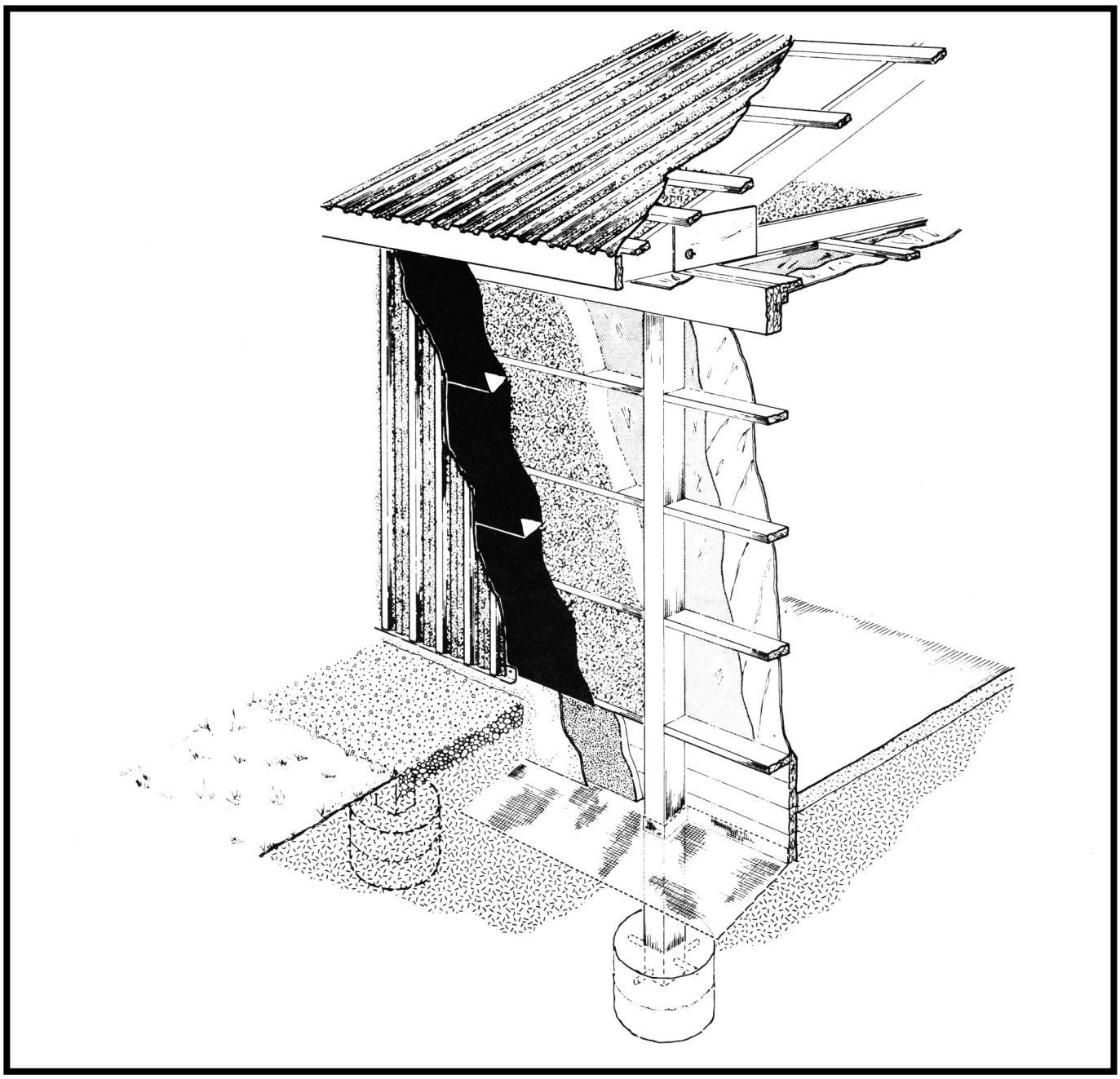
INSULATED POLE - FRAME WALLS



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INSULATED POLE-FRAME WALLS

CPS
PLAN 9314 REVISED: 82:12

This plan gives details for framing insulated farm building walls with poles of sawn, pressure-treated timber. The plan is intended primarily for single-storey livestock or storage buildings that will be heated in winter. The general plan is to use pressure-treated rectangular-sawn wood poles spaced at 8 ft centers instead of the conventional continuous strip footing and foundation of concrete below grade.

This construction offers a number of advantages:

- eliminates concrete framework – the pole footings are placed directly into post holes dug to below frost;
- shorter construction time from start to closed building (an advantage in winter construction);
- better windstorm resistance – poles connect all the building components directly to concrete pads at the base of each pole;
- door and window openings do not need any special header framing as long as the openings do not exceed 7 ft 4 in. in width;
- sawn-rectangular poles are easy to align and fit smoothly into walls that are to be clad both inside and out.

PRESSURE-TREATED WOOD Except for very temporary construction, all wood in contact with or near the ground should be pressure-treated with wood preservative. Brush or dip treatments do not penetrate enough for long-term protection against fungus and rot. Commercial wood-preserving plants use chemicals, methods and wood species recommended in CSA Standard 080 to ensure long-term durability of poles and base planking. In closed buildings, avoid the use of wood treated with pentachlorophenol (PCP, or 'Penta') because of long-term risks to the health of animals and humans.

Also, if you plan to use perimeter foundation insulation of polystyrene board, be sure not to use wood treated with oil-based preservatives or solvents. Polystyrene will quickly dissolve in contact with these. Water solution salt preservatives such as CCA and ACA are safer, do not bleed out to dissolve the insulation, and provide a paintable wood surface.

CEILING–TO-WALL CONNECTIONS
Great improvements can be made to the wind resistance of a building by secure attachment of the ceiling to the four walls. This plan makes ver specific suggestions for connecting ceilings of either sheet steel or plywood to the four side and end walls. Other plans such as 305-10 and 9374 give structural details for ceilings of steel and plywood, respectively.

STARTING CONSTRUCTION Instead of excavating a continuous perimeter trench, use a power auger big enough to five the required footing diameter. A small back-hoe is also satisfactory, especially in stony ground. At each pole location, dig post-holes. Precise depth is not important, as the concrete footings can be poured level to compensate for holes excavated too deeply.

Establish a datum floor level, and use a surveyor's level to determine the precise elevation at the top of the pole footings, usually 2 ft 8 in. or 4 ft 8 in. below floor datum. Level the top surface of the concrete footings with a plywood tamper secured to the bottom of a wood pole marked clearly at the level of the surveying instrument. Then, for fastening the plate beam and roof trusses later all the poles can be precisely notched and drilled before erection. This is much easier and faster than measuring, notching and drilling the poles up in the air after they are erected. Another method is to take a reading with surveyor's level and rod on the top of each concrete footing, then calculate the length for notching each pole to receive the leveled plate beam after the poles are put up. Do not cut away any of the treated wood where it will be in contact with the ground, as cuts will expose untreated wood to fungus.

Erect and align the poles, then pour a 'plug' of concrete around the base of each pole to prevent accidental uplift during windstorms. Short dowels of steel rebar (or spikes driven into the base) anchor each pole securely to the concrete plug.

FRAMING THE WALLS Spike the laminated plate beam at the top of the wall and the treated planking at the bottom. Note that the top splash plank should be rabbeted at the top outside edge before nailing, to receive the interior cladding later. Fit horizontal girts between the poles, spaced at 2 ft centers to correspond with insulation widths. Girts and blocking should fit well enough to isolate each wall space; this helps prevent rodents (and possibly fire) from travelling easily throughout the structure. The bottom girt should be pressure-treated like the bottom splash planking, since it is also close to ground and susceptible to fungus.

Pole frame walls are insulated, protected with vapor barrier and clad exactly like conventional frame walls except that the cladding sheets are run vertically instead of horizontally. Note that the dimension from the ceiling to the rabbet in the top splash plank should correspond to the length of interior cladding sheets (usually 8 ft).

FOUNDATION PERIMETER INSULATION This is optional. Wood splash planking alone provides better insulation than the conventional concrete foundation. However, in situations where the building will be maintained at 70°F (20°C) or above for the entire winter, it will probably pay to add perimeter insulation as shown in the plan. Pre-drill the cement-asbestos board cover and nail through cover, polystyrene board and into the splash planking with galvanized nails.