

MFD20-0019



Valley Quality Homes

"Building The Future TODAY"

By Exceeding Home Building Standards"

Homeowner or Contractor To-Do-List

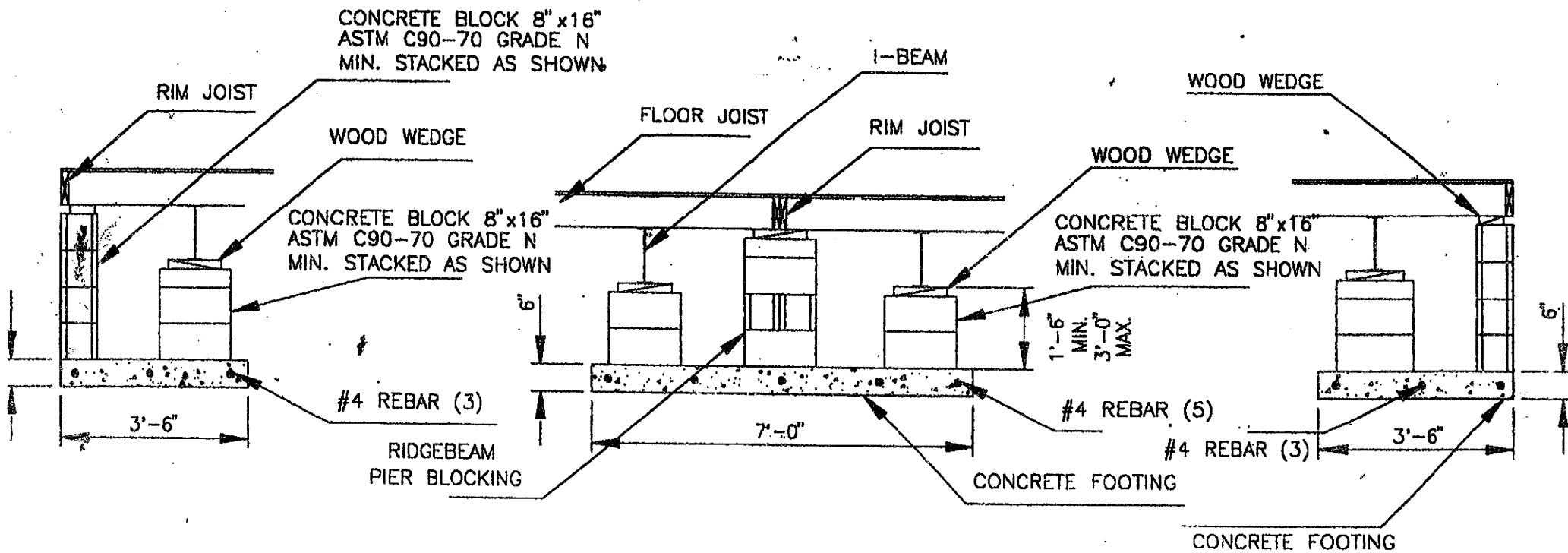
APPROVED PLANS

Must be on site and readily available
for inspection

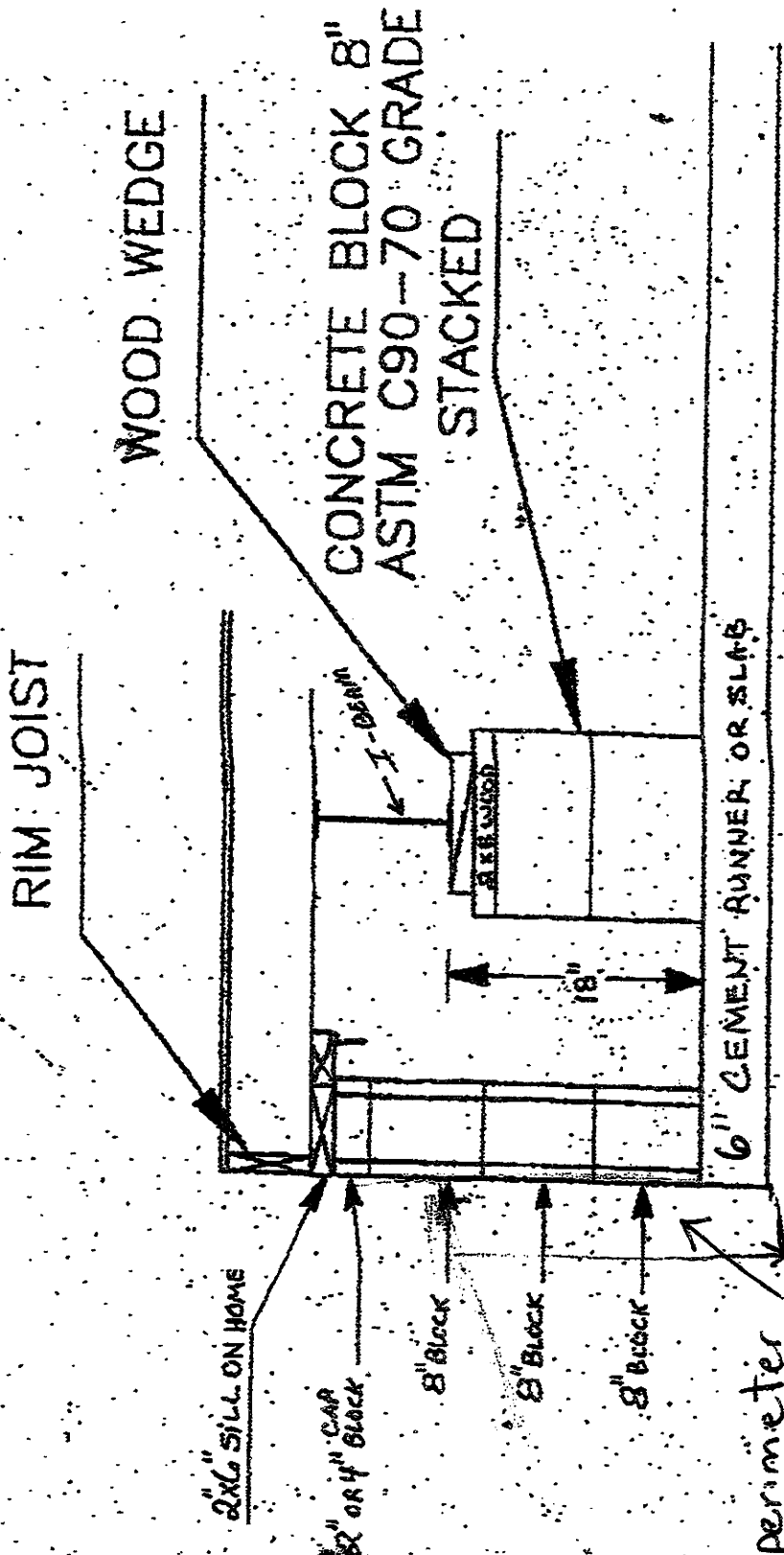
1. Permits: building, sewer or septic, water, electrical, gas. Valley must have a copy of building permit prior to scheduling delivery.
2. Site preparation: excavation, trenching of all utilities, cable, phone (contact gas company for specifics on their installation). Water & sewer hook-ups to edge of home at closest point to drop/15 ft. The water line must accommodate a 3/4" male or female adapter, 3" drain & 4" dryer vent. Valley must have copy of plot-plan prior to scheduling delivery.
3. Concrete footings (Valley requires 6" runners/slab), tie downs anchor and strap installation. Backfilling of all concrete edges, middle & grade pad site for truck access & escape. All sites must be accessible by truck. Backfilling must be completed prior to delivery. Valley does not install tie downs. 2 X 6 pressure treated top plate fastened on prior to delivery. Valley's standard set is 2 blocks, cap & a wedges (18" high); 27" side-wall; adjusted pricing for additional blocks
4. Electrical connections from pedestal (30' or less from home) to electrical panel after home sections are joined together. Your home may have a 220 crossover between 2 sections that will need to be connected at this time. Power (110/220) required at site for set-up; if power is not available, Valley must be notified to plan for use of generators.
5. Call building department for first inspection when our crew has completed their set-up
6. If you ordered T.V. or phone jacks, the cable/satellite and telephone companies need to connect each individual wire drop under the home; the most efficient time to do this is prior to the skirting installation. Gas applications must be converted by a gas provider/technician.
7. Skirting: standard metal, cement board, pressure treated plywood or mortared cement blocking. Skirting needs to have openings for dryer vent, hot water pop-off, A/C conduit, ventilation blocks, crawl space openings and cover, etc. For block-skirting, the perimeter piers and wedges need to be removed. Mark all wedge locations and replace when wall is complete. Install bottom trim & paint to match. Valley provides the trim & paint if the home is ordered "Foundation Ready" (Valley does not install bottom trim nor paint). An additional charge will be required if the home is rolled onto a stem-wall or set higher than a standard 2-block set (see standard attached blocking diagram)
8. Using bright colors, "front door" & "back door" locations must be spray painted on the strips/slab to ensure proper placement
9. Backfill skirting wall to proper grade and install permanent steps at all exterior doors
10. If an air-conditioned or heat-pump has been purchased through Valley, we will schedule the installation upon communication of size/ backfilling completion
11. Call for final occupancy inspection

Signature _____

Date _____



DETAIL A-A
 LONGITUDNAL FOUNDATION DETAILS



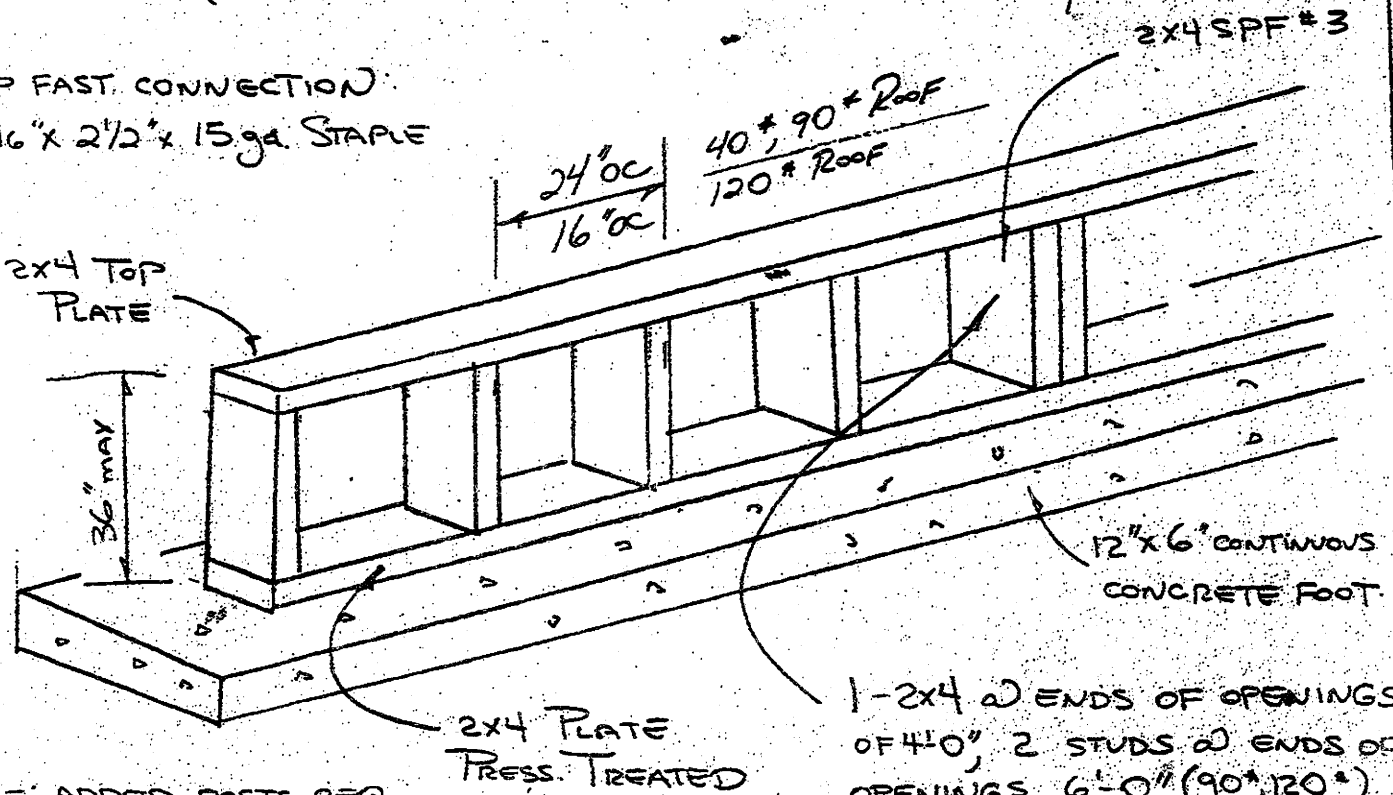
perimeter
Blocking
@ select locations
NOT A FULL WALL

- 8" I-BEAM = 24 1/2 @ PERIMETER (3-8" blocks)
- 10" I-BEAM = 26 1/2 @ PERIMETER (3-8" blocks with a 2" PPHIO BLOCK)
- 12" I-BEAM = 28 1/2 @ PERIMETER (3-8" blocks with a 4" block)

PERIMETER PONEY WALL

(ALT. TO TYP. PERIMETER PIER SUPPORTS - FIG. 4B)

TYP. FAST. CONNECTION:
 - 7/16" x 2 1/2" x 15 ga. STAPLE



NOTE: ADDED POSTS REQ.
 B. POSTS IN WAB* (see f/p)

* WAB = WALK-A-BAY

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TIE-DOWNS REQUIRED PER HOME LENGTH

Floor Length	Tie-Downs Each Side	Tie-Down Spacing
36' - 0"	4	10' - 8"
37' - 4"	4	11' - 1"
38' - 8"	4	11' - 7"
40' - 0"	4	12' - 0"
41' - 4"	4	12' - 5"
42' - 8"	4	12' - 11"
44' - 0"	4	13' - 4"
45' - 4"	5	10' - 4"
46' - 8"	5	10' - 8"
48' - 0"	5	11' - 0"
49' - 4"	5	11' - 4"
50' - 8"	5	11' - 8"
52' - 0"	5	12' - 0"
53' - 4"	5	12' - 4"
54' - 8"	5	12' - 8"
56' - 0"	5	13' - 0"
57' - 4"	5	13' - 4"
58' - 8"	6	10' - 11"
60' - 0"	6	11' - 2"
61' - 4"	6	11' - 6"
62' - 8"	6	11' - 9"
64' - 0"	6	12' - 0"
65' - 4"	6	12' - 3"
66' - 8"	6	12' - 6"
68' - 0"	6	12' - 10"
69' - 4"	6	13' - 1"
70' - 8"	6	13' - 4"
72' - 0"	7	11' - 4"

Start tie-downs at 2'-0" from each end

OUTSIDE runners.

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Use a torque probe with a shaft of sufficient length to test the soil at the depth of the anchor helical plate. Augur the probe into the ground and, following the probe manufacturer's instructions, take the torque wrench reading in the area where the anchors will be installed and at the depth of the anchor helix. If the soil varies in consistency across the site, then use the lowest reading. Based on this reading, consult the anchor manufacturer's charts to select the anchor type(s).

What type of support system will this installation use?

- ▶ For pier and ground anchor, go to **Install Footings**, (p.36)
- ▶ For load bearing perimeter wall, go to **Construct Foundation**, (p.37)

Install Footings

This chapter provides instructions for the design and construction of individual footings that transfer the load from a single pier to the ground. A footing and pier together (discussed in **Set the Home**) is referred to as a "support". A footing may also be designed to carry the load of multiple piers (often called "strip" footings).



Strip footing. For pier support we highly recommend a strip footing configuration. This consists of a series of concrete strips the length of the home at each outside perimeter, and at each mating line. See step 4 for footings.

Follow the Steps below:

- ▼ **STEP 1. DESIGN POINT LOAD SUPPORTS** (p.22)
- ▼ **STEP 2. DESIGN FRAME AND PERIMETER SUPPORTS** (p.26)
- ▼ **STEP 3. SELECT FOOTING MATERIALS** (p.30)
- ▼ **STEP 4. SIZE FOOTINGS** (p.31)
- ▼ **STEP 5. INSTALL FOOTINGS** (p.36)

STEP 1. DESIGN POINT LOAD SUPPORTS

All homes will need supports, and therefore footings, under the frame, marriage line, exterior wall openings and other heavy point loads.

Valley Manufactured Housing, Inc. has provided exterior wall and marriage line pier locations marked with paint on the underside of the floor and marks along the steel frame for these points for your home.

Create a sketch of the home that includes the exterior walls, the frame I-beams and the marriage line(s). The sketch will be used in this chapter to locate

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each support, and note the size of the corresponding footing. **Figure 7** is an example of such a support plan.



High roof loads. For roof loads greater than 40 psf, the maximum opening between marriage line supports may decrease.

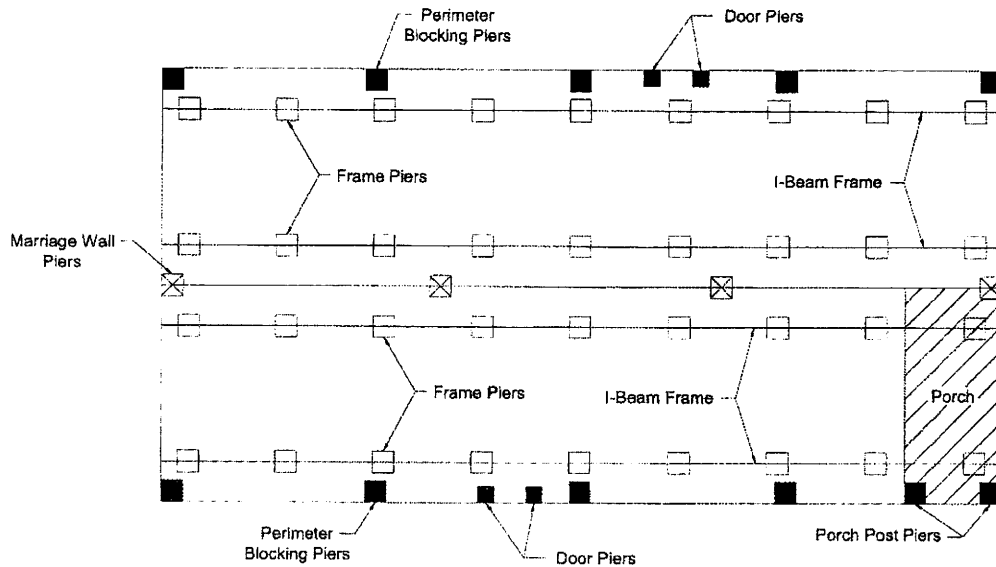


Figure 7
Example support plan

As the location and load for each support is determined, note it on the sketch. When selecting locations for supports, keep in mind that increasing the spacing between supports will increase the load on that support and the size of the required footing.

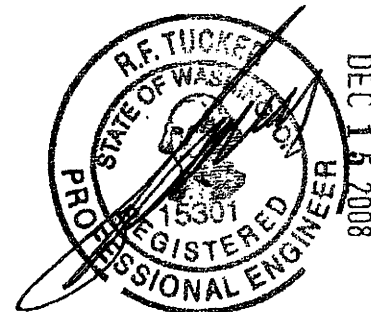


Align supports. Where possible, align perimeter supports with frame supports.

DETERMINE LOCATIONS

Point loads exist where a bearing/structural weight is concentrated and transferred to the foundation at a specific point. Locate a support under each point load, including the following examples:

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- At both sides of exterior doors, patio doors, and sliding glass doors on side walls (blocking is not required at exterior doors on non-bearing end walls).
- Under porch posts, factory installed fireplaces, and fireplace stoves.
- Under jam studs at multiple window openings, and at side wall openings four feet and greater at both sides of each opening (including multiple windows that total four feet wide or more without intermediate supports, even if individual windows are less than four feet).
- Marriage line openings four feet or greater at both sides of each opening (where marriage line openings are greater than 10 feet, intermediate supports must be placed at maximum 8 feet on center).
- Locations where through-the-rim crossover ducts penetrate the rim joist at the marriage line (unless otherwise noted in supplemental documents provided with the home or unless the home is constructed with a perimeter frame system).
- Marriage line columns.
- Load-bearing porch posts.
- Under heavy (400 lbs or greater) items, such as heavy furniture, waterbeds, fireplaces and large fish tanks [located outboard of the home's main I-beams].

Mark the required point load support locations on the sketch. Supports are not required where the manufacturer has reinforced the floor (such as with additional outriggers or floor joists) and so noted in the documentation provided with the home. **Figure 8** and **Figure 9** identify typical point load support locations.

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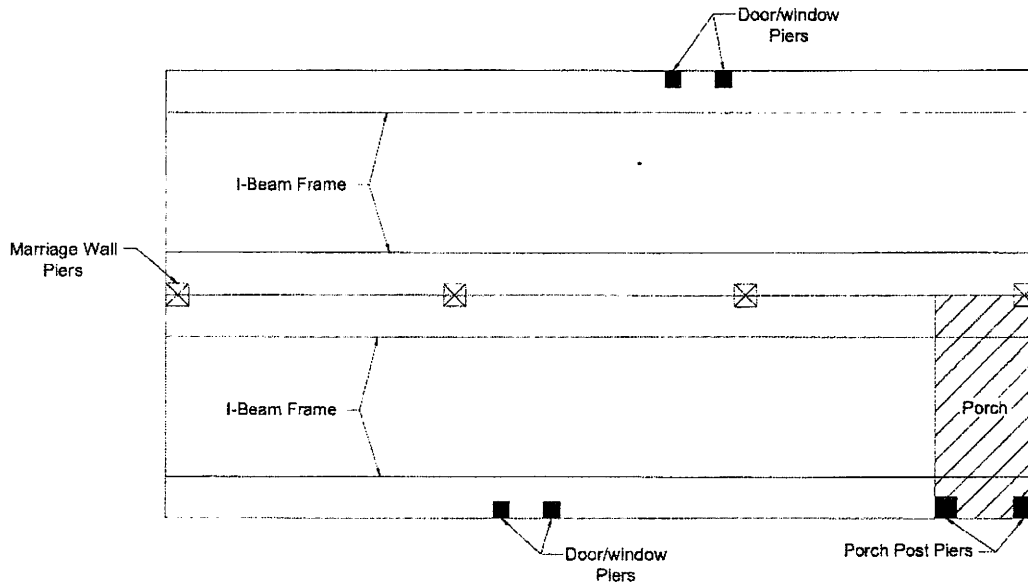


Figure 8
Typical point-load support locations

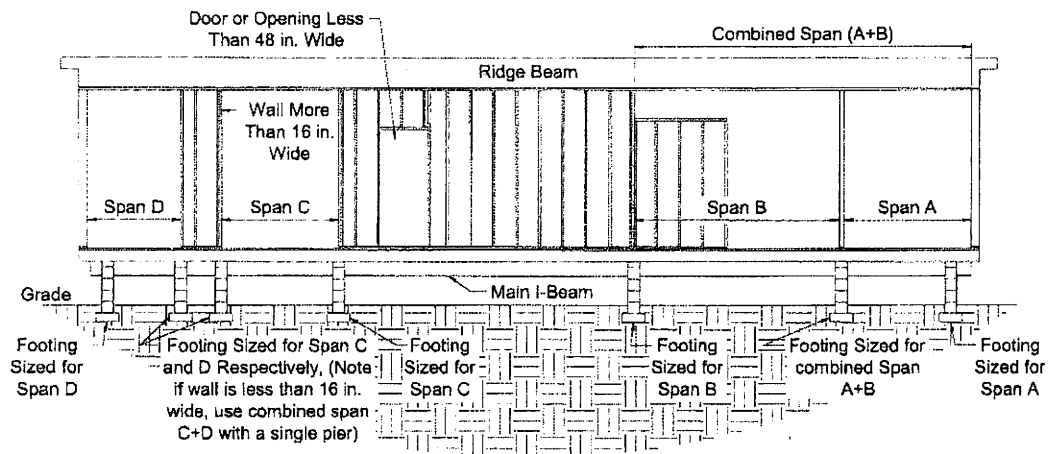
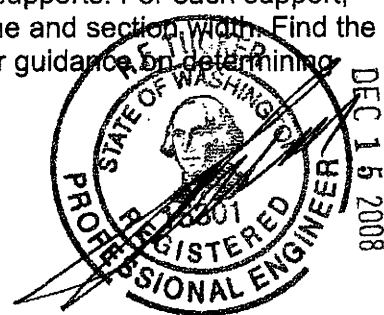


Figure 9
Typical point-load support locations along marriage line

CALCULATE LOADS

Use **Table 2** to determine the loads on point load supports. For each support, find the columns with the appropriate roof load zone and section width. Find the row(s) corresponding to the span (see **Figure 9** for guidance on determining

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spans — if a support is shared by spans on both sides, add the respective loads together to arrive at the total load under that point).

The number in the columns under the "M" and "P" headings are the loads for supports along the marriage line and perimeter respectively (point loads in the center of a section, i.e. not along a marriage line or perimeter wall, require the load in the "P" column). Interpolation for openings between those shown in the table is permitted.

Note the required loads next to each point load support on the sketch.

TABLE 2. LOAD ON POINT-LOAD FOOTINGS

Valley Manufactured Housing, Inc.		Roof Live Load Rating					
		North (40 psf)		Other (65 psf)		Other (120 psf)	
Location*		M	P	M	P	M	P
Span in Feet	4	3411	1905	4744	2672	7677	4359
	8	6821	3811	9488	5344	15354	8717
	10	8526	4763	11860	6680	19193	10896
	12	10232	5716	14232	8016	23032	13076
	14	11937	6668	16603	9352	26870	15255
	16	13642	7621	18975	10688	30709	17434
	18	15347	8574	21347	12024		19614
	20	17053	9526	23719	13360		21793
	22	18758	10479	26091	14696		23972
	24	20463	11432	28463	16032		26152
	26	22168	12384	30835	17367		28331
	28	23874	13337		18703		30510
	30	25579	14289		20039		
	32	27284	15242		21375		
	34	28989	16195		22711		
36	30695	17147		24047			

M = Marriage line column supports, P = Perimeter at openings 48" and greater

** Marriage line piers have roof live load included for nominally spaced pier loads see Table 3.

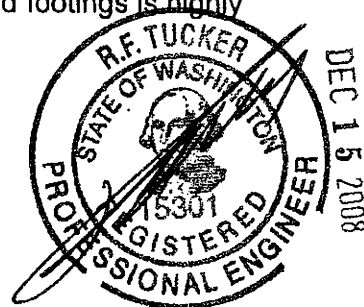
The information in the chart above is based on the following dead loads:
 Roof – 10 PSF, Floor – 6 PSF, Wall – 35 PLF, Chassis Beam – 10.8 PLF

STEP 2. DESIGN FRAME AND PERIMETER SUPPORTS

DETERMINE LOCATIONS

All homes built by Valley Manufactured Housing, Inc. require regularly spaced perimeter supports along all of the sidewalls and marriage walls in addition to frame supports. Utilizing 6" thick concrete spread footings is highly recommended (see Figure 10).

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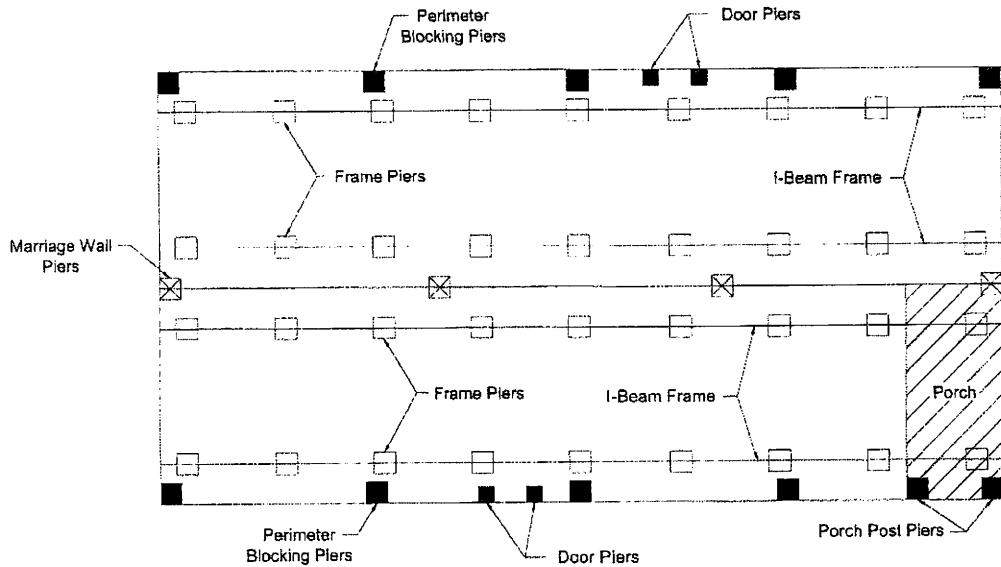


Figure 12
Example support plan

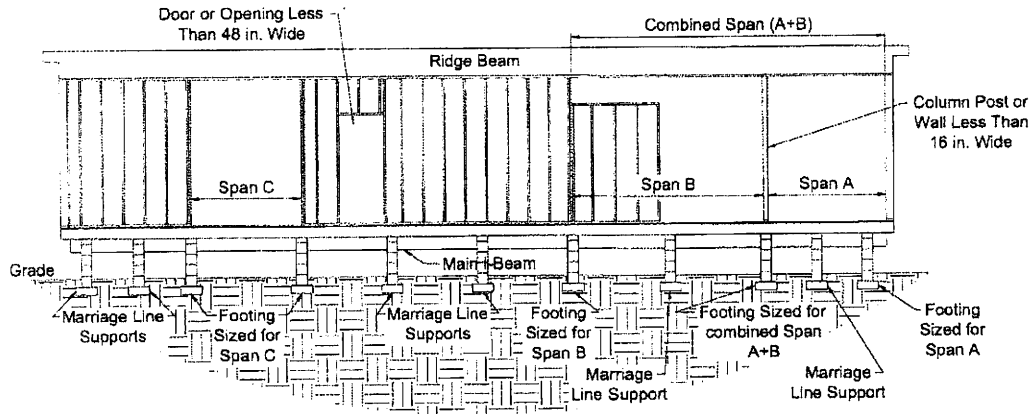


Figure 13
Typical marriage line support locations

CALCULATE LOADS

Use **Table 3** to determine the loads on frame and perimeter supports for homes requiring perimeter blocking. Find the column with the appropriate roof load (**Table 3**) and section width. Find the group of rows corresponding to the selected support spacing. The values in the intersecting cells are the loads for the frame, perimeter and marriage line supports respectively. Loads on supports of a given type (frame, perimeter or marriage) can be assumed to be equal if

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support spacing is equal. However, if different support spacings are used then each support with a different spacing should be calculated separately. Note the location and load required of each support on the sketch.

TABLE 3. LOAD ON FRAME AND PERIMETER SUPPORTS

Valley Manufactured Housing, Inc.		Roof Load Zone		
Maximum Spacing	Location	North 40 psf	65 psf	120 psf
4 ft	Frame	1038	1038	1038
	Perimeter	1905	2672	4359
	Marriage	744	744	744
6 ft	Frame	1557	1557	1557
	Perimeter	2858	4008	6538
	Marriage	1116	1116	1116
8 ft	Frame	2076	2076	2076
	Perimeter	3811	5344	8717
	Marriage	1488	1488	1488

** Marriage line pier loads do not include roof live load. See table 2 for marriage line piers with roof live loading.

The information in the chart above is based on the following dead loads:
Roof – 10 PSF, Floor – 6 PSF, Wall – 35 PLF, Chassis Beam – 10.8 PLF

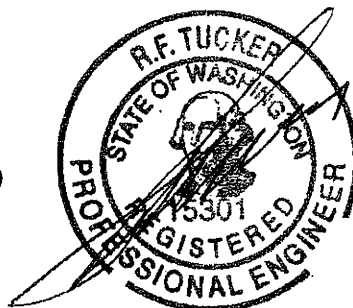
STEP 3. SELECT FOOTING MATERIAL

Select one of the products and materials from **Table 4** for the footings.

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TABLE 4. FOOTING MATERIALS

Material	Appropriate Use	Specification
Poured Concrete	All Soil Types	Minimum 6" thick poured in place concrete runners, pads, or slabs with at least a 28 day compressive strength of 3,000 psi. Cast-in-place concrete footings may also require reinforcing steel based on acceptable engineering practice, the design loads, and site soil conditions.
Pre-cast Concrete	All Soil Types	Minimum 4" thick nominal precast concrete pads meeting or exceeding ASTM C 90-02a, Standard Specification for Load Bearing Concrete Masonry Units, without reinforcement, with at least a 28 day compressive strength of 2,500 psi
ABS Plastic	Stable Soils	Use in accordance with the pad manufacturer's instructions. Must be certified for use in the soil classification at the site, listed and labeled for the required load capacity.
Proprietary Systems	Consult System Manufacturer	Consult system manufacturer

Will footings be concrete?

► **YES**, go to **STEP 4, SIZE FOOTING**, (p.31).

► **NO**, see footing system manufacturer's instructions, then go to **Set the Home** (p.40).

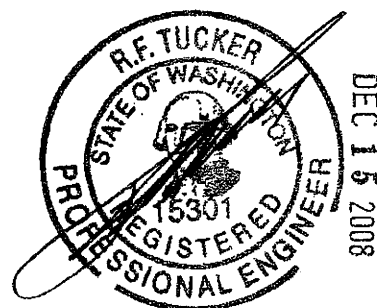
STEP 4. SIZE FOOTINGS

Once the load on the footing and the soil bearing capacity are known, calculate the size of each footing as follows:

- 1) From **Table 7** determine if the pier is to be of single stack blocks (8 inch x16 inch) or double stack blocks (16 inch x 16 inch) pier.
- 2) Locate the group of rows in **Table 5** with the soil bearing capacity determined in **Prepare the Site, STEP 5. DETERMINE SOIL BEARING CAPACITY AND FROST LINE** (p. 13). Use the next lowest value if the exact value does not appear.
- 3) Read across the table to determine the minimum required footing area and the minimum footing thickness for the corresponding footing type (single or double stacked blocks).

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- 4) The required footing size may be changed by selecting another support spacing (Table 2 or Table 3).

TABLE 5. FOOTING DIMENSIONS (for dry stacked single 8 in x 16 in blocks)

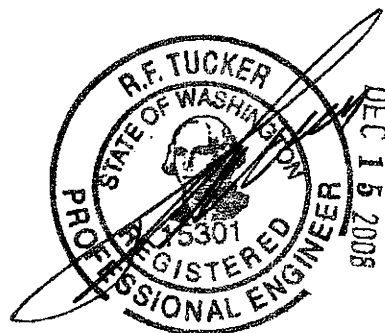
Minimum Footing Size (in)	Minimum Footing Size (sq in)	Footing Thickness (in)	Footing Capacity-Soil Bearing Capacity				
			1000	1500	2000	2500	3000
12 x 16	192	6	953	1620	2287	2953	3620
12 x 18	216	6	1108	1858	2608	3358	4108
12 x 20	240	6	1262	2095	2928	3762	4595
12 x 22	264	6	1416	2333	3249	4166	5083
12 x 24	288	6	1570	2570	3570	4570	5570
24 x 14	336	6	1878	3045	4212	5378	6545
24 x 16	384	6	2187	3520	4853	6187	7520
24 x 18	432	6	2495	3995	5495	6995	8000
24 x 20	480	6	2803	4470	6137	7803	
28 x 20	560	6	3317	5262	7206	8000	
24 x 24	576	8	3320	5320	7320		
24 x 26	624	8	3620	5787	7953		
24 x 28	672	8	3920	6253	8000		
24 x 34	816	8	4820	7653			
36 x 24	864	8	5120	8000			
36 x 26	936	8	5570				
36 x 28	1008	8	6020				
36 x 30	1080	8	6470				
36 x 32	1152	8	6920				
36 x 36	1296	8	7820				

Note: The capacity values listed have been reduced by the dead load of the pier and concrete footing.

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TABLE 5. FOOTING DIMENSIONS (for dry stacked double 8 in x 16 in blocks)

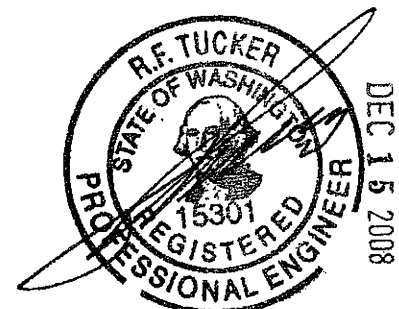
Minimum Footing Size (in)	Minimum Footing Size (sq in)	Footing Thickness (in)	Footing Capacity-Soil Bearing Capacity				
			1000	1500	2000	2500	3000
24 x 16	384	6	1907	3240	4573	5907	7240
24 x 18	432	6	2215	3715	5215	6715	8215
24 x 20	480	6	2523	4190	5857	7523	9190
24 x 22	528	6	2832	4665	6498	8332	10165
24 x 24	576	6	3140	5140	7140	9140	11140
24 x 26	624	6	3448	5615	7782	9948	12115
24 x 28	672	6	3757	6090	8423	10757	13090
28 x 28	784	6	4476	7198	9921	12643	15365
24 x 34	816	8	4540	7373	10207	13040	15873
36 x 26	936	8	5290	8540	11790	15040	16000
36 x 28	1008	8	5740	9240	12740	16000	
36 x 30	1080	8	6190	9940	13690		
36 x 32	1152	8	6640	10640	14640		
36 x 36	1296	8	7540	12040	16000		
36 x 38	1368	8	7990	12740			
36 x 44	1584	8	9340	14840			
44 x 44	1936	10	11540	16000			
48 x 40	1920	10	11107				
48 x 42	2016	10	11690				
48 x 46	2208	10	12857				
48 x 48	2304	10	13440				
52 x 46	2392	10	13975				

Note: The capacity values listed have been reduced by the dead load of the pier and concrete footing.

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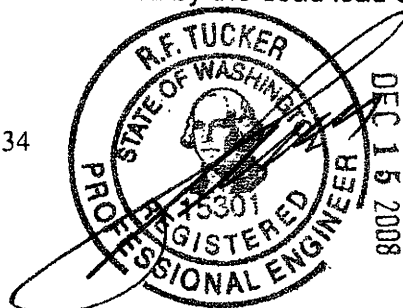
TABLE 5. FOOTING DIMENSIONS (for fully grouted quadruple 8 in x 16 in blocks)

Minimum Footing Size (in)	Minimum Footing Size (sq in)	Footing Thickness (in)	Footing Capacity-Soil Bearing Capacity				
			1000	1500	2000	2500	3000
24 x 26	624	6	2608	4775	6942	9108	11275
24 x 28	672	6	2917	5250	7583	9917	12250
28 x 28	784	6	3636	6358	9081	11803	14525
24 x 34	816	8	3700	6533	9367	12200	15033
36 x 26	936	8	4450	7700	10950	14200	17450
36 x 28	1008	8	4900	8400	11900	15400	18900
36 x 30	1080	8	5350	9100	12850	16600	20350
36 x 32	1152	8	5800	9800	13800	17800	21800
36 x 36	1296	8	6700	11200	15700	20200	24700
36 x 38	1368	8	7150	11900	16650	21400	26150
36 x 44	1584	8	8500	14000	19500	25000	30000
44 x 44	1936	10	10700	17422	24144	30000	
48 x 42	2016	10	10850	17850	24850		
48 x 46	2208	10	12017	19683	27350		
48 x 48	2304	10	12600	20600	28600		
52 x 46	2392	10	13135	21440	29746		
52 x 48	2496	10	13767	22433	30000		
52 x 50	2600	10	14399	23426			
52 x 52	2704	10	15031	24419			
58 x 48	2784	10	15517	25183			
58 x 50	2900	10	16222	26291			
58 x 52	3016	10	16926	27399			
58 x 54	3132	10	17631	28506			
58 x 56	3248	10	18336	29614			
58 x 58	3364	10	19041	30000			
64 x 54	3456	10	19600				
64 x 56	3584	10	20378				
64 x 58	3712	10	21156				
64 x 60	3840	10	21933				
64 x 62	3968	10	22711				
64 x 64	4096	10	23489				
70 x 62	4340	12	24218				
70 x 64	4480	12	25044				

Note: The capacity values listed have been reduced by the dead load of the pier and concrete footing.

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Design footings to comply with the following additional requirements:

- Design each footing at least slightly larger than the base of the pier it supports.
- To keep footings directly under I-beams and other support points, size them slightly larger than the minimum required area to allow slight adjustment of the pier location during home installation.
- Design footings with a footing extension (projection beyond the base of the pier) no greater than the footing thickness (Figure 14). Increase footing thickness if necessary.

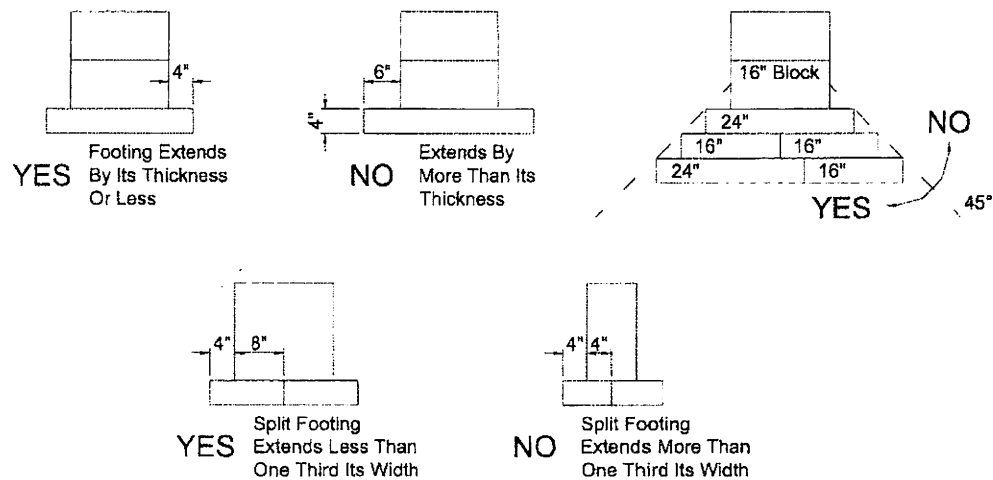


Figure 14
Maximum footing extensions

- The footing sizes shown are for square pads and are based on the surface area (square inches). Design non-square footings such that the area and depth is equal to or greater than the area and depth of the square footing shown in Table 5, and the distance from the edge of the pier to the edge of the footing is not more than the thickness of the footing.
- For four inch thick un-reinforced pre-cast concrete footings, use the minimum footing size for the six inch cast-in-place footing from Table 5.

R A D C O FEDERAL MANUFACTURED HOUSING CONSTRUCTION & SAFETY STANDARDS APPROVED 07 12/16/2008

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DEC 15 2008

STEP 5. INSTALL FOOTINGS

Construct the footings as follows:

- Maintain the distance between adjacent piers to within 10% of the tabulated spacing and so the average distance between piers is equal to or less than the tabulated spacing.
- Whenever possible, place point load supports directly under the required locations. If plumbing, electrical, mechanical equipment interferes, place supports no more than 6 inches in either direction of the support point.
- Recess perimeter blocking supports and perimeter point load using lumber blocking supports no more than 10 inches from the edge of the floor with added support as shown in Figure 15.

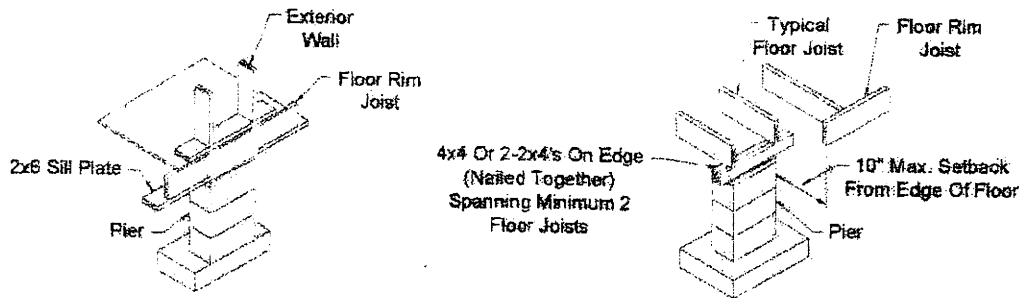


Figure 15
Perimeter supports

- If footings are rectangular, orient them so that the long side is perpendicular to the home's I-beam.
- Place the bottom of footings on undisturbed soil or fill compacted to at least 90% of its maximum relative density.
- In freezing climates protect footings from the effects of frost heave in accordance with any LAHJ requirements (see **Prepare the Site**, p.14). Place the bottom of the footings below the frost line (insulated foundations and monolithic slabs are other frost protection options not covered in this manual).
- All lumber in contact with a monolithic concrete or masonry pier (a single one piece pier or foundation wall in contact with the ground) must be pressure treated.
- Make sure the top surface of the footing is level, flat and smooth.

