



**US Army Corps
of Engineers.**

Sandbagging Video

Voiceover: . . . fill a sandbag and put it into place can be the difference between success and failure when it comes to levee building. Tim shows us how to build an effective sandbag levee and how to use pumps to manage the seepage that occurs.

Tim: I'm going to talk a little bit today about sandbag protection, using sandbags to build levees around a structure that you're trying to protect from any high water. The most important thing in your protection obviously is going to be the sandbag.

Your basic sandbag here is about 16 inches by about 30, 32 inches. When it comes to getting sandbags, the homeowner is going to have an awful lot to choose from, and that means that there's going to be big bags, like pinto bean bags or potato bags, very unwieldy, very hard to fill; they're very large. If you put sand in them, the correct amount of sand, you're going to have it so heavy that most people won't be able to even handle the bags. So obviously you want to make sure that you're buying or obtaining the correct sandbag.

Most of them now are made out of poly. There are also burlap bags, which are better but much more expensive, but this plastic bag right here is your basic sandbag, and that's what you want to look for.

You'll notice when we fill the bag that we want to fill the bag only half to three-quarters full. We want to leave some room in the bag so when the bag is laid, the sand can settle in, and it makes a much better protective barrier then. And then the other factor is you get the right size sandbag, and about half to three-quarters full, it gives you about a 50-pound bag, and that's about as much as we want folks to have to handle.

We want to have a pointed shovel, because if you have a square shovel, you're not going to be able to fit it in the bag. As you can see here, we'll be able to just get the point right down in there, and it will take about three or four of our shovelfuls. And we're about half full there. About one more and we're about two-thirds full, and that's as full as you want to have that bag.

Voiceover: A washed clean sand is best for filling sandbags. You can buy it from sand and gravel companies.

Tim: We've got a small cross section of a levee that we've constructed here. The rule of thumb that we recommend is for a sandbag levee, just like an earthen levee, to be three times as wide as it is high. So if you're going to build a 3-foot high sandbag levee, we'd like to see that thing about 9 feet wide.

We understand that because of manpower and resource needs and time constraints, that's the optimum, and any time we see a flood, often we see levees that aren't quite built like that, but that's what we'd like to recommend is three times as wide as it is high, and then if you have to make it a little bit smaller than that, you have to do so. You obviously have got to get the protection in place before the water comes.

When we lay the bags, again, we have these bags that are half to three-quarters full, we lay them with the flow. So if the river is flowing from my back to my front this way, we want to lay the bag with the open end with the flow. So we'll go ahead and lay a few bags on top

of this one and show you that the bag will lay in there just like this. We leave the open end downstream, and it settles nicely into some of those spots and that will fill in the voids.

And, of course, the width of the levee gives us a number of things. It gives us a much longer seepage path, because any levee will seep. It doesn't matter if it's a dam built to hold back a lake or an earthen levee or a plywood levee or a sandbag level, water is going to get through it. So what we want to do is get the sandbags down on the bare ground and get them laid in, in a good cross section, and then, for extra protection against seepage in a sandbag levee, we like to put plastic.

We recommend putting plastic over every sandbag levee that's ever constructed. And how we do that is you get the plastic, and you lay it down first here, and you put your first row of sandbags on your water side on the plastic in order to anchor it down. And then we'll pull the plastic up over the top. We'll still see some seepage underneath the levee as it gets underneath the plastic and moves through, but this protects. It gives a solid barrier against the water, and so you've got even another line of defense against water getting through your levee.

What we've found is putting poly over the top of your levee like this will reduce the seepage through your levee 60 to 70 percent. Once we get the plastic over the top, we want to anchor it down so the wind or something else doesn't blow it and kind of ruin our efforts. So we'll put sandbags either on the top or on the back side in order to anchor this plastic in place and keep it there.

You're always going to be pumping on the back side of the levee some seepage, and the more you can keep the water out, the less pumps you have to maintain and the less concern we have with water getting near the structure we're trying to protect.

Voiceover: When covering your levee, use heavy plastic. Plastic is measured in mils. A 6-mil plastic is recommended.

Tim: We constructed a small cross section here, approximately 3 feet high. We probably didn't even get our 9 feet at the base. We only are at about 7.5 to 8 feet, but that does allow a very long seepage path, which is better. It allows for those bags that are only half full to settle into those voids and really give us a good seal. It also allows that if the water level forecast were raised, that you can get on this levee, and, even though you'd lose the good side slopes, you can raise this levee quite a bit and still have good protection, probably another foot — 1.5 to 2 feet.

Over here we have a levee that you see probably more often during an emergency because of the limits in time and the limits in manpower and resources, not having enough bags or sand. Homeowners will stack these up, and they are only two wide here. You can see it's the same, approximately the same height as the levee we just showed you. The seepage path is very narrow, so you're going to have an awful lot of seepage to manage, and that means more pumping, a lot more pumping behind the levee.

Once the water gets up on this, the force of it, these bags will slide, and the water has a tremendous amount of force when it gets up against these. This bag here, you can see it wouldn't take very much to push that and allow it — and it will just slide, and it will just slide right off, and that's what will happen on your levee too.

And the last thing that's very bad about this is if your water levels did raise, if the forecast was to raise the river level, you really don't have very much of anywhere to go. You don't have those side slopes to build up a nice higher levee, that you only could probably place a bag or two on top of this, and that would be very iffy if you could get much more protection from a levee like this.

Voiceover: Four feet is the maximum recommended height for a sandbag levee. Anything higher will increase the potential for failure.

Tim: Another type of barrier that folks use is what's called a flashboard levee, where they'll pound some stakes in the ground, and then they'll attach a piece of plywood to them, and about a foot on the riverward side they'll do the same thing, and they'll put these two pieces of plywood parallel and construct their levee that way, and then — Chris, if you could put some sand in — they'll fill in the interior of this with sand, and that just, again, creates a much bigger barrier. Some people will just use the one piece of plywood, but there's an awful lot of seepage that occurs with that. Obviously, plywood doesn't deal with water very well, but when you use both of them and then fill that area up with sand, that provides a pretty good barrier.

When you're limited in time and resources and have to build a levee like this where you don't have a very good cross section, another way to use this plywood is you can use it on the backside, say, if the water is out there, we can use this plywood and some 2 x 4 bracing behind it to brace that to keep it from sliding. If the water is pushing those bags back this way, that will keep the bags from sliding and causing us a problem.

Secondary to that, we'll go to the other side here, Milt, and we'll just set these in like this. We could put the plywood on the water side. If we have enough time, we can put the plywood on the water side, and if we only have a few sandbags, we could back them up and use them as ballasts against — and that requires — and then you wouldn't have near as much bracing required on the back side.