

Flood Fighting: How To Use Sandbags

Sandbag Construction

The use of sandbags is a simple, but effective way to prevent or reduce flood water damage. Properly filled and placed sandbags can act as a barrier to divert moving water around, instead of through, buildings. Sandbag construction does not guarantee a water-tight seal, but is satisfactory for use in most situations. Sandbags are also used successfully to prevent overtopping of streams with levees, and for training current flows to specific areas.

Untied sandbags are recommended for most situations. Tied sandbags should be used only for special situations when pre-filling and stockpiling may be required, or for specific purposes such as filling holes, holding objects in position, or to form barriers backed by supportive planks. Tied sandbags are generally easier to handle and stockpile. However, sandbag filling operations can generally be best accomplished at or near the placement site and tying of the bags would be a waste of valuable time and effort. If the bags are to be pre-filled at a distant location, due consideration must be given to transportation vehicles and placement site access.

The most commonly used bags are untreated burlap sacks available at feed or hardware stores. Empty bags can be stockpiled for emergency use, and will be serviceable for several years, if properly stored. Filled bags of earth material will deteriorate quickly.

Commercial plastic sandbags, made from polypropylene, are also available from most bag suppliers. These will store for a long time with minimum care, but are not biodegradable. Thus, they have to be disposed of, or will remain around for a long time. Do not use garbage bags, as they are too slick to stack. Do not use feed sacks, as they are too large to handle. Use bags about 14-18" wide, and 30-36" deep.

A heavy bodied or sandy soil is most desirable for filling sandbags, but any usable material at or near the site has definite advantages. Coarse sand could leak out through the weave in the bag. To prevent this, double bag the material. Gravelly or rocky soils are generally poor choices because of their permeability.

Sandbag barriers can easily be constructed by two people, as most individuals have the physical capability to carry or drag a sandbag weighing approximately 30 pounds.

How to fill a sandbag



Filling sandbags is a two-person operation. Both people should be wearing gloves to protect their hands. One member of the team should place the empty bag between or slightly in front of widespread feet with arms extended. The throat of the bag is folded to form a collar, and held with the hands in a position that will enable the other team member to empty a rounded shovel full of material into the open end. The person holding the sack should be standing with knees slightly flexed, and head and face as far away from the shovel as possible.

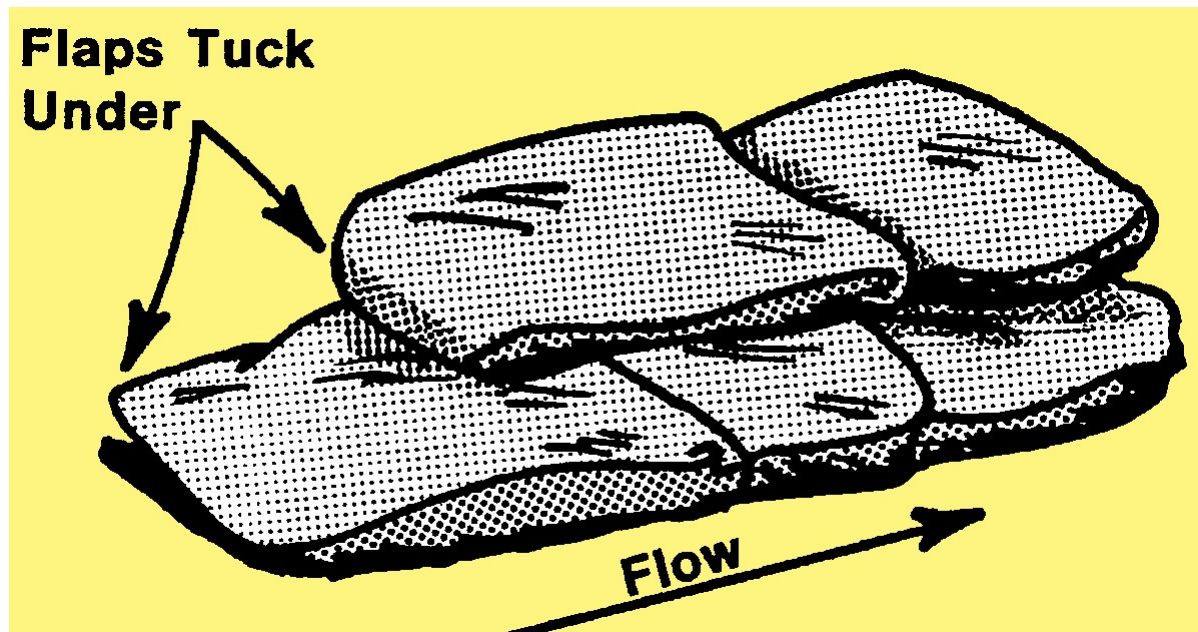
The shoveler should carefully release the rounded shovel full of soil into the throat of the bag. Haste in this operation can result in undue spillage and added work. The use of safety goggles and gloves is desirable, and sometimes necessary.

Bags should be filled between one-third ($1/3$) to one-half ($1/2$) of their capacity. This keeps the bag from getting too heavy, and permits the bags to be stacked with a good seal.

For large scale operations, filling sandbags can be expedited by using bag-holding racks, metal funnels, and power loading equipment. However, the special equipment required is not always available during an emergency.

Sandbag placement

Remove any debris from the area where the bags are to be placed.



Fold the open end of the unfilled portion of the bag to form a triangle. If tied bags are used, flatten or flare the tied end.

Place the partially filled bags lengthwise and parallel to the direction of flow, with the open end facing against the water flow. Tuck the flaps under, keeping the unfilled portion under the weight of the sack.

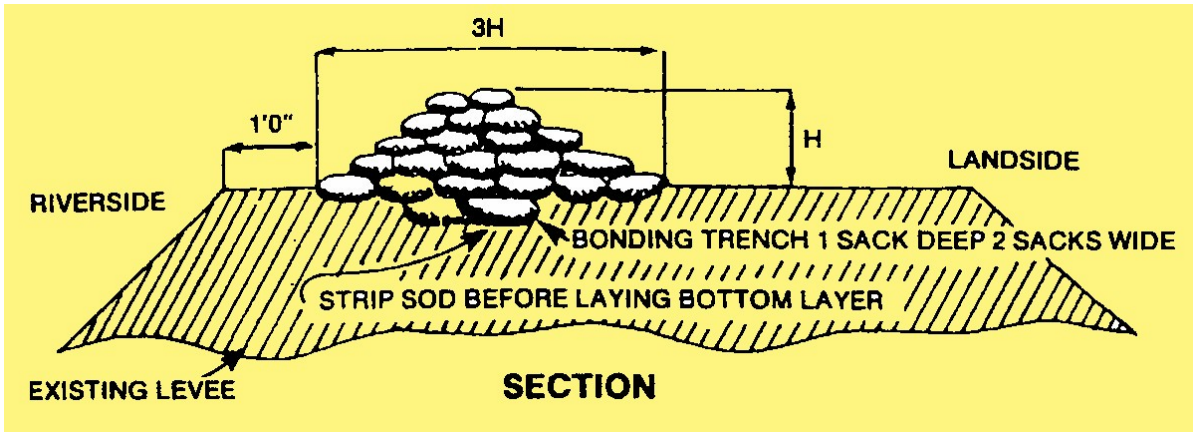
Place succeeding bags on top, offsetting by one-half (1/2) filled length of the previous bag, and stamp into place to eliminate voids, and form a tight seal.

Stagger the joint connections when multiple layers are necessary. For unsupported layers over three (3) courses high, use the pyramid placement method.

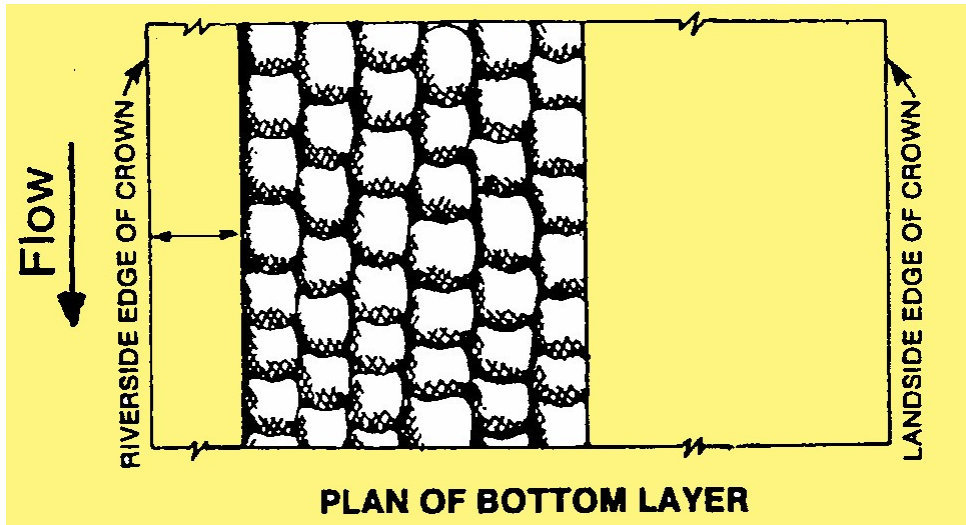
Pyramid Placement Method

The pyramid placement is used to increase the height of sandbag protection.

Place the sandbags to form a pyramid by alternating header courses (bags placed crosswise) and stretcher courses (bags placed lengthwise).



Stamp each bag in place, overlap sacks, maintain staggered joint placement, and tuck in any loose ends.

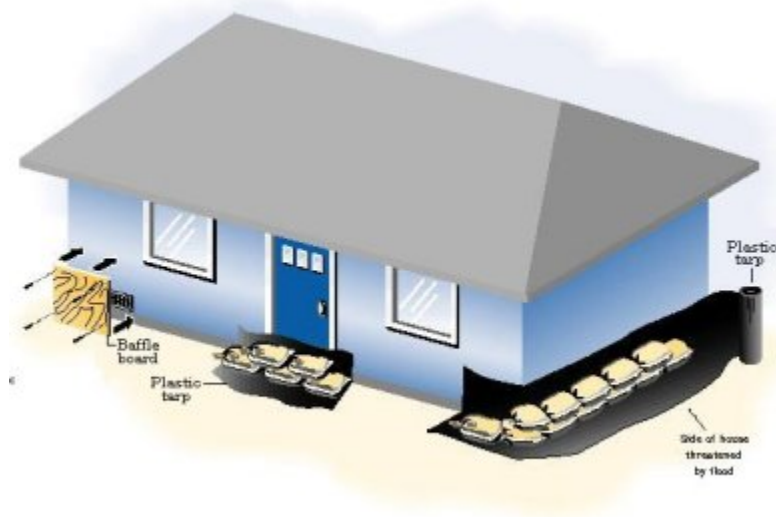


Materials required for 100 lineal feet of sandbag wall		
Height above ground	Bags required	Cubic yards of sand
1 foot	600-800	10 to 13
2 feet	1400-2000	23 to 33
3 feet	2200-3400	37 to 57
4 feet	5300	88
5 feet	7600	137
6 feet	10000	167

How do I use sandbags?

Sandbags alone should not be relied on to keep water outside a building. Use baffle boards (plywood sheeting) or sheets of plastic tarp with sandbags. To form a sandbag wall, place bags tightly against one another to form the first layer of defense. Stagger the second and subsequent layers of bags, much like the pattern of bricks in a wall.

Sandbags should never be used to build a fortress around the perimeter of one's property. Doing so can actually trap floodwaters between sandbag walls and structures, leading to further damage.



Building a last line of defense around your home

Steps to protect your home

How to make baffle boards to temporarily seal foundation vents, windows, doorways and garage doorways:

These steps should only be taken immediately prior to flooding and removed immediately after the threat of flooding has passed.

- Use 3/4" plywood to overlap the window or vent by three or four inches on all sides.
- Use a soft gasket material like felt or foam rubber that is at least 2 inches wide. Attach it with waterproof glue to the 3/4" plywood.

- Use four or more nails, screws or bolts to secure the baffle boards over the opening. In stucco, cement or brick walls, special screws or expansion bolts will be required.
- For doorways, install baffle boards to the outside frame of the door.
- For garage doors, suitable board's one-inch thick may be used instead of plywood for the door seals. The bottom edge of the baffle board should be shaped to fit the driveway surface so there will be a watertight seal on the bottom. Use baffles to seal door cracks vertical to and higher than the bottom seal.
- In an emergency, fasten sheets of plastic or building (tar) paper over the opening and seal with caulk, putty or clay.
- **Baffle boards** (above), consist of 3/4 inch plywood sheets with a soft gasket material like felt or foam rubber. They are effective for closing off vents, low windows and doors from floodwater. If placed over vents, however, baffle boards must be removed once the danger of flooding passes.
- Using plastic tarp between a structure and sandbags helps keep floodwater from seeping between the house siding and foundation sills.
- Care should be taken to place sandbags tightly against one another. Place the next sandbag over the folded, tied end to provide a good seal. Complete each layer before starting the next layer. Limit placement to two layers.
- After placing the first layer of sandbags, stagger the second layer of bags, much like the pattern of bricks in a wall.

Taking these precautions will minimize the amount of water and sediment entering your home and crawl space and prevent damage to your home's structure.

However:

Keep in mind that sealing off foundation vents prohibits air circulation under your home. These measures to protect your home should be temporary and should be removed immediately after the threat of flooding has passed. Opening vents after or in between storms is critical to protect your homes foundation and sub floor and prevent the growth of mold and mildew in your crawl space.

Before flooding is a threat

If you believe your home is in danger of being flooded, there are steps you can take in advance of a flood to reduce property damage.

For homes with cement slab floors:

- Use special paints to keep the water from penetrating exterior stucco or brick.
- Patch all cracks in the outside foundation with regular patching mixes.
- Clear dirt away from the bottom of stucco or wood walls and seal the lower exposed edge with caulking compound. Replace the dirt, which will not affect the seal.

For homes with wood floors and crawl spaces:

- Water can leak into crawl spaces and/or basements through foundation cracks, pipe holes, vents, doors or windows. It can also seep between the house siding and foundation sills. Once the crawl space or basement is filled, the water pushes up into the building through floors and wall joints until it reaches the height of the outside flood waters.
 - Seal vents and windows with plywood. Vents are required by building codes to prevent mildew and rot. Therefore, all plywood over vents must be removed as soon as the danger of a flood passes.
 - Fill cracks in the foundation or stucco wall with cement or other effective crack-filler material.
 - Seal small openings around pipes with cement, crack filler or caulk.
 - Seal the joint between siding and foundation with caulk.
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