'-0"	4'-8"	5'-4"	5'-4"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	5'-8"	

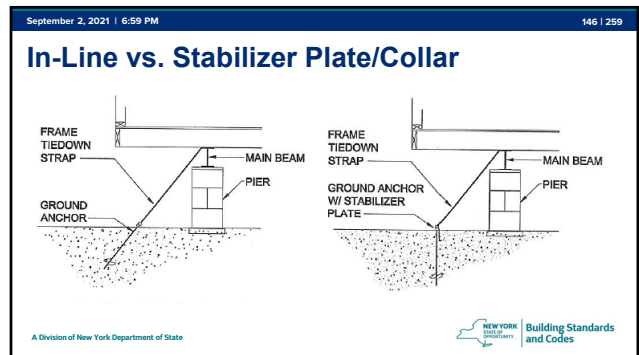
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In-Line vs. Stabilizer Plate/Collar

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Straps

Utilize radius clips – if strap wraps frame
galvanized strap – formed to fit corners of frame

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Straps

Utilize radius clips – if strap wraps frame
galvanized strap – formed to fit corners of frame

Connection to top of beam

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Tension strap and anchor
minimum 3 complete turns around

Fewer than 3 turns
strap may not hold when force applied

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Longitudinal Frame Anchors

Bracket provided by factory

Beam clamp

Installed same as frame tie-downs

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Alternative Foundation Designs

Slabs/Basements

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Introduction


When installer

Does not provide support and anchorage in accordance with manual

Encounters site conditions (flood hazard area)

Or other conditions that prevent the use of instructions provided in the manual

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The installer must obtain site specific design

1. From the manufacturer
2. Or from a local licensed design professional.
These designs **must** be approved by manufacturer and DAPIA

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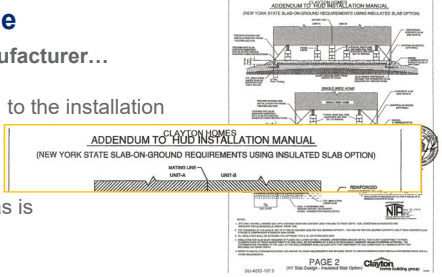
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Slab Example

1. From the manufacturer...

Part of/addendum to the installation instructions

Plan acceptable as is




ADDENDUM TO HUD INSTALLATION MANUAL
(NEW YORK STATE SLAB-ON-GROUND REQUIREMENTS USING INSULATED SLAB OPTION)

CLAYTON HOMES

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2. Or from a local licensed design professional.
designs must be approved by manufacturer and DAPIA

Site specific

Soil conditions indicated (ie: Bearing Capacity, Moisture Content)

Protection from effects of frost (ie: drainage, insulation)

Support and anchorage (consistent with Manuf. Installation Inst.)



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Crawlspace/Basement Example


Special considerations...

Floor framing system & Steel Frame Assembly
Combine as an integrated unit for intended life of MH

MH Chassis may not be removed under HUD regulations

Foundations must accommodate the special MH support requirements of this integrated design

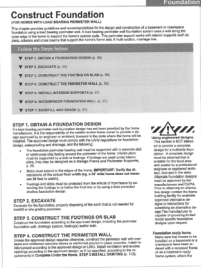
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This chapter provides guidelines and recommendations for the design and construction of a basement or crawlspace foundation using a load bearing perimeter wall...



Construct Foundation

- STEP 1. OBTAIN A FOUNDATION DESIGN
- STEP 2. EXCAVATE
- STEP 3. CONSTRUCT THE FOOTING ON SLAB
- STEP 4. CONSTRUCT THE PERIMETER WALL


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This chapter recommends construction crawlspace bearing per



Using engineered designs.
This section is NOT intended to provide a complete design for a buildable foundation. A complete design must be obtained that is suitable for the local area and sealed by a professional engineer...

Construct Foundation
The chapter will cover the construction of foundations for various types of buildings. The foundation design and construction must be in accordance with the applicable code requirements. The foundation design and construction must be in accordance with the applicable code requirements.

- STEP 1. OBTAIN A FOUNDATION DESIGN
- STEP 2. EXCAVATE
- STEP 3. CONSTRUCT THE FOOTING OR SLAB
- STEP 4. CONSTRUCT THE PERIMETER WALL

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Responsibility of retailer/installer or homeowner

Foundation design by NYS registered design professional

- in conformance with Uniform Code, and
- requirements within the installation manual
- Manufacturer and DAPIA approval



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Traditional recessed frame with cross channels and "outriggers"

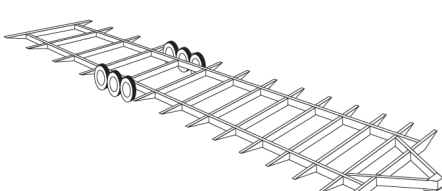


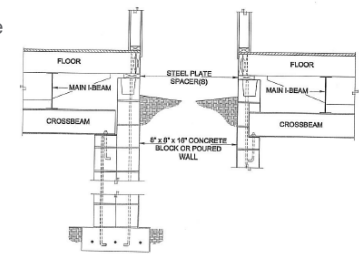
Figure 2-1. Traditional chassis system.

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Traditional recessed frame with cross channels and "outriggers"



Rim joist sets on wall
Utilizing cross beams to support Main I-beams

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Integrated frame

Moves steel beams to perimeter

Requires support at side wall and centerline

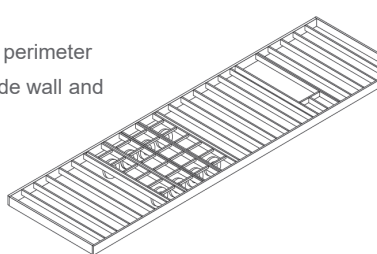


Figure 2-2. Integrated floor system consisting of steel-reinforced perimeter framing.

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Integrated frame

Moves steel beams to perimeter

Requires support at side wall and centerline

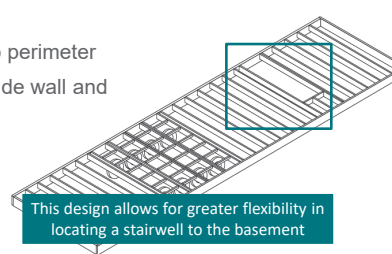


Figure 2-2. Integrated floor system consisting of steel-reinforced perimeter framing.

This design allows for greater flexibility in locating a stairwell to the basement

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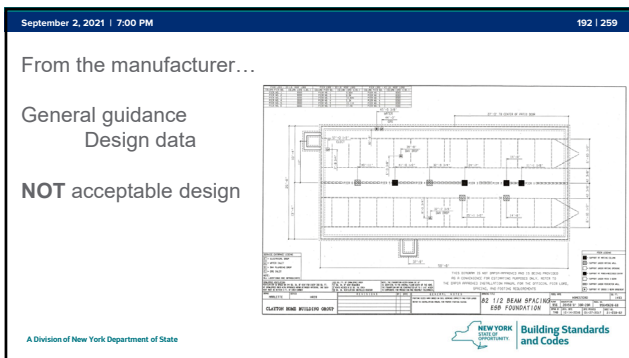
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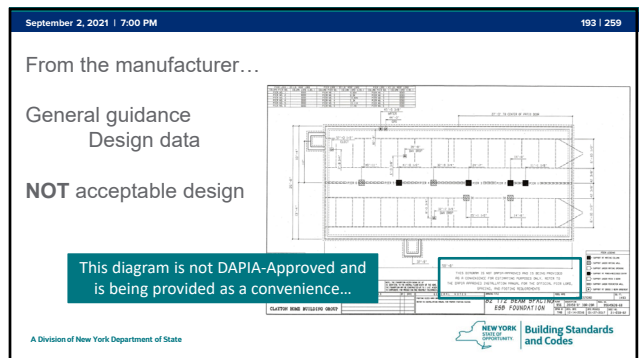
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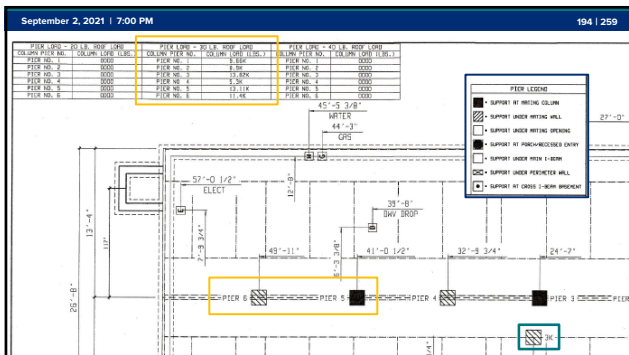
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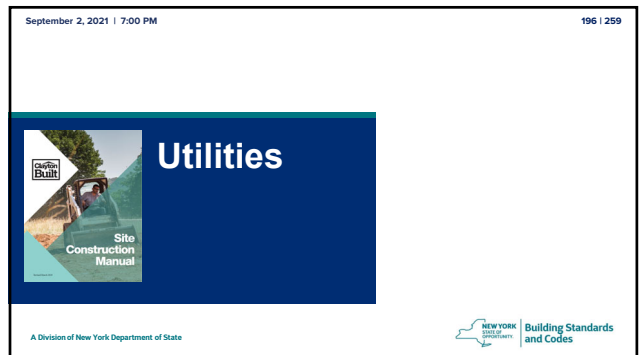
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AE404.1 Building Service Equipment.

The installation, *alteration*, repair, replacement, *addition* to or maintenance of the building service *equipment* within the *manufactured home* shall conform to regulations set forth in the Manufactured Home Standards. Such work that is located outside the *manufactured home* shall comply with this code.

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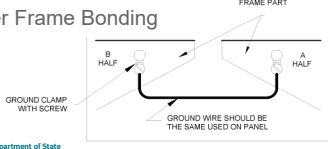
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Electric Service

Installation by qualified professionals
Electrical Inspection – required
Service amperage to match distribution panel amperage

Remember Frame Bonding



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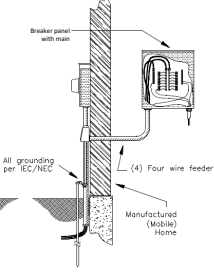
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Service Equipment – sidewall


Permitted to be in or on MH in conformance with requirement's of *NEC 70-(2005) §550.32(B)

"Where the service equipment is not installed in or on the unit, the installation shall comply with the other provisions of this section"

* Remember: Preemption



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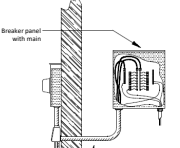
Service Equipment – sidewall

Permitted to be in or on MH in conformance with requirement's of *NEC 70-(2005) §550.32(B)


"Where the service equipment is not installed in or on the unit, the installation shall comply with the other provisions of this section"

§3280.801(a) Subpart I (Electrical Systems) of this part and Part II (Mobile and Manufactured Homes) of Article 550 of the NEC (NFPA 70-2005) cover the electrical conductors and equipment installed within or on manufactured homes **and the conductors that connect manufactured homes to a supply of electricity.**

* Remember: Preemption



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Service Equipment – remote

In sight from MH
Less than 30' from sidewall
*NEC 70-(2005) §550.32

* Remember: Preemption

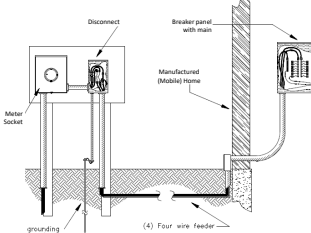



Figure 2 - Typical underground service entrance on remote structure (service entrances may be overhead or underground)

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Water Service

Protect from freezing
Insulation
Heat tape installation (GFCI protected outlet, under home)

Water heater pan drain to exterior

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Water Service

Protect from freezing
Insulation
Heat tape installati
Water heater pan drai

APPROVED BY
NIA INC.
REVISED
Mar 11, 2016
FEDERAL MANUFACTURING CODE
CONSTRUCTION AND SAFETY STANDARDS

WATER HEATER PAN DRAIN CONNECTIONS SHALL BE INSTALLED AT THE END OF THE CONDENSATION LINE. THE CONDENSATION LINE SHALL NOT BE CONNECTED TO THE DRAIN PAN UNLESS THE DRAIN PAN IS INSTALLED AT THE END OF THE CONDENSATION LINE. ANY DRAIN PAN SHALL BE INSTALLED AT THE END OF THE CONDENSATION LINE.

Labels in diagram: TOP RULING LINE, DRAIN PAN, WATER HEATER, AFTER INSTALLED, PLUMBING & PIPE FITTERS, LOCAL 109 PUM, FLOOR DRAIN, LINE OUTLET, 1/2" MIN. & 2" MAX. PLUMBING CODE DIVISION (TYPICAL)

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Gas / Fuel Oil Service

Natural Gas or Liquid Petroleum Gas
Installation by qualified professionals

Fuel Oil
Installation by qualified professionals

Tank Installation in conformance with Uniform Code

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Complete Exterior Work

Site Construction Manual

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Miscellaneous

Repair and Seal Bottom Board

Install Ground Moisture Retarder
6-mil Polyethylene sheeting
Overlap 12" secured with tape or adhesive

Extend vents, drains and inlets to exterior

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Skirting

Is any structural or non structural crawlspace enclosure

Must be weather resistant materials

Must provide ventilation
prevent rodent entry

Follow conditioned space

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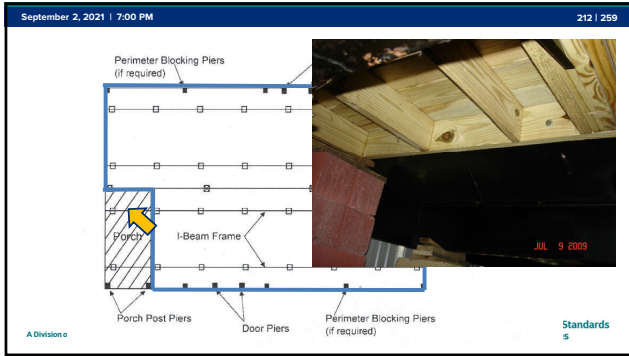
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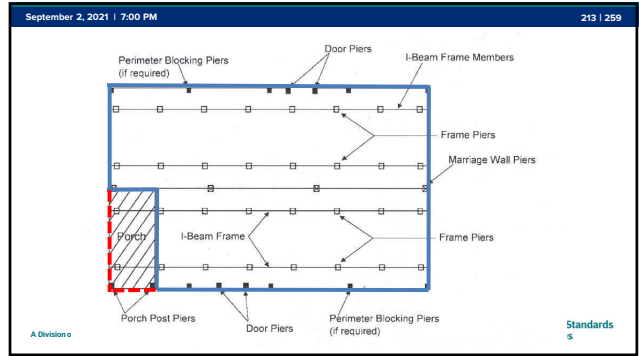
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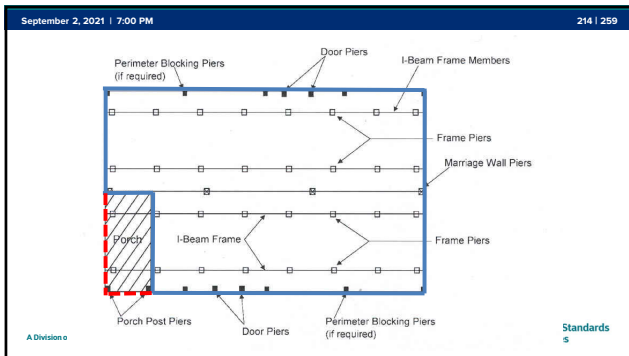
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Crawl Space Ventilation

Vents equal size, opposite sides
Within 3' of corners

144sqin net free vent for 1500sqft conditioned floor space

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NOTE: NFA not equal foundation opening size

Foundation Opening
8"x16"=128sqin

NFA = 39sqin

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Lets do some math...

1500 sq. ft. home

Solid block skirting with block vents (39sqin)

144 sq. in. ventilation required

39 sq. in. ventilation provided

$144 \div 39 = 3.69$

How many are needed? 4

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Lets do some math continued...

1500 sqft home


30" tall center vent vinyl skirting (12.25sqin)

144 sqin ventilation required

21 sqin ventilation provided

$144 \div 12.25 = 11.75$

How many are needed? 12



• Center vent panels offer 4.9 square inches/foot of ventilation

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Complete Site Built Structures

Install site built structures such as steps, landings, garages, awnings, carports, breezeways, porches, decks, railings, sheds and utility rooms according to manufacturer's instructions, **in compliance with all local regulations** including fire separation and electrical requirements, and according to the following:

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Complete

Install site built awnings, carports and utility rooms in compliance with electrical and electric.

- Do not obstruct any of the egress windows or the two required exit doors from the home.
- The addition must be entirely self-supported and cannot rely on the home for support (superficial connections are acceptable). The home's structural system is not designed to support the extra loads imposed by the addition.
- Do not damage the integrity of the home's structural or weatherproofing system. Seal any weatherproofing connections between the site built structure and the home and flash any roof connections.
- The home's structural system may not be cut or altered in any way. A registered engineer or architect shall approve any alterations or changes.
- Utilize only GFCI outlets for site built structures.
- Install and test smoke alarms in any site built structures according to local code.
- All joints between the home and the addition must be properly sealed so they are watertight.
- The home's mechanical system has been designed for the home itself and does not consider the heating or cooling of the addition.
- The addition must meet all local codes, including site work and fire separation requirements. The manufacturer does not accept any responsibility for the addition's design.
- The home with an addition must be in conformance with the HUD Manufactured Housing Code, such as egress, light and vent, etc. The addition must be approved by the jurisdiction having authority.
- Site work shall be consistent with the objectives of site grading as described in Prepare the Site (p. 15).
- The manufacturer will not honor the warranty for any problem that relates to the construction of the addition (leak problems, etc).

garages, awnings, sheds and utility rooms, in compliance with electrical and electric.

following:

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[NY] AE405 Exits

Exterior stairways and ramps that provide egress to the public way shall comply with **AE102.1.2.1** and all other applicable provisions of this code.

Should say AE102.2.1

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[NY] AE405 Exits

Exterior stairways and ramps that provide egress to the public way shall comply with **AE102.1.2.1** and all other applicable provisions of this code.

Should say AE102.2.1

(ie: R311 Means of Egress, R312 Guards, R403.1.4 Minimum [footing] depth...)

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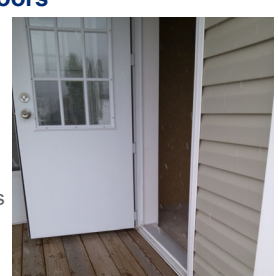
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[NY] R311.3.1 Landings at doors

Landing not more than 1.5" lower than the threshold

Exception: Landing or floor on exterior side shall not be more than 8 1/4" below the top of the threshold provided the door does not swing over the landing or floor



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[NY] R311.3.1 Landings at doors

Landing not more than the threshold...
 Exception: Landings on exterior side of door shall not be more than 8 1/4" below threshold...
 not swing of floor

Figure R311.3.1 THRESHOLD HEIGHTS
 For SI: 1 inch = 25.4 mm.

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R311.3.2 Landings at other exterior doors

Doors other than the required egress door shall be provided with landings or floors not more than 7 3/4 inches below the top of the threshold...

While [NY] R311.3.1, was modified by to match [NY] R311.7.5.1 Risers: "The riser height shall be not more than 8 1/4" inches..."

This dimension in R311.3.2 was not.

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Complete Check List

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Valuable Tool

Checklist to confirm the listed aspects of an installation are complete and correct

Included within MOST installation manuals since 2008

Typically completed by the installer

"Not all-inclusive" – has limits

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Valuable Tool

Checklist to confirm the listed aspects of an installation are complete and correct

Included within MOST installation manuals since 2008

Typically completed by the installer

"Not all-inclusive" – has limits

Limits of the Checklist.
 This checklist is not all-inclusive. Some homes have important features not listed here. Completing this checklist does not guarantee that all installation requirements have been met.

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Complete Installation Checklist	Complete Installation Checklist	Complete Installation Checklist
<p>GENERAL REQUIREMENTS</p> <ul style="list-style-type: none"> 1. The door shall be installed in accordance with the manufacturer's instructions. 2. The door shall be installed in a level and plumb opening. 3. The door shall be installed in a frame that is square and true. 4. The door shall be installed in a frame that is free of any obstructions. 5. The door shall be installed in a frame that is free of any damage. 6. The door shall be installed in a frame that is free of any rot or decay. 7. The door shall be installed in a frame that is free of any insect damage. 8. The door shall be installed in a frame that is free of any mold or mildew. 9. The door shall be installed in a frame that is free of any other defects. 10. The door shall be installed in a frame that is free of any other damage. 	<p>DOOR SWINGS</p> <ul style="list-style-type: none"> 1. The door shall swing in the direction indicated on the manufacturer's instructions. 2. The door shall swing clear of the frame and any other obstructions. 3. The door shall swing clear of the frame and any other damage. 4. The door shall swing clear of the frame and any other defects. 5. The door shall swing clear of the frame and any other damage. 6. The door shall swing clear of the frame and any other defects. 7. The door shall swing clear of the frame and any other damage. 8. The door shall swing clear of the frame and any other defects. 9. The door shall swing clear of the frame and any other damage. 10. The door shall swing clear of the frame and any other defects. 	<p>DOOR OPERATION</p> <ul style="list-style-type: none"> 1. The door shall operate smoothly and quietly. 2. The door shall operate without any binding or sticking. 3. The door shall operate without any excessive noise. 4. The door shall operate without any excessive vibration. 5. The door shall operate without any excessive heat or cold. 6. The door shall operate without any excessive humidity or dryness. 7. The door shall operate without any excessive air flow. 8. The door shall operate without any excessive sound. 9. The door shall operate without any excessive light. 10. The door shall operate without any excessive smoke or fumes.


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Minimum steps needed for a successful installation

- Foundation completed (approved by local)
- Anchoring systems completed
- Assembly completed
- Required testing completed


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Required Testing...

Smoke/CO alarms operational



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Required Testing...

Smoke/CO alarms

Water supply and drain line

WATER AND DRAIN SYSTEMS

- Crossover and service connection and splices have been properly made with correct materials
- Water and drain lines are insulated or otherwise protected from freezing
- Pipe supports are installed and properly spaced
- Proper slope has been maintained on all drain lines**
- All necessary inspections and tests have been performed
- All sinks, basins, tubs, and toilets operate properly
- All hot and cold water lines are properly connected to fixtures, dispense water as labeled, and operate properly

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Required Testing...


Smoke/CO alarms

Water supply and drain line

Potable Water Testing
Hydrostatic or Pneumatic:

1. Fill all water lines including water heater. Utilize pump, valve and gauge. Pressurize to 100psi: isolate w/ shutoff
2. Pressurize system.
3. Hold pressure, 15minutes
4. Find and fix leaks
5. **REPEAT until pass**

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Required Testing...


Smoke/CO alarms

Water supply and drain line

Remember the Drain System Testing 2 Part Method

1. Drain Tightness
 1. All fixtures connected plug main drain line
 2. Fill with water to rim of toilet bowl
 3. Hold 15 minutes
 4. Find and fix leaks
 5. **REPEAT until pass**
2. Max Flow –after Part 1 success
 1. Plug all fixtures and fill with water
 2. Release simultaneously
 3. Find and fix leaks
 4. **REPEAT until pass**



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Required Testing...


Smoke/CO alarms

Water supply and drain line

Tub/shower water temperature

Anti-Scald Valves.
...the outlet temperature at each tub, tub/shower and shower must be tested to ensure that it does not exceed 120°F...



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Required Testing...

Smoke/CO alarms

Water supply


GAS/FUEL OIL SYSTEMS

- The gas system pressure test has been conducted
- Connections between units are properly made with access as required
- The main fuel line has been properly connected and tested by a qualified technician

Tub/showers

Gas/Fuel Oil system

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Required Testing...

Smoke/CO alarms

Water supply

ELECTRICAL SYSTEMS


- The panel amperage matches the connection to the home
- The home has been properly grounded
- The main power supply has been properly connected and tested by a licensed electrician
- All electrical crossovers have been connected
- All receptacles, switches, and light fixtures operate properly
- Ground fault circuit interrupters operate properly
- All exterior lights have been properly installed

Tub/showers

Gas/Fuel Oil system

Electrical

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Required Testing...

Smoke/CO alarms

Water supply

ELECTRICAL SYSTEMS


1. Test continuity
 1. Metal parts and chassis effectively bonded
2. Test operation
 1. Breakers, GFCI, etc working
3. Test polarity

Tub/showers

Gas/Fuel Oil system

Electrical

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Other Notable Items

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19 NYCRR 1265

Each residential structure... utilizes truss type construction

MH utilize truss in roof

Every manufactured home installed since January 1, 2015



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Carbon Monoxide Alarms


HUD Code is silent – NY requirements apply R315.1 "Carbon monoxide alarms shall be provided in accordance with Section 915 of the Fire Code of New York State"

[NY] F915.3.1 Residential buildings...that contain a fuel-burning appliance.

"...installed outside of sleeping areas and within 10' of the entrance to the sleeping area..."

Unless also expressly required elsewhere

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Carbon Monoxide Alarms

HUD Code is silent – NY requirement apply R310. "Carbon monoxide alarms shall be provided in accordance with Section 915 of the Fire Code of New York State"

Effective July 12, 2021 MHCSS will contain requirements for carbon monoxide alarms thereby rendering them preempt like smoke alarms.

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Carbon Monoxide Alarms

- DOM: 7/12/2021 and after
- §3280.211 (a) Labeling
- §3280.211 (b) Required carbon monoxide alarm locations
- §3280.211 (c) Interconnectivity
- §3280.211 (d) Connection to power source
- §3280.211 (e) Combination alarms
- §3280.211 (f) Basement applications
- §3280.211 (g) Testing

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Article 21-B of Executive Law of NY

MANUFACTURED HOMES

- *Title 1 General Provisions
- *Title 2 Single-family dwellings in residential districts

*A2362/S4193 Amended Article 21-b Signed by Gov. Cuomo 11/20/2015

Information only:

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Title 2 Single-family dwellings in residential districts

Prohibits a municipality from excluding the installation of a manufactured home when on a permanent foundation, conforming with the identical development specification and standards in a residential district.

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"The improved design, appearance, and technological advances of manufactured housing [over the past decade] have made it equivalent to conventional, site-built, single-family dwellings."

"MH provides homeowners with an affordable source of decent, safe, and sanitary housing on a permanent basis and the State should promote its utilization...there exists a need for state-enabling legislation such as this bill to oversee local government regulation of manufactured housing."

*NYS Assembly Memorandum in Support
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Wrap up

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Often installers let others take responsibility for the building permit (customers, retailers or community owners)

That needs to change

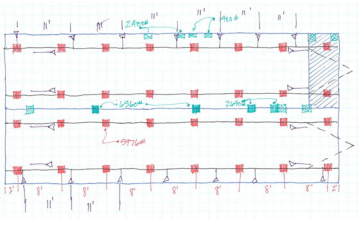
Proof of Installer Certification (Req. since June 1, 2006)
 Manufacturer's Installation Instructions
 w/ indications for pier spacing, footing size, anchor systems...highlighting the actual charts

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Plan Review necessary prior to permit issuance even for a manufactured home



Remember the installers sketch

- was it compliant with the installation manual
- were the components proposed compliant with the installation manual

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