

B.E. Dunham-on-the Hill: a WW2 bulk explosive store

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A distribution centre for high explosives from Canada shipped into Birkenhead during WW2 and then into local factories has a long history.

The title "Royal Ordnance Factories" was the collective name of the UK Government's munitions works, during, and after WW2. Until privatisation, they fell under the MoS (Ministry of Supply), and then latterly the MoD (Ministry of Defence). During WW1, the equivalent was the NEF (National Explosive Factory) and the NFF (National Filling Factory).

Some ROFs were built and run by the government, others were built and owned by ICI, but were not considered to be part of the MoS ROF organisation, and were not called ROFs. Other MoS funded factories were managed by ICI, and were known as "Agency Factories". Other ROF Filling Factories, especially later in the war, were managed in a similar manner to the "Agency Factories", but by organisations not normally connected with armaments.

During WW2, new ROFs were constructed, but usually in areas that were considered "safe", i.e. north west of a line drawn from Bristol, to Weston-super-Mare, to Haltwhistle (Northumberland) and then to Linlithgow (west of Edinburgh). There were some exceptions to this geographical rule.

The three main types of ROF were engineering, filling and explosives. For these the buildings needed to be widely spaced. The other types were medium machine shops, small arms ammunition factories and rifle ROFs. These tended to be self-contained, with regards to power, hostels, domestic arrangements, well-being, and accommodation. The Ministry of Defence Police maintained the security.

Some were designated "temporary", i.e. only extant until the end of WW2, and others were "permanent" – which continued in use after WW2; these WW2 survivors eventually succumbed to a wide range of fates, the later surviving ones becoming part of QinetQ. This particular depot is often marked on period maps as "B.E.", i.e. a "Bulk Explosive" store.

Dunham-on-the-Hill

This is a puzzling site. It is easily visible from the M56, travelling in both directions. The most frequent view is of the two brick "sheds" from the M56, travelling past the Helsby turnoff towards North Wales. They are obviously too big to be normal agricultural barns, one end is obviously intended to be driven through, but at the same time is far too big for even a modern heavy goods vehicle. They look like a typical WW2 structure, but not quite. After driving past several times, it is then obvious that there are other "sheds", scattered around the fields.

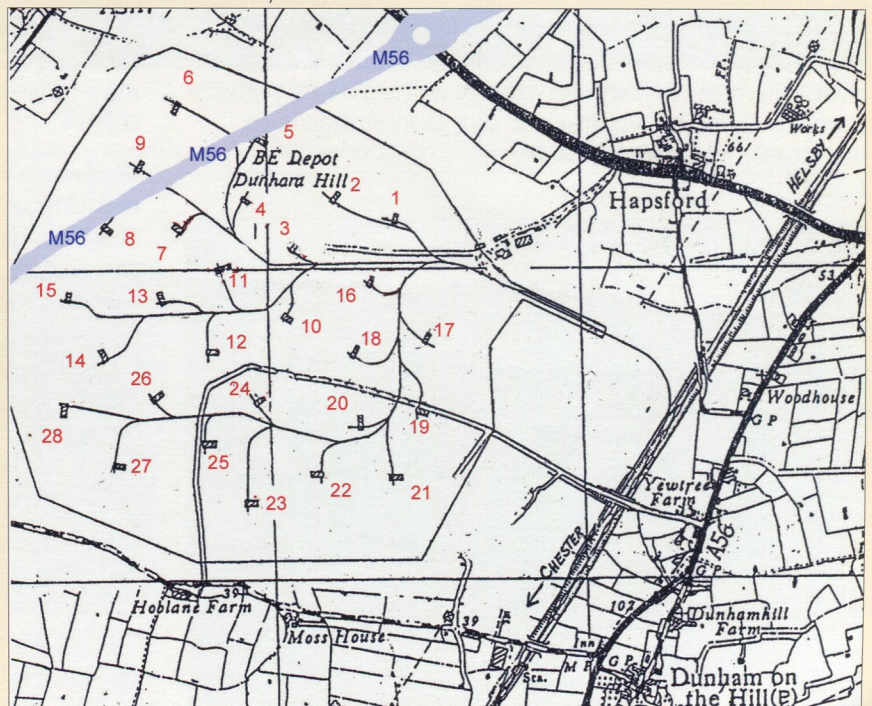
The examination of aerial photography websites reveals a considerable number (28) of the sheds, and visual hints of tracks connecting them. They look military, and they start looking like an ammunition storage area.

Casual discussions with local people suggested that the site was a munitions dump, built by Italian PoWs in WW1, that it was owned by Cheshire CC, and that it was currently used for agricultural purposes. One good source stated that earth banks were essentially clay, and were taken away and used to line the nearby Cheshire CC Gowly landfill site. The site appeared to be very large, but with very little information available, and even to the extent that the name was missing.

Internet searches revealed pieces of information, but very little. The key fact, discovered in a Signal Box directory, was that the main line signal box (Dunham-on-the-Hill No.2) was a Midland Railway ARP (Air Raid Precaution) design, which was a WW2 design, which was designed to be operational even after a close miss from an exploding Luftwaffe bomb. The signal box looks substantial, which is probably why it is still in existence (since demolished a few years ago).

Despite the main function of the ROFs being the manufacture of munitions, Dunham-on-the Hill (DotH) was to be different. It was not actually involved in manufacturing at all. It was primarily for the storage and distribution of explosives that were then to be used in other ROF establishments as fillings for shells and munitions. The DotH site was built on a site requisitioned in 1941 for the war effort, on behalf of the Ministry of Supply (MoS) under the Emergency Powers (Defence) Act 1939.

This map shows the internal layout, perimeter fence line, the railway line, the numbering of the sheds & magazines, and the route of the modern M56 motorway.



Feature

Construction of the site started on the 7th June 1941, completed by the 5th August, and was open for use on the 11th August 1941. The supplies were initially received by the nearby, and already existing Dunham Hill Station goods yard. The LMS railway was given a special license for the right of access.

Upon cessation of hostilities, the depot was retained for food storage, eventually ending up responsible to the Ministry of Agriculture, Fisheries and Food (MAFF). This role ceased in September 1985, and in 1990, it was disposed of into the private sector. When used in this latter role, it was known as a "Buffer Depot".

The stored food included large tins of baked beans, margarine, butter, cocoa powder and large tins of dried milk. Local information is that the food, after closure was to be stored in old mine workings, and was removed by road vehicles. Some of the food was certainly transported by road to a company Lovell & Christmas. As a Buffer Depot, the food was regularly replaced. The stored food initially included tins of corned beef, but a batch, after it had been replaced in the depot was put onto the open market, was blamed for an outbreak of Typhoid, and as a result the storage of corned beef was ceased. There are also recollections of the depot being used for the storage of machine gun bullets, and other items that were manufactured at ROF Capenhurst, which was only a small number of miles away, presumably before Capenhurst took on its nuclear role.

The role of Dunham-on-the-Hill in WW2

The main role of DotH during WW2 was for the storage of explosives, but there is a significant story behind this role. Explosives were shipped into the Mersey ports, for use during the war. The geographical position of DotH was very appropriate, as it was in a very good strategic position on the railway lines in the area. The site was not chosen by chance. It was in a position to receive the explosives and munitions, and to then store them for further distribution to other ROF factories and filling depots, the workers recollect shipments from Canada, and distribution to ROFs at Fazakerley, Rhydymwyn, Chorley and Chelford. The shipments to Fazakerley would suggest that the shipments were into Birkenhead Docks, rather than Liverpool Docks.

The received explosives were mainly Neonite, Cordite and TNT; they arrived packed into cloth bags, which were in turn packed into wooden crates and boxes. There were also substantial quantities of ammunition boxes and cartridge cases, as well as boxes of yellow powder, presumably Uranium ore for early Uranium separation development work at Rhydymwyn

Storage magazine unloading bay.



Storage magazine from the top of the clay earthworks.

This distribution activity, made the local railway line very important to the war effort. There are some local defensive weak spots to the railway, namely a cutting, and the Frodsham Viaduct, which crosses a wide valley over the River Weaver navigation. This is easily observed from the M56 Frodsham Viaduct. A road bridge across the cutting was protected by a pillbox, which still remains to this day in the corner of a private garden on Wood lane. The viaduct itself was protected from air attack by two Heavy Anti Aircraft (HAA) gun sites, each with four guns. They are situated off Aston Lane, and Townfield Lane. The example on Aston Lane is still in excellent condition and a credit to the owners. The only remains of the Townfield Lane site are pieces of broken up concrete used in the gardens, walls and rockeries of local housing.

Construction

The building of DotH was subject to the usual WW2 secrecy, and misinformation that abounded. One quantity surveyor that worked on the project stated that it was an "Empty Component Store", and that it was to be associated with Risley ROF No.6, and the nearby Hooton ROF No.10 (still known locally as Roften). He believed it to be just a storage depot, but did query as to why the buildings were so dispersed, and as to why some had earth banks surrounding them. Note: Hooton (Roften) ROF No.10 has also been demolished in 2014.

DotH was built at the start of WW2, on a flat, marshy area adjacent to the Mersey Estuary. It is between the Hooton to Helsby, and Chester to Helsby railway lines. It was intended for the bulk storage of explosives, and as such, also had to be remote from centres of population. The site is roughly about a mile square, but has an irregular perimeter of between four and five miles. The storage of the bulk explosives was in a number of brick and steel built sheds, 28 in total, which included 10 sheds which were designated as "magazines", these were surrounded by earth and clay blast mounds, with a brick blast wall at the rail entrance as it was a weakness. They are also very well landscaped into the scenery.

The earthworks that were used as blast barriers around the magazines were constructed using a narrow gauge railway, using a petrol engine locomotive, which pushed tipper trucks around the site. The driver sat sideways in the locomotive. The main construction contractors were a company called Demolition and Construction Ltd.



Storage magazine rail wagon unloading area.

The term “magazine” was used within ROF sites, but many were much smaller, and some not even rail connected. The correct term for the Traversed Sheds (Earth Banked Buildings) is Explosives Store Houses (ESH). These one-sided ESH buildings are of the same design as could be found at CAD Bramley in Hampshire, and at CAD Kineton in Warwickshire. Most of the examples at CAD Kineton were demolished in the mid 70s to 80s to make way for a new build depot, leaving only three remaining. CAD Nesscliffe was a mix of this single sided design of ESH, and a centre access design, which was also earth covered.

Some of the ESH buildings have had the earth mound removed by Cheshire CC, and taken away to line the nearby Gowy landfill site. These are obvious, as they usually have a substantial brick blast wall at the point in the bank where the railway track would enter, where the mound has been removed, it usually leaves a diagonal line on the blast wall. Some of the ESH buildings had a complex shaped earth mound, presumably as some attempt at camouflage / landscaping.



Magazine that has had the surrounding earth mound removed – note the diagonal earth line on the brick blast wall to the right.

Storage magazine with Helsby Hill in the background. This example was never surrounded with clay earthworks because it was one of the outer storage areas.



The sheds are approx. 35 m long, and 12 m wide (measured at the “storage” section), and 15 m wide at the loading / unloading dock end. The engine shed is slightly smaller at 19 m by 6 m. The buildings were constructed of a lightweight steel framework, filled in with a single layer of common bricks. Each building had a small “sentry” box, on the storage side of the entrance, nearby was usually a concrete pipe water butt, with asbestos guttering and downpipes. The roof was made of very lightweight concrete sections, and covered in asphalt. There were lines of glass lights set into the brickwork at the top of the walls. Each shed had a steel ladder for access to the roof.

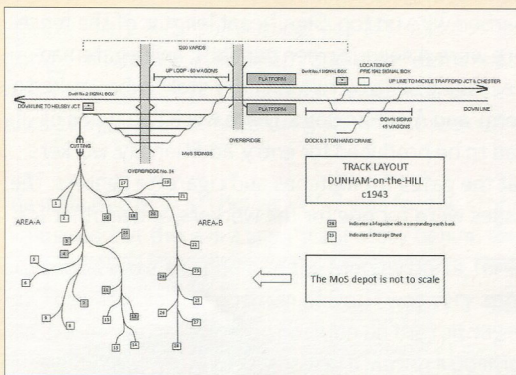
The sheds did not contain any electrical wiring, lights or fittings, obviously because of the explosion and fire risk.

Security

The security was the responsibility of the “Ministry of Defence Police”, but there are also recollections of a detachment of the Home Guard being stationed there, and being accommodated in huts for the duration. The whole site was surrounded by a single line of seven-foot high chain link fencing with concrete posts seven feet apart, with the usual barbed wire on top. Significant lengths of the fence still remain. There were 4 security men per shift, and a gateman. The patrols were usually done by two security staff (who worked a three shift system), and Alsatian dogs. There were two types of passes, which had to be produced for entry, additionally; workers were searched at the gates for matches and cigarette lighters. The two types of passes were for one for the workers, and another for



Storage magazine with remaining clay earthworks in a camouflaged design.



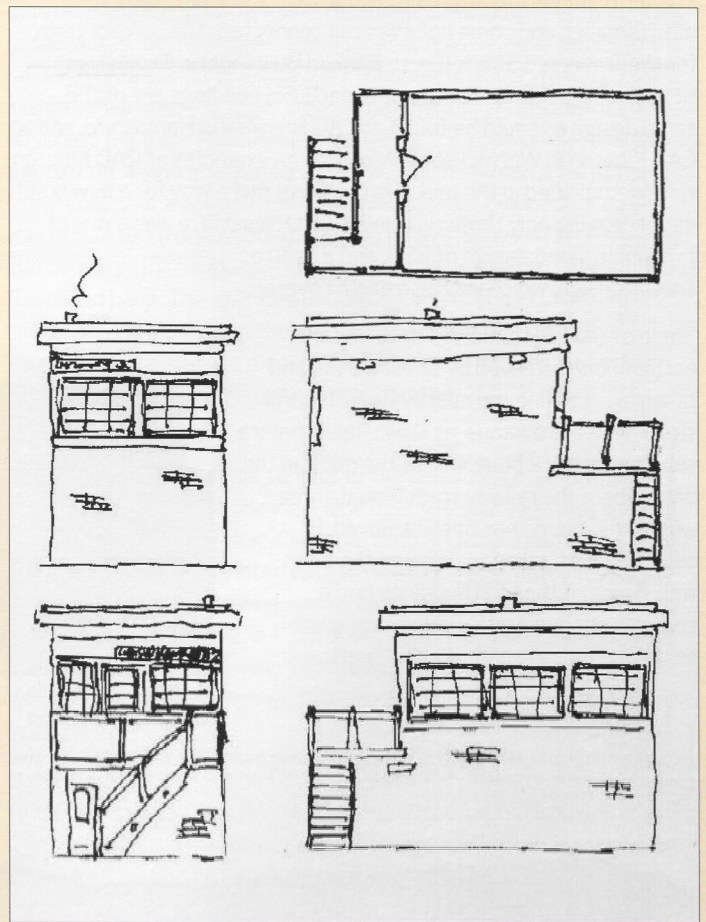
This map shows the main line railway, sidings, signal box locations and the connection to the internal rail network, as well as the shed and magazine numbering.

the farmers, presumably attending to the cattle. At times, during WW2, there were as many as eight gates used for access onto the site, each gate had a sentry box, and guards, when in use. No doubt, in an effort to keep up the war effort, and to keep the grass down, cattle (both for milk and beef) were allowed into the site for grazing.

The explosives arrived by rail, the wagons were stored in the sidings until being brought into the site by the MoS 4-wheeled diesel shunters, "match" wagons were inserted between the goods wagons and the locomotive, then they were shunted (usually in groups of four) to the storage sheds, where they were unloaded, one at a time under cover. For safety reasons, the "match" wagon was to prevent the diesel shunter having to enter the storage shed, and the explosives were manually unloaded onto wooden supports, i.e. there was no motorised assistance. Trains on the mainline railway system used 'Buffer Wagons' of Inert Stores or two empty goods wagons to create a spacer between the locomotive and the wagons carrying explosives.

There were two gangs in the engine sheds up to 1949, reducing to nine workers by 1959. The site traffic was very busy, until 1944, when the ROF work started to decline. The site had an underground fuel dump, holding diesel for the shunters, and petrol for road vehicles and the personnel tram.

To provide control of access into the site, a new signal box was required and built in 1942. This was named Dunham-on-the-Hill



Sketches of Dunham No. 2 ARP Signal Box.

No.2. It was built to Air Raid Precautions specification, usually abbreviated to ARP. To meet the specification, it had to resist damage from direct 1 Kilogram incendiary bomb hits, and the blast from nearby large bombs.

Post war

There was a regular annual landscaping maintenance of the grounds, and some pest control in the spring, which was done by a Leicester company. The site saw little activity immediately post-war, but that was soon to change in 1956 with the Suez and Hungarian crises.



Dunham-on-the-Hill ARP Signal Box No.2 being passed by a modern class 158 DMU, shortly before demolition.

The last recalled "military" use was during the Suez and Hungarian Uprising crises in 1956, when the depot was used for the storage of shells, including American shells. The shells included Phosphor bombs.

The local construction company (based at nearby Hooton) of McAlpine, was employed to rebuild and repair the earthworks around the magazine sheds, and to repair the fences around the magazine earthworks – presumably to keep the cattle off. Additionally the lightning protection was re-done, consisting of three bands of one and a half inch copper strip over the roof and sides, connected to another band around the shed, which was in turn earthed to the railway track.

Post 1957, the site was used for storing Ammonium Nitrate in approximately 100Kg drums. This was stored in the open, and was later burnt off in the open air between 1957 and 1958. The local populace was informed by telephone before the burning off.

Closure

The Dumham-on-the-Hill ARP Signal Box No.1 (at the passenger station) was closed around 1956, and demolished soon afterwards. There is a closure notice for the No.2 signal box dated for the 24th November 1951, which was not demolished until recently. Dunham-on-the-Hill station closed in 1952.

Track lifting within the site started in early 1963, and finished in 1964. The labourers were bussed in from Walton Jail, in Liverpool. The track leading to the site was left in for the CEGB, who at the time had outline plans for a power station on the site, however, these plans did not come to fruition, and the track was lifted sometime in 1966/67.

A BR Temporary Speed Restriction Notice, implemented during the closure of DunhamNo.2 ARP Signal Box

B.R.O. 10/92
WI—No. 47

BRITISH RAILWAYS
LONDON MIDLAND OPERATING AREA

(WESTERN DIVISION) **WI**

THIS NOTICE MUST BE KEPT STRICTLY PRIVATE, AND MUST NOT BE GIVEN TO THE PUBLIC.

TEMPORARY SPEED RESTRICTIONS
PERMANENT WAY OPERATIONS
SIGNAL ALTERATIONS
APPENDIX INSTRUCTIONS ETC.

SATURDAY, NOVEMBER 24th,
to
FRIDAY, NOVEMBER 30th (inclusive) 1951

Sunday, November 25.—Dunham Hill No. 2.—The box will come to be a block post and will be taken away. With the exception of the up colour light distant signal, which is also controlled by No. 1 box, all signals including the up inner distant 1 signal for No. 1 box will be taken away.
 The up colour light distant signal will be moved 470 yards nearer to No. 1 box and will continue to be the up outer distant signal for this line. This up outer distant signal will then be 550 yards from the up outer home signal for No. 1 box.
 The control by No. 2 box on the dwarf starting signals leading from up main to reception siding and from down main to reception siding at No. 1 box will be taken away.
 On and from completion of the above work No. 1 box will be resumed Dunham Hill.

Receipt of this notice need not be acknowledged. If not received on Thursday afternoon, advise, "Trains, Crewe" by wire as follows:—"Nile Not 1."

W. B. SHELTON,
 Divisional Operating Superintendent.

CREWE,
 November 20th, 1951.

The site was leased by Cheshire County Council, for several purposes, one is the obvious Travellers camp, accessed from the A5117, the other being to use the earth embankments (which were actually clay), as an easily accessible source of clay to line the nearby Gowy land fill site. This explains why some of the magazines have had the embankment removed, and also explains the diagonal line present on some of the brick blast walls where the rail entrance would have been.

Further information: pritchard_phil@hotmail.co.uk