Service Change

Upgrading the electrical service in an older home can be a challenging project. Replacing fuses with a breaker panel involves removing the utility meter and carefully labeling the individual branch circuits as they are removed from the old fuse enclosure. Often, the existing feeders from the meter base to the fuse enclosure are not long enough to reach the main breaker in the new panel, and sometimes the neutral conductor goes through the meter base, unbroken, to the weatherhead. Working inside an old, "banjo" meter base without cutting the utility service drop can be very risky. There is no overcurrent protection on the service drop, and one transformer can be used to serve several houses. If an electrician shorts one of the line conductors, the only protection is a fuse on the primary side of the transformer. If it blows, every house fed by that transformer will be out of power until the utility company can come and replace the fuse. If the fuse doesn't open, the short will continue to spew molten metal until it clears itself.

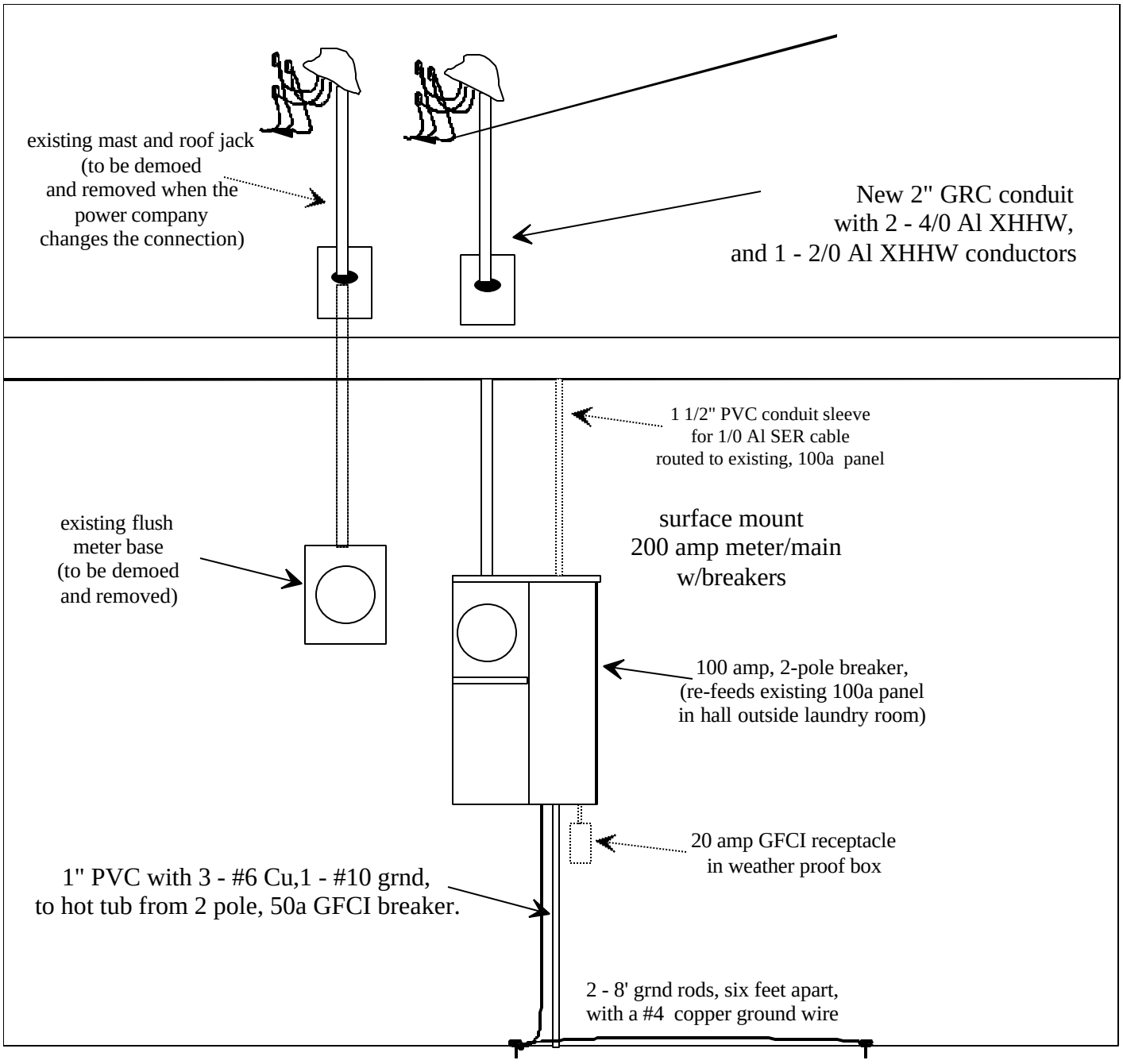
Upgrading from a small panel to a larger one involves all the same steps as above, with the additional task of increasing the size of the pipe riser and conductors from the meter to the weatherhead. The power company may also want to increase the size of their service drop from the transformer. If the service comes in underground, the added problem of locating other underground utilities and excavating around them can have an overwhelming effect on the cost of the project. In every case, a permit should be acquired from the building department, and an inspection scheduled to insure that proper grounding and guarding of energized components has been done.

In the 1960s and 70s there was a common practice in new houses, of putting the meter on the outside of the house, and placing the panel on an interior wall, sometimes 40 or 50 feet from the meter. The SE (Service Entrance) cable, is usually routed through the attic from the meter to the panel. This cable is not protected by an overcurrent device, and if damaged severely enough to short out, the fuse at the transformer primary is the only safety device.

Solution; Sub-panel

The best method I have found to insure protection of all distribution conductors within a house is to install a meter/main, or meter with adjacent main panel at the service, and re-feed the existing panel as a sub panel. A minor problem is that the existing feeder may only have three conductors, and a sub panel must have four conductors to insure that the neutral and grounds are separated. The following illustration shows an actual service change that was required when the home-owner added a hot tub to a fully loaded existing service. This method of installing a meter/main on the outside of the house gives the added flexibility of being able to route a new sub-panel feeder to a detached building such as a shop, greenhouse, or other additional buildings on the property. Three different electrical contractors are likely to find three different ways to accomplish the goals of the home-owner, and consulting an electrical designer is a good idea.

This type of work should only be done by a qualified electrician, and should not be attempted by the home-owner!



In this installation, the old three-conductor feeder to the existing panel had to be replaced with a new, four-conductor SER cable to separate the neutrals from the ground. A new ground bar was added to the existing panel, and all ground conductors were removed from the neutral and connected to the new ground, (see the trailer service illustration for further information). Now the 100 amp breaker in the meter/main protects the new feeder, and there are no unprotected cables in the attic of the house.