ASHI®
SEPTEMBER 2003 • VOL.20, #9
REPORTER

An ounce of prevention is worth a gallon of cure

Preventing basement flooding

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Basement flooding is common in many parts of the United States, causing structural damage as well as health concerns such as foundation failure and mold growth respectively. In addition, as basements transformed from their original utilitarian function into well-appointed and sometimes extravagant living spaces within the home, the loss of personal property and valuables from flooding skyrocketed.

Early on water control within a basement was not an issue of great importance. These typically stone basement foundations would seep ground water, which was absorbed by the dirt floor. When basement floors were first poured with concrete, drains where added and the floors were heavily pitched towards the drains. This allowed the utilitarian use of the basement for mechanical equipment and laundering needs.

As construction methods progressed, masonry block and poured foundations were installed. Exterior draintile systems conducting the ground water into crocks with sump pumps were designed to help control high water tables in the surrounding soils, hydrostatic pressure and capillary attraction of the foundation wall materials. These improvements helped maintain a much drier environment, allowing the basement to be used for dry storage. As homeowners realized the cost benefits in finishing their basements versus building additions, basement remodeling became a popular practice. Homeowners relied on their sump pump system to maintain a dry, living environment. Quickly, the failure* problems related to electric sump pumps became apparent. When the electricity went out, damaging water entered the finished basements. Some form of back-up system was needed.

Battery back-up sump pumps were designed to give owners a brief period of time for interrupted electrical service to be restored or to do what was necessary to get their primary pump working again. Battery backup systems rely on a deep cycle marine-style 12-volt battery and a 120-volt trickle charger to maintain the battery (some 24-volt systems are available). The battery life** is approximately two to three years.

Battery back-up sump pumps have published pumping rates from 960 GPH to 2,160 GPH based on a fully charged battery. This design is readily available and works well in most conditions, but requires periodic maintenance of both the pump and battery. Although this system is widely used, there are several reasons to consider a more innovative design – water powered sump pumps.

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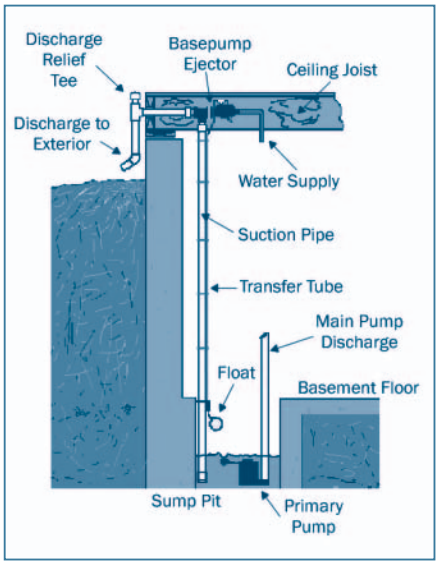
Most battery back-up systems require the pump to be mounted within the sump crock where deterioration can take place due to the inherent moisture condition. When used in smaller crocks, interference with the primary pump can be a problem. These systems are typically installed into the same discharge line used by the primary pump, which can lead to problems. Silt being drawn through the discharge pipe by the primary pump can clog the backup pump, and if the discharge line becomes clogged or frozen, the backup pump will also not be able to pump out rising ground water.

Water-powered, back-up sump pump designs have been in existence for years, but have received little attention. These devices operate without electricity or a battery. They use the home's domestic water pressure to pump out the water if the primary pump fails. Compara-tively priced to the battery-powered pumps with regard to initial installation, long-term maintenance costs are far less.

All manufacturers of water-powered, back- up sump pumps use a venturi principle to create suction produced by municipal water flowing through a nozzle. The suction pulls the sump water into a chamber where it is mixed with the municipal water and then discharged outdoors. Typically the pumps are activated by a mechanical float valve that rises when the water level rises and opens the valve as a result of the primary pump failing to maintain or properly function. Newer hydraulic float valve designs have proven to be more durable and reliable than the older weighted or spring designs used in earlier pumps. These pumps have published pumping rates from 380 GPH to 750 GPH based on a full flow 3/4" supply, 60 PSI and a lift of 10 feet.

Of the water powered designs, one design stands out as a complete and independent system. The Basepump device is the only design that is mounted to the floor joist system above the sump crock, which protects it from the high moisture environment and mineral deposits of the sump crock, and eliminates component interference within the crock. Also it has a completely independent discharge from the primary pump, and has a timing control built-in to allow the pump to run as long as needed to empty the sump pit and minimize operating cycles.



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The Basepump also has a distinct advantage over other designs with regard to pumping flow rates and protection from cross connection of potable water. All other water-powered devices mount inside the sump crock and require the municipal water to be plumbed down into the crock. This allows for potential cross connection and possible health risks along with creating more static head and substantially lower flow rates. The Basepump, with its joist mounted installation, assures no cross connection because the discharge is vented to atmosphere, not allowing a back-siphon condition and also maintains optimum flow rates. The system can operate with water pressures ranging from 50-100 PSI and will discharge 750 GPH of sump water with 60 PSI and a lift of 10 feet. Therefore, the homeowner can even leave for extended periods of time confident pumping will continue as necessary until the primary pump is working again.

For more information regarding battery and water powered back-up pumps, visit www.basepump.com or contact a plumbing supplier. ■

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*Failures of the electric sump pumps occur due to a wide range of conditions. Power loss, mechanical failure, jammed floats, clogged suction screens, pumps left unplugged or circuit breakers tripped or left off are all common pump failure problems.

**In order to maintain the battery, the battery terminals should be kept free from corrosion build up and the battery water level (if applicable) should periodically be checked once a month.