Part 6: RAF Coltishall a Peace and War Operational Fighter Station

6.1 Introduction and Notes on Sources

This part examines in more detail concerning pavement and hardstanding upgrades at Coltishall in order to make it a peace and war station. Most of these type of civil engineering projects were in support of aircraft upgrades or the introduction of guided missiles. It is based on surviving Air Ministry and Property Services Agency (PSA) drawings that have been digitised, copies of which are held on site at Coltishall. Another primary source is the PSA document 'Airfield Pavements Maintenance Inspection 1991', a copy of which is also held on site.

6.2 First Post-War Phase, 1948–58

6.2.1 Runway Construction

In 1948, Coltishall became the headquarters of Eastern Sector within 12 Group and 23 and 141 Squadrons moved in from Wittering with Mosquito night fighters. On 13 January 1948 they were joined by 264 Squadron, also from Wittering. The units were kept busy with visits to the Armament Practice Stations at Acklington and Lübeck. However with jet fighters entering service, it was clear that Coltishall's tracked and grass runways were inadequate. Coltishall was selected, along with Duxford and Wattisham, to be one of the first stations upgraded, and to facilitate this the three Mosquito squadrons moved out to Church Fenton on 20 November 1949.

The airfield was rebuilt to drawing 1607/49 and 2279/49 with a single main concrete runway of 6,000 ft, in 7 inches of concrete surfaced with 3 inches of bituminous material laid in two courses. ORPs were provided at each end along the eastern edge of the runway in 8 inch pavement quality concrete on 6 inch dry lean concrete. The runway is aligned on 04/22 with the required spacing for a second parallel runway at 300 ft separation to be constructed later; this is shown on drawings 2279-2280/49, 3099/50 and 3461/50. It is for this reason, that the original ORPs (then called war readiness platforms) were constructed on the eastern side of the runway.

Lighting included high-intensity bidirectional runway lighting, taxi track and approach lighting. Allowance had also been made for the sodium straight line approach or alternatively the more expensive Calvert centre line and bar approach lighting. ASPs totalling 32,300 square yards were also required in the vicinity of the hangars (see below). On 20 October 1949 total costs of £439,000 were approved as follows:

- Runway £273,000
- Servicing Platforms £82,000
- Taxi-tracks £50,000
- Airfield lighting 34,000.

In addition to the above, it was also necessary to buy the area of land having the WWII southern perimeter track as this was not owned by the Air Ministry and had been requisitioned during the war. It had a market value of £7,750, and this figure included demolition of a small number of farm buildings and their rebuilding elsewhere; the cost of the land amounted to £6,000.

Note that a total of 128 acres were actually purchased in 1948, affecting two owners at an approximate cost of £11,750 – the land holding already owned by the Air Ministry prior to this purchase was 534 acres (Treasury Authority S39428/067).

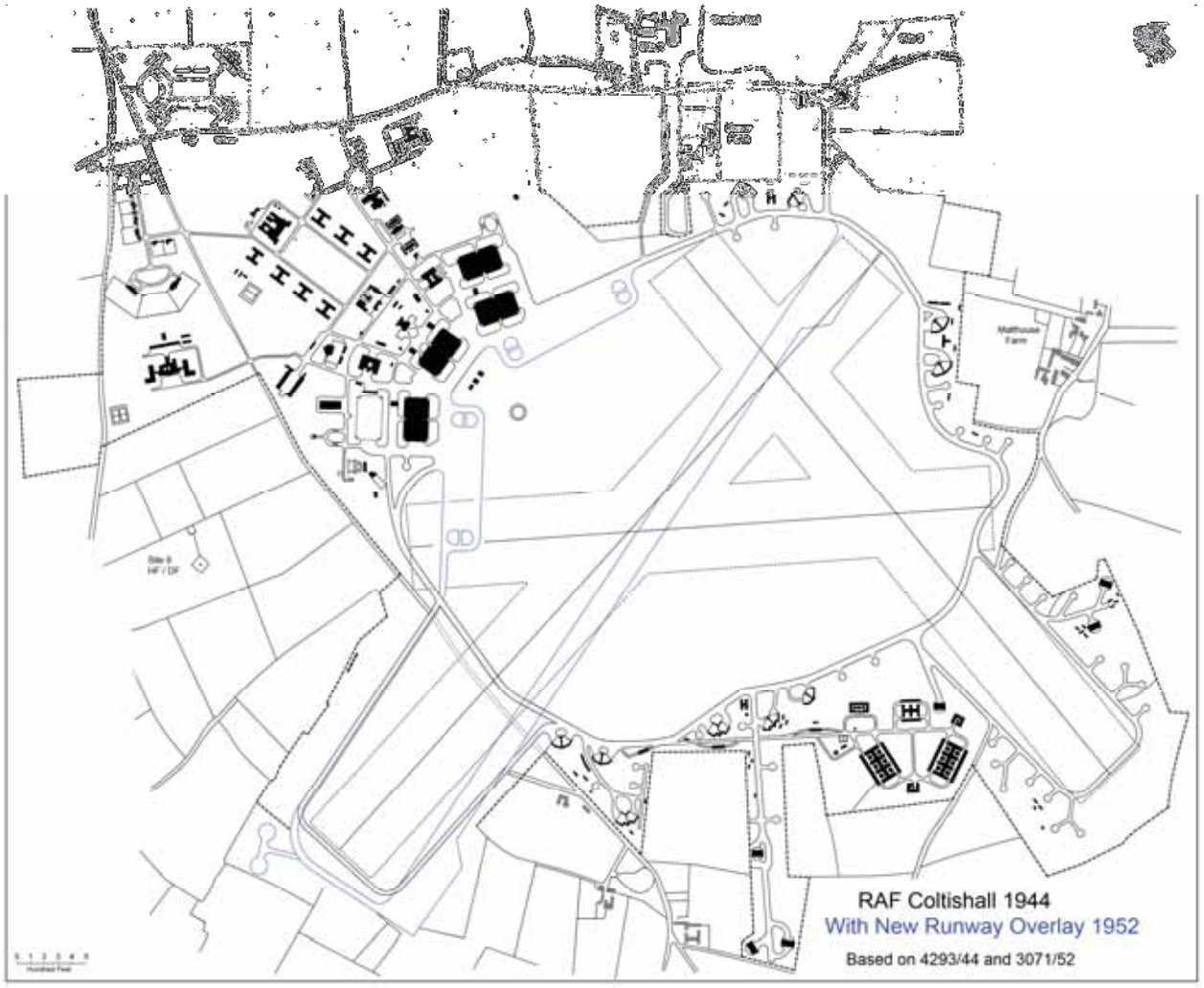

Fig 10: Runway overlay

Plate 43: Aircraft landing

Photo: AHB

Plate 44: Meteors on the ASP being refuelled c.1951

Plate 45: Newly-built airmen's married quarters c.1951.
Photos: AHB

6.2.2 Preparations for the Javelin

In preparation for the introduction of the Javelin fighter, the new western and eastern taxiway which used the bulk of the original WWII perimeter track had to be widened along the inner edge to 49 ft with nominal 175 mm concrete, and a new section was added to straighten out the meandering wartime perimeter track. The old WWII extended perimeter track at the south-western end was partly abandoned (at the extreme southern end), partly incorporated into the new parallel western taxiway ('04' end) and partly into the new runway (at this point the south-eastern parallel taxiway had yet to be built).

The complete western taxi track was then surfaced with 75 mm bituminous material laid in two courses. This work was not completed until after the three squadrons returned in September and October 1950. The cost of this work was £43,000 of which £13,000 was allocated for resurfacing. The WWII E/W grass runway and perimeter track extension was now only in occasional use, the former public road had also been re-opened to the public (closed permanently c.1958).

In 1951 a type 'B' ASP was constructed by the control tower. A third one for 12 aircraft was proposed in October of that year (4930/51) to be located at the close to the existing and straightened perimeter track to the extreme west of the site (opposite Malthouse Farm), together with a new T2 hangar and a Uni-Seco annexe. However, this was cancelled and the two ASPs were built on either side of the control tower in 1951/52. The same drawing also proposed a new 72,000 gallon aviation fuel installation just west of the T2 which was actually built (BFI #3 302). The control tower itself was internally upgraded to drawing 278/51 which included an 'A' centre to control the airfield lighting. All of the pavement work was completed to drawing 3071/52. An update on 7 July 1951 confirmed that Coltishall's runway, ORPs and two ASPs were complete, as were Wattisham's ORP and ASP. The runway work was to LCN 10–16 and would soon require further work to bring it up to LCN 40.

Two short lengths of the new western parallel taxi track ('04' end) on the eastern side from the ORP, built to link up with the existing taxi track were constructed in 1954, in rigid construction of 200 mm pavement quality concrete on 100 mm dry lean concrete. The original WWII taxiway connecting these two parallel lengths was then resurfaced with a single asphalt course.

The western taxiway was also surfaced with an asphalt wearing course and the eastern taxiway was resurfaced with 40 mm asphalt wearing course on a 75 mm base course. The existing AN/MPN-1 GCA system was replaced by a new ground controlled approach, AN/CPN-4 system in August 1955.

A complete reconstruction of the airfield pavements was carried out between 1956 / 57. This was in support of the forthcoming Javelin fighter, to LCN 40 and so both units moved out to Horsham St Faith in October, which were equipped with Venom NF.2s at this point, but converted to Javelins whilst away (drawings 8681A/56 to 8684A/56 refer).

The 3 in thick bituminous surfacing was removed from the runway and the underlying concrete was strengthened with reinforced concrete over-slab, 225 mm thick for 840 ft from the '04' end, and a minimum of 150 mm thick for the remainder of the 6,000 ft length. This was carried out in 120 ft by 20 ft bays.
A similar 150 mm RC over-slab was laid on the existing concrete surface of the ORP at the '04' end, and over the existing bituminous surfacing of the western taxiway (except for the new straightened eastern taxiway section) and hangar aprons. Doweled expansion joints were inserted at 120 ft centres, longitudinal joints being tongued and grooved. This work was carried out to drawings 4876/56, 8683A/56 and 8684/56 and was completed in April 1957 at a cost of £407,000. The work not only involved the strengthening of the runway, but also of one ORP, hangar aprons and the western taxiway. The taxiway on the east side and the northern ORP were not worked on, partly to save on costs, and partly because the northern ORP would shortly be made redundant.

6.3 Post-War Dispersals

In order to complete the development of Coltishall as a war readiness station, it was necessary to construct 18 pairs of dual hardstandings to accommodate aircraft of the Hunter, Swift or Javelin types. New dispersals were therefore, constructed in 1954/55 mostly of the protected type which included blast walls, their positions shown for the first time on drawing 7209B/53. These were positioned as two groups of 18, one to the south-west and the other on the east side of the runway. Those at Coltishall were one of the first sets to be built; they were constructed in pairs with a single access track, rather like the letter 'Y', with turning circles at the end of each arm of the 'Y'. Each pair could be served by a refueller vehicle from which a standing was provided between at the junction of the two arms of the 'Y'.

Coltishall never had any suitable panhandle hardstanding from which to redevelop for modern fighters, and therefore the station had to start from scratch. Furthermore, it was also necessary at this stage to complete the development of the airfield by joining the southern taxi track to the south-west end of the runway, so that aircraft would not have to back track before taking off in a north-easterly direction and one section of the old perimeter track required straightening out (see 6.2.2). The cost of this phase one work was £128,000.

Construction was therefore in two phases, the first was the aircraft pavements themselves plus the taxi track work (2908/53), while the second phase (7209A/53) requiring additional funding and Treasury approval, was for the construction of the blast walls, secondary pavement for aircraft servicing and the armoury hut. The blast wall had to be strong enough to withstand rocket attack and so the use of lean-mix concrete was decided upon. The hut was designed to provide accommodation for ready-use stocks of guided weapons, gun packs and ammunition sufficient for one-day's operations for two aircraft. It would be replenished with stocks from a central armament building and from the explosives area during the night. The total cost for Coltishall for this phase of the work came to roughly £79,000 and for the 18 armouries in Uni-Seco hutting was £10,250 plus an erection cost of £14,000.

6.4 Protected and Unprotected Aircraft Hardstandings

All hardstandings were built in two phases, the first was to lay the pavement down to drawing 2908/53, and the second was to build the revetment walls. The concrete slabs are mainly 10 ft square blocks of 6 in concrete laid on 4 inches of rolled dry lean mix. Altogether eight double protected and one double unprotected types were built c.1953 in two groups, one aligned along the SW parallel taxiway and the other on the eastern taxiway.

Those at Coltishall, unlike elsewhere, were started from scratch as there were no existing WWII concrete that was suitable for conversion. Each one has a 'Y'-shaped paved area, the arms of the 'Y' terminating as turning circles. In all cases a refuelling concrete stand is located between the aircraft parking areas. Nearly all are as-built except in more recent times most of the parking areas have concrete slab fillets that have been added between the concrete floors and the revetment walls and these continue towards the turning circle, thus altering their shape. This has not occurred on the unprotected versions and hardstandings 4 (D) and 16 (11) are the only ones that retain their original shape. Hardstanding 17 has been drastically altered to include a tarmacked area for access to building 401 which has been built on the site. The adjacent 16 (11), while it is one of those that retains its original shape, now has building 88 erected on it.

Plate 46: View looking towards the turning circle

Plate 47: Non-protected hardstanding

Plate 48: Protected revetments

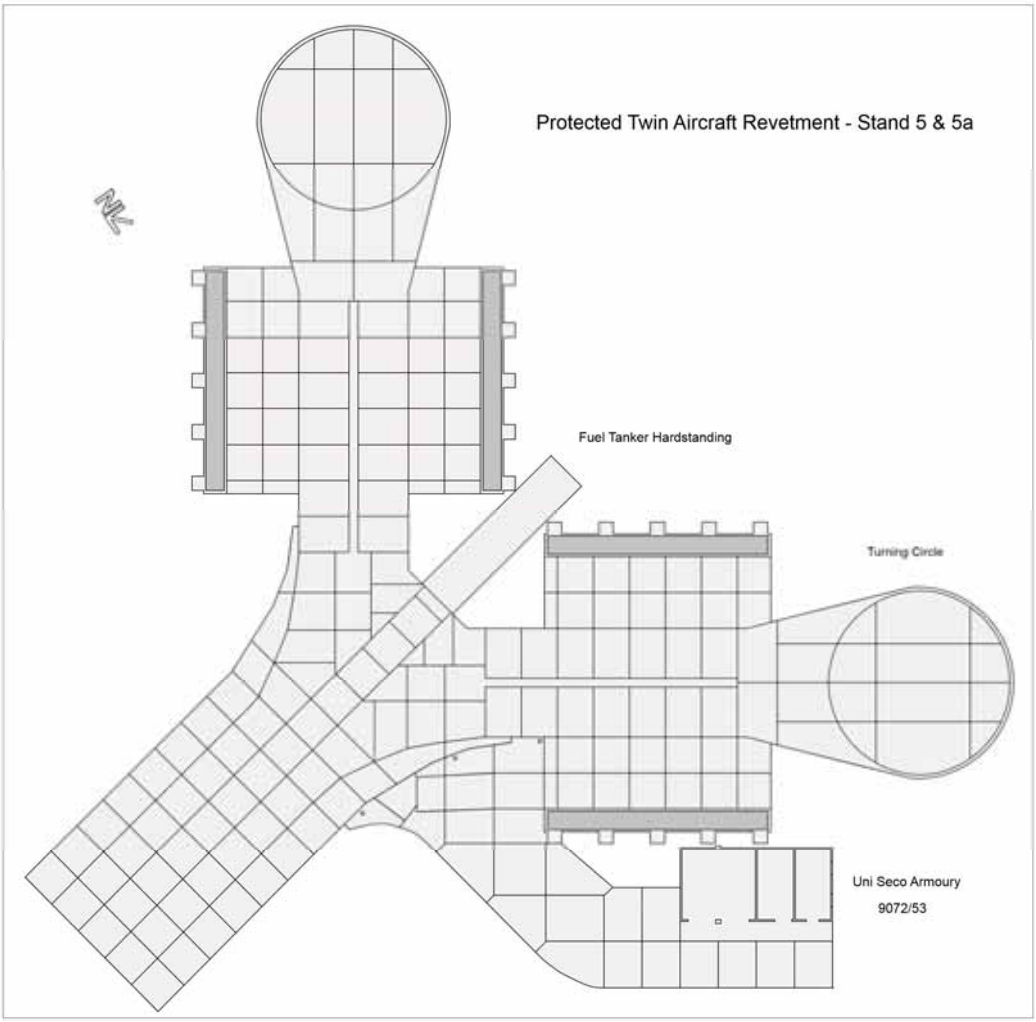

Fig 11: Plan of stand 5 and 5a

Table 2 – Summary of Post-War Aircraft Hardstandings							
all NGRs are TG							
Western Set							
Stand	**NGR**	**Stand**	**NGR**	**Stand**	**NGR**	**Stand**	**NGR**
1 (A)	26146 22357	2 (B)	26123 22324	3 (C)	26045 22273	4 (D)	26024 22242
5 (1)	26009 22150	5a (2)	25990 22121	6 (3)	25911 22058	7 (4)	25894 22027
8 (5)	25783 21935	9 (6)	25791 21972	10 (7)	25854 22146	11 (8)	25871 22179
12	25918 22242	13	25933 22272	14 (9)	25978 22344	15 (10)	26001 22375
16 (11)	26046 22447	17 (12)	26065 22477	Note that the 1986 numbering had changed by 1999 which is shown in brackets and that 12 & 13 are unprotected			
Eastern Set							
40	27146 23062	41	27149 23029	42	27132 22918	43	27142 22886
44	27207 22816	45	27218 22784	46	27213 22690	47	27221 22657
48	27246 22555	49	27226 22527	50	27145 22470	51	27112 22456
52	2701622461	53	26983 22448	54	26917 22382	55	26885 22371
Unprotected hardstandings NGR: TG 27306 22810 and TG 27317 22777 (no number allocated for these)							

6.5 1958–60

The units that had left in October had returned on 28 May 1957. No.141 was renumbered as 41 Squadron in February 1958 but moved away to Wattisham on 5 July. No.23 Squadron then moved out on 7 September, back to Horsham St Faith. The reason for these moves was that further runway work was now required to cater for the forthcoming Lightning, primarily by extending it to 7,500 ft; a contract for this work was let on 1 February 1957 to John Laing & Son Ltd. The 1,500 ft extension was laid out continuously reinforced concrete surface without traverse joints. It is 175 mm thick on 100 mm rolled dry-lean concrete. This extension also included a new ORP to the north-west of the runway and a parallel taxiway 1,640 m long, all in similar construction – the old northern ORP then became disused. This work was completed at a cost of £238,000 and involved the laying of 50,000 square yards of concrete.

The additional land required for its construction was in single ownership, covering some 46 acres and affected three farms belonging to the Scottow Estate, the provisional estimated cost for this land was £25,000. The owner of the estate, Lieutenant-Colonel GRD Shaw, retained Hall Farm in the centre of the estate from which 10 acres of permanent pasture and 5 acres of woodland were required. The other two known as Manor Farm and Rookery House Farm were occupied by tenants and were farmed together. The Air Ministry required 4 acres from the former and 27 acres from the latter. This land was partly pasture and partly arable and the cost of acquiring this land came to £3,212 for part of Hall Farm and £2,904 for the other two. Compensation for the loss of tenants' rights came to £445.

Scottow Hall which was largely rebuilt in 1952 formed the centre but the estate would now be severed by the runway extension and together with a proposed road diversion would curtail certain farming and shooting activities and the value of this loss was put at £4,114. In addition to this a number of trees in two plantations situated in the flying approach to the extended runway would have to be felled and compensation was paid of £1,609. It had also been intended to demolish a mortuary chapel which stands within the runway approaches, but it had been found that by reconstructing the roof, the building would satisfy runway approach criteria. This was achieved at a cost of £50.

The total cost of the land requirement was reduced to £12,334 from the provisional estimate of £25,000 and was submitted to the treasury on this basis on 8 October 1959.

Also in 1958, the new north and the old south ORPs were strengthened and extended in preparation for the ORP to handle 12 Javelins, and a new roadway built for tankers and other MT vehicles which was completed

in 8 in reinforced concrete on prepared subgrade to drawing 11232/58. This work cost £28,000 and involved 7,500 square yards of new concrete plus another 2,500 square yards for the access road.

The airfield was ready for re-occupation in June 1959 and 23 Squadron returned, this time joined by 74 Squadron, a Hunter unit. In September, a taste of the future arrived in the form of the Air Fighting Development Squadron from West Raynham, part of the Central Fighter Establishment. Coltishall had been selected as the first Lightning base and so this unit moved in to support the aircraft's introduction by developing new tactics. It was initially equipped with Hunter and Javelin aircraft, the first Lightning not appearing until 23 December, thus neatly closing the decade.

The off-site Instrument landing system middle and outer markers buildings were built and equipment installed in 1958 to drawing 11759A/1958:

- Middle Marker: The Severals, south-east of Swanton Abbot. Located about 3,520 feet from the end of the runway
- Outer Marker: the corner of Church Plantation, south of Pollard Street, Bacton. Located about 31,300 ft from the end of the runway.

The localiser itself was positioned out on the airfield, 450 feet from the runway centre line and 1,100 ft from the end of the runway (at the '04' end – west side).

6.6 Anti-Aircraft Guided Weapons (AAGW)

Coltishall was the first RAF station at which air-to-air guided missiles were operated and funds were sought in January 1957 for the provision of the necessary storage, assembly and maintenance facilities. The airfield was used to mount the service trails of Blue Jay Mk.1 (de Havilland Propellers Ltd Firestreak) and became the prototype airfield for air-to-air missiles and the facilities formed the basis for all future AAGW sites. The Blue Jay trials were planned to commence by March 1959. It was necessary to get as much experience as possible of the operation of the Coltishall installation so that lessons learned in operational techniques could be incorporated in further installations which would be required at the other peace and war airfields. It was requested therefore that a start should be made on the sites construction by 1 March.

The layout was to consist of buildings for storage of unassembled components such as motors, initiators, electronic parts and explosives for the assembly and functional testing processes and stores for holding of ready-use missiles. These facilities totalling 27,000 square feet were planned to be built with the existing boundary, at a combined cost of £160,000, (see Part 12).

6.7 Public Roads

The wartime airfield had meant that two public roads had to be closed under defence regulations, the Coltishall – Skeyton Road to the west and the B1150 Norwich – North Walsham road to the east which had been obliterated. Their permanent closure was regarded by the Air Ministry as essential for the future of RAF Coltishall. If they were reopened, the airfield would be reduced to a minor grass airfield. The reopening of the B1150 road, while it would leave the main strip intact, would reduce the SE/NW grass runway to its wartime length of 2,790 ft. The permanent closure of these roads would involve an expenditure estimated by the Ministry of Transport of £30,000 for the provision of a diversion and improvements of for the Coltishall – Skeyton Road, and £38,000 for the construction of a diversion for the B1150.

After the Treasury had approved the lengthening of the main runway on 13 January 1958, they also gave provision for the construction 2¼ miles of Class 'B' diversionary road north of the airfield, linking up with existing roads to the east and west, at an estimated cost of £70,850. In addition to this, it was also agreed with Norfolk County Council to make an access track leading south from the new diversionary road to Scottow Church at an estimated cost of £1,000 and together with additional and unforeseen construction costs involving the council and the main land owner (Colonel Shaw); the total revised sum as estimated in November 1960, came to £90,755.

6.8 1960–69

From 1 April 1960 until 1 August, the resident squadrons were again detached with 23 and 74 Squadrons going to Horsham St Faith, – AFDS 'A' Flight going to Leconfield and 'B' Flight to West Raynham. The drainage characteristics of the runway was improved by forming a camber to the north-west of the centre line, this was achieved by regulating with dry lean concrete, surfaced with 2 courses of rolled Marshall Asphalt, the wearing course having grooved flails to improve breaking characteristics. The cost of the wearing course and grooving alone came to £40,000 plus £125,000 for the asphalt work. This was necessary because of the increased all-up weight of the Lightning, which had a landing speed of 160 knots and a runway with a length of only 7,500 feet was considered to be too short in bad weather without increasing the breaking coefficient of the runway surface by grooving.

In 1962 the northern ORP was enlarged slightly with the addition of two triangular-shaped fillets which were added to the grass edge in support of a pair of V-bombers. This provided more room near to the starboard wing tips when the aircraft were parked at the required 45 degrees from the runway centreline. A small vehicle link road was also constructed between the ORP and the vehicle servicing road, then a moon-shaped fillet was added between the ORP and the existing taxi-way to enable the Vulcans to negotiate the tight corner when taxying. A further 60 ft square area of concrete with a 10 ft wide access track some 50 ft long was also added to the northern end of the ORP; it functioned as a parking apron for the crash fire tender, a caravan and a floodlight. Drawing CIVA/22/65 which applied to Wittering, Wyton, Gaydon, Coltishall and St Mawgan, was for the layout of nose wheel markers, picket points and for the installation of two below-ground high-test peroxide (HTP) vessels in support of the Victor bomber carrying the Blue Steel weapon. The peroxide vessels were to be placed in the grass adjacent to the new triangular-shaped fillets and the picket points were for the cables from thermal heaters for Blue Steel – it is quite likely that they were never built and furthermore, the triangular-shaped fillets are also missing. Despite this, there are four picketing points extant.

A compass platform (282) was built between the northern ORP and the north parallel taxiway.

Around 1965 a new aircraft washing platform (64) was built opposite hangar 3 apron and half of protected hardstanding 'C' was converted into a running-up platform for the Lightning.

6.9 Land Loss and Gain

The quest of disposal of Site 7 (Gymnasium and Chancel) was raised at the end of 1952 – it is unknown whether this took place in 1953 or not.

Around September 1964, Coltishall's VHF receiver site at Hainford was disposed of. This site had been held on a 21 year lease from 25 December 1949, from the firm of Youngs, Crawshay & Youngs Ltd at a rent of £2 10s per annum. At this time there was a receiving site in Stratton Strawless which was also held on a 21 year lease from 15 December 1949, plus a DF homing station held on a similar lease but it is unknown when these two sites were disposed of.

In 1966 more land was required for building additional married quarters and in order to appease the Ministry of Agriculture, Fisheries and Food, some 30 acres of redundant land was offered up in exchange. It is presumed that this area of land is that of the WWII western grass runway extension, beyond the bomb stores.

6.10 1970–90

In 1970, a new sealing compound developed by the National Coal Board, was used to seal serious transverse cracks that had previously been filled, but had cracked again.

The next major runway works took place in 1972; the transverse expansion joints which had been formed by dowels, which had been installed in the reinforced concrete section of the runway during 1957, were removed and modified which was achieved by cutting 900 mm trenches across the runway at each joint. These were then filled in with high-alumina cement concrete. The black top section was resurfaced with

30 mm Marshall Asphalt wearing course on 65 mm Marshall base course and overlaid with 20 mm friction course. Feathering down to the '04' concrete end was carried out over a length of 46 m with 250 mm pavement quality concrete (drawings 285 to 291/72 refer). The contractor was Wimpey Asphalt Ltd.

Also at this time, the '22' concrete end, ORP and part of the parallel taxiway were over-slabbed with 250 mm pavement quality concrete. The rest of the NW parallel taxiway was resurfaced with 30 mm Marshall Asphalt wearing course on 65 mm asphalt base course and a part of the curve at the SW end of the parallel taxiway was overlaid with a 20 mm friction course.

During 1976, a new rectangular 65 mm by 30 m Sea King helicopter pad (115) was constructed adjacent to the NW perimeter taxiway in 200 mm pavement quality concrete on 100 mm dry lean concrete to drawing NAO/146/75. The base has a tie-down base with anchor points. It was extended in 1978 to drawing NAO/43/77/2.

In 1978 the north-western and south-western link taxiways connecting the former runway ends with the western taxiway were resurfaced with 40 mm Marshall Asphalt wearing course on 60 mm Marshall Asphalt base course. In 1981 the south-eastern link taxiway was resurfaced with 40 mm Marshall Asphalt base course.

Also in 1981, the floor of hangar 4 was broken out and reconstructed in 200 mm pavement quality concrete on 100 mm dry lean concrete and the apron to the west of the hangar was resurfaced.

In 1982 the transverse cracks caused by the 1972 transverse expansion joint repair work had to be repaired by breaking out the high-alumina cement concrete which was removed and replaced with reinforced pavement quality concrete and then resurfaced in two courses plus a 20 mm friction course.

The arrester barriers at each end of the runway were resited 60 m back from the thresholds

During 1982, surveys were carried out for a possible Bloodhound deployment at Coltishall; the chosen site was based around the protected hardstandings 54/55, 52/53, 46/47 and 42/43 but nothing came of it.

During 1984, part of the eastern taxiway was resurfaced and three of the 'Y' stands received full depth bay replacements. In 1986 concrete areas of the ASPs were over-slabbed and strips of concrete paving were broken out on various hardstandings during this period.

During 1990, old areas of pavement north-west of hangar 4 were rehabilitated for helicopter use.

Plate 49: Northern ORP – one of several aircraft armed signage painted onto the tarmac surface.

Plate 50: Runway tyre marks, ‘04’ end

Plate 51: Runway tyre marks, ‘22’ end

Photos: Aldon Ferguson 2006

Fig 12: RAF Coltishall site plan, north-west

Fig 13: RAF Coltishall site plan, north-east

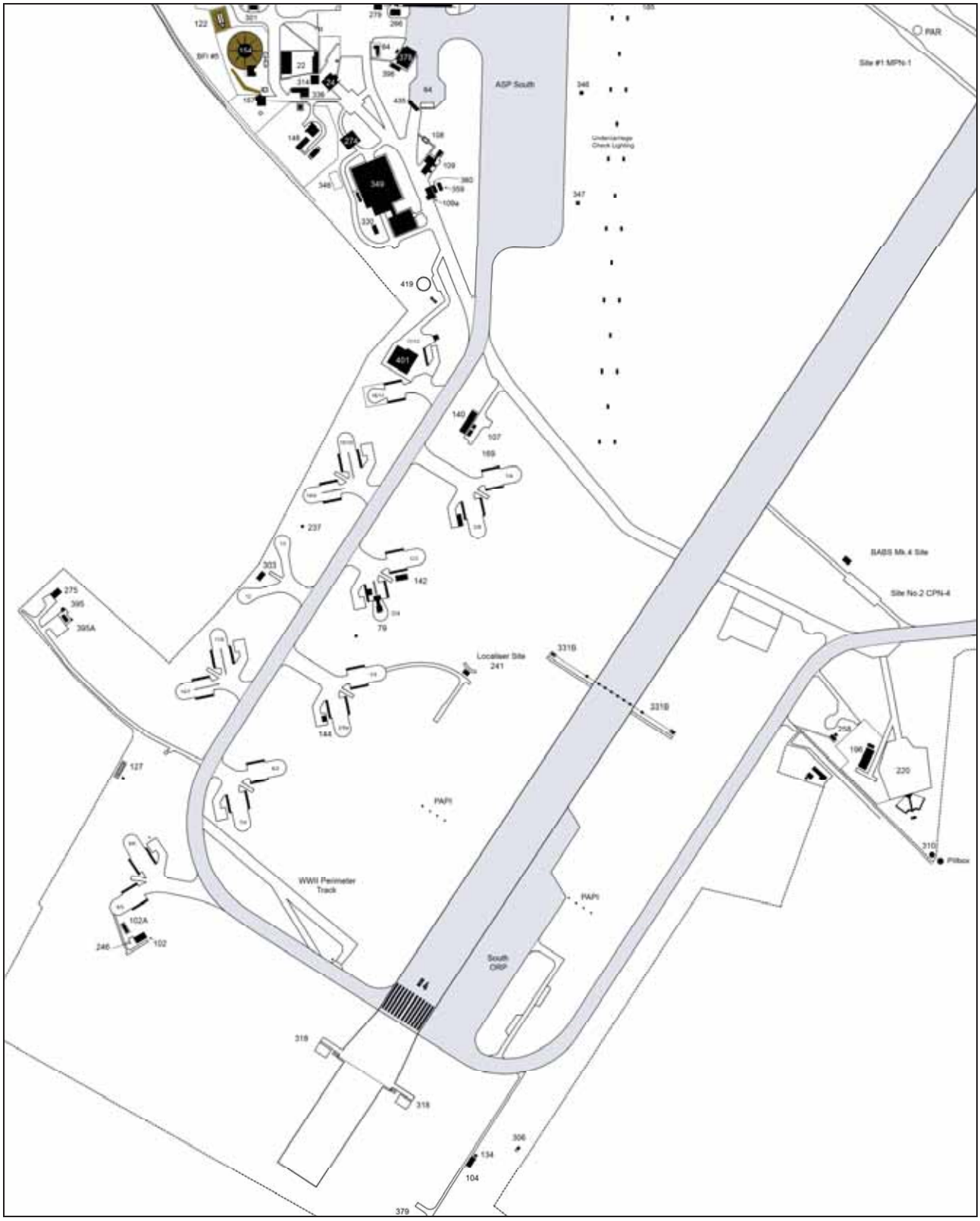

Fig 14: RAF Coltishall site plan, south-west

Note that the western set of hardstanding have two sets of numbers, the first for 1986 and the second in 2000, for example in 2000 stand 11 was known as stand 8 and this is shown here as 11/8.

The hardstands on the eastern side of the airfield do not have this problem, but the non-protected stands are not numbered.

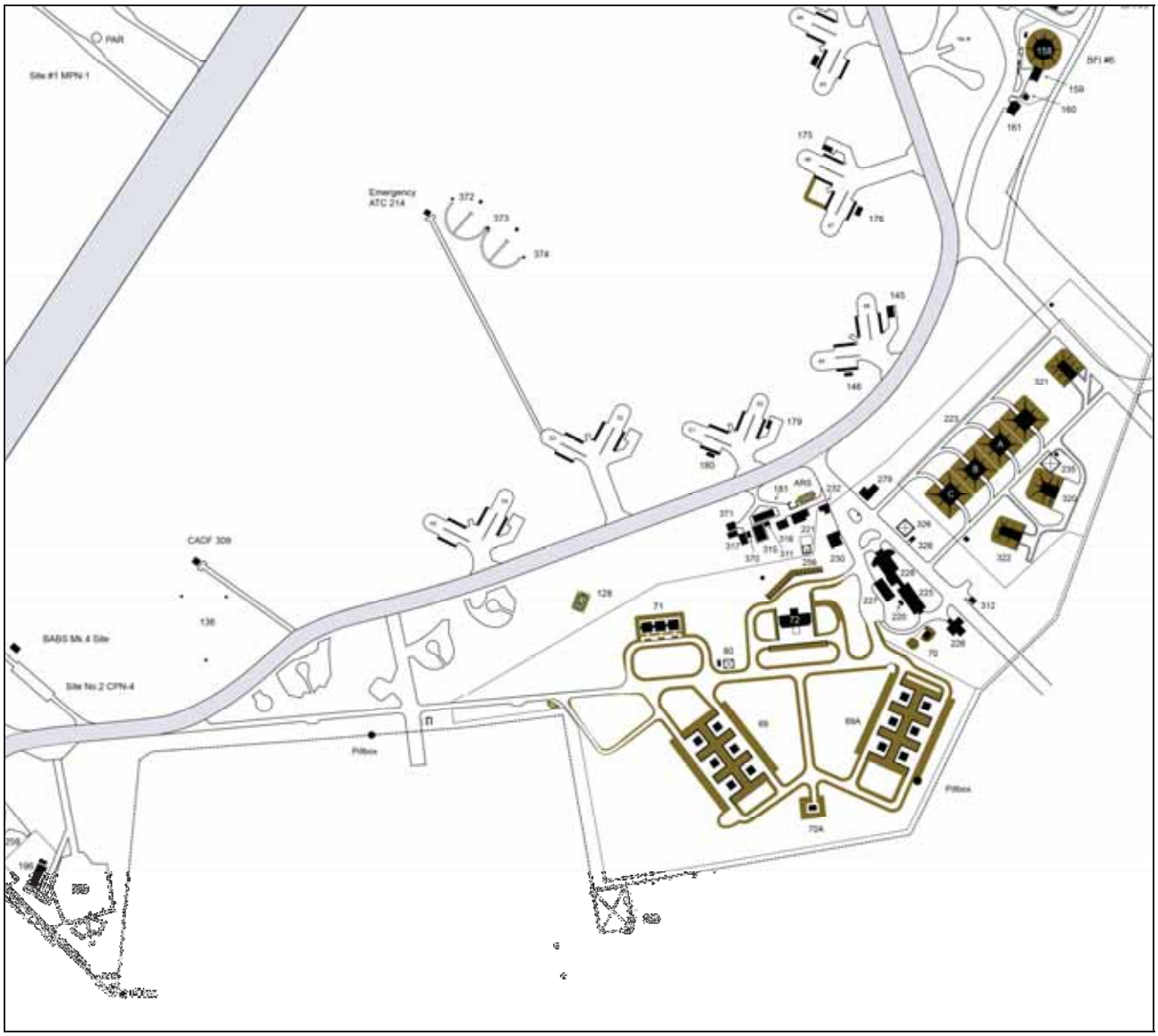

Fig 15: RAF Coltishall site plan, south-east