

HOW-TO BOOKLET #3133

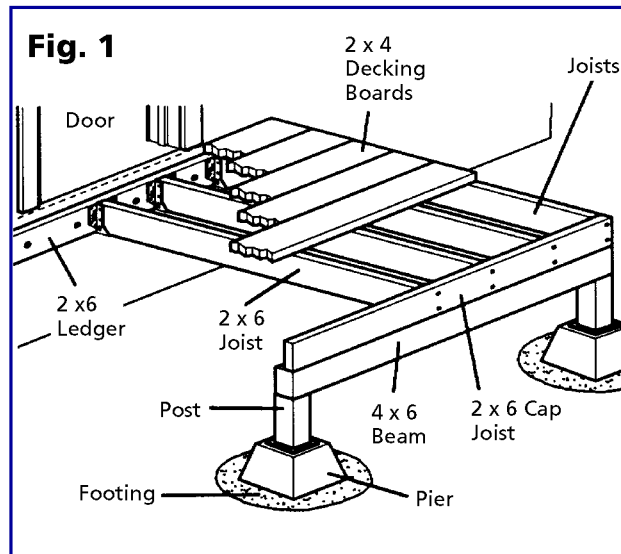
ATTACHED DECKS



TOOL & MATERIAL CHECKLIST

- Premixed Concrete
- Nails/Decking Screws
- Chalk Line/Twine
- Level/Line Level
- Wheelbarrow
- Circular Saw
- Adjustable Wrench
- Rot-Resistant Lumber
- Metal Connectors
- Tape Measure
- Shovel/Rake/Hoe
- Hammer
- Drill/Screw Gun
- Framing/Combination Square

Read This Entire How-To Booklet for Specific Tools and Materials Not Noted in the Basics Listed Above



A wood deck is basically an outdoor floor structure (**Fig. 1**). Design options include steps, railings, benches, and overhead shade structures (see How-To Booklets #3111 and #3112). This booklet shows how to build a simple low-level deck attached to the house.

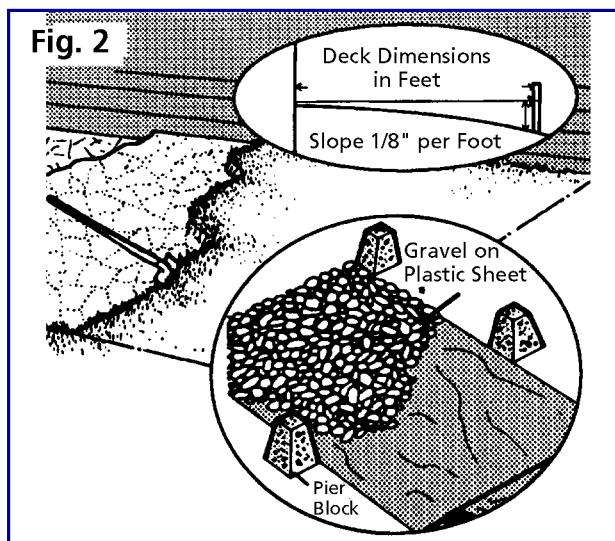
You may need a building permit to construct your deck, as well as any design options. Check with your local building department or community planning commission.

PREPARE THE SITE

- 1** Remove any plantings, sod, loose topsoil, big rocks, and other debris from the site (**Fig. 2**).
- 2** Provide truck access, if required, and clear a spot to store lumber and materials.
- 3** The ground should slope away from the house about 1/8" per foot to provide drainage. Angle the downspouts of roof gutters to direct runoff away.
- 4** To prevent weeds from growing under the deck after it's finished, cover the soil with 4 to 6 mil. black plastic, topped with 2 to 4 inches of gravel. This is best done after you've set the piers.

INSTALL THE LEDGER

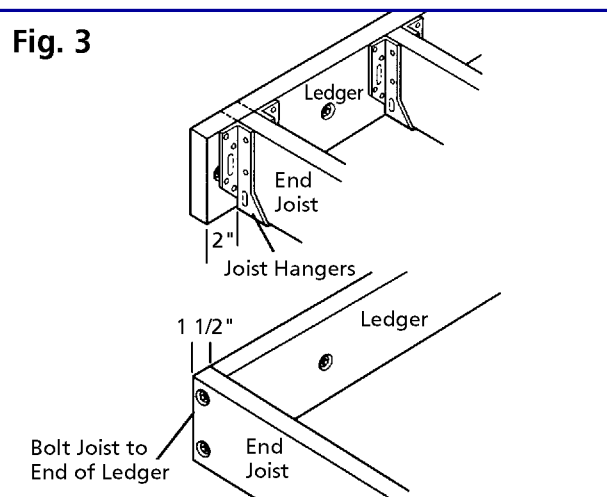
Fasten the ledger to the house wall. The ledger takes the place of piers, posts, and/or beams on one side of the deck and anchors the deck to the house. If attaching beams or joists directly to the piers, the



height of the ledger above ground will determine how much the pier must extend above ground. For higher decks, use the ledger as a guide to determine post heights. In both cases, the finished deck should slope away from the house about $1/8$ " per foot to allow for water runoff. Usually the ledger and joists are the same size lumber. However, local codes may specify ledger size. Cut the ledger either a bit longer or a bit shorter than the proposed width of the deck, depending on how you attach the end joists to the ledger. If you use joist hangers for the end joists, allow 2" beyond the joist's outside edge to provide nailing for the outer sides of the hanger (Fig. 3).

Conversely, if you're attaching the end joists with nails, screws, or bolts, cut the ledger $1-1/2$ " shorter than the outside dimensions of the deck. Attach the end joists to each end of the ledger, so they butt against the house siding. In this case, the end joists will be $1-1/2$ " longer than the intermediate joists, which you attach to the face of the ledger with nails or joist hangers.

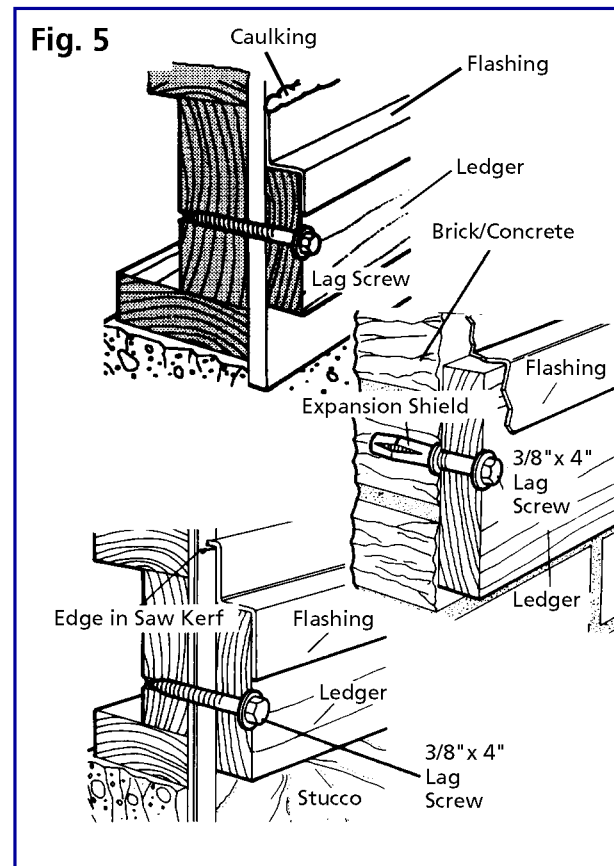
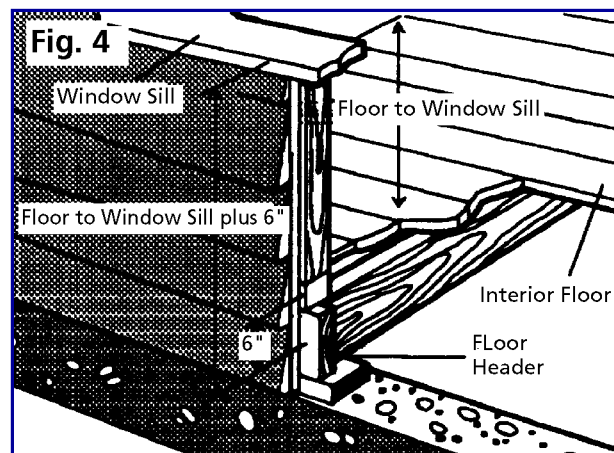
On wood frame construction, the ledger must be attached to the floor header or rim joist, not to the wall studs or exterior siding (Fig. 4). On masonry

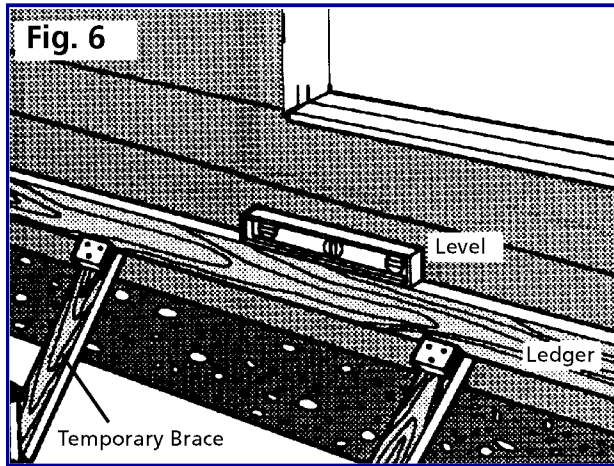


walls, the ledger can be located at any level. In both cases, if the deck adjoins an entry door to the house, position the ledger so that the finished deck will be at least 1" below the inside floor level or door threshold; this will prevent water on the deck from entering the house. If there is no existing opening, measure down from a nearby window sill to the floor inside the house, and transfer the measurement to the outside wall. Then measure down 1" plus the thickness of the decking; this is the top edge of the ledger. In most cases, if the centerline of the ledger is 6" below floor level, it will be directly opposite the floor header.

Attach the ledger as follows:

- 1 On wood frame houses, use lag screws long enough to extend through the ledger and house siding, and well into the house framing.
- 2 For masonry walls, use 4" lag screws and expansion shields (Fig. 5) or stud anchors. Space the lag screws or anchors about 2' apart, in a staggered pattern (one near the top of the ledger, the next near the bottom, the next near the top, and so on). Make sure the bolts or screws don't fall at locations where joists attach to the ledger.

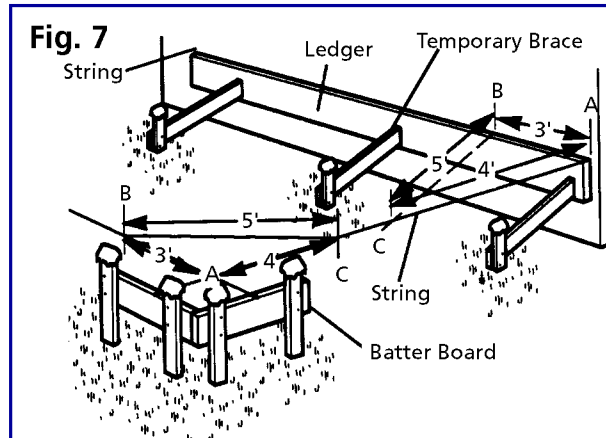




- 3 Position and level the ledger, then support it with temporary braces (Fig. 6).
- 4 Drill holes for screws, then attach the bolts or anchors with a wrench.
- 5 Install metal flashing over the top edge of the ledger to prevent water entry between the ledger and house siding. Before installing the flashing, run a bead of silicone/latex caulk on the siding behind it. Caulk all nail heads in the flashing.
- 6 To attach flashing to stucco, snap a chalk line on the wall about 2" above the ledger. Use a circular saw and a carborundum (masonry) blade to cut a 3/8"-deep saw kerf into the stucco.
- 7 Bend the top of the flashing into the groove; seal with silicone/latex caulk.

LOCATE THE FOOTINGS

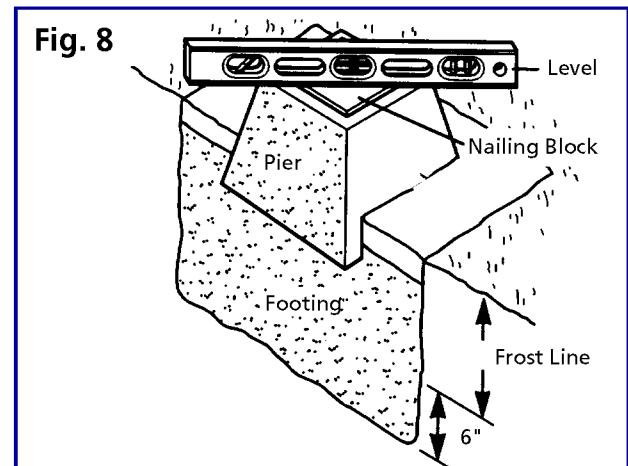
- 1 Set up temporary stakes, string, and batter boards to outline the proposed deck and to locate holes for the footings (Fig. 7).
- 2 Adjust the strings to form 90° angles at each corner of the deck (two of the strings will be at right angles to the ledger). Measure along one string 3' from the intersection (A) and mark (B).



- 3 Mark the second string 4' from the intersection (C).
- 4 Adjust the strings until the distance between B and C is 5'. (Use the 6-8-10 ratio method for large decks.) Repeat for each corner.
- 5 Drive stakes at each outside corner, directly beneath the intersecting strings.

DIG HOLES AND POUR FOOTINGS

- 1 Starting at each outside corner, dig a footing hole directly beneath the intersection of the strings. Dig the remaining perimeter footing holes so that the pier blocks will be 4', on-center.
- 2 To locate the interior footings and piers, stretch additional strings across the deck area, and square them to the perimeter strings.
- 3 After marking all hole locations, temporarily remove the strings to facilitate digging.
- 4 In mild climates, the footing holes needn't be deep, as long as they extend down to firm soil. In firm soil, a 12" x 12" x 8" hole will suffice.
- 5 In areas subject to winter frost heave, the footing should extend 6" below the frost line.
- 6 If the ground beneath the footing is loose, compact it with a hand tamper.



- 7 Mix the concrete and pour it into the footing holes. Pour in enough so that the top of the pour is several inches above ground level. One 90-pound sack makes 2/3 cubic foot of wet concrete, or enough for a 12"x12"x8" footing hole.

SET AND LEVEL THE PIERS

- 1 Reattach the strings and use them as guides to set the piers into the wet footings. The concrete should be firm enough to support the pier without sinking, yet be wet enough to allow for leveling the pier and adjusting it for height.
- 2 Place a level diagonally in two directions across the pier nailing blocks to level the pier (Fig. 8).
- 3 If you will be attaching the beams directly to the piers, the piers must be adjusted for height. Place the pier nailing blocks so the beams allow for a slight slope away from the house.
- 4 Make sure the beam height is in the correct relationship to the ledger. The tops of the pier nailing blocks should be level to each other; place a long, straight board and level across the tops of the blocks and adjust the pier heights.

INSTALL THE POSTS/BEAMS

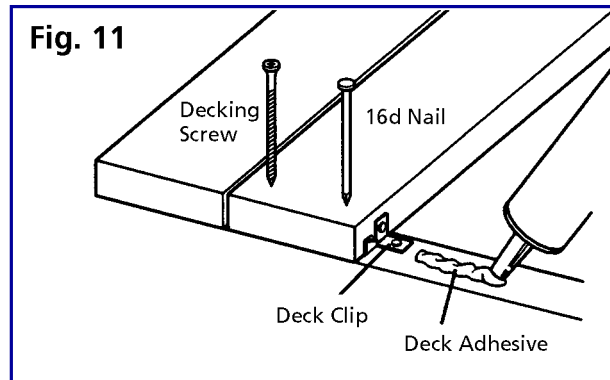
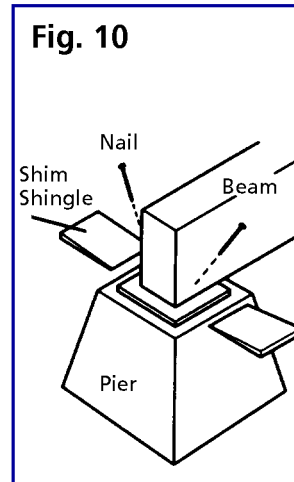
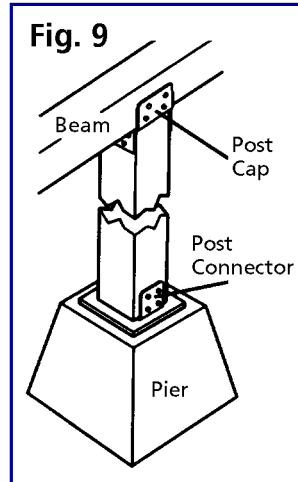
Most low-level decks use 4 x 4 posts, and 4 x 6 beams set on edge. Larger sizes may be required for higher decks or in heavy snow areas.

- 1 If your plan calls for posts, attach them to the piers with post connectors (**Fig. 9**). Nail each connector to the pier's nailing block and bolt the post to it. Use a 2' level to make sure the post is plumb.
- 2 After installing the posts, attach a string and line level to the posts at the desired post height, mark each post, then cut off the post tops with a circular saw. Again, allow for a slight slope away from the house.
- 3 If attaching the beams directly to the pier nailing blocks, you can level them by driving shingle shims between the pier block and beam (**Fig. 10**).
- 4 Toe-nail the beams to the nailing block with 16d galvanized nails. To attach beams to posts, use a connector called a post cap.

INSTALL THE JOISTS

Joists are set on top of the beams and attached to the ledger with joist hangers. You can simplify the job by installing the cap joist first, then cutting the remaining joists to fit between the cap joist and ledger. Joist spacing is typically 24", on-center.

- 1 Starting with an end joist, attach one end of the joist to the ledger with a joist hanger, and the other end to the cap joist.
- 2 Toe-nail the joist to the beams where it crosses. For a stronger connection, use metal saddle anchors.
- 3 Fill in the remaining joists in the same manner, maintaining the desired spacing. The distance between the last two joists can be less, but not greater, than the chosen spacing.
- 4 If you're laying down the decking in a diagonal or herringbone pattern, install



blocks between the joists to support the board ends.

LAY DOWN THE DECKING

Deck boards can be 2 x 4s, 2 x 6s, or 2 x 8s. Attach them to the joists with 3" galvanized decking screws (similar to drywall screws) or 16d galvanized nails. Although more expensive, screws make a stronger connection.

To eliminate visible screw or nail heads, you can use decking adhesive, or use special fasteners called deck clips. Apply decking adhesive to the joists with a caulking gun. Deck clips fasten to the joists between the deck boards (**Fig. 11**).

If the boards aren't long enough to span the entire length of the deck, make sure the spliced ends are supported by a joist, stagger the spliced joints for a neater appearance.

- 1 Fasten the two outside deck boards at opposite ends of the deck, then lay out, space, and fasten the remaining boards. Leave a 1/8" to 1/4" gap between each board.
- 2 Pre-drill all nail or screw holes at the board ends to keep the boards from splitting.
- 3 At each support point, use two nails or screws for 2 x 4s, three for 2 x 6s, and four for 2 x 8s. Use a nail set to countersink nail heads, then fill holes with wood putty.
- 4 When all the deck boards are down, snap a chalk line across the overhanging board ends, slightly past the outside edge of the end joist below. Trim the boards flush using a circular saw (**Fig. 12**).

