



# **HUDs Model Installation Standards for Manufactured Homes**

**Presenter: Michael S. Henretty & Jason McJury**

**Monday, September 11, 2017**

**4:00 PM – 5:30 PM**





# ***Federal Manufactured Housing Program***

**September 2017**

“ The mission of HUD is to create strong, sustainable, inclusive communities and quality affordable homes for all. ”

# HUD's Manufactured Housing Programs

- Mission: *“To protect the quality, durability, safety, and affordability of manufactured homes and facilitate the availability of affordable manufactured homes and to increase homeownership for all Americans.”*

(NATIONAL MANUFACTURED HOME CONSTRUCTION AND SAFETY STANDARDS ACT OF 1974 (AS AMENDED IN 2000), 42 U.S.C. 5401)

# Program Scope

- Manufactured homes provide subsidy-free affordable housing for more than 20 million Americans.
- The manufactured housing industry creates more than 38,000 jobs in over 127 communities nationwide.
- Manufactured housing industry consists of 127 operating production facilities
- FY 2016 manufactured housing production was 121,732 floors, equaling a total of 78,372 homes. Year-to-date home production and floor production were both 15% ahead of the same period last year (January – September 2016)

# Program Scope

- Total inventory of occupied manufactured housing was 6,917,000, which is about 9.5 percent of single family housing stock. (Annual Housing Survey 2013)
- Almost one in five homes in rural America is a manufactured home.

# Program Description

- The National Manufactured Housing Act of 1974, as amended in 2000, established the authority and framework for the preemptive Federal Standards and the Regulations used to enforce the Standards that are in use and effect today.
- The Act authorized HUD to regulate the design and construction of all new manufactured housing.
- The HUD Program is funded by label fees collected from manufacturers.

## Program Description (cont'd)

- The Federal Manufactured Housing Program is administered exclusively from HUD Headquarters in Washington, DC (no support provided by HUD's field offices).
- Program support is provided by private and state agency partners accepted by HUD.
- Contractor services are used to assist HUD in monitoring and assessing the performance of Private and State Agency partners, for implementing and carrying out the installation and dispute resolution programs; and for administering the Manufactured Housing Consensus Committee (MHCC).

# Program Purpose

The Manufactured Housing Program was established by the National Manufactured Housing Construction and Safety Standards Act of 1974, amended in 2000, as a nationwide program to protect the **quality**, **safety**, **durability**, and **affordability** of manufactured homes. The Office of Manufactured Housing regulates the industry and enforces the Federal Manufactured Home Construction and Safety Standards, the Model Installation Standards and the Dispute Resolution Program.



# Program Scope

- Manufactured housing industry consists of 127 operating production facilities
- Fiscal Year 2016 Manufactured Housing Production was 121,731 floors equaling a total of 78,372 homes. Year-to-date home production was 18.8% ahead and floor production was 13.4% ahead of the same period last year (October 2016 – March 2017)
- Total inventory of occupied manufactured housing was 6,917,000, which is about 9.5 percent of single family housing stock. (Annual Housing Survey 2013)
- One in every five rural single family homes is a manufactured home.

# Manufactured Home Act

The National Manufactured Housing Construction and Safety Standards Act gives HUD authority to:

- Establish preemptive manufactured home construction and safety standards using the MHCC
- Determine whether manufactured homes comply with the standards
- Conduct inspections and investigations necessary to enforce the standards
- Contract with separate and independent organizations to carry out monitoring and inspection work
- Establish model installation standards and implementing program regulations
- Establish and implement a dispute resolution program

# What is a Manufactured Home?

- THE HUD STANDARDS DEFINE A MANUFACTURED HOME AS:

**“A STRUCTURE, TRANSPORTABLE IN ONE OR MORE SECTIONS, WHICH IN THE TRAVELING MODE IS EIGHT BODY FEET OR MORE IN WIDTH OR FORTY BODY OR MORE IN LENGTH OR WHEN ERECTED ON SITE IS 320 OR MORE SQUARE FEET, AND WHICH IS BUILT ON A PERMANENT CHASSIS AND DESIGNED TO BE USED AS A DWELLING WITH OR WITHOUT A PERMANENT FOUNDATION WHEN CONNECTED TO THE REQUIRED UTILITIES, AND INCLUDES THE PLUMBING, HEATING, AIR CONDITIONING, AND ELECTRICAL SYSTEMS CONTAINED IN THE STRUCTURE...”**

- THE HUD STANDARDS AND REGULATIONS DO NOT APPLY TO MODULAR OR SELF PROPELLED RECREATIONAL VEHICLES.

# HUD Code Production Levels

- Approximately Eight (8) million HUD Code Manufactured Homes have been built since the Program's inception in 1976.
- In Fiscal Year 2016: Total Floors = 121,731 / Total Homes = 78,372

# What is Manufactured Housing?

- America's largest source of unsubsidized, affordable, single family housing.
- Comprises approximately 10% of single family homes in the United States
- 96% of MH Homeowners have annual household income of \$50,000 or less
- Built to America's only national, pre-emptive building code.
- Regulated by HUD since 1976.
- 1 in 5 homes in rural America is a manufactured home



# A Manufactured Home Defined

- The HUD Standards define a manufactured home as:

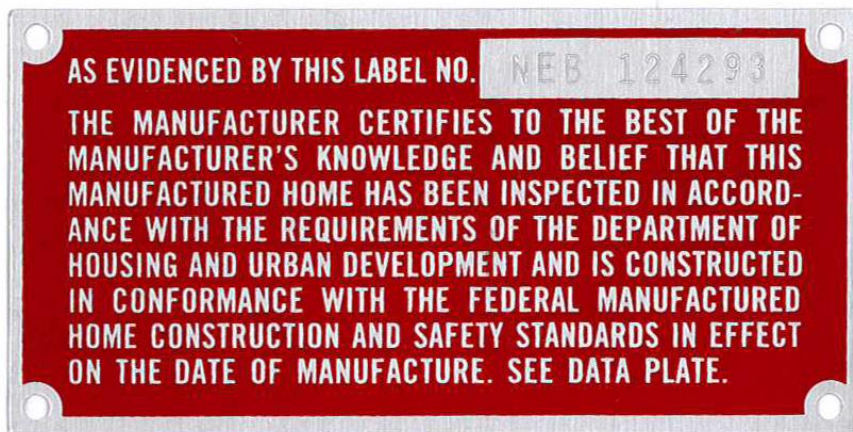
**“A STRUCTURE, TRANSPORTABLE IN ONE OR MORE SECTIONS, WHICH IN THE TRAVELING MODE IS EIGHT BODY FEET OR MORE IN WIDTH OR FORTY BODY OR MORE IN LENGTH OR WHEN ERECTED ON SITE IS 320 OR MORE SQUARE FEET, AND WHICH IS BUILT ON A PERMANENT CHASSIS AND DESIGNED TO BE USED AS A DWELLING WITH OR WITHOUT A PERMANENT FOUNDATION WHEN CONNECTED TO THE REQUIRED UTILITIES, AND INCLUDES THE PLUMBING, HEATING, AIR CONDITIONING, AND ELECTRICAL SYSTEMS CONTAINED IN THE STRUCTURE...”**

- The HUD Standards and Regulations do not apply to modular or self-propelled recreational vehicles.

# HUD Code Production Levels

- Approximately Eight (8) million HUD Code Manufactured Homes have been built since the Program's inception in 1976.
- In Fiscal Year 2016: Total Floors = 121,731 / Total Homes = 78,372
- In Fiscal Year 2017: Anticipated total home production of 80,000

# What is HUD's role in Manufactured Housing?

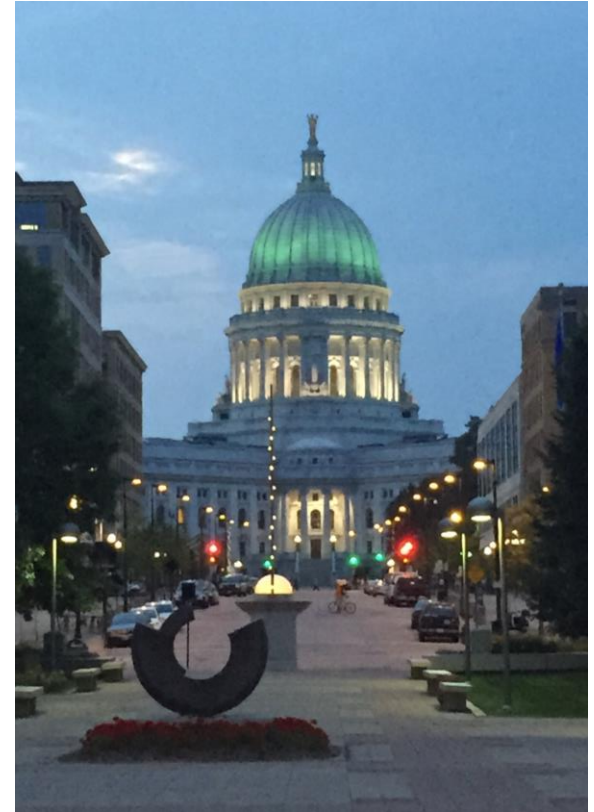


- The Office of Manufactured Housing Programs:
  - Administers, updates, and enforces the National Manufactured Home Construction and Safety Standards
  - Administers, updates, and enforces Model Manufactured Home Installation Standards nationwide
  - Administers the National Manufactured Home Dispute Resolution Program
- Through the Office of Single Family Housing, FHA operates mortgage insurance programs through which eligible Manufactured Homes can be purchased or refinanced



# Approved Manufactured Housing Partners

- 36 State Administrative Agencies (SAAs)
- 36 State Installation Programs
- 26 State Dispute Resolution Programs
- 15 In-Plant Primary Inspection Agencies (IPIAs)
- 6 Design Approval Primary Inspection Agencies (DAPIAs)
- 5 Contractors
  - Assist in monitoring IPIAs, DAPIAs, and Manufacturer Quality Assurance.
  - Assist in administering Dispute Resolution and Installation Programs.
  - Assist in administration of the Manufactured Housing Consensus Committee
  - Assist in planning meetings of the MHCC, SAAs, and PIAs

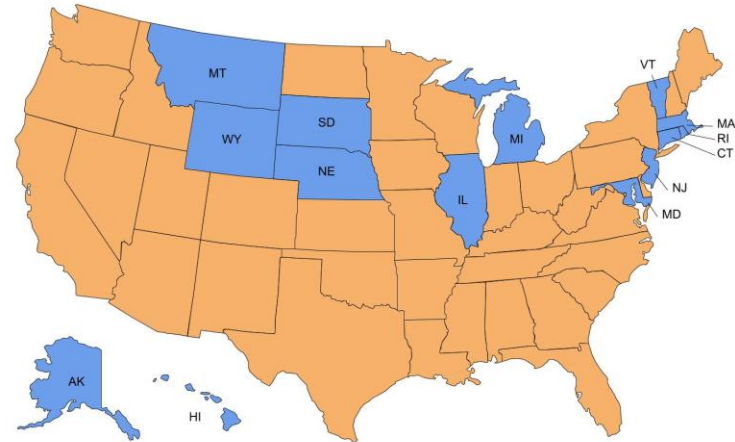


Wisconsin State Capitol, Madison

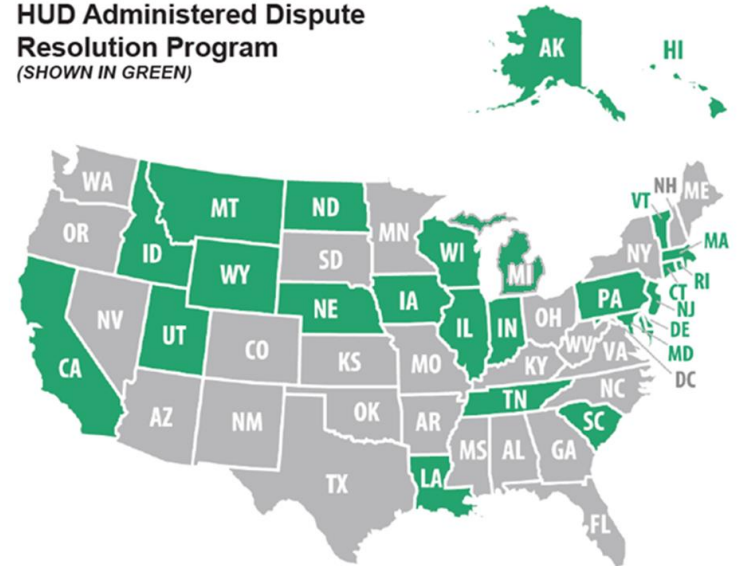
# HUD's Role in States

- Serves as the State Administrative Agency for 14 states that do not participate as a HUD SAA partner. Tasks include receiving consumer complaints and administering Notification and Correction of Defects.
- Administers Manufactured Home Installation programs in 14 states that do not have their own installation programs.
- Administers Dispute Resolution Program in 24 states that do not have their own programs.

HUD-Administered Installation States



HUD Administered Dispute Resolution Program (SHOWN IN GREEN)



# National Program and Industry Impacts

- About 10 million manufactured home owners
- 22 million Americans live in manufactured homes
- In 2011, manufactured housing accounted for:
  - 71% of all new homes sold under \$125,000
  - 50% of all new homes sold under \$150,000
  - 30% of all new homes sold under \$200,000
- Manufactured housing industry is an important economic engine, accounting for about 38,000 jobs

# Standards & Regulations

## **24 CFR 3280**

- Nationally Preemptive Manufactured Home Construction and Safety Standards

## **24 CFR 3282**

- Manufactured Home Procedural and Enforcement Regulations

# Other Standards & Regulations

## **24 CFR 3285**

- Model Manufactured Home Installation Standards

## **24 CFR 3286**

- Manufactured Home Installation Program

## **24 CFR 3288**

- Manufactured Home Dispute Resolution Program

# Industry Stakeholder Overview

## Production and Retail Stakeholders

### Manufactured Home Builders

- Approximately 45 corporations or other legal entities with 123 production facilities

### Manufactured Home Retailers

- About 2,000 retailers with about 4,000 locations

### Supply Chain

- Product and component suppliers, installers, etc.

# HUD's Regulatory Partners

## All Agencies/partners must be accepted by HUD

- Design Approval Primary Inspection Agencies
  - Review and approve building plans and Quality Assurance Manuals/Manufactured contract with DAPIAs for design services provided
  - 6 Agencies (5 private, 1 unit of state government)
- In-Plant Primary Inspection Agencies
  - Oversee implementation and effectiveness of quality assurance programs/Manufacturers contract with IPIAs for In-Plant inspection services provided
  - 15 Agencies (5 private, 10 units of state government)

# HUD's Regulatory Partners (cont'd)

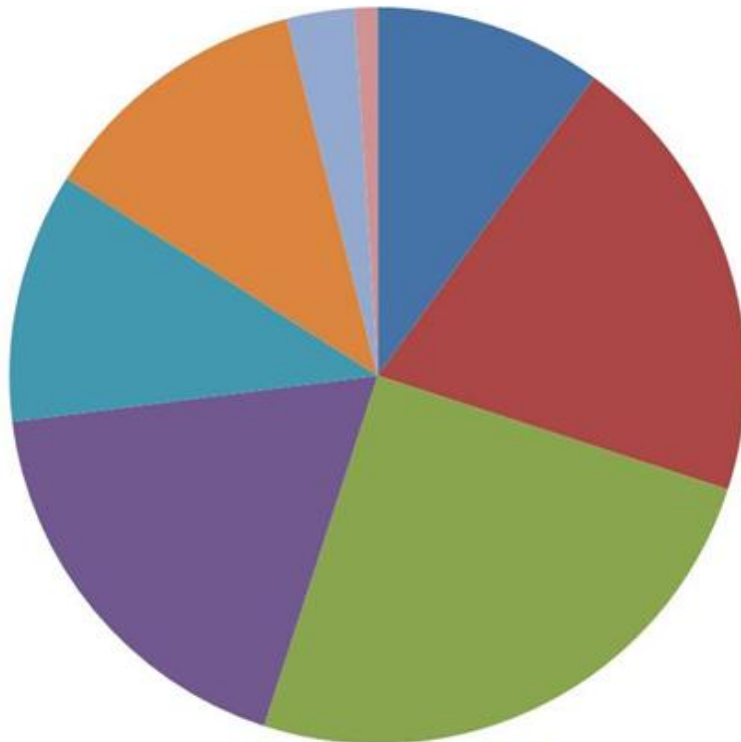
- State Administrative Agencies
  - Handle consumer complaints and oversee manufacturer actions within their state related to remedial actions/SAs are paid by HUD for enforcement services provided
  - 37 Agencies (All units of state government)
- Approved State Installation Programs
  - Establish and enforce HUD approved installation program based on model installation standards.
  - 37 agencies / all units of state governments.
- Approved State Dispute Resolution Programs
  - Establish and administer HUD approved dispute resolution program
  - 26 agencies / all units of state governments.

Primary objective of the monitoring services needed by the Program is assessment of the performance of these agencies to assure manufacturer compliance to HUD Standards and Regulations. This will require comprehensive knowledge of HUD Standards and Regulations to provide the monitoring oversight required.



# Manufactured Home Constituents

## Annual Household Income



**= 96 %**

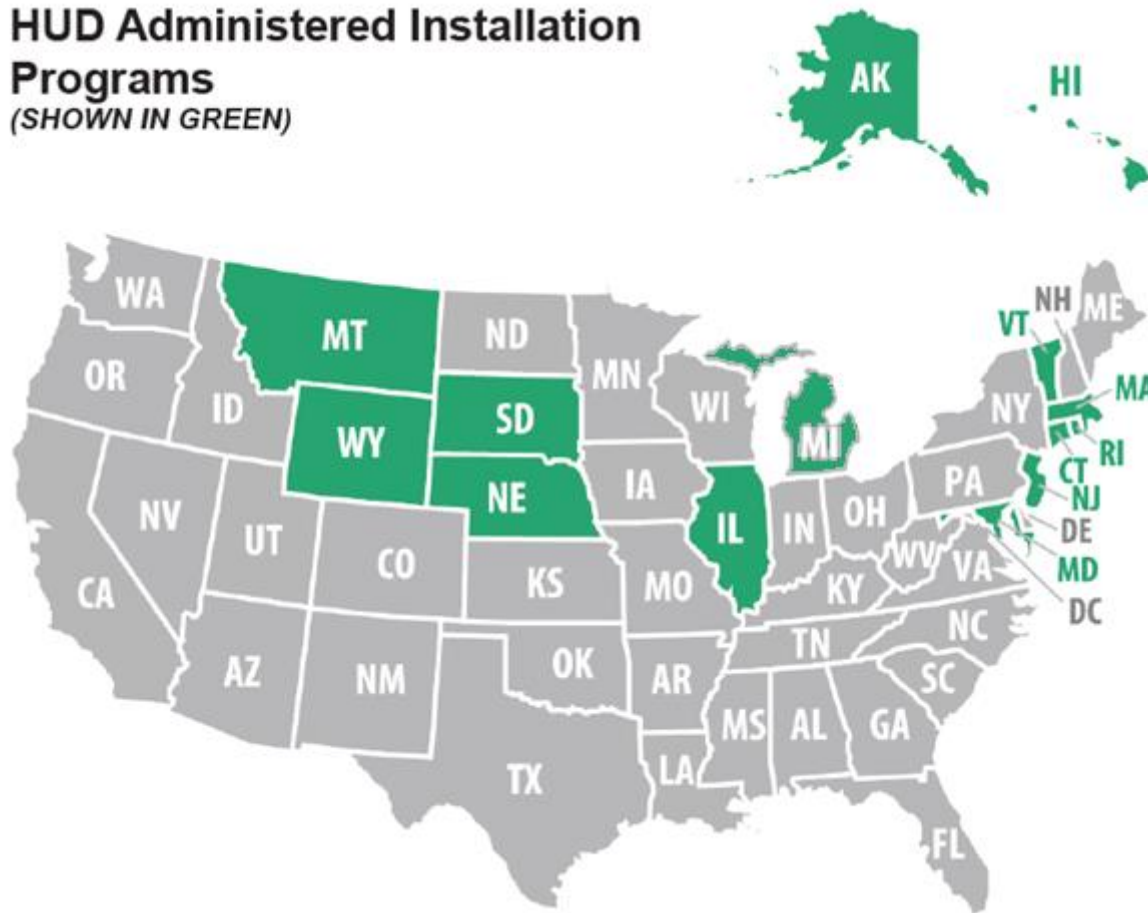
Source: 2012 Mobile Home Market Facts, by Foremost Insurance Company

# Installation Program

- Obtained contractor to assist with implementation of installation program for 14 HUD administered states with SEBA Professional Services.
- SEBA helps OMHP manage trainer and installer licensing processes, and monitor inspections.
- SEBA helps OMHP review HUD-approved installation programs
- SEBA helps OMHP review manufacturer installation manuals

# Installation Program

**HUD Administered Installation Programs**  
*(SHOWN IN GREEN)*



# Installation Program

- HUD Manufactured Home Installation website at [www.manufacturedhousinginstallation.com](http://www.manufacturedhousinginstallation.com):

**Manufactured Housing Installation Program** Home Installers Inspectors Retailers More

### Program Overview

The purpose of the Manufactured Home Installation Program is to implement regulations 24 CFR 3285 and 24 CFR Part 3286 to ensure that states have in place a minimum installation standard and an operating installation program.

In states where the U. S. Department of Housing and Urban Development (HUD) will administer the Manufactured Home Installation Program, HUD will ensure that trainers of installers planning to work in HUD-administered states are registered with HUD, and that persons planning to install homes in HUD-

### Frequently Asked Questions

Click below to find the most current questions and answers regarding the HUD installation program and all of its regulations, licensing, training and inspection requirements.

[FAQ Page](#)

100%

# Dispute Resolution Program

The Manufactured Home Dispute Resolution Program (DRP) is available to assist in resolving disputes between manufacturers, retailers and installers of manufactured homes regarding responsibility and, if required, correction or repair of defects in manufactured homes.

To qualify for resolution under the Manufactured Home Dispute Resolution Program, defects must be reported within the one-year period after the date of first installation.

# Dispute Resolution Program

- HUD Dispute Resolution website:

MANUFACTURED HOME DISPUTE RESOLUTION PROGRAM

[Download the Brochure \(PDF\)](#)

[Home](#) [Submit a Dispute](#) [FAQs](#) [Events](#) [Contact](#)

## Submit a Dispute

The online dispute resolution request form is the fastest, most efficient way to submit your request. Submit a request once you have determined your eligibility to use the program.

[GET STARTED](#)

### What is the Dispute Resolution Program?

The HUD Manufactured Home Dispute Resolution Program (DRP) provides timely resolution of disputes between manufacturers, retailers and installers when the parties cannot agree on a solution to a construction and/or safety defect with a manufactured home.

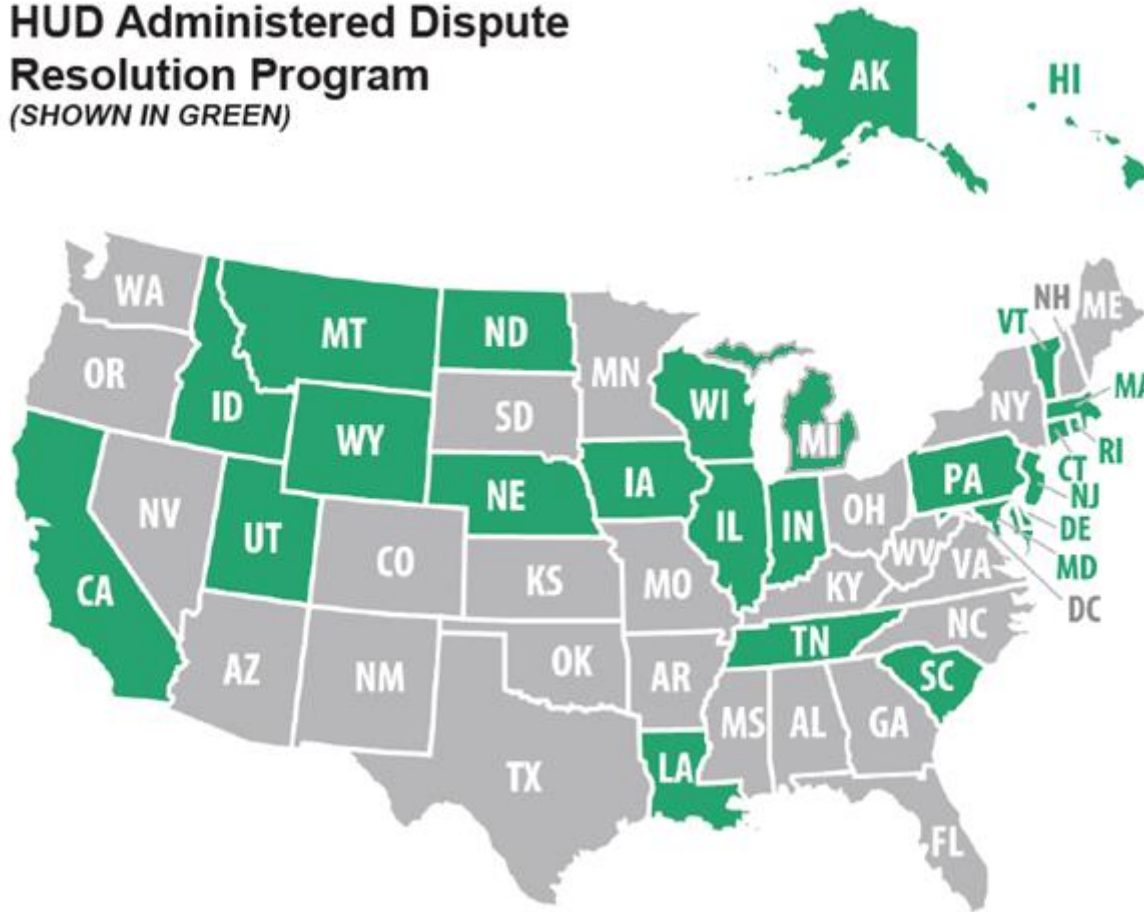
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# Ending the Blame Game



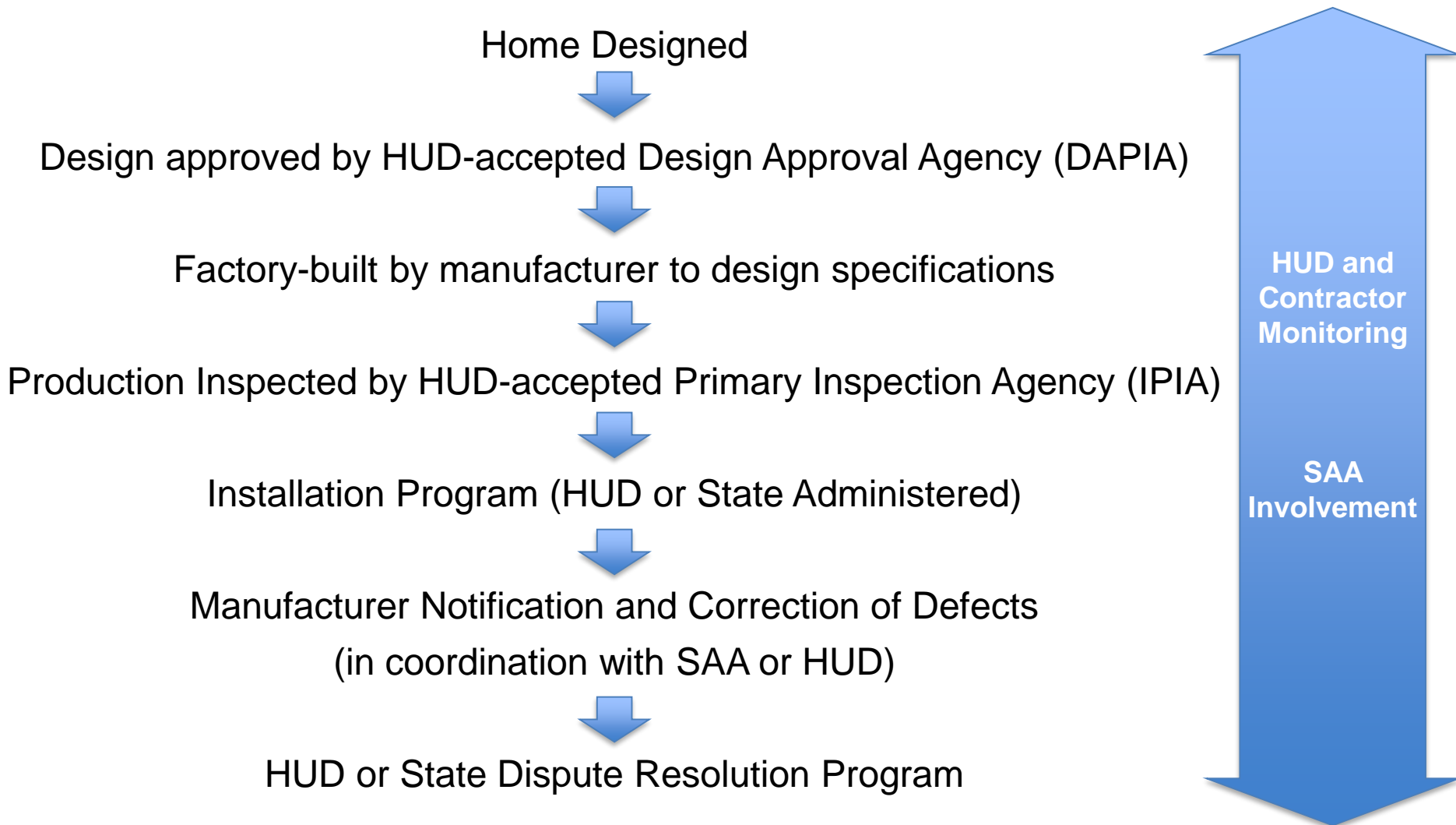
# Dispute Resolution Program

HUD Administered Dispute Resolution Program  
*(SHOWN IN GREEN)*





# The HUD Monitoring & Enforcement Process



# On Site Completion

- A manufacturer-authorized retailer add-on, not including a garage add-on, provided during installation, that may initially take the home out of compliance but the home is brought back into conformance
- Site completion of a fireplace hearth that cannot be completed in the factory because it spans the mating line of a multi-section manufactured home
- Site completion of exterior French doors that cannot be completed in the factory due to potential damage during home shipment
- Site completion of roof dormers including windows in dormers that cannot be completed in the factory due to shipment height limitations

# On Site Completion

- Site completion of sidings not considered close-up, such as stone, brick, stucco, or other materials that cannot be installed at the factory due to transportation challenges
- Site completion of limited, specific building components such as any appliance and or fireplace provided they are listed or certified for use in manufactured homes (may be provided by retailer, purchaser, manufacturer)
- Removable or open floor sections to accommodate basement stairs
- Completion of sidewall bay windows
- Completion of site installed tile tub surrounds

# Alternative Construction

- Homes that will not comply with the standards
  - Two story home designs
  - Accessible Showers
  - Homes without floor insulation installed over heated basements
- Triple Wide homes with center section roofs installed at the site
- Use of tankless water heaters
- Homes that exceed 2571 square feet, due to WHV requirements
- Homes with less than 50 amp power supply
- Homes with site construction specifically addressed otherwise
  - Garages
  - Carports

# Installation

- Exterior siding close up at mating line
- Chain hung lighting fixture completion
- Completing ceiling suspended fans
- Exterior lighting fixture completion
- All low slope (less than 7/12) hinged roof completion for Wind Zone 1 only.
- Peak flip and peak cap roof completion for low slope (less than 7/12), Wind Zone 1
- Duct connection between home sections
- Main power supply connection and section crossovers
- Dryer venting completion
- Range cooktop exhaust termination vent
- Plumbing connections between halves
- Gas line connection between sections
- Mate line gasket
- Floor, roof, wall interconnections
- Evaporative/Swamp Coolers



# Building Permit to Occupancy Permit

- Permits to install a manufactured Home can only be issued to a licensed HUD installer a list is maintained at [manufacturedhousinginstalltion.com](http://manufacturedhousinginstalltion.com). There is an exception for homeowners to install their own home.
- Homes must be installed to the Manufacture Installation Manuals or if an alternative foundation plan you should have a plan that has an engineer's/registered architect seal and seal from the manufacture and its DAPIA. You can at your option require a state seal from the PE or RA HUD does not require state specific seals.
- Permits for trade work attachments are at the discretion of the local building department.

# Building Permit to Occupancy Permit

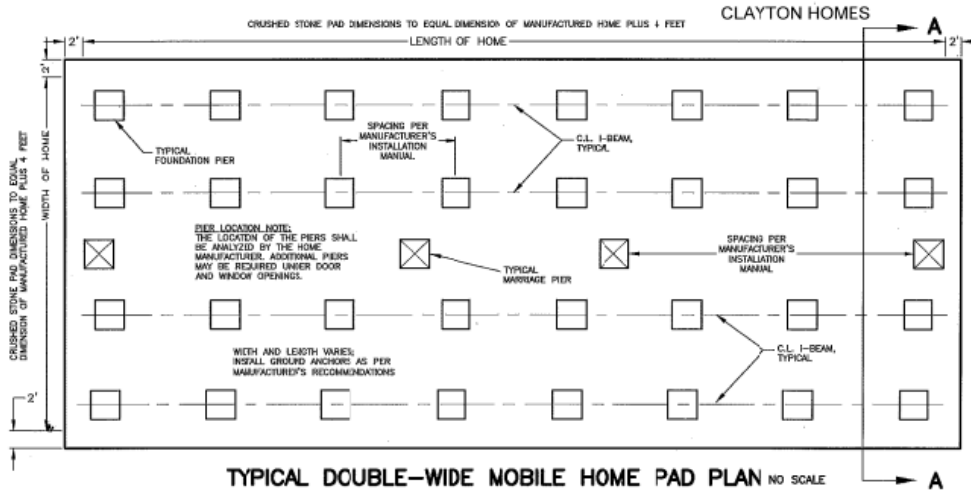
- Inspection for foots and or slabs before a pour is at your discretion.
- Your finial inspection for installation should be based on the Manufacture Instruction Manual and any supplement plans approved for the house.
- If the HUD label has an AC or SC in the label number there also should be an inspection form showing that that work has been inspected before your finial inspection. We will go over what you need to do for a final inspection. On another side,
- After all inspections are passed you sign off on the HUD 309 form and the house can have an Occupancy permit issued one is issued by your locality.



# Foundations for HUD Code homes

- In freezing climates there are two options for compliant foundations.
- Test soil and if it is non frost susceptible then you can use a standard slab, runners, or pads.
- For a site to be non-frost susceptible the soil must be tested and must have less than 6% fines passing a #200 Sieve on an ASTM D442 test. HUD allows a licensed installer to take the samples on a single site and send the soil to a lab for the test.
- Untested or sites that fail need to have a frost protected foundation system that is an alternative design to what is in the standard MII

# Non Frost Susceptible Design



## DOUBLE WIDE MOBILE HOME SLAB DESIGN NON-FROST-SUSCEPTIBLE SOILS

### DESIGN NOTES:

- THIS CONCRETE BLOCK PIER AND FOOTER FOUNDATION DESIGN APPLIES ONLY TO SITES THAT CONTAIN ALL OF THE FOLLOWING SOIL CONDITIONS:
1. WELL DRAINED GRANULAR SOILS THAT ARE NOT SUSCEPTIBLE TO FROST HEAVE.
  2. NO GROUNDWATER TO A DEPTH OF AT LEAST 4 FEET BELOW THE BOTTOM OF THE PROPOSED SLAB.
  3. SOILS WITH A SAFE BEARING CAPACITY OF 2,000 PSF OR GREATER.
  4. SOIL CONDITIONS AT EACH LOT SHALL BE VERIFIED BY SOILS ENGINEER PRIOR TO CONSTRUCTION.
  5. A RAIN TO DAYLIGHT, OR AN APPROVED FOUNDATION DRAINAGE SYSTEM SHALL BE PROVIDED.

THE ALTERNATIVE SUPPORT AND ANCHORAGE SYSTEM PROVIDED IN THIS DESIGN IS CONSISTENT WITH THE DESIGN OF THE SPECIFIC MANUFACTURED HOME TO BE SUPPORTED AND WILL NOT TAKE THE HOME OUT OF COMPLIANCE WITH 24 CFR 3280. FURTHERMORE, THE ALTERNATIVE SUPPORT AND ANCHORAGE SYSTEM PROVIDED IN THIS DESIGN CONFORMS TO 24 CFR 3285 AND IS CAPABLE OF RESISTING ALL DESIGN LOADS REQUIRED BY 24 CFR 3280.

THIS SLAB DESIGN DOES NOT INCORPORATE INSULATION AROUND AND/OR UNDER THE PROPOSED SLAB. THE FOUNDATION SHALL BE ENCLOSED WITH SKirting IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS AND IN CONFORMANCE TO 24 CFR 3285.

FOUNDATION SHALL BE PLACED ON NON-FROST SUSCEPTIBLE LAYERS OF WELL-DRAINED, UNDISTURBED GROUND OR FILL MATERIALS THAT EXTEND BELOW THE RECORDED FROST DEPTH. THE MATERIAL SHALL BE TESTED IN ACCORDANCE WITH ASTM D422 AND FOUND TO HAVE LESS THAN 6% OF MASS PASSING #200 MESH BEVE TO BE CONSIDERED NON-FROST SUSCEPTIBLE. SOIL CONDITIONS SHALL BE VERIFIED BY A SOILS OR GEOTECHNICAL ENGINEER TO VERIFY THE SOIL CONDITIONS ARE NOT SUSCEPTIBLE TO FROST HEAVE.

PIERS AND FOOTINGS TO BE CONSTRUCTED IN COMPLIANCE WITH MANUFACTURER'S RECOMMENDATIONS. IN GENERAL, PIERS AND FOOTINGS TO BE CONSTRUCTED ON 8" CRUSHED STONE PAD COMPACTED TO 95% PROCTOR IN ACCORDANCE WITH THIS DRAWING. NOMINAL PIER DIMENSIONS OF 16" X 16" USING 8" X 8" X 16" CONCRETE BLOCKS CONFORMING TO ASTM C90 STACKED VERTICALLY WITH MAXIMUM HEIGHT OF APPROXIMATELY 36".

DURING CONSTRUCTION IF SOIL CONDITIONS OTHER THAN WELL DRAINED SOILS OR GROUNDWATER IS ENCOUNTERED AT A DEPTH OF LESS THAN 4 FEET THE CONTRACTOR SHALL NOTIFY THE DESIGN ENGINEER PRIOR TO CONTINUING CONSTRUCTION.

PIERS SHALL BE CONSTRUCTED WITH EVERY LAYER AT RIGHT ANGLES TO THE PREVIOUS ONE. PIER SPACING TO BE IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS. PIERS EXCEEDING 36" IN HEIGHT MUST BE SPACED NOT MORE THAN 8' ON CENTER.

### CONCRETE FOOTINGS SHALL CONSIST OF:

- (i) FOUR INCH NOMINAL PRECAST CONCRETE PADS MEETING OR EXCEEDING ASTM C 90-02a STANDARD SPECIFICATION FOR LOADBEARING CONCRETE MASONRY UNITS (SEE 24 CFR 3285 SUBPART A: §3285.1-1 INCORPORATED BY REFERENCE), WITHOUT REINFORCEMENT, WITH AT LEAST 28-DAY COMPRESSIVE STRENGTH OF 1,200 PSI; OR
- (ii) SIX INCH NOMINAL Poured-IN-PLACE CONCRETE PADS, SLABS, OR RIBBONS WITH AT LEAST 28-DAY COMPRESSIVE STRENGTH OF 1,000 PSI. SITE SPECIFIC SOIL CONDITIONS OR DESIGN LOAD REQUIREMENTS MAY ALSO REQUIRE THE USE OF REINFORCING STEEL IN CAST-IN-PLACE CONCRETE FOOTINGS.

ABS FOOTING PADS MAY BE USED IN COMPLIANCE WITH MANUFACTURER'S INSTRUCTIONS

ANCHORAGE TO CONSIST OF STEEL STRAPS AND GROUND ANCHORS RATED FOR A MINIMUM WORKING CAPACITY OF 3100-POUNDS INSTALLED IN ACCORDANCE WITH THE ANCHOR MANUFACTURER'S INSTALLATION INSTRUCTIONS. ANCHORS TO BE SPACED IN ACCORDANCE WITH THE HOME MANUFACTURER'S INSTALLATION INSTRUCTION AND IN CONFORMANCE TO 24 CFR 3285.

### DESIGN CRITERIA (PER MANUFACTURER'S MANUAL):

WIND ZONE	WIND ZONE 1
SNOW LOAD	MIDDLE (30 PSF)
FROST DEPTH	NON-FROST-SUSCEPTIBLE SOIL
FLOOD ZONE	X (NOT DESIGN FOR FLOOD HAZARD AREA)
SOL BEARING CAPACITY	3000 PSF

### APPROVED BY

Jul 20, 2016  
**NIA INC.**  
 FEDERAL MANUFACTURED HOME  
 CONSTRUCTION AND SAFETY STANDARDS

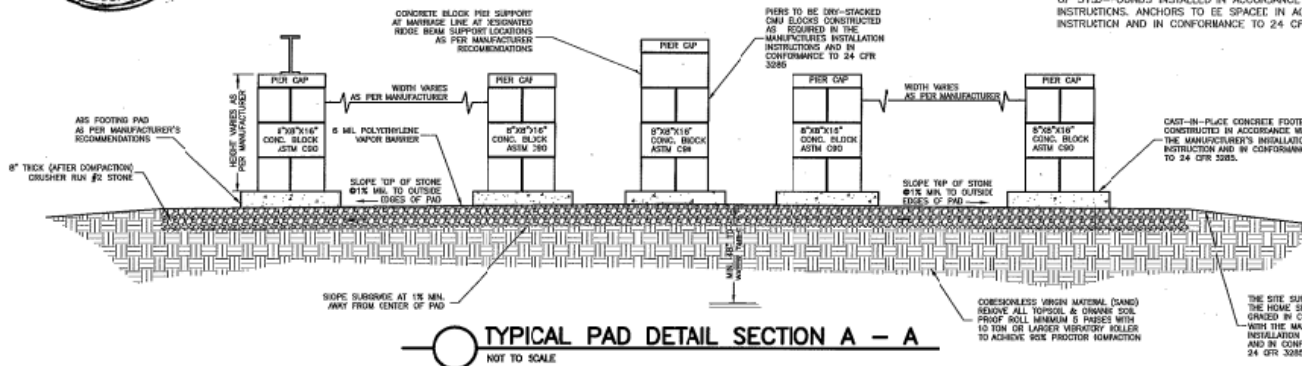
### LOCAL REVIEW NOTE:

THE LOCAL AUTHORITY HAVING JURISDICTION SHALL REVIEW AND APPROVE THE DESIGN CRITERIA ON THIS DOCUMENT FOR CONFORMANCE WITH THE LOCAL REQUIREMENTS. THE LOCAL AUTHORITY HAVING JURISDICTION SHALL ALSO REVIEW THE DATA PLATE FOR EACH HOME UTILIZING THIS FOUNDATION TO ENSURE IT HAS BEEN CONSTRUCTED TO MEET OR EXCEED THE LOCALLY REQUIRED DESIGN CRITERIA.

### ANCHOR NOTES:

ALL ANCHORS AND STRAPS ARE TO BE RUSHED AND INSTALLED BY A CERTIFIED INSTALLER IN FULL COMPLIANCE WITH MANUFACTURER'S INSTALLATION MANUAL. DISTANCE BETWEEN ANCHORS AS PER MANUFACTURER'S RECOMMENDATION AND IN CONFORMANCE WITH 24 CFR 3285.

THIS IS A GENERAL DESIGN IN ACCORDANCE WITH M8553 AND APRIL 11, 2016 HUD MEMO, THIS DAPFA AND MFG. APPROVED DESIGN MAY BE USED BY OTHER PEs PROVIDED A SITE SPECIFIC DESIGN CERTIFICATION IS PERFORMED AND ACCEPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION.

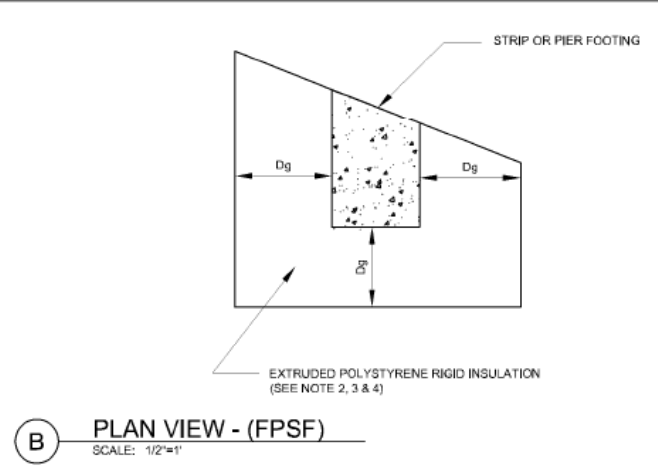
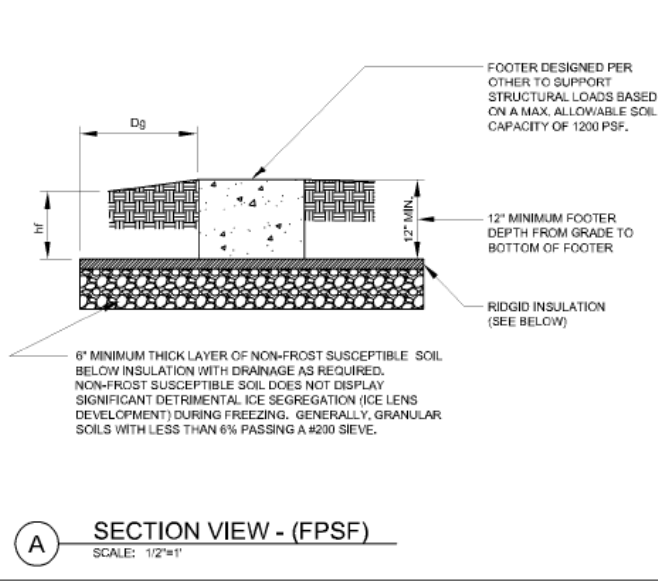


TYPICAL PAD DETAIL SECTION A - A

NOT TO SCALE



# Frost Protected Slab Design



**FROST-PROTECTED SHALLOW FOUNDATION INSULATION CHART:**

F100 (MAT)	750 (55)		1200 (47)		2250 (40)		3130 (38)	
hf	R(min)	Dg (min)	R(min)	Dg (min)	R(min)	Dg (min)	R(min)	Dg (min)
10 "	5.7	30"	6.36	41.4"	11.4	63"	18.98	81.08"
12 "	5.1	27.5"	5.76	38.9"	10.8	60.5"	18.38	78.58"
13 "	4.8	26.25"	5.46	37.65"	10.5	59.25"	18.08	77.33"
14 "	4.5	25"	5.16	36.4"	10.2	58"	17.78	76.08"

**SYMBOLS DEFINITIONS:**  
 F100: Design Air-Freezing Index is the 100-year mean return period Air-Freezing Index (AFI) used in this standard for protection of building foundations against frost damage.  
 MAT: Mean Annual Air Temperature is the average of all daily averaged outdoor air temperatures (minimum plus maximum daily temperature divided by two) in one or more years.  
 R (min): Minimum Effective thermal resistivity to protect footing from freezing effects.  
 Dg (min): Minimum Distance that R (min.), ground insulation must extend beyond footing.  
 hf: Minimum depth of soil cover over insulation.

**C FPSF DESIGN**  
SCALE: N/A

**GENERAL NOTES:**

- Maximum F100 and the Minimum MAT of site location can be obtained at: [www.nrcdc.noaa.gov/oa/psf/fpsfmaps.html](http://www.nrcdc.noaa.gov/oa/psf/fpsfmaps.html) or Table A3 in ASCE 32-01.
- All insulation shall be extruded rigid polystyrene type IV, V, VI or VII per ASTM C578.
- Multiple layers of insulation may be used to meet the required minimum total R value in chart; however each layer must meet minimum thickness of (1" for types VI, VII & V and 1.5" for IV).
- Minimum thickness of required insulation shall be determined by dividing R min. by Effective R per inch (4 unless otherwise stated).
- All FPSF shall have footing sizes based on 1200 psf max. allowable soil bearing pressure.
- The site shall be graded to drain surface water away from foundation walls per local codes.
- FPSF should not be installed on frozen ground.

**Example:**  
 A footing located in Duluth Minn. is located with hf = 12", footing depth 12" below ground surface.  
 Determine minimum insulation thickness and size.  
 Per Table A3 for Duluth MAT = 38.2 and F100 = 3130.  
 Per Table above for hf = 12" Rmin = 18.38 and Dg = 78.58"  
 Therefore a minimum thickness of 18.38/4 = 4.59" of extruded rigid polystyrene would be required to extend horizontally 78.5" past all edges of the support footings.

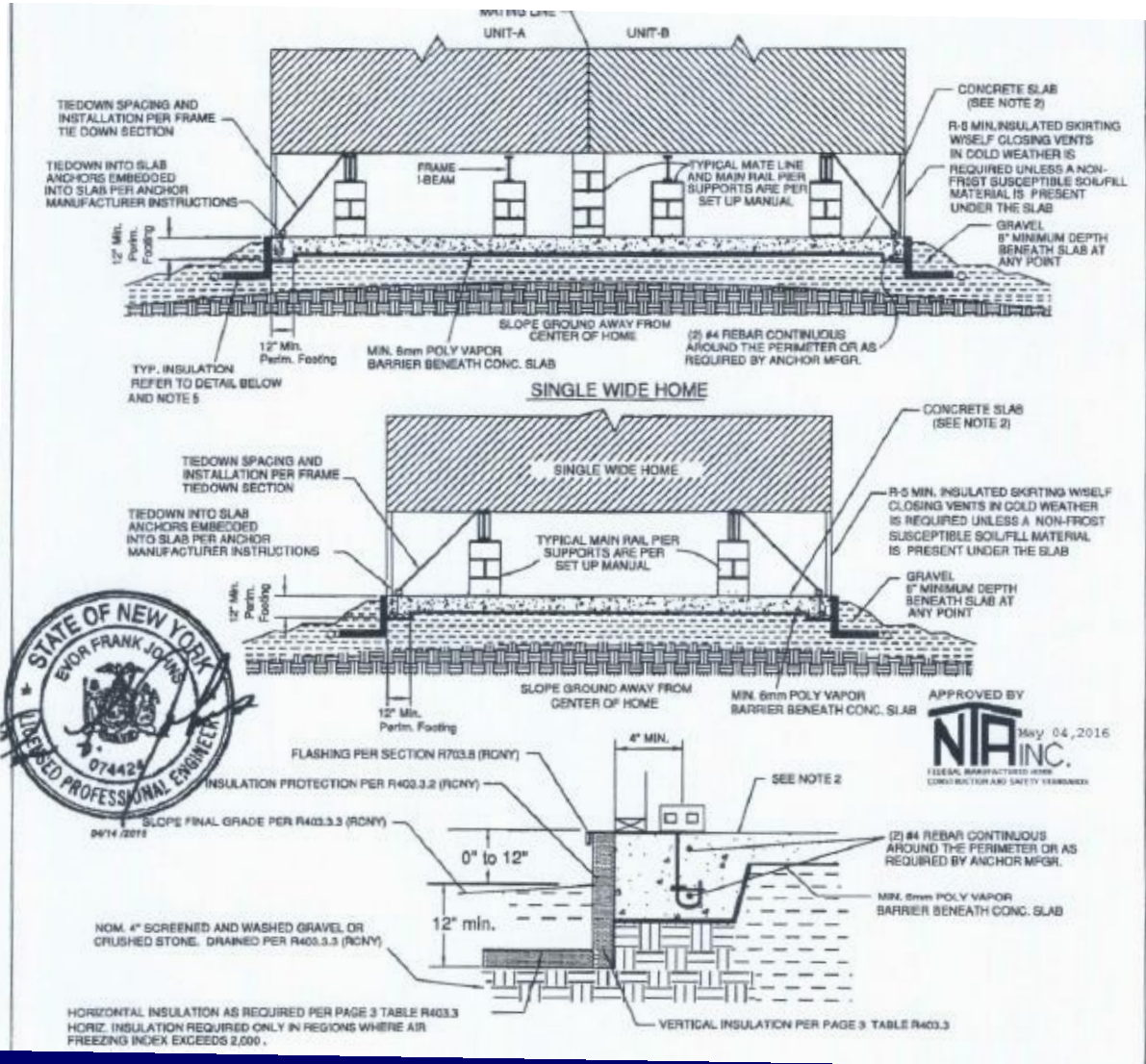


APPROVED BY  
**NIA INC.**  
 FEDERAL MANUFACTURED HOME  
 CONSTRUCTION AND SAFETY STANDARDS  
 Jun 16, 2009

WIND ZONE APPROVAL:	FROST-PROTECTED SHALLOW FOUNDATION DESIGN		Clayton Home Office 5000 Clayton Road, Maryville, TN 37684 PH: 423.593.3000 FAX: 423.593.3781
All	DRAWN BY: JWW	DATE: 7/03/06	SHEET: SU-ADD-136.0
	REVIEWED BY: JW	LAST REVISED: 5/27/2009	
	CHECKED BY: NTA	CALC REF: N/A	



# Insulated Skirting Design



# Insulated Skirting Design

## NOTES :

1. SITE ONLY ON WELL DRAINED SOIL WITH AVERAGE MOISTURE CONTENT LESS THAN 25% TO FROST DEPTH. SOIL CONDITIONS AS INDICATED ARE ADEQUATE FOR SLAB INSTALLED ABOVE FROST LINE.
2. THE THICKNESS OF THE SLAB IS SET AT 8" FOR AN ASSUMED 2000 PSF SOIL BEARING CAPACITY. FOR 1000 PSF MIN SOIL BEARING CAPACITY, USE 8" THICK CONCRETE SLAB. CONCRETE COMPRESSIVE STRENGTH: 3500 PSI MIN.
3. ALL INSULATION SHALL BE EXTRUDED POLYSTYRENE TYPE V, VI, OR VII PER ASTM C578.
4. INSULATION FOR SLAB IS NOT REQUIRED IF PLACED ON A LAYER OF WELL DRAINED, UNDISTURBED GROUND OR FILL THAT IS NOT SUSCEPTIBLE TO FROST. CLASSIFICATION OF FROST SUSCEPTIBILITY OF SOIL SHALL BE DETERMINED BY A SOILS OR GEOLOGICAL ENGINEER UNLESS OTHERWISE APPROVED. THE DETERMINATION PROVIDED TO THE LAHJ BY THE SOILS ENGINEER SHALL INCLUDE DATA THAT DESCRIBES THE SOIL CONDITIONS TO A MINIMUM DEPTH THAT INCLUDES THE FROST DEPTH.
5. REFER TO PAGE 3 FOR TABLE R403.3 (RCNY) SPECIFYING REQUIRED INSULATION LENGTH AND R-VALUES AND TABLE R-403.3(1) (RCNY) FOR AIR FREEZING INDEX VALUES PER GEOGRAPHIC LOCATION.
6. REFER TO INSTALLATION INSTRUCTIONS FOR ANCHOR TIE DOWN REQUIREMENTS AND SPACING. REFER TO ANCHOR MANUFACTURER INSTALLATION INSTRUCTIONS FOR ALL OTHER REQUIREMENTS.

# Other Solutions



Date: April 28, 2017

To: Cecil Ayllon  
Sedco Pier

Re: Foundation Design Approval

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Clayton Homes and the DAPIA organizations HWC and NTA have reviewed the Sedco Base Wall Skirting for Frost Protected Shallow Foundation designs. Clayton Homes and these DAPIA organizations approve the use of this foundation design for homes constructed from Clayton Home Building Facilities that are affiliated with HWC and NTA as the DAPIA. This design is initially a conceptual design and must be submitted to Hayman Engineering for a site-specific design and approval. Construction of the foundation must be in full compliance with the design package provided by Hayman Engineering. A copy of the site-specific design package must be submitted to Clayton Homes Engineering prior to construction of the foundation. Clayton Homes will index these designs as confirmation of receipt and final approval of the site-specific design. Please give me a call if you have any questions.

Sincerely,

A handwritten signature in black ink that reads "J. Gavin Mabe, P.E.".

**Clayton Home Building Group**

J. Gavin Mabe, P.E.

Director of HUD Engineering and Technology

Phone 865.380.3000 Ext. 5318

Email: gavin.mabe@claytonhomes.com

- Manufacturer approval of proprietary system/design

# HUD's Inspection Form (HUD 309)

**HUD Manufactured Home  
Installation Certification  
And Verification Report**

**U.S. Department of Housing and Urban Development  
Office of Manufactured Housing Programs**

OMB Approval No. 2502-0578  
Expires 04/30/2018

The Manufactured Housing Installation Program Regulations 24 CFR Chapter XX Part 3286 Sections 111 and 411 require the licensed installer certify that the manufactured home has been installed and inspected in accordance with the regulations. The Manufactured Housing Installation Program Regulations 24 CFR Chapter XX Part 3286 Subpart F requires a qualified inspector verify that the manufactured home has been installed in accordance with the requirements of Part 3286 and Part 3285. The information collected here will ensure that the licensed installers and qualified inspectors inspect the minimum elements for compliance. The public record burden for the collection of information is estimated to average 3.5 hours per response including the time to review instructions, search existing data sources, gather and maintain the data needed, and complete and review the collected information. Response to this information is mandatory. This agency may not collect this information, and you are not required to complete this form, unless the form displays a currently valid OMB control number.

Certification Label Number(s) <small>(include all zeros and agency prefix)</small>	Manufacturer's Serial Number(s) <small>(include all letters and numbers)</small>	_____ <small>(Installer Name)</small>		_____ <small>(HUD License No.)</small>	
_____ <small>(Homeowner Name)</small>		_____ <small>(State)</small>		_____ <small>(Inspector Name)</small>	
_____ <small>(Street Address)</small>		_____ <small>(City)</small>		_____ <small>(Zip)</small>	
		_____ <small>(Street Address)</small>		_____ <small>(Phone)</small>	

**1. Initial Inspection**

Inspection Item	Inspector Verification	Installer Certification
Site location with respect to home design and construction	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Consideration of site specific conditions	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
24 CFR 3285 Subpart C - Site preparation and grading for drainage	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
24 CFR 3285 Subpart D - Foundation construction	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
24 CFR 3285 Subpart E - Anchorage	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
24 CFR 3285 Subpart F - Optional features (Skirting, etc.)	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
24 CFR 3285 Subpart G - Completion of ductwork, plumbing, and fuel supply systems	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
24 CFR 3285 Subpart H - Completion of electrical systems	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
24 CFR 3285 Subpart I - Exterior and interior close-up	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Completion of operational checks and adjustments	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A

**2. Reinspection of Home** (To be completed and initialed by the inspector)

If the inspector discovers that any item during the initial inspection fails to comply with the manufacturer's installation instructions or with an installation design and instructions that have been certified by a professional engineer or registered architect, the installation must be reinspected after the installation is corrected.

Briefly describe the work that did not pass the initial inspection. Upon reinspection, inspector must initial item(s) that are in compliance. Attach additional sheet(s) if necessary.

\_\_\_\_\_

\_\_\_\_\_

**3. Inspector Verification**

I have performed a visual inspection in accordance with 24 CFR § 3286.507, of the manufactured home installation identified above. I have inspected the minimum elements noted above, as required by 24 CFR § 3286.505 and the items above have been installed in accordance with an installation design and instructions that have been provided by the manufacturer and approved by the DAPIA or an installation design and instructions that have been prepared and certified by a professional engineer or registered architect that have been approved by the manufacturer and the DAPIA as providing a level of protection for residents of the home that equals or exceeds the protection provided by the federal installation standards in part 3285 of this chapter. It is a crime to knowingly make false statements in any matter within the jurisdiction of the United States such as the verification statement on this or any similar form. Penalties upon conviction can include a fine and imprisonment. See 18 U.S. Code Section 1001.

Inspector Signature \_\_\_\_\_ (Date) \_\_\_\_\_

**4. Installer Certification**

I hereby certify, in accordance with 24 CFR §§ 3286.111 and 3286.411, that the manufactured home identified above has been installed in accordance with an installation design and instructions that have been provided by the manufacturer and approved by the DAPIA or an installation design and instructions that have been prepared and certified by a professional engineer or registered architect that have been approved by the manufacturer and the DAPIA as providing a level of protection for residents of the home that equals or exceeds the protection provided by the federal installation standards in part 3285 of this chapter. It is a crime to knowingly make false statements and/or certifications in any matter within the jurisdiction of the United States such as the certification on this or any similar form. Penalties upon conviction can include a fine and imprisonment. See 18 U.S. Code Section 1001.

Installer Signature \_\_\_\_\_ (Date) \_\_\_\_\_

Distribution:  
Installer  
Retailer  
Purchaser

Form HUD - 309

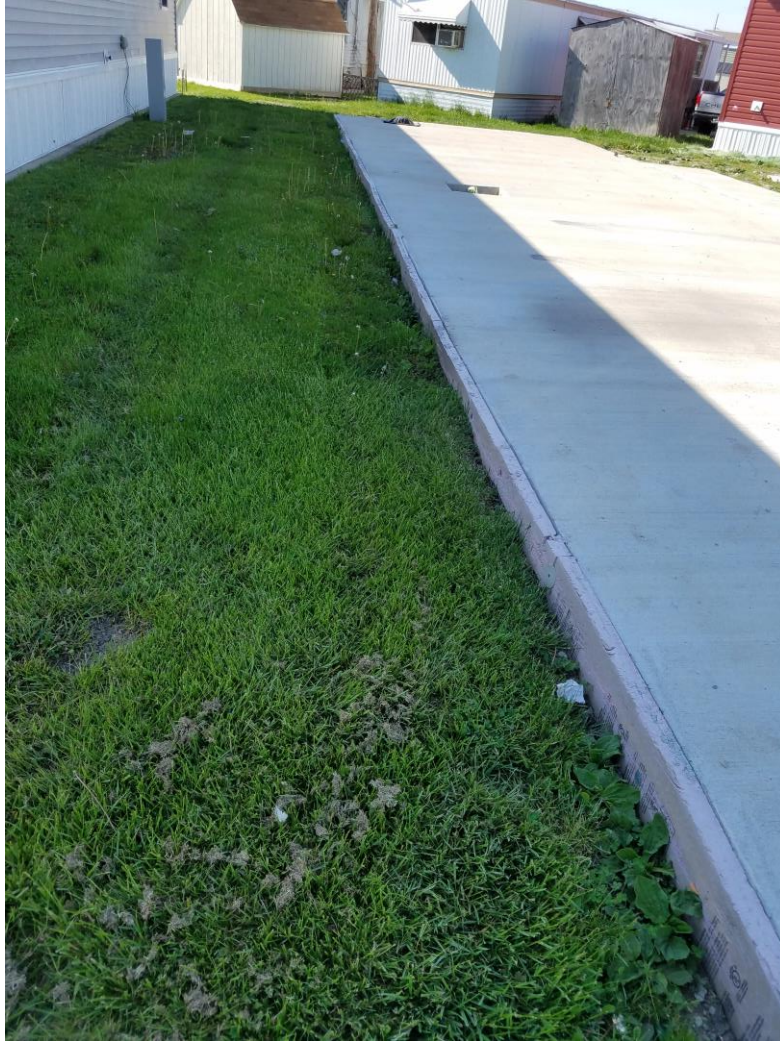


# Inspection Photographs

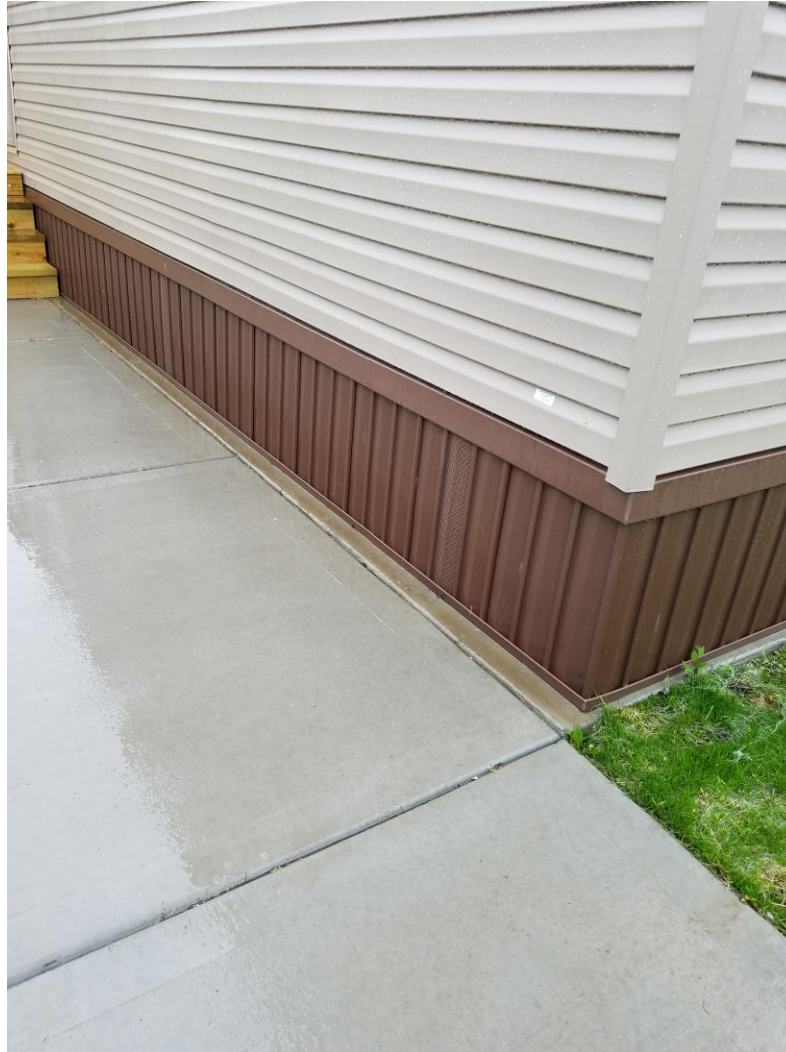




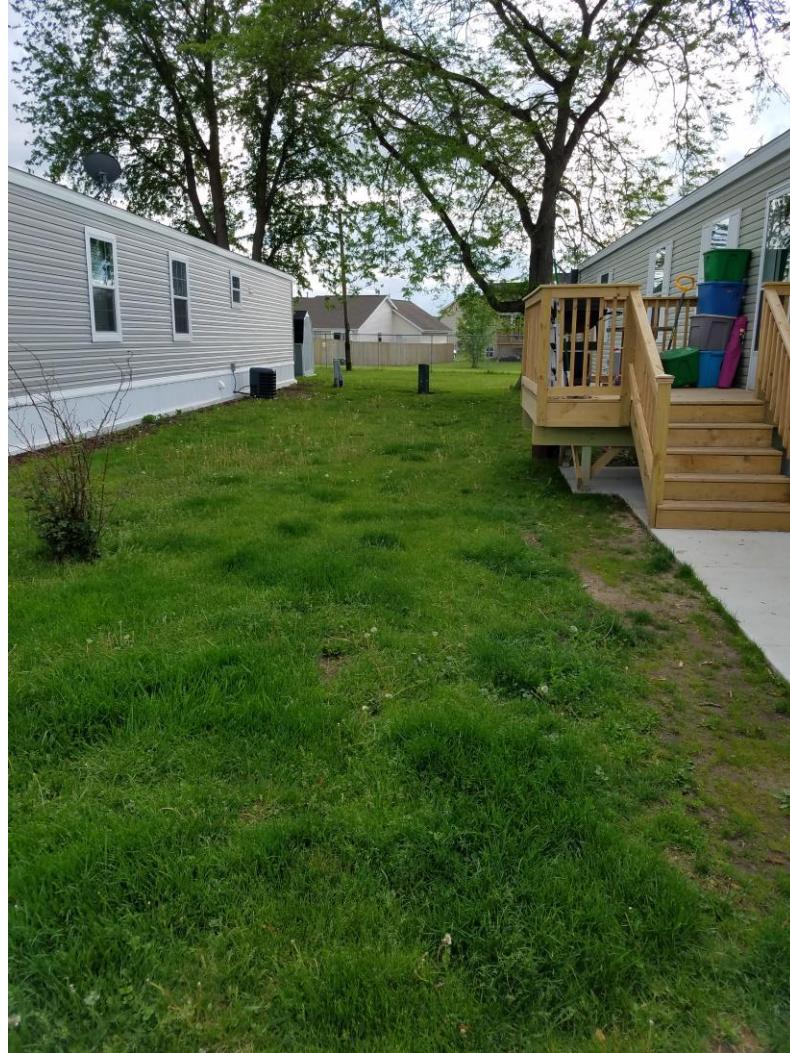
# Inspection Photographs



# Inspection Photographs



# Inspection Photographs



# Inspection Photographs



# Inspection Photographs



# Inspection Photographs



# Inspection Photographs



# Inspection Photographs





# Inspection Photographs



# Inspection Photographs



# Inspection Photographs





# Thank You.

For more information visit:

[www.hud.gov/mhs](http://www.hud.gov/mhs)

Or e-mail:

[mhs@hud.gov](mailto:mhs@hud.gov)

