AGRI-FACTS
Practical Information for Alberta's Agriculture Industry

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Pump Houses

An insulated pump house provides excellent protection from freezing and contamination for the farm water pressure system. It is necessary to keep the pressure system warm and dry.

In the past, pits were often dug around the well head to house the pressure system. Unfortunately, these pits often caused well contamination and safety hazards. **Pits have not been allowed since environmental regulations changed in 1993**.

Locating the pressure system in the house basement is an alternative, but is not always feasible since the well may be too far from the house. A pump house is often a more convenient point for distribution to other areas of the farm.

Planning

The site for the pump house must be well drained, preferably on higher ground than the surrounding area. Ideally, the well should be offset from the pump house, using a pitless adapter on the well for the pump connection. This configuration allows easy access for a water well service rig to set up over the well. It is very difficult to move a pump house to get rig access to a well.

A pump house must be well insulated

Note: Some wells release methane (explosive), carbon dioxide or nitrogen (asphyxiants). These wells can be dangerous and need to be vented outside; they should not be located inside buildings.

If the pump house is placed over the well, locate the well near one side of the structure and not dead centre. The pump and equipment should be near the other side. The 8 foot by 8 foot size shown in Figure 1 is ample for most farms; however, the size can be adjusted to suit specific needs.

A pump house should be only used for housing water facilities and equipment. It should not be used to store chemicals, livestock feed, etc.

Consideration must always be given to the distance from the pump house to the electrical power. A pump house located too far from the yard pole may require an additional transformer to provide sufficient power.

Construction

Framing

A pump house must be well insulated to prevent freezing with minimum energy. Providing for ample insulation requires walls about 8 inches thick. This can be accomplished with 2 by 6 foot framing or staggered 2 by 4 foot double wall construction. Insulate with batt insulation and line with plywood or equivalent sheathing. Use 6 mil polyethylene sheeting as a vapour barrier and seal, and caulk to minimize cold air leakage.

Roof framing can be a 24 inch on centre (O.C.) with plywood and shingles or at 48 inch O.C. strapped for metal roofing. A simpler shed roof is also effective. Whichever method is used, a ceiling is desired to allow for thick (R-32) batt or loose fill insulation.

Floor/foundation

An excellent foundation is a 6 inch reinforced concrete slab with thickened edge over a well compacted gravel base. The perimeter of the slab is best insulated with impermeable foam insulation as illustrated. Pump house floors must not allow ponding of water, to minimize the risk of well contamination and electrical hazard. The floor should slope toward a drain, but if a floor drain is used, it needs to go to a proper disposal system that is not going to freeze.

If the well casing is in the building, it should protrude above the floor at least 8 inches to prevent contamination. The well casing needs to have a vermin-proof cap or sanitary well seal on the top.

Before placing the concrete, install the drain line and underground power line. The water supply line is best run through a larger line for the first 7 to 10 feet. This approach provides extra protection for the water line. It also provides a conduit to feed a new water line through if replacement is needed, which can eliminate the future need to tunnel under the building and jackhammer through the floor.

It may be necessary to remove the pump house to service the well. If so, use an anchor bolt and steel strap system (as show) inside the shed where it is accessible; otherwise, use simpler anchor bolts through the sill. A foam gasket or caulking under the wall sills is also recommended.

Heating

The pump house must be kept above freezing. Heating can be accomplished in a number of ways:

- a 500 watt thermostatically controlled electric space heater
- a thermostatically controlled gas space heater (with proper venting)
- a thermostat setting, for the heaters of four degrees to six degrees C should be sufficient

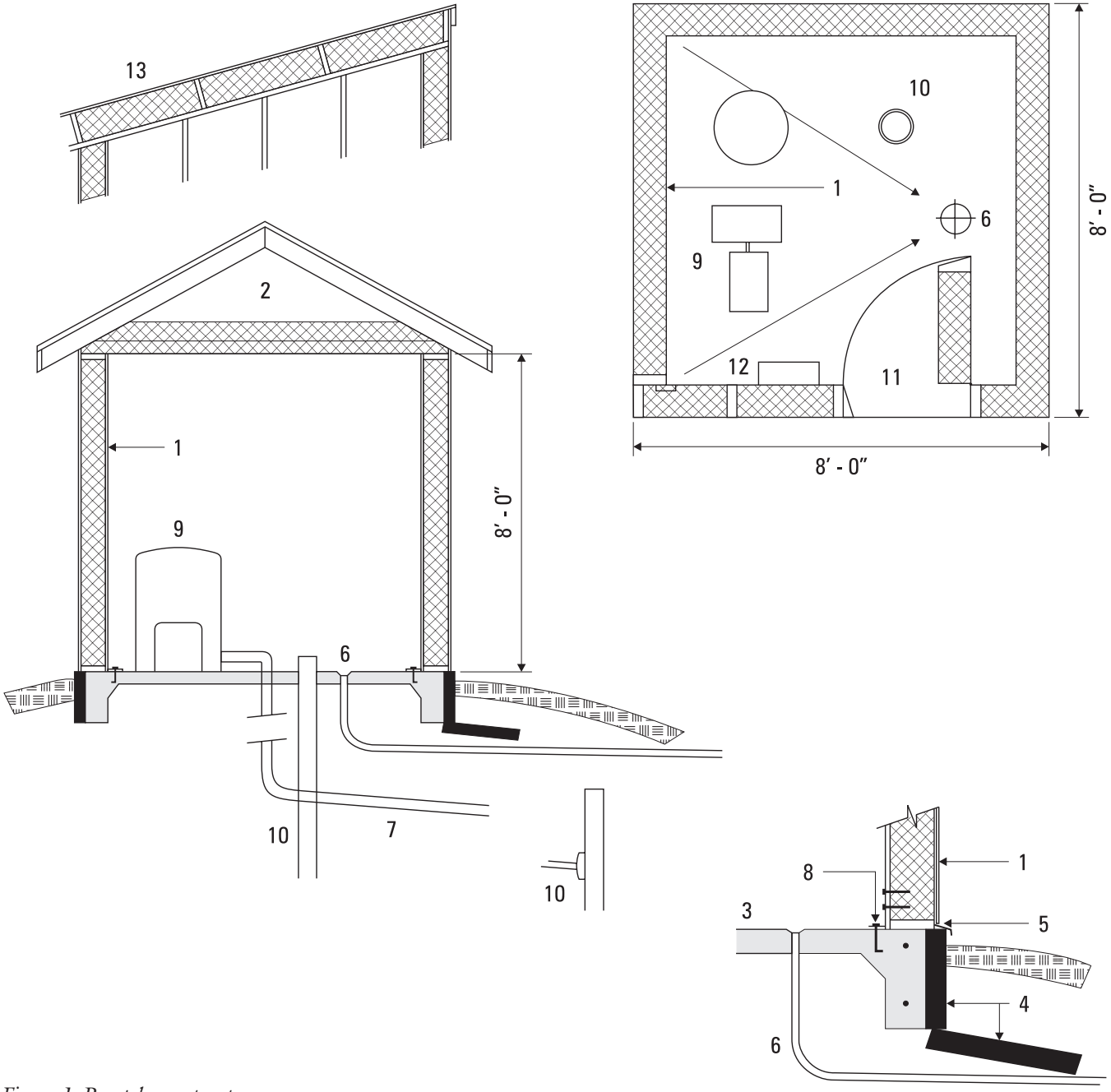

Figure 1. Pump house structure

Pump house

1. well insulated (R-20 min) wall, 2 x 6 or double 2 x 4 framing, caulk or foam gasket at sill
2. 2 x 4 rafters and ceiling framing R-30 attic insulation
3. concrete floor and reinforced foundation (2 - 15M rebar)
4. 3" x 24" rigid insulation
5. flashing and protection for the rigid insulation
6. floor drain for spillage (optional – depends on need)
7. water line in pipe sleeve and well below frost
8. 2" x 12" x 3/16" steel strap anchor (if shed movable) or bolts in sill
9. pressure system
10. well casing, in shed, or outside using pitless adapter (recommended)
11. insulated, gasketed door
12. electrical panel
13. shed roof detail, use 2' x 10' rafters across the slope

For more information

Alberta Ag-Info Centre at 310-FARM (3276)

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