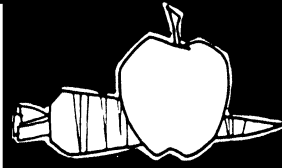




BRITISH
COLUMBIA

Ministry of Agriculture, Food and Fisheries

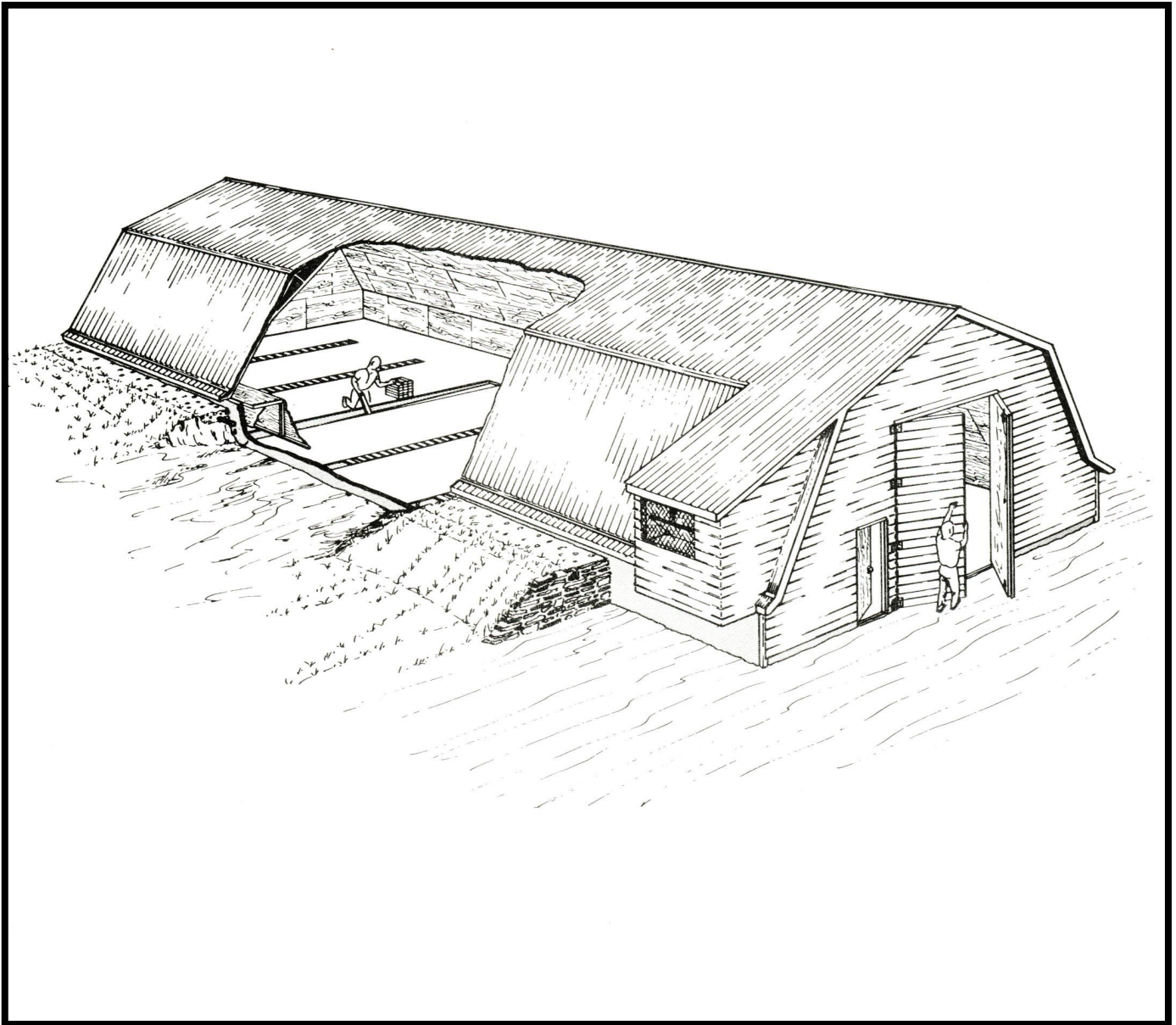
Agricultural Building Systems Handbook



PLAN

331-07

BRACED RAFTER BULK VEGETABLE STORAGE



DEVELOPED BY CANADA PLAN SERVICE

BRACED RAFTER BULK VEGETABLE STORAGE

CPS
PLAN 6311 NEW 11:76

This is a plan for 40 x 108 ft gambrel-roofed building that will hold 24,000 cwt of potatoes stored to a 16 ft depth. At the entrance end, there is a 10 ft work area separated from the stored produce by a removable bulkhead.

CONSTRUCTION FEATURES

This design incorporates two cost-saving features. The concrete foundation wall is banked with earth on the outside to balance the pressure of the vegetables and to provide frost protection for the footing. The second feature is the inward slope of the lower portion of the gambrel roof. This slope approaches the slope of piled potatoes, resulting in lower lateral pressures and allowing the use of smaller-sized timber than that needed for vertical walls.

The braced rafter frames can be fabricated on the ground and tilted up in one or two sections. Specifications call for 2 1/2 in. nails, to penetrate the 1 1/2 in. frame members as well as the 1/2 in. plywood gussets on both sides of the joint. It is extremely important that the nails fully penetrate the second gusset; otherwise, the joints will be only half as strong as required. The lateral thrust of the braced rafters is transferred to the sill by joist hangers. The rafters must be trimmed to fit these hangers.

Insulation can be any of the commercial varieties applied to the required thickness (R-20 minimum). Plastic insulations (polystyrene, polyurethane) are a serious fire hazard if not covered on interior surfaces with metal lath, plywood, hard-pressed fiberboard, particleboard or equivalent.

VENTILATION

The storage is ventilated by a forced air system. The amount of outside air introduced in the storage is regulated by a mixing damper controlled by thermostats through a modutrol motor. The main air plenum runs parallel to the long axis of the storage with the delivery ducts extending under the pile at 14 ft intervals. The main plenum extends up the end wall to allow recirculation of air in the storage without forcing it through the potatoes. There is a 2 in. air space between the potatoes and the outside wall to avoid frost damage.

Since this storage is cooled by introducing outside air, the vapor barrier is shown inside the insulation. If refrigeration is added to extend the storage period through summer, the vapor barrier for most locations in Canada should be placed outside the insulation to minimize condensation in the insulation.