

Decks



Village of Hoffman Estates

Code Enforcement
1900 Hassell Road
Hoffman Estates, IL 60169
(847) 781-2631

www.hoffmanestates.org/permits

Submittal Requirements:

- A plat of survey must be submitted with the deck location and scaled dimensions. Setbacks from the property lines, principal structure, and other structures should also be indicated.
- A scope of work or contract must be submitted.
- A framing plan must be submitted.
 - If attached to a house, indicate exterior finish of home (brick, siding, etc.) and method of attaching the deck to the house.
 - Specify overall dimensions of the deck, including post and beam locations with dimensions indicating beam spans between posts and clear span of joists. Also, specify the type and direction of decking as well as the nominal lumber sizes of all joists, beams, and posts.
 - Indicate the location of basement window wells, hose bibbs, electric, and gas.
 - Provide a detail of the stair width, tread depth, riser height, handrail and guardrail details.
 - Computer-generated framing plans from retail outlets that fail to provide the required information will not be accepted.
 - Decks associated with swimming pools have special requirements for maintaining the pool barrier.

Code Requirements:

- Piers
 - Minimum depth is 42" below grade.
 - Shall be sized to carry the load imposed (see table 3 for maximum load occupancy).
 - Piers placed in the over dig of the foundation (assumed 5 feet from house wall) must be placed at footing depth.
- Posts
 - Shall be water resistant or pressure treated lumber.
 - Shall be secured on top of concrete piers.
 - Are not permitted to be installed below grade.
- Beams
 - Splices in beams shall be made over a post or pier and splices in beams mid-span are prohibited.
 - All beams must be fastened together and bear directly on a post.
 - Beams shall be sized per Table 1.
- Floor Joists
 - Floor joists must be a maximum of 16" on center spacing when using 5/4 nominal lumber for the decking.
 - Joists may bear directly on beam or joist hangers shall be used to secure joists to beams.
 - Must be rated at 40 PSF live-load using pressure-treated lumber and shall be sized per Table 2.
- Stairs
 - 7 3/4" maximum riser height and 10" minimum tread width. All treads must be the same depth.
 - All risers must be the same height.
 - Solid risers are required unless the opening is less than 4".
 - Guardrails are required at all stairs with 4 or more risers and handrails must return (see figure 2).

- Guard Rails
 - Must prevent the passage of a 4" sphere and maximum spacing between balusters and intermediate rails must be less than 4".
 - Must be 36" in height.
- Ledger Board
 - Shall be the same size lumber as the joist it is supporting.
 - Ledger board shall be installed using a minimum of 1/2" lag screws (washers required) or 1/2" bolts (washers required).
 - Bolts or lag screws with washers shall be placed 2" in from the bottom, top, or ends of the deck ledgers.
 - Siding at the ledger board location must be removed prior to the installation of the ledger board.
 - Ledger board shall be at least the same dimension as the joist attached to it (a 2 x 8 joist requires a 2 x 8 ledger board) and shall be attached to the structure with a minimum 1/2" lag screw or bolt (washers required) spaced 10" – 30" on center, depending on the joist span, placed in a staggered pattern.
 - Deck ledgers shall not be supported on stone/masonry veneer or any cantilever of the structure.
- Other Requirements
 - Joist hangers shall be installed by the use of approved nails or screws approved by the hanger manufacturer.
 - Deck must be designed to support a 40 – pound per square foot live load.
 - Guardrails greater than 42" in height are considered privacy screening and are limited to 40 linear feet.
 - The location of the deck on the property must meet all zoning requirements (contact Code Enforcement for details).
 - Structures must be kept out of areas designated as utility, open space, or drainage easement on the Plat of Survey for a property.

Inspection:

- A location/pier inspection is required prior to pouring concrete.
 - A framing inspection after the structure is complete prior to the placing of the decking is required. Stairs do not need to be installed at the time of inspection.
 - A final inspection is required upon completion of work.
 - Additional inspections may be required.
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Table 1: Deck Beam Spans (ft. – in.)

SIZE ^a	DECK JOIST SPAN LESS THAN OR EQUAL TO: (feet)						
	6	8	10	12	14	16	18
2 – 2 × 6	6-11	5-11	5-4	4-10	4-6	4-3	4-0
2 – 2 × 8	8-9	7-7	6-9	6-2	5-9	5-4	5-0
2 – 2 × 10	10-4	9-0	8-0	7-4	6-9	6-4	6-0
2 – 2 × 12	12-2	10-7	9-5	8-7	8-0	7-6	7-0
3 – 2 × 6	8-2	7-5	6-8	6-1	5-8	5-3	5-0
3 – 2 × 8	10-10	9-6	8-6	7-9	7-2	6-8	6-4
3 – 2 × 10	13-0	11-3	10-0	9-2	8-6	7-11	7-6
3 – 2 × 12	15-3	13-3	11-10	10-9	10-0	9-4	8-10

Table 2: Joist Spans (ft.-in.)

SIZE	SPACING OF DECK JOISTS WITH NO CANTILEVER ^b (Inches)			SPACING OF DECK JOISTS WITH CANTILEVERS ^c (Inches)		
	12	16	24	12	16	24
2 × 6	9-11	9-0	7-7	6-8	6-8	6-8
2 × 8	13-1	11-10	9-8	10-1	10-1	9-8
2 × 10	16-2	14-0	11-5	14-6	14-0	11-5
2 × 12	18-0	16-6	13-6	18-0	16-6	13-6

Figure 1

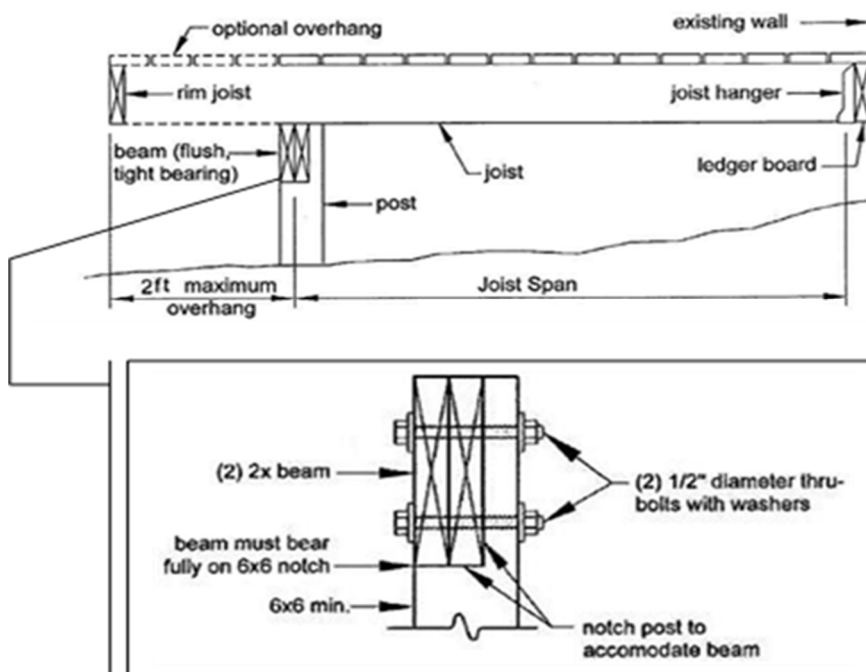
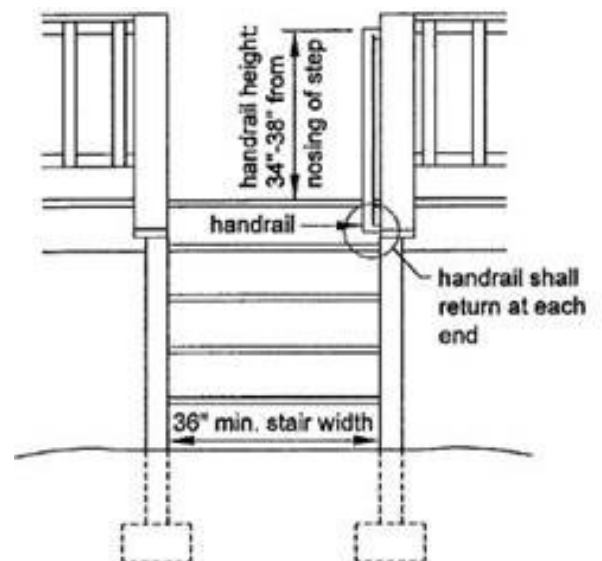


Figure 2



CALCULATING THE CORRECT PIER DIAMETER

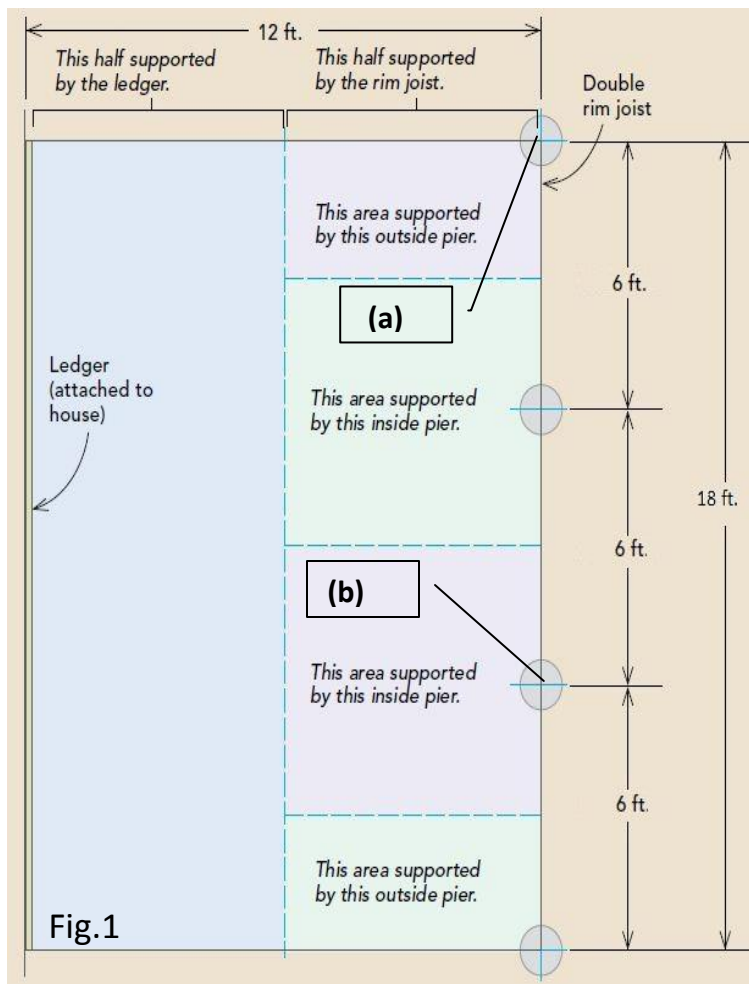
Concrete piers are used to transfer the deck's weight to the ground. To be effective, they need to be sized and spaced according to the deck's design load and the soil's bearing capacity. In cold climates, piers need to be placed below the frost line to prevent frost heaves. The frost line used in Hoffman Estates is 42 inches below grade.

How many and what size?

Three things affect the number and the size of piers you use:

1. The way you frame the deck.
2. The weight the deck is designed to carry. In Hoffman Estates decks must be designed to carry 50 lb. per sq. ft. (psf); (40 psf live load, 10 psf dead load).
3. The load-bearing capacity of the soil (assume 3,000 pounds for Hoffman Estates).

How to calculate the load?



As indicated in the deck design shown in fig.1, using 4 piers allows a span of roughly 6 ft. The maximum weight each pier must carry is based on its location of the deck. To determine the load of a deck pier, you must take half the length of the joist span multiplied by half the length of the beam span (measured from pier to pier). This number is then multiplied by 50, which is the 40 psf live load, 10 psf dead load mentioned earlier. This is the amount of weight that must be supported by the pier.

Using figure 1 and location (a), half the joist span is 6 feet (12 feet divided by 2) and half the beam span is 3 (6 feet divided by 2). Now multiply by 50 (total load). The total load needed to be carried by pier (a), equals 900 pounds. The same calculation can be used to figure the weight for pier (b), however instead of using 3 feet for the beam span you must use 6 feet to adjust for half the span in both directions. Therefore the length of the joist 12 divided by 2 = 6, multiplied by the length of the beam 6 = 36. Multiply 36 by the total load 50 = 1800 pounds. Using the examples, pier (a) is holding a total load of 900 pounds while pier (b) is carrying a total load of 1,800 pounds. Once the total load of each pier has been calculated, it is time to determine what size pier is needed. Using the chart in figure 2, determine the diameter of the pier needed to carry the load. In the example pier (a) was carrying a total load of 900 pounds, therefore an 8 inch diameter pier (.35 X 3000) would be sufficient. In the second example pier (b) was carrying an 1800 pound load, therefore a 12 inch pier (.79 X 3000) would be needed. If poor soil conditions are found in your area adjust the soil capacity accordingly.

Square foot diameter equivalent of a pier				
Diameter In inches	Square Foot multiplier		Soil Capacity In pounds	Total load In pounds
6	.20	X	3,000	600
8	.35	X	3,000	1050
10	.55	X	3,000	1650
12	.79	X	3,000	2370
14	1.1	X	3,000	3300

Fig. 2

Plat of Survey

The plat (as it is commonly called) is the legal description of the property, which indicates the size and shape of the land. This document is normally given to the homeowner at the closing of the house and should be kept for future reference.

