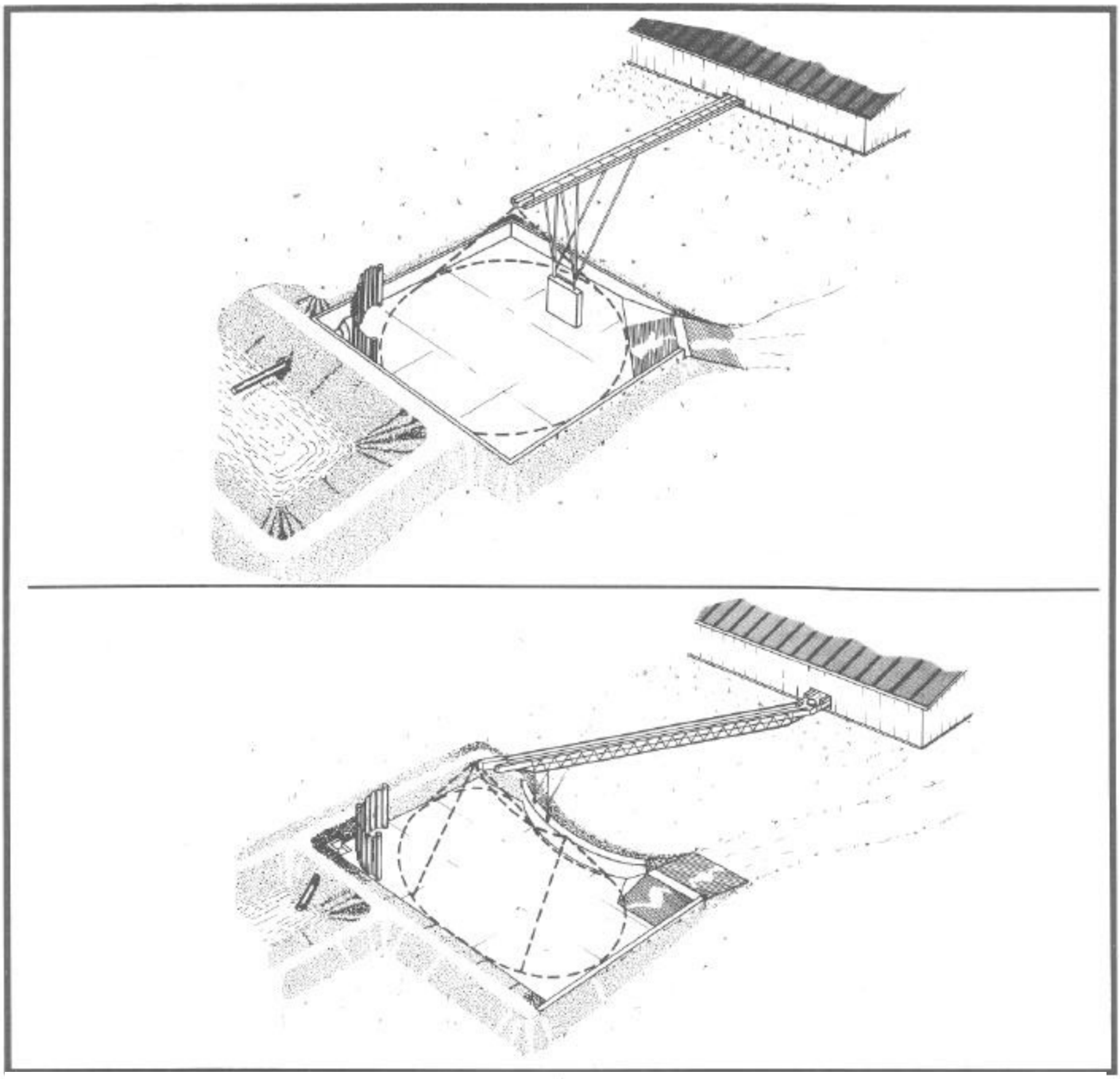
CANADA PLAN SERVICE

CURBED STORAGE SLABS FOR STACKED MANURE

M-10707



COMPLETE INSTRUCTIONS

The Canada Plan Service, a Canadian federal/provincial organization, promotes the transfer of technology through factsheets, design aids and construction drawings that show how to plan and build modern farm structures and equipment for Canadian agriculture.

For more information, contact your local provincial agricultural engineer or extension advisor.

CURBED STORAGE SLABS FOR STACKED MANURE

PLAN M-10707 NEW 79:05

Manure from typical livestock operations where considerable bedding is added (dairy tie stalls, for example) can be piled up with a mechanical stacker. With this "solid" manure, a low concrete curb around a storage slab plus a connected holding pond for polluted runoff can control pollution of nearby streams and water supplies.

This plan shows a rectangular slab for swinging manure stackers, or a square slab for fixed stackers. The manure will form into a roughly conical pile: with the fixed stacker the round base of the cone fits best into a square slab; with the swinging stacker the pile will be elongated to better fit a rectangular slab. It is important to size the slab to correspond with the particular stacker you have in mind.

MANURE STORAGE CAPACITY

Storage capacity of a manure stack depends on the surface slope of the manure pile which in turn depends on moisture, bedding materials, freezing conditions and other factors. Because these factors are variable, the plan includes a set of tables for estimating manure storage capacities. The tables give estimated storage capacities for square and rectangular slabs and for various combinations of stack width and height. To estimate your requirements examine stacks of manure under management conditions similar to your own, estimate the manure stack slope, and choose a manure stacker capable of forming a stack big enough for your present and future needs.

The fixed stacker will probably be cheaper than the swing stacker, but the fixed stacker will have to be much higher. Your choice will depend on the type of stacker available from local suppliers.

For example, 50 dairy cows in tie stalls for six months will require storage as follows:

50 cows x 0.05 m^3 /d x 180 days = 450 m^3

If your manure will stack at 45°, this requires a slab 15 m square and a fixed stacker to deliver manure to 7.5 m above the center of the slab. If a stacker is not available to 7.5 m high, an alternative is a swing stacker to 7 m high with a rectangular slab 13 x 22 m.

CLEANING THE STORAGE

For loading and hauling, an entrance ramp is provided at one corner of the slab. This ramp provides a smooth approach for driving tractors and spreaders up over the curb. The finished grade around the slab and entrance ramp is sloped away to keep out surface water.

The concrete curb around the square slab is shown 600 mm high. This retains manure, keep out yard and field runoff, and is handy for use as a 'buck-wall' for cleaning up the manure with a tractor loader. For this purpose it should be steel-reinforced as shown.

The rectangular and square slabs can use an earth bank (as shown with the rectangular slab) wherever a concrete curb is not essential. The earth bank is cheaper of course, but it requires more maintenance to prevent soil erosion and damage due to manure-handling operations. Earth banks should be seeded to a tough grass mixture and trimmed with a mower to control weeds.

The slab slopes to a low point at the corner farthest from the entrance ramp. Here a 'filter fence' helps keep manure solids from plugging the overflow and filling the holding pond.

This filter fence may be made from a strip of snow-fencing secured to 3 strong posts as shown in plans. Or a more durable fence could be made by bolting two horizontal beams across the curb to support vertical planks spaced about an inch apart.

A vacuum tanker or small irrigation pump and sprinkler system can be used for loading, hauling and spreading the liquids collected in the holding pond. The quantity of liquid manure is not known, but will depend on manure moisture, bedding, precipitation and surface evaporation factors. In areas of very heavy precipitation it may be necessary to increase the size of the holding pond and use an irrigation system for spreading the liquids.

ODORS, LOCAL REGULATIONS

Open manure storages can be sources of bad odors and flies, making life unpleasant around the farmstead, especially when manure is disturbed at spreading time. Locate the manure stack as far as possible and downwind from the farm residence and from neighbors. Plan to have the manure hauled out and plowed under before warm weather and the fly breeding season. If the slab is used for manure storage in summer, clean at intervals of a week or less to prevent flies from .multiplying.

Obtain approval from local authorities while planning any improvements to your manure system and livestock housing.