

Limited Building Official Program: Manufactured Structures



Staff Contacts



Jason Kelzer, Supervisor
Manufactured Structures
Jason.Kelzer@state.mn.us

651-284-5806



Herman Hauglid, Bldg. Code Rep.
Manufactured Structures
Herman.Hauglid@state.mn.us

651-284-5870



Ermias MeKonnen
Bldg. Code Rep
Manufactured Structures

Ermias.MeKonnen@state.mn.us
651-284-5833



Dave Rewey, Building Code Rep.
Manufactured Structures
Dave.Rewey@state.mn.us

651-392-9902

Staff Contacts

Continued



Krystina Nickila, Building Code Rep
Manufactured Structures
Krystina.Nickila@state.mn.us

651-284-5807



Jamie Anderson, Bldg. Code Rep
Manufactured Structures

Jamie.Anderson@state.mn.us

651-284-5810



Stacy Jeffrey, Support Staff
Manufactured Structures
Stacy.Jeffrey@state.mn.us

651-284-5579

Property of DLI
Use for Educational Reference Only

About Your Instructor



MANUFACTURED STRUCTURES

Course Objective

- *This program will discuss the three following types of Manufactured structures, the applicable code that applies, and where to find the information:*

- **Manufactured Dwellings (HUD (federal codes))**

<http://www.ecfr.gov/cgi-bin/text-idx?SID=a2c5655a370540584f7dd6a0ed240fb8&node=pt24.5.3280&rgn=div5>

http://portal.hud.gov/hudportal/HUD?src=/program_offices/housing/rmra/mhs/csp

- **Prefabricated Buildings (MNSBC)**

<http://www.dli.state.mn.us/CCLD/ManufacturedPrefab.asp>

- **Industrialized/Modular Buildings**

<http://www.interstateibc.org/>(Interstate Industrialized Building Commission)

MANUFACTURED STRUCTURES

Course Objective

- This purpose of this presentation is to;
- Provide instruction on the different types of manufactured structures that are regulated by the Minnesota State Building Code as well as federal requirements.
- Provide instruction on how to identify the three different certification labels used for structures in the industry.
- Provide instruction on how to interpret and understand information contained on the buildings data plate.
- Provide instruction on the requirements for site work and what to look for during inspections.

In The Beginning

MAKEUP AND USE OF THE MINNESOTA STATE BUILDING CODE

Makeup of the Minnesota State Building Code

Required Enforcement

- Chapter 1300 Minnesota Building Code Administration
- Chapter 1301 Building Official Certification
- Chapter 1302 State Building Code Construction Approvals
- Chapter 1303 Special Provisions
- Chapter 1305 Minnesota Building Code
- Chapter 1307 Elevators and Related Devices
- Chapter 1309 Minnesota Residential Code
- Chapter 1311 Minnesota Conservation Code for Existing Buildings
- Chapter 1315 Minnesota Electrical Code
- Chapter 1322 Residential Energy Code
- Chapter 1323 Commercial Energy Code
- Chapter 1325 Solar Energy Systems
- Chapter 1335 Floodproofing Regulations
- Chapter 1341 Minnesota Accessibility Code
- Chapter 1346 Minnesota Mechanical Code
- Chapter 1350 Manufactured Homes
- Chapter 1360 Prefabricated Structures
- Chapter 1361 Industrialized/Modular Buildings
- Chapter 1370 Storm Shelters (Manufactured Home Parks)
- Chapter 4715 Minnesota Plumbing Code
- Chapter 5230 Minnesota High Pressure Piping Systems
- These codes have specific statutory authority and with limited exception, are mandatory throughout the entire state.

Optional Enforcement

International Building Code Appendix J (Grading) See Minnesota Rules, part 1300.0060
Special Fire Protection Systems. Either 1306.0020, subpart 2 (existing and new buildings) or
subpart 3 (new buildings only)

Manufactured Home:

Means a structure, transportable in one or more sections, which in traveling mode is eight body feet or more in width, or forty (40) body feet or more in length, or when placed on the site of installation, is 320 or more square feet, and which is built on a permanent chassis, and is designed to be used as a dwelling with or without a permanent foundation when connected to the required utilities, and includes the plumbing, HVAC, and electrical systems contained therein.

Manufactured Home (continued):

- ...except that the term includes any structure which meets all the requirements and with respect to which the manufacturer voluntarily files a certification required by the secretary and complies with the standards established under Minnesota Statutes, Chapter 327.
- Code of Federal Regulations (CFR) 3280.2)
- Minnesota Chapter 1350 Subp. 38
- **(State definition must match HUD definition.)**

Prefabricated Building:

Means any building or building module intended for use as a group R-3 residential one, or two-family dwelling, or group U accessory building, which is of *closed construction* and which is constructed, on or off the building site, for installation, or assembly and installation, on the building site.

Closed Construction:

Means any building manufactured in such a manner that all portions of its construction cannot be readily inspected at the installation site without disassembly, damage, or destruction of the building.

- Pre Fab MN Licensed Residential Builders are limited to the maximum of three (3) buildings per calendar year.
- More than three buildings requires submittal, review and approval in accordance with Chapter 1361 for Industrialized / Modular Building Commission

Prefabricated Structures



Prefabricated Structures



University of DLI Reference Only

Prefabricated Structures

Use for Educational Reference Only
Property of DLI
CODE
COMPLIANCE

PREFABRICATED BUILDINGS Minnesota Issued Data Plates

STATE OF MINNESOTA
BUILDING CODE DIVISION
COMPLIANCE CERTIFICATE AND DATA PLATE
MANUFACTURED STRUCTURE

The manufacturer warrants that this structure is in compliance with the State Building Code as of date of manufacture, and the information listed below is true and correct.

Date _____ Signed _____ (Authorized Signature)

Manufacturer's Name & Location			
Date of Manufacture	Serial No.	Plan Approval No.	
Approval Agency:	State of Minn. <input type="checkbox"/>	Other (list name)	State Seal No.
Occupancy Classification:	R3 <input type="checkbox"/>	R4 <input type="checkbox"/>	Other (list use also)
Design Criteria:	Wind Load PSF	Roof Live Load PSF	Floor Live Load PSF
Electrical System:	Service Panel	Building Amps	Security: Installed Yes <input type="checkbox"/> No <input type="checkbox"/>
Comfort Equipment:	Furnace or Boiler Output	BTU	Fuel
Cooling Capacity:	BTU	CFM	Water Heater Gal. Fuel
Chimney Type	Size	Combustion Air Factory <input type="checkbox"/>	On Site <input type="checkbox"/>
Water System:	Tested at PSIG for	Min.	DWV System PSIG Min.
Energy Design:	Design Temp. Winter °F	Summer °F	Annual Degree Days Heating
N.F.I. – Not Factory Installed NONE – Not Furnished			
List Below – Exceptions/Special Instructions/Factory Installed Appliances			
Shipping Destination – City and State (if known)			

MAIL TO: BUILDING CODE DIV.
408 Metro Square Building
7th & Robert Streets
St. Paul, MN 55101

STATE COPY

Prefabricated buildings which are sold, offered for sale, or installed in the state must bear... a “Compliance Certificate” and a “data plate”.

PREFABRICATED BUILDINGS

Minnesota Issued Data Plates

STATE OF MINNESOTA
BUILDING CODE DIVISION
COMPLIANCE CERTIFICATE AND DATA PLATE
MANUFACTURED STRUCTURE

The manufacturer warrants that this structure is in compliance with the State Building Code as of date of manufacture, and the information listed below is true and correct.

Date _____ Signed _____ (Authorized Signature)

Manufacturer's Name & Location			
Date of Manufacture	Serial No.	Plan Approval No.	
Approval Agency:	State of Minn. <input type="checkbox"/>	Other (list name)	State Seal No.
Occupancy Classification:	R3 <input type="checkbox"/>	R4 <input type="checkbox"/>	Other (list use also)
Design Criteria:	Wind Load PSF	Roof Live Load PSF	Floor Live Load PSF
Electrical System:	Service Panel Amps	Building Security:	Installed Yes <input type="checkbox"/> No <input type="checkbox"/>
Comfort Equipment:	Furnace or Boiler Output	BTU	Fuel
Cooling Capacity	BTU	CFM	Water Heater Gal. Fuel
Chimney Type	Size	Combustion Air Factory <input type="checkbox"/>	On Site <input type="checkbox"/>
Water System:	Tested at PSIG for	Min.	DWV System PSIG Min.
Energy Design:	Design Temp. Winter °F	Summer °F	Annual Degree Days Heating
N.F.I. - Not Factory Installed NONE - Not Furnished			
List Below - Exceptions/Special Instructions/Factory Installed Appliances			
Shipping Destination - City and State (if known)			

STATE COPY

MAIL TO: BUILDING CODE DIV.
408 Metro Square Building
7th & Robert Streets
St. Paul, MN 55101

Any necessary on-site work would be listed here, as well as any factory installed appliances.

Property of DLI
Use for Educational Reference Only

PREFABRICATED BUILDINGS

On Site Work



PREFABRICATED BUILDINGS

On Site Work



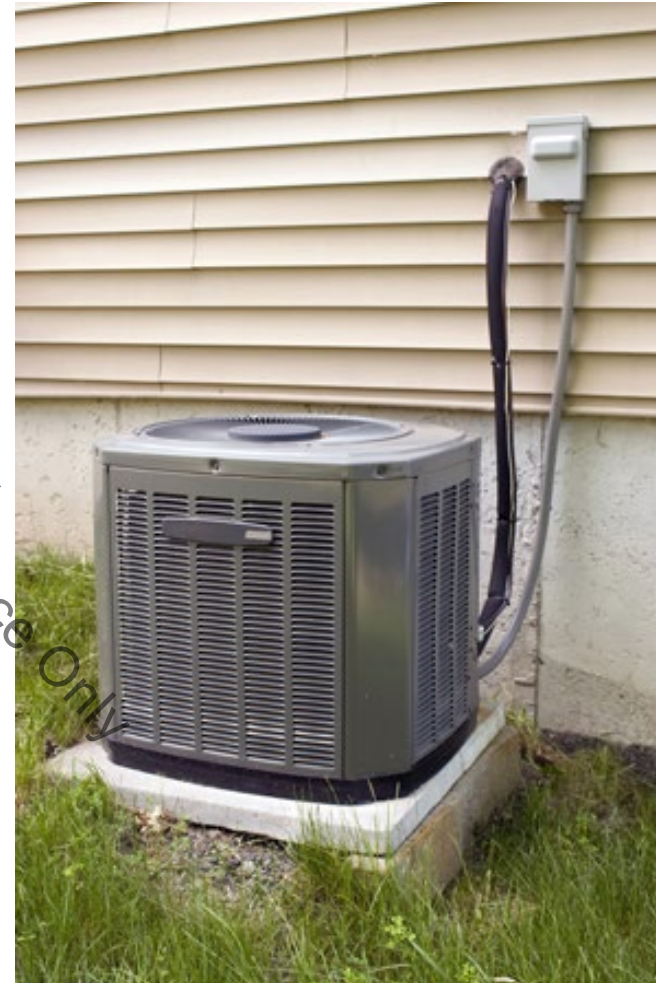
PREFABRICATED BUILDINGS

On Site Work



PREFABRICATED BUILDINGS

On Site Work



PREFABRICATED BUILDINGS

On Site Work



PREFABRICATED BUILDINGS

On Site Work



PREFABRICATED BUILDINGS

On Site Work



Industrialized and Modular Buildings



Industrialized and Modular Buildings

Definition:

An Industrialized/Modular Building is a building of *closed construction*, constructed so that concealed *parts or processes* of the manufacturer *cannot be inspected at the site without disassembly, damage, or destruction*, which is *made* or assembled *in manufacturing facilities*, off the building site, for installation, or assembly and installation, on the building site.

Industrialized and Modular Buildings





Industrialized and Modular Buildings



**Industrialized Buildings
Commission**
◆ **An Interstate Compact** ◆

505 Huntmar Park Drive
Suite 210
Herndon, Virginia 20170
(703) 481-2022
(703) 481-3596 fax
www.InterstateIBC.org

FORMAL INTERPRETATION No. 16-03

Subject: Special Exterior Wall Panel Labeling and Inspections
Reference: UAP, Part IV, Section 4(A)(1)(b) and Part VIII, Section 3(B)
Effective Date: October 15, 2016

ISSUE

Certain companies manufacture exterior wall panels that are open construction except for the exterior wall covering and sheathing. The remainder of the building including floors and roof are constructed and inspected on site. The wall panels typically enclose large areas and require the same number of labels as closed panel construction – one for every 600 square feet of finished floor area in accordance with UAP, Part IV, Section 4(A)(1)(b). Furthermore, the minimum frequency of inspections – which is specified in terms of units or modules under UAP, Part VIII, Section 3(B) – cannot be readily applied to wall panel manufacturers.

INTERPRETATION

The Commission has determined that requirements for exterior wall panels that are open construction except for the exterior wall covering and sheathing should be based on linear feet of wall manufactured.

1. Each structure shall require one certification label for every 125 linear feet or part thereof, of wall length.
2. The minimum frequency of inspections shall be such that not less than 20 percent of the walls of each structure in linear feet are inspected by the inspection agency.

Certain companies manufacture exterior wall panels that are open construction except for the exterior wall covering and sheathing. The remainder of the building including floors and roof are constructed and inspected on site. The wall panels typically enclose large areas and require the same number of labels as closed panel construction – one for every 600 square feet of finished floor area in accordance with UAP, Part IV, Section 4(A)(1)(b). Furthermore, the minimum frequency of inspections – which is specified in terms of units or modules under UAP, Part VIII, Section 3(B) – cannot be readily applied to wall panel manufacturers.

INTERPRETATION

The Commission has determined that requirements for exterior wall panels that are open construction except for the exterior wall covering and sheathing should be based on linear feet of wall manufactured.

1. Each structure shall require one certification label for every 125 linear feet or part thereof, of wall length.
2. The minimum frequency of inspections shall be such that not less than 20 percent of the walls of each structure in linear feet are inspected by the inspection agency.

Industrialized and Modular Buildings



Industrialized and Modular Buildings



Industrialized and Modular Buildings



Industrialized and Modular Buildings



Industrialized and Modular Buildings

APPLICATION FOR BUILDING PERMIT

Use for Educational Reference Only

Property of DLI

NEAREST CROSS STREET _____

ZIP _____

CONTRACTOR NAME _____

MAILING ADDRESS _____

CITY, STATE _____

PHONE (____) _____ FAX (____) _____

CONTRACTORS LICENSE # _____

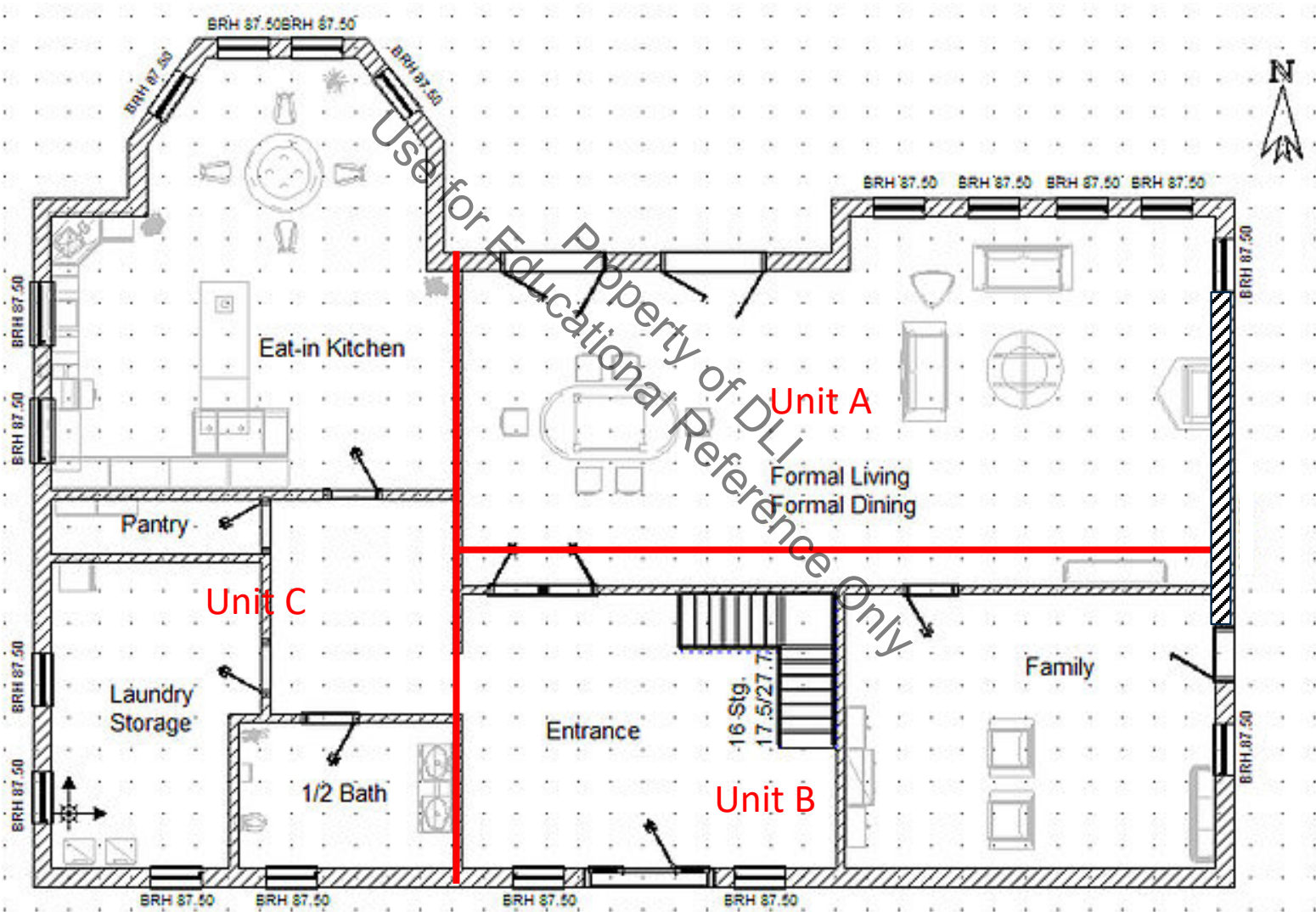
CLASS _____

EMAIL ADDRESS _____ WORKERS COM _____

ZIP _____

CONTRACTOR _____

Industrialized and Modular Buildings



Industrialized and Modular Buildings



- **Industrialized/modular buildings and building components must bear an Industrialized Buildings Commission (IBC) label/seal .**

This label/seal shall be applied to any building or building module of closed construction permitted under the International Building Code or International Residential Code.

Typically located on the side of the *Under-Sink Cabinet or Near Electrical Panel.*

Industrialized and Modular Buildings

Industrialized/modular buildings and building components must bear a data plate.

Data plate is designed by the manufacturer and contains all required information.

Typically located on the side of the *Under-Sink Cabinet or near Electrical Panel.*

(Manufacturer's Name)

COMPLIANCE CERTIFICATE AND DATA PLATE

The manufacturer warrants that this structure is in compliance with the State Building Code as of date of manufacture, and the information listed below is true and correct.

Date _____ Sign _____
(Authorized Signature)

Manufacturer's Name and Location			
Date of Manufacture	Serial No.	Manufacturer's ID No.	
Approval Agency:	State of MN:	Other: (list name)	Certification Label Number:
Name and Date of Building Code Constructed to:		Name and Date of Plumbing Code Constructed to:	
Name and Date of Energy Code Constructed to:		Name and Date of Mechanical Code Constructed to:	
Construction Classification:	Occupancy Classification: (circle one) R-3 R-4		Other (list use also)
Design Criteria:	Wind Load PSF	Roof Live Load PSF	Floor Live Load PSF
Fire Rating of Exterior Walls:	(circle one) No Rating 1-Hour 2-Hour		Other (list rating)
Thermal Transmittance:	Walls	Roof	Floor Rim
Electrical System:	Service Panel Amps	Building Security:	Installed (circle one) Yes No
Comfort Equipment:	Output Chimney	Furnace or Boiler	Fuel Type BTU
Type	Size	Factory	Combustion Air (circle one) On-site
Water System:	Tested at PSIG for Min.	DWV System:	Tested at PSIG for Min.
Energy Design:	Design Temp. Winter Deg. F. Summer	Design Temp. Deg. F. Heating	Annual Degree Days
N.F.I. = Not Factory Installed NONE = Not Furnished			
Listed Below: Exceptions/Special Instructions/Factory Installed Appliance			
Shipping Destination: City and State (if known)			

Original Copy to Module Copy to Manufacturer's Records Copy to Inspection Agency

MANUFACTURED HOME (HUD Units)

What is a Manufactured Home?



MANUFACTURED HOME (HUD Units)



MANUFACTURED HOME (HUD Units)

Manufactured Homes



Pre-code non-labeled
Constructed Prior to July 1, 1972
ANSI Labeled Structure



State Labeled Structure
July 1, 1972 to June 14, 1976



Current HUD Labeled Structure

MANUFACTURED HOME (HUD Units)

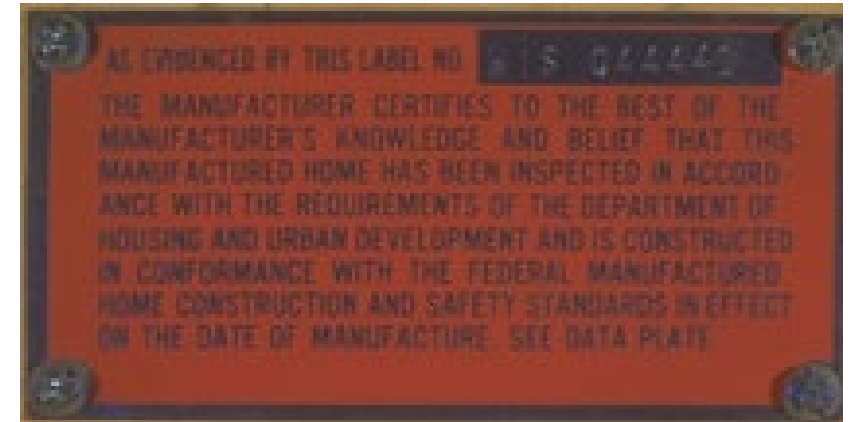
Manufactured Home Labels



Pre-code non-labeled
Constructed Prior to July 1, 1972
ANSI Labeled Structure
Voluntary Program



State Labeled Structure
July 1, 1972 to June 14, 1976



Current HUD Labeled Structure

MANUFACTURED HOME (HUD Units)

CFR 3280.11

Each Section Labeled

Permanently Affixed

Using:
Rivets, screws, or
other means that will
make it difficult to
remove the label
without defacing it.



MANUFACTURED HOME (HUD Units)

Manufactured Home built prior to July 1, 1972



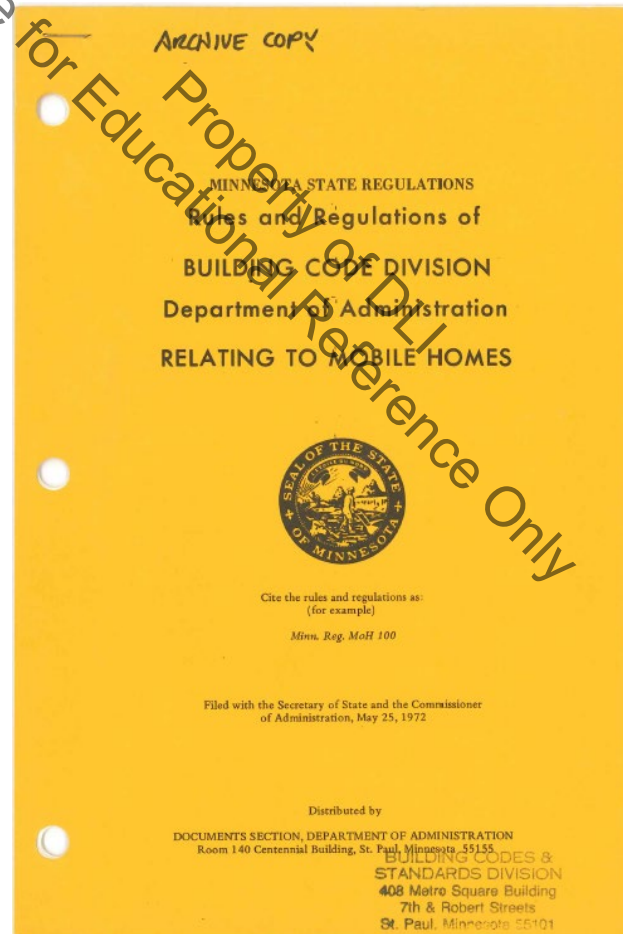
MANUFACTURED HOME

Built prior to July 1, 1972, AKA, “Pre Code Homes”

- **Not built or inspected to a recognized Manufactured Home Construction Code. (MN Chapter 1350)**
- **State/Federal Construction Codes are not applicable. Local maintenance ordinances may apply.**
- **MN Chapter 1350.2500 “Stabilizing Systems” for at site installation are permitted. (NO MFG installation manual).**
- **Minnesota Statute (MS) 327B for “ Regulations for the Sales of Manufactured Homes ” does apply.**

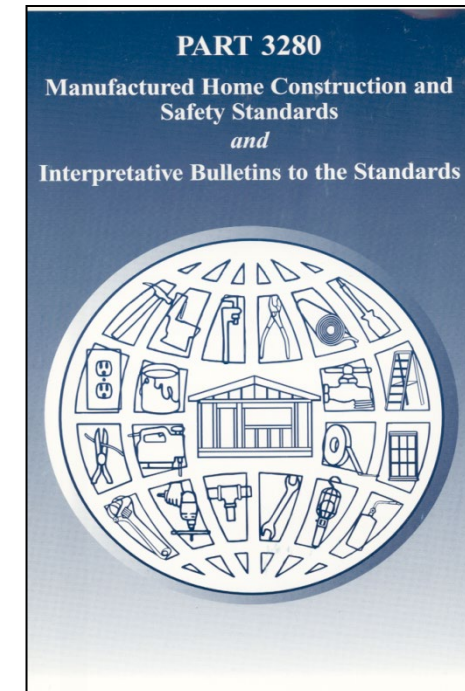
MANUFACTURED HOME

Minnesota Rule Chapter 1350, Manufactured Home Code, Effective July 1, 1972



MANUFACTURED HOME HUD CODE

HUD Manufactured Home and Safety Construction Standard



MANUFACTURED HOME HUD CODE

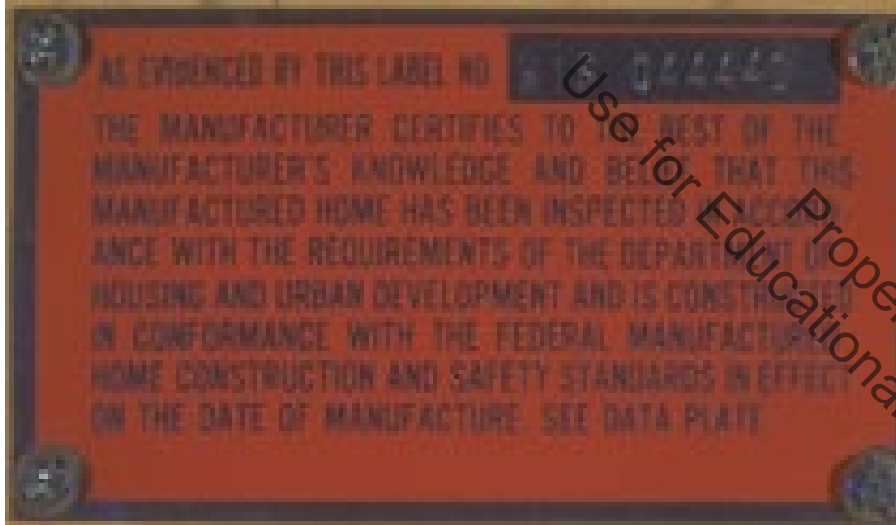
June 15, 1976 to present.

- **Manufactured to Code of Federal Regulations
(24 CFR) PART 3280.**
- **Inspected for construction compliance by HUD
approved independent third party agencies, IPIA's.
(In-Plant *Primary Inspection Agencies*)**
- **HUD Label applied in manufacturing plant by IPIA
to each home /section per HUD 24 CFR 3280.**

- **CFR 3282.11 Preemption of Reciprocity**
 - **No State manufactured home standard regarding manufactured home construction and safety may be established or continue in effect unless it is identical to Federal Standards.**
 - **No state or locality may establish or enforce any rule or regulation that stands as an obstacle to the accomplishment and the execution of the full purposes and objectives of Congress.**
 - ***For the construction of the labeled unit, no State or local laws, rules, or ordinances may supersede HUD construction standards and regulations.***

MANUFACTURED HOMES

HUD CODE



Typically located on the *ditch side rear* at or near the *floor level* for *single wide*, and on the *sides*, or *ends* of *multiple module homes*.

- A permanent HUD *label* shall be affixed to *each transportable section* of *each manufactured home / module* after *June 14, 1976*.

- HUD issued label affixed in the manufacturing plant by the approving In Plant inspection Agency.

- (IPIA Third party)

24 CFR 3280.11

MANUFACTURED HOMES Data Plate

Manufacturer Address _____

Plant Number _____

Date of Manufacture HUD No. _____

Manufacturer's Serial Number and Model Unit Designation _____

Design Approval by (O.A.P.T.A.) _____

This manufactured home is designed in comply with the federal manufactured home standards and safety standards in force at time of manufacture. (For additional information, consult owner's manual.)

The factory installed equipment includes:

Equipment	Manufacturer	Model Designation
For heating		
For air cooling		
For cooking		
Refrigerator		
Water heater		
Washer		
Clothes Dryer		
Dishwasher		
Garbage Disposal		
Fireplace		

COMFORT HEATING
This manufactured home has been thermally insulated in conformance with the minimum of the federal manufactured home construction and safety standards for all seasons without electric heat.

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

The above heating equipment has the capacity to maintain an average 70° F temperature in this home at outdoor temperatures of _____.

To maintain normal operating conditions, and to conserve energy, it is recommended that this home be occupied when the outdoor winter design temperature (32°F) is not higher than _____.

The above information has been calculated assuming a maximum wind velocity of 15 mph standard atmospheric pressure.

COMFORT COOLING
An air conditioner is provided at factory (Alternative I).

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

Control equipment manufacturer and model (see list on left).

This manufactured home is designed to comply with the federal manufactured home standards and safety standards in force at time of manufacture. (For additional information, consult owner's manual.)

The central air conditioning system installed in this home has been sized according to the ASHRAE Handbook of Fundamentals.

The central air conditioning system is designed to maintain an indoor temperature of 75° F when outdoor temperature is _____.

The temperature to which this home can be cooled will depend on the amount of exposure of the windows of the home to the sun's radiation. Therefore, home's heat gain will vary depending upon the location, orientation and amount of shading provided. Information concerning the calculation of cooling loads is provided in the ASHRAE Handbook of Fundamentals.

Information necessary to calculate cooling loads is provided in Chapter 23 of the ASHRAE Handbook of Fundamentals.

AN AIR CONDITIONER NOT PROVIDED AT FACTORY (Alternative II)
The air conditioning system installed in this home is sized to maintain an indoor temperature of _____.

The supply air distribution system installed in this home is sized to provide the required amount of conditioned air to all rooms.

The supply air distribution system installed in this home is sized to provide the required amount of conditioned air to all rooms.

Information necessary to calculate cooling loads is provided in Chapter 23 of the ASHRAE Handbook of Fundamentals.

The air conditioning system installed in this home is sized to provide the required amount of conditioned air to all rooms.

DESIGN WIND ZONE MAP
Zone I: Design Wind 15 PSF Horizontal & 15 PSF Uplift
Zone II: Hurricane Resistant 25 PSF Horizontal & 15 PSF Uplift

DESIGN ROOF LOAD ZONE MAP
North 40 PSF Middle 30 PSF South 20 PSF
North Middle South

OUTDOOR WINTER DESIGN TEMPERATURE ZONE MAP
Zone I Zone II Zone III Zone IV Zone V Zone VI Zone VII Zone VIII Zone IX Zone X Zone XI Zone XII Zone XIII Zone XIV Zone XV Zone XVI Zone XVII Zone XVIII Zone XIX Zone XX Zone XXI Zone XXII Zone XXIII Zone XXIV Zone XXV Zone XXVI Zone XXVII Zone XXVIII Zone XXIX Zone XXX

Manufacturer Address _____

Date of Manufacture HUD No. _____

Manufacturer's Serial Number and Model Unit Designation _____

Design Approval by (O.A.P.T.A.) _____

This manufactured home is designed in comply with the federal manufactured home standards and safety standards in force at time of manufacture. (For additional information, consult owner's manual.)

The factory installed equipment includes:

Equipment	Manufacturer	Model Designation
For heating		
For air cooling		
For cooking		
Refrigerator		
Water Heater		
Washer		
Clothes Dryer		
Garbage Disposal		
Fireplace		

COMFORT HEATING
This manufactured home has been thermally insulated in conformance with the minimum of the federal manufactured home construction and safety standards for all seasons without electric heat.

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

The above heating equipment has the capacity to maintain an average 70° F temperature in this home at outdoor temperatures of _____.

To maintain normal operating conditions, and to conserve energy, it is recommended that this home be occupied when the outdoor winter design temperature (32°F) is not higher than _____.

The above information has been calculated assuming a maximum wind velocity of 15 mph standard atmospheric pressure.

COMFORT COOLING
An air conditioner is provided at factory (Alternative I).

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

Control equipment manufacturer and model (see list on left).

This manufactured home is designed to comply with the federal manufactured home standards and safety standards in force at time of manufacture. (For additional information, consult owner's manual.)

The central air conditioning system installed in this home has been sized according to the ASHRAE Handbook of Fundamentals.

The central air conditioning system is designed to maintain an indoor temperature of 75° F when outdoor temperature is _____.

The temperature to which this home can be cooled will depend on the amount of exposure of the windows of the home to the sun's radiation. Therefore, home's heat gain will vary depending upon the location, orientation and amount of shading provided. Information concerning the calculation of cooling loads is provided in the ASHRAE Handbook of Fundamentals.

Information necessary to calculate cooling loads is provided in Chapter 23 of the ASHRAE Handbook of Fundamentals.

AN AIR CONDITIONER NOT PROVIDED AT FACTORY (Alternative II)
The air conditioning system installed in this home is sized to maintain an indoor temperature of _____.

The supply air distribution system installed in this home is sized to provide the required amount of conditioned air to all rooms.

The supply air distribution system installed in this home is sized to provide the required amount of conditioned air to all rooms.

Information necessary to calculate cooling loads is provided in Chapter 23 of the ASHRAE Handbook of Fundamentals.

The air conditioning system installed in this home is sized to provide the required amount of conditioned air to all rooms.

DESIGN WIND ZONE MAP
Zone I Zone II Zone III Zone IV Zone V Zone VI Zone VII Zone VIII Zone IX Zone X Zone XI Zone XII Zone XIII Zone XIV Zone XV Zone XVI Zone XVII Zone XVIII Zone XIX Zone XX Zone XXI Zone XXII Zone XXIII Zone XXIV Zone XXV Zone XXVI Zone XXVII Zone XXVIII Zone XXIX Zone XXX

DESIGN ROOF LOAD ZONE MAP
North 40 PSF Middle 30 PSF South 20 PSF
North Middle South

OUTDOOR WINTER DESIGN TEMPERATURE ZONE MAP
Zone I Zone II Zone III Zone IV Zone V Zone VI Zone VII Zone VIII Zone IX Zone X Zone XI Zone XII Zone XIII Zone XIV Zone XV Zone XVI Zone XVII Zone XVIII Zone XIX Zone XX Zone XXI Zone XXII Zone XXIII Zone XXIV Zone XXV Zone XXVI Zone XXVII Zone XXVIII Zone XXIX Zone XXX

INFORMATION PROVIDED BY THE MANUFACTURER NECESSARY TO CALCULATE SENSIBLE HEAT GAIN

Walls (without windows and doors) _____

Ceilings and roofs of light color _____

Ceilings and roofs of dark color _____

Floors _____

Air ducts in floor _____

Air ducts in ceiling _____

Air ducts installed outside the home _____

The following are the duct areas in this home:

Air ducts in floor _____

Air ducts in ceiling _____

Air ducts outside the home _____

To determine the required capacity of equipment to cool a home efficiently and economically a cooling load must be calculated. The cooling load is dependent on the location, location and the structure of the home. Cooling air conditioners replace heat losses and provide the greatest comfort when their capacity closely approximates the entire cooling load. Each home's air conditioner should be sized in accordance with Chapter 23 of the ASHRAE Handbook of Fundamentals, and the location and orientation are shown.

INFORMATION PROVIDED BY THE MANUFACTURER NECESSARY TO CALCULATE SENSIBLE HEAT GAIN

Walls (without windows and doors) _____

Ceilings and roofs of light color _____

Ceilings and roofs of dark color _____

Floors _____

Air ducts in floor _____

Air ducts in ceiling _____

Air ducts installed outside the home _____

The following are the duct areas in this home:

Air ducts in floor _____

Air ducts in ceiling _____

Air ducts outside the home _____

DATE: OCT. 25, 1994

Each manufactured home shall bear a data plate affixed in a permanent manner near the main electrical panel or other readily accessible location. CFR 3280.5

MANUFACTURED HOMES

Data Plate

Manufacturer Address:

PLANT NO:
DATE OF MFG:

HUD Label No. (s)

Manufacturer's Serial Number and Model Unit Designation

Design Approval

This manufactured home is designed to comply with the federal manufactured home construction and safety standards in force at time of manufacture.

The factory installed equipment includes:

Equipment	Manufacturer	Model Designation
Heating		
Air cooling		
Cooking		
Refrigerator		
Water Heater		
Washer		
Clothes Dryer		
Dishwasher		
Garbage Disposal		
Fireplace		
Microwave		
Oven		
Whole House Filter		
Water Softner		
R/O System		

MANUFACTURED HOMES

Data Plate

Manufacturer Address:

PLANT NO:
DATE OF MFG:

HUD Label No. (s)

Manufacturer's Serial Number and Model Unit Designation

Design Approval

This manufactured home is designed to comply with the federal manufactured home construction and safety standards in force at time of manufacture.

The factory installed equipment includes:

Equipment	Manufacturer	Model Designation
Heating		
Air cooling		
Cooking		
Refrigerator		
Water Heater		
Washer		
Clothes Dryer		
Dishwasher		
Garbage Disposal		
Fireplace		
Microwave		
Oven		
Whole House Filter		
Water Softner		
R/O System		

MANUFACTURED HOMES

Data Plate

Manufacturer Address:

PLANT NO:
DATE OF MFG:

HUD Label No. (s)

Manufacturer's Serial Number and Model Unit Designation

Design Approval

This manufactured home is designed to comply with the federal manufactured home construction and safety standards in force at time of manufacture.

The factory installed equipment includes:

Equipment	Manufacturer	Model Designation
Heating		
Air cooling		
Cooking		
Refrigerator		
Water Heater		
Washer		
Clothes Dryer		
Dishwasher		
Garbage Disposal		
Fireplace		
Microwave		
Oven		
Whole House Filter		
Water Softner		
R/O System		

MANUFACTURED HOMES

Data Plate

Manufacturer Address:

PLANT NO:
DATE OF MFG:

HUD Label No. (s)

Manufacturer's Serial Number and Model Unit Designation

Design Approval

This manufactured home is designed to comply with the federal manufactured home construction and safety standards in force at time of manufacture.

The factory installed equipment includes:

Equipment	Manufacturer	Model Designation
Heating		
Air cooling		
Cooking		
Refrigerator		
Water Heater		
Washer		
Clothes Dryer		
Dishwasher		
Garbage Disposal		
Fireplace		
Microwave		
Oven		
Whole House Filter		
Water Softner		
R/O System		

The statement: *This manufactured home is designed to comply with the Federal Manufactured Home Construction and Safety Standards in force at the time of manufacture.*

A list of the certification (HUD) label numbers that are affixed to each transportable section.

A list of major factory installed equipment and appliances.

The roof load zone, heating design area, and wind load zone design the home was constructed for

A statement regarding the requirement of installation of storm shutters. (high wind zone area)

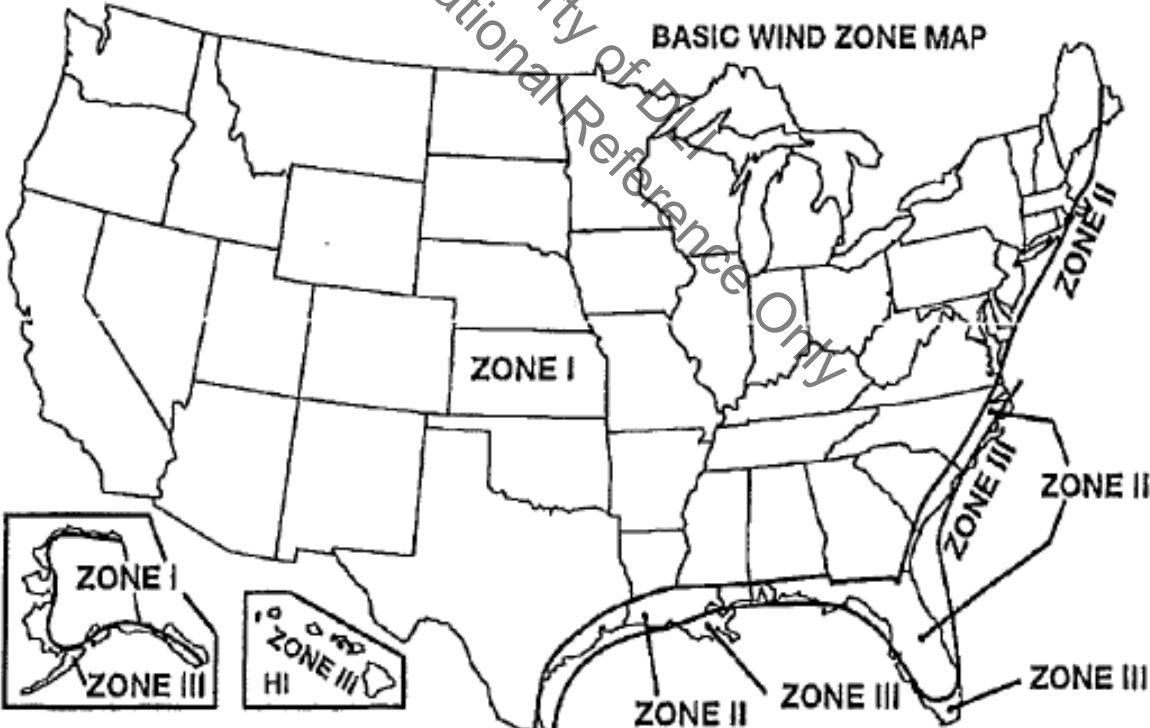
The statement: “*Design Approval By*” followed by the name of the agency that approved the design (DAPIA) Design Approval Primary Inspection Agency.

MANUFACTURED HOMES

Data Plate

HOME CONSTRUCTED FOR : ZONE I

This home has not been designed for the higher wind pressure and anchoring provisions required for ocean/coastal areas and should not be located within 1500' of the coastline in Wind Zones II and III, unless the home and its anchoring and foundation system have been designed for the increased requirement 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 shutters or equivalent covering devices, it is strongly recommended that the home be made ready to be equipped with these devices in accordance with the method recommended in manufacturers printed instructions.



MANUFACTURED HOMES

Data Plate

DESIGN ROOF LOAD ZONE MAP:



Building Division

BUILDING PERMIT

This card must be kept posted in a conspicuous place on site of construction

MANUFACTURED HOMES Building Permit Requirements

MANUFACTURED HOMES

Building Permit Requirements

Minnesota Rule Chapter 1300.0010 establishes the Building Official's responsibilities with regard to manufactured home installations:

- ***Administration.***
- ***Issuance of Building Permits.***
- ***Inspection of all manufactured home installations.***
- **MSBC 1350.0300 Any authorized representative of the Department of Labor and Industry may examine any records and inspect any manufactured home, equipment, or installations to ensure compliance with parts 1350.0100 to 9200 of the code.**

MANUFACTURED HOMES Building Permit Requirements

Department of Inspections

**Building (BL)
Permit Application**
Office Use Only
Permit No. _____

Please Type or Print

City of: _____ Date: _____
 Site Address: _____ Suite No.: _____
 Legal Description: Lot _____ Block _____ Addition _____

Property Owner	Name _____ Phone No. _____ _____ _____ City _____ State _____ ZIP _____
Contractor	Company _____ Phone No. _____ Contractor License No. _____ Expiration Date _____ Contact Person (Print) _____ Phone No. _____ Address _____ City _____ State _____ ZIP _____
Designer/ Architect	Name _____ Phone No. _____ Company _____ Registration No. _____ Address _____ City _____ State _____ ZIP _____

Office Use Only	New	New	New	<input type="checkbox"/> 434 - Alt/Add/Res
Census Code	<input type="checkbox"/> 101 - 1 Fam. Res.	<input type="checkbox"/> 214 - Other Shelter	<input type="checkbox"/> 324 - Office/Bank	<input type="checkbox"/> 437 - Alt/Add/Nonres
	<input type="checkbox"/> 102 - 1 Fam. Attached	<input type="checkbox"/> 318 - Amusement/Rec.	<input type="checkbox"/> 325 - Utilities	<input type="checkbox"/> 438 - Alt/Add/Res. Gar.
	<input type="checkbox"/> 103 - 2 Fam. (Duplex)	<input type="checkbox"/> 319 - Place of Worship	<input type="checkbox"/> 326 - Schools/Ed.	<input type="checkbox"/> 645 - Demo 1-Fam.
	<input type="checkbox"/> 104 - 3 & 4 Family	<input type="checkbox"/> 320 - Industrial	<input type="checkbox"/> 327 - Retail/Rest.	<input type="checkbox"/> 646 - Demo 2-Fam.
	<input type="checkbox"/> 105 - 5 or more Family	<input type="checkbox"/> 321 - Non Res. Garage	<input type="checkbox"/> 328 - Other Nonres.	<input type="checkbox"/> 647 - Demo 3 & 4 Fam.
	<input type="checkbox"/> 322 - Service Station	<input type="checkbox"/> 329 - Nonbidg	<input type="checkbox"/> 648 - Demo 5 or more	
	<input type="checkbox"/> 213 - Hotel/Motel	<input type="checkbox"/> 323 - Hosp./Institution	<input type="checkbox"/> 649 - Demo Other	
SAC Code	<input type="checkbox"/> 01 - Single Family	<input type="checkbox"/> 30 - Commercial/Institutional		

Building Permit Type	<input type="checkbox"/> 01-Residential	<input type="checkbox"/> 08-Remodel	<input type="checkbox"/> 16-Fireplace	<input type="checkbox"/> 24-Industrial	<input type="checkbox"/> 31-Foundation	<input type="checkbox"/> 38-Tenant Fin.
	<input type="checkbox"/> 02-S.F. Dwelling	<input type="checkbox"/> 10-Pool	<input type="checkbox"/> 17-Screened Porch	<input type="checkbox"/> 25-Non-Res Bldg	<input type="checkbox"/> 32-Apartment	<input type="checkbox"/> 39-Windows
	<input type="checkbox"/> 03-Addition	<input type="checkbox"/> 11-Fence	<input type="checkbox"/> 18-Demolition	<input type="checkbox"/> 26-Non-Bldg Struct	<input type="checkbox"/> 33-3 Season Porch	<input type="checkbox"/> 99-Other
	<input type="checkbox"/> 04-Garage	<input type="checkbox"/> 12-Softw/Fascia	<input type="checkbox"/> 19-Multi-Family	<input type="checkbox"/> 27-Pub Work/Utility	<input type="checkbox"/> 34-4 Season Porch	
	<input type="checkbox"/> 05-Deck	<input type="checkbox"/> 13-Comm. New	<input type="checkbox"/> 20-Comm. Add.	<input type="checkbox"/> 28-Grading/Excavate	<input type="checkbox"/> 35-Doors	
	<input type="checkbox"/> 06-Roof	<input type="checkbox"/> 14-Comm. Rem	<input type="checkbox"/> 21-1 Fam. Attached	<input type="checkbox"/> 29-Townhome	<input type="checkbox"/> 36-Basement	
	<input type="checkbox"/> 07-Siding	<input type="checkbox"/> 15-Move	<input type="checkbox"/> 22-Duplex	<input type="checkbox"/> 30-Shed	<input type="checkbox"/> 37-Drain Tile	
Work Type	<input type="checkbox"/> 01 - New	<input type="checkbox"/> 03 - Repair	<input type="checkbox"/> 05 - Demolition	<input type="checkbox"/> 07 - Disconnect/Abandon	<input type="checkbox"/> 09 - Repair	<input type="checkbox"/> 11 - Replace
	<input type="checkbox"/> 02 - Addition	<input type="checkbox"/> 04 - Remodel	<input type="checkbox"/> 06 - Foundation Only	<input type="checkbox"/> 08 - Move	<input type="checkbox"/> 10 - Temporary	

Office Use Only Required Inspections	<input type="checkbox"/> 01 - Footing	<input type="checkbox"/> 04 - Final	<input type="checkbox"/> 18 - Foundation	<input type="checkbox"/> 53 - Silt Fence
	<input type="checkbox"/> 02 - Framing	<input type="checkbox"/> 15 - C of O	<input type="checkbox"/> 36 - Wall Board	<input type="checkbox"/> 99 - Other
	<input type="checkbox"/> 03 - Insulation			

No work shall begin until the installation permit has been approved and issued to the permit applicant and all associated fees are paid.

Use for Educational Reference Only

MANUFACTURED HOMES

Building Permit Requirements

MSBC 1300.0120 *Permits* are required for the installation of all manufactured homes.

- **MSBC Chapter 1350.2600-2700**
 - ***Stabilizing/Anchoring and Support.***
- **MSBC Chapter 4715**
 - ***Water and Sewer connections.***
- **MSBC Chapter 1346**
 - ***Gas, A/C, Crossover Ducting, Flues, etc.***

MANUFACTURED HOMES

Building Permit Requirements

Permit Application requirements:

- **Legal description of property site.**
- **Use and occupancy of the proposed work**
- **Type of Construction**
- **Describe the work to be covered by the permit**
- **Manufactured Home Installation Instructions and related Construction Documents.**
- **Valuation of the proposed work**
- **Signature of the applicant**

MSBC Chapter 1300.0120, Subp. 7.

MANUFACTURED HOMES

Building Permit Requirements

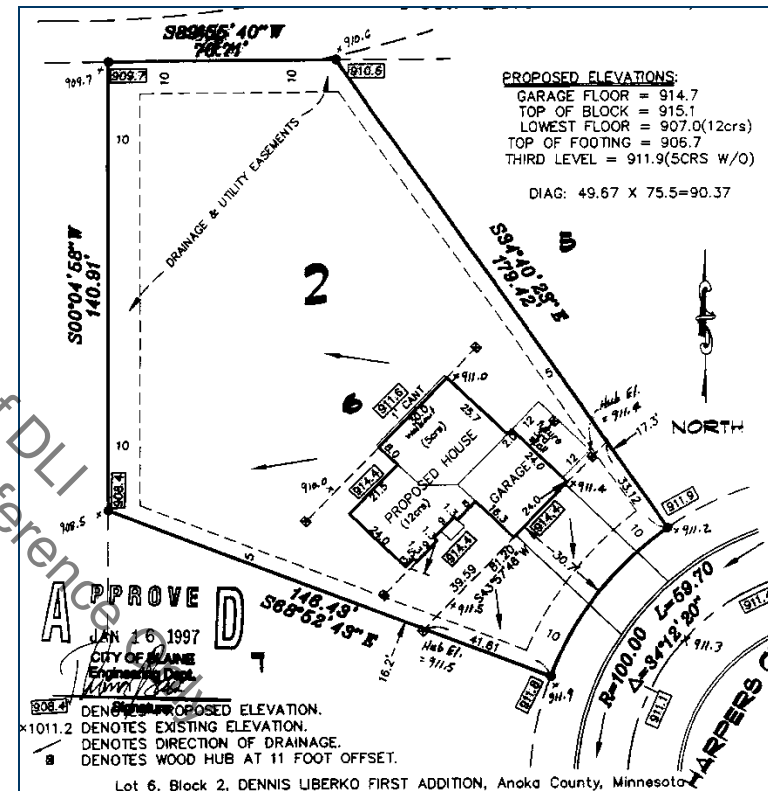
Other Useful Information:

- **Installers Name.**
- **What work is under the installers responsibility**
- **What work is under the homeowners responsibility, if any.**
- **Describe all work to be covered by the permit(s)**
- **Manufactured Home Installation Instructions and related Construction Documents must be on site.**
- **Any paperwork for the Stabilizing/Support system**
- **Soils test information, etc.**

MANUFACTURED HOMES Building Permit Requirements

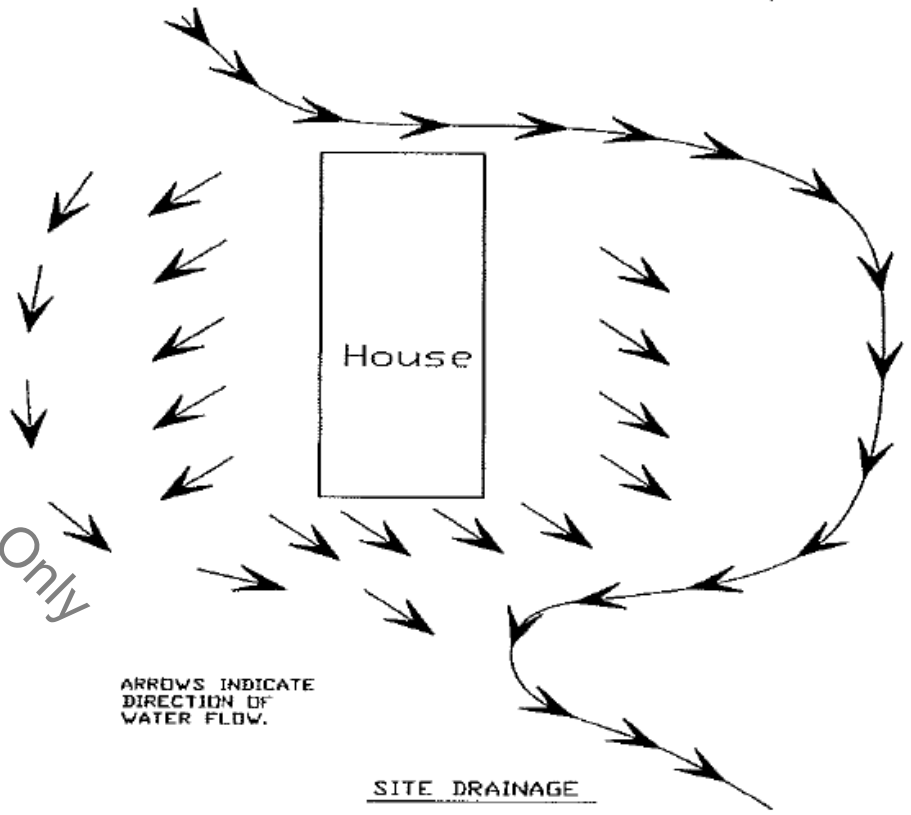
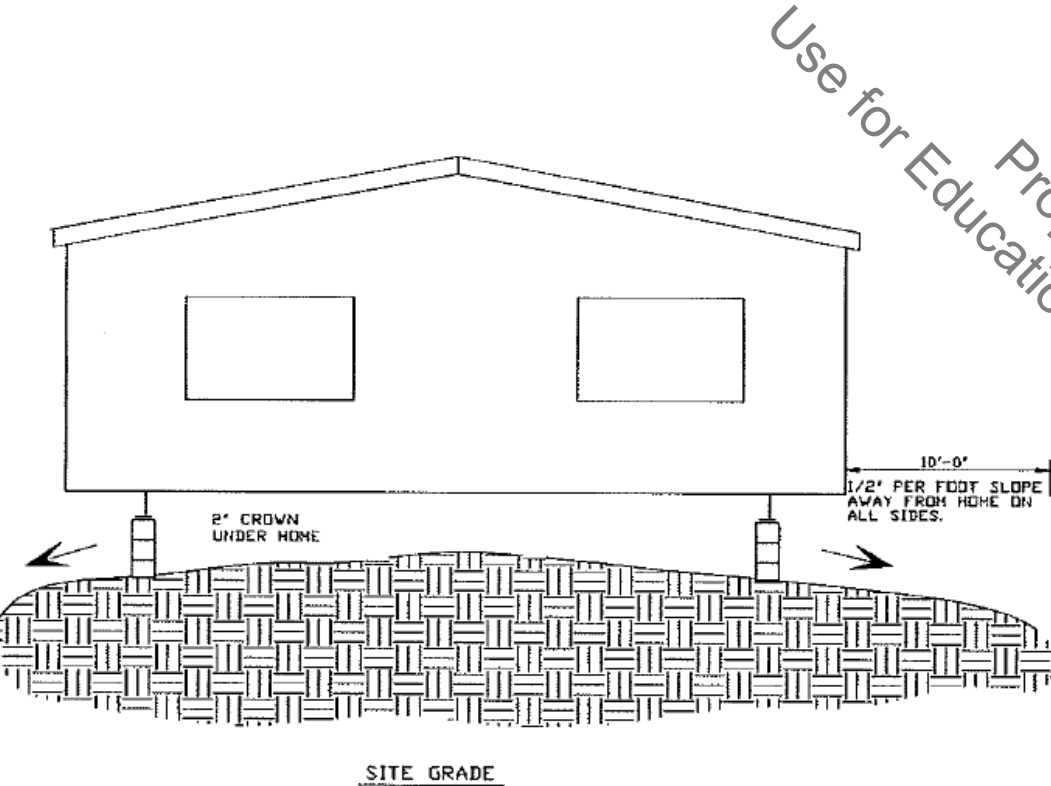
The construction documents submitted with the permit application shall include a site plan showing the location and set back distances of all new and existing structures and the distances from lot lines.

All drainage and utility easements must be clearly identified and shown.



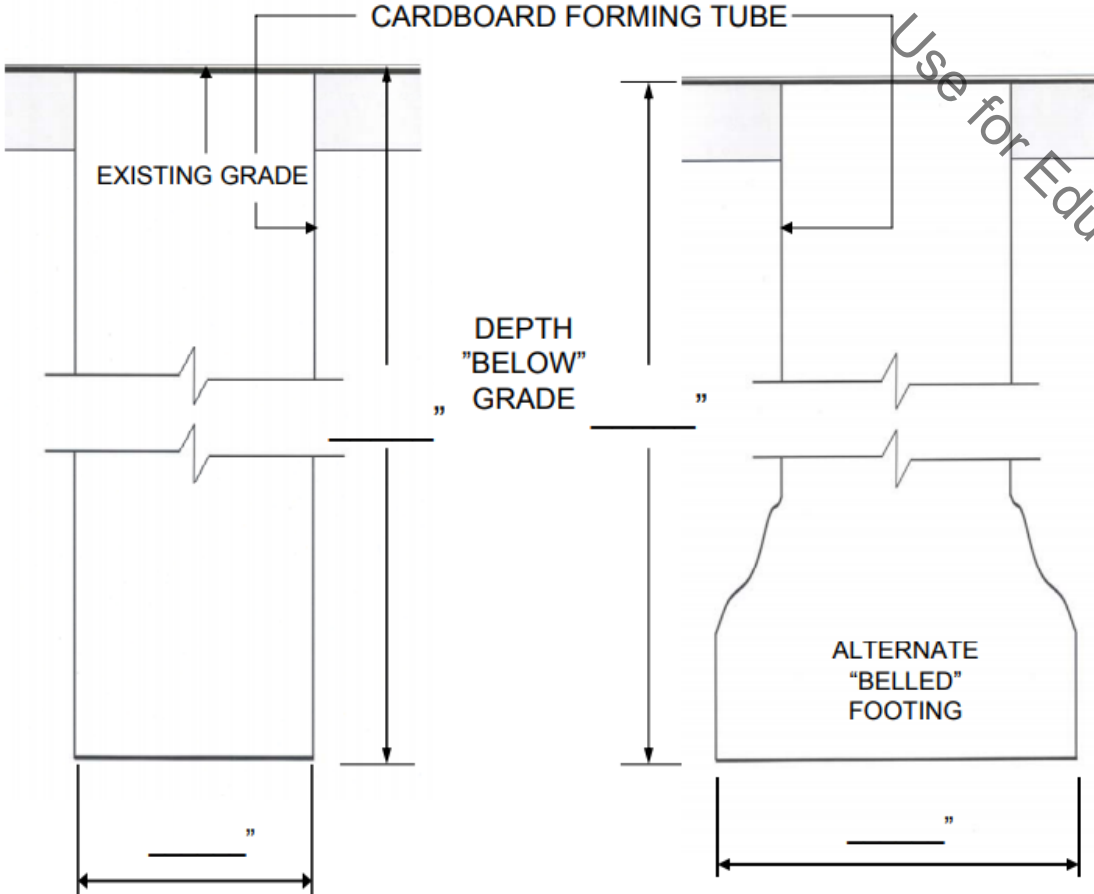
MSBC 1300.0130 Subp. 4

MANUFACTURED HOMES Building Permit Requirements



MANUFACTURED HOMES Building Permit Requirements

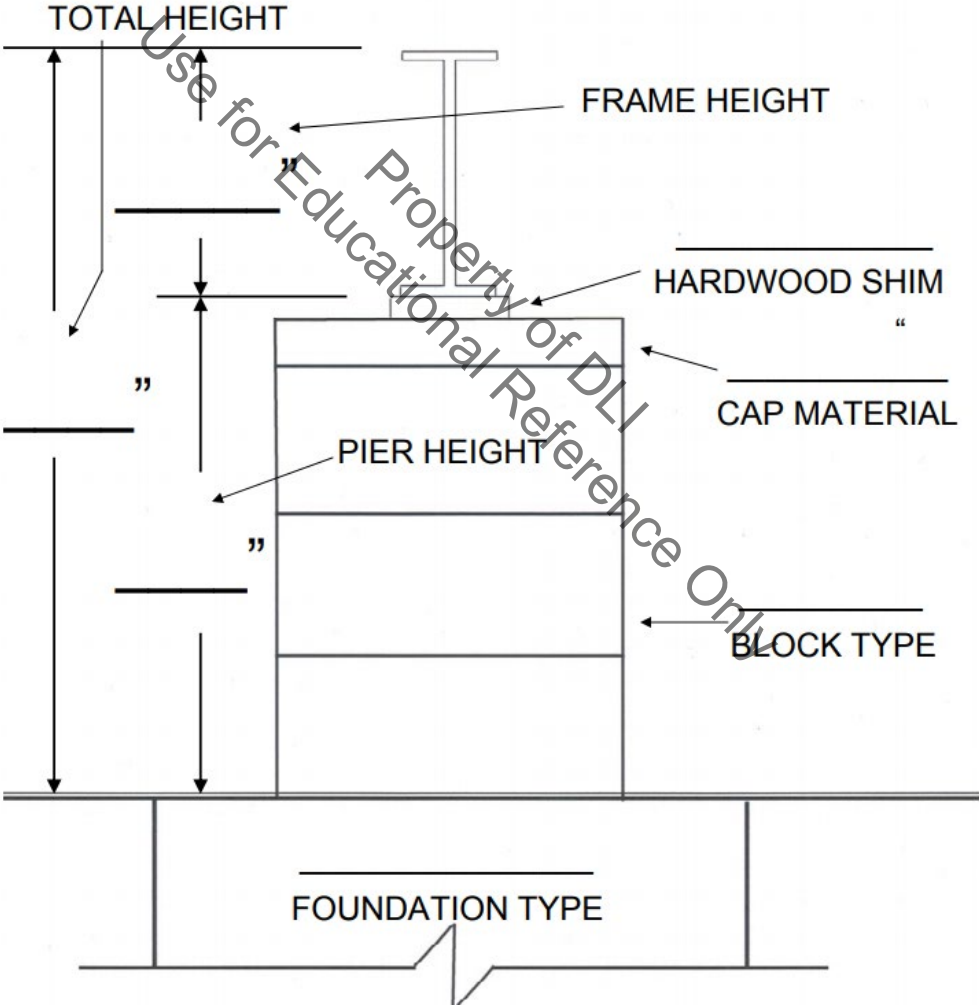
Pier Plan Below Grade



SOIL CLASSIFICATION _____
SOIL BEARING CAPACITY _____ PSF
FOOTING AREA _____ SQ. IN.
SOILS TOTAL LOAD CAPACITY _____
PSI CONCRETE _____

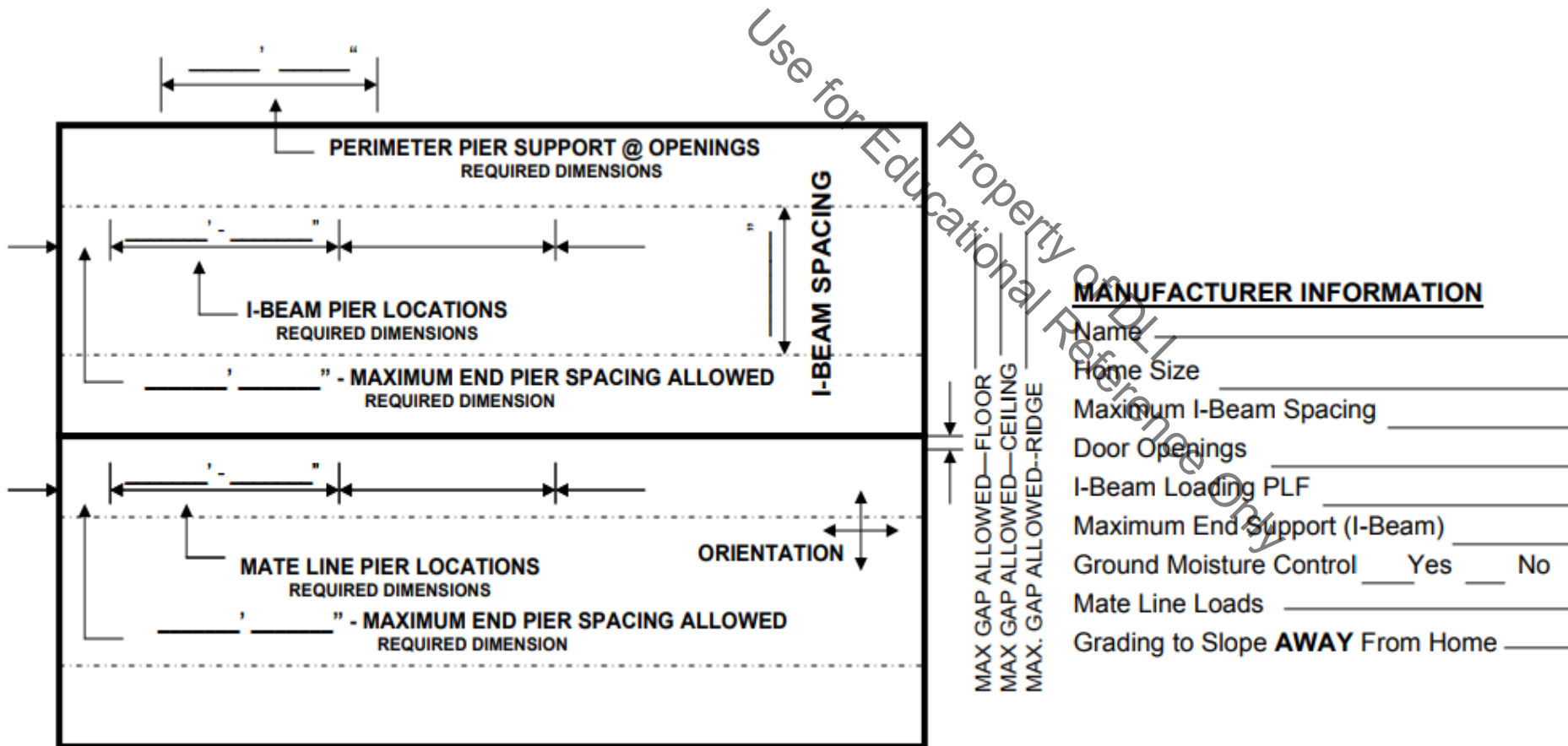
MANUFACTURED HOMES Building Permit Requirements

Blocking Plan



MANUFACTURED HOMES Building Permit Requirements

Support Plan



MANUFACTURER INFORMATION

Name _____
 Home Size _____
 Maximum I-Beam Spacing _____
 Door Openings _____
 I-Beam Loading PLF _____
 Maximum End Support (I-Beam) _____
 Ground Moisture Control Yes No
 Mate Line Loads _____
 Grading to Slope **AWAY** From Home _____

SOIL INFORMATION

Classification No. _____
 Soil Bearing Capacity _____

FOOTING INFORMATION

I-Beam _____ x _____ x _____
 Mate Line _____ x _____ x _____



MANUFACTURED HOMES Installation Requirements

Minnesota State Building Code Chapter 1350

- **Home shall be installed per the Manufacturers Installation Instructions.**
- **Applies to all HUD labeled manufactured homes.**
- **Contains generic rules for the installation of homes when home manual is not available or installed with exceptions in MN Statute 327.32.**
- **All installations shall be performed by a Minnesota Licensed Manufactured home installer or by the owner holding title to the home.**

24 CFR 3285, HUD Installation Standards

- **Applies to all new homes manufactured on or after January 1, 2009.**
- **Home shall be installed per Manufacturer's Installation Instructions or per CFR 3285.**
- **Support footings shall be placed below the frost line or an alternate shallow frost protected foundation shall be provided in accordance with ASCE 32-1, when a foundation system is required by the homes installation instructions.**

MANUFACTURED HOMES

Installation Requirements



**MINNESOTA DEPARTMENT OF
LABOR & INDUSTRY**

443 Lafayette Road N.
St. Paul, Minnesota 55155
www.dli.state.mn.us
(651) 284-5000
1-800-DIAL-DLI
(342-5354)

INSTALLATION INSPECTION/AUDIT

Installer Name: _____ License Number: _____ Date: _____
 Installation Address: _____
 Homeowner name: _____ Phone: _____
 Manufacturer: _____ Serial #: _____
 D.O.M.: _____ HUD Label #: _____

Description

Subpart A General

3285.2 Manufacturers Installation Instructions

	Yes	No	Status
Manufacturers Installation Instructions On-Site.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Subpart B Pre Installation Considerations

	Yes	No	Status
Zoning approval and permits from local jurisdiction.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Manufacturing installation instructions or engineering documents on site.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Plan approval from the Local Authority Having Jurisdiction (LAHJ).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Does the home conform to the Alternate Construction Instructions (if applicable)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3285.101 Fire Separation

	Yes	No	Status
LAHJ has approved Fire Separation Distance and Setbacks.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

MANUFACTURED HOMES Installation Requirements

Soil Classification

Soil Classification and Bearing Table

From CFR* 3285.202 - Manufactured Housing Installation

<u>SOIL CLASSIFICATION</u>		<u>SOIL DESCRIPTION</u>	<u>ALLOWABLE PRESSURE</u>	<u>BLOW COUNT</u>	<u>TORQUE</u>
Classification Number (5)	ASTM D 2487 or D 2488		(Pounds Per Square Foot (1))	ASTM D 1586	Probe (3) Value (4) Inch Pounds
1		Rock or Hard Pan	4000		
2	GW,GP SW,SP, GM SM	Sandy gravel and gravel; very dense and/or cemented sands; coarse gravel/cobbles; preloaded silts, clays and corals	2000	40+	More than 550
3	GC,SC,ML CL	Sandy; silty sand; clayey sand; silty gravel; medium dense course sands; sandy gravel; and very stiff silt, sand clays	1500	24 - 39	351 - 550
4A	CG,MH(2)	Loose to Medium dense sands; firm to stiff clays and silts; alluvial fills	1000	18 - 23	276 - 350
4B	CH,MH(2)	Loose sands; firm clays; alluvial fills	1000	2 - 17	175 - 275
5	OL,OH,PT	Uncompacted fill; peat; organic clays	Refer to CFR* 3285.202(e)	0 - 11	Less than 175

- 1) The values provided in this table have been adjusted for overburden pressure, embedment depth, water table height, or settlement problems.
- 2) For soils classified as CH or MH, without either torque probe values or blow count test results, selected anchors must be rated for a 4B soil.
- 3) The torque probe is a device for measuring the torque value of soils to assist in valuating the holding capacity of the soil in which the ground anchor is placed. The shaft must be of suitable length for the depth of the ground anchor.
- 4) The torque value is measurement of the load resistance provided by the soil when subject to the turning or twisting force of the probe.
- 5) The allowable pressure of 1500 psf may be used, unless the site specific information requires the use of lower values based on soil classification and type.

* Code of Federal Regulations (CFR)

MANUFACTURED HOMES Installation Requirements



All organic materials such as *grass, roots, twigs,* and *wood scraps* must be removed in areas where footings are to be placed.

MANUFACTURED HOMES Installation Requirements

- *Soils are classified at the depth of the footing installation .*
- *Fill soil, and unusual soil conditions--wet, mucky, expansive soils, and or the presence of ground water require special examination by a licensed MN Soils Engineer.*



MANUFACTURED HOMES Installation Requirements

- **Conventional footings must be placed below the frost line depth for the site unless an Engineered insulated foundation or monolithic structural slab is approved by the LAHJ.**



CFR 3285.312 Footings

MANUFACTURED HOMES Installation Requirements



A vapor retarder shall be installed, except in arid regions, where the under floor area is to be enclosed

- **6-mil poly or an equivalent is an acceptable moisture control material when lapped a minimum 12"**
- **The vapor retarder may be placed directly beneath the footings when footings are permitted to be placed at grade level.**

MANUFACTURED HOMES Installation Requirements



MANUFACTURED HOMES Installation Requirements

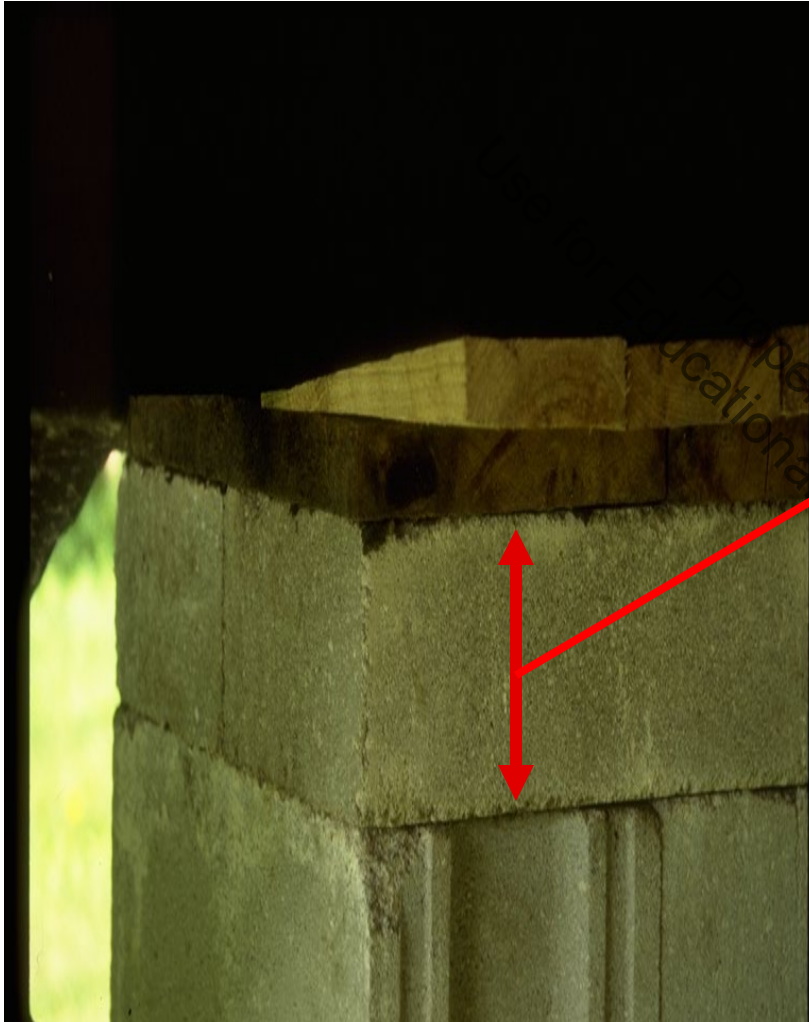


MANUFACTURED HOMES Installation Requirements



- ***Shims shall be nominal 4" x 6" and used in pairs to fill gaps between the pier cap and the home's structural member.***
- ***Shims shall not exceed 1" in height.***
- ***Wood used to fill gaps between the pier cap and the home's structural members shall not exceed 2"***

MANUFACTURED HOMES Installation Requirements



- ***Pier Caps shall be of solid masonry at least 4" thick or dimensional lumber at least 2" nominal thickness or of steel.***

MANUFACTURED HOMES Installation Requirements



Use for Educational Reference Only

- ***Concrete blocks shall have nominal dimension of at least 8" x 8" x 16"***
- ***Concrete blocks shall be stacked with their hollow cells aligned vertically and be structural block at least equal to an ASTM C-90 N-1 block***

MANUFACTURED HOMES Installation Requirements



MANUFACTURED HOMES Installation Requirements



MANUFACTURED HOMES Installation Requirements



MANUFACTURED HOMES Installation Requirements



MANUFACTURED HOMES Installation Requirements



MANUFACTURED HOMES

Installation Requirements



MANUFACTURED HOMES Installation Requirements



MANUFACTURED HOMES Installation Requirements



MANUFACTURED HOMES

Installation Requirements



Each manufactured home shall have its Stabilizing System installed according to the home manufacturers installation instructions and the Anchor manufacturers installation instructions.

MANUFACTURED HOMES

Installation Requirements

MINUTE MAN RECOMMENDED NUMBER AND LOCATION OF STRAPS AND GROUND ANCHORS

Strap Method	Anchor Ultimate Load Capacity	Maximum Anchor Spacing		
		Zone 1	Zone II	Zone III
Single Strap	4725 lbs. ₁	11' - 0" ₂	6' - 0" ₂	4' - 6" ₂
Double Strap	4725 lbs.	11' - 0"	6' - 0"	4' - 6"

Note:

1. The distance from the end of the home to the first anchor must not exceed 2' - 0".
2. All homes located in Wind Zones II and III must have a vertical tie installed at each diagonal tie location.
3. Minute Man recommendations are for homes where the home manufacturer installation instructions are not Available. The home manufacturer's installation instructions supercede Minute Man recommendations.

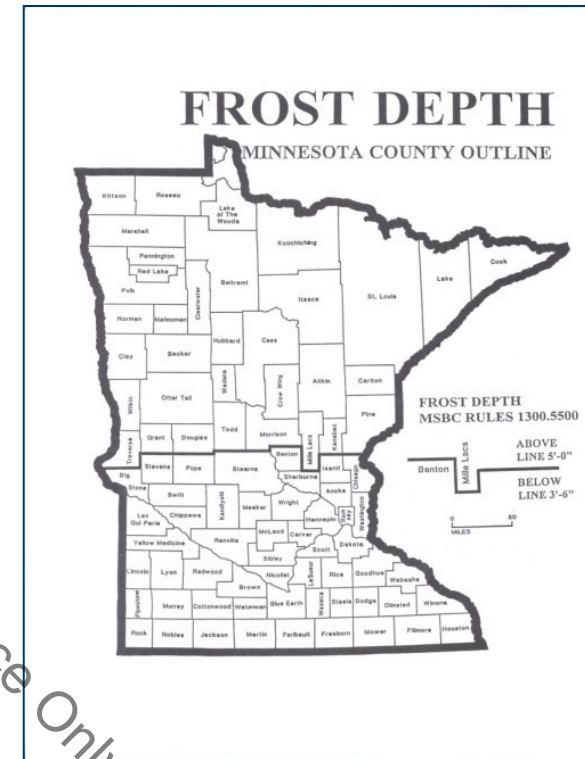
SOIL CLASSIFICATION CHART

Soil Class	Soil Description	Blow Count (ASTM D1586)	Test Probe Value	Recommended Minute Man Anchor
1	Sound hard rock	NA	NA	Cross Drive or Rock Anchor
2(a)	Very dense &/or cemented sands, coarse gravel and cobbles, caliche, preloaded silts, and clays.	40-up	551 lb. in. Up	4430DH 650DH 4430 EZDH 636 EZDH 24 BA
2(b)	Coral	40-up	551 lb. in. up	4430 DH 650DH 24 BA
3	Medium dense coarse sands, sandy gravels, very stiff silts, and clays.	24-39	351 to 550 lb in.	4430 DH 4430 EZDH 636 EZDH 650DH 4636 EZDH
4(a)	Loose to medium dense sands, firm to stiff clays and silts alluvial fill.	18-23,3	276 to 350 lb. in.	650DH 6650 EZVDH(FL).
4(b)	VERY loose to medium dense sands, firm to stiff clays and silts, alluvial fill.	12-17	175 to 275 lbs. in	760DH 860DH 8860 EZVDH (FL) 1060DH 4636 7/8 NU Concept

Remember: Each state, county or municipality may require a specific anchor from the groups shown for each soil classification. Check local regulations first.

Note: Many anchors are designed for particular soil condition(s) and are unacceptable for use in other type soils. We have listed the soils for which each anchor is designed and approved. Soil classifications are taken from the "standard for the installation on mobile homes". Each anchor listed meets ANSI A225.1 and ASTM D3953.91 codes.

Use for Educational Reference Only
Property of DLI



Ground anchors shall be installed to their full depth below the local frost line depth and at least 12 inches above the local water table.

MSBC 1350.3000 & CFR 3285.401

MANUFACTURED HOMES Installation Requirements

Table 7.5.2.4.1(a) Maximum Diagonal Tiedown Strap Spacing, Wind Zone I

Nominal Floor Width, Single Section/ Multisection	Max. Height from Ground to Diagonal Strap Attachment	I-Beam Spacing (82.5 in. max.)	I-Beam Spacing (99.5 in. max.)
12/24 ft 132 in. to 155 in. box(es)	25 in.	14 ft 2 in.	9 ft 9 in.
	33 in.	11 ft 9 in.	7 ft 8 in.
	46 in.	9 ft 1 in.	5 ft 8 in.
	67 in.	6 ft 6 in.	4 ft 0 in.
14/28 ft 156 in. to 179 in. box(es)	25 in.	18 ft 2 in.	15 ft 11 in.
	33 in.	16 ft 1 in.	13 ft 6 in.
	46 in.	13 ft 3 in.	10 ft 8 in.
	67 in.	10 ft 0 in.	7 ft 9 in.
16/32 ft 180 in. to 204 in. box(es)	25 in.	20 ft 7 in.	19 ft 5 in.
	33 in.	19 ft 0 in.	17 ft 5 in.
	46 in.	16 ft 5 in.	14 ft 7 in.
	67 in.	13 ft 1 in.	11 ft 3 in.
18 ft 204 in. to 216 in. box(es)	25 in.	22 ft 4 in.	21 ft 8 in.
	33 in.	21 ft 1 in.	20 ft 2 in.
	46 in.	19 ft 0 in.	17 ft 8 in.
	67 in.	15 ft 9 in.	14 ft 3 in.

Notes:

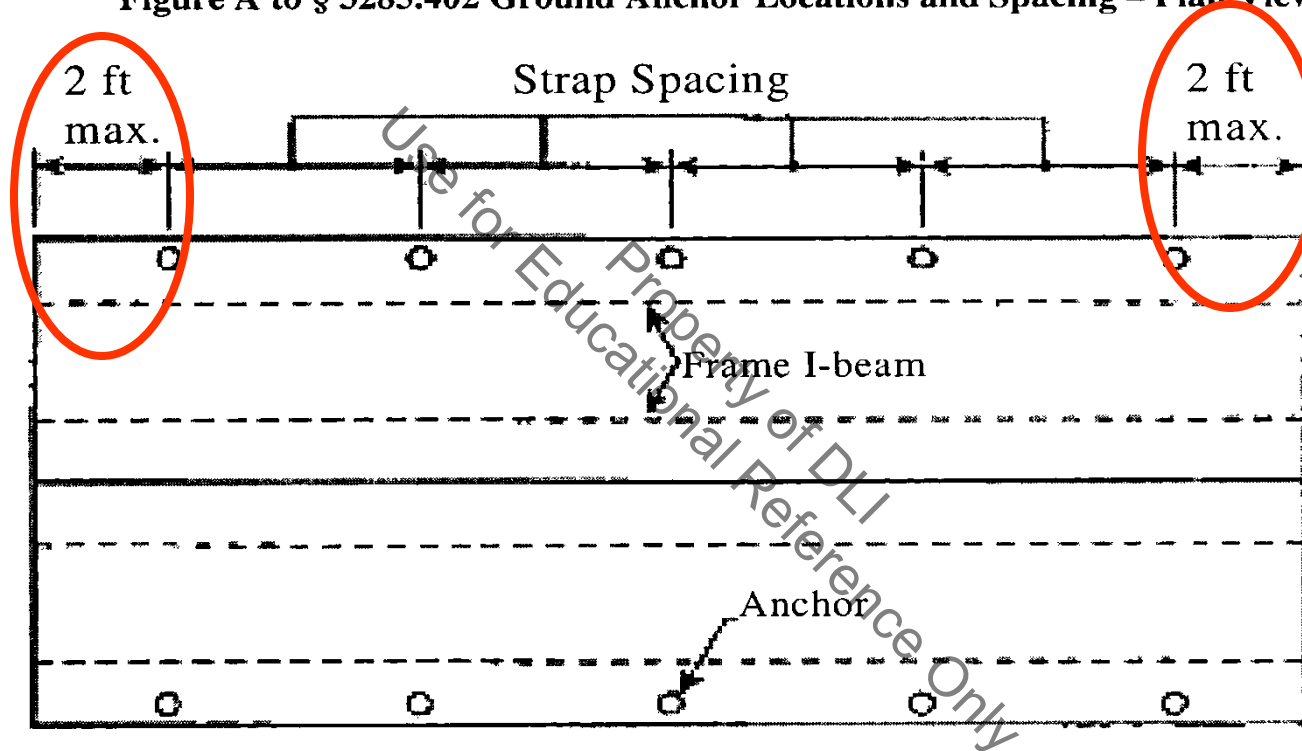
1. Sidewall heights not to exceed 90 in.
2. Maximum inset for ground anchor head from edge of floor or wall is 4 in.
3. Main rail (I-beam) spacing is the maximum spacing per given column (maximum I-beam spacing is 99.5 in.).
4. Maximum eave width is 4 in. for single-section homes and 12 in. for multisection homes.
5. Maximum roof pitch is 20 degrees (4.3/12).
6. The minimum height from the ground to the bottom of the floor joist shall be 18 in.
7. Additional tiedowns may be required per manufacturer's instructions.
8. Anchors shall be certified for these conditions by a professional engineer, architect, or nationally recognized testing laboratory.
9. Ground anchors should be installed to their full depth, and stabilizer devices shall be installed per manufacturer's instructions.
10. Strapping and strapping equipment should be certified by a registered professional engineer or architect to resist these specified forces in accordance with testing procedures in ASTM D 3953-97, *Standard Specification for Strapping, Flat Steel and Straps*.
11. Alternative methods capable of sustaining the design load requirements of the manufactured home construction and safety standards, approved by the authority having jurisdiction, shall be permitted to be used.
12. Table is based on a 3150 lb working load, and straps shall be placed within 2 ft of the ends of the home.
13. For SI units, 1 ft = 0.3048 m; 1 in. = 25.4 mm; 1 lb = 0.4535 kg.

Each manufactured home installation manual shall have *details for the installation and stabilizing systems of the home. The details must be stamped as certified by a registered professional engineer or architect and shall be at least equal to the provisions in HUD CFR 3285, Installation Standards.*

MANUFACTURED HOMES

Installation Requirements



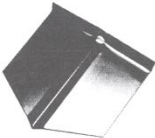

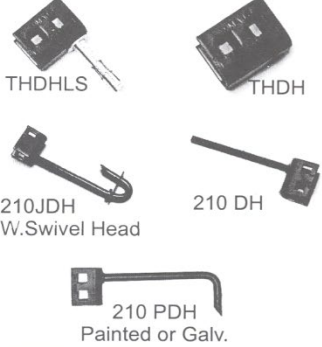





Figure A to § 3285.402 Ground Anchor Locations and Spacing – Plan View.



Anchors locations *must be located* within 2'- 0" of end of the home. Per Manufactures installation requirements

MANUFACTURED HOMES

Installation Requirements

<p>Single Disk Anchors</p>  <p>650, 636, 860, 1060 DH Anchor</p>	<p>Double Disk Anchors</p>  <p>4430, 4636 DH Anchor</p>						
<p>Stabilizers</p>  <p>Available Painted Black or Galvanized as required in Florida</p>	<p>Drive Anchors</p> <p>36X And 48X Gross Drive Anchors 24" Barbed Rock Anchor</p> 						
<p>Concrete Anchors</p>  <p>THDHLS THDH 210JDH W.Swivel Head 210 DH 210 PDH Painted or Galv.</p>	<p>NU-CONCEPT ANCHOR <i>Patent Pending</i></p> <p>Designed to be used with any model Minute Man Anchor. Packaged 16 to a box and includes Grad #5 bolts and nuts. Total Weight: 25 lbs.</p>  <p>N C 1 Swivel Stabilizer Cap Full view of anchor with cap and with cap attached Anchor w/cap attached</p>  <table border="1"> <thead> <tr> <th>Item#</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>2211</td> <td>NU Concept Cap</td> </tr> <tr> <td>1311</td> <td>4636 7/8" DH</td> </tr> </tbody> </table>   <p>Tension Head w/ Elongated Hole MMA97/ C4 Nu-Concept Drive Adapter</p>	Item#	Description	2211	NU Concept Cap	1311	4636 7/8" DH
Item#	Description						
2211	NU Concept Cap						
1311	4636 7/8" DH						
<p>E-Z Anchors (Patented)</p>  <p>4430, 4636, 636, 650, DH Anchor 6650, 8860 VDH Galv. Anchor (FL)</p>							

- **Ground Anchors must be installed with the required stabilizer devices.**
- **Each installed in accordance with the anchor's tested listing and per the home installation requirements**

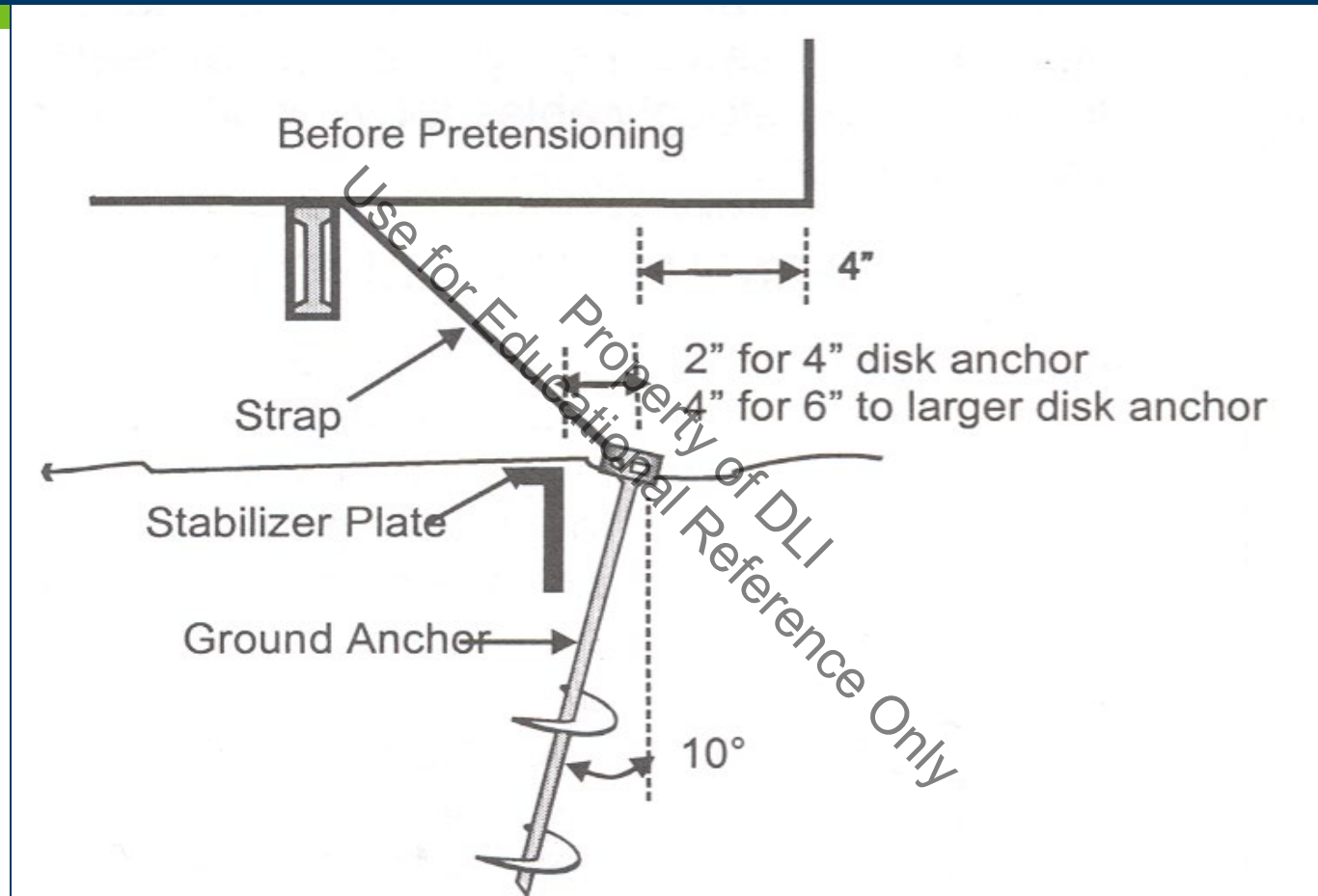
CFR 3285.401

MANUFACTURED HOMES Installation Requirements



MANUFACTURED HOMES

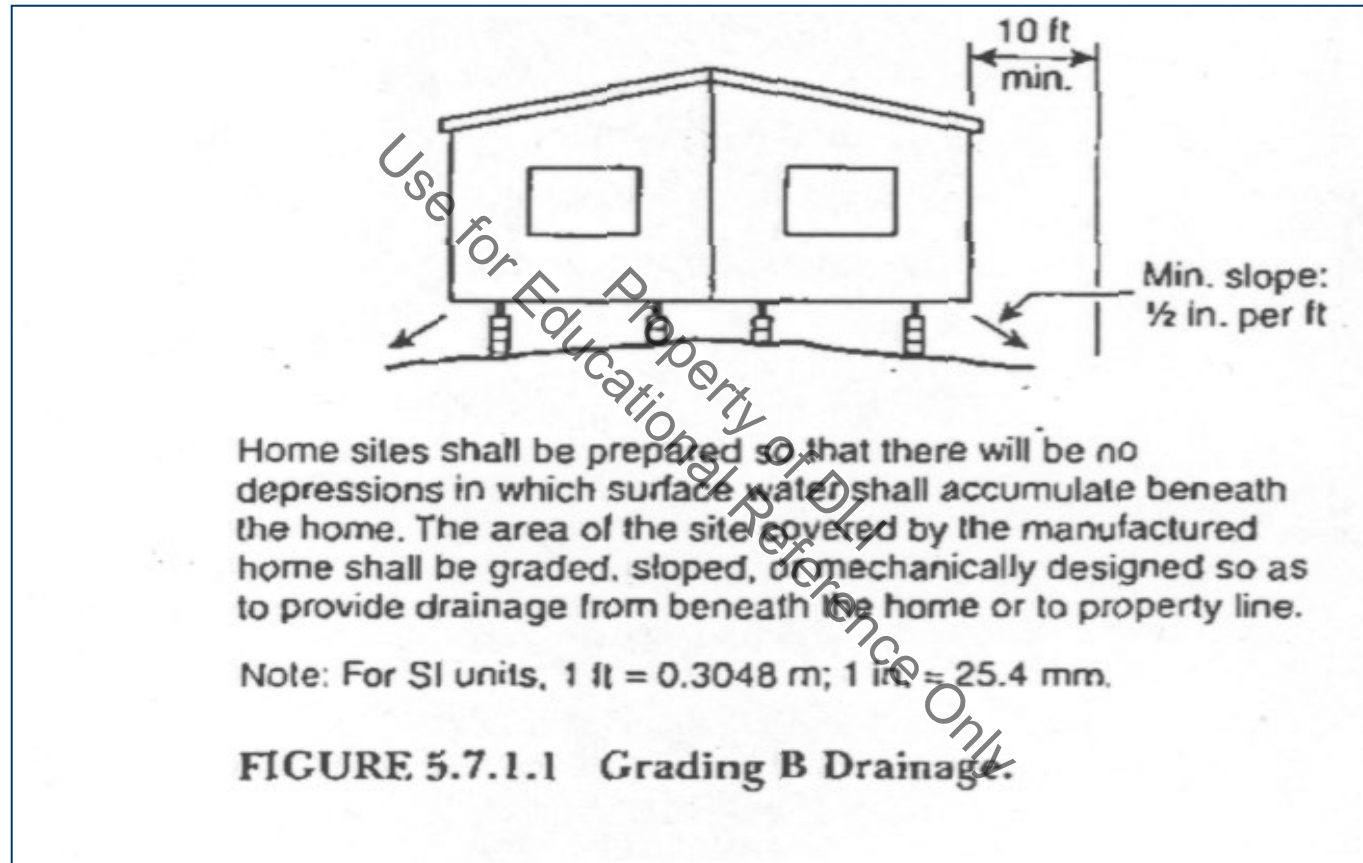
Installation Requirements



Anchor heads shall be within 4" of the home's floor/wall edge

CFR 3285.401

MANUFACTURED HOMES Installation Requirements



All drainage must be diverted away from the home and must slope a *minimum slope of 1/2" per foot for the first 10 feet.*

MANUFACTURED HOMES Installation Requirements

- The *installer* shall provide to the *commissioner, the retailer, and the home owner an installation certificate*—the certificate evidences compliance with *MSBC Chapter 1350.0100 to 1350.6900*.
- *Within 7 days of having completed the installation the installer is to affixed the seal and provide the parties listed above the required installation certificate.*

Reset

Minnesota Department of Labor and Industry
Construction Codes and Licensing Division
Plan Review/Inspections
443 Lafayette Road North
St. Paul, MN 55155-4341
Phone: (651) 284-5068 Fax: (651) 284-5749
www.doli.state.mn.us TTY: (651) 297-4198

Manufactured Home Installation Compliance Certification

PRINT IN INK or TYPE your responses. Mail a copy to MN CCLD within 7 days of completion of installation.

General Information

HOMEOWNERS NAME			COUNTY
HOME LOCATION/ADDRESS			CITY
MANUFACTURED HOME BRAND	MODEL	SERIAL NUMBER OF HOME	DATE OF MANUFACTURE
HUD or STATE LABEL(S) NUMBER (S) (If home was manufactured prior to July 1, 1972, no label number required.)			
Is the home located in a park?	Name of Park		
<input type="checkbox"/> No <input type="checkbox"/> Yes			
Building Permit Required?	City or <input type="checkbox"/> County		Inspection of installation completed?
<input type="checkbox"/> No <input type="checkbox"/> Yes			<input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> City or <input type="checkbox"/> County

Support System

Support System Seal Number:	Foundation Type:	<input type="checkbox"/> Ground Block	<input type="checkbox"/> Frost Depth Piers	<input type="checkbox"/> Basement	<input type="checkbox"/> Crawlspace w/frost ftg.
S1-	<input type="checkbox"/> Engineered Slab	<input type="checkbox"/> Other Approval Alternate		Alternate approval number:	
Soil Bearing Capacity (p.s.f.)	Method of verification	DATE OF INSTALLATION			

Support System Items of Utility Work: (Enter completed by, if installer state installer, if homeowner state homeowner, if other give name of person, company name, license number if known.)

Sewer	Tested:
Water:	Tested:
Gas:	Tested:
Electrical (By licensed electrical contractor or homeowner for electrical items.)	Tested:

Other Items Included in Installation Contract:

<input type="checkbox"/> Home Stand/Pad	<input type="checkbox"/> Lot grading	<input type="checkbox"/> Skirting (Type: _____)	<input type="checkbox"/> Exterior Stairs/Landings	How many?
Other Items:				

I hereby certify that the Support System on the Manufactured Home listed has been completed in accordance with the manufacturers instructions and the Minnesota State Building Code.

MN REGISTRATION NUMBER	INSTALLER COMPANY NAME	LICENSED/REGISTERED INSTALLERS SIGNATURE:
MI-		

Anchoring System

Anchor System Seal Number:	ANCHOR MANUFACTURER'S NAME	MODEL-PART/PRODUCT NO.	DATE OF INSTALLATION
A1-			
Soil Anchors	Test Probe Torque Value (inch lbs.)	Concrete Anchors:	Other anchor system: (Give approval numbers & describe other approve anchoring system)
<input type="checkbox"/> No <input type="checkbox"/> Yes		<input type="checkbox"/> No <input type="checkbox"/> Yes	

I hereby certify that the Anchoring System on the Manufactured Home listed has been completed in accordance with the manufacturers instructions and the Minnesota State Building Code.

MN REGISTRATION NUMBER	INSTALLER COMPANY NAME	LICENSED/REGISTERED INSTALLERS SIGNATURE:
MI-		

If anchoring of the home completed by others indicate name and address of responsible party for the required anchoring.

This material can be made available in different forms, such as large print, Braille or on a tape. To request, call 1-800-342-5354 (DIAL-DLI) Voice or TDD (651) 297-4198.

MS Certification (5/06) Copies: 1-homeowner, 1-installer, 1-dealer, and 1-State of MN CCLD

MANUFACTURED HOMES Installation Requirements

- Installation seals and certificates are required for *all* manufactured homes installed in MN, including those in a municipality enforcing the MSBC.

Use for Educational Reference Only



Minnesota Department of Labor and Industry
Construction Codes and Licensing Division
Plan Review/Inspections
443 Lafayette Road North
St. Paul, MN 55155-4341
Phone: (651) 284-5068 Fax: (651) 284-5749
www.doli.state.mn.us TTY: (651) 297-4198

**Manufactured Home Installation
Compliance Certification** Reset

PRINT IN INK or TYPE your responses. Mail a copy to MN CCLD within 7 days of completion of installation.

General Information

HOMEOWNERS NAME			COUNTY
HOME LOCATION/ADDRESS			CITY
MANUFACTURED HOME BRAND	MODEL	SERIAL NUMBER OF HOME	DATE OF MANUFACTURE
HUD or STATE LABEL(S) NUMBER (S) (If home was manufactured prior to July 1, 1972, no label number required.)			
Is the home located in a park?		Name of Park	
<input type="checkbox"/> No <input type="checkbox"/> Yes			
Building Permit Required?		Inspection of installation completed?	
<input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> City or <input type="checkbox"/> County		<input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> City or <input type="checkbox"/> County	

Support System

Support System Seal Number: _____ Foundation Type: Ground Block Frost Depth Piers Basement Crawlspace w/roft ftg.
 Engineered Slab Other Approval Alternate approval number: _____

Soil Bearing Capacity (p.s.f.) _____ Method of verification _____ DATE OF INSTALLATION _____

Support System Items of Utility Work: (Enter completed by, if installer state installer, if homeowner state homeowner, if other give name of person, company name, license number if known.)

Sewer	Tested:
Water:	Tested:
Gas:	Tested:
Electrical: (By licensed electrical contractor or homeowner for electrical items.)	Tested:

Other Items Included in Installation Contract:

Home Stand/Pad Lot grading Skirting (Type): _____ Exterior Stairs/Landings How many? _____

Other Items: _____

I hereby certify that the Support System on the Manufactured Home listed has been completed in accordance with the manufacturers instructions and the Minnesota State Building Code.

MN REGISTRATION NUMBER	INSTALLER COMPANY NAME	LICENSED/REGISTERED INSTALLERS SIGNATURE:
MI-		

Anchoring System

Anchor System Seal Number: _____ ANCHOR MANUFACTURER'S NAME _____ MODEL-PART/PRODUCT NO. _____ DATE OF INSTALLATION _____

A1-

Soil Anchors	Test Probe Torque Value (inch lbs.)	Concrete Anchors:	Other anchor system: (Give approval numbers & describe other approve anchoring system)
<input type="checkbox"/> No <input type="checkbox"/> Yes		<input type="checkbox"/> No <input type="checkbox"/> Yes	

I hereby certify that the Anchoring System on the Manufactured Home listed has been completed in accordance with the manufacturers instructions and the Minnesota State Building Code.

MN REGISTRATION NUMBER	INSTALLER COMPANY NAME	LICENSED/REGISTERED INSTALLERS SIGNATURE:
MI-		

If anchoring of the home completed by others indicate name and address of responsible party for the required anchoring.

This material can be made available in different forms, such as large print, Braille or on a tape. To request, call 1-800-342-5354 (DIAL-DLI) Voice or TDD (651) 297-4198.

MS Certification (5/06) Copies: 1-homeowner, 1-installer, 1-dealer, and 1-State of MN CCLD

MANUFACTURED HOMES Installation Requirements

STATE OF MINNESOTA - MANUFACTURED HOME
TEMPORARY INSTALLATION CERTIFICATE

S1
Assigned Seal No.

SUPPORT/UTILITY SYSTEM
From Nov. 15th to April 1st, or
when climate conditions interfere.

CONSTRUCTION SEAL NO. _____
IF NONE - WRITE "NONE"

CONSTRUCTION SEAL NO. _____
(MULTIPLE UNITS) IF NONE - WRITE "NONE"

Owner's Name _____ Temporary Date _____
Manufactured Home Location _____
ADDRESS CITY COUNTY
Manufactured Home Mfr. Name _____ Serial No. _____

When climate conditions permit, I agree to Re-Install the Support/Utility System as required for Code Compliance (Rule 1350.0400, Subdivision 4) and affix the assigned seal and furnish a permanent certificate, to the owner and Building Codes & Standards Division. Rework for winter installations to be done by June 1st.

Installer Company _____ MI _____ Reg. No. _____ Installer Signature _____

OWNER'S COPY

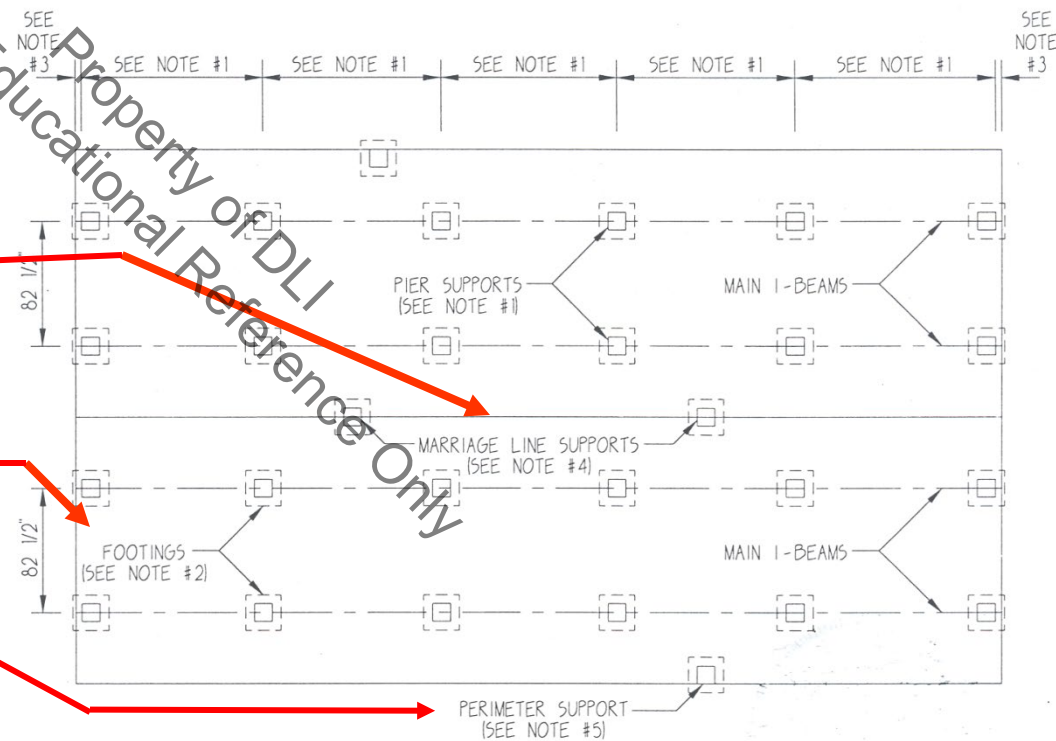
The *installer* shall issue a temporary certificate when *climatic conditions* prohibit a completed complying installation. Temporary certificates shall be issued for installations completed between *November 15 and March 31*, except where a MN Building Official, *in writing*, determines *climatic conditions* permit a *complying installation* or when the home is installed on a *foundation system* in compliance with the MSBC.

MANUFACTURED HOMES Installation Requirements

Per the Manufacturer's requirements. MSBC 1350.2600 for Size, Placement, and Re-bar.

- Marriage Wall Piers Footings
- I-beam Support Piers Footings
- Perimeter Footings

TYPICAL BLOCKING LAYOUTS
DOUBLE-SECTION HOMES
STANDARD BLOCKING AND 30 LB. ROOF LOAD





MANUFACTURED HOMES

Soils, Footings & Foundations

MANUFACTURED HOMES Soils, Footings & Foundations

TABLE TO §3285.202

Soil classification		Soil description	Allowable soil bearing pressure (psf) ¹	Blow count ASTM D 1586-99	Torque probe ³ value ⁴ (inch-pounds)-
Classification number	ASTM D 2487-00 or D 2488-00 (incorporated by reference, see §3285.4)				
1		Rock or hard pan	4000 +		
2	GW, GP, SW, SP, GM, SM	Sandy gravel and gravel, very than dense and/or cemented sands; coarse gravel/cobbles; preloaded silts, clays and coral	2000	40 +	More than 550.
3	GC, SC, ML, CL	Sand; silty sand; clayey sand; silty gravel; medium dense coarse sands; sandy gravel; and very stiff silt, sand clays	1500	24-39	351-550.
4A	CG, MH ²	Loose to medium dense sands; firm to stiff clays and silts; alluvial fills	1000	18-23	276-350.
4B	CH, MH ²	Loose sands; firm clays; alluvial fills	1000	12-17	175-275.
5	OL, OH, PT	Uncompacted fill; peat; organic clays	Refer to 3285.202(e)	0-11	Less than 175.

Notes:

¹The values provided in this table have not been adjusted for overburden pressure, embedment depth, water table height, or settlement problems.

²For soils classified as CH or MH, without either torque probe values or blow count test results, selected anchors must be rated for a 4B soil.

³The torque test probe is a device for measuring the torque value of soils to assist in evaluating the holding capacity of the soil in which the ground anchor is placed. The shaft must be of suitable length for the full depth of the ground anchor.

⁴The torque value is a measure of the load resistance provided by the soil when subject to the turning or twisting force of the probe.

Class Exercise

Footing Calculations

Soils Classification

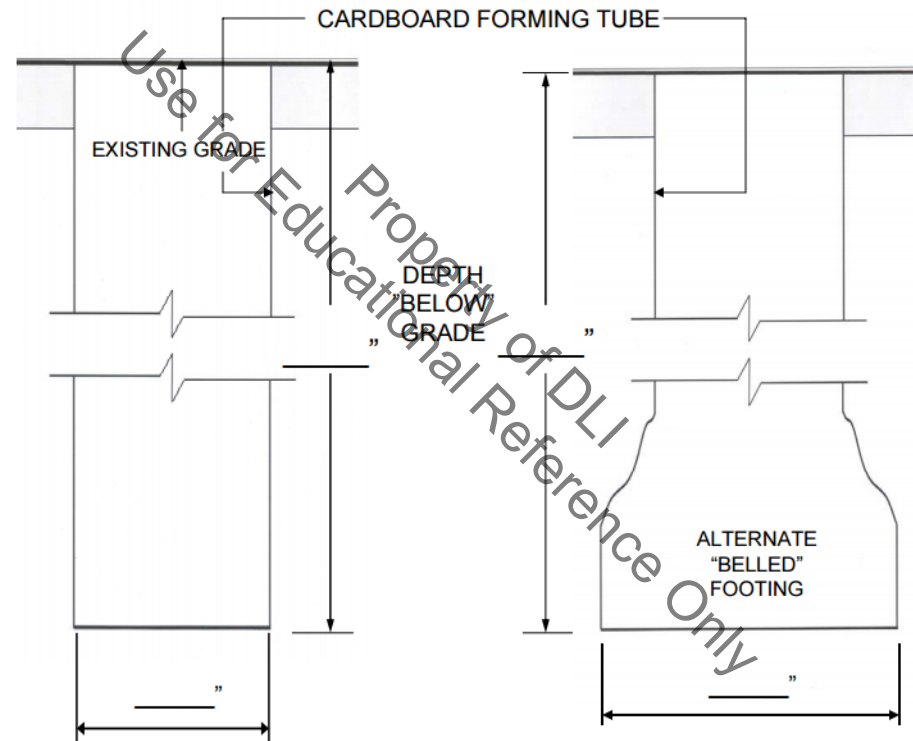
Well Graded Gravel(GW)
Poorly Graded Gravel (GP)
Well Graded Sand (SW)
Poor Graded Sand (SP)
Gravelly Clay (GC)
Sandy Clay (SC)
Clay & Sandy Clay (CL)
Silty Clay (ML)
Firm to stiff Clays- Silts(MH)
Loose Sandy silts (CH)

Soils Load Bearing Capacity

2000 psf. (GW)
2000 psf. (GP)
2000 psf. (SW)
2000 psf. (SP)
1500 psf. (GC)
1500 psf. (SC)
1500 psf. (CL)
1500 psf. (ML)
1000 psf. (MH)
1000 psf. (CH)

Class Exercise

FROST DEPTH PIER SECTION VIEW



SOIL CLASSIFICATION _____

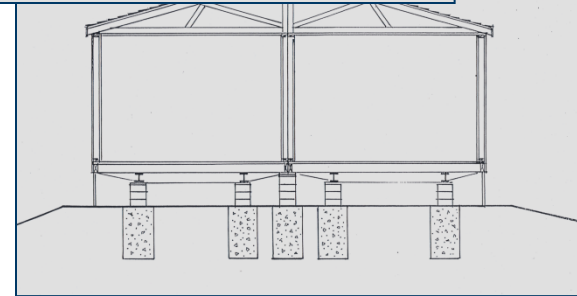
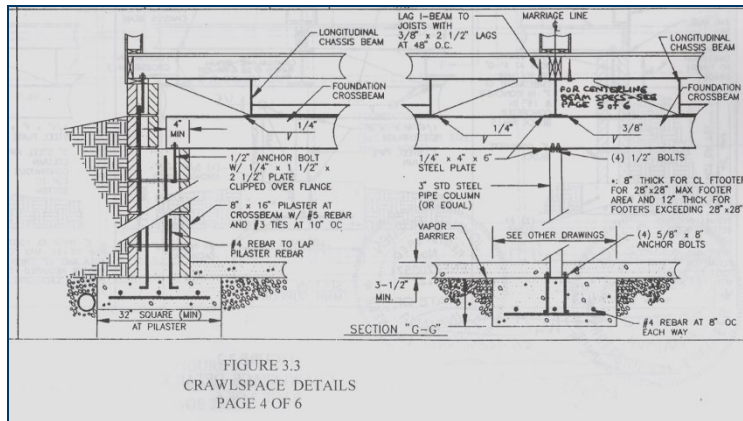
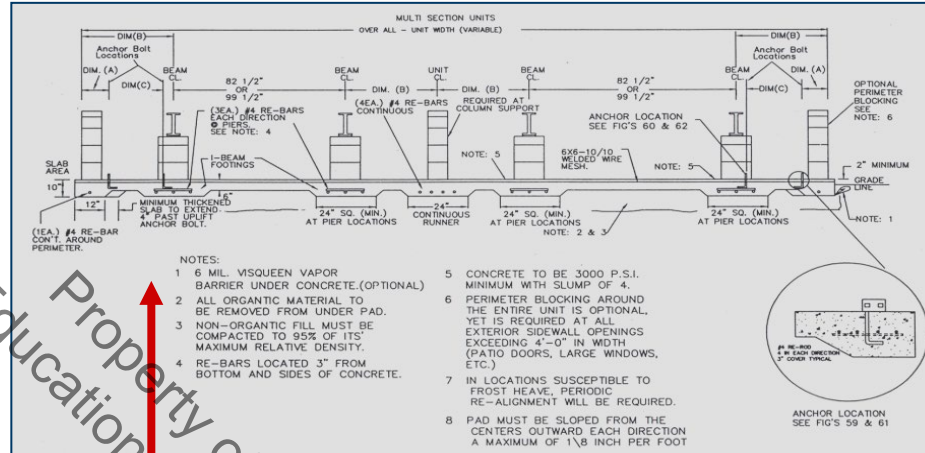
SOIL BEARING CAPACITY _____ PSF

FOOTING AREA _____ SQ. IN.

SOILS TOTAL LOAD CAPACITY _____

PSI CONCRETE _____

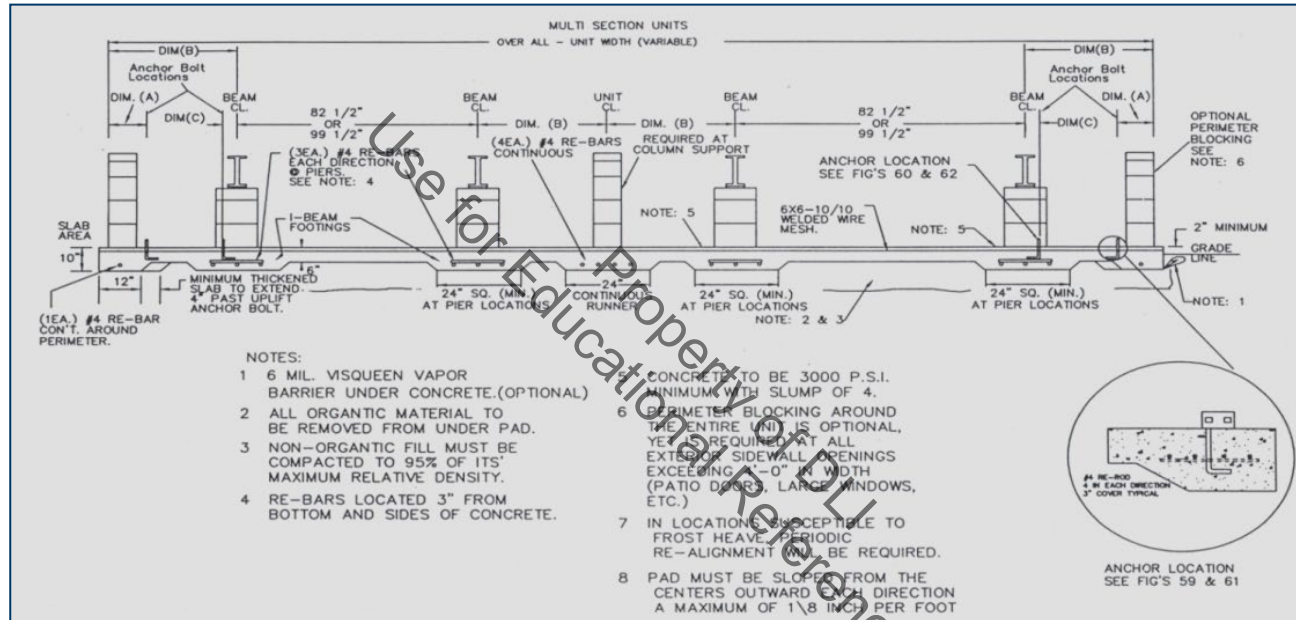
MANUFACTURED HOMES Soils, Footings & Foundations



**An engineered drainage
System is required**

A foundation system is defined as a permanent foundation constructed in conformance with the *State Building Code*.

MANUFACTURED HOMES Soils, Footings & Foundations

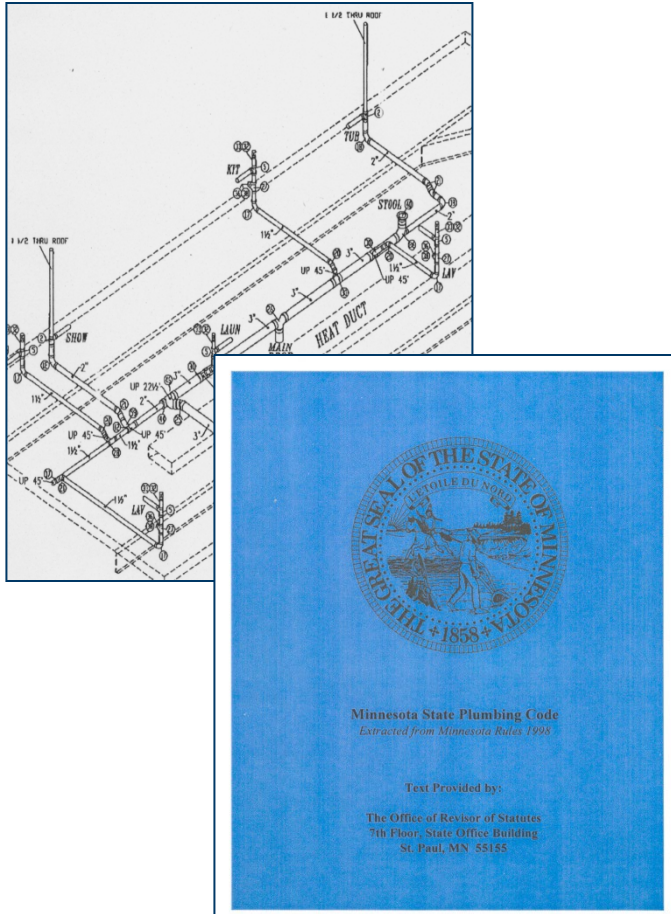


A monolithic concrete slab is permitted above the frost line when all relevant site-specific conditions are considered and anchorage requirements are accommodated as set out in 3285.401. Each monolithic slab system must be designed by a registered professional engineer or architect and designed for that specific site.



MANUFACTURED HOMES On Site Plumbing

MANUFACTURED HOMES On Site Plumbing



Work completed in the connection of the *drain waste piping* and in bringing the system to a *single point of discharge* shall be in accordance with the manufacturer's installation manual and *DAPIA* approved drawings.

Work completed *beyond the single point of discharge* shall be completed in accordance with the *State Plumbing Code*.

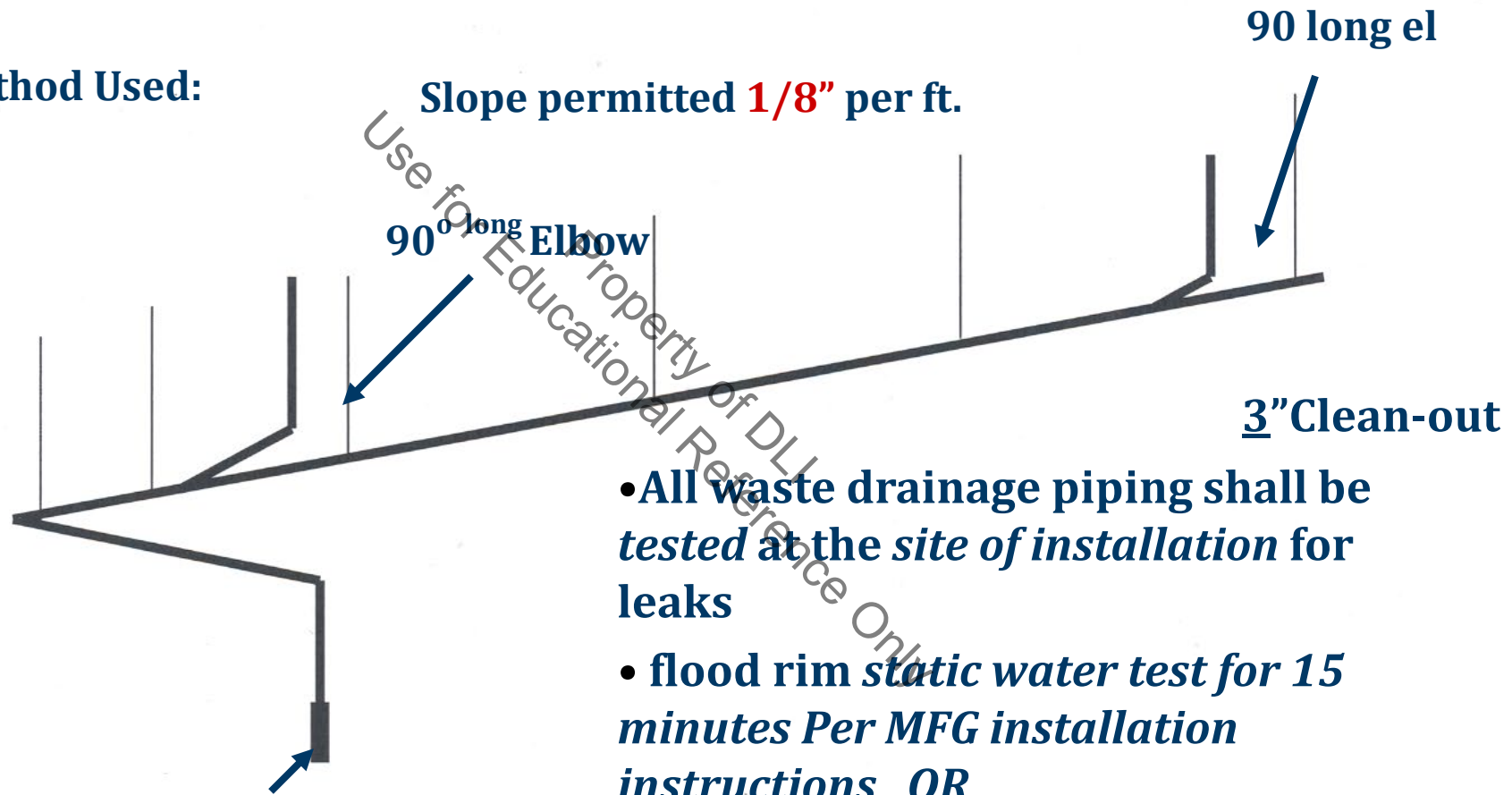
MSBC 1350.3400 Utility Connections

- Subpart 1, Water Connections
- Water piping to the home shall comply with MPC, Chapter 4715.
- Pipes shall be protected from freezing.
- Heat tapes when installed shall be listed and installed in accordance with the listing.
- When home is installed subject to ground movement (freeze/thaw) approved flexible connectors or semi-rigid copper tubing shall be used.
- Subpart 2, Sewer Connections
- Waste piping to the home shall comply with MPC, Chapter 4715.
- When home is installed subject to ground movement, offsets or approved flexible connectors, or both shall be used.

MANUFACTURED HOME

On-Site Plumbing

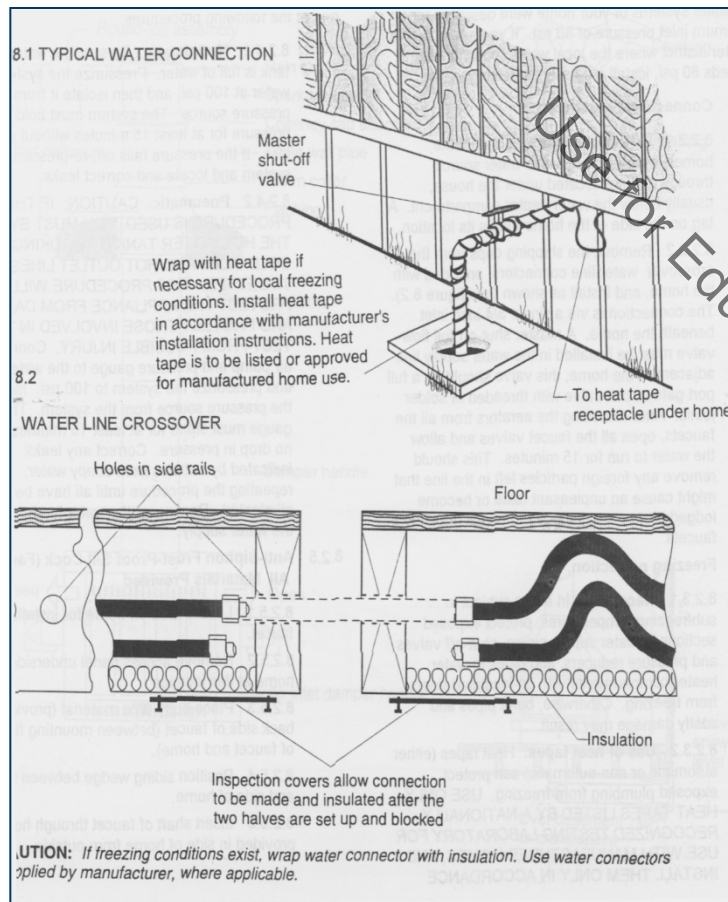
Test Method Used:



**3" x 4" Fully Jacketed Elastomeric
Transition Fitting**

MANUFACTURED HOMES

On Site Plumbing



- ***Water Distribution System shall be Sized to provide adequate quantity of water to each fixture without any danger of backflow or siphoning.***
- ***When the maximum working pressure exceeds 80 psi a pressure reducing valve shall be installed***
- ***System shall Be Tested on-site at a maximum 100 psi.***

MANUFACTURED HOMES

On Site Plumbing



CFR 3285.603

Water supply lines and crossovers must be protected from freezing.

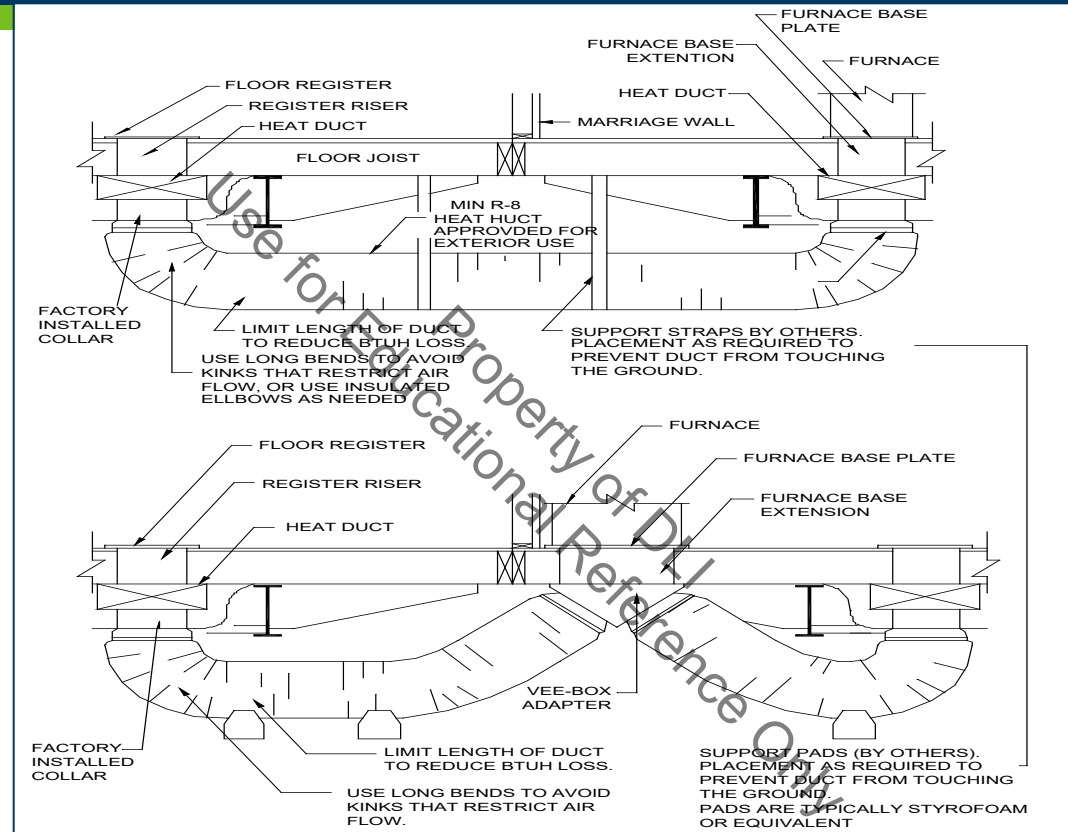
Water systems must be inspected and tested for leaks after completion at the site. Manufactures installation instruction must provide testing requirements.

MANUFACTURED HOMES HVAC Cross Over



Exposed *duct insulation* shall be insulated with materials having an *R-8 value*. Exposed *duct* shall be *covered* with a material having a *1.0 perm barrier*.

MANUFACTURED HOMES HVAC Cross Over



***Support straps shall be secured with sheet metal screws.
Ducting shall be suspended/supported above grade.
Kinking and compression are to be minimized.***

MANUFACTURED HOMES

Smoke/Carbon Monoxide Detectors & Egress Windows



- **Operating instructions shall be affixed to each egress window and device and must state “Do Not Remove”**

24 CFR 3280.404

MANUFACTURED HOMES

Exterior Stairs





MANUFACTURED HOMES Final Recap

What are the three types of structures that we talked about today?

Use for Educational Reference Only
Property of DLI

What are the three types of structures that we talked about today?

HUD Units

Prefabricated Units

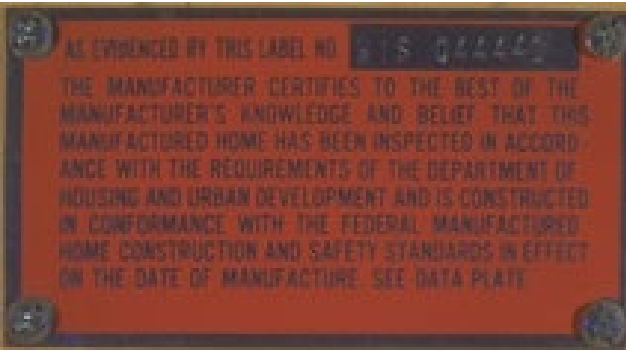
Modular Units

Use for Educational Reference Only
Property of DLI

MANUFACTURED HOMES

Final Recap

These labels go with which type of structure?

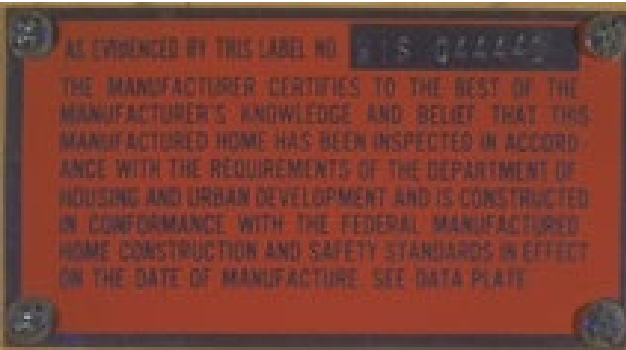


MANUFACTURED HOMES

Final Recap

These labels go with which type of structure?

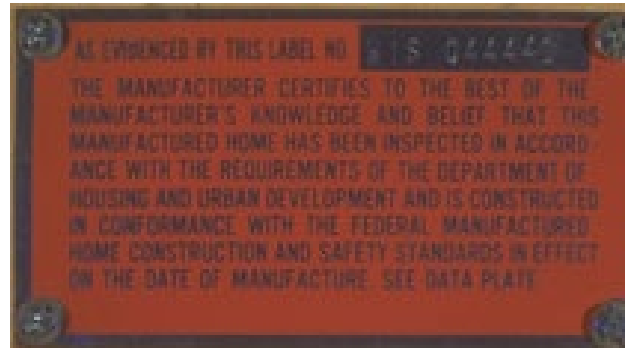
HUD



MANUFACTURED HOMES

Final Recap

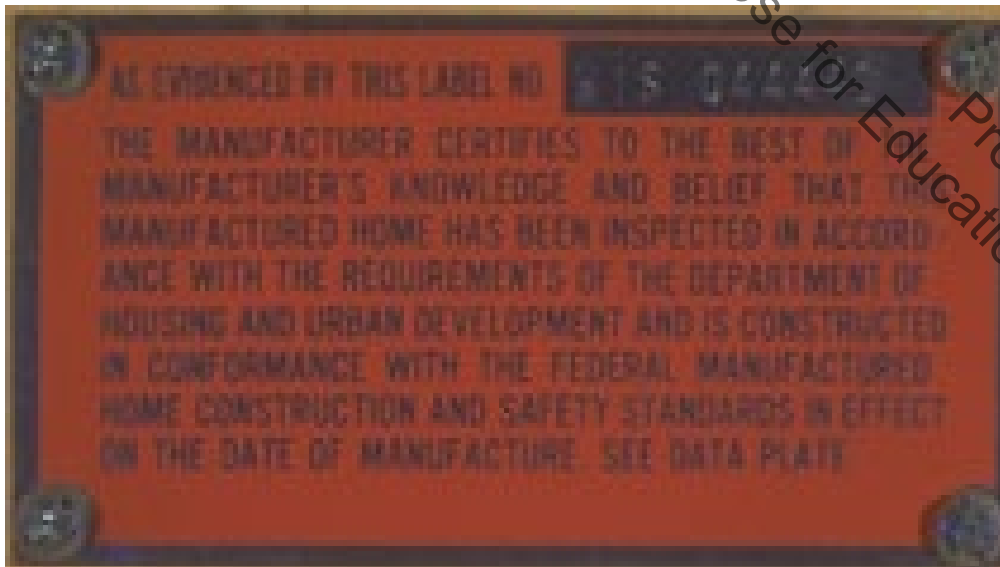
What are the two labels shown here, who issues them, and where are they applied to the structure?



MANUFACTURED HOMES

Final Recap

What are the two labels shown here, who issues them, and where are they applied to the structure?

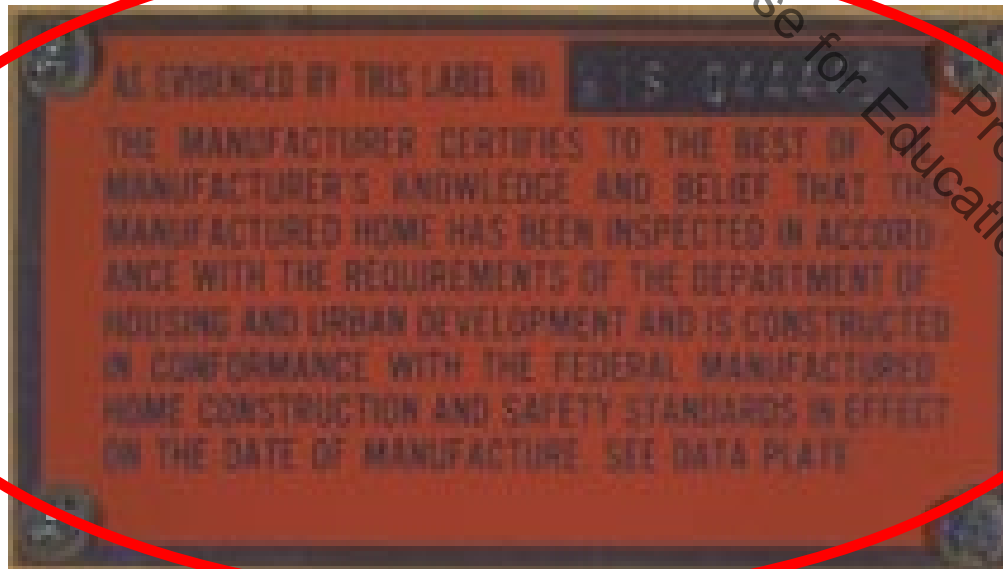


Green Installation Label, issued by the installer, it is applied to the structure once the installer believes the installation is complete and code compliant.

MANUFACTURED HOMES

Final Recap

What are the two labels shown here, who issues them, and where are they applied to the structure?



Red HUD Label, Issued by the IPIA (In Plant Inspection Agency), Applied at the manufacturing facility once inspected by the IPIA.

MANUFACTURED HOMES

Final Recap

This label goes with which of the structures?

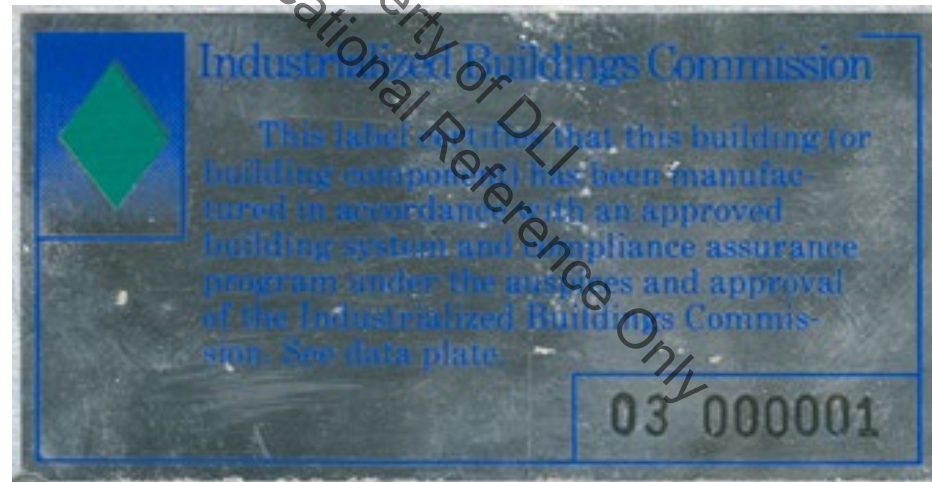


MANUFACTURED HOMES

Final Recap

This label goes with which of the structures?

Modular Structure



MANUFACTURED HOMES

Final Recap

This label goes with which of the structures?

Modular Structure



How many labels to a completed structure?

MANUFACTURED HOMES

Final Recap

This label goes with which of the structures?

Modular Structure



How many labels to a completed structure?
One Label for each completed box (Module).

MANUFACTURED HOMES

Final Recap

What about a panelized modular structures? How many labels for a structure?



MANUFACTURED HOMES

Final Recap

What about a panelized modular structures? How many labels for a structure?



1 label for every _____ square feet of finished floor area. (True Closed Construction)

MANUFACTURED HOMES

Final Recap

What about a panelized modular structures? How many labels for a structure?



1 label for every 600 square feet of finished floor area. (True Closed Construction)

MANUFACTURED HOMES

Final Recap

What about a panelized modular structures? How many labels for a structure?



1 label for every 600 square feet of finished floor area. (True Closed Construction)

1 label for every _____ linear feet of finished wall length (Exterior only closed const.)
with a minimum of _____% being inspected and issued labels

MANUFACTURED HOMES

Final Recap

What about a panelized modular structures? How many labels for a structure?



1 label for every 600 square feet of finished floor area. (True Closed Construction)

1 label for every 125 linear feet of finished wall length (Exterior only closed const.)
with a minimum of 20% being inspected and issued labels

MANUFACTURED HOMES

Final Recap

Which label goes with each of the structures?



MANUFACTURED HOMES Final Recap

Which label goes with each of the structures?

Prefabricated



MANUFACTURED HOMES

Final Recap

Can you give me an example of this type of structure?



MANUFACTURED HOMES

Final Recap

Can you give me an example of this type of structure?



Houses that are built away from the site of occupancy,
by schools or lumber yards.

MANUFACTURED HOMES

Final Recap



To stay in compliance as a prefabricated builder, the school or lumber yard is limited to building not more than _____ prefabricated structures in a calendar year?

MANUFACTURED HOMES

Final Recap



To stay in compliance as a prefabricated builder, the school or lumber yard is limited to building not more than 3 prefabricated structures in a calendar year?

MANUFACTURED HOMES

Final Recap

What MN Rule Chapters are associated with these structures?

HUD	1361
Prefab	1350
Modular	1360

Property of DLI
Use for Educational Reference Only

MANUFACTURED HOMES

Final Recap

What MN Rule Chapters are associated with these structures?

HUD	1361
Prefab	1350
Modular	1360

Property of DLI
Use for Educational Reference Only

MANUFACTURED HOMES

Final Recap

What MN Rule Chapters are associated with these structures?

HUD	1361
Prefab	1350
Modular	1360

Property of DLI
Use for Educational Reference Only

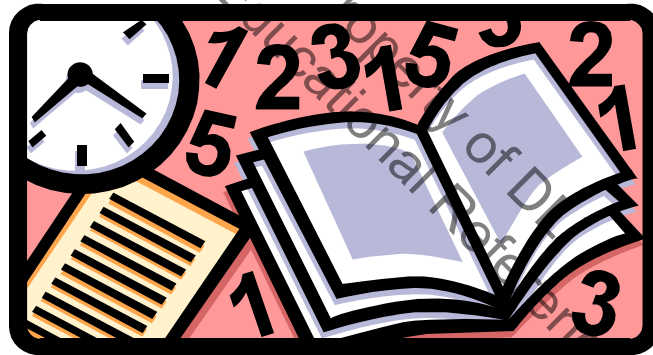
MANUFACTURED HOMES

Final Recap

What MN Rule Chapters are associated with these structures?



Final Questions ?



Thank You!

Herman Hauglid
Herman.Hauglid@state.mn.us
651-284-5870

Using Images

- Some of the slide layouts in this PowerPoint template rely on the use of background photos or icons.
- Please do not take images from Google without permission – they are almost certainly someone’s intellectual property.

