

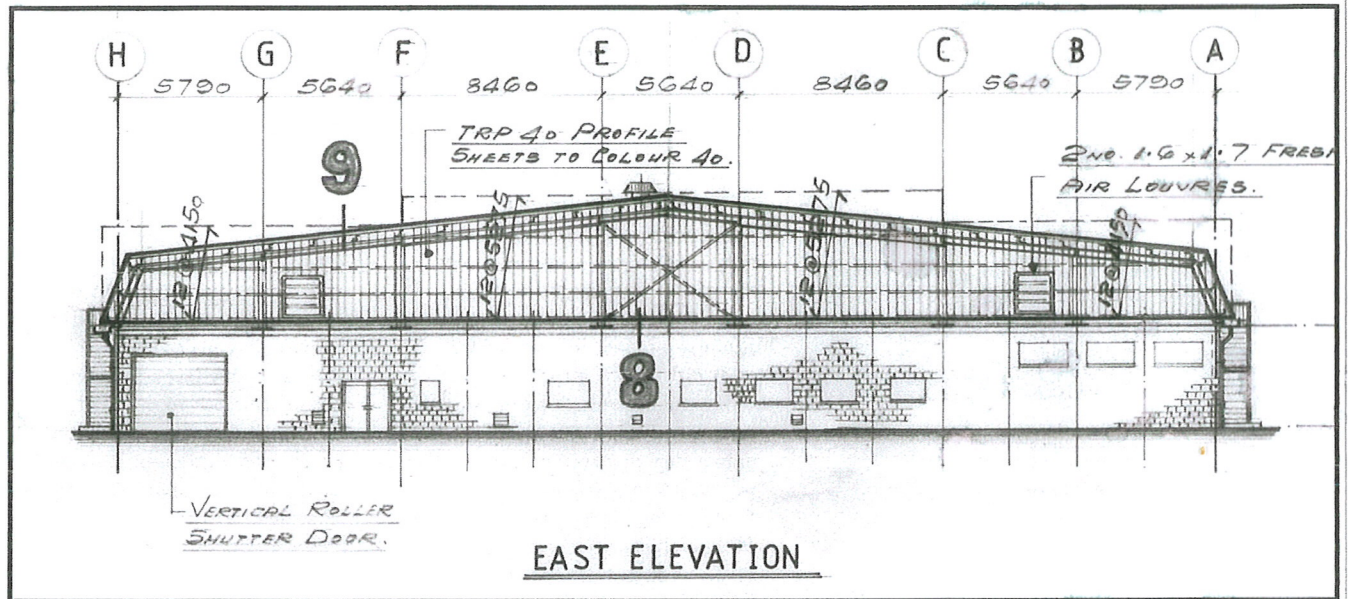
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'Packing and
Filing at Featherstone'

George Nash, Duncan Fairwood and Colin Summerscales have recently completed a survey of a remarkable complex of buildings before its demolition. Theirs is the first full study of what remains at times a mysterious site, though less than 70 years old



PACKING AND FILLING AT ROF FEATHERSTONE

East of a former hospital we found a sinister, dark building, one of two within the boundary of the site we were investigating. Its thick concrete elevations with an enclosed concrete water tower had been identified as an infirmary. Yet two pairs of reinforced steel doors, one for male and one for female patients, led from the reception area to shower units. Beyond these were several small rooms, presumably wards – but they had no windows. Field stretchers, once stacked on the walls, littered the reception floor, decayed and torn. This had all the appearance of a secure decontamination unit for use in the event of a poison gas attack.

It is a general principle of archaeology and history that the further one goes back in time, the more inaccessible the past becomes – not least because of the record's varying state of preservation. However, there

Above: Detail from roofing plan for building 8F6, where depleted uranium amour plating was manufactured



are also sites less than 100 years old of which very little is known, shrouded in mystery because of their sensitive and secret past. Amongst these are the Royal Ordnance Factories (ROFs) which provided nearly all of Britain's munitions during world war two and later during the cold war.

We were recording ROF Featherstone, near Wolverhampton. The surviving factories had been acquired by BAE Systems (formerly British Aerospace) in 1987. During the height of munitions production, ROF Featherstone employed a large workforce, including many women, and it continued producing armour-piercing components for munitions until 2002. However in 2008, following site investigation and remediation by BAE Systems, the northern section of the remaining site was cleared so the neighbouring Featherstone Prison

could expand (the existing prison had been constructed on the northern half of the original ROF Featherstone site). BAE Systems commissioned SLR Consulting to survey the 45 or so threatened buildings: everything in the photos has now gone. The remaining 140 buildings on the site are to be demolished to make way for new development.

The hospital and the large decontamination unit were considerably distant from the main manufacturing areas of the site. What happened there? What were these factories – several are still in use today, providing British and NATO forces with small arms and large calibre munitions – and what did they look like?

The industry of war
Anticipating a potential war with



Germany, from 1936 the British government started a massive and hasty programme of rearmament. Despite this counter-measure to Hitler's expansion into central Europe, Britain was desperately under-prepared. Munitions sites from world war one had commonly been decommissioned and dismantled – the result of “a war to end all wars”.

Thus many of the ROF sites – there were 20 in all – were commissioned by the government just prior to the outbreak of war in 1939. These massive complexes were the size of small towns. Factories were located to relieve areas of depression-torn Britain that had suffered large-scale unemployment,

while minimising the threat of bombing by being distant from the continent. As a result the majority of the ROFs were in the heavy industrial areas of western Britain.

Construction at ROF Featherstone began in November 1940 and production, managed by Courtaulds, in April 1941. Following the capture of German armour-piecing munitions, in 1942 part of the factory was redesigned for the production of armour-piecing (tungsten carbide) anti-tank ammunition by Hard Metal Tools Ltd. Featherstone was only one of three factories to manufacture such weaponry during world war two, specialising in tungsten carbide cores for small arms ammunition (SAA) and larger calibre ammunition (0.303, 20mm, 6 pounder and 17 pounder calibres).

Maps indicate that before 1939 the site was a series of enclosed fields; the only evidence of a mechanised world was the north-south route of the Grand Junction line of the London North & Western Railway (constructed in 1846). This line was to prove an important communication link between Featherstone and other ROF installations. Munition parts could be loaded and off-loaded at an extensive railway siding using a standard track gauge. A branch line, encircling most of the ROF complex, delivered high explosives and shell components to individual storage facilities, many of which were enclosed by substantial brick blast walls.

During world war two the bulk of the

work at ROF Featherstone was concerned with the packing and filling of high explosive shells. Propellants such as cordite were imported to site, filled into cartridges and transported other Royal Ordnance supply depots. Within the production buildings at Featherstone high explosives such as amatol, a mixture of trinitrotoluene (TNT) and ammonium nitrate, were melted to form a liquid which was poured into heated shell cases. Lessons learned from accidental explosions during the latter stages of the first world war at sites in east London and Nottingham, which killed workers and local residents, ensured that the buildings were laid out properly.

To complete the process, ROF Featherstone also manufactured sensitive fuses and detonators. These devices, assembled separately on site, were added directly to the filled rounds. For safety reasons different stages of the munitions production process were segregated into different compatibility areas, termed groups. These group buildings each played a specific role in munitions manufacture. At ROF Featherstone groups 1, 5, 8, 9, 10 and 11 buildings were present: group 8 was on the prison extension site, and groups 1, 5 and 10 on the remaining BAE Systems property, south of Featherstone Brook.

Group 1 was responsible for the manufacture and assembly of initiators (shell caps and detonators for primers and fuses). These buildings were located away from the main charge filling buildings in group 8, which were

Above: Enamel and hand-painted notices on a blast wall surrounding a series of group 8 buildings

Below: A group 8 building enclosed by a massive earthen bank

Below right: End view of a blast wall that surrounded one of the group 8 buildings (scale 2m)



ADAM STAMFORD/AERIAL CAM, GEORGE NASH (3)



responsible for filling shell casings with main charge explosives. These were usually constructed in blocks of four, each enclosed by brick blast walls and an earthen bank (or bund). Group 5 buildings were primarily used for filling small arms brass cartridge cases, usually with cordite; at Featherstone, however, they were also used for the production of armour-piercing components, and included a large powder store, sintering areas, furnace shops, hydrogen storage tanks and various support service structures. Again, the location of these buildings was chosen carefully,

Above: Group 8 buildings (back) and group 10 (admin) buildings (fore)

Below: Entrance to a group 8 building via two converging blast walls (scales 2m)



strategically placed away from any potential explosive source.

Group 10 housed ancillary buildings including pillboxes or observation posts, shelters, offices, a hospital and several decontamination units. The decontamination units provide a stark and chilling reminder of Britain's precarious situation in world war two and the cold war, when chemical and biological warfare – in particular a mustard gas attack – were potential threats.

Building repertoire

ROF Featherstone's buildings once extended over some 13.5ha; many to the east of the site remain standing but deserted. When the current prison was built, staff living quarters, proof ranges and a small number of manufacturing buildings were demolished. Prior to part-demolition in 2008, the site still retained over 110 production and ancillary buildings, all constructed using a generic design blueprint. Within the study area we recorded 40 buildings or structures: these date from around 1942, with probable later buildings – based on two distinct styles of brickwork and brick type – dating to around 1950 that may be the result of the need for munitions for the Korean war.

The largest structure was a multi-phased warehouse-type devoted to the manufacture of modern armour-

piercing tank munitions. To the south and west of this building, and once set into managed lawned areas, were the main packing and filling buildings (groups 1, 5 and 8). These were constructed using a variety of materials. The windowless elevations, employing mainly cheaply-made double non-cavity brick and single-coursed ceramic cavity block tiles, were capped by a standard fit concrete flat-slab roof. Conical ventilation chimneys were inserted into the roof to expel toxic fumes created by the melting of amatol.

The single-coursed ceramic blocked walls were strategically inserted into the building superstructure. Architects assigned to the Ministry of Supply had determined that any impact to cavity tiles would create less damage than to brick, should an explosion occur within buildings used to assemble ("pack and fill") high explosives. Many of the group 5 and 8 buildings were enclosed within blast walls and earthen bunds, ensuring that in the event of one building exploding, others would not ignite. Internal blast walls physically separated the assembly processes within several of the larger packing and filling complexes. Many of the smaller assembly buildings, each standing within massive blast-wall enclosures, contained serving-hatch devices where high-explosive substances would be transferred from one part of a building



to another.

During fieldwork we recorded many of the original fixtures and fittings, including electricity switches, fuse boxes, lighting furniture and generators. Also recorded was a significant quantity of hand-painted signage, and within a group 8 building a poster issued by the Ministry of Supply promoting the careful use of timber.

Beside the main manufacturing areas were buildings associated with administration, welfare, health and safety and protection. The large office complex, located within the western section of the site, comprised a series of interconnected single-storey H-plan sections. Here, as elsewhere, non-cavity brick and single-coursed ceramic cavity block tiles for the elevations were capped by a concrete flat-slab roof.

The two decontamination units and the hospital were within the southern and western sections of the site. The hospital was constructed from a steel frame with single-course ceramic cavity tiles and brick infill. The building complex, one of the largest on site, may date from the cold war era as most of the floor space was devoted to decontamination, presumably in the event of an accidental explosion or a poison gas attack from a potential invading force. A central boiler room divided both contact and non-contact patients. Long concrete-floored corridors linked the decontamination shower units with a series of small wards.

Above: World war two air raid shelter and pillbox north of the infirmary

Right: Group 8 buildings constructed within blast walls and earthen banking

Below: Group 5 propellant buildings (right) and (left) the decontamination building

Interestingly, the hospital was flanked by two pillboxes (or make-shift observation posts); one dating to world



war two, the other to the early cold war phase (c 1949–70). Based on the CBA Defence of Britain database (www.britarch.ac.uk/cba/projects/dob) both structures, constructed of brick and supporting a concrete slab-capped roof, are probably the result of on-site design: neither conforms to any known pillbox classification. The embrasures from each structure are concrete and of a standard design and shape, found on pillboxes from other ROF sites (such as Radway Green, near Crewe).

ROF Featherstone is now but a memory for some of its many thousands of employees. For the archaeologist, this installation and many other world war two sites of this sensitivity and calibre are a dwindling archaeological resource.

George Nash works for SLR Consulting, Shrewsbury; Duncan Fairwood and Colin Summerscales for BAE Systems Property and Environmental Services, Chorley, Lancashire



Top left: A decontamination building, with group of 5 propellant buildings and others behind

Centre and top right: Stretchers unexpectedly found in the secure decontamination building

Above: Another view of the decontamination building

Right: Racking for holding the field stretchers