NEW YORK STATE OF OPPORTUNITY. | Building Standards and Codes

Manufactured Homes

Installation+

A Division of New York Department of State

April 19, 2022

2

Trainer:

Hon. William Sherman

Administrator – Manufactured Housing (State Administrative Agent)

3

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

4

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.

5

Attendance Issues

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

Her: "babe, I want a castle in the sky"

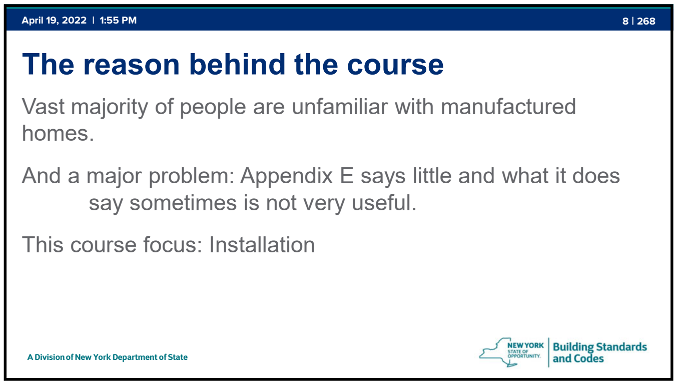
Me: "say no more"

@YeeYeeApparel

6

This course is cursory in nature.

7



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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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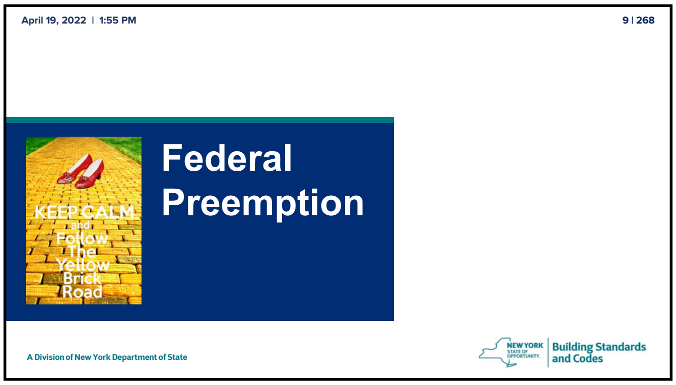

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Federal Preemption

KEEP CALM
and
Follow
The
Yellow
Brick
Road

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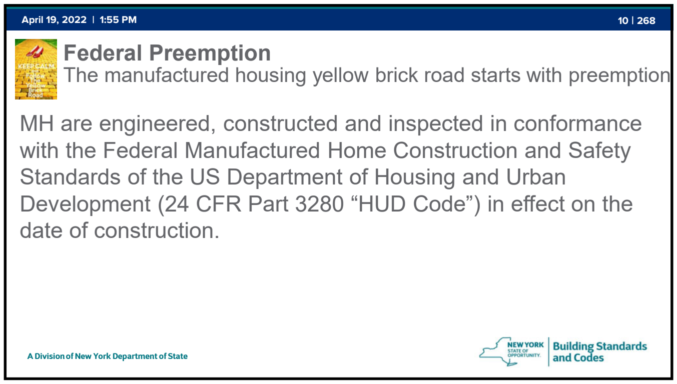

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Federal Preemption

The manufactured housing yellow brick road starts with preemption

MH are 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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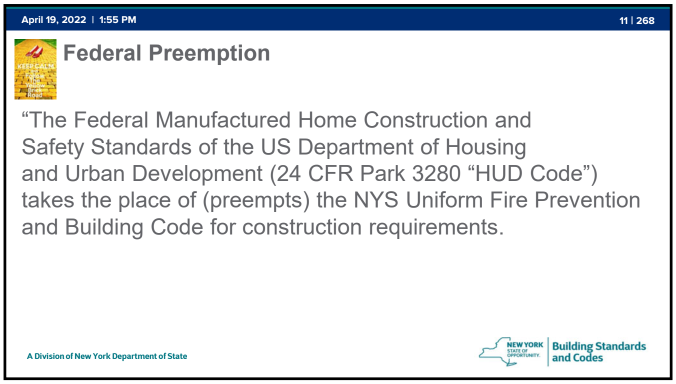

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Federal Preemption

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

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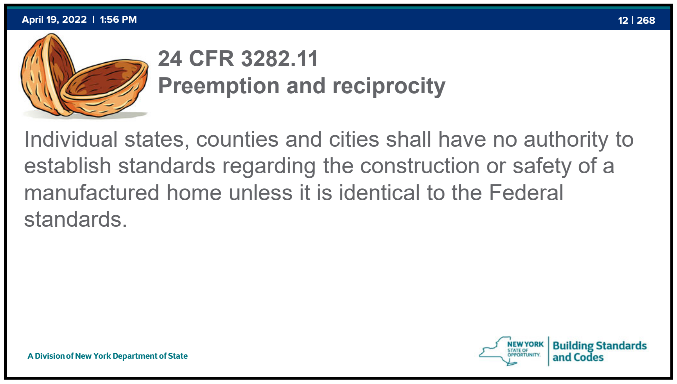

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24 CFR 3282.11
Preemption and reciprocity

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

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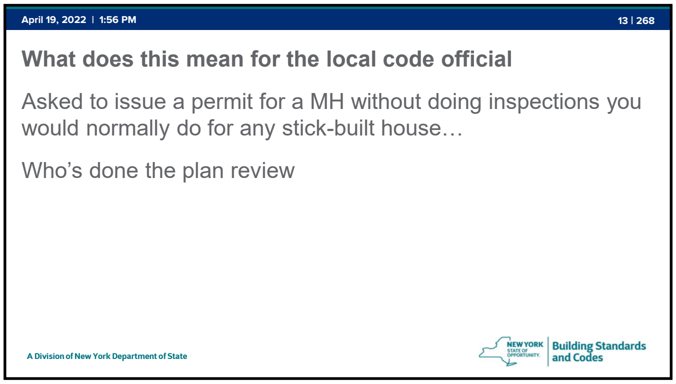

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What does this mean for the local code official

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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13

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

Who's done construction inspections

Who's done construction inspections IPIA

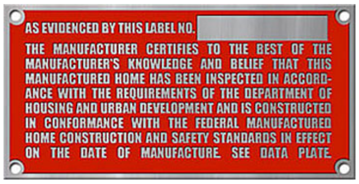
Production Inspection Primary Inspection Agency
- ensuring approved designs and QA manual followed
- production surveillance
- label control

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

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



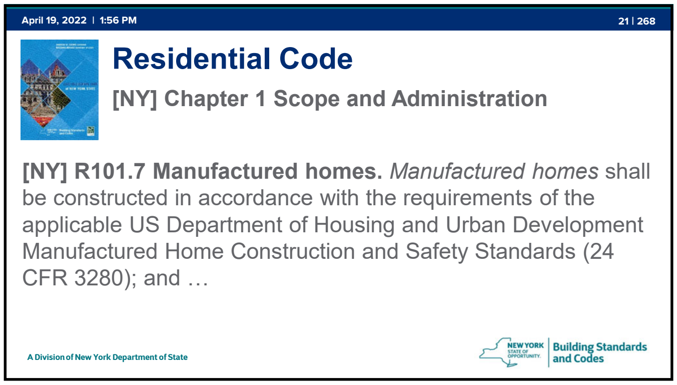
AS EVIDENCED BY THIS LABEL NO.

THE MANUFACTURER CERTIFIES TO THE BEST OF THE MANUFACTURER'S KNOWLEDGE AND BELIEF THAT THIS MANUFACTURED HOME HAS BEEN INSPECTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT AND IS CONSTRUCTED IN CONFORMANCE WITH THE FEDERAL MANUFACTURED HOME CONSTRUCTION AND SAFETY STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE. SEE DATA PLATE.

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

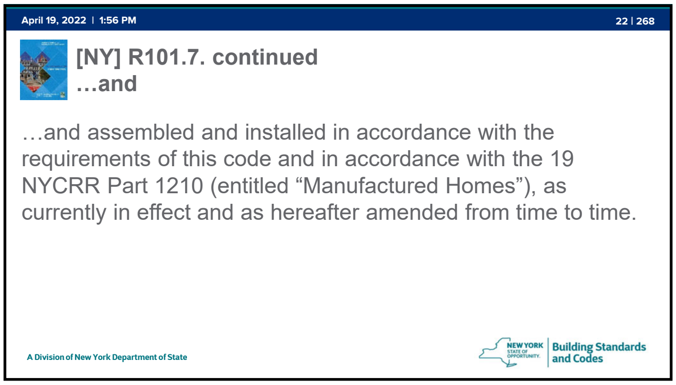


Residential Code

[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 …

21



[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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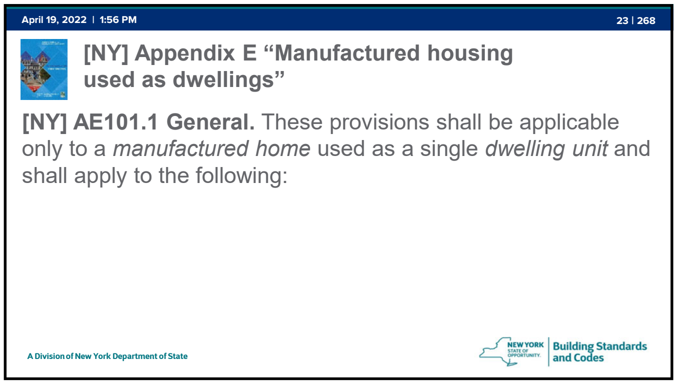

[NY] Appendix E “Manufactured housing used as dwellings”

[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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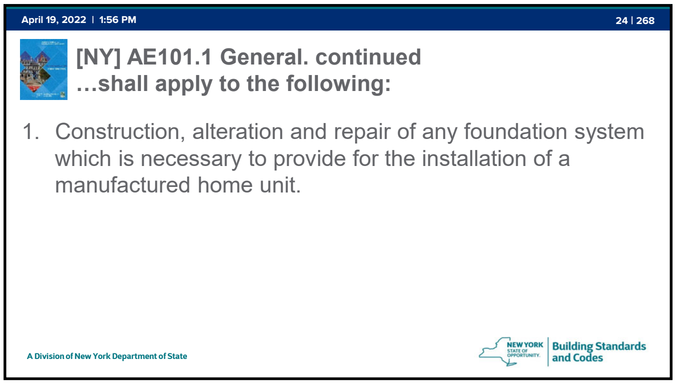
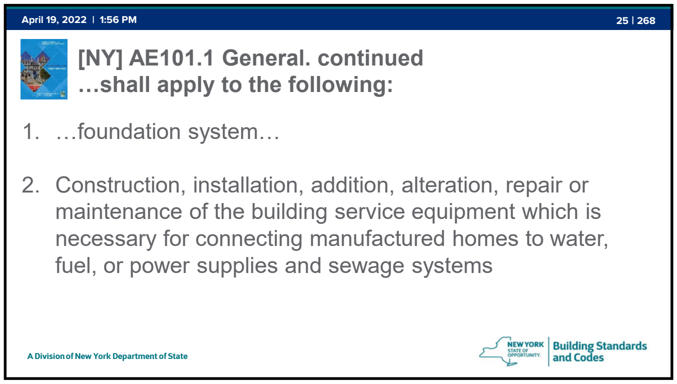


[NY] AE101.1 General. continued …shall apply to the following:

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

24

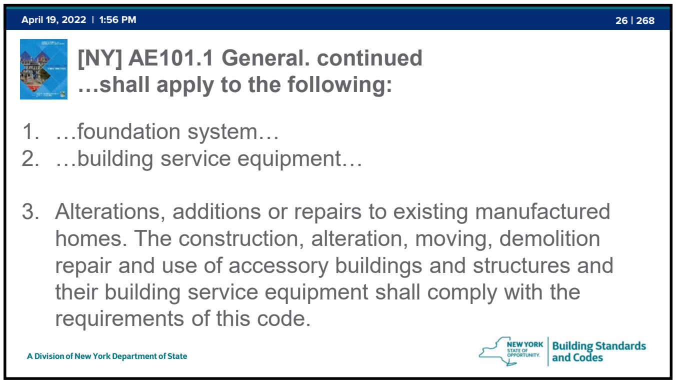


[NY] AE101.1 General. continued …shall apply to the following:

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

25



[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).

[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.

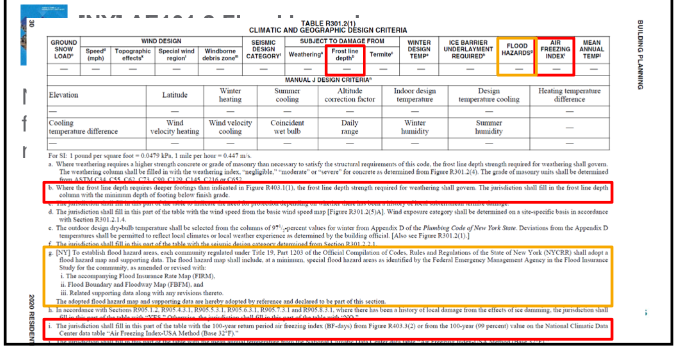


TABLE R301.2(1)
CLIMATIC AND GEOGRAPHIC DESIGN CRITERIA

GROUND SNOW LOAD[o]	WIND DESIGN				SEISMIC DESIGN CATEGORY[f]	SUBJECT TO DAMAGE FROM			WINTER DESIGN TEMP[e]	ICE BARRIER UNDERLAYMENT REQUIRED[h]	FLOOD HAZARDS[g]	AIR FREEZING INDEX[i]	MEAN ANNUAL TEMP[j]
	Speed[d] (mph)	Topographic effects[k]	Special wind region[l]	Windborne debris zone[m]		Weathering[a]	Frost line depth[b]	Termite[c]					
—	—	—	—	—	—	—	—	—	—	—	—	—	—

MANUAL J DESIGN CRITERIA[n]

Elevation	Latitude	Winter heating	Summer cooling	Altitude correction factor	Indoor design temperature	Design temperature cooling	Heating temperature difference
—	—	—	—	—	—	—	—
Cooling temperature difference	Wind velocity heating	Wind velocity cooling	Coincident wet bulb	Daily range	Winter humidity	Summer humidity	—
—	—	—	—	—	—	—	—

For SI: 1 pound per square foot = 0.0479 kPa, 1 mile per hour = 0.447 m/s.

a. Where weathering requires a higher strength concrete or grade of masonry than necessary to satisfy the structural requirements of this code, the frost line depth strength required for weathering shall govern. The weathering column shall be filled in with the weathering index, "negligible," "moderate" or "severe" for concrete as determined from Figure R301.2(4). The grade of masonry units shall be determined from ASTM C34, C55, C62, C73, C90, C129, C145, C216 or C652.

b. Where the frost line depth requires deeper footings than indicated in Figure R403.1(1), the frost line depth strength required for weathering shall govern. The jurisdiction shall fill in the frost line depth column with the minimum depth of footing below finish grade.

c. The jurisdiction shall fill in this part of the table to indicate the need for protection depending on whether there has been a history of local subterranean termite damage.

d. The jurisdiction shall fill in this part of the table with the wind speed from the basic wind speed map [Figure R301.2(5)A]. Wind exposure category shall be determined on a site-specific basis in accordance with Section R301.2.1.4.

e. The outdoor design dry-bulb temperature shall be selected from the columns of 97½-percent values for winter from Appendix D of the *Plumbing Code of New York State*. Deviations from the Appendix D temperatures shall be permitted to reflect local climates or local weather experience as determined by the building official. [Also see Figure R301.2(1).]

f. The jurisdiction shall fill in this part of the table with the seismic design category determined from Section R301.2.2.1.

g. [NY] To establish flood hazard areas, each community regulated under Title 19, Part 1203 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 in the Flood Insurance Study for the community, as amended or revised with:
  i. The accompanying Flood Insurance Rate Map (FIRM),
  ii. Flood Boundary and Floodway Map (FBFM), and
  iii. Related supporting data along with any revisions thereto.
The adopted flood hazard map and supporting data are hereby adopted by reference and declared to be part of this section.

h. In accordance with Sections R905.1.2, R905.4.3.1, R905.5.3.1, R905.6.3.1, R905.7.3.1 and R905.8.3.1, where there has been a history of local damage from the effects of ice damming, the jurisdiction shall fill in this part of the table with "YES." Otherwise, the jurisdiction shall fill in this part of the table with "NO."

i. The jurisdiction shall fill in this part of the table with the 100-year return period air freezing index (BF-days) from Figure R403.3(2) or from the 100-year (99 percent) value on the National Climatic Data Center data table "Air Freezing Index-USA Method (Base 32°F)."

j. The jurisdiction shall fill in this part of the table with the mean annual temperature from the National Climatic Data Center data table "Air Freezing Index-USA Method (Base 32°F)."

Skipping ahead

[NY] AE102 Existing Manufactured Homes & Service Equipment

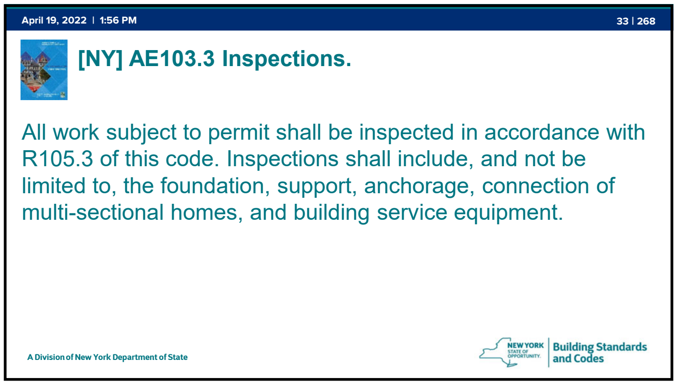
[NY] AE103 Permits and Inspections
- **[NY] AE103.1 Permit required.**
- **[NY] AE103.2 Application for permit.**
- **[NY] AE103.3 Inspections.**

[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.

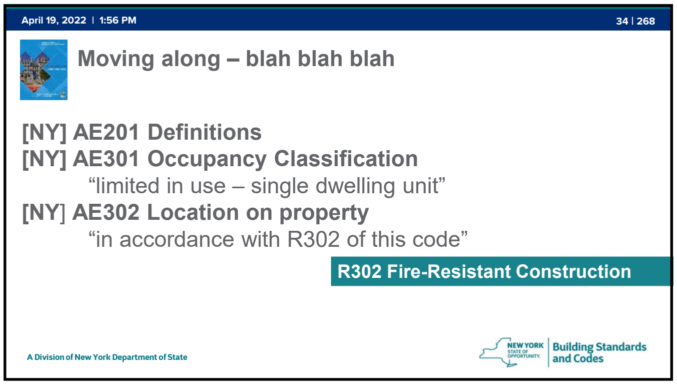
[NY] AE103.2 Application for permit.

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)…



[NY] AE103.3 Inspections.

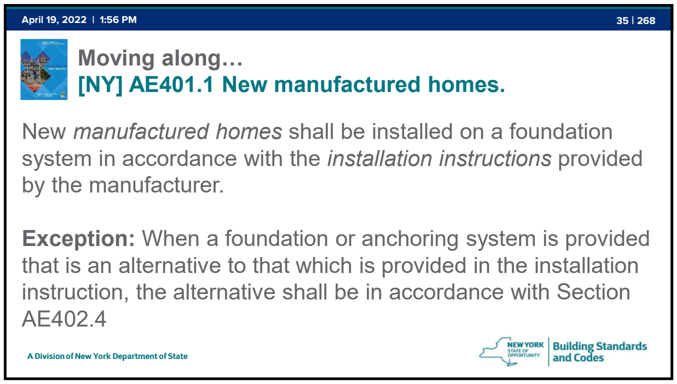
All work subject to permit shall be inspected in accordance with R105.3 of this code. Inspections shall include, and not be limited to, the foundation, support, anchorage, connection of multi-sectional homes, and building service equipment.



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”

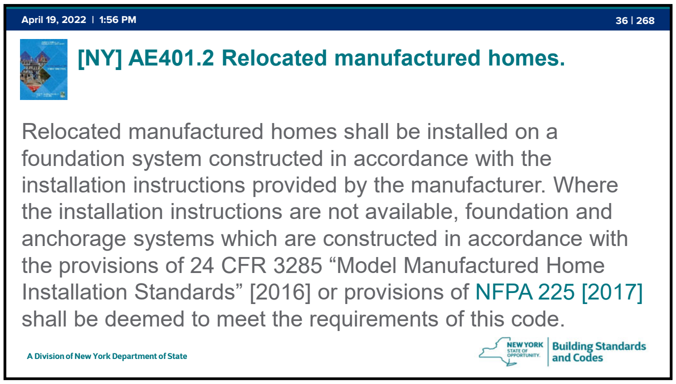
R302 Fire-Resistant Construction



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



[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.

NOTE: You Are Leaving the Uniform Code…

Click HERE to continue

Course Development

Utilized Installation Instruction Manual for

Clayton lewistown
Marlette Pennsylvania
SCHULT LEWISTOWN

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

Manual Information

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.

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

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.

APPROVED BY
NTA INC.
Revised Aug 03,2015
FEDERAL MANUFACTURED HOME CONSTRUCTION AND SAFETY STANDARDS

Engineer's stamp

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

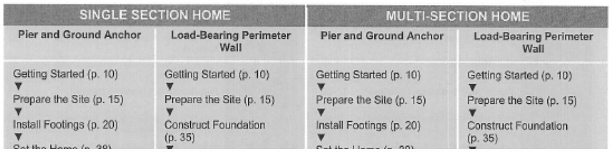
J. GAVIN MABE
REGISTERED ENGINEER
AGRICULTURE
COMMERCE
No. 00109422
STATE OF TENNESSEE
9/8/15

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.

Using the Manual

Organized into a series of steps
take you through the entire installation process
utilizing the sections needed relevant to specific home



SINGLE SECTION HOME		MULTI-SECTION HOME	
Pier and Ground Anchor	Load-Bearing Perimeter Wall	Pier and Ground Anchor	Load-Bearing Perimeter Wall
Getting Started (p. 10) ▼ Prepare the Site (p. 15) ▼ Install Footings (p. 20) ▼	Getting Started (p. 10) ▼ Prepare the Site (p. 15) ▼ Construct Foundation (p. 35) ▼	Getting Started (p. 10) ▼ Prepare the Site (p. 15) ▼ Install Footings (p. 20) ▼	Getting Started (p. 10) ▼ Prepare the Site (p. 15) ▼ Construct Foundation (p. 35) ▼

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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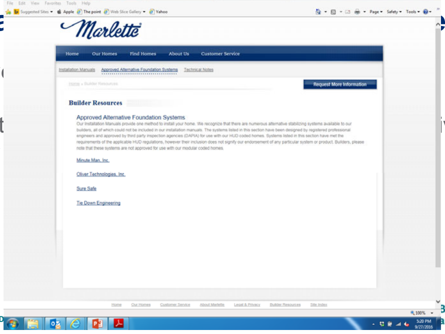
design or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Suggested Sites
Apple
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Web Slice Gallery
Yahoo
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Safety
Tools
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100%

Builder Resources

Approved Alternative Foundation Systems

Our Installation Manuals provide one method to install your home. We recognize that there are numerous alternative stabilizing systems available to our builders, all of which could not be included in our installation manuals. The systems listed in this section have been designed by registered professional engineers and approved by third party inspection agencies (DAPIA) for use with our HUD coded homes. Systems listed in this section have met the requirements of the applicable HUD regulations, however their inclusion does not signify our endorsement of any particular system or product. Builders, please note that these systems are not approved for use with our modular coded homes.

Minute Man, Inc.

Oliver Technologies, Inc.

Sure Safe

Tie Down Engineering

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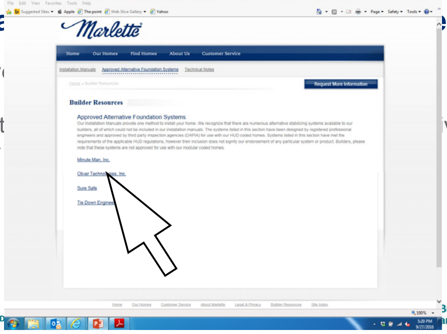
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Find Homes
About Us
Customer Service
Installation Manuals
Approved Alternative Foundation Systems
Technical Notes
Request More Information
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9/27/2016

Builder Resources

Approved Alternative Foundation Systems

Our Installation Manuals provide one method to install your home. We recognize that there are numerous alternative stabilizing systems available to our builders, all of which could not be included in our installation manuals. The systems listed in this section have been designed by registered professional engineers and approved by third party inspection agencies (DAPIA) for use with our HUD coded homes. Systems listed in this section have met the requirements of the applicable HUD regulations, however their inclusion does not signify our endorsement of any particular system or product. Builders, please note that these systems are not approved for use with our modular coded homes.

Minute Man, Inc.

Oliver Technologies, Inc.

Sure Safe

Tie Down Engineering

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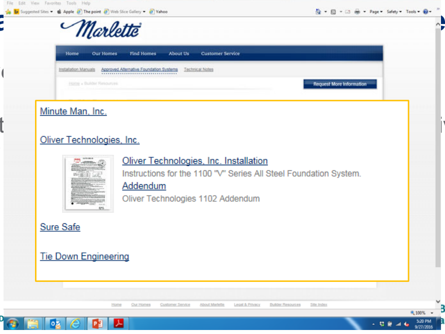
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Approved Alternative Foundation Systems
Technical Notes
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Minute Man, Inc.

Oliver Technologies, Inc.

Oliver Technologies, Inc. Installation
Instructions for the 1100 "V" Series All Steel Foundation System.
Addendum
Oliver Technologies 1102 Addendum

Sure Safe

Tie Down Engineering

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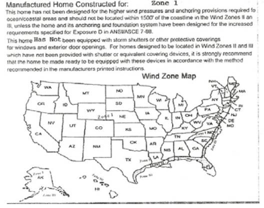
Locate the Data Plate

Confirm wind zone



Manufactured Home Constructed for: Zone 1

This home has not been designed for the higher wind pressures and anchoring provisions required fo ocean/coastal areas and should not be located within 1500' of the coastline in the Wind Zones II an III, unless the home and its anchoring and foundation system have been designed for the increased requirements specified for Exposure D in ANSI/ASCE 7-88.

This home Has Not been equipped with storm shutters or other protective coverings for windows and exterior door openings. For homes designed to be located in Wind Zones II and III which have not been provided with shutter or equivalent covering devices, it is strongly recommend that the home be made ready to be equipped with these devices in accordance with the method recommended in the manufacturers printed instructions.

Wind Zone Map

WA
OR
CA
NV
ID
MT
WY
UT
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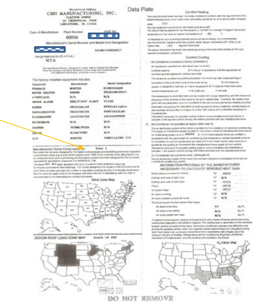
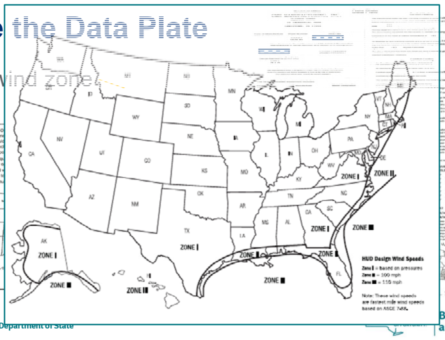

Data Plate
DO NOT REMOVE

61

Locate the Data Plate

Confirm wind zone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SC
NC
VA
WV
PA
NY
MD
DE
NJ
FL
AK
ZONE I
ZONE II
ZONE ■

HUD Design Wind Speeds
Zone I = based on pressures
Zone ■ = 100 mph
Zone ■ = 110 mph

Note: These wind speeds are fastest mile wind speeds based on ASCE 7-88.

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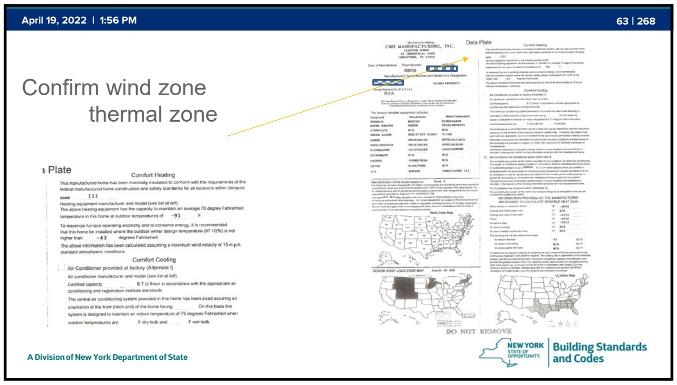
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Confirm wind zone
thermal zone

Data Plate

a Plate

Comfort Heating

This manufactured home has been thermally insulated to conform with the requirements of the federal manufactured home construction and safety standards for all locations within climactic zone III

Heating equipment manufacturer and model (see list at left).

The above heating equipment has the capacity to maintain an average 70 degree Fahrenheit temperature in this home at outdoor temperatures of -91 F.

To maximize furnace operating economy and to conserve energy, it is recommended that this home be installed where the outdoor winter design temperature (97 1/2%) is not higher than -43 degrees Fahrenheit.

The above information has been calculated assuming a maximum wind velocity of 15 m.p.h. standard atmoshperic conditions.

Comfort Cooling

☐ Air Conditioner provided at factory (Alternate I)

Air conditioner manufacturer and model (see list at left).

Certified capacity ____ B.T.U./hour in accordance with the appropriate air conditioning and registration institute standards.

The central air conditioning system provided in this home has been sized assuring an orientation of the front (hitch end) of the home facing ____. On this basis the system is designed to maintain an indoor temperature of 75 degrees Fahrenheit when outdoor temperatures are ____ F dry bulb and ____ F wet bulb.

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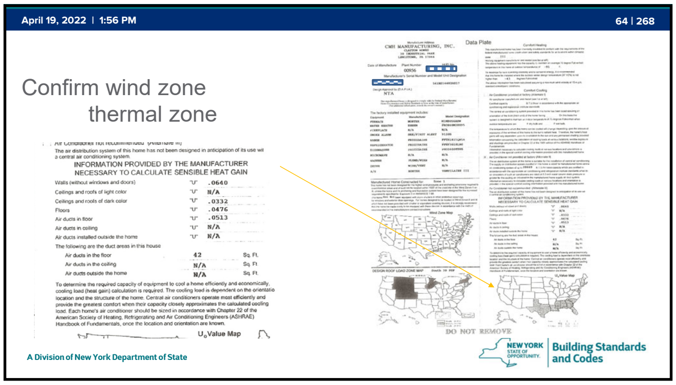
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Confirm wind zone
thermal zone

Data Plate

☐ Air Conditioner not recommended (Alternate III)

The air distribution system of this home has not been designed in anticipation of its use wit a central air conditioning system.

INFORMATION PROVIDED BY THE MANUFACTURER
NECESSARY TO CALCULATE SENSIBLE HEAT GAIN

Walls (without windows and doors)	"U"	.0640
Ceilings and roofs of light color	"U"	N/A
Ceilings and roofs of dark color	"U"	.0332
Floors	"U"	.0476
Air ducts in floor	"U"	.0513
Air ducts in ceiling	"U"	N/A
Air ducts installed outside the home	"U"	N/A

The following are the duct areas in this house

Air ducts in the floor	42	Sq. Ft.
Air ducts in the ceiling	N/A	Sq. Ft.
Air ducts outside the home	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 orientatio location and the structure of the home. Central air conditioners operate most efficiently and provide the greatest comfort when their capacity closely approximates the calculated cooling load. Each home's air conditioner should be sized in accordance with Chapter 22 of the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) Handbook of Fundamentals, once the location and orientation are known.

U_o Value Map

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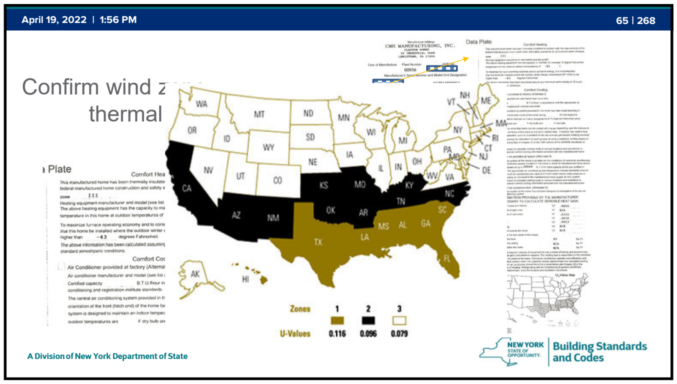
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Confirm wind z
thermal

Data Plate

a Plate

WA
MT
ND
MN
OR
ID
SD
WI
WY
MI
NY
VT
NH
ME
MA
IA
NE
NV
UT
CO
IL
IN
OH
PA
CT
RI
NJ
DE
MD
CA
KS
MO
KY
WV
VA
OK
TN
NC
AZ
NM
AR
SC
TX
LA
MS
AL
GA
FL
AK
HI

Zones	1	2	3
	🟫	■	□
U-Values	0.116	0.096	0.079

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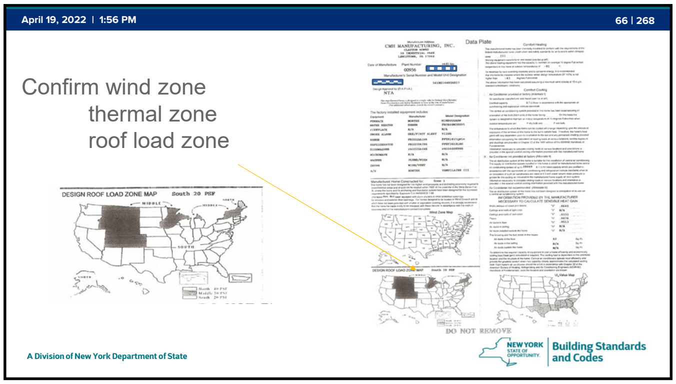
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Confirm wind zone
thermal zone
roof load zone

Data Plate

DESIGN ROOF LOAD ZONE MAP

MIDDLE
South 30 PSF
SOUTH

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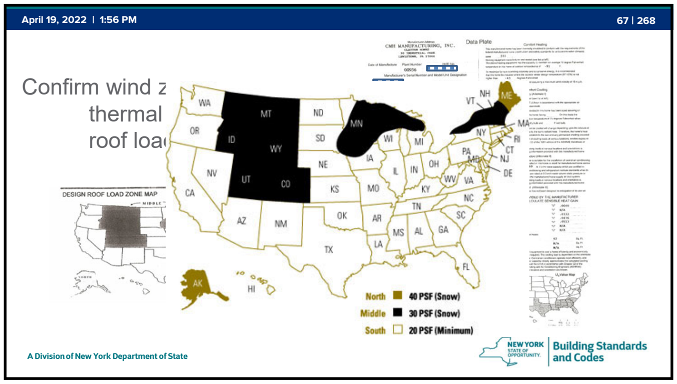
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Confirm wind z
thermal
roof loa

Data Plate

DESIGN ROOF LOAD ZONE MAP

WA
MT
ND
MN
OR
ID
SD
WI
WY
MI
NY
VT
NH
ME
MA
IA
NE
NV
UT
CO
IL
IN
OH
PA
CT
RI
NJ
DE
MD
CA
KS
MO
KY
WV
VA
NC
AZ
NM
OK
AR
TN
SC
TX
MS
AL
GA
LA
FL
AK
HI

North	🟫	40 PSF (Snow)
Middle	■	30 PSF (Snow)
South	□	20 PSF (Minimum)

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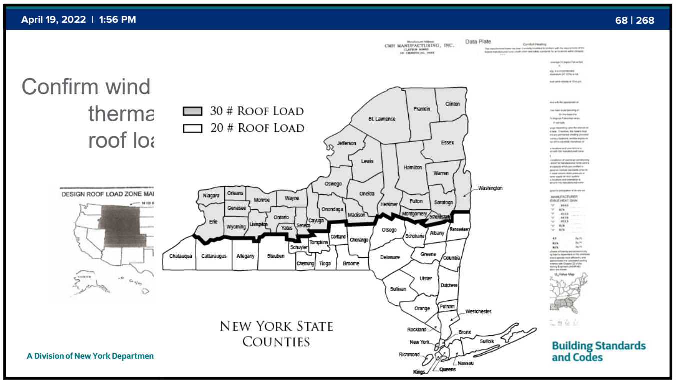
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Confirm wind
therma
roof loa

Data Plate

DESIGN ROOF LOAD ZONE MAI

▨ 30 # Roof Load
□ 20 # Roof Load

St. Lawrence
Franklin
Clinton
Jefferson
Essex
Lewis
Hamilton
Warren
Oswego
Washington
Oneida
Herkimer
Fulton
Saratoga
Niagara
Orleans
Monroe
Wayne
Onondaga
Madison
Montgomery
Schenectady
Genesee
Erie
Wyoming
Livingston
Ontario
Yates
Seneca
Cayuga
Otsego
Schoharie
Albany
Rensselaer
Chautauqua
Cattaraugus
Allegany
Steuben
Schuyler
Tompkins
Cortland
Chenango
Chemung
Tioga
Broome
Delaware
Greene
Columbia
Ulster
Dutchess
Sullivan
Orange
Putnam
Westchester
Rockland
Bronx
New York
Suffolk
Richmond
Nassau
Kings
Queens

New York State
Counties

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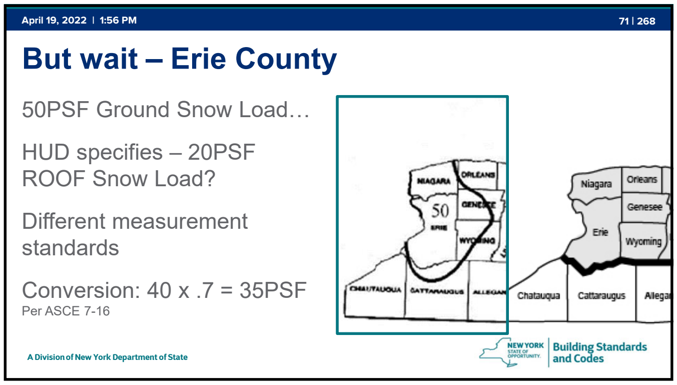

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But wait – Erie County

50PSF Ground Snow Load…

HUD specifies – 20PSF ROOF Snow Load?

Different measurement standards

Conversion: 40 x .7 = 35PSF

Per ASCE 7-16

NIAGARA
ORLEANS
50
GENESEE
ERIE
WYOMING
CHAUTAUQUA
CATTARAUGUS
ALLEGAN
Niagara
Orleans
Genesee
Erie
Wyoming
Chatauqua
Cattaraugus
Allega

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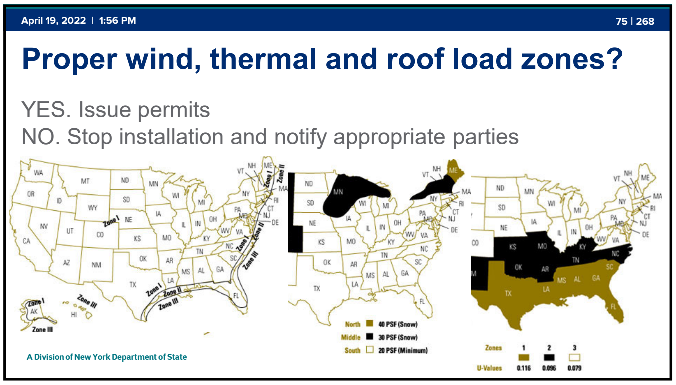

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Proper wind, thermal and roof load zones?

YES. Issue permits

NO. Stop installation and notify appropriate parties

Zone I
Zone II
Zone III
North 40 PSF (Snow)
Middle 30 PSF (Snow)
South 20 PSF (Minimum)
Zones 1 2 3
U-Values 0.116 0.096 0.079

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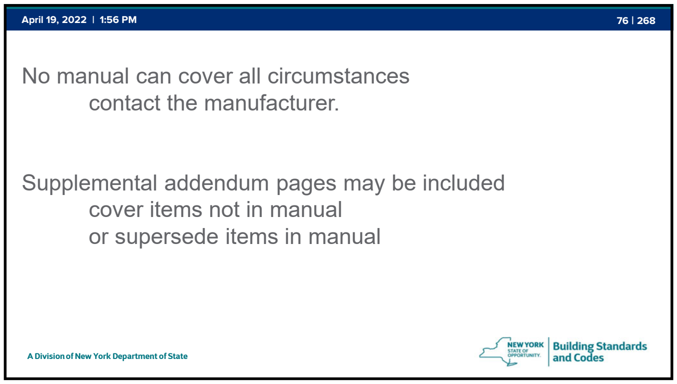

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No manual can cover all circumstances

contact the manufacturer.

Supplemental addendum pages may be included

cover items not in manual

or supersede items in manual

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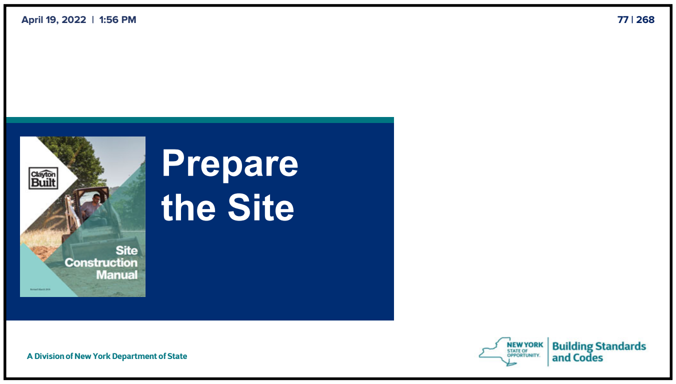

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Prepare the Site

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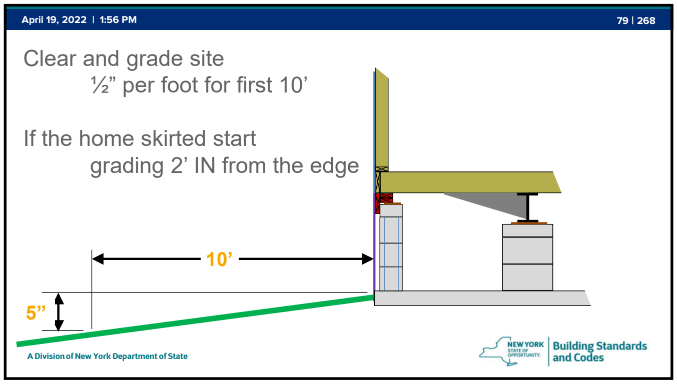

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Clear and grade site

½” per foot for first 10’

If the home skirted start

grading 2’ IN from the edge

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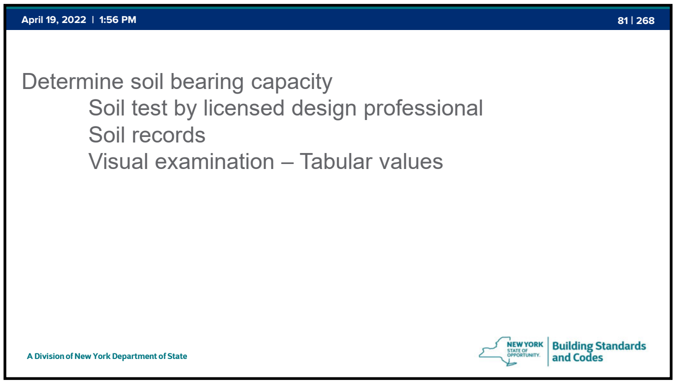

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Determine soil bearing capacity

Soil test by licensed design professional

Soil records

Visual examination – Tabular values

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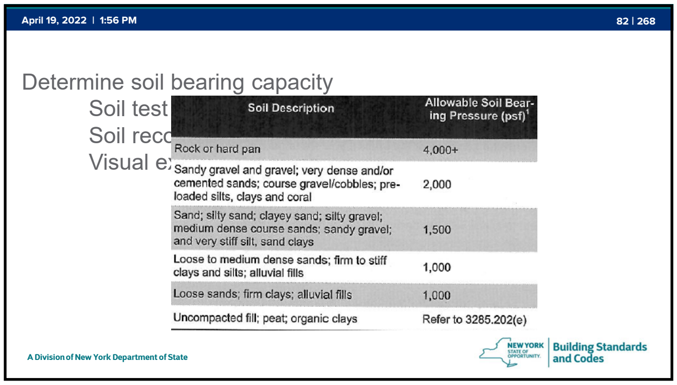

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Determine soil bearing capacity

Soil test

Soil reco

Visual e

Soil Description	Allowable Soil Bearing Pressure (psf)[1]
Rock or hard pan	4,000+
Sandy gravel and gravel; very dense and/or cemented sands; course gravel/cobbles; preloaded 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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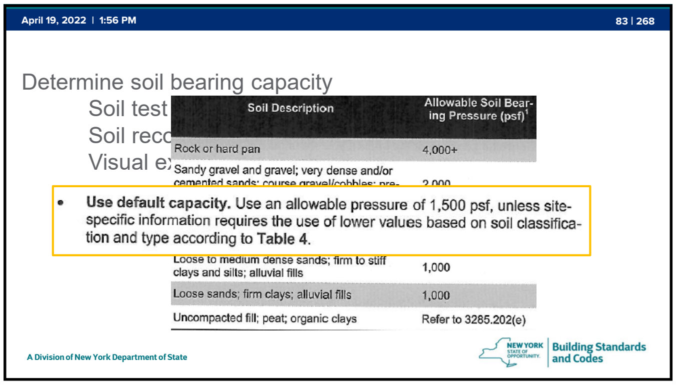

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Determine soil bearing capacity

Soil test

Soil reco

Visual e

Soil Description	Allowable Soil Bearing Pressure (psf)[1]
Rock or hard pan	4,000+
Sandy gravel and gravel; very dense and/or cemented sands; course gravel/cobbles; pre-	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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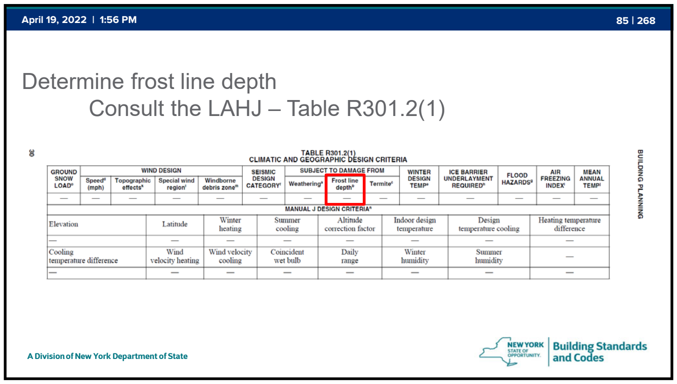

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Determine frost line depth

Consult the LAHJ – Table R301.2(1)

30

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

GROUND SNOW LOAD[o]	WIND DESIGN				SEISMIC DESIGN CATEGORY[f]	SUBJECT TO DAMAGE FROM			WINTER DESIGN TEMP[e]	ICE BARRIER UNDERLAYMENT REQUIRED[h]	FLOOD HAZARDS[g]	AIR FREEZING INDEX[i]	MEAN ANNUAL TEMP[j]
	Speed[d] (mph)	Topographic effects[k]	Special wind region[l]	Windborne debris zone[m]		Weathering[a]	Frost line depth[b]	Termite[c]					
—	—	—	—	—	—	—	—	—	—	—	—	—	—

MANUAL J DESIGN CRITERIA[n]

Elevation	Latitude	Winter heating	Summer cooling	Altitude correction factor	Indoor design temperature	Design temperature cooling	Heating temperature difference
—	—	—	—	—	—	—	—
Cooling temperature difference	Wind velocity heating	Wind velocity cooling	Coincident wet bulb	Daily range	Winter humidity	Summer humidity	—
—	—	—	—	—	—	—	—

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Install Footings SAMPLE

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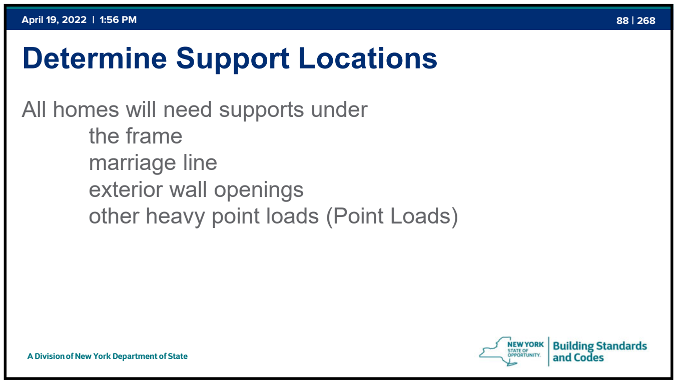

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Determine Support Locations

All homes will need supports under

the frame

marriage line

exterior wall openings

other heavy point loads (Point Loads)

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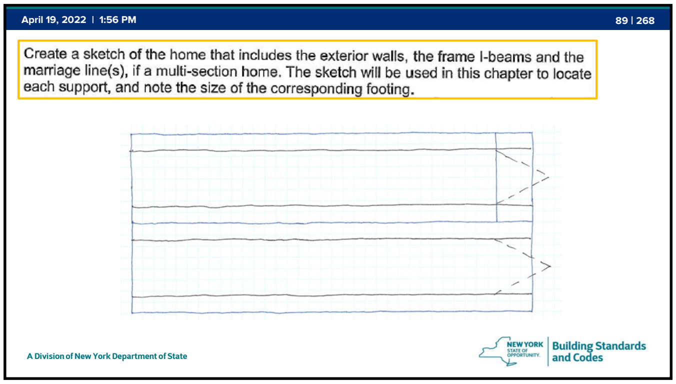

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Create a sketch of the home that includes the exterior walls, the frame I-beams and the marriage line(s), if a multi-section home. The sketch will be used in this chapter to locate each support, and note the size of the corresponding footing.

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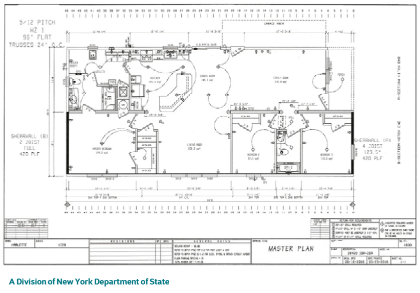
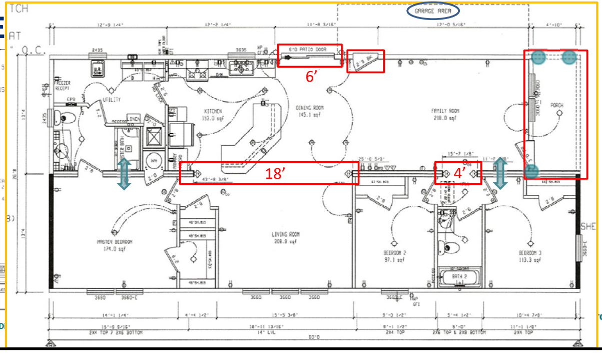
Additional Point Load Locations

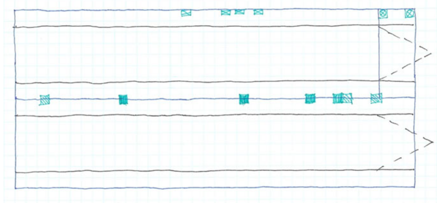
- Side wall exterior doors – hinge & latch sides
- Other side wall openings, 4’ and greater – both sides
- Marriage line openings 4’ and greater – both sides
- Through the rim crossover ducts
- Marriage line columns
- Load bearing porch posts
- Fireplaces (side wall or marriage wall only)

Examine the floor plan





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.



Determine Point Loads

Tabular Data

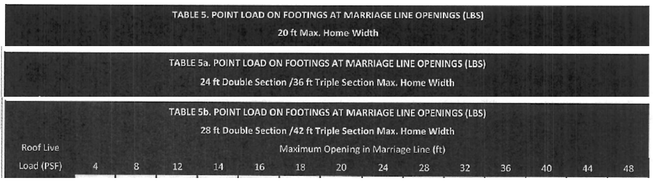


TABLE 5. POINT LOAD ON FOOTINGS AT MARRIAGE LINE OPENINGS (LBS)

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)	Maximum Opening in Marriage Line (ft)													
	4	8	12	14	16	18	20	24	28	32	36	40	44	48

Determine Point Loads

Tabular Data

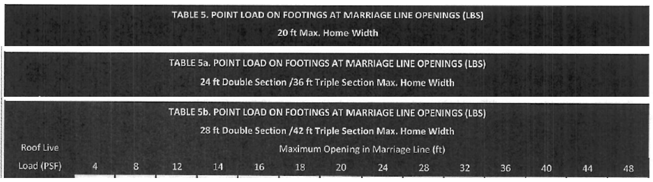


TABLE 5. POINT LOAD ON FOOTINGS AT MARRIAGE LINE OPENINGS (LBS)

20 ft Max. Home Width

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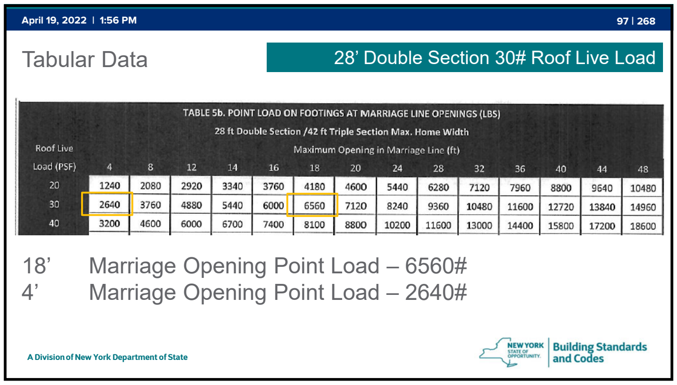
TABLE 5b. POINT LOAD ON FOOTINGS AT MARRIAGE LINE OPENINGS (LBS)

28 ft Double Section /42 ft Triple Section Max. Home Width

Roof Live Load (PSF)	Maximum Opening in Marriage Line (ft)													
	4	8	12	14	16	18	20	24	28	32	36	40	44	48



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Tabular Data

28’ Double Section 30# Roof Live Load

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)	Maximum Opening in Marriage Line (ft) 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#
4’ Marriage Opening Point Load – 2640#

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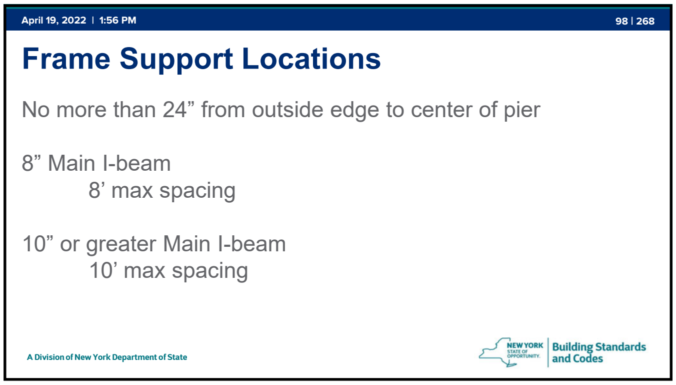

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Frame Support Locations

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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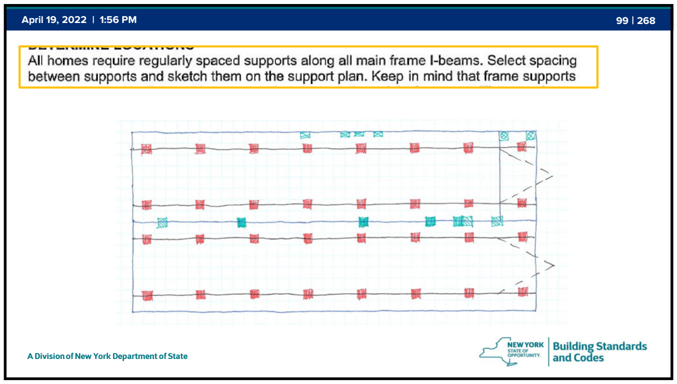

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All homes require regularly spaced supports along all main frame I-beams. Select spacing between supports and sketch them on the support plan. Keep in mind that frame supports

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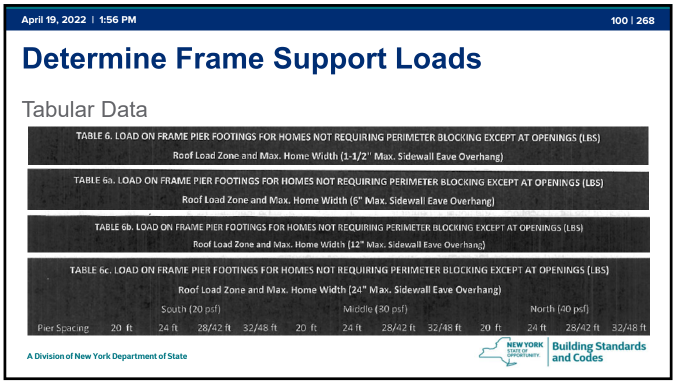

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Determine Frame Support Loads

Tabular Data

TABLE 6. 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 6a. 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 6b. 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 6c. 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)

	South (20 psf)				Middle (30 psf)				North (40 psf)			
Pier Spacing	20 ft	24 ft	28/42 ft	32/48 ft	20 ft	24 ft	28/42 ft	32/48 ft	20 ft	24 ft	28/42 ft	32/48 ft

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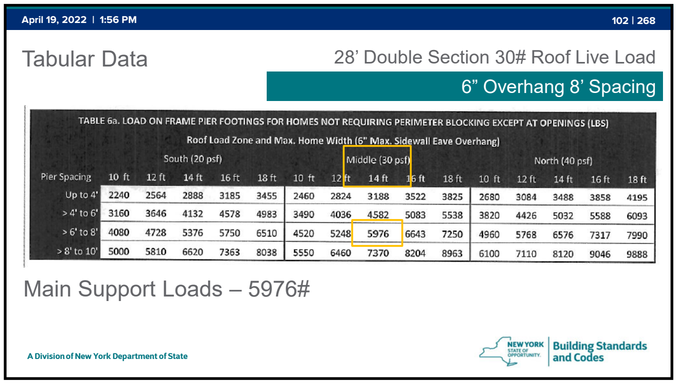

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Tabular Data

28’ Double Section 30# Roof Live Load

6” Overhang 8’ Spacing

TABLE 6a. 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)

	South (20 psf)					Middle (30 psf)					North (40 psf)				
Pier Spacing	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	4960	5768	6576	7317	7990
> 8' to 10'	5000	5810	6620	7363	8038	5550	6460	7370	8204	8963	6100	7110	8120	9046	9888

Main Support Loads – 5976#

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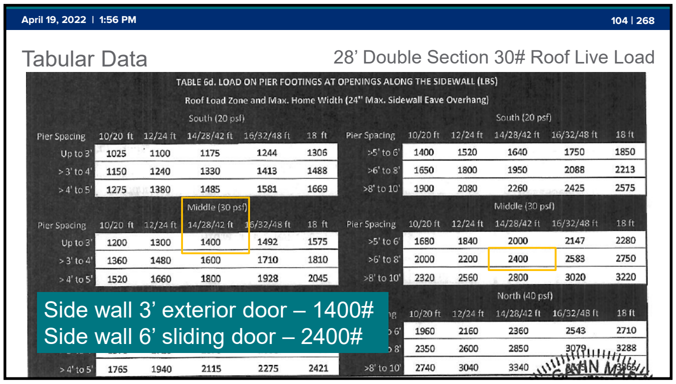

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Tabular Data

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)

	South (20 psf)						South (20 psf)				
Pier Spacing	10/20 ft	12/24 ft	14/28/42 ft	16/32/48 ft	18 ft	Pier Spacing	10/20 ft	12/24 ft	14/28/42 ft	16/32/48 ft	18 ft
Up to 3'	1025	1100	1175	1244	1306	>5' to 6'	1400	1520	1640	1750	1850
> 3' to 4'	1150	1240	1330	1413	1488	>6' to 8'	1650	1800	1950	2088	2213
> 4' to 5'	1275	1380	1485	1581	1669	>8' to 10'	1900	2080	2260	2425	2575
	Middle (30 psf)						Middle (30 psf)				
Pier Spacing	10/20 ft	12/24 ft	14/28/42 ft	16/32/48 ft	18 ft	Pier Spacing	10/20 ft	12/24 ft	14/28/42 ft	16/32/48 ft	18 ft
Up to 3'	1200	1300	1400	1492	1575	>5' to 6'	1680	1840	2000	2147	2280
> 3' to 4'	1360	1480	1600	1710	1810	>6' to 8'	2000	2200	2400	2583	2750
> 4' to 5'	1520	1660	1800	1928	2045	>8' to 10'	2320	2560	2800	3020	3220
							North (40 psf)				
						ng	10/20 ft	12/24 ft	14/28/42 ft	16/32/48 ft	18 ft
						o 6'	1960	2160	2360	2543	2710
						o 8'	2350	2600	2850	3079	3288
> 4' to 5'	1765	1940	2115	2275	2421	>8' to 10'	2740	3040	3340	[illegible]	[illegible]

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

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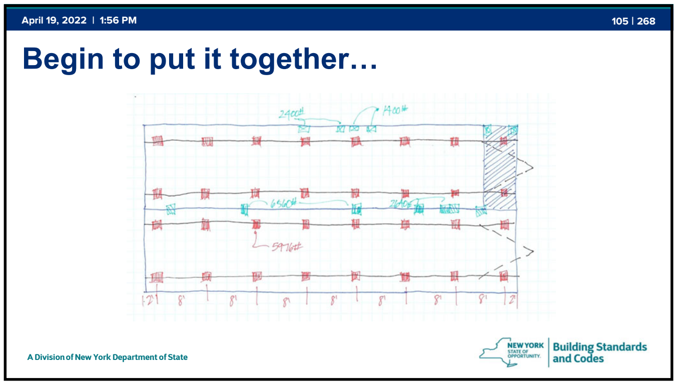
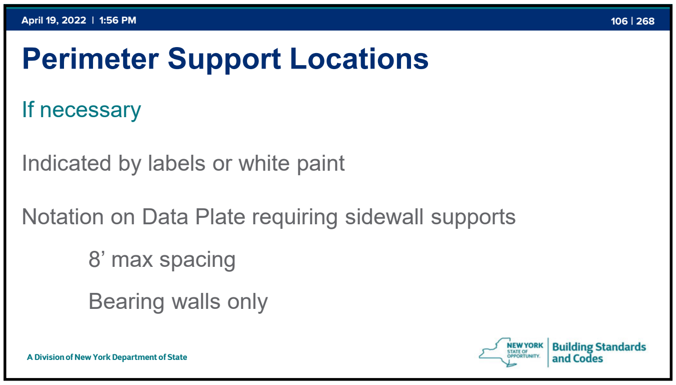


Begin to put it together…

105



Perimeter Support Locations

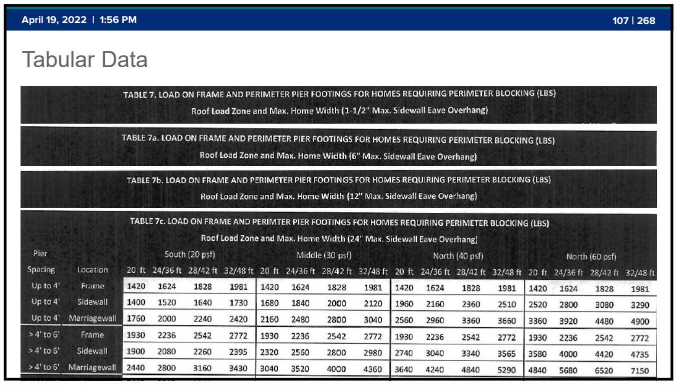
If necessary

Indicated by labels or white paint

Notation on Data Plate requiring sidewall supports

- 8' max spacing
- Bearing walls only

106



Tabular Data

TABLE 7. LOAD ON FRAME AND PERIMETER PIER FOOTINGS FOR HOMES REQUIRING PERIMETER BLOCKING (LBS)
Roof Load Zone and Max. Home Width (1-1/2" Max. Sidewall Eave Overhang)

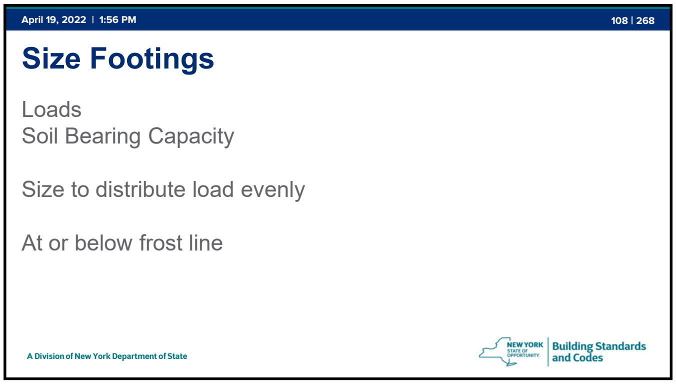
TABLE 7a. LOAD ON FRAME AND PERIMETER PIER FOOTINGS FOR HOMES REQUIRING PERIMETER BLOCKING (LBS)
Roof Load Zone and Max. Home Width (6" Max. Sidewall Eave Overhang)

TABLE 7b. LOAD ON FRAME AND PERIMETER PIER FOOTINGS FOR HOMES REQUIRING PERIMETER BLOCKING (LBS)
Roof Load Zone and Max. Home Width (12" Max. Sidewall Eave Overhang)

TABLE 7c. LOAD ON FRAME AND PERIMTER PIER FOOTINGS FOR HOMES REQUIRING PERIMETER BLOCKING (LBS)
Roof Load Zone and Max. Home Width (24" Max. Sidewall Eave Overhang)

Pier		South (20 psf)				Middle (30 psf)				North (40 psf)				North (60 psf)			
Spacing	Location	20 ft	24/36 ft	28/42 ft	32/48 ft	20 ft	24/36 ft	28/42 ft	32/48 ft	20 ft	24/36 ft	28/42 ft	32/48 ft	20 ft	24/36 ft	28/42 ft	32/48 ft
Up to 4'	Frame	1420	1624	1828	1981	1420	1624	1828	1981	1420	1624	1828	1981	1420	1624	1828	1981
Up to 4'	Sidewall	1400	1520	1640	1730	1680	1840	2000	2120	1960	2160	2360	2510	2520	2800	3080	3290
Up to 4'	Marriagewall	1760	2000	2240	2420	2160	2480	2800	3040	2560	2960	3360	3660	3360	3920	4480	4900
> 4' to 6'	Frame	1930	2236	2542	2772	1930	2236	2542	2772	1930	2236	2542	2772	1930	2236	2542	2772
> 4' to 6'	Sidewall	1900	2080	2260	2395	2320	2560	2800	2980	2740	3040	3340	3565	3580	4000	4420	4735
> 4' to 6'	Marriagewall	2440	2800	3160	3430	3040	3520	4000	4360	3640	4240	4840	5290	4840	5680	6520	7150

107



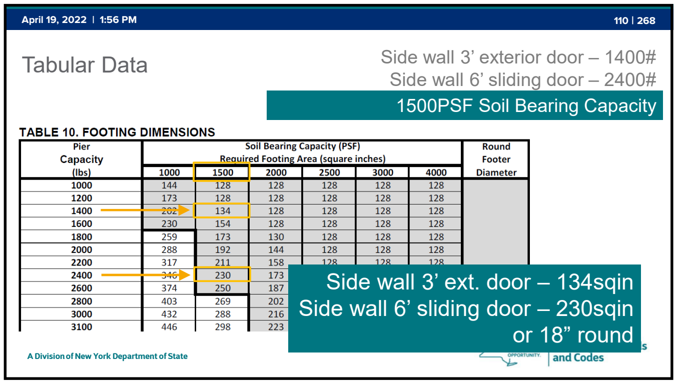
Size Footings

Loads
Soil Bearing Capacity

Size to distribute load evenly

At or below frost line

108



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) Required Footing Area (square inches)						Round Footer Diameter
	1000	1500	2000	2500	3000	4000	
1000	144	128	128	128	128	128	
1200	173	128	128	128	128	128	
1400	202	134	128	128	128	128	
1600	230	154	128	128	128	128	
1800	259	173	130	128	128	128	
2000	288	192	144	128	128	128	
2200	317	211	158	128	128	128	
2400	346	230	173				
2600	374	250	187				
2800	403	269	202				
3000	432	288	216				
3100	446	298	223				

Side wall 3' ext. door – 134sqin
Side wall 6' sliding door – 230sqin
or 18" round

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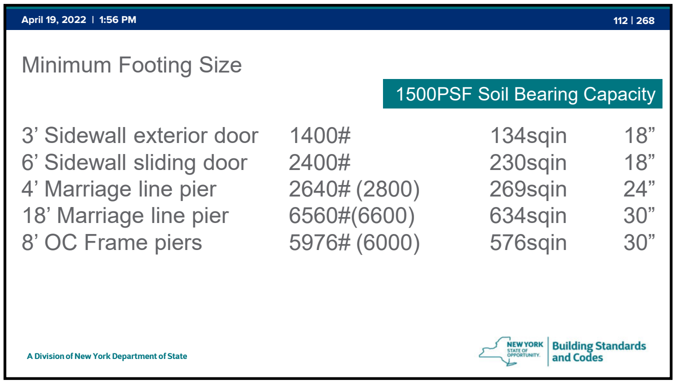

Minimum Footing Size

1500PSF Soil Bearing Capacity

3' Sidewall exterior door	1400#	134sqin	18"
6' Sidewall sliding door	2400#	230sqin	18"
4' Marriage line pier	2640# (2800)	269sqin	24"
18' Marriage line pier	6560#(6600)	634sqin	30"
8' OC Frame piers	5976# (6000)	576sqin	30"

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Set the Home

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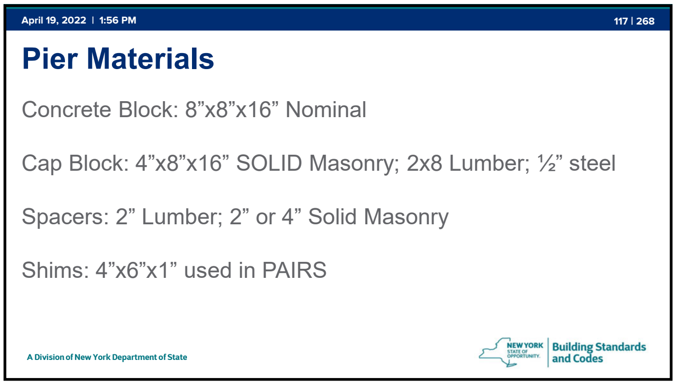

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Pier Materials

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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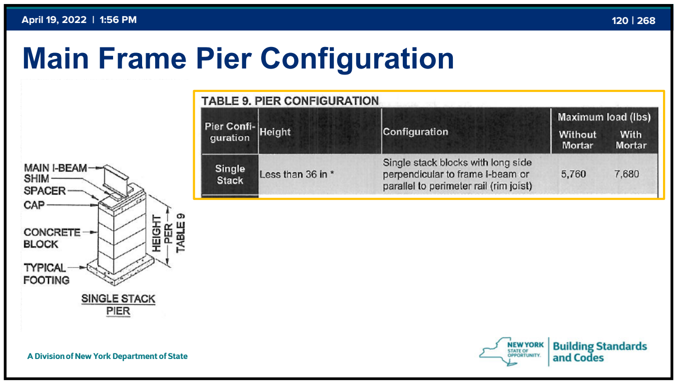

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Main Frame Pier Configuration

MAIN I-BEAM
SHIM
SPACER
CAP
CONCRETE BLOCK
TYPICAL FOOTING
HEIGHT PER TABLE 9
SINGLE STACK PIER

TABLE 9. PIER CONFIGURATION

Pier Configuration	Height	Configuration	Maximum load (lbs) Without Mortar	Maximum load (lbs) 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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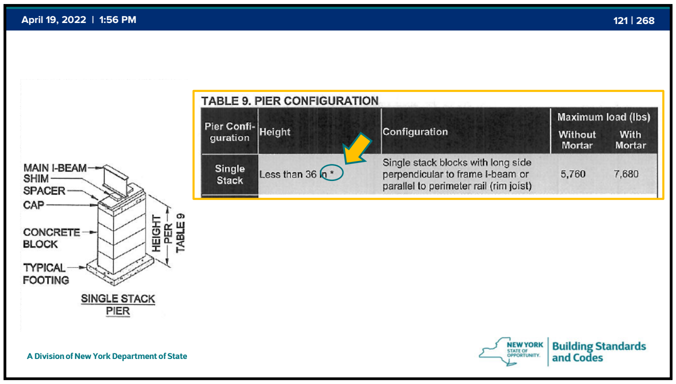

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MAIN I-BEAM
SHIM
SPACER
CAP
CONCRETE BLOCK
TYPICAL FOOTING
HEIGHT PER TABLE 9
SINGLE STACK PIER

TABLE 9. PIER CONFIGURATION

Pier Configuration	Height	Configuration	Maximum load (lbs) Without Mortar	Maximum load (lbs) 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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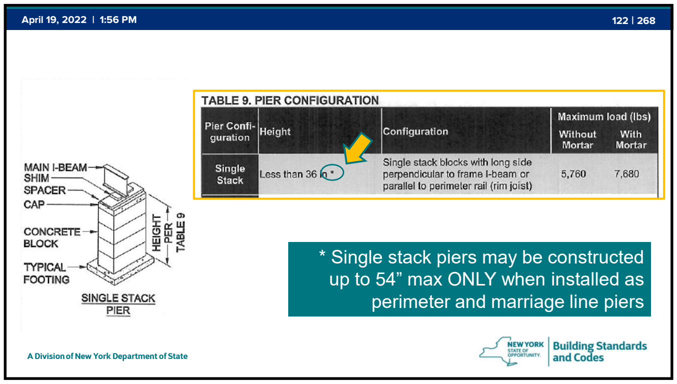

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MAIN I-BEAM
SHIM
SPACER
CAP
CONCRETE BLOCK
TYPICAL FOOTING
HEIGHT PER TABLE 9
SINGLE STACK PIER

TABLE 9. PIER CONFIGURATION

Pier Configuration	Height	Configuration	Maximum load (lbs) Without Mortar	Maximum load (lbs) 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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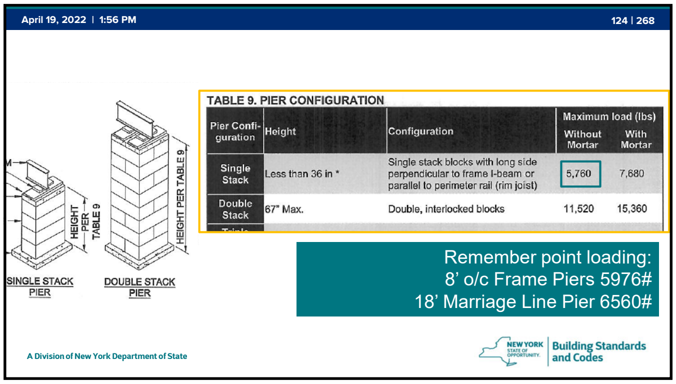

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HEIGHT PER TABLE 9
SINGLE STACK PIER
HEIGHT PER TABLE 9
DOUBLE STACK PIER

TABLE 9. PIER CONFIGURATION

Pier Configuration	Height	Configuration	Maximum load (lbs) Without Mortar	Maximum load (lbs) 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

Remember point loading:
8’ o/c Frame Piers 5976#
18’ Marriage Line Pier 6560#

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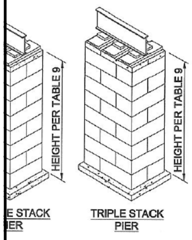

TABLE 9. PIER CONFIGURATION

Pier Configuration	Height	Configuration	Maximum load (lbs) Without Mortar	Maximum load (lbs) 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	23,034
Double Reinforced	108" Max. **	Double, interlocked blocks	NA	39,500

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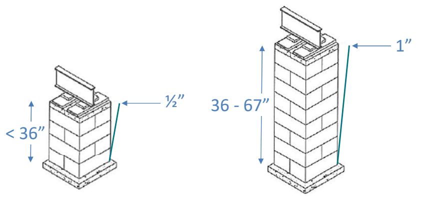
Maximum offset top to bottom



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Marriage Line Pier Configuration

Single Stack blocks*
Long side perpendicular to the marriage line
Caps: 4” solid, 2” lumber, ½” thick steel
Spacer: 2” hardwood or 2” concrete block
Shims: 4”x6” by 1” max

*8000# Maximum weight capacity

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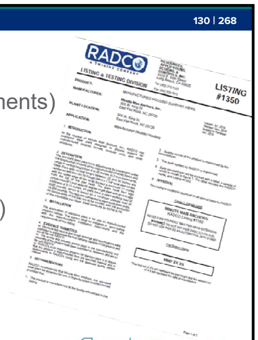
Commercial Steel Piers

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


RADCO
LISTING & TESTING DIVISION
LISTING
#1350

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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

TABLE 6a. 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)														
	South (20 psf)					Middle (30 psf)					North (40 psf)				
Pier Spacing	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	4960	5768	6576	7317	7990
> 8' to 10'	5000	5810	6620	7363	8038	5550	6460	7370	8204	8963	6100	7110	8120	9046	9888

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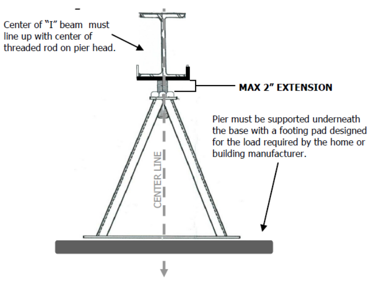
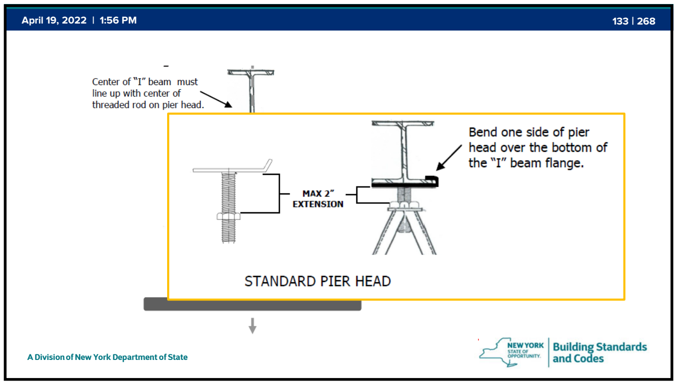


Center of “I” beam must line up with center of threaded rod on pier head.

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.

132



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

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

MAX 2"
EXTENSION

STANDARD PIER HEAD

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Complete Multi-Section Set

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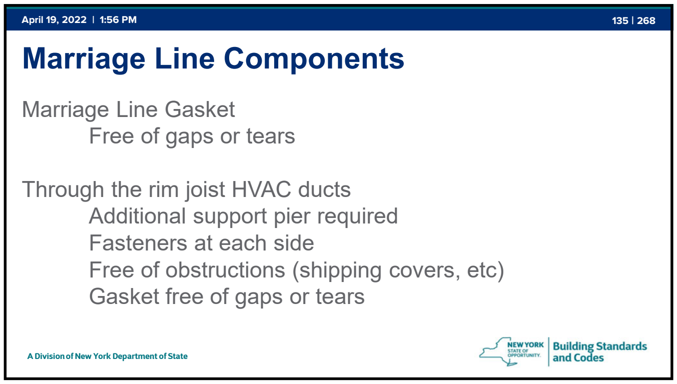

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Marriage Line Components

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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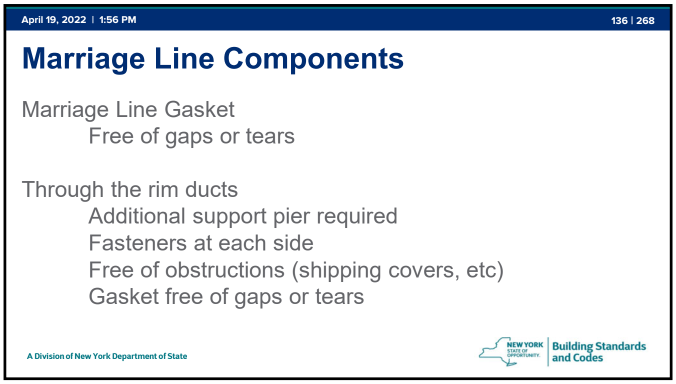

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Marriage Line Components

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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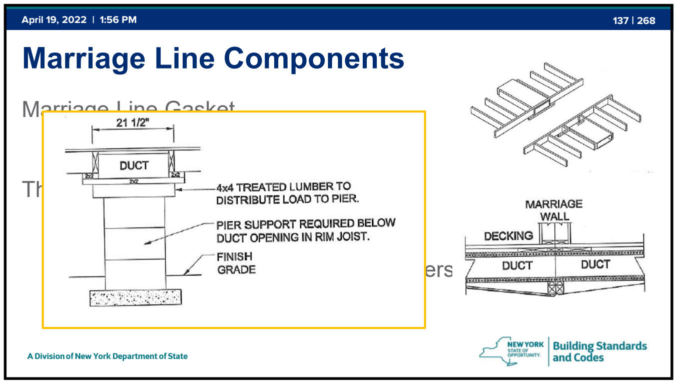

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Marriage Line Components

Marriage Line Gasket

Th

ers

21 1/2"
DUCT
2x2
2x2
2x2
4x4 TREATED LUMBER TO DISTRIBUTE LOAD TO PIER.
PIER SUPPORT REQUIRED BELOW DUCT OPENING IN RIM JOIST.
FINISH GRADE
MARRIAGE WALL
DECKING
DUCT
DUCT

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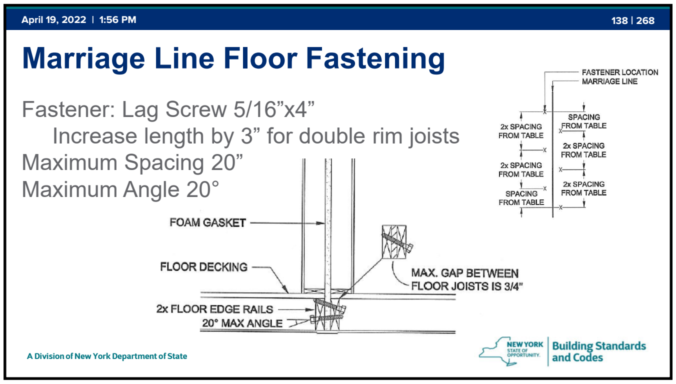

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Marriage Line Floor Fastening

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

FASTENER LOCATION
MARRIAGE LINE
SPACING FROM TABLE
2x SPACING FROM TABLE
2x SPACING FROM TABLE
2x SPACING FROM TABLE
2x SPACING FROM TABLE
SPACING FROM TABLE
FOAM GASKET
FLOOR DECKING
MAX. GAP BETWEEN FLOOR JOISTS IS 3/4"
2x FLOOR EDGE RAILS
20° MAX ANGLE

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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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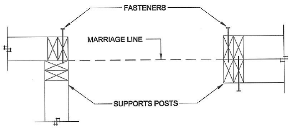
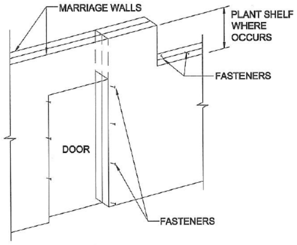
Interior Wall Connections

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


FASTENERS
MARRIAGE LINE
SUPPORTS POSTS


MARRIAGE WALLS
PLANT SHELF WHERE OCCURS
FASTENERS
DOOR
FASTENERS

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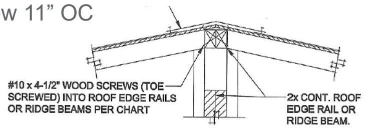
Roof Connections

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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Site Construction Manual

Stabilizing Systems

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Determine Locations

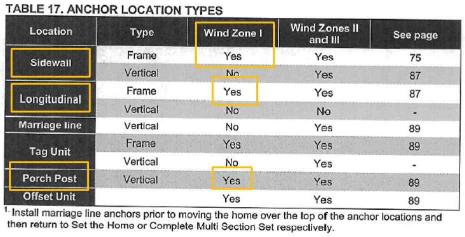

TABLE 17. ANCHOR LOCATION TYPES

Location	Type	Wind Zone I	Wind Zones II and III	See page
Sidewall	Frame	Yes	Yes	75
	Vertical	No	Yes	87
Longitudinal	Frame	Yes	Yes	87
	Vertical	No	No	-
Marriage line	Vertical	No	Yes	89
Tag Unit	Frame	Yes	Yes	89
	Vertical	No	Yes	-
Porch Post	Vertical	Yes	Yes	89
Offset Unit		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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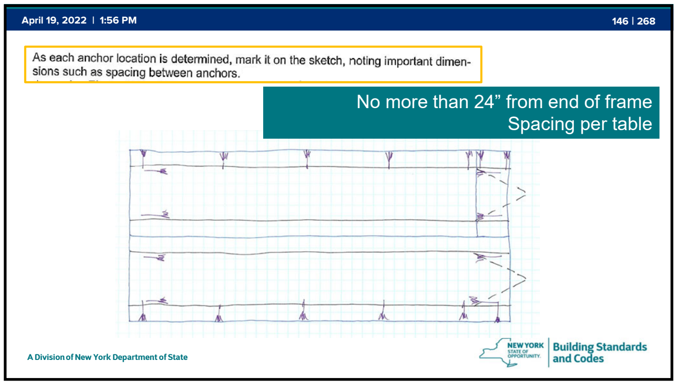
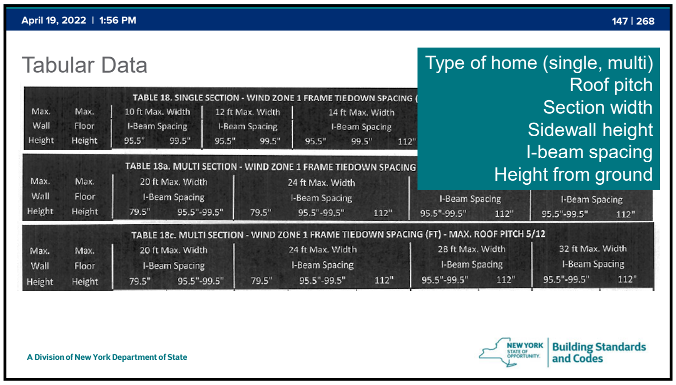


As each anchor location is determined, mark it on the sketch, noting important dimensions such as spacing between anchors.

No more than 24" from end of frame
Spacing per table



Tabular Data

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

TABLE 18. SINGLE SECTION - WIND ZONE 1 FRAME TIEDOWN SPACING (

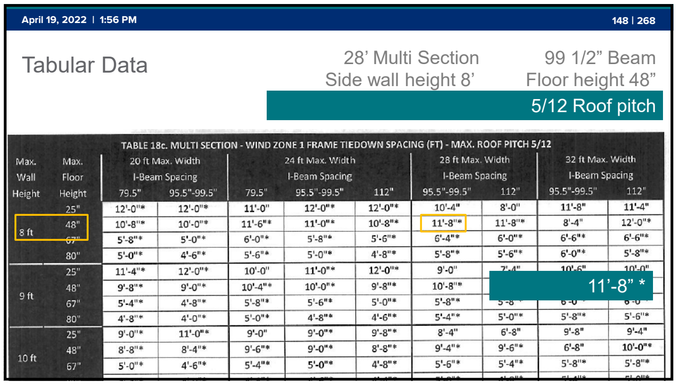
Max. Wall Height	Max. Floor Height	10 ft Max. Width I-Beam Spacing		12 ft Max. Width I-Beam Spacing		14 ft Max. Width I-Beam Spacing		
		95.5"	99.5"	95.5"	99.5"	95.5"	99.5"	112"

TABLE 18a. MULTI SECTION - WIND ZONE 1 FRAME TIEDOWN SPACING

Max. Wall Height	Max. Floor Height	20 ft Max. Width I-Beam Spacing		24 ft Max. Width I-Beam Spacing			I-Beam Spacing		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"

TABLE 18c. MULTI SECTION - WIND ZONE 1 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"	95.5"-99.5"	112"



Tabular Data

28' Multi Section
Side wall height 8'

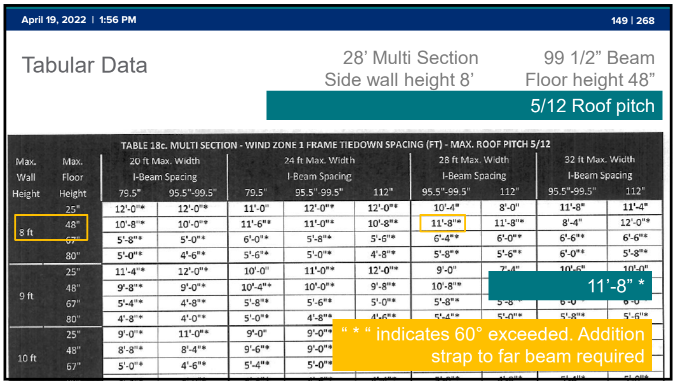
99 1/2" Beam
Floor height 48"

5/12 Roof pitch

TABLE 18c. MULTI SECTION - WIND ZONE 1 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"	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"
	48"	10'-8"*	10'-0"*	11'-6"*	11'-0"*	10'-8"*	11'-8"*	11'-8"*	8'-4"	12'-0"*
	67"	5'-8"*	5'-0"*	6'-0"*	5'-8"*	5'-6"*	6'-4"*	6'-0"*	6'-6"*	6'-6"*
	80"	5'-0"*	4'-6"*	5'-6"*	5'-0"*	4'-8"*	5'-8"*	5'-6"*	6'-0"*	5'-8"*
9 ft	25"	11'-4"*	12'-0"*	10'-0"	11'-0"*	12'-0"*	9'-0"	7'-4"	10'-6"	10'-0"
	48"	9'-8"*	9'-0"*	10'-4"*	10'-0"*	9'-8"*	10'-8"*	[illegible]	[illegible]	[illegible]
	67"	5'-4"*	4'-8"*	5'-8"*	5'-6"*	5'-0"*	5'-8"*	5'-8"*	6'-0"*	6'-0"*
	80"	4'-8"*	4'-0"*	5'-0"*	4'-8"*	4'-6"*	5'-4"*	5'-0"*	5'-8"*	5'-6"*
10 ft	25"	9'-0"*	11'-0"*	9'-0"	9'-0"*	9'-8"*	8'-4"	6'-8"	9'-8"	9'-4"
	48"	8'-8"*	8'-4"*	9'-6"*	9'-0"*	8'-8"*	9'-4"*	9'-6"*	6'-8"	10'-0"*
	67"	5'-0"*	4'-6"*	5'-4"*	5'-0"*	4'-8"*	5'-6"*	5'-4"*	5'-8"*	5'-8"*

11'-8" *



Tabular Data

28' Multi Section
Side wall height 8'

99 1/2" Beam
Floor height 48"

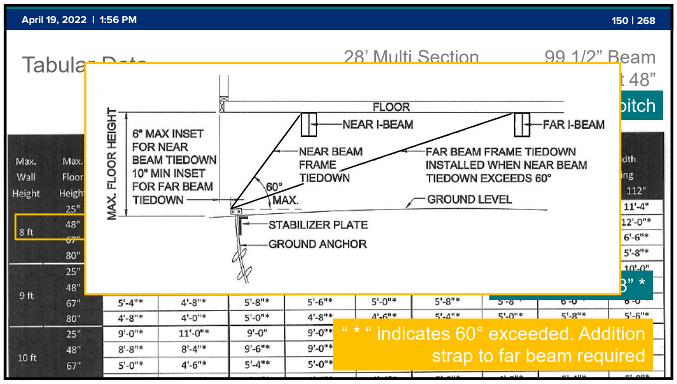
5/12 Roof pitch

TABLE 18c. MULTI SECTION - WIND ZONE 1 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"	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"
	48"	10'-8"*	10'-0"*	11'-6"*	11'-0"*	10'-8"*	11'-8"*	11'-8"*	8'-4"	12'-0"*
	67"	5'-8"*	5'-0"*	6'-0"*	5'-8"*	5'-6"*	6'-4"*	6'-0"*	6'-6"*	6'-6"*
	80"	5'-0"*	4'-6"*	5'-6"*	5'-0"*	4'-8"*	5'-8"*	5'-6"*	6'-0"*	5'-8"*
9 ft	25"	11'-4"*	12'-0"*	10'-0"	11'-0"*	12'-0"*	9'-0"	7'-4"	10'-6"	10'-0"
	48"	9'-8"*	9'-0"*	10'-4"*	10'-0"*	9'-8"*	10'-8"*	[illegible]	[illegible]	[illegible]
	67"	5'-4"*	4'-8"*	5'-8"*	5'-6"*	5'-0"*	5'-8"*	5'-8"*	6'-0"*	6'-0"*
	80"	4'-8"*	4'-0"*	5'-0"*	4'-8"*	4'-6"*	5'-4"*	5'-0"*	5'-8"*	5'-6"*
10 ft	25"	9'-0"*	11'-0"*	9'-0"	9'-0"*	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	48"	8'-8"*	8'-4"*	9'-6"*	9'-0"*	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	67"	5'-0"*	4'-6"*	5'-4"*	5'-0"*	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

11'-8" *

" * " indicates 60° exceeded. Addition strap to far beam required



Tabular Data

28' Multi Section

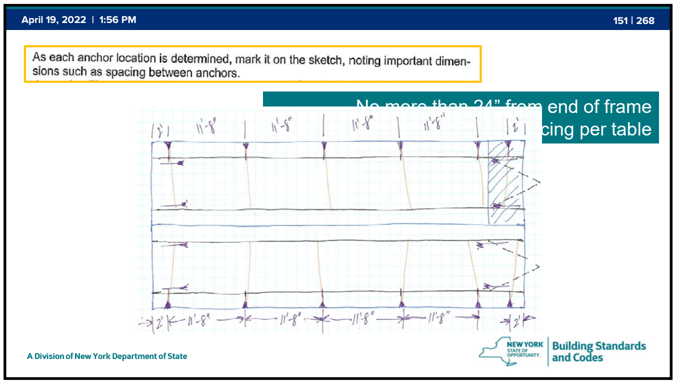
99 1/2" Beam
48"

pitch

MAX. FLOOR HEIGHT
6" MAX INSET FOR NEAR BEAM TIEDOWN 10" MIN INSET FOR FAR BEAM TIEDOWN
FLOOR
NEAR I-BEAM
FAR I-BEAM
NEAR BEAM FRAME TIEDOWN
FAR BEAM FRAME TIEDOWN INSTALLED WHEN NEAR BEAM TIEDOWN EXCEEDS 60°
60° MAX.
GROUND LEVEL
STABILIZER PLATE
GROUND ANCHOR

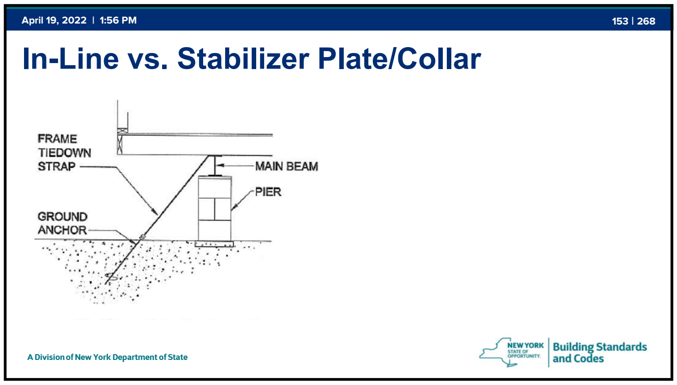
Max. Wall Height	Max. Floor Height									112"
8 ft	25"									11'-4"
	48"									12'-0"*
	67"									6'-6"*
	80"									5'-8"*
9 ft	25"									10'-0"
	48"									
	67"	5'-4"*	4'-8"*	5'-8"*	5'-6"*	5'-0"*	5'-8"*	5'-8"*	6'-0"*	6'-0"*
	80"	4'-8"*	4'-0"*	5'-0"*	4'-8"*	4'-6"*	5'-4"*	5'-0"*	5'-8"*	5'-6"*
10 ft	25"	9'-0"*	11'-0"*	9'-0"	9'-0"*					
	48"	8'-8"*	8'-4"*	9'-6"*	9'-0"*					
	67"	5'-0"*	4'-6"*	5'-4"*	5'-0"*					

" * " indicates 60° exceeded. Addition strap to far beam required



As each anchor location is determined, mark it on the sketch, noting important dimensions such as spacing between anchors.

No more than 24" from end of frame
cing per table



April 19, 2022 | 1:56 PM 153 | 268

In-Line vs. Stabilizer Plate/Collar

FRAME TIEDOWN STRAP
MAIN BEAM
PIER
GROUND ANCHOR

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Building Standards and Codes

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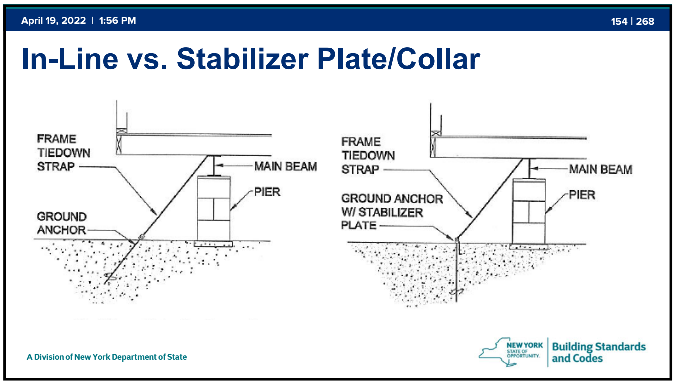

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In-Line vs. Stabilizer Plate/Collar

FRAME TIEDOWN STRAP
MAIN BEAM
PIER
GROUND ANCHOR
FRAME TIEDOWN STRAP
MAIN BEAM
PIER
GROUND ANCHOR W/ STABILIZER PLATE

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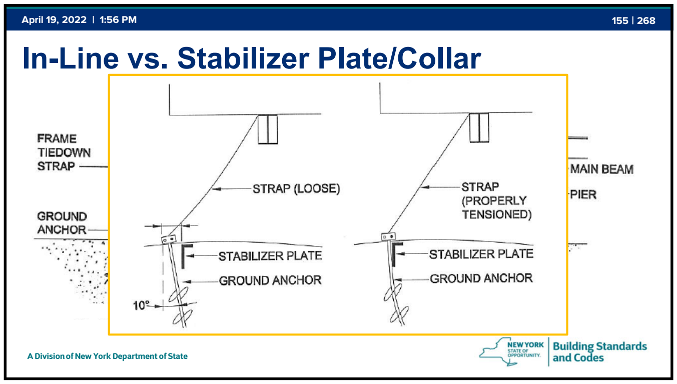

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In-Line vs. Stabilizer Plate/Collar

FRAME TIEDOWN STRAP
GROUND ANCHOR
MAIN BEAM
PIER
STRAP (LOOSE)
STABILIZER PLATE
GROUND ANCHOR
10°
STRAP (PROPERLY TENSIONED)
STABILIZER PLATE
GROUND ANCHOR

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Building Standards and Codes

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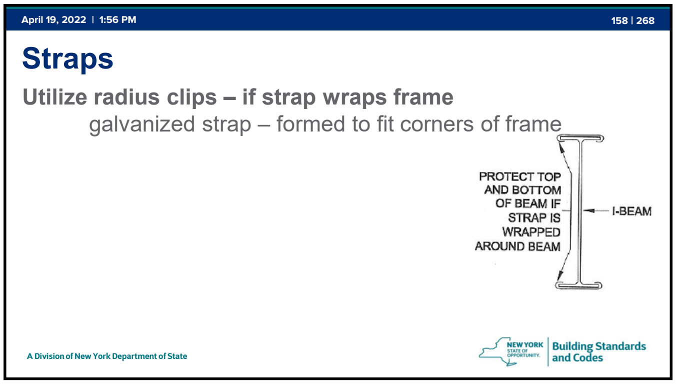

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Straps

Utilize radius clips – if strap wraps frame

galvanized strap – formed to fit corners of frame

PROTECT TOP AND BOTTOM OF BEAM IF STRAP IS WRAPPED AROUND BEAM
I-BEAM

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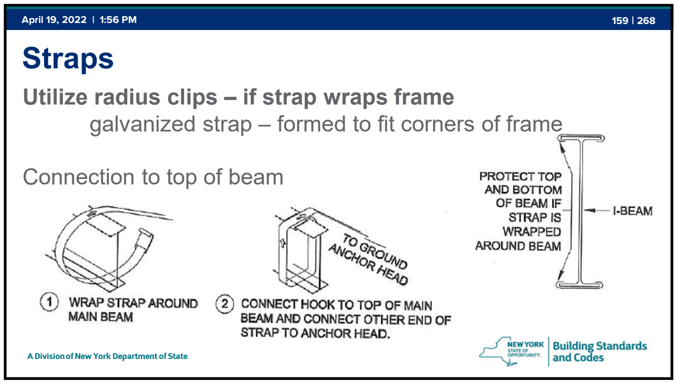

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Straps

Utilize radius clips – if strap wraps frame

galvanized strap – formed to fit corners of frame

Connection to top of beam

TO GROUND ANCHOR HEAD
① WRAP STRAP AROUND MAIN BEAM
② CONNECT HOOK TO TOP OF MAIN BEAM AND CONNECT OTHER END OF STRAP TO ANCHOR HEAD.
PROTECT TOP AND BOTTOM OF BEAM IF STRAP IS WRAPPED AROUND BEAM
I-BEAM

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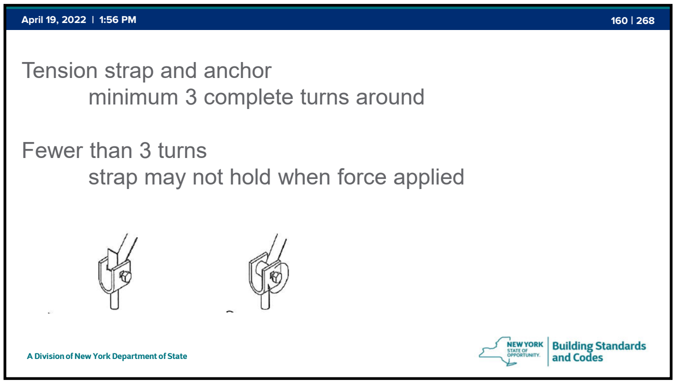

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Tension strap and anchor

minimum 3 complete turns around

Fewer than 3 turns

strap may not hold when force applied

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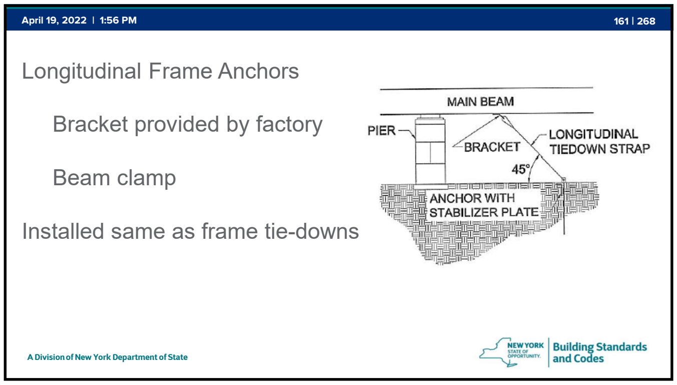

Longitudinal Frame Anchors

- Bracket provided by factory
- Beam clamp

Installed same as frame tie-downs

MAIN BEAM
PIER
BRACKET
LONGITUDINAL TIEDOWN STRAP
45°
ANCHOR WITH STABILIZER PLATE

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Tilt-roof Addendum

If Applicable

Clayton Built
Site Construction Manual

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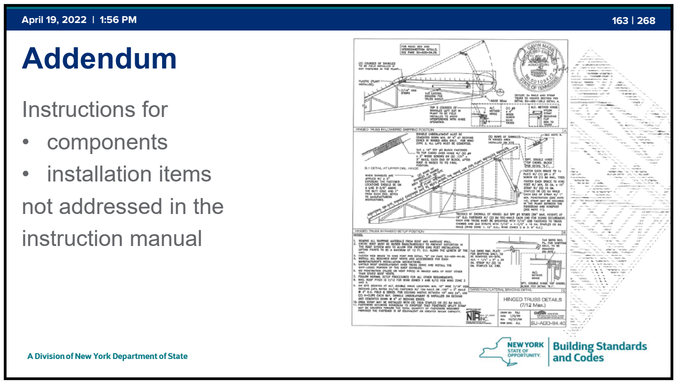

Addendum

Instructions for

- components
- installation items

not addressed in the instruction manual

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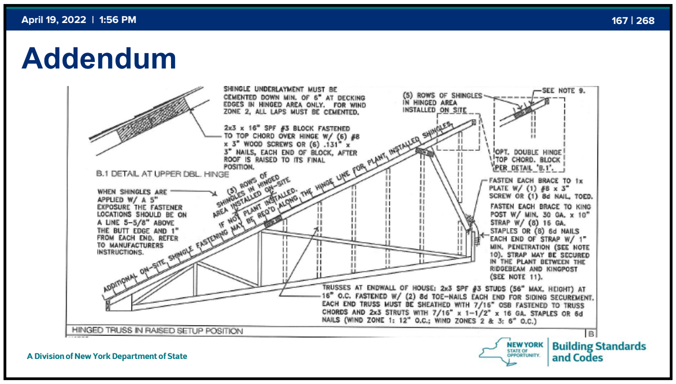

Addendum

SHINGLE UNDERLAYMENT MUST BE CEMENTED DOWN MIN. OF 6" AT DECKING EDGES IN HINGED AREA ONLY. FOR WIND ZONE 2, ALL LAPS MUST BE CEMENTED.
2x3 x 16" SPF #3 BLOCK FASTENED TO TOP CHORD OVER HINGE W/ (6) #8 x 3" WOOD SCREWS OR (6) .131" x 3" NAILS, EACH END OF BLOCK, AFTER ROOF IS RAISED TO ITS FINAL POSITION.
B.1 DETAIL AT UPPER DBL. HINGE
(5) ROWS OF SHINGLES IN HINGED AREA INSTALLED ON SITE
SEE NOTE 9.
OPT. DOUBLE HINGE TOP CHORD. BLOCK PER DETAIL 'B.1'.
WHEN SHINGLES ARE APPLIED W/ A 5" EXPOSURE THE FASTENER LOCATIONS SHOULD BE ON A LINE 5-5/8" ABOVE THE BUTT EDGE AND 1" FROM EACH END. REFER TO MANUFACTURERS INSTRUCTIONS.
(3) ROWS OF SHINGLES IN HINGED AREA INSTALLED ON-SITE
IF NOT PLANT INSTALLED.
ADDITIONAL ON-SITE SHINGLE FASTENING MAY BE REQ'D ALONG THE HINGE LINE FOR PLANT INSTALLED SHINGLES.
FASTEN EACH BRACE TO 1x PLATE W/ (1) #8 x 3" SCREW OR (1) 8d NAIL, TOED.
FASTEN EACH BRACE TO KING POST W/ MIN. 30 GA. x 10" STRAP W/ (8) 16 GA. STAPLES OR (8) 6d NAILS EACH END OF STRAP W/ 1" MIN. PENETRATION (SEE NOTE 10). STRAP MAY BE SECURED IN THE PLANT BETWEEN THE RIDGEBEAM AND KINGPOST (SEE NOTE 11).
TRUSSES AT ENDWALL OF HOUSE: 2x3 SPF #3 STUDS (56" MAX. HEIGHT) AT 16" O.C. FASTENED W/ (2) 8d TOE-NAILS EACH END FOR SIDING SECUREMENT. EACH END TRUSS MUST BE SHEATHED WITH 7/16" OSB FASTENED TO TRUSS CHORDS AND 2x3 STRUTS WITH 7/16" x 1-1/2" x 16 GA. STAPLES OR 6d NAILS (WIND ZONE 1: 12" O.C.; WIND ZONES 2 & 3: 6" O.C.)
HINGED TRUSS IN RAISED SETUP POSITION
B

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Alternative Foundation Designs

Slabs/Basements

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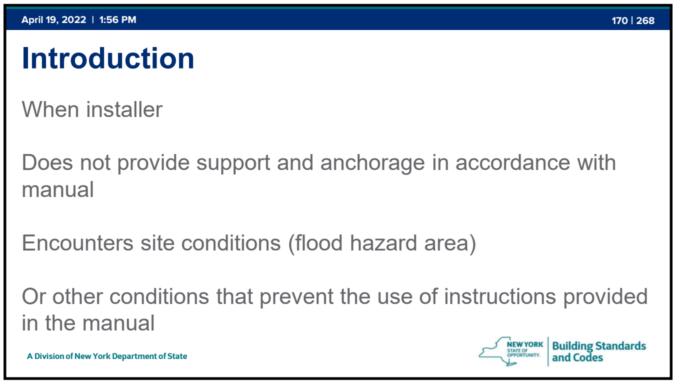

Introduction

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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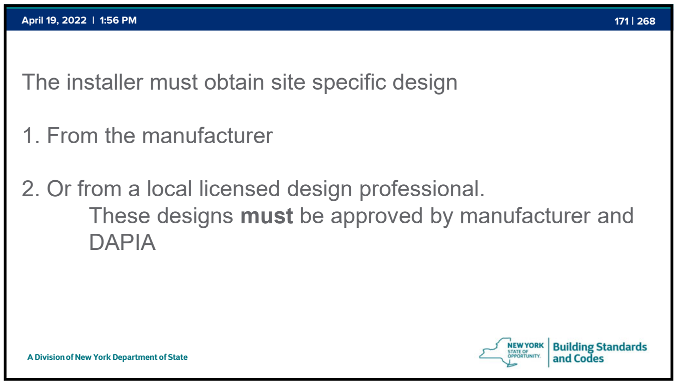

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The installer must obtain site specific design

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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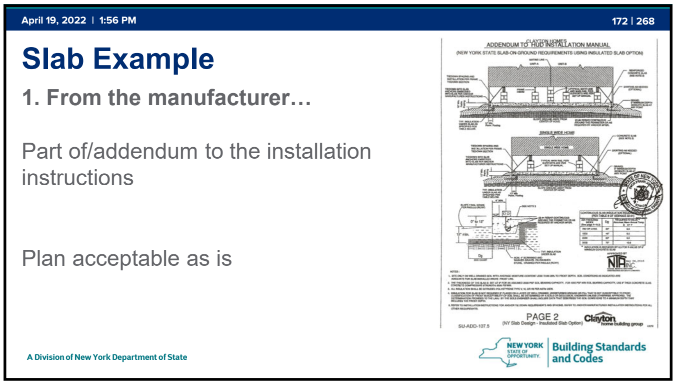

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Slab Example

1. From the manufacturer…

Part of/addendum to the installation instructions

Plan acceptable as is

CLAYTON HOMES
ADDENDUM TO HUD INSTALLATION MANUAL
(NEW YORK STATE SLAB-ON-GROUND REQUIREMENTS USING INSULATED SLAB OPTION)
SINGLE WIDE HOME
0" to 12"
12" min.
APPROVED BY
NTA INC.
PAGE 2
(NY Slab Design - Insulated Slab Option)
SU-ADD-107.5
Clayton home building group

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Building Standards and Codes

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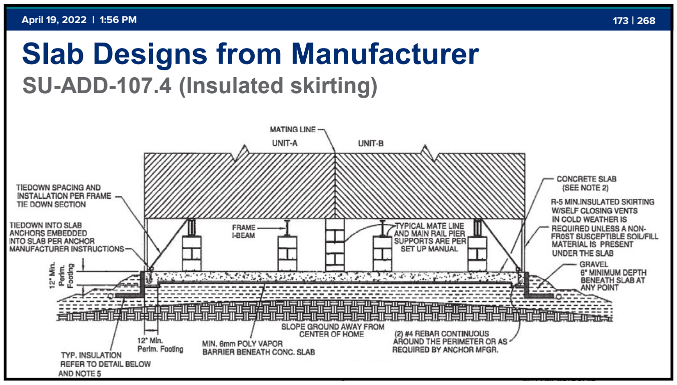

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Slab Designs from Manufacturer

SU-ADD-107.4 (Insulated skirting)

MATING LINE
UNIT-A
UNIT-B
TIEDOWN SPACING AND INSTALLATION PER FRAME TIE DOWN SECTION
TIEDOWN INTO SLAB ANCHORS EMBEDDED INTO SLAB PER ANCHOR MANUFACTURER INSTRUCTIONS
FRAME I-BEAM
TYPICAL MATE LINE AND MAIN RAIL PIER SUPPORTS ARE PER SET UP MANUAL
CONCRETE SLAB (SEE NOTE 2)
R-5 MIN.INSULATED SKIRTING W/SELF CLOSING VENTS IN COLD WEATHER IS REQUIRED UNLESS A NON-FROST SUSCEPTIBLE SOIL/FILL MATERIAL IS PRESENT UNDER THE SLAB
GRAVEL 6" MINIMUM DEPTH BENEATH SLAB AT ANY POINT
12" Min. Perim. Footing
SLOPE GROUND AWAY FROM CENTER OF HOME
(2) #4 REBAR CONTINUOUS AROUND THE PERIMETER OR AS REQUIRED BY ANCHOR MFGR.
12" Min. Perim. Footing
MIN. 6mm POLY VAPOR BARRIER BENEATH CONC. SLAB
TYP. INSULATION REFER TO DETAIL BELOW AND NOTE 5

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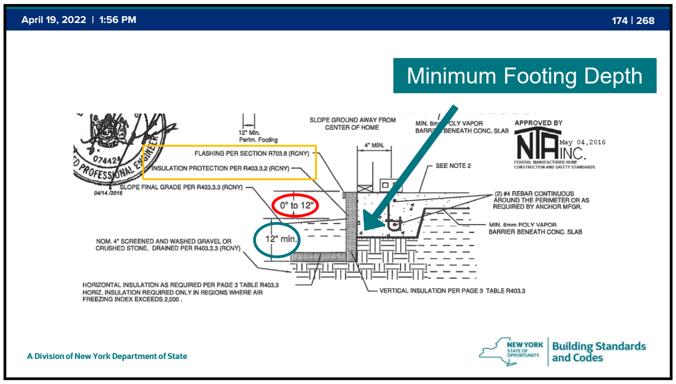

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Minimum Footing Depth

12" Min. Perim. Footing
SLOPE GROUND AWAY FROM CENTER OF HOME
MIN. 6mm POLY VAPOR BARRIER BENEATH CONC. SLAB
APPROVED BY
NTA INC.
May 04,2016
FEDERAL MANUFACTURED HOME CONSTRUCTION AND SAFETY STANDARDS
FLASHING PER SECTION R703.8 (RCNY)
INSULATION PROTECTION PER R403.3.2 (RCNY)
4" MIN.
SEE NOTE 2
SLOPE FINAL GRADE PER R403.3.3 (RCNY)
04/14/2016
0" to 12"
12" min.
(2) #4 REBAR CONTINUOUS AROUND THE PERIMETER OR AS REQUIRED BY ANCHOR MFGR.
MIN. 6mm POLY VAPOR BARRIER BENEATH CONC. SLAB
NOM. 4" SCREENED AND WASHED GRAVEL OR CRUSHED STONE. DRAINED PER R403.3.3 (RCNY)
HORIZONTAL INSULATION AS REQUIRED PER PAGE 3 TABLE R403.3 HORIZ. INSULATION REQUIRED ONLY IN REGIONS WHERE AIR FREEZING INDEX EXCEEDS 2,000 .
VERTICAL INSULATION PER PAGE 3 TABLE R403.3

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Building Standards and Codes

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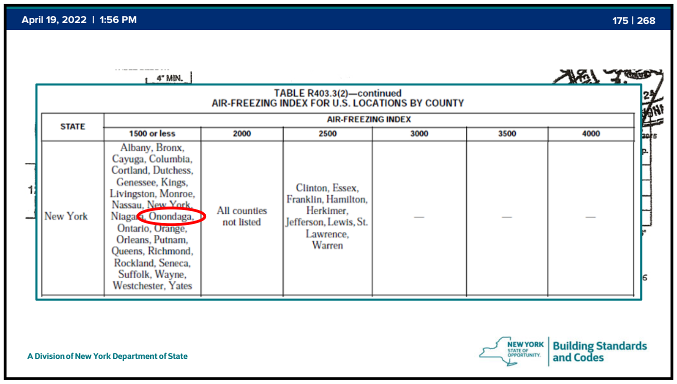

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TABLE R403.3(2)—continued
AIR-FREEZING INDEX FOR U.S. LOCATIONS BY COUNTY

STATE	AIR-FREEZING INDEX					
	1500 or less	2000	2500	3000	3500	4000
New York	Albany, Bronx, Cayuga, Columbia, Cortland, Dutchess, Genessee, Kings, Livingston, Monroe, Nassau, New York, Niagara, Onondaga, Ontario, Orange, Orleans, Putnam, Queens, Richmond, Rockland, Seneca, Suffolk, Wayne, Westchester, Yates	All counties not listed	Clinton, Essex, Franklin, Hamilton, Herkimer, Jefferson, Lewis, St. Lawrence, Warren	—	—	—

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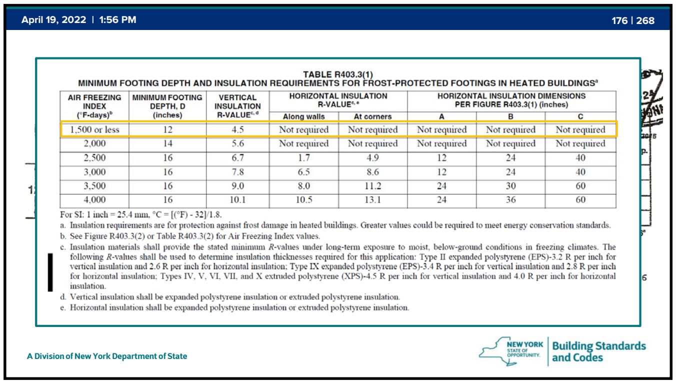

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TABLE R403.3(1)
MINIMUM FOOTING DEPTH AND INSULATION REQUIREMENTS FOR FROST-PROTECTED FOOTINGS IN HEATED BUILDINGS[a]

AIR FREEZING INDEX (°F-days)[b]	MINIMUM FOOTING DEPTH, D (inches)	VERTICAL INSULATION R-VALUE[c, d]	HORIZONTAL INSULATION R-VALUE[c, e]		HORIZONTAL INSULATION DIMENSIONS PER FIGURE R403.3(1) (inches)		
			Along walls	At corners	A	B	C
1,500 or less	12	4.5	Not required	Not required	Not required	Not required	Not required
2,000	14	5.6	Not required	Not required	Not required	Not required	Not required
2,500	16	6.7	1.7	4.9	12	24	40
3,000	16	7.8	6.5	8.6	12	24	40
3,500	16	9.0	8.0	11.2	24	30	60
4,000	16	10.1	10.5	13.1	24	36	60

For SI: 1 inch = 25.4 mm, °C = [(°F) - 32]/1.8.

a. Insulation requirements are for protection against frost damage in heated buildings. Greater values could be required to meet energy conservation standards.

b. See Figure R403.3(2) or Table R403.3(2) for Air Freezing Index values.

c. Insulation materials shall provide the stated minimum R-values under long-term exposure to moist, below-ground conditions in freezing climates. The following R-values shall be used to determine insulation thicknesses required for this application: Type II expanded polystyrene (EPS)-3.2 R per inch for vertical insulation and 2.6 R per inch for horizontal insulation; Type IX expanded polystyrene (EPS)-3.4 R per inch for vertical insulation and 2.8 R per inch for horizontal insulation; Types IV, V, VI, VII, and X extruded polystyrene (XPS)-4.5 R per inch for vertical insulation and 4.0 R per inch for horizontal insulation.

d. Vertical insulation shall be expanded polystyrene insulation or extruded polystyrene insulation.

e. Horizontal insulation shall be expanded polystyrene insulation or extruded polystyrene insulation.

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Building Standards and Codes

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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.)

Clayton home building group 4/4/16

APPROVED BY NTA INC. May 04, 2016

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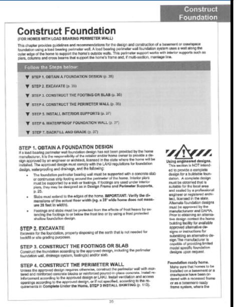
This chapter provides guidelines and recommendations for the design and construction of a basement or crawlspace foundation using a load bearing perimeter wall…



Construct Foundation

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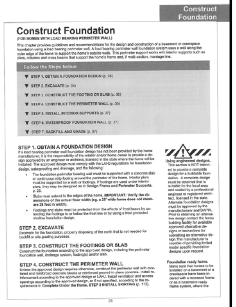
This chapte
recommen
constructio
crawlspace
bearing pe

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

195

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

APPROVED BY NTA INC. May 04, 2016

196

Traditional recessed frame with cross channels and "outriggers"

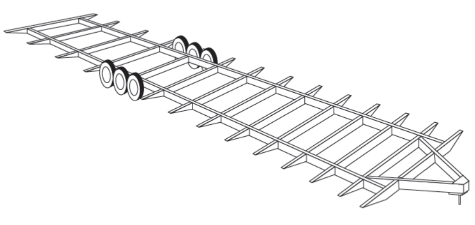
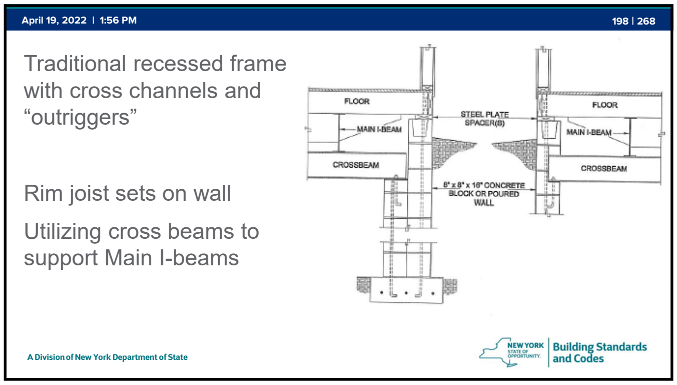


Figure 2-1. Traditional chassis system.

197



April 19, 2022 | 1:56 PM 198 | 268

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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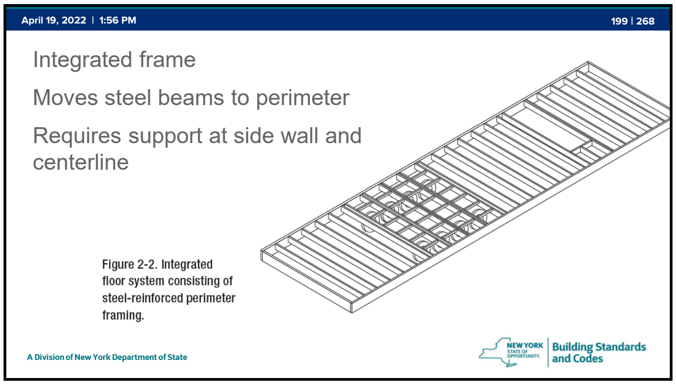
Building Standards and Codes

198



April 19, 2022 | 1:56 PM 199 | 268

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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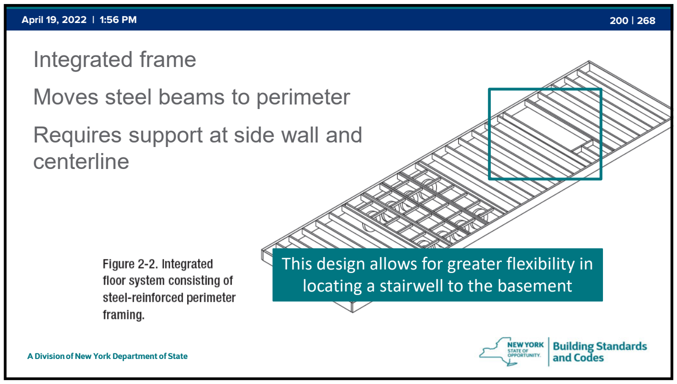
Building Standards and Codes

199



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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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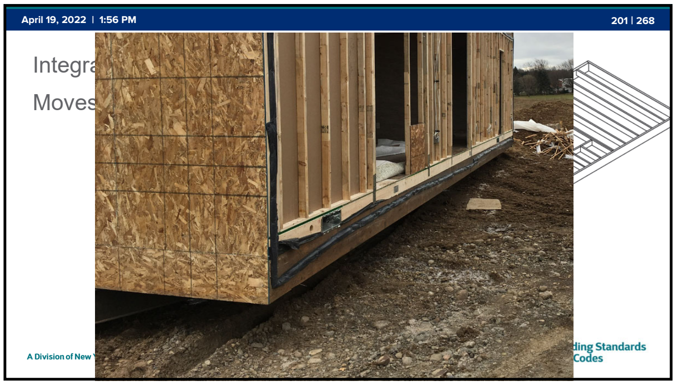
Building Standards and Codes

200



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Integra

Moves

A Division of New Y

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201

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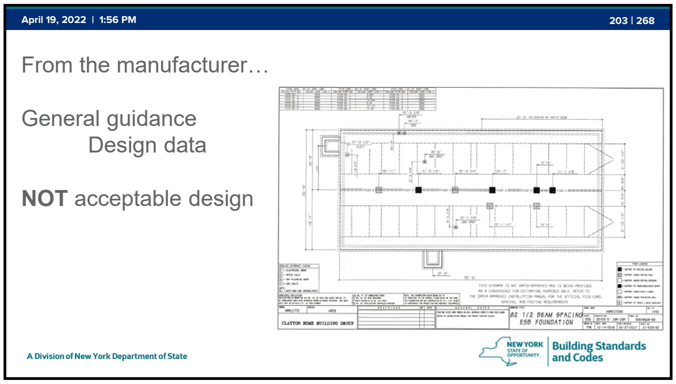
202



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From the manufacturer…

General guidance
Design data

NOT acceptable design

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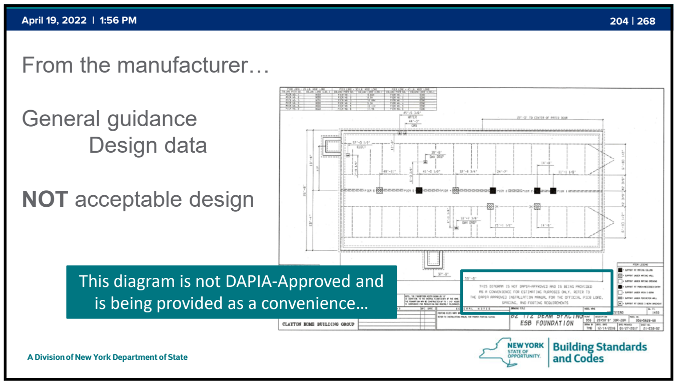
203



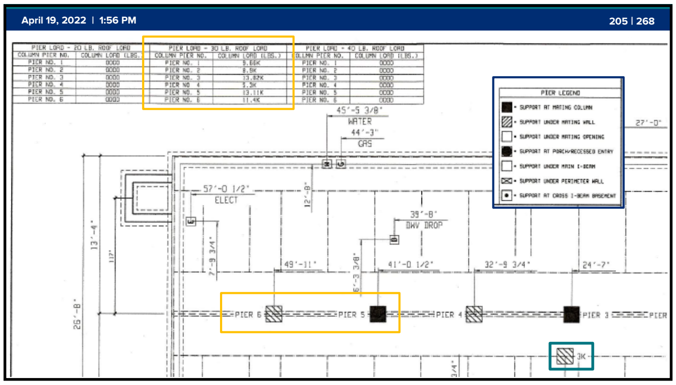
From the manufacturer…

General guidance
Design data

NOT acceptable design

This diagram is not DAPIA-Approved and is being provided as a convenience…

CLAYTON HOME BUILDING GROUP
ESB FOUNDATION

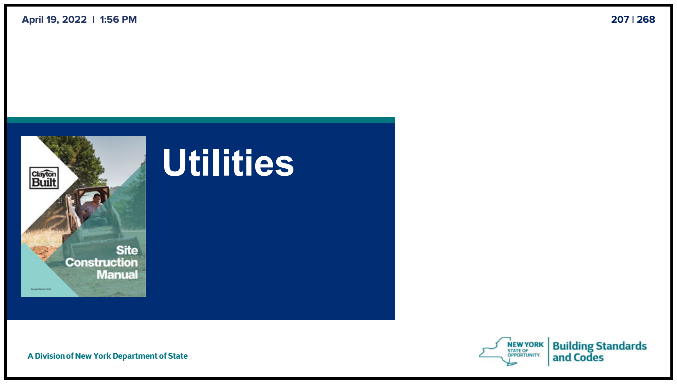


PIER LOAD - 20 LB. ROOF LOAD		PIER LOAD - 30 LB. ROOF LOAD		PIER LOAD - 40 LB. ROOF LOAD	
COLUMN PIER NO.	COLUMN LOAD (LBS.)	COLUMN PIER NO.	COLUMN LOAD (LBS.)	COLUMN PIER NO.	COLUMN LOAD (LBS.)
PIER NO. 1	0000	PIER NO. 1	9.66K	PIER NO. 1	0000
PIER NO. 2	0000	PIER NO. 2	8.9K	PIER NO. 2	0000
PIER NO. 3	0000	PIER NO. 3	13.82K	PIER NO. 3	0000
PIER NO. 4	0000	PIER NO 4	5.3K	PIER NO. 4	0000
PIER NO. 5	0000	PIER NO. 5	13.11K	PIER NO. 5	0000
PIER NO. 6	0000	PIER NO. 6	11.4K	PIER NO. 6	0000

PIER LEGEND

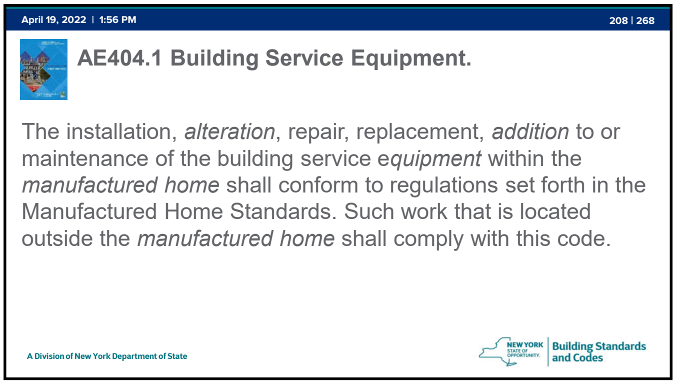
- ■ - SUPPORT AT MATING COLUMN
- ▨ - SUPPORT UNDER MATING WALL
- ☐ - SUPPORT UNDER MATING OPENING
- ● - SUPPORT AT PORCH/RECESSED ENTRY
- ☐ - SUPPORT UNDER MAIN I-BEAM
- ⌧ - SUPPORT UNDER PERIMETER WALL
- ⊡ - SUPPORT AT CROSS I-BEAM BASEMENT

45'-5 3/8"
WATER
44'-3"
GAS
27'-0"
57'-0 1/2"
ELECT
12'-8"
13'-4"
117"
7'-9 3/4"
39'-8"
DWV DROP
49'-11"
6'-3 3/8"
41'-0 1/2"
32'-9 3/4"
24'-7"
26'-8"
PIER 6
PIER 5
PIER 4
PIER 3
PIER
3K
3/4"



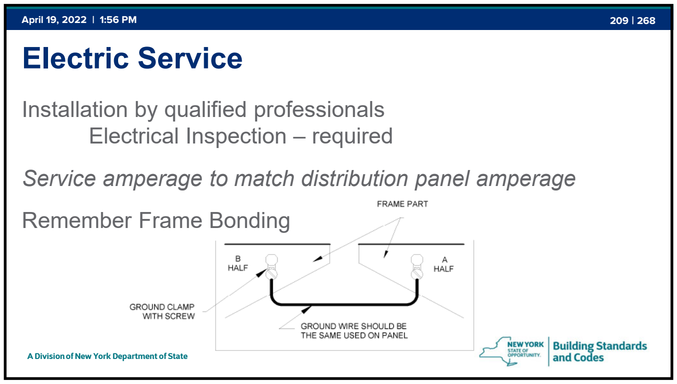
Utilities

Clayton Built
Site Construction Manual



AE404.1 Building Service Equipment.

The installation, *alteration*, repair, replacement, *addition* to or maintenance of the building service e*quipment* 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.



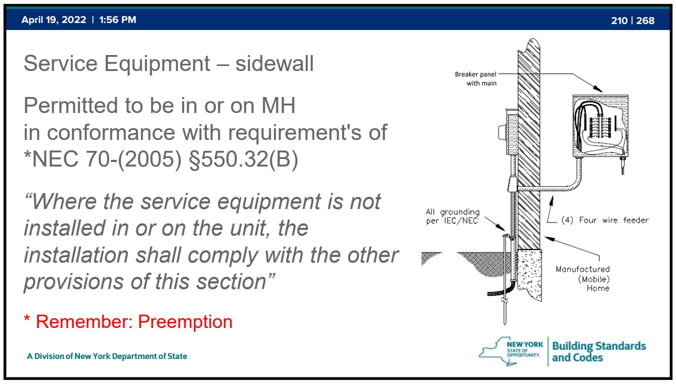
Electric Service

Installation by qualified professionals
Electrical Inspection – required

Service amperage to match distribution panel amperage

Remember Frame Bonding

FRAME PART
B HALF
A HALF
GROUND CLAMP WITH SCREW
GROUND WIRE SHOULD BE THE SAME USED ON PANEL



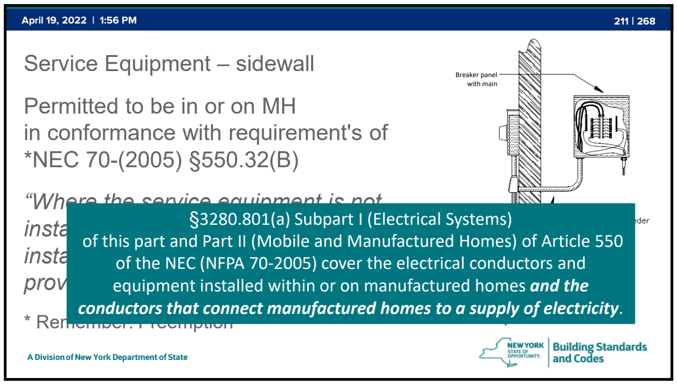
Service Equipment – sidewall

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

Breaker panel with main
All grounding per IEC/NEC
(4) Four wire feeder
Manufactured (Mobile) Home



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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
insta
insta
prov

§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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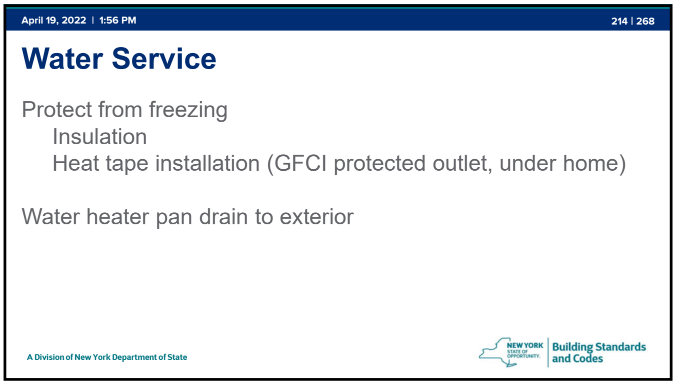
211



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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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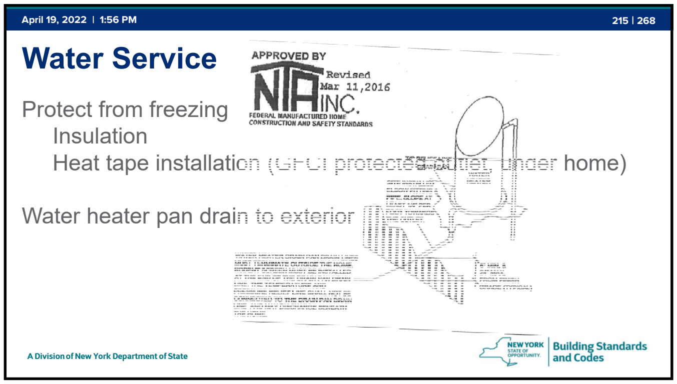
214



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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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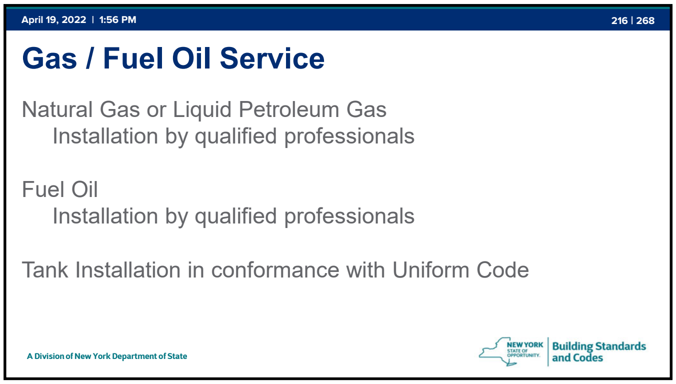
215



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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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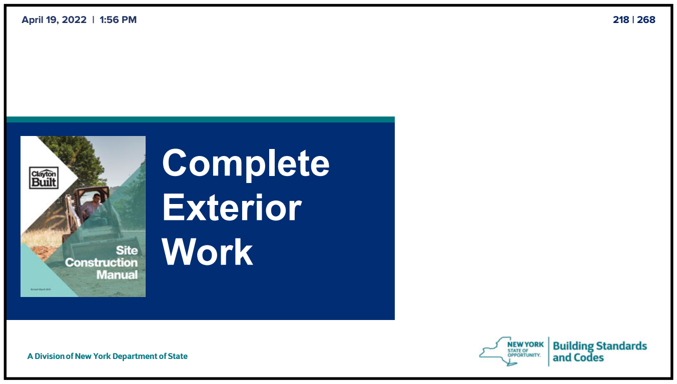
216



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Complete Exterior Work

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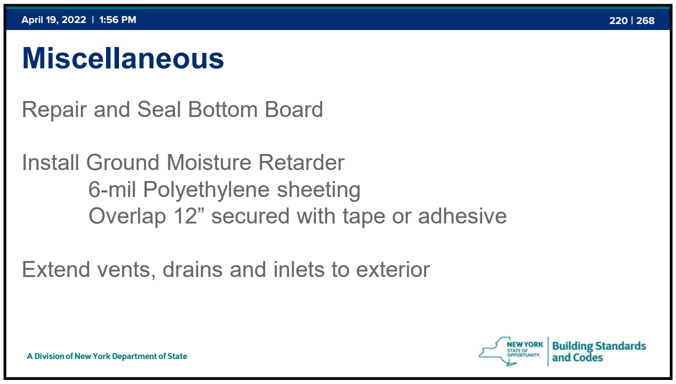
218



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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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220

Skirting

Is any structural or non structural crawlspace enclosure

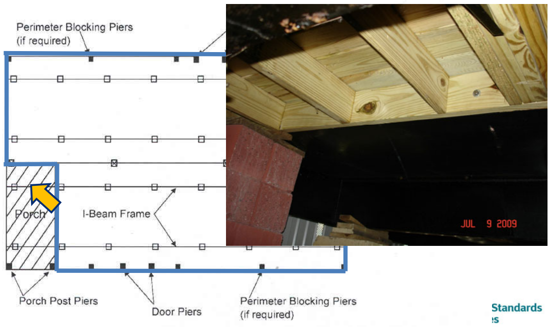
Must be weather resistant materials

Must provide ventilation
prevent rodent entry

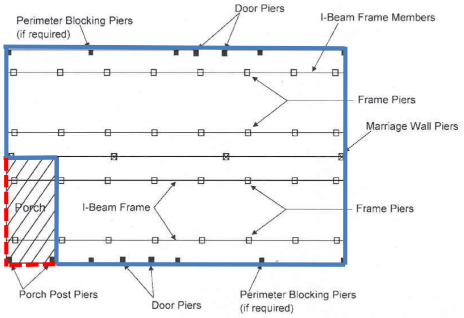
Follow conditioned space

221

222


Perimeter Blocking Piers
(if required)
Porch
I-Beam Frame
JUL 9 2009
Porch Post Piers
Door Piers
Perimeter Blocking Piers
(if required)

223


Perimeter Blocking Piers
(if required)
Door Piers
I-Beam Frame Members
Frame Piers
Marriage Wall Piers
Porch
I-Beam Frame
Frame Piers
Porch Post Piers
Door Piers
Perimeter Blocking Piers
(if required)

224

Crawl Space Ventilation

Vents equal size, opposite sides
Within 3' of corners

144sqin net free vent for 1500sqft conditioned floor space

225

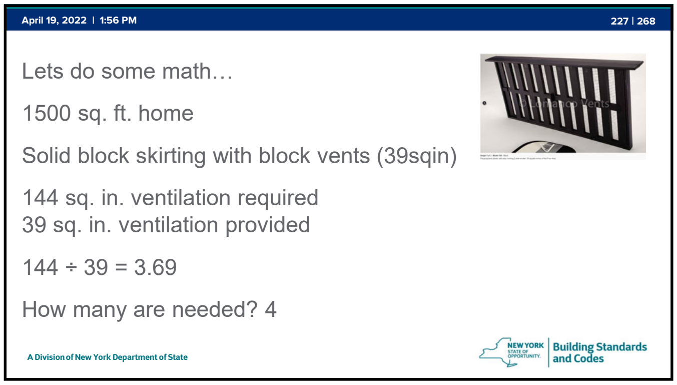
NOTE: NFA not equal foundation opening size

Foundation Opening
8"x16"=128sqin

NFA = 39sqin

© Lomanco Vents

226



Lets do some math…

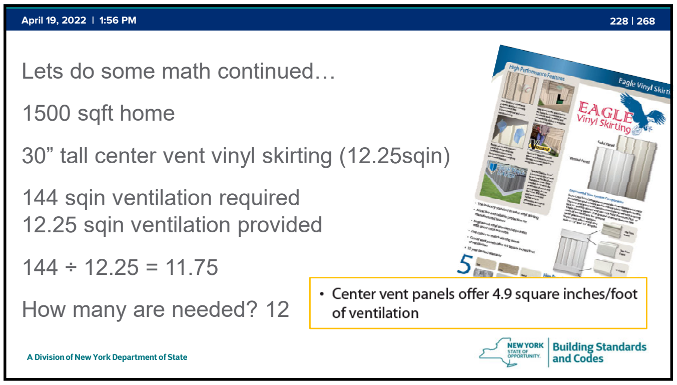
1500 sq. ft. home

Solid block skirting with block vents (39sqin)

144 sq. in. ventilation required
39 sq. in. ventilation provided

144 ÷ 39 = 3.69

How many are needed? 4



Lets do some math continued…

1500 sqft home

30” tall center vent vinyl skirting (12.25sqin)

144 sqin ventilation required
12.25 sqin ventilation provided

144 ÷ 12.25 = 11.75

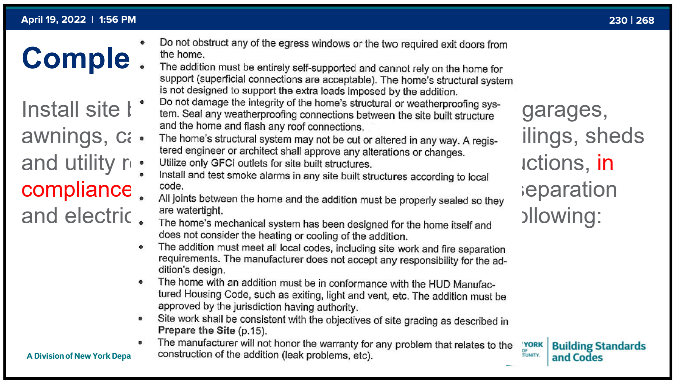
How many are needed? 12

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

Eagle Vinyl Skirting
High Performance Features
EAGLE Vinyl Skirting
5

Complete Site Built Structures

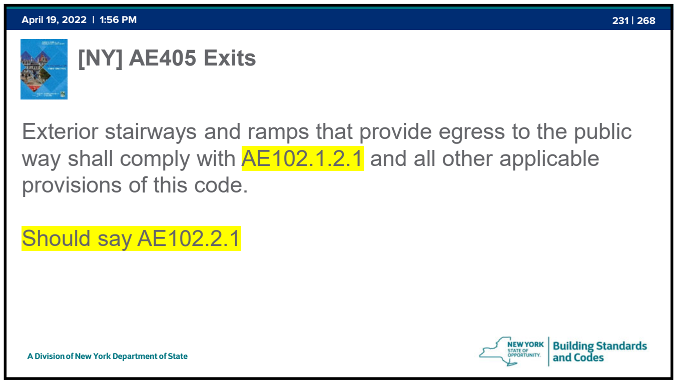
Install site built structures such as steps, landings, garages, awnings, carports, breezeways, porches, decks, railings, sheds and utility rooms according to manufacturer’s instructions, in compliance with all local regulations including fire separation and electrical requirements, and according to the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



Comple

Install site b garages,
awnings, ca ilings, sheds
and utility r uctions, in
compliance separation
and electric ollowing:

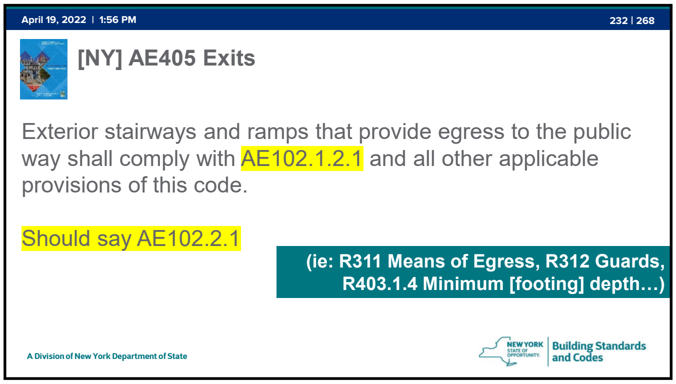
- Do not obstruct any of the egress windows or the two required exit doors from the home.
- The addition must be entirely self-supported and cannot rely on the home for support (superficial connections are acceptable). The home’s structural system is not designed to support the extra loads imposed by 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 exiting, 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).



[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

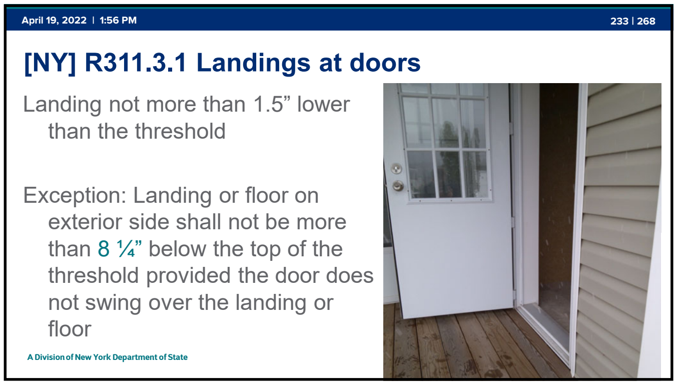


[NY] AE405 Exits

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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[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 ¼” below the top of the threshold provided the door does not swing over the landing or floor

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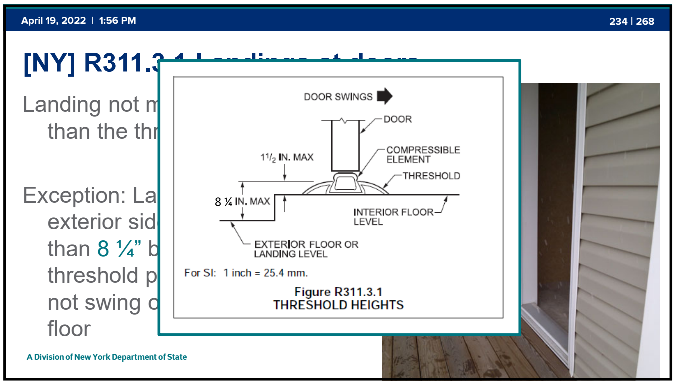

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[NY] R311.3

Landing not m
than the thr

Exception: La
exterior sid
than 8 ¼” b
threshold p
not swing o
floor

For SI: 1 inch = 25.4 mm.

Figure R311.3.1
THRESHOLD HEIGHTS

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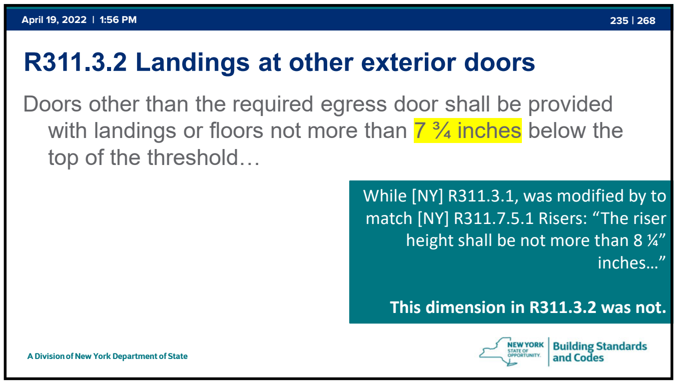

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R311.3.2 Landings at other exterior doors

Doors other than the required egress door shall be provided with landings or floors not more than 7 ¾ 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 ¼” inches…”

This dimension in R311.3.2 was not.

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Building Standards and Codes

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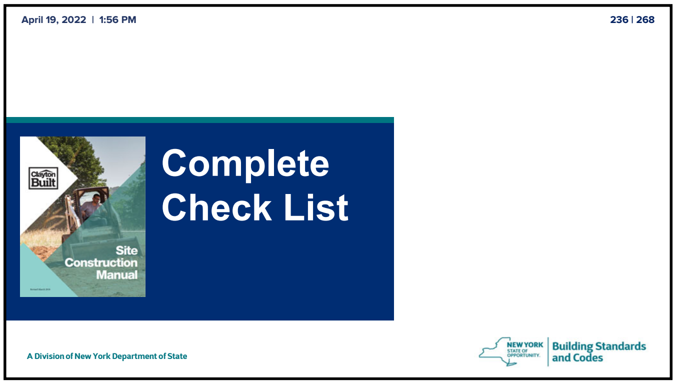

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Complete Check List

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Building Standards and Codes

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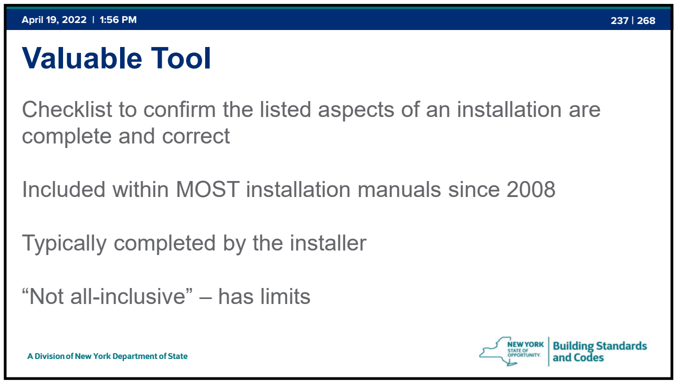

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Valuable Tool

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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Building Standards and Codes

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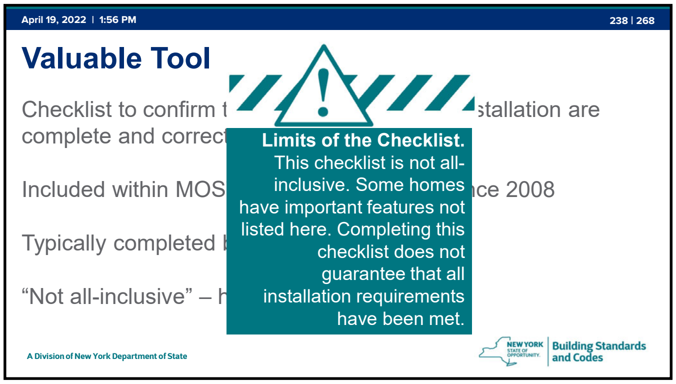

April 19, 2022 | 1:56 PM 238 | 268

Valuable Tool

Checklist to confirm t stallation are complete and correc

Included within MOS nce 2008

Typically completed

“Not all-inclusive” – h

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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Building Standards and Codes

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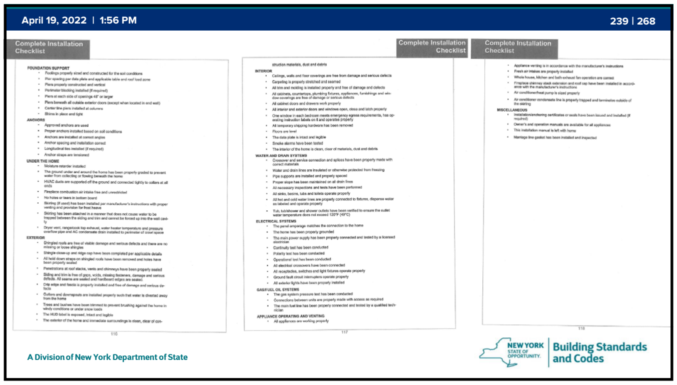

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Complete Installation Checklist

Complete Installation Checklist

Complete Installation Checklist

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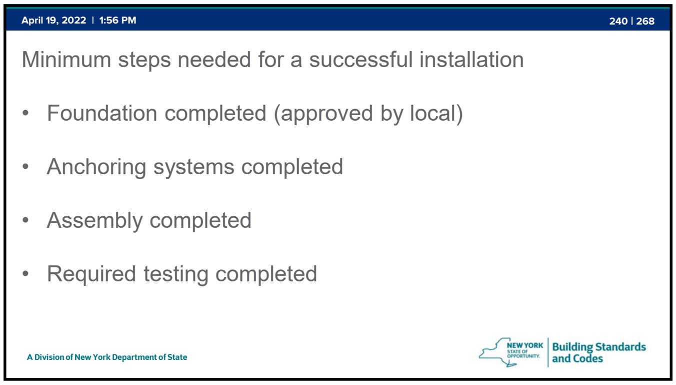
Building Standards and Codes

239



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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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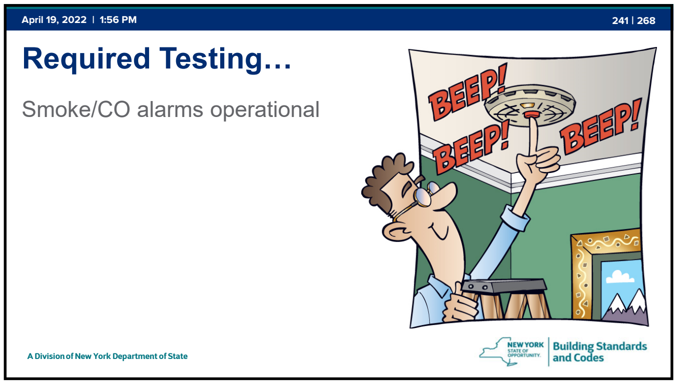

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Required Testing…

Smoke/CO alarms operational

BEEP!
BEEP!
BEEP!

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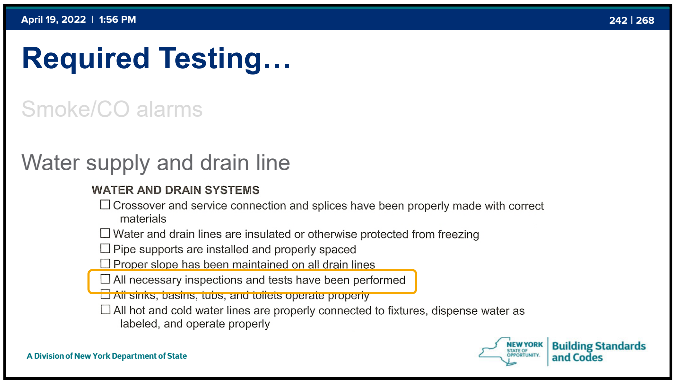
Building Standards and Codes

241



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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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Building Standards and Codes

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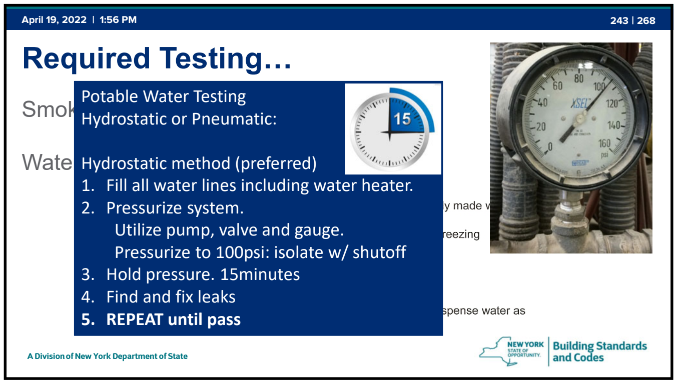

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Required Testing…

Smok

Wate

y made w

reezing

spense water as

Potable Water Testing
Hydrostatic or Pneumatic:

Hydrostatic method (preferred)

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

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Building Standards and Codes

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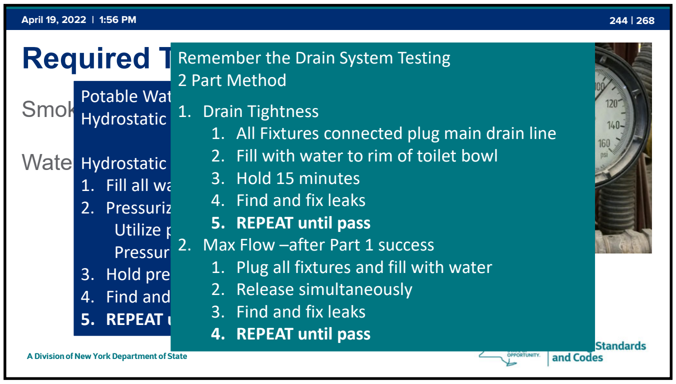

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Required T

Smok

Wate

Potable Wat
Hydrostatic

Hydrostatic

1. Fill all wa
2. Pressuriz
   Utilize p
   Pressur
3. Hold pre
4. Find and
5. **REPEAT**

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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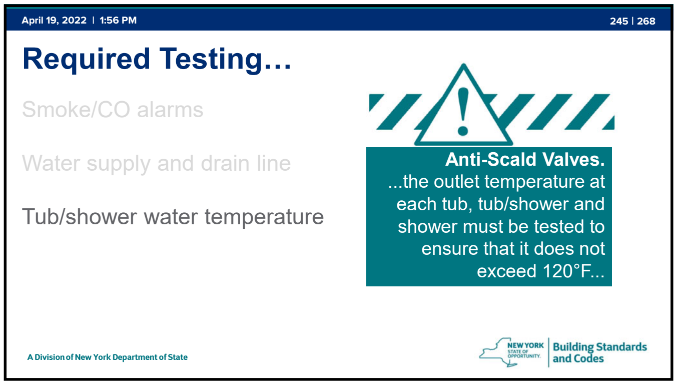

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Required Testing…

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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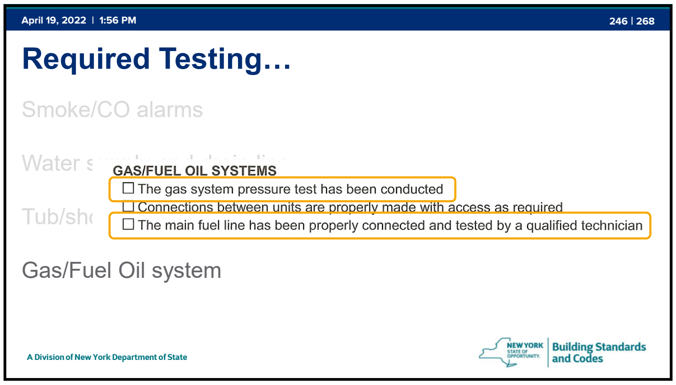

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Required Testing…

Smoke/CO alarms

Water s

Tub/sh

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

Gas/Fuel Oil system

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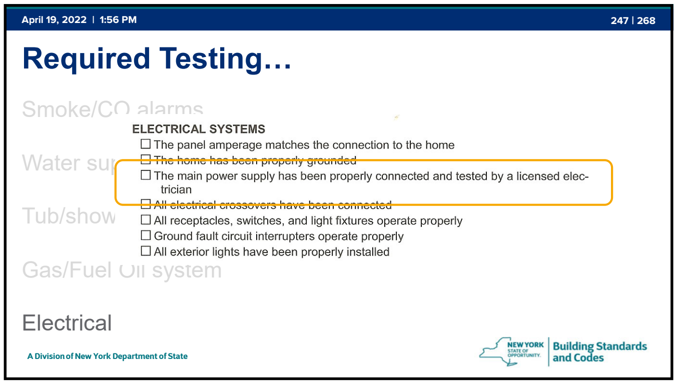

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Required Testing…

Smoke/CO alarms

Water sup

Tub/show

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

Gas/Fuel Oil system

Electrical

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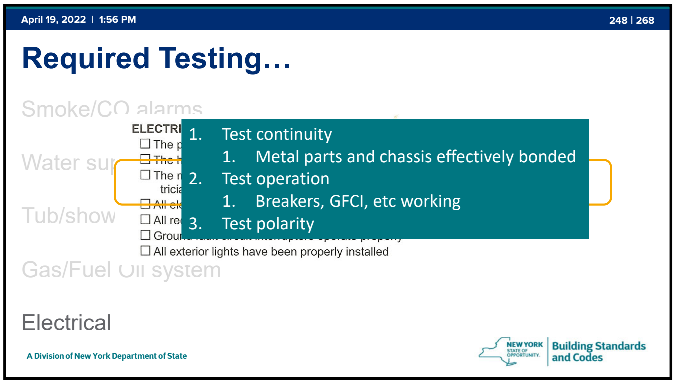

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Required Testing…

Smoke/CO alarms

Water sup

Tub/show

ELECTRI
☐ The p
☐ The h
☐ The m tricia
☐ All el
☐ All re
☐ Grou
☐ All exterior lights have been properly installed

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

Gas/Fuel Oil system

Electrical

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Other Notable Items

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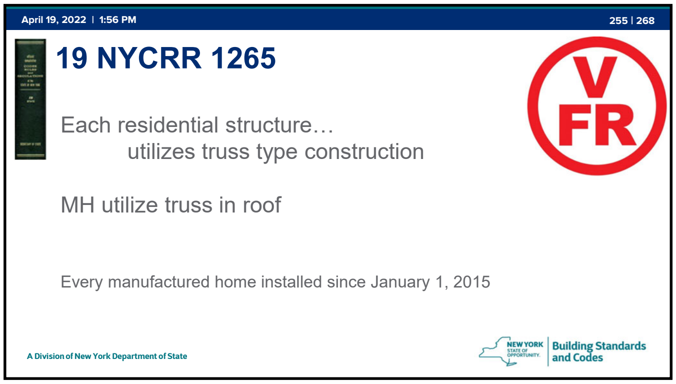

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19 NYCRR 1265

Each residential structure…
utilizes truss type construction

MH utilize truss in roof

Every manufactured home installed since January 1, 2015

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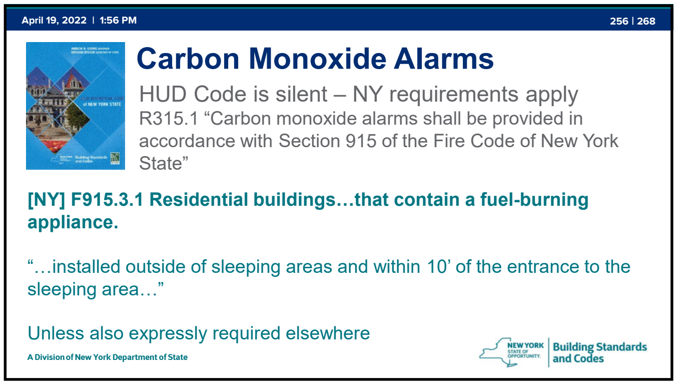

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Carbon Monoxide Alarms

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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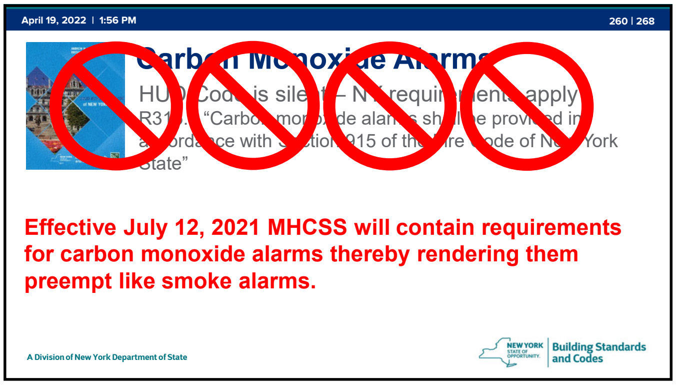

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Carbon Monoxide Alarms

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”

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

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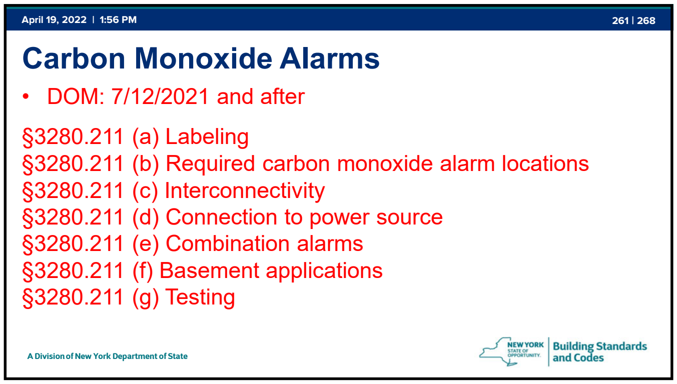

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Carbon Monoxide Alarms

- 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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Wrap up

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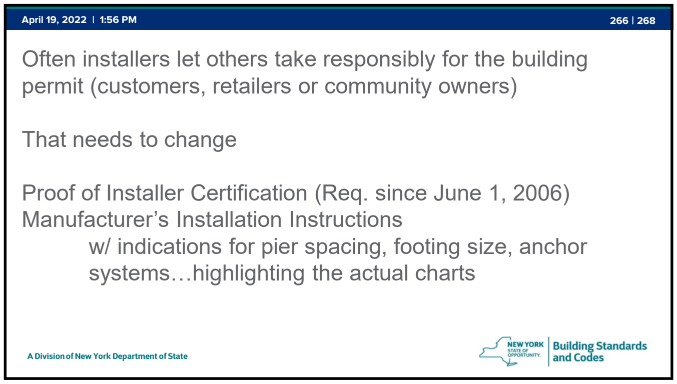

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Often installers let others take responsibly for the building permit (customers, retailers or community owners)

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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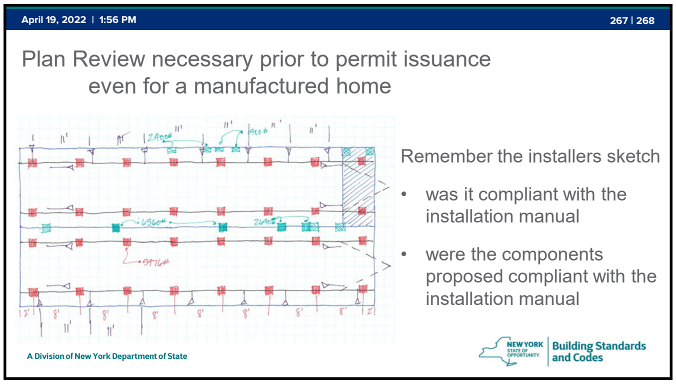

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Plan Review necessary prior to permit issuance
even for a manufactured home

Remember the installers sketch

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

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