



Technical Bulletin 02/02

World War II Hangars - Guide to Hangar Identification

The contents of this Technical Bulletin are Advisory.

This Bulletin is intended for use by Project Sponsors, Property Managers (PROMs), Establishment Works Consultants (EWCs), Works Services Managers (WSMs), Project Managers, and Consultants engaged in works on Hangar Structures constructed around the World War II period.

This Bulletin supersedes clauses 10 to 13 incl of:
TB 99/31 - Hangars - Guidance on Works During Hangar Refurbishment

ADVISORY

SUBJECT CONTACT POINT:

Wind Sensitive Structures
Specialist Services
Direct Dialling: 0121 311 2174
Sutton Coldfield Mil: (9) 4421 2174

DEFENCE ESTATES
MINISTRY OF DEFENCE

February 2002

World War II Hangars - Guide to Hangar Identification

INTRODUCTION

1. This Technical Bulletin gives guidance for identification of Hangar Structures constructed around the World War II period, and which are still in use today, on the Ministry of Defence (MOD) Estate.
2. The contents of this Technical Bulletin are Advisory and should not be interpreted as instructions to carry out any works.
3. The Hangar Structures under discussion in this Bulletin are steel framed, reinforced concrete, and hybrid structures, built in the pre-war to post-war period up to the mid 1940's.
4. This Bulletin is primarily intended to provide guidance to assist with the identification of the structure types for planned maintenance and refurbishment works.
5. No work involving expenditure on an MOD account is to be entered into without proper authority from the appropriate Budget Holder.

HANGAR IDENTIFICATION

6. In order to assist addressees in identifying the various 'hangar types' currently in use, AutoCAD sketch drawings of each of the most common types have been prepared. Each sketch drawing shows the basic form of construction and particular structure details. The main frame dimensions and principal section sizes of the particular hangar type are also included.
7. Photographs of the common types are also included to show the main features of the Hangar types.
8. The original Air Ministry designs allocated a system of 'structure type' names i.e. Type A, B, C, Bellman, T2, etc. From our archive information, there are known to be approximately 56 structure types. Sufficient detailed information is available to enable production of general arrangement drawings.
9. Each of the establishments has subsequently identified the structures on the establishment with either a **Building Reference**, or a **Hangar Reference**, as required by the Property Management Register, therefore, the majority of the structures may not be known by their structure type names.
10. It is important to identify each hangar type correctly, as some have only minor distinctions between them. Any doubts about identification of the structure type can be clarified with the Subject Contact Point.

HANGAR NOTIFICATION

11. Defence Estates have produced a database for collating information on Hangar Structures and existence of structures on the MOD Estate. The database is used to obtain information and to circulate Health and Safety issues relating to the major structure types. All Property Managers and Project Sponsors are requested to fill in the structure details on the form at Annex A, and forward it to the address given below.
12. The Wind Sensitive Structures section of Defence Estates is the Technical Authority on Hangar Structures. In order to continually update the section's knowledge on hangar refurbishment projects, Property Managers and Project Sponsors are requested to complete the form at Annex A, giving as much detail as possible. Only those works or projects covering major refurbishment such as re-cladding works, strengthening of structure, etc are to be reported. The form should be completed and returned to the following address:

Defence Estates
Specialist Services
Wind Sensitive Structures
Blakemore Drive
Sutton Coldfield
West Midlands
B75 7RL

AVAILABILITY OF INFORMATION

13. Some general arrangement and detail drawings of each hangar type exist in the form of microfiches, and paper prints. These are 'generic' Air Ministry 'structure type' drawings and not site specific 'as-built' drawings. A list of all the microfilmed drawings is also available. It cannot, however, be confirmed whether the drawings listed are 100% complete i.e. representing, **ALL** of the drawings as originally produced.
14. All of the available microfiche cards and paper drawings have been 'scanned' into a (PDF) digital format. The scanned digital images can be viewed on a Personal Computer (PC), and if facilities are available, the images can be printed to a suitable size, or be transmitted electronically.
15. Photographs to aid the identification of the most common Hangar types have been included at Annex B.
16. The Hangar Identification drawings have been produced in AutoCAD (Release 14 format), and printed in A1 and A3 paper formats. The A3 drawings are included at Annex C to this Bulletin. Copies of the A1 drawings can be obtained from DE Information Management.
17. This Bulletin is also available on the Defence Estates Intranet and the Defence Estates external web page, which can be found in the download area at the following address:

www.defence-estates.mod.uk

Note; the AutoCAD drawings have been converted into a (PDF) format, therefore, the drawings on the web pages are read-only files.

18. The DE contact point for details of the drawings, drawing register, availability of the drawings, and access to the digital images is:


Defence Estates
Information Management (Library)
Blakemore Drive
Sutton Coldfield
West Midlands
B75 7RL

Direct Dialling: 0121 311 3648
Sutton Coldfield Mil: (9) 4421 3648

Bulletin Authorised by:

M A GRANT
Technical Authority
Hangar Structures

Annex A

	<p>DEFENCE ESTATES Wind Sensitive Structures Specialist and Procurement Blakemore Drive Sutton Coldfield B75 7RL</p>	<p>NOTIFICATION OF:</p> <p>(a) HANGAR RELATED PROBLEMS or (b) WORKS ON A HANGAR BUILDING or (c) EXISTENCE OF HANGAR FOR INSERTION ONTO DATABASE</p>	
<p>HANGAR TYPE:</p>			
<p>MOD Establishment Name: Address: Tel No:</p>	<p>Location of Hangar (if different from Establishment)</p>	<p>Building Reference</p>	
	<p>Current Use of Hangar</p>	<p>Hangar Reference</p>	
<p>Details of Modifications carried out to original construction: (eg. new roof cladding and purlins, modified hangar doors, etc)</p>			
<p>Description of Hangar Works/Project (or description of problem)</p>			
<p>Programme of Works/Project</p> <p>(include expected dates of main activities eg. option study, design, tender, construction, etc)</p>			
<p>Property Manager Name: Address: Tel No:</p>	<p>Project Sponsor Name: Address: Tel No:</p>	<p>Project Manager Name: Address: Tel No:</p>	
<p>Any Other Comments:</p>			
<p>Form Completed By: Name: Appointment: Date:</p>		<p>Address: Tel No: Fax No: Email Address:</p>	

Annex B

HANGAR IDENTIFICATION - PHOTOGRAPH INDEX

- Photograph 1 – Type A Hangar
- Photograph 2 – Type A1 Hangar
- Photograph 3 – Type B Hangar
- Photograph 4 – Type B1 Hangar (Double)
- Photograph 5 – Type Bellman Hangar
- Photograph 6 – Type Butler Shed
- Photograph 7 – Type C 1934 Hangar
- Photograph 8 – Type C 1938 Hangar
- Photograph 9 – Type Callender – Hamilton Hangar
- Photograph 10 – Type D Hangar
- Photograph 11 – Type E Hangar
- Photograph 12 – Type F Hangar
- Photograph 13 – Type Gaydon Hangar
- Photograph 14 – Type Hinaidi Hangar
- Photograph 15 – Type J Hangar
- Photograph 16 – Type K Hangar
- Photograph 17 – Type L Hangar
- Photograph 18 – Type Luria Hangar
- Photograph 19 – Type Mainhill Hangar
- Photograph 20 – Type Miskins Blister Hangar
- Photograph 21 – Type Pentad Hangar
- Photograph 22 – Type Quedgeley Hangar
- Photograph 23 – Type T2 Hangar
- Photograph 24 – Type B Storage Shed



Photograph 1 - Type 'A' Hangar



Photograph 2 - Type 'A1' Hangar



Photograph 3 - Type 'B' Hangar



Photograph 4 - Type 'B1' Hangar (Double)



Photograph 5 - Type Bellman Hangar



Photograph 6 - Type Butler Shed



Photograph 7 - Type 'C' 1934 Hangar



Photograph 8 - Type 'C' 1938 Hangar



Photograph 9 - Type Callender Hamilton Hangar



Photograph 10 - Type 'D' Hangar



Photograph 11 - Type 'E' Hangar



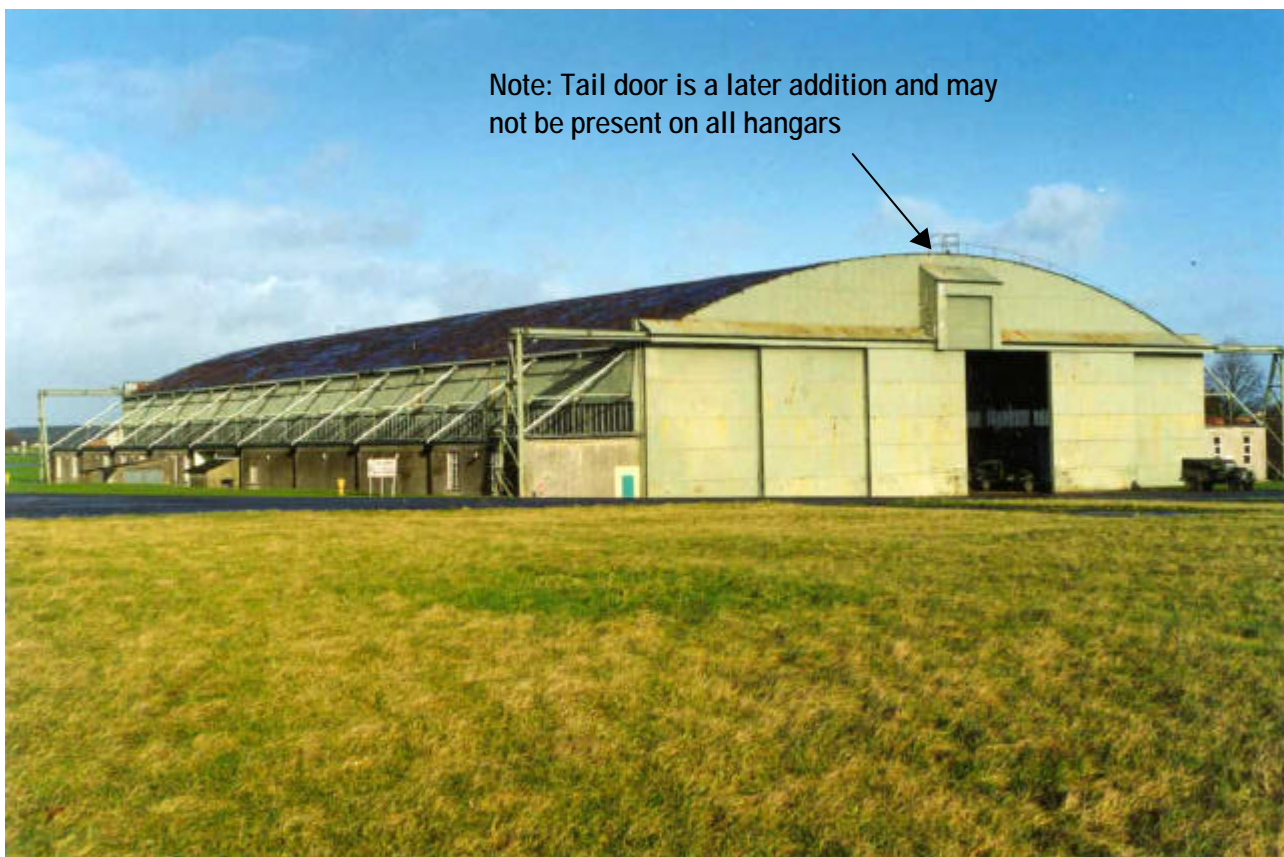
Photograph 12 - Type 'F' Hangar



Photograph 13 - Type Gaydon Hangar



Photograph 14 - Type Hinaidi Hangar



Photograph 15 - Type 'J' Hangar



Photograph 16 - Type 'K' Hangar



Photograph 17 - Type 'L' Hangar



Photograph 18 - Type Luria Hangar



Photograph 19 - Type Mainhill Hangar



Photograph 20 - Type Miskin's Blister Hangar



Photograph 21 - Type Pentad Hangar



Photograph 22 - Type Quedgeley Hangar



Photograph 23 - Type T2 Hangar



Photograph 24 - Type 'B' Storage Shed

Annex C

Hangar Identification - Drawings

Drawing Title/Hangar Type		DE Drawing No.
Type 'A' Hangar	(Sht 1 of 3)	DE/H1/100/010
	(Sht 2 of 3)	DE/H1/100/011
	(Sht 3 of 3)	DE/H1/100/012
Type 'A1' Hangar	(Sht 1 of 2)	DE/H1/100/020
	(Sht 2 of 2)	DE/H1/100/021
Type 'A2' Hangar	(Sht 1 of 2)	DE/H1/100/030
	(Sht 2 of 2)	DE/H1/100/031
Type 'B' Hangar	(Sht 1 of 3)	DE/H1/100/040
	(Sht 2 of 3)	DE/H1/100/041
	(Sht 3 of 3)	DE/H1/100/042
Type 'B' Flying Boat Hangar	(Sht 1 of 3)	DE/H1/100/045
	(Sht 2 of 3)	DE/H1/100/046
	(Sht 3 of 3)	DE/H1/100/047
Type 'B1' Hangar	(Sht 1 of 2)	DE/H1/100/050
	(Sht 2 of 2)	DE/H1/100/051
Type 'B2' Hangar	(Sht 1 of 2)	DE/H1/100/060
	(Sht 2 of 2)	DE/H1/100/061
Type 'Balloon' Bellman Hangar	(Sht 1 of 2)	DE/H1/100/070
	(Sht 2 of 2)	DE/H1/100/071
Type 'Balloon' British Steel Hangar	(Sht 1 of 1)	DE/H1/100/080
Type 'Bellman' Hangar	(Sht 1 of 2)	DE/H1/100/090
	(Sht 2 of 2)	DE/H1/100/091
Type 'Butler' Hangar	(Sht 1 of 2)	DE/H1/100/100
	(Sht 2 of 2)	DE/H1/100/101
Type 'C' 1934 Hangar	(Sht 1 of 2)	DE/H1/100/110
	(Sht 2 of 2)	DE/H1/100/111
Type 'C' 1938 Hangar	(Sht 1 of 2)	DE/H1/100/120
	(Sht 2 of 2)	DE/H1/100/121
Type 'Callender' Hangar	(Sht 1 of 3)	DE/H1/100/130
	(Sht 2 of 3)	DE/H1/100/131
	(Sht 3 of 3)	DE/H1/100/132
Type 'Callender Hamilton' Hangar	(Sht 1 of 3)	DE/H1/100/135
	(Sht 2 of 3)	DE/H1/100/136
	(Sht 3 of 3)	DE/H1/100/137
Type 'D' Hangar	(Sht 1 of 2)	DE/H1/100/140
	(Sht 2 of 2)	DE/H1/100/141
Type 'E' Hangar	(Sht 1 of 1)	DE/H1/100/150
Type 'L' Hangar	(Sht 1 of 1)	DE/H1/100/160
Type 'Lamella' Hangar	(Sht 1 of 2)	DE/H1/100/170
	(Sht 2 of 2)	DE/H1/100/171
Type 'Luria' Hangar	(Sht 1 of 3)	DE/H1/100/180
	(Sht 2 of 3)	DE/H1/100/181
	(Sht 3 of 3)	DE/H1/100/182
Type 'Edd' Hangar	(Sht 1 of 1)	DE/H1/100/190
Type 'F' Hangar	(Sht 1 of 3)	DE/H1/100/200
	(Sht 2 of 3)	DE/H1/100/201
	(Sht 3 of 3)	DE/H1/100/202
Type 'F' Seaplane Hangar	(Sht 1 of 2)	DE/H1/100/205
	(Sht 2 of 2)	DE/H1/100/206
Type 'Fromson' Hangar	(Sht 1 of 1)	DE/H1/100/210
Type 'Fromson Masion' Hangar	(Sht 1 of 1)	DE/H1/100/220

Drawing Title/Hangar Type	DE Drawing No.
Type 'Hinaidi' Hangar (Sht 1 of 2)	DE/H1/100/230
(Sht 2 of 2)	DE/H1/100/231
Type 'Hinaidi' Instructional Shed (Sht 1 of 2)	DE/H1/100/235
(Sht 2 of 2)	DE/H1/100/236
Type 'Iris' Hangar (Sht 1 of 1)	DE/H1/100/240
Type 'J' Hangar (Sht 1 of 3)	DE/H1/100/250
(Sht 2 of 3)	DE/H1/100/251
(Sht 3 of 3)	DE/H1/100/252
Type 'K' Hangar (Sht 1 of 3)	DE/H1/100/260
(Sht 2 of 3)	DE/H1/100/261
(Sht 3 of 3)	DE/H1/100/262
Type 'Mainhill' Hangar (Sht 1 of 3)	DE/H1/100/270
(Sht 2 of 3)	DE/H1/100/271
(Sht 3 of 3)	DE/H1/100/272
Type 'Mainhill B' Hangar (Sht 1 of 3)	DE/H1/100/280
(Sht 2 of 3)	DE/H1/100/281
(Sht 3 of 3)	DE/H1/100/282
Type 'Miskins Blister' Hangar (Sht 1 of 2)	DE/H1/100/290
(Sht 2 of 2)	DE/H1/100/291
Type 'Nissen Hut' Hangar (Sht 1 of 1)	DE/H1/100/300
Type 'Pentad' Hangar (Sht 1 of 2)	DE/H1/100/310
(Sht 2 of 2)	DE/H1/100/311
Type 'Quedgeley' Hangar (Sht 1 of 2)	DE/H1/100/320
(Sht 2 of 2)	DE/H1/100/321
Type 'Robin' Hangar (Sht 1 of 1)	DE/H1/100/330
Type 'Robin' M.A.P. Hangar (Sht 1 of 1)	DE/H1/100/340
Type 'Romney Hut' Hangar (Sht 1 of 1)	DE/H1/100/350
Type 'S' Hangar (Sht 1 of 2)	DE/H1/100/360
(Sht 2 of 2)	DE/H1/100/361
Type 'Super Robin' Hangar (Sht 1 of 2)	DE/H1/100/370
(Sht 2 of 2)	DE/H1/100/371
Type 'Super Robin' M.A.P. Hangar (Sht 1 of 2)	DE/H1/100/375
(Sht 2 of 2)	DE/H1/100/376
Type 'T1' Hangar (Sht 1 of 2)	DE/H1/100/380
(Sht 2 of 2)	DE/H1/100/381
Type 'T2' Hangar (Sht 1 of 3)	DE/H1/100/390
(Sht 2 of 3)	DE/H1/100/391
(Sht 3 of 3)	DE/H1/100/392
Type 'T2 Marine' Hangar (Sht 1 of 2)	DE/H1/100/395
(Sht 2 of 2)	DE/H1/100/396
Type 'T3' Hangar (Sht 1 of 2)	DE/H1/100/400
(Sht 2 of 2)	DE/H1/100/401
Type 'T.F.B.' Hangar (Sht 1 of 3)	DE/H1/100/410
(Sht 2 of 3)	DE/H1/100/411
(Sht 3 of 3)	DE/H1/100/412
Type 'Airship' 1924 Hangar (Sht 1 of 3)	DE/H1/100/420
(Sht 2 of 3)	DE/H1/100/421
(Sht 3 of 3)	DE/H1/100/422
Type 'Airship' 1928 Pulman No 2 (Sht 1 of 2)	DE/H1/100/425
(Sht 2 of 2)	DE/H1/100/426
Type 'Gaydon' Hangar (Sht 1 of 3)	DE/H1/100/430
(Sht 2 of 3)	DE/H1/100/431
(Sht 3 of 3)	DE/H1/100/432
Type 'G' Hangar (Sht 1 of 2)	DE/H1/100/440
(Sht 2 of 2)	DE/H1/100/441
Storage Shed Type 'A' (Sht 1 of 2)	DE/H1/100/450
(Sht 2 of 2)	DE/H1/100/451
Storage Shed Type 'B' (Sht 1 of 2)	DE/H1/100/460
(Sht 2 of 2)	DE/H1/100/461
Type 'Alframa' Hangar (Sht 1 of 1)	DE/H1/100/470
Type 'Cantilever' Bally Kelly Hangar (Sht 1 of 1)	DE/H1/100/480
Type 'Cantilever' Brize Norton Hangar (Sht 1 of 1)	DE/H1/100/490