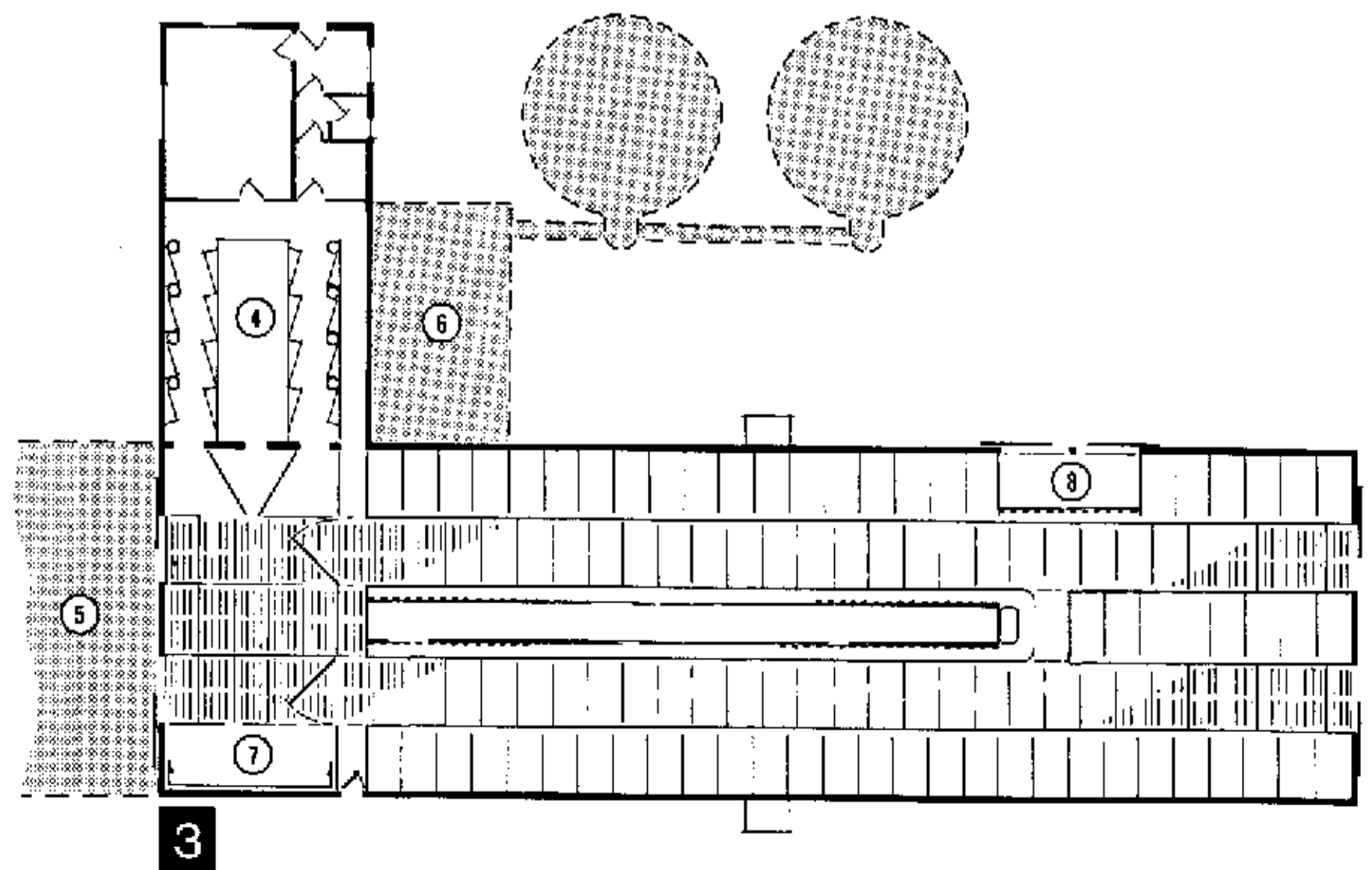


**2**

EXHAUST FAN	No. OF CATTLE (600 kg)	VENTILATION RATE L/s/cow	FAN CAPACITY L/s	THERMOSTAT	SETTING, °C ON/OFF	INLET SLOT OPENING mm	OUTSIDE TEMPERATURE
F <sub>1</sub>	64	x 15	= 960	T <sub>1</sub>	30°/10°		cold
F <sub>2</sub>	64	x 15	= 960	T <sub>2</sub>	60°/40°		mild
F <sub>3</sub>	64	x 60	= 3840	T <sub>3</sub>	160°/140°		warm
F <sub>4</sub>	64	x 90 <sup>(10)</sup>	= 5760	T <sub>4</sub>	210°/190°		
<b>TOTALS</b>	<b>64</b>	<b>x 180</b>	<b>= 11520</b>				



- 1 ventilation and electrical plan  
 2 ventilation schedule  
 3 floor plan, free stall system, slotted floor  
 4 milking center, see plan M-2501  
 5 optional wing for dry cows and heifers  
 6 optional feed center and silo location  
 7 holding area, with optional crowding gate  
 8 optional feeder for square or giant bales  
 9 ceiling center air inlet shown dotted

**SPECIFICATIONS**

If cattle are not housed in hot weather, fan F<sub>4</sub> capacity may be reduced to 3840 L/s like F<sub>3</sub>

Unless otherwise specified, all cast-in-place concrete is to be at least 30 MPa @ 28 days, 6% air entrained.

All reinforcing steel to be at least Grade 300 deformed bars; provide 50 mm concrete cover over reinforcing steel.

All exposed steel to be galvanized or painted to resist corrosion from moisture and manure gases.

All untreated framing lumber is No. 2 (or better), S-P-F species group, unless otherwise specified.

All wood indicated 'pressure-treated' is CCA pressure-treated to a net retention of 6.4 kg/m<sup>3</sup> (ground contact specification, CSA-080 Wood Preservation).

All nails exposed to treated wood, humid atmosphere or weather to be hot-dip galvanized.

This plan is designed to meet the requirements of the Canadian Farm Building Code.

Notes thus marked indicate where this plan gives structural choices to be selected to meet local climatic loads (wind, snow), soil bearing capacity and other local conditions. The plan user must ensure that these requirements are met. Consult an engineer if you are not familiar with the details required.

- ONE SET OF DRAWINGS AND LEAFLETS SHOULD INCLUDE:
- | CPS no. | sheet no. | Title   |
|---------|-----------|---|
| M-2102  | -1-       | Free stall dairy system - Slotted Floors                |
| M-2102  | -2-       | Foundation and floor plans                              |
| M-2102  | -3-       | Cross-section and details                               |
| M-2102  | -4-       | Typical cross-section and details                       |
| M-2102  | -5-       | Truss design and spacing to suit local snow + dead load |
- AND
- M-2501 - - Herringbone Milking Center
  - Q-2503 - - Milking Parlor Grounding Method
  - M-9314 - - Insulated Pole Frame Walls
- AND LEAFLETS
- M-2102 Free Stall Dairy System - Slotted Floors
  - M-2658 Tombstone Feed Fence
  - M-9102 Truss Erecting and Bracing
  - M-9341 Sliding Doors
  - M-9715 Self-adjusting Slot Air Inlets

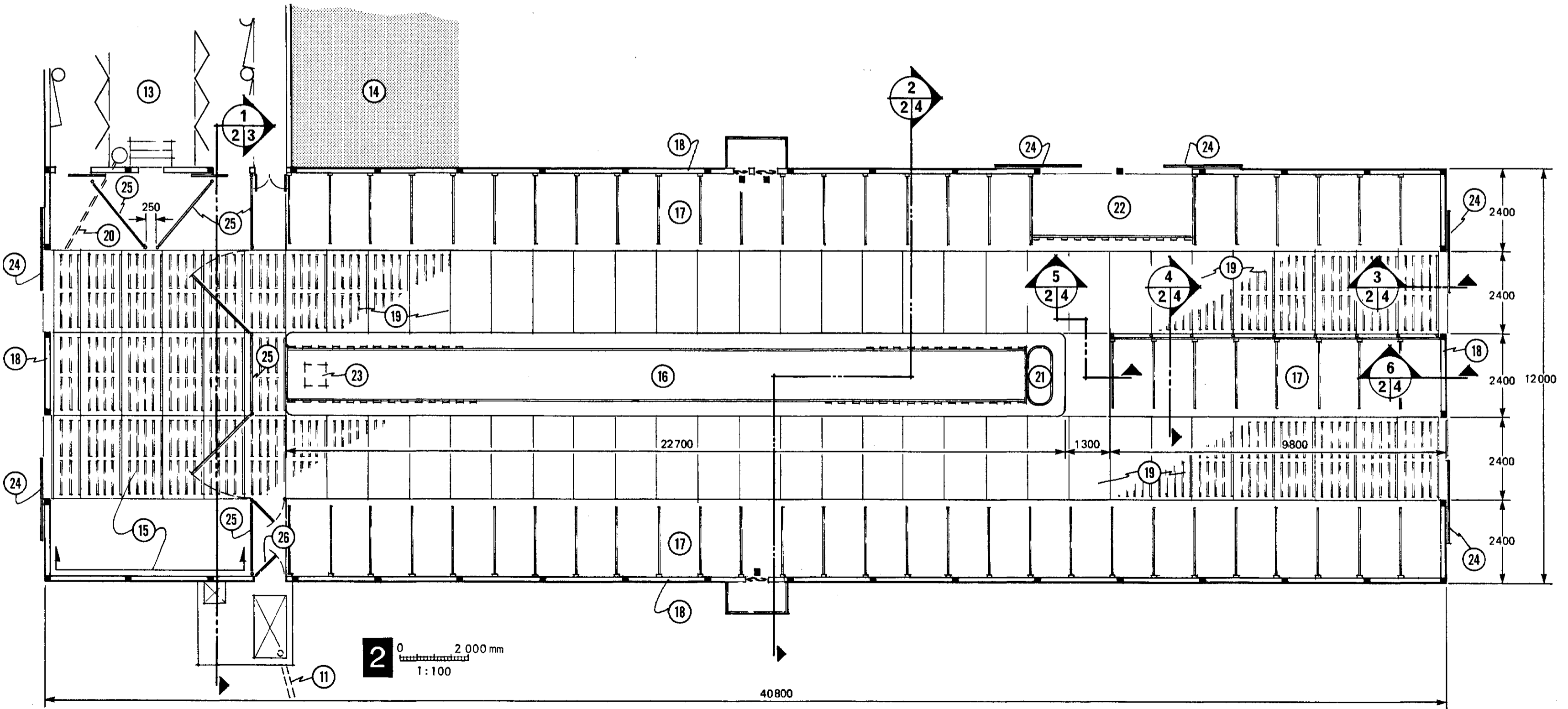
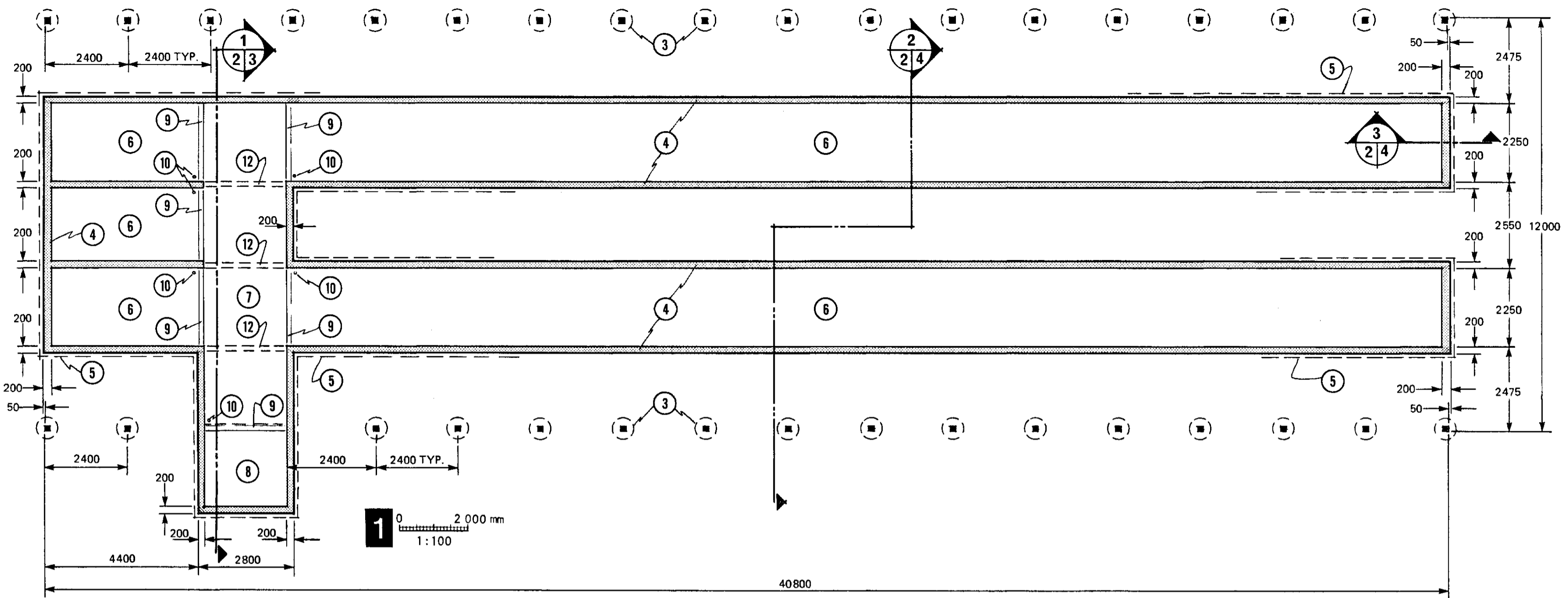
REVISED & RE-ISSUED	H A J	87-09	J E T
REVISED & RE-ISSUED		81-01	

**CANADA PLAN SERVICE**


FREE STALL DAIRY SYSTEM

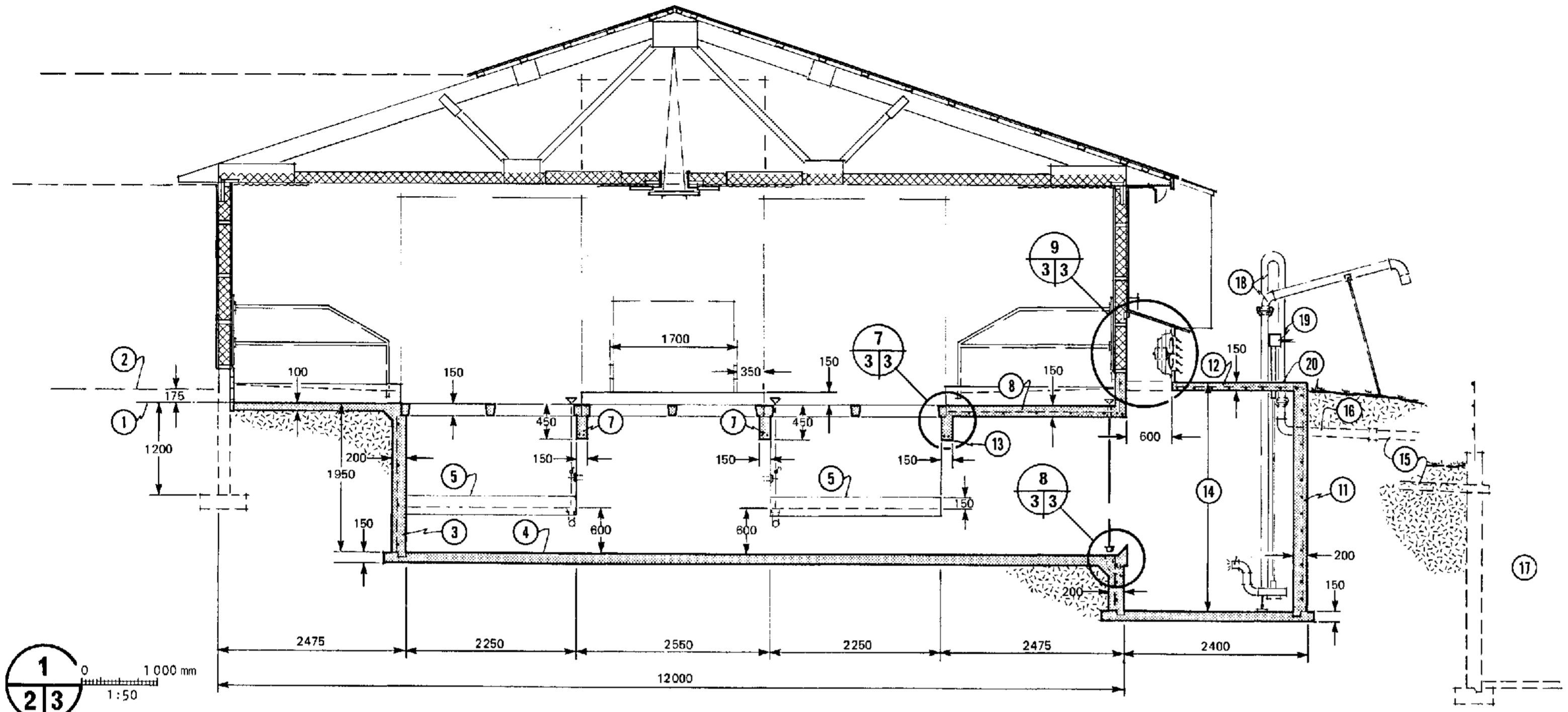
DESIGNED	DATE 78-01	PLAN
DRAWN R. PELLA	REVISED 87-09	M-2102
TRACED	DETAIL NUMBER A	SHEET 1 OF 1
CHECKED JAM	ORIGINATOR ON SHEET B DRAWN ON SHEET C	

ALL DIMENSIONS ARE IN MILLIMETRES (mm) UNLESS OTHERWISE SPECIFIED

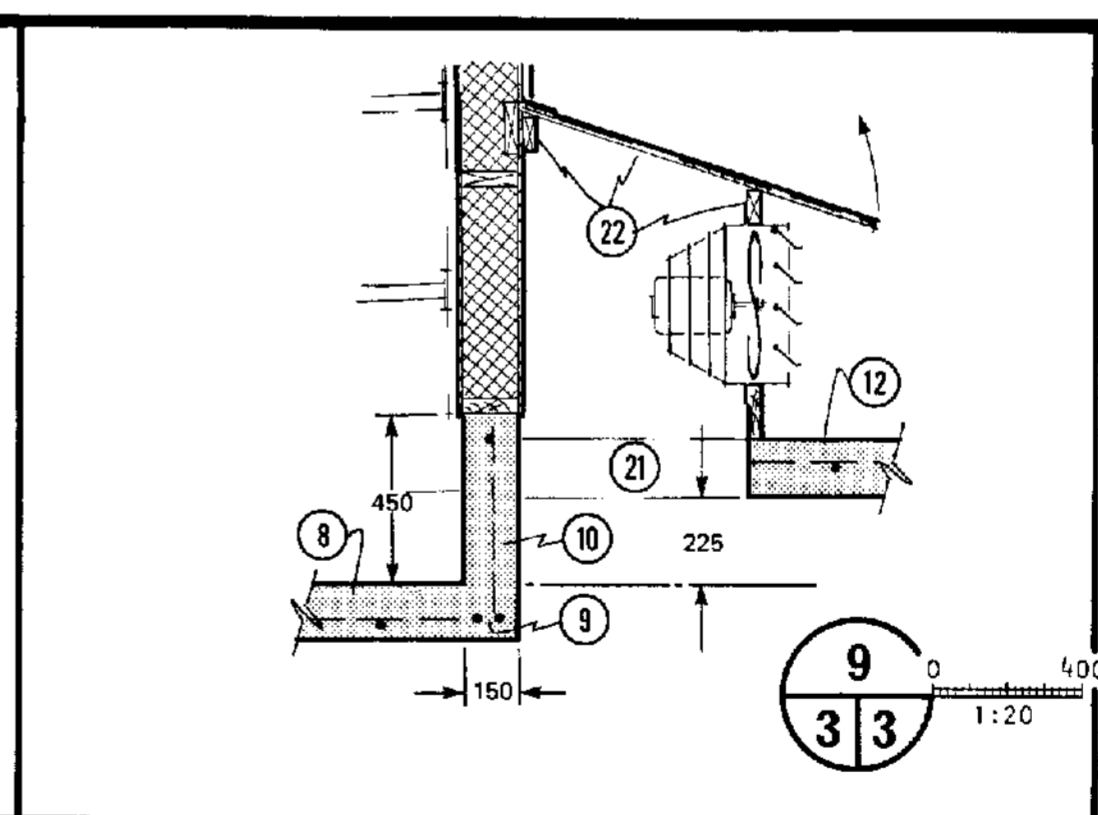
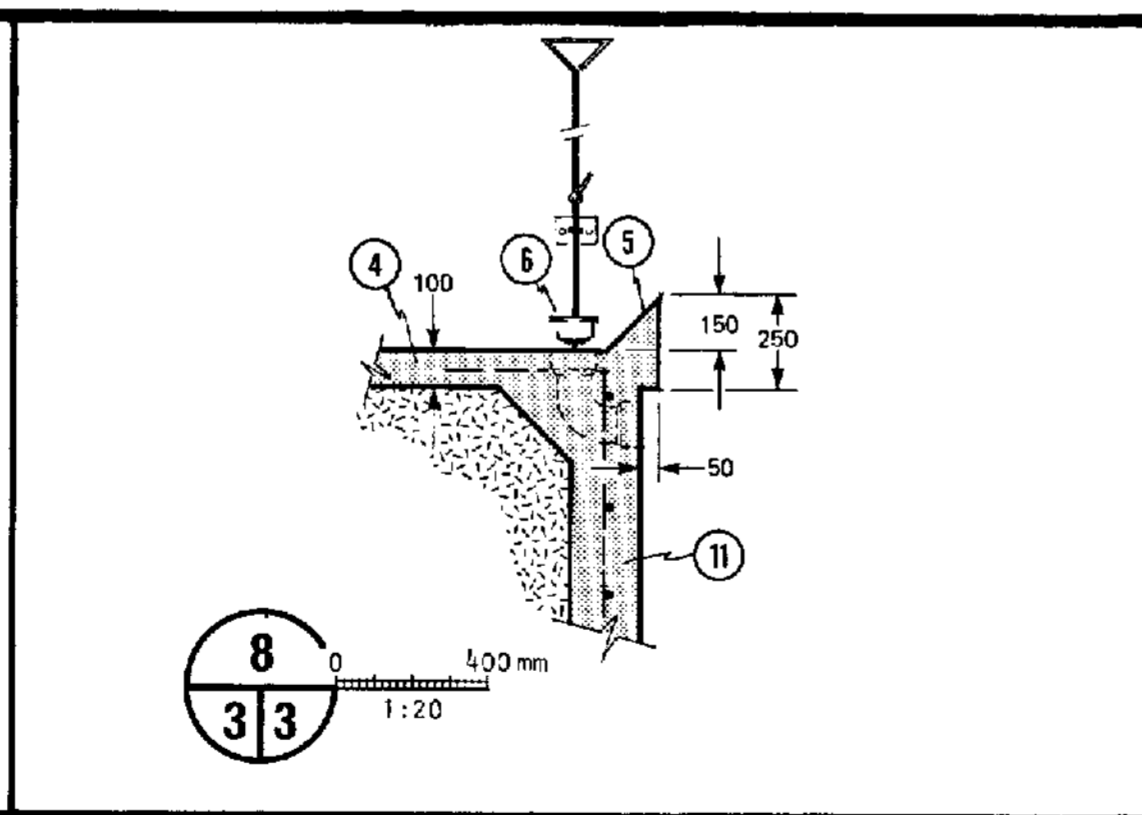
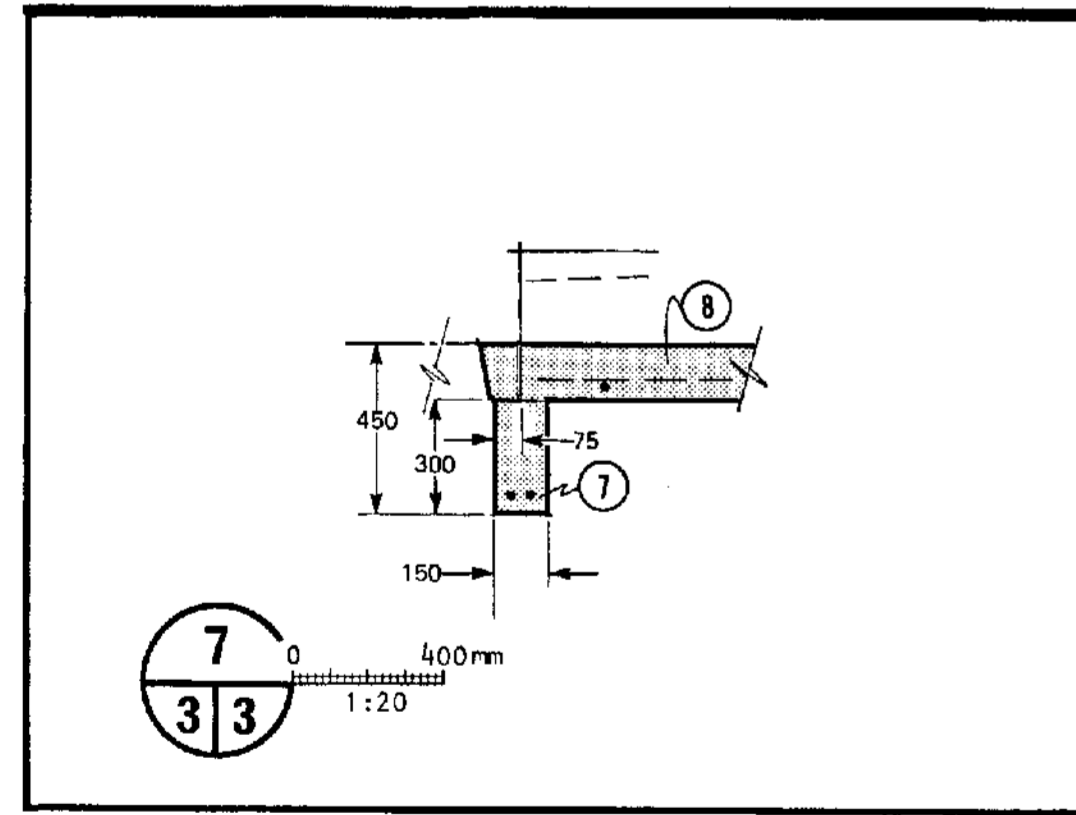
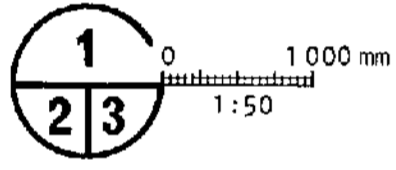


- 1 foundation plan, pump transfer system
- 2 floor plan, 60/64 free stalls
- 3 concrete pad footings shown dotted (600 mm diam. safe to 1.64 kN/m<sup>2</sup> roof snow load on 100 kN/m<sup>2</sup> soil); 140 x 140 mm pressure-treated poles, see plan M-9314
- 4 reinforced concrete manure trench walls
- 5 edge of footings shown dotted
- 6 collecting channel, no bottom slope, all channel surfaces trowelled smooth; channel bottom 1350 mm below floor datum is minimum depth for channels 33600 mm long as shown
- 7 cross channel, no bottom slope, all channel surfaces trowelled smooth, bottom is 600 mm below (6)
- 8 pumping pit bottom is same depth as set length of manure transfer pump (3000 mm typical)
- 9 overflow weir, 150 mm above floor of channel
- 10 100 mm drain elbow c/w removable plug, see sheet 3
- 11 pvc transfer pipe, size to match pump (typ. 125-150 mm), to long-term storage, see sheet 3
- 12 concrete beam over, shown dotted
- 13 milking center, see plan M-2501
- 14 feed center optional
- 15 holding area; mechanical crowding gate optional
- 16 feed bunk with tombstone feed fence (see leaflet M-2658)
- 17 free stalls @ 1200 mm wide, see manufacturer for hardware specifications
- 18 insulated pole frame wall, see plan M-9314
- 19 1200 x 2400 mm precast reinforced concrete slab grid, see manufacturer
- 20 outlet pipe from milkroom sump pump, same pipe size as pump outlet; optional valve and branch pipe to far ends of channel (6)
- 21 automatic water trough, 350 x 150 mm concrete step around 3 sides
- 22 optional round bale feeder with tombstone feed fence, or additional 4 free stalls
- 23 feed conveyor from (14) drops through ceiling
- 24 2400 x 2400 mm insulated sliding door
- 25 1½" galv. pipe fencing and gates
- 26 910 x 2030 mm insulated exterior door

SYM	REVISIONS	CHECKED	DATE	APPROVED
		FOUNDATION AND FLOOR PLANS PUMP TRANSFER SYSTEM		
DESIGNED <i>JET</i>	DATE 78-01	PLAN		
DRAWN R. PELLA	REVISED <i>JET</i> 84-01	M-2102		
TRACED	DETAIL NUMBER	SHEET 2 OF		
CHECKED <i>JAM</i>	ORIGINATES ON SHEET <i>B</i>	DRAWN ON SHEET <i>C</i>		



- 1 datum line, top of slotted floor grid
- 2 milking parlour floor line shown dotted
- 3 smooth finish concrete walls, 15M rebars @ 600 mm oc both ways centered in wall, bend vertical rebars into floor slab, place slat grids before backfilling and compacting stalls
- 4 conc. floor, steel trowelled smooth and level
- 5 overflow weir, top sharp-edged and level
- 6 optional 100 mm pvc drain elbow and removable plug for complete drainage of trench; rubber stopper or wood plug, galv. bolt, nuts and washers, weld to steel rod with eye for removal with hook; use eye-bolt anchored to wall to hold rod in place
- 7 2-10M rebars, bend 150 mm into wall at ends of beam
- 8 15M rebars @ 450 mm oc top and bottom, min. 25 mm cover from bottom of slab, bend and extend into wall and beams
- 9 2-15M rebars
- 10 15M rebars @ 500 mm oc both ways, centered in wall
- 11 10M rebars @ 225 mm oc both ways, centered in wall, extend vertical rebars 600 mm into slab
- 12 10M rebars @ 225 mm oc both ways
- 13 to prevent ventilation failure and fan burnout do not allow liquid level to reach bottom of beam
- 14 see pump manufacturer for set-length of pump (3000 mm typical)
- 15 125 or 150 mm pvc pipe to match pump (19), slope to long term storage; flush with water and drain at end of pumping to prevent freezing; if storage is uphill add drain valve to back-drain pipe to transfer tank
- 16 galv. steel pipe joins pvc (or other) pipe beyond excavation from transfer tank
- 17 long term liquid manure storage shown downhill from barn; if uphill, see (15)
- 18 galv. steel pipe and fittings to match pump, with quick-coupler to J-pipe for manure pump connection; couple to (15)
- 19 tractor pto pump or submersible electric manure pump, to agitate pit and pump out
- 20 tight-fitting weatherstripped steel cover plate (prevents air short-circuit to fan)
- 21 600 x 600 mm opening in cover slab
- 22 frame weather-hood with pressure-treated wood, line with plywood and paint with 2 coats of wood preservative, weatherstripped tight-fitting cover, hooked in place and removable for servicing fan



SYM	REVISIONS	CHECKED	DATE	APPROVED

**CANADA PLAN SERVICE**

CROSS-SECTION & DETAILS  
PUMP TRANSFER SYSTEM

DESIGNED <i>JET</i>	DATE 78-01	PLAN
DRAWN <i>R. PELLA</i>	REVISED <i>JET 84-01</i>	<b>M-2102</b>
TRACED	DETAIL NUMBER <i>A</i>	SHEET 3 OF
CHECKED <i>JAM</i>	DRAWN ON SHEET <i>C</i>	

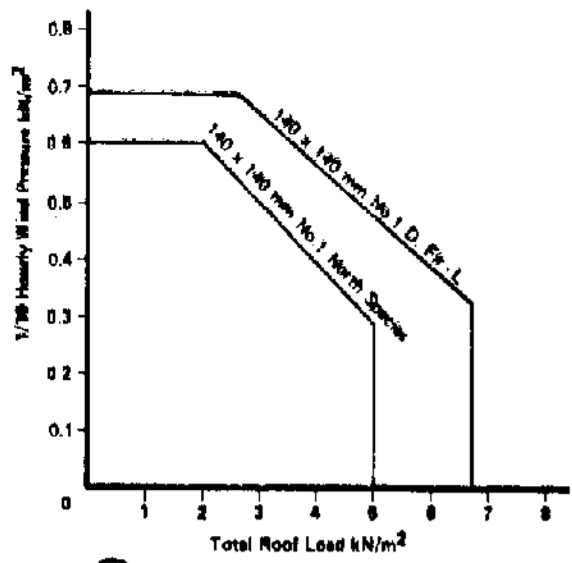
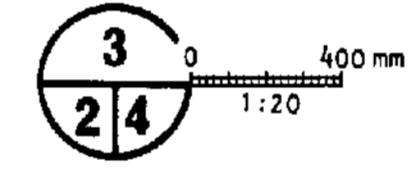
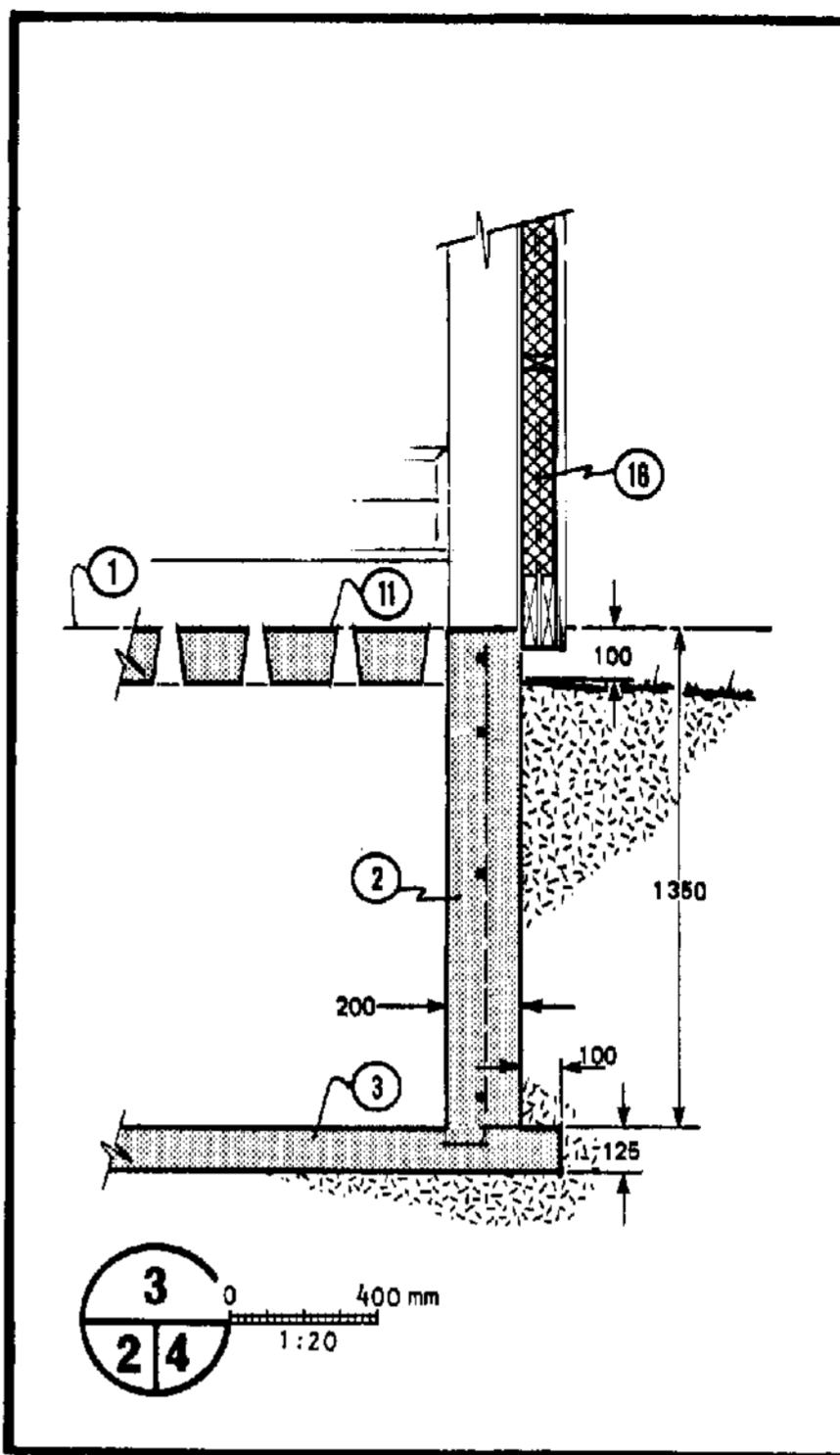
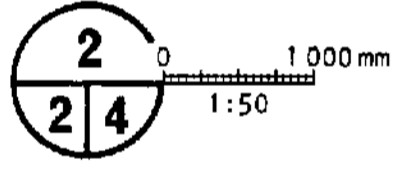
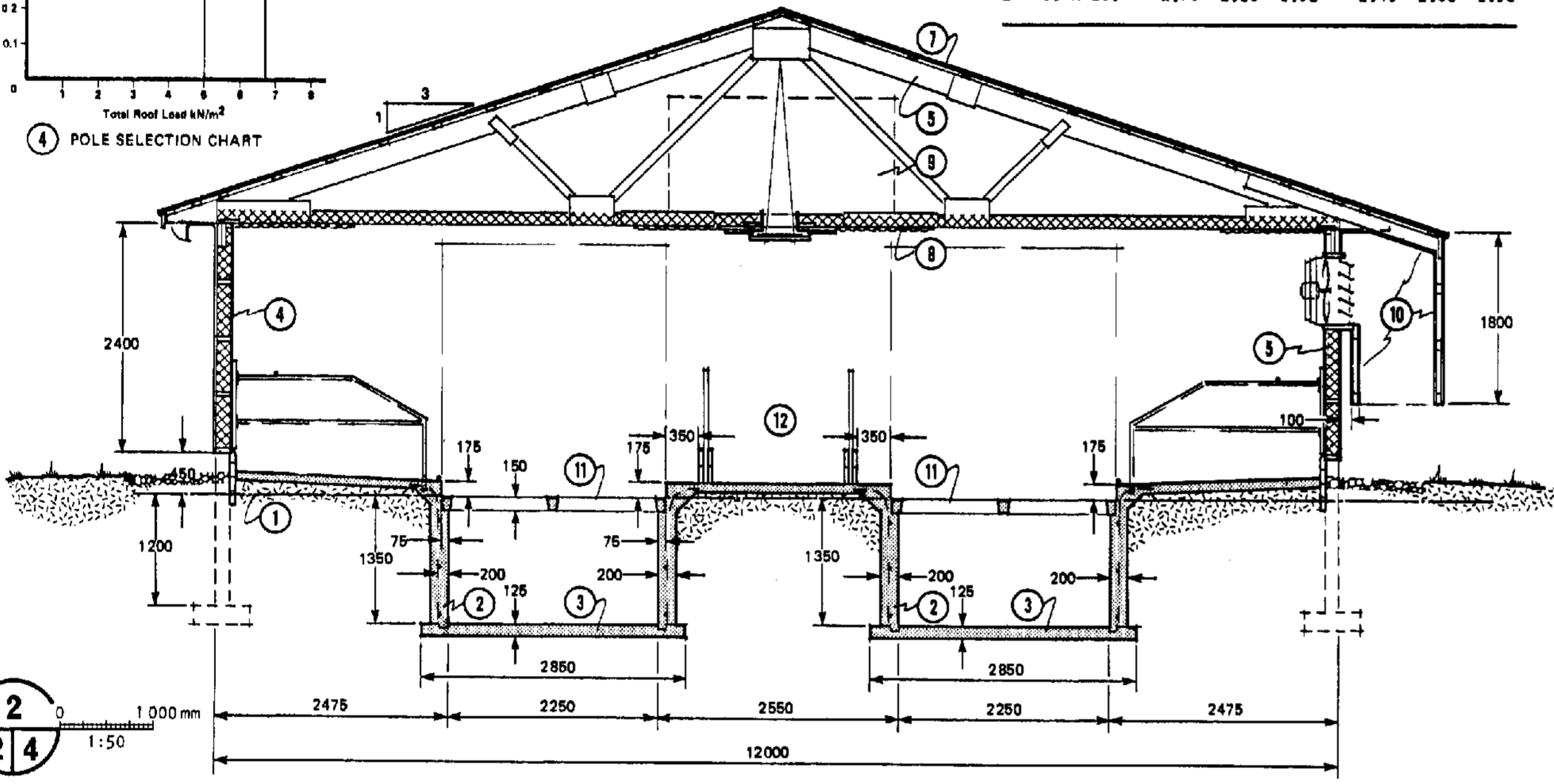


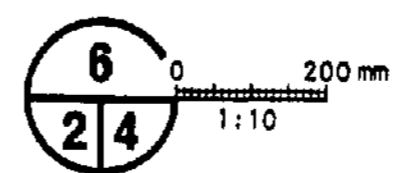
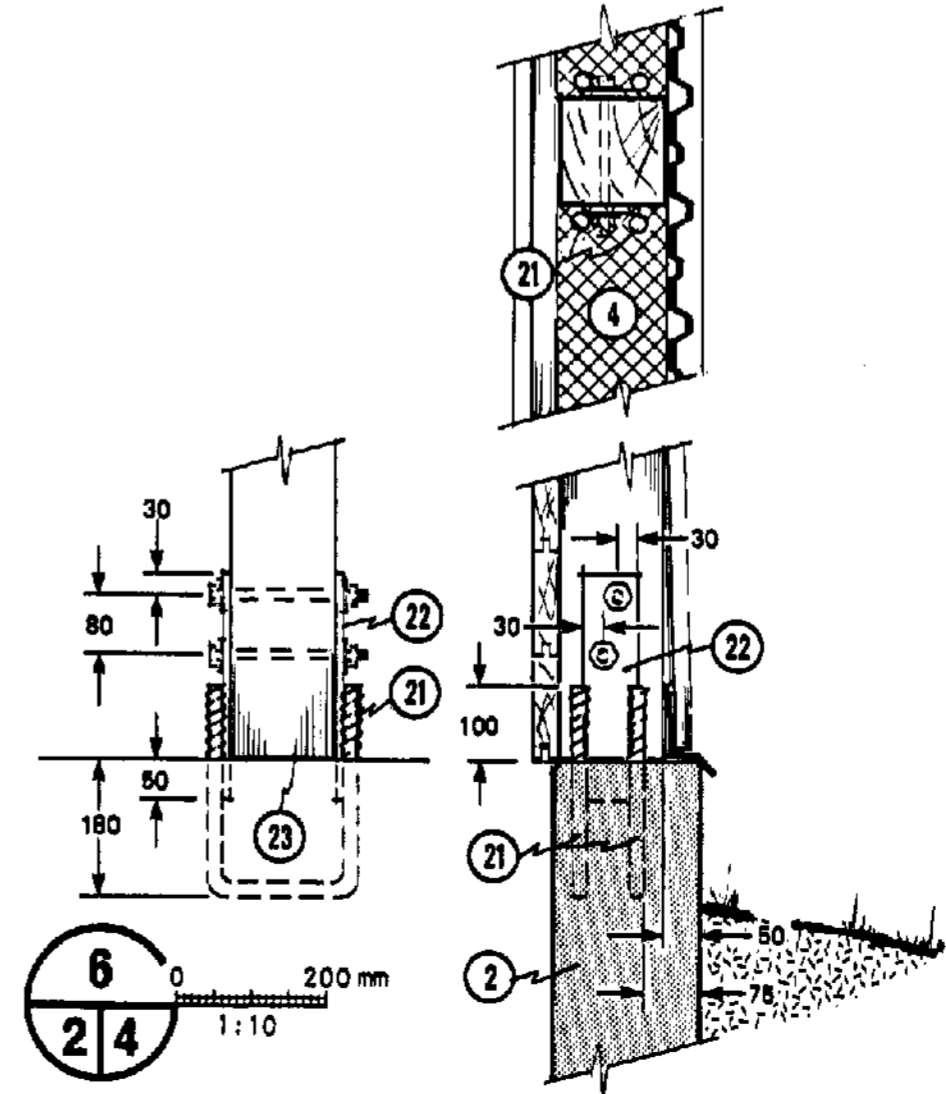
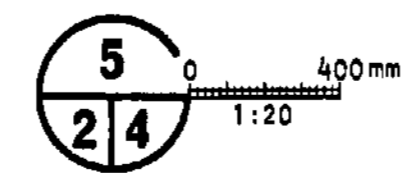
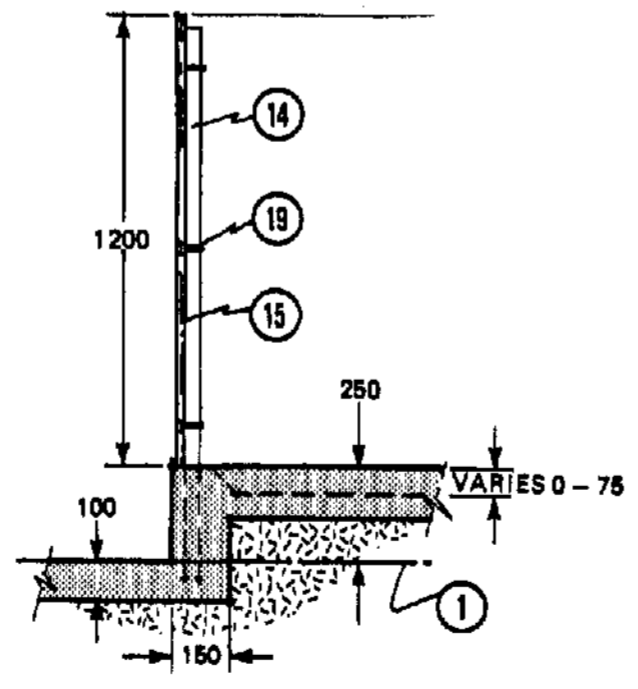
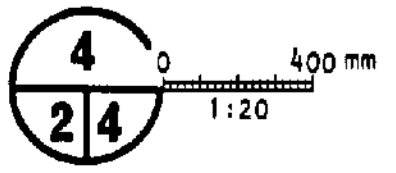
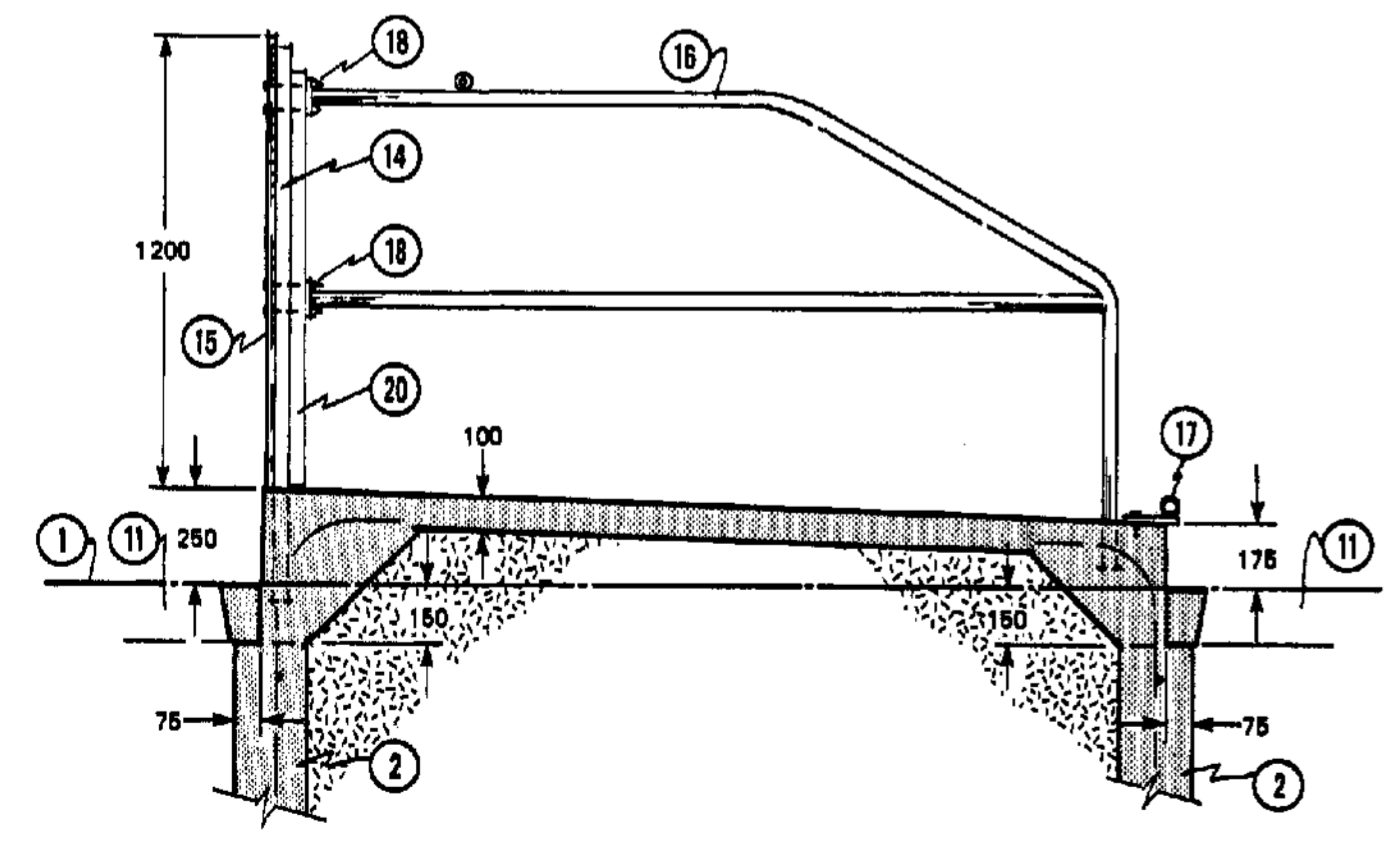
Table ⑥ Plate beam safe uniform total roof loads, kPa

Plate beam	No. 2 S-P-F Truss spacing, mm on center			No. 2 D. Fir		
	1200	800	600	1200	800	600
2 - 38 x 184	1.44	1.22	1.16	1.22	1.03	--
2 - 38 x 235	2.16	1.75	1.58	1.83	1.54	1.47
2 - 38 x 286	2.75	2.13	1.92	2.46	2.08	1.98



ALL DIMENSIONS ARE IN MILLIMETRES (mm) UNLESS OTHERWISE SPECIFIED

- 1 datum line, top of slotted floor grids
- 2 smooth finish concrete walls, 15M rebar @ 600 mm oc both ways centered in wall, bend vertical rebar into floor slab, place slat grids before backfilling and compacting stalls
- 3 conc. floor, steel trowelled smooth and level
- 4 insulated pole frame wall, see plan M-9314; see plate beam Table ⑥, see pole selection chart ④
- 5 trusses @ 1200 mm oc, to meet local design loads, see M-9102 for bracing requirements
- 6 2 - 38 x 235 x 4800 mm plate beam (3 in end spans), joints staggered 2400 mm oc at poles; no. 2 spruce safe to 2.16 kPa total roof load; for truss spacings other than 1200 mm oc and/or heavier roof loads, see Table ⑥
- 7 galv. roofing on 38 x 89 mm purlins @ 600 mm oc max. or to suit local design snow loads and roofing profile
- 8 insulated steel or plywood ceiling with center air inlet, see M-9715
- 9 2400 x 1200 mm summer ventilation door (in both gables), see plan M-9373
- 10 fan weatherhood framed with 38 mm; 7.5 mm plywood lining; opening area at least 2 times frame area of all fans
- 11 precast reinforced concrete slat grid (see manufacturer)
- 12 feed bunk, tombstone feed fences, see M-2658
- 13 insulated sliding door, see leaflet M-9341
- 14 1 1/2" x 1500 mm long galv. steel pipe @ 1200 mm oc, embedded 300 mm into concrete
- 15 18.5 mm sheathing plywood
- 16 stall divider with adjustable headrail, see manufacturer
- 17 optional bedding retainer, 1 1/2" galv. steel pipe, secured 13 mm above stall curb
- 18 carriage bolts both sides of ⑱ to pipe flange of stall hardware
- 19 fasten plywood to pipe with U-bolts, cut U-bolt flush
- 20 38 x 89 mm blocking @ each stall divider ⑯
- 21 2 - 20M x 700 mm U-bars, weld to strap ⑳
- 22 9 x 75 x 300 mm steel strap tie, drill for 2 - M20 bolts, paint with asphalt rustproofing before installing poles
- 23 soak butt of pole in penetrating wood preservative after drilling, before erecting



REVISOR	REVISIONS	CHECKED	DATE	APPROVED

**CANADA PLAN SERVICE**

TYPICAL CROSS-SECTION AND DETAILS

DESIGNED <b>JET</b>	DATE 78-01	PLAN <b>M-2102</b>
DRAWN <b>R. PELLA</b>	REVISED 87-09	
TRACED	DETAIL NUMBER <b>A</b>	SHEET 4 OF 4
CHECKED <b>JAM</b>	ORIGINATES ON SHEET <b>B</b> DRAWN ON SHEET <b>C</b>	