

Supplying Power to an Outbuilding

Q. *What's the right way to deliver power to an outbuilding? I'd like to have a panel capable of powering a small shop.*

A. *Rex Cauldwell responds:* An outbuilding should be treated as a separate building, as opposed to an extension of the house. The takeoff point for the cables to the shop should be the home's main service panel or a subpanel (see illustration, below). There should be four cables feeding the shop: hot, hot, insulated neutral, and ground. (There are times when code allows you to use three cables by combining the neutral and ground in one conductor. I don't recommend that, however, and many electricians, including me, refuse to do it because combining the two conductors could result in a hazardous condition, especially for an electrician working on the circuit.)

The code requires an insulated neutral, which means you can't use com-

mon USE (underground service entrance) cable with a bare stranded neutral. You should use four individual insulated cables approved for direct burial. Bury the cables at least 2 feet deep or whatever your local codes and utilities require.

The size of service depends on what loads you're going to have in your shop. I would recommend at least a 50-amp/240-volt service (the same size as your electric stove circuit). Therefore, you'll need two open slots in your service panel.

Typically, you would come out of the back of the panel, through the exterior wall, down along the exterior wall, and then underground. Since you are running individual cables, they need to be in conduit from where they leave the panel until they're underground. I would use plastic conduit, not metal, because plastic is a nonconductor and easier to work with, since you glue the joints. Use at least

1-inch-diameter conduit; that allows extra room inside, which makes handling and pulling the cable easier. To make the turns from horizontal to vertical, use an LB, or elbow. Once the cables are underground, they don't need to be in conduit.

Try to pick an approach to the shop that doesn't take you under sidewalks and paved driveways. Always contact the utility-location company to verify that you're not crossing any underground services.

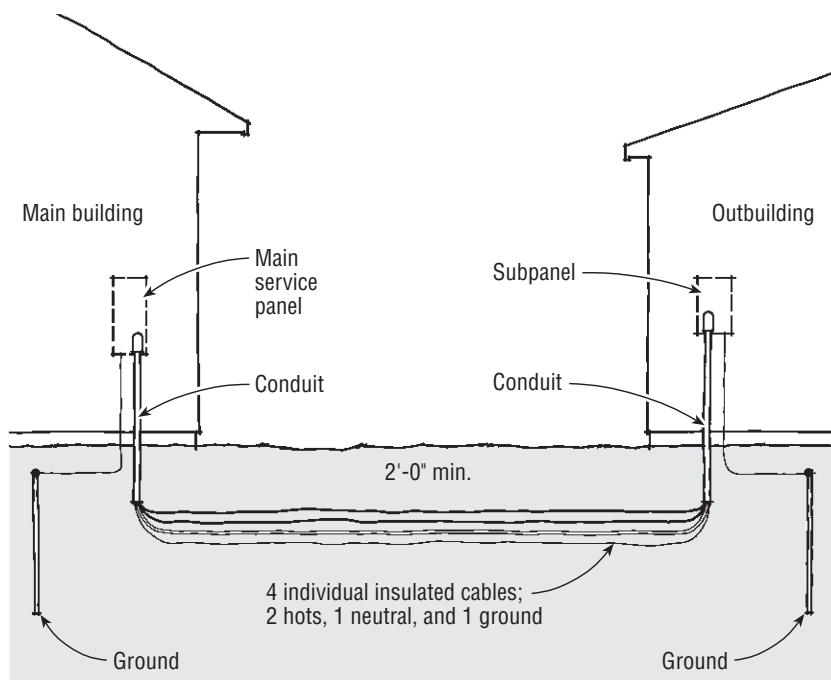
Once at the shop, the cable must again be in conduit as it comes out of the ground, up the wall, and makes a turn into the shop service panel. The shop service panel must have a ground rod (or two) at its location, just like the main service panel at the house.

Rex Cauldwell is a master electrician in Rocky Mount, Va., author of Wiring a House, and a frequent contributor to JLC.

Should Floor Trusses Be Attached to Walls Below?

Q. *What is the proper way to attach an interior basement wall to floor trusses — both perpendicular walls and walls that run parallel with the bottom chord and fall between the trusses. I have been told to nail directly to the trusses, and I have been told to leave a 1/8-inch to 1/4-inch gap between the top plate and the bottom chord.*

A. *Rachel Smith responds:* The proper way to attach the bottom chord to the wall below depends on a few things. If the interior basement wall is load-bearing and the truss is using it as an intermediate support, the truss bottom chord must be directly attached to the wall, no matter what their relative orientations are. Check the truss design drawing from the truss manufacturer



for information on the location and size of the required bearing points.

If the interior basement wall is non-load-bearing and perpendicular to the truss, you can leave a gap between the truss and the wall. However, for the sake of the wall's lateral stability, you may want to have some form of attachment, like a slotted metal anchor at the top of the partition wall, that will allow for vertical movement of the truss. If the truss is parallel and off center to the non-load-bearing wall, you can block the truss space over the wall and make an attachment. But there's no point in doing that if you plan to leave a gap, unless you're installing the slotted anchors.

Supposedly, the gap between the bottom chord and the wall is to allow for vertical movements of the floor (or roof) system and to avoid creating an

“unintentional” bearing wall below. There are a lot of variables that affect how much load the truss will transmit unintentionally to the wall. It goes back to the old engineering adage “Stiffness attracts load,” so the less stiff the support and the truss-bearing location, the less load it will pick up.

The upshot is that in most instances the gap is unnecessary. In fact, in the case of a basement partition wall, a direct attachment is preferable because it may reduce potential floor vibration problems.

Rachel Smith is the director of technical education at the Wood Truss Council of America.

Adequate Compaction

Q. *When compacting a gravel base for a slab, how can you tell when the gravel is compact enough?*

A. *Jay Meunier responds:* The only positive way is to have a Proctor test done. A Proctor test uses special equipment, which a soils engineering firm would have, to measure the percentage of compaction. Typically, though, if the compaction has been done using mechanical compactors in 8- to 12-inch lifts, the compaction should be adequate, as long as the soils underneath are good quality.

Jay Meunier is an estimator for Pizzagalli Construction in Burlington, Vt.

Got a question?

Send it to Q&A, JLC, 186 Allen Brook Ln., Williston, VT 05495; or e-mail to jlc-editorial@hanleywood.com.

