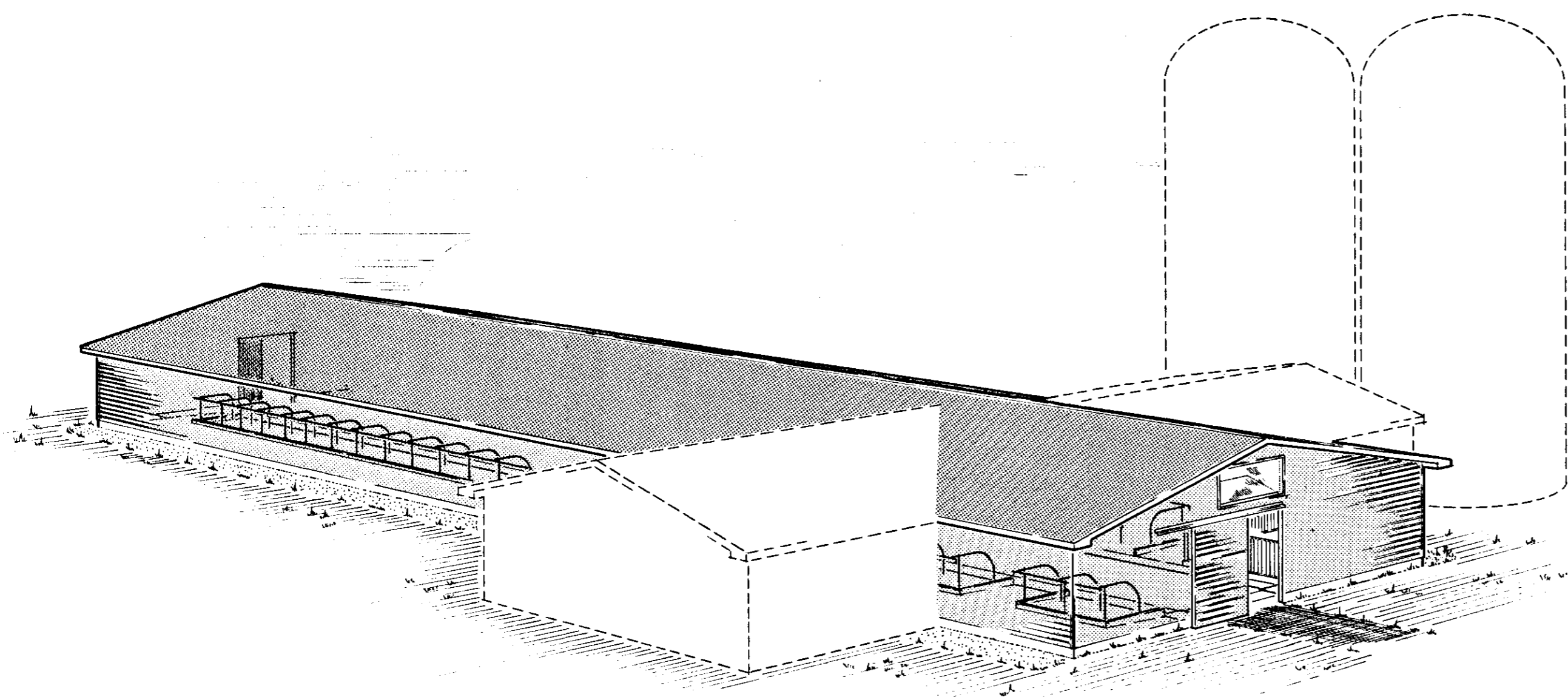


**WARNING**  
 This plan may require structural and other changes to meet local site conditions, climatic loads, user requirements and applicable building regulations (such as the Canadian Farm Building Code). Before construction, the user of this plan is responsible to ensure that all required changes are made.



- 1 ventilation and electrical plan for mechanical cleaner option, minor alterations may be required for other layouts
- 2 ventilation schedule
- 3 milking herd area
- 4 milkhouse
- 5 feedroom
- 6 optional calf or replacement heifer area
- 7 ceiling center air inlet shown dotted
- 8 put alternate lights on different circuits to permit two lighting levels in barn

**SPECIFICATIONS**

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

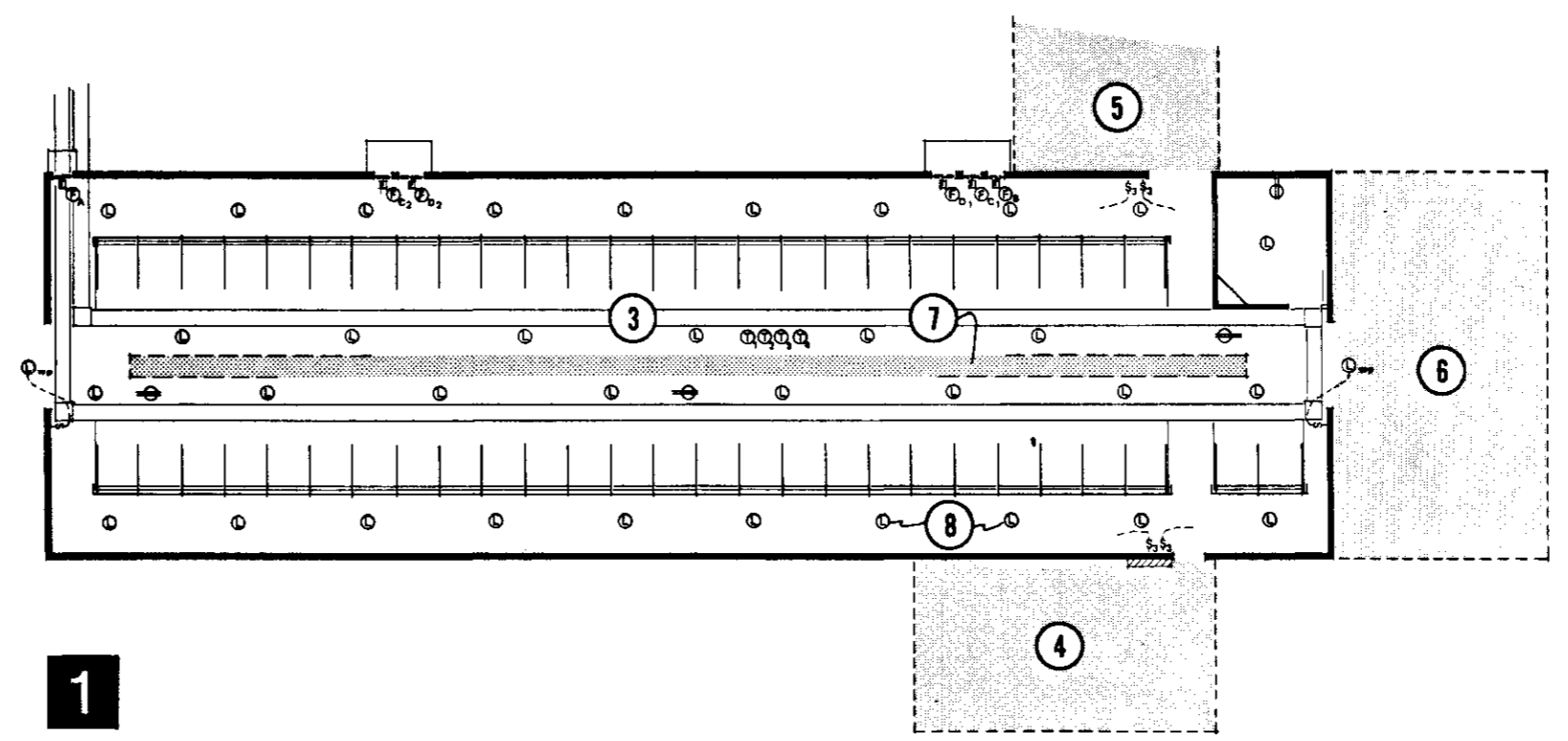
All reinforcing steel to be min. Grade 300 deformed bars; provide 50 mm concrete cover over reinforcing steel

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

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

This plan conforms to the requirements of the Canadian Farm Building Code. The user of this plan must ensure that the design criteria indicated herein will meet all local design conditions, building regulations and special requirements.

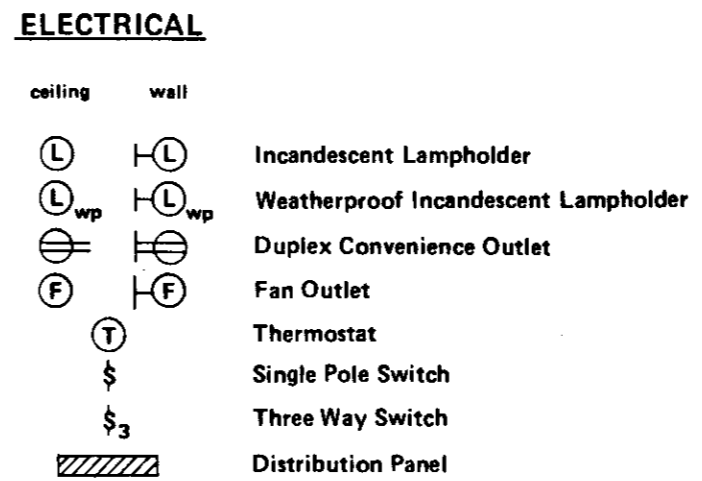


**1**

- ONE SET OF DRAWINGS AND LEAFLETS SHOULD INCLUDE:**
- | CPS no.    | sheet no. | title   |
|------------|-----------|---|
| 2220       | -1-       | Single story tie stall barn - 50 stalls                         |
| AND        |           |   |
| 2220       | -2-       | Floor plan and section, gutter cleaner option                   |
| OR         |           |   |
| 2220       | -3-       | Floor plan and section, continuous flow gutter option           |
| 2220       | -4-       | Cross-section and manure trench details                         |
| AND ONE OF |           |   |
| 2821       | --        | Single headrail tie stall                                       |
| 2822       | --        | Low arch chain tie stall  |
| 2823       | --        | Stanchion tie stall   |
| AND        |           |   |
| 9102       | --        | Truss erection and bracing                                      |
| 9324       | --        | Insulated stud frame walls                                      |
| 9341       | --        | Sliding doors   |
| 9373       | --        | Steel ceiling diaphragm with center air inlet                   |
| 9701       | --        | Interlocked heating/ventilation control for livestock buildings |
| AND ONE OF |           |   |
| M-9142     | --        | 10.8 m (38'-0") light, medium or heavy duty, gable roof truss   |
| M-9143     | --        |   |
| M-9144     | --        |   |

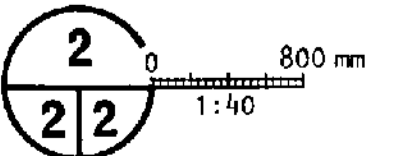
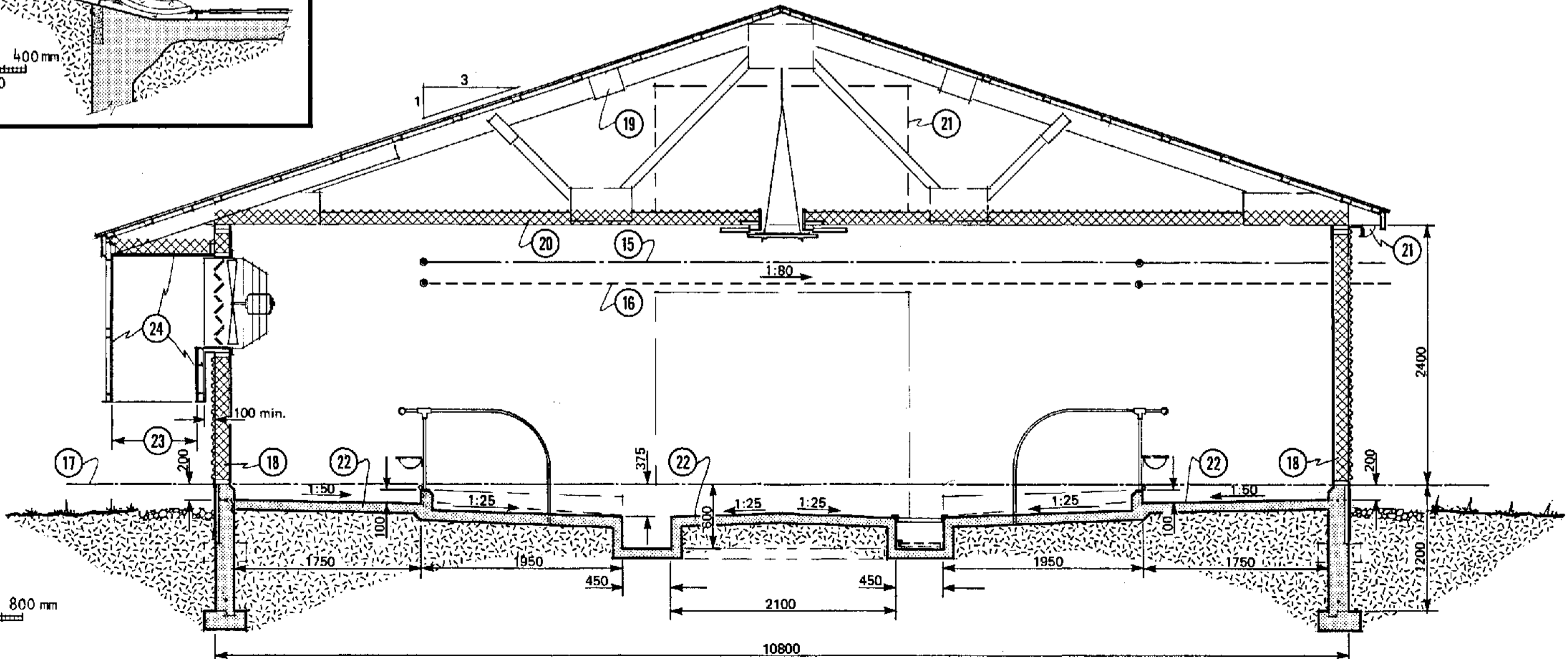
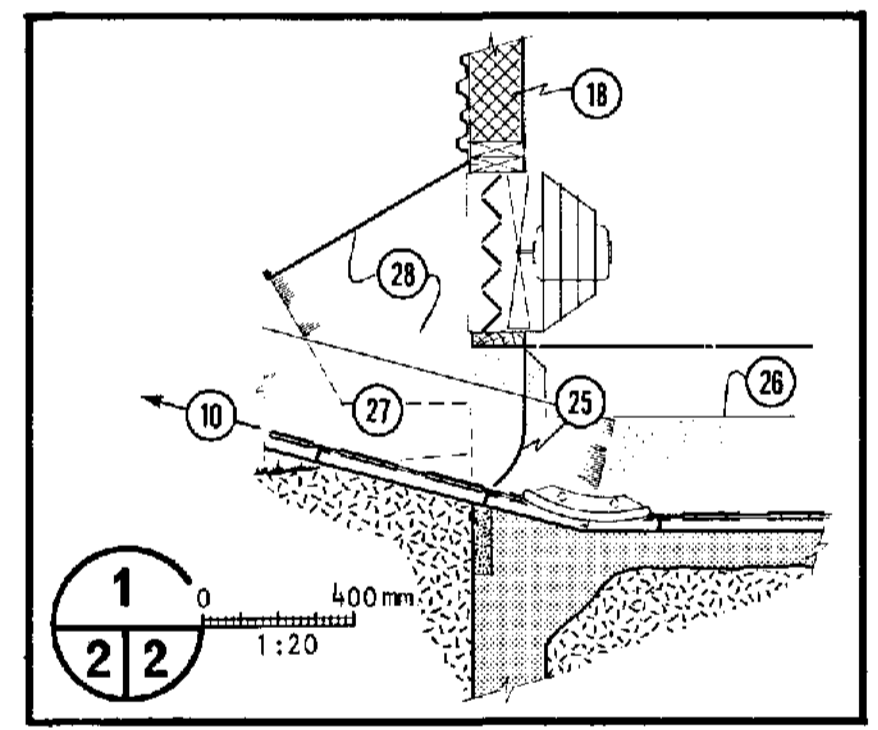
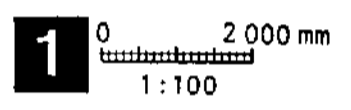
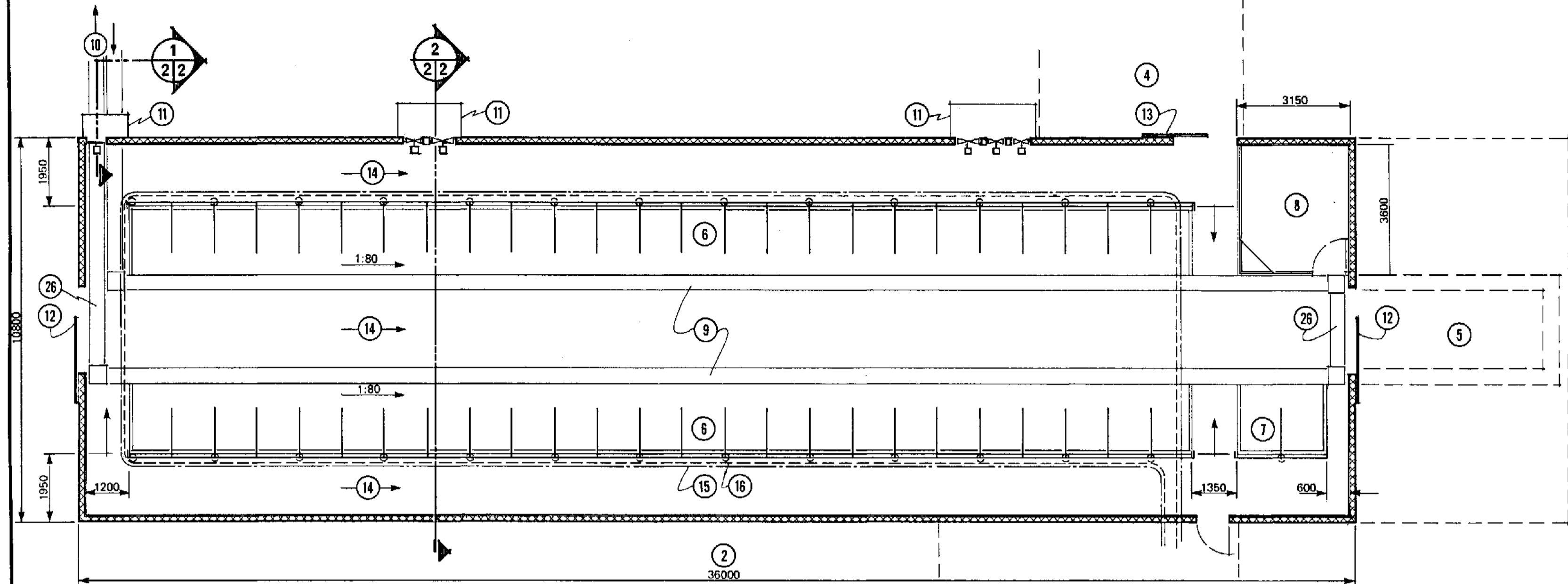
EXHAUST FAN	No. OF CATTLE (600 kg)	VENTILATION RATE L/s/cow	FAN CAPACITY L/s	THERMOSTAT	SETTING, °C ON/OFF	INLET SLOT OPENING mm	OUTSIDE TEMPERATURE
A	50	x 15	= 750 (low speed)	T <sub>1</sub> (2-stage)	8°/10°	5	cold
	50	x 30	= 1500 (high speed)		10°/8°		
B	50	x 30	= 1500	T <sub>2</sub>	14°/12°	10	mild
C <sub>1</sub>	50	x 30	= 1500	T <sub>3</sub>	18°/16°	20	warm
C <sub>2</sub>	50	x 30	= 1500				
D <sub>1</sub> *	50	x 60	= 3000	T <sub>4</sub>	22°/20°	40	hot
D <sub>2</sub> *	50	x 60	= 3000				
<b>TOTALS</b>	50	x 240	= 12000				

\*D<sub>1</sub> and D<sub>2</sub> required if cattle are housed continuously in summer in barn with non-opening windows.



SYM	REVISIONS	CHECKED	DATE	APPROVED
SINGLE STOREY TIE STALL BARN - 50 STALLS				PLAN
DESIGNED	J.A.M.	DATE	78-06	PLAN
DRAWN	R. PELLA	REVISED	84-09	
TRACED				M-2220
CHECKED	J.E.T.			
				SHEET 1 OF

ALL DIMENSIONS ARE IN MILLIMETRES (mm) UNLESS OTHERWISE SPECIFIED



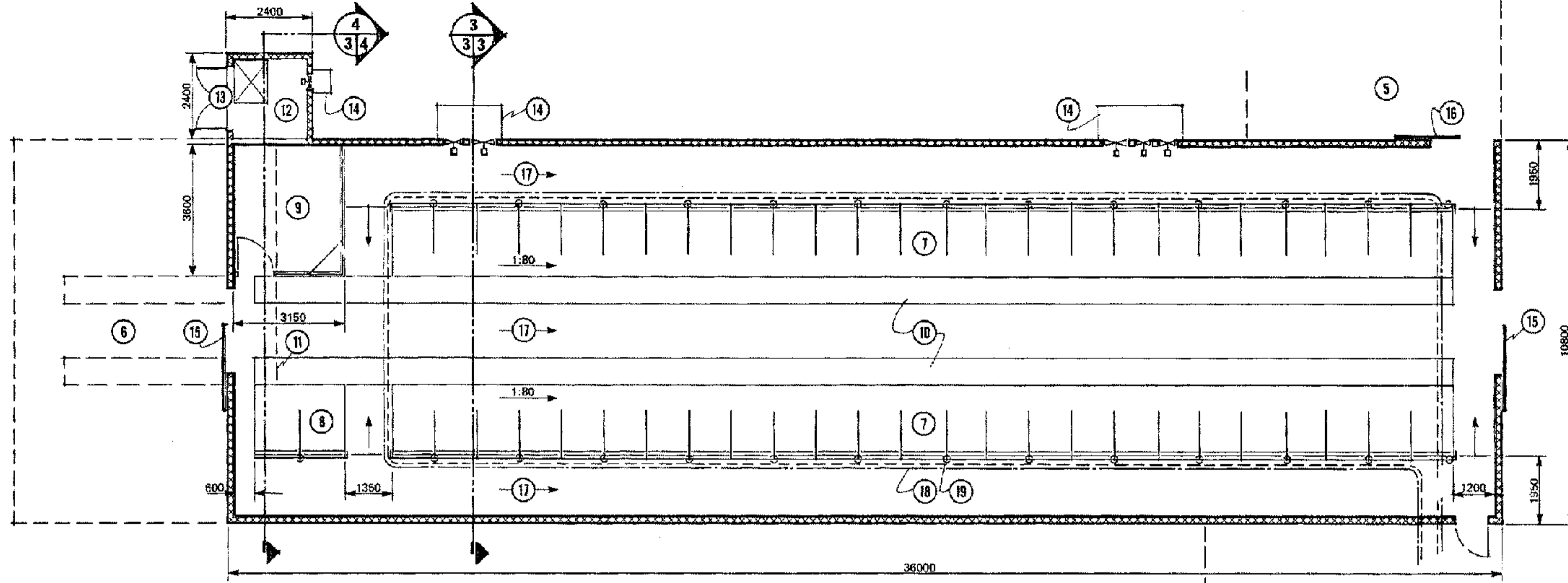
- 1 floor plan, gutter cleaner option
- 2 barn length shown for 25 stalls per row, increase by 1200 mm for each additional stall
- 3 milkhouse
- 4 feedroom
- 5 calf or replacement heifer area
- 6 25 tie stalls @ 1200 mm wide, length to suit, see leaflets M-2821, M-2822 or M-2823
- 7 2 maternity tie stalls @ 1275 mm wide
- 8 maternity/treatment pen
- 9 gutter cleaner, optional grating over
- 10 to manure stacker or ram pump
- 11 hooded exhaust fans, see sheet 1 for sizes
- 12 2400 mm wide insulated sliding door, see M-9341
- 13 1800 mm wide insulated sliding door, see M-9341
- 14 optional, slope barn to milkhouse, 1:80 min., permits uniform height of milklane, gutter bottoms slope with barn, but remains level within 3 m of gutter turns
- 15 milk pipe line
- 16 vacuum pipe line
- 17 datum line, top of concrete foundation, same slope as (14)
- 18 insulated stud frame wall, see M-9324 for construction details
- 19 trusses @ 1200 mm oc to suit local snow loads, 38 x 89 mm purlins, 12.5 mm fibreboard or aluminum-foil-faced paper, pre-finished steel roofing
- 20 insulated steel diaphragm ceiling, see M-9373, attic ventilation doors both gables
- 21 gable and soffit ventilation, open to attic in hot weather
- 22 100 mm concrete floor, wire mesh reinforcing all electrically bonded, see tie stall leaflet
- 23 min. hood opening equals framing size of larger fan, extends to below mid-height of wall
- 24 hood constructed of 38 x 140 mm rafter extensions, 38 mm framing and 7.5 mm plywood lining, exterior cladding to match walls
- 25 gutter flaps from belting, cut to fit
- 26 6 mm steel checkered plate gutter cover, sits in 6 x 9 mm rabbet in concrete, at ends of barn only
- 27 steel trough for gutter cleaner, see supplier
- 28 galv. steel weather hood, full width of gutters, covers fan A (see sheet 1)

SYM	REVISIONS	CHECKED	DATE	APPROVED

FLOOR PLAN & SECTION,  
GUTTER CLEANER OPTION

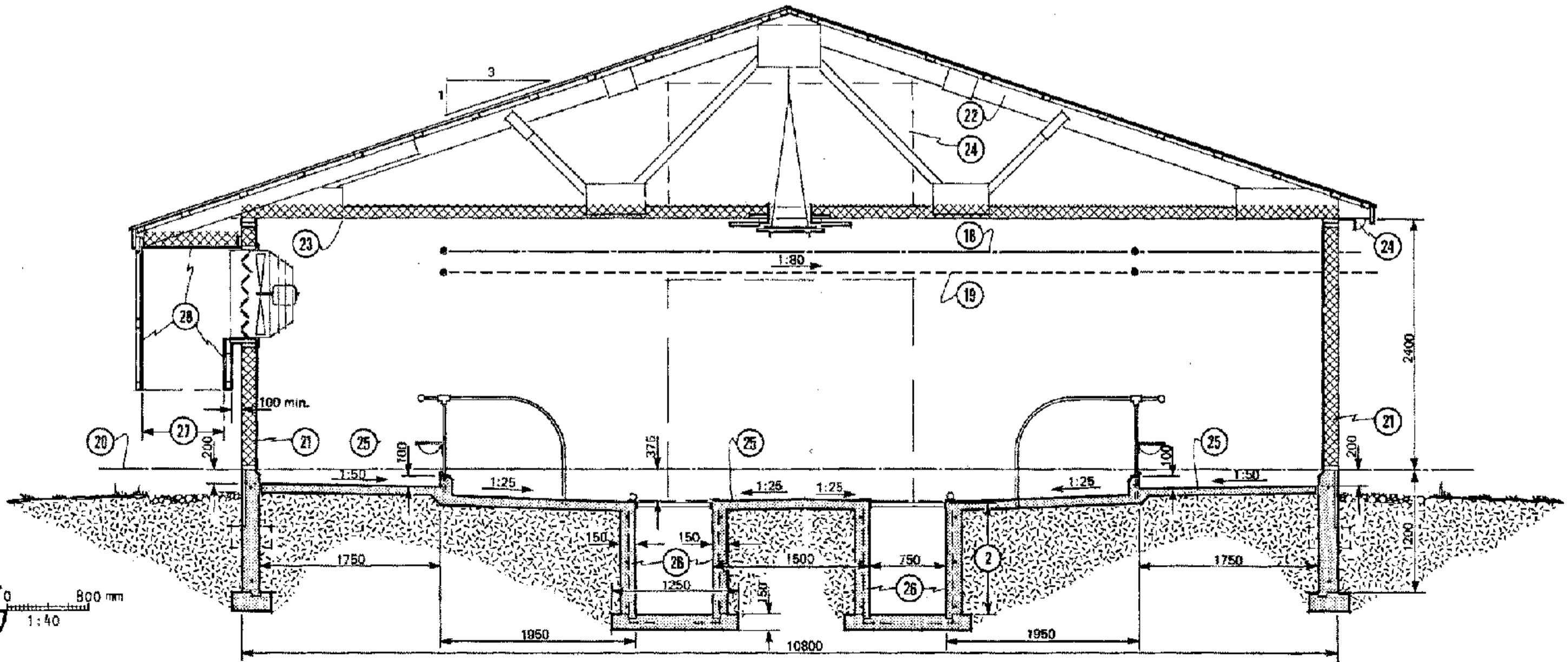
DESIGNED <i>J.A.M.</i>	DATE 78-06	PLAN <b>M-2220</b>
DRAWN <i>R.PELLA</i>	REVISED 84-09	
TRACED	ORIGINATES ON SHEET <b>A</b>	SHEET 2 OF
CHECKED <i>J.E.T.</i>	DRAWN ON SHEET <b>C</b>	

ALL DIMENSIONS ARE IN MILLIMETRES (mm) UNLESS OTHERWISE SPECIFIED



1 0 2000 mm  
1:100

2	LENGTH OF GUTTER (mm)	15000	18000	21000	24000	27000	30000	33000	36000
	MIN. GUTTER DEPTH (mm)	800	850	900	950	1000	1050	1100	1150



3 0 800 mm  
3/3 1:40

- 1 floor plan, continuous flow manure gutter option
- 2 table of minimum depths for manure gutter, max. length 36000 mm
- 3 barn length shown for 25 stalls per row, increase by 1200 mm for each additional stall
- 4 milkhouse
- 5 feedroom
- 6 optional calf or replacement heifer area
- 7 25 tie stalls @ 1200 mm wide, length to suit, see leaflets M-2821, M-2822 or M-2823
- 8 2 maternity tie stalls
- 9 maternity/treatment pen
- 10 continuous flow gutter, steel grate cover
- 11 cross gutter under floor shown dotted
- 12 liquid manure transfer tank, to long-term storage
- 13 airtight doors, sized to accommodate manure pump
- 14 hooded exhaust fans, see sheet 1 for sizes
- 15 2400 mm wide insulated sliding door, see M-9341
- 16 1800 mm wide insulated sliding door, see M-9341
- 17 optional, slope barn to milkhouse 1:80 min., permits uniform height of milkline, do not slope gutter bottoms
- 18 milk pipe line
- 19 vacuum pipe line
- 20 datum line, top of concrete foundation, same slope as (17)
- 21 insulated stud frame wall, see M-9324 for construction details
- 22 trusses @ 1200 mm oc to suit snow loads, 38 x 89 mm purlins, 12.5 mm fibreboard, pre-finished steel roofing
- 23 insulated steel diaphragm ceiling, see M-9373, attic ventilation doors both gables
- 24 gable and soffit ventilation, open to attic in hot weather
- 25 100 mm concrete floor, wire mesh reinforcing all electrically bonded, see tie stall leaflet
- 26 smooth finish concrete walls, steel trowelled floor smooth and level, 10M rebar @ 600 mm oc both ways
- 27 min. hood opening equals framing size of larger fan, extends to below mid-height of wall
- 28 hood constructed of 38 x 140 mm rafter extensions, 38 mm framing and 7.5 mm plywood lining, exterior cladding to match walls

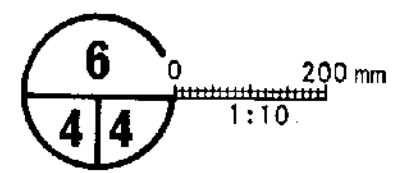
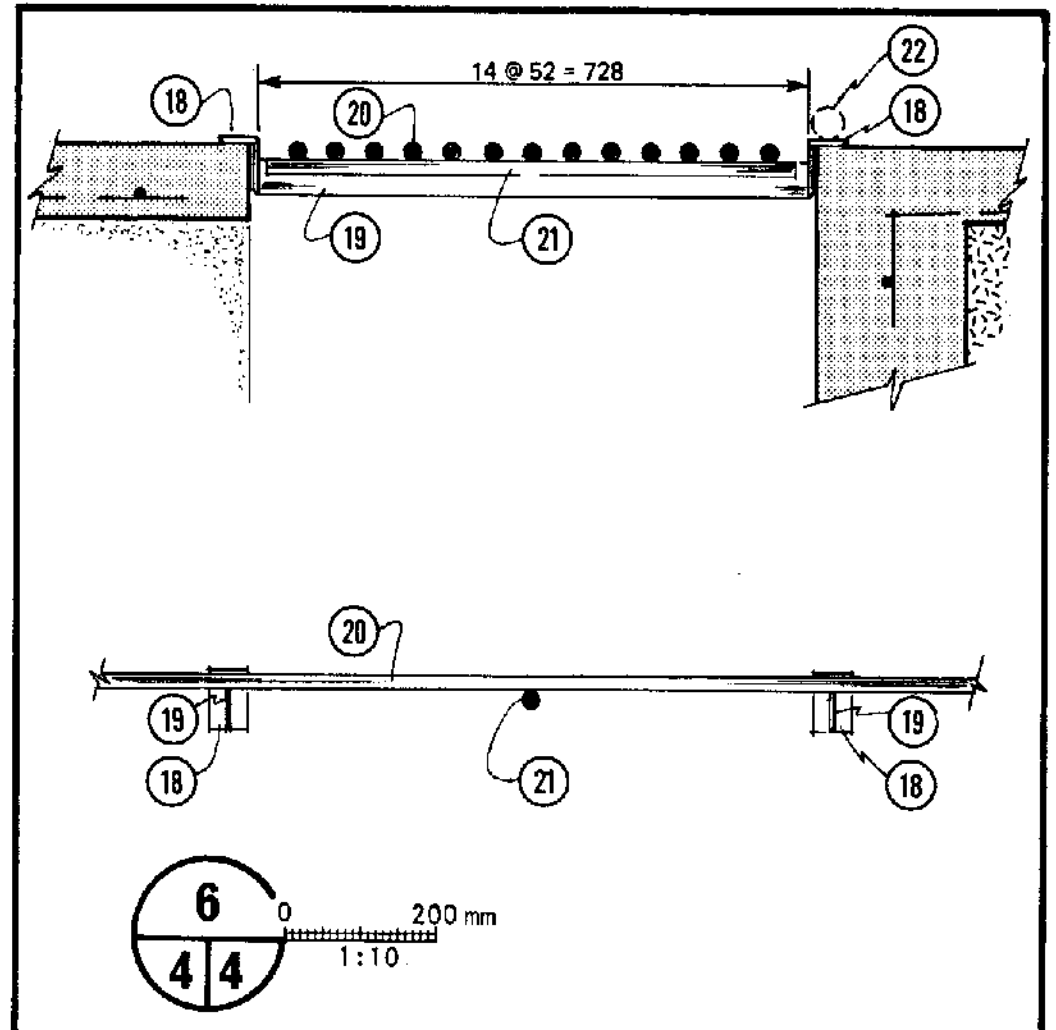
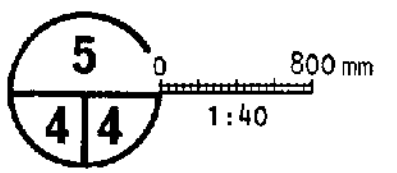
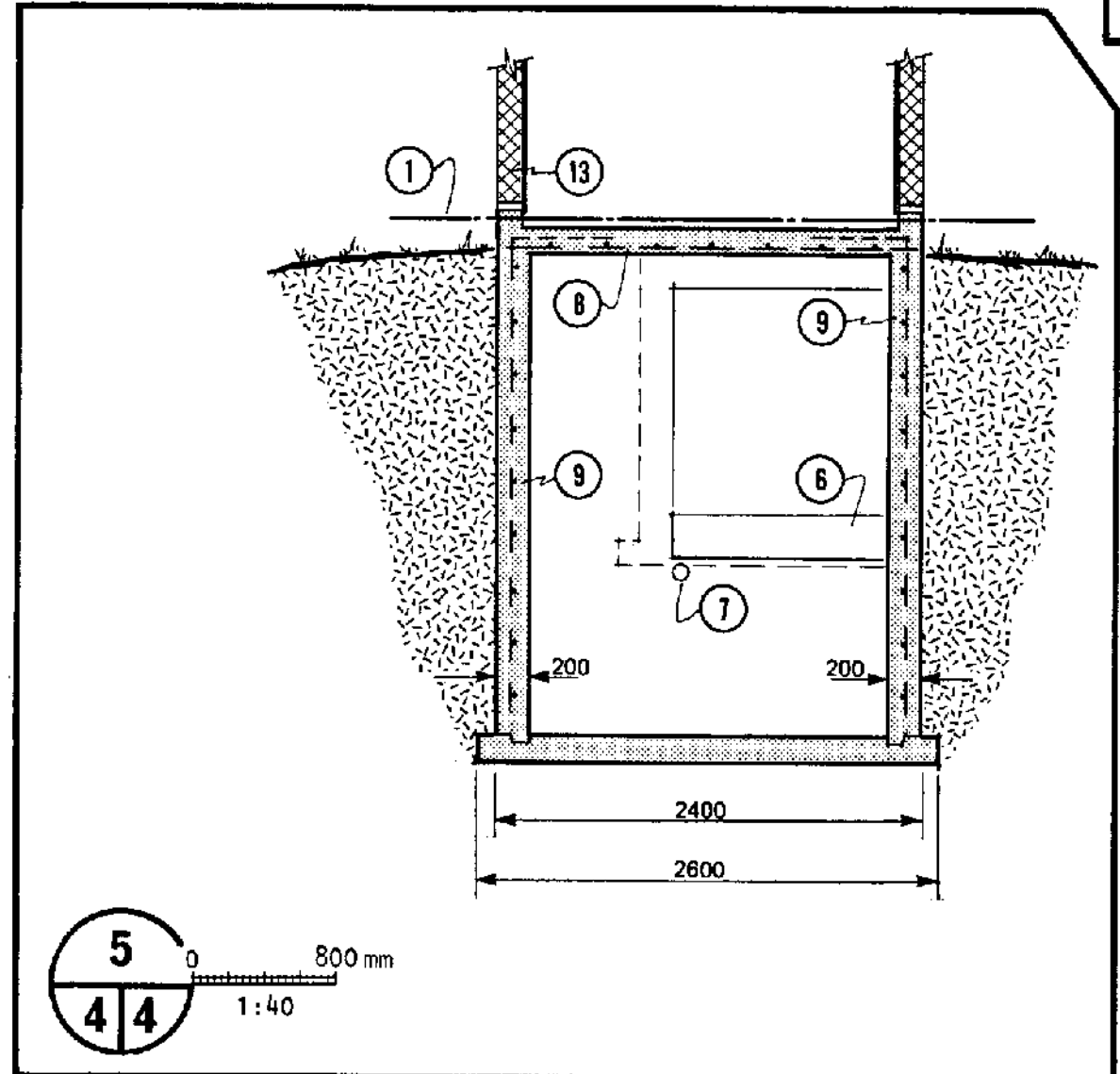
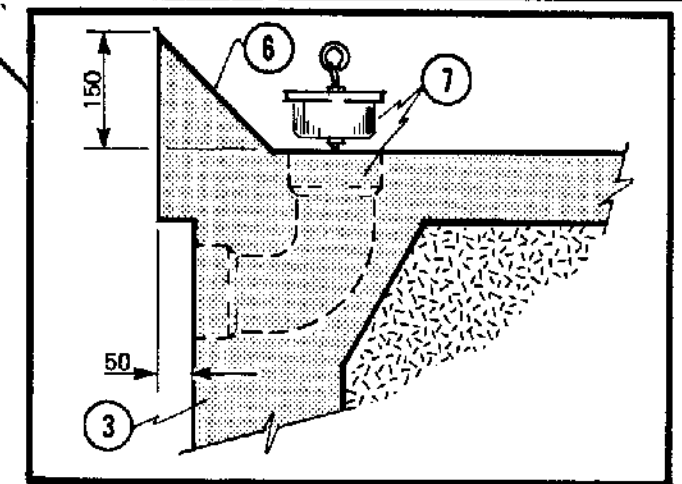
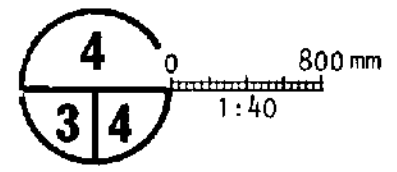
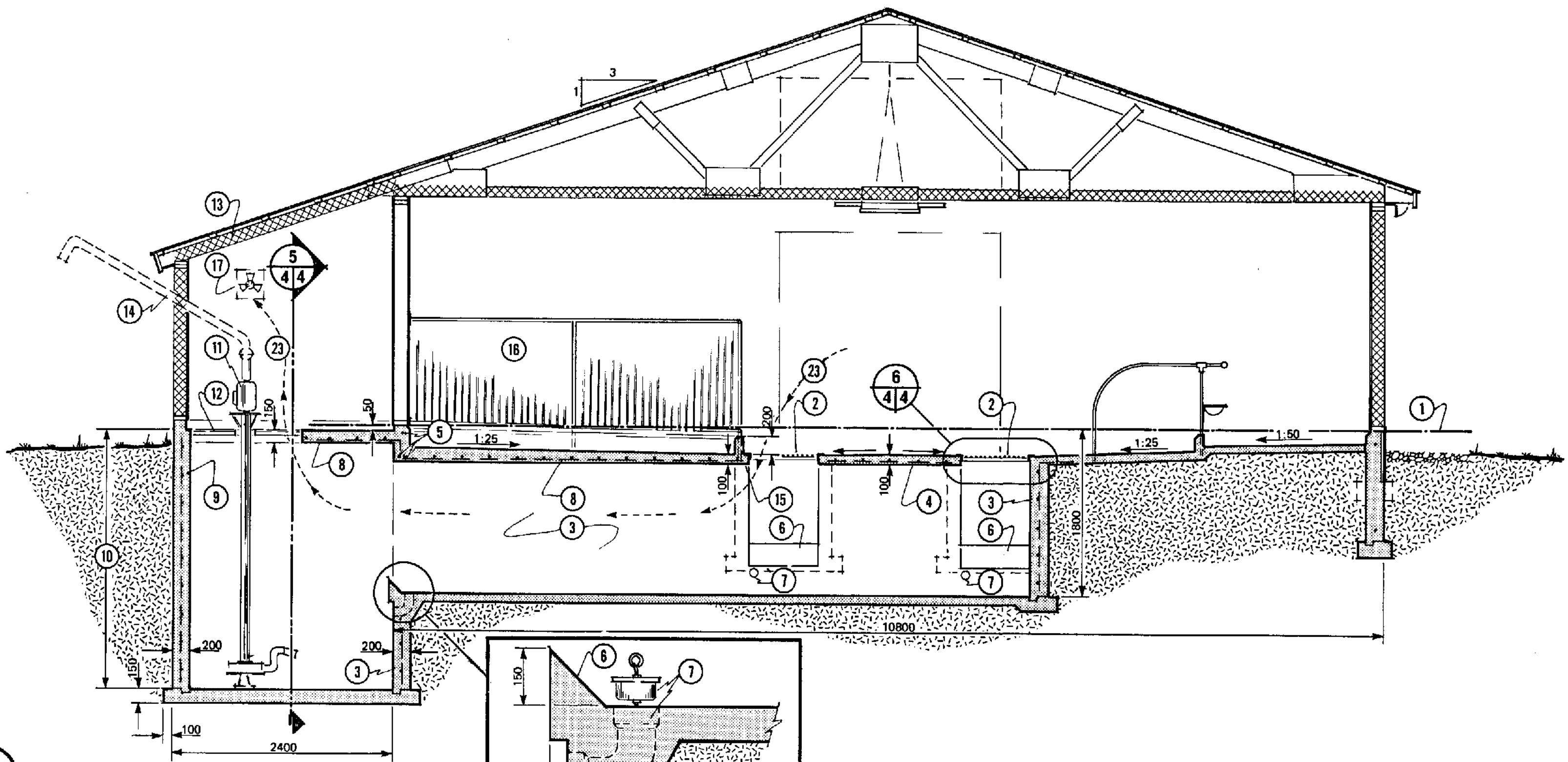
SYM	REVISIONS	CHECKED	DATE	APPROVED

**CANADA**  
PLAN SERVICE

FLOOR PLAN & SECTION,  
CONTINUOUS FLOW  
GUTTER OPTION

DESIGNED J.A.M.	DATE 78-06	PLAN A
DRAWN R.P.E.L.A.	REVISED 84-08	
TRACED	DETAIL NUMBER A	M-2220
CHECKED J.E.T.	ORIGINATOR SHEET B	
	DRAWING SHEET C	SHEET 3 OF

ALL DIMENSIONS ARE IN MILLIMETRES (mm) UNLESS OTHERWISE SPECIFIED



- 1 datum line, top of concrete foundation
- 2 typical steel cover grate in 2400 mm sections
- 3 200 mm concrete walls; 10M rebars @ 600 mm oc both ways centered in walls, bend vertical rebars into floor slab
- 4 10M rebars @ 300 mm oc both ways in 100 mm floor slab, 38 mm bottom cover
- 5 2-10M rebars bottom, 1-10M rebar top
- 6 overflow weir, top edge must be exactly level
- 7 100 mm plastic pipe elbow, rubber stopper or wood plug, plated eyebolt; for complete drainage of trench if required
- 8 10M rebars @ 300 mm oc both ways, 38 mm bottom cover
- 9 10M rebars @ 300 mm oc both ways, centered in walls, extend verticals 600 mm min. into cover slab
- 10 3000 mm or see pump manufacturer
- 11 electric manure pump with valves to agitate pit or pump out
- 12 removable safety grill, openings max. 100 mm wide
- 13 pump enclosure, frame with 38 x 89 and 38 x 140 mm, RSI-3.5 insulation and linc inside with plywood
- 14 galv. steel pipe and fittings with quick coupler to suit manure pump connection; transfer pipe to long-term storage, slope to drain to prevent freezing
- 15 to prevent ventilation failure and fan burnout do not allow liquid level to reach this point
- 16 maternity/treatment pen, 1200 mm high penning set in concrete curb
- 17 ventilation fan in wall beyond
- 18 75 x 50 x 6 x 50 mm steel angle @ 800 mm oc
- 19 12.7 x 38.1 mm flat bar welded to 18
- 20 19 mm diam. smooth steel bars, 2400 mm long weld to 19, top of bars in line with top of concrete
- 21 19 mm diam. smooth steel bar welded to 20 @ 800 mm oc, alternating with 19
- 22 optional 1 1/2" galv. pipe bedding retainer, weld to 18, omit retainer at cross-alleys and maternity stalls
- 23 step 1 ventilation air path

SYM	REVISIONS	CHECKED	DATE	APPROVED

**CANADA PLAN SERVICE**

CROSS-SECTION & MANURE TRENCH DETAILS

DESIGNED <i>J.A.M.</i>	DATE 78-06	PLAN
DRAWN <i>P.BELLA</i>	REVISED 84-09	
TRACED	ORIGINATES ON SHEET <i>A</i>	M-2220
CHECKED <i>J.E.T.</i>	DRAWN ON SHEET <i>C</i>	
		SHEET 4 OF 4