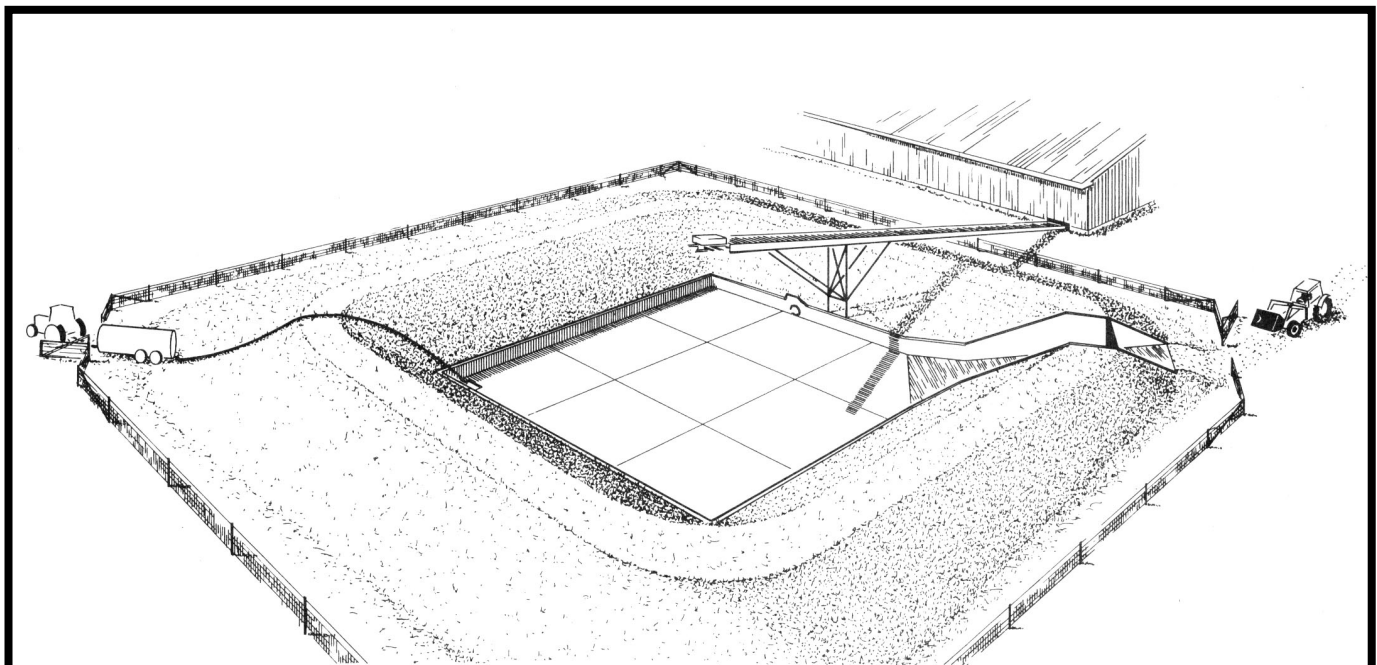


CURBED SLAB MANURE STORAGE WITH EARTH BANKS



CPS
PLAN 8715 REVISED: 85:08

This plan (formerly plan 2704) gives details of an open rectangular concrete slab with a low curb and a high earth bank to contain manure liquids as well as solids. To prevent pollution of nearby streams and water supplies, build this storage only where the subsoil contains enough clay or fine silt to make the banks water-tight. Stop-logs may be placed across the entrance ramp when required to contain manure liquids.

The storage is for semisolid manure that contains little bedding, such as that from free-stall dairy barns. Start unloading the manure from storage by pumping and spreading the liquid first. Then remove the remaining solids through the entrance ramp with

a tractor front-end scoop loader and a manure spreader. If you prefer to pre-mix and completely remove the manure by tractor-powered mixer-pump, the concrete floor and ramp are not essential: see plan M-8716

CAPACITY

The plan shows a floor slab 18 x 18 m (60 x 60 ft) with curbs and packed earth bank to 3 m (10 ft) above the low point of the slab. A table gives storage capacities for various slab dimensions, and for depths of 2.4 or 3.0 m (8 or 10 ft).

For example, the 12 x 18 m slab with 3 m bank holds about 890 m³ when level full at 300 mm from the top. With no rain or snow this gives about 6 months storage for manure from 110 dairy cows or 1000 growing and finishing hogs.

Remember to allow for precipitation that accumulates during the storage period. The last two columns of the table give the volume that will collect within the banks and entrance ramp with each 25 mm (1 in.) of precipitation. If, in the above example, you expect 200 mm (8 in.) of rain and melted snow during the storage period, the usable storage capacity is reduced to $890 - (14)(200/25) = 778 \text{ m}^3$. In feet and inches, this is $31300 - (493)(8/1) = 27356 \text{ cu ft}$. A disadvantage of this type of storage is that the sloping banks act like a funnel, collecting all the rain and snow that fall within the banks. Since this extra polluted water must be handled as liquid manure, this storage type is best for a dry climate where precipitation is low and surface evaporation high, as in the prairie provinces. The surrounding land must be ditched and graded so field runoff water cannot get into the storage, especially at the entrance ramp.

FILLING AND EMPTYING

Semisolid manure that contains little bedding will spread and flow out from the point where it enters, so you can fill the storage from nearby barns with:

- a gutter cleaner extension stacker;
- a plunger manure pump and underground pipe;
- a tractor pto-driven manure spreader, re-piled with tractor loader;
- gravity flow through 600 or 750 mm diameter pipe; buried below frost

The gutter cleaner extension stacker is the traditional transfer system, but the stacker part must run at a relatively flat slope (1:4 or less) to handle sloppy manure. In winter, freezing of the gutter cleaner and manure stack is a major problem. The

plunger manure pump works better for very cold climates since the pipe can be buried below frost and the storage fills from beneath instead of from the top. Recently, several operators have installed gravity flow systems; these have the same winter advantages as the plunger manure pump, but are simpler and non-mechanical. The gravity pipe should discharge into the lowest point of the floor slab so that it can be quickly submerged. This prevents freezing at the outlet and keeps manure gas out of the barn.

To empty, use a vacuum tanker or small irrigation pump and sprinkler system to draw off the spread the separated liquids, then remove the remaining semi-solid manure through the entrance ramp with a tractor loader and manure spreader. Box-type manure spreaders need special hydraulic endgate attachments to carry this sloppy manure without leaking.

ODORS, SAFETY AND LOCAL REGULATIONS

An open manure storage gives off bad odors that can make life unpleasant around the farmstead, and especially when the manure is disturbed for loading and spreading. Place the storage downwind and as far as possible from the farm residence and from neighbors.

Semisolid manure for which this type of storage is designed can develop a dry surface crust that appears much more solid than it really is. A safety fence complete with a padlocked gate is recommended to keep out children and livestock. This fence is outside the bank perimeter so that the grass on the banks in the enclosure can be clipped periodically with a tractor or lawnmower. If you let weeds grow inside the fence, more snow and soil will drift into the storage.

Obtain approval from local authorities when planning any improvements to manure systems and livestock housing.

Storage slab size		Maximum depth		Storage capacity		Reduction in effective storage capacity per 25 mm (1 in.) of precipitation	
m x m	(ft x ft)	m	(ft)	m	(cu ft)	m	(cu ft)
12 x 12	(40 x 40)	2.4	(8)	425	(15000)	8.9	(314)
		3.0	(10)	640	(22600)	10.7	(380)
12 x 18	(40 x 60)	2.4	(8)	600	(21300)	11.8	(415)
		3.0	(10)	890	(31300)	14.0	(493)
18 x 18	(60 x 60)	3.0	(10)	1230	(43500)	18.1	(639)
30 x 18	(100 x 100)	3.0	(10)	1920	(67800)	26.4	(932)
30 x 30	(100 x 100)	3.0	(10)	3000	(106000)	38.3	(1350)

* Based on manure stored to 300 mm (1 ft) below top of earth banks