


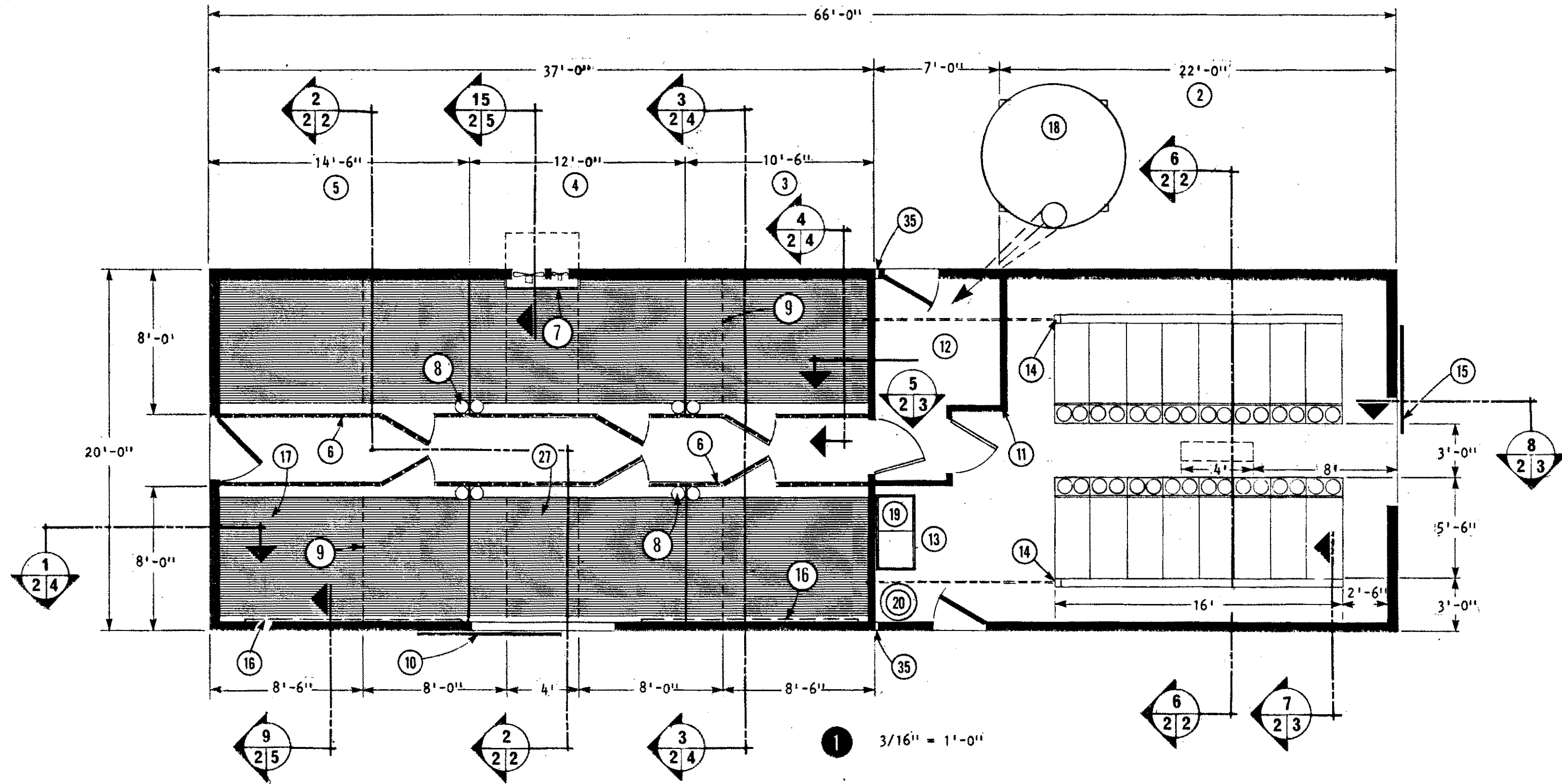
1. include leaflet 1401 for management information
2. attach roof truss to suit local design loads - 20'-0" span, double sloped
3. attach plan 2368, tie stall for bull and heifer calves
4. include leaflet 2358, tombstone feed fence
5. include leaflet 8300, roof purlins
6. include leaflet 8419, interlocked heating/ventilating control for livestock buildings

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.

SYM	REVISIONS	CHECKED	DATE	APPROVED

	DAIRY / BEEF STARTER BARN	
	64 CALVES	

DESIGNED <i>H.A.J.</i>	DATE SEPT./74	PLAN 1401
DRAWN <i>J.E.T.</i>	REVISED	
TRACED	DETAIL NUMBER A	SHEET 1 OF 6
CHECKED <i>J.E.T.</i>	ORIGINATES ON SHEET B DRAWN ON SHEET C	



1. floor plan
2. 16 calves 0-6 weeks; (calf tie stalls, plan 2368)
3. 16 calves 6-12 weeks (9.4 ft²/calf) in 2 pens
4. 16 calves 12-18 weeks (11.3 ft²/calf) in 2 pens
5. 16 calves 18-24 weeks (13.1 ft²/calf) in 2 pens
6. tombstone feed fence (leaflet 2358) decreased to 3'-2" in height (hinge for gates shown on plan)
7. vertical duct for under-floor ventilation
8. pressure water bowl
9. reinforced concrete beam @ 8' o.c. max.
10. 8'-0" x 8'-0" sliding door for manure pumpout
11. all interior walls, 2" x 4" stud frame
12. dry feed preparation room
13. liquid diet preparation area
14. 4" drain under floor to manure tank; rubber stopper with handle
15. 6' x 8'-10" sliding door for removal of stalls
16. ventilation inlet 12' long at ceiling
17. 6" slats, 1 1/2" slots between, see sheet 4
18. optional bulk feed bin, 4" auger into (12)
19. double sink, mixing faucet with swing spout
20. water heater
21. top of plate
22. datum line, top of concrete foundation
23. white roof to reduce summer heat
24. alternate feed alley slab shape if precast
25. 2" x 6" wood cove cut to 45° over galv. water supply pipe
26. pump for liquid manure agitation and transfer
27. 4' slat sections removable to allow installation of liquid manure pump
28. 3" curb
29. feed alley, crowned for drainage
30. 4'-8" or below frost
31. 20'-0" truss & 2" x 4" roof purlins to suit local roof loading (leaflet 8300) and metal roofing gage and profile
32. 4' x 4' x 1' deep sump for pumping out
33. door header, see table 1 for size
34. 1/2" x 12" plywood, secure to 2" x 2" at top and door track at bottom (box ends)
35. keyed contraction joint in concrete foundation

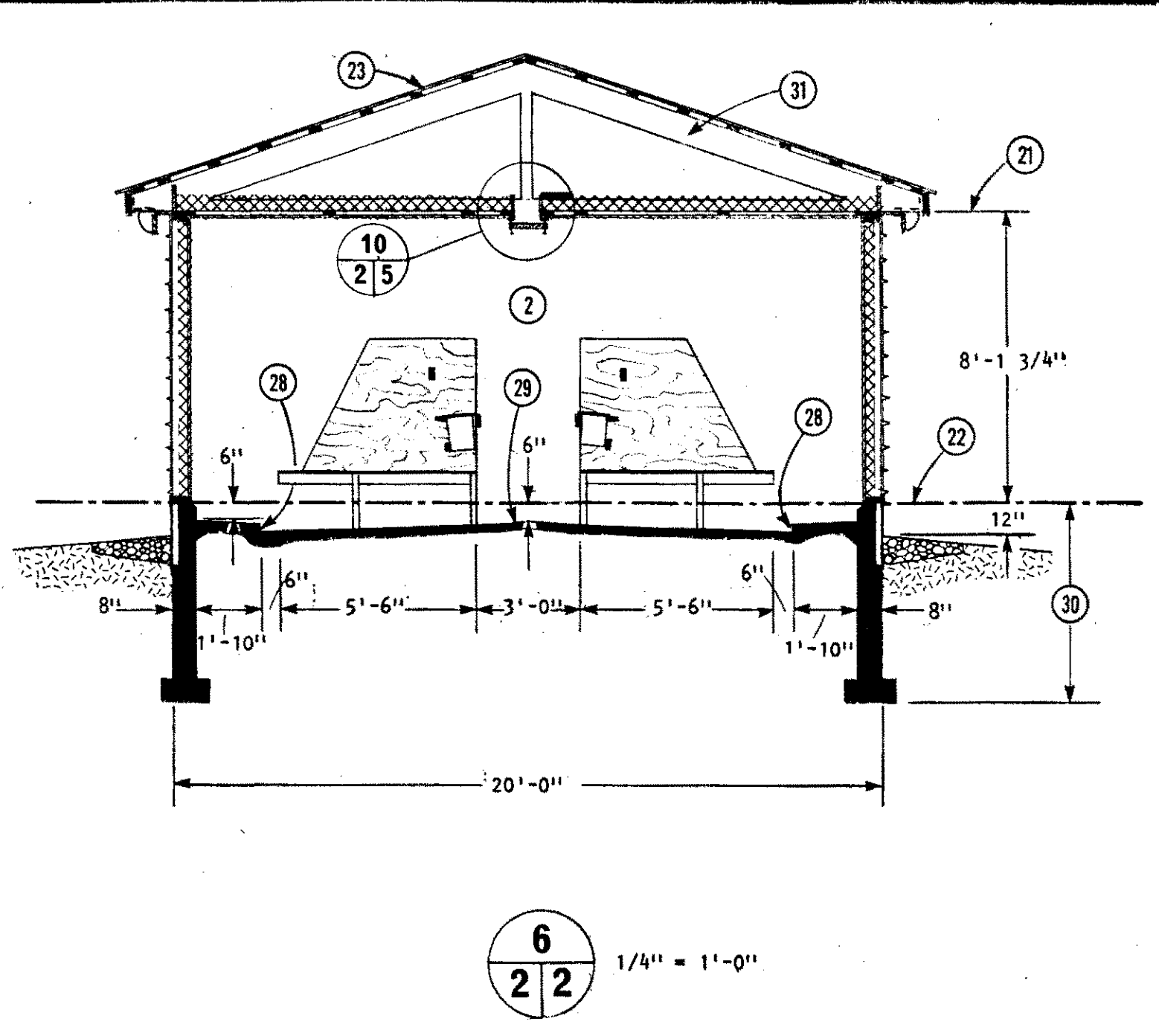
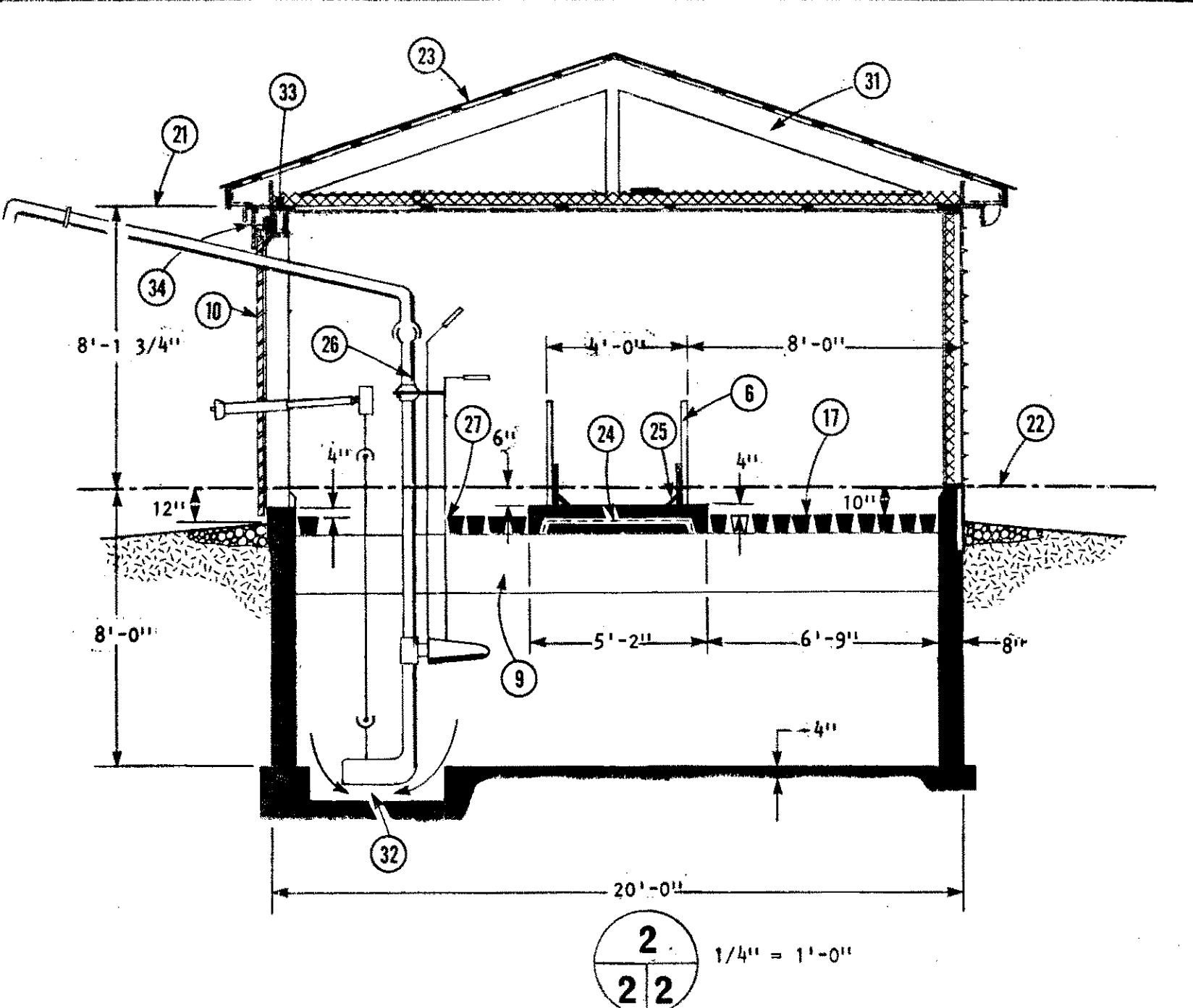
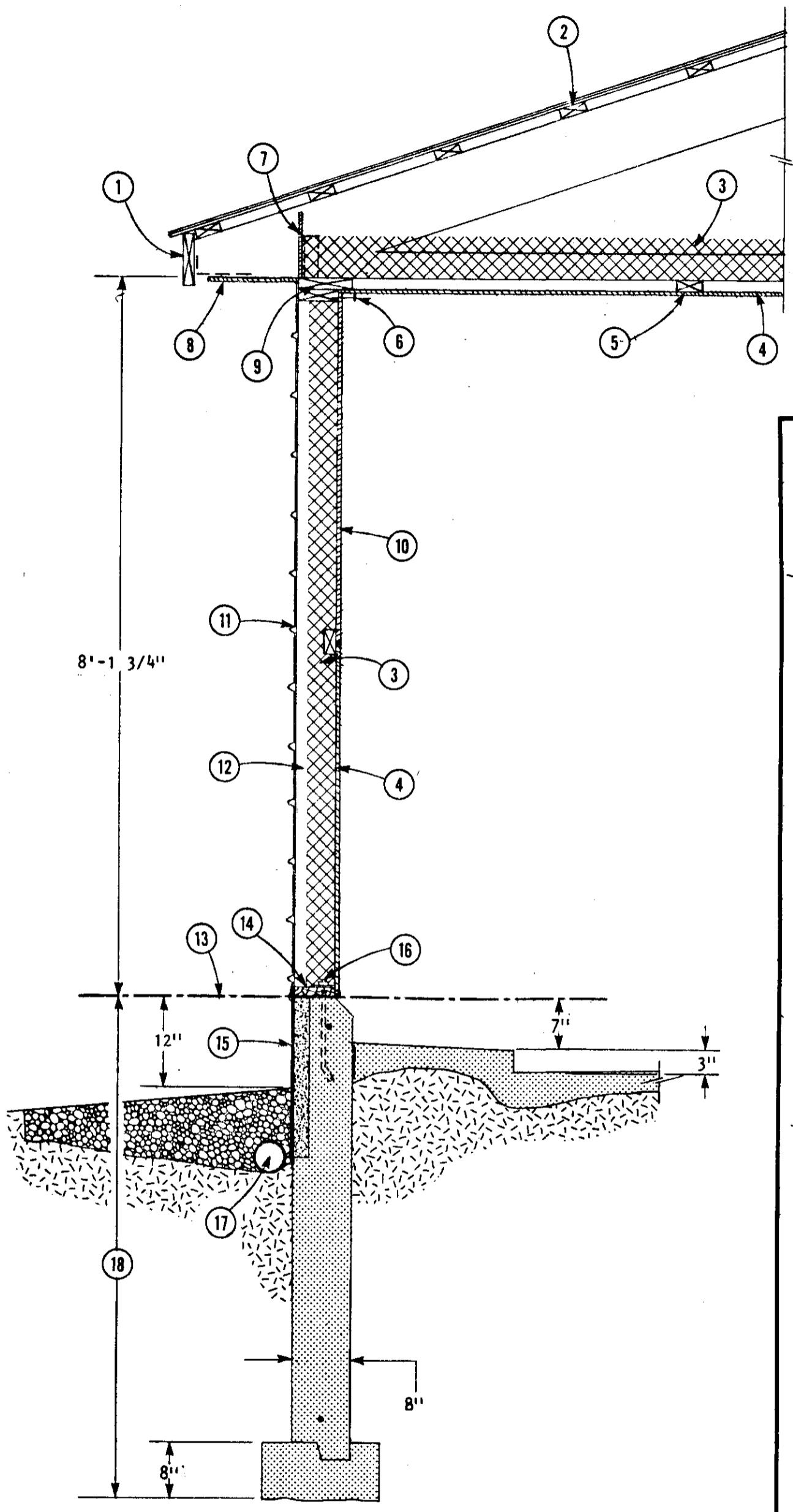


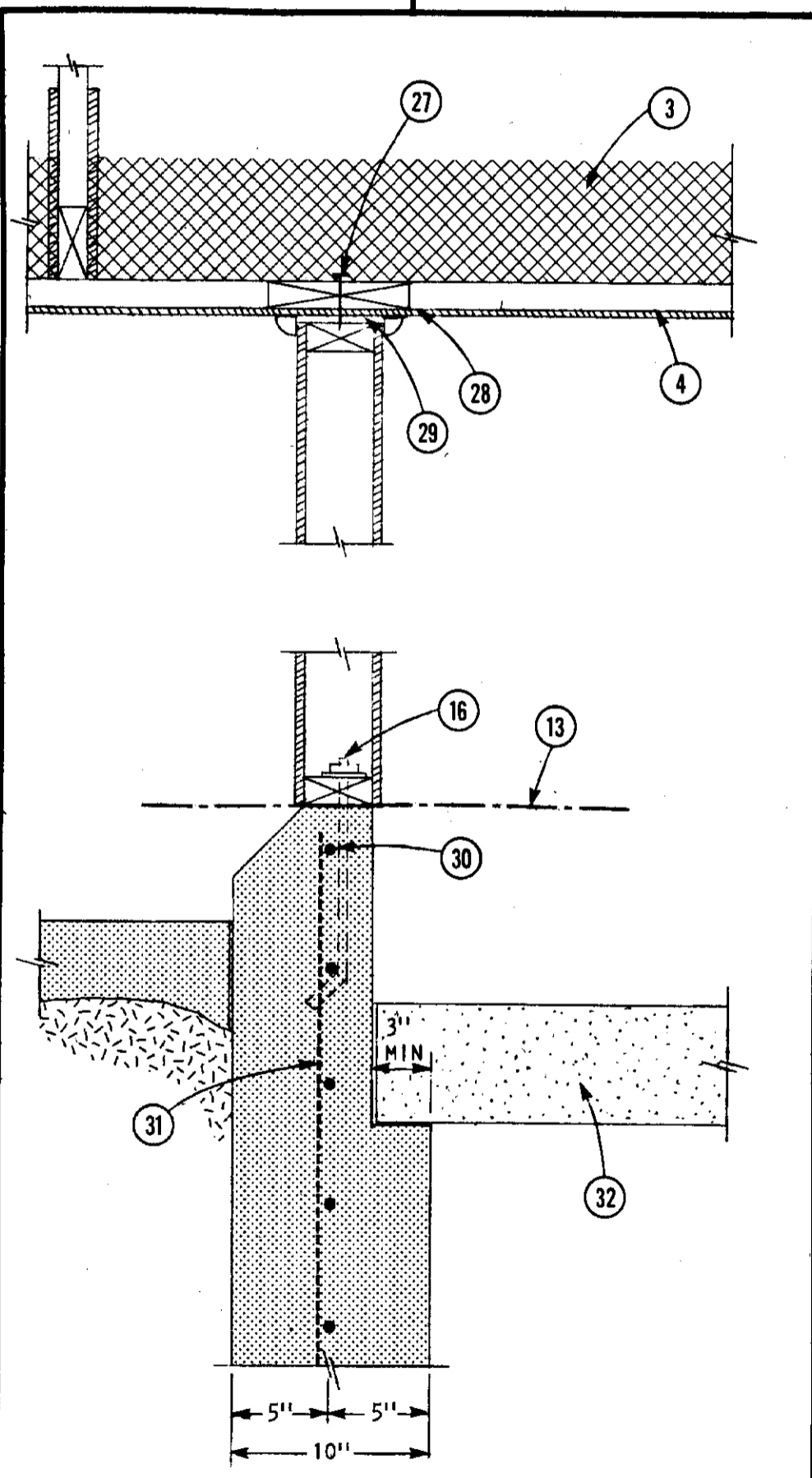
Table 1 Door Header

header size	total roof load (snow + dead) psf	
	#2 spruce	#2 douglas fir
2-2" x 8"	30	45
3-2" x 8"	45	68
4-2" x 8"	60	90

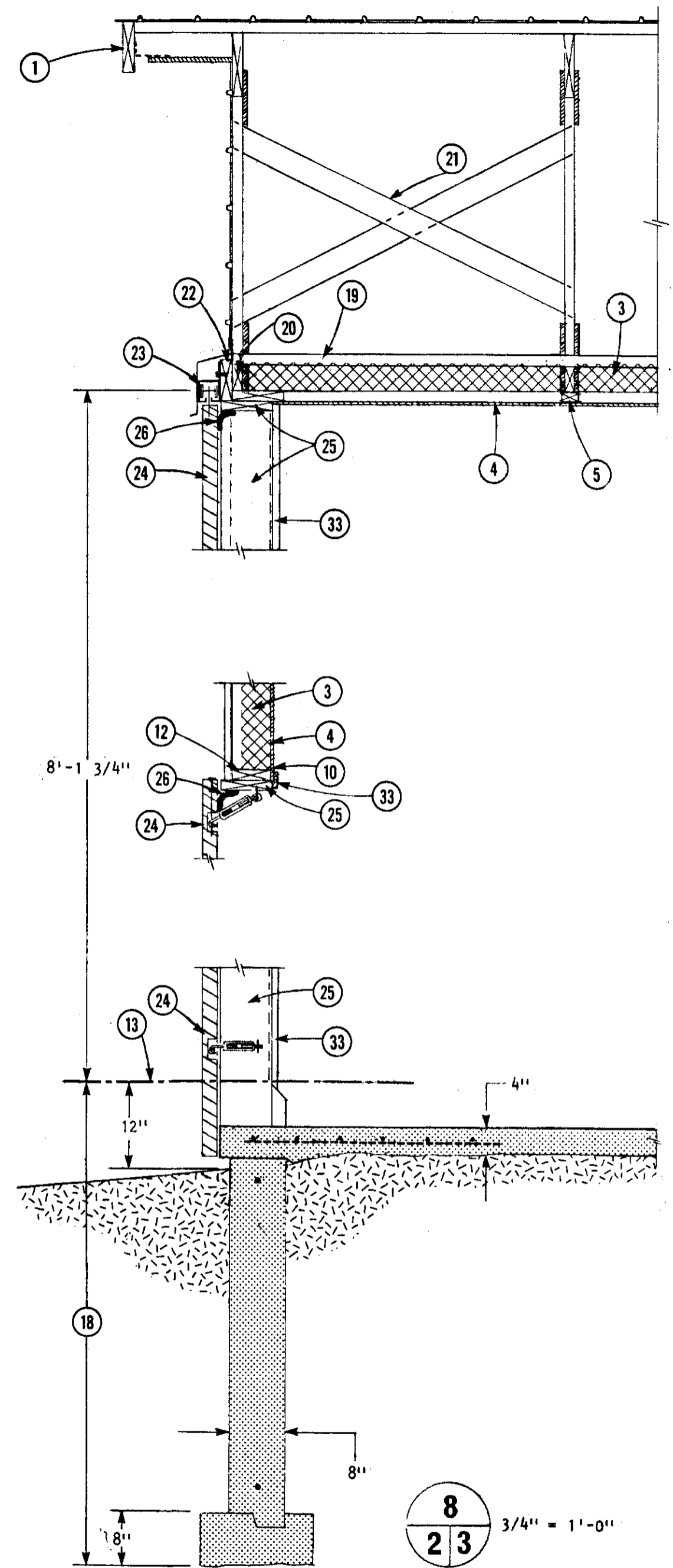
SYM	REVISIONS	CHECKED	DATE	APPROVED						
PLAN & CROSS SECTIONS				PLAN 1401						
DESIGNED <i>H.A.J.</i>	DATE SEPT./74	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td style="width: 20px; text-align: center;">A</td> <td style="font-size: 8px;">DETAIL NUMBER</td> </tr> <tr> <td style="width: 20px; text-align: center;">B</td> <td style="font-size: 8px;">ORIGINATES ON SHEET</td> </tr> <tr> <td style="width: 20px; text-align: center;">C</td> <td style="font-size: 8px;">DRAWN ON SHEET</td> </tr> </table>			A	DETAIL NUMBER	B	ORIGINATES ON SHEET	C	DRAWN ON SHEET
A	DETAIL NUMBER									
B	ORIGINATES ON SHEET									
C	DRAWN ON SHEET									
DRAWN <i>J.E.T.</i>	REVISED	SHEET 2 OF 6								
TRACED										
CHECKED <i>J.E.T.</i>										



7
2/3 3/4" = 1'-0"



5
2/3 1 1/2" = 1'-0"



8
2/3 3/4" = 1'-0"

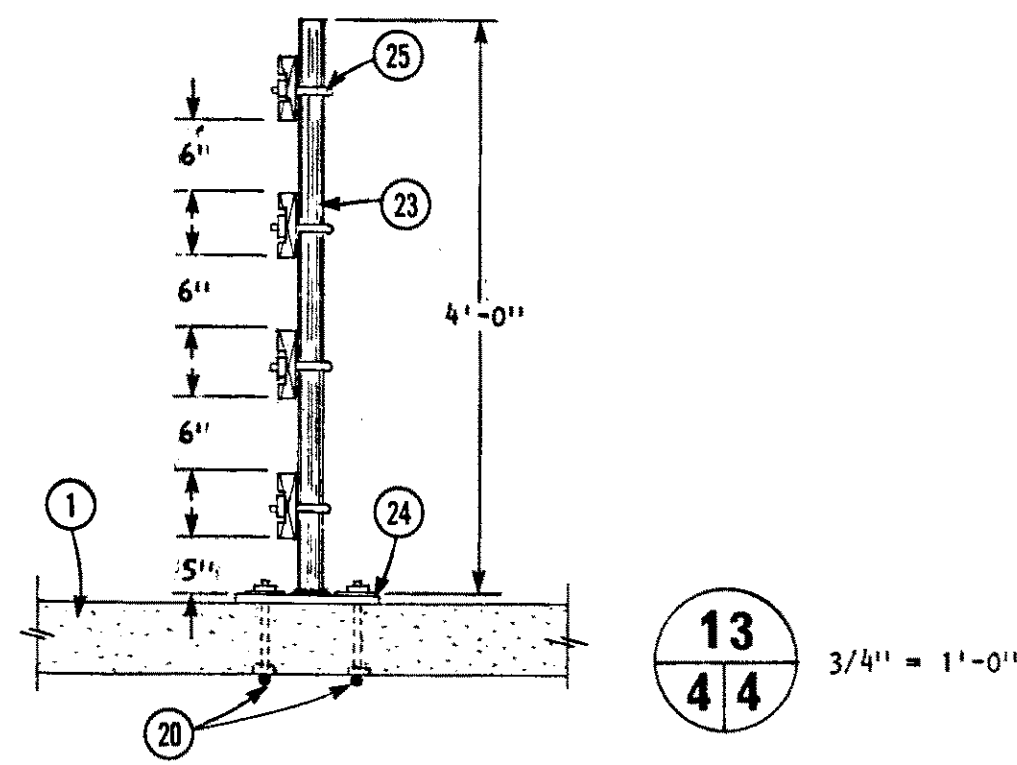
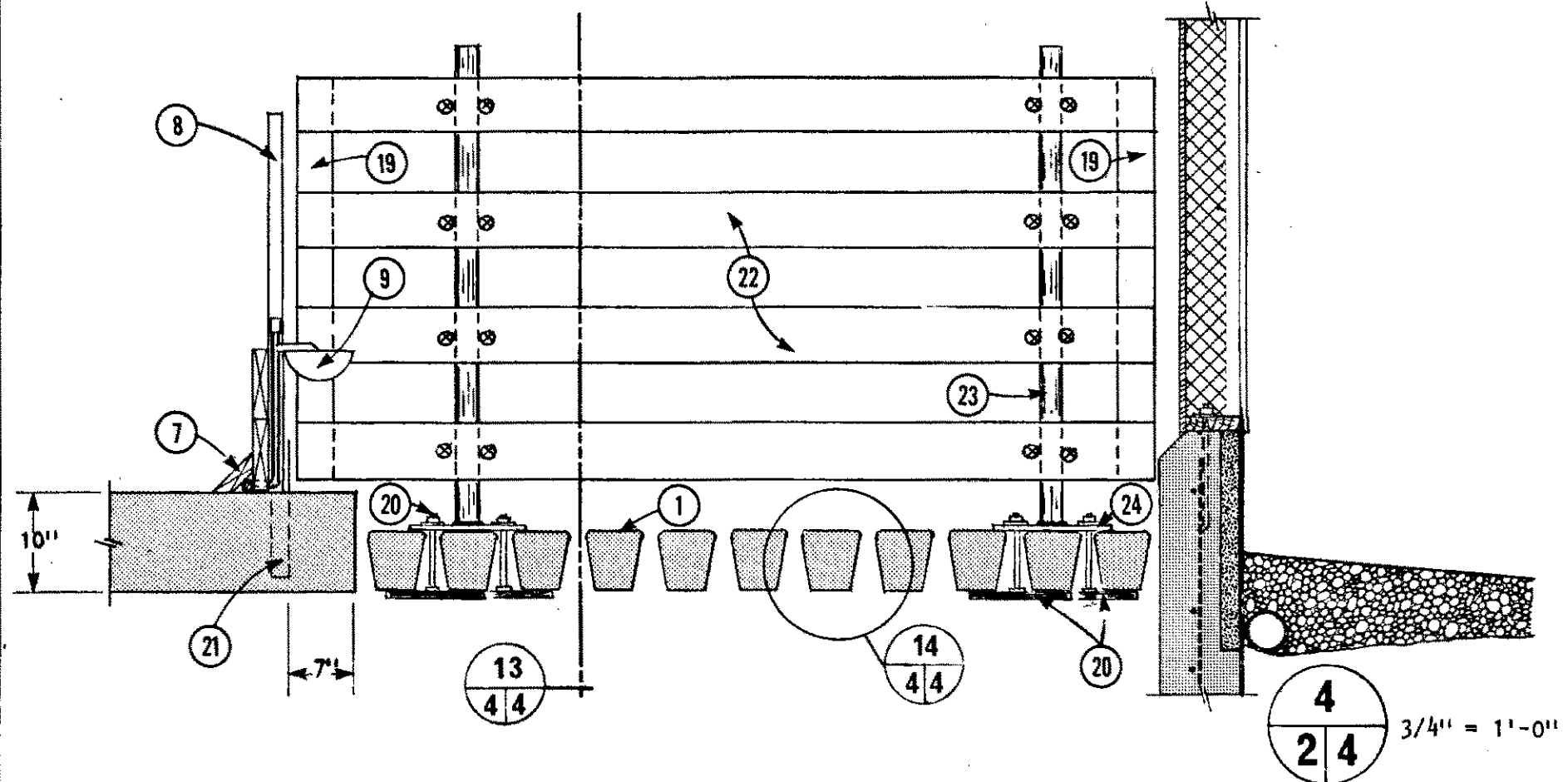
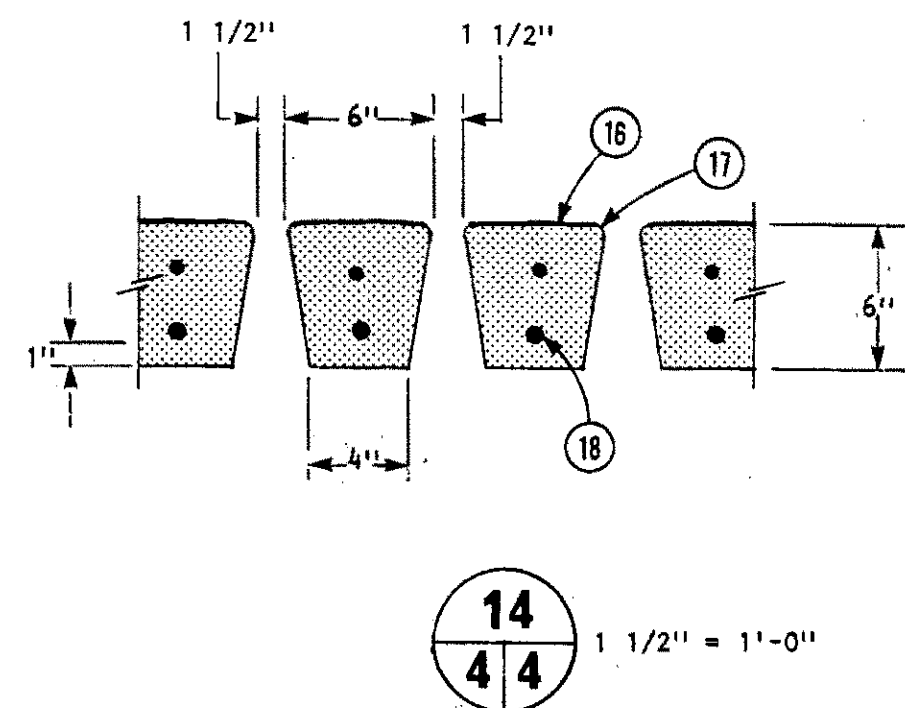
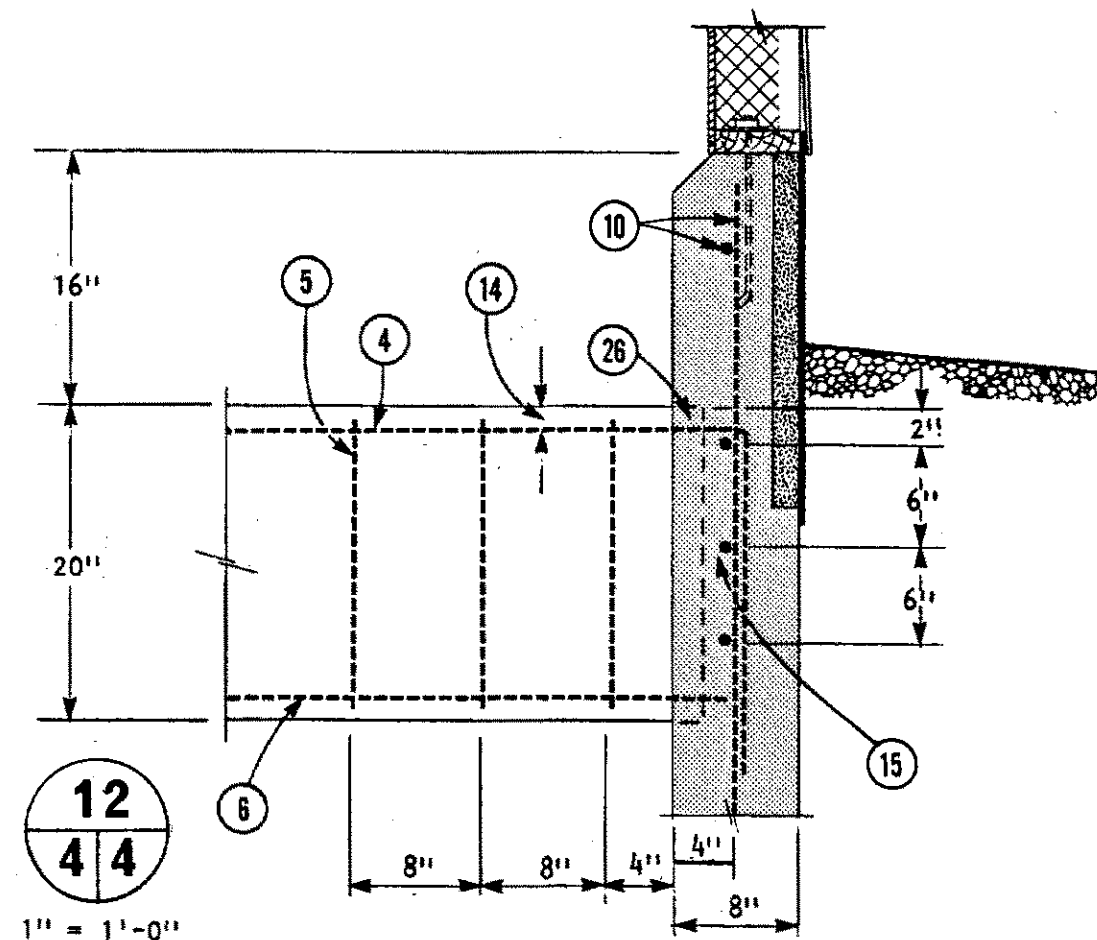
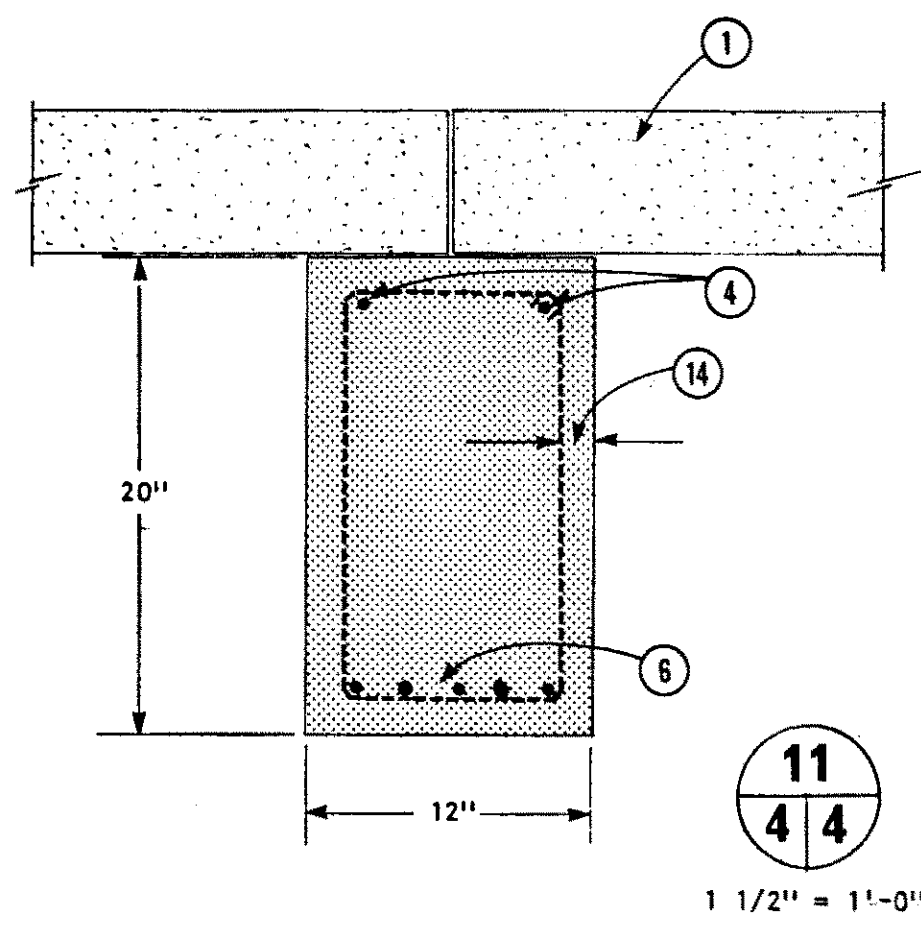
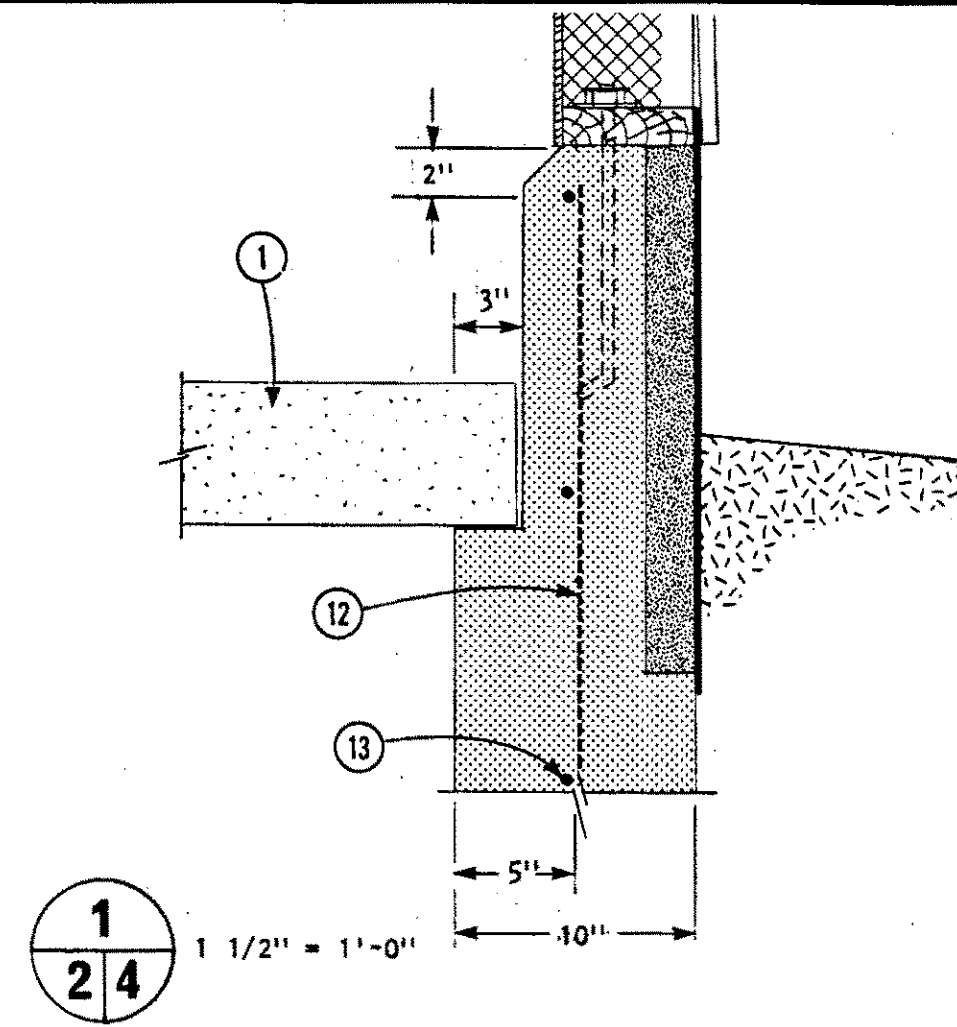
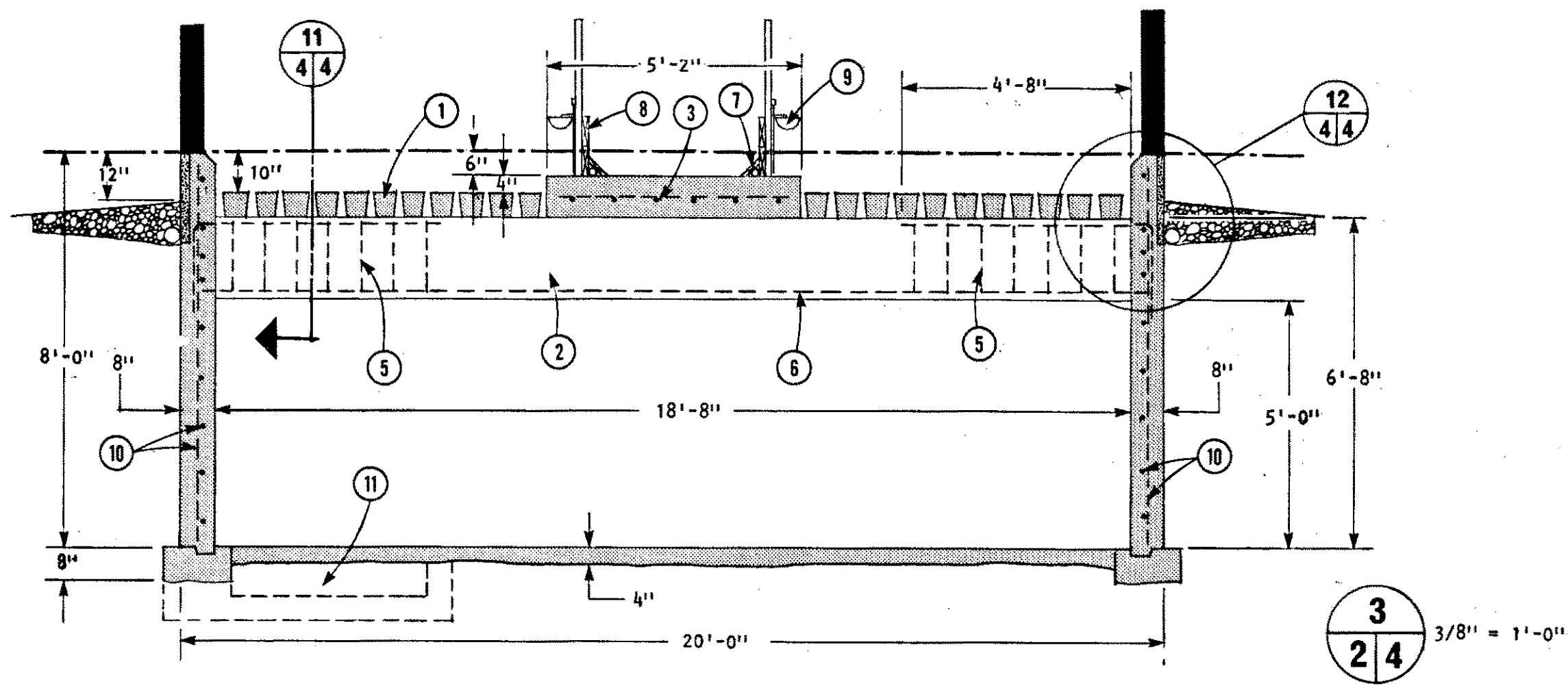
1. 2" x 8" face board
2. white painted metal roofing on 2" x 4" purlins (leaflet 8300) over wood trusses at 4' o.c.
3. insulation - R-12 or R-20 in walls, R-20 in ceilings
4. 4 mil polyethylene vapour barrier
5. 5/16" plywood ceiling on 2" x 4" strapping at 4' o.c. & 2" x 3" blocking between strapping at trusses
6. wall and ceiling plywood nailed 6" o.c. all 4 edges of sheets with 1 1/2" large head galv. roofing nails
7. plywood baffle
8. 3/4" soffit and 2" cont. vent with 1/2" x 1/2" galv. hardware cloth bird screen
9. 2" x 8" & 2" x 6" plates with end joints staggered 8'-0" o.c.
10. 3/8" plywood interior sheathing, face grain horiz.
11. exterior siding over 15 lb. asphalt felt
12. 2" x 6" studs @ 2'-0" o.c.
13. datum line
14. 2" x 6" pressure treated sill
15. 3/16" high-density recompressed exterior-type asbestos board over 2" x 22" expanded polystyrene insulation tacked to concrete forms with finishing nails, pour concrete; nails pull through insulation when forms are stripped
16. 1/2" dia. x 1'-0" anchor bolts @ 4' o.c. end & partition walls, 6' o.c. side walls
17. 4" polyethylene drain tubing to outlet, crushed stone backfill
18. 4'-8" or below frost
19. 2" crawl plank
20. 2" x 4" lower chord
21. 1" x 4" cross bracing both endwalls
22. 2" x 6" track board
23. single track sliding door hardware, galv. flashing over
24. 6'-0" x 8'-10" insulated slide door (secure closed with 4 turnbuckle hooks)
25. 2" x 8" head & side jambs
26. rubber weather stripping, sides & top of door
27. nail through blocking & plywood to wall with 3 1/2" nails @ 6" o.c.
28. ceiling plywood continuous over wall
29. wedge wall to ceiling, quarter-round both sides to close
30. #5 horizontal rebars @ 6" o.c.
31. #4 vertical rebars @ 12" o.c.
32. floor slats over liquid manure tank
33. 1" x 3" door casing

SYM	REVISIONS	CHECKED	DATE	APPROVED

CANADA PLAN SERVICE

WALL DETAILS

DESIGNED <i>H.A.A.</i>	DATE SEPT. /74	PLAN 1401
DRAWN <i>J.E.T.</i>	REVISED	1401
CHECKED <i>J.E.T.</i>	DETAIL NUMBER A	ORIGINATES ON SHEET B
	DRAWN ON SHEET C	SHEET 3 OF 6

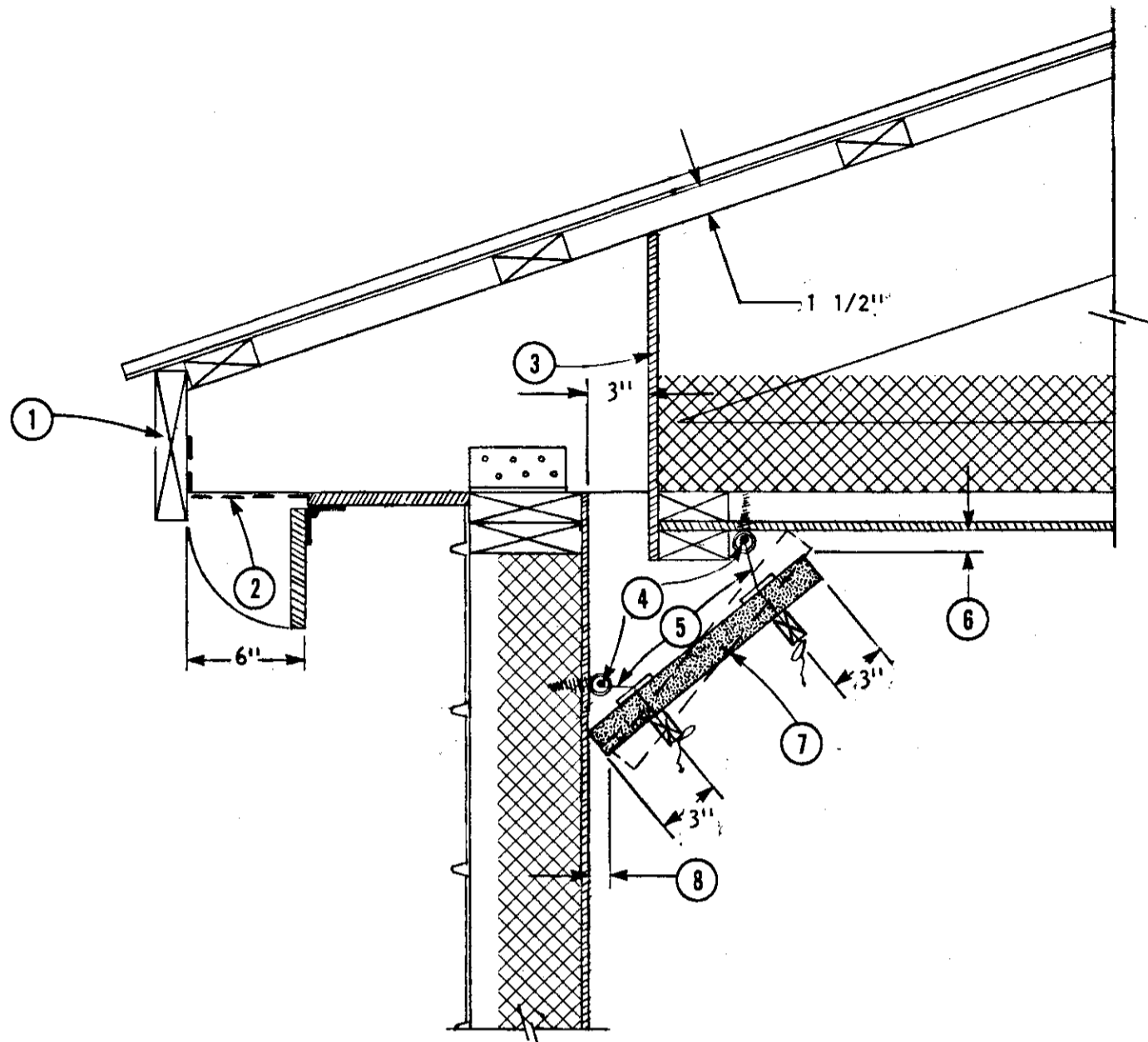


1. floor slats
2. 12" x 20" beams, see sheet 2 for spacing
3. #4 rebars @ 10" o.c. both ways, 4 1/2" from bottom
4. 2-#7 rebar hooks 6' long; 4'-8" into beam from inside wall face
5. 7-#3 stirrups; one @ 4" from wall, 6 @ 8" o.c.
6. 3-#6 rebars & 2-#7 rebars, 19'-8" long
7. 2" x 6" wood cove cut to 45° over galv. water supply pipe
8. tombstone feed fence (leaflet 2358) reduced to 3'-2" in height
9. water bowl
10. #4 rebars @ 12" o.c. both ways
11. sump for agitator pump, 4' x 4' x 1' deep at sliding door (see sheet 2)
12. #4 vertical rebars @ 12" o.c.
13. #7 horizontal rebars @ 12" o.c.
14. 1 1/2" clear to face of concrete
15. 3-#4 horizontal rebars @ 6" o.c.
16. textured finish top surface with magnesium float
17. 1/4" radius
18. see slat manufacturer for slats designed to loading requirements specified in Canadian Farm Building Code
19. 2" x 4" stiffener
20. 1/2" x 7" bolt; weld head to 3/4" dia. x 10" cross bar
21. 1 1/2" dia. x 22" galv. pipe 8" in concrete for tombstone feed fence
22. 2" x 6" fence rails
23. 2" dia. x 4'-0" galvanized pipe
24. 3/8" x 12" x 12" steel plate welded to pipe (23) galvanize after welding
25. 3/8" U-bolts with nuts and washers
26. 2" polystyrene tacked to wall forms before pouring concrete (makes a pocket for beam connection)

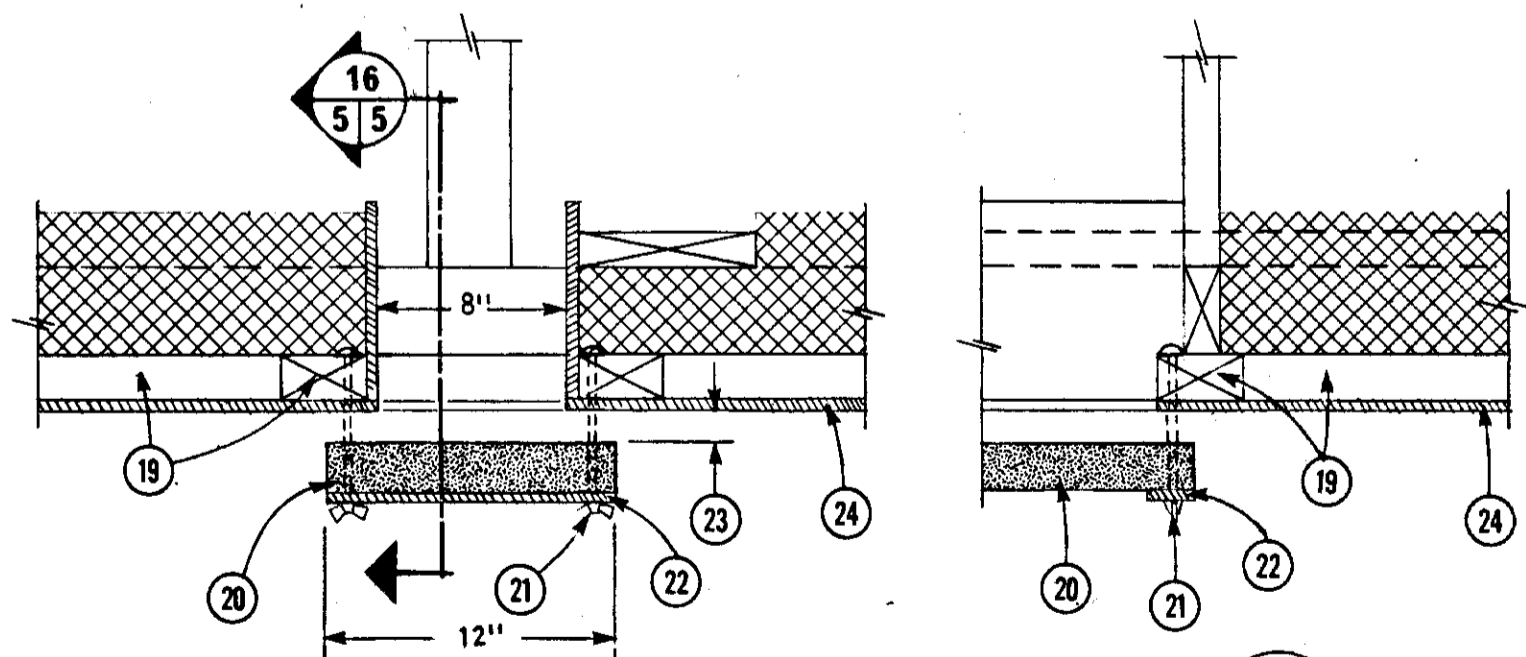
NOTE

- concrete compressive strength 4000 psi min. @ 28 days
- reinforcing steel yield point 60,000 psi min.

SYM	REVISIONS	CHECKED	DATE	APPROVED
MANURE TANK DETAILS				PLAN 14 01
DESIGNED <i>H.A.J.</i>	DATE SEPT./74	PLAN		
DRAWN <i>J.E.T.</i>	REVISED	14 01		
TRACED	DETAIL NUMBER A	ORIGINATES ON SHEET B		
CHECKED <i>J.E.T.</i>	DETAIL NUMBER B/C	DRAWN ON SHEET C		
				SHEET 4 OF 6

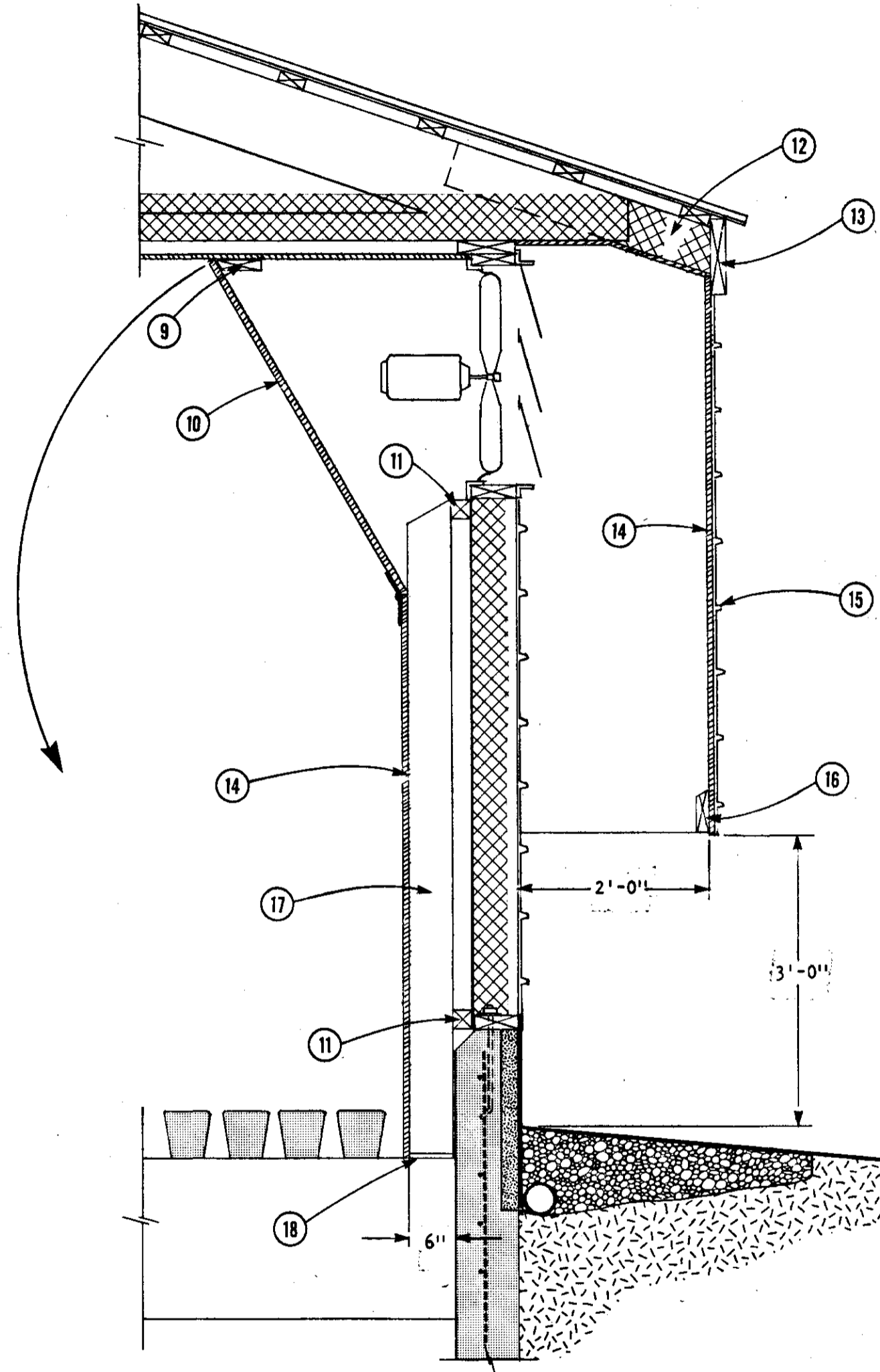


9
2 5
1 1/2" = 1'-0"



10
2 5
1 1/2" = 1'-0"

16
5 5



15
2 5
3/4" = 1'-0"

1. 2" x 8" face board
2. 1/2" x 1/2" galv. hardware cloth bird screen, bent to go behind ①
3. plywood insulation stop fitted between trusses; opening above is winter air inlet when soffit door is closed
4. 3/16" plastic covered marine steering cable, run through screw eyes to boat winch for adjustment at one end, to return spring at opposite end
5. nylon control cords, clamp to control cable, run through screw eyes and baffle ⑦ at 4'-0" o.c., tie to secure baffle closed
6. ceiling air inlet adjusts 0" to 1"
7. 1 1/2" x 14" polystyrene board (Dow SM or equal) 5/16" x 2" x 6" plywood strips at joints nailed through to 1" x 2" wood stiffeners cont., drill for cords ⑤ at 4'-0" o.c.
8. optional air inlet down wall for summer, adjusts 0" to 1"
9. 2" x 6" stop block (bevel to suit angle of door)
10. 1/2" x 4' x 4' plywood door to fan, open for max. summer ventilation, otherwise closed
11. spacer blocks, each stud
12. 2" x 6" rafter extension at truss
13. 2" x 10" face board at fan hood only
14. 1/2" plywood
15. exterior siding to match walls
16. 2" x 6" hood frame, bevel as indicated for easy cleaning
17. 2" x 6" false studs @ 2'-0" o.c.
18. remove 1 slat 4' long for air duct
19. 2" x 4" nailing girts
20. 1 1/2" x 12" baffle of high-density extruded polystyrene (Dow SM or equal)
21. 1/4" plated carriage bolts, washers & wing nuts for inlet adjustment, 6 per inlet
22. 3/8" x 1 1/2" plywood cross strap drilled for bolts ②①
23. air inlet slot; see sheet 6 for adjustment
24. plywood ceiling

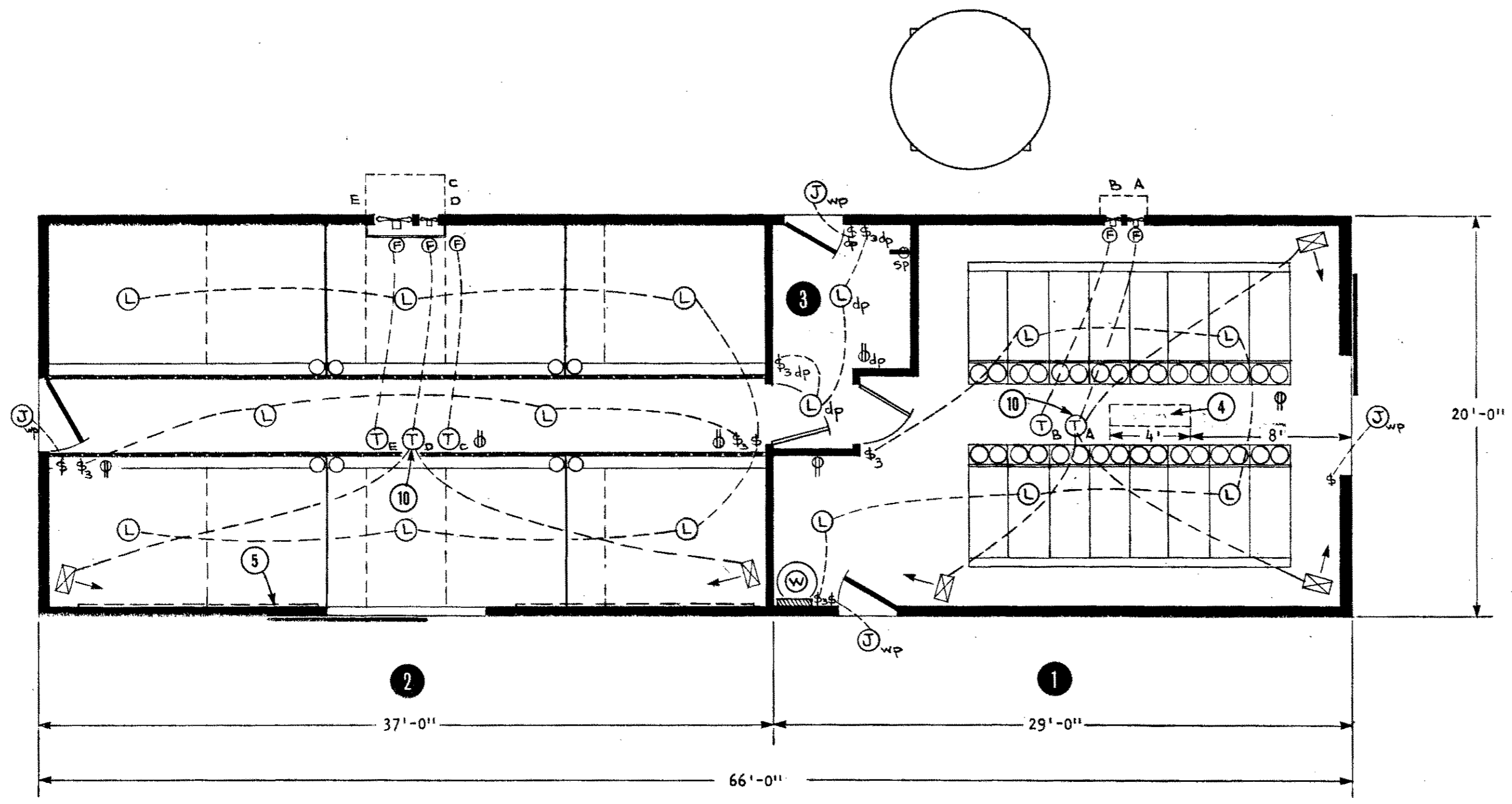
SYM	REVISIONS	CHECKED	DATE	APPROVED

CANADA PLAN SERVICE

VENTILATION DETAILS

DESIGNED <i>H.A.A.</i>	DATE SEPT/74	PLAN 1401
DRAWN <i>J.E.T.</i>	REVISED	
TRACED	DETAIL NUMBER A	SHEET 5 OF 6
CHECKED <i>J.E.T.</i>	ORIGINATES ON SHEET B DRAWN ON SHEET C	

1. calves (0-6 weeks)
2. calves (6-24 weeks)
3. feed center
4. ceiling air inlet (see sheet 5)
5. wall air inlet (see sheet 5)
6. diagram for positioning of fans C, D, & E
7. fan C
8. fan D
9. fan E
10. interlocked heating/ventilating thermostat, see leaflet 8419



- (T) - thermostat
- (J_{wp}) - 150 watt weatherproof incandescent lampholder
- (L) - 100 watt incandescent lampholder
- (L_{dp}) - 100 watt dust-proof incandescent lamp-holder
- (F) - fan outlet
- (S_{sp}) - special-purpose outlet for bulk grain bin auger
- (C) - duplex convenience outlet
- (C_{dp}) - dust-proof duplex convenience outlet
- (S) - single pole switch
- (S₃) - three way switch
- (S_{3dp}) - dust-proof three way switch
- (DP) - distribution panel
- (H) - heater
- (W) - water heater

Table 2 VENTILATION FANS FOR 64 CALF UNIT

Room	Fan	Ventilation Step	No. of Calves	Ventilation cfm/calf	Total cfm	No. of Fans	Fan Capacity cfm @ 1/8" sp	Thermostats on	Thermostats off
1	A	10	16	x 6	= 96	= 1	@ 100cfm	60°	57°
	B	2	16	x 39	= 624	= 1	@ 650cfm	70°	67°
Totals			16	x 45	= 720	= 2 fans			
2	C	1	48	x 6	= 288	= 1	@ 300cfm	45°	42°
	D	10	48	x 6	= 288	= 1	@ 300cfm	60°	57°
	E	3	48	x 78	= 3744	= 1	@ 3800cfm	70°	67°
Totals			48	x 90	= 4320	= 3 fans			

Table 3 Ventilation Inlet Slot Width

Room	Outside Weather	Inlet to Ceiling	Inlet to Wall
1	cold (40° and below)	1/8"	0
	mild & warm (above 40°)	1"	0
2	cold (40° and below)	1/8"	0
	mild & warm (above 40°)	1/2"	1/2"

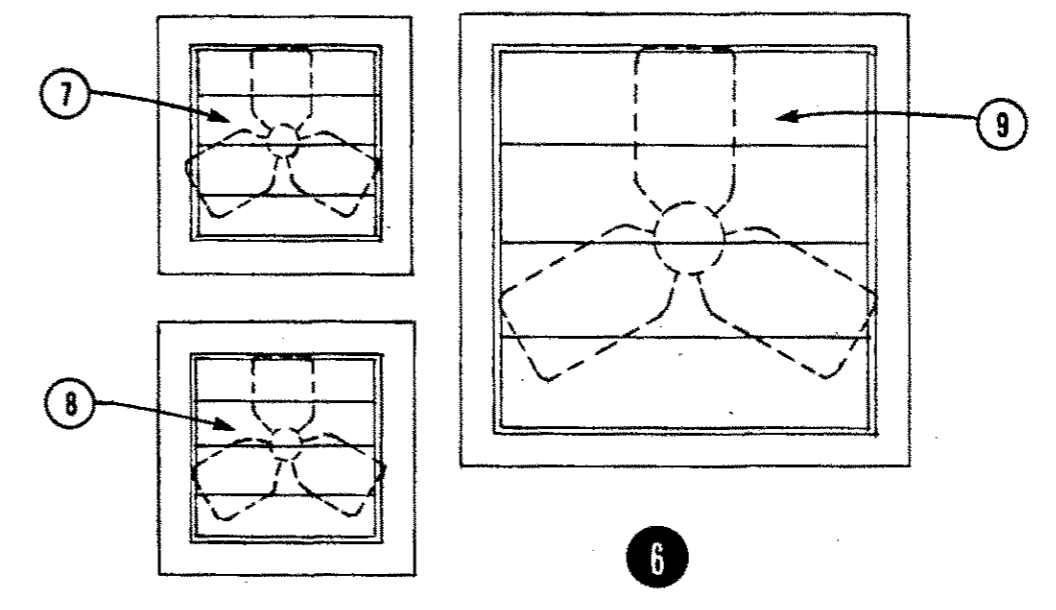


Table 4 SUPPLEMENTAL HEAT TO MAINTAIN WINTER RELATIVE HUMIDITY NOT OVER 75%

Winter Design Temperature (°F)	Room	No. of Calves	Heat (kw/calf)	Supplemental Heat (kw)
+10°	1	16 x	.153	= 2.5
	2	48 x	.028	= 1.3
0°	1	16 x	.182	= 2.9
	2	48 x	.054	= 2.6
-10°	1	16 x	.209	= 3.3
	2	48 x	.080	= 3.8
-20°	1	16 x	.239	= 3.8
	2	48 x	.108	= 5.2
-30°	1	16 x	.268	= 4.3
	2	48 x	.138	= 6.6
-40°	1	16 x	.300	= 4.8
	2	48 x	.168	= 8.1

SYM	REVISIONS	CHECKED	DATE	APPROVED
		ELECTRICAL & VENTILATION LAYOUT		
		DESIGNED <i>H.A.J.</i>	DATE SEPT./14	PLAN 1401
DRAWN <i>J.E.T.</i>	REVISED	DETAIL NUMBER A		
TRACED		ORIGINATES ON SHEET B		
CHECKED <i>J.E.T.</i>		DRAWN ON SHEET C		
				SHEET 6 OF 6