

to pass the increased flows that result from a newly developed area upstream from your lot are neither simple nor easy. In such cases, you need help.

Some of the sources for assistance and information are: Engineering firms, contractors, city, county, and State engineers, State natural resources agencies, the Extension Service, soil and water conservation districts, and the Soil Conservation Service.

For further reading:

U.S. Department of Agriculture, *First Aid for Flooded Homes and Farms*, Agriculture Handbook No. 38, Superintendent of Documents, Washington, D.C. 20402, 20 cents.

Don't Blow A Fuse! Tips on Electricity

ELECTRIC ENERGY perhaps contributes more to the convenience and high standard of living in the home than any other one item. But if the electrical system is not properly designed, installed, and maintained, it can be a safety and fire hazard as well as a great source of irritation to the homeowner.

Are you planning to build a house, or to purchase or remodel a house, which includes a rewiring job? Have someone from the electric power supplier assist in design of the wiring system, and hire an electrician to install the wiring. Some knowledge of electric systems will be of help when you contract for the installation, and aid you in future maintenance.

To meet all your needs for electric power, install enough lighting and general purpose outlets and circuits. There should be sufficient special purpose circuits to handle those larger appliances which are generally operated in the same location. A rule of thumb is to have lighting branch circuits with a total capacity of 3 watts per square

foot of building area. There should be one 15- or 20-ampere branch circuit for each eight to 10 convenience outlets or duplex receptacles in the house.

The National Electrical Code, a recognized authority, has given guidelines as to needs and safe practices in electrical systems. The code requirements in your own locality may differ in some details. These are minimum requirements for safety and do not necessarily cover adequacy of the wiring for convenience.

Now let's check the wiring system for adequacy. Convenience outlets or duplex receptacles should be spaced at most 12 feet apart, so that no point on the wall measured along the floor line will be more than 6 feet from an outlet. Any wall space more than 2 feet wide also needs an outlet.

Outlets in the kitchen, laundry, pantry, dining room, and breakfast room should be equally divided between two or more 20-amp branch circuits.

Some homeowners have each kitchen outlet installed on an individual circuit. This increases the cost of installation, but the extra load-handling capability is worth the difference.

Under provisions of the National Electrical Code, all outlets are to be grounded. Grounded type outlets permit the connection of parallel-blade two-wire cords and plugs used on appliances, as well as three-wire plugs or cords which are attached to devices which must be grounded.

Weatherproof outlets are desirable on the driveway side of the house and on the opposite side, about 4 feet above the ground. Additional weatherproof outlets may be needed in outside walls of the house or on patios or porches to serve the many appliances used in outdoor living.

All circuits serving outside outlets must be protected by ground-fault interrupter equipment that automatically disconnects the circuit in case something goes wrong with the wiring or

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This kitchen features an entire ceiling of indirect light. Tubes are recessed slightly in the false beams so they can't be seen. Honeycomb material diffuses the light. Additional lighting is above the sink.

the appliance which would cause an accidental shock.

Install convenience outlets in the wall 18 inches above the floor in bedrooms, living room, and dining room, no more than 12 feet apart. Additional outlets take care of furniture arrangements.

Have one wall outlet in the dining room above table height to connect portable cooking or warming appliances from the table. Put kitchen and work area receptacle outlets 8 inches above the worktable level.

Clock outlets in kitchen and work-shop areas can be connected to lighting

circuits but not controlled by the wall switch.

Center the outlets for ceiling lights in bedrooms, dens, kitchens, dining and living rooms, halls, passageways, and stairways. Lights in bathrooms are placed above mirrored cabinets and overhead in shower stalls.

Work areas in kitchen, laundries, and home workshops need lighting outlets directly over task areas. Overhead lighting is also recommended in basements and recreation rooms.

Outlets for lights are desirable over or alongside each outside entryway to

the house and for flood lights around the dwelling.

Outlets for the switch control of lights are placed in the wall about 48 inches above the floor at the latch side of entrances.

You can install dimmers in place of off-on switches to control the amount of light for different moods or effects.

Three-way and four-way switches are needed to control lights from two or more locations. These may be at entry points to the living room, dining room, kitchen, at the top and bottom of stairways, and inside and outside entrances to the basement and recreation room. A switch control for outside floodlighting outlets may be desired in the master bedroom.

Time clock switches for inside and outside lights will turn lights on and off at pre-set times. This will allow you to return home to a lighted house. It will also discourage burglars while you are away. Photo electric cells do a similar job of turning lights on at dusk and off at dawn.

Lighting outlets may also be controlled by low voltage switching systems which are currently available. In these, the actual switching is done by a relay operated by a 24-volt circuit and controlled by low-voltage switches. Any number of switches to control the same light outlet can be easily and inexpensively added to the circuit. In addition, the use of master switches allows control of many lighting outlets from several different locations.

At least one receptacle outlet for floor or table lamps in the living room should be controlled by a switch, especially when ceiling outlets are not used.

Here, as well as in the bedrooms, silent-type or mercury switches may be desired. Most low-voltage switching systems are silent.

Bathrooms may require an outlet for a heater. The frame of electric heaters must be grounded for safety. Receptacles for electric shavers, toothbrushes, makeup lights, etc., may be incorporated in the lighting fixture over the mirror.

In the kitchen and the workshop, individual circuits for each receptacle provide minimum interruption in the use of appliances. Circuits of 20 amp at 120 volts are a minimum requirement here. They include outlets for irons, automatic washers, garbage disposals, dishwasher, roaster, refrigerator, food freezer, and the like.

Individual power circuits of 240 volts are needed for such major appliances as electric ranges, table top cooking unit, wall oven, clothes dryer, space heater, and large air conditioning equipment.

Thought should be given to the proper selection of wire sizes for circuits throughout the home. General purpose circuits and lighting circuits should be number 12 copper wire or larger. In some old installations, number 14 wire was used for these circuits. The wire sizes are increased whenever heavier loads or larger appliances or equipment are expected.

Protective devices built into home electric systems for safety and convenience are of two approved types, circuit breakers and fuses. Both give acceptable protection for the wiring system.

Use only the proper size fuse or circuit breaker to protect the wire in the circuits; generally a 15-amp fuse or circuit breaker with number 14 wire, and a 20-amp fuse or circuit breaker with number 12 wire.

The procedure used to restore interrupted service varies. A blown fuse must be replaced with a new one of the same capacity. Circuit breaker resetting requires operation of a toggle, or switchlike handle, to restore the circuit connection.

Replacing a fuse or resetting the circuit breaker should be done only after the cause of interruption has been removed.

Circuit breakers or fuses may be installed in a cabinet whose exterior trim and covers are flush with the walls in which they are placed. The interior of this cabinet should be covered with a plate so only the top of the fuses or the circuit breaker handle portions are

exposed and all wiring connections are concealed.

The main service entrance of wires and load center in most homes is in the utility area of the home nearest the point of entry of the electric service. Never locate these in a cabinet or closet where they are not readily visible or accessible.

Most homes today require a capacity of between 100 and 200 amperes.

When much of the heavy electrical load is some distance from the main service center, a subcenter is extended with a second distribution panel in order to shorten the length of the circuit conductors.

In the choice and planning of main disconnect and load center equipment, branch circuits of 120 and 240 volts must be provided to care for the needs of installed circuits. At least two 120-volt and one 240-volt circuit spaces should be allowed for future circuits.

The cabinet door of each load center has a table of numbered circuits. Your electrician should list on this table exactly which area or individual appliance is served by each circuit.

Finally, require your electrician to have his work checked and inspected for safety. An authorized inspector can furnish you with a copy of the Certificate of Approval.

Examples of methods used to calculate required circuits, feeders, and main entrances may be found in the National Electrical Code, a copy of which may be purchased from your State fire insurance writing bureau which is most likely in your State capitol, or obtained from the National Fire Protection Association, 60 Battery-march Street, Boston, Mass. 02110 for \$3.50.

Other helpful guides may be obtained from the National Electrical Manufacturers Association, 155 E. 44th Street, New York, N.Y. 10017, or from the Residential Group, Electric Energy Association, 90 Park Avenue, New York, N.Y. 10010.

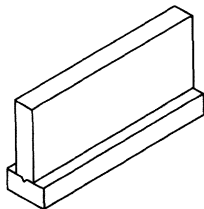
State universities and your power supplier generally have pamphlets.

Foundation Facts, Basement Basics

A FOUNDATION SERVES several purposes. It supports the weight of the house and other vertical loads such as snow. It stabilizes the house against horizontal forces such as wind. It is a retaining wall which supports the earth fill around the house. And often it is a basement or cellar wall which may need to be a barrier to moisture, heat loss, or sound transmission.

The most common foundation is the continuous wall which may be built of stone, clay tile, block, brick, or concrete. Recently, treated wood, metal, and other materials have been used.

CONTINUOUS WALL FOUNDATION



Continuous walls are used to support heavy loads or to enclose a crawl space or basement. If enclosure of space is the main objective, then the wall may be built of lighter, more porous insulating materials which will reduce heat loss and sound transmission.

A step foundation is a continuous wall of variable height. It is used on steep grades or for houses with partial basements.

The pier foundation is a series of piers which support the house. They are generally masonry but sometimes

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