

GRAY WATER SYSTEMS

Gray water is waste water drained through, sinks, lavatories baths, showers and washing machines. Basically, gray water is waste water devoid of any human waste. Water which contains human waste is referred to as black water.

As plumbers when we rough in the drainage system of a building, be it residential or commercial, the waste and drainage are piped together at some point. When working with grey water systems these systems are kept separate and piped individually to a point of disposal. The black water or human waste system is still piped to either the public sewer or to a private point of disposal. The gray water systems can either be piped to a holding tank where it is treated after a number of stages. It may be used for flushing toilets or washing. Another venue that it may be used for is garden or lawn irrigation. This water is treated by the soil and root systems of the plants. Consideration must be taken with this system as soaps and salts can be harmful to plants. Gray water should never be used as drinking water.

In some cases purifying the water before use may not be required. Potable water is not required for the flushing of toilets or urinals. Purified water *may* also not be required in some agricultural applications such as tree farms.

When it comes to purifying contaminated water, gray water is much easier to treat due to the much lower levels of contaminants found within the waste. Grey water still contains micro-organisms so some form of treatment is required in most cases.

There are a many types of purification soft processes for gray water such as mechanical systems that include sand filtration, lava filter systems and systems that are based on UV radiation. There is also a biological system for plant systems that may use treatment ponds, constructed wetland or living walls. Bio reactors or compact systems such as activated sludge, biorotors, aerobic and anaerobic biofilters, submerged aerated filters, and biorolls systems.

Hard processes that include evaporation (distillation) or mechanical process such as membrane filtration, which are usually ultra-filtration and reverse osmosis, that can handle a large volume of water.

For adequately purifying the water, many of these systems may be combined to work together. These system use a primary (1st stage) and secondary (2nd stage) and in some cases a third stage for purification of the water.

When used for indoor applications such as flushing toilets, a system can save as much as 30% in an average home. As we stated before there is the danger of biological contamination but this can be avoided by installing a cleaning tank, to help eliminate floating and sinking items and by having an control that flushes the collected water if it has been stored over a period of time deemed to be hazardous (usually 24 hours) which would allow for the growth of bacteria.

As stated before another large use for grey water is irrigation. Since grey water has lower levels of nitrogen and phosphorus it will break down much faster than black water. Grey water still does contain various pathogens and should be applied below the surface. Spraying grey water must be avoided as the aerosol created by the spray can be inhaled and be the cause for health issues.

When installing grey water system the customer must understand that they cannot put any type of toxic substance down the drain. These include bleaches, bath salts, artificial dyes, cleansers or products that contain boron which is toxic to plants in high doses.