Fighting the 2011 **Flood** Fact Sheet

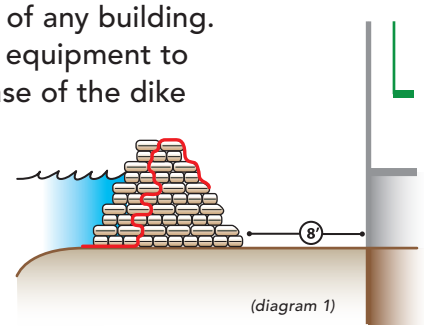
Manitoba

How to Build Sandbag Dikes

Where to Build Sandbag Dikes

Location

- The base area for dikes should be cleared of snow and ice.
- Dikes should **NOT** be built on porous land or septic fields.
- Dikes should be at least 2.4 metres (8 feet) from the foundation of any building. It prevents foundation damage and leaves room for people and equipment to move inside the dike area. It also leaves space to expand the base of the dike if it's needed later. *(see diagram 1)*
- Wherever possible, dig a trench in the soil that's about one sandbag deep and two sandbags wide. This makes a more secure dike.



(diagram 1)

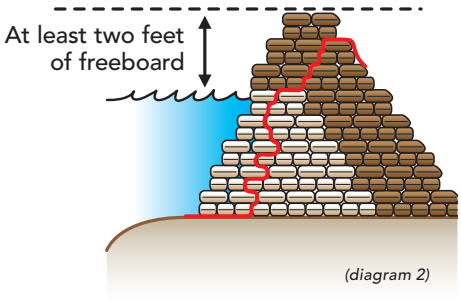
The Right Size for Dikes

Height

Freeboard is the area of the dike between the highest floodwater level and the top of the dike. The formula for setting the height for dikes is:

- take the predicted height the water is going to rise above ground level
- add 0.6 metres (2 feet) of freeboard
- add 5 per cent for the amount wet sandbags will compact when they're stacked

For example: *If the floodwater is predicted to rise 1.2 metres (4 feet), the dike has to be about 1.8 metres (6 feet), plus 5 per cent 0.3 metres (4 inches) for a total of about 2.1 metres (6.3 to 6.6 feet). (see diagram 2)*



(diagram 2)

Disclaimer: This document provides general information only. Please contact your local municipal authorities for more detailed information and directions about the specific needs

Width

The formula for setting the width for dikes:

- must be 0.6 metres (2 feet) **wider than the required height**
- must be at least 0.6 metres (2 feet) **wide at the top**

For example: *If the height of the dike is 2.1 metres (6.3 feet) high, the width has to be about 2.4 metres (8 feet) at the base and 0.6 metres (2 feet) wide at the top.*

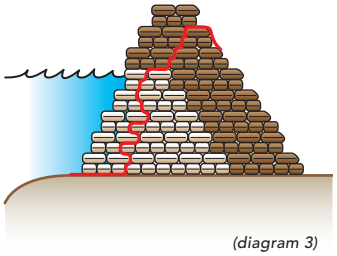
Higher dikes

Because of the high pressure water can exert, talk to your local municipal authorities about measurements for dikes higher than 1.8 metres (6 feet).

Use Polyethylene Sheets

Polyethylene sheets must be placed properly along the inside of the dike to stop water seeping through the sandbags.

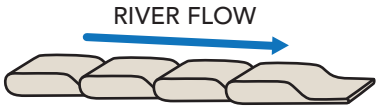
- Use 6 millimetre (0.2 inches) thick sheets, in 3 metre (10 feet) rolls on the river side of the dike. The sheets will be woven between layers of sandbags.
- The polyethylene sheets should stick out a little on the river side of the dike at the bottom. *(see diagram 3)*



(diagram 3)

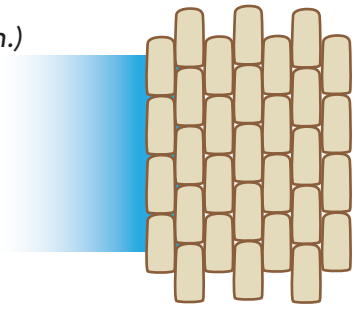
Layering the Dike

Bottom layer *(see diagram 4):*



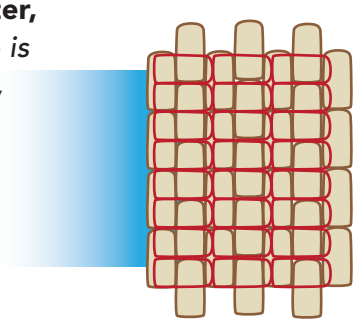
(diagram 4)

- Lay the **first row of bags parallel to the river/water**, with the bottom side of the bag (the sewn side, not the tie side) sitting against the direction of the river's flow. *(Ex: if the river is running north, the sewn end of the bag should be pointed south.)*
- Lap the sandbags – put the filled end of the second bag over the unfilled part of the first bag.
- Drop bags into place and use your feet to lodge them tightly into place. Don't leave any gaps.
- Lay the second row of bags in an offset pattern like bricks are laid. *(see diagram 5)*
- Repeat for all the rows of bags.



(diagram 5)

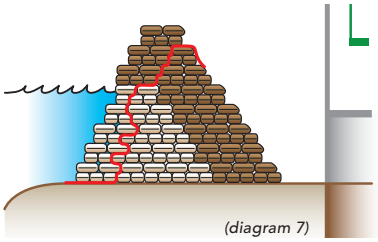
- Lay every **second layer of bags perpendicular to the river/water,** with the bottom side of the bag toward the river. *(Ex: if the dike is running north/south, and you're building a dike on the east side, point the bottom (sewn end) of the bag west towards the river.)*
- Lay the second layer of bags in a line that's one-quarter of the width of the sandbag **in from the first row**. Do this on both sides, and do it on every second layer, so that as the dike gets higher, it has a gentle slope of steps to the top. *(see diagram 6)*



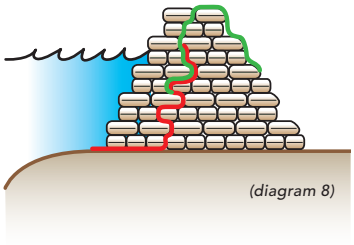
(diagram 6)

Polyethylene layers:

- Weave sheets between layers of sandbags, at least two rows of sandbags deep, protecting the sheets from the face of the river/water *(see diagram 7)*. The outside rows of sandbags will protect the sheets from rips or holes from river debris.
- Sheets should be no deeper than three rows of sandbags, or one-quarter of the cross section of the dike.
- If more height is needed for the sheets, make them overlap at least 0.6 metres (2 feet). *(see diagram 8)*



(diagram 7)



(diagram 8)

Added protection

No matter how well you build a dike, extreme water pressure could cause water to seep through or bubble up from the ground. It's a good idea to have pumps (and enough fuel and oil to run them) available to pump excess water, if it's possible to do so.

Have an emergency evacuation plan in case the dikes leak heavily or break.

Safety Tips for Sandbag-Group Leaders

- Make sure nobody in your group has a medical condition that makes it dangerous for him/her to do sandbagging work.
- Make sure everyone who is working in your group is registered on your registration sheet and deliver your registration sheets to the community emergency co-ordinator regularly.
- Wherever possible, make sure your group wear sufficient protective gear to ensure their personal safety (ex: heavy/steel-toed boots, gloves, safety glasses, etc.).
- Make sure there is enough drinking water for the group and make sure people take regular water breaks.
- Make sure your group has easy access to bathroom facilities (ex: portable bathrooms, public restrooms).

Safety Tips for Sandbagging Volunteers

- Always pay attention to large equipment moving around or through the sandbagging area.
- Floodwater can be dangerous, so pay attention to, and protect yourself from, possible problems, including contamination, floating debris, fast water flow and undercurrents.
- Fill sandbags only half full (no more than 40 pounds) with sand, clay or silt.
- Fold or tie the flap (sewing isn't necessary).
- Do not bend more than 20 degrees in any direction while handling filled sandbags.
- Bend from your knees, not your waist, when picking bags up and putting them down.
- Keep about 0.6 metres (2 feet) apart when you're forming a line to pass sandbags.
- Don't extend your arms too far when passing filled bags down a line.

- Keep heavy sandbags below your shoulders and above your knees.
- Keep heavy sandbags close to the body
- Use your feet to pivot and turn your body when you pass filled bags down a line.
- Don't twist your body to pass filled sandbags down a line.
- Do not throw or drag filled sandbags.
- If there are not enough people to form a continuous line, use a wheelbarrow to move sandbags.

After the Flood

- Sandbags should be removed using the same health and safety tips used for building dikes.
- Do not use the sand from sandbags for children's sand boxes or play areas because they may have contaminants.
- Sand from sandbags can be used for landscaping.

For more information, contact your municipal office or

Manitoba Emergency Measures Organization (EMO)

1525 – 405 Broadway Avenue, Winnipeg R3C 3L6

Phone: 204-945-4772 in Winnipeg

Toll free: 1-888-267-8298

Website: www.manitobaemo.ca