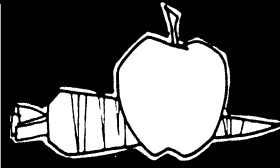




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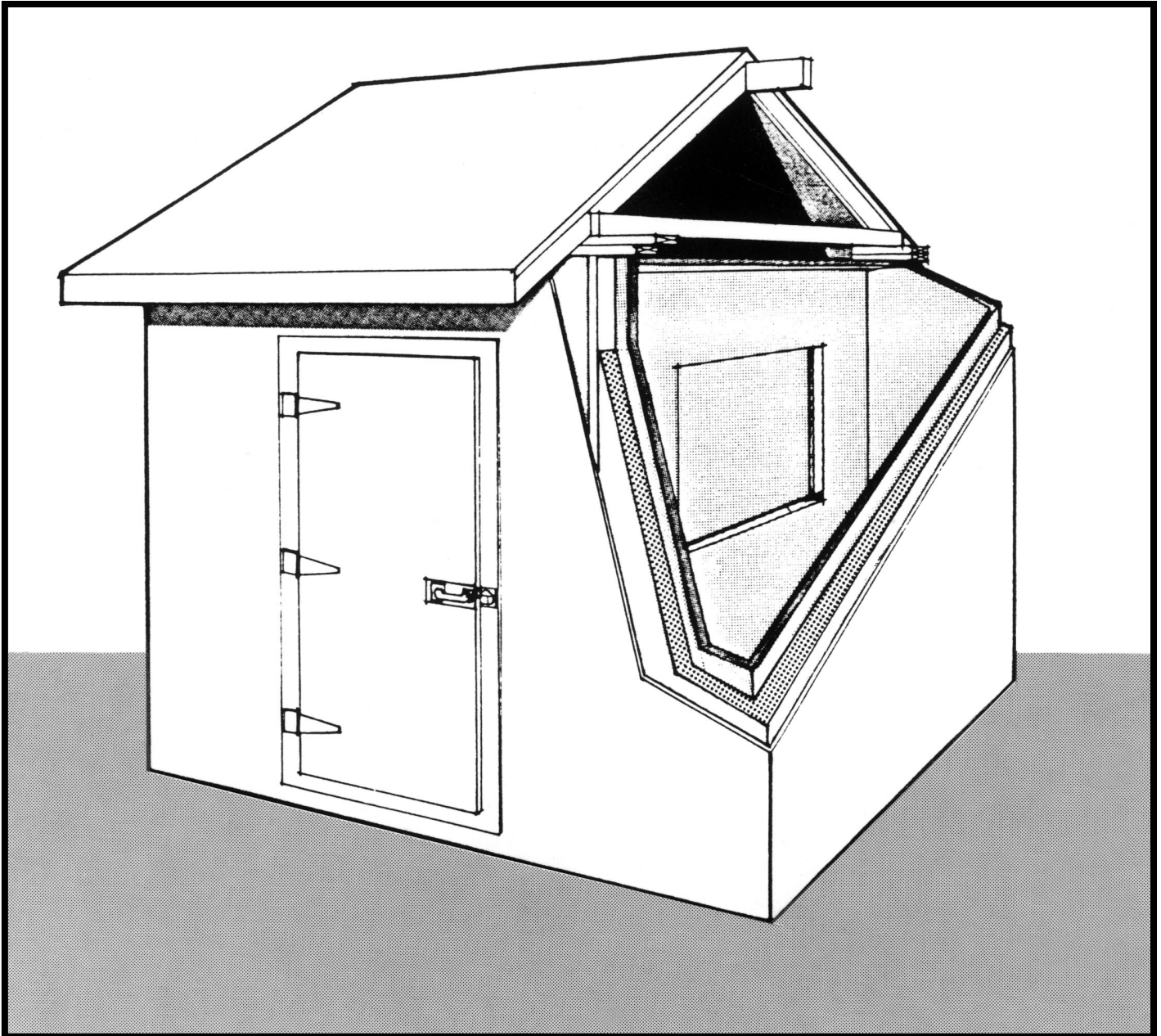
Agricultural Building Systems Handbook



PLAN

330-20

## WALK - IN COOLER / FREEZER



DEVELOPED BY CANADA PLAN SERVICE

## 330-20

### WALK-IN COOLER / FREEZER

CPS  
PLAN M-6319

A large cooler is excellent for storage of garden and dairy produce. For the market gardener, a cooler improves quality and farm operations by allowing picking in advance of marketing. A freezer provides added storage for many frozen foods and vegetables.

The cooler and freezer can be any practical size. The cooler in this plan, about 2 m X 2 m, will hold about 3 m<sup>3</sup> (100 ft<sup>3</sup>) of produce, or about 1.5 tonnes (3,200 lb). Either the cooler or freezer, or both, may be constructed from this plan.

The plan shows access to the smaller "reach-in" freezer section through the walk-in cooler, to save energy. There are many situations, however, where it is more convenient to have separate outside access doors for each section. Small freezer rooms like this also may not be as practical or convenient as another deepfreeze.

Cold rooms like this are usually constructed in another building, such as a garage, basement, or sales building. They can however, be made as a separate building.

#### CONSTRUCTION OPTIONS

This plan illustrates basic wood frame construction. Rigid insulation is attached to the inside of the framing with adhesive, then covered with a liner. Commercial cooler wall sections of "sandwich panel" construction are another high quality choice.

Coolers should be insulated to RSI 3.5 (R-20) minimum; freezers to RSI 5.0 (R-28). Insulation should be impervious to moisture, such as closed cell styrene (Dow SM or equal) or foil-faced urethane panels. Stud spaces can be filled with cheaper batt insulation. Vapour barriers should be located on the "warm" or outside of the insulation. It is essential for non-moisture-tight insulations like "beadboards" or urethane foam.

Floors for small cold rooms, for long term use, should be insulated. Large vegetable storage areas though, are not, due to the high cost and heavy loads. Freezer floors must be well insulated. Plywood, painted with floor paint or commercial floor topping, or concrete, is a good floor covering.

Cold room doors must be rugged and well sealed. Though this plan shows one construction method, consider purchasing commercial cooler door units for smooth operation, durability, and ease of installation.

Instead of building a cooler, consider buying used coolers from hotels, restaurants or supermarkets. Used transport trailer coolers are also available.

#### REFRIGERATION EQUIPMENT AND CONTROLS

Cooling equipment consists of a compressor and condensor outside the cold room, and evaporator or cooling coils in the coolers, together with appropriate plumbing, controls, and electrical service. Reliable used equipment is often available. The services of an experienced refrigeration supplier should be obtained.

Cooling coils require regular defrosting (electric defrost) with related controls. Though both cooler and freezer can be operated from one compressor unit, it is better to have separate units for each section. Overall cost will not be much greater.

Condensers may be either air or water cooled. Air-cooled condensers are most common. Heat from the condenser may be used in the room or vented to outdoors. Though water-cooled condensers are more efficient, they require a water supply.

The size of refrigeration compressor and cooling coils will depend both on the size of cold room or freezer, and how the room is used. A room for cooling quantities of summer produce requires much larger cooling capacity than one which simply "holds" produce which is added slowly and field cooled.

The following is a guide to cooling requirements for cold rooms and freezers. However, it is important that equipment and controls be properly matched.

Storage Volume <sup>1/</sup>		Refrigeration Coil Capacity (kW) <sup>2/</sup>		
m <sup>3</sup>	Tonnes	A	B	C
5	1.0 - 1.5	1.0 - 1.3	0.4 - 0.7	1.0
10	2.5 - 3.0	1.5 - 2.0	0.8 - 1.2	2.0
20	3.0 - 5.0	3.0 - 4.0	1.5 - 2.0	---

1. About 1/3 to 1/2 the room volume will be actual produce volume.  
Most produce will weigh 400 to 650 kg/m<sup>3</sup> (25 - 40 lbs/ft.<sup>3</sup>)
2. 1 kW = 3400 BTU/h; for coolers, 1 kW requires about 1/2-horsepower compressor.
  - A. Heavy usage - cooler at 4°C filled with produce every 2-3 days.
  - B. Light usage - storage of fall crops, mostly field cooled; and partial summer use.
  - C. Freezer section at -20°C.