

## Installing Outdoor Wiring: Cutaway View

The outdoor circuit installation shown on the following pages gives step-by-step instructions for installing a simple outdoor circuit for light fixtures and receptacles. The materials and techniques also can be applied to other outdoor wiring projects, such as running a circuit to a garage workshop, or to a detached shed or gazebo.

Your outdoor wiring probably will be different from the circuit shown in this chapter. Refer to the circuit maps on pages 164 to 179 as a guide for designing and installing your own outdoor electrical circuit.

Learn These Techniques  
for Installing Outdoor Wiring

**A: Install weatherproof decorative light fixtures** with watertight threaded fittings (page 288).

**B: Use rigid metal or intermediate metallic conduit (IMC)** with threaded compression fittings (pages 280 to 281) to protect exposed wires and cables.

**C: Install a cast-aluminum switch box** (page 283) to hold an outdoor switch. The box has a watertight coverplate with toggle lever built into it.

**D: Use weatherproof receptacle boxes** made of cast aluminum with sealed coverplates and threaded fittings to hold outdoor receptacles (pages 280 to 281).



**E: Install a retrofit light fixture box** (page 279) to hold a motion-sensor security light. Retrofit boxes are used to install electrical fixtures that fit inside existing finished walls. The box is sealed with a foam gasket that fits between the light fixture and the box.

**F: Run NM cable** (pages 197 to 201, 279) through walls to provide power to electrical boxes that fit inside finished walls.

**G: Install retrofit single-gang boxes** (page 279) to hold a manual override switch for the motion-sensor light and the GFCI receptacle.

**H: Attach a cast-aluminum extension ring** to a retrofit receptacle box (page 280) to hold a GFCI receptacle.

**I: Dig trenches** (pages 276 to 277) to hold underground cables bringing power from the house to yard fixtures.

**J: Install UF (underground feeder) cable** (pages 282 to 283) to bring power from the house to the outdoor fixtures.

**K: Run a feeder cable** to connect the outdoor circuit to the circuit breaker panel (page 280).

### Tools You Will Need

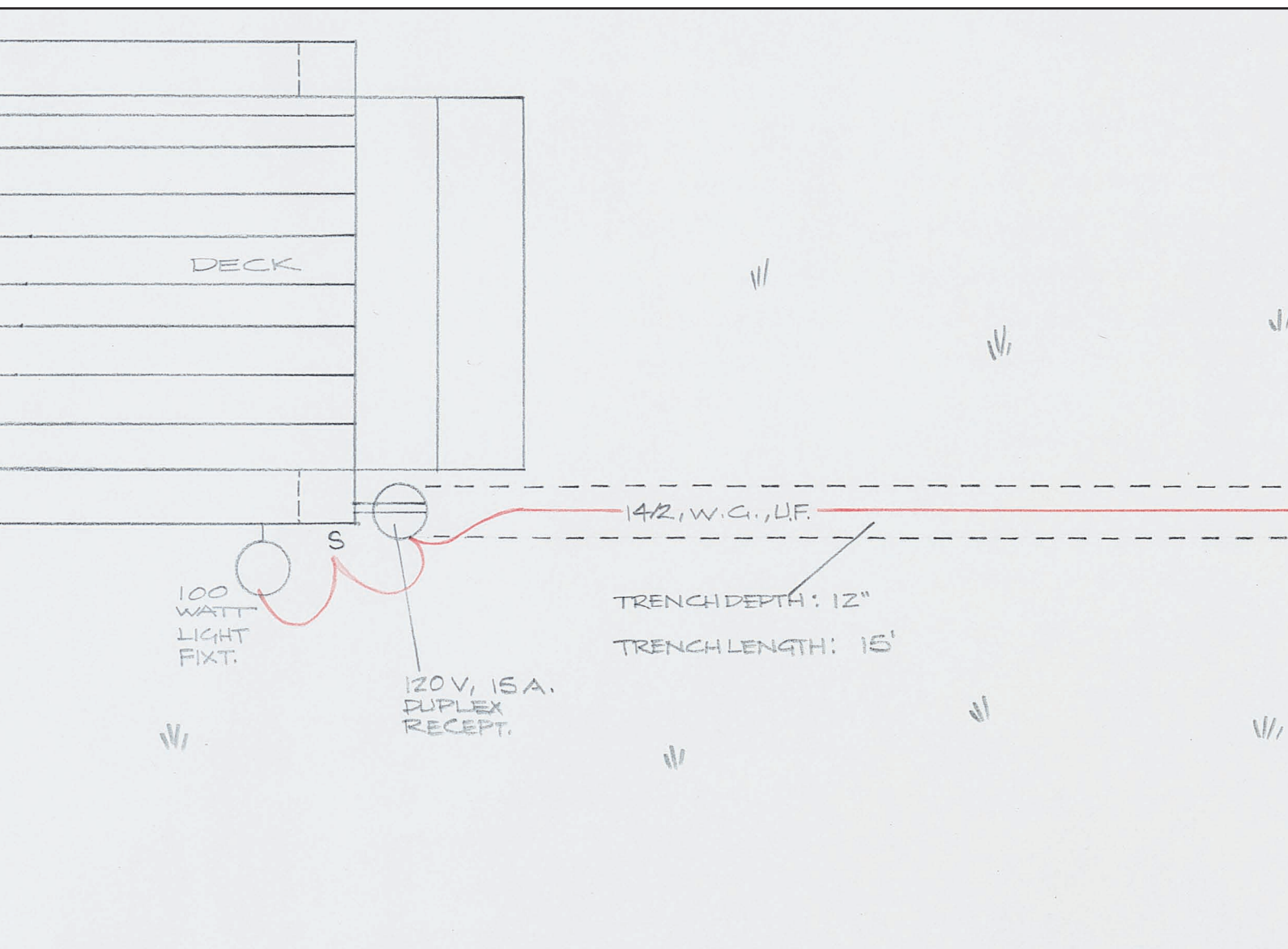
Tape measure, drill with masonry bits and twist bits, jig saw or reciprocating saw, shovel, hammer, screwdriver, caulk gun, ball-peen hammer or masonry hammer, masonry chisel, hacksaw, fish tape, cable ripper, combination tool, utility knife, needlenose pliers, circuit tester.



## Installing Outdoor Wiring: Diagram View

This diagram view shows the layout of the outdoor wiring project featured on these pages. It includes the location of the switches, receptacles, light fixtures, and cable runs you will

learn how to install in this chapter. The layout of your yard and the location of obstacles will determine the best locations for lights, receptacles, and underground cable runs. The wiring



**Yard is drawn to scale**, with the lengths of trenches and cable runs clearly labeled.

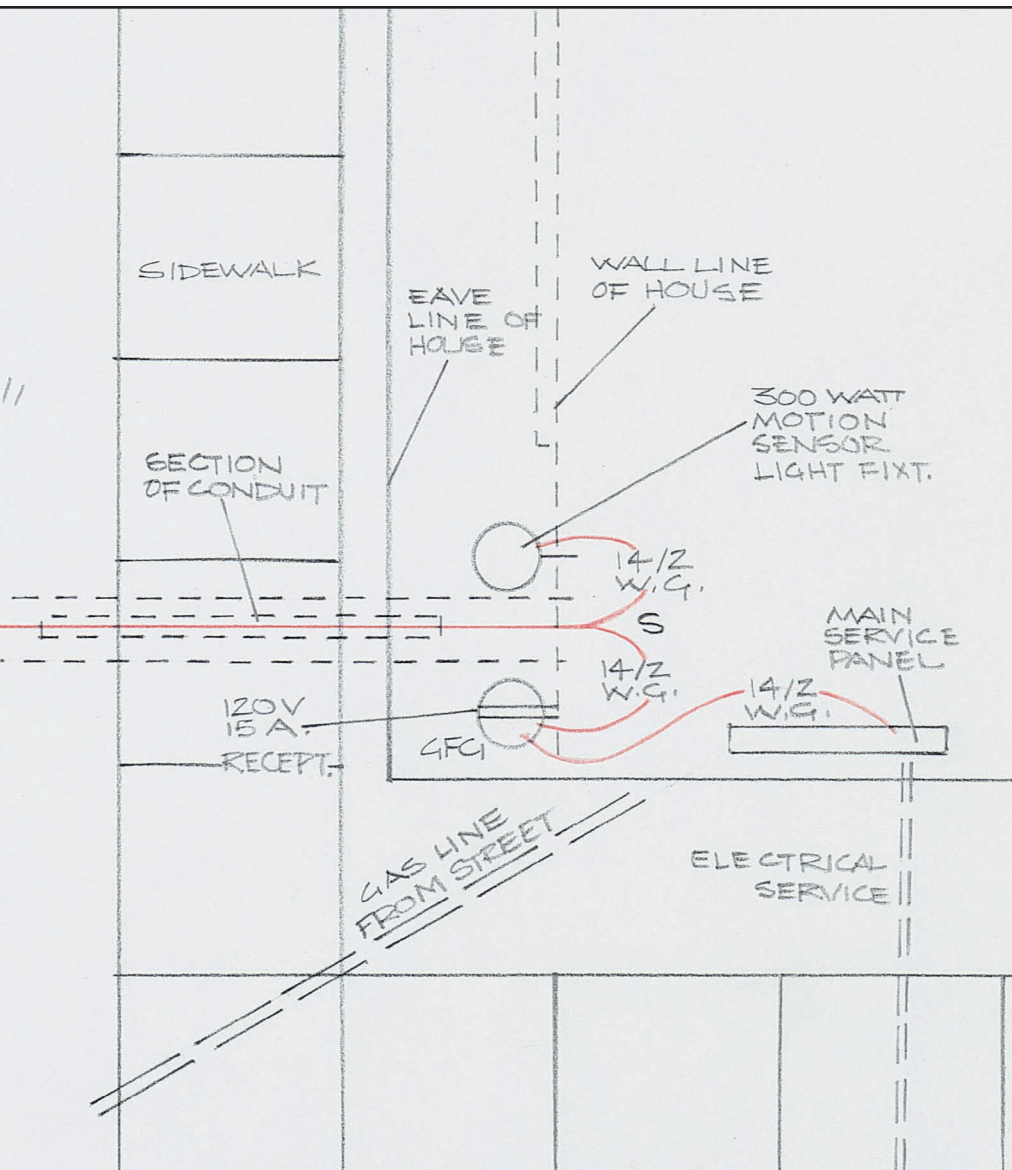
**Decorative light fixture** is positioned to highlight the deck. Decorative fixtures should be used sparingly, to provide accent only to favorite features of your yard, such as flower beds, ornamental trees, or a patio.

**Outdoor receptacle** is positioned on the deck post, where it is accessible yet unobtrusive. Another good location for a receptacle is between shrubs.

diagram for your own project may differ greatly from the one shown here, but the techniques shown on the following pages will apply to any outdoor wiring project.

**Note:**

See page 155 for a key to the common electrical symbols used in this diagram, and to learn how to draw your own wiring diagrams.



**Motion-sensor security light** is positioned so it has a good “view” of entryways to the yard and home, and is aimed so it will not shine into neighboring yards.

**Manual override switch** for motion-sensor light is installed at a convenient indoor location. Override switches are usually mounted near a door or window.

**Entry point** for circuit is chosen so there is easy access to the circuit breaker panel. Basement rim joists or garage walls make good entry points for an outdoor circuit.

**Yard obstacles**, like sidewalks and underground gas and electrical lines, are clearly marked as an aid to laying out cable runs.

**Underground cables** are laid out from the house to the outdoor fixtures by the shortest route possible to reduce the length of trenches.

**GFCI receptacle** is positioned near the start of the cable run and is wired to protect all wires to the end of the circuit.