

**CITY OF WINNEMUCCA  
AND  
HUMBOLDT COUNTY  
BUILDING DEPARTMENTS**

**SETTING UP YOUR MANUFACTURED  
HOME**

THE INFORMATION CONTAINED IN THIS HANDOUT IS FOR SETTING UP MOBILE  
HOMES/MANUFACTURED HOUSES FOR ALL AGES

Please utilize the checklist on the back of this handout. Review checklist and complete  
all items before calling for an inspection

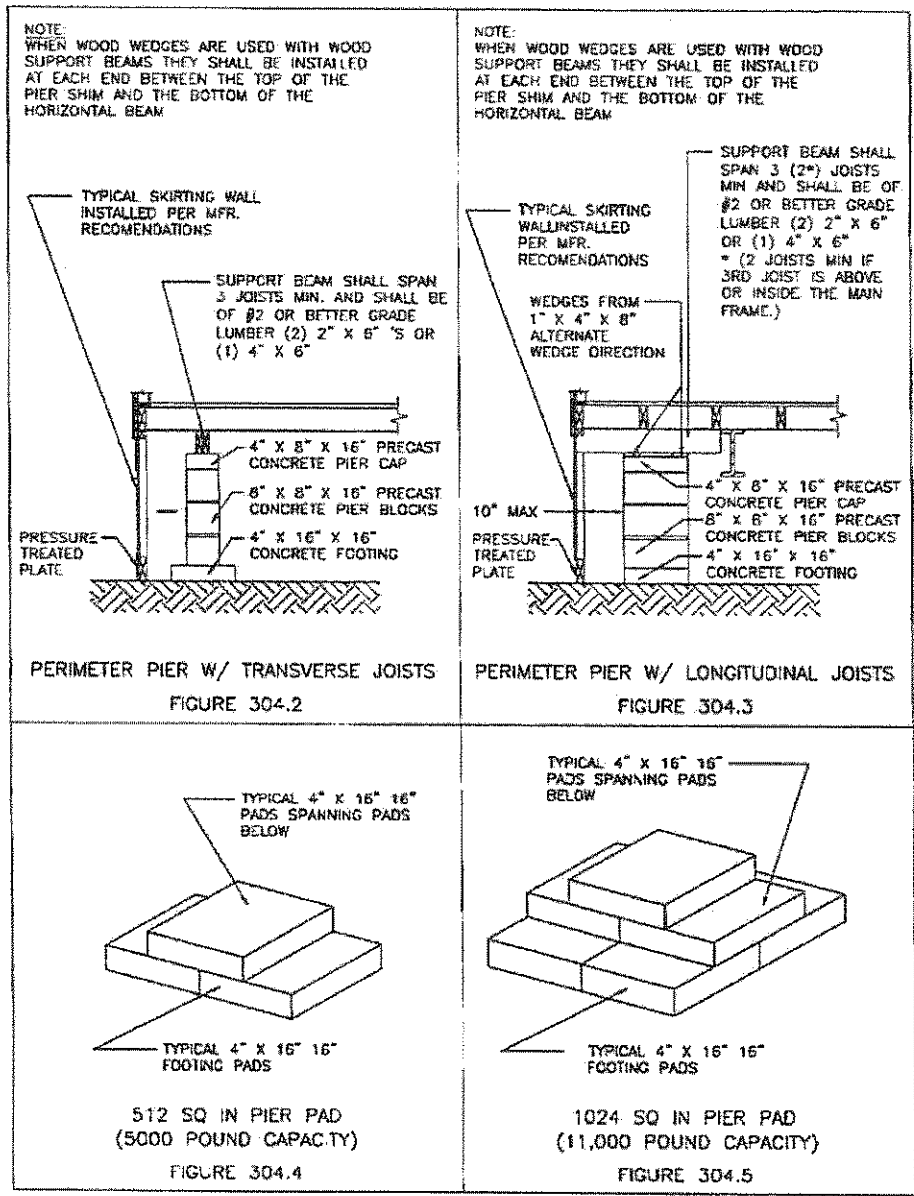
REVISED MARCH 2014

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*part 2*

FIGURE 306 - PERIMETER BLOCKING



7. Marriage Line/Ridge Beam (Figure 306, Table 307, & Figure 308)
- A. During set-up of the MH multi-section homes shall be sealed at marriage lines to resist the elements.
  - B. Wall & roof close up shall be made with similar materials and installed according to the material specified by the manufacturer.
  - C. Support on the marriage line shall be provided at each location as identified by the manufacturer. The areas shall be clearly marked by the manufacturer and are visible at the floor area of the house.
  - C. The diagram for location and load of the supports shall be on site at the inspection.
  - E. Marriage/ridge supports shall also be located within 6" of each end and 7' o.c. for roof loads up to 40 psf. (This is in conjunction with the manufacturer's requirements.) Care shall be taken on open spans to prevent any raised floor problems.
  - F. Marriage line footing size shall be determined by the column load and per attached Table 307.
  - G. Ridge beam support column footings shall be constructed according to any one of the following four methods. (See Figures 306.3 & 306.4)
    - 1. Multi-layered 16"x16"x4" pre-cast concrete pads placed in a pyramid shape to distribute load from the pier to the base. Each layer of blocks shall span at least 50% of each block in the layer beneath.
    - 2. Poured in place concrete pads min. of 6" thick with (2) #3 reinforcing bars in each direction (can not be used for real property conversion)
    - 3. A poured concrete footing runner with a minimum of 6" nominal thickness by 20" wide with two properly positioned #3 reinforcing bars. (See separate runner handout)
    - 4. Pads of two to four layers of min. 2"x10" pressure treated lumber. The length shall not exceed double the width. The boards in each layer shall be laid crosswise to the boards in the layer beneath.
  - H. Marriage line/ridge beam supports may be combined with perimeter blocking requirements if necessary. The loads will determine footing and pier requirements.
  - I. Piers: (Figure 304)  
 All materials or products for support of a MH must be approved by State of Nevada Manufactured Housing Division or listed specifically as a support or pier system. The maximum height shall be 36". Real property requires minimum 16" pier height.
    - 1. Block Piers (Figure 304.1- 304.3)
      - a. Concrete blocks
        - 1. Blocks shall be either open or closed cell pre-cast of nominal size 8"x8"x16". Open cell blocks shall be positioned vertically. Blocks used on a poured footing must have a minimum ½" pressure treated wood pad between the block and the top of the footing. Cinder or pumice blocks shall not be used.
        - 2. Single Stack – block piers up to 36" high under the main frame or marriage line and 48" high under perimeter walls may be single stacked. Shall be placed perpendicular to the main and marriage line and parallel at the perimeter wall. Shall be placed perpendicular to the joint of (2) 8"x16" nominal size concrete pad. Shall be used for loads not to exceed 5,000 lbs. Single and double piers may be combined for higher loads.
        - 3. Double Stack – block piers over 36" high under the main frame and marriage line, and over 48" high under the perimeter walls, shall be double stacked with blocks interlocking. Block piers more than 60" in height must be constructed of concrete, cinder or pumice block laid in mortar with ½" reinforcing steel bars inserted vertically and the cell of the blocks poured solid with concrete. Shall be used for loads not to exceed 16,000 lbs. Double & single piers may be combined for higher loads.
        - 4. Max. height 80" unless designed by a Nevada Registered Professional Engineer.

- b. Block Pier Caps (Figures 304.1, 304.2, 304.3)
  - 1. Pre-cast block – a solid concrete block with a nominal thickness 4".
  - 2. Lumber – (1) 2" nominally thick #2 or better grade lumber
  - 3. Polymer – (1) 2" nominally thick wood polymer composite
  - 4. Other – Listed or equivalent materials approved by Manufactured Housing.
- c. Block Pier Shims (Figures 304.1, 304.2, 304.3)
  - 1. Precast concrete – 2" thick solid concrete blocks equal in area to the pier cap
  - 2. Plywood – ¾" or thicker plywood equal in area to the pier cap
  - 3. Lumber – 2" nominally thick #2 or better grade lumber not less than 5 ½" in width and 16" long
  - 4. Polymer – 1 ¼" min. thickness wood polymer not less than 5 ½" in width and 16" long
  - 5. Other – listed or equivalent materials approved by Manufactured Housing.
- 2. Prefabricated Piers (Figure 304.4)
  - a. Shall be placed on approved footings. They shall not exceed the size of the footing and shall be used in a manner consistent with its listing.
  - b. All prefabricated piers shall be tested and listed to be used as 4,000 lbs.
  - c. The installation of piers shall be in compliance with pier manufacturer's instructions, which shall be present at the time of inspection.
  - d. No shims shall be used with prefabricated piers
  - e. All piers shall be of the type fitting with an adjustable head and nut. The adjustment shall not exceed that permitted by the manufacturer's instructions.
  - f. The heads of prefabricated piers shall alternate at the frame support.
- J. Marriage line rim joist supports shall be located along the entire length of the marriage line 8' o.c.
- K. A house with a deck/porch area shall have a separation barrier between the house crawl space and the deck area (if open decking). This barrier shall be skirting, a foundation, or a durable flexible material such as sheet vinyl, Plexiglas, Fiberglass, ABS, or EPDM. The area below an open floor may be enclosed with lattice work, skirting, or a foundation wall if made accessible. A vapor barrier shall not be placed in these areas.
- L. Each section shall be secured at site to immobilize each section. Interior spaces must be protected from damage. All loads transferred adequately to the ground.
- M. Gaps greater than ½" – the fastener length must be increased. Do not attempt to reduce gap by tensioning the lag screws.
- N. Gaps greater than 1 ½" must be corrected by the manufacturer.
- O. Ridge Beam Connection (Figure 308)
  - 1. With 3/8" diameter lag screws with full penetration through the ridge beams, with washers, and spaced equally along the length of the ridge beam at a maximum of 24" on center and no more than 45 degrees from perpendicular. Lag screws will be installed on both sides of the beam offset approximately ½ the spacing from each other. All ridge beam lag screws shall be installed in an area where there is solid ridge beam material between the manufactured home sections. Ridge beams shall be predrilled for lag screws.
  - 2. With a connection system other than lag bolts which may be engineered by the manufacturer who shall supply the dealer and installer with complete installation instructions. The instructions shall be in the manufactured home at the time of inspection and the ridge beam shall be tagged to indicate an alternate system is required.

8. Floor Connections (Multi-Section Homes)(Figure 308)
  - A. For homes with a single rim joist use 3/8" diameter by 6" long lag screws with washers installed diagonally at 45 degrees or less through each section's rim joists installed in pairs or staggered, but not exceeding a max. spacing of 24" o.c.
  - B. For homes with a double rim joist use 3/8" diameter by 8" long lag screws with washers installed diagonally at 45 degrees or less through each section's rim joists installed in pairs or staggered, but not exceeding a max. spacing of 24" o.c.
  - C. With a connection system installed with the manufacturer's installed mating devices bolted together with appropriately sized bolts and washers.
9. End Wall and Interior Wall Connections (Figure 308)
  - A. All end wall studs and interior wall column supports shall be screwed together with 4" long #8 screws long enough to have a minimum of 1 1/2" penetration into the receiving member spaced 16" o.c.
10. Lag Screws
  - A. Whenever lag screws are used 1/4" pilot holes shall first be drilled. The screws shall be installed so as to provide full penetration of the lag screw into both beams or joists
11. Sealing
  - A. During installation, joints between all sections shall be cleaned.
  - B. Where gaps exceed 1/2" top or bottom it shall be filled with a shim. (Maximum gap – 1 1/2")
  - C. The joints shall be sealed with a weather stripping gasket material to limit heat loss and prevent air, moisture and other damaging infiltration. The gasket material shall be durable, non-porous caulking, closed cell foam, urethane, or sill seal. If the manufacturer supplies a sealer, the installer shall use it. Caulking when used, shall fill the gap and be capable of compressing and stretching. Sill seal, if used, shall be a minimum of 5 1/2" wide and attached with fasteners staggered at 6" o.c. and compressed to form a tight seal. Any remaining gaps shall be caulked or foamed to complete the seal.
12. Patching
  - A. All cuts, holes, or tears in the bottom board (rolled plastic material) or floor insulation including, but not limited to, area around structural connections and electrical, plumbing, mechanical, and heating equipment penetrations shall be adequately repaired to prevent the entrance of rodents and to limit heat loss. Repairs shall be made with materials and adhesives designed for this use.

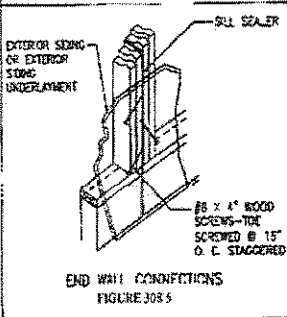
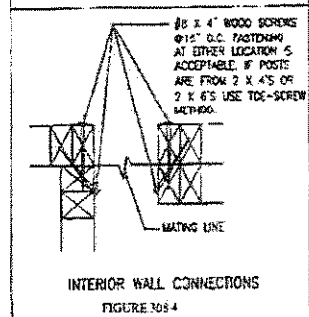
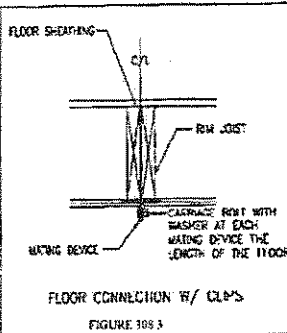
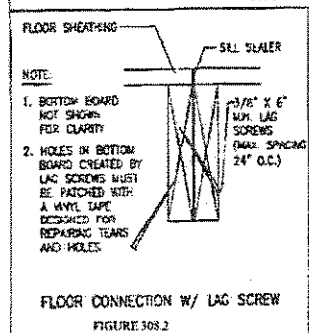
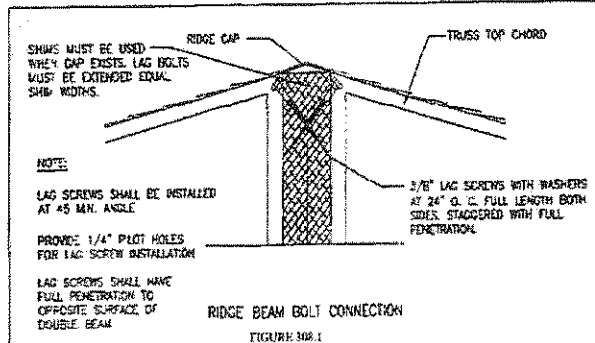
## MARRIAGE LINE FOOTING SIZES

TABLE 307

Footing Size(inches)	Capacity (pounds)	Footing Size (inches)	Capacity (pounds)
15x15	2,500	29x29	8,500
17x17	3,000	30x30	9,000
18x18	3,500	31x31	10,000
20x20	4,000	32x32	11,000
21x21	4,500	34x34	12,000
22x22	5,000	35x35	13,000
23x23	5,500	37x37	14,000
24x24	6,000	38x38	15,000
25x25	6,500	39x39	16,000
26x26	7,000	40x40	17,000
27x27	7,500	42x42	18,000
28x28	8,000	43x43	19,000

The footing sizes shown are for square pads and are based on the area (square inches) required for the load. Other footing configurations, such as a rectangular configuration, may be used provided the area (square inches) is equal to or greater than the area of the square footing shown in the table. For example a 12"x12" (264 square inch) footing may be used in place of a 16"x16" (256 square inch) footing. Also two 12"x24" pads may be used in place of one 24"x24" pad

FIGURE 308

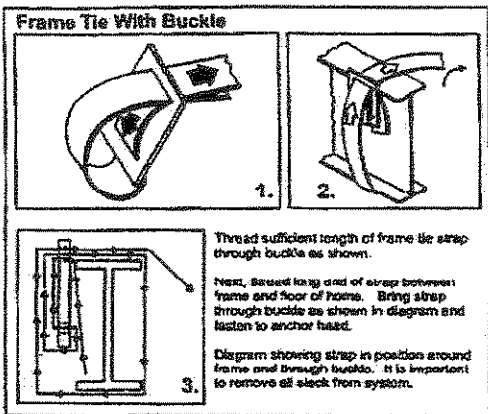
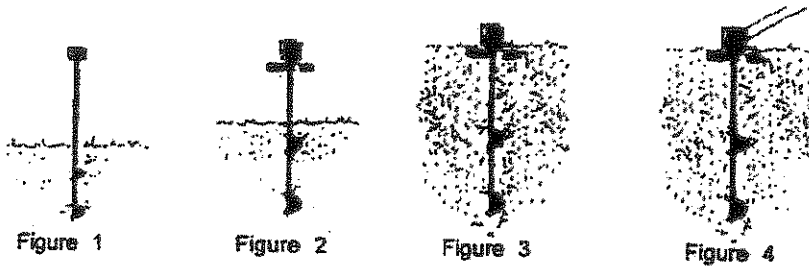




13. Ground Anchor Systems (Figures 309 & 310)

- A. Before placing MH set any anchors necessary to the set-up.
- B. Anchoring must be installed on all MH's to resist lateral movement from wind and earthquakes.
- C. Anchor shall be capable of resisting 4725 lbs without failure. All anchors shall be a listed approved product and installed to this manual and manufacturer's instructions.
- D. The anchors shall be approved for the soil where anchors are to be installed. Generally figure tie downs for soil class 4A which will require an auger with a stabilizer plate and use a soil test probe to determine the soil classification.
- E. Anchors must be installed to full depth with stabilizer plates. The anchor must extend below the frost line.
- F. Tie down strapping shall be fastened to anchors and drawn down tight with adjustable tension devices. Straps must be capable of resisting 3150 lbs working load. Cable is not permitted as a tie down strap.
- G. Ties shall connect the anchor to the main frame I-beams that run lengthwise under the manufactured home. Ties shall not connect to steel outrigger or cross member beams that fasten to, and intersect with, the main frame I-beams. If the ties are attached to the bottom flange of the main chassis beam the frame must be designed to prevent rotation of the beam.
- H. Ties must be designed to prevent self disconnect when ties are slack. Use frame tie with buckle. Open hooks shall not be used. The buckle shall be placed on the inside of the frame. A method must be used for protecting vertical and diagonal strapping at sharp corners by use of radius clips or other means.
- I. A tie down anchor with strapping must be installed on both sides of the MH with max. spacing of 11' o.c. for homes installed on piers with a maximum of 60" in height and not more than 2' from each end. For homes installed with piers greater than 60" the tie down system must be designed by a Nevada Registered Engineer.
- J. Cross drive anchors are not permitted unless installed in solid bedrock or approved by the manufacturer for our soil
- K. Longitudinal Anchor (Figure 310)
  - 1. Each home being installed must be installed with an anchoring device designed to resist longitudinal (lengthwise) movement. Any device used must be tested and listed for the specific use and installed to the device's manufacturer's instructions. If the number of devices to be used is not mentioned or is unclear, a minimum of one device for each direction per chassis main beam must be used. This could require 8 anchor devices. Follow the manufacturer's instructions.
- L. If sidewall, over-the-roof, mate line or shear wall straps are installed on the home, they must be connected to an anchoring assembly.
- M. Each anchor shall be provided with protections against weather deterioration and corrosion at least equivalent to that provided by a coating of zinc on steel on not less than 3.302 oz/sf ft of surface coat.
- N. Check for underground utilities before installing anchors.
- O. Alternate anchoring systems may be used when approved by Manufactured Housing.
  - 1. Oliver Technology Systems
  - 2. Tie Down Engineering Xi2 System

FIGURE 309  
Ground Anchor System



1. Auger tie downs with stabilizer plates are required.
2. Anchor shall be capable of resisting 4725 lbs without failure.
3. Tie down strapping must be capable of resisting 3150 lbs working load.
4. Ties shall attach to frames that run lengthwise under the home.
5. Ties must be designed to prevent self disconnection when ties are slack. Open hooks shall not be used.
6. A tie down anchor shall be installed on each side of the MH with max. spacing of 11' o.c. and no more than 2' from each end.
7. Cross drive anchors are not permitted unless installed in solid bedrock or approved by the manufacturer for our soil type.
8. Buckle on the strap shall be located on the inside of the frame.

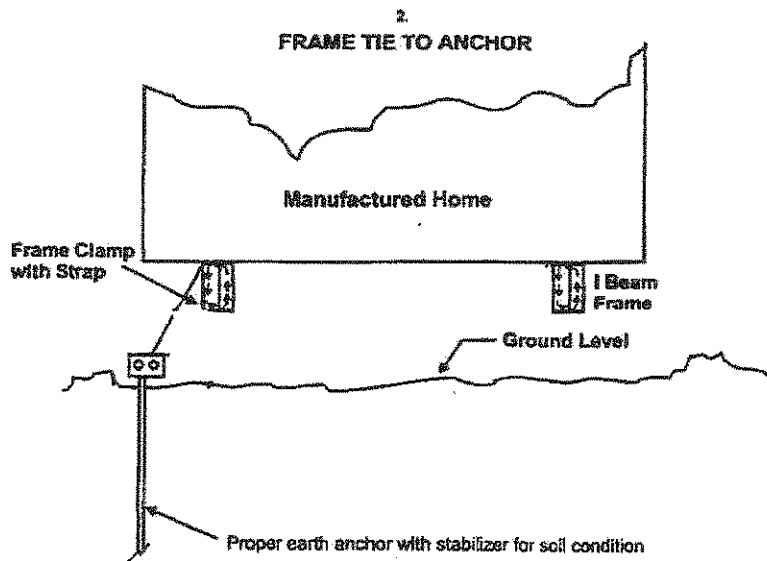
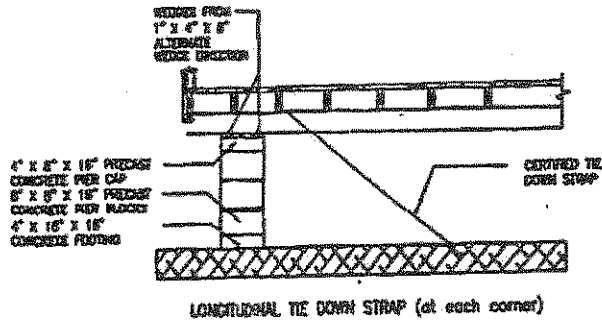
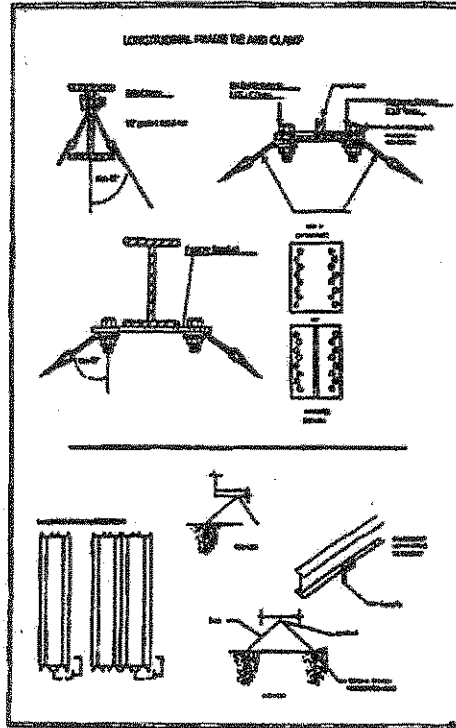
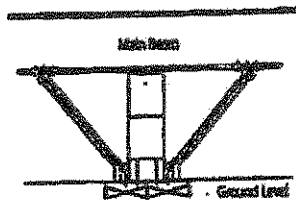


FIGURE 310  
EXAMPLES OF LONGITUDINAL ANCHORS



- Each home being installed must be installed and an anchoring device to resist longitudinal (lengthwise) movement. Any device used must be tested and listed for this specific use and installed to the devices manufacturer's instructions. If the number of devices to be used is not mentioned or is unclear, a minimum of one device for each direction per chassis main beam must be used.



14. Flood Resistance

- A. You may request information on flood resistance if applicable.

15. Egress

- A. Each required egress door shall be accessible by stairs, ramp or deck equipped with stairs or ramp. See attached stair detail (Figures 313A-313D). Steps shall be rot resistant and structurally sound.
- B. Windows and doors shall be adjusted, secured in place, and made operational to provide security, egress, and to minimize air leakage and water penetration.
- C. Damage to windows and doors, which affect their safety features, thermal performance, or operation shall be repaired or replaced.
- D. there shall be a minimum of (2) exit doors from each house. Each bedroom shall have one emergency egress window providing access to the outside.

16. Electrical Systems (See Figures)

All electrical installations shall comply with the most current adopted National Electrical Code, Humboldt County and City of Winnemucca Ordinances and Nevada Revised Statute requirements from Manufactured Housing Division.

- A. Burial Depth—18" if installed in approved electrical conduit; 24" if not installed in conduit; 24" if installed under a driveway. Electrical wire shall be approved for below grade installations.

B. Grounding:

1. All metal parts of a MH must be grounded by connection to the grounding bus of the distribution panel board in the MH.
  - a. The ground bus must be grounded through the green-insulated conductor in the supply cord or feeder wiring to the service ground in the service entrance equipment or, if the bus cannot be properly grounded to the service entrance, it must be connected to a properly installed grounding rod which is at least 8 feet long.
  - b. The frame of the MH and the frames of appliances may not be connected to the neutral conductor of the power supply of the MH.
2. Ground conductor must be #6 copper wire or equivalent.
3. The chassis shall be bonded by installing a #8 conductor between multi-sections.

C. Service (Figures 312A-312C)

1. The service entrance cable may be run underground or overhead depending on the MH manufacturer's design.
2. The meter electrical service must be consistent with the MH requirements. The applicant should install a service adequate for the load of the MH and any other buildings (existing and future).
  - a. Whenever the load of the electrical system of the MH is more than 50 amps, a flexible metal conduit may be used for above ground raceway; not portion of the flexible conduit may be buried.
  - b. Whenever the load of the electrical system of the MH is less than 50 amps a flexible supply cord of molded butyl rubber approved by a testing laboratory may be used.
  - c. A (4) wire system conductor system is required for the feeder to the MH.
  - d. MH service equipment shall be located with site and **note more than 30 feet from the exterior wall of the MH it serves** and is not less than that required for service equipment. The service or subpanel may not be installed/attached to the MH.
  - e. Outdoor MH disconnecting means shall be installed so the bottom of the enclosure containing the disconnecting means is not less than 2 feet above finished grade. This disconnecting means shall be so installed that the center of the grip of the operating handle, when in its highest position, will not be more than 6 1/2' above finished grade. NEC Article 550-23(3).
  - f. Electrical conduit shall be strapped or supported under the house 6' o.c.

- g. If flexible metal conduit is installed it shall be placed 6" above grade and grounded per Manufactured Housing's requirements.
- h. All electrical boxes are required to have clearance of 24" from bottom of box to finished grade. NV Energy's requirement for meter height is a minimum of 48", maximum of 75" from the middle of the meter socket.

D. Electrical Continuity Test

- 1. A multi-test is required for this test. The multi-tester shall be set to ohms. The set-up person shall run the test as the inspector witnesses test results. Run the test before calling for inspection to verify test will pass at final inspection.
- 2. Before conducting the continuity test and mega ohm meter test, the outside main circuit breaker which controls electrical power to the MH must be in the off position and the neutral or white wire must be disconnected in the MH.
- 3. The continuity test must be made with all interior branch circuit switches, circuit breakers and switches controlling individual outlets, fixtures and appliances in the "on" position. The test must be made by connecting one lead of the test meter to the grounding conductor of the MH at the point of supply to the feeder assembly and applying the other lead to each of the supply conductors, including the neutral conductor. There must be no evidence of a connection between any supply conductor and the grounding conductor (neutral). In addition, each non-current-carrying metal part of coach, including fixtures and appliances, must be tested to determine continuity between the part and the equipment grounding conductor.
- 4. If the home has been rewired additional electrical tests may be required.

E. Smoke Detectors

- 1. Smoke detectors must be functionally tested in accordance with applicable requirements of the smoke alarm manufacturer.

F. Generator or Other Alternative Sources

- 1. Wiring is required to be installed to the National Electric Code and set-up manual requirements. Sizing of alternative power sources shall provide adequate amperage to the house as required by the rating of the house.
- 2. All wiring shall be permanent.
- 3. Generator & batteries are required to be placed in an approved outbuilding.

G. Temporary Electric

- 1. A temporary electric permit shall be obtained for connection of power prior to MH final. There are restrictions to this requirement.(See temporary electric agreement)

FIGURE 311 - ELECTRICAL

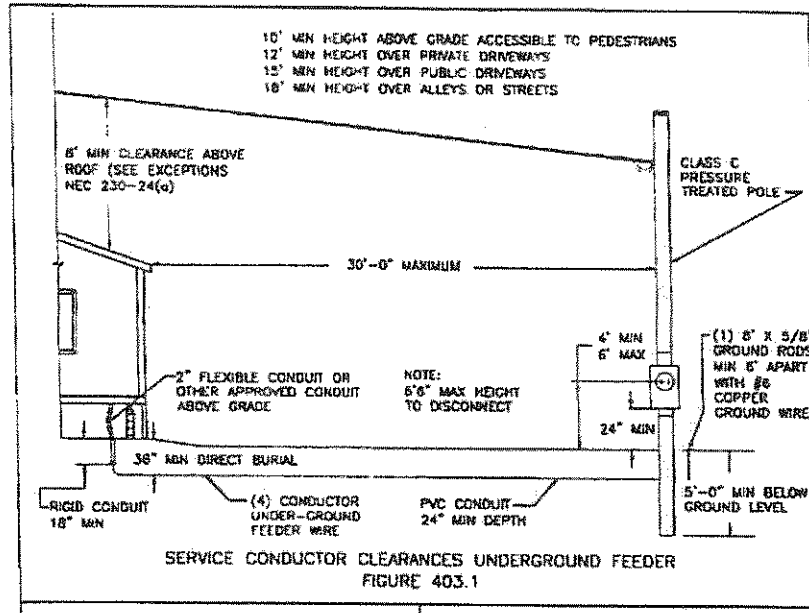
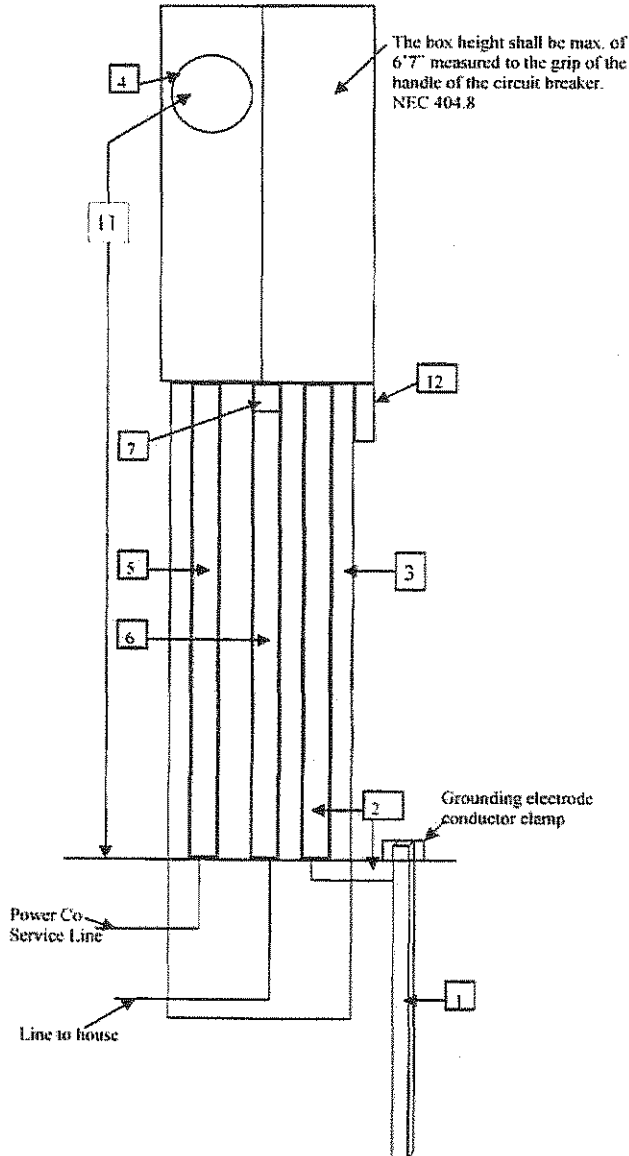


Table 401  
 Service Conductor & Grounding Electrode Conductor Size

CONDUCTOR TYPES AND SIZES -- THHN, THHW, THW, THWN, USE, XHHW, THW-2, THWN-2, XHHW-2, SE, USE-2		ALLOWABLE AMPACITY	MINIMUM GROUNDING ELECTRODE CONDUCTOR SIZE	
Copper (AWG)	Aluminum and copper clad aluminum (AWG)	Maximum load (amps)	Copper (AWG)	Aluminum (AWG)
4	2	100	8	6
3	1	110	8	6
2	1/0	125	8	6
1	2/0	150	6	4
1/0	3/0	175	6	4
2/0	4/0	200	4	2

FIGURE 312A

UNDERGROUND ELECTRICAL SERVICE HANDOUT



1. Ground Electrode Conductor may be:
  - a. Rods of iron or steel or stainless steel at least 5/8" in diameter
  - b. Rods of listed nonferrous metal (copper or copper clad) not less than 1/2" diameter
  - c. Pipe or conduit not less than 3/4" trade size & where of iron or steel shall have the outer surface galvanized or otherwise metal coated for corrosion protection
  - d. The electrode shall be installed such that at least 8' of length is in contact with the soil. NEC, Section 250-52 A(5)
  - e. The grounding electrode conductor clamp shall be installed above ground
2. Grounding Electrode Conductor—Bare #6 copper for 100 amp service. Bare #4 copper for 200 amp service. NEC Table 250.66.  
Shall be secured in an approved manner & connected to ground rod. If using metal conduit enclosure see attached for bonding of conduit.
3. Wood pole—6x6 square pressure treated
4. Meter base—(socket) with main disconnect breaker NEC 230.70. General means shall be provided to disconnect all conductors in a building or structure from the service entrance conductors. The disconnect shall be an external disconnect in stalled immediately adjacent to the meter locations. Switch boards and panels shall comply with NEC, Article 408.
5. Service conduit Schedule 80 sunlight resistant PVC (8' long min) Size conduit per wire size installed. Secure conduit to pole.
6. Load side conduit, Schedule 80 sunlight resistant PVC. Size conduit per wire size.
7. Conduit access fitting (optional). Install approved fittings and bushings.
8. Electrical lines burial depth
  - a. Direct burial cables—24"
  - b. Rigid metal conduit—6"
  - c. Intermediate metal conduit—6"
  - d. Rigid nonmetallic conduit (Sunlight resistant PVC) approved for direct burial—18"
  - e. All wiring installed in conduit shall be approved for underground or wet location.
9. If a bucker board is used it shall be of rot resistant material. Unistrut preferred
10. Panels shall be attached to the pole with lag bolts or other means that provide a permanently secured connection. NEC 110.13
11. NV Energy requires 48" from the ground to the center of the meter socket.
12. For temporary electric for construction purposes a GFCI outlet or circuit breaker shall be installed & wired appropriately. Receptacles used in wet locations outdoors will be required to have an enclosure that is weatherproof and remains so even when plug is inserted. (Bubble covers required). NEC 406.8(B)
13. Contact the local power company for specific utility company requirements. Commercial equipment is required to be preapproved by the power company.  
NV Energy—(800)962-0399  
Harney Electric—(775)272-3336

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