HENEB
Trust for Welsh Archaeology

Bro Tathan (former RAF St Athan, East Camp)
Vale of Glamorgan
Part A

Historic Building Recording

Archaeoleg Morgannwg-Gwent
Heneb
Glamorgan-Gwent Archaeology

2024/033

REGISTERED ORGANISATION CIfA

Heneb
Trust for Welsh Archaeology

Bro Tathan East (former RAF St Athan, East Camp), Vale of Glamorgan

Historic Building Recording.

Project Details:	
Planning Number	2023/00949/Ful
Project Number	LD24-049
Client	Welsh Government
Date	11/03/2025
Author	Tuck M (MCIfA)
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The report is presented in two parts, Part A the descriptive text and Figures,

and Part B, the photographic catalogue.

This document is Part A

DOCUMENT CONTROL

Region	Author	Illustrations	Review	Date
Heneb: GGA	MT	MT and SLJ	MT	11/03/2025

Front Cover: Workshop Building 361 South elevation

Contents

FIGURES

TABLES

PLATES (PART A)

SUMMARY

Heneb: Glamorgan-Gwent Archaeology was commissioned by Welsh Government to carry out a series of building surveys within the former East Camp of RAF St Athan (Bro Tathan) prior to proposed demolition and redevelopment. The surveys were carried out intermittently from April 2024 to February 2025 to fulfil Condition No. 4 of Planning Consent 2023/00949/FUL.

In addition to the buildings surveyed Condition 4 required survey of several barrack blocks (Bldgs. 438-442). These buildings however have not yet been released from the MOD and will be surveyed when appropriate. This report therefore may be considered as an interim report pending survey of all conditioned buildings.

St Athan, built during the Expansion Period (1934-1939, with permanent brick buildings to a standard design) to face of threat of war with Germany, was one of the most important RAF wartime maintenance bases which functioned as a School of Technical Training and an Aircraft Storage Unit. It became the home of No. 4 School of Technical Training in September 1938. The Station was divided into two camps with No. 4 School based in East Camp as was No. 19 Maintenance Unit (MU), which formed in March 1939 as a civilian Aircraft Storage, whilst No. 32 MU formed in July 1939 as a Service Repair Depot with an Aircraft Repair Section, a Motor Transport Repair Section and General Engineering Section was based in West Camp.

The Station provided vital services during the wartime years and after the end of the Second World War, St. Athan remained an engineering training centre for the RAF, and between 1947 and 1973 also provided an Administrative Apprentice Training School. Forces reorganisation later saw the Station becoming the Head Office of the Defence Aviation Repair Agency (DARA) and later again the Defence Support Group which was responsible for the maintenance and repair of RAF, Royal Navy and Army aircraft. The final RAF farewell parade took place in August 2023.

Seven buildings were surveyed (between Levels 2 and 4, Historic England 2016) of which four (Bldgs. 354 (recreational facilities and faith centre), 361 (workshop), 371 (Bellman hangar) and 377 (workshop)) were of late 1930s vintage, with the other three dating from the latter part of the 20th century (Bldgs. 355 (WCs), 348 (garage workshop) and 375 (crew room)).

The main findings were that the original basic fabric, brick with aircraft sized hangar openings and several large windows along the elevations and extensive steelwork framing supporting the hipped roofs, was common to all the large 1930s structures. Thereafter, for the workshops several internal adaptations took place during the war and after, in keeping with changing technological advancements in aircraft design, transport maintence and servicing, modern engineering practices and general building maintenance as befitting buildings over 80 years old.

Internally the workshops had been cleared of all portable equipment. Several rooms, open areas and general larger fixed workshop fittings such as overhead cranes and stanchions, and occasional permanent vehicle maintence fixtures indicated the training, teaching and circulation areas however, the actual teaching function of a particular classroom or purpose of some open areas was not determined and reliance for function therefore was placed on annotated site fire plans.

Fewer structural changes were made to Bldg. 354 which housed a swimming pool, cinema (theatre), two gymnasiums, fitness suite and faith centre. The function of these spaces was clear. The three later 20th century structures (Bldgs. 355, 348 and 375) were unchanged and as built.

Records as appropriate to Condition 4, except for the pending barrack buildings, were made of the Conditioned structures, and which form the subject of this report.

The survey and report were carried out by Heneb (GGA Field Services) to the requirements of Historic England's Understanding Historic Buildings: A guide to good recording practice (2016) and to the Chartered Institute for Archaeologists' Standard and guidance for the archaeological investigation of standing buildings or structures (2014, updated 2020).

CRYNODEB

Comisiynwyd Heneb: Archaeoleg Morgannwg-Gwent gan Lywodraeth Cymru i gynnal cyfres o arolygon o adeiladau yn hen Wersyll Dwyreiniol yr RAF yn Sain Tathan (Bro Tathan) cyn y gwaith arfaethedig o ddymchwel ac ailddatblygu. Cynhaliwyd yr arolygon yn ysbeidiol rhwng mis Ebrill 2024 a mis Chwefror 2025 i gyflawni Amod Rhif 4 o Ganiatâd Cynllunio 2023/00949.

Yn ogystal â'r adeiladau a arolygwyd roedd Amod 4 yn gofyn am arolwg o sawl rhes o farics (Adeiladau 438-442). Fodd bynnag, nid yw'r adeiladau hyn wedi'u rhyddhau gan y Weinyddiaeth Amddiffyn eto a bydd arolygon yn cael eu cynnal pan fo hynny'n briodol. Gellir ystyried yr adroddiad hwn felly yn adroddiad interim wrth i ni aros am arolwg o'r holl adeiladau cyflyrol.

Roedd Sain Tathan, a adeiladwyd yn ystod Cyfnod yr Ehangu (1934-1939, trwy godi adeiladau parhaol o frics a defnyddio dyluniad safonol) yn wyneb y bygythiad o ryfel yn erbyn yr Almaen, yn un o ganolfannau cynnal a chadw pwysicaf yr RAF adeg rhyfel a oedd yn Ysgol Hyfforddiant Technegol ac yn Uned Storio Awyrennau. Daeth yn gartref i Ysgol Hyfforddiant Technegol Rhif 4 ym mis Medi 1938. Rhannwyd yr Orsaf yn ddau wersyll. Roedd Ysgol Rhif 4 yn y Gwersyll Dwyreiniol ynghyd ag Uned Cynnal a Chadw (MU) Rhif 19, a ffurfiwyd ym mis Mawrth 1939 i fod yn storfa ar gyfer awyrennau sifilaidd. Roedd MU Rhif 32, a ffurfiwyd ym mis Gorffennaf 1939 i fod yn Ddepo Gwasanaeth Atgyweirio ac iddo Adran Atgyweirio Awyrennau, Adran Atgyweirio Trafnidiaeth Fodur, ac Adran Peirianneg Cyffredinol, wedi'i lleoli yn y Gwersyll Gorllewinol.

Roedd yr Orsaf yn darparu gwasanaethau hanfodol yn ystod blynyddoedd y rhyfel, ac ar ôl i'r Ail Ryfel Byd ddod i ben, parhaodd Sain Tathan yn ganolfan hyfforddi peirianneg i'r RAF, a rhwng 1947 a 1973 darparodd hefyd Ysgol Hyfforddi Prentisiaid Gweinyddol. Yn sgil ad-drefnu'r lluoedd arfog, daeth yr Orsaf yn ddiweddarach yn Brif Swyddfa'r Asiantaeth Atgyweirio Awyrennau Amddiffyn (DARA) ac yn ddiweddarach eto y Defence Support Group a oedd yn gyfrifol am gynnal a chadw ac atgyweirio awyrennau'r Llu Awyr, y Llynges Frenhinol a'r Fyddin. Cynhaliwyd parêd olaf yr RAF wrth iddynt ffarwelio ym mis Awst 2023.

Cynhaliwyd arolygon o saith adeilad (rhwng Lefelau 2 a 4, Historic England 2016), ac roedd pedwar ohonynt (Adeiladau 354 (cyfleusterau hamdden a chanolfan ffydd), 361 (gweithdy), 371 (hangar Bellman), a 377 (gweithdy)) yn dyddio o ddiwedd y 1930au, ac roedd y tri arall yn dyddio o ddiwedd yr 20fed ganrif (Adeiladau 355 (toiledau), 348 (gweithdy garej) a 375 (ystafell i'r criwiau)).

Y prif ganfyddiadau oedd bod yr adeiladwaith sylfaenol gwreiddiol, sef bric ag agoriadau mawr o faint awyren ym mhob hangar, a nifer o ffenestri mawr ar hyd y gweddau, a fframiau dur helaeth yn cynnal y talcendoeon, yn gyffredin i holl adeileddau mawr y 1930au. Wedi hynny, gwnaed nifer o addasiadau mewnol i'r gweithdai yn ystod y rhyfel ac ar ôl hynny, yn unol â datblygiadau technolegol newidiol o ran dylunio awyrennau, cynnal a chadw a gwasanaethu cludiant, arferion peirianneg fodern, a'r gwaith cyffredinol o gynnal a chadw adeiladau a oedd yn addas i adeiladau dros 80 oed.

Y tu mewn i'r gweithdai, roedd yr holl eitemau o gyfarpar cludadwy wedi'u symud oddi yno. Roedd nifer o ystafelloedd, mannau agored, a gosodiadau sefydlog cyffredinol mwy mewn gweithdai, megis craeniau a stansiynau uwchben, ac ambell osodiad parhaol yn ymwneud â chynnal a chadw cerbydau, yn dynodi'r ardaloedd hyfforddi, addysgu, a chylchrediad pobl; fodd bynnag, nid oedd modd pennu swyddogaeth addysgu gwirioneddol ystafell ddosbarth benodol na diben rhai o'r mannau agored, ac felly bu'n rhaid dibynnu ar gynlluniau tân anodedig y safle i bennu eu swyddogaeth.

Gwnaed llai o newidiadau adeileddol i Adeilad 354 a oedd yn lleoliad ar gyfer pwll nofio, sinema (theatr), dwy gampfa, ystafell ffitrwydd a chanolfan ffydd. Roedd swyddogaeth y mannau hyn yn glir. Nid yw'r tri adeiledd hwyrach o ddiwedd yr 20fed ganrif (Adeiladau 355, 348 a 375) wedi eu newid ers iddynt gael eu hadeiladu.

Gwnaed cofnodion fel sy'n briodol i Amod 4 o'r adeileddau Cyflyrol, ac eithrio adeiladau'r barics sydd yn yr arfaeth, a dyna sy'n ffurfio testun yr adroddiad hwn.

Cynhaliwyd yr arolwg a'r adroddiad gan Heneb (Gwasanaethau Maes Archaeoleg Morgannwg-Gwent, a hynny i ofynion Historic England yn Understanding Historic Buildings: A Guide to Good Recording Practice (2016) a Standard and guidance for the archaeological investigation and recording of standing buildings or structures (2014, diweddarwyd 2020), sef cyhoeddiad Sefydliad Siartredig yr Archaeolegwyr.

AUTHORSHIP AND ACKNOWLEDGEMENTS

The project was managed by Martin Tuck MCIfA (Head of GGA Archaeological Services). The fieldwork was carried out by Martin Tuck and Jon Burton MA, BA (hons) (PCIfA). Site photographs by Jon Burton. The original field survey, survey drawings and report were undertaken by Martin Tuck with Sophie Lewis-Jones BA ACIfA (Project Officer) assisting with report illustrations.

The author is grateful to Tetra Tech and Burroughs (Robert Stokes, Richard Clement and Rhys Meredith) acting as agents for Welsh Government (the client) with on-site and background assistance and especially to William (Bill) Everatt MBCS, RITTech from DARA who gave up valuable time to share an insightful account of the current Station and its buildings.

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ABBREVIATIONS

APM:	Archaeological Planning Management
HER:	Historic Environment Record (curated by The Trust for Welsh Archaeology (Heneb))
LB:	Listed Buildings Grade I, II and II* (Cadw)
LPA:	Local Planning Authority
NGR:	National Grid Reference
NMR	National Monuments Record (curated by the RCAHMW)
NPRN:	National Primary Record Number (in NMR)
PRN:	Primary Record Number (in HER)
RCAHMW:	Royal Commission on the Ancient and Historical Monuments of Wales
SM:	Scheduled Monument (Cadw)
SMC:	Scheduled Monument Consent
TWA:	Trust for Welsh Archaeology (Heneb)
WSI:	Written Scheme of Investigation

1| Introduction

Works Proposal and Planning Background

Planning permission with conditions has been granted within the former RAF St Athan East camp, known now as Bro Tathan, under Pl. App. 2023/00949/FUL for 'Demolition of buildings including the removal of hazardous materials, foundations and associated utility disconnections, reprofiling of land and erection of bat house mitigation and associated landscaping. Land to the East of Aston Martin Lagonda and West of Cowbridge Road, Bro Tathan, St. Athan'.

Two of the attached Conditions, numbers 3 and 4, are related to the Historic Environment; Condition 3 required a Written Scheme of Historic Environment Mitigation (WSHEM) for demolition work and Condition 4, a Written Scheme of Investigation (WSI) for historic building recording.

Condition 3 stated.

No development shall take place until the applicant, or their agents or successors in title, has secured agreement for a written scheme of historic environment mitigation which has been submitted by the applicant and approved by the Local Planning Authority. Thereafter, the programme of work will be fully carried out in accordance with the requirements and standards of the written scheme.

Reason:

In order that archaeological operations are undertaken to an acceptable standard and that legitimate archaeological interest in the site is satisfied and to ensure compliance with Policies SP1 (Delivering the Strategy), SP10 (Built and Natural Environment) and MD8 (Historic Environment) of the Local Development Plan.

Condition 4 stated.

No demolition works shall be undertaken to the buildings numbered 354, 309, 348, 354b, 377, 361, 375, 361a, 361b, 371, 438, 439, 440, 441, and 442 as identified on plan no. 784-B027635 6 (Figure 6 in Appendix E of the Archaeological and Heritage DBA) until an appropriate programme of historic building recording and analysis for the building(s) in question has been secured and implemented in accordance with a written scheme of investigation which has been submitted to and approved in writing by the Local Planning Authority. The final report on such recording shall be deposited with the Local Planning Authority prior to first beneficial use of the development hereby approved.

Reason:

As the building is of significance the specified records are necessary in order that records are kept of any features of archaeological and/or cultural interest and the report forwarded to the Historic Environment Record, operated by Heneb, and to ensure compliance with Policies SP1(Delivering the Strategy), SP10 (Built and Natural Environment) and MD8 (Historic Environment) of the Local Development Plan.

Prior to the Decision, correspondence between the Vale of Glamorgan (VOG) Council archaeological advisors GGAT APM (Dunning 2023, now Heneb) in respect of the application recommended building surveys as set out in Understanding Historic Buildings: A Guide to Good Recording Practice (Historic England 2016), and to include a scale and a directional plan for the photographs, and the scope of the survey to be set out in a Written Scheme of Investigation.

In addition to the archaeological advisor's letter, correspondence (Email Ref 2023/00094/Ful. 2 January 2024) between VOG Council and Cadw regarding demolition stated.

'RAF St Athan was one of the RAFs most important wartime maintenance bases in the UK and functioned as an Aircraft Storage Unit and School of Technical Training. It was built during the Expansion Scheme period in anticipation of a future conflict with Nazi Germany and the designs and materials are better quality than those temporary buildings subsequently built from utility materials to austerity designs during the Second World War. The function of the airfield dictated the design types and numbers of buildings constructed on it. There has been significant erosion of the inter-war and wartime period RAF building resource in Wales since the Second World War.

'It would be premature to approve the demolition of these inter-war buildings until sufficient research has been undertaken to determine whether the buildings proposed for demolition are rare, unique, or special in a Welsh context. ……. This study should be undertaken by a specialist airfield archaeologist and compare the surviving examples within the proposed development area with the original provision and existing survival of these building types at similar airfields in Wales. The results should be presented to Cadw for assessment before the determination of the application as the buildings may meet the criteria for statutory designation as listed buildings.'

Paul Francis (ACIfA) and Graham Crisp of the Airfield Research Group were commissioned to undertake the specialist report (Workshop Buildings and Barrack Blocks on East Camp at the former RAF St Athan, 2024) requested by Cadw. The assessment considered Architectural, Historical, Close Historical Association, Group Value, Aesthetic Merits, Age and Rarity and Aircraft Safety.

The conclusions and recommendations were.

Workshops (354, 361 & 377)

RAF St Athan was planned as one of a small number of pre-war, RAF establishments built as a shared airfield with maintenance units and a school of technical training. It also functioned as an aircraft storage unit as well as an aircraft repair depot.

Buildings 354, 361 and 377 are of high significance because of rarity: with no similar examples surviving in Wales. However, finding the original drawings would clarify whether they conform to their original architectural type design – the loss of the up-and-over workshop doors for example (see Plate 73)

Comparable buildings are extant at other RAF sites in England, notably four similar structures in scale to Building 354 are at RAF Cosford. Although there are no comparable structures in Wales or England of 361 and 377 because of their greater roof height and half-length. However, structurally they are like the four extant structures at Cosford and the one at Halton.

The condition of 354 is not good, with significant structural issues evident, including cracking recorded by Burroughs.

Bellman (371)

Building 371 is the only one left out of twenty Bellman Aeroplane Sheds (hangars) erected at St Athan between 1938 and 1940; however, it has lost its door and door outriggers, reducing its significance. Examples survive on three other sites in Wales (Aberporth, Fairwood Common and Llanbedr) and there are several in England (Brooklands Museum, RAF Cosford, Exeter Airport and RNAS Yeovilton – to name just four sites).

Barrack Blocks (437 to 442)

The six barrack blocks by type are unique in Wales (1960s era 'T'-shaped planform erected on RAF technical training schools). But seventeen are still present on a small number of former RAF technical training stations in England.

Recommendation

This report has been compiled without access to original drawings but to have a better-informed understanding of the workshops (361 and 377) and the barracks (437 to 442) from an architectural and structural aspect, it is important to locate them (drawings 6331/37 and 6335/37 refer to the workshops). Architectural drawings of the Bellman hangar (371) can be found at the RAF Museum, Hendon. The workshop and barrack drawings (numbers are unknown) will be in the form of sets of 1/8, 1/4 and 1/2-inch scale linen or paper drawings (or copied onto 35mm aperture card) with typical details covering the following:

- *Architects and or structural engineers*
- *Date of design*
- *Plans, general arrangement, structural, detail, and deviation drawings (such as conversion from workshop to gymnasium), foundation drawings.*

The full report can be found in the VOG planning portal under reference 2023/00949/Ful.

A review of the report by Cadw determined that the buildings despite their strong historical associations, were deemed to have lost much of their early detailing and materials, and accumulated too many recent alterations, to remain of national interest, and the recommendation was therefore not to List (Thomas 2024).

Following on from the Airfield Research Group survey and the Cadw decision not to List the buildings, Tetra Tech also acting as consultants for Welsh Government confirmed the number of buildings subject to different levels of survey (354, 309, 348, 354b, 377, 361, 375, 361a, 361b, 371, 438, 439, 440, 441, and 442) and as listed in Condition 4 of the planning consent and as per the table following.

Building Number and grid ref (centre).	**Asset Name**	**Function/ Name**	**Year built**	**Recording Level**
354 **NGR ST 01053 68897 centre** Cinema ST 01054 68952 Wood gym ST 01074 68901 Stone gym ST 01039 68889 Church ST 01062 68838 Fitness Suite ST 01100 68848	Gymnasium (Wood Gym, Stone Gym, Fitness Suite, Church, Cinema)	Sports and Recreational Facilities/ Places of Worship	1938	Level 4

Building Number and grid ref (centre).	Asset Name	Function/ Name	Year built	Recording Level
309 (355 on ground) NGR ST 00998 68803	MTT 4STT Toilet Block	Welfare/ Community Facilities/ Ablutions	1995	Level 1-2
348 NGR ST 00820 68678	Ambulance Storage	Workshops	1980s	Level 1-2
354b NGR ST 01017 68934	Swimming Pool	Sports and Recreational Facilities/ Swimming Pool	1938	Level 3
377 NGR ST 010061 68633	Mechanical Engineering Training Workshop/ EETF	Classroom/ Training Facilities	1938	Level 4
361a NGR ST 00979 68730	Workshops Training Flight	Workshops	1938	Level 3
361b NGR ST 01014 68734	EETF Workshop ST	Workshops	1938	Level 3
371 NGR ST 00809 68605	Support Engineering Services	Hangars/ Fixed Wing Aircraft Storage	1938	Level 4
375 Crew room ST 01003 68682	Workshops/ Crew Room/ Locker Room EETF		1980s	Level 4
438 NGR ST 01395 68895	Victor Barrack Block	Junior Ranks Accommodation	1960	Level 3 (Only the one barracks that is in the best condition)
439 NGR ST 01421 68829	Vampire Barrack Block	Accommodation	1960	Level 3
440 NGR ST 01248 68841	Mosquito Barrack Block	Junior Ranks Accommodation	1960	Level 3
441 NGR ST 01279 68769	Spitfire Barrack Block	Junior Ranks Accommodation	1960	Level 3

Building Number and grid ref (centre).	Asset Name	Function/ Name	Year built	Recording Level
442 **NGR ST 01357 68780**	Auster Barrack Block	Junior Ranks Accommodation	1960	Level 3

Table 1. Table of Building numbers, date and function, grid refences and Recording level

Heneb - The Trust for Welsh Archaeology – Glamorgan Gwent Archaeology was commissioned by Welsh Government through their agents Burroughs and Tetra Tech to prepare the written schemes (Condition 3, Written Scheme of Historic Environment Mitigation for demolition work and Condition 4, Written Scheme of Investigation for historic building recording. Tuck 2024), which set out the framework for recording works to be undertaken, and to undertake the building survey.

Condition 4 works will be undertaken to the guidelines set out in English Heritage's Understanding Historic Buildings, A guide to good recording practice (2016) to Levels 2, 3 and 4 guidelines as appropriate, and to the Chartered Institute for Archaeologists' Standard and guidance for the archaeological investigation and recording of standing buildings or structures (2014, updated October 2020) and Condition 3, to the professional standards laid down by the Chartered Institute for Archaeologists' Universal guidance for archaeological monitoring and recording (2023), and in accord with Welsh Government planning policies (Historic Environment (Wales) Act 2023, Planning Policy Wales, Edition 12, Chapter 6, (2024,) Planning Policy Wales, Technical Advice Note 24: The Historic Environment (2017).

This subject of this report is related to Condition 4, the building survey only.

Site Description

The site within a broadly rural setting area in the Vale of Glamorgan is located to the north-northwest of the village of St Athan which is separated from the base by a runway. Cowbridge Road and the main entrance bound the east side of the Camp whilst outside of the camp to the north is residential housing and to the west, off Eglwys Road, the Aston Martin car production site. The buildings subject to survey lie within East Camp, a part of the wider and former RAF base of West and East Camps and are located on flat ground and spread over an area of approximately 700m centred on NGR ST 011 688. The area is flat at approximately 45m OD (Figure 1).

From 1938 on the RAF base once dominated the area, and it is still the dominant influence on the local landscape with the airfield operational and many of the former large scale RAF hangars and buildings in use by private business.

Geology

The solid geology of the Site is Porthkerry Member - Limestone and mudstone, interbedded. Sedimentary bedrock formed between 201.3 and 190.8 million years ago during the Jurassic period. No superficial deposits are recorded (BGS Geology of Britain Viewer 02/03/25).

HER

A search centred on ST 00976 68747, the East Camp of the Station, conducted by the HER (enquiry reference 9086. 13/11/2024) returned 111 Core results, 84 Events and 527 NMW results within the area. Given the context of the military buildings and that this report reflects building surveys, the

greater number of Core records are not considered relevant. However, several records are indirectly related to the report and the RAF Station in general (which encompasses sites in Picketston and Flemingston) because of their military purposes and include shelters, taxiway, hangar, St Athan airfield battle HQ and pillboxes (GGAT02373s, GGAT03863s, GGAT03864s, GGAT04481s, GGAT05774s, GGAT06399s to GGAT06437s and GGAT08259s).

Similar criteria could be applied to the Events record which details desk-based assessments, geophysical survey and intrusive investigations but most again are indirectly associated with the current buildings. One record (GGATE008463) details recording of hangar Building 406 at Beggars Pound.

NMW data reflects almost exclusively prehistoric and Roman remains in the area.

National Archives

Visits to the National Archives (Booking refs, RR181-617-06144J and RR187-559-06210F) although providing detailed daily orders including administration and recreational activities for the MU units and No. 4 S of TT did not elaborate on any tangible structural changes that could be pinpointed to the buildings surveyed but it was clear that various structural changes were constantly being made to the camps overall as personnel, trainees and civilian workers increased (including arrangements specifically for women) and as maintenance demand and equipment changed. That said the exterior fabric of the brick buildings did not undergo significant change apart from later infilling of hangar sized openings and thus they would have looked very much the same as surveyed except for the Bellman hangar (Bldg. 371) which was reclad albeit with corrugated sheeting and probably also fitted with window lights. A 1940 copy of the Bellman Transportable Hangar Description and Erection Notes proved invaluable in reference to the structure on site and confirmation that its steel framework was built to a 'standard design' (Work 44/37 and Work 44/38).

Further records pertaining to RAF cinemas, swimming pools and the water supply to the Station and School of Physical Training similarly did not result in direct evidence to assist with changes noted in the surveyed buildings.

Where St Athan is named, references included a 1944 review of installed cinema equipment within RAF Stations with over 1000 on Establishment and equipped with 35mm apparatus (Air 20/11661) and a 1950 document concerning safety, not just with lighting and exits but with RAF cinema floor coverings and ramps and the associated fire risk between boards on a wooden floor that records St Athan 2 as having a Hard Wood floor and Wood ramp (that must surely refer to the common practice of being able to smoke in cinemas and the danger therein). Linoleum was suggested as a solution and that covering would accord with the present flooring in the reduced sized auditorium (Air 2/ 13161) although that may not have been the original lino surface. To do so would have necessitated removal and replacement of the seating. The unresolved element is the reference to St Athan 2 (Technical Training Command) as there is no mention of another St Athan. Both East and West Camps had cinemas/theatres (Astra and Athenaeum respectively (Air 29/1492)), and it is not known to which this refers.

Another named reference of the 1960s (Air 2/16634) included provision and change to diving boards in the pool (see refence under Bldg. 354), and there is much correspondence ongoing from the outset and continuing over many years concerning excessive water usage, with explanations of where the water is consumed (workshops manufacturing and personnel usage) and the estimated gallons required (AIR 2/14740).

Documents referencing the Empire Games included the provision of huts and sports facilities for the games (AIR 2/13294) and subsequent claims for damages and reuse of equipment (AIR 2/15050).

The documents consulted are listed in Table 3.

Central Register of Aerial photography Wales (CRAPW)

Aerial photographs received from CRAPW starting with a January 1941 Luftwaffe photograph (where it appears that the workshop roofs were camouflaged) through to 2001 show that unsurprisingly in respect of the buildings surveyed none have changed significantly but that development has taken place around them.

What the photographs provide are date brackets for the more recent structural additions and proof that the Bellman hangar (Bldg. 371) had had its roof changed, the crew room and corridor (Bldg. 375) were built between 1981 and 1991 and similarly that Bldg. 348 was built prior to 1991 where it stands adjacent to the engine testing building (Francis 2024). Building 309 (actual 355 number on the building) was present prior to 1991. One of the key findings is that the large exterior fan houses of which the large box and circular ducting is interwoven amongst the workshop steelwork were built post 1945 and before 1962.

A shot taken in 1962, during an airshow, shows what appears to be the original hangar openings before infilling, as black in stark contrast to the roof and walls in grey, and a thinner grey streak near the top is probably the top of an open horizontal hangar door of up and over style as indicated by a 1940s photograph in Francis (2024). That clearly places the infilling occurring after 1962 (Plate EEE).

Extracts from of photographs are reproduced in Chapter 6 as is the Table (Table 2) of photographs viewed.

Royal Air Force Museum (Hendon) Archive Collection, the Airfield Research Group and Cadw draft listing report

Emails to the Museum and to the Airfield research group in reference to the original known building drawings in respect of buildings 354 (ref 6331/37), 361 and 377 (6335/37) and for additional information to that published in the 2024 Francis report, drew a blank. If they exist, then their location at present is unknown. A Cadw (Thomas 2024) report to determine whether to List or not provided background source information to complement the Airfield Research Group report. Elements of this report draw on those sources.

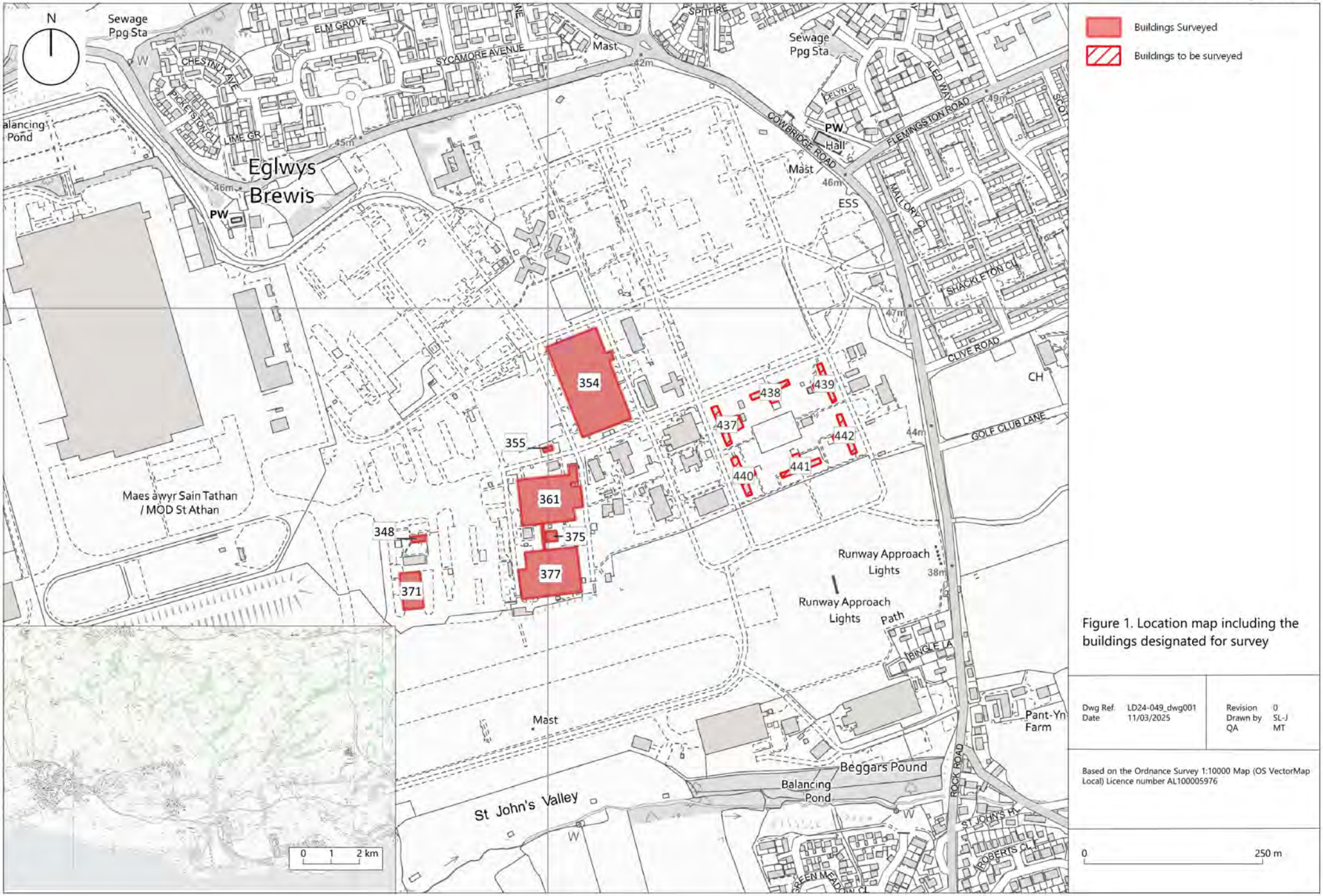


Figure 1. Location map including the buildings designated for survey

Dwg Ref	LD24-049_dwg001	Revision	0
Date	11/03/2025	Drawn by	SL-J
		QA	MT

Proposed Works

Previous works to the Bro Tathan site have seen several phases of demolition. This application would mark the final phase of demolition to prepare the site for future redevelopment. To clear the site, buildings, infrastructure, foundations and areas of hardstanding are to be removed (Rio Architects 2023). The proposed demolition area includes additional buildings to those subject to historic survey.

Figure 2. Plan indicating buildings for demolition and groundworks (Red - buildings to be demolished. Grey - previously demolished. Pink - area of fill and regrading).

The barrack blocks (437-442) conditioned for survey are presently occupied and survey work as conditioned (No. 4) will be undertaken when vacated. In effect this report is an interim report until the survey of the barrack buildings is completed.

2| Methodology

The methodology for the building recording followed that set out by the English Heritage's Understanding Historic Buildings, A guide to good recording practice (2016) to Levels 2. 3 and 4 specifications as appropriate, and CIfA's Standard and guidance for the archaeological investigation and recording of standing buildings or structures (2014, updated October 2020) and the WSI.

Martin Tuck MCIfA (Head of Archaeological Services GGA Region) and Jon Burton MA, BA (hons) (PCIfA). (Project Archaeologist) of Heneb - The Trust for Welsh Archaeology (Glamorgan Gwent Archaeology) carried out the building survey on an intermittent basis between April and July 2024 and again in February 2025 when the Recording Level was raised to Level 4 for buildings 361, 371 and 377.

The report is in two parts Part A, the descriptive text starting with the earlier buildings 354, 361, 377 and 371 followed by the three later 348, 375 and 355 (309), and Part B, the photographic catalogue. Plates in Part A are listed alphabetically to differentiate from the catalogue, as are the Figures with photograph directions also labelled alphabetically. The reports should be read in conjunction with each other.

The buildings which had been vacated by the RAF just prior to the survey generally appeared to be in good order as would be expected with fixed structural fittings in place but portable equipment removed. Visual indication of structural movement and probable water damage was evident in places with crack in walls, exposed steel reinforcing in concrete lintels and peeling paintwork. Earlier repairs to brickwork were evident notably on the corners of the wartime buildings. Access was largely unhindered apart from isolated locked doors to some smaller rooms.

Limitations included foliage and tree branches planted close to the external elevations, possibly intentionally planted as a means of camouflage masking some of the elevation detail, security fencing preventing the ability to capture wider photographs, as did modern buildings occasionally prevent an overall elevation view. Internally overhead detail and particularly in building 354 was hidden by suspended ceilings. An assumption that similar structural steelwork continued above the suspended ceilings was made from the elements that were visible.

Phasing of internal detail was problematic in as much that all internal features abutted the first phase walls with nothing apparently keyed in and in very many instances the build-up of paint layers was sufficiently thick to hide the bonding and hide the joint between abutting walls.

This report refers to buildings 354, 309 (355 on ground), 348, 354b, 377, 361, 375, 361a, 361b and 371 only. Unforeseen events had required the remaining buildings, barrack blocks 438, 439, 440, 441 and 442 to be scheduled for survey later in 2025 as they are currently occupied and the full condition (No. 4) unable yet to be completed.

Recording was by a combination of written notes, annotated plans, sketches and digital photography (Canon Eos 2000D (24.1 megapixels)). The photographic survey included digital images of elevations and detailed images of significant architectural features. Measurements were undertaken with traditional tapes, staff, and Leica Disto A2 laser measurement. Scales in photographs are in 0.5m divisions unless otherwise stated. Survey drawings (1/200 scale accuracy) were plotted with AutoCad LT and adapted into report Figures in Coreldraw.

Datum for all elevation drawings is DPC level. Internal doors not shown unless significant. Electrical trunking and switches not recorded in detail unless significant. All rooms served by electricity. Room designations and circulation areas refer to detail surviving on doors and from on-site fire plans (dated

2010). The most recent usage may not correspond to those designations, nor necessarily do they reflect their original purpose: Where two names are given in the text and figures, the fire plan designation is in brackets.

Measurements were recorded in metric units during the survey although Imperial units were the standard measures used in the earlier buildings. In the report occasional rounded equivalents are given in feet for larger overall areas and other metric measurements rounded to one decimal place.

3| General Historic Background

The primary role of RAF St Athan was for technical training and vehicle maintenance and repairs, with East camp providing training and West camp vehicle storage. The No.4 School of Technical Training at St Athan was one of only four such schools established before the outbreak of war with large permanent workshop buildings, the others being RAF Cosford, RAF Halton and RAF Locking.

The origins of St. Athan began in 1936 as part of the interwar expansion period (1934 onwards, when the RAF was mandated to increase its number of airfields because of the political instability of the 1930s, eventually leading to war in 1939) with consideration of the land required for constructing a new permanent RAF station (Plate A) to include a School of Technical Training (S of TT), Aircraft Repair Depot (ARD) and Aircraft Storage Unit (ASU); consideration of the Establishment then included temporary and permanent quarters and recreation facilities for an estimated minimum of 4,475 service personnel (Air2/2429). In their initial conception the ASU units were to be civilian manned and thus only in exceptional cases were domestic buildings provided apart from those for RAF officers and in canteens (Stationery Office 1997, p60). The ARD and ASU facilities would materialise as No. 19 and No. 32 Maintenance Units.

Plate A. Air Ministry preliminary Station layout DWG 1232/37 dated 16th Feb 1937 (National archives Air2 / 2429)

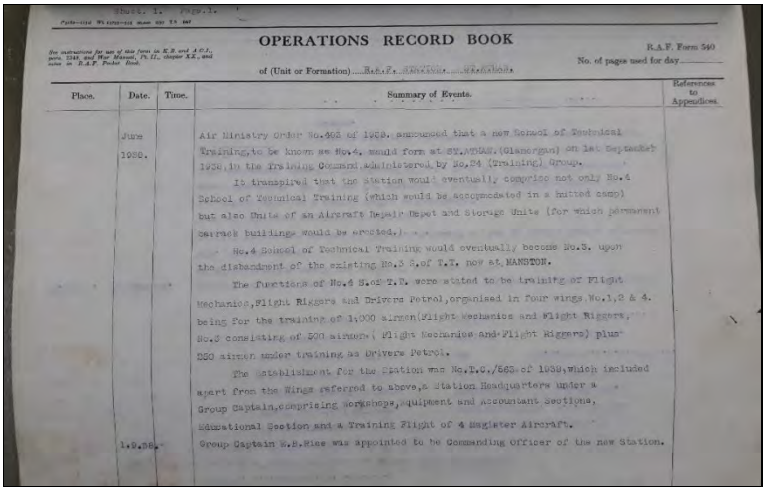
A contract for construction was given to the Demolition & Construction Co. in the autumn of 1937 (Jones 2007). Unsurprisingly given the vast scale of the construction, local labour force, and that the country was not yet on a war footing, the local population were aware of the works and local newspapers reported on progress, commenting on the facilities. The Western Mail newspaper reported on Friday 13th January 1939 that 'a striking landmark at the St Athan air base is gigantic steel skeleton which will one day encase a church, a cinema, swimming pool, and a gymnasium (British Newspaper Archive). That refence could include any of the buildings with structural steelwork but noteworthy is the intended recreational facilities.

Construction of the Station's permanent buildings which would be divided into West and East camps included the workshop No 12 (as numbered on the 1944 plan and equating to Bldg. 354, Plate B and Figure 3) housing the cinema, swimming pool and gymnasiums (also used for indoor drill) and the

workshops (1944 plan, Nos 8 and 9. Bldg. 361 and 377 (Plate B and Figure 1)). Bellman hangars were not considered permanent as their design allowed for transportability. No 4 School of Technical Training (No. 4. S of TT) and No. 19 MU were based in East Camp, and No. 32 MU in West Camp.

Plate B. 1944 plan extract showing the actual development to that of the 1937 preliminary layout (National Archives BD54/15)

Station Headquarters opened on 1 September 1938, under the command of Group Captain E B Rice, the Station being administered by No 24 Group Training Command with the first active unit No 4 School of Technical Training (divided into 4 training wings, originally Nos. 1, 2, 3 and 4 (T), renumbered 448, 449, 450 and 451 (TT) wings 22/9/1941 (Air 29/737)) responsible for the training of flight mechanics, riggers and MT drivers (Plates C - E). No. 4 School continued training in East Camp until closure in April 2024.



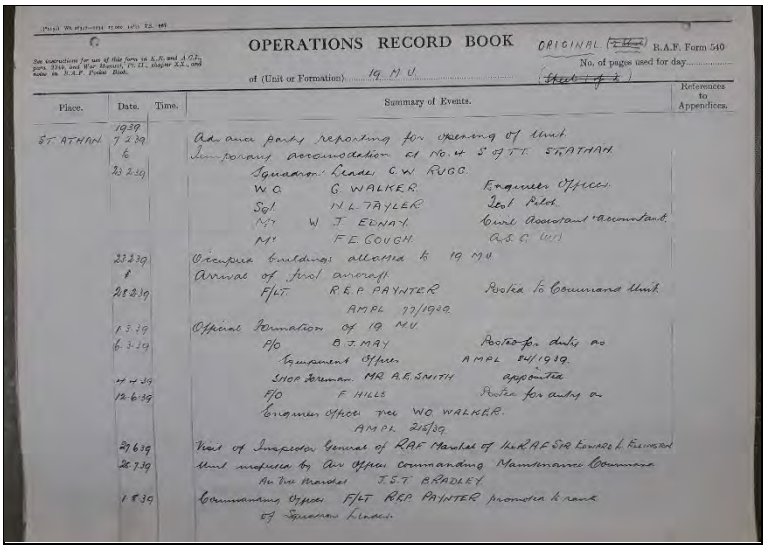
OPERATIONS RECORD BOOK

R.A.F. Form 540

of (Unit or Formation) ... No. of pages used for day ...

Place.	Date.	Time.	Summary of Events.	References to Appendices.
	June 1938.		Air Ministry Order No.468 of 1938, announced that a new School of Technical Training, to be known as No.4, would form at ST.ATHAN (Glamorgan) on 1st September 1938, in the Training Command administered by No.24 (Training) Group. It transpired that the Station would eventually comprise not only No.4 School of Technical Training (which would be accommodated in a Hutted camp) but also Units of an Aircraft Depot and Storage Units (for which permanent barrack buildings would be erected.) No.4 School of Technical Training would eventually become No.3. upon the disbandment of the existing No.3 S.of T.T. now at MANSTON. The functions of No.4 S.of T.T. were stated to be training of Flight Mechanics, Flight Riggers and Drivers Petrol, organised in four wings, No.1, 2 & 4. being for the training of 1,000 airmen (Flight Mechanics and Flight Riggers, No.3 consisting of 500 airmen (Flight Mechanics and Flight Riggers) plus 200 airmen under training as Drivers Petrol. The establishment for the Station was No.E.C./563 of 1938, which included apart from the Wings referred to above, a Station Headquarters under a Group Captain, comprising Workshops, Equipment and Accountant Sections, Educational Section and a Training Flight of 4 Magister Aircraft.	
	1.9.38.		Group Captain E.B.Rice was appointed to be Commanding Officer of the new Station.	

Plate C. June 1938 announcement of new School of Technical training No. 4 at St Athan

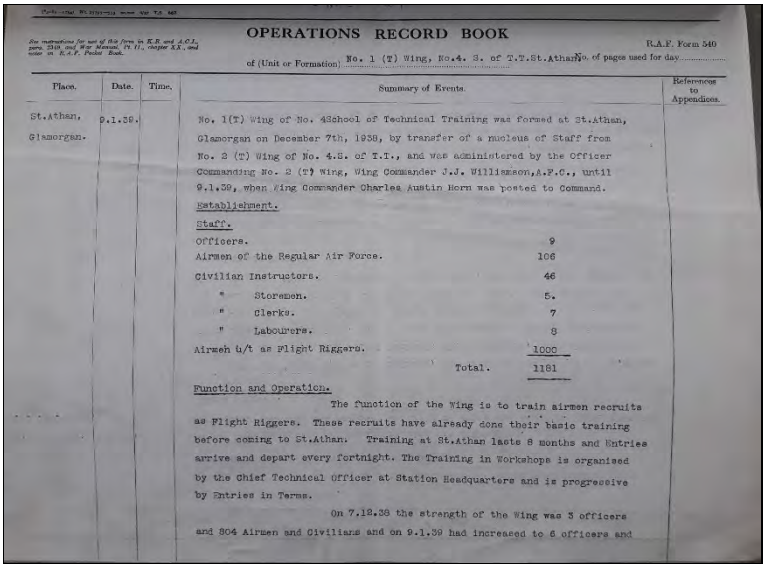


OPERATIONS RECORD BOOK ORIGINAL R.A.F. Form 540

of (Unit or Formation) 19 M U No. of pages used for day ...

Place.	Date.	Time.	Summary of Events.	References to Appendices.
	1939			
ST ATHAN	7 2 39		Advance party reporting for opening of Unit.	
	6		Temporary accommodation at No.4 S of TT ST ATHAN.	
	23 2 39		Squadron Leader C W RUGG.	
			W O G WALKER Engineer Officer.	
			Sgt N L TAYLER Asst Pilot	
			Mr W J EVANS Asst Accountant Accountant.	
			Mr F E GOUGH A.S.C. (W)	
	23 2 39		Various buildings allotted to 19 M U.	
	24		Arrival of first aircraft.	
	28 2 39		F/Lt R E P PAYNTER Posted to Command Unit AMPL 77/1939	
	1 3 39		Official formation of 19 M U.	
	6 3 39		F/O B J MAY Posted for duty as Equipment Officer AMPL 84/1939.	
	11 4 39		Shop Foreman MR A E SMITH appointed	
	12 6 39		F/O F HILLS Posted for duty as Engineer Officer vice W O WALKER. AMPL 215/39.	
	27 6 39		Visit of Inspector General of RAF Marshal of the RAF Sir Edward L Ellington	
	28 7 39		Unit inspected by Air Officer Commanding Maintenance Command Air Vice Marshal J.S.T. BRADLEY	
	1 8 39		Commanding Officer F/Lt R E P PAYNTER promoted to rank of Squadron Leader.	

Plate D. 19 MU Ops record showing February 1939 entry for the School advance party



OPERATIONS RECORD BOOK

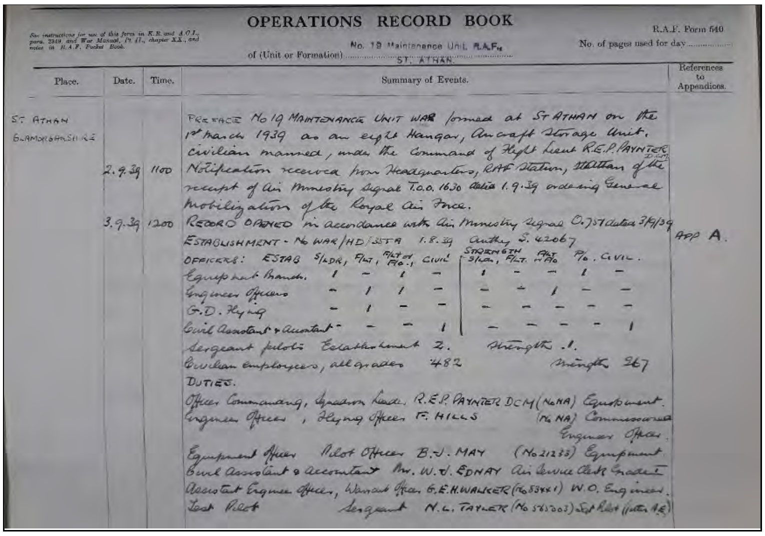
R.A.F. Form 540

of (Unit or Formation) No. 1 (T) Wing, No.4. S. of T.T.St.Athan No. of pages used for day ...

Place.	Date.	Time.	Summary of Events.	References to Appendices.
St.Athan, Glamorgan.	9.1.39.		No. 1(T) Wing of No. 4School of Technical Training was formed at St.Athan, Glamorgan on December 7th, 1938, by transfer of a nucleus of Staff from No. 2 (T) Wing of No. 4.S. of T.T., and was administered by the Officer Commanding No. 2 (T) Wing, Wing Commander J.J. Williamson, A.F.C., until 9.1.39, when Wing Commander Charles Austin Horn was posted to Command. Establishment. Staff. Officers. 9 Airmen of the Regular Air Force. 106 Civilian Instructors. 46 " Storemen. 5. " Clerks. 7 " Labourers. 8 Airmen u/t as Flight Riggers. 1000 Total. 1181 Function and Operation. The function of the Wing is to train airmen recruits as Flight Riggers. These recruits have already done their basic training before coming to St.Athan. Training at St.Athan lasts 8 months and Entries arrive and depart every fortnight. The Training in Workshops is organised by the Chief Technical Officer at Station Headquarters and is progressive by Entries in Terms. On 7.12.38 the strength of the Wing was 3 officers and 804 Airmen and Civilians and on 9.1.39 had increased to 6 officers and	

Plate E. No. 4 S of TT entry of January 1939 detailing No 1 wing formation

Associated with the School, No.19 Maintenance Unit were formed on 1 March 1939 as a civilian Aircraft Storage Unit employing hundreds of people bussed in each day (Plate F). By January 1940, 280 aircraft were in storage with over 700 by the autumn.



OPERATIONS RECORD BOOK

R.A.F. Form 540

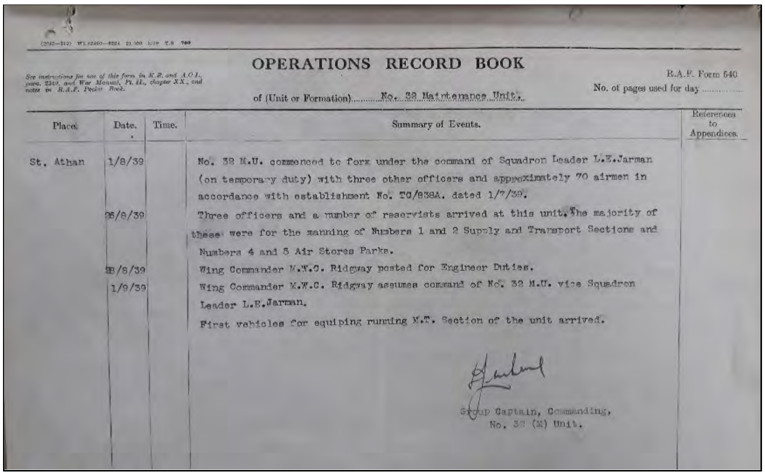
of (Unit or Formation) No. 19 Maintenance Unit. R.A.F. ST. ATHAN.

Place.	Date.	Time.	Summary of Events.	References to Appendices.
ST ATHAN GLAMORGANSHIRE			PREFACE No 19 MAINTENANCE UNIT WAS formed at ST ATHAN on the 1st March 1939 as an eight Hangar, Aircraft Storage Unit, civilian manned, under the Command of Flight Lieut R.E.P. PAYNTER D.C.M.	
	2.9.39	1100	Notification received from Headquarters, RAF Station, St Athan of the receipt of Air Ministry Signal T.O.O. 1630 dated 1.9.39 ordering General Mobilization of the Royal Air Force.	
	3.9.39	1200	RECORD OPENED in accordance with Air Ministry Signal O.757 dated 3/9/39 ESTABLISHMENT - No WAR/HD/357A 1.8.39 Authy S. 42067	APP A.
			Sergeant pilots Establishment 2. Strength 1. Civilian employees, all grades 482 Strength 267 DUTIES. Officer Commanding, Squadron Leader R.E.P. PAYNTER DCM (No NA) Equipment Engineer Officer, Flying Officer F. HILLS (No NA) Commissioned Engineer Officer. Equipment Officer Pilot Officer B.J. MAY (No 21233) Equipment Civil Assistant & Accountant Mr. W.J. EDNAY Air Service Clerk Grade Assistant Engineer Officer, Warrant Officer G.E.H. WALKER W.O. Engineer. Test Pilot Sergeant N.L. TAYLER Sgt Pilot	

Plate F. No. 19 MU formation date and mobilisation record 3rd September 1939

No.32 MU formed on 1 August 1939 as a Service Repair Depot with an Aircraft Repair Section, a Motor Transport Repair Section and General Engineering Section (Plate G). This MU was manned by RAF personnel and continued under that name until disbandment on 1 November 1968, when it was then re-formed as an Aircraft Engineering Wing, with Nos 1, 2, 3, 4 and IO Squadrons; a General Engineering Wing with Nos 5, 6, 7 and 8 Squadrons; Engineering Plans and Development with No.9 Squadron (Jones 2007).

No 32 MU was mainly concerned with fitting special electronic installations like ASV, IFF and AI to aircraft (Smith 1981, p152-154).



OPERATIONS RECORD BOOK

R.A.F. Form 540

No. of pages used for day

of (Unit or Formation) No. 32 Maintenance Unit.

Place.	Date.	Time.	Summary of Events.	References to Appendices.
St. Athan	1/8/39		No. 32 M.U. commenced to form under the command of Squadron Leader L.E.Jarman (on temporary duty) with three other officers and approximately 70 airmen in accordance with establishment No. TO/838A. dated 1/7/39.	
	26/8/39		Three officers and a number of reservists arrived at this unit. The majority of these were for the manning of Numbers 1 and 2 Supply and Transport Sections and Numbers 4 and 5 Air Stores Parks.	
	28/8/39		Wing Commander M.W.C. Ridgway posted for Engineer Duties.	
	1/9/39		Wing Commander M.W.C. Ridgway assumes command of No. 32 M.U. vice Squadron Leader L.E.Jarman. First vehicles for equiping running M.T. Section of the unit arrived.	

Group Captain, Commanding,
No. 32 (M) Unit.

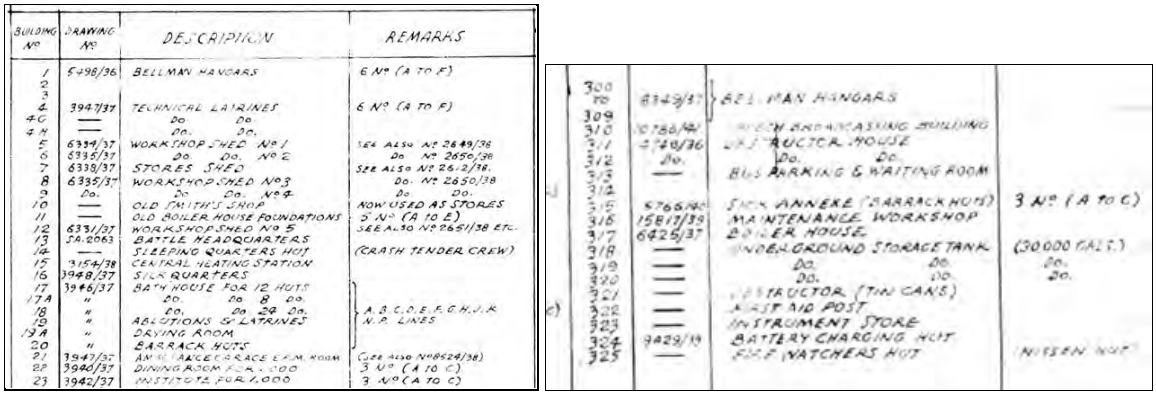
Plate G. No 32 MU Ops book formation entry, August 1939

As the war continued the base expanded and No.4 School of Technical Training entered a new phase, as the advent of bombers with four-engine needed a flight engineer on each aircraft, and thus a need to train addition personnel. By mid-1942, every allied flight engineer, Americans and Canadians apart,

came through the gates of St Athan and for the rest of the war their training was the exclusive task of No.4 School of Technical Training (Jones 2007).

A huge number of both military and civilian staff have been based at the airfield, in 1944 there was accommodation for 14,000 personnel, a very large number for a wartime station (Airfields of Britain Conservation Trust (https://www.abct.org.uk/airfields/airfield-finder/st-athan/)). During wartime civilians always outnumbered service personnel. With a total of 36 large hangars in November 1944, this sprawling MU probably held the record for aircraft accommodation at any airfield in the UK. They comprised no less than 20 Bellman hangars, two 'D' -type, six 'E' -type, four 'C' -type and four large workshop hangars of unspecified design. There were also about 20 Robin hangars dispersed around the perimeter (Smith 1981). Plate B shows the Station buildings in 1944 and Figure 3 a close-up of the same plan with the buildings surveyed and with an extract of the building numbers following. Francis (2024) cites RAF Cosford as a near equivalent in overall layout.

Figure 3. Extract of the 1944 plan showing the main hangars surveyed with their original numbering (8 = 361, 9 = 377, 12 = 354, 309 = 371.See extract following)



BUILDING Nº	DRAWING Nº	DESCRIPTION	REMARKS
1	5498/36	BELLMAN HANGARS	6 Nº (A TO F)
2			
3			
4	3947/37	TECHNICAL LATRINES	6 Nº (A TO F)
4C	—	Do. Do.	
4H	—	Do. Do.	
5	6334/37	WORKSHOP SHED Nº 1	SEE ALSO Nº 2649/38
6	6335/37	Do. Do. Nº 2	Do. Nº 2650/38
7	6338/37	STORES SHED	SEE ALSO Nº 26-2/38.
8	6335/37	WORKSHOP SHED Nº3	Do. Nº 2650/38
9	Do.	Do. Do. Nº4	Do. Do.
10	—	OLD SMITH'S SHOP	NOW USED AS STORES
11	—	OLD BOILER HOUSE FOUNDATIONS	5 Nº (A TO E)
12	6331/37	WORKSHOP SHED Nº 5	SEE ALSO Nº 2651/38 ETC.
13	SA.2063	BATTLE HEADQUARTERS	
14	—	SLEEPING QUARTERS HUT	(CRASH TENDER CREW)
15	3154/38	CENTRAL HEATING STATION	
16	3948/37	SICK QUARTERS	
17	3946/37	BATH HOUSE FOR 12 HUTS	
17A	"	Do. Do. 8 Do.	
18	"	Do. Do. 28 Do.	A, B, C, D, E, F, G, H, J, K
19	"	ABLUTIONS & LATRINES	N.P. LINES
19A	"	DRYING ROOM	
20	"	BARRACK HUTS	
21	3949/37	AMBULANCE GARAGE E.A.M. ROOM	(SEE ALSO Nº 8524/38)
22	3940/37	DINING ROOM E.C.R. 300	3 Nº (A TO C)
23	3942/37	INSTITUTE FOR 1,000	3 Nº (A TO C)

300 to 308	6343/37	BELLMAN HANGARS	
309		[illegible]	
310	10788/42	[illegible]	
311	2728/36	INSTRUCTOR HOUSE	
312	Do.	Do. Do.	
313	—	BUS SHELTER & WAITING ROOM	
314			
315	5765/40	SICK ANNEXE (BARRACK HUTS)	3 Nº (A TO C)
316	15817/39	MAINTENANCE WORKSHOP	
317	6425/37	BOILER HOUSE	
318	—	UNDERGROUND STORAGE TANK	(30000 GALS.)
319	—	Do. Do.	Do.
320	—	Do. Do.	Do.
321	—	INSTRUCTOR (TIN CANS)	
322	—	FIRST AID POST	
323	—	INSTRUMENT STORE	
324	9429/39	BATTERY CHARGING HUT	
325	—	FIRE WATCHERS HUT	(NISSEN HUT)

After the end of the Second World War, St. Athan remained an important engineering training centre for the RAF. Between May 1947 and August 1973, St Athan was also home for the Administrative Apprentice Training School, which provided a 20-month training programme for entrants who enlisted to become clerks or work in accounting, supply, and administration, prior to posting to other RAF units for a 12-year term of service.

The airfield was the site of the Head Office of the Defence Aviation Repair Agency (DARA) and later the Defence Support Group which was responsible for the maintenance and repair of RAF, Royal Navy and Army aircraft (Airfields of Britain Conservation Trust (https://www.abct.org.uk/airfields/airfield-finder/st-athan/)).

The airfield part of the site was transferred from military to civilian licencing on 1 April 2019. It is wholly owned by the Welsh Government, operated by Cardiff Wales Airport and known as St Athan Aerodrome, situated within the Bro Tathan Business Park (https://www.brotathan.wales/egsyoverview)

The final RAF farewell parade took place in August 2023 and the greater part of the site vacated by April 2024.

There is no doubt that this was a large and important RAF Station testified by over 80 years of operational usage with several adaptations made to accommodate change in aircraft size and technology and all requiring engineers trained to maintain aircraft and the ancillary automotive vehicles without which operational bases would not function efficiently. It is worthwhile here including part of the Francis 2024 report assessing the value of the site, which compares St. Athan and comparable sites to which 'In a 20th century historical context, the former RAF St Athan is the Welsh equivalent of RAF Cosford (and vice versa). Both stations are of the same pre-war vintage, they had similar functions such as a shared airfield with maintenance units and a school of technical training. From the aircraft maintenance aspect St Athan scores more highly as it functioned as an aircraft storage unit as well as an aircraft repair depot. On looking at the technical school context, Cosford has a slight upper hand as it has the huge and impressive Fulton Block but St Athan with its twenty transportable Bellman hangars had far more workshop and school square footage than Cosford, which had just two transportable hangars.

In terms of wartime usage including the units based there, the closest Welsh RAF station to St Athan is the former RAF Sealand. The surviving buildings at Sealand (East Camp) have more in common with St Athan West Camp as they were part of the aircraft repair depot (30 MU). No.5 Flying Training School (West Camp) at Sealand never had any large workshop buildings, the school made use instead of a

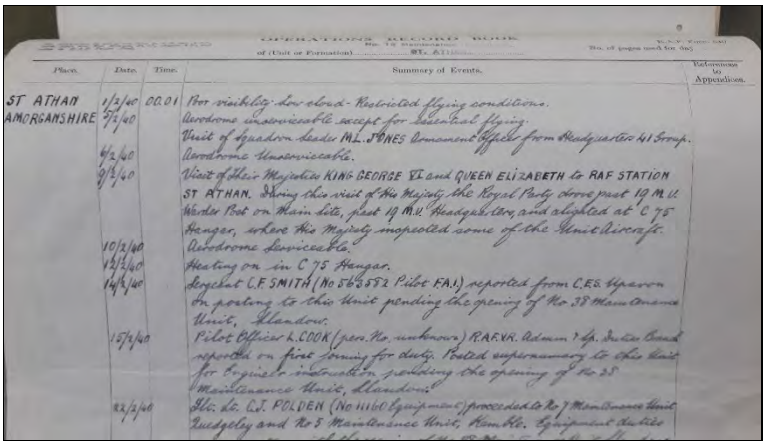
1936 design 'C' type hangar as well as First World War-era general service sheds. The packing depot site (South Camp) had two prototype and rare 1934 design 'C' type hangars, but the site was cleared by the developer c.2010 (Francis P, 2024).

This indicates the unique differences from other similar RAF sites in the UK because of its early foundation (one of four) and buildings associated with operational functions in a Wales context.

There are several informative books regarding the Station and its history with Jones (2007) and Phillips (2006) the most informative, but for overall airfield construction and development The Royal Airforce Builds for War (HMSO 1955 reprinted 1997) was invaluable.

Notable events

From the time of opening Unit records indicate many visitors mainly as expected with military association as well as visitors from the local area including dignitaries and contractors including Prime Minister Neville Chamberlain on 24th June 1939 during a tour of the Industrial settlements of South Wales but also notably during wartime, two significant visitors were King George VI and Queen Elizabeth who visited on 9th February 1940 (Plate H).



OPERATIONS RECORD BOOK
of (Unit or Formation) No. 19 M.U.

Place.	Date.	Time.	Summary of Events.	References to Appendices.
ST ATHAN GLAMORGANSHIRE	1/2/40	00.01	Poor visibility: low cloud - Restricted flying conditions.	
	3/2/40		Aerodrome unserviceable except for Essential flying.	
			Visit of Squadron Leader M.L. JONES Armament Officer from Headquarters 41 Group.	
	4/2/40		Aerodrome Unserviceable.	
	9/2/40		Visit of their Majesties KING GEORGE VI and QUEEN ELIZABETH to RAF STATION ST ATHAN. During this visit of His Majesty the Royal Party drove past 19 M.U. Warder Post on Main Site, past 19 M.U. Headquarters and alighted at C 75 Hangar, where His Majesty inspected some of the Unit Aircraft.	
	10/2/40		Aerodrome Serviceable.	
	12/2/40		Heating on in C 75 Hangar.	
	14/2/40		Sergeant C.F. SMITH (No 566552 Pilot F.A.) reported from C.E.S. Sparrow on posting to this Unit pending the opening of No. 38 Maintenance Unit, Llandow.	
	15/2/40		Pilot Officer L. COOK (pers. No. unknown) R.A.F.V.R. Admin 1 Gp. Duties Board reported on first joining for duty. Posted supernumerary to this Unit for Equipment purposes pending the opening of No. 38 Maintenance Unit, Llandow.	
	22/2/40		Flt. Lt. C.J. FOLDEN (No 41160 Equipment) proceeded to No. 7 Maintenance Unit Sudgeley and No. 5 Maintenance Unit, Rumble. Equipment duties	

Plate H. No. 19 MU entry for the visit of the King and queen in 1940

The most prominent event would appear to be referring to the 1958 Empire Games in Cardiff and that St Athan hosted the athletes' Sport's village offering free accommodation and free use of the sports facilities, but the cinema was not included with free entry as it may have led to local cinemas losing business (Plate I).

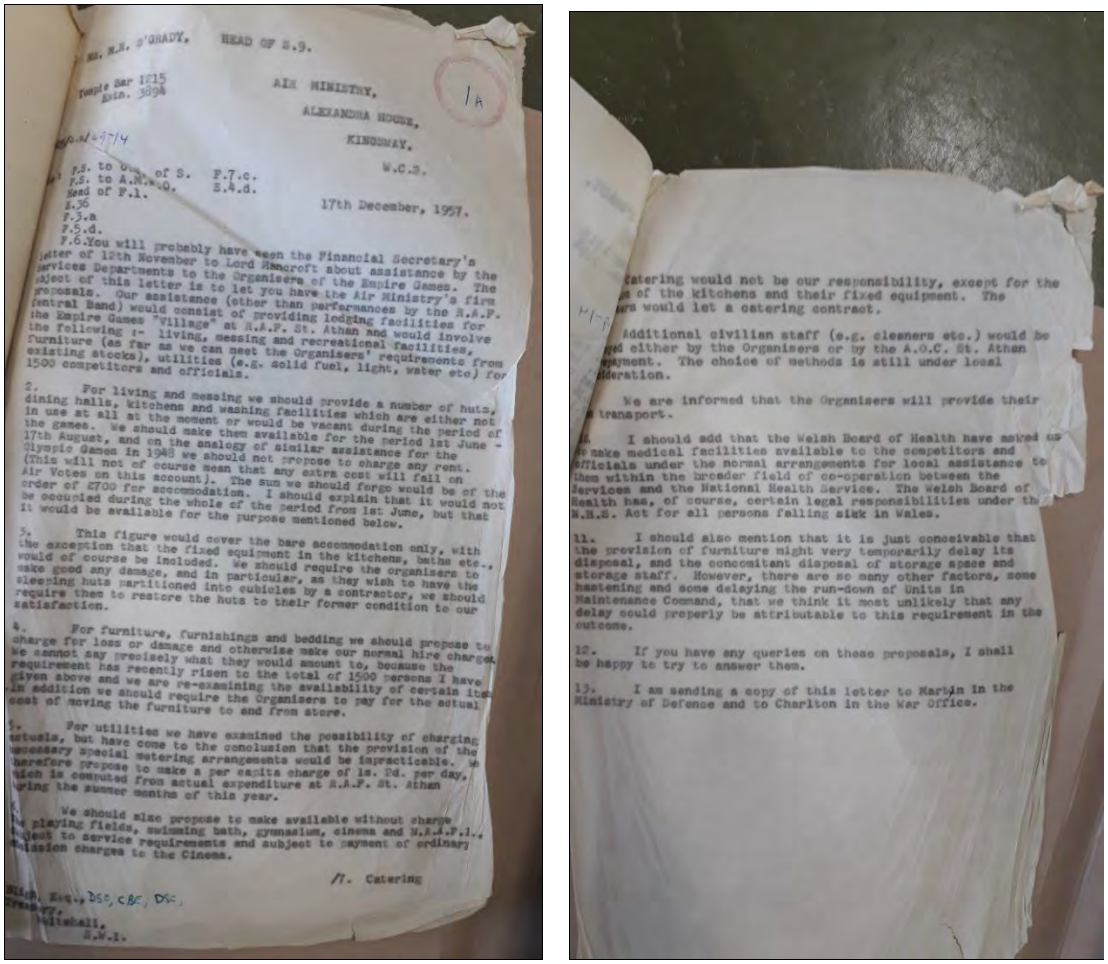


Plate I. Early Air Ministry letter (1957) referencing Raf St Athan assistance with the Empire Games (Air 2/15050)

The athletes were accommodated within a fenced area to the east side of the Station and fenced to maintain a degree of separation from the operational base. The 1957 plan (Plate J) indicates the Sports Village (AIR 2/13294).

Plate J. Bldg. 354, the swimming pool and gymnasium in the lower left of the plan. The hutted accommodation in the centre north of the pitches

4| The Early Buildings (late 1930s) Nos. 354, 361, 377 and 371

Building 354. The cinema, church, gymnasiums, fitness suite, swimming pool and pool pumping room (Figures 4 to 10, 17 and 18)

This brick building orientated 17 degrees west of grid north was the largest of all the buildings in East Camp measuring 138m (453 feet) in length by 74.1m width (243 feet) with a height of 7.52m (approx. 24.5 feet) to the parapet (0.33m wide) and 9.83m (approx. 32 feet) to the roof ridge of which there were 15 pitched roofs transverse to the building's length, with skylights facing north, ranged between the hipped roofs. A slightly splayed U-shaped metal gutter with a flat base (0.32m wide, 0.15m high) collected runoff from each roof leading to downpipes below parapet level and of which the greater number were internal; gutter height to parapet level 0.45m (Plate K).

Plate K. Roof detail showing lights gutter and tiles covered in' bituminous felt'

Internally, the main framework comprised horizontal wind girders along the north and south elevations with six vertical X-frame girders, one in each corner and one half-way along the north and south elevations. Stanchions, in cased stell columns supported the six main roof girders (18.3m (60 feet) centres) along the north-south centreline that divided the gymnasiums with the pillars on the east side of the wall; between each of the girders were three angle ties. A notable difference was a single angle tie in the fitness suite and almost certainly the church even though the steelwork was hidden above suspended ceiling. North-south oriented, 19 trusses supported the roof. The steelwork comprised riveted plates for the lattice girders and beams and nut and bolt for the trusses.

The underside of the wind girders (0.23m high) the lowest element of the steelwork started at 5.2m from floor level with the roof trusses above it reaching 6.8m and 9.25m from floor level to the internal apex.

The exterior fabric was of Flemish bond red brick (0.4m (15.5 inch) wide cavity wall), blended with contrasting random black-hued brick (polychromatic), bonded with sand coloured mortar but where hangar doorways and other doorways were blocked red brick stretcher bond, except for a bricked in window in the east elevation which was Flemish bond (Plate L).

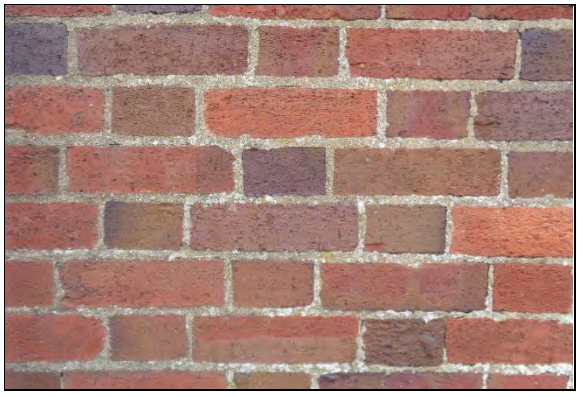


Plate L.Typical and original exterior elevation wall in Flemish Bond

Notwithstanding the different uses internally or original adaptations or modern alterations, the elevations, dominated by windows, doorways and bricked up recessed hangar doorways were essentially similar. The original large rectangular window reveals (3.75m high by 2.74m wide) were consistent on all elevations with a continuous lintel overhead (with lead sheeting over and projecting approximately 40mm out acting as a drip mould) and continuous sills below where not interrupted by other openings. The lintel and sills were in reinforced cement sections with a yellow hue to imitate Cotswold stone; the sills below the windows (2.74m wide) were in pairs each 1.47m (58 inches) long extending under the brickwork on each side by 0.1m where the section between the windows, and a continuation of the sill, was infilled with a 0.69m (27 inches) long section (Sill depth 130mm directly below the frame tapering to 100mm depth at 0.15m from the frame where the sill projected 40mm off the wall line. Windows are inset 0.1m back off the wall line).

The north and south elevations were similar with 14 windows each, on the west there were 15 and, on the east, originally 13, but reduced to 12 with adaption (this elevation unique in that it hosted the cinema entrance); glazing was again consistent with 9 panes in each with their frame set back 30mm from the elevation line. Smaller window reveals (1.37m high by 2.74m wide) their top flush with the lintel were also consistent on all elevations, and present over the original main doorways. Other standard fabric features of note were air bricks present above the lintel central to each window including over the cinema doors and at ground level integrated with the first course of brick above DPC level (Plate M).

Plate M. Original air brick detail

Although access to all the rooms from any of the external doorways would have been possible, the division into the particular functions or indeed standing orders may have, although not physically, restricted that movement.

Entrances as originally built were four art deco style double doorways under flat cement canopies (3.3m long tapering to 2.9m wide 0.76m off the wall, by 0.13m thick) each in the north and south elevations with maintenance access doors towards the corners; two double doorways in the north elevation and a single doorway near the southeast corner of the south elevation.

The entrances were 2.89m high to underside of canopy, with 2.2m high doors, and along the face of the elevation 2.3m wide reducing over 0.45m to 1.52m wide at the door. In addition to stepping in, the brick stepped up in two lifts, the outer 0.29m (four brick courses) and the inner 0.37m (five brick courses) from ground level and it was this lower-level architectural brickwork that suggested an art deco influence (Plate N).

Plate N. Decorative brickwork common to pedestrian entrances for the cinema, pool and Church

There were similar doorways on the west elevation including the entrance to swimming pool and its fire exit, but two other doorways along the southern extent one a folding door had canopies but not inset decorative brickwork. The east elevation, the distinctive cinema entrance aside, had five similar sized openings all with canopies and all except the side entrance to the cinema, had doors flush with the elevation. It is possible that all were built to the same recessed pattern but later adapted bringing the doors to near flush with the elevation.

Beside the standard doorways and giving access directly into each gymnasium, the east and west elevations each had two large and wide hangar openings (17.2m long, by 5.22m high to the lintel) inset from the elevation line (variable distance between 100mm and 180mm). These typical original ‘aircraft size’ openings were infilled with brick and all except for the southern opening on the east elevation, had small doorways of either a single or double door. The south however, measuring 6m wide by 4.58m high, and fitted with sliding doors was the only entrance large enough for vehicle access if required.

Noticeable in all bays was a rounding of the entrance corners which appeared, by the rough-hewn extant grooves, to have been fashioned on site, rather than employing bullnose brick.

The hipped roof with lights was tiled throughout in asbestos cement slate and covered in what appeared to be a dark grey bituminous felt like material, including the lights over the cinema auditorium but excepting the other lights and the area over the pool (21.8m from the west ranged over 4 roof elements) which had a series of larger lights. Of note and only at the north, there was an open area related to the cinema close to the northeast corner, and three dormer roofs, one near the open area and the other two, also related to the cinema, west of centre.

Bldg. 354 Exterior elevations (Figure 4)

The North elevation

This elevation formed the external walls of the cinema, swimming pool and pump room with around two thirds of its length from the east side being the cinema (Plates 1-4). The main architectural features of the 74.1m long elevation were four similar art deco style main entrances (double doors,18.5m between centres) along with two other service doorways each 8.5m in from the respective corners and between them all, 14 large window positions (3.75m high by 2.74m wide, 0.9m separation where adjacent) with another four smaller windows over the main entrances. A ventilation louvre to the cinema second storey was present above the east service door

All nine of the cinema window reveals were blocked, rendered and painted green, in contrast to the five swimming pool windows finished with modern UPVC. Of the four main doorways all but the one to the west (opposite the pool), which was blocked with Flemish bond brick below a rendered panel, were of unglazed wood with the purpose of the two eastern doors as fire exits from the cinema and the other, access to the pump room. The other doorways were, to the east, access to the cinema basement and stairs to the second storey, and to the west a Plant room (2.9m wide by 4.34m) in which the northwest corner vertical X-frame bracing spanned the west wall.

The plant room comprised two 1.1m diameter by 1.93m high cylinders (heat exchangers or calorifers supplied by Rother Company Limited, Meadowbank Works, Rotherham (Plate O). A website indicates that all RAF camps were supplied by the firm, as well as many hospitals and holiday camps) and extensive lagged piping which provided heated water for the pool and for which a protective cover over electrical wiring was present just off the external west elevation corner. The filtration system is contained in the Pool Plant room.

Plate O. Rother Company Limited plate in swimming pool plant room.

Notable were structural repairs where brickwork had been replaced on the corners above and out to the corners from the window lintel level.

The East elevation

The east elevation (138m long) for its greater length was the external wall of the Stone Gymnasium with the Fitness Suite to the south taking up approximately 19m and Cinema to the north, 28m. The addition of a modern building (not accessible but a plant room) abutted the wall, and a sheltered walkway masked a short section of the infilled hangar wall (Plates 5-7).

The key structural elements included two wide blocked hangar openings, doorways with windows over, larger windows and the cinema entrance.

Twenty-four metres from the south corner was the southern (17.2m wide by 5.18m high) of the two blocked (brick stretcher bond) hangar openings (Plate 8) with the north opening, slightly wider at 17.6m, 78.5m from the same corner; spatially the distance between them was 37.6m and both were inset between 90-120mm from the main elevation line with chamfered edges. A sliding metal door (6m wide by 4.5m high) in the centre of the south opening provided access to the gymnasium as did a single fire door present in the centre of the other blocked opening to the north.

Excluding the cinema there were 5 original main entrance openings, those under canopies and only one of these, the side door to the cinema, with art deco brickwork. The southernmost was bricked up (stretcher bond) but if open would have provided access to the Fitness Suite and its office; the probability is that it was blocked when the offices were constructed. The two openings in the centre between the hangar openings were metal sheathed and gave further access to the gym as did another bricked up doorway (stretcher bond) adjacent to the cinema doorway; five entrances overall into the gym.

The side door to the cinema differed to the art deco doorways on the north elevation in that there were two small windows within the brick on each side of the door, one on the north side for a WC and the other on the south side through a separate side door to a small plant room (2.52m long by 1.21m) with several water pipes and valve taps (Plate 9).

Of the 12 similar main window reveals all were glazed except for one located between the Cinema and Plant room which had been bricked up, and based on the general layout there were likely 13 originally, with the Plant room built over the other although this was not evident internally. The windows directly opposite the gym were blanked out internally with white sheeting as were all but two of the smaller windows over the main entrances. Original frames were present except for those in UPVC where the Fitness Suite was adapted for WCs, showers and office space.

The Cinema entrance of original build was symmetrical around a central pillar with the doorways and glazing (3.2m wide, 2.3m high) a mirror image of each other inset 0.7m behind the facade. Overhead were two boarded windows to the room behind the projection room. The ‘Astra’ name panel had been removed from the light box over the entrance. A feature of note directly above the entrance in the roof hip was the addition of a dormer roof (Plates 10, 11).

The only other features of note were a rectangular ventilation opening at high level toward the north corner of the elevation an integral part of the internal fan housing intake and the addition of the modern Plant room (11.7m by 7.5m) abutting the earlier building masking the north half of a hangar opening appeared to coincide with a probable window position evidenced by a crudely cut sill. A number 50 in light green paint above the blocked window just north of the modern plant may have

related to an earlier building numbering system but nothing similar was noted on the other buildings. The modern covered passage (6m long 1.3m wide) adjoining the Plant room led to the single door to the gymnasium (Plate 12).

The modern Plant room was part of a planning application (1991/00535/CROWN) in the early 1990s for rationalisation of boiler houses in the Station and the structure as built similar to the submitted designs in the application (https://vogonline.planning-register.co.uk/Planning/Display/1991/00535/CROWN).

The South elevation

This elevation, the exterior of the Faith Centre to the west and the Fitness Suite to the east shared a similar symmetry with the north elevation with four main doorways with small windows over and 14 large window reveals all mainly with modern UPVC frames. The structural difference between the elevations was a small window 1.8m off the west corner providing natural light for a WC and a single doorway to a small maintenance room (1.4m by 2.4m) 1.8m from the east corner (Plate 13).

The major changes were that four of the seven larger windows of the Faith centre had been blocked with Flemish Bond brickwork over the upper 2m of their 3.75m overall height with UPVC frames below. There was also a difference in the doors with the Faith centre having two similar modern glazed UPVC doors and frames (Plates 15, 16), whilst the Fitness Suite had a metal door, probably original, toward the centre and a differently glazed UPVC door to that of the Faith Centre toward the east which was its main entrance (Plate 17); the two small windows over the Faith centre entrances were likely original frames (thin metal -aluminium ?) both with 6 panes.

Notable again were structural repairs to the west corner down to the small window where brickwork had been replaced and more extensive repairs at the east from near ground level and rising long the edge of the door frame to the parapet (Plate 18)**.**

The West elevation

Similar and generally matching the east elevation, the greater proportion of its length provided the external wall to the Wood gym and the remainder, walls of the ablutions at the south (19m length) opposite the Faith Centre, and the swimming pool (37m length) to the north (Plate 19)**.**

Structurally the main features were two inset wide blocked hangar openings with doors, five main doorways with windows over, 15 larger UPVC windows set between the hangar openings of which five were arranged along the pool elevation (Plate 20) and eight along the gymnasium and a small window at the north probably recent and added during repair work.

The inset blocked hangar openings (stretcher bond) were the same dimensions at the east elevation with the north again slightly wider than the south and both had wooden doors, a double to the north (Plate 21) and single at the south.

The main differences in the elevation were in the main doorways under the canopies. The two at the north were art deco in style and the northernmost of those was the main entrance to the pool (modern UPVC -Plate 22), the other a fire door from the pool changing rooms. Of the two doorways to the gymnasium in the centre, the north had been adapted leaving its original width intact but removing the canopy, and an external conservatory (5.4m by 1.76m) added leading to a gymnasium office and foyer (Plate 23). The other opening was fitted with a folding metal clad door opening outwards with a guide rail for the movement just below the canopy (Plate 24). The remaining doorway at the south

was fitted with double wooden doors with vents above and a sign indicated restricted access. This was locked at the time of survey but likely gave access to a small room (approximately 5m by 2m) of unknown purpose but probably connected with maintenance for the adjacent WCs and changing rooms.

Notable were extensive repairs to the brickwork on both corners and at the north, the insertion of a later, small UPVC window to the viewing gallery over the pool which differed from the other window positions as the sill was grey concrete and not like the original yellowed cement sills used elsewhere. This may have been inserted during repair work (Plate 25).

Building 354 Interior circulation areas (Figures 5, 6, 8, 9 and 10)

Building 354. The Swimming Pool (354b)

The northwest corner of building 354 housed the swimming pool. The north-south orientated footprint including changing rooms below a viewing area, measured 36.52m long (120 feet) by 25.14m wide (82.5 feet) with the rectangular pool itself central within the area measuring 30.43m (100 feet) by 15.23m (50 feet). The depth at the shallow end (south) was 1.64m (approx. 5 feet), 3.3m deep at the filters 5.7m in from the north edge and rising slightly to 2.86m deep (approx. 9 feet) at the north. Three circular filters in rectangular frames were present in the shallow end side wall of the pool (Plates 26-31).

Access to the pool after leaving the changing rooms on the west side was via vertical steps set close to each corner of the pool from the surrounding perimeter walkway comprised of cream coloured anti slip ceramic tiles 0.15m square. The pool tiles were of similar size but a deeper cream colour and without a raised pattern. Five swimming lanes were demarked by brown tiles. The lower parts of the elevations were also cream coloured including those with cladding, and above that a band of dark blue provided a bold contrast with the white painted upper brickwork walls as did children's cartoon figures present along the south wall below pool cover sheets on rollers.

Related poolside features included drainage measures with an open shallow gutter present along the walkway edges but enclosed or covered with a metal grill where it crossed the pedestrian accesses, and all leading to small drains in the pool side corners. A series of in line inspection covers were present on each side of the long axis of the walkways.

In the northwest corner a flight of steps gave access to the viewing gallery and two diving boards were present bolted along the north edge of the pool (Plate 32).

The Viewing gallery

The floor of the wood panel gallery extended across the length of the building (36.54m) with the viewing area starting just south after the landing. Behind a protective handrail (0 .091m high) and board, a 0.83m wide walkway gave access to a 0.9m wide by 0.23m high raised platform which was separated by a wooden partition to another slightly higher (0.09m) and wider tier (1.18m) behind. A 2.04m high partition forming the back of the second platform screened the gallery from the main wall with its supporting pillars and large windows 0.82m beyond. The large windows aside a small window (0.48m wide by 0.93m high) located between structural pillars and steelwork provided illumination for the northwest corner (Plates 32-35). Along the north wall were several pipes extending from the northwest corner Plant room below.

The North elevation

At pool level the elevation comprised five large windows, four to the east of a blocked main doorway with overhead window; all windows had radiators below sill level (1.35m up from floor). At the west a flight of metal stairs rising to 2.92m gave access to the viewing gallery. In the northwest corner at gallery level, the elevation measuring 4.12m overall, was the main corner pillar for the wind girder and the white painted brickwork of the main walls, with a series of vertical and horizontal pipes passing through the wooden gallery floor (Plate 28).

The East elevation

The east elevation which had a single doorway at its north and south ends was otherwise fairly plain with four equally spaced structural pillars each with two radiators each between them. The doorway at the north provided access to the pump room and that to the south access to the passageway to the squash courts. A small first aid cupboard in the centre also once opened to the adjacent pumping room (Plate 29).

The South elevation

The south elevation was not dissimilar to that of the east with three structural pillars, a doorway and three windows. At the east with one on each side of the pillar were two small windows allowing viewing to the pool from the lower offices as was at higher level a single window immediately west of the central pillar from the offices above the gymnasium. A single doorway in the west corner allowed access to the gymnasium (Plate 31).

The West elevation, entrance and changing rooms

The west elevation provided the access points from the exterior entrance and access to the changing rooms. The main entrance through double doors was toward the north and located close to the gallery staircase. From the exterior a short passageway with a ticket machine led through doors to another lobby and to the poolside doors.

There were three small rooms off the inner lobby, one 4.45m long by 0.91m wide and parallel to the pool and two other smaller rooms and all were likely used as storerooms. An electrical switch cupboard was inset into the west wall of the longer storeroom at its entrance (Plate 36).

The entrance to the male changing rooms at approximately halfway along the elevation, was through a passage divided by a wall separating a footbath from a dry walkway. Once through, turning north gave access to a 9m long changing room (Plate 37) whilst the south led to an ablutions area with WC, hand basins shower and urinals.

Just over 9m to the south of the male entrance, the female entrance was similarly divided by a wall but there was no footbath, and the dividing wall was set back from the line of the wall. In the line of the passage was a fire escape through double doors directly to the exterior (Plate 38). The female ablutions were mirrored on either side of the passage with changing area WC and shower cubicles.

All ablutions and changing room walls were clad in modern materials with suspended ceilings.

The upper part of the west elevation and directly over the changing rooms, was the kickboard and handrail of the viewing gallery with the low tiered viewing arrangement behind them.

Alterations

Two similarly sized (0.9m wide) but now blocked (with breeze type) openings were located toward the southern half of the poolside along the west elevation with the southernmost opening only 0.1m off the corner. The central one had 'shower' in slightly raised letters just visible on the painted lintel (Plate 39).

If open, they would have led into the shower cubicles of the present female changing rooms and in effect that would appear to have been the same before they were blocked. Unless they were small cubicles for a shower only, the probability is that these were original accesses to the poolside evidenced by similar 0.225m high lintels over each opening and with no indication of any brickwork alteration.

There were also differences in the present openings in that that the male entrance had a brick column flush with the walling separating the opening whilst the dividing wall in the female opening was set back and any evidence for a brick column if any was hidden by cladding. However, given the double doors (fire exit) in line with the female opening it may originally have been an unrestricted opening and never intended to have a dividing wall. The only footbath in the male entrance may suggest that this was once the only entrance to the poolside.

Clearly there were two original entrances from the outside to the pool but whether both were originally in use at the same time and for the same purpose is unknown. The present entrance appears to be somewhat restricted and leads through the store rooms to the pool albeit that that is the closest side to the viewing gallery steps, and that perhaps was the difference, with one entrance for swimming and one for viewing, which would suggest the gallery was original or if not original then a roof over the changing rooms later converted to a gallery, as it seems unlikely that the changing rooms were open to the roof. Records indicate that unit swimming galas took place in the early years and as such a gallery would seem appropriate from the beginning.

Roof level

The pool was open to the roof and comprised the exposed steelwork bracing with the wind girder parallel to the north elevation, roof trusses and girders, all painted white and with rust staining evident on many surfaces (Plates 40, 41). The base of the steelwork started at 5.05m from floor level extending to 9.45m at the apex, and from the gallery the minimum distance to the steelwork was approximately 2.13m (Figures 8 and 9).

The manufacturers name on the wind bracing read Hallside from the Hallside Steelworks, Newton, Lanarkshire, Scotland (1873-1979).

In contrast to the other circulation areas the north facing roof lights were clear allowing natural light. Also, in contrast to the other spaces red painted wooden purlins (200mm thick by 75mm wide) supported wooden roof panels. Of note was the uneven distribution with only two on the north side, (one across the windows) between the gutter and apex purlins and three on the opposite side (Plate 40).

In the northwest corner of the gallery and in line with the staircase a rectangular tank had been constructed on and above the wind girder steelwork. The corner was directly over the pool's water heating tanks

Phasing

The pool was an original design concept and in essence there were no changes to the main pool or poolside tiled areas. Clear changes but of unknown date included UPVC windows (earliest date likely 1970s) and modernisation of the changing rooms with a rearrangement of the pool entrances. Although the north rooms were labelled as Male changing rooms there were no excusive male fittings such as urinals and all changing areas were therefore similar, so as one would expect that indicated male/female segregation. It was not ascertained whether there was earlier segregation with female and male personnel (as opposed to male or female only sessions) or whether the large civilian contingent had access to the pool. The pool was not just for recreation and physical exercise, but its primary purpose was a survival training pool for aircrew to practice dinghy handling and swimming skills. The last quarter of the 20th century would be a suggested date from the cladding.

There is a 1960s RAF Swimming association record to bring the RAF into line with Amateur Swimming Associations regulations regarding international diving and to provide 3m and 5m springboards in place of the 1m and 3m springboards but a reply concerning both St Athan and Cosford pools says that it is not possible without making the pool deeper or raising the roof height. The baths at both camps were only 10 feet deep and the requirement for 3m and 5m springboards depths were 11' 6'' and 12' 5.5'' respectively (Air 2/16634). The height of the present boards was 1.77m and 0.76m and lengths 3m and 4.27m respectively.

Francis (2024) mentions that the roofs of all three buildings (354, 377 and 361) had been reclad and glazed, although originally it is understood that Bldg.354 was glazed over half of one 60-feet-wide bay only. Given the lifespan of the structures that would not be unusual, and the resolution of the aerial photographs could not substantiate either recladding or half glazing.

Building 354. Pool plant room

The pumping room comprising a small anteroom and larger plant room shared a party wall with the pool on the west and on the east side a party wall with the cinema. Orientated north-south and parallel to the pool, in overall length internally it measured 27.38m (approx. 89 feet) by 5.17m wide; In height it was similar to the pool area and open to the roof (Figures 5, 8 and 9).

The entrance through double doors in the north elevation led via a short passage, formed from the walls of a separate WC and storeroom to the right and left respectively, into a small rectangular anteroom 4.05m wide by 3.22m long. Features of note along the west elevation included a doorway to the pool (0.2m step up) and between the WC and the door a small hand basin and boiler unit with a secondary circular metallic bowl facility above likely for chemical water testing or preparation purposes (Plate 42). Immediately adjacent to the door and fitted into the corner was a cupboard with louvered door for carbon dioxide storage (Plate 43). On the opposite side behind a workbench and metal cabinet in the centre of the wall a 1.54m wide opening to the cinema had been blocked up (Plate 44). The celling, including that of the WC and store, at 2.8m high comprised brown stained pine strips; a small loft hatch was present in the southeast corner. Above the concrete floor, the lower part (1.5m (5 feet)) of the brick elevations were painted gloss brown and off-white above.

Passing through double louvered doors in the centre of the south elevation gave access to the plant room itself. Before descending a short flight of steps (0.47m height overall) to the plant floor, on the right (west side) was a small office (2.6m by 1.4m by 2.4m high) and on the left at the same platform level a handrail and ladder to a roof height platform. At the lower level, 19.8m from the base of the

steps, a narrow passage 0.9m wide edged by piping, tanks, chamber, plinths and supporting steelwork for a gantry, continued to the end of the plant room (Plate 45).

The West elevation

Although the west elevation itself was of plain English bond painted brick excepting a wooden panel covering the first aid cabinet opening from the pool, electrical wiring, and structural steelwork, an in-line series of plinths and pipes extended across the elevation 0.1m off the wall (Plate 46).

Adjoining the office south along the west wall was a low platform (3.2m long by 1.5m wide) hosting a control panel cabinet and chemical container for balancing the pool chemicals (Plate 47) and immediately south of that low metal steps that partly covered a 4m deep concrete edged chamber (2.6m long by 1.2m wide) edged by guard rails and housing a large diameter water pipe and associated valves. A ladder on its south side provided access (Plate 48). At the chamber base a 315 mm diameter pipe with a junction and blanking plate, and separate valve wheel extended south parallel to the wall rising vertically up the chamber 0.32m off its edge. A metre below the chamber lip a branch pipe entered the side wall of the chamber whilst the pipe continued upward to 0.85m above the lip, bending through a right angle to continue southward to enter a valve housing, with counterweights on its lid, and on exit reducing twice in diameter before extending to an electric motor bolted to a concrete plinth 0.38m high off the floor and ending 3.5m from the chamber edge (Plate 49). The motor drove an impellor which connected to a vertical rising pipe connecting to further pipes above and the water cylinders on the opposite side of the plant room. A second similar arrangement of pipes and valves started 0.3m off the plinth with a pipe rising through the floor; a switch box fixed to the wall had controls for pumps 1 and 2 which perhaps indicated that it could function on one pump (Plate 50). The probability is that this pipe was an extension of the pipe entering the chamber wall a metre below the lip. In the southwest corner two higher but smaller plinths (0.7m apart and 1.17m high) supported vertical cylinders and pipes. The two pipes, one high and one low entering the vertical cylinders were fed from the large cylinder opposite initially be a single overhead pipe before returning to ground level and dividing into two one for each vertical cylinder. Both pipes came out at the top, joining again and descending through the floor in the southwest corner (Plate 51).

The only other feature of note, 0.6m off the wall and with the rail underside at 4.77m up from ground level was a 3m long crane rail (SWL 1500kg); Not an original fitting evidenced by a supporting bracket attached to the truss above and disturbance to its anchor point in the brickwork in the south elevation (Plate 52). The rail ran above the line of motors and plinths and was presumably although nothing obvious was noted a hoist for associated equipment.

No visible means of a connection directly with the pool was observed, however the three inlets in the south wall of the pool almost certainly connected with the pipe in the south corner, and the deep chamber because of its depth and location, related to the filters at the deepest part of the pool.

The South elevation

The east side of the 5.17m long south elevation was plain Flemish bond excepting electrical switch boxes and pipes but the west side comprised two windows one above the other. The lower window 0.88m off the west corner was 1.82m wide by 2.13m high with 18 glass panes all painted light green, the same colour as the walls (Plate 53). Centrally and in line above was the smaller boarded window (1.22m wide, 1.3m high (sill level 3.5m from floor level)) with central wooden mullion; the opposite side is clearly visible from the squash courts balcony. Halfway between the window and the corner

the crane rail entered the wall. At ground level toward the opposite corner a low plinth supported a small motor.

This elevation was the only one in Flemish bond, the others were English bond.

The East elevation

The east elevation with four evenly spaced supporting pillars was also plain English bond brick. Of note was the presence of blocked centrally positioned air bricks 0.26m off floor level between the pillars; this was unusual as air bricks were only otherwise recorded on external walling. Below the brick a gap of 0.7m separated the black painted 'skirting' that marked DPC level. Disturbed brickwork allied with a difference in paint hue either side of the second pillar north of the south elevation indicated an opening now bricked up and that was confirmed from the cinema side.

Parallel to the wall and fitted into the north corner was a metal platform a (2.16m long metal, 0.89m wide) 2.46m up from floor level and accessed by ladder (Plate 54). The platform appeared to be the only access to a valve wheel on piping that extended through the platform floor and upward.

The most significant fittings, offset 0.3m off the elevation, were two large in line cylindrical water tanks each supported on four pairs of metal brackets with the southern tank starting 2.13m off the south elevation and its underside 0.48m off floor level (Plate 55). Each tank measured 6.8m long by 2.44m diameter with the 2.38m separation between the two an array of interconnecting low and high-level pipes and support rails; one low level pipe (0.2m dia.) extended along the east wall and through the north wall. Also located partly between the two tanks and extending toward the centre of the floor space, a ladder gave access to a lower platform with another ladder extending upward from it to approximately 4.8m high (similar height to the crane rail) to a high level platform supported on two girders, whose ends were inserted into the side walling; disturbance in the brickwork would suggest that these were secondary fittings similar to the crane rail. This platform held what appeared to be large concrete blocks suggestive of a counterweight but if so, nothing was readily apparent to provide confirmation (Plate 56).

Beyond the cylinders toward the north elevation were two low level plinths, the closest plinth supported an impellor motor connected to vertical piping at each end and the other plinth in the space opposite the entrance platform at a right angle to the other preserved traces of two circular fittings.

The North elevation

At lower level the north elevation comprised on the west the small office adjacent to the central double louvered doors to the anteroom and to the east at a lower level the pump room floor. At higher level and similar to that of the south wall was a louvre window (1.22m square) its centre 2.94m off the east wall (Plate 57); this opening was shared with a small room above the anteroom and only accessible by ladder from the rear of the cinema.

Two separate ladders at the north gave access to overhead platforms, one ladder fixed to the entrance platform rose to just above the uppermost level of the window (5.56m off floor level) with another shorter ladder off it rising further again (Plate 58). The second ladder to a lower platform was located close to the corner of the northernmost plinth which gave access to 2.46m high platform. Both platforms are assumed to be maintenance platforms for the pipes (Plate 59).

Alterations and Observations

The layout of the pump room appeared little changed from original including the plinths and the two large cylinders of which no present openings or possibly blocked openings appeared large enough to allow their later insertion, in which case that would suggest that the walls were built around them. The certain alterations were the blocking up of the wall in the anteroom and blocking of the 'window' in the east elevation, which was clearly visible from cinema auditorium, and the blocked windows in the south elevation.

Of interest, is the south elevation built with windows, when it appears that there was no intention for them to be used. If open, they may have offered some light to the pump room but not directly from an open source and likely insignificant with light from the overhead standard roof lights. The other side of the wall is shared with the squash court accessed from the sprung floor gymnasium where the lower window is completely hidden, and the only visible evidence of the windows is mainly the lintel of the upper smaller window. Even if the squash courts were an unlikely later addition, it seems unusual that one would need to see the pump room operation from the gymnasium. Possibilities for this unusual wall arrangement seemingly an anomaly is that the overall floor plan was not fixed at the time of building but built because it was on the' blueprint' or it was built with a specific purposed later abandoned. The upper window is inaccessible; its counterpart on the north is only accessible from a small room accessed by ladder and to a degree the function of that room is also in question particularly with the difficult access. The interior portion of the window is from the pump room evidenced by the sill. A similar scenario could be applied to the opening in the east elevation shared with the cinema.

All motor fittings were raised up from floor level on plinths and speculation suggests that it was precautionary to protect from possible water leakage. It was uncertain although likely that all the motors were replacements as were some of the piping tubes and electrical fittings modernised.

Manufacturers plates on the end of the cylinders bore the name' Bell Brothers Limited (Manchester 1927), Denton Manchester England' and along its length 'Suppled to the order of the Freeman Heating Company limited, 4, Golden Square, London W1' (Plate P).

Plate P. Bell Brothers and Freeman plates on the tanks

Given that the manufacturers are Bell Brothers the likely function of these tanks is as part of water purification and filtration for which they were well known in the 1930s. The quantity of chlorine varies with water temperature, number of bathers and water quality. This continued use of the Pump room for water purification was evidenced by chemicals and a testing/mixing station along the east elevation between the deep chamber and the office and demonstrating continuity of use.

There is long lasting suggestion that the pool was the first heated pool in Wales (Glamorgan Star), and this may have been so, but no evidence was found for a boiler house or a setting to heat the water either in the building or nearby, present modern northwest calorifier plant with recent equipment room excepted. The Cadw draft scheduling report suggested that Maindee Baths in Newport which predated the pool in St Athan was heated (Thomas 2024).

Pipes entering the wall in the northeast corner of the pumping room (linked to the large tanks and other piping) appear to lead out of the building and, still underground in a concrete capped channel, head east to the corner of the building then turn south toward the modern plant room on the east elevation which appears to be the main power plant for the structure (The now demolished water tower was just southeast of this building). It is assumed that, given the South Wales coalfield context, coal would have provided the fuel however other possibilities included oil or gas heating. It is considered unlikely that heated warm water would have travelled far from its heating source.

Records consulted in the National Archives make no mention of a heated pool but of interest is concern over excessive water supply and consumption and the correspondence explaining why high quantities are required. The swimming pool is first mentioned in a document of 13th April 1939 and so clearly the pool was in use at that date and mentioned later again also concerning water usage in April 1943 where 'Makeup water in Station Swimming Bath' is mentioned and in May 1944 where the 'Swimming Bath has a heavy load due to rubber dinghy training causing excessive backwashing of the filtration plant' and also in June 1944 the need to wash the pool filters frequently as cotton fluff from swimming fully clothed tended to clog the filters (AIR 2/14740).

There is no question as to boilers on the site either as indicated in 1942 correspondence related to hardness of the local water and its scaling effect on the boilers and high temperature plant, and again in May 1944 connected to 13 vertical boilers at the Bellman hangars that had been temporarily shut down with the possibility of replacing them with 13 new and larger boiler feed pumps: these feed pumps were installed by November 1944 (AIR 2/14740).

The Western Mail newspaper report of January 1939 reporting on the construction of the building mentioned the swimming pool but without reference to it as a heated pool and that would be very surprising if indeed it was to be the first heated pool in Wales which surely would have made headline news, and its absence may be telling. Glamorgan Star western mail

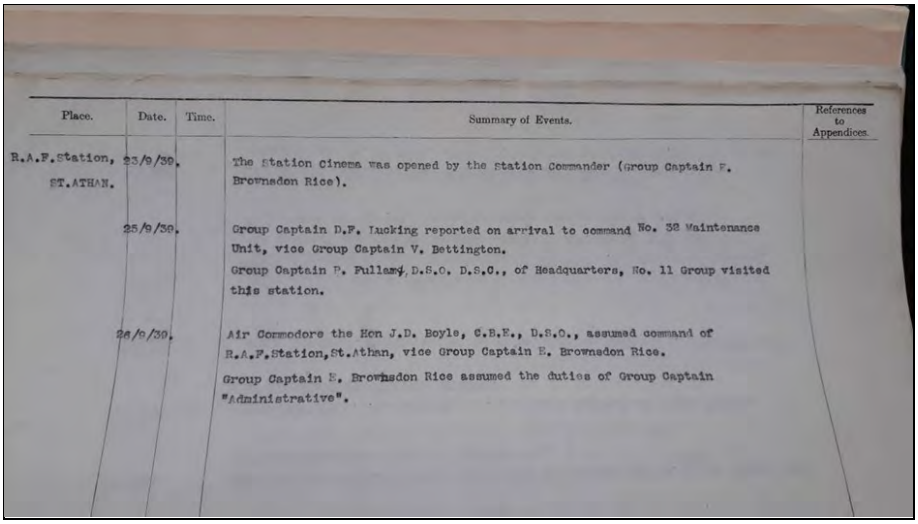
Phasing

The pump room is a single original phase and complemented the operation of the pool, but a secondary and likely early alteration was the blocking of the windows in the south elevation with the squash courts. Squash courts in themselves were normal on RAF bases (often as stand-alone structures often related to the Officers' Mess). It is likely that the Flemish Bond brick of the south elevation complete with windows was an initial internal division built in Flemish bond in keeping with the exterior, and perhaps as, yet it was not certain how the larger hangar space would be used as the upper window particularly seems anomalous although matching that of the room above the pump room anteroom where a room had been provisioned and the window louvred possibly for ventilation

rather than a window. The centre of the building, now the gymnasiums, was likely an open hangar space until subdivision into both gyms possibly in 1941 and that likely coincided with provision of at least one squash court. In the anteroom stretcher bond brickwork would suggest that the small WC and store abutting the north elevation were both later additions. A later again, and comparatively recent change indicated by breeze block, included the blocking of the anteroom opening with the cinema/theatre. The function of this opening seems unusual unless as a fire exit/ back door for stage players rather than for a cinema setting and it was closed off when theatre shows ceased in favour of cinema. Because it was unpainted and in stretcher bond the blocked opening in the east elevation was considered a recent change. Even so the purpose of this high opening is unknown and unusual in that it was over 2m high from floor level (near 2m high from stage level) and that there was little space between it and the large northern tank although its height, may have been related to the fact that half of its height was above the tank level.

Building 354. The Cinema

With its main 'public' entrance in the east elevation the northeast corner of structure 354 housed the Astra cinema; officially opened in September 1939 (Plate Q), originally the auditorium was for both theatre and film. Orientated east-west, internally it measured a maximum of 35m long (auditorium doors to rear of stage) by 27.35m wide. There were three entrances altogether (emergency exits excluded) with a side entrance of unglazed wooden doors in the same elevation further south of the main doors and another doorway in the north elevation near the northeast angle of the building which led to a semi-sunken room which had a flight of steps leading to the second storey. With its orientation aligned east-west it comprised three main elements, the foyer, the second floor and projection room and the auditorium and stage (Figures 5, 6, 8, 9 and 10).



Place.	Date.	Time.	Summary of Events.	References to Appendices.
R.A.F.Station, ST.ATHAN.	23/9/39.		The Station Cinema was opened by the Station Commander (Group Captain F. Brownadon Rice).	
	25/9/39.		Group Captain D.F. Lucking reported on arrival to command No. 38 Maintenance Unit, vice Group Captain V. Bettington. Group Captain P. Fullam, D.S.O. D.S.O., of Headquarters, No. 11 Group visited this station.	
	26/9/39.		Air Commodore the Hon J.D. Boyle, C.B.E., D.S.O., assumed command of R.A.F.Station, St.Athan, vice Group Captain E. Brownadon Rice. Group Captain E. Brownadon Rice assumed the duties of Group Captain "Administrative".	

Plate Q. Operation Record Book entry 23 September 1939 - Opening of the Station Cinema (AIR 29/736. No. 4 SoTT. Note this is a year after the official opening of the operational base (1st September 1938. No, 4 S of TT).

The Foyer

Symmetrically, with one each side of a central pillar, double doorways in the east elevation gave access to the foyer where a short flight of upward steps divided by a small plinth led to a central kiosk and separate pay box and on either side of them doorways to the auditorium and other ancillary rooms (Plates 60-62). In contrast to the walls and ceiling which were white the foyer floor comprised square

pink-hued grey terrazzo tiles with black edging separated by light green terrazzo for the steps and general edging. Linear cracks (subsidence) across some of the tiles were noticeable.

There were two rooms to the left (south) of the kiosk, the first via a single door opposite an auditorium entrance led via a short flight of steps downward to an office room (5m by 3.5m) that housed a safe supported on a stand positioned in the opposite corner of the room to the door and adjacent to the single window (Plates 63, 64); the assumption is that cinema takings were kept in the safe. The safe was manufactured by Samuel Withers and Co. Ltd, West Bromwich was inscribed AM (probably Air Ministry) No 484 with further numbering reading B984166/39 over 21c/1050 and the supporting stand supplied by Roneo Ltd, Steel Office Furniture, Romford, England (Plate R).

Plate R. Photos showing detail of the incised numbering and manufacturer of the Safe

To the south of the office and turning left through a right angle led to a narrow second room with a small hand basin and separate single WC (Plate 65). The only other WC facility in the cinema is a room off the corridor from the side door and for male use. The other room (lacking a urinal) was labelled for female use but perhaps originally it was also WC for the staff in the adjacent office.

To the right of the kiosk and beyond the entrance to the auditorium a single doorway led to an enclosed room (3m by 1.7m) most likely a storeroom with plain yellow painted brick walling and recent shelving. A probably recent ventilation opening present in the north face with the grill missing vented to a basement room in the northeast corner of the main building (Plate 66).

The sales kiosk (3m wide) which was central to the elevation (8.2m between the double doors on each side) extended 1.13m into the foyer and to its immediate left was the small window and wooden counter of the paying box. Modern heating radiators behind mesh were the only other features (Plate 60).

A pair of similarly sized double doorways (1.37m wide, 2.12m high with a small art-deco style viewing window in each door, on each side of the kiosk gave access to the auditorium (Plate 67). The manufacturers name stamped into the brass base plates on the pivot points for these doors and the front doors was PARWINAC (Parker. Winder & Achurch) Limited Birmingham (Plate S).

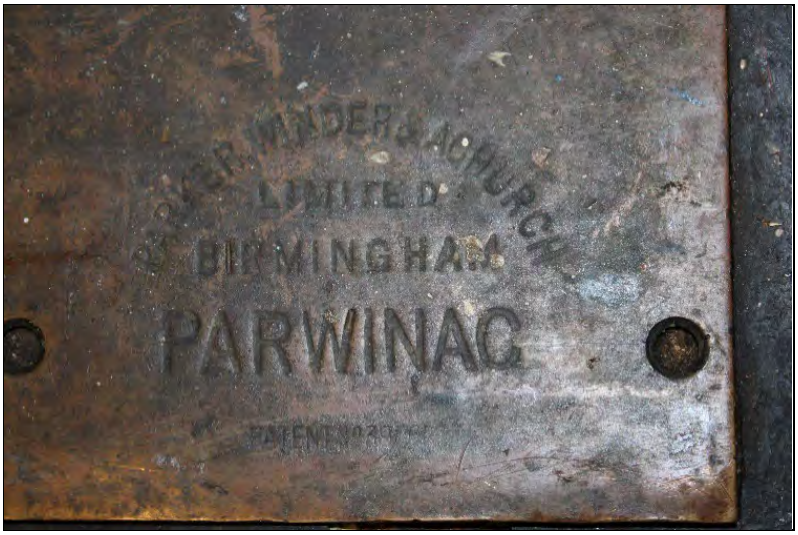


Plate S. Floor plate showing manufacturer of the foyer and auditorium doors

Alterations and Observations

Few alterations were apparent, however modern heating radiators apart, the kiosk of wood and glass appeared to be a modern addition adapted from what was another original auditorium doorway making three entrances/exits (each 1.37m wide,) in total accessed from the foyer entrance. A second room of similar dimensions to the extant pay box on the right of the kiosk had had its opening blocked off with the foyer. Its use may have been as a second Pay box or perhaps a sales window for refreshments and possibly the forerunner of the kiosk.

Cinema side entrance

Another doorway, approximately 6m south of the main entrance, provided another access to the cinema via a short length of porch, with a single door to a small plant room (2.5m by 1.2m) on the left with piping and valves, leading through unglazed double wooden doors to a corridor (1.52m wide) with male toilet on the right, then up via a short flight of steps to another room on the left and straight ahead a double doorway to the auditorium, and immediately to the right the main stairway to the second storey rooms, including the projection room (Plate 68). The male toilet contained original urinals (unnamed manufacturer) and a WC.

The other room off the corridor accessed by a single door was plain painted brick, 4.23m long, narrow (1.21m) and its use unknown except for piping and electrical gear continuing through from the small room to the east (Plates 69, 70). On the opposite side of this room a single doorway led to a small rectangular open space and the 'red lead' painted concrete staircase (0.84m wide) rising 2.44m over 13 steps to second storey floor level (Plate 71).

Second storey

The second storey directly over the foyer and its rooms comprised 10 rooms and two stairwells, a projection room with two rooms behind it in the centre, with partition walls separating them from three rooms and staircase to the south and three rooms, staircase and atrium to the north. All the floors were concrete and painted red, the scheme carried on from the stairs, except for the atrium which was unpainted, but in general the brick walls were cream coloured except for one painted pink and the other, the west wall of the projection room with the portholes which was matt black; a cement skirting (180mm high, 15mm thick) in gloss black edged the walls.

The south rooms

The short length of landing at the south staircase (Plate 72) gave access immediately on the right (south side) to an L-shaped room (6.88m long by 4.61m to 2.95m wide) illuminated by a large metal framed single window of three panes (original, 2.76m wide, 1.26m high, sill height 0.88m, sill width 0.3m to glass) and with another doorway at the west beyond the stairwell facing the projection room. The wall adjacent to the stairwell (2.5m high, stretcher bond) was without any fixings but interestingly the roof truss cut across half of the top course of brick which may indicate and building mismatch during construction with tolerances between steel and brick. This room of cream coloured Flemish Bond brick (main walls- south and west elevations), other than a modern electrical free-standing box and associated electrical boxes attached to the south wall, and four vertical pipes between the electrical box and the southeast corner (Plate 73) was plain.

There was no ceiling as such and the space was open to roof level leaving exposed the silver painted structural steelwork (underside 2.52m), the flat underside of the roof gutter troughs (4m above floor level), and wooden planks (starting 4.15m up) matching the pitch of the roof to the apex, 6.73m from floor level. This open roof space was common to these rooms on the south side of the partition wall with the projection room.

The second room off the landing to the north was mainly rectangular (generally 4m long by 4.5m wide but slightly wider adjacent to the window along the east elevation at 5m wide for 1.08m length); floor level cut across the central panes of the larger 3.75m high nine pane window. This room appeared to be a rest room with pink painted brick, a hand basin, mirror and boiler unit on the same elevation as the door. Other fixtures included a radiator located directly across the centre of the window and a downpipe in the corner. Any ceiling panels had been removed to reveal timber joists. The brickwork was stretcher bond at the south and English Bond along the partition wall (Plate 74).

The third element was not a room but an extension of and an opening up of the landing to become floor space leading to the projection room where a two-step flight of stairs (1.21m wide, 0.3m high overall) led through a single doorway in the partition wall (firewall) to the projection room (Plate 75). Affixed to the west wall opposite the step, was a large box ventilation duct, an extension of the duct from the Projection room, with its base 1.2m off floor level and its top at 4m. This duct one of two, the other in the atrium, vented the auditorium.

The Projection Room

The projection room raised 0.3m above the general second storey floor level measured 7.25m long by 3.18m wide and was open to roof level (6.28m to the internal apex). The throw distance (projector lens to the screen) measured 30.8m.

The room was accessed by three doorways one in the north elevation from the atrium, one from the landing area to the south and a doorway in the east elevation to another room. There was no projection equipment present nor any positive indication of projector position just a freestanding electrical unit; clearly the projectors must be opposite the portholes and a slot in the floor opposite the central porthole and a circular electrical opening was possibly the only remaining evidence of a projector position or its power supply. A single radiator provided heating (Plates 76-79).

Whereas the other walls were cream coloured, the west elevation (Flemish bond) which comprised the windows (portholes) between the auditorium and projection booth and electrical switch boxes and trunking, was painted matt black brick (to a height of 2.7m and a trunking conduit) with cream

above to roof level. Although there was no designation on the glass, cinema portholes are generally known to be thick double glazed optical quality glass set at an angle to lenses to reduce reflections, provide sound insulation and act as a firewall and as seen, the glass would match those qualities.

The six extant portholes arranged in diagonal pairs (0.5m between centres) across the centre and north half of the west elevation were set at two different heights with the right-hand porthole higher than the left, The three higher square (225mm) portholes were on the same horizontal plane with centres 1.53m apart with their upper edge 1.62m above floor level. The lower windows comprised a rectangular (610mm by 285mm) opening in the centre with its lower edge at 1m above floor level and two 300mm square portholes either side, the south 1.4m and the north 1.7m from its centre point. The centre opening had been painted black to leave a 225mm square porthole. Whilst the centre and north were on the same horizontal plane the south was higher at 1.2m off the floor. Although not all extant portholes were framed with a hand operated sliding shutter to close off unwanted light sufficient evidence remained to indicate that all originally had that shutter device.

At higher level (between 3.04m and to 3.7m) the elevation included a metal box duct (0.65m deep, 1m wide) that extended across the whole elevation. The roof space was otherwise open.

Alterations and Observations

Apart from overpainting the central lower porthole to leave a smaller window further alteration included a complete or partial blocking up to reduce an opening and removal of sliding shutters. Although not a proven porthole but within the same horizontal horizon as the others a rectangular opening 0.6m square under a 0.94m long lintel had been bricked up and north of it its top on the same plane as the lintel a 0.5m square opening had been reduced in size, now accommodating the extant 0.3m square porthole. As built, there were eight openings in the projection room wall.

Further alterations were present on the opposite wall on the north side of the doorway where a larger opening below a timber lintel had been bricked up and again another smaller opening within the original blocking (Plate 79). It is very likely that these low height (2.2m) dividing walls were a secondary build as they did not have the black edged skirting. These alterations were likely resulting from technological changes and the replacement of cinema projectors and possibly theatre spotlights.

The Projection room backroom

This rectangular room measured 7.24m long by 3.6m wide and was subdivided along its length by a 2m long wall toward the south to make a small almost square space 2.4m wide with wooden shelving along its west elevation. The south elevation was plain, and the east elevation comprised two likely original metal frame windows (three panes, 2.75m wide, 1.26m high, sill 0.58m off floor level) either side of a structural column with the panes blacked out; a radiator sat below the south window. The west elevation had a single doorway offset west of centre with a step down (0.35m) to another room beyond. The main room however was plain except for a metal clad table (possibly a splicing table) flush with the door frame and extending into the corner with the partition wall to the north.

Plate T. External view to south of the cinema backroom dormer

Plate U. External view to west of the dormer over the stage.

Roofing comprised cream-coloured wooden planks matching the pitch however an unusual feature, positioned almost central to the structural pillar along the east elevation was a wooden dormer style roof arrangement 1.95m wide with its flat roof 5.2m off floor level and of unknown purpose. A similar dormer roof was observed above the cinema stage (Plates 80, 81 and Plates T and U).

A manufacturers stamp on the bracing rail over the windows read Cargo Fleet England (Plate V). This is Cargo Fleet Iron Co Ltd, iron and steel manufacturers, Middlesbrough, England (1883-1970).

Plate V. Cargo Fleet manufacturers stamp in the cinema backroom

Room to the north of the backroom

This rectangular room, at a lower level (0.3m) than the backroom and open to the roof measured 4.9m by 3.9m. The north wall was plain, the east comprised a 2.72m wide large window opening (sill 60mm off floor level and 2.07m to the top) with floor level cutting across the central panes of the larger 3.75m high nine pane window which was similar to the rest room to the south, and two 150mm downpipes, 0.12m off the elevation passed through the floor. The south elevation had the doorway and steps to the room the projection rooms a metre from the west corner where there was also a downpipe (60mm dia.). The west elevation was plain with a single doorway to the atrium 3m from the south corner. The north corner had a 50mm dia. downpipe offset 0.5m off the wall (Plates 82, 83).

The lower part of the walls was cream painted brick to 2.38m high and above that plain red brick (notable the red and yellow brick colouring indicating brick stacking arrangements and firing in the kiln), cream painted structural steelwork, piping and the cream-coloured wooden planks at roof level. As with the backroom a bracing rail read Cargo Fleet England.

The Atrium

This small rectangular space (4.83m by 2.77m) of plain red Flemish Bond brickwork was open to the sky. In the east corner of the south elevation were the steps and doorway leading directly to the projection room and at the west side of the elevation at higher level the metal box flue that continued through to the projection room. Overhead, and on this elevation only, the roof slope extended for 0.9m (to the guttering trough) into the atrium space.

The west elevation, in effect half of a gable end, was plain brick to 'eaves' level (6.4m high at corner with the north elevation) with metal trunking (100mm square) affixed to it at 3.0m up. Offset and parallel to the elevation was a continuation of the projection room box flue which divided into two flues one rising higher and continuing through the south elevation and into the projection room and the other at lower level (base 1.2m off floor) turning through a right angle into the west elevation (0.3m off the south corner) ending in the auditorium.

The north elevation had a single door in the east corner directly opposite the door in the south elevation and to its west (0.28m) the box ducting. Of note was a 0.23m high concrete lintel over the door and box flue that extended across the whole elevation (2.77m) as opposed to the opposite

doorway with a 1.2m long 0.15m high lintel over the door alone. The remainder of the elevation above the lintel was brick to roof level (4.64m).

The east elevation was not notable apart from a single doorway 3m off the south elevation that afforded movement between the atrium and room to the north of the backroom (Plates 84-86).

Discussion and Observations

An original feature, the reason for the open space was not readily apparent. Access to the roof would seem reasonable as there were no external vertical ladders on the exterior elevations as one may have expected, given that they were present on the albeit taller workshop buildings. In the absence of other evidence, consideration was given to the idea that the open space may have been a fire break; Early nitrate film reels were known to be a fire risk. There were three ways out of the Projection Room - one could move to the south rooms and stairs or retire to the back room and move through the rooms to arrive at the Atrium or leave via the north door straight out of the Projection Room. Configuration and the number of the projectors is unknown but conceivably there could have been three to four based on the portholes.

The north rooms and stairwell

In line 1.6m from the doorway in the north elevation of the atrium was the top of a stairwell leading to a lower basement room and to the left and right of the landing two other rooms with exposed structural main bracing corner steelwork open to roof level. The floors were unpainted concrete, and the walls cream painted brick.

Northwest room

To the west of the stairwell an open a space 1.4m wide opened to a narrow rectangular room (4.93m long by 1.6m wide) that housed the box duct which crossed the room from the west stairwell sidewall, and turning through a curving right angle to run parallel to the west elevation where it joined through to the atrium (Plate 87). It appeared that the only function of this space was to accommodate the duct angle change as the base of the duct was low, at 1.3m above ground level whilst turning through the angle, before joining another box part at ground level (1.64m off the south elevation), and leaving little space to do anything else within that room.

The floor level cut across a blocked cement rendered window on the north elevation otherwise the north and west walls were brick to celling planks and lights at roof level.

Stairwell

The stairwell, located between the two northern rooms open to the ceiling led to a basement that formed the corner of the main building; a handrail was present on the east side. At second storey level the stairwell (Plate 88) measured 3.5m long by 0.82m wide, with a 2m descent to a 0.9m wide landing where it turned east through a right angle and another descent to the basement.

As with the room to the west, the stairwell west sidewall (0.1m wide) intersected with the cement rendered blocked window, 0.81m in from the east reveal.

The stairwell also accommodated a short section of joining ducting, with that in the rooms on each side and structural steel beams of the wind girder the underside only 2.1m off floor level) which passed through at an angle to the wall with the brickwork of the upper four courses of the side walls

accommodating the beam (Plate 89); the side walls supporting the flue stopped at the top level of the beam.

Northeast room

This room (4.9m by 3.3m), accessed by a single doorway, housed box ducting, a circular fan housing and the belt driven motor to drive the air circulation. The machinery and ducting occupied the greater part of the room with access to the north elevation itself, other than by crawling underneath, restricted by the ducts crossing the space.

The 1.8m high fan housing ('Keith Fan' manufactured Keith Blackman Ltd, Engineers London (Plate W) was bolted to a low 1.62m by 1.22m long concrete base was central to the north half of the room with its attendant motor on dampeners, central to it on a low plinth (0.88 by 0.48m) 0.17m to its south (Plate 90).

Plate W. Keith Blackman plate on fan housing and Bull on the motor

On the east side of the motor, a drive shaft entered a 2.08m long protective cage mounted on two stanchions and set at a right angle to the motor and fan, that housed one small and one large wheel, driven by four close set drive belts (Plate 91). The 'Bull' model motor made to B.E.S.A. 168/1936 standard and manufactured by ER & F Turner Ltd, Ipswich (Plate E). Both motor and fan appeared to have some age, but no dates were found.

Two flues one attached to the north elevation and the other from the east elevation, both drawing in external air, joined the fan housing on its north face. On the west side of the housing a circular outlet with adjoining fabric strip (likely for servicing access indicated by an adjacent vertical tube, possibly an oil dipstick) extended upward from near floor level to enter the sidewall of the stairwell as the first section of the air flow ending at the auditorium.

Ducting aside and a downpipe in the northeast corner, the west, north and east walls were plain. Attached to the south elevation however was an electrical voltage control box manufactured by AEM (Airedale Electrical & MFG. Co., Ltd., Bradford, England) (Plate X). These manufactures were all in existence in the latter 1930s and it is considered that these were perhaps original fittings.

Plate X. Airedale Electrical & MFG. Co., Ltd plate

Of note is the shorter width of the room at 3.3m to a brick wall rather than 3.9m in the room to the south, where the 0.6m difference is taken up by a continuation of the vertical steel bracing from the lower basement room which here has been bricked over with stretcher bond courses.

Lower Basement Room

Double wooden doors (1.5m wide) in the north elevation 1.8m from the northeast corner of Building 354 gave access to a Lower Basement which measured 10m long (north south) by 4.94m wide with a concrete ceiling 3.4m in height. The elevations were plain cream painted brick and the floor plain concrete. On entering immediately to the right was the flight of stairs to the second storey and the north rooms but just beyond that at 1.25m in from the doors were steps down to the general floor level, 0.45m below threshold.

At floor level were a series of in-line concrete plinths offset east of centre the largest (2.6m by 2.1m by 0.18m high with a slot at its north end 1.15m by 0.3m) positioned 2.5m from the steps with a second smaller but higher rectangular plinth (1.75m by 0.56m by 0.53m high), 0.3m behind it. A third plinth of irregular rectangular shape (broadly 2.1m by 1.6m) and only 0.075mm high off the floor was located 0.6m behind the centre plinth (Plate 93). Its eastern edge met next to a downpipe. A related unusual feature was a rectangular (1.96m by 1m by 0.85m high) concrete shelf built into the southwest corner of the room from floor level with an angled taper leaving the centre of the shelf and tapering 1.15m to abut the west elevation brickwork. A space under the shelf had been blocked up.

Basement elevations

The apparent recess of 0.28m deep with a downpipe in the north corner of the east elevation was caused by the blocking off with a single brick skin, the vertical X-girder structural steelwork that extended for 4.8m and which incorporated a structural column at each end; the internal width was 0.55m. To its south and supplying natural light to the room was a 2.75m wide window with sill height at 2m off floor level (Plate 94).

The south elevation (Flemish bond) was entirely plain apart from the shelf built into its west corner. The west elevation was plain except for a large alcove at 5.7m north of the south corner at 1m off floor level. The alcove measured 1.68m wide by 1.14m deep by 2.4m high to ceiling level (Plate 95). Continuing north from the alcove where the height of the elevation reduced gradually, mirroring the staircase above, and a parallel wall, structurally supporting the staircase 0.73m off the main elevation,

effectively made that north half into a narrow passageway. This passageway under the stairs continued along the north elevation (3.4m from the corner) reducing in height with the steps until unusually ending under the threshold itself.

Alterations and observations

The purpose of this lower room is unclear apart from providing another access to the second storey. The plinths, generally accepted from other evidence on site as platforms for motors, appeared unused without any indication of bolt holdings and because of that it may indicate that there never was anything fitted to them. However, if there was, it was difficult to see how anything was easily transferred out of the room given that the room was lower than general ground.

The purpose of the alcove and the corner shelf with its taper was again unclear. There was no indication that it served a purpose with anything at second storey level where it was directly under the landing at the top of the stairs in the north rooms and although attached to the cinema it may have had an unrelated function perhaps as a self-contained unit, a workshop/store, but the taper suggested that whatever occurred in this room required that adaptation for necessary function.

One of the observations made in the upper story because of the proximity to the steelwork was number of different manufacturers names stamped on the steel work and all are well known 1930s makers of steel rails and beams with Hallside and Cargo Fleet the most prominent, but others were Skinningrove and DL and Co (Dorman Long).

The Auditorium

The east-west orientated auditorium measured 35.6m from projection room wall to the back wall with the pump room by 27.4m north-south. Essentially it comprised a single large open space but within that it could be subdivided into five distinct areas, the stage and screen and a second storey room at the west, three original seating areas with aisles of which only the central section was in use, and an adjoining entrance aisle along the partition wall with the foyer, with access to the foyer kiosk, pay box, another small room and the doors to the corridor and male WCs. Other features of note were ten large rectangular boxed radiators along the seating aisles, two fire exits on the north elevation and two blocked exits on the south elevation that would have led to the solid floor gymnasium.

At the date of survey only the central seating tier was in use, enclosed by dark blue cloth shrouds that extended to the screen and masked the redundant seating areas to the north and south and the back of the stage.

Entrance aisle and projection room (east) elevation

The three doors into the auditorium, two from the foyer and the other the side door, opened to the aisle (conjoined with the seating aisles) that extended along the width of the room. Behind the kiosk it was at its narrowest width of 1.2m to a wooden partition screen 8.78m long, 1.58m high separating the central seating from the aisle.

The kiosk (2.1m wide by 1.9m internal) was central to the elevation and, and on each side of it was a separate small L-shaped pay box (1.7m by 0.9m internal, ceiling 2.2m) with a single door on the north and south elevations. The south pay box had remained in use, but the north had been boarded off and the room used as a storeroom (Plate 96).

South of the south foyer door and the aisle opened out to 2.3m wide and continued to the double doors from the side entrance corridor (Plate 97). The aisle continued to the north from the north foyer

door where it became wider (approximately 3m) to end at steps leading down to an emergency exit door, one of two on that side. To the east of the steps the aisle led to a single doorway and a small rectangular cream painted room (3.08m long by 1.7m wide ceiling 2.3m) of unknown purpose, with a single radiator just below the sill (0.9m up) central to the north elevation and a cement rendered blocked window opening. This room was directly below the room with the curving box flue.

The east elevation at higher level to the suspended ceiling (4.31m) to the south and north of the central kiosk block was plain cream painted Flemish bond brick whilst the central block rising to the projection room apertures was painted a lighter blue than the shrouds (Plate 98). The exposed elevation was slightly higher at 4.85m in the centre to the top of the large fan outlet grills (1m wide by 1.23m high) positioned directly above (1.22m) the doorways. Between them were the three pairs of projection room portholes and clearly visible from this side as opposed to the projection room, two blocked rectangular openings with the smaller under a lintel. Neither opening was similar in size to the portholes, both being larger, nor, although broadly on a similar plane to the portholes, their original purpose known; the presence of the lintel suggests another purpose perhaps a theatre spotlight.

The auditorium seating areas

Originally, raked seating and associated aisles occupied the whole of the auditorium.

The present seating in the centre which started 1.9m in from the foyer doors and stopped 5.35m from the stage edge, accommodated an audience of 352 people in 22 rows of 16 seats on a 22.2m long rake with a gradient of 1:15 (1.51m fall east to west). At the rear (east) for 5.1m, 5 rows of seating were further raised on a gradient of 1/28. This additional raised area was common to the redundant seating areas to the north and south where the raised floor was also angled inward to face the stage centre (Plates 99, 100). No record could be found for the original seating capacity, but numbers vary with different authors as Jones (2007) mentions 1200 seats and Thomas (2024) 900 seats.

Three different styles of curved back seats were present with 8 rows of leather or leather effect seating at the front, nine rows of dark red soft fabric seats in the centre and five rows of soft fabric blue coloured seats at the back; repairs noted were where several red cushions had replaced the original black cushion. Of the two different cast iron aisle end panels recorded, the greater number were circa 1920's gold painted art deco style curving vertical reeded line decoration (Plate Y), and the others circa 1930s art deco plain style (plausibly original but reset onto the present lino flooring), and all with wooden arm rests.

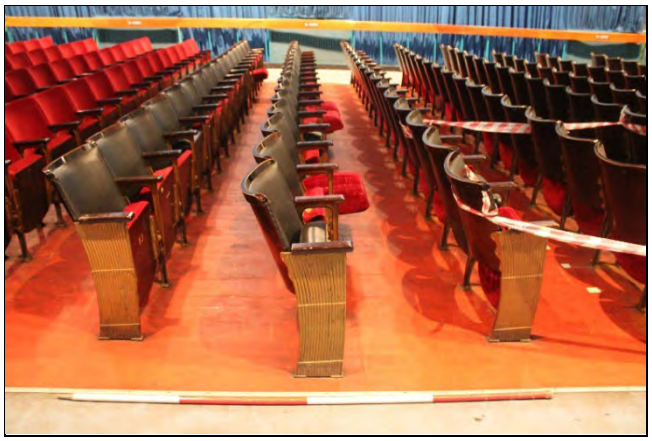


Plate Y. Reeded cast iron seating end panels

The blue seats were modern fabric on simple metal legs. Flooring within the seating area and adjacent aisles was of a vinyl-type overlying wooden planking with cream coloured vinyl for the aisle and across the front of the stage contrasting with pinkish red under the seats. Repairs and inconsistency apart, stylistically the aisle ends would not be out of place for a late 1930s building and in essence these were likely original seating frames.

The present seating area was enclosed by a wooden handrail (1.07m high) demarking the edge of the 1.9m wide aisles on each side of the seating, and immediately behind the rail, the floor to ceiling blue curtains, and interrupting the curtains at the same height as the handrail, 5 opposing radiators in rectangular housings (1.86m long by 0.5m wide) on each side with their open mesh facing the seating. A permanent fire exit route with handrails was located between the two radiators closest to the stage on the north side aisle.

The now redundant seating area behind the curtains on the north side was divided into three areas of which the central area was used for storing old and replacement seating, which was stacked between the two fire exit routes that led directly out of the building through the north elevation and the other two separated from the centre by fire exit routes (Plates 101, 102).

Flooring throughout comprised tongue and groove reddish-brown wooden planks (89mm (3.5'') wide by 22mm thick) and at least up to 4.04m long and laid parallel, including the raised areas, with the rake to the base of the slope (and thereafter changing direction through 90 degrees to lie parallel to the stage.

Of the three areas, that closest to the stage was made generally inaccessible by the handrails but of interest is that the piping to the radiator housings is above floor level, which would have impeded passage (Plate 102). As there was no clear indication of any seating having been attached to the floor, except perhaps for just one row adjacent to the handrail, it is possible that this area may not have been used for an audience; a secondary consideration for the suggestion is that the viewing angle to the stage becomes more acute the closer to the stage and as such undesirable. That aside the heating itself is almost certainly considered a later fitting as it only provides heating toward the central area.

The central area, including the irregularly shaped raised seating area (5.7m east-west by 5.3m with the east 0.27m high reducing to 0.06m at the west) at the east and in front of the handrail to the north fire exit was plain; of note was that the raised areas respected the radiator housings to leave a clear space around them and that would suggest that the raised areas were a later phase than the heating (Plate 103).

The remaining area was defined by a handrail at the east, and which marked the difference between the rake and the flat floor to fire exit and room beyond in the east elevation.

Auditorium north elevation

The main features along the north elevation (28.5m long from stage to the projection room elevation) were two fire exits, structural pillars (0.92m wide) and seven blocked window reveals. The fire exits were similar in build both with short lengths of brick side walls (1.5m long) enclosing steps (1.47m wide) but because of the rake the western exit had steps leading upward to outside ground level and the east steps downward to ground level. Of the blocked windows five were fully visible with the ones at the west and east partly masked by stage screening or walling respectively. Sills, although on a common plane, varied in height from floor level because of the slope, with the west at 2.4m up

reducing to around a metre up at the north fire exit. The full height of the windows masked by the suspended ceiling were consistent and all 3.45m high sill to ceiling (Plates 101, 102).

Auditorium south elevation

The redundant south seating area matched that to the north except that there was no extant fire exits routes (Plates 104, 105). The main difference was in the south elevation, the wall dividing the cinema from the stone gymnasium. The elevation was distinguished by four pillars (centres approx. 7.3m apart) and two blocked openings, both toward the west and the stage. One, now blocked with breeze ,7.5m from the stage, and opposite a similar fire exit in the north elevation was also intended as a fire exit with steps up and brick side walls, and indeed a removed exit sign was indicated by paintwork and electrical trunking (Plates 106). The second blocked opening (1.3m wide, 2.2m high) again with breeze, was a plain rectangular opening with a single step up (0.15m) and located immediately adjacent to the stage (Plate 107). Both blocked openings were visible from the gymnasium side with the definite fire exit opening at full height (2.0m) but the other was low at only 1.45m high. The steps necessarily account for the gain to regular floor level with the fire exit but the other opening at only 1.45m high on the gymnasium side seems somewhat anomalous and not intended for passage of people as it was too low. Indeed, another factor is that the wall is not wide enough to accommodate reasonable height steps to provide the rise.

The pillars in stretcher bond were of interest and interpreted as buttresses (Plates 105, 106) as they mirrored the slope of the rake, did not rise to ceiling level and from 4.9m high their tops were finished in 7 courses of pyramidal stepped brick (0.5m high overall).

The main south wall in Flemish bond indicated an original planned wall built prior to any other sub-divisions such as the gymnasium division. Stretcher bond appears to have been used for later adaptations.

The stage

The stage, with its floor recently boarded (probably replacing planks), at 1m higher than floor level at the base of the seating rake, occupied the western part of the room and measured 7.7m in depth generally, from the front of the stage by the full width of the room at 27.4m; the north end was wider at 8.8m (Plates 100, 108). The suspended ceiling of white coloured tiles was 4.86m high from stage level. Original access to the stage platform was from opposing wooden steps 2.3m in from the main walls to the north and south where the steps were central to and flanked by wooden side screens 4.9m long at the south and 5.2m long at the north (Plate 109); the screens masked a vertical steel column at the south and vertical bracing at the north. A more recent and movable flight of steps abutted the stage just to the north of the seating area.

In line with the seating 2.85m back from the edge, the stage supported a large curving screen (8.8m wide screen by 5m drop (4.45m high visible screen height). Plate 100) tied to and supported by a tubular metal framework (10.65m overall length) on four small solid roller wheels. A motor, manufactured by RAE Stage Equipment Ltd. Lant St., London SE1, attached to the framework at the north operated the screen curtains with options for wide screen (1950s on), cinemascope (in use from 1953) or side masking (Plate Z).

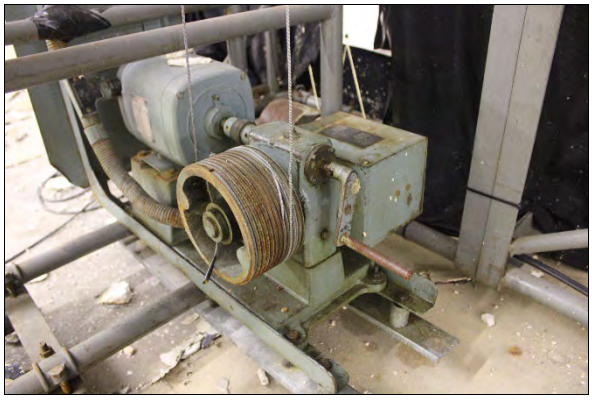



Plate Z. Screen curtain motor and RAE manufacturers plate

https://www.layersoflondon.org/map/records/lant-streety the late 1950s it was used by cinema engineers, Rae Stage Equipment.

To the south of the stage and 0.5m off the side screen an exposed vertical steel column comprised of two H-shaped members (0.68m by 0.39m wide overall) with a 0.15m downpipe on each side rose from below stage level to the ceiling (Plates 110, 111). Manufacturer Skinningrove England (also stamped British Steel and 15 x 6 x 6 x 45 LBs) on the upright and Cargo fleet on a side piece.

Although not proven entirely as its was boxed over, circumstantially, 20m to the north and again just behind the wooden side screen was another vertical column, however here it supported exposed vertical X-frame bracing similar to that found in each corner of the main building; the framework extended for 5.06m from the north wall to the boxed off column (Plate 112). Skinningrove England was the manufacturer's stamp on a horizontal member.

Only at the north and west, the stage area extended back for 1.1m depth (8.8m overall distance front to back) over 4.8m, with at floor level a series of metal access plates for piping, as indicated by an extension of the line matching the alignment of two pipes in the pump room; the pipe line extended to the exterior of the building. In association with the pump room, a narrow steep ladder rose from stage level to a 2.88m high platform to give access to a second storey room over the foyer area of the pump room (Plate 113).

The second storey walls which were cream painted brick, was open to roof level with its ceiling planks and roof lights. There was nothing of note at floor level which comprised 0.18m wide pine planking in this 4.8m long by 4m wide room but the south, west and north elevations supported a metal box flue 1.81m off floor level, and its top just below the exposed structural wind girders (2.22m up), with its entry/exit point within the UPVC window (1.83m wide, 1.28m high, sill at 0.9m up) central to the north elevation; modern electrical switch boxes and trunking were also present (Plate 114). Above and clear of the horizontal wind girder, lagged piping came through the west elevation and ran parallel to the elevation to enter the pump room; two redundant cut off pipes were visible in the west elevation (Plate 115).

Opposite the main window in the south elevation, a smaller (1.22m wide, 1.3m high, sill 0.9m up) wooden framed slatted opening afforded a view of the pump room. This opening matched the 'blind' window in the south elevation of the pump room. The small loft hatch, noted in the pump anteroom and below this room, was not visible in the floor (Plate 116).

This room, given the restricted ladder access only, may have been purely for maintenance and ventilation purposes for the pump room indicated by the slatted window (missing slats) and box flue.

Whilst at the stage end of the auditorium, it seems convenient to account for the elevations behind the auditorium screens. The south elevation was plain white painted brick with a radiator in the corner with the west wall. The west wall itself was plain brick (English bond) apart from a blocked 2.28m wide (header courses, 1.78m high, 1.95m off floor level) likely window opening 12.5 m from the south corner (Plate 117). A further 7.8m to the north of the blocked opening the elevation stepped back 1.13m at a right angle and then continued north for 4.8m to the corner with the north elevation. Within this recessed elevation at 0.75m from the south corner and underneath the platform to the room above, a 1.54m wide opening, originally opening to the pump room anteroom, had been blocked with breeze (Plate 113). Along the north elevation, between the corner and a pillar supporting the stand-alone structural X-frame, were two window positions (2.76m wide, sill height 1.41m) both blocked and with panelling to mask the blocking rising to the suspended ceiling height of 4.86m; each window had a radiator centrally below it (Plate 118).

A feature of note was a suspended hand cranked wheel probably for rope operation located opposite the ladder but with no visible access to it for operation (Plates 119, 120), and observed where ceiling panels were missing, apart from open structural steelwork to roof level, the position of another dormer roof, like that installed behind the projection room. Also, and probably related to the suspended wheel, additional overhead steelwork appeared to be scaffold bars and similar for rigging lighting and typical of a theatre and although no longer used as such the dimensions of the stage indicated a former use for theatre performance or as a platform for addressing a large audience more so than a cinema screen. Theatre shows are attested in National Archive documents A 1942 poster in the South Wales Aviation Museum (Plate AA) collected from the cinema advertises a February theatre performance but even though St. Athan is not mentioned by name, the name of the Station Commander, Air Commodore J.C Quinnell DFC is printed and that accords with known Station commanders of No. 4 S of TT at that time. Astra was the default name for RAF cinemas but on west camp within No 32 MU lines there was another cinema/theatre named the Athenaeum (Air 29/1492).

Plate AA. 1942 theatre advert from the Astra Cinema (South Wales Aviation Museum)

Alterations and observations

The cinema complex in general appeared to have had few significant alterations assuming that the windows in the north elevation had always been blocked for darkness as it was a planned cinema/theatre from the outset. Where they occurred, it was more an infilling of the exits along the south elevation with the stone gymnasium, abandonment of north and south seating areas, replacement flooring with original seating reused, changes to the kiosk and the north pay box, recent boarding of the stage and infilling of openings with the pump room. The cinema screen appeared modern but the framework earlier as a motor for side curtains gave options for wide screen and cinemascope, both 1950s developments. Reduction in the seating capacity and reducing the auditorium viewing area must have been in tandem with provision of the shrouds and probably the box radiators along the sides.

Phasing

No definitive phases were determined other than those changes already observed but separating when those occurred has not been resolved.

Building 354. The Gymnasiums

The greater and central part of the footprint of building 354 was taken up with two adjacent gymnasiums orientated north-south, separated by a dividing wall and colloquially named, the stone gym (rubberised (polyurethane floor) and wooden (sprung floor) gymnasium after their floor surfaces; the stone gym on the east side and the wooden gym, the west. They were similar in many respects, characterised by being large rectangular open spaces with structural girders, trusses, beams and the roof, open to view, and with the exercise floors marked out with sports track, courts and pitches (Figure 5).

The Stone Gym (east side)

The Stone gym which measured 91.25m in length, including a suite of changing rooms at the south, by 36.6m wide, was free of any fixtures attached to the floor; the exercise area itself measured 85.8m in length. The floor which comprised a flat rubberised surface was marked with three RAF roundels, a 2-lane running track and sprint lanes, 5 a side football pitch, hockey pitch, reddish-brown rectangles for tennis courts and cricket nets practice areas at each end. Netting rails to separate the sports were attached to the walls and beams and drawn or opened by hand as appropriate (Plates 121 to 126).

Elevations

North elevation

The north elevation (Flemish Bond) shared with the cinema comprised four structural brick columns (7.3m between centres) supporting trusses, a blocked doorway (cinema fire exit, 1.4m wide) stepped out 0.35m off the line in the centre of the west half of the elevation, and close to the northwest corner a low level (1.34m wide, 1.45m high, under a heavy duty 1.85m long 0.39m high lintel) blocked opening, again to the cinema (Plates 125 to 128). At the east, two parallel pipes 2.25m up from floor level entered the gymnasium from the cinema side, continued west for 3m before rising upward above the truss level and continuing west.

East elevation

The main features of the east elevation (Plates 129 to 134) were five lattice girder stanchions at 18m intervals, drainpipes, five intermediate columns (18.3m centres), six large nine pane windows (2.72m wide) in the centre, two on each side of the double metal clad doorways (2.75m wide) with smaller 6 pane windows over the doorways; originally there three similar doorways along the elevation but the one in the northeast corner was blocked (Plate 129). To the north and the south of the centre were the infilled airframe wide hangar door openings (Plate 131) with a large sliding hangar door (rail length 14.92m, 0.55m wide. Plates 132, 133, 134) central to the south and a small single fire door central to the north. The wall between the fire door and stanchion offered climbing opportunities with brick arranged for hand and toe holds (Plate 130). All the windows were blanked out with white paint and mesh protected against glass breakages from ball games.

South elevation

Single storey changing rooms, showers and WCs separated by a heating /generator room (no access) spanned the whole width of the south elevation (Plate 135 to 137). The facilities extended 5.5m north of the elevation for the greater part (29.5m) of its width (single skin stretcher bond brick), with the east side, built with breeze, stepping out a further 1.85m over 7.5m (Plate 136). The changing rooms open to the roof were protected by metal mesh raking down from a height of 3.7m on the back wall with the fitness suite, to 2.75m high at the front wall and 2.46m high at the east rooms. The WCs were fitted with suspended ceilings 2.35m high. The main elevation dividing the gym from the Fitness Suite was built in Flemish bond brickwork to match that of the north elevation. This indicated an original first phase division maintaining the style of the original exterior elevations.

The heating /generator room which was 3.85m high by approximately 3m wide (Plate 137), divided the changing rooms and showers (13.5m overall, 8.8m long changing rooms), which were near mirror images of themselves with wooden benches along the walls, alongside back-to-back wooden benches in the centre separated by a low wall (1.7m high, 5.7m long); the showers backed onto the heating /generator room wall. The difference with the changing room on the east compared with that of the west was the addition of a separate ablutions room (approximately 3.7m square with 2 cubicles, urinal and wash basin) occupying the corner of the east and south elevation. Adjoining the ablution to the north was another separate ablution with similar facilities and adjoining that to the west, a separate utility room (3.5m by 1.7m) with Belfast style sink (0.61m by 0.46m) in the southeast corner (Plates 138 to 147).

The south elevation provided direct access between the gym and the Fitness Suite passing through the east changing room to do so. The west changing room was once similar, but its Fitness Suite doorway had been blocked, to leave just one doorway to/from the gym (Plate 145). The other access from the gym to rooms at the south was an antechamber (2.8m wide) with a single door from the gym directly opposite double doors to the Fitness Suite and a single door to the wooden gym through the west dividing wall (Plate 148).

West elevation

There was nothing particularly distinctive along the English bond west elevation to roof height which longitudinally divided the gymnasiums (Plates 149 to 154, south to north sequence). Matching that of the east elevation and directly opposite were five lattice girder stanchions (each having a 0.15m diameter vertical drainpipe on each side), and five intermediate columns. There were four doorways overall, three of single width and a larger double doorway (2.45m wide, 2.7m high) with metal doors

in the centre, 46m from the north corner (Plate 151). The bonding is suggestive of a secondary but early phase when the central space was divided for the two gymnasiums.

Overhead detail

Roof level marked by the steelwork was also differentiated by a difference in paint colour from light blue below to cream above the steelwork and netting to arrest wayward balls from damaging roof lights and lighting strips fitted to the trusses. Internally, the roof, clad with white panels apart from the north facing roof lights, measured 9.25m up from floor level to the apex. The lattice girders, the lowest element of the roof steelwork was 5.2m from floor level, the trusses (north-south orientated, 11 in number, centres averaged 3.6m spacing (approx. 12 feet)) from 5.25m extending to 6.8m at the valley and 9.25m the apex, the tie beams 5.25m and the underside of the roof gutters, 7m from floor level.

Alterations and observations

Consensus seems to concur (Francis 2024 and Thomas 2024) that the wall dividing the gymnasiums was a secondary but still early wartime phase and that may be evidenced by use of English bonding rather than Flemish bond as one may have reasonably expected a continuation of the Flemish bond from the north elevation to continue along the gymnasium divide. The infilling of the large hangar openings of which there were two in the east elevation is post-war and post 1962 (based on an aerial photograph Plate EEE) in date. Certainty in date is also lacking for the changing rooms along the south elevation and although modernised they may be of the same vintage as the gym dividing wall, both being in stretcher bond brickwork. If these changing rooms were not original, then there were no obvious changing rooms for this gym, nor was it clear that the changing facilities in the wood gym were original.

There is the very strong possibility that there were no original changing rooms, as contained within routine orders record from 1940 (28/2/1940), is that trainees will parade outside squadron offices in PT kit (in the event of inclement weather boots will be worn and gym shoes carried) to be marched to the gymnasium (Air 29/736).

Personnel paraded in sports kit directly from the barracks (a practice from personal experience that was prevalent in the 1980s).

Phasing

The first phase is the main north and east walling and supporting roof columns, followed by the division on a north-south alignment to create the gymnasiums. Tertiary phasing is considered the infilling of the wide hangar openings (post 1962) and lastly the changing rooms and WCs with an additional room later added to these, but there is still the possibility based on brickwork bonding, that the changing rooms were initially provided with the gymnasium.

The Wooden Gym (west side)

The main rectangular space of the Wood floored gym measured 36m wide by 82m in length from the church (Faith Centre) at the south to the wall with the swimming pool at the north and its two-storey range of offices, and a pair of east-west orientated squash courts that further extended the length locally in an L-shape by 9.2m. The sprung floor (hardwood tongue and groove possibly maple, 18mm thick (0.75 of an inch) (Plate BB)) comprised 70mm wide (2.5'') staggered planks at least 6.18m long with markings for racquet, basketball and volleyball courts with two painted RAF roundels in the

centre towards each end. The playing surfaces of the wooden floor was a light brown varnished whilst for edging darker brown varnish was used (Plates 155, 156).

Of note was the wide (15.5m) and high (5.4m) hangar sized opening in the centre of the south elevation infilled and provided with folding doors to form the church and the two infilled aircraft sized openings along the west elevation mirroring those in the main east elevation. Walling was light blue throughout to roof level with white panels cladding the roof itself.

Plate BB.Cross section of the sprung floor timber and plan view of the varnished surface

Elevations

The North elevation

The two-storey suite of offices started 5.4m in from the west elevation and extended for 20m east to a corridor leading to the squash courts. A flight of stairs (13 treads) at each end of the suite gave access to the upper floor (2.46m up) and the squash court balcony (Plates 157, 158). The rooms were all similar with modern windows, doors facing the gym and few fittings. The windows on the ground floor were square (1m wide by 1m high, sill level 0.97m up) and the upper storey similar but wider at 1.12m and all windows had the lower portion frosted with the circular emblem of the RAF Physical Education Flight. The ground floor in English bond brick comprised four rooms, and on the west side a 1m wide, 3.9m long corridor to the pool (Plate 159), whilst the second storey, built with plasterboard, comprised five rooms.

The brick English bond elevation to the west of the offices was plain however conduits and cabling excepted, offset off the wall and between the stairs to the second storey was a large electricity generator within a protective cage (Plate 160). In the absence of any similar plant it is likely that this power plant may well have been the primary electricity supply for the building.

From west to east the first ground floor office annotated as Training Office (function from original Fire Plans in the building) with a single door and two windows measured 4.37m wide by 3.7m by 2.5m high, the depth and height common to all the lower rooms (Plate 161). The second and largest of the lower rooms at 8.1m long with three windows was the Sports Store. This was the only room of the suite that had a different doorway being fitted with 1.52m wide split stable doors (Plate 162). The next room, an APTC Office, with a single door access from the gymnasium, measured 2.7m wide. Apart

from a window facing the gym, there was another window in the opposite elevation to view the swimming pool (Plate 163), and a doorway flush with the elevation gave access to the remaining room (Staff Locker Room) of similar size and again with windows to the pool and gym in the front and rear elevations. Whereas the other rooms were cream coloured this office was blue over pinkish brown (Plate 164). The doorway to this room, opposite the internal doorway between the rooms, was from the squash court passage.

The first office from west to east along the second storey and built over the pool corridor was the JNCO and HA Training Office with a single doorway and window (Plate 165). It measured 2.8m wide by 3.7m in depth with a height of 2.41m to the suspended ceiling; the depth and height was common to all the upper offices. The only distinguishing features of this office were 4 bolt fixings for the pool roller cover mechanism and a sliding hatch opening 1m off the floor between this room and the adjacent SNCO office with a single doorway and two windows which measured 4.25m in width (Plate 166); this room was painted blue grey. The central office Ped O Office (3.95m wide) not only had a single door and two windows facing the gym, but a window in the back wall overlooking the pool. Bolt fixings for the pool roller covers were also present (Plate 167).

The fourth office was the Pool Manager's Office measuring 3.6m wide with a single doorway and window and the last and largest room (Ped Crew Room, 5.1m wide) with single door and three windows facing the gym also had a blocked doorway to the squash court balcony. This room was fitted with a kitchen sink and worktop and the only other fixing of note were bolt fixings for the pool roller covers (Plates 168-170).

The squash courts

The two squash courts aligned east-west on the east side of the offices were enclosed by the wall to the swimming pool to the west, the wall to the pump room and cinema to the north and to the east, the stone gym (Plates 171-173). The brick stretcher bond south elevation was slightly longer extending 0.17m into the gym space than the offices east-west alignment and panelling above the sloping court side matched the height of the upper storey offices. Each court 6.4m wide by 9.8m long was defined by sloping side walls, with the higher side at the east (4.91m high) reducing to 2.5m at the west, although the wooden balcony panel above raised the enclosed court to 3.54m. Access to the courts through a doorway central to each court in their west elevations was from a blind passage 0.8m wide, 13.2m long by 2.5m high (Plate 174). A single doorway 4.6m along the passage on its west side gave access to the pool. Overhead, the viewing balcony extended to the north wall with the pump room where the blocked off windows were clearly marked by lintels (the lower 2.3m long, the upper 1.6m long and both 0.23m thick) and blanking panels (Plate 172). The top of the lintel to the larger window from the balcony floor was 0.9m and the upper lintel of the smaller window 2.8m (6.4m from squash court level).

The East elevation

There was nothing distinctive along the Flemish bond east elevation which longitudinally divided the gymnasiums, other than it was used to affix gymnasium equipment along all its length (Plates 175-180).

The main metal doors of the four into the gym from the east opened into this gym (Plate 176, 180). The 5 lattice girders stanchions continuing west from the stone gym were flush with the elevation and only differentiated by their smooth shuttered concrete clad exteriors contrasting with the brickwork, and except for the south and north stanchion the other three were partly obscured by the vertical

woodwork supporting horizontal beams (4.42m off the wall) manufactured by Spencer, Heath and George Ltd, Ponders End. Middlesex (Plate CC): In addition, the trusses of the four intermediate steelwork columns were used to support climbing ropes which were suspended from a secondary rail and which extended out to match the beams (Plates 178, 179).

Plate CC. Spencer, Heath & George Ltd plate on gymnasium equipment

Although unnamed but likely the same manufacturer, were five gymnastic ladders (4.27m long 2.8m high divided into seven divisions) fixed to the wall, four to the south of the centre and one surviving to the north, however the indication from old fixings was that there were two more ladders, but since removed and replaced by metal frames for suspended punchbags.

Spencer, Heath & George Ltd designed, patented and manufactured a range of goods including gymnasium equipment and "medico-mechanical" apparatus, between 1900 and the 1950s.

The South elevation

The distinctive elements of the brick English bond south elevation were the wide (11.1m long by 3m high) wooden folding doors (concertina folding, 13 in number) inserted into a wider (15.5m) and higher blocked opening under a 5.9m long lintel (5.4m high) with rendered walling (2m wide) abutting brickwork on each side of the doors, an opening (1.5m wide, 2.13m high) 5.3m east from the folding doors with stable doors to a briefing room, and 5.25m west of them, a corridor opening to WC, shower and changing facilities and adjacent to that, a later classroom (PEd Fit Classroom) in the corner with the west elevation (Plates 181, 182, 183). The wooden gym floor abuts the south elevation.

Of note was a blocked doorway (1.9m high, 0.92m wide) with two heating pipes passing through the opening at second storey level (3.49m up from floor level) 0.25m off the west elevation. There was no indication of any ladder or stair access to that opening and like the apparently always redundant windows in the squash court /pump room built but never used as a doorway.

The Physical Education Flight Briefing room

Labelled as Physical Education Flight Briefing Room this near square shaped room with stable doors, which measured 7.3m by 7.1m with a suspended ceiling at 2.4m, was created from a larger room with its south wall of plasterboard in contrast to the other walls of English bond brick. A single blocked doorway gave access to the room behind now part of the Church/Faith Centre rooms. Features

included two supporting structural columns and horizontal electrical trunking with switch sockets on all walls (Plates 184, 185).

The PEd Classroom

This classroom adjacent to the 1.2m wide corridor opening, constructed of plasterboard with a pine clad exterior (2.8m high), extended 4.7m into the gym from the elevation; a chamfered angle (0.86m long) marked the return to the west elevation. Internally the room measured 4.63m north- south by 5.1m with suspended ceiling at 2.4m. Features of note and all part of the main west elevation were a stanchion, downpipes in the corners and the sill (1.55m up) and lower panes of a main window, the upper panes hidden by the false ceiling (Plates 186, 187, 188).

Male and Female WCs and shower facilities

The changing facilities to the west of the Faith centre and separated from it by a single corridor aligned north-south (9.9m long, 1.19m wide. Ceiling 2.72m high), comprised three separate rooms all accessed from single doors along the corridor (Plate 189). All rooms were fitted with modern facilities, walls were clad in panels, and all had a suspended ceiling (2.68m high) with lighting.

The room (7.2m by 3.4m) at the south accessed from a doorway directly in line with the corridor was for male use with three showers and three urinals on the back wall, three hand basins along the west elevation below the UPVC window and a single WC cubicle inset into the north wall. Flooring was anti-slip vinyl (Plates 190, 191).

The central rectangular room was a plain shower room (6.16m long north-south) by 4m wide) with a recess (0.4m deep, 0.85m wide) at the southwest corner; the recess matched the width and was in line with the WC in the male facilities. The only fitting was a screen opposite the shower heads which were attached to the north wall (Plates 192, 193). The walls were panelled and there were no windows in this room.

The remaining room at the north was for females and slightly smaller in size (6.2m wide by 3.5m) than the male facility. Nearly all the fittings, starting at 2m in, were along the south wall, where two small individual shower cubicles, a hand basin and WC, were all separated by partitions. The WC adjacent to the main window was mirrored along the west wall with another WC of similar size on the north wall. Decoration was pink partitioning with white walls and a reddish-brown anti-slip floor vinyl; the male room was finished with blue flooring and blue screening (Plate 194).

The West elevation

The key structural features of the elevation which measured 77.2m from the PEd classroom to the wall with the swimming pool were the two wide infilled English bond airframe hangar openings, windows n in the centre along with a modern entrance foyer and office and four entrances. These features mirrored those of the main east elevation (Plates 195, 196, 197).

The infilled south hangar opening (17.2m between two lattice girder stanchions) was plain except for a single central fire door. In the centre arranged over 36m and again between lattice girder stanchions were three pairs of large windows with entrances between the pairs. The south entrance (2.75m wide) was fitted with a metal 3 panel folding door (Plate 198) with overhead external plate and rail guides (the doors dated 03 September 1991 manufactured by Rhino Doors LLandybie, Ammanford, Dyfed. Plate DD)).

Plate DD. Door manufacturer plate for the west elevation south doors

The north entrance was incorporated into a flat roofed plasterboard and glass foyer (9.2m long by 3.18m by 3m high). Adjoining the foyer on the north was a smaller office (5.5m long). The second (north) of the infilled airframe hangar openings was plain and fitted with double doors in its centre. Between the blocked hangar opening was a single large window in the corner with the swimming pool. Other features were internal downpipes (0.15m diameter) adjacent to the stanchions.

Newer fixings included as series of metal cages arranged over 27m (2.4m off the wall, 2.23m high front, 2.5m high rear) between the PEd classroom and the folding doors. A difference in local ground level was noted between the cages and the single door where the floor sloped down 75mm over 2.3m to a step at the door; the remainder of the floor was flat (Plate 202). The cages also demarked the edge of the wooden gym floor with a concrete strip that ran parallel to the elevation.

Overhead detail

Roof level demarked by the steelwork was a direct continuation of the steelwork from the stone gymnasium (Plate 203). No netting was installed to protect the roof lights nor the lighting strips fitted to the trusses. Internally, the roof, clad with white panels apart from the north facing roof lights, measured 9.25m up from floor level to the apex. Three of the lattice girder stanchions supported rails for the manual dividing of playing areas by netting.

Alterations and observations

The major alterations noted in the wood gym were the two infilled hangar openings in the west elevation, the blocking of the windows in the squash courts north elevation shared with the Pump room and the blocking in in the south elevation to form the Church/Faith centre.

Phasing

It is accepted based on brickwork style, that the gymnasium was divided shortly after initial construction. Thereafter again phasing proved difficult. There is a suggestion based on aerial photography that the west hangar openings were infilled in the 1960s.

It is possible that the southern squash court is a later addition as its exterior wall doesn't quite align with the offices and projects south beyond the recessed north part of the gymnasium which could suggest an afterthought rather than squash courts designed to fit neatly with 'solid' walls. Its outer

wall is stretcher bond with supporting piers and panelling above to the trusses. A question also arises with the two-storey block of offices at the north. The lower floor is in brick whilst the rooms above are plasterboard and there is the strong possibility that the upper floor is a later addition and if so, then the staircases and gallery to the squash court would also be of similar date.

The other clear alterations were in the south elevation with a 15.5m wide by 5.4m high opening (aircraft sized) was infilled and fitted to create the church rooms. The suggested and a reasonable date for these changes is in 1941 and based on a date carved into a decorative surround inside the church that flanked an organ.

Building 354. The Church (Faith Centre)

The Church/Faith Centre aligned parallel to the long axis of Building 354 (broadly north northwest) comprised a large open central space acting as the nave and chancel for the church with four rooms and a lobby to its west and five rooms and a lobby to its east (Figure 5). The north side of the nave was separated from the gymnasium by folding wooden doors. The addition of gothic arched windows and an organ position and its surround provided the recognisable distinction between the church and its adjacent rooms. Room names where given, although not verified, are taken from a Fire Plan noted during the survey as the rooms were mostly bare, with portable features removed. The main colour scheme throughout was cream with blue carpet tiles.

The church

Overall, the church measured 18.2m long with the nave 11.1m wide reducing to 8.4m wide where it became the chancel. Structurally, defined by walling, the chancel was 4.6m long but a raised platform extended north of the walling to extend the chancel to approximately 5.7m overall (Plates 204 to 209).

The backdrop to the chancel at the south, was two of the large 9 pane windows of the south elevation flanked by two structural stanchions. The side walls were plain. The floor, which was raised above the nave in three tiered platforms increased in height toward the rear (0.63m overall), and with each rise the platforms decreased in width; the main floor extended from wall to wall with the larger platform (6.6m by 3.14m) and the smaller (4.5m by 2m) platform on top and both fronting the main south elevation. The altar was missing from the highest platform but an impression in the carpeting indicated that it was of rectangular shape (3m by 0.56m).

The walls of the nave, in plasterboard were similar with two doorways and two Gothic windows each, although they were not with direct opposing features. On the west 1.78m from the chancel a double doorway (1.4m wide, 2.15m high) led to a large room annotated Lounge on a fire plan. From the doorway the first of the Gothic windows started at 1.25m from the door and the second 3.1m further on. The window (1.12m wide by 3.2m high, sill 1.3m off floor level) surrounds including the sill were of light brown wood (probably pine) with white painted wood for the glazing bars (Plate 210); Glazing comprised eight obscure glass panes (6 rectangular and two curved to match the pointed arch). To the north of the windows and 0.7m short of the corner with the gym was a single door (0.76m wide, 1.98m high) to a Meeting Room.

The wooden concertina doors (11.1m long, 3m high), below a plain 0.95m high wall with the suspended ceiling above it and separating the gym from the church completed the north elevation of the nave (Plate 204). The opening with the gym was originally wider and higher and infilled to create the Church.

The east wall from the chancel had a double door at 2.5m along it leading to a Font Seating Area, and beyond that were the two Gothic windows starting at 0.6m and 4.9m respectively from the door. A plaque on the wall between the door and window stated that 'these windows were made by No. 1 Entry Basic Carpenters Course and installed by M.P.B.W'. Plate EE).

Plate EE. No. 1 Entry Basic Carpenters Course plaque in church

The windows were exactly like those on the opposite wall except that on the reverse side religious images and scenes in faux stained glass and drawn by children had been applied to the glass (Plate 211).

Just north of the window (0.8m) and 1.9m from the north wall was a single door 0.84m wide by 2m high to the Font Storeroom. This door and its plasterboard surround were a replacement for the church organ of which flanking oak panel columns, with the head of the north column carved with the letters RAF and the head of the south column the date 1941, were in situ below a Gothic arch inset with two wooden vertical frames each providing support for 5 small diameter imitation organ pipes: originally 10 pipes but one now missing (Plates 212, 213).

Plate FF. Detail showing the 1941 dated organ surround wood columns and imitation pipes

The overall height was just under 5m, width 2.56m, the columns were 3.13m high by 0.58m wide (the lettering panel itself 0.19m high) and the top of the pipe frame, 4.23m (Plate FF). As with the windows the organ surround was reputedly made by one of the earlier carpentry school intakes.

The floor of the nave, carpeted with a T-shaped walkway leading from the centre of the folding doors and returning to left and right across the chancel in line with the side doors, was marked out by light blue tiles contrasting with the dark blue on either side where seating could be accommodated. The suspended ceiling was for the most part 4.97m high from the nave floor but at 1.5m in from the folding doors the ceiling inclined downward to 3.96m in height above the folding doors. To allow natural light into the space apart from the main windows, clear ceiling panels spanned the width above the organ and across the chancel front. Artificial light was supplied by two modern chandeliers each with 12 lightshades arranged opposite each other across the centre of the room.

The West rooms

On entering the west lobby (4.07m long, 2.7m wide, ceiling 2.9m high) access was afforded to three separate rooms - WC and shower room to the left, double doors to the Lounge straight ahead and via steps upward, a doorway to the Multi Faith Room (Plates 214, 215). Of note was that the west wall of the lobby with the WC was stretcher bond and the opposite side English bond; this difference was also apparent in the other lobby.

The WC and facilities (overall dimensions 7.2m (east-west) by 4.6m) which occupied the southwest corner of Building 354 was divided into three areas linked by a short L-shaped short corridor (Plate 216). Directly in line with the corridor in the corner was a single WC with hand basin and baby changing facilities (1.9m square) (Plate 217). Adjacent to the north and divided by plasterboard walling was a shower room with a single shower cubicle. Inset into the north wall was a narrow cupboard (1.75m long, 0.6m wide, ceiling height 3.23m) with wooden shelving and coat hooks (Plate 218). The remaining room and the largest (5.2m east-west by 3m) of the three were modern male toileting facilities with two WC cubicles, three hand basins and three urinals (Plates 219, 220). The walls of male facilities along the corridor were plasterboard as opposed to brick for the greater number of walls in this corner.

The Muti Faith room (4.4m by 3.2m. Suspended ceiling 3m high) on the right of the lobby was accessed via 2 steps (0.3m rise above lobby floor level) and through a single door. The room and elevations were plain excepting an aircon fitting and a radiator below the window and on the wall of the south elevation which was partially obscured by the plasterboard of the east elevation (Plate 221).

Double doors from the lobby led north into a large (6.9m by 4.9m, suspended ceiling 5.51m high) rectangular space (Lounge). Other than the two windows in the plasterboard party wall with the church and double doors in the centre of plasterboard north elevation leading to a Meeting room, there was a recessed (0.34m) blocked opening just inside the doors in the west elevation of English bond brick (Plates 223, 224, 225). The 3.4m high opening below a lintel (2.33m long, 0.15m high) was generally 2.13m wide but from 2.8m up corbelled with the width decreasing with height over 0.6m in two steps (0.08m reduction with each 0.3m rise). The opening, an original feature, was mirrored on the east side (21m distant (Plate 235)) where it was open.

The remaining room to the north and an extension of the Lounge was a Meeting room (6.1m long, 4.9m wide, suspended ceiling 5.51m high). The west wall was plain brick as was just over a half of the north elevation with the remaining walling smooth rendered to the corner of the plasterboard party walling with a single door and Gothic window to the nave (Plates 226, 227). The plasterboard abutting

the brick was a later adaptation added to create the rooms forming part of the church; a similar matching arrangement can be seen in the Font storeroom.

The East rooms

As with the west rooms the entrance lobby gave direct access to three rooms (Plates 228, 229), an office on the left, kitchen on the right and ahead to a Font Seating Area. The lobby was of the same dimensions as that of the west lobby and the Office was a mirror image of the multi-Faith Room including access via steps. The main difference between them was in the blocking of the north wall where the recess was 0.2m deep as opposed to approximately 40mm deep at the west.

Just inside the lobby to the right was a modern kitchen (7.25m long by 4.6m wide. Ceiling at 3.2m) with an L-shaped worktop in the centre and ending at the south elevation east of centre between the main full width windows. Fixed features included a stainless-steel smoke hood in the northeast corner, a sink and work surface between it and the southeast corner of the east elevation and a small hand basin in the centre of the east window. White glazed tiles were present below sill level (1.55m up) along the east and partway along the south and north walls; the floor was red coloured anti-slip vinyl. Electrical boxes, trunking and piping were prominent (Plates 230, 231, 232). Although all elevations were in brick, the west wall with the lobby was stretcher coursed, the north wall English bond and the east Flemish bond and indicative of different phases.

North through double doors the lobby opened to a long room (Font Seating area, 10m long, 4.6m wide, suspended ceiling 3.7m high). On the west was the plasterboard party wall with the nave with a double doorway and two Gothic windows, the north window flush with the corner of the north elevation with its central double doors to the Font Storeroom. The east elevation of English bond was similar to that of the west Lounge elevation with a similarly sized corbelled opening (Plates 233, 234, 235). This opening was not blocked but gave access to a rectangular room (Children's Play area, 7.1m (east-west) by 5.9m, (Plates 236, 237, 238)). The walls were plain and of Flemish brick except for the north wall in plasterboard with the blocked doorway to the Physical Education Flight Briefing Room, accessed from the gymnasium (Plate 238).

The remaining room to the north of the Font Seating area, the Font Storeroom (4m wide by 3.15m, ceiling 2.72m high) was the room behind the organ. The east wall was a continuation of Font Seating area brick wall and the north wall brick for 2.7m from the northeast corner, render to the northwest corner and plasterboard thereafter for the other walls. It is not known when the organ was removed but this room was likely a back room for storage and only accessible from the south (Plates 239, 240, 241). The plasterboard abutting the brickwork was a later addition to close off a wider area (15.5m overall) to separate the gym from the church and associated rooms.

Alterations and observations

The west elevation of the Muti Faith room was English bond brick, which continued across the north elevation but for only 0.6m ending in a chamfered brick corner, like the hangar openings along the external elevations, and thus clear evidence of a blocked opening using plasterboard (Plate 222). Initially slightly recessed for 1.5m, the wall returned to the general line for the remaining 1.15m to the east. The plasterboard walling, which also formed the east elevation where it partially blocked the window was clearly a later build. The blocking which was repeated in the east rooms of the Church indicated an open space 14m wide between brick corners before the church as existing was formed.

The current folding doors of the church sit in a much larger, partly blocked hangar division with a large opening facing north complemented by high corbelled openings to the west and east. The configuration indicates three original larger spaces (the largest, the nave and chancel and the rooms with the gothic windows in the centre, 20.8m east-west by 18.18m maximum), and equally sized rooms to the east (children's play area and Physical Education Flight Briefing Room) and west (changing rooms and WCs, 7.5m by 13.3m). That layout leaves four rooms along the main south elevation, two on each side of the lobby doorways, that could have been stores or offices.

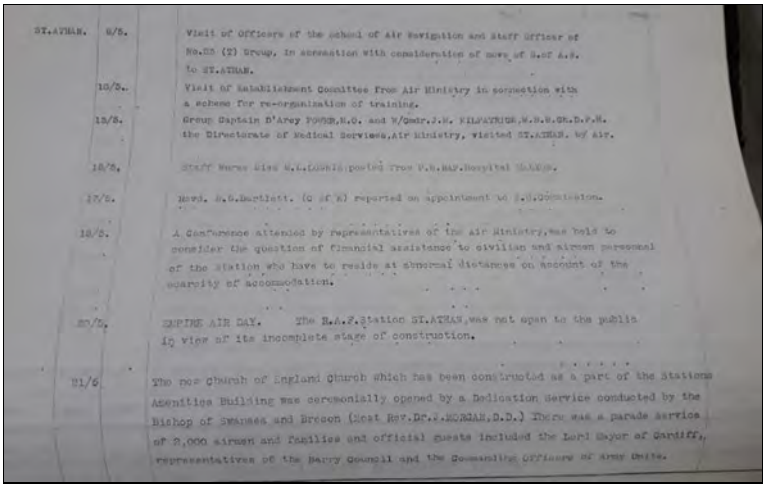
No similar corbelled brickwork was recorded in the workshops nor elsewhere in this building. Its true purpose is unknown, but one possibility includes the need to enable passage of aircraft frame components such as wing sections, tail sections or perhaps propellors through the openings to other workshop sections.

Phasing

The first phase would appear to be the larger divisions, possibly with a workshop function as discussed earlier, followed by conversion to a church probably in 1941 as indicated by the wood carving in the nave with more recent partitioning associated with the installation of kitchen equipment, WCs and shower room.

General notes on the church

Intriguingly a Station record from May 1939 (Air 29/736) states that a new Church of England church was constructed as a part of the Stations Amenities Building and ceremonially opened by the Bishop of Swansea and Brecon (Plate GG).



ST.ATHAN. 6/5. Visit of Officers of the School of Air Navigation and Staff Officer of No.25 (T) Group, in connection with consideration of move of S.of A.N. to ST.ATHAN.

10/5. Visit of Establishment Committee from Air Ministry in connection with a scheme for re-organisation of training.

12/5. Group Captain D'Arcy POWER,M.C. and W/Cmdr.J.M. KILPATRICK,M.B.B.Ch.D.P.H. the Directorate of Medical Services,Air Ministry, visited ST.ATHAN. by Air.

18/5. Staff Nurse Miss E.L.LOCKE posted from R.A.F.Hospital HALTON.

17/5. Revd. A.G.Bartlett. (C of E) reported on appointment to R.A.F.Station.

18/5. A Conference attended by representatives of the Air Ministry,was held to consider the question of financial assistance to civilian and airmen personnel of the station who have to reside at abnormal distances on account of the scarcity of accomodation.

20/5. EMPIRE AIR DAY. The R.A.F.Station ST.ATHAN,was not open to the public in view of its incomplete stage of construction.

21/5 The new Church of England Church which has been constructed as a part of the Stations Amenities Building was ceremonially opened by a Dedication Service conducted by the Bishop of Swansea and Brecon (Most Rev.Dr.J.MORGAN,D.D.) There was a parade service of 2,000 airmen and families and official guests included the Lord Mayor of Cardiff, representatives of the Barry Council and the Commanding Officers of Army Units.

Plate GG. May 1939 entry stating that a new Church of England church was constructed as a part of the Stations Amenities Building

The amenities building is not believed to be Bldg. 354 as a later (17/2/1940) record mentions a church parade at the Social Hall, Amenities Centre for Roman Catholic personnel (Air 29/736). That said it is not clear which building was the amenities Centre. The same sheet also mentions that the Empire Air Day display was not open to the public as the station was incomplete. 1939 would be the last Empire Air Day.

Further records indicate and in keeping with the period, segregation for different denominations forming up for parades in their different groups.

The church is depicted in a 1949 Battle of Britain air display programme for 17th September 1949 (Air 29/ 1766) where Bldg. 354 is open to the public and the church named St Michaels (Plate HH) but by 2008 the dedication had changed to St Christopher's (Francis 2024).

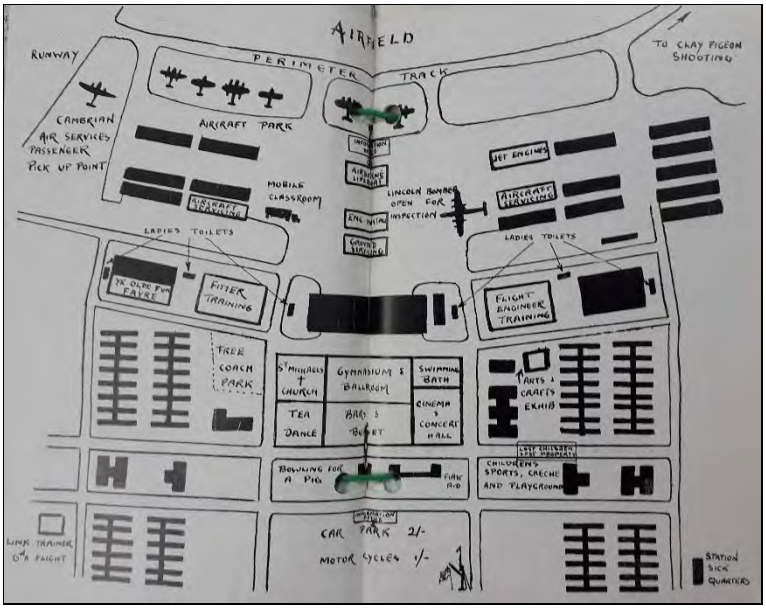


Plate HH. Extract from a 1949 air display programme showing Bldg. 354

Building 354. The Fitness suite

The suite, rectangular in shape, orientated east-west and open to the roof occupied the southeast corner of Building 354 (Figure 5). The floorspace (37m long) was divided into two main elements, a larger exercise area to the west (32.8m by 18.1m) and arranged along the east elevation modern WC facilities and office with a balcony above (3.7m by 18.1m).

A rectangular raised platform (13.35m by 4.9m by 0.4m high) east of the centre and two staircase were the only features within the floorspace itself; all exercise machinery (aerobic - rowing machines, exercise bikes, weightlifting frames etc) had been removed except for a small wooden wall frame and several mirrors remained on some elevations along with notice boards. The floor was faux wood vinyl (Plates 242, 243).

Water ingress was clear within the modern rooms and balcony at the east and in general the area was out of bounds.

The West elevation

The elevation was divided into three sections by structural pillars. The south section (4.3m) which was panelled probably masked a vertical X-frame and which would correspond with the frame to the north in the cinema. Between the pillars of the brick central section (8.6m wide), the main features were an array of mirrors (2.65m high starting 0.45m off floor level. Individually 2.2m high), whilst the remining section retained a gymnastic ladder (1.64m wide) (Plate 244).

The North elevation

The main features of the north elevation (Flemish bond) were four structural pillars and three doorways with mirrors affixed to the walling (Plates 245, 246). Between the west corner and a pillar (7.1m) were two equally sized (1.8m wide, 2.22m high) double doorways, with the west open (allowing

access via an anteroom and separate doorways to both gyms (Plates 247, 248)) and the east blocked, which would have given access to the west changing room in the stone gym (Plate 249). Mirrors, similar to those on the west wall were fixed to the wall between the next two pillars and also on the next bay to the edge of a double door (1.64m wide, 2m high) that gave access to the stone gym and east changing room. The elevation which continued eastward was plain, however just before (0.3m) the last pillar but 0.5m off the wall the metal staircase ascended to the balcony. Other features along the general elevation included two modern TV monitors and electrical cabling.

The anteroom was a small rectangular area (5.7m long by 2.7m wide) with three doorways, one in the east corner of the north elevation to the stone gym, one in the southwest corner to the wood gym and a 1.8m wide opening to the Fitness Suite in the south elevation. Features were two structural pillars of which the larger, and part of the west elevation with downpipes on each side, stepped out 0.7m off the wall.

Structural differences in the thinner lintel over the opening and keying in of brick in the southwest corner of the south elevation between the Suite and the anteroom in comparison with the other two openings indicated that this doorway was a later addition.

The East elevation

At ground level, three modern rooms all constructed of plasterboard spanned the width of the Suite (Plate 250). The room toward the north was an office with a window on each side of the door (Plate 251). Internally (8m long by 3.6m wide, suspended ceiling 2.4m high), little of note apart from, six metal stanchions (0.15m square), a hand basin, pipes, radiators and electrical trunking. The room encompassed two of the main east elevation windows (3.7m high, 2.7m wide, sill height 1.56m) of which the south was blocked, and the suspended ceiling had cut across all but the lowest of the north panes (Plates 252, 253).

The centre of the three rooms, a windowless disabled access WC (3.58m deep by 1.68m wide, ceiling 2.4m) was fitted with a WC in the north corner and a hand basin close to it on the north elevation (Plate 254).

Between the central WC and a single doorway (under the flight of stairs adjacent to the south elevation) in the southeast corner giving access to female WC facilities, the elevation supported a 3.7m long mirror and notice boards.

Another four stanchions supporting the upper platform were present within the female facilities which was divided into two areas (maximum 8.2m long by 3.5m, suspended ceiling 2.4m). On entering and turning left along a wall, were two WC cubicles and a similar cubicle with a stanchion and bench seat set against the east wall and on the opposite wall, a radiator and two hand basins within a cabinet. An opening between the WCs and basin opened to a changing area and two shower cubicles attached to the west wall. Alongside artificial light, natural light was supplied from a main window opposite the shower cubicles. Colour schemes were blue doors, pink and/or cream for the walls, blue anti-slip vinyl flooring and white ceiling panels (Plates 255, 256, 257).

Two flights of similar metal stairs (1.12m wide overall with 16 steps (treads 0.27m, risers 0.17m)) 4.04m long in plan and rising to 2.93m gave access to a balcony over the rooms (Plates 258, 259). The only fitting on the floor comprised of large tiles was two sets of three, paired wooden battens of unknown purpose adjacent to the handrail which prevented a fall to the suite floor.

The balcony, flush with the east wall extended into the window reveals (Plates 260, 261). The key features were the upper sections (2.32m high) of two main windows and between then a smaller window (sill level 1.04m up, window 1 .27m high) over a 3.4m long 0.44m thick lintel. In the southeast corner 4m of panelling (2.17m high) masked the vertical structural steelwork of the wind girder. From platform level the underside of the steelwork was 2.2m up with the elevation rising to 4.85m at roof level.

The South elevation

This elevation, the eastern part of the main brick south elevation, comprised seven large UPVC windows (2.74m wide, 3.71m high, sill level 1.56m up), one opposite the staircase, four in the centre and two toward the west, and two double doorways with windows over, one either side of the central windows. Radiators were centred below five of the windows. Both doorways (1.46 wide), the east glazed UPVC and the west wooden were inset 0.54m into the Suite within a brick porch 2.09m wide by 2.36m high (Plates 262, 263, 264).

Overhead detail

The south elevation was dominated by the wind girder but otherwise there was just one angle tie across the room, 11 trusses and the supporting braced framework along the east elevation. The roof itself comprised two strips of roof lights with brown plastic shading panels and insulation panels.

Alterations and Observations

Sometimes referred to as the small gymnasium there were few apparent significant changes other than the blocking of an opening to the stone gym changing room in the original Flemish bond wall. The offices and WCs were of a single phase with stanchions to support the roof.

Phasing

The original layout would appear to have been a single floor space with two entrances from the south elevation and two openings in the north elevation to access the stone gymnasium, the third opening to the west and just over 2m from it was clearly an insert and the anteroom originally only provided access between the two larger gyms. The latest phase would be provision of the office and WC suites along the east elevation. These were not dissimilar to the offices in the wood gym.

Building 361. Workshops Training Flight (361A), EETF Workshop (361B).

Workshop 361 since construction in the late 1930s was used for training RAF engineers (Figures 11 to 13, 17 and 18). Originally a single open area open to the roof, it has since been divided into four training areas with associated mainly single storey offices, classrooms and training areas many with superficial partitioning. A two-storey classroom was built into the southeast quadrant. The west half was used for metalworking training and the east electrical trade training.

The rectangular workshop orientated west of north measured 73.77m east-west by 64.8m north-south (approximately 243 feet by 212 feet) by 9.92m high (approx. 32.5 feet) to the parapet and 12.2m (approx. 40 feet) to roof level. The fabric was Flemish bond red brick (Cavity walls (single course brick external, 75mm cavity (3 inches), double course brick internal) between 0.38m to 0.41m (15-16inches) thick), blended with contrasting random black brick, bonded with sand coloured mortar. Stretcher bond brick of similar polychromatic brick to the original build was used for the hangar doorway blocking and where windows where blocked (Plates 261-272).

The roof comprised seven east-west pitched roofs (parallel to the building's longer side, with adjoining skylights (108, each 2 feet wide (0.61m wide) facing north ranged between the hipped ends of the asbestos slate roofs. A flat-bottomed U-shaped metal gutter (0.32m wide, 0.15m high) around the inner perimeter of the parapet and along the roof valleys collected water runoff to mainly internal downpipes. Fitted to the external elevations, safety railing extended 1.1m above the parapet (top rail 11.01m from DPC); this was absent on the lower height building, 354 (Plates 273-275).

The predominant features of the elevations were tall window reveals most with 39 panes and three panels or adaptations to that pattern, glass block glazing in the east and west elevations, original doorways in the north and south elevations, bricked up recessed hangar openings in the centre of the east and west elevations and a modern connecting corridor to the crew room (Building 375) on the south side adapted from a window reveal to form the corridor entrance. An external spiral fire escape staircase and associated doorway was present on the east elevation located between the southernmost windows. Additional modern external bays and storage facilities abutted the north side of the west elevation. Air bricks were present above the lintel, central to each main window and at ground level, integrated with the first course of brick above DPC level.

Adjacent to the north and south elevations (1.82m off the elevation) were related fan houses (Keith Blackman Ltd., London. 'Tornado' centrifugal fans), with ventilation ducting that entered the building at high level through bricked in window reveals (Plate II). These are post 1945 fittings evidenced by aerial photos.

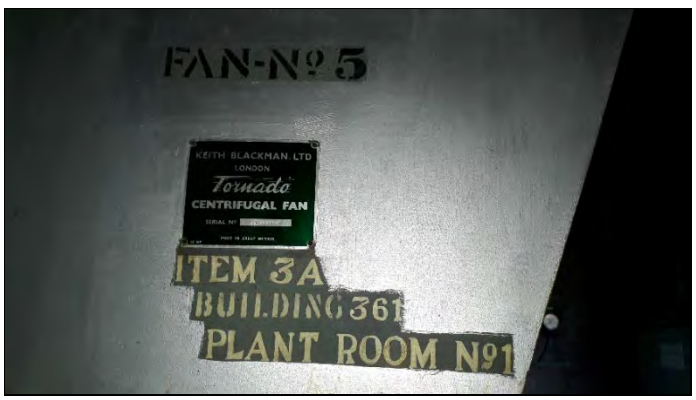


Plate II. Annotated detail on the side of the fan unit

Two modern buildings and a canopy over the central doorway abutted the east side of the original building masking some of the original structure. None of these buildings gave access to the workshop.

Original large rectangular window reveals (6.18m high by 2.73m wide) below a continuous lintel were consistent on all elevations, as was a sill where not interrupted by other openings or adaptation. The lintel and sills were in reinforced cement sections with a yellow hue to imitate Cotswold stone; the sills below the windows (2.74m wide) were in pairs each 1.47m (58 inches) long extending under the brickwork on each side by 0.1m where the section between the windows, and a continuation of the sill, was infilled with a 0.69m (27 inches) long section (Sill depth 130mm directly below the frame tapering to 100mm depth at 0.15m from the frame where the sill projected 40mm off the wall line. Windows are inset 0.1m back off the wall line). The larger windows were complete with original steel metal frames. The north and south elevations were originally built with 16 matching large window reveals each, whilst on the east and west there were originally eight each. One on the east elevation was subsequently partly blocked and the upper part replaced with glass blocks; window frames in aluminium were painted olive green or brown. Of the window's eighteen panes and panels, 15 panes and/or panels were of equal size (760mm by 690mm) and the three blanking panels over six lower panes at 1.6m up from the sill, double the size of the panes.

Wave pattern glass blocks were used in the window reveals of the recessed hangar openings, two in the west elevation (2.74m wide by 2.8m high with 196 blocks) and four in the east (2.74m wide by 2m high with 140 blocks), one of which was an adaptation of a main window. These blocks were not noted in any of the other buildings surveyed (Plate JJ).

Plate JJ. Detail of the glass block windows in the infilled hangar openings

Four smaller window reveals (2.2m high by 1.88m wide with 10 panes) their top flush with the lintel, were consistent over the four original doorways, on the north elevation and west side of the south elevation small windows (1.7m high, 0.9m wide) were present 1.8m in from each corner, and a modern small window (1.5m by 0.87m) had been inserted between window reveals to the east of the corridor of the south elevation.

All main entrances, (overall 4.06m high to underside of canopy by 2.7m wide) were of similar size and fitted with wooden or aluminium wooden doors and sidelights (together 2.1m high), differences however, were whether sidelights (four in number) were panelled or whether panelled or glazed below the door rail. Other details included another panel (0.76m high) between the door/sidelight

frame and a lintel (0.3m high), and above the lintel a window frame (0.915m high) with six panes. One original doorway, 1.8m off the east corner of the south elevation had been infilled, and none were of art deco style as recorded in building 354.

An original maintence door was present along with three later single doors, one in place of the original doorway on the south elevation and two to Lab and Crew rooms in the north.

Internally, open to roof level, it was divided into two halves on a north-south basis with both sides complete with offices, classrooms, stores, and open workspaces; WC facilities and a two-storey classroom block were present on the eastern half only.

Aside from any external power supply the small room in the southeast corner appeared to be the only source for the building's electrical services.

External elevations (Figure 11)

The North elevation

The original north elevation, symmetrical with the features of the eastern half matching those of the west, comprised 16 large windows (0.9m separation between the central 14), main doors and window over and a small window (1.7m high, 0.92m wide, sill 1.5m from DPC. Four panes, horizontal pivot hinged in the centre) 1.8m off the corners. A modern (Battery shop) with steps adjacent to the elevation partly abutted the east angle of the building.

The main wooden door at the east with signage over attached to the wooden panel, gave access to Electrical and Workshops Training Flight, Electrical Engineering Training Section, whilst that at the west accessed the Electrical and Workshops Training Flight, Workshops Training Section. The western doors were metal framed replacements, and the signage attached to the adjacent infilled window.

There were five alterations and/or adaptations to the elevation. The main window at the west had had its sill removed and was bricked up. The seventh and eight window reveals from the west were adapted to provide ventilation ducting with the insertion of a lintel (3.1m long, 0.3m high) into the brick 2.5m above the sill. The window was retained below the lintel and the upper 3.35m was bricked in (stretcher bond, light brown brick) with a circular (1.7m diameter) duct (4.2m from sill to underside) offset west of centre in the seventh reveal and a rectangular duct (1.4m by 1m, 4.5m from sill to underside) central and under a small lintel in the eighth reveal. A ring of brick on edge encircled the circular duct and another two lagged pipes (approximately 0.15m diameter) one above the other entered the wall adjacent to the circular duct. The brown blanking window panels (2.47m high from the sill) started from the sixth pane opposite the lintels, which contrasted with the south elevation, where they started from the fourth pane and continued to below the lintel (1.65m from the sill (Plate 276).

The remaining changes were to the east of centre, where the sill was cut and two single doorways (2.2m high, 1.0m wide) inserted partly into the window reveals and partly the dividing column of windows eight and three from the east corner. The wooden red painted fire doors with a single pane gave access to a Lab and Crew room. Smaller ancillary changes were another vent through a window panel and vent grills both to the west side either side of the window (Plate 277).

The East elevation

From the south, this elevation comprised three main windows with a single fire door (2.1m high, 0.9m wide, threshold 3.48m from DPC) inserted between the first two and accessed from a spiral staircase

to a second storey classroom. At ground level, 0.4m from the third window, a modern building (GSE Support 18.4m long, 5.5m high) abutting the original elevation, encompassed part of the inset hangar opening. Between its roof and the main window lintel (underside 7.91m), were four glass block windows (2.74m wide by 2m high each with 140 blocks) with 2.74m long 0.75m concrete sills of which three were within the hangar opening recess but the southern window had been adapted from a main window evidenced by 'redundant' queen closers within the modern building. At ground level north of the modern building and still within the hangar recess were large folding doors (3.5m wide by 4.1m high) for vehicles complete with an inset door for pedestrians to Zone 4 within the building. Directly over the doors (0.6m) was a 21-pane window (2.74m wide by 2.95m high) with white painted metal frames.

To the north of the door were four main windows (1.83m spacing) with a vertical roof ladder and platform offset north of centre between the centre windows, and 0.2m off the sill at the north with its roof overhang almost in line with the window reveal, was the Battery shop (Plates 278-281).

The South elevation

The elevation was essentially similar to that at the north with 16 window and two main doorway positions, including the later ventilation ducting with the insertion of a lintel 2.5m above the sill and with the upper 3.35m was bricked in (stretcher bond, light brown brick) with a circular (1.7m diameter) duct (4.2m from sill to underside) offset east of centre in the eighth reveal and a rectangular duct (1.4m by 1m, 4.5m from sill to underside) central and under a small lintel in the seventh main window reveal from the east. A ring of brick on edge encircled the circular duct and another two lagged pipes (approximately 0.15m diameter) one above the other entered the wall adjacent to the circular duct. In contrast to the north elevation, the window blanking panels started from the fourth pane up and the underside of the lintel in this elevation. It was also noted that in the three windows to the west of the corridor that above the blanking panel the windows were painted brown to provide shielding from sunshine.

Changes however included the blocking in of three window reveals, one, the fifth from the west corner, was bricked in above the sloping roof (4.35m high east, 2.96m high west) of the linking corridor to Buildings 375 and 377 and adapted from the window reveal. East from the corridor the next two reveals were bricked in (stretcher bond) and sills removed, and a small window (1.51m wide, 0.87m high) with sill and lintel inserted in line with the west side of the window reveal and extending west into the east corner of the adjacent reveal; This window offered natural light to CNC Pipe Bay (Office 1) in Zone 5 south.

Further changes included removal of the main west doorway frame and panels, which were replaced by brick (stretcher bond) to the underside of the canopy and single doorway (2.14m high, 0.91 wide). The door directly accessed a room labelled CNC programming (CPU controlled Pipe bending).

Remnant lead flashing present over the small window on the corner of the west elevation and similar present over the single door to a maintenance room near the east angle suggested some alteration had taken place.

Other external features toward the east included two runs of electrical cabling, one entering the building through a window panel and the other at higher level though the brickwork above the main window lintel, and lagged pipes adjacent to the maintenance door (Plates 282-284).

The West elevation

The main original structural elements, four windows to the north and south of the central recessed hangar opening matched that of the east elevation, and the infilled recessed opening was almost symmetrical (doorway excepted) around its centre point with two large folding doors with windows over and another two windows between those. Several alterations were made to some of the windows with brick infilling and replacement of window glass with metal panels.

The southernmost three of the main windows were unaltered with 39 panes and a plain panel between the sixth and seventh panes, and the lower four panes and the four panes above the panel were pivot hinged in their centres (rotating as one unit). Between the second and third windows a vertical ladder with a landing stage part way up was attached to the wall. The fourth window 1.81m to the north was adapted to fit a single door by removing the sill, extending the opening to ground level and infilling the remainder with brick (stretcher bond).

The central section of the elevation (17.24m long between chamfered corners, inset 100mm north and 85mm south) at ground level comprised two large four panel folding doors (4.2m high, width 3.7m north, 3.5m width the south) for vehicles and a single pedestrian door 0.9m south of the north vehicle access. A metal security cage for chemicals or canisters and a downpipe were also present in the central part of the elevation.

At higher level, 4.8m from DPC (0.6m above the folding doors), were four window positions (2.8m high from the sill, 2.74m wide) of which the outer two were complete with glass blocks and the inner two, sills removed and bricked up. Metal vents and panels were fitted within and between the former window positions. Whether intentional or not the upper windows of the elevation were not strictly symmetrical with their distance from their respective chamfers as the north was a brick length longer (Plates 285-288).

The four windows of the northern third of the elevation had all been altered with the northernmost entirely bricked up and the two reveals south, bricked up to panel level (4.1m above DPC, 2.6m above sill). The southerly of these windows retained most of its lower panes except for one strip of four where vertical joints below a newer sill hinted that this was once a doorway (0.91m wide) and similar to the inserted doorways in the north elevation. Above the panels on the three windows the first four panes had been removed and replaced with metal blanking plates on the inside of the frame.

External structures abutting the north elevation included four adjacent roofed open bays facing west (13m length overall, 1.3m off the wall and another open bay structure (4m square) stopping 0.25m short of the north corner, divided into two with one bay facing north and two bays facing south.

Other fixtures included redundant piping (4.6m above DPC) and supporting right angled brackets cutting across the elevation at panel level before reducing in height to the roof level of the north bay building. Above the roof of the bay were a large blanking plate and two smaller vents either side and lower than it, the one to the north bricked up and the other with a louvre.

361B EETF Workshop Internal detail (Figure 12)

Internally, in keeping with the separate training facilities existing named rooms and fire plans, two Zones, Zone 4 to the east (Electrical Engineering Training Flight) and Zone 5, Workshops Training Section to the west divided the building. These have been further subdivided for descriptive reporting purposes based on clear internal divisions. Main internal walls were breeze block, although a double course of brick provided a plinth along the north-south divide, with other divisions plasterboard

partitions. All zones were open to the roof with all structural steelwork and ventilation ducting exposed.

Zone 4 northwest

This area measuring 22m east-west by 32.6m north-south overall encompassed an enclosed room with two rooms to its north. The area was broadly square (22m) with, just north of centre, a small flat roofed office (General engineering flight control. 4m long by 2m wide, ceiling 2.25m high) with a door facing south and two windows facing the bay on its west elevation and eight small open board partitioned bays along the south elevation, each with an electrical switch box (Plates 289-292). A larger freestanding electrical box 0.65m off the wall to the west of the doorway to the Lab room (Plate KK).

Plate KK. The large electrical services unit in Zone 4

The west elevation comprised double doors (2.3m wide, 2.06m high) to Zone 5, 1.65m north of the flight control office and 7m from the office, the corner with the Lab room, and to the south of the office 1.3m beyond a structural pillar with downpipes on each side was a blocked doorway (1.6m wide, 2m high). A brick column (3.51m high) noted 3.75m south of the blocked doorway may have indicated the north edge of a 3.1m wide blocked opening with its partner column recorded in Zone 5 and Zone 4 southwest (Plate 293).

There were two flat roofed (3.96m high) similarly sized rooms on the north elevation (22m long) each accessed from double doors 0.9m apart in its centre. The west room, a Lab (10.6m wide by 10m deep, ceiling 3.95m high), and the east a crew room (10.9 wide by 10m deep, ceiling 3.95m high). Internal fittings in the Lab included electrical switchboxes, three narrow lightweight metal stanchions bolted to the floor off the south elevation supporting a rail for electrical wiring, piping for air extraction that passed through the window into which the later fire door had been fitted, six wall radiators, four of which were unusually set closely together along the east elevation (Plates 294, 295). By comparison the adjacent Crew room was plain other than a later doorway inserted into the window reveal adjacent to the east wall, three small modern radiators and a kitchen worktop and sink in the centre of the east wall (Plate 296). Both rooms had blue vinyl floors. The vents in the crew room ceiling were connected by flexible tubing to the high-level ventilation tubing downpipes.

Apart from electrical boxes and wiring the main feature in the east elevation was a wide square doorway (3.95m wide, 3.98m high) 12.87m from the north elevation with folding doors to Zone 4

northeast. This doorway wide enough for vehicles was in line with the large doorways in the main east and west elevations.

Overhead detail included the wind girder over the two rooms along the north elevation, trusses, tie angles beams and ventilation piping. The floor in grey vinyl had yellow edged pedestrian route turning through right angles to join the doorways.

Zone 4 northeast

This zone 24m long by 14.2m wide accounts for the six offices in two ranges, two WCs, entrance lobby and the 5.1m wide walkway between them to the north of the main east elevation vehicle doorway (Plates 297, 298).

Almost in line and at right angles to the west vehicle doorway to the flight control area, two offices (16.5m long overall, 4.39m wide, ceiling 2.4m) with plasterboard walls abutted the west elevation. Office A the southern office with wide double doors (1.5m) opening to the south and a window facing east was square (4.3m) was plain with no fittings other than electrical sockets (Plate 299). Although larger at 12m long, Office B to its north, with a single doorway and window facing east was similarly plain (Plate 300).

North of the offices but stepped back 0.8m off the line and lining up with the west wall of the lobby with its door 0.3m from the lobby doors was a modern male 'wet wall' cladded WC (4.3m long by 3.4m wide) with three cubicles, three urinals and three hand basins (Plate 301).

The main entrance lobby with double doors to the workshop measured 3.3m by 3m (east west) with a ceiling height of 2.87m to wood lath strips. There were two main features in the lobby, on the east in the centre of the wall, a small sliding window shared with Office C, and on the west opposite the window a door to a disabled WC (3.4m long 1.63 wide) with a single WC on the west wall and two hand basins below a main window on the north elevation (Plates 302-305). These were the only WCs in the building and a later adaptation particularly with the WC off the lobby. Generally, the entrance lobbies in buildings 361 and 377 were of similar size and build without any alteration.

To the east of the lobby four offices abutted the east elevation. The north office (Office C) was the largest (7.2m long by 4.6m, ceiling 3.04m) and its entrance and adjacent window both facing south along the face of the offices to the south formed from plasterboard angled to meet the lobby wall. The decoration for these offices was akin to those opposite with cream walls, white ceilings and blue carpet tiles with black skirting (Plate 306).

Office C was in the northeast corner of the building 361 and behind its east elevation, hosting several electrical switchboxes, and with 0.15m diameter downpipe in the northeast corner, was the hidden vertical X-frame of the north wind girder. The room was bare apart from pipes, electrical trunking and radiators. Natural light came from both a main window and smaller window on the north elevation (Plate 307). Of note was a continuation under the carpet of the floor plates housing water pipes, and which continued external to the building.

Offices D and E immediately south of Office C and stepped back 2m from its door, were similar in size (4.6m long (north-south) by 3.8m wide, suspended ceiling 3.05m) and each with a single doorway and a pair of adjacent windows facing west and a main window on the east. The only different features in the rooms were a downpipe in office D, a small (0.3m square) sliding screen in the dividing wall between Offices D and E adjacent to the east elevation and another larger opening (0.7m wide, by

0.46m high, 1.1m from floor level) in the dividing wall between Offices E and F. Signage over Office E read EWTF TRG MGR Elect (Plates 308-311).

Office F, the southerly room of the range, with plasterboard west and south walls (6.25m long by 4.63m wide, ceiling 3m) stepped out 0.6m into the passageway from the line of offices D and E. Its doorway in the northwest corner faced west as did three adjacent semi-transparent safety glass windows in the west elevation whilst another similar window but smaller was present in the centre of the south elevation which intersected a main window. A downpipe was present on the east elevation between the windows of which the southern window, 1.15m in length was formed by the wall intersection. Sign attached to the door read Temporary Electrical Installations (Plates 312-313).

Externally the facades of the office elevations were slightly different in height with office C, 3.15m high, Offices D and E 3.42m high and office F the lowest at 3.05m. Overhead detail along the main elevation behind the offices included the wind girder in the corner, four main windows, ventilation tubing and structural steelwork to roof level.

The floor of the 5.1m wide passageway between the offices was concrete within which a channel covered by metal plates (0.94m wide, anti-slip pattern, painted red) set flush with the floor extended south directly from below the window in Office C to 4m along the face of Office F where it turned through a right angle for 3m before turning south again in another right angle and continued for another 31.7m with another right angled turn. The concrete channel (1.17m deep by 0.82m wide internal width contained two large (0.25m diameter (10'') water pipes with the top of the pipes 0.61m down, (see bldg. 377 example Plate OO). This if not original, which it likely is, would be an early alteration.

For approximately 20m, between the range of offices at the north and the rooms in Zone 4 southeast the floorspace widened out to 14m. Along the east elevation of this section were the 3.4m wide main hangar doors, and for 19m south, a continuation of the east elevation to a store, which apart from a lattice girder column was plain brick until the higher level glass block windows and steelwork (Plate 314). The opposite elevation, from office A, comprised the hangar door to Zone 4 northwest and a continuation of that wall south for 5.8m where it stepped back (0.47m) on the line of the dividing wall between Zones 4 northwest and southwest, continuing south for 22m as the east wall of an office and an electrics room, both part of the southwest zone. The wall to the rooms was 2.5m high (breeze with internal supporting pillars) with no roofing, whereas to the north, the dividing wall was to roof level. Apart from a handrail south of and at right angles to the office doorway (which continued south, turning west through a right angle, before turning south again to the end of the range), the workshop floorspace was clear of standing structures (Plate 315). This general open area was open to the roof with 3m of headspace before encountering strip lighting suspended on rails (rails 3.05m from floor level).

Zone 4 southeast

The southeast area (17.5m (north-south) by 10m) a continuation of that from the north comprised two stores, stairwell and understairs passage, two-storey classroom (7.1m high), plant room and entrance lobby abutting the east and south main elevations in the southeast corner of the building (Plate 316). Decoration was again similar to other rooms with cream walls, white ceilings and blue carpet tiles).

The small store (4m by 3.4m, ceiling 3.9m) at the north, with a west facing single door and glazed side panel, abutted the east elevation and north wall of the two-storey breeze block classroom; it was plain other than a radiator on the wall below the window (Plate 316).

Between the store and on the corner of the classroom block, a doorway facing north opened to an understairs passage (6.35m long, 0.97m wide and reducing in height in steps from 3.2m inside the door to approximately 0.2m high at the south (Plate 317)).

Moving south 7.5m from the corner and through a set of double doors adjacent to the southwest zone passageway, a small anteroom (3.2m by 3m maximum) gave access via a doorway to the main south east entrance lobby, whilst to the east were two adjacent doorways, one on the north side to Classroom 2 and the other to a short passage to a store and plant room beyond (Plates 318 and 319). The foot of the stairs to the upper storey and Classroom 1 lay outside and at right angles to the classroom doorway (Plate 320).

The southeast entrance lobby with metal replacement door frame was nearly identical directly to the north lobby but slightly smaller in size (3m by 2.7m, ceiling in wood lath 2.88m high. Plate 321)).

The short passageway open to the roof (3m long by 1m wide to the door) extended for another 1.1m before opening out to a rectangular plant room with electrical switch boxes on its south and west elevations and along the east elevation, a vertical X-frame common to all the workshop corners: Shelton England was stamped on the X-frame members.

A gantry accessed from a vertical ladder on the south side of the entrance passage let to a metal gantry over the electrical boxes and the small storeroom accessed externally in the southeast corner, 3.83m up from floor level where it provided a platform for maintenance purposes related to water pipes and associated motors. This plant room appeared to be the main power source for the building (Plates 322-326).

The Store (brick walled, 4.16m by 3.7m, ceiling 3.16m) with 1.5m wide double doors on the south side of the passage was plain except for pipes, electrics, and a boxed radiator below the window on the south elevation (Plate 327). A metal inspection cover (0.98m by 0.74m) was present in the passage opposite the store doors.

On the north side of the passage Classroom 2 although large (8.2m by 7.2m maximum, ceiling 3.16m) with two main windows providing natural light (sill height 1.55m) was not particularly different to other rooms and fitted with radiators, electrical trunking and air-con units. A pull-down projector screen was affixed to the ceiling in its southeast corner (Plates 328, 329).

The enclosed north-south orientated stairwell rose in two flights of nine treads (1m long landing at 2.35m horizontal distance from first step and 1.4m landing at the top) to Classroom 1 which was directly above, of similar size and with similar fittings to Classroom 2. The exception was a fire door to an external spiral staircase in the centre of the east elevation between the windows and a narrow room (0.98m wide 2.5m long) with a door in its southwest corner over part of the stairwell (Plates 330, 331).

Zone 4 southwest

Directly south of the northwest zone this area (31.2m (north-south) by 21.6m) was defined by enclosed rooms along its south and west walls whilst in the centre and separated by a right-angled passageway were large working areas open to the roof (Plates 332, 333).

To the west of the entrance lobby and abutting the south elevations were three classrooms (Classrooms 3-5) accessed through single doorways from the open passageway (approximately 16m long by 3m wide) along their north elevation.

Classrooms 3 and 4 were both 7.3 m wide by 6.1m deep (ceiling 3.1m) and the only differences between them being that of the two doors to the room the east door was blocked in classroom 3, and that in Classroom 4 the radiator below the centre of each window (sill height 1.53m - two main windows (2.74m wide), providing natural light from 12 panes in each room) was boxed in rather than plain (Plates 334, 335). Classroom 5 was larger (11m by 6.1m) with three windows, radiators and doorways of which the west door to Office H was blocked (Plates 336, 337). Features on the west wall included a downpipe adjacent to the structural pillar of the wind girder central support. All rooms were fitted with strip lights, electrical boxes and sockets, air-con units and trunking (). Decoration comprised cream walling, white ceilings and blue carpet tiles. The space above the flat roof (3.4m high) was open to the main roof with structural steelwork, main south elevation windows and rectangular and circular ventilation ducting.

The Offices to the north of the classrooms (plasterboard, Office H, 7.5m by 5.25m, Office G, 7.3m by 5.25m, ceilings 3m) were not dissimilar in themselves nor to the classrooms other than each had a 1.9m wide doorway facing (east) the passageway, none had windows to supply natural illumination and a doorway between Office H and Classroom 5 was blocked (Plate 338-340). The passageway to the east of the offices was 1.1m wider at 4.1m than the width along the classrooms.

Double doors in the centre of the passageway at the north led to an Instrument testing room which was essentially an open floor space area (10m by 9.4m, brown vinyl floor) open to roof level as were its walls on the west (Zone 4/5 division) and north (Zone 4 northwest and southwest division) whilst the east and south elevation walls were plain at only 2.5m high with doorways in each; the north elevation was also plain except for electrical trunking and sockets, and strip light and supporting rails at just over 3m up from floor level. The main features of the west elevation were a lattice truss column with downpipes on each side and 0.8m from the northwest corner a brick pier (3.5m high, single brick wide) marking the southern of two such columns of unknown function; the other 3.15m north and the other side of the boundary division with Zone 4 northwest (Plates 341-344).

Adjacent to and east of the testing room was a large office space (12m wide (east-west) by 10.9m long) with double doors in its east elevation near the northeast corner; the other door was broadly opposite in the northwest corner. The north elevation (12m long) was a continuation of the wall from the testing room (22.1m overall length with pier supports and rising to roof level) with lighting rails bolted to the wall. The three other elevations were all 2.5m high with an unequal number of breeze piers in the elevations. Fittings included electrical boxes some attached to the piers and others attached to the wall and sockets all fed from the top of the wall downward. An indication of former equipment was noted in the form of rectangular marks made in the light brown wood effect vinyl floor (Plates 345-347).

The two remaining areas of similar dimensions divided by a north-south partition and directly south of the Office, were a Motors /generator area (10.7m long by 6.1m) to the west and Domestic electrics area (10.7m by 5.8m) to the east with both areas accessed from 1.63m wide double doors off the east-west passageway to their south. The 2.5m high walls of both areas were supported by piers. The west area was divided into eight open booths each with electrical feed divided by 1.2m long plasterboard partitions on south, west and north walls. Electrical feeds were also present toward the door on the

east wall with three supporting brick piers. The flooring, light brown vinyl, matched that of the office to the north (Plates 348-350).

The adjacent Domestic electrics area was similar but with a single partition divide on its north elevation with a shelf attached to the wall and a freestanding wooden board partition in the shape of a cross (probably unfinished booths) south of the centre of the room. Along with a window facing east toward the small store off the main east elevation, the east wall with three piers was marked out for boards and socket outlets and again suggesting planned but unfinished fittings. Extant fittings included standard electrical trunking and boxes/switches/sockets all fed from the top of the wall. The floor was again wood effect light brown vinyl (Plates 351-353). Both areas were finished in cream with a black skirting. Overhead strip lights provided lighting.

Overhead detail in Zone 4 (Figures 13, 17 and 18)

Overhead detail included structural steelwork and ventilation tubing to roof level with the rooflights facing north fitted with yellow brown screening. At the lowest level were strip lights at 2.9m from floor level supported on rails at 3.05m. At higher level, the base of vertical extractor tubes part of the main north-south orientated ventilation tubes was at 5.04m with the underside of main tube itself passing between the structural steelwork at 8m from ground level; these vertical tubes were approximately 1m in length in the northwest zone. The underside of the lattice and wind girders were at 7.61m, internal roof valley at 9.18m and the apex 11.71m.

Of note was the single beam at 8 5m in the centre of the workshop extending north from the wind girder to the next lattice girder which was used as a beam for lifting (possibly with chains) equipment. A similar beam was fitted to the adjacent workshop.

Alterations and observations

The basic shell of the east half is unchanged apart from the early infilling in breeze block to roof level to provide two workshops on a north south divide, and the later infilling (post 1962) of the large hangar opening in the centre of the east elevation. The two lobbies in brick are likely original features. There were no major structural alterations noted except for the alteration of two windows in the north elevation to provide doors for the two rooms on the north elevation, the provision of a disabled WC through the wall of the north and construction of the two-storey classroom which was built over the sunken waterpipe channel in the workshop floor. One feature not noted elsewhere in the surveyed buildings was the provision of the high-level glass block lights in the infilled hangar openings.

Breeze block and panelling was the favoured walling for internal divisions and that material potentially assisted with dating as did partitioning which intersected with windows rather than walling.

Phasing

Accepted that the split into two on a line between vertical X-frames supporting the wind girders was an early phase it is also thought likely that some offices close to the lobbies were also near original features. These include the range of three offices on the south elevation and the assumption is based on stylistic grounds mainly in that the roof covering is wooden planking identical to that of the lobby roof level planking, and panelling detail is similar to that seen in 1944 workshop photographs. The other likely early phase offices, of similar style, are on the east elevation (Offices D and E) just south of the lobby. It would seem reasonable to expect some capacity for internal administration particularly located close to the pedestrian entrances and space for controlled items or small stores

equipment. WCs were external. The store adjacent to the south lobby because it is in brick is also likely first phase. That configuration would leave the greater area open for training purposes.

The next phasing date bracket is in the east-west and north-south partition separating the Zone 4 areas. The walls were almost certainly in place before the ventilation ducting was installed sometime between 1945 and 1962, as the surrounding brickwork bears the scars of breaking through the wall and shows poor quality infilling of the gaps thereafter and therefore something unlikely to have happened if the other way around. The two-storey classroom possibly also falls within this bracket and also the workshop areas in the centre, but no definite evidence was determined for either.

The remaining offices and WCs in the north (Offices A and B), conversion of Office D into a room with the addition of an unusual, angled partition and the two offices in the south (Offices H and G) are probably the last main phase.

361A Workshops Training Flight. Zone 5 south (Lathes and Milling) (Figure 12)

This zone (28.6m (east-west) by 28.9m) open to roof level included the dividing wall with Zone 5 north, a range of five rooms to the east abutting the internal north-south divide with Zone 4, the entrance from the linking corridor to building 375 and another range of four rooms abutting the main south elevation, and the main wall of the west elevation with a large folding door toward the northwest corner, and all enclosing an open workshop floor space 28.8m by 22.8m fitted with thin vertical metallic frames, all with electrical switches, bolted to the floor and affixed at higher level within the roof steelwork. These would have powered the lathes and milling machinery (Plates 354-358).

The North elevation

The main features along this breeze block wall, rising to roof level with built in 0.2m wide pier supports at 3.4m centres, were two 5.42m high columns (0.39m wide, 0.45m off the wall and matching two in the zone to the north) probably for strengthening purposes, 6.8m from the west corner and 3.1m between column centres and a 2.61m wide 3.19m high opening opposite Office 1 at the east and providing access between zones. There were two blocked doorways, one only 0.87m from the main opening and likely originally intended for pedestrians rather than using the adjacent opening likely used for vehicles, and the other 2.4m to the west of it where it would have provided access to Office 3 in the north zone (Plate 359).

The East elevation

Five adjoining rooms in breeze, with doors facing west and the three in the centre the same size, were ranged along the east elevation (Plate 360). Features in the Instructors Prep room (Office 1. 8.7m by 7.6m, suspended ceiling 2.7m high and common to all rooms) included a double door access north of centre and small window facing west to the south of the doors in the west elevation, single door to the WTS exam coordinator/ Student's JPA terminal (Office 2) in its south elevation near the southeast corner and two structural pillars along the east wall. Fittings included notice boards, a bank of sockets in trunking across the whole of the east wall (0.8m up from floor level), additional sockets and switches on the west elevation and in the roof, strip lights and a parallel run of box ventilation ducting (2.2m high, 0.2m square, 4.4m apart) that extended through all the rooms (Plates 361, 362); the ventilation source was via tubing from the ceiling through to the higher level ventilation box and pipe ducting in Office 1 respectively. All rooms were painted in white with white ceilings and blue carpet tiles.

The WTS exam coordinator/ Student's JPA terminal (Office 2) to the south (3.6m by 7.6m) was mainly plain other than the door with Office 1, its main door in the centre of the west elevation, a 0.8m square

window in the centre of the south wall with Office 3 and another linear bank of sockets in trunking along the east wall (Plate 363). Office 3 (Plate 364) was the same size as Office 2 and the main difference between them being electrical trunking along the north, east and south walls again at 0.8m up from floor level. Both rooms had notice boards fixed to the walls. The Female Lockers of similar size to Offices 2 and 3 and south of Office 3 with a single door facing west was self-contained with no opening or windows to adjacent rooms (Plate 365). The walls had standard electrical switches, and the ceiling, strip lights and ventilation ducting.

The CNC Pipe Bay (Classroom 7) the southern room of the range was the same size as Office 1 and not dissimilar to the others (Plates 366, 367). The north wall other than the box vents was plain, and the west wall with wind girder pillar in the centre had electrical trunking and sockets across the wall stopping short of the southeast corner. A modern window with electrical trunking extending across the width and two radiators below that, one on each side of the window in the centre of the south wall, were the main fittings with additional electrical cabling and gas pipes around the window. The insertion of the window also coincided locally with an additional skin of blocks to the south wall to increase its overall width to 0.56m (22inches) rather than the standard 15.5 inches. The reason for this is unknown.

The north wall comprised an entrance door (1.3m wide) with a window to its south and immediately south of it the 2m high back wall of a recess from the linking entrance corridor. Other fittings included sockets, notice board and low-level vent. On the exterior a signboard over the door read 'Aircraft Pipe Manufacturing Bay'; between the two larger doors of the east façade were a small mirror and information boards.

The main east wall behind the rooms (flat roof, 3.9m high) appeared plain to roof level with structural lattice girder columns and box ventilation ducting.

Between the north-south orientated range of rooms and those of the range along the south elevation was a pedestrian passageway (2.6m wide, 6.1m long) from the linking corridor with building 375. The only structural detail of note being a recess (0.37m deep, 1.16m long, 1.9m high) 0.56m inside the doorway on the east side whose back wall was recorded in classroom 7. The passage continued demarked by yellow markers and a handrail along the front of the east range and through the opening to the north zone.

The South elevation

The four rooms along the south elevation ranged over 22m to the west of the passageway were of equal size (plasterboard, 6.4m wide by 6m deep, suspended ceiling (tiles) height 2.7m. External flat roof 3m high). Each had an individual single door entrance facing north positioned either side of the west and east internal divisions (Plate 368); there were no interconnecting doors. Internal plasterboard partitions intersected three of the five main windows and a single door in the CPU controlled pipe bending room replaced the main southwest entrance of the south elevation. Natural light complemented strip lighting in the ceiling. All rooms were in white with white ceilings and blue carpet tiles.

Structural features in Machine Shop 1 (Classroom 1), the eastern of the rooms, included two structural pillars along the south wall one on either side of the eastern window. Fittings included electrical trunking with sockets around the walls (1.2m up from floor level and below sill level (1.52m)) with the trunking vertical and entering the ceiling on both sides of the door. Other features were radiators

below the windows, with the east in the centre and the west almost in line with the east edge of the 1.85m window length remaining between it and the partition (Plate 369).

The Standards Room (Precision Manufacturing room) to the west of the classroom was very similar with a structural pillar along the south wall, electrical trunking with sockets around the walls with the trunking vertical and entering the ceiling near the door and a radiator below the centre of the main window. On each side of the centre window, because of the partitioning, short lengths of the adjacent windows (0.8m wide to the east and 1m to the west) also provided natural light (Plate 370).

Features within the CNC Programming (CPU controlled pipe bending) room were similar to that of the room to the east including the trunking, however the main difference was that the main southwest entrance had been blocked to be replaced with a single door (Plate 371). To the west of the door (1.15m) were a structural pillar and in the corner of the room, a 0.3m length of main window before the partition. Between the door and the wall at the east was another partitioned window (1.55m wide) with a radiator below it.

The remaining room at the west, Machine Shop 2 (Classroom 2 CNC teaching) abutting the south and west elevations was again akin to the others with electrical trunking along the east south and north walls, a window (2.3m wide) intersected by the partition and another smaller window, both with radiators below, toward the west corner with a downpipe in the corner (Plate 372).

North along the west wall between structural pillars (3.75m) was a vertical X-frame (Shelton, England. British Steel) and 1.18m from the pillar, the north wall and part of a partitioned window reveal (0.6m wide) (Plate 373).

The elevation above the flat roof comprised the main windows, box ducting, wind girder and trusses to roof level.

The West elevation

Other than two structural pillars extending into the floorspace there were no rooms abutting the west elevation from the face of the classroom at the south over the 22.8m to the northwest corner. North from the classroom the elevation comprised three main windows with radiators in their centres below sill level (sills 1.55m from ground level), 2.8m to the north of these a single door (0.91m wide) and 1.5m further on the lattice girder structural pillar with adjacent downpipe that marked the south side of the inset blocked hangar opening with its folding doors for vehicles (4.27m high, 3.4m wide). The only other feature of note was freestanding compressed air cylinder nestled in the northwest corner. At higher level the elevation continued to roof level with the exposed structural steelwork (Plate 374).

Zone 5 north (General metalwork) Figure 12

This zone (36.26m (east-west) by 35m), open to roof level, north of the Zone 5 south wall and west of the main building division with zone 4 included an entrance lobby and rooms on the north elevation, rooms along the south elevation, and along the west a vehicle entrance and welding booths leaving the area to the east largely open floorspace (Plates 375-380).

The North elevation

Four rooms with one leading to two other rooms and a lobby took up approximately three quarters (29.2m) of the length of this elevation. The western room (Noisy Workshop, 9.8m (north-south) by 5.7m, ceiling 3.6m high) with a double doorway (1.7m wide, 2m high) facing east (Plate 381) opened to a larger room (7.1m by 5.7m) that led to two smaller rooms ((Plates 382, 383). 3.4m (east-west) by

2.6m at the west and 2.1m by 2.6m to the east) abutting the north elevation. Structural features along the east elevation of the larger room included a blocked opening between the small room and a breeze pier and a small window adjacent to the main doorway, and along the south wall a blocked opening (0.91m square), probably a window (Plate 382) and possibly similar to the window adjacent to the doors, was present 1.5m from the doors; at higher level were two circular vents. Construction of the welding bays was the likely factor resulting in the blocking of the window.

The west wall (the main building elevation) included a breeze pier and main structural pillar, bricked in main window with radiator below its centre and north from the pillar to the corner a skin of breeze block masking the brick behind. The north wall in breeze had adjacent 0.8m wide openings offset east of centre with heavy plastic curtains in place of doors to the two rooms on the north; other fitting were electrical switches and sockets, strip lights and supply pipes for manufacturing gases. The room to the west, the larger of the two rooms, which had a small main window offset west of centre with a radiator below was similarly fitted out as the larger room. A small, boarded panel in the breeze of the west wall is thought likely to be an access panel for maintenance to the vertical X-frame that had been blocked off (Plates 384, 385). The adjacent smaller room to the east with four adjoining metal funnels and hood on the east wall appears to have been used for shot blasting evidenced by dust residues on the walls and floor and by the protective curtains (Plate 386 and Plate LL).

Plate LL. Shot blasting collection troughs

Between the Noisy Workshop and the store to the east, the floorspace was largely open (5.18m wide) except for the main entrance lobby on the north elevation that extended 2.7m into the zone; The lobby (3.3m by 2.6m, wooden lath ceiling 2.7m high) was plain, painted light green and with no features other than coat hangers and notice boards. Four hand basins however were fitted to the 3.9m high workshop wall in the space (1.7m wide 2.7m long) between the lobby and external wall of the Noisy workshop. This external washing area outside of the 'dusty' workshop was likely primarily used following shot blasting work (Plate 387).

The remaining three rooms to the east included a Pipe Bay (store) and two similarly sized classrooms in plasterboard (Basics one and two). The store (7.9m (north-south) by 6.5m wide, suspended ceiling 2.7m high) with 1.71m wide double doors facing south was plain with just a cupboard (2.9m long 1.24m wide) housing a large electrical switchbox in its northwest corner which intersected the western of two windows both with radiators in their centres below their sills (Plate 388). The concrete floor of

the store marked with yellow walkway lines clearly indicated that this was once part of the workshop floor. This appeared to continue under the classrooms.

The adjacent classrooms (each 5.7m wide 10.2m long, suspended ceiling 2.7m high) with single doors either side of their shared wall were similar, and both fitted with electrical trunking with sockets below sill level along all walls other than for 1.1m between a window and structural pillar in classroom 5. The plasterboard walling of the three rooms intersected with the windows resulting in Classroom 5 with a complete window (2.74m wide) with radiator below and a short width (0.15m) of the adjacent west window and 0.9m of the east window. Classroom 6 was fitted with a smaller radiator below its full width window and a small radiator below the wall dividing the windows (Plates 389, 390).

The walls of the rooms were white, ceiling panels white and the floors of both classrooms were carpeted in blue tiles. Apart from natural light strip lights were suspended from the ceilings.

The space between the east wall of the classrooms (7.3m) was left open as part of the workshop floor but fitted with electrical trunking and sockets similar to the rooms, along the north elevation above the radiators and below the windows which served a function connected with a lightweight metal framework parallel to the trunking bolted to the floor north of the structural pillar on the east wall (Plate 391).

Crossing the elevation above the 3m high flat roofs were rectangular and circular ventilation ducting, braced steelwork and behind, the main windows.

The East elevation

The 26.4m length of the east elevation to the Welding room (Classroom 3) and adjacent electrical switch room was essentially walling to roof level albeit with electrical fittings, compressed air and water pipes with supporting brackets and rails and box ducting. Structural features were two lattice girder pillars and a double doorway to Zone 4 northwest, 8.4m south of the north pillar. Signage over the door read Basic Engineering.

At the south end of the east elevation adjacent to the switch room was a blocked opening 2m high by 1.6m wide to Zone 4 (Plate 392). A plasterboard wall with door separated a continuation of the elevation (8.5m) to the south corner where the opposite side of the two brick piers (3.15m apart) noted in zone 4 were evident projecting 0.22m into the switchbox area.

The South elevation

The 7.5m of the south elevation between the east wall and the opening to Zone 5 south, was taken up with the Welding room (Classroom 3) and a narrow open area with a large electrical switch box (Plate 393). Although the west wall of Welding room was in line with the Zone 5 rooms, to the south it was 0.34m short of the dividing wall because of existing electrical switchboxes on the wall, thus leaving a narrow gap along the greater part (4.9m) of its wall that was only filled in adjacent to the vehicle opening presenting a continuous façade (Plate 394).

The gap was part of the larger open area (2.4m wide (east-west) by 8.5m long) to the east of the classroom where a partition wall and door on the north elevation in line with the classroom masked off a large freestanding electrical cabinet (5.36m long, 0.8m wide, 2.15m high) 0.75m off the east wall and a compressed air tank on a low plinth in the southeast angle (Plate 393, 395) .

Fittings in the Welding room itself (external dimensions 8.2m (north-south) by 5.1m, 3m high) with its door facing west near the vehicle opening with Zone 5 south included electrical trunking and sockets

along its north and east walls. Because of the electrical boxes on the adjacent south wall an opening (1.6m wide, 1.5m up from floor level and to the suspended ceiling (2.7m high)) 0.9m along the south wall from the door and fitted with wooden doors was made for practical reasons to access the electrical switchboxes (Plate 396).

Beyond the 2.66m wide opening between north and south zones and a pier and adjacent blocked doorway, there were a further four breeze-built rooms abutting the east-west Zone 5 divide over the 24.2m to the west elevation and all of which once had interconnecting openings now blocked.

Office 3, at the east with its entrance facing north and the smallest of the rooms (5.1m (north south) by 3.85m, suspended ceiling tiles and strip lights at 2.6m) was fitted with similar fittings to those in the other offices with electrical trunking, but only on the west wall (and fitted after blocking of a door), heater and notice boards. Two small windows, one faced north and the workshop floor, and the other which faced east and the passageway, also had a mirror angled to view movement apparently from the opening on the west. This office appeared to have been a control room between zones as along with the positioning and windows there was blocked doorway (0.93m wide) in the south elevation to Zone 5 south and a larger blocked opening 1.7m wide along the west elevation south from the northwest corner to Sheet Metalwork room (Plates 397, 398).

Sheet Metalwork room (6.85m wide by 5.1m, ceiling 2.6m) was fitted with a switchbox on the south wall and similar electrical trunking, along all walls except for across the blocked eastern opening with Office 3 (Plate 399). The north wall of the room was plasterboard. That was not the case on the opposite side where trunking crossed a blocked 1.8m wide opening in the west wall to the pipe bending room (Plate 400). The wide openings in Office 3 and the Sheet Metalwork room were directly opposite each other. Both office and classroom were painted white with white ceiling tiles and blue carpet tiles.

The rooms west of the Sheet Metalwork room (Pipe Bay (Manual pipe bending) and Prep area) stepped out 1.7m northward in a right angle to align with the northern of the two main vehicle openings in the west elevation. Coincident with the larger footprint, the height of the front elevations rose too, with the office and classroom 2.94m high, the pipe bending room 5.65m high and the highest part of the Prep area directly above its opening, 6.6m high. At the change in angle, a vertical ladder gave access to the roof above the pipe bending room.

The Pipe Bay accessed from double doors in the north elevation was L-shaped with the main rectangular area (6.7m (north-south) by 6.3m by 5m high) and the smaller area (3m by 1.5m) opposite and west of the doorway. Features were few. Affixed to the concrete floor 0.2m off the south wall and offset west of centre a 0.45m diameter galvanised pipe extended upward and through the ceiling and the roof (Plate 401). Behind it on the wall were electrical sockets and compressed air pipes. Electrical sockets were also present on the other walls and at 3.3m up from floor level strip lights and associated rails.

Structural features included two boarded up square windows 2m apart in the north elevation and 1.65m from the northeast corner, the 1.8m wide, 2.1m high blocked opening with Classroom 4 in the east elevation (Plate 402). The west walls including the return to the west opposite the doors were plasterboard and within the narrowest part south of centre was a blocked 0.9m wide doorway to the Prep area (Plate 403). The walls and ceiling were white.

The Prep area was also L-shaped with the narrowest part (3.66m wide, 1.6m deep, 6.1m high) opposite the north facing opening (2.86m wide 3.8m high) and the larger area (6.7m (east-west) by 5.1m, 6.1m

high) extending to the south and east. Internally, the room subdivided into two on a north-south line with the west room (2.83m wide, 5.1m long) accessed through a 3.6m wide, 2.5m high opening. A similar vertical pipe (0.5m diameter) to that recorded in the Pipe Bay room was fixed to the concrete floor 0.5m off the southeast corner of the room and which extended upward through the roof (Plate 404). The adjacent room directly in line with the opening was fitted with a north-south orientated single rail traveling crane (500kg safe working load) at roof level as well as electrical sockets and pipes (Plate 405). Structural features included in the northwest corner of the west elevation adjacent to a pier, a single doorway leading to the outside, and the blocked doorway with the Pipe Bay opposite the single doorway in the east elevation.

At higher level the elevation continued to roof level with its trusses and circular ventilation ducts. The flat roof above the Prep area and Pipe Bay supported what appeared to be a newer but unfinished box ducting with smaller associated circular ducting and the circular vertical pipes in the rooms below were part of this system (Plate 406). This high-level view offered a good overall view of the workshop floor (Plates 407-409).

The West elevation

The main features along the 18m of the west elevation between the Prep room at the south and the Noisy workshop at the north included the main large folding doors (3.7m wide (four panels), 4.23m high) with glass block window over and to the north of them, 0.65m from a lattice girder pillar and downpipe (Plate 410), the first of the three main 2.74m wide, 6.18m high windows albeit with several alterations (see exterior elevations); another downpipe was present between first and second windows. The elevation which continued for 10m to the northwest corner and over the Noisy workshop included another main window (the fourth along the north section of the elevation), and two structural columns the corner one the support for the wind girder of which the vertical X- frame could be seen over the workshop roof.

Abutting the west elevation and accessed from the workshop floor were two back-to-back welding area training bays (13.8m overall distance north-south) each with 12 (each 1.19m wide), wooden booths 2.4m high and open to the roof (Plate 411). The south wall of the booths in line with the north side of the folding doors resulted in a 4.2m wide, 12m long corridor with the south elevation rooms leading to central open workshop floor. The welding areas to the north aligned with the Noisy workshop wall where construction of the booths resulted in the blocking of a window. All booths were painted matt black and fitted with electrical switches; the black theme of the walls was continued along the brickwork of the main elevation.

The General Metalwork Area

The grey concrete floor working area, approximately 14m square and defined by handrails, lay within the centre of the broadly rectangular open area (24.4m (east west) by a minimum of 16m) with safe walking routes of approximately 2.5m width outside the handrails and between the rooms; worn painted yellow lines, some with light green paint between them, and some crossing each other indicated present and older walkways and equipment areas. The crossing and worn paint indicated changes in use of floorspace areas. The area was for the greater part clear, electrical sockets were attached to the north handrail and also thin lightweight metal columns in line with the handrail to the west, however two vertical pipes for compressed air or gas were present toward the north handrail and another toward the south with an adjacent electrical column (Plate 408). The area was open to the roof.

Overhead detail in Zone 5 (Figures 13, 17 and 18)

Overhead detail was unsurprisingly a direct continuation of that from zone 4 which included structural steelwork and ventilation tubing to roof level with the rooflights facing north fitted with yellow brown screening and panels elsewhere on roof. At higher level, the base of vertical extractor tubes part of the main north-south orientated ventilation tubes was at 5.04m with the underside of main tube itself passing between the structural steelwork at 8m from ground level; these vertical tubes were approximately 1m in length in the northwest zone. The underside of the lattice and wind girders were at 7.61m, internal roof valley at 9.18m and the apex 11.71m.

Circulation areas

Although the building was divided into two workshops (361A Training Flight left and 361B EETF on the right) and by east-west subdivisions, circulation was possible to all parts from any entrance albeit with just one doorway toward the north along the north-south divide between zones 5 and 4. The only WC facilities were located just inside the northeast entrance lobby. Movement on foot took precedence with two entrance lobbies at the north, one in the southeast and via the linking corridor to buildings 375 and 377. A separation could be maintained with the various workshop and classroom areas as each entrance led directly to specific work areas and classrooms. Vehicle movement appeared to be a secondary consideration and limited to the larger open areas accessible from the folding doors in the west and east elevations and then manoeuvring room would be further constrained by handrails, rooms and fittings. The likelihood is that vehicle movement was generally confined to maintenance vehicles and perhaps machinery delivery or collection vehicles and the west entrances (361A) probably more used than the east side by the nature of materials required for metalwork training.

Alterations and observations

In zone 5 south all rooms appeared to be recent (later 20th century date). The emphasis with the placement of the four same sized rooms along the south elevation seemed guided by the size of the rooms as none neatly fitted existing features with partition walls intersecting windows as an example, and the rooms may have coincided with the loss of the lobby to be replaced by a single door. The range of rooms to their east in breeze block are likely and possibly part of the general earlier breeze building phase (post 1945, pre 1962 by the installation of ducting) whose included the east-west wall that divided the Zone 5 areas: it is noted that their facades align well with the alignment of the connecting corridor (built between 1981 and 1991). The most interesting feature in these rooms occurred in the CNC Pipe Bay where another skin of brick was added to the south elevation to create a 22-inch wall rather than the standard 15.5-inch walls. This addition was related to the blocking in of two large windows and emplacement of a small window for the Pipe Bay room. It was noted that ducting passing through the rooms was connected to the high overhead tubular duct and as the connection appeared irregular in comparison with the original ducting it appeared that the rooms took advantage of the existing ducting. Hot air passed through these tubes indicated by fire damper signs on the ducting.

The lobby appeared to be the only certain original feature in the north half of Zone 5. Following that and built in breeze were two rooms on the south elevation which were subsequently partitioned to become four rooms. The original layout included both the Prep area and Manual Pipe Bending room as one space with a wide opening facing a similar sized opening in Office 3 which was a standalone room adjacent to the opening between north and south zones. That suggested movement of material between these two areas. Office 3 had its own door (blocked) to the south workshop even though there was an adjacent door immediately outside of its east wall (blocked) that likely allowed

pedestrians to pass into the south workshop without using the wider adjacent main opening. A similar doorway (blocked) for pedestrians was present between the Prep area and Pipe Bending room.

The Prep area and Pipe Bending room were of two storey height and the presence of an overhead crane in the Prep area indicated that it was always intended to be for a crane where sufficient lifting height was required.

In the northwest corner another room (The Noisy workshop) in breeze was likely of similar date to the south rooms and used for shot or sand blasting. That had a blocked opening facing the lobby. The placement of the three rooms (Pipe Bay and Basics classrooms) on the north wall may have been the reason for blocking the opening as its space was now restricted. The partitioning of these rooms like those in the south zone ill fitted existing detail with partitioning intersecting window frames. The positioning of Classroom 3 in the southwest corner appears odd and that it had to be located there and nowhere else despite being close to a freestanding electrical unit to its east, but more intriguing is that a high slot fitted with wooden doors had to be cut into the south wall of the room to access existing electrical boxes on the south wall. Clearly these were workshops with functionality taking precedence over niceties.

Other changes appeared to be to the windows in the west elevation where from the pattern on metal plates in places of glass bore circular shapes indicating tubing. Modern tubing above the Prep area and vertical pipes in the Prep and Pipe bending rooms exiting through the roof and further tubing in the northwest corner were elements of new unfinished piping.

Phasing

There is no certainty in phasing, but the suggested sequence was the Noisy workshop in the northwest corner together with the Prep area, Pipe Bending, Office 3 rooms and the range of offices built in breeze along the southeast elevation with the latter phase being Classroom 3 and the offices along the north and south elevations where the partitions cut across the windows.

Building 377. Mechanical Engineering Training Workshop

Building 377, originally and up to the present used as training workshop, was of similar size and orientation to Building 361. The workshop was primarily used for vehicle servicing, maintenance and training (Figures 14 to 18).

Separate structures as built they have since been connected by a modern corridor and crew room. Height difference apart, building 377 shared common characteristics, with Buildings 354 and 361 particularly in the fabric (Cavity walls (variable thickness between 0.38m to 0.41m (15-16inches)), Flemish bond red brick blended with contrasting random black brick, bonded with sand coloured mortar) and the roofing detail. The original rectangular workshop orientated just west of north measured 74m east-west by 64.7m (approximately 243 feet by 212 feet) with a height of 9.9m (approx. 32.5 feet) to the parapet (0.33m wide) and 12.2m (approx. 40 feet) to the roof ridge of which there were 7 pitched roofs parallel to the building's length, with skylights facing north ranged between the hipped ends of the roofs. A U-shaped metal gutter (0.32m wide, 0.15m high) around the perimeter of the parapet and roof valleys collected water runoff from each roof leading to downpipes of which the greater number were internal. Fitted to the external elevations, safety railing extended 1.1m above the parapet.

The addition of a modern vehicle bay (stretcher bond brick, 41.3 m by 11m, height 7.8m to a flat roof) abutting approximately two thirds of the south side of the west elevation, extended the overall footprint of the workshops (Plates 412-422).

The predominant features of the elevations were the tall window reveals and their adaptations, doorways in the north and south elevations, bricked up recessed hangar doorway in the centre of the east elevation, the almost unbroken modern brick wall of the vehicle bay on the west elevation, and a modern connecting corridor to the crew room (Building 375) on the north side adapted from a window reveal. In addition, although not physically adjoining the main structure (1.82m off the elevation) were related fan houses (Keith Blackman Ltd., London. 'Tornado' centrifugal fans), one each on the north and south side of the respective elevations with ducting that entered the building at high level through bricked in window reveals.

The original large rectangular window reveals (6.18m high by 2.73m wide) below a cement lintel were consistent on all elevations, as was a reinforced cement sill where not interrupted by other openings. The north and south elevations were matching with 16 window reveals each, whilst on the west four were visible and, on the east, eight; both glazing and brown panels (to block sunlight) were present in brown metal window frames. Of the eighteen panes and panels, 15 panes and/or panels were of equal size (760mm by 690mm) and three panels over six lower panes at 1.6m up from the sill, double the size of the others; this pattern repeated, the lower six panes glazed, panels above and glazing above that except for the south elevation which was panelled from the lower six panes upward. These frames, based on the examples considered original in Building 361, were replacements.

Smaller window reveals (2.2m high by 1.88m wide) their top flush with the lintel were also consistent on all elevations, and present over the four original main doorways and on the north elevation alone a small window (1.7m high, 0.9m wide) was present 1.8m in from each corner. Five windows were added to the elevation with the blocking up of the hangar opening.

Other standard fabric features included air bricks above the lintel central to each window and at ground level integrated with the first course of brick above DPC level.

Entrances to the workshop as originally designed were two double doorways each in the north and south elevations under flat cement canopies (3.3m wide tapering to 2.9m wide 0.76m off the wall, by 0.13m thick) each 8.2m in from the corners; the southwest doorway was later blocked. Single doors were present between the doorways and building corners in the south elevation only; the equivalent on the north elevation were windows.

Later entrances included a single door and roller shutters in the east elevation, roller shutters and adjacent doorway facing north in the vehicle bay on the west and three adjacent single doorways in the north elevation to a kitchen and offices.

All main entrances, (overall 4.06m high to underside of canopy by 2.7m wide) were similar and fitted with wooden doors and sidelights (together 2.09m high), differences however were whether sidelights (four in number) were panelled or whether panelled or glazed below the door rail; probability is that the differences were caused by glass breakages and the easiest repair was a panel. Other details included another wooden panel (0.76m high) between the door/sidelight frame and a lintel (0.3m high), and above the lintel a window frame (0.915m high) with three panes of which all three doorways were finished with brown panels. These doorways matched those in Building 361.

The main doorways aside, the centre of the east elevation had a blocked hangar opening (17.2m long by 7.67m high to the lintel) inset 0.43m from the general elevation, infilled with Flemish Bond brickwork (red brick, not the polychrome of the original walls. Darker brick observed in the wall likely caused by temperature differences during kiln firing). The corners of the brick walls on each side of the blocking were again as in Building 354, rounded off rather than fashioned in bullnose brick.

External elevations (Figure 14)

The North elevation

The main features of the original elevation were symmetrical either side of its centre seven large windows, (0.9m separation) doorway with window over, another large window and a small window toward the corners however, mainly to the west but also to the east of the centre there were alterations to that symmetry. The major changes occurred with the three window positions immediately west of centre.

The first and second window reveals were adapted to provide ventilation ducting with the insertion of a lintel (3.1m long, 0.3m high) into the brick 2.5m above the sill. Whereas a window was retained below the lintel, the upper 3.36m was bricked in (stretcher bond, light brown brick) with a circular (1.7m diameter) duct (4.2m from sill to underside) offset west of centre in the first reveal and a rectangular duct (1.6m by 1m, 4.6m from sill to underside) central and under a small lintel in the second reveal. The third reveal and a later adaption again, was utilised to form an entrance corridor (26.34m in from the northwest corner, 43.64m from the northeast corner (3.64m overall external)) width to link buildings 377 and 361 where the upper part of the reveal was again bricked in (stretcher bond and a darker brick than the ventilation blocking) above a corrugated sloped (4.9m high east, 3.5m west) metal roof (Plate 423).

Within reveals 3 to 5 east of centre, the sill was cut and three single doorways (2m high, 0.9m wide) were built against the west sides of the windows. The probability is that these were constructed when the original frames were replaced as they fit well with the general pattern of panes and style of frame despite the height of the door not matching a glazing bar (Plate 424).

Signage affixed to the elevation included on the northwest corner Mechanical Engineering Training Unit DSEME and on the panel over the east doorway two signs both with Engineering Training Squadron and DCEME but additionally Support Engineering Section on the one and HLSEI Training the other.

Although not on the same plane the north facing entrance to the modern vehicle bay with a single doorway and roller shutter (5.85m wide, 4.9m high) was set back 23.2m from the northwest corner (Plates 412, 422).

The East elevation

To north and south of the central Flemish bond bricked hangar opening (17.26m wide) were four similar large windows, whilst in the centre was roller shutter door (3.58m wide, 4m high) with a nine-pane window above and on each side two windows each, one above the other, all with nine panes (Plate 425). There were two entrances, through the roller shutters for vehicles, and a single doorway adjacent to the south of the shutters.

Ancillary external features were a small storage shed abutting the north corner, piping and electrical wiring and a vertical ladder to access the roof 9.5m from the south corner (Plate 426).

The South elevation

The main architectural features were of the same pattern as that to the north with the same number of original windows and doorways, including the two later bricked-in windows with ventilation ducting.

The major differences were toward the west where the original doorway had been blocked and rendered. To the west of it, the window reveal was opened to ground level and a lintel inserted flush with the reveal edge, 3.16m up from ground level; the reveal over the lintel was blocked with stretcher bond brickwork. Below the lintel the extended reveal hosted a single wooden door to a small space (0.87m deep by approximately 1.8m wide) with the other half stretcher bond bricked but with different brick colour to that above (Plate 427).

Another single doorway (0.92m wide, 2m high but 3.25m high including a pane over) to the west gave access to a room in the southwest corner of the main building. The companion to this doorway at the east (1.8m in from the corners) side was a standard single doorway to a maintenance area.

For eleven metres to the west of the original corner and stepped back 0.22m was the back of the modern vehicle bay with double louvre doors and two louvred vents to a Plant room (10.55m wide by 5.8m deep) (Plates 428-430). The Plant room lay directly below a second storey room.

Of note was that all except the lower six panes of the south facing windows were blanked out as protection from sunshine and two of these windows were fitted with sheet panelling; the two smaller windows over the doors were also blanked out

The West elevation

The greater part (41.3m) of the original elevation was masked by the addition of a vehicle bay (7.84m high, 2m short of parapet level) with just a single doorway and six vents breaking the brickwork (Plate 421). However, at the north, starting at 5.9m from the corner were four large original windows extending across the remaining elevation (23.2m) and stopping 0.85m short of the bay.

External features included a vertical ladder located adjacent to the brickwork in the centre of the windows and external piping rising above parapet level and entering the building through a window (Plate 432).

Internal detail

The floorspace of the original building was divided into three areas on a north-south axis with the largest area on the east (Zone 2). The west was subdivided into two with approximately three-quarters of the available floorspace to the north (Zone 1) separated from a corridor with classrooms to the south (Zone 3); the addition of the later vehicle bay on the west amount to four overall zones. The layout favoured rooms along the length of the north, east and south elevations with the west side clear, leaving the main areas (bays) open to allow vehicle movement. The bay on the west (Zone 1) was a minimum of 37m square and on the east (Zone 2) a minimum of 50m by 29m. The main feature in the northwest quadrant were 15 stanchions in three rows with flexible ventilation hoses for exhaust extraction, and in the northeast quadrant a travelling crane supported by 10 stanchions.

Overhead, the structural steelwork was exposed to roof level with the lowest member 7.75m from floor level (Figures 16, 17 and 18). Ducting both box and tubular section passed between the trusses; the ducting was introduced after the war. Modern radiators and electrical fittings were present.

Circulation areas

This building divided on a north-south axis was clearly a workshop for vehicle maintenance and training with two main accesses opposite each other in the centre of the building in the east and west elevations and complemented by a similar opening in the dividing wall between them. An additional later vehicle entrance was provided by the extension on the west, with doors in its north elevation. Internally, the rolling road pit and stanchions apart, vehicles could have moved freely within the open spaces however, in use movement would be controlled by staff directing movement to designated training /servicing areas. For pedestrians, internal movement was possible to all areas.

Zone 1

Stanchions apart, this area comprised mainly the open bay with offices ranged along the north elevation (Plates 433-438).

The north elevation

The main northwest entrance lobby, eleven rooms and the access to the linking corridor with building 361 and 375, ranged over 36.5m comprised the north elevation.

In the northwest corner were four offices (overall occupying 8.3m (north-south) by 7.3m) accessed by a short corridor (5.2m long, 1.1m wide, ceiling height 3.2m) between the rooms on the west of the entrance lobby They were all similar with blue carpet tiles, cream painted breeze walls abutting the exterior brick, single doorways and suspended ceilings (3.2m high). Offices 3 and 4 had an interconnecting door. Offices 1 and 2 had main windows facing north (sill 1.55m high), Office 3 a main window facing west and a small window facing the bay as did Office 4 which also had another small window facing the corridor.

Exposed to ceiling level in Office 1 was the main vertical X-frame of the wind girder adjacent and parallel to the west wall (Plates 439-446).

An entrance lobby (3.49m by 3m, ceiling height 2.86m) with double doors directly to the bay separated Offices 1 to 4 from Offices 5 to 8. The only feature was a small sliding window shared with Office 5 toward the southeast corner of the east wall. Electrical fittings and a small sloping shelf below the window were the only features of the lobby (Plates 447, 448).

Between the lobby and the linking corridor passage were four similarly sized offices (3.6m/3.5m wide, suspended ceiling height, 3.15m), extending 5.7m into the bay with their dividing walls central to the main window pillars on the north elevation. Three of the offices, 6 to 8, were accessed through either the double doors of a corridor facing Office 4, or from a single door facing the bay at the end of the 10.5m long, 1.5m wide corridor whose south elevation had windows facing the bay; Office 5 was not enclosed. The only feature of note in any of these rooms was another small sliding window between Office 5 and 6. All were similarly decorated with cream painted breeze walls and blue carpet tiles (Plates 449-453).

The east wall of Office 8 including the end of the corridor (7m long) and the walls of Offices 9 and 10 (6.65m long) demarked the sides of the 3.5m wide passage to the linking corridor and its double doors.

The remaining 7.34m of the elevation were taken up with Offices 9 to 11 all of which had individual doors from the bay or the linking passage (Office 9) and additional internal doors joining Office 9 to 10 and office 10 to 11. Although Offices 9 and 11 had natural light from the main windows, the design of Office 10 did not benefit directly from any natural light, and to offset that the upper part of the dividing wall between Offices 9 and 10 was glazed (from 2.1m to the suspended ceiling at 3.2m) to provide some natural light. These were decorated in similar fashion to the other Offices (Plates 454-458).

The exterior roof level (flat roofs) of the offices, was 4.2m from floor level with the exceptions of Office 4 at 3.36m high and the lobby at 3.07m. All were below structural steelwork truss level (7.72m). Above the offices and across the main north elevation were large rectangular and circular ventilation ducts and the main window reveals. No alterations were visible.

The East elevation

The single breeze block skin of the east elevation rising directly to roof level and dividing Zone 1 from Zone 2 measured 38m in length from Office 11 to the back wall of a classroom at the south. It was plain except for two openings, a double doorway and folding doors, two truss pillars (18.6m apart), rail supports embedded into the elevation for strip lighting and additional electrical fittings (Plates 435, 436).

The double doors (1.68m wide) just under a metre from the corner of Office 11 gave access to the range of offices and ablutions on the north elevation of Area 2, and the folding doors (3.6m wide, 4.06m high) for vehicle access, 22.8m from Office 11, were in line with the hangar doors in the east and west elevations (Plates 459, 460).

Between the southern truss and the southeast corner (3.7m) a 1.48m wide, 3.16m high opening, to Zone 2, was blocked. This blocking continued to the classroom to the south and the likelihood is that this opening was closed off when the Zone 3 classrooms were built (Plate 461).

The South elevation

This elevation in breeze block to roof level comprised two sections, the longer part at the east (22.3m) with a projection northward, the back wall of the classrooms to Zone 3, and stepped back 6.7m south

in a right angle from the general line, the low-level back wall (13.5m) of the Zone 3 corridor (roof level 3m high) to the west and rising behind that the wall to roof level (Plates 437, 438).

The main features of the elevation were five blocked openings at the east and a single doorway in the southwest corner to the Zone3 corridor. From the southeast corner there were three blocked openings, the first starting at 4.2m (2m wide, 2.8m high) along, the centre at 8.5m (2.4m wide, 2.6m high) and the third at 12.2m (1.5m wide, 2.8m high). From 19.4m the elevation projected northward, in two steps, for 1.3m before returning for 3m to the west with another blocked opening (1.5m wide, 3.46m high) in the centre. From the projection the elevation turned south for 7.3m where at 1.55m along there was another blocked opening (1.76m wide, just over 1m high); both latter openings were adjacent to the same classroom. From the corner the elevation returned to the west with a dog leg ending with a single door (0.9m wide) to Zone 3, 0.3m off the corner (Plates 462-467).

Behind the corridor wall (3.3m) toward the west side of the elevation, at approximately 4m from the southwest corner within plasterboard walling was a single high level (approximately 3.3m threshold) doorway (labelled with a chemical hazard warning sign) to a second storey room) but with no indication of any steps to access the door from workshop level. This doorway was part of a room over the adapted rooms in the southwest corner of the main structure (Zone 3) (Plate 468).

The corridor and classrooms were secondary phases and blocking of the openings likely co-incident with those changes which includes the second storey room and isolated doorway.

The West elevation

The west elevation at 43.4m long between Office 3 at the north and the Zone 3 corridor at the south mirrored the structural detail of the main east elevation with no significant alterations with the addition of the modern vehicle bay. The bricked in recessed hangar opening (stretcher bond) with all five windows bricked in, was flanked to the north and south with four main windows in each of which the four at the south were bricked in; all sills had been removed and the brickwork flush. Access for vehicles between Zones 1 and 4 was through the folding doors (3.6m wide by 4.04m high) in the centre and for pedestrians, the single doorway to its south (0.9m wide) (Plates 469, 470).

In addition to the roof steelwork pillars there were a series of later narrow in line steel I-frames of which those adjacent to the inset hangar opening were encased and attached to the elevation wall as opposed to those ‘free standing’, and approximately 0.4m off the elevation to the north and south. These columns were out of use, evidenced by the cross members at the upper level having been cut off to the vertical line of the column however, a short and lower-level unaltered cross member on the column now supported metal trunking. As nothing at floor level could be discerned in connection with the columns, the assumption is an overhead support beam function but one confined only to the west elevation (Plate 471).

The workshop floor

The greater area of the concrete floorspace, painted grey, in contrast to green coloured strips edged in yellow for vehicle movement and walkways, demarked the working areas; the green paths were in line with doorways and the larger openings or adjacent to rooms.

The northwest quadrant of the floorspace was taken up with a rectangular pattern framework of 15 I-frame columns (three rows of five (north-south), 0.2mm by 0.21m on a 0.35m square base bolted to the floor, rising 5.18m to beam top) which supported flexible coiled ventilation trunking. In the southeast quadrant was a stand-alone triangular formation of three I- frames with the same purpose.

Features flush with and below floor level included a rolling road vehicle pit (3.95m by 0.9m, depth 0.71m) and beam setting bars located 7.5m from, parallel to and in line with the doorway between Zone 1 and 2 and a series of metal anti-slip access plates covering channels in the floor (each plate 0.62m long (2 feet), 0.18m wide, trough 0.16m deep). These channels located only in the east half of Zone 1 were of variable length and parallel or at right angles to the walls. Four channels were present in the northeast quadrant including the largest (H-shaped, 8.7m by 4.45m overall) adjacent to the Office corridor and three separate channels each 3.4m long at a right angle to the Zone dividing wall. The southeast quadrant had three long (two at 9.4m and the other 5.2m) separate channels, with two closest to the classroom walls with short side branches (Plates 433-438).

In addition to the extant and clear features, numerous bolt holes and faded paint lines indicated former divisions and uses. The fire plan indicted engine building to the west, service bays (chevron pattern) in the centre and servicing, foul discharge, engine maintenance and battery change areas along the dividing wall on the east.

Zone 2

The floorspace of Zone 2 (approximately 64m by 36.5m) on the east half of building 377 and the largest of the four areas comprised rooms along the north, east and south elevations, whilst the workshop floor (broadly 56m by 29m) between them and the dividing wall with Zone 1 and Zone 3 on the west, was clear apart from 12 stanchions supporting a travelling crane (Plates 472-745).

The North elevation

Extending for 25.8m to the east of the double doors with Zone 1 and terminating at the northeast main entrance passageway were a range of single storey storerooms, modern WCs, kitchen areas and offices, ten rooms in all; all constructed with breeze, with suspended ceilings at 3.1m high, coincident with the height of two of the main elevation windowpanes. Visually the exterior elevation comprised blue painted doorways, electrical rails and switch boxes and a hand basin (Plates 476).

From west to east the first room, accessed by a single door facing the workshop, was a storeroom (3m square, ceiling 3.1m) and immediately adjacent to it, a doorway to a short passageway (3.2m) leading to male WCs (6.9m by 4.6m) with four cubicles, four hand basins and three urinals. The next door led to a small storeroom (1.5m by 1.4m). Four metres from the storeroom another passageway led to, on its left female WCs and shower room (L-shaped 5m by 3.1m maximum) and directly ahead, to a kitchen (3.7m by 4.6m) which had a doorway to the exterior built into the window reveal. A similarly sized passageway 2.6m to the east gave access to a small shower room (3m by 1.8m) on its left and another kitchen to the north. As with the adjacent kitchen this had a doorway built into the window reveal and a connecting opening without a door with Office 12; the main door (double width, 1.7m) to Office 12 was 5.3m along the elevation from the passageway.

Office 12, the largest of the rooms (7.3m by 7.9m) was directly connected to Office 13 (3.6m by 4m) by another opening, in line with kitchen opening, and again without a door. The east elevation of Office 13 was the back wall of the northeast entrance lobby and as with all lobby walls it was brick rather than breeze; a door in the southeast corner gave access to the entrance lobby passageway (Plates 477-488).

The remaining room (3.7m by 4m) forming the corner with the lobby passageway (5.1m long, 3.27m wide) appeared to be a storeroom but with double doors (1.6m wide by 2.85m high) and louvre vents it may once have housed plant (Plate 489).

Eight metres behind the front elevation of the rooms and above the level of the flat roof (4.14m) were a ventilation duct and the main window reveals.

An entrance lobby (brick, 3.25m by 2.8m, ceiling height 2.86m to wooden laths, 3.07m roof height) with double doors directly to the workshop separated Office 13 from Office 14 (Plate 490, 491). This lobby was plain without a window to an office, in contrast to the lobby on the west.

The East elevation

The east elevation was not dissimilar to the north with five rooms spread over 24.3m to the north of the central hangar opening (11m between corners) and six rooms over the remaining 28.7m at the south. Room decoration was again like that of the north with blue carpet tiles, cream-coloured walls, black skirting and white suspended ceiling with strip lights.

The exterior of the north range with five doorways and electrical fittings rose to 4.17m high but dropped .17m to 3m high over classroom 2 (Plate 492).

At the north, Office 14 (7.4m by 6m maximum, ceiling height 3.1m) with a double door entrance from the lobby passageway occupied the northeast corner of the structure. Features of note were the large and small window on the north, a downpipe in the northeast corner, the vertical X-fame of the wind girder on the east wall was sealed behind breeze walling which continued over a main window frame and that the south wall was of Thermalite block walling with two supporting pillars (Plates 493, 494).

Office 15 (7.3m by 3.6m, ceiling 3.1m) to the south of Office 14 with double door entry, was plain other than for a downpipe and the two supporting pillars in the wall shared with Office 14 which abutted the east elevation, intersecting the window at 2m from its south reveal but leaving the sill (height 1.55m) open for the remaining 0.7m to the north (Plate 495).

Just 1.3m south of Office 15 were double doors to a narrow store (7.3m by 2.2m, ceiling 3.1m) which was plain except for its south Thermalite block wall intersecting the window and with a doorway (0.87m) 1.2m from the east wall to Classroom 1 (Plate496). Distinguishing features of the classroom (7.3m by 6m, ceiling height 2.7m to suspended panels and 0.4m lower than the rooms to the north) were double doors with an adjacent window facing the workshop and a large window and adjacent downpipe.

The remaining room, HLSEI Training (Classroom 2, 7.4m by 5.25m, ceiling height 2.7m) 1.1m south of Classroom 1 was a later addition to the range evidenced by plasterboard walling on its west and south whereas the north was breeze. Internally, little of note other than a window, wide (1.2m) truss pillar (0.8m off the south wall) which also marked the infilled inset hangar opening, and as with all the rooms, electrical fittings (Plate 498).

At ground level the open central section (11m wide) of the east elevation between the north and south rooms was a reversal of the infilled hangar opening external elevation detail with a large window (2.58m wide, sill height 1.8m) to the north, roller shutter door (3.36m wide, 4.48m high) and a single door 0.65m to its south adjacent to the north wall of Refrigeration area room of the south range (Plate 499).

The exterior of the south range (height 4.1m to a flat roof) included two single doorways with adjacent windows and a ladder between them at the south, double doors to a Classroom toward the centre, an inset area (1m deep) with a continuous bank of electrical switchboxes and to the north a small single window to the Refrigeration area (Plates 500, 501). Internally room decoration was similar to the north

with blue carpet tiles, cream coloured breeze walls, black skirting and white suspended ceiling with strip lights (height 3.17m) and apart from Office 19 in the south corner, all the rooms were interconnected.

The Refrigeration room (9.5m by 7.4m maximum, ceiling 3.17m) at the north end of the range, was one of the larger rooms, with a side door from the central bay, small window facing the workshop and a narrow column with plug sockets in the middle of the floor. A step in the east elevation approximately in the centre of the room between the two windows (sill level 1.55m) marked the division with the infilled hangar opening; structural pillars were present in all walls except the north and a single doorway in the southwest led to Classroom 3 (Plates 502-504).

There were no distinguishing features in Classroom 3 (9m by 7.4m maximum) other than the addition of two plasterboard walls, complete with door and windows in both elevations, to create a small office (Office 16, 4m by 2.2m) adjoining the east elevation in the southeast corner adjacent to a door to Office 18 and abutting a structural pillar. Opposite the office adjacent to the southwest corner were the double doors to Classroom 3 from the workshop (Plates 505-507).

Two single doors in the south elevation of Classroom 3 led to similarly sized Offices (3.7m by 4.7m), Office 18 to the east and Office 17 the west. Divided by a plasterboard wall with a window and doorway these were almost certainly once a single room (Plate 508). The west elevation of Office 17 was similar to Office 19 with a doorway at the south adjacent to two 6 pane windows each windows facing the workshop (Plate 509).

Office 19, the southern room (6.9m by 4.7m) of the range in the southeast corner of building 377 was plain, however the blocked off back wall (east elevation) masked a vertical X-frame wind girder (similar to the blocking at the northeast) and a projection (2.1m by 1.4m) into the corner reflected an exterior maintenance room (Plates 510, 511).

Behind the ground level elevations of the north and south offices and rooms the elevation continued to roof level with the main windows and steelwork visible.

The South elevation

Of the 28.9m from Office 19 to the Zone 3 dividing wall with, 15m was taken up with a modern Training Aids classroom encompassing four main windows, and 2.74m with the main southeast entrance doors adjacent to Office 19 (Plates 512-514).

The training classroom in the centre of the elevation comprised in plasterboard, a single room (14.9m long by 5m wide, suspended ceiling 3.15m) with double door entrance facing Office 19 at the east and a single door in its northwest corner facing the workshop as were a series of 11 windows (13.1m long overall, 0.84m high starting 1.16m from floor level). Internal decoration matched the other rooms with blue carpet tiles and cream walls (Plates 515, 516).

Behind the classroom (3.6m high) including the open space to the west and east, between the entrance and the classroom, were box and tubular ventilation fittings, eight main windows all blocked out at higher level leaving six panes open and the steelwork of the wind girder.

The West elevation

This elevation (55.9m long from main south elevation to the office along the north elevation) dividing Building 377 and demarking Zone 2 from Zones 1 and 3 was clear of offices or rooms (Plates 472, 474). The main features were openings to Zones 1 and 3, and two blocked openings.

From the south at 9.8m along a double doorway (1.83m wide) led to the corridor and classrooms of Zone 3, whilst broadly in the centre (18.8m north of the double doors) was the vehicle entrance to Zone 1 and 20.1m further north the pedestrian entrance to Zone 1 (Plates 517, 518).

The southern of the two blocked openings (3.4m wide 3.6m high) flush with the elevation incorporated the doors to Zone 3 with the doorway to its north side; the alteration almost certainly the result of the decision to create the classrooms. The second blocking occurred 4m to the north and again was latterly likely connected with the classrooms as the blocking is visible in Classroom 5. The difference with the second blocking (5.6m overall) was that 0.8m was flush with the general elevation and the remainder to the north (4.77m, height 3.46m) stepped out (0.18m south and 0.15m north) into the workshop. This stepped element had two breeze blocked openings each 1.4m wide separated by brick pillars of which the centre was 0.45m wide and the two end pillars 0.67m wide, and all capped by a 0.3m thick lintel (Plate 519).

Fitting attached to the cream painted elevation included numerous electrical switch boxes and sockets, piping, loudspeakers, rails for the strip lights and at higher level the box ventilation system and structural steelwork to roof level.

The workshop floor

The floor was a direct continuation of that from Zone 1 with workshop area painted grey, with green coloured strips edged in yellow marking the vehicle route and walkways, from the working and storage areas. The only upstanding fixtures were ten I-frame supports for a crane (Fellows Stringer Ltd. SWL 0.5 ton) with a north-south movement (five each side, overall, 17.7m east-west, 19.8m north-south including supporting struts. Height 4.63m top of rail. Crane rail 5.49m top, underside 4.96m) taking up approximately two thirds of the floorspace north of the central doors. The frame supported coiled ventilation hoses on its east side.

Fixtures flush with floor level included two sizes of metal anti-slip access plates covering channels (Plates MM and NN). Seven of the narrow channels (2.4m long overall by 0.18m wide and similar to those in Zone 1) at right angles to the west elevation extended north along the wall from the southwest corner at approximately 3.8m spacing except for the first which was 3m off the corner and 6.9m distant from the next which was in line with the Zone 3 corridor and another further north in line with a blocked opening. None were coincident with those in Zone 1.

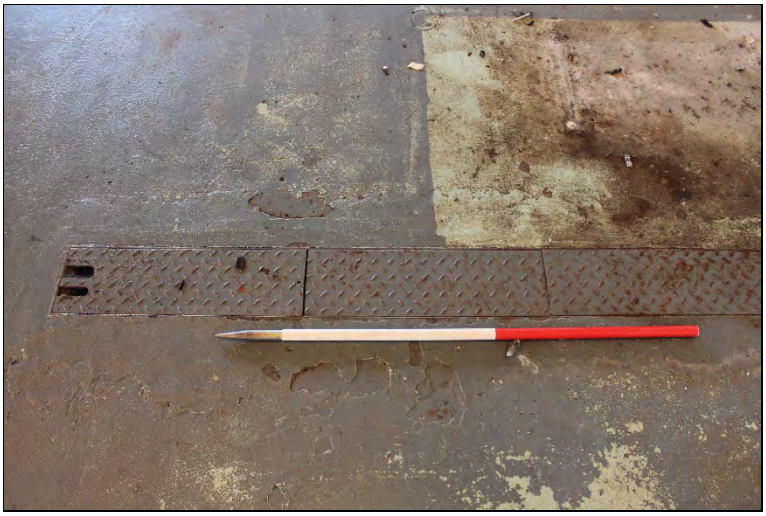


Plate MM. Photograph of one of the narrow plates

Another narrow channel extended from the rooms west in an L-shape (7.97m (east-west) by 2.64m) in the northwest quadrant, whilst in the northeast narrow a series of conjoined channels lay to the west of a wider right-angled channel (1.15m long plates by 0.91m wide), with both stopping before the east-west vehicle access. Another narrow branch ran from the wider channel adjacent to Classroom 2 to the east elevation and a 0.2m diameter drain

The wider plates covered a water supply (two 0.25m diameter pipes) and cabling in a 1.17m deep, 0.81m wide concrete lined channel (Plate OO).

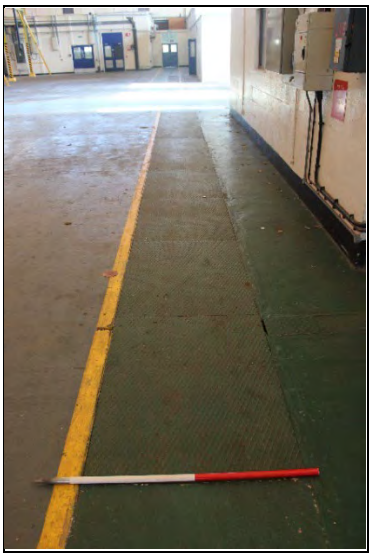


Plate NN. Photograph showing the run of the wider water pipe channel plates

Leaving a four-metre gap for the vehicle route the wider channel restarted in line with the other, again with a right angle turn and continued to the south elevation where a right-angle branch headed to the Office 19 doorway meeting it halfway along the doorway. At the angle change the channel had been filled with concrete, and two narrow branches extended toward the inset electrical switchboxes.

Plate OO. Pipes in floor channels below plating

Zone 3

Zone 3 is attributed to several rooms to the north (four classrooms) and south (six including three classrooms, two labs and a store) of an east-west corridor (36.3m long, width 3.4m maximum at the west, 2.7m at the east, ceiling 2.52m), directly south of Zone 1. The corridor itself was divided into two sections (22.6m long on the east, 14.1m long the west) marked by double doors which also marked a 1.1m step southwards in the alignment; a small alcove (1m by 1.4m) reflecting the step was built into the south side of the east section at the end of the corridor. There was no natural light to the corridor (nor to classrooms 5 to 8), the walls were white and the flooring grey vinyl (Plates 520-522).

Of the classrooms to the north on entering the corridor from Zone 2, three (Classrooms 5 to 7) were similarly sized (5.5m/5.4m wide by 6.3m deep, ceiling 2.7m) and the fourth, stepped back (0.37m) from the line of the previous three, slightly larger (5.6m wide by 6.1m deep but extending to 7.15m) with the addition of a recess (2.8m wide) in its northwest corner. Each had a single door entry. All rooms were painted white with blue carpet tiles.

All classrooms displayed evidence of blocked openings in sympathy with that noted from Zone 1 and Zone 2. Along the east elevation of Classroom 5, 2.7m of the overall length from the northeast corner south displayed blocking in brick and breeze, whilst in its northwest corner the dividing wall with Classroom 6 intersected another blocked opening (1.1m long). That blocking continued for 0.8m in Classroom 6 where there was also another blocking (2.4m long) 2.2m west of the first, which stopped short of the dividing wall with Classroom 7. The blocked opening (1.5m long) in Classroom 7 was 1m from the division with Classroom 6. Two blocked openings were present in Classroom 8, one 1.5m wide in the centre of the recess and the other (1.7m long) along the east wall ending almost in line with the back wall of the classrooms (Plates 523-526). These openings would have allowed movement to Zone 1 to the north.

To the south of the corridor the first three rooms (Pneu Lab 2, HYD Lab 3 and Classroom 4) were all similar in size (6.2/6.6m wide by 9.4m deep, ceiling 2.7m) with single door access from the corridor; the Labs also had a connecting door adjacent to the main south elevation (Plates 527-529). Classroom 9 (4.4m wide by 8.3m deep) was the last room at the end of the first part of the corridor and adjacent to the alcove (Plates 530, 531).

There was nothing distinctive in the classroom themselves, but the partition between HYD Lab 3 and Classroom 4 intersected one of the main windows as did partitions between Classroom 4, Classroom 9 and Classroom 10.

The west section of the corridor was plain on its north side apart from a door to Zone 1 near the west corner whilst two doorways, one to Classroom 10 with its door central between two pillars and under a lintel, and the other to a storeroom, were present on the south side of the corridor. Double doors in the original west elevation led to a modern room and lobby beyond in Zone 4; Approximately half the width of the doorway (1.87m wide) was formerly part of an original west elevation reveal (Plates 532. 533). An I-frame was present in the southeast corner of the corridor and downpipe in the southwest corner.

Three blocked openings were present in Classroom 10 (4.5m wide by 8.2m), one to the north adjacent to the doorway and of similar width to the door, and another directly south of it where the original southwest main entrance was blocked. The third blocking just north of centre (3.9m along the west

elevation from the southwest corner) was 2.3m long by 2.1m high under a 0.25m lintel and when open would have allowed movement between it and the adjacent storeroom to the west (Plates 532, 533)

The west wall of Classroom 10 not only indicated an opening with the room to the west, but the partition had closed off access via a spiral staircase (Plate PP) to an upper storey (one door of which was visible from the workshop floor in Zone 1) and a small emergency shower recess (1.7m by 1.1m. Plate 534).

The 1m radius staircase (Plate PP) with a short platform leading to the first step fitted into a rectangular space 2.7m by 2.2m adjacent to the south elevation and rose 3.44m to a single room to its west (over the storeroom in the southwest corner) that from discarded paper appeared to have been a casual rest room 'for the boys' as indicated by pin ups on a wall.

The room was T-shaped (8.42m by 7.1m. Ceiling 2.54m high) with one door facing the north workshop floor and the other from the staircase, facing east over the classrooms of Zone 3. Two windows also faced east (Plates 535-542).

Plate PP. View to the east looking down onto the spiral staircase

Underlying the rest room was a storeroom (7m maximum by 8.4m, ceiling 3.2m) with several structural features. In the southwest corner and like that in all corners of the building, was a vertical X-frame (Shelton England British Steel maker's mark. Plate QQ) parallel to its west elevation.

Plate QQ. Shelton stamped into the X-frame steelwork

Overhead and supported by pillars were two large parallel beams (2.4m apart), one an RSJ (2.95m to underside) and the other concrete (2.82m to underside) aligned parallel to the X-frame. These beams, related to the upper storey room. Three walls indicated blocked openings, one in a recess forming the partition wall with Classroom 10 to the east, another comprised of two openings (each 0.92m high by 0.64m wide under 0.15m lintels) one over the other and separated by 0.45m between the X-frame in the west wall and possibly once vent holes, 0.3m, and in southeast corner part of the infilled main window reveal (0.3m), which had been extended to ground level (Plates 543-547).

Exterior walls and the suggested blocked vents were brick whilst the remaining walls were breeze. All walls and ceiling were painted white and floor grey concrete. Circulation included a door to the corridor to the north and diagonally opposite a single door to the outside of the building.

Zone 4

This zone related to the modern vehicle bay extension and adjoining plant room and entrance lobby on the west of the original building which encompassed approximately 41m of the original west elevation south from the inset hangar opening. No alterations were made to the original façade other than to infill the window reveals. Folding concertina metal doors and single doorway enabled vehicle and pedestrian access to Zone 1.

In essence, the vehicle bay with roller shutter doors and adjacent single side doorway both facing north, comprised a long open area (29.7m by 10.5m, ceiling sloping from 7.6m east to 6.95m west) with a travelling crane (Fellows-Stringer Ltd, S.W.L. 3 tons) running on sunken rail tracks (26.8m long, 5.9m between centres, each rail 145mm wide sunk 50mm below concrete level) in the floor.

A series of stanchions along the east side and associated castellated beams supported a corrugated roof with rooflights. Electrical equipment including large heating units were the main features on the side walls.

The south wall of the bay had a large opening blocked off (approximately square 4.1m high by 4.36m wide) with a set of double doors inserted adjacent to the west side of the blocked opening, the doors now central to the elevation (Plate 551). These doors gave access to a room (6.9m by 4.2m, ceiling 6m) to the south labelled as a dis-used plant room on the fire plan. The room which was plain gave access to the Zone 3 corridor to the east and a door on the west to an entrance lobby (3.4 m by 4.3m) with stairs and spiral staircase to a second storey room (Plate 552).

The second storey (10.55m by 6.18m) accessed from a single doorway from a short corridor protruding into the room, was plain except for an I-frame stanchion and lighting strips and a heater suspended from the beams which were a direct continuation of the roof beams from the vehicle bay (Plates 553-555).

A single vertical joint seen in the brickwork of the east wall (the original elevation) may have been an indication of an entrance through to the upper storey in the southwest corner above the Store, however as only a single line was seen it more likely reflected repairs, which were prevalent on all building corners, to the original elevation.

Alterations and Observations

In keeping with other hangars surveyed the hangar sized openings in the east and west elevations were infilled and fitted with doors providing vehicle access into the interior. Otherwise, the significant alterations were concentrated in the southwest quadrant with several openings blocked to

accommodate the suite of offices and associated corridor (Zone 3), and surprisingly the closing off with a partition wall the upper storey room and emergency shower space, but the introduction of the recent large vehicle bay extension had little impact on the original structure.

Of note was that between Zones 1, 2 and 3 there were seven blocked openings in proximity, five between Zone 1 and 3 (four facing north-south) and two on the junction of Zones 1 and 3 with Zone 2. Why the need for so many closely spaced openings has not been determined, and it may well be that construction of the classrooms has removed evidence for the circulation and function of this area. The presence of the emergency shower indicated that potentially hazardous materials such as chemicals, acids or other corrosive harmful materials were used in this area.

Phasing

Similar to Bldg. 361 phasing is not certain. The north lobbies are considered original and accepted again is that the north-south divide was an early phase. However as mentioned with Building 361 the provision of offices could well be original whilst still maintaining an open hangar space prior to the division. To that end it is suggested that Offices 1 and 2 adjacent to the lobby in the northwest, and rooms (Office 14, and Classroom 1 before subdivision with 'thermalite' breeze blocking) just off the northeast lobby were potentially also early. The same rationale is also considered for the rooms in the southeast immediately adjacent to the entrance where Offices 17 and 19 bear similar styling to the buildings in 1944 photographs. Of note is that there was no lobby in the southeast just doors straight into the workshop. Because of the alterations on the southwest it is not known if there ever was a lobby, but part of the entrance has clearly been blocked.

The other rooms mostly in breeze are considered later but difficult to date. Thermalite (late 1950s on) which is a later block has been used to subdivide some of the larger rooms and provision of WCs showers, canteen facilities and three doorways cut into the north elevation are modern adaptations.

General observations and common features in Buildings 354, 361 and 377

All three of these late 1930s structures were built to a similar pattern with the same materials to individual plans specific to their function (drawing numbers are referenced on the 1944 plan i.e. dwg. no. 6334/37) and the main elements are described as follows.

Externally brickwork was exclusively Flemish bond and from the outset the greater number of entrances on the elevations of Building 354 which was to be used for recreational purposes (pool, theatre/cinema entrances) were finished with low level stepped decorative brickwork. That style of brickwork was not used for the workshops and although the 1944 plan names Building 345 as a workshop, this brickwork indicates that that designation was not correct and the plan never updated, as it was well known to the local population in early 1939 from a newspaper report mentioning construction work (Western Mail, January 1939) on a cinema, pool and gymnasium. Thomas (2024) said that because the creation of large new airfields in the countryside often aroused local opposition, the RAF engaged with architects, notably Archibald Bulloch and JH Binge, in developing new air bases employing neo-Georgian and Moderne styles (generally for residential and technical buildings respectively) and the result of that engagement likely evident in Building 354 doorways.

Window reveals were of similar width and accordingly fenestration adapted to suit the difference in height between the two higher workshops and the recreation building. Many windows had been changed and particularly those in Bldg. 354 which were replaced with UPVC. The earlier windows over the small window above the southwestern entrance to the church and the windows flanking the cinema entrance and the small lights in the cinema side entrance doorway however were steel framed (T shaped glazing bars (4mm wide) sealed with putty. Rust was clear on many) and likely original. The windows in Bldg. 361 were in a similar steel frame and again considered original albeit adapted with sun shading panels. None of the frames in Bldg. 371 matched that of Bldg. 361 or 354 and thus evidence that these were later additions. Provision of sun screening was evident in the workshop windows where many panes on the south side were panelled. This screening extended to the north facing roof lights (safety glass), common to all the buildings which were indirectly covered by a thin brown plastic material as part of modern roof insulation. A difference was that the roof lights over the pool were larger to allow light into the pool area. All the roofs were tiled (probably asbestos tile).

The same pattern of structural steelwork was common with substantial wind girders (4.5m (15 feet) wide) parallel to and spanning their north and south elevations with intermediate lattice girders (17.9m centres (approx. 60-feet). 0.325m wide by 0.23m depth) between the wind girders, and longitudinal roof trusses (3.65m (12-feet spacing)) connected by angle ties. Further structural support was provided by vertical X-frame bracing below the wind girders set into the fabric in each corner of the building and another halfway between the corners all aligned along the long axes. Otherwise, the steel work was supported by concrete cased and brick column. Several of the photographs in Part B display examples of structural steelwork. Wind girders in combination with the trusses provide longitudinal and lateral bracing.

The steelwork was built to the structural design standards of the day for spanning wide buildings with heavily riveted plates on the lattice and wind girders (Plates RR and SS, examples) and nut and bolt for the angled bars with fishplates or gussets covering the forks.

Plate RR. Typical wind girder detail (Bldg. 377)

Plate SS. Typical lattice girder and truss elements in the cinema. Note original wooden ceiling plank in the hipped roof

Noted particularly with the structural steelwork, was the supply by several known different manufactures all from the north of the country. These included.

Hallside Steelworks, Newton, Lanarkshire, Scotland (1873-1979)

Cargo Fleet Iron Co Ltd, iron and steel manufacturers, Middlesbrough, England (1883 - 1970).

DL (Dorman Long) and Co Ltd. Iron and Steel Works, Middlesbrough England (since 1875).

Skinningrove Iron and Steel Company, North Yorkshire (since 1874)

Shelton Iron and Steel Company, Stoke on Trent, England (since 1889)

Consett Iron and Steel Works, Durham, England (1840 - 1980)

A 1924 Dorman, Long & Co. Ld. Handbook for Constructional Engineers (second imprint 1930) available online provides comprehensive and detailed drawings for a range of structural steelwork including drawings of jointing, rivets, fishplates and connections to stanchions, beams and roof trusses. The steelwork in the surveyed Buildings were a match for the steel frame components in the book.
(https://www.dormanlongtechnology.co.uk/Download_files/DL%20Historical/Dorman%20Long%201924%20handbook.pdf).

Building 371. Support Engineering Services

In contrast to the other surveyed contemporary wartime buildings, the elevations of Bellman hangar Building 371, was not of brick construction but corrugated sheets supported by a steel lattice framework and a low brick plinth. Orientated parallel to building 377 it measured 53.96m long (north-south) by 29.3m wide by 7.73m high, the apex of the pitched roof (nominally 177 feet by 96 feet by 25 feet high). This low version corresponds to that of No.2 in the image (Plate TT). Francis (2024) believed most of those at St Athan were higher versions (Figures 19, 20 and 21).

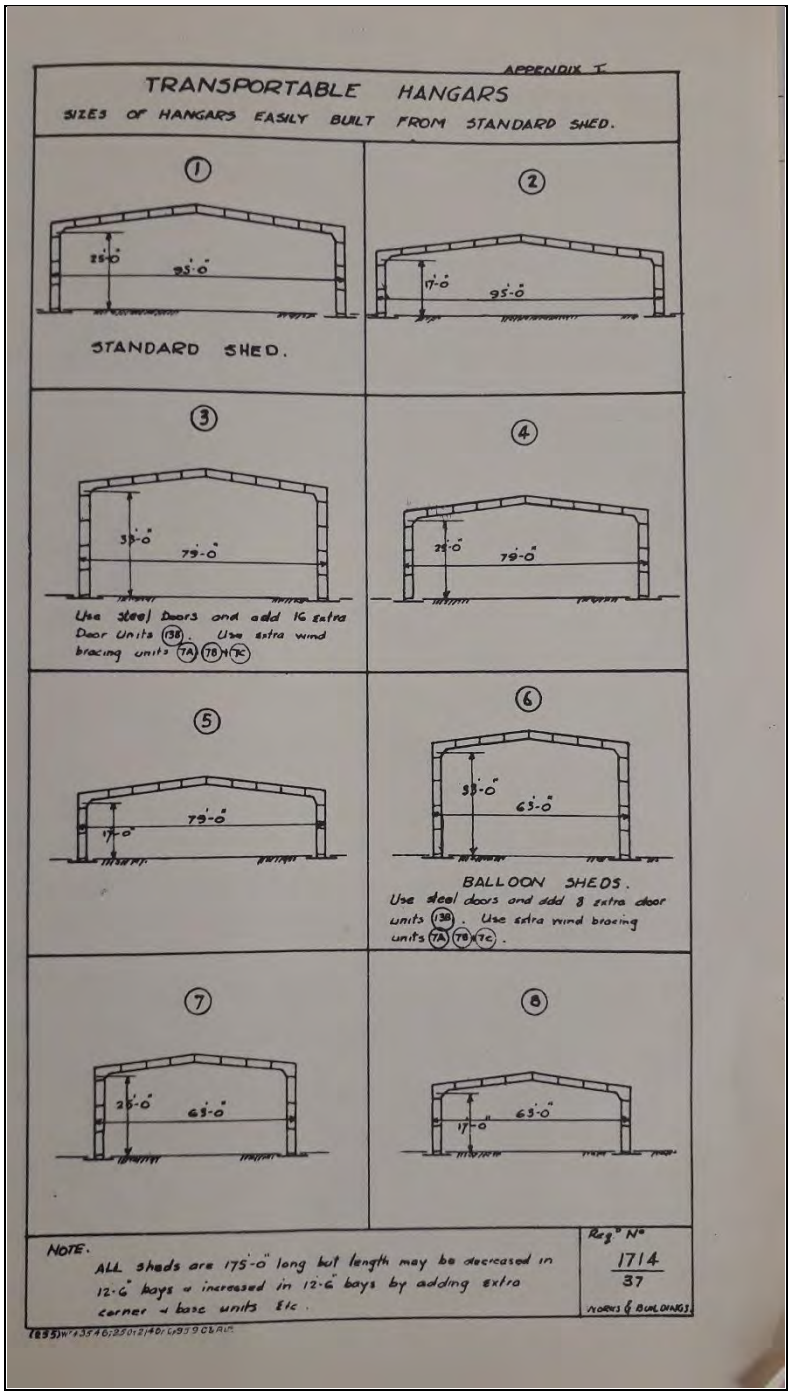


Plate TT. Air Ministry Bellman Transportable Hangar Description and Erection Notes (Revised 1940 edition) (National Archives. Work 44/49)

An indication of the first phase of construction was that the frames were set within large rectangular concrete pads which were visible on both sides of the east and west walls. Internally and externally the pad measured approximately 1m wide by 0.9m long; overall each pad was approximately 1.9m long (east-west) by 1m wide (Plates UU).

Plate UU. Concrete steelwork base (top image external, bottom internal)

The original south facing main doors (facing the east-west runway) and associated outriggers had been replaced, but immediately outside of the doors three parallel sunken rail tracks embedded in concrete testified to the original sliding hangar doors. The longest rail in one section and furthest from the doors measured 36.58m long, the centre line in two rails each 13.4m long and 9.77m apart, and the inner rails each 8.48m long by 19.6m apart. A short distance out (0.64m) from and parallel to the rails, was an original drainage channel (29m long, 0.41m wide with abutting gratings each 0.95m long stamped Elkington Gatic 250) (Plate VV).

Plate VV. Original rails for the sliding doors. View to west

Internally, along the west side of the north elevation and extending approximately halfway along the west elevation were demountable cabins used as offices and along the east half of the north elevation an enclosed breeze block vehicle bay, with a lobby joining the office and bay them in the centre.

External elevations (Figure 14)

All exterior elevations and roof were similar in that they were of corrugated sheets with the north, west and east sides provided with opaque fibreglass sheets (69 in total) as was the roof. The frame apart no other was original, including the doorway in the north elevation which appeared to be earlier; there were a further four single doors (Plates 556-559).

The North elevation

A brick plinth interrupted only by the double doorway (2.05m wide by 2.1m high) extended across the elevation at ground level. The plinth 0.43m high on the exterior comprised 4 original courses of English bond brick with two courses of later stretcher bond above to cladding sill level. The doorway offset west of centre was of plain wood and only the east half opened as internal partitioning had closed off the original double door width. Corrugated cladding in single sheets 0.91m (3 feet) wide by 5.15m long panels bolted to the internal frame (bolt lines denoting internal rails) extended vertically upward from sill level to a flat roof that stepped back 0.35m before rising 1.71m to the apex (7.7m overall height to apex) with corrugated sheets cut to suit the roof pitch (approximately 1 in 9). At lower level a series of 11 opaque corrugated sheets (0.88m wide by 2.35m high and 0.36m above sill level) allowed natural light to the interior (Plate 560). The third light from the west was blanked off with metal sheeting.

The East and West elevations

Six metres high to eaves level the east and west elevations were alike each with 29 opposing opaque panels equally spaced along the elevation with 0.9m separation between each and with their base 1.05m up from ground level. The difference between the elevations was that the east elevation was fitted with a single metal (including frame) doorway 8.9m from the southeast corner of the east elevation whilst the west elevation was fitted with similar doors, one 6.6m from the northwest corner and the other 29m from the same corner. All the doors are considered secondary fittings as each one intersected an opaque panel (Plates 561-563).

Two lights along the west elevation were blanked off with metal plates (Plate 564). Whilst maintaining the same upper horizontal alignment to the other lights, they were shorter in length at 2.1m. Internally they were fitted with wooden louvre frames as opposed to just opaque sheets.

Rainwater goods were present at eaves level with downpipes at each corner and two more spaced equally apart between them.

The South elevation

The relatively recent elevation was of similar profile to north elevation, but missing the stepped flat roof, although at a similar height (5.76m) a horizontal rail marked the same change just below eaves level and the start of the roof pitch. There were three features in the elevation, in the centre the hangar doors (4.51m wide by 5m high, recessed 0.3m off the general line), 1m to the east of the hangar a single doorway (2.1m high, 0.9m wide) and 1.4m to the west a circular vent (0.3m diameter. 0.63m off floor level) (Plate 565).

Internal detail

The hangar which measured 29m between the east-west brick plinths by 53.6m from the north plinth to the corrugated wall of south elevation comprised a typical Bellman lattice framework of 14 bays of rolled steel sections used for both the walls and roof (15 truss frames each side (long axis), 3.8m between centres (12 feet, 6 inches), each 0.71m long (28 inches) by 0.16m wide (6 and a quarter inches). The floorspace between frames which were bolted to the plinths and floor was 27.58m. In height, the frame extended vertically for 4.91m, before angling inward (over 0.3m) and rising (0.27m) with the underside of the frame for the roof pitch starting at 5.23m and then rising uniformly over 13.8m to 6.9m high, the underside in the centre (7.67m top of frame) (Plates 566, 567).

The framework matched that of the original design drawings (Work 44/37 and work 44/38) of which a selection follow (Plates WW to ZZ).

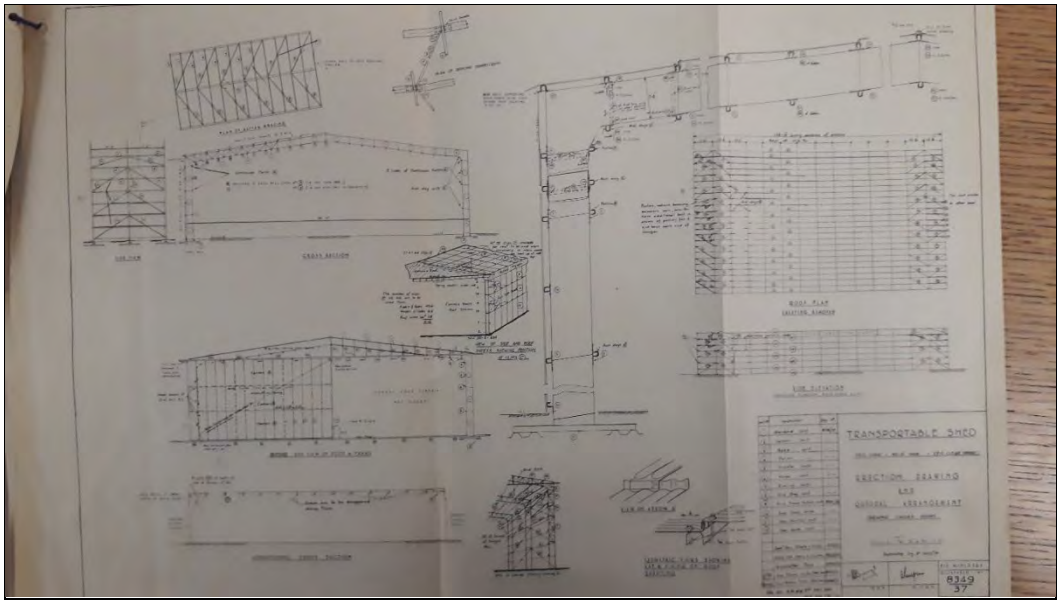


Plate WW. General arrangement drawing (Work 44/37 and work 44/38)

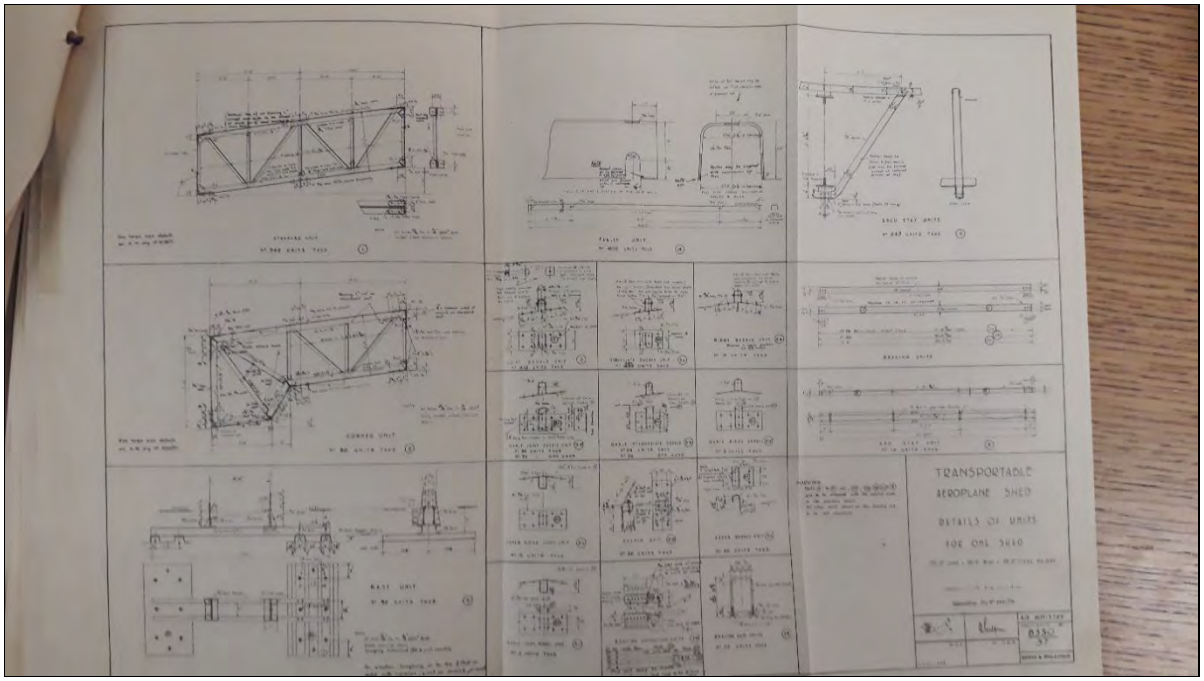


Plate XX. Detail of Units drawing (Work 44/37 and work 44/38)

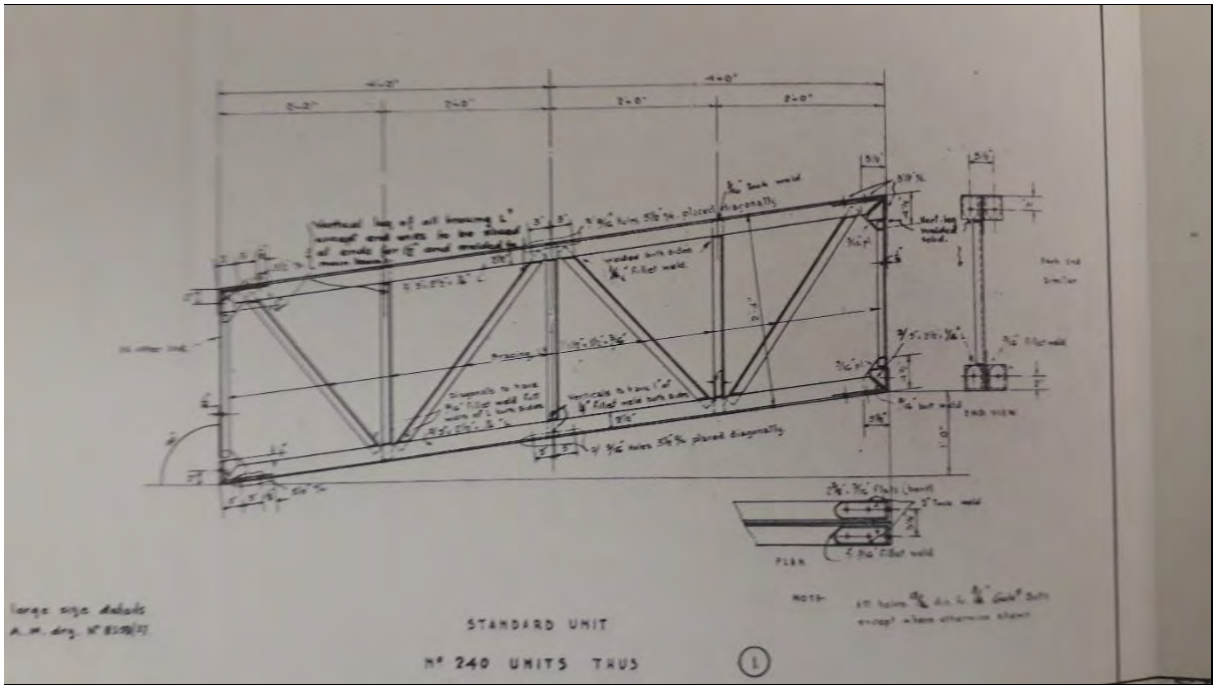


Plate YY. Detail of a standard section (Work 44/37 and work 44/38)

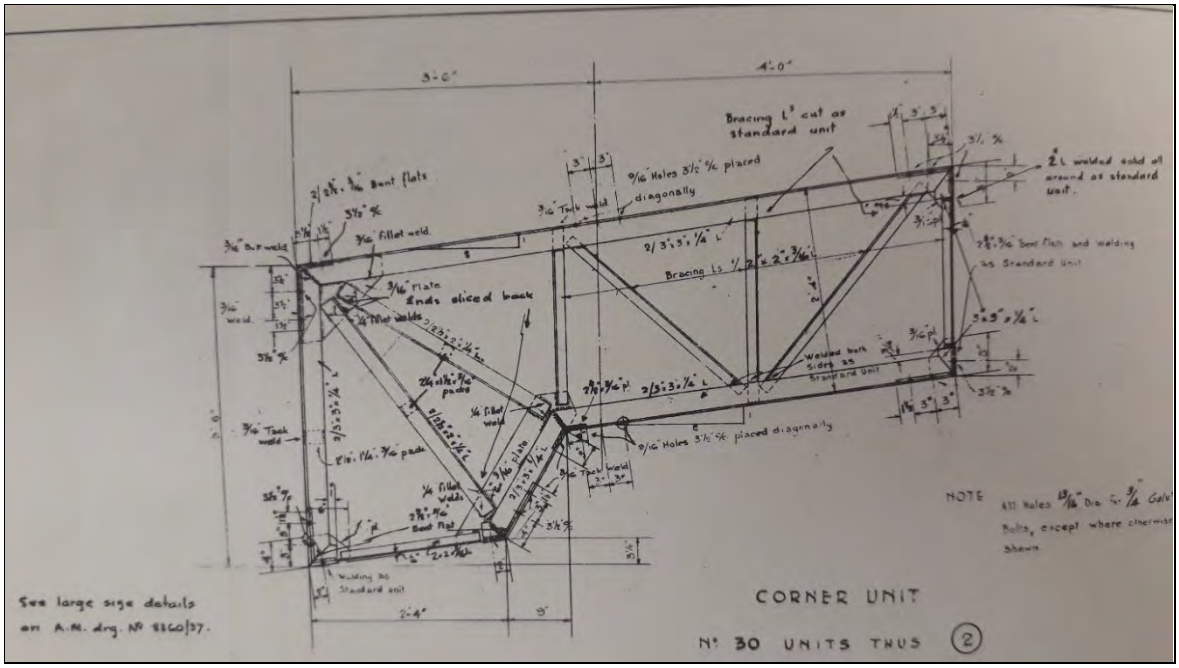


Plate YY. Corner Unit details (Work 44/37 and work 44/38)

The manufacturers stamp on the steelwork read SK Grove British Steel. The SK is believed to be a shortening of Skinningrove Steelworks in North Yorkshire; prior to this, the suggestion was that Head Wrightson & Co of Teesdale Iron Works may have supplied the steelwork. In the cinema, BLDG 354, Skinningrove in full was noted. All frames were coated with multiple layers of grey paint sufficient to obscure the raised lettering of the manufacturer's stamps.

The North elevation

The north elevation either side of the doorway comprised a brick wall (0.85m high, 0.24m wide) with 6 courses of original brick (originally painted green and overpainted in white) topped by five courses of new brickworks with a cement capping supporting original vertical stanchions (0.115m wide, 0.17m deep, 4.92m high) bolted to concrete blocks (0.4m wide by 0.38m high) set 2.47m apart and 0.48m up from ground level, and all with additional X-frame bracing bolted to the stanchions (Plate 568); the stanchions provided support for six parallel horizontal rails (0.25m, 1.53m, 2.46m, 2.72m, 3.72m and 4.66m up from wall level respectively) to the step in the elevation. This was the only elevation with this steelwork pattern (joining the longitudinal cladding to the gable), with the standard Bellman framework stopping 0.2m short of the wall (Plates 569-572).

The introduction of an office portacabin resulted in an alteration to the main double doorway where a plasterboard screen erected between the office and the door reduced the opening to a single door width. access to a lobby with ramp access to all; floor level 0.15m below threshold level.

The east and west elevations

These elevations were similar and almost a mirror image of themselves with low brick plinths (0.1m wide, 0.2m high), steelwork framing in 14 opposing bays (3.8m between centres) and with 29 lights (including the west elevation which had two blocked lights with wooden frames) in 2m lengths (external 2.35m long, the difference in the overlap to attach to existing horizontal rails) internal,1.4m above floor level (Plates 573-578). Four parallel horizontal rails behind the steelwork supported the corrugated cladding panels (0.91m long panels, pitch 150mm, bottom rib opening 70mm, top flange

35mm, depth 30mm). A door 8.7m from the southeast corner was fitted in the east elevation and two doors in the west, one 23.7m north of the southwest corner and the other door through a lobby in the elevation 6.3m south from the northwest corner (Plates 579-581).

The South elevation

The original sliding doors, replaced by roller shutter doors in the centre (4.68m wide, 5.07m high) and a single door 0.9m to its east were supported by three vertical H-beams (135mm width by 205mm depth, red-brown painted, on rectangular plate (0.25m 0.22m) bolted to the floor on each side of the roller doors, with the roller doors and single door supported by parallel flange channel beams. Five horizontal galvanised rails bolted to flanges on the uprights alongside vertical bars between the H-beams provided the framework for the corrugated cladding (Plates 582, 583).

The new southern wall sits partly over modern concrete, which may be the infilling of an inner drain inside the hangar doors evidenced on the adjacent demolished hangar sites to the east of 371, where not only a large drain was noted outside and parallel to the hangar door runners (similar to the extant 371 drain) but a smaller narrower drain was seen on the inside and parallel to the hangar door runners.

The Floorspace (Figure 20)

The north half of the hangar was used for modern adjoining demountable offices (supplied by City Cabin), lobbies and an enclosed vehicle garage/bay, none of which apart from plasterboard side panels abutted the original structure primarily because of the steelwork frames extending into the floorspace and also to allow maintenance; the north office was placed 0.6m off the north wall, the west offices 0.9m off the western side and the vehicle bay positioned 0.54 off the north wall and 1m from the east wall. The south side of the hangar was open (Plates 584-586).

All the demountable cabins were raised above hangar floor level and accessed from wooden steps (0.3m and 0.4m high). The cabins were of similar design, green on the exterior and internally decorated with blue or brown carpets, cream-brown walls and white ceilings with strip lights. The rooms retained electrical fittings but otherwise they had been cleared of office furniture.

North office

The north office (internal measurements 12m by 3.5m. ceiling 2.3m) aligned east-west and parallel to the main elevation to the west of centre, comprised a rectangular office with three doorways, with six double glazed brown framed windows. The two main doorways (east and south sides) led from/to the lobbies and the third in the northwest corner of the cabin only gave access to the limited space to the between the cabin and the walls to the north and west. Of the six windows, two windows in the south wall faced the main hangar space, and the one in the west wall and three in the north all having a limited view of the hangar walls. Fittings included along the north wall a line of sockets, a small key safe in the southwest corner and air-con unit on north wall (Plates 587, 588).

West offices

This office aligned north south and parallel to the west side of hangar was divided into two rooms, with the north smaller than the south (4.84m long by 3.5m wide and 7.07m long by 3.5m wide respectively. Ceiling 2.3m) with the doorway between them offset east of centre in the partition wall.

Of the two main doorways, the one in the north accessed the lobby and another in the south gave direct access to the hangar. The north room had two windows, one facing west with a view of the west hangar wall, and another facing east with a view into the hangar floorspace. The larger room had five

double glazed brown framed metal windows, two windows each in the west and east walls, and a single window in the south wall. Fittings included sockets and internet connections along the west wall of both rooms as were air-conditioning units (Plates 589-591).

Stand-alone office

A smaller (6m (north-south) by 2.9m, ceiling 2.25m) stand-alone cabin lay 1m south of the longer two room cabin with its single doorway facing east (door missing) (Plate 585). Windows included two each in the west and east walls (brown metal double glazed frames). Fittings included power sockets and air-con unit on the west wall and strip lights on ceiling. The floor was brown carpet (Plate 592).

West Lobby

This small roughly square room (4.1m by 3.4m, ceiling 2.65m) with a narrow passage (1.2m long by 1m wide) to the exterior doorway on the west linked the north and west offices and the main hangar space with access by raised steps to the northern cabin through the north wall and access again by raised steps to the west cabins at the south; the doorways in the west and east were at hangar floor level. Access to the main hangar space was through the east wall (Plates 581, 593, 594). Fittings included a former internet server box mounted high on the west wall. The floor was plain concrete, walls were painted the same as the rooms and all doors were blue.

North Lobby

The rectangular north lobby (5.63m (east-west) by 4m, ceiling 2.7m) through three doorways linked the office on the west, the vehicle bay to the east and the hangar floor through double doors to the south; access to the northern office alone was via wooden steps (0.2m risers, 0.4m high overall) and the main door in the north elevation was fitted with ramp (1m wide by 1.23m long) sloping down to hangar floor level. Fitting included switches and main fuse boxes and compressor isolator for the hangar mounted on the north wall. The anti-slip floor surface was blue, walls were cream white, doors blue and the ceiling white with three strip lights (Plates 595, 596).

Vehicle garage/bay

The enclosed rectangular breeze-built bay (exterior 12.05m (north-south) by 9.08m. Flat roof 4.9m high) with three reinforcing columns in the east and west walls, was constructed in the northeast quadrant of the hangar with its roller shutter doors (4.45m wide, 4.1m high) facing south toward the main hangar doors as was a pedestrian side door 0.65m to the east of the roller shutter (Plates 586, 597, 598)); another pedestrian door in the west wall at the north linked through to the north lobby.

Internally (11.78m by 8.8m, ceiling 4.47m) the grey painted floor was clear except for staining and bolt holes indicating removed equipment (Plate 599). The walls were fitted with power sockets except for the south, air or gas piping on the west and the east walls, four high level heaters (two each on east and west walls), a water tap on west wall at the south and on the north wall hooks for specialist equipment with its image marked in orange paint.

The walls were cream and the ceiling with seven lines of strip lights, four in each line, painted white. Its use was not determined but possibilities include welding, specialist cleaning or painting where dust or contamination needed to be contained, hence the enclosed area and the garage having a function requiring separation from the main servicing areas.

Externally its west elevation was fitted with switchboxes, air or gas pipelines and floodlighting.

Main hangar space

The main working space of the hangar (40.65m long by 27.6m wide with an additional area of 8.3m by 14.1m wide between the offices and garage) was segregated into bays. The floor was a mix of tarmac and concrete. In the north and flanked by the offices, the floor was a grey painted concrete vehicle servicing area with two three shallow (30mm deep) sunken channels (two parallel, 5m long, 0.1m wide and 0.3m apart. The single channel 3.66m long) and, three stanchions bolted to the floor one hosting extraction tubing and the others probably fans (Plates 584, 586), whilst along the east side of the hangar a row of vehicle parking bays was painted in a pale blue protective surface as was an isolated blue painted concrete parking bay in the southwest corner of the hangar. The only other feature of note was a compressed air generating system between the two trusses immediately south of the central doorway on the west wall elevation.

Overhead detail (Figure 21)

The trusses were identical to that issued with the Bellman hangar design. But the roof with two rows of lights had been replaced between 1981 and 1991 evidenced by aerial photographs (Plate HHH).

Phasing

The structural framework was original dating to the late 1930s but otherwise the sides and north cladding were replacements attached to the existing framework. This is earlier than the replacement roof and possibly a 1970/1980s replacement; the corrugated panels are of different design. Mention is made in the erection guide that if internal light is required the middle or bottom line of corrugated sheets can be removed to be replaced with window lights, but it says that these will have to be made locally as no general stock is carried. The replacement sheeting in single lengths rather than panels was fitted with lights.

It is not known if the door in the north elevation was an early fitting, but it would seem reasonable to have a double door entrance into the building other than using the hangar door. This doorway was adapted to become a single door when the internal demountable buildings were brought in.

The original hangar floorspace appeared to have been clear between the framework until the introduction of offices in demountable cabins and construction of the vehicle bay. These are suggested to be 1970s at the earliest and the vehicle bay later than that.

Building 348. Ambulance Storage (NGR ST 00819 68678)

This structure lies to the north of Building 371 (Bellman hangar) and to the west of the workshop buildings 377 and 361 and although termed an ambulance storage building there was nothing internally to differentiate it from a general vehicle maintenance workshop (Figures 22 and 23).

Planning permission (1981/00489/CROWN) for a crew room, office and workshop was granted in 1981 for this building (Plate AAA), however Francis (2024) states that the building had a presumed construction date of the early to mid-1990s as it was not present in 1988 and later used as an ambulance garage. It is not known when it was built but the present structure is built to the plan.

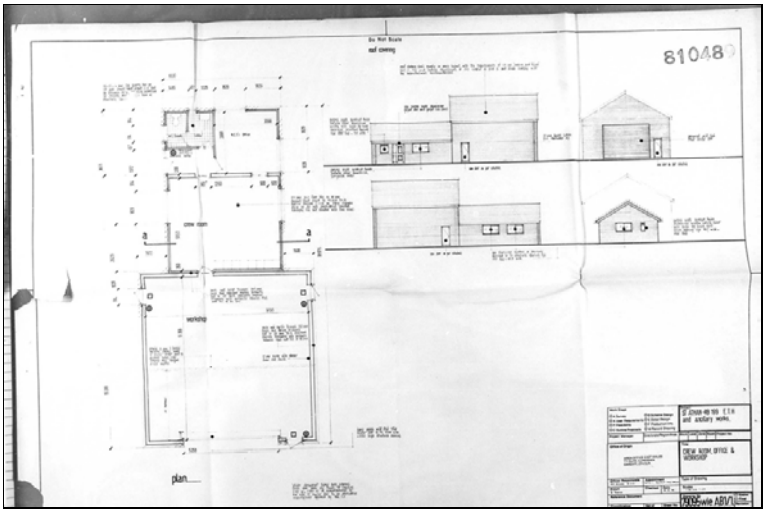


Plate ZZ. Plan dated 1979 submitted for planning permission for a new Crew Room, Office and Workshop (VoG. App. No. 1981/004489/Crown)

External elevations (Figure 22)

The structure orientated east-west and in stretcher bond red brick with pitched synthetic slate roofs, comprised three elements, a larger and higher garage with its main roller shutter door facing east, lower and narrower office suite (with WC and kitchen) behind it, and a lean-to facing north on the north elevation of the garage. Windows all with chamfered brick sills were present only in the office suite.

The overall garage dimensions were 10.1m long (east-west) by 9.85m wide with the roof at 8m (eaves 5m), the offices 9m long (east-west) by 6.65m wide with the roof at 4.6m (eaves 2.5m), and the lean-to, 6.58m long by 1.36m with its roof at 3.45m (eaves 2.48m) (Plates 600-605).

The North elevation

The main features of the north elevation were the lean-to starting 0.9m off the northeast corner of the garage and projecting north for 1.36m off the main elevation with adjacent wooden doors (0.93m wide by 2.15m high), a single wooden door (0.93m wide by 2.15m high) to the garage bay 0.7m west of the lean-to and 1.07m off the northwest garage corner. From the corner the elevation stepped back 1.62m south to the start of the 9m long north elevation of the offices with two UPVC windows (1.78m wide by 1.05m high) (Plates 600-602).

The lean-to was divided into two rooms with the east room the smaller (2.67m by 1.1m east, 3.23m by 1.1m west). Signage in the east room included loading information (Plate BBB).

Plate AAA. Weight loading signage in the lean-to

The East elevation

Below eaves level the greater part of the 9.85m long east gable end was taken up with the roller shutter doors (5.37m wide, 3.7m high and inset 0.37m from the elevation) offset north of centre and a single doorway, just 0.3m to its north. The remainder of the elevation apart from a handrail near the door and perpendicular to the elevation was brick (Plates 600, 605).

The South elevation

The south elevation of the garage (10.1m long) was except for a single door near the southwest corner brick to eaves level (5.15m); the door was directly opposite and the same size as the door in the north elevation. From the garage corner the elevation stepped back 1.6m north to the beginning of the south elevation of the offices and kitchen with glazed UPVC doorway and side panels (1.34m wide overall) west of centre, and with a window on either side of the doorway. The eastern window (1.78m long by 1.05m high and 0.9m from the door) offered light to a kitchen area whilst the smaller (0.9m wide) west window 0.6m from the door was fitted with obscure glass for WC and shower facilities.

The West elevation

The gable ends of both the garage and office were the main features of the west elevation. However, there were two windows in the office suite elevation, a narrow (0.42m wide, 1.05m high) window to the south of centre for the internal shower room and a larger window (1.78m long by 1.05m high) for the office in the northwest corner, and two vent covers with their tops opposite eaves level in the garage gable and vertically in line above the north and south office elevations. Otherwise, brick dominated (Plates 603, 604).

Internal Detail (Figure 23)

The grey painted floorspace (9m (north-south) by 9.34m) of the garage was clear of any equipment and the only indication of a fitting were boltholes and the associated outline of a probable vehicle jack (3.9m long, 0.6m wide) offset at an angle 4m in from and to the left of the 5.37m wide roller shutter doors. There were four doors one in each elevation and the main roller shutters in the east elevation.

The elevations, white painted as was the ceiling (5m height) were similar with various electrical fittings and switches all fed from electrical trunking at around halfway up the elevation (2.6m) with branches extending downward from it and heating units above it but nothing extending upward from floor level.

The features of the north elevation included a single door to the outside, 0.7m off the west corner and east of centre (5.16m from the west. 3.76m from the east) a supporting pier (0.42m wide extending 0.6m into the floorspace) that stopped 0.7m short of the ceiling (4.3m high, ceiling 5m).

The east elevation was dominated by the 5.37m wide 3.7m high roller shutters in the centre and a single doorway (0.87m wide) to its north.

The south elevation was a near mirror image of the north elevation with a single doorway in the southwest corner and a similar pier opposite the other pier, except for an upright wooden box pier 1.3m high below an electrical switch box which may have enclosed electrical cabling; this may indicate protection required for something nearing ground level which was otherwise clear of electrical fittings. A coiled flexible air extraction hose was attached to the wall between the pier and east elevation and a heater over the doorway.

No alterations were noted to the garage.

The main feature of the west elevation was the doorway to the offices 0.7m south of the centre line. That apart there were two heaters and two vents near ceiling height close to each corner. The room was lit by strip lights and a loft hatch was present in the southwest quadrant (Plates 606-611).

The office suite comprised three rooms of different sizes and a short corridor (2.7m by 1.4m wide) to the rooms from the UPVC front door on the south elevation. Upon entering, the first door on the left led to a small WC and shower facility (2.7m long by 1.8m wide), the doorway straight on led to an office room (3.3m square) and the remaining doorway on the right to the largest room (6.15m by 5.17m) with kitchen facilities. This room provided the single door access to the garage bay in its east elevation (Plates 612-617).

All fittings were removed except those related to water supply (Shower and WC, electrical supply to heaters and water boilers and kitchen worktop and drawers. Ceiling height was 2.52m in all the rooms and wall colour white as was the ceiling. Door frames were blue and the floor in black vinyl or carpet.

No alterations were noted to the office rooms.

Phasing

This was single phase building as drawn up in the 1979 plans.

Building 375. Crew Room (ST 01003 68683 centre)

The Crew room of relatively modern (1980s) construction was sited approximately halfway between workshop buildings 377 and 361 and on the east side of a contemporary corridor linking the workshops (36.4m external distance between workshops), via a short (2m long external) flat roofed corridor, where original windows were adapted to become corridor doorways. Both corridor and crew room were of similar construction and likely one building phase. Access was from two single doorways in the east elevation and an enclosed doorway from the corridor. Internally, the floorspace was divided on an east-west axis into two rooms. On a recent fire plan the larger of the rooms room to the north was annotated Cadet Mess, and the smaller room to the south, Staff Mess (Figures 24 and 25).

External elevations (Figure 24)

The rectangular single storey structure orientated east-west in stretcher bond red-brown brick cavity walls (0.34m) with metal clad roof and gables measured 16.2m (east-west) by 14.6m at ground level but 16.7m by 15.82m when taking account of the wide roof overhang (0.6m each side along the north and south elevation, 0.25m on the east and west) at eaves level (2.75m) which was also the roof height of the short connecting passage to the corridor on the west elevation; ridge height 6.3m (Plate 618). The roof and gable were clad in light brown corrugated sheets and the fascia formed from curved sheeting extending vertically for approximately 0.75m to the gutters (no manufacturer's name was identified but Flowclad or a similar sheeting was suggested by Francis (2024)).

The East elevation

The east elevation reflected the internal division by a difference in windows and fire door colour. The northern two thirds were a continuation of the north elevation with two similar windows and between them a wooden doorway in green with light over flanked by smaller brown metal windows whilst the southern third had a similar doorway but in blue and toward the corner a white UPVC window. The Above the windows, corrugated sheeting covered the gable. Between the blue door and the window to the north two services pipes (probably water) rose from underground passed across the elevation and entered the building to the Staff mess and cupboard with louvred doors (Plate 619).

The North elevation

The lower part of the elevation was brick with a soldier course of mainly plinth bricks but with standard soldier brick across the piers demarking five equally sized (2.7m wide) and spaced (0.44m between brick piers) windows (sill level 1.05m from DPC) with brown aluminium frames each with four panes which dominated the 16.2m length of the elevation. The windows extended to eaves level, with the sloping pitch of the roof rising to the ridge above. The decorative brickwork was common to all elevations with windows but only the aluminium windows had soldier courses of plinth bricks (Plate 620).

The South elevation

This elevation was different to that at the north in that there were three white UPVC windows to eaves level in the centre of the elevation (each 1.9m wide by 1.83m high, with 1.3m separation) and standard soldier coursing across the whole width as opposed to plinth bricks under the sills in the north elevation. It was clear that the UPVC windows were replacement windows evidenced by poor pointing and askew adjacent brick but not whether there was ever soldier courses of plinth bricks under the sills. Over the windows the sloping pitch of the roof rose to the ridge (Plate 622).

The West elevation

At lower level at right angles to the elevation and offset to south of centre was the short passage (2m long) linking to the workshops' corridor (5.52m wide external). The elevations to the north and south of the passage were similar but of different lengths with the north 5.6m long and the south side 3.5m. The decorative soldier course aside which continued along the faces and the passage walls, the only differences between them were four small vents in the north and a single larger vent in the south (Plates 622, 623). The flat roof of the passage was coincident with the base of the cladding to the gable and both sides of the short linking passage had opposing 0.65m wide 1.2m high brown aluminium windows with plinth soldier bricks 0.4m off the corridor elevation. RWG downpipe present on the south.

Internal Detail (Figure 25)

The half glazed main doors to the rooms were off the linking corridor where two double doors (1.77m wide) flush with the north and south walls were separated by a 1.3m wide wall with electrical switchboxes. The doors were set 2.5m back from the north-south aligned workshops corridor (Plates 624-626).

The floorspace of the north Crew room (Cadet Mess) which measured 15.5m by 8.4m was clear apart from a small sink unit and combined cupboard in the northwest corner. Only the west and south elevations were full height walls as the north and east were mainly windows and a fire door (sill height 0.9m, ceiling 2.98m). Radiators were fitted below the windows along the east elevation and under the first window of the north elevation with another two along the south partition wall (0.15m wide) from the east elevation. Apart from the single door to the Staff Mess in the centre of the south wall only electrical cabling and pipes were of note and that was similar for the west elevation, the main doors excepted and a water boiler unit near the sink unit. Three of the vents clearly visible on the exterior elevation were panelled over, leaving one open at low level near the sink (Plates 627, 628).

The floor was in grey vinyl and the suspended ceiling tiles with strip lighting in white, as were the walls. Windowsills were finished in brown ceramic tiles.

The smaller Crew room (Staff Mess) to the south of the partition wall (15.5m by 5.4m) was open to the corrugated pitched roof with four exposed steel beams (approximately 3.1m centres) and four angled purlins. Roof height at the south was 3.57m rising to 5.52 at the north; the beams started at 3m up along the south wall. Strip lights were attached to two east-west 3.5m high rails.

The only features, windows and doors aside, included a cupboard (locked) with louvred doors in the northeast corner of the north elevation and flush with the fire door in the east elevation and a 3m long kitchen worktop sink and cupboard unit south of the doorway in the east elevation. Radiators were present on the south wall, two pipes (water) from the cupboard extended across the north wall (the lower of the two at approximately 2.5m high), and electrical switches, boxes and trunking was present on all elevations except the south. The west wall had a vent toward its south corner (Plates 629, 630).

Blue carpet tiles covered the floor up to the line of the east window with grey vinyl continuing to the east and the kitchen sink. The walls and beams were white were white

Circulation areas

The Crew room appeared to have provided recreational and rest areas to personnel passing along the corridor between the workshops. Once through either of the doors from the corridor access could be gained to all areas unless rank differentiation or teacher/student separation was in force. The fire doors in the east elevation were unlikely to have been used on a regular basis.

Phasing

This was a single-phase build structure was considered to be as originally built likely in the 1980s with no alterations. Evidence from aerial photographs puts the building built within a decade post 1981 and before 1991 (Plate HHH).

Building 355. MTT 4STT Toilet Block (ST 00996 68804)

This small single storey detached modern male and female WC facility with four rooms was sited just off an internal road to the west of building 354 and north of workshop 361 and used by nearby workshops staff and students (Plate 631). Figure 26.

External elevations

The rectangular single storey structure orientated east-west in stretcher bond red-brown brick cavity walls (0.34m) on a concrete base (minimum 0.16m depth below DPC) with gablet roof of artificial slate tiles, measured 13.3m (east-west) by 6.66m. Height from DPC to a wooden fascia was 2.25m with a further rise to roof level of another 0.25m. The fascia overhang extended for 0.46m off all elevations. There were four single recessed (0.9m) door entrances with buff-coloured tiles (0.15m square), two in the south elevation and one each in the west and east and all vertical corners and edges were chamfered (45 degrees). All main windows were aluminium, and opaque half glazed with panels below, and the doors were painted red and the similarly glazed. The entrance

Both halves of the13.3m long north elevation were similar with two windows (0.88m wide, 2m high) over panels towards the corners and five small (1.7m from DPC, 0.45m high) high level conjoined windows in the centre illuminating the interior WC cubicles.

The east elevation had a doorway south of centre to the female WCs and 0.8m from it to the north a window, whilst to its south a gas supply cabinet was attached the wall.

The front elevation (south) comprised five abutting full-sized windows in the centre with single doorways to male facilities 0.9m to the east and west, and a single window between the west corner and the west door. To the east of the east door the wall (2.26m long) was plain brick as it was to the west of the west door.

The west elevation had a single recessed doorway to the south of centre and a small high-level window between the doorway and the south corner (Plates 632-636).

Internal Detail

Internally the space was divided on a north-south axis into four separate rooms, a large central space (7.9m by 6m), another smaller room to the west, 2.6m by 6m, a female WC in the northeast third (1.65m by 4.1m) and a storage room in the southeast corner, 1.7m square.

The two main doorways from the south elevation led into short (1.5m long) lobbies. The west lobby via another door gave access direct to the central WC facilities as did the east lobby but there was also another doorway in the east lobby to a storage room with a low ‘Belfast’ style sink and water boiler unit (Plate 637).

The central area was fitted with five WC cubicles central to the north elevation, and directly opposite were seven wash basins on the south elevation. Opposite the WC cubicles, were three urinals on the west elevation and four on the east elevation. Dividing the central floorspace into north and south areas were three 1.8m high partitions (1.4m gap between partitions) screening the urinals from the doorways and the cubicles from the hand basins. Water boilers were present on the walls at each end of the basins (Plates 638-642).

The west elevation of the west room was fitted with three WC cubicles to the north of the entrance and three urinals to the south. Opposite the urinals on the east wall were three hand basins. The

remaining room in the northeast, the female facilities, comprised a single WC cubicle in the northeast corner, a single hand basin under the window and a boiler unit on the wall (Plates 643-646).

The decoration scheme included tiling all walls and floors (light pink hue wall tiles with black tiles just above floor level and another band at approximately 1.7m) and buff coloured floor tiles. Drainage provision was provided by several 0.3m diameter drains at floor level in all rooms except the storeroom. The ceiling (2.65m high) with strip lights was painted white (Plates 647, 648).

There were no alterations to this building. From aerial photographs the structure was in place prior to 1991, and it is suggested that it is a late 1980s building.

5| Conclusion

St Athan, built during the Expansion Period (1934-1939, with permanent brick buildings to a standard design) to face of threat of war with Germany, was one of the most important RAF wartime maintenance bases which functioned as a School of Technical Training and an Aircraft Storage Unit. It became the home of No. 4 School of Technical Training in September 1938. The Station was divided into two camps with No. 4 School based in East Camp as was No. 19 Maintenance Unit (MU), which formed in March 1939 as a civilian Aircraft Storage, whilst No. 32 MU formed in August 1939 as a Service Repair Depot with an Aircraft Repair Section, a Motor Transport Repair Section and General Engineering Section was based in West Camp.

The Station remained an engineering training centre for the RAF, and later with reorganisation the Station became the Head Office of the Defence Aviation Repair Agency (DARA) and later again the Defence Support Group which was responsible for the maintenance and repair of RAF, Royal Navy and Army aircraft. The station closed in the spring of 2024.

Seven buildings were surveyed of which four (Bldgs. 354 (recreational facilities and faith centre), 361 (workshop), 371 (Bellman hangar) and 377 (workshop)) were built in the late 1930s, with the remaining three dating from the latter part of the 20th century (Bldgs. 355 (WCs), 348 (garage workshop) and 375 (crew room)).

The survey confirmed that the basic shell (exterior elevations, roofs and supporting structural steelwork) of the original 1930s buildings excepting the Bellman hangar (Bldg. 371) were all built to a similar design using similar materials, and all were constructed with opposing aircraft sized hangar openings. The double sized 'workshop' Bldg. 354 had two on each side opening into the gymnasiums; evidence from aerial photographs indicated that they were infilled after 1962.

With the shell in place, it has generally been accepted that there was short period of time before the buildings were subdivided internally.

Building work started in the autumn of 1937. A year later No. 4 SoTT took up residence in September 1938 followed by 19MU in March 1939 and 32MU in August 1939. Building work was still ongoing during formation of these units (temporary accommodation is mentioned) and it may be possible that the MU units could not have moved in earlier as there were no buildings for them. Records indicate that between 19MU and 32MU moving in, Empire Air Day held in May was cancelled as the Station was incomplete and that a newly built church was dedicated in May (suggesting recently completed). Further evidence that the Station was still under construction, and particularly in relation to Bldg. 354 was that the Station cinema was officially opened in September 1939, again suggesting recently completed, and just over a year since No. 4 School started. These records explicitly record ongoing building works and mark significant events, and it is possible that other parts of Bldg. 354 and other Station buildings were still under construction. There could have been a priority list for buildings with the essential operational buildings the first to go up and the recreation buildings a secondary consideration although complexity may have played a part with Bldg. 354.

The subdivision of the training workshops may have operational factors that influenced their subdivision but in respect of Bldg. 354, it was generally known to the public (January 1939 newspaper report) that part of the building was to be a gymnasium and it seems unusual that it wasn't divided as part of the initial build given that general construction work was taking place over at least two years or longer.

Another anomaly in Bldg. 354 were the two windows facing the gymnasium (squash courts) from the pool pumping room both of which were possibly never used. This was an original first phase wall and a direct continuation of the external wall. It seems unlikely that they were built in the wrong place or that the builders made an error, but it could indicate that there was a late change in the layout of part of the internal areas, speculatively perhaps necessitated by a requirement for squash courts that couldn't be placed elsewhere.

The church formed from a probable operational hangar layout that appeared to allow for high level passage of equipment is another anomaly, particularly as a newly built Church of England was only dedicated in May 1939 at the Station Amenities building. The need for the conversion possibly in 1941 as indicated by a date on a wooden organ surround has not been determined.

These remain unresolved and it may not be until original drawings if they exist are uncovered that some explanation can be found for these changes. Searches failed to produce definitive evidence for original design or even later adaptations.

The reason for the infilling post 1962 of the hangar openings in all the buildings is unknown but could it be that in the case of the workshops, training purposes no longer required access for larger aircraft parts, so the doors were infilled and new doors installed sufficient for MT training purposes and small equipment. That scenario would not apply to the gymnasium although the wide hangar opening would have allowed bodies of airmen marching in column to access the stone gym that likely served as an indoor parade ground during inclement weather. There were no other large doors that would have allowed this. Or perhaps it was a more pragmatic reason such as simply keeping the buildings warm.

Changes to the workshops appeared to be largely superficial with periodic additions of mainly single storey small classroom and office ranges or partitioning of existing rooms or installation of modern WC and welfare facilities arranged along the elevations. The larger central areas mainly in bldg. 377 were open but fitted with stanchions supporting a crane or exhaust extraction tubing and these were probably replacements for earlier similar supports. Noted was the importance for ventilation with the provision of early large-scale ducting at roof level fitted through the windows and threaded through the trusses in the workshops and similarly large-scale ventilation in the cinema.

The workshops had been cleared of all portable equipment. Several rooms, open areas and general larger fixed workshop fittings such as overhead cranes and stanchions, and occasional permanent vehicle maintence fixtures indicated the training, teaching and circulation areas however, the actual teaching function of a particular classroom or purpose of some open areas was not determined and reliance for function therefore was placed on annotated site fire plans and labelling on doorways. Whatever the function most working areas were amply supplied with electrical sockets and switches presumed to have powered equipment.

Definitive evidence for phasing was lacking and the suggested phasing is based mainly on differing brick bonding to that of the Flemish bond of the elevations where English bond appeared to indicate secondary works and stretcher bond, possibly a later phase again. Phasing will likely to a degree only ever be resolved if the original drawings can be located and at present if they exist then they have not been discovered. Building 354 is the key building of interest but if that footprint was only ever applied to RAF St Athan and RAF Cosford then the chances of discovery are reduced rather than plans used for common building types.

Despite the uncertainty in phasing, the survey drawings backed by photographs have provided a detailed record of the buildings.

6| Aerial photographs

Plate BBB. 1942 photograph clearly showing the workshops, Bellman hangar and Bldg. 354

Plate CCC. 1945 photograph with no real change to the layout to that seen in 1942

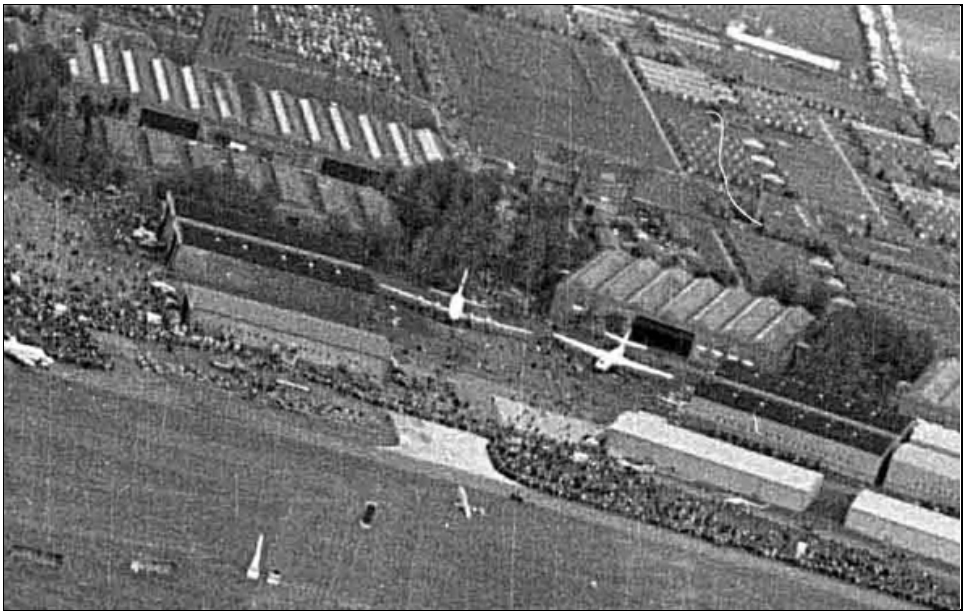


Plate DDD. 1962 image showing Bldg. 354 (left) and Bldg. 361 (right) with what surely are the large open hangar doors that were later infilled in all the buildings. The thin grey line just visible in the hangar on the right is probably the top of the up and over hangar door. The photograph also show that the fan housings were also in place

Plate EEE. 1969 image clearly showing the fan houses outside the workshops and also that the roof of the Bellman hangar (Bldg. 37, top right1) was without the double row of roof lights.

Plate FFF. 1981 general view showing removal of a Bellman hangar and the engine test building in place (top right).

Plate GGG. 2001 photograph showing the Bellman hangar (Bldg. 371, top right) with its new roof, the linking corridor and crew room (Bldg. 375) between the workshops and the ambulance garage (Bldg. 348, upper right) adjacent to the engine test building and the WC block (Bldg. 355) between

Aerial Photographs

Sortie Reference	
1941. Luftwaffe NCAP_NARA_GX-11946. (10th January)	Black and White
1942. 4221 RAF Medmenham 2267	Black and White
1944. 4405 RAF Medmenham 1281	Black and White
1945. 4540 RAF 106GUK_844	Black and White
1962 15_9_62 Bob display	Black and White
1963 OS63-54	Black and White
1969 6935 OS 69_153	Black and White
1979 OS 79-130	Black and White
1981 8101 JAS 2181 231	Black and White
1981 8101 JAS 2281 034	Black and White
1981 8101 JAS 2281 035	Black and White
1991 Geonex 134_91 045	Colour
1991 Geonex 134_91 100	Colour
2001_11 OS01_1018 1485	Colour
Additional Google earth and WDA photos 2002- 2023	Colour

Table 2. Table of aerial photographs examined

7| Sources

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Email Ref 2023/00094/Ful. 2 January 2024 Cadw to The Vale of Glamorgan Council https://vogonline.planning-register.co.uk/Document/Download?module=PLA&recordNumber=77029&planId=1037704&imageId=96&isPlan=False&fileName=Cadw%20-%202023_00949_FUL%20-%202024-01-26%20-%20Demolition%20%26%20reprofiling%20of%20land%2C%20Land%20East%20of%20Aston%20Martin%20Lagonda%20%26%20West%20of%20Cowbridge%20Road%2C%20Bro%20Tathan%2C%20St.%20Athan%20-%20%20Response.pdf

National Archives Documents

Reference No.	Title
AIR 29/1843:	No 2 School of Physical Training, St. Athan
AIR 29/1492	Maintenance Unit: No 32, RAF St. Athan. With appendices
AIR 29/1476	Maintenance Unit: No 19, St. Athan. With appendices
AIR 29/1766	Administrative Apprentice Training School, St. Athan. With appendices
AIR 29/1491	Maintenance Unit: No 32, RAF St. Athan. With appendices
AIR 29/995	32 Maintenance Unit, formed at St Athan August 1939 (MU UK). With appendices
AIR 29/979	19 Maintenance Unit, formed at St Athan (UK) February 1939; includes 6 Satellite Landing Ground, St Brides; includes history of E Company, 10 (Glamorgan) Battalion, Home Guard (19 MU Aerodrome Company), December 1944, with photographs. With appendices
AIR 29/736	Operational Training Unit: 4 School of Technical Training, Henlow and St Athan (UK). Includes photographs of personnel and Daily Routine Orders. With appendices
AIR 29/737	Operational Training Unit: 4 School of Technical Training, Henlow and St Athan (UK). Includes photographs of equipment. With appendices
AIR 29/780	4 Air Stores Park including 1 Supply and Transport Section, Advanced Air Striking Force; formed St Athan (UK) September 1939, moved to France September 1939, moved to Halton and disbanded June 1940 (ASP AASF). With appendices
AIR 29/781	Air Stores Parks. (Described at item level)
AIR 2/2429	School of Technical Training St. Athan: establishment
AIR 2/16634	Swimming pools: provision at RAF stations etc
AIR 2/15922	Provision of swimming pools at RAF stations
BD 54/15	Plans of St Athan airfield, Glamorgan
AIR 2/15050	Empire Games 1958: use of RAF St Athan
AIR 2/13294	RAF St. Athan: preparation for British Empire and Commonwealth Games 1958
AIR 2/13161	RAF Cinema Corporation: operation in buildings on RAF stations
AIR 20/11661	RAF cinema corporation 1943-1959
AIR 20/11600	RAF Cinema Corporation: formation 1946-1949
AIR 29/2956	School of Physical Training, St Athan. With appendices
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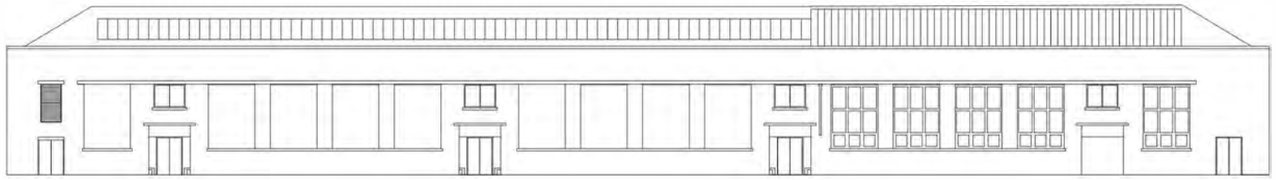
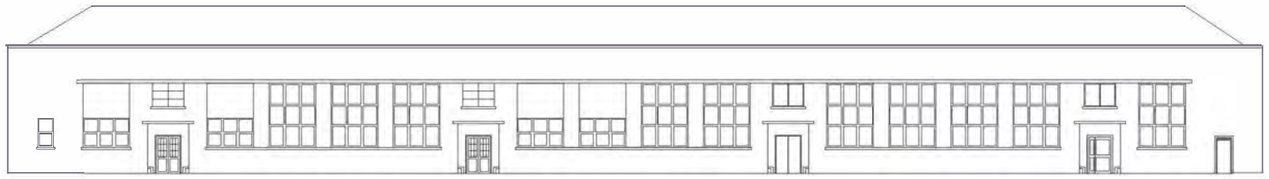
Vale of Glamorgan Council Planning portal. https://vogonline.planning-register.co.uk/Planning/Display/1991/00535/CROWN



North Facing Elevation



South Facing Elevation

Cinema Entrance

East Facing Elevation

Pool Entrance

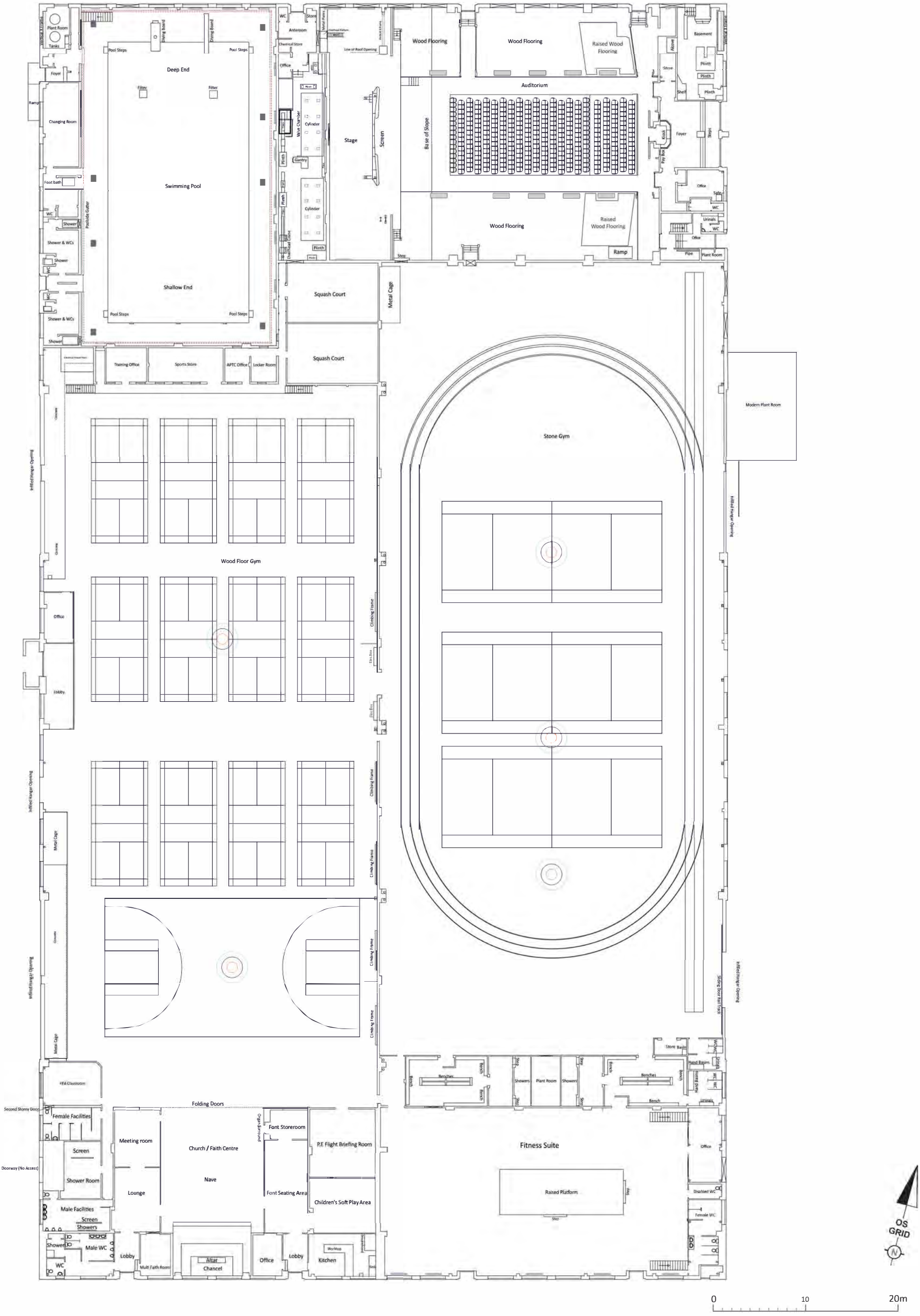
West Facing Elevation

0 25m

Project Title	Bro Tathan (former RAF St Athan, East Camp) Vale of Glamorgan Historic Building Recording	**Project Number**	LD24_049
		Report Number	2024/033
		Survey May 2024	MT
		Figure Drawn By	SL-J

Figure Number

Figure 4. Building 354 External elevations



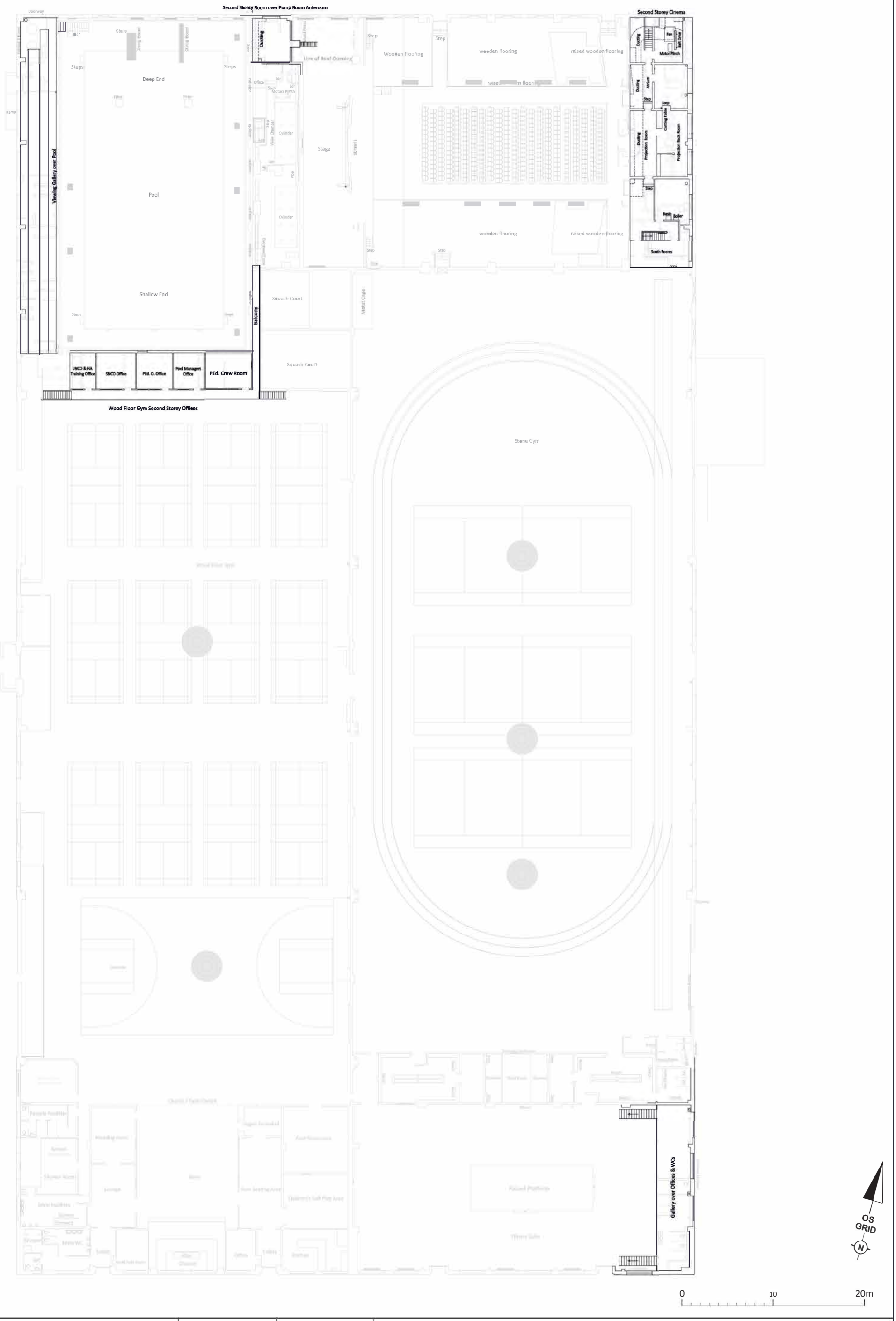
Project	Bro Tathan (former RAF St Athan, East Camp) Vale of Glamorgan Historic Building Recording	**Project Number**	LD24_049
		Report Number	2024/033
		Survey May 2024	MT
		Figure Drawn By	SL-J

Figure Number

Figure 5. Building 354 Floor Plan

Key

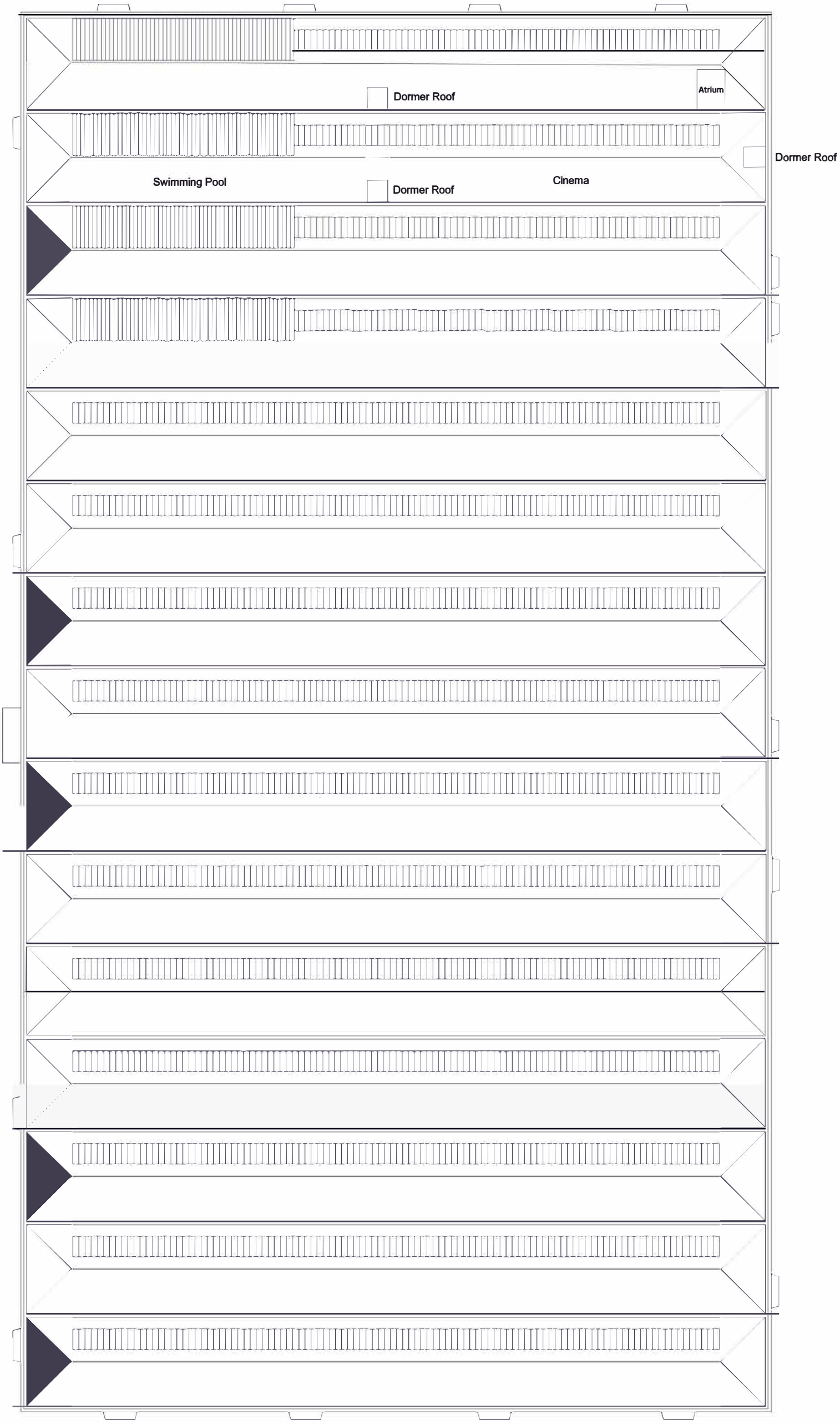
Overhead
Gutter
Radiator/Heater
Drain Cover
Steps Direction
Blocked Opening
Downpipe



Project	Bro Tathan (former RAF St Athan, East Camp) Vale of Glamorgan Historic Building Recording	**Project Number**	LD24_049
		Report Number	2024/033
		Survey May 2024	MT
		Figure Drawn By	SL-J

Figure Number

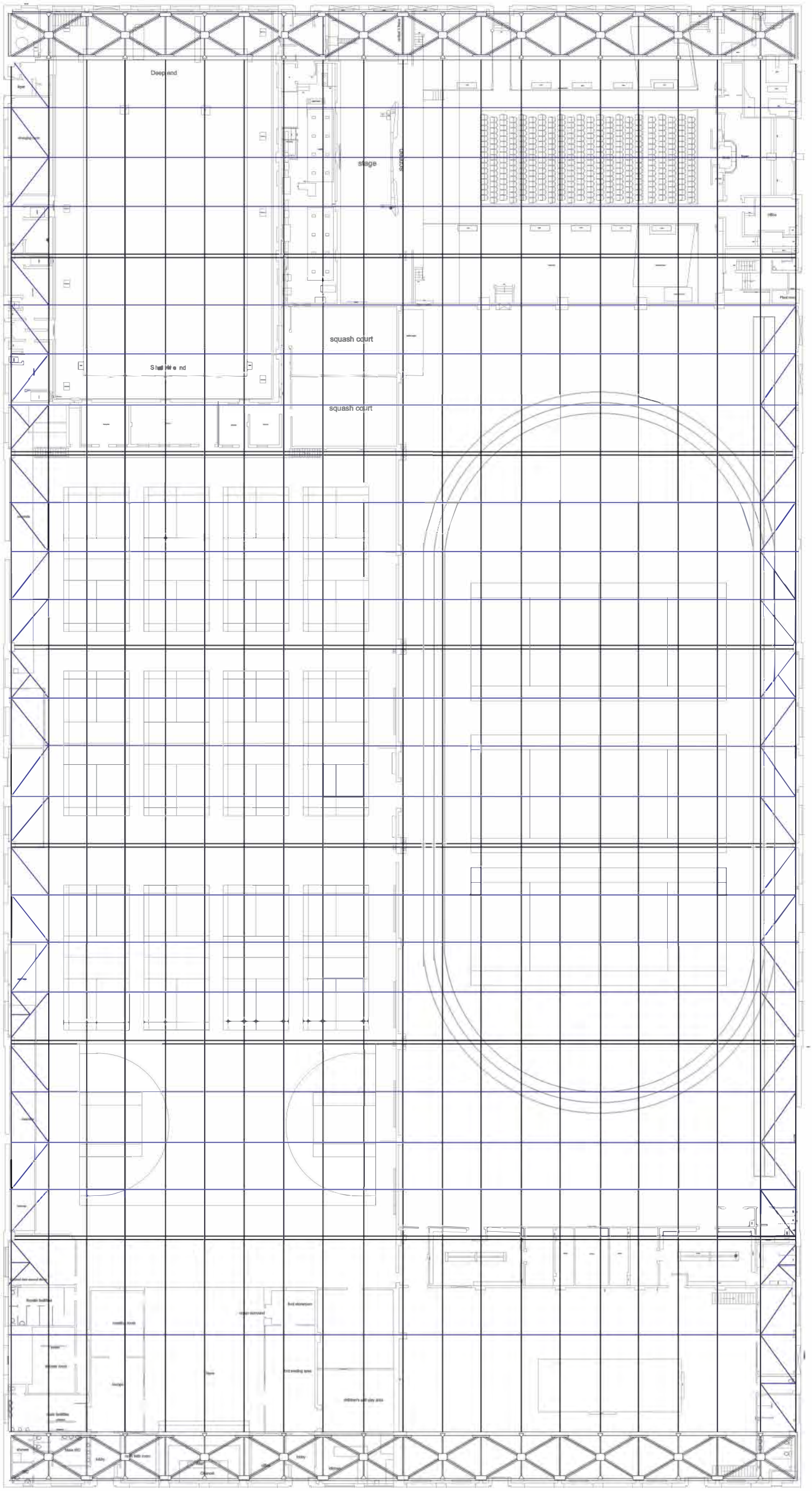
Figure 6. Building 354 Second Storey Floor Plan



Project	Bro Tathan (former RAF St Athan, East Camp) Vale of Glamorgan Historic Building Recording	**Project Number**	LD24_049
		Report Number	2024/033
		Survey May 2024	MT
		Figure Drawn By	SL-J

Figure Number

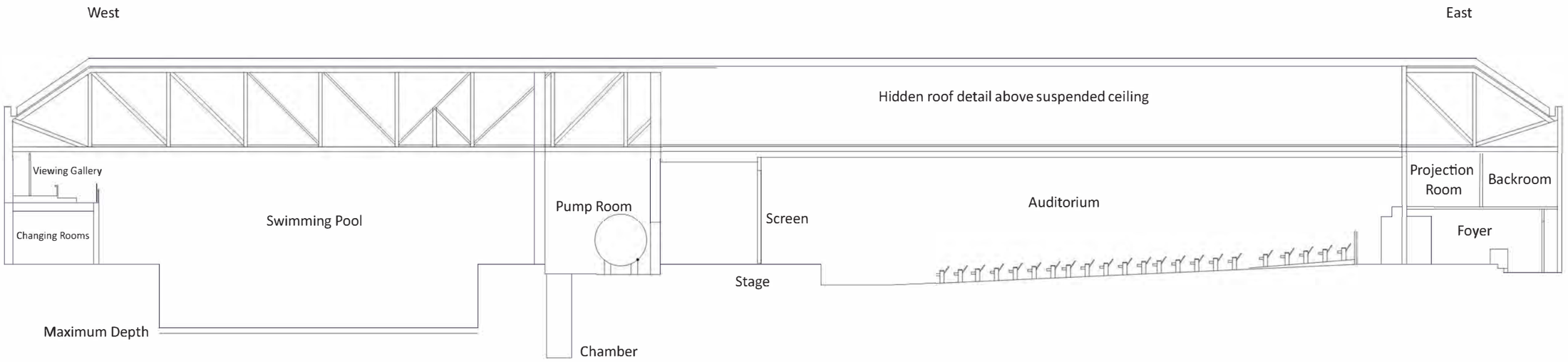
Figure 7. Building 354 Roof Plan



Project	Bro Tathan (former RAF St Athan, East Camp) Vale of Glamorgan Historic Building Recording	**Project Number**	LD24_049
		Report Number	2024/033
		Survey May 2024	MT
		Figure Drawn By	SL-J

Figure Number

Figure 8. Building 354 Structural Steelwork Plan



Project Title	Bro Tathan (former RAF St Athan, East Camp) Vale of Glamorgan Historic Building Recording	**Project Number**	LD24_049
		Report Number	2024/033
		Survey May 2024	MT
		Figure Drawn By	SL-J

Figure Number

Figure 9. Building 354 Schematic East-West Section through the Swimming pool and Cinema

South

North

0 2.5 5

Project Title	Bro Tathan (former RAF St Athan, East Camp) Vale of Glamorgan Historic Building Recording
Project Number	LD24_049
Report Number	2024/033
Survey May 2024	MT
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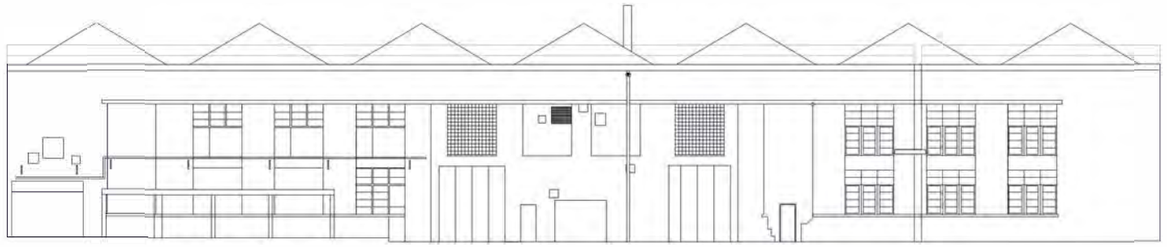
Figure Number

Figure 10. Schematic section across Cinema Rooms (view to west)

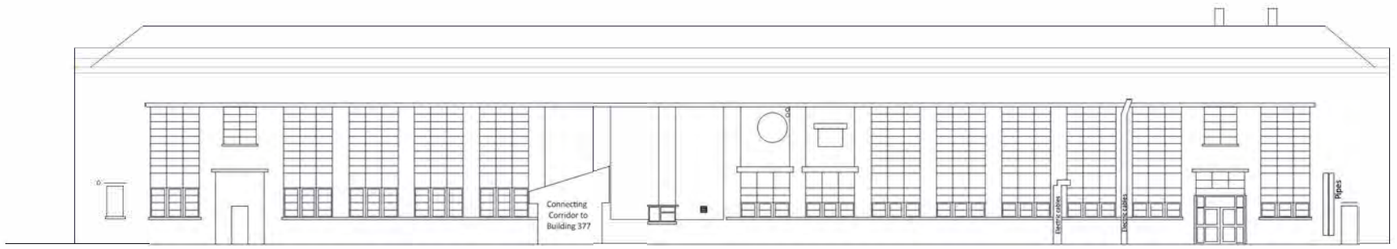
Key

Ducting

East Facing Elevation



West Facing Elevation



South Facing Elevation

North Facing Elevation

0 10 20m

Project Title Bro Tathan (former RAF St Athan, East Camp) Vale of Glamorgan Historic Building Recording	**Project Number**	LD24_049	**Figure Number** **Figure 11.** Building 361 External Elevations (North-South & East-West)
	Report Number	2024/033	
	Survey May 2024	MT	
	Figure Drawn By	SL-J	

Key

Railings

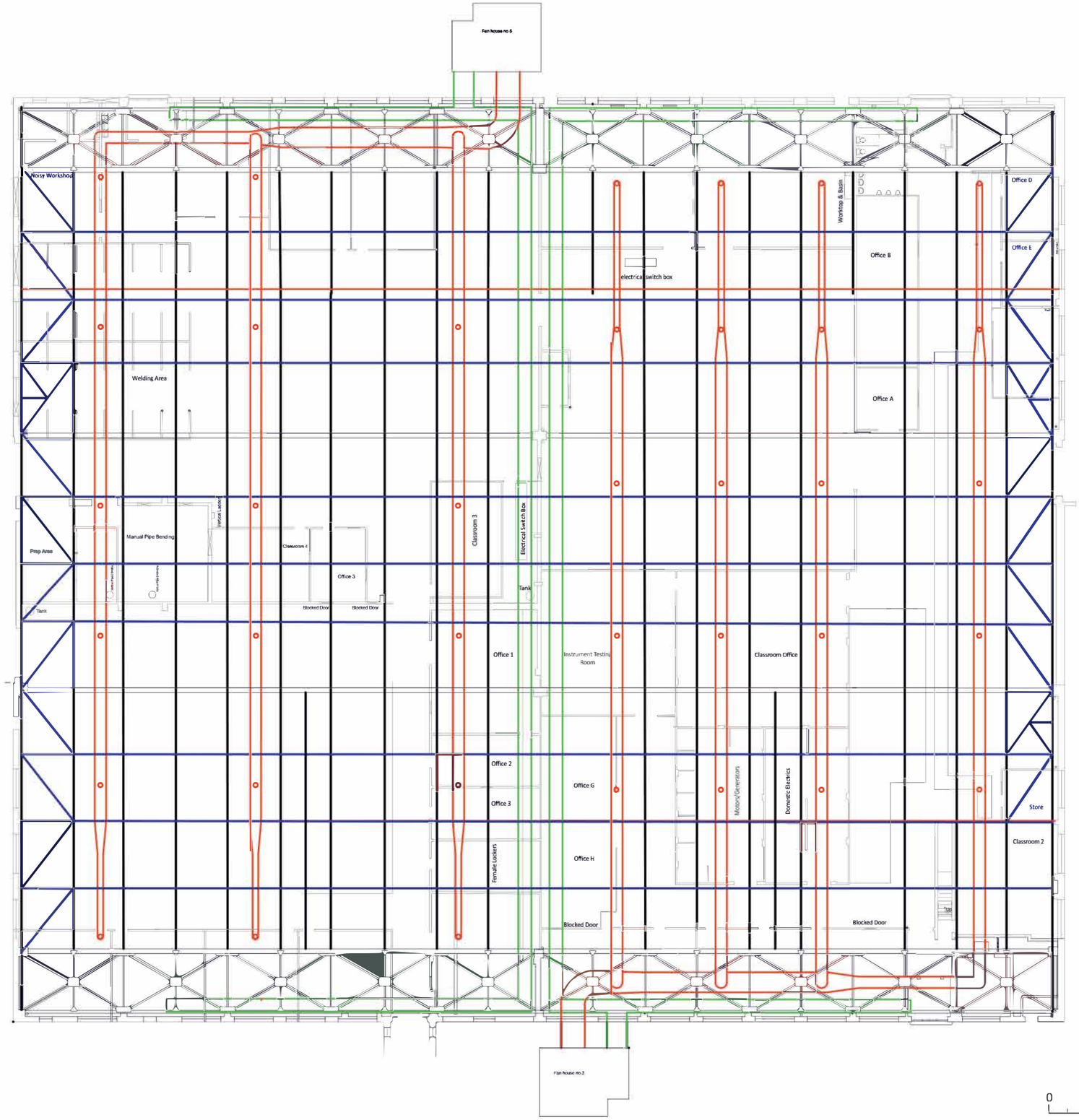
Project Title	Bro Tathan (former RAF St Athan, East Camp) Vale of Glamorgan Historic Building Recording	**Project Number**	LD24_049
		Report Number	2024/033
		Survey May 2024	MT
		Figure Drawn By	SL-J

Figure Number

Figure 12. Building 361 Floor Plan

Key

- Metal Floorplates
- Downpipe
- Steps
- Blocked Opening



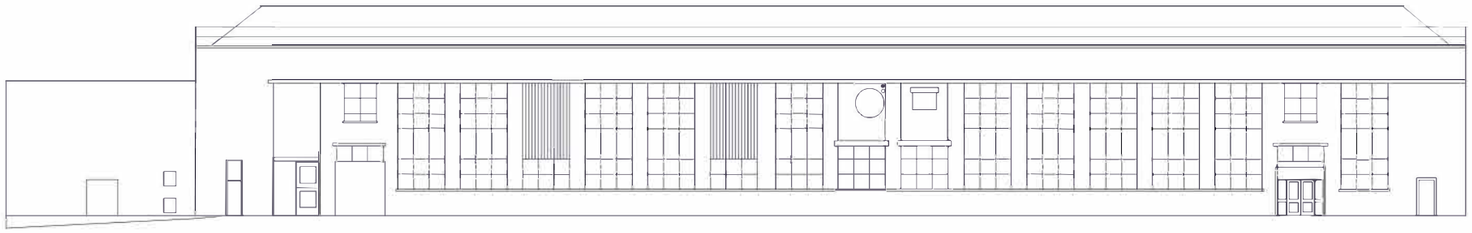
Project Title	Bro Tathan (former RAF St Athan, East Camp) Vale of Glamorgan Historic Building Recording	**Project Number**	LD24_049
		Report Number	2024/033
		Survey May 2024	MT
		Figure Drawn By	SL-J

Figure Number

Figure 13. Building 361 Structural Steelwork Plan

Key

- Tubular Ducting
- Box Ducting
- Angle Ties
- Roof Trusses
- Wind Girder
- Lattice Girder



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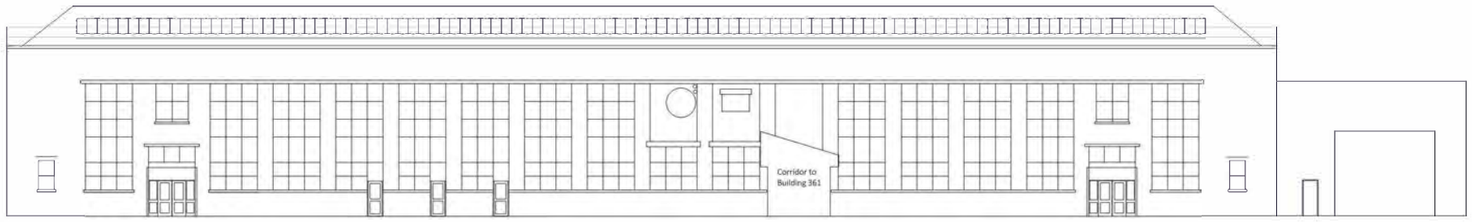
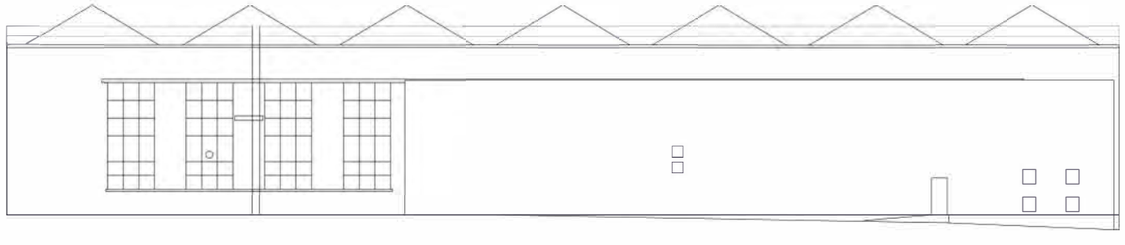


North Facing Elevation

East Facing Elevation



West Facing Elevation

0 25m

Project Title Bro Tathan (former RAF St Athan, East Camp) Vale of Glamorgan Historic Building Recording	**Project Number**	LD24_049	**Figure Number** **Figure 12.** Building 377 External Elevations
	Report Number	2024/033	
	Survey May 2024	MT	
	Figure Drawn By	SL-J	

Key

—— Railings

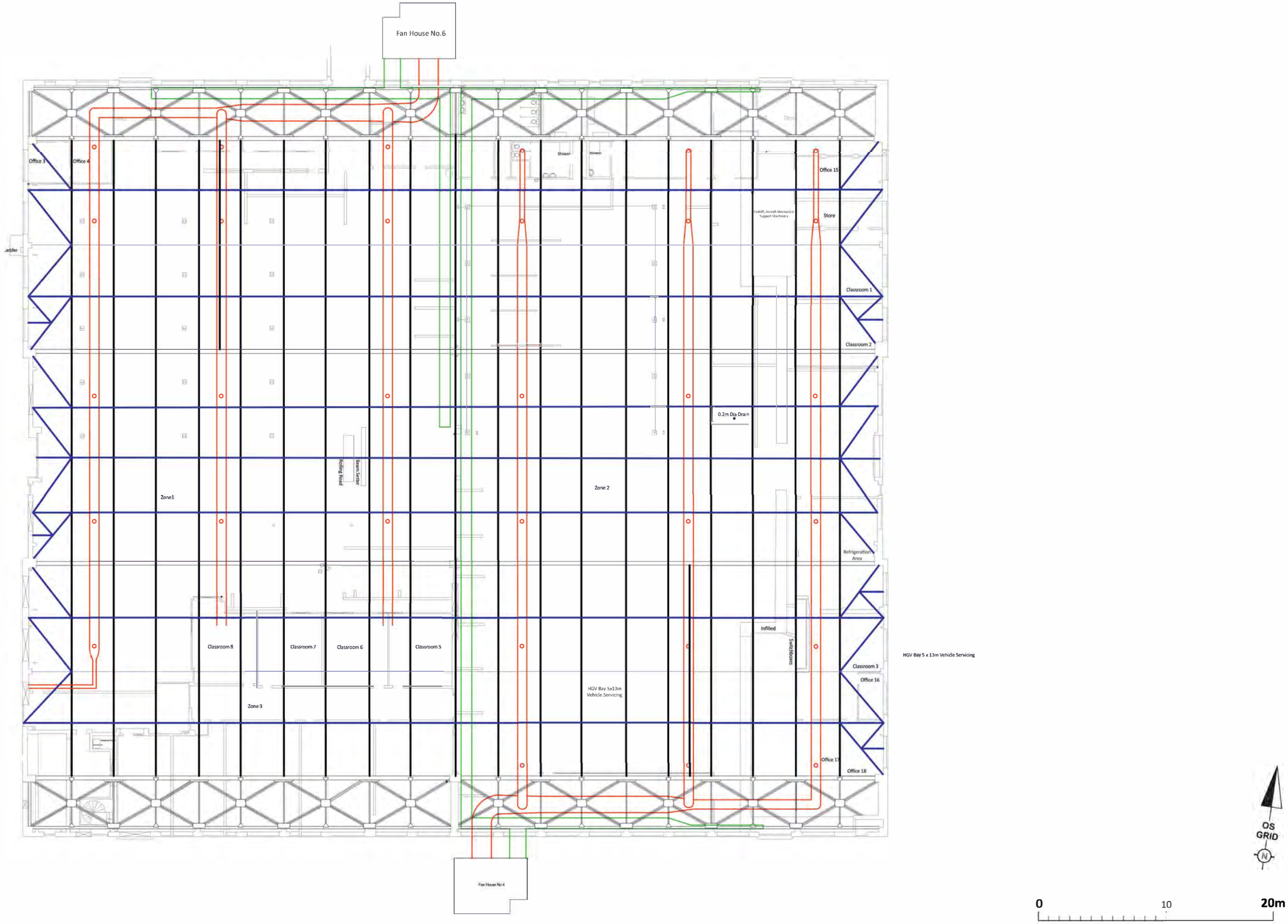
Project Title	Bro Tathan (former RAF St Athan, East Camp) Vale of Glamorgan Historic Building Recording	**Project Number**	LD24_049
		Report Number	2024/033
		Survey May 2024	MT
		Figure Drawn By	SL-J

Figure Number

Figure 15. Building 377 Floor Plan

Key

- Metal Floor Plates
- Stanchions
- Steps



Project Title	Bro Tathan (former RAF St Athan, East Camp) Vale of Glamorgan Historic Building Recording	**Project Number**	LD24_049
		Report Number	2024/033
		Survey May 2024	MT
		Figure Drawn By	SL-J

Figure Number

Figure 16. Building 377 Structural Steelwork Plan

Key

- Tubular Ducting
- Box Ducting
- Angle Ties
- Roof Trusses
- Wind Girder
- Lattice Girder

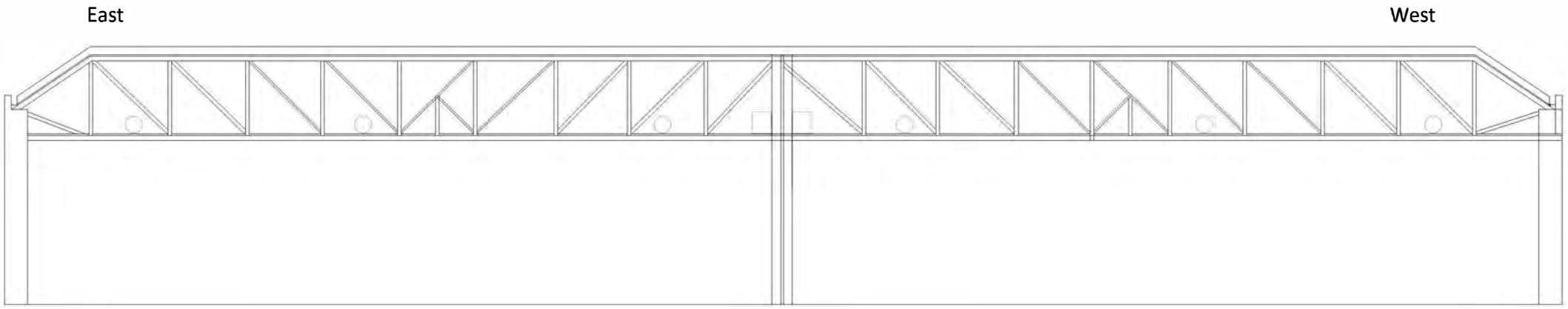


Figure 17. Schematic Lattice Girder Cross-Section (East-West) Buildings 354/361/377 and Ducting Buildings 361/377

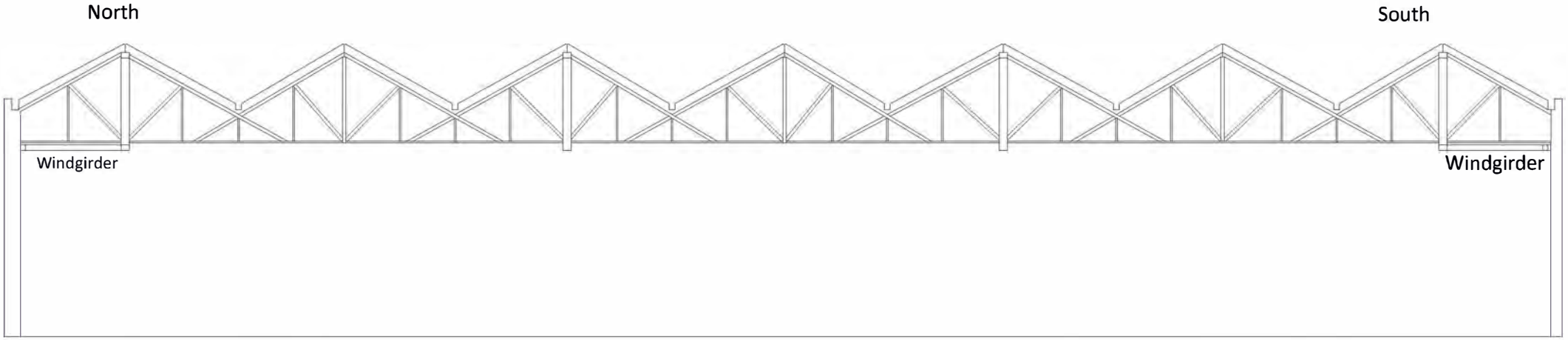


Figure 18. Schematic Cross-Section of Typical Roof Truss Buildings 354/361/377

Project Number	LD24_049
Report Number	2024/033
Survey May 2024	MT
Figure Drawn By	SL-J

Figure Number

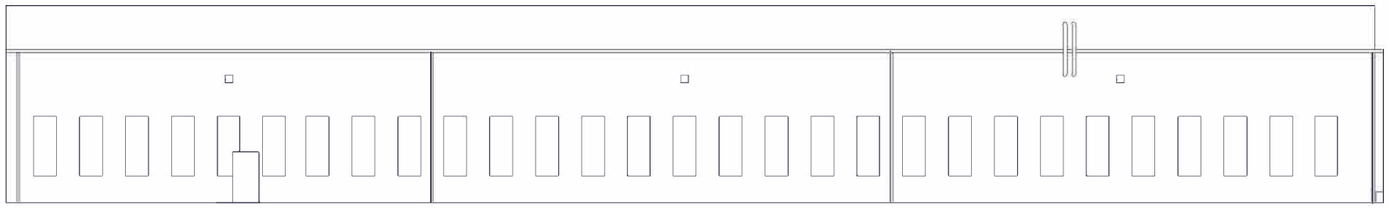
Figure 17. Schematic Lattice Girder Cross-Section (East-West) Buildings 354/361/377 and Ducting Buildings 361/377
Figure 18. Schematic Cross-Section of Typical Roof Truss Buildings 354/361/377

Key

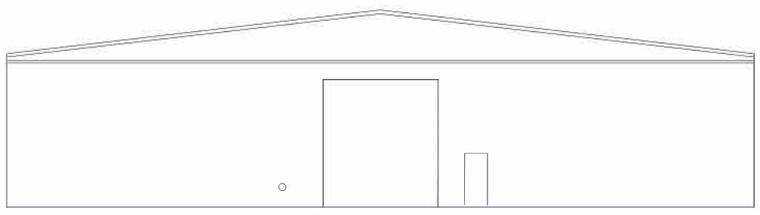
Tubular Ducting

Box Ducting

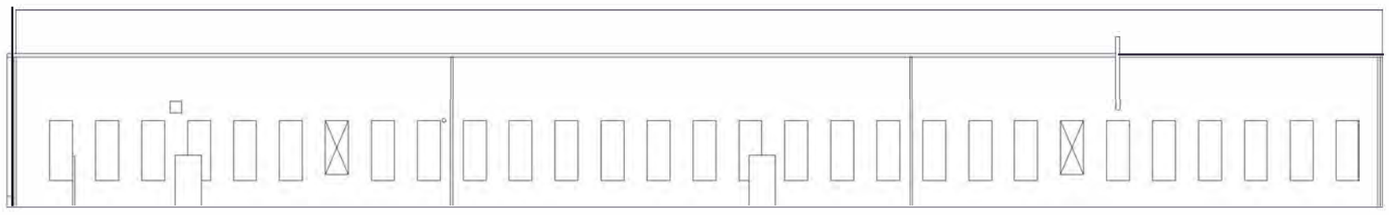
North Facing Elevation



East Facing Elevation



south Facing Elevation



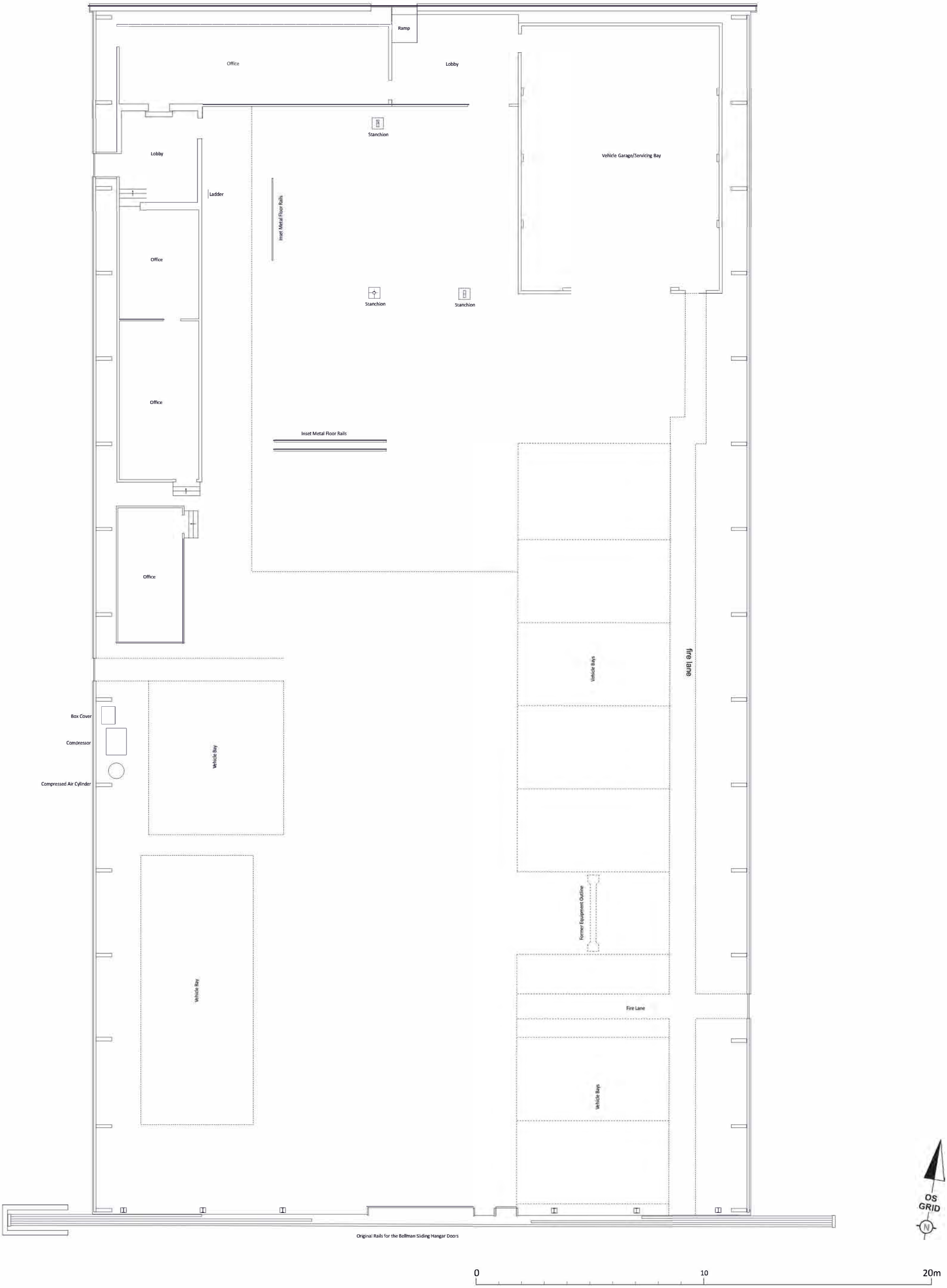
West Facing Elevation

0 25m

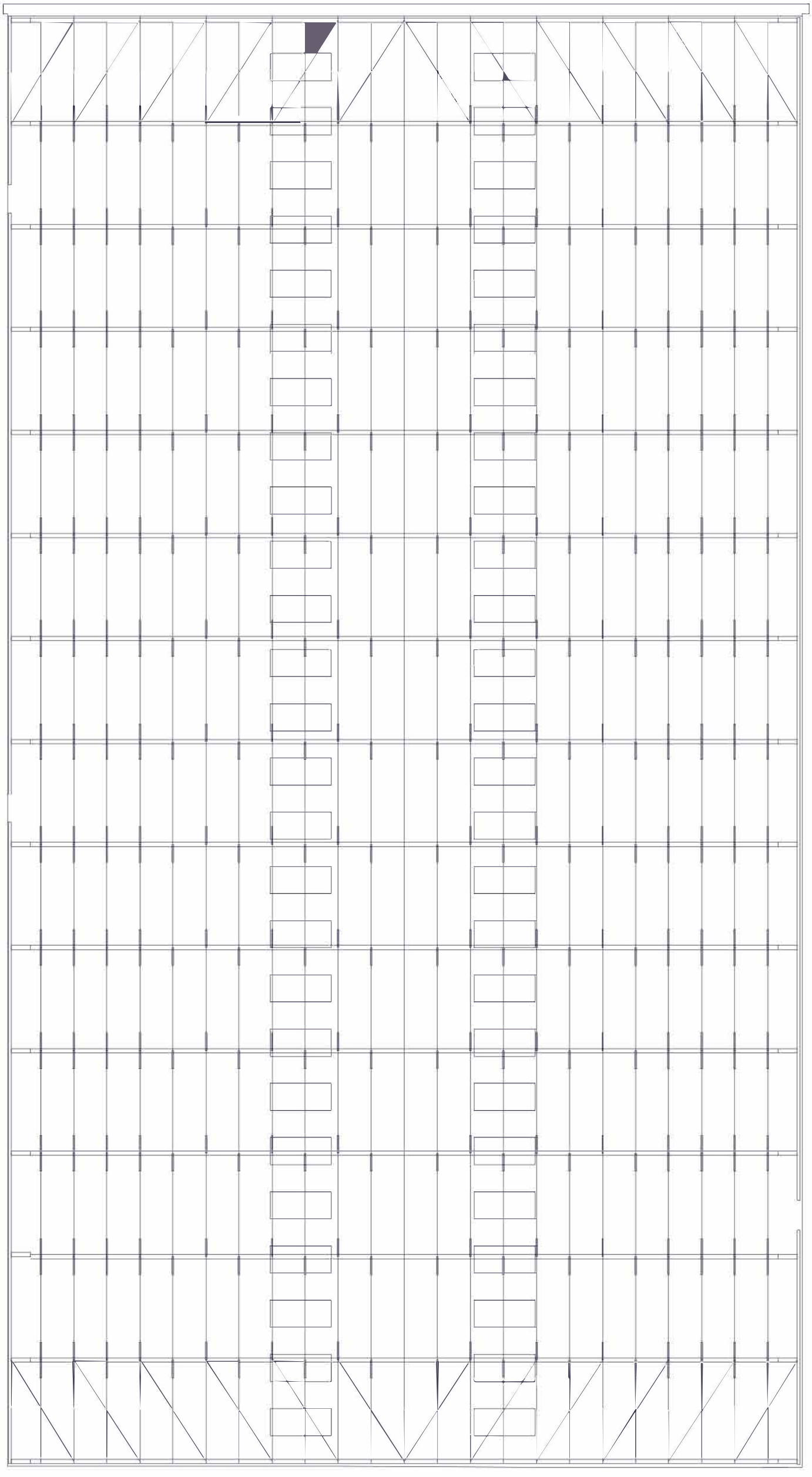
Project Title	Bro Tathan (former RAF St Athan, East Camp) Vale of Glamorgan Historic Building Recording	**Project Number**	LD24_049
		Report Number	2024/033
		Survey May 2024	MT
		Figure Drawn By	SL-J

Figure Number

Figure 18. Building 371 Bellman Hangar External Elevations



Project	Bro Tathan (former RAF St Athan, East Camp) Vale of Glamorgan Historic Building Recording	**Project Number**	LD24_049	**Figure Number** **Figure 20.** Building 371 Bellman Hangar Floor Plan	**Key** Steps
		Report Number	2024/033		
		Survey May 2024	MT		
		Figure Drawn By	SL-J	Page | 155	



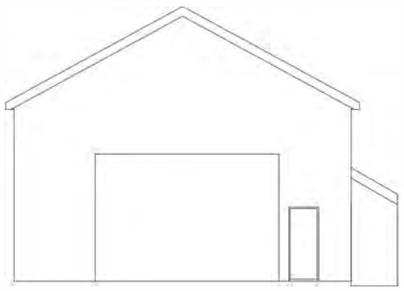
OS GRID

0 10 20m

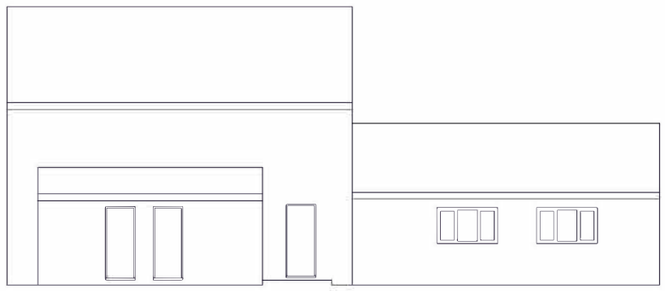
Project	Bro Tathan (former RAF St Athan, East Camp) Vale of Glamorgan Historic Building Recording	**Project Number**	LD24_049
		Report Number	2024/033
		Survey May 2024	MT
		Figure Drawn By	SL-J

Figure Number

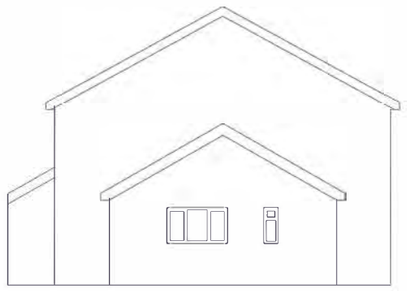
Figure 21. Building 371 Bellman Hangar Structural Steelwork & Roof Lights



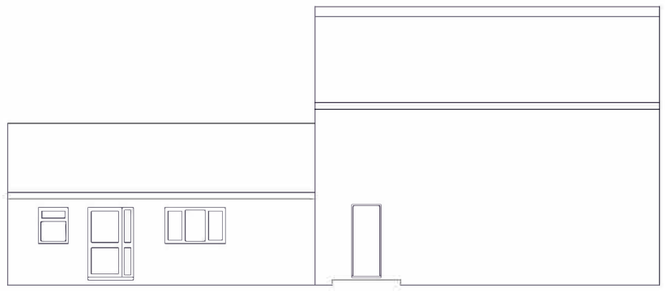
East Elevation



North Elevation



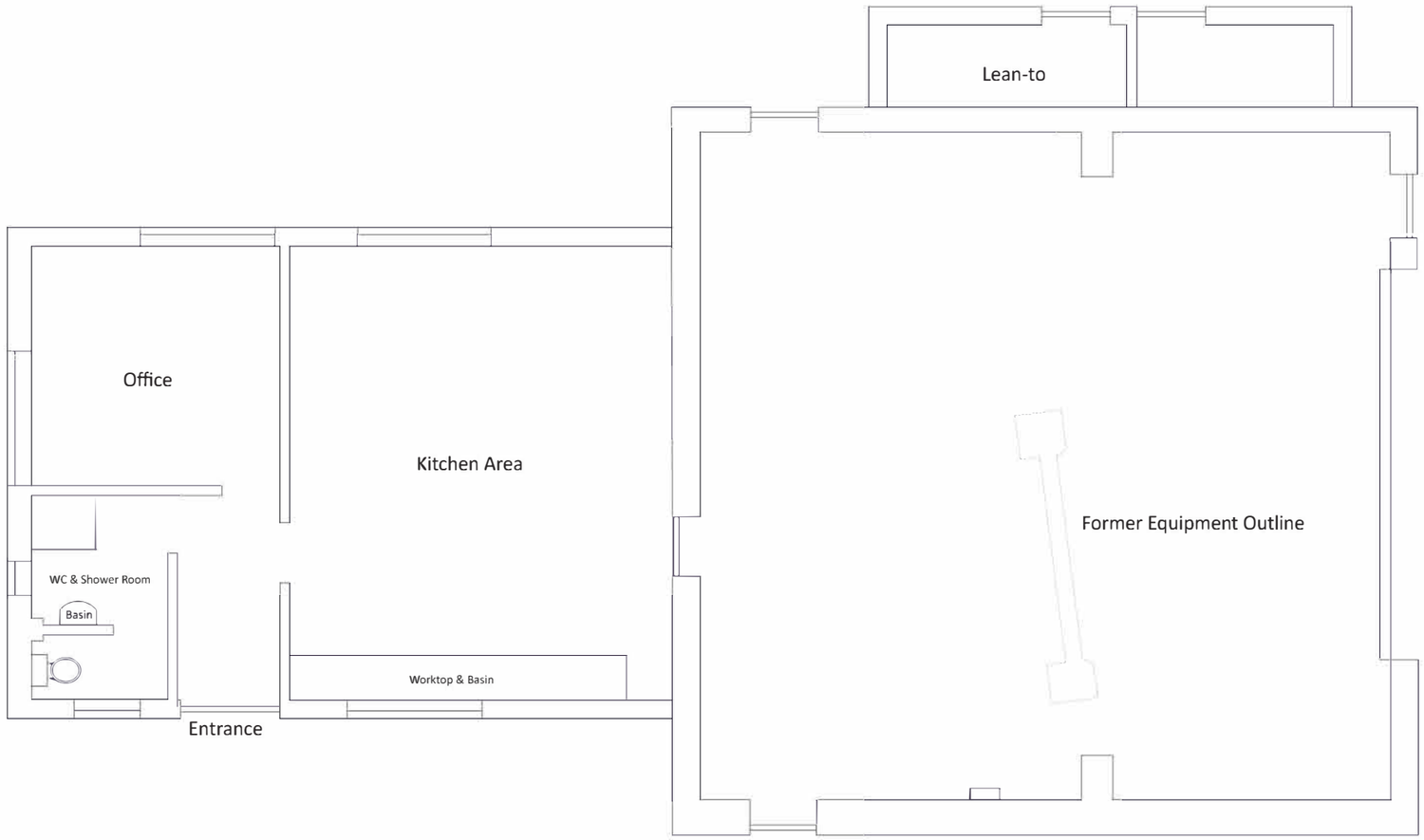
West Elevation



South Elevation

0 10.00 20.00m

Figure 22. Building 348 External Elevations



OS GRID N

0 2.5 5m

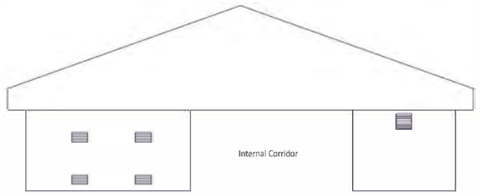
Figure 23. Building 348 Plan

Project Title	Bro Tathan (former RAF St Athan, East Camp) Vale of Glamorgan Historic Building Recording	**Project Number**	LD24_049
		Report Number	2024/033
		Survey May 2024	MT
		Figure Drawn By	SL-J

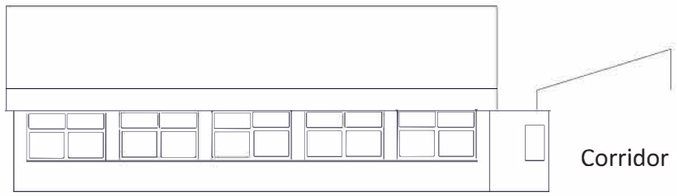
Figure Number

Figure 22. Building 348 External Elevations

Figure 23. Building 348 Floor Plan



West Elevation



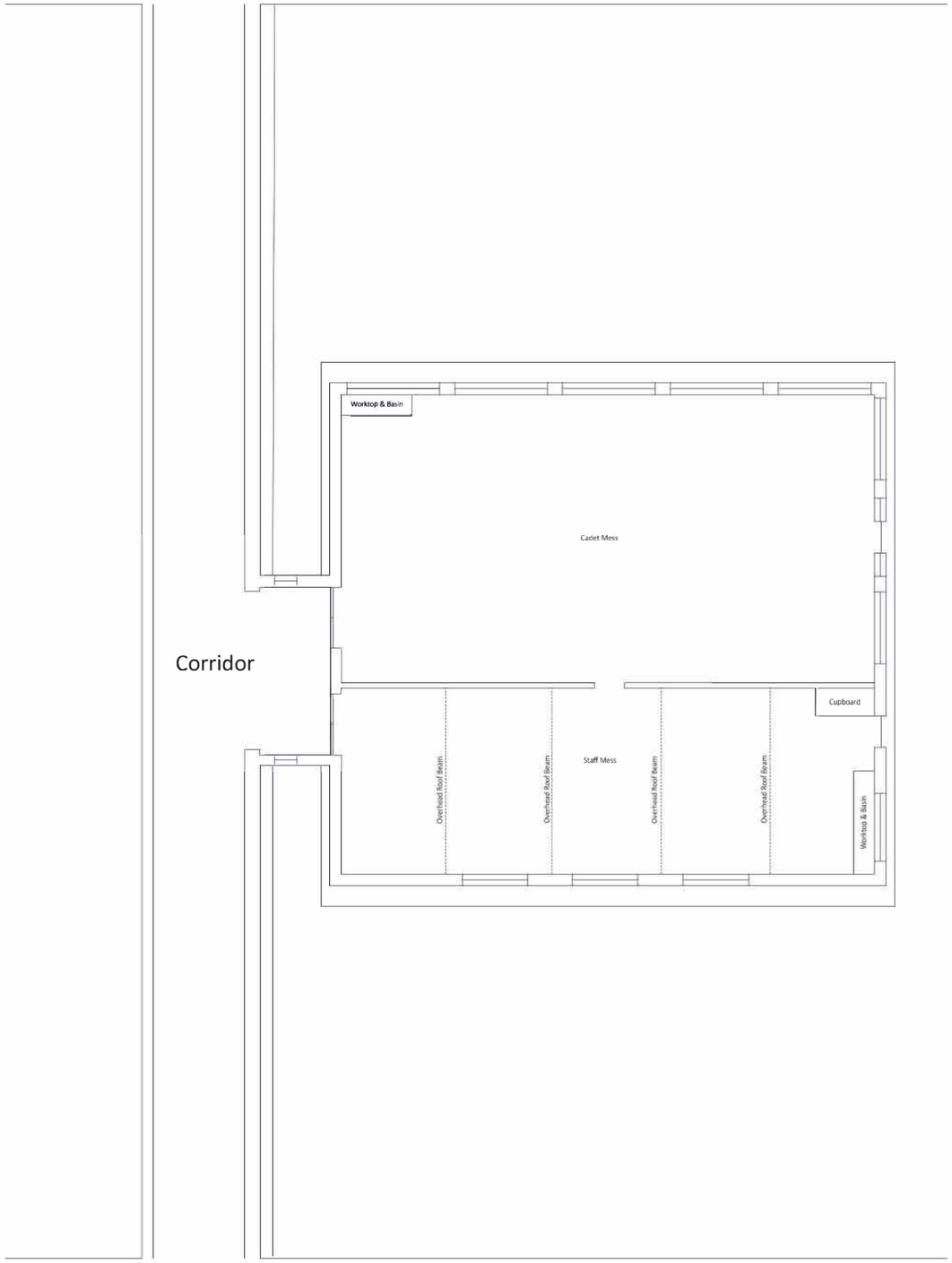
North Elevation

East Elevation

South Elevation

Figure 24. Building 375 External Elevations

Building 361



Building 377

0 10 20m

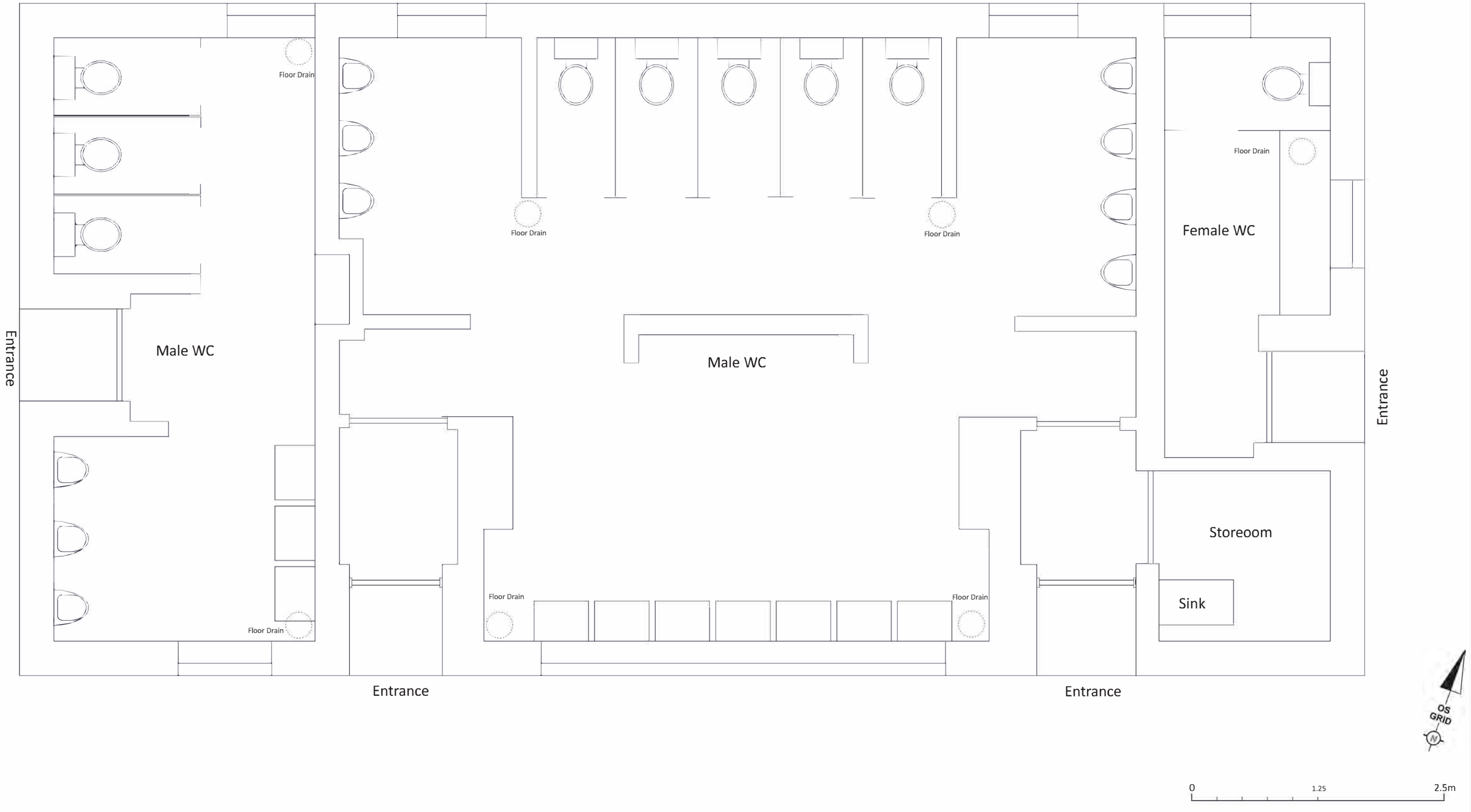
Figure 25. Building 375 Plan

Project Title	Bro Tathan (former RAF St Athan, East Camp) Vale of Glamorgan Historic Building Recording	**Project Number**	LD24_049
		Report Number	2024/033
		Survey May 2024	MT
		Figure Drawn By	SL-J

Figure Number

Figure 24. Building 375 External Elevations

Figure 25. Building 375 Plan



Project	Bro Tathan (former RAF St Athan, East Camp) Vale of Glamorgan Historic Building Recording	**Project Number**	LD24_049
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		Survey May 2024	MT
		Figure Drawn By	SL-J

Figure Number

Figure 26. Building 355 Floor Plan

Heneb

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