

MOBILE & MANUFACTURED HOME INSTALLATION REQUIREMENTS



INSTALLATION REQUIREMENTS

The installation of a mobile or manufactured home shall strictly follow the manufacturer's installation instructions. Manufacturer's installation instructions shall be made available to the inspector at the job site. No manufactured home or mobile home shall be occupied before a Certificate of Occupancy is issued. When a mobile or manufactured home has been previously set up and the manufacturer's installation instructions are not available, the setup shall meet the standards based on ANSI 225.1-1994. Engineered foundations based on a soils report or an open hole inspection are required for any mobile or manufactured home placed on a basement or crawlspace.

MANUFACTURER'S INSTALLATION HANDBOOK: To obtain a copy of the *Installation Handbook from the Colorado Division of Housing for the Installation of Manufactured Homes and Factory Built Housing*, contact the Colorado DOH at 1313 Sherman St #518, Denver, CO 80203, phone (303) 866-2033.

CLEARANCE UNDER HOMES: A minimum clearance of 12 inches shall be maintained beneath the lowest member of the frame (I-beam or channel beam) and the ground under the home.

FOOTINGS:

Footings and foundations shall be installed in accordance with the manufactured home installation instructions. If the home was previously installed and the manufacturer's installation instructions are not available, ANSI 225.1-1994 installation standards shall be used.

Crawlspace and basements shall be insulated to meet the 2009 International Energy Conservation Code.

If using a soil bearing capacity other than 1000 pounds per square foot, follow the instructions in Chapter 2 of the *Installation Handbook from the Colorado Division of Housing for the Installation of Manufactured Homes*

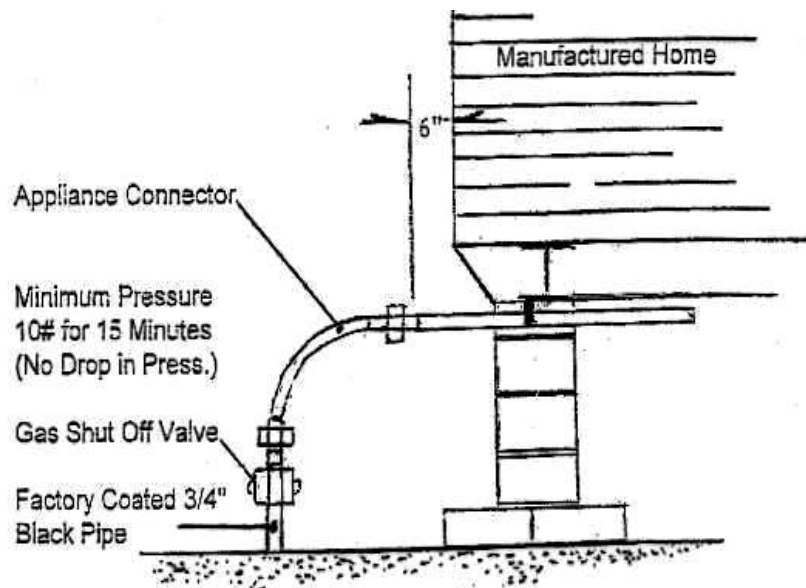
and Factory Built Housing.

GAS PIPING AND PRESSURE TEST:

Gas supply piping at the inlet to the mobile or manufactured home shall be $\frac{3}{4}$ " minimum in size. It shall extend 6 inches beyond the outside wall of the home and be a minimum 6 inches above the ground. All appliances must have a valve above the floor and directly adjacent to the appliance in the same room. A shutoff valve that disconnects the gas supply shall be located in the home. A shutoff valve at an LP tank is acceptable.

The homeowner or agent will obtain a pressure gauge and attach it to the gas piping on the outside of the home. Close all gas valves to appliances, disconnect the union between the gas valve and the appliance. (This is important as air pressure may damage the gas control on each appliance.) Next, use an air pump to pressurize all inside gas piping to a pressure of 10 pounds per square inch (psi). The gas piping must hold 10 psi of air pressure for a period of 15 minutes with no appreciable drop in pressure. An inspector must view and approve the test before the pressure is released and the gauge is removed.

Means shall be provided to compensate for any settling or movement of the home. This can be accomplished through a loop installed in a copper supply line at the connection to the home gas inlet or by means of a gas appliance connector. If an appliance connector is used, it must be listed for outdoor usage and be the same size as the mobile or manufactured home gas inlet.



Any black pipe located below ground or within 6" of the ground must be factory coated to prevent corrosion. Individual fittings may be hand-wrapped using tape that is approved for the purpose.

BUILDING DRAIN:

The building drain under the home shall have a slope of $\frac{1}{4}$ " per foot toward the septic tank or sewer. A cleanout is required for the building sewer. The cleanout is to be located outside or directly inside the skirting or perimeter wall. If located outside the home, it shall be brought up to the finished ground level.

ABS or PVC DWV schedule 40 is required under the house and must extend 2 feet beyond the skirting or perimeter wall. All drain pipe and fittings must be the same material. For example, PVC and ABS pipe and fittings cannot be intermixed and glued to each other but must be connected by means of approved fittings such as threaded male and female adapters or rubber "no hub" clamps. Once outside the home, it must be covered with a minimum of 12 inches of earth. Connect the main drain to the sewer line using an approved flexible connector.

Strap plastic pipes a maximum of 4 feet between straps or other approved supports.

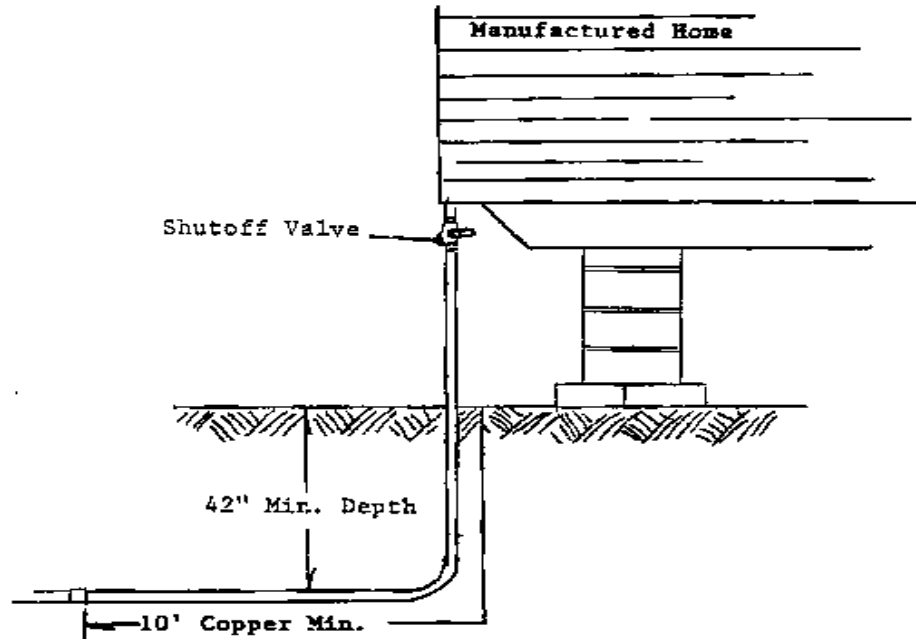
Plumbing drains shall be tested by filling all drains with water. An inspection by ProCode is required. The drainage line will be required to hold water for minimum of 15 minutes without leaking during the inspection.

WATER SERVICE:

Water service piping shall be ¾" or larger. All water service pipes shall have a minimum working pressure rating of 160 psi and must be listed for potable water. The water service pipe shall be buried a minimum of 42 inches below grade.

A fullway shutoff valve shall be located in the house. The shutoff valve is required to be accessible and must be protected from freezing.

250.52(A) 3



FINAL PLUMBING:

After the water and gas have been connected and turned on, a final plumbing inspection is required. Check all lavatories, sinks, bathtubs, showers, etc. to make sure hot water is located on the left side, as you face the plumbing fixture, and cold water is on the right. The proper installation of traps and vents is also inspected.

ELECTRICAL SERVICE:

The 2011 National Electrical Code devotes an entire article to the wiring provisions for mobile and manufactured homes. Providing electrical service to a home is very complicated and should be done by a professional licensed electrician; however, Colorado State law does allow homeowners to wire their own residences.

For the purpose of electrical grounding refer to the 2011 National Electrical Code. Homes with permanent foundations, footings and grade beams require a concrete encased electrode (UFER ground) {NEC 250.52(A)(3)} This is an electrode encased by at least 2 inches of concrete located near the bottom of the foundation or footings that is in direct contact with the earth, and which consists of at least 20 feet of ½" reinforcing bars or 20 feet of bare copper no smaller than 4 AWG.

The following standards are general requirements. Exceptions or additional requirements may come into play depending upon each individual situation. A minimum 100-amp electrical service is required for each mobile or manufactured home. For manufactured homes, a disconnecting means with overcurrent protection shall be provided on the outside and within 30 feet of the home. (Normally, the disconnect cannot be attached directly to the home.) For mobile homes, a disconnecting means shall be installed so the bottom of the enclosure containing the disconnecting means is not less than two (2) feet above finished grade or working platform. For

the outside disconnecting means, a four-wire electrical service is required. All four conductors, including the equipment grounding conductor, must be insulated [NEC Article 550.33]. Normal SER cable is not permitted. Grounding must be provided as required in Article 250 of the *2011 National Electrical Code*. If a double-wide home is set up, be sure to bond both sections with the bonding conductor provided from the factory and located in one of the ends of the home on the metal frame.

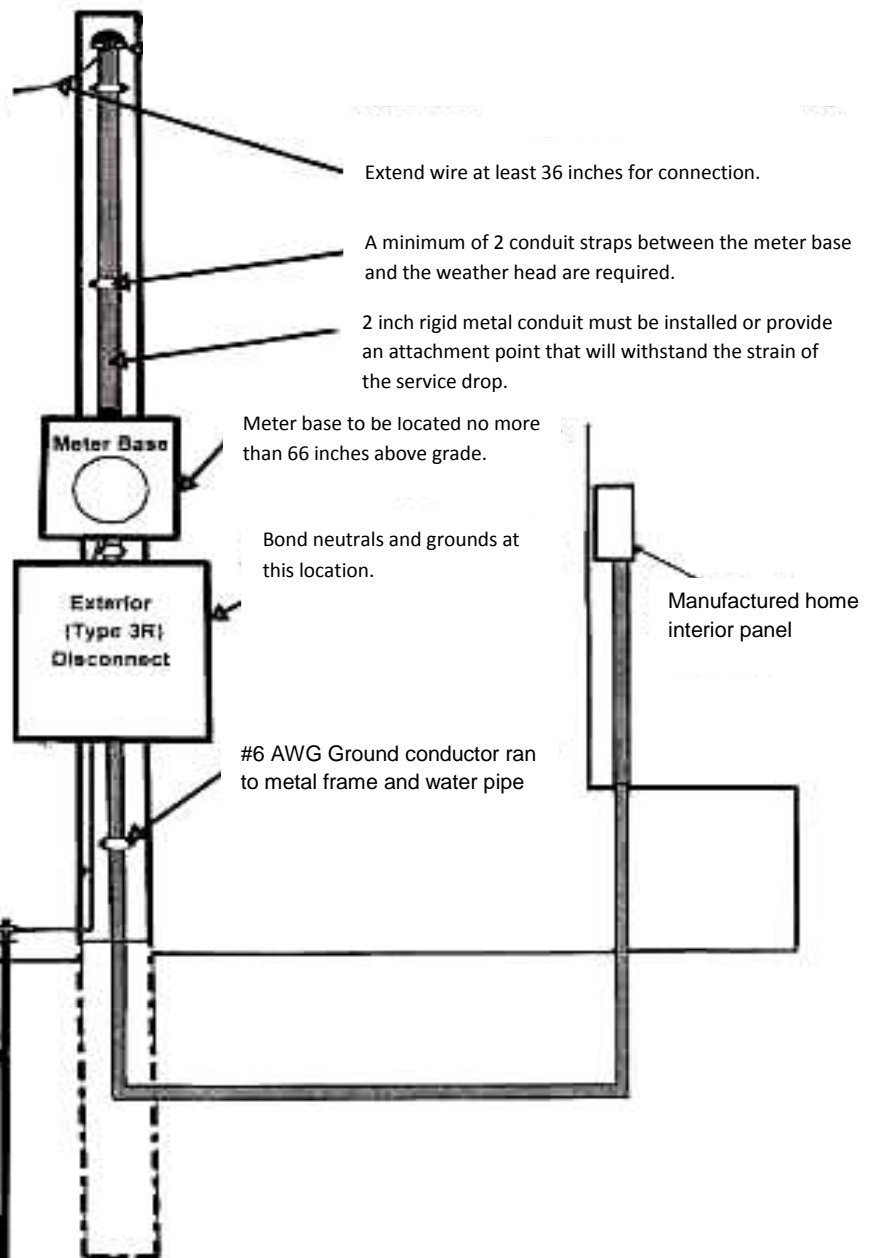
It is impossible to illustrate or describe all possible situations and code requirements that may be encountered. The following illustration is only designed to give a brief overview. Not all code requirements are shown.

SERVICE POLE

WIRING SHALL MEET THE 2011 NEC AND ALL REQUIREMENTS OF THE WELD COUNTY BUILDING CODE AND ANY OTHER PRIVATE POWER UTILITY REGULATIONS.

GENERAL NOTES

- A minimum of 12 feet is required from grade to the top of the weather head.
- The manufactured home service shall be sized in accordance to the manufactures installation requirements and section 220 of the NEC
- Outside disconnect shall be installed within 30 feet of the home.
- Service Entrance Cable shall be rated for direct burial or ran in conduit when underground.
- Direct burial cable shall be run 24 inches below grade or in conduit 18 inches below grade.
- A four wire system shall be run from the service to the manufactured home.
- The wire to the ground rod shall not be smaller than a #6 AWG copper or #4 AWG aluminum.



Extend wire at least 36 inches for connection.

A minimum of 2 conduit straps between the meter base and the weather head are required.

2 inch rigid metal conduit must be installed or provide an attachment point that will withstand the strain of the service drop.

Meter base to be located no more than 66 inches above grade.

Bond neutrals and grounds at this location.

#6 AWG Ground conductor ran to metal frame and water pipe

Manufactured home interior panel

2 Ground rods spaced no less than 6 feet apart are required.

Grounding electrodes (rods) shall be at least

-5/8 inch by 8 galvanized steel or copper and listed for such use

SKIRTING:

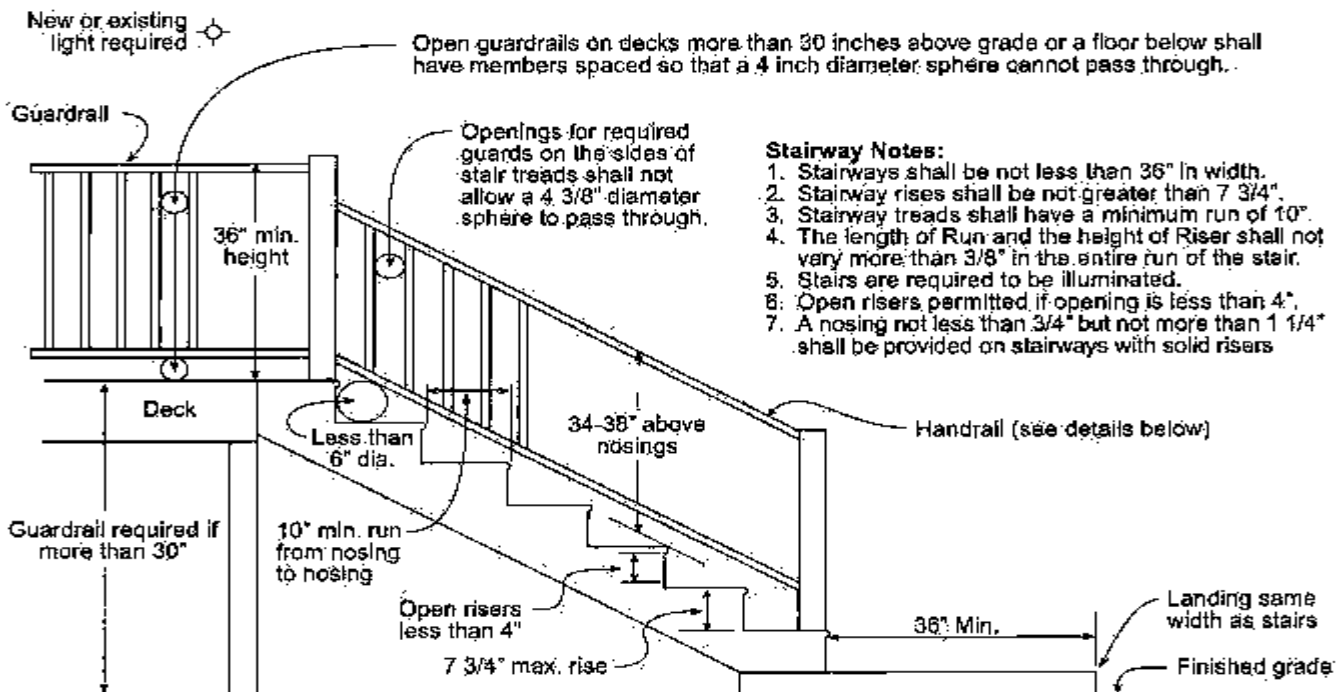
Skirting shall be of material suitable for exterior exposure and contact with the ground. Material designed specifically for skirting shall be installed in accordance with the skirting manufacturer's installation instructions. Skirting shall be adequately secured to ensure stability and to minimize vibration and susceptibility to wind damage.

PROTECTION FROM FROST:

When footings are placed less than 30 inches below grade, the footings must be protected from the effects of frost heave. If the manufacturer allows a frost protected shallow foundation, then the manufacturer's instructions must be followed completely. The Colorado State Division of Housing has documents on a "floating slab system" above the frost line. This must be approved by the manufacturer or designed by a Colorado registered engineer and be compatible with anchoring requirements.

LANDINGS AND STEPS:

Every door is required to have a landing and a set of steps (Section R-311.2 2012 IRC). The landing shall be a minimum of 36 inches by 36 inches and shall not be more than 1 inch below the floor level. When a door does not swing out over the landing, other than a screen door or a storm door, the landing may be a maximum of 7 3/4 inches below the floor level. (Screen doors and storm doors may swing out over the landing.) The landing may have a slope no greater than 1/4" per foot. Landings shall be securely anchored. All wood steps and landings exposed to the weather that is 8 inches or less above the earth shall be redwood or treated wood.



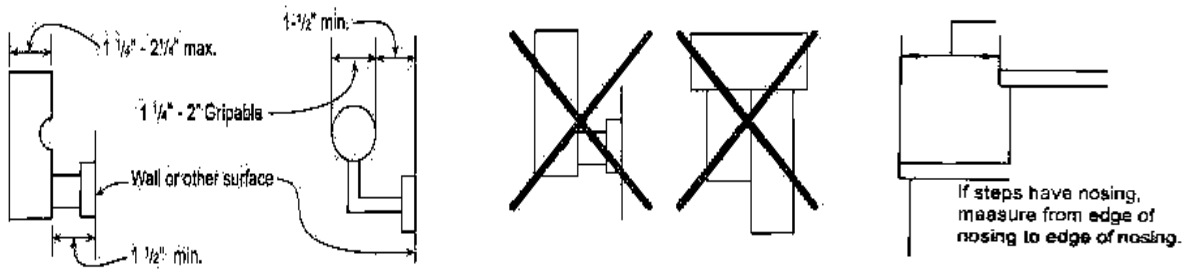
Stairway Notes:

1. Stairways shall be not less than 36" in width.
2. Stairway rises shall be not greater than 7 3/4".
3. Stairway treads shall have a minimum run of 10".
4. The length of Run and the height of Riser shall not vary more than 3/8" in the entire run of the stair.
5. Stairs are required to be illuminated.
6. Open risers permitted if opening is less than 4".
7. A nosing not less than 3/4" but not more than 1 1/4" shall be provided on stairways with solid risers.

Handrail Notes:

1. Handrails shall be continuous on at least one side of stairs with 4 or more risers.
2. Top of the handrails shall be placed not less than 34 inches nor more than 38 inches above stair nosings.
3. The handgrip portion of handrails shall be not less than 1-1/4 inches nor more than 2-1/4 inches in circular cross section.
4. Handrails shall be placed not less than 1-1/2 inches from any wall or other surface.
5. Handrails to be returned to wall, post or safety terminal. (per 311.5.6.2 IRC)

Any wood below grade must be pressure treated. Steps or landings more than 30 inches above the ground must have a guardrail. If a landing or deck exceeds 4 feet by 4 feet or 16 feet square, is covered by a roof, or is enclosed on at least two sides, a separate building permit is required. Minimum setbacks and offsets must be met.



RETAINING WALLS:

Where retaining walls are used as a permanent perimeter enclosure, they shall resist the lateral displacement of soil or other materials. Retaining walls shall be constructed of approved treated wood, concrete, masonry, or other approved materials. When wood retaining walls are used, the entire wall, including bracing, must be treated wood.

MANUFACTURER’S INSTALLATION MANUALS ARE TO BE FOLLOWED FOR PERMANENT INSTALLATION OF THE HOME. IF THE HOME WAS PREVIOUSLY SET UP AND THE MANUFACTURER’S INSTALLATION MANUAL IS NOT AVAILABLE, FOLLOW THE STANDARDS IN THE HUD “PERMANENT FOUNDATIONS GUIDE FOR MANUFACTURED HOUSING” GUIDE.