POST-WAR BUILDING NO. 17

FARM BUILDINGS

BY

A COMMITTEE APPOINTED BY THE MINISTER OF AGRICULTURE AND FISHERIES



LONDON: 1945 (REPRINTED 1949)

PUBLISHED FOR THE
MINISTRY OF AGRICULTURE AND FISHERIES
BY HIS MAJESTY'S STATIONERY OFFICE
THREE SHILLINGS NET

FOREWORD BY THE

MINISTER OF AGRICULTURE AND FISHERIES

old country such as ours, many industries have been handicapped because be inherited fixed plant that does not suit modern practice. Agriculture able case, and our farms daily demonstrate the difficulty of maintaining standards of milk production, animal health and of the storage of produce dings which may be anything between 100 and 500 years old, and often d state of repair.

bod set of buildings cannot change a poor farm into a rich farm, but a good buildings properly laid out and properly equipped will enable the best use made of land, labour and stock. I believe firmly that British agriculture take a most important contribution to the maintenance of a high standard ing in this country, and to this end we should re-equip our farms with date structures as soon as we can.

have got to achieve this work of re-equipment as soon as possible, largely in a period when there will be many other calls upon building labour and rials. We must, therefore, make the fullest possible use of all the existing dings that can be adapted, and make sure that we do not make mistakes in the buildings we put up. These new buildings, whether they are needed for stock, for storage or for processing, must be well laid out, designed to ease work on the farm, capable of adaptation to meet the varying needs of agriture, simple, cheap and in harmony with the countryside. All these problems tion and new construction are difficult.

reasons that I appointed, in November 1942, a Committee on two years' hard work they have completed a most valuable tions are now being carefully studied. One has sion will visit Canada and the United States this there. The Report of the Committee, with and designs, should be of great help o architects, and to all others interested pped. I hope, therefore, that it will be

R. S. Huls

COMMITTEE ON FARM BUILDINGS

To THE RIGHT HON. R. S. HUDSON, MINISTER OF AGRICULTURE AND FISHERIES

IR, We were appointed by you in November 1942, "to consider and make recommendations regarding the layout, design, and construction of farm buildings after the war," and we now submit our Report.

We have suffered two pieces of great ill-fortune in the course of our work. Mr. George Gee, whom you had appointed to the Committee, died in February 1943. We were thus deprived of help in which an authoritative knowledge of building was coupled with first-hand farming experience and solid common sense; and we lost a colleague for whom we felt sincere affection. His place was taken by Mr. H. T. Holloway. Then our Chairman, Mr. Tristram Haward, was taken so seriously ill in March 1944, that he was unable to take any further part in our work, and he died in the following December. While he presided over us he was a wise counsellor, a gentle but firm mentor, and a friend.

Mr. J. C. Turner, who left on a mission abroad shortly before the Committee finished its work, has not been able to sign the Report. His comments on the final drafts of nearly all the Chapters had, however, been received before he left, and he was in agreement with our recommendations.

Your Committee was linked with a series of Study Groups set up by Departments or by members of technical organizations under the general supervision of the Ministry of Works. This relationship with bodies investigating analogous subjects has been valuable.

Mention should be made of the way in which our work was organized. We set up a Technical Sub-Committee with the duty of designing and reducing to drawings, buildings satisfying those requirements which our studies had led us to spec fry. The Sub-Committee had no enviable task; their meetings have been frequent and the The Committee are greatly indebted to them and in particular to Major J. B. F. Cowper, F.R.I.B.A., who was their Chairman. We must also record the services given to the Committee by Mr. A. Thorpe, F.R.I.B.A., Architect to the Ministry of Agriculture and Fisheries, and his staff who carried out an immense amount of highly proficient work in the preparation of drawings.

The hardest part in the work has inevitably been that of our Secretary, Mr. P. J. Moss. To all the difficulties under which we as a Committee have laboured have been added for him other hindrances to the discharge of an exacting task. We highly appreciate his services and heartily thank him.

The preparation of Chapter 9, "Accommodation for Milking Cows, their Followers, and the Dairy"—one of the most important Chapters in our Report—requires particular mention. The Ministry's Bulletin No. 40, The Construction of Cowhouses, has, we understand, always been the most popular of the Ministry's Bulletins, in greatest and most constant demand. Your predecessor of the time had appointed a Committee in 1938 to revise the Bulletin with a view to reprinting. That Committee had made a revised draft but the outbreak of war led to the post-ponement of its presentation. Realizing that our Chapter 9 must cover substantially the same wound as Bulletin 40 we approached the Chairman of the

FARM BUILDINGS

Bulletin 40 Committee, Professor H. D. Kay of Reading University, and the following joint Sub-Committee was set up:

Chairman: J. Mackintosh.

Farm Buildings Committee: W. Alexander.

J. Turner, B.Sc. R. W. Trumper.

A. Thorpe, F.R.I.B.A.

Bulletin 40 Committee: H. T. Tate, F.S.I., F.L.A.S.

E. Whone, M.B.E.

J. Holmes, B.Sc.(Agric.), N.D.D.(Hons.).

Secretary: L. J. Gray.

Their work resulted in a revised form of Bulletin 40 which appears as Chapter 9 of our Report.

In normal circumstances we would have been able to reap great advantage from extensive visits to farm holdings in various parts of the country, and from the study of modern farm building development in certain other countries. The difficulties of war travelling have confined us to this country and have limited our inspection of buildings to a relatively small number of specially selected examples.

We naturally desired to draw as fully as possible on the knowledge and experience of landowners and agents, of farmers, of farm workers and of agricultural scientists. To this end we invited the bodies named in an Appendix to our Report to assist us by sending statements of their views. We are greatly indebted to the bodies and the individuals who have assisted us by statements and by designs, and for all their help we make grateful acknowledgment.

We believe that the recommendations on the layout, design, and construction of farm buildings which we make in our Report are the best which can be made in the light of present knowledge. We have, however, been impressed by the limitations of this knowledge, particularly on the relation of housing with health for livestock. Moreover, big changes in farming practice must be expected in the not distant future and these will influence some of the essential features of farm buildings. We have, therefore, recommended for your consideration the setting up of an organization for the continuous study, with experimentation, of farm buildings. We attach the highest importance to this project.

F. L. ENGLEDOW, Chairman. W. ALEXANDER.
J. STANLEY CHIVERS.
A. DOUGLAS.
EDWIN GUNN.
E. HOLLAND-MARTIN.
HENRY T. HOLLOWAY.
W. HOLMES.
RICHARD W. TRUMPER.

P. J. Moss, Secretary.
ALEC THORPE, Technical Secretary.

19th March, 1945.

CONTENTS

PART I. GENERAL

CHAPTER	1. THE PROBLEMS	page 6
	2. Basic Requirements of Farm Buildings	. 9
	3. Design, Methods of Construction, and Materials	14
	4. ACCOMMODATION FOR LIVESTOCK	26
	5. An Advisory Service on Farm Buildings	30
	3, 12, 12, 12, 12, 13, 13, 13, 13, 13, 13, 13, 13, 13, 13	J-
	. PART II. LAYOUTS AND DESIGNS	
•	6. THE LAYOUT OF THE FARMSTEAD—GENERAL CONSIDERATIONS	33
	7. THE FARMSTEAD—SPECIMEN LAYOUTS	39
	8. THE MAIN STORAGE BUILDING OR GRANARY	49
	9. Accommodation for Milking Cows, their Followers, and the Dairy	55
	The Cowhouse System	55
	The Milking House System	84
	The Open-Air System	92
	The Farm Dairy	93
	Accommodation for Calves Accommodation for the Bull	100
		106
	10. Accommodation for Heavy Draught Horses 11. The Housing of Pigs	107
		113
	12. LOOSE BOXES	123
	13. THE STOCKYARD	129
	14. STRAW YARDS AND STRAW BUILDINGS	139
	15. THE DUTCH BARN	149
	16. Silos	156
	17. Storage Buildings for Bulk Grain, Seeds, and Fertilizers	160
	18. Housing of Tractors and Implements: The Workshop	164
	19. Buildings for the Small Farm	170
	20. THE IMMEDIATE POST-WAR PERIOD: IMPROVISATION	180
	PART III. OTHER ASPECTS OF FARM BUILDINGS	
	21. Exclusion and Control of Insects, Rodents, and other Pests	183
	22. FIRE PREVENTION	187
	23. ELECTRICITY ON THE FARM	191
	PART IV. RECOMMENDATIONS	_
	24. PROPOSALS FOR CONSIDERATION BY THE MINISTRY OF AGRICULTURE	200
	APPENDIX	202
	INDEX	203
		243

FARM BUILDINGS

ILLUSTRATIONS

		page
Fig. 1.	Traffic in and around the Farmstead	35
	Layout of the Farmstead:	
2.		42
. 3-		43
4.		44
5.		45
6.		46
` 7.	<u>-</u>	47
	Granary: section and elevation	52
9.	Granary: plan showing arrangement of bins	53
	Cowhouse:	
; io.		57
II.	• • • • • • • • • • • • • • • • • • •	60
12.		6r
13.	•	62
14.		63
	Ventilation of cowhouse: outlets and inlets	66
	Mangers: narrow Scottish, narrow continuous, and wide continuous types	70
	Ties for cows: side tie and central tie with chains	72
	Ties for cows: central tie, yoke and Dutch types	74
	Drainage of cowhouse, dual system	76
	Storage tank for water or liquid manure	77
21.	Covered manure pit	79
	Adaptations:	_
22.	Narrow building into cowhouse	81
23.	• • •	82
24.		83
	The milking house system: plans	85
	The milking house system: example A	86
	The milking house system: example B	87
-	Farm dairies: for small herds	94
	Farm dairies: for medium and large herds.	96
	Farm dairies: for large herds	98
	Calf house	101
	Housing calves in loose boxes. Pen divisions	105
	Stables: section and plan	108
	Stables: details of eaves and doors	111
• • •	Cottager's pigsty	115
36.	Piggery: sections and elevation	116
	Piggery: plan	117
_	Removable farrowing crate	118
	Loose boxes with feeding passage	124
	Loose boxes without feeding passage	126
	Isolation boxes	128
	Fixings for wood posts. Movable pig ark. Outlet to gulley	131
	Partially covered yard	133
44.	Covered yard ·	135
45.	Ventilating roof coverings	137
46.	Methods of supporting roofs for yards	138
47•	Partially covered straw yard	140
48.	Open straw yard	144
· 49.	Straw pig-houses	145
50.	Standard Dutch barns	151
51.	Corn drier in brick Dutch barn	152
52.	Corn drier in steel Dutch barn	153

CONTENTS

.	The state of the s	page		
	Rick covers: tarpaulin and corrugated iron sheet	154		
	Wooden silo			
	Reinforced concrete tower silo	158		
	Reinforced concrete pit silo			
	Sheep dip	161		
	Bulk grain and seed stores	162 163		
	Fertilizer store			
	Farm implements showing common overall dimensions Pull-through implement shed			
62.	62. Workshop			
	Buildings for the small farm:			
63.	Examples A and B	171		
64.		172		
65.		175		
66.	Example F	176		
67.	Electrical installation for a farm	192		
V .				
		ng page		
	A modern farmstead in Somerset: general view	16		
	A modern farmstead in Somerset: silos, cowhouse and dungstead	17		
-	The single building in Holland	32		
4.	Interior of single building	32		
	Adaptation of barn into milking shed and open yards:			
5.	·	33		
6.	South side: yards for dairy cows	33		
	Horse yards facing south and sheltered by high fence	112		
	Interior of horse yard	112		
•	Movable farrowing hut showing feeding trough and entrance	113		
10.	Movable farrowing hut showing trap-door for inspection	113		
11.	Double range of farrowing pens facing south	128		
12.	Farrowing crate	128		
- 13.	Range of sties with yards adapted from draughty double-range piggery	129		
14.	Straw fattening pens for pigs	129		
15.	Straw farrowing pens	144		
16.	Interior of straw farrowing pens	144		
	Pig hut	145		
18.	Implement shed: straw wall added to brick building; corrugated iron roof	145		
	Straw and poles implement shed	160		
20.	Another straw and poles implement shed	160		
	Poles and light battens in straw roof	161		
	Straw roof held down by baling wire and thatching pins	161		

ACKNOWLEDGMENTS

We wish to thank the following for permission to include photographs as illustrations to the Report: Mr. E. W. Towler for Plates 1 and 2 (photographs by Mr. S. W. Kenyon, Wellington, Somerset); Messrs. Longmans Green and Co. Ltd. and Mr. P. Lamartine Yates, Plates 3 and 4 (reproduced from Food Production in Western Europe by P. Lamartine Yates); Mr. J. S. Chivers, Plates 5-8 (incl.) and 11-13 (incl.) (photographs by the Eastern Press Agency, Cambridge University Farm, Plates 9 and 10 (photographs by the Eastern Press Agency, Cambridge); Mr. R. J. Burrell, Plates 14-16 (incl.); and Mr. P. J. Macfarlan, Deputy Executive Officer of the Northamptonshire War Agricultural Executive Committee, Plates 17-22 (incl.).

FARM BUILDINGS

APPENDIX

Written statements of evidence were received from the following bodies, to whom we make grateful acknowledgment:

The Auctioneers' and Estate Agents' Institute of the United Kingdom.

The Central Landowners' Association.

The Chartered Surveyors' Institution.

The County Councils' Association.

The County Land Agents' Association.

The Land Agents' Society.

The National Farmers' Union.

The National Federation of Building Trades Employers

The National Institute for Research in Dairying.

The National Union of Agricultural Workers.

- The National Veterinary Medical Association.

The Royal Institute of British Architects.

The Sanitary Inspectors' Association.

INDEX

The references are to paragraphs

Numbers in brackets refer to the Memorandum from the N.F.U. Mutual Insurance Society Ltd. reproduced in Chapter 22, and to the extract from Post-War Building Studies No. 11 reproduced in Chapter 23

```
ACCOMMODATION for livestock.
                                    See LIVE-
                                                 Concrete:
    STOCK
                                                    drinking troughs and aprons, 63b, 64
                                                   feeding troughs, 331
Adaptability, ensurance of:
  buildings generally, 4, 7, 15b
buildings for small farms, 462
                                                    floors, 51, 148, 184, 244, 275, 325, 354,
                                                      370
  Dutch barn, 419
                                                   framed structures, 52b
  granary, 151
                                                   mangers, 190
  stable, 309
                                                   stall divisions, 192
                                                   standings, 185, 294
Adaptations:
  existing barns to granaries, 152-153
                                                 walls, 47, 172, 242, 292, 322
Construction of buildings:
  existing buildings to cowhouses, 208-210,
     212-213
                                                    calf house, 266-277
  existing buildings to provide dairy, 211
                                                   cowhouses, 172-204
  war-time huts to farm uses, 479c
                                                   dairy, 242-247
Dutch barns, 412-418
Advisory Service proposed, 85-96
Animal health, 8, 15i, 67c, 77
Appearance of buildings, 150
                                                    granary, 143-150
                                                    loose boxes, 342-349
Architects, functions of, 97-98
                                                    mass production, 32-43
Asbestos cement :
                                                    pig houses (temporary and movable), 312-
  pipes, 59
sheets: ceilings, 48a; huts, 53b; roofs,
                                                      314, 402
                                                    piggery, 321-330
                                                   recent methods, 54
     53c, 145, 175, 324, 382
  troughs, 63c
                                                    silos, 424–431
  tubular roof trusses and supports, 52d,
                                                    stables, 291-297
                                                    stockyards: covered, 380-384;
                                                                                        open,
                                                    366-371; partially covered, 375-378 storage buildings: permanent, 43
BAILS, milking, 70, 226, 231-234
                                                                                          434;
                                                      straw, 403
Barns:
  adaptation of existing, 152-153
                                                    straw yards, 395–401
  Dutch. See DUTCH BARNS
                                                 Control of insects, rodents and other pests,
  North American, 29
                                                      481-489
                                                 Conveyor-loaders, 19
Bins, storage:
  grain and cake, 149, 437
                                                 Conveyors, overhead, 17, 149
                                                 Corrugated iron, 48b, 213
  meal, 332
                                                 Cost of buildings, 152
Boiler house in dairy, 253-256
Boiling house in piggery, 320c, 332
                                                 Cottager's pigsty, 316a, 317
Brickwork:
                                                 Covered yards, 380-384
  partitions, 272, 323, 345
                                                 Cowhouses:
                                                    adaptations of existing buildings, 208-213
  walls, 45, 49, 172, 242, 292, 322, 342, 352,
                                                   approaches, 206
dimensions, 168-171
375
Builders, rural, 32
Building materials. See MATERIALS
                                                    doors, 173
Bulk grain and seed stores, 432-438
                                                    double range house, 162
                                                   drainage, 167, 201-204
Bull, accommodation for, 281-284
                                                    dung channels, 186
                                                    electrical installation, 491(397)
CALVES, accommodation for:
                                                   feeding passages, 197
  buildings, types of, 257-259
  calf-rearing unit, 262-279
                                                    floors, 183
  loose boxes adapted for calf rearing, 280
                                                    gangways, 187
                                                   lighting, 165, 180-183
  management, systems of, 260-261
Cedar shingles, 50, 175
                                                    mangers, 188–191
```

FARM BU	ILDINGS
Cowhouses—continued.	Drinking bowls, automatic:
manure disposal, 158, 205	bull box, 283
objective, 158	calf house, 278
plan, 160-161	cowhouse, 196
roof, 174–176	loose box, 307e
single range houses, 162 siting, 159	stable, 303 Drinking troughs:
space, 163-164	field, 63-64
stall divisions, 192	stable, 303
standings, 185	Dung channels:
ties, 193–195	cowhouse, 169, 186, 202
ventilation, 164, 177–179 walls, 172	piggery, 326
water bowls, 196	stables, 295 Dung:
water supply, 166, 198-200	conservation, 15j, 74-75
Cows, management for milk production:	disposal: cowhouse, 210; general, 111;
cowhouse system, 157-213	yards, 75, 368,385–387
general description, 154-156	Dunging passages, 326, 327 Dutch barns:
milking house system, 214–230 open air system, 231–234	adaptability, 419
Crates:	construction, 412-418
farrowing, 325	design, 408-411
service, 284	object, 404–406
D	siting, 407, 490(II)
DAIRY:	
approaches, 206 boiler house, 253–256	ECONOMY:
construction, 242–247	labour, 15p, 16–21
dimensions, 239-241	maintenance of buildings, 15f Electricity:
electrical installation, 491(397)	applications of, 491(389)
milk room, 248	earthing arrangements, 491(387)
requirements, essential, 236–238	electrical requirements for farms, 491(397)
site, 235 washing and sterilizing room, 249–252	electrification of buildings, 490(14),
Damp, precautions against, 484	491(386–387)
Damp-proof courses, 148, 484b	fences, 491(419) fittings and accessories, 491(402)
Design of buildings:	fuses and circuit breakers, 491(403–404)
buildings generally, 25–31	installation, alterations to, 490(3i)
calf houses, 262–265	lighting, 491(398-399)
cowhouses, 160–171 Dutch barn, 408–411	loading of appliances, 491(395)
granary, 138-142	mechanized methods, influence on design
implement shed, 443–448	of buildings, 491(388) outbuildings, supply to, 491(418)
loose boxes, 339-341	probable post-war developments, 491(385)
pig houses (temporary or movable), 312-	socket outlets, 491 (400)
314	specimen installation for farmstead,
pigsty, 317 range of piggeries, 318–320	491(<i>421</i>)
stable, 289–290	Erection of buildings, 15e Estate Agents, responsibility of, 99
stockyard: covered, 380-384; open, 364-	Expenditure on buildings, 12, 15a
365; partially covered, 373-374	Experiment on buildings, 84-96
storage buildings: for bulk grain, 435- 438; for fertilizers, 439	
workshop, 450–452	FARROWING CRATES, 335
Doors:	Feeding passages:
cowhouse, 173	cowhouse, 197
dairy, 247	loose boxes, 340, 343
isolation boxes, 353	Fences: electric, 491(419)
loose boxes, 307, 348 piggery, 334	stockyard, 367–369
stables, 305	Fertilizer stores, 433-434, 439
Drainage of buildings:	Field hovels for cattle, 81, 394
calf house, 276-277	Finance, 12, 152
cowhouse, 167, 201-204	Fire prevention: causes of fire, 490(1-2)
isolation boxes, 355	electrification of buildings, 490(14)
loose boxes, 307, 349 piggery, 326	layout and construction of buildings,
stable, 295	-490(<i>4</i> -13)
stockyard, 371	precautions, 490(3)
straw buildings, 393d	water supply, 490(15)
. 2	04

INDEX

Floors, materials and construction : buildings generally, 51 calf house, 275–277	Improvisation, 15n, 471–480 Insect pests, control of, 482–488 Isolation boxes, 207, 351–356
cowhouse, 184 dairy, 244	
Dutch barn, 417 granary, 138-140, 148	LABOUR, comfort and economy of, 15p, 16-21
implement shed, 445	Layout: fire prevention, 490(13)
isolation boxes, 354 loose boxes, 307, 342, 349	general considerations, 100-120
piggery, 325 stables, 294	specimen layouts, 121-134 Lighting of buildings:
stockyards, 72, 370	calf house, 269
tractor shed, 442 Food preparation:	cowhouse, 165, 177–183 dairy, 246
calf house, 265	granary, 146 loose boxes, 346
piggery, 332–333 Food Stores. See Granary	piggery, 327
Framed structures, 34-41, 52 Fuel, storage of, 453	stables, 296 Liquid manure, conservation of, 204
_ ·	Livestock: field hovels, 81, 394
GALVANIZED IRON: bins, 332	health, 8, 15i, 67c, 77d
sheeting, 48b, 175, 213	housing: general requirements, 65-67; practice, 68-69
stall divisions, 192 troughs, 63a, 331	improvisation of buildings, 70
Gangways: cowhouse, 187	open air accommodation, 70-78 regulations as to buildings, 80
milking house, 226	Loading ramps, 16, 148 Loose boxes:
Granary: adaptability, 151	construction, 307, 342-349
adaptation of existing barns, 152-153	design, 339–341 fittings, 350
construction, 143–150 design, 138–142	objects, 337–338
object, 136	use for calf rearing, 258, 280 use for pig keeping, 316c
Siting, 137 Granolithic concrete:	Lubricating oil, storage of, 453
floor finish, 51, 148, 189, 294 paving, 307	
troughs, 331	Machinery and Shafting, 142, 490(3h)
Gulleys: calf house, 277	Main storage building. See Granary Maintenance of Buildings, economy of, 15
cowhouse, 201, 203 loose boxes, 349	Mangers: cowhouse, 188–191
piggery, 326	loose boxes, 350
stables, 295	stables, 301 stockyards, 372, 379
HARBOURAGES FOR INSECT PESTS, elimination of, 485	Manure. See Dung and Liquid Manure Mass production, 15d, 32-43, 479d
Hardcore:	Materials, building:
aprons round open-air troughs, 64 floors, 370, 385, 415, 442	types: floors, 51; framed structures, 52; roofs, 50; walls, 45-49
_ foundations, 51, 184, 275, 325, 354	use of scrap war materials, 479b
Harness, storage of, 306 Hayracks:	Methods, changes in : building, 5
cowhouse, 191 loose boxes, 350	farming, 4, 7, 15g Milk production, systems of management
stable, 302	for:
stockyards, 372, 379 Horses, accommodation for:	cowhouse system, 157-213 general description, 154-156
loose boxes, 307 stables, 287–306, 309	milking house system, 214–230 open air system, 231–234
yards, 285–286, 308. See also Stock-	Milk room, 248
YARDS Husbandry Experiment Stations, 95-96	Milking house system of herd management: description, 214-222
Hydraulic rams, 57e	examples, 229–230 general housing, 223–224
IMPLEMENTS:	milking houses: cowhouse type, 225, 227;
dimensions, 441 housing, 443–449	walk through type, 225, 226 milking machines, 219
w/ 110 /12	

FARM BUILDINGS		
Movement of farm material:	Roofs, construction and materials:	
labour saving, 16-21	buildings generally, 50	
systems, 119	cowhouse, 174-176	
Multiple purpose buildings, 25-29, 469	dairy, 245	
	Dutch barn, 415-416	
North American Barn, 29	granary, 145	
	implement shed, 448	
Objectives:	loose boxes, 342	
cowhouse system, 158	piggery, 324	
Dutch barn, 404-406	stables, 293 stockyard: covered, 381-383; part-	
granary, 136	covered, 376	
loose boxes, 337–338	straw buildings, 393f	
pig keeping: indoor, 311; outdoor, 315	Roof water, conservation of, 57d, 414	
Stables, 287 Open air accommodation for livestock, 70—		
78; 285	Community The Illeria and	
Open air system of herd management for	Scandinavian Pig House, 318–320	
milk production, 231-234	Sheeting: walls, 48	
Open stockyards:	roofs, 50	
construction, 366–372	Shelter buildings:	
design, 364-365	fields, 81, 394	
siting, 363	stockyards, 366	
	Shingles, cedar, 51, 175	
Part-Covered Stockyard:	Silos:	
construction, 375-379	capacity, 422	
design, 373–374 Partition walls :	design, 420	
	permanent, 427–431	
dairy, 243 loose boxes, 345	siting, 421 temporary, 424–426	
Pen divisions:	Single building type of farmstead, 26-28,	
calf house, 270-274	469	
piggery, 323	Siting:	
Permanence of buildings, 15c	buildings generally, 100–120, 490(13)	
Pig keeping, indoor:	calf house, 262	
construction of piggery, 321–330	cowhouse, 159	
design of piggery, 317–320 fittings of piggery, 331–335	dairy, 235 Dutch barn, 115, 407	
methods, 316	farmstead, 100–104	
objects, 315	granary, 137	
Pig keeping, outdoor:	implement shed, 109	
design and construction of buildings, 312-	silos, 421	
314	stables, 288	
object, 311	stockyards, 114-115, 363	
Pipes:	storage buildings, 109	
for farm water systems, 58-60 rainwater down pipes, 57d, 415	Small farms, buildings for, 454–470 Stables;	
Power house, 490(3h, 9)	adaptability, 309	
Prefabricated types of buildings, 53	construction, 291–297	
Prefabrication, 15d, 32-43, 479d	design, 289-290	
Principles affecting buildings, 15	fittings, 298–306	
Problems considered by the Committee, 1-	loose box in range of stabling, 307	
13	object, 287	
Proposals for consideration by the Ministry	siting, 288	
of Agriculture, 492	Stall divisions:	
Public water mains, 57a Pumps:	cowhouse, 192 stables, 298–300	
for water supply, 61-62, 491(391)	Standardization, 15d, 32-43, 479d	
for liquid manure, 209a	Stockyards:	
	description of types, 357-362	
RICK COVERS, 406	dung steadings, 385-387	
Rodents, control of, 489	covered yards, 380-384	
Roof lighting:	mechanical clearing, 75, 368, 385	
calf house, 269	open yards, 363-372	
cowhouse, 181	partially covered yards, 373-379	
dairy, 246	use of, 71-78, 357 Storage building, main. See GRANARY	
granary, 146	Storage buildings, for bulk grain, seeds, and	
loose boxes, 346 piggery, 327	fertilizers. 433-430	
stables, 296	Storage of fuel and lubricating oil, 453	
· ·		

INDEX

Storage tanks:
liquid manure, 204
water, 199-200
whey, 333
Straw buildings:
pig houses, 402
storage buildings, 403
general considerations, 388-394, 479a
yards, 395-401

TERMS OF REFERENCE, I
Ties for cows, 193-195
Timber:
framed structures, 52c
pig arks and houses, 313-314
shelter buildings in stockyards, 366
silos, 428
use of, 490(5)
Tractors, housing of, 442, 449
Traffic in and around the farmstead, 105-114
Transport of farm material:
labour saving, 16-21
systems, 119
Troughs, drinking:
open-air, 63-64
stable, 303
Troughs, feeding:
piggery, 331
strawyard, 398
See also MANGERS
Tyings for horses, 304

VENTILATION: calf house, 267-268 cowhouse, 164, 177-179 granary, 147 isolation boxes, 356 loose boxes, 307, 347 pig house, 328-330 stables, 297 Vermin, control of, 489

WALLS, materials and construction: buildings generally, 45-49 cowhouse, 172 dairy, 243 granary, 144 isolation boxes, 352 piggery, 322 stables, 292 stockyards: covered, 380; part-covered, 375 straw pig house, 402 straw yards, 395-401 Washing and sterilizing room, 249-252
Water bowls, automatic. See Drinking BOWLS Water Supply: calf house, 278 cowhouse, 166, 196 dairy farms, 198-200 farmstead, 15k, 55-64, 490(15), 491(391) loose boxes, 307, 344 stable, 303 Wells, 57b, 199 Windmills for pumping water, 62 Workshop, farm, 450-452 Windows: calf house, 269 cowhouse, 182 dairy, 246 granary, 146 loose boxes, 346 piggery, 327 stables, 296 YARDS: horse yards, 285-286, 308

stockyards, 357-384

straw yards, 395-401 use of, 71-78

FARM BUILDINGS COMMITTEE

- ¹ T. W. Haward, Chairman.
- ² Professor Sir Patrick Abercrombie, M.A., F.R.I.B.A. William Alexander.

J. Stanley Chivers, J.P.

Major A. Douglas, M.R.C.V.S., D.V.S.M.

Professor Sir Frank Engledow, C.M.G., M.A., B.Sc.

* George Gee.

Edwin Gunn, A.R.I.B.A.

Edward Holland-Martin.

Henry T. Holloway, P.P.I.O.B.

W. Holmes, C.B.E.

R. W. Trumper.

4 James Turner, B.Sc.

P. J. Moss, B.Sc.(Agric.), Secretary

Ministry of Agriculture

A. Thorpe, F.R.I.B.A., Technical Secretary

and Fisheries.

- ¹ Mr. T. W. Haward was taken seriously ill in March 1944, and was unable to take any further part in the work of the Committee. He died in the following December. Sir Frank Engledow has since acted as Chairman.
 - ² Sir Patrick Abercrombie was unable to sign the Report owing to absence abroad.
 - * Mr. George Gee died in February 1943.
- ⁴ Mr. James Turner left on a mission abroad in October 1944, and has, therefore, been unable to sign the Report.

TECHNICAL SUB-COMMITTEE

Major J. B. F. Cowper, F.R.I.B.A., Chairman.

Edwin Gunn, A.R.I.B.A.

Henry Holloway, P.P.I.O.B.

R. H. Sheppard, F.R.I.B.A. (Ministry of Works).

A. Thorpe, F.R.I.B.A. (Ministry of Agriculture and Fisheries).

TERMS OF REFERENCE

To consider and make recommendations regarding the layout, design, and construction of farm buildings after the war.

Printed in Great Britain under the authority of HIS MAJESTY'S STATIONERY OFFICE
by T. and A. CONSTABLE LTD., Edinburgh

Wt. 70699/--K40 11/49 53-2611

M.A.F. STANDARD BUILDING COMPONENTS

Following the recommendation of the Committee on Farm Buildings that the possibility of the mass production of standard framed units should be examined, arrangements have been made for the large-scale production and distribution of standard building components These are designed for buildings of 18 ft. or 33 ft. span (17 ft. 6 ins. or 32 ft. 3 ins. internal widths between columns), of 8 ft., 12 ft., or 16 ft. in height and in multiples of 15 ft. in length. Multi-span buildings can also be constructed, and provision has been made for the easy lengthwise extension of the buildings. Brick or concrete block piers or walls of any required height can be substituted for the standard wall components provided that the standard spans and bay widths are retained.

Further information may be obtained from County Agricultural Executive Committees, or the Ministry of Agriculture and Fisheries, 4-10 Chester Terrace, Regents Park, London, N.W. 1.

CROWN COPYRIGHT RESERVED

LONDON: 1945

PUBLISHED BY HIS MAJESTY'S STATIONERY OFFICE

To be purchased directly from H.M. Stationery Office at the following addresses:
York House, Kingsway, London, W.C. 2; 13A Castle Street, Edinburgh 2;
39 King Street, Manchester 2; 2 Edmund Street, Birmingham 3;
1 St. Andrew's Crescent, Cardiff; Tower Lane, Bristol 1; 80 Chichester Street, Belfast
OR THROUGH ANY BOOKSELLER

Price 3s. od. net

REPRINTED 1949

MINISTRY OF WORKS

POST-WAR BUILDING STUDIES REPORTS

- HOUSE CONSTRUCTION. By an Inter-Departmental Committee appointed by the Minister of Health, the Secretary of State for Scotland and the Minister of Works. 2s. (2s. 3d.)

 STANDARD CONSTRUCTION FOR SCHOOLS. By a Com-
- 2. mittee appointed by the President of the Board of Education. 6d. (7d.)
- PLASTICS. By a Committee convened by The British Plastics Federation. 1s. (1s. 2d.)
 PLUMBING. By the Plumbing Committee of the Building Research Board of the Department of Scientific and Industrial Research. 1s. 3.
- (15. ad.)
 THE PAINTING OF BUILDINGS. By a Committee convened by The Paint Research Association. 1s. (1s. 2d.)
- GAS INSTALLATIONS. By a Committee convened by The Institution of Gas Engineers. 6d. (8d.)

 STEEL STRUCTURES. (Out of print.)
 REINFORCED CONCRETE STRUCTURES. (Out of print.)
- 7· 8.
- MECHANICAL INSTALLATIONS. By a Committee con-
- vened by The Institution of Mechanical Engineers. 2s. (2s. 3d.) SOLID FUEL INSTALLATIONS. By a Committee convened 10. by the British Coal Utilisation Research Association. 9d. (11d.)
- ELECTRICAL INSTALLATIONS. By a Committee convened by The Institution of Electrical Engineers. 1s. 6d. (1s. 8d.)

 THE LIGHTING OF BUILDINGS. By the Lighting Com-TT.
- 12. mittee of the Building Research Board of the Department of Scientific
- and Industrial Research. 2s. 6d. (2s. 9d.)

 NON-FERROUS METALS. By a Committee convened by the British Non-Ferrous Metals Research Association. 1s. (1s. 2d.)

 SOUND INSULATION AND ACOUSTICS. By the Acoustics 13.
- IA. Committee of the Building Research Board of the Department of Scientific and Industrial Research. 1s. (1s. 2d.)
- WALLS, FLOORS AND ROOFS. By a Committee convened by The Royal Institute of British Architecta. 9d. (11d.) 15.
- BUSINESS BUILDINGS. By a Committee convened by The Royal Institute of British Architects. 1s. (1s. 2d.)

 FARM BUILDINGS. By a Committee appointed by the Minister 16.
- 17.
- of Agriculture and Fisheries. 3s. (3s. 4d.)
 THE ARCHITECTURAL USE OF BUILDING MATERIALS. 18. By a Committee convened by The Royal Institute of British Architects.
- 2s. 6d. (2s. 9d.) HEATING AND VENTILATION OF DWELLINGS. By the TO. Heating and Ventilation Committee of the Building Research Board of
- the Department of Scientific and Industrial Research. 2s. 6d. (2s. 10d.) 20.
- FIRE GRADING OF BUILDINGS. By the Fire Grading Committee of the Building Research Board of the Department of Scientific and Industrial Research, and of the Fire Offices' Committee. 1s.6d. (1s.9d.) SCHOOL BUILDINGS FOR SCOTLAND. By a Committee
- appointed by the Secretary of State for Scotland. 18. (18. 2d.) FARM BUILDINGS FOR SCOTLAND. By a Com By a Committee 22.
- appointed by the Secretary of State for Scotland. 13. 6d. (1s. 9d.)
 HOUSE CONSTRUCTION. SECOND REPORT (see No. 1 23.
- above). 1s. 6d. (1s. 8d.)
 SCHOOL FURNITURE AND EQUIPMENT. By a Sub-Committee of the Standards Committee of the Ministry of Works. 6d. (7d.) 24.
- HOUSE CONSTRUCTION. THIRD REPORT (see Nos. 1 and 23 25.
- above). 2s. (2s. 2d.)
 DOMESTIC DRAINAGE. The Plumbing Committee of the Building Research Board of the Department of Scientific and Industrial Research.
- 6d. (7d.)
 27. HEATING AND VENTILATION OF SCHOOLS. By the Heating and Ventilation (Reconstruction) Committee of the Building Research Board of the Department of Scientific and Industrial Research. 6d. (7d.)

Prices in brackets include postage.

HIS MAJESTY'S STATIONERY OFFICE