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Metalwork from the Cyfarthfa Ironworks coking plant, Merthyr Tydfil

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Abstract

The site has produced 366 metal objects during both the excavation and subsequent watching brief. A high proportion of the objects were not recorded from stratified contexts and many were recovered from the scrap metal from the groundworks crushing plant following mechanical overburden removal. Structural metalwork from the re-use of the site during the mid-late twentieth century was excluded from the investigation as far as possible.

The assemblage described here is mostly material that was associated with the coking plant of the steelworks period (1882-1919); a few pieces are derived from earlier use of the site.

The majority of the pieces are not identifiable to particular uses, being relatively 'stock' items or forms. The more specific items include a series of cogged wheels, probably from roller crushers or breakers. Such roll crushers may have been a component of the 1882 crushing plant, rather than the 1894/5 washery that largely replaced it. The washery was represented by several large castings that were probably basal supports for the internal conveyors. Structural ironwork was also present, as were items from the water supply.

Items relating to transport formed a significant group, with items derived from both standard gauge and light railways, as well as wheel from a hand cart and a wheel barrow. A few items from the plateways of the pre-steelworks period were also recovered.

Tools included pieces that would have been employed in the coke works, including large spanners, long handled tools, a shovel and a possible rake, as well items usually associated with mining, such as a mandrel, a wedge and prise bars.

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Background

The development of the Cyfarthfa coking plant is moderately well documented. Percy (1861, 159) described the use at Cyfarthfa of coke ovens with a pusher mounted on a railway to the rear of the ovens to push out the coke. The plant employed was similarly described in 1874 (with paired rows of ovens, with a steam powered pusher) following a site visit by the Society of Mechanical Engineers (*Engineering*, August 14th 1874, 122). A new coking plant involving Coppée ovens fed by coal passed through a Carr's Disintegrator (having been crushed in roller crushers where required) was constructed as part of the conversion of the site to a steelworks in 1881-2. The washery (a Sheppard Coal Washer), described and illustrated in detail in *The Engineer* of 1895 and again by Tonge (1906, 316-38 including Fig. 197), was constructed in 1894-5 largely to replace the 1882 crushing plant, which remained operable. The steelworks and its coking plant were closed in 1910, but re-opened briefly between 1915 and 1919

The collections derive from excavations (335 items) on the site (the former Thorn Electrical factory) by the Glamorgan-Gwent Archaeological Trust in 2013 and from the subsequent watching brief on development (34 items). Preservation of the site was to a level well below the contemporary external ground surface, leading to only a very limited potential for artefacts to be stratified in pre-demolition contexts. A high proportion of the objects were not therefore recorded to stratified contexts and many were recovered from the scrap metal stock from the groundworks crushing plant following mechanical overburden removal. Structural metalwork from the re-use of the site during the mid-late twentieth century was excluded from the investigation as far as possible.

Most of the collection was described briefly and photographed on-site, to allow for disposal of the less important items. Material recovered at the end of the excavations and during the watching brief was mainly recorded off-site.

The project was commissioned by Rowena Hart of the Glamorgan-Gwent Archaeological Trust.

The Catalogue

Stock and fragmentary materials

Pieces of rolled wrought iron with standard sections (present either as pieces of standard products or as fragments of objects incorporating such materials as components) includes square-sectioned bar (Cat. #1-9), round-sectioned bar or rod (Cat. #10-22), flat-sectioned (rectangular) iron (Cat. #23-47) and fragments of unknown original section (Cat. #48-49).

Fragments of iron sheet (Cat #50-60) were mainly fragments of cladding from equipment or buildings, but none was diagnostic of a precise original use.

Cast iron plate (Cat. #61-70) was represented mainly by fragments, but a few complete examples were large, including Cat #64 (870mm x 485mm x 18mm), #65 (1210mm x 610mm x 20mm thick.), #66 (1040mm x 330mm x 47mm), #67 (920mm square) and #68 (830mm x 375mm x 5mm). Such plates resemble those employed as flooring plates and service channel covers.

A single piece of round-sectioned steel bar (Cat #71) was recorded.

Fastenings

A large number of fastenings were recovered as items isolated from any indication of their original use. The vast majority of these pieces were of wrought iron, with just the wire nails probably of steel.

Rivets were represented by two conventional iron rivets (Cat #72-73) for sheet metal, one with a 12mm shaft, the other 18mm. A compound item of an iron nail-like object with an hourglass-shaped copper alloy head (Cat. #74) may be a form of pop rivet.

Threaded bolt connectors include a few examples of great length that may be better considered threaded bars, rather than bolts (Cat. #75-78). These have lengths of 2520mm, 2410mm, 810mm and 830mm respectively. The two longer items are threaded at both ends and fastened by hex nuts approximately 60mm a/f and 37mm thick, with a large circular washer on at least one end.

The smaller square-headed bolts (Cat. #79-102) are less than 220mm in length (mostly less than 120mm), with shaft diameters of 11-25mm. The 'square' heads are commonly not precisely square, suggesting these are mainly hand-made items.

Simple dome-headed bolts (Cat #103-111) are up to 160mm in length. Most have 12mm (1/2 inch) shafts, although two have 16mm diameter shafts and one possible example has a 20mm diameter shaft. The largest of these (Cat. 103-104) resemble the bolts (or just possibly spikes) present in the railway chair (Cat. #226).

A single incomplete hex-headed bolt (Cat. #112) was recovered, with a 30mm a/f head and an 18mm diameter shaft.

Four bolt fragments of unknown form were also recorded (Cat. #113-116).

Carriage bolts (Cat. #117-126) were mostly of 67-89mm surviving length; one (Cat #119) was longer at 138mm. The shaft diameters were variable, with one at 12mm, one at 14mm, five at approximately 17-18mm and three at 23-25mm.

One example of a coarsely-threaded coach bolt with a 21mm maximum shaft diameter was recorded (Cat. #127). Coach bolts of this type are commonly used for securing railway chairs to wooden sleepers.

Washers (Cat #128-148) were present as round examples (mostly 38-54mm outside diameter and 11-26mm inside diameter, but with one larger example at 94mm outside diameter and 41mm inside diameter) and as mostly larger approximately square forms (60-90mm across, with 23-25mm internal diameters).

A single double securing washer (Cat. #149), with an overall size of 350mm by 70mm and 40mm thick, with rounded ends, carried two 27mm diameter holes.

Only three isolated square nuts (Cat. #150-152) and twelve hex nuts (Cat. #153-164) were recorded. Most of these items were slightly irregular in shape and thus probably hand-made. As with the corresponding bolts, they possessed a wide variety of dimensions.

A cotter pin (Cat. #165) was 110mm long overall, formed of folded 23mm x 6mm bar with a loop of 28mm outside diameter.

A bar (Cat. #166) of 20mm diameter and 154mm length had a burred end and was probably a securing pin (apparently without a cotter).

Simple pointed iron bars that may have functioned as 'spikes' for fastening, rather than as tools, include an example 990mm long and 22mm diameter (Cat. #167) and a fragmentary second example (Cat. #168), 24mm in diameter.

A spike (Cat. #169) 280mm long and 13mm in diameter, has a 65mm long 'barb' expanding outwards away from the blunt end of the bar. The purpose of such spikes is not known, although two examples were found at Ffos y fran (Young 2014b, 7; #701 and#702).

Two items (Cat #170-171) were similar ringed mounts on square-sectioned shafts. They are grouped with the spikes, although neither has a pointed shaft. One (#170) had a ring 70mm outside and 35mm internal diameter, above a 70mm diameter collar and a shaft100mm long and 25mm square. The other (#171) has an 'Ω' shaped head 55mm tall, 50mm wide and 30mm thick with a central hole 17mm in diameter. The cross bar is 35mm wide and divides the head from the 145mm long, 20mm square shaft.

There were eleven examples (Cat. #172-182) of short 'dogs', spikes with their tops folded through 90 degrees (equivalent to the 'fold-headed spikes' from Ffos y fran, Young 2014b, #685-693). These were relatively uniform, 62-90mm in length, mostly with approximately 8mm section (though variable and not necessarily square) and with the head extending 18-30mm. The use of these small spikes is unclear; they are of similar form to, but smaller than, spikes used to attached railway fittings to wooden sleepers, but they might have been so used on the narrow gauge tracks (see below).

A wide variety of nails were present (Cat. #187-221). There were several distinct types of nails with multiple examples. Approximately square-sectioned nails with flat heads (Cat #186-198, mostly 70-80mm in length, although largely examples (the largest 159mm long) were also present.

Nails with domed heads were of two varieties. One variety (Cat. #199-203) was large (approximately 100mm in length) and round sectioned (10-12mm maximum diameter). These had a head of 20-22mm diameter and 8-10mm high. The shanks are reduced to a chisel tip. These nails are similar to, but slightly smaller than, the round-headed, chisel-tipped spikes from Ffos y fran (Young 2014b, 7, #662-684), which were suspected of being fastenings for plateways or railways.

The second variety of dome-headed nails (Cat. #204-216) were smaller, 80mm long, with a square sectioned shank (maximum of 7mm), but also reducing to a chisel tip.

Five examples of wire nails were also present (Cat. #217-221). These were all similar at 115mm long, 4mm diameter, with a 10mm diameter head.

Transport

Railway components included three sections of rail. One section was a flat-bottomed wrought iron rail (Cat #222), 90mm high, with a 95mm wide base, a head 50mm wide and up to 30mm deep, a web 13mm thick, and a base 20mm thick in the centre, 8mm at margins, and 1470mm overall length. This rail is smaller in section that the lengths flat-bottomed wrought iron from the Ynysfach ironworks (also part of the Cyfarthfa Ironworks complex; Young 2014a, 8, #208-209). The rail is likely therefore to be from a narrow gauge installation. The flat bottom is, however, wider than the gap present in some of the light chairs and the tie from the site, which would take rails of 75-80mm width.

A second 2.05m long symmetrical flat bottomed rail (Cat. #223), 80mm wide, 85mm tall, with a head 40mm wide and 30mm deep, a web 17mm thick, and base 20mm in centre, was apparently of steel rather than wrought iron. The narrower base meant this rail might have been compatible with use both with the light chair (Cat. #228) and, just possibly, in the pressed steel sill (Cat. #225).

The third rail piece (Cat #224) is a steel 'bullhead' type of rail with an asymmetrical base. The piece is 1940mm long fragment, 120mm tall , 63mm wide, with a web 15mm thick and 60mm tall, base asymmetrical with one side 36mm and the other 24mm wide. This rail would appear to be compatible with use in a chair of the type illustrated by chair (Cat. #226).

A pressed steel sill (Cat #225) flat bottom rail is 1210mm long. The chairs are formed simply by up-folded sections, cut from holes 100-125mm and 175-190mm from each end. These would take a maximum of a 80mm width base. The bar is formed from 105mm x 4mm section but with sides folded down to 18mm below top. The shape suggests use of a flat bottomed rail of 60-65mm width and gauge of 890mm. If the folds were bent slightly more abruptly, they might be able to hold an 80mm wide rail as in Cat. #223 above.

A cast railway chair (Cat. #226) was for 'bullhead'-type rail. The slot is 90mm wide at its curved base, with an expansion 35mm deep to one side and 85mm deep overall. The vertical top 40mm section of the slot is 65mm wide. The baseplate is 355mm x 110mm base, and of slightly sigmoidal shape with two offset mounting holes, fastened by bolts or spikes, the tips of which were not seen. They were 170mm in preserved length and 18mm diameter. Their domed heads are 35mm diameter and 11mm tall. These bolts resemble the large isolated dome-headed bolts described above (Cat. #103-104).

A cast railway chair (Cat. #227) is unusual in having only a single cheek. It is unclear if there was only one or if a second has fractured cleanly from the base. The base plate has rounded ends, an overall length 300mm, a width of 80mm, and is 20mm thick. The cheek face is 105mm from end, and is 34 tall, with an undercut 19mm tall and 35mm wide. There is a central nail 35mm from either end, with 20mm surviving below the base, of 5mm square section.

A lightweight cast chair for flat bottomed rail (Cat. #228) has a baseplate of 250mm x 75mm (10x3 inches) and has 16mm (5/8 inch) holes in diametrically opposite corners. The slot has a basal width of 75mm (3 inches). A curved cheek, typically approximately 16mm thick, overhangs the base by 38mm and is 32mm above the base at its inner end. The low cheek is a slight hook of just 6mm width. Such a chair would have been able to hold the same profile of rail as the pressed steel sill described above (Cat. #225)

Fishplates were recovered in two broad groups with a high degree of internal variability:
- larger examples (Cat. #229-232) with a length of 460-510mm, a bevelled profile, widths of either approximately 70mm or 80mm and holes typically of 30mm diameter (often with one of more elongate holes to ease fitting) at 105-120mm centres. There are also several fragments, probably also of this type (Cat. #233-237).
- small plates (Cat. #238-240) 360mm long, either bevelled or flat profiles, 43-65mm wide, with holes of 22mm diameter at 90mm centres.

The larger fishplates are too wide to have been used with the rail types present in the collection and are likely to have been used on standard gauge track. The smaller varieties may have been from the narrow gauge industrial railway, but even some of these are too wide for the particular track types recovered.

Plateway components were rare, with just two plates, one sill, and one pointer being recovered.

A 3 foot plateway plate (Cat. #241) preserved entire, was a plate for use with an iron sill. No fixing holes were visible. The plate was 115mm wide centrally with the line of the crest of the riser 25mm from the inner edge. The plate has an overall thickness of 30mm towards its outer edge. The integral chairs were very slight, 130x50mm, lacking the inward-facing lug employed on plates for horned sills, but apparently with two raised bosses on their side facing the centre of plates, which would have located either side of a sill approximately 70-80mm wide (an unusual and very narrow configuration). The base of the plate shows a recess below the riser and another along the outer edge. The base of the plate bears no strengthening ribs. The riser is slightly hogged, 72mm tall at the ends and 100mm in the centre. The running surface bears a wide hollow, 5mm deep, 45-85mm from the outer edge. No parallels for this sill have been described.

A fragment of a channel plate (Cat. #242), 725mm long and 120mm wide, bears integral chairs of 140mm x 85mm, which have slight rounded external bosses (not as fully inflated as in a true Outram-style plate, but nonetheless in the same family of designs). A rib, 25mm wide and 5mm high lies along the midline of the otherwise flat basal surface. The crenulated sides are 15mm thick typically at mid-height, 40mm tall, leaving a channel of 80mm width.

A probable broken tip from a plateway pointer (Cat. #243) was 230mm long, and had a maximum section at the break of 55mm wide by 60mm tall

A single, incomplete example of a horned plateway sill (Cat. #244) had an 830 mm long central bar (the estimated original length was 990mm), with a 45mm x 45mm 'D' section. The surviving waisted head was230mm long and 110mm wide. There as an upturned tip as an outer cheek; the inner horns do not survive. The head was 20mm thick. This sill is broadly similar to, but slightly lighter weight than, the standard examples from the Ynysfach ironworks (Young 2014a, 7, #184-189).

A thin stone slab (Cat. #245) was a stone sleeper block from the plateway associated with the early coke ovens. It was 550mm long and 390mm wide, with a maximum thickness of 72mm. Impressions were visible of the two integral chairs, which were (1) 75mm wide and 130-140mm long, possibly with a semi-circular end and (2) is 74mm wide and faded out at 125mm. The securing iron spike head was 35mm x 18mm, with 30mm proud of the stone. Its section where it disappears into the stone was about 16 x 11mm. the impression of the chairs is similar to the expected footprint of the chairs in the channel plate (Cat. #242) described above. The sleeper is much smaller than the classic Outram block, but is broadly similar in size to equivalent sleepers at the Ynysfach Ironworks. It may have been intended for bearing only light loads – and it is even possible this plateway was solely for the coke 'pusher' described by Percy (1861, 159) and the Society of Mechanical Engineers in 1874.

Two wheels probably document the continued importance of hand-carts for transport within the works.

An 8-spoked cast iron wheel (Cat. #246) is 750mm diameter, 50mm wide, with a hub 75mm diameter that extends 35mm out on one side, containing an axle hole c.35mm diameter but obscured by concretion. The spokes are planar, approximately 12mm thick and extending the full width of the rim. The style of the hub shows some parallels with the design of the wheels for plateway drams, but in a totally different style of wheel. Handcarts employing wheels of a similar size to this example and similar to that of a dram (but larger, with narrower spokes) are shown in an old photograph of the furnace bank area in the steelworks era (http://http://www.alangeorge.co.uk/ Images_A-/Cyfarthfa_Works_InclinedLiftGonperStoves_TopOfdFurnaces.JPG, accessed 13/12/14). The wheels in this photograph are, however, even more like plateway dram wheels, in having very narrow rims and curved spokes.

A smaller, five-spoked wrought iron wheel (Cat. #247), with attached short stub axles, is possibly from wheelbarrow. The rather elaborate hub is marked 'PERKS WROUGHT IRON WHEEL LYE. PAT No. 18595'. The rim is formed from a 40mm x 8mm section. The spokes are 14mm diameter spokes. The hub in formed of two halves with a total thickness of 30mm. The short axle swells towards the hub one side, but not the other, suggesting the means of assembly; 65mm of stub axle protrudes each side of the hub, which is 82mm diameter. John Perks was the company operating the Crown Works in Lye, Worcestershire in the late 19th and early 20th century. They produced a variety of iron components and objects, including 'wheelwrights' iron-works' (as advertised in the 'Macdonalds Scottish Directory and Gazetteer of1906, p188), specialising later in components for motor vehicles.

Ladders

There were multiple fragments of wrought iron ladders (Cat. #248-252). The uprights were formed of 60mm x 4mm (twice), 60x10mm and 53x10mm bar in the four examples. The rungs were of 17mm, 20mm, 22mm (twice) and 24mm diameter, with a slight collar near each end, probably formed by upsetting and with the end spread over the upright in the manner of a rivet.. The distance between the uprights varied from 300mm to 450mm. The distance between rungs varied from 230mm to 320mm. Only one of the ladders was complete, if deformed (Cat. #251). This had an overall length of 2.56m, possessed nine rungs, and had the uprights truncated a slight angle at one end and rounded (with holes 30 and 130mm from the end) at the other. A second, almost complete example, was 2.86m in length and had had eleven rungs originally.

Chains & hooks etc.

This site produced fewer chains and hooks than other sites where plateways and haulage formed a more significant component. There were two lengths of chain, two eyed attachments (one very large) and two 'S' hooks.

A wrought iron chain (Cat. #253) was 1650mm long, and comprised elongate links with long straight sides, 90x45mm, formed of 12mm diameter material.

A large, stout, wrought iron chain (Cat. #254) with a hook one end and a large ring the other, has an overall length of 1625mm. The hook has an overall length of 240mm and a maximum width of 120mm. The chain has nineteen links, each 110mm x 56mm and of 15mm diameter section. The terminal loop is 156mm x 115mm and of 20mm diameter section.

A wrought iron ringed fastening (Cat. #255), formed of round bar (50mm diameter) forged into a ring 250mm o/d ,

150mm i/d ring, welded onto the end of a broken stem, also of 50mm diameter, provides an extremely strong attachment of unknown purpose.

A slighter, but morphologically similar, ringed attachment (Cat. #256) is 112mm long (although the stem is broken) with a 22mm diameter shaft. The ring is 62mm outside diameter. It is attached to a single chain link of 62mm long formed of 12mm diameter round bar.

A 16mm square bar (Cat. #257) had been formed into crude hook 270mm long and 75mm wide. A 17mm round rod (Cat. #258) had also been formed into 'S hook', 270mm long and 75mm wide.

A much smaller 'S' hook (Cat. #259), 47mm long, had been formed from round rod 5mm diameter and may possibly be a door fastening.

Sheet metal vessels

Galvanised ferrous sheet metal vessels were represented by a bucket handle with attached escutcheons (Cat. #260) and by a collection of small body fragments (Cat. #261).

Handles

The collection included three isolated handles, or handle-like objects.

A stout wrought iron handle-like object (Cat. #262) is 165mm wide, 95mm tall, with a rounded section in the centre of 19mm diameter, which passes laterally to a square section, which is forged to a point, extending straight for 58mm each side, tapering down to a blunt point of 12mm square section. This item may possibly be a very simple form of linkage – perhaps between plateway drams or similar.

A wrought iron looped handle (Cat. #263) 120mm wide, 85mm loop height; total height 122mm, with short shank and possible nut, 38mm square by 12mm thick

A small bow-shaped handle (Cat. #264) formed from 9mm diameter rod, is now deformed and spread. It is182mm wide, with flared tips 14mm wide pierced with 9mm holes, one of which still bears a small rivet. The use of a rivet suggests this was originally attached to sheet metal – either as a vessel handle or as, perhaps, a drawer pull.

Tools

The tools from the site were few in number but diverse in variety.

There were four open-ended spanners (Cat. #265-268), four long-handled hooked tools (Cat. #269-272) that may be tools for the operation of the plant.

Three prise bars (Cat. #273-275), a chisel (Cat. #274), a possible mining wedge (Cat. #277), part of mandrel (Cat. #278), a hafting wedge (Cat. #279) and part of shovel (Cat. #280) may also have been used within the coking plant, but are also forms that might have been employed for mining. The tools in this group differ in detail to the mining tools from Ffos y fran (Young 2014b) and its unclear whether this reflects the use of different tools at Cyfarthfa Ironworks as opposed to Dowlais ironworks, a difference in age (the Cyfarthfa assemblage may be mostly younger than that from Ffos y fran), or perhaps to the usage of similar, but different tools for handling and breaking of coal in the stock yard as opposed to underground.

The assemblage was completed by part of a smiths' tongs (Cat. #281), a possible fork tine (Cat. #282) and three small hooked tools (or more likely hook latches; Cat #283-285).

The open-ended spanners varied from 290mm to 560mm in length, with jaws from 32mm to 50mm. They were all rather simply fashioned, mostly from rectangular bar, but the largest were formed from 20mm round bar.

The long hooked tools were 950-1200mm long, formed from 13 to 22mm round bar, with ring handles at one end and either crude rounded hooks up to 140mm across, or a right angled tip 50-80mm long.

The prise bars were 625-1430mm long. The shortest example (Cat. #273; 625mm long) had an unusual double-curved flattened tip similar to those on smiths' tongs. This item was revered from within a cast iron trough and may have had a specialised function. The two longer examples (Cat. #274-275; 1190 and 1430mm long respectively) resemble those employed in mining, but are longer than the examples of prise bars from Ffos y fran (which range up to approximately 1000mm).

A stout bar (Cat. #276) was 320mm long and 60mm in diameter is interpreted as a chisel, but is much larger than the examples from Ffos y fran (Young 2014b, #1016-1017).

A wrought iron wedge (Cat. #277) 165mm long, 40mm wide and up to 10mm thick, resembles the wedges from Ffos y fran (Young 2014b, 16).

Mandrels were represented by only half of an example (Cat. #278) 225mm long, representing over half of the original c.410mm length. The lugs were 30mm deep and the square section close to the eye was 20x30mm. The eye would have been 60mm long when complete. The size is close to that of the Group 1 mandrels at Ffos y fran (Young 2014b, 17).

A piece of a small wedge (Cat. #279) was probably for hafting a tool.

A small fragment of a shovel handle Cat. #280) was 240mm long.

Smiths' tongs are represented by a single handle (Cat. #281): 420mm long, handle 10mm diameter, cheek 80mm x 20mm x 7mm

12mm square bar slightly curved (Cat. # 282), forged to point, like fork tine but may just be bent spike

The three smaller hooked tools or latch hooks (Cat. #283-285) range from 320 to 550mm in length.

Footwear

The only personal item in the entire collection was a large heel tap (Cat. #286),

Structural ironwork – castings

Two pieces of structural ironwork (Cat. #287-288) are the only items that show evidence contact with heated brickwork. Both are likely to be elements of the early coke ovens (i.e. pre-1880), but only the second (Cat #288) was formally recorded to particular context.

An elongate hinge plate (Cat. #287) is of width 162mm and overall length 1390mm. It is 1280mm between the bases of the pintles, of which one survives and is 67mm long and 24mm diameter, which are set into holes in 45mm o/d raised lugs in recesses in two corners. There are terminal holes 30mm x 20mm. There are 17 rivets down each long side, Raised edges of plate are 40mm wide along line of rivets 43mm deep .The purpose of a door supported by such a plate is unclear. Early coke ovens were typically closed with temporary brick blockings, while some later ones employed vertically sliding doors. No varieties with a hinged door have been identified. It is possible that a door hinge plate from another part of the works has been reused simply as a beam.

An elongate wide bar (Cat. #288) with section 155mm x 45mm, 480mm long (as preserved) with a transverse terminal rectangular loop ,200mm long x 260mm wide externally, with a 50mm x 145mm slot. The adhering altered brickwork suggests that the bar was embedded in the kiln wall with just the loop protruding. The most likely use for such a loop would be to carry a tie bar strengthening the face of the oven.

Two securing plates (Cat #289-290) of very different sizes, but similar styles, show mountings for large bolts. One shows support for eight bolts in two groups of four, the other a single large bolt. These are likely to be for securing large pieces of equipment to substantial timbers.

The cast securing plate (Cat. #289) has raised double cross bracing and associated rims to mounting holes. It is 1080mm x 400mm overall, with 8 holes, each 40mm diameter, containing 32mm diameter wrought iron bolts with 48mm a/f heads, 700mm long, threaded for 50mm at inner end. Four bolts, one now headless, remain in situ. The plate is37mm thick, with the ribs up to 25 mm

A small cast securing plate (Cat. #290) measures 460mm x 310mm and is 25mm thick, has a single hole and collar , which are slightly off centre. The 50mm diameter hole has a raised collar 125mm diameter, with four radial braces to edges. It contains a 45mm diameter bolt, with an asymmetrical hex nut approximately 60mm a/f.

Two substantial cast iron securing plates show a different design of a thick planar casting with recesses for bolt heads. Both of these show adhering mortar and are likely to represent anchor points for mounting equipment onto a masonry or brickwork (Cat. #291-292). Cast iron plate (Cat. #291) is 770x460x50mm It has recesses 70mm square to take the heads of bolts, leading to circular holes 50mm diameter. A bolt 34mm diameter with square head 50mm and30mm deep survives.

A cast iron securing plate (Cat. #292) measures 770mm wide by 650mm surviving width, with a thickness of 40mm. Two square holes lie 160mm from complete end and 100mm from edges They are 25mm square; a single hole 380mm from the complete edge and 240mm from the broken edge is 20mm square, and is associated with a diagonal rectangular impression, 60mm wide by 210 mm surviving to break and 3mm deep. A wrought iron bolt with a 25mm square head passes though the plate 230mm from the complete edge and 380mm from the broken edge.

A series of large castings represent various forms of anchoring into, and strengthening of, brick structures (Cat. #293-298). Many of these have a box-like form – either forming a girder like support (with brickwork inside the ironwork in some instances) or as a support for timber. These pieces were extracted during groundworks and are almost all badly broken, inhibiting their interpretation. One box-like piece (Cat. #296) appears to form a placement for a large timber (the box has internal dimensions of approximately 300mm square and 630mm deep). The base of the 'box' has a 110mm diameter hole, associated with radial slots and bolts. A girder-like example (Cat. #298) bears low, overhanging 'stops' bolted to the upper surface – presumably to brace the location of overlying equipment or structural components.

Interpretation of these major structural elements may depend on their recognition within the recording of the site prior to the destructive groundworks.

A section of grating 1045mm wide with an arcuate margin (Cat. #299) is probably a section of segmented circular grating 1200mm in diameter. The grating has a maximum thickness of 110mm, reducing to 30mm at the edge. It has five slots, each 20mm wide, a central transverse bar 35mm wide and a marginal flat zone 70mm wide.

Two large castings (Cat. #300-301) provide inclined supports. A cast iron plate with two angled supports bolted on. The plate is 2.17m long by 1.84m wide and 42mm thick. The acute side of the support plates is 430mm from one end, 190mm in from sides. Each plate is 970mm long, 390mm wide and 30mm thick on its base. The bolt heads are hexagonal, 45mm a/f and 22mm deep, The bolts are approximately 100mm from the end of the support plates and 50mm in from sides. The webs extend all the way to the ends of the baseplates, are 30mm thick. There is a 200mm maximum height gap of the box (i.e. thickness of supported beam), box 460mm x 130mm, and has central circular hole 30mm diameter. The supports are inclined at approximately 60 degrees. The orientation and section of the supports resemble those illustrated in Plan 1 (p. 558) of '*The Engineer*' for December 6th, 1895, as supporting the base of main conveyor 'B' lifting coal from the delivery hopper 'A' to the rotating screen 'C'. Although the details are not depicted, a similar arrangement presumably existed in the support for the washed coal elevator 'H'.

A tall casting for an approximately 45° angled support (Cat. #301), with overall height of 740mm, has an upright section of C shape box section 395mm wide, 30mm section and 140mm thick. The highest point of this box is 450mm above the base and lower side 330mm. The base plate is 630mm x 200mm and 55mm thick Four holes close to the rounded corners are 30mm diameter secure the mounting plate. The support itself has an open 'C' form, with the support slot 130mm deep, 130mm wide and 150mm deep. It has a slot extending from each side, with a total width of 180mm and 40mm wide. There are holed lugs on either side of the jaws of the mount. The bottom of the lug below the jaws are 270mm above base, the lug protrudes 80mm and has a 40mm diameter hole. The lug is 110mm thick and does not extend all the way to front plane. The tall side of the upright section curves-in slightly at 540mm above the mounting plate. The upper lug has an external diameter of 110mm and bears a hole, probably of 30mm diameter. The back face of the casting is planar, including the rear face of base plate.

Two castings provide support for curved items (Cat. #302-303). A rectangular plate (Cat. #302), 425x370mm, bears a hole 220mm square offset, with one side 130mm from one end and the other 65mm from the opposite side, eight round mounting holes, 18mm diameter, and an asymmetrical raised curved flange 368mm across and 358mm wide, with a minimum distance of 55mm from the base plate, rising to a maximum of 110mm. The baseplate is 17mm thick. The asymmetry of the piece suggests that, like the previous two items, it provided support to an inclined component with a rounded end – probably indicating it was associated with the lower end of a component such as one of the inclined elevators.

A cast iron rest for a curved item (Cat. #303) has a 200mm square base plate 20mm thick, with four ribs supporting a curved rest 265mm above base. The ribs and rest are 20mm thick. The rest is 150mm long and 140 mm wide (equivalent to an internal diameter of approximately 160mm).

In addition to the major pieces, eight fragments of castings were also in the examined collection (Cat. #304-311).

A substantial structural casting appears of be of steel (Cat. #304) and may be a tension rod mounting point for a steel-framed building from the late 20th century activity on the site. It comprises a heavy bracket (with each side of the bracket 380mm x 225mm and 35mm thick) with a pivoting mount for a rod within the angle of the bracket. The end of one arm of the bracket has an overhanging stop 30mm deep on its base (to hook over a beam/girder?). The the swinging arm is 40mm in diameter and is secured by a bar/cap/split-pin cotter. Both arms of the bracket have four 30mm diameter holes at 50mm in from edges, 80mm and 230mm from their outer ends.

Structural ironwork – forgings etc.

Two iron plates secured with four long bolts (Cat. #313) apparently provides timber jointing. Each plate has four holes, three towards one end, the fourth close to the opposite end, secured by long bolts with nuts and multiple washers. One plate is 1120mmx190mmx10mm, the other plate 1060mmx190mmx10mm. The square headed bolts are 270mm to 370mm in length and are secured by large square nuts and round washers of 55-70mm o/d (in one case 13 washers are present on one bolt).

Wrought iron strapping (Cat #314) comprised of two halves, each 102cm long, 30cm wide, formed of bar with section 60mm x 12mm thick, attached by bolts with square heads, hex nuts and square washers, passing through out-turned flanges 80mm long. This type of strapping might be employed to help support a chimney or s a binding around timber.

A rectangular wrought iron frame or binding (Cat. #315) provides a means of locating a collared fastening, possibly threaded, onto a wooden beam. The frame has external dimensions of 190mm x 105mm and is formed from bar of 24mm x 7mm section. On one long side it widens around a drifted hole to which an external annular collar 42mm in external and 20mm in internal diameter, has been welded. It is not known if the collar was internally threaded, but this would seem likely to have been the case.

A large structural fragment (Cat. #316) comprises sheets of iron bolted to a 3.55m long section of angle iron. The fragment is highly deformed (the angle iron is folded through 90° 2.2m from one end) and its original form is difficult to interpret. The angle iron is 70mm x 70mm and 9mm thick; Bolts with very small heads pass through the main sheet and are secured with square nuts and washers on top (inside) of the angle iron. The iron sheets were badly corroded, but one better preserved example measured 600mm by 1110mm and 2-3mm thick. The other section of the angle iron bears the riveted margin of an iron sheet. The purpose of this fragment is uncertain. The great density of fastenings suggests the material is probably not cladding for a building, but it is more likely the sheeting forms part of one of the coal hoppers.

An isolated piece of angle iron (Cat. #317) was somewhat larger section than that forming part of the complex item described above. The angle iron was 90mm x 90mm, of 15mm thickness, and was 2.16m long.

A large sheet of iron with an attached ring (Cat. #318), is of uncertain purpose. The sheet has a maximum length of 1980mm centrally, but with a truncated corner at one end leaving a side of 1840mm, a width of 740mm. and the thickness of the sheet is 10mm. A hole 20mm diameter cuts the sheet 70mm down from narrowed end. The looped attachment for an iron ring is 760mm down from the narrowed end The attachment is 70mm diameter at base and 105mm tall; it was interlinked with a ring 150mm in diameter and 26mm round section. The piece is of unknown purpose; the ring would facilitate lifting of the heavy iron plate, which is more likely to have functioned as a floor plate, than as a door-like object.

Two wrought iron objects may be associated with attachment of ironwork to masonry or brickwork. A wrought iron bar (Cat. #319) is 770mm long iron bar, 85mm x 20mm section, has a roughly central 29mm diameter hole, and has 150mm of 30mm round threaded bar attached on one end. The flat section of the piece shows mortar on its surface, suggesting this part was encased in in the stone or brickwork, with the threaded bar exposed. A somewhat similar piece (Cat. #320) comprises a wrought iron bar, measuring 360mm x 90mm x 20mm, with two holes and with rounded ends, welded to a stout rod, 30mm diameter, protruding 480mm at 45° to the plane of the bar, and threaded for the terminal 70mm.

Plumbing & related items

Items related to water management fall mainly into three groups. Firstly, there are three large valves (together with a possible control wheel), all made by Blakeborough & Sons of Brighouse. Secondly there is a variety of large cast iron pipes. Thirdly, there are small diameter wrought iron and steel pipes.

The three recovered valves (Cat. #321-323) are all different. They are marked with variations of *Blakeborough & Sons*, *Manufac* or *Makers*, *Brighouse*. The pipe connections to the valves are variously of 80mm, 95mm, 140mm and 150mm internal diameters, suggesting these examples derive from rather different roles within the water distribution system.

A small cast wheel (Cat. #324), 310mm in diameter, with a 32mm diameter rim and six 28mm x 17mm flattened rounded section spokes, but with a missing centre, is probably a valve control.

The collection includes eleven large cast pipes, pipe unions, or fragments of pipes (Cat. #325-335) and many pieces are believed to have been removed, unrecorded, during the groundworks. These pipes are variable in size (50mm to 150mm internal diameter) and variable in joining technique. Many show bolted flanges, others show overlapping leaded joins, one appears to show a rubber or bitumen gasket; there is also one example (Cat. #336) of a lead gasket. It appears likely that although the majority of the retrieved pipes are part of the coking plant's water supply, some are from the later twentieth century services.

Smaller pipes are represented by ten pipe fragments (Cat. #337-346). Of these one appears to be steel (Cat. #345) and another with a threaded union may be steel (#344). One example was galvanised (Cat. #337). As with the larger cast pipes, this collection is likely to be of varied ages.

A mineralised object appears to iron corrosion forming an internal mould of a now vanished thin pipe (Cat. #347).

A cast iron trough (Cat. #348) formed of a 20mm thick casting, with external dimensions 380-400mm tall, 1820mm long, 590mm wide. Each narrow side has an approximately

semi-circular notch in the rim, 70mm deep and 100mm wide. The trough contained the prise bar #273.

Coal crusher/breaker

Four heavy cogged wheels (Cat. #349-352) represent three sizes of similar items. The smallest (Cat. #349) has planar faces, is 340mm in diameter, 120mm thick and has a central hole approximately 70mm diameter. The seventeen teeth 28 mm wide at base, 30mm tall, 15mm wide at top, with the sides radial to 10mm then sloped in as a facet The gaps between teeth are 20mm wide.

There is one complete and one partial medium sized wheel (Cat. #350-351). These are 560mm in overall diameter and have a complex profile; with a c.135mm diameter central hole, a 180mm thick central section to 270mm diameter then a recess by 70mm to just 40mm thick to 390mm diameter, then 155mm thick out to the margin. The teeth are 40mm wide at base, 30mm tall, with a gap 35mm. There are 22 teeth (11 preserved in the poorer example.).

The large cogged wheel (Cat #352), is 625mm overall diameter, with a similar complex profile. The central hole is 135mm diameter, with the inner ring 170mm wide, the 60mm deep recess is from a diameter of 260mm to one of 440mm, with a 150mm thick outer section to the margin. The teeth are c.45mm wide at base, 40mm tall, 25mm wide at top, and the gaps are c.27mm. There were 25 teeth.

These wheels resemble the interlinking drive wheels present on roller coal crushers and breakers, although other uses for such wheels are possible. The roller coal breaker was developed from crude precursors into a useful piece of equipment by Battin in America in the 1840s. The idea was widely copied, particularly after expiry of his patent in 1858 (Pinkowski 1949). Fulton (1906, Fig. 4) shows a coal breaker constructed by the Link-Belt Company with particularly similar cogged wheels to the present examples.

The three sizes of drive wheels probably would have been associated with rollers nominally of 12 inch, 21 inch and 24 inch diameters. Fulton (1906, p. 55) provides a table of expected throughputs and power requirements for rollers of different sizes. Twenty four inch diameter rollers, thirty inches long could process 35 tons per hour, requiring only 20 horsepower and could break coal blocks of up to 14x24 inches. Tonge (1906, 316) stated that the Cyfarthfa washery was capable of handling 350 tons of coal in a 9 hour day – a very similar throughput.

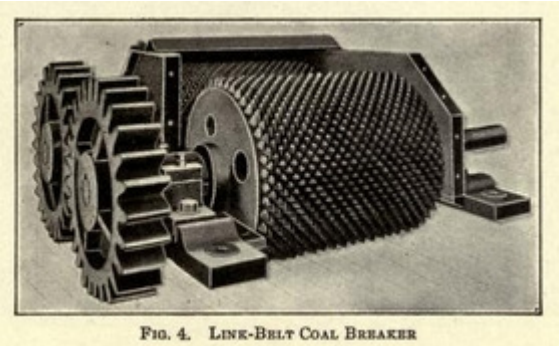

FIG. 4. LINK-BELT COAL BREAKER

A roller coal breaker of the Link-Belt Company, Chicago, after Tonge 1906, Figure 4.

Miscellaneous

The base of a small gas burner (Cat. #353), has three feet, a dished interior and a threaded brass insert for the supply, 20mm o/d and 14mm i/d. The dish is 220mm diameter, 60mm high, with the upper side of the bowl 170mm in diameter. The feet protrude slightly outside the line of the bowl. There is a flat lip with a raised rim, bearing three lugs on the rim just slightly off-set in orientation from the feet which carry small slot-headed screws for attachment of the (missing) top. A small fragment of a similar base is also present (Cat. #353).

A 55 60mm diameter and 70mm tall rounded lead cone with central iron rod (Cat. #354), is a weight of unknown purpose

A slightly curved brass block with central threaded hole (Cat. #356) is a bearing. The block is 76mm x 46mm wide and 26mm thick overall, the hole is 21mm diameter. The perpendicular thickness is variable, possibly through wear.

A copper alloy earthing plate (Cat. #357), 440x460mm and 11mm thick; has nine holes not quite evenly spaced along one long side, each 18mm diameter. There were 2 threaded holes close to one shorter side, 19-20mm diameter, and there was a third threaded hole symmetrically placed with one of those on the opposite side. There was an attached strap 250mm long, 37mm wide, 2mm thick, riveted to the plate centrally close to the other long side. The free end of the strap was folded back 80mm. This item was found *in situ*, embedded in a layer of coke. The placement of earthing plates within a bed of coke and salt is a recognised installation procedure.

A thin iron sheet (Cat #358), 1mm thick, has been pressed into an irregular facetted bowl shape, 185mm x 180mm.

A composite object (Cat. #359) comprises two springs joined by two external iron or steel rods. External corrosion prevents examination of the precise attachment of the rods to the springs. The whole object is 180mm long. There are seven turns in each spring and the two springs are wound in opposite directions. Each spring has an outside diameter of, 17mm and is formed of 3mm diameter wire. The two bars are each 125mm long and 5mm diameter. The gap between the inner ends of the springs is 77mm; the, gap between bars 18mm.

A short, broken, section of iron bar (Cat. #360) has a section of 32mmx7mm. It has a right angled fold, with 85mm length on one side and 80mm length, pierced by a hole on the other. The hole bears a bears a 72mm long, 15mm diameter, bolt with large square curved head (56mm x 46mm and is 5mm thick). The securing nut is 30mm square and 12mm thick.

A stout spring (Cat. #361) 85mm long with an outer diameter of 72mm, was hand-forged from 15mm square-sectioned bar. It has three turns and tapers to a chisel tip at either end.

A brass rod (Cat. #362) 58mm long was 3mm diameter, except for a length of 2mm from one end where it narrowed to 2mm diameter.

A slab of lead (Cat. #363) measured 369mm x 82mm x 11mm. One surface was planar, the other slightly wrinkled.

A corroded electrical cell (battery) (Cat. #364) was 77mm long and 18mm diameter. There was a copper alloy contact 5mm in diameter in the centre of one face. The whole item was very decayed

A handled plate (Cat. #365) overall 330mm long and 95mm wide in the centre of the flat plate, which was 230mm long. At each end the plate curves around a possible rivet - that at the proximal end has a 35mm head, that at the distal end

a 45mm head; the 100mm long circular-sectioned handle swells towards its tip, to a maximum of 30mm diameter, just before the end.

An irregular half ring of wrought iron sheet (Cat. #366) was 215mm in maximum width and 2mm thick. The internal curvature was equivalent to a diameter of 120mm. The piece varies from 50 to 70mm wide.

Discussion

The metalwork assemblage from the site was largely disturbed from its original location – either within demolition deposits or removed from the site by mechanical excavation.

The majority of the items were derived from the structure of the coal washery and crushing plant, the transport infrastructure and the water supply. There were very few items derived from the machinery of the plant and possibly none at all from the Coppée ovens. This suggests that the demolition and salvage of useful metal was thorough.

It may be significant that the drive wheels from a coal breaker or crusher (Cat. #349-352) are some of the very few pieces of the heavy plant recovered. Wear on cogged drive wheels in such a dirty environment may have necessitated their replacement, so these wheels were not necessarily an active part of the plant at the time of disuse.

Other heavy castings from the machinery (e.g. Cat. #300-301) appear to be associated with the lower ends of conveyors from the washery, and so may have been abandoned in their below ground level settings.

The large structural box-work and girder castings of the assemblage are likely to have remained in situ in the building remains until disturbed by the constructional groundworks.

The water supply system for the plant comprised, at least in part, distribution via cast iron pipes with control valves produced by Blakeborough & Sons of Brighouse (Cat. #321-323). None of the valves was retrieved under archaeological conditions, so it is not known whether this water system was part of the 1880s works or the 1890s washery.

The assemblage is interesting, for it largely dates to within the period when bulk steel was gradually supplanting wrought iron as the construction material of choice (indeed, the introduction of bulk steelmaking was, of course, the purpose behind the construction of the Coppée coking works). Very few pieces of the assemblage are, however, actually made of steel; most of the metalwork is still of either cast or wrought iron. Most of the fastenings (nuts, bolts etc.) are still apparently hand-made.

There are, however, glimmers of modernisation when compared with the mainly slightly older assemblages from Ynysfach Ironworks and the Ffos y fran project. There are slightly more objects of steel, there is a greater use beginning to be made of hex-headed bolts and nuts and the internal plateway system of the Cyfarthfa Ironworks has finally (by 1882) been replaced by edge rail systems.

As seen on those other sites, the edge rail systems (both standard and narrow gauge) have produced large quantities of screws, bolts, spikes and fishplates during track laying, replacement and final removal, which dominate the transport component of the assemblage; there are very few of the larger items of rails or chairs.

As well as the railed transport systems, the site produced wheels probably cart from a hand cart and a wheel barrow.

Although most of the assemblage is likely to relate to the steelworks period, there is a small proportion of earlier material. Two substantial pieces of iron (Cat. #287-288) may be associated with the earlier coke ovens, one probably a structural support binding, the other a hinged plate of uncertain purpose. The pre-1882 phase also produced evidence for the plateway system adjacent to the ovens, which employed lightweight stone sleepers with an Outram-style plate. A single unstratified example of an Outram-style channel plate (Cat. #242) may be indicative of the associated plates. There were also other fragmentary pieces of plateway track, including a complete plate with very narrow integral chairs (Cat. #241), a pointer fragment (Cat. #243), and a horned sill (Cat. #244). The plate and sill cannot be paralleled precisely in examples from other sites, but the late use of horned sills at Cyfarthfa compared with other ironworks has been discussed previously (Young 2014a, 14).

The tool assemblage from the site includes several examples of spanners, long handled tools, a shovel and a possible rake fragment (Cat #265-272, 280, 282) that may have been employed in the coke works. Other tools, including prise bars, a chisel, a wedge and a mandrel (Cat. #273-278) are either mining tools or for manually processing coal (or perhaps coke) in the stockyard. The slightly larger size of the implements compared with the underground tools from Ffos y fran may hint that these tools were or overground use.

Recommendations

The assemblage contains a small number of pieces for which both illustration and retention is recommended. Some twenty two items have been identified in the catalogue (Table 1) as being worthy of illustration in the site report; these same items should be retained if possible.

References

FULTON, J., 1906. *Coke*. Scranton. 476pp.

PINKOWSKI, J. 1949. Joseph Battin, Father of the Coal Breaker. *Pennsylvania Magazine of History and Biography*, **73**, 337-348.

TONGE, J. 1906. *The Principles and Practice of Coal Mining*. London, Macmillan.

YOUNG, T.P. 2014a. Metalwork from Ynysfach Ironworks. *GeoArch Report 2014-19,* 69pp.

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Table 1: Summary Catalogue. WB items are from the watching brief. Items labelled 'keep' are in Swansea and 'store' in Caerphilly at the time of writing. 'Scrap pile' means the item was extracted during groundworks, not under archaeological control.

no	photos	context	notes	location	draw?
1	322	2066	wrought iron bar: 720mm length of c.20mm square bar, narrowing and corroded both ends		
2	225	none	wrought iron bar: 490mm long, 20mm square		
3	322	none	wrought iron bar: 500mm length of 12mm square bar passing into highly corroded section, possibly curved		
4	361	2071	curving wrought iron bar, overall 80mm wide, 11mm square		
5	353	u/s bag	square sectioned rod fragment slightly flaring one end, 114mm long, 9mm square, flaring to 16mm before broken		
6	353	u/s bag	iron bar: twisted square-sectioned rod, 245mm long, 8mm square		
7	353	u/s bag	iron rod, probably twisted, 118mm long, 8mm square		
8	362	2312	twisted square sectioned rod, 185mm long, 7mm square		
9	353	u/s bag	wrought iron rod: bent in right angle, 125mm long, 7mm diameter.		
10	326	none	wrought iron rod: 1140mm long, 50mm diameter rod		
11	332	2066	wrought iron bar: varying from round to square 1745 long, square 455mm long, 35mm square, round 35mm diameter		
12	299	none	wrought iron rod fragment: 200mm long, 30mm diameter		
13	322	2066	wrought iron rod: 410mm length of 30mm round rod		
14	332	none	wrought iron rod: round bar with point on one end, 1750mm long 30mm diameter		
15	332	2132	wrought iron rod: 1660mm long with one pointed end, 25mm diameter		
16	322	2132	wrought iron rod: 530mm of 23mm diameter rod		
17	299	none	wrought iron rod fragment: 360mm long, 20mm diameter		
18	322	2132	wrought iron rod: 550mm length of 20mm diameter, passing into short hook at one end		
19	322	2132	wrought iron rod: 620mm length of 20mm round bar		
20	364	2132	iron rod, 190mm long, 18mm diameter		
21		WB	220mm long 16mm diameter rod	store	
22	362	2312	wrought iron fragment 100x6mm diameter rod		
23	341	none	wrought iron bar: 300mm long curved iron bar, 95mm x 12mm section		
24	312	none	wrought iron bar fragment: 90mm x 18mm x 320mm		
25	312	none	wrought iron bar fragment: 90mm x 20mm x 600mm		
26	312	2132	wrought iron bar fragment: 80mm x 12mm x 280mm		
27		WB	wrought iron bar fragment: 310x80x15mm	store	
28		WB	wrought iron bar fragment: 80x8x450mm	store	
29		WB	wrought iron bar fragment: 75x10x330mm bar with semi-circular end	store	
30	337-338	none	wrought iron angle iron: 970mm long, 75mm sides, 10mm thick; one end has face folded as termination and bears 20mm diameter hole		
31	312	none	wrought iron bar fragment: 62mm x 8mm x 290mm		
32	312	none	wrought iron bar fragment: 60mm x 18mm x 190mm		
33	312	none	wrought iron bar fragment: 60mm x 5mm x 200mm		
34	312	none	wrought iron bar fragment: 60mm x 8mm x 215mm		

no	photos	context	notes	location	draw?
35	312	none	wrought iron bar fragment: 50mm x 8mm x 200mm		
36		WB	wrought iron bar fragment: 90x43x6mm	store	
37	362	2312	Wrought iron bar 187x40x7		
38	318	none	wrought iron bar fragment: 40mm x 10mm section, 300mm long, rounded tip on preserved end with 30mm diameter hole		
39	332	2132	wrought iron bar: 1380mm x 40mm x 28mm		
40	353	u/s bag	wrought iron bar fragment, 173x36x7mm		
41	225	none	wrought iron bar: 1020mm long, 35mm x 12mm rectangular section		
42	342	2066	folded iron bar 390mm long 30x5 section		
43	362	2312	folded iron bar, 150mm long 27x8mm, end folded back by 48mm		
44	318	none	wrought iron bar fragment: 26mm x 7mm bar, 500mm long, widening and flattening at broken end		
45	336	none	wrought iron bar: folded in 'walking-stick' shape, formed from 1020mm of 26mm x 16mm bar, 835mm overall length		
46	362	2312	iron bar fragment, 185mm x 23mm x 6mm thick, possible broken square hole at end about 17x10mm, but not certain		
47	361	2071	wrought iron bar 80x15x6		
48	322	2066	wrought iron fragment: 380mm fragment of highly corroded wrought iron - original section unknown		
49	323	none	wrought iron fragment: 265mm long corroded sliver of wrought iron		
50	361	2071	wrought iron sheet 105x57x5		
51	353	u/s bag	iron strap: twisted, fragment 233mm x 39mm x 7mm		
52	335	2132	wrought iron plate fragment: 370mm x 200mm x 12mm		
53	233	2066	wrought iron sheet: 1600mm x 530mm x 5mm sheet, with 4 rows of five rivet holes		
54	234	2066	wrought iron sheet: 3-4 mm thick, 1800mm long, 530mm wide, 3 c.20mm holes 85mm from each end and one central one 55 from side, very deformed, apparently a parallelogram with c.100 mm offset at ends		
55	235	none	wrought iron sheet: torn fragment 1370mm x 470mm x 5mm, no certain perforations		
56	236	2066	wrought iron sheet: 5mm thick, 480mm x 760mm with 6 12mm mounting holes		
57	240	2066	wrought iron sheet: 500mm x 1050mm x 4mm iron sheet, 20mm hole 55mm from centre of each narrow end,		
58	241-243	2066	wrought iron sheet: 475mm x 940mm x 4mm , 2 small mounting holes one end, the other is ?torn through a single central hole, with has then been repaired by roughly semi-circular patch held by three rivets with a new 20mmx28mm hole		
59	286	none	wrought iron sheet fragment: folded roughly through right angles, 560mm x 320mm x 3mm		
60	343	2132	wrought iron plate: square one corner corroded, sub-semi-circular hole near one edge, 545mm x 545mm x 5mm; hole 77mm from edge, 95mm wide and 40mm tall. Presumably hatch cover		
61	321	none	cast iron plate fragment: small curved fragment of 12mm thick plate		
62	321	none	cast iron plate fragment: 240mm x165mm x 12mm, with six irregularly spaced holes		
63	232	none	fragment of cast iron plate: 460mm wide, 22mm thick, 240mm surviving from end		
64	259	none	cast iron plate: complete, rectangular 870mm x 485mm x 18mm.		
65	262	none	cast iron plate: rectangular plain, 1210mm long, 610mm wide, 20mm thick.		
66	263	none	cast iron plate: rectangular, one end has rounded corners, the other angular, 1040mm x 330mm x 47mm		
67	266	none	cast iron plate: 920mm square, has small hole centrally 215mm in from one edge and 10mm across		
68	344	none	cast iron plate: 830mm x 375mm x 5mm		

no	photos	context	notes	location	draw?
69	345	2332	cast iron plate: highly altered, 420mm x 350mm x 23mm maximum, very sulphurous accretion attached		
70	348	none	cast iron plate fragment: 180mm x 130mm x 15mm		
71	320	none	steel bar: slightly bent round bar, 20mm diameter, 400mm long, steel		
72	361	2071	rivet 34mm long, 12mm diameter, head 18mm diameter and 7mm high		
73	361	2071	rivet 48mm long, 18mm diameter, head 25mm diameter and 10mm high, spread other end preserved		
74	361	2071	iron rivet with hourglass shaped copper alloy top, 46mm long, nail form unknown, roughly 4mm across, non-ferrous head like sword handle, diameter 11mm and height 4mm rounded top, then 7mm widening to 12mm at basal flare		
75	230-231	2066	wrought iron rod: 2520mm long, one end threaded to 120mm with 60mm a/f hex nut 38mm thick, no washer, other end threaded to 100mm with 60mm a/f hex nut 37mm thick and washer		
76	230-231	2066	wrought iron rod: 2410mm long, 38mm diameter, threaded for 80mm from one end, other end similar but with 62mm a/f hex nut, 35mm thick and 70mm diameter, 5mm thick washer		
77	339	none	wrought iron bolt/threaded bar: 810mm long bolt, 24mm diameter, head appears to be round, 45mm diameter and 21mm tall		
78	239	none	wrought iron bolt: 830mm long, 27mm diameter, with corroded nut or head one end		
79	347	none	square-headed bolt: small square-headed bolt; head c.35mm square, 10mm tall; 40mm threaded of 90mm shaft, 18mm diameter		
80	347	none	square-headed bolt: with square sprung curved washer, 25mm square, 10mm deep head, shank 75mm and 16mm diameter; washer 54mmx2mm		
81	347	none	square-headed bolt: 40mm head, 10mm deep, shank 105mm long, 22mm diameter		
82	347	none	bolt: highly corroded 94mm long, head 32mm x 29mm		
83	353	u/s bag	square-headed bolt: 71mm long, 10mm shaft, widens to 16mm below head but still appears round, head 30mm square		
84	353	u/s bag	square-headed bolt: fragment, 118mm long, 23mm diameter, square head 33mmx 16mm thick		
85	353	u/s bag	square-headed bolt: 172mm long, 27mm diameter ,threaded for 42mm, head 44mm square and 18mm thick		
86	353	u/s bag	square-headed bolt: fragment, 69mm long, 15mm, head 29mm square nd14mm thick, threaded for 230mm, possibly carriage bolt		
87	353	u/s bag	square-headed bolt: 137mm long, 18mm diameter, head 32mm square and 13mm thick		
88	353	u/s bag	fine square headed bolt, 211mm long, 12mm diameter, head 24mm square and 5mm thick, threaded for 40mm, tip broken		
89	353	u/s bag	broken large bolt with square nut, 270mm surviving, 24mm diameter, head 38mm square and 18mm thick, thread seen but extent not known - at least 70mm		
90	353	u/s bag	square headed bolt fragment with washer, 106mm surviving, 25mm diameter, head 34mm square and washer diameter 50mm, head 16, washer 12mm thick		
91	353	u/s bag	square headed bolt, 102mm long, diameter 12mm, threaded for 28mm, head square 21mm and 10mm thick		
92	353	u/s bag	square headed bolt with nut, overall 120mm long, 25mm diameter, head 37mm square and 20 thick, nut 44mm square nd 22mm thick		
93	353	u/s bag	square headed bolt 111mm surviving, 11mm diameter, square head 17mm and 6mm thick		
94	359	2071	square headed bolt with no visible threaded, tip missing, 113mm surviving, 14mm diameter, head 26mm and 11mm thick		
95		WB	150mm simple bolt, 28mm diameter; 42x38mm head, 17mm thick	store	
96		WB	95mm fragment of 28mm diameter bolt with c.40mm square head	store	

no	photos	context	notes	location	draw?
97		WB	75mm long simple bolt; 32 square head, 16mm thick; 20mm diameter shaft, thin square nut 27mm square and 3mm thick	store	
98		WB	115mm simple bolt, 42mm square head 6mm thick; broken, 18mm round shaft	store	
99		2012	115mm long bolt or carriage bolt, 37mm square head, 24mm diameter shaft, accretion obscures detail	store	
100	362	2312	square head bolt with square nut, 156mm long, head 34 square and 15mm thick, nut 44mm square and 26mm thick, diameter approximately 22mm		
101	362	2312	square headed bolt, 125mm long surviving, 23mm diameter, head 40mm square and 16mm thick		
102	362	2312	square headed bolt with square nut, length 128mm, head 30mm and 11mm thick, shaft c. 21mm diameter, threaded to 45mm, nut 40mm square and thickness of 21mm		
103	353	u/s bag	round-headed bolt: 160mm long, 16mm diameter, head 32mm diameter and 10mm domed		
104	359	2071	badly accreted as 248, but 88mm long, 16mm diameter, head 30mm diameter, 12mm high		
105	359	2071	dome headed simple bolt 120mm long, 12mm diameter, head 28mm diameter and 6mm high		
106	359	2071	dome head from bolt, 40mm surviving, 13mm diameter, head 20mm diameter and 11mm high		
107	359	2071	as 252, 60mm long, threaded for 24mm, diameter 13mm, head 22mm diameter, 7mm high		
108	359	2071	as 252 52mm long, 12mm diameter, snapped off before thread, 20mm diameter head 12mm high		
109	359	2071	as 252, 42mm long, diameter 12mm, head 20mm diameter, 12mm high		
110	359	2071	badly corroded as 252, 32mm surviving length, 11mm diameter, head 20mm and 9mm high		
111	365	2241	dome headed bolt or spike, tip missing, 148mm long, 20mm diameter, 33mm diameter head 13mm tall		
112	364	2132	hexagonal headed bolt, 58mm surviving, 18mm diameter, head 30mm a/f and 15mm thick		
113	none	none	bolt fragment: 430mm bolt fragment, with nut.		
114	323	none	bolt: 375mm long bolt shaft 25mm diameter		
115	359	2071	iron rod or bolt shaft 98mm long, 9mm diameter		
116	359	2071	as 256, 97mm long, 13mm diameter		
117	362	2312	carriage bolt, dome head, 89mm long, 12mm diameter, threaded for 25mm, length of square section c12mm, dome 26mm and 10mm high		
118	347	none	carriage bolt: 30mm head 5mm deep, 17mm square shank going 17mm diameter shank of which 30mm threaded, overall 80mm long		
119	353	u/s bag	dome headed carriage bolt, overall 138mm long, threaded 75mm, dome 20mm high, diameter 38mm to dome, diameter of shaft 25mm		
120	359	2071	carriage bolt, dome head, 72mm long, 14mm diameter, threaded for 33mm, length of square section c10mm, dome 34mm and 13mm high		
121		WB	carriage bolt, 180mm log, 26mm diameter, 85mm threaded on 30mm diameter shaft, 27mm square for 33mm long, head 47mm square and 23mm deep	store	
122		WB	carriage bolt; 40mm square head, 23mm deep; 18mm long 23mm square section; 85mm corroded round surviving	store	
123		WB	67mm carriage bolt, 30mm square 4mm thick head, 13mm long square section, 18mm diameter shaft	store	
124		WB	87mm carriage bolt, 30mm square 4mm thick head, 13mm of 18mm square section, 18 mm diameter shaft	store	
125		WB	67 carriage bolt, 28mm square 3mm thick head, 12mm of 17mm square section , 17mm diameter shaft	store	
126		WB	70mm carriage bolt fragment, 32x27 x6mm head, 18mm log square section, the 17mm round	store	

no	photos	context	notes	location	draw?
127	359	2071	square headed coarse (5mm pitch) threaded sleeper screw? 21mm diameter, head 31mm and 14mm thick		
128	352	u/s bag	washer: 37mm o/d, 15mm i/d, 4mm thick		
129	352	u/s bag	washer: 40mm o/d, 16mm i/d, 4mm thick		
130	352	u/s bag	washer: 50mm o/d, 23mm i/d, 4mm thick		
131	352	u/s bag	washer: 54mm o/d, 25mm i/d, 4mm thick		
132	352	u/s bag	washer: 94mm o/d, 41mm i/d, 9mm thick		
133	358	2071	washer 50 od, 26 id, 4mm		
134	358	2071	washer 50 od, 26 id, 4mm		
135	358	2071	washer 43 od, 20, 4mm		
136	358	2071	washer 43 od, 20, 4mm		
137	358	2071	washer 39 od, 19mm id, 4mm		
138	358	2071	washer 39 od, 19mm id, 4mm		
139	358	2071	washer 38 od, 11mm, 4mm		
140	358	2071	washer 38 od, 11mm, 4mm		
141	358	2071	washer, broken, 33mm, 20mm, 4mm		
142	358	2071	washer 17mm, 8mm, 2mm		
143	352	u/s bag	square washer: 85x90mm, 25mm internal diameter, 6mm thick		
144	354	2332	square washer, 90x85x5, with 25mm central hole		
145		WB	60x70x14mm, square washer?	store	
146		WB	53x63x8mm, 23mm diameter hole, square washer?	store	
147		WB	63mm square, 8mm thick, 25mm square hole, square washer?	store	
148		WB	70x83x7mm with 18mm round hole, square washer?	store	
149	320	none	wrought iron bar/double washer: 350mm x 70mm x 40mm bar with rounded ends and 27mm diameter holes 37mm from each end		
150	360	2071	square nut 28 square, 15mm thick, id 12mm		
151	360	2071	square nut 36mm, 16mm thick, id 14mm		
152	360	2071	square nut on bolt shaft, 96mm long, ll threaded, 12mm diameter, 25mm square nut, 11mm high		
153	360	2071	hex nut with bolt fragment still in place, 30mm a/f, 14mm thick, hole c. 16mm		
154	360	2071	hex nut, 48mm a/f, id 25mm, thickness 27mm		
155	360	2071	hex nut on bolt shaft remnant, shaft surviving 85mm, nut 47 a/f, 24 thick diameter 23		
156	360	2071	hex nut, 46mm a/f, id 22mm, thickness 28mm		
157	360	2071	hex nut, 47mm a/f, id 23mm, thickness 22mm		
158	360	2071	hex nut, 37 a/f, id 17mm, thickness 20mm		
159	360	2071	hex nut on square headed bolt, 60mm long, head of bolt 18mm square, 10mm high, nut 26mm a/f, 15 tall, diameter of shaft 11mm with some surviving thread, 23mm - nut appears to be washer on unthreaded part		
160		WB	32mm a/f hex nut, 27mm thick, 17mm diameter hole	store	
161		WB	40mm a/f hex nut, 20mm thick, 20mm diameter hole	store	
162		WB	32mm a/f hex, 27mm thick, 17mm diameter hole	store	

no	photos	context	notes	location	draw?
163		WB	49mm a/f hex, 40mm thick, 22mm diameter hole	store	
164	360	2071	bolt shaft with two hex nuts, each 48 a/f, id 23mm, thickness 26mm - identical nuts		
165	318	none	cotter pin: 110mm long cotter pin, 23mm x 6mm section, loop c. 28mm o/d		
166	361	2071	fastening pin, formed from 154 long, 20mm diameter, burred end from hammering to 34mm and 7mm thick max		
167	222	none	pointed wrought iron spike: 990mm long, 22mm diameter		
168	299	none	wrought iron spike: possible spike, corroded, 275mm long, up to 24mm wide		
169	219	none	barbed wrought iron spike, 280mm long, 17mm diameter in centre, 65mm long 'barb' to maximum of 32mm wide		
170	299	none	wrought iron ringed 'spike': rod with upset collar and ring on one end, 202mm long, ring o/d 70mm i/d 35mm, shaft length 100mm, square 25mm square, collar to 70mm diameter		
171		WB	200 mm long object, 17mm diameter hole in omega shaped tip of 55x50x30mm thick, with a 35mm wide flat base on a 145mm long, 20mm square, shaft	store	
172	347	none	hooked nail/spike: 106mm long, head extends 18mm, shank 15mm square		
173	357	2071	right angle headed spike, 87mm long (no tip), 10mm thick 14mm wide, head 20mm across but broken 12 deep		
174	357	2071	as 229, chisel ended, 84mm long, taper 15mm long, section 10mm square, head max width 27mm and 10mm thick		
175	357	2071	as 229, smaller, 74mm long, 9x4mm, head 20mm and 8mm thick		
176	357	2071	as 229, larger, 79mm long, 12mm square, head 24mm and 10mm thick		
177	357	2071	as 229, 93 mm long, 9mm square, head 23mmm 9mm thick		
178	357	2071	as 229, possibly not complete at tip, 81mm long, 8mm square, 23mm head and 8mm deep		
179	357	2071	as 229, but curved, 72mm long, 10x6 section, head 22mm long		
180	357	2071	as 229, 77mm long, 9x5mm, head 20mm		
181		WB	dog spike 93mm long, 10mm square 30mm across	store	
182	357	2071	chisel end hooked object 62mm long, curve 20mm wide, square section 6mm		
183	362	2312	short spike with hammered end, 173mm long, max section 25mmx13mm, tapered in from sides at 100 down from top,		
184	347	none	triangular headed nail/spike: 175mm long, 15mm x 20mm section, head 45mm wide, semi-circular in plane of nail		
185		WB	225mm long spike, tip turned 180°, upper end with irregular 22-25mm a/f hex nut; possibly up to 12mm on wide threaded end; 180x60mm overall	store	
186	354	2332	large square section wrought iron nail, 159 long, 11m square, head 16mm irregularly square, 5mm thick		
187	347	none	nail: possible square section nail up to 10mm, 120mm long		
188	347	none	nail: slender chisel ended nail, 150mm long, 8mm square at top, head circular 20mm diameter,		
189	347	none	nail: square-headed nail, shank 115mm, 22mm square head, 8 mm thick, shank up to 15mm square		
190	353	u/s bag	nail: 72mm long, square-sectioned 8mm square, head 16mm, point missing		
191	354	2332	piece of wood with highly corroded nail - 103mm long, 6mm x 4mm		
192	356	2071	square sectioned flat head nail, 80mm long, 7mm tapering, head 18mm max dimension		
193	356	2071	as 192 but more corroded		
194	356	2071	as 192 but smaller and fragmented		
195	356	2071	as 192 but smaller and fragmented		
196	356	2071	as 192 but smaller and fragmented		

no	photos	context	notes	location	draw?
197	356	2071	as 192 but smaller and fragmented		
198	357	2071	probably handmade wood nail, flattened 67mm long, 8mm wide, 4mm thick, rectangular head 12mm x 4mm		
199	353	u/s bag	chisel ended dome headed spike or nail, 97mm long, 12mm diameter, head 22mm diameter and 10mm high		
200	355	2071	dome headed nail, chisel ended, stout, 100mm long, 10mm diameter flattened to chisel, head 20mm diameter, height 8mm		
201	355	2071	as 200		
202	355	2071	as 200		
203	355	2071	as 200		
204	355	2071	dome headed nails, smaller, with square section, 80mm long, 7mm square, flattening to chisel, head 15mm diameter and 3mm high		
205	355	2071	as 204		
206	355	2071	as 204		
207	355	2071	as 204		
208	355	2071	as 204		
209	355	2071	as 204		
210	355	2071	as 204		
211	355	2071	as 204		
212	355	2071	as 204		
213	355	2071	as 204		
214	355	2071	as 204		
215	355	2071	as 204		
216	355	2071	as 204		
217	356	2071	wire nail 115mm long, 4mm diameter, head 10mm		
218	356	2071	as 217		
219	356	2071	as 217 but fragment		
220	356	2071	as 217 but fragment		
221	356	2071	as 217 but fragment		
222	220-221	none	flat bottomed wrought iron rail, 90mm high, 95mm wide base, head 50mm wide up to 30mm deep rounded section, riser 13mm wide, base 20mm in centre, 8mm at margins, 1470mm overall length		
223	395-396	scrap pile	rail, possibly steel , symmetrical flat bottomed rail, 80mm wide, 85mm tall, 40mm wide bullhead section 30mm deep riser 17mm thick, base 20mm in centre, 2.05m long		
224	407	scrap pile	rail, 1940mm long fragment, bullhead profile, height 120mm, 63mm wide, 15mm riser, 60mm tall, one side asymmetrical flange one side 36 and 24mm at centre,		
225	315-316	none	railway sill: steel narrow gauge railway tie for flat bottom rail, 1210mm long, folded up from slots 100-125mm and 175-190mm from end would take maximum 80mm width base; 105mm x 4mm main section but sides folded down to 18mm below top. Suggests flat bottomed rail of 60-65mm width and gauge of 890mm	keep	draw

no	photos	context	notes	location	draw?
226	305-307	none	railway chair: chair for narrow rail, slot 90mm wide at base, expansion 35mm deep, then 65mm wide for top 40mm or 85mm deep. 355mm x 110mm base, slightly sigmoidal with offset holes, fastened by bolts or spikes, tip not seen, 170mm preserved 18mm diameter, 35mm domed head 11mm tall	keep	draw
227	390-391	scrap pile	single side chair, base plate with rounded ends, overall length 300, width, 80mm, base plate 20mm thick, cheek face 105mm from end, 34 tall, gap, 19mm tall, and 35mm undercut, central nail either end, 20mm surviving below, 5mm square section, 35mm from end	keep	
228		WB	light chair for flat bottomed rail; baseplate 10x3 inches; 5/8 inch holes in diametrically opposite corners; 3 inch wide flange slot, raised side 5/8 inch thick, comes in 1.5 inches and with 1.25 inch vertical gap, opposing side is 0.2 5inch hooked flange.	store	draw
229	223	none	fishplate: 510mm long, 67mm wide, 25mm thick, bevelled edges narrow face 50mm, four 25mm holes at 120mm centres		
230	304	2132	fishplate: 500mm long, 76mm wide, bevelled edges, holes circular 30mm, one end bent up		
231	304	2066	fishplate: 455mm long wrought iron fishplate, holes variable from one end round, square, elongate and elongate; the two at one end are square on reverse		
232	304	2241	fishplate: 500m long, wrought, 80mm x 22mm bevelled edges, all holes round 30mm		
233	304	none	fishplate fragment: 350mm surviving, broken at 3rd hole, 80mm wide 23 mm thick, slightly recessed narrow face, probably cast iron		
234	304	none	fishplate fragment: 270mm surviving, 65mm x 20mm bevelled edges, end hole elongate 30x45mm, inner round 30mm		
235	313-314	none	fishplate fragment: 230mm long fragment of fishplate as 234		
236	321	none	fishplate: 460mm x 73mm x 20mm, fishplate with bevelled edges, round holes 103mm apart, starting 33mm from end		
237	354	2332	possible fishplate fragment, 318mm surviving, bevelled edges, 80mm wide, 20mm thick, two holes surviving 20mm diameter, 175 centres, one 50mm from one end		
238	363	2332	fishplate, small wrought iron, bevelled edges, 360mm long, 43mm wide, 9mm thick, 4 holes each 22mm diameter, 45mm to centre on ends, spaced by c. 90mm	keep	
239	313-314	none	fishplate: 360mm x 45mm x 10mm small fishplate with four square holes, slightly bevelled edges, holes 20mm square at 90mm centres		
240		WB	380x65x8mm thin bar, with four holes 22mm diameter, fishplate	store	
241	227-229	none	plateway rail: 3 foot long, entire, chair 130x50mm with two raised bosses on inner side, base of rail shows recess below rising section, 30mm thick flange on outer face, riser 72mm off base at ends, 100mm in centre, flange has inset 45-85mm from outer edge, about 5mm deep, crest of riser is 25mm inside inner edge of chair, rail 115mm wide in centre, no fixing holes visible	keep	draw
242	379-382	scrap pile	channel rail fragment, 725mm long piece, width 120mm, chair 140mm x 85mm, slight rounded lump extends on wide, lower face has central, 25mm wide, 5mm high, crenulated sides, 15mm thick typically on vertical, wider at base, channel 80mm, sides c. 40mm high, badly damaged , accreted.	keep	draw
243	294-295	2279	tramway pointer: probable broken tip of tramway pointer, 230mm long, maximum section at break 55mm wide by 60mm tall	keep	
244	308-309	2306	plateway sill: horned sill, 830 mm centre bar, 160mm to tip, 45mm x 45mm 'D' section; lotus head 230mm long, 110mm wide, upturned tip as outer cheek, inner horns do not survive, head 20mm thick	keep	draw

no	photos	context	notes	location	draw?
245	366-371	in situ sleeper block	thin stone slab, 550 long y 390 wide maximum thickness 72mm. Impressions visible of the integral chairs. Chair 1 75 wide 140 long, second is 74 wide and fades out at 125. iron spike head is 35mm x 18mm, 30mm proud, section where disappears into stone is about 16 x 11mm. method of securing into stone is not known, hole must be very small and does not extend through slab, rust might conceal lead or wood, just possible one of the chairs has a semi-circular end with a maximum length of 130mm.	keep	draw
246		WB	Cast iron wheel, 750mm diameter, 50mm wide, hub 75mm diameter extends 35mm out on one side, axle hole c.35mm but obscured, 8 spokes	store	draw
247	283-285	none	five spoked wrought iron wheel, with attached short stub axles, possibly from wheelbarrow? marked 'PERKS WROUGHT IRON WHEEL LYE.. PAT No. 18595', on possible enamelled or plated 'hub'. 40mm x 8mm rim section, 14mm diameter spokes, hub in two halves total 30mm thick, axle swells to hub one side, not the other, suggesting means of assembly; 65mm protrudes each side of the hub which is 82mm diameter	keep	draw
248	225	none	wrought iron ladder rung: 470mm long 17mm diameter wrought iron rod with upset collar thickening to 20mm at both ends with 15-17mm length of return to 17mm outside,		
249	251	none	ladder fragment: rungs 22mm diameter, 370mm between uprights, uprights 60mm x 4mm section, rungs treated like large rivets, wrought iron; 3 steps, over 650 mm, 230mm between rungs.		
250	252	none	ladder fragment: one rung with fragments of uprights, same dimensions as #249.		
251	253-254	2055	ladder: 9 rungs, each circular section, 20mm diameter, 30cm between uprights, ends treated like rivets; uprights 53mm x 10mm, 270mm apart, one end uprights truncated at slight angle, the other end rounded termination; rounded end has holes 30mm and 130mm from end; holes 10mm diameter; overall 2.56m long		
252	255	2163	ladder fragment: 7 rungs remaining, circular section 24mm diameter, 365mm between uprights, uprights 60mm x 10mm wrought iron, 240mm between rungs, 4 rungs are missing at one end; 2.86m long overall		
			CHAINS & HOOKS		
253	224	none	wrought iron chain: 1650mm long, elongate links, 90x45mm with long straight sides, 12mm diameter material		
254	303	none	wrought iron chain: one end has large oval loop, 19 links, then hook; loop 156mm x 115mm and 20mm diameter section, other loops 110mm x 56mm and 15mm diameter section; hook 240mm overall, max width of 120mm; overall length 1625mm	keep	
255	310-311	none	wrought iron fastening ring: stem snapped off, 50mm diameter at fracture, bar 50mm diameter formed into ring 250mm o/d , 150mm i/d		
256	364	2132	ring headed attachment snapped of with single link attached, 112mm long, diameter of shaft 22mm, eye o/d 62mm wide, link deformed 62mm long, 12mm diameter. Link tight onto loop and fractured end extends out – could have taken hook to hold door or something similar, rather than a simple chain		
257		WB	16mm square bar, formed into crude hook form 270mm long	store	
258		WB	17mm round rod formed into 'S', 270mm long and 75mm wide	store	
259	361	2071	small 'S' hook, 47mm long, round rod 5mm diameter - door hook or equivalent		
260	323	2132	galvanised vessel: galvanised bucket handle and escutcheons		
261	346	none	galvanised sheet vessel: thin galvanised metal fragments, possibly from thin sheet metal vessel		
262	361	2071	wrought iron handle/link 165mm wide, 95 tall, round sectioned in centre of bow 19mm diameter, square sections taper to blunt point, 12mm square section, point relatively straight and 58mm long each side	kept	

no	photos	context	notes	location	draw?
263	353	u/s bag	wrought iron looped handle: 120mm wide, 85mm loop height; total height 122mm, with short shank and possible nut, 38mm square by 12mm thick		
264	353	u/s bag	small bow-shaped handle, now spread and 182mm wide, tips have 9mm hole in flared pad, 14mm wide, one end with rivet in, bar 7mm diameter		
265	244	none	open-ended spanner: 350mm long, 42-45mm wide gap, head slightly angled to flattened handle 48mm x 15mm, head 21mm thick		
266	318	2066	open-ended spanner: 290mm long spanner, head 77mm wide and 32mm gap, handle 28mm x 9mm		
267	297-298	2066	open-ended spanner: 425mm long, shaft 350 and 30mm x 20mm section, gap is 33mm	keep	draw
268	297-298	2241	open-ended spanner: 560mm long, 20mm diameter, gap 50mm, head 22mm thick, bent in slight S form	keep	draw
269	279	2055	wrought iron tool: hooked tool with round ring handle, 1200mm long, handle 140mm wide x 130mm long, 22mm diameter rod, right angled tip 80mm slightly flattened		
270	291-292	2066	wrought iron tool: 730mm of shaft surviving, no handle, 110mm flattened hook, 18mm diameter		
271	291-292	none	wrought iron tool: 950mm long tool, small suspension loop and large curved hook, 13mm diameter, hook 130mm across 55mm return, loop 60mm o/d, 32mm i/d	keep	draw
272	293	2132	wrought iron tool: 1120mm long hook tool, 15mm diameter rod, 112mm x 85mm outside handle, 83mm x 50mm inside, short spikey hook turns 55mm	keep	draw
273		WB (in trough)	prise bar with sigmoidal flattened tip (cf smiths tongs),625mm long, 530mm of 22mm diameter, flattens down to 45mm long basal surface widening tip 25mm wide inclined at 10 to shaft	store	draw
274	297-298	2066	possible prise bar: chisel tip, 1190mm long, 30mm diameter, chisel 30mm wide		
275	332	none	wrought iron bar: 1430mm long, 31mm square section 400mm long including chisel end, then round section 30mm diameter		
276	296	none	cold chisel: 320mm long, 60mm diameter, tapering to 60mm wide edge	keep	draw
277	342	none	wrought iron wedge: possible wedge, 165mm x 40mm x maximum 10mm thick	keep	draw
278	350-351	u/s bag	mandrel: half a mandrel, 225mm long, representing half of original c.410mm, cheeks 30mm, square section close to eye 20x30mm, hole would have been 60mm long	keep	draw
279	357	2071	small broken fragment of possible hafting wedge, 48mm long x 16mm x 8mm, burred on top where hit		
280	297-298	none	fragment of shovel handle: 240mm long		
281	323	2066	smiths' tongs: 420mm long, handle 10mm diameter, cheek 80mm x 20mm x 7mm	keep	
282		2012	12mm square bar slightly curved, forged to point, like fork tine but may just be bent spike	store	
283	289-290	none	wrought iron tool/latch: bar with right angled flatted tip and loop head , 320mm long, 20mm diameter, 90mm hook, c.55mm o/d head, 25mm i/d	keep	
284	289-290	none	wrought iron tool/latch: bar with flattened tip 380mm long, 15mm diameter, head 57mm o/d, 28mm i/d, hook 36mm	keep	
285	289-290	2132	wrought iron tool/latch: 12mm square bar, flatted tip at right angles, 550mm long, 47mm surviving of broken hook		
286	354	2332	large heel tap, shaped like horseshoe, 82mm long, 71mm max width, 5 nails, section 12mmx4mm		
287	327-331	none	cast iron hinge plate: overall length 1390mm long, 1280mm on edge away from protruding lugs, which are 110mm wide, main part 162mm wide, 17 rivets down each long side, lugs have holes 30mm x 20mm, adjacent to part with lug are raised loops one with 67mm pin extending, pin 24mm diameter, loop external diameter 45 mm. Raised edges of plate are 40mm wide along line of rivets 43mm deep . (fitting from early coke oven??)	keep	draw

no	photos	context	notes	location	draw?
288	281-282	2362	structural iron: fastening for bar from wall in beehive oven? Cast iron bar with terminal loop, 155mm x 45mm bar section, 480mm surviving, snapped end, 200mm long x 260mm wide head with 50mm x 145mm slot, inner long face of slot is coincident more or less with remains of attached brickwork	keep	draw
289	237-239	none	cast iron securing plate: with raised double cross bracing and associated rims to mounting holes. 1080mm x 400mm overall; 8 holes, each 40mm diameter, containing 32mm diameter wrought iron bolts with 48mm a/f heads, 700mm long, threaded for 50mm at inner end. 4 bolts , 1 headless in situ, main casting 37mm thick, with ribs up to 25 mm		
290	260-261	none	cast securing plate: hole and collar slightly off centre, 460mm x 310mm, 25mm thick with raised sections , hole 180mm from one long edge, centrally in other direction, 50mm diameter hole, raised collar 125mm diameter, 4 radial braces to edges; contains 45mm diameter bolt, with asymmetrical hex nut approximately 60mm a/f		
291	264-265	one	cast iron securing plate. Cast iron plate 770x460x50mm, has recesses 70mm square to take heads of bolts, leading to circular holes 50mm diameter; bolt 34mm diameter with square head 50mm and30mm deep; edge of recess 40mm from margin, one in centre of each narrow side; surface of plate with recesses has grey mortar.		
292	270-272	none	cast iron mounting plate: 770mm wide by 650mm surviving width, cast iron sheet with thickness of 40mm; two square holes lie 160mm from complete end and 100mm from edges, 25mm square; single hole 380mm from complete edge and 240mm from broken edge, 20mm square, associated with diagonal rectangular impression, 60mm wide by 210 mm surviving to break and 3mm deep; wrought iron object emerges from accretion 230mm from compete edge and 380mm from broken edge, protrudes 28mm and is 12mm wide - has a poorly-preserved 25mm square head on base		
293	245-246	2055	cast iron reinforced beam: structural casting with central bolt; overall length 2.6m; 0.46m wide base, 50mm thick, bears curved flange from end to end, 230mm high in centre; lateral flanges are more rectangular but with curved corners; all flanges 35mm thick; flanges support central round section 140mm diameter, bolt comes up through 50mm diameter, nut hex 90mm a/f and 55mm tall, washer 105mm diameter, 10mm thick; lateral surfaces have two courses of bricks, with lead sheet below along one long side; lower surface presumed flat but not seen		
294	397-399	scrap pile	box work structural cast iron 940mm long, 270mm wide, 30mm thick, 260mm tall, transverse member 720mm from one end		
295	388-389	scrap pile	cast iron object, tray like area 430mm long. 250mm wide, 15mm thick, one end rounded and has protruding flange 45mm long, with three mounting holes, 17mm diameter, curving side plates from 90-320mm, other end has flange on preserved side, also 45mm wide with one surviving hole 18mm		
296	392-394	scrap pile	timber support, Square sectioned open end box with out-turned flange at open end, perforated closed plate, 360mm square, flange extends out 80mm, 650mm tall, 110mm diameter hole with six radial 70x30mm slots, two have protruding wrought iron which may be bolt ends. Appears to be some timber inside		
297	401	scrap pile	1.9m long structural open cast iron box, 260mm wide, 270mm tall, has transverse lateral strap of wrought iron roughly in middle held by two large bolts with hex nuts		
298	402-404	scrap pile	as #308, bur partly filled with bricks, one end has raised stop on one side and bolted-on second box-work component, with terminal bolt, 161cm long, 250mm tall, 250mm wide, 24mm thick, raised stop 470mm from end with slightly overhanging profile, 50mm high, attached piece as 50mm high basal section500mm long, 250mm wide300mm tall, square nut on attachment to first beam, and hex on terminal bolt		
299	247-248	none	segment of circular cast iron grating: maximum width 1045mm , maximum thickness 110mm, dropping to 30mm thick at edge, 325mm wide, has five slots each 20mm wide, linked by central bar 35mm wide, 70mm flat zone at margin, if circular would be approximately 1200mm diameter.	keep	

no	photos	context	notes	location	draw?
300	372-374	scrap pile	cast iron plate with two angled supports bolted on. 2.17m long by 1.84m wide and 42mm thick. Acute side of support pates 430mm from one end, 190mm in from sides, each plate 970mm long, 39cm wide, 30mm thick on base, bolts hexagonal, 45mm a/f, 22mm deep head, bolts, Bolts approximately 100mm from end of support plates and 50mm in from sides. Webs go all the way to the ends of the base of supports, 30mm thick, 200mm maximum height gap of box (i.e. thickness of supported beam), box 460mm x 130mm, has central circular hole 30mm diameter, supports at roughly 60 degrees to base.		
301	375-378	u/s	casting for angled support, overall height 740mm, upright C shape section 395mm wide, 30mm section and 140mm thick, highest point of box 450mm low side 330mm, base plate 630mmx200mm 55mm thick, 4 round holes close to rounded corners 30mm diameter, bottom of lug on low side 270mm above base, lug protrudes 80mm, 40mm diameter hole, 110mm thick, does not extend all the way to front plane, tall side cures in slightly at 540mm, lug above, external diameter 110mm, hole probably 30mm diameter, support slot 130mm deep, 130mm wide, 150mm thick, has slot from each side total width of 180mm, 40mm wide. hollow part of box 105mm deep, back face planar including rear face of base plate.		
302	418-419	scrap pile	rectangular base plate 425x370mm, hole 220mm square, offset 130mm from one end 65 mm from other, eight mounting holes, 18mm diameter, raised curved to 368mm across and 358mm, minimum of 55mm off base plate, max 110mm, baseplate 17mm.		
303	275-276	2055	cast iron curved rest: 20cm square base plate 20mm thick, 4 ribs support curved rest 265mm above base; flanges and rest are 20mm thick, 150mm long at rest, chord is 140 mm, rest approximately 160cm diameter equivalent. Single square head on inner corner of flange on one side but does not appear to be actual fastening.		
304	323	none	cast iron fragment: small fragment of casting with nut and bolt		
305	341	none	cast iron piece: 325mm x 100mm x 12mm roundedly rectangular cast iron piece slightly irregular		
306	341	none	cast iron piece: 295mm long, 102mm wide, pointed end, 11mm thick		
307	361	2071	curving fragment of triangular section - broken casting, overall length 43mm, thickness of 8mmx4mm		
308	361	2071	casting fragment, 65mm x 40 x 9mm with remains of hole c. 14mm		
309	361	2071	casting fragment 86mm true width, 47mm wide remaining, thickness up to 12mm , thins to surviving edges		
310	361	2071	casting fragment, 90mm surviving length, max surviving width of 50mm, 11mm thick expanding to 14mm thick down one edge with linear step, thin part bears 15mm hole		
311	341	2132	sub-semi-circular piece of cast iron: 230mm wide, 160mm tall, 12mm thick, small notch out of top edge		
312	273-274	2055	cast bracket with pivoting mount: pivoting rod attachment lies in angle of bracket; one arm of bracket has overhang on base (to hook over beam/girder?); the swinging arm 40mm diameter, secured by bar/cap/split pin cotter; both arms of bracket have four circular holes 50mm in from edges, 80mm and 230mm from outer edges of brackets, 30mm diameter; base plate 380mm x 230mm; 35mm thick flanges, thickening to 65mm for front 40mm of basal flange, planar side of bracket is also 380mm x 225mm and 35mm thick. Very well preserved, unclear if cast iron or cast steel.		
313	385-387	scrap pile	2 plates, probably wrought iron, just possibly steel, plates secured with four long bolts (Cat. #313) apparently provides timber jointing. each with four holes , secured by four long bolts with nuts and multiple washers. Plate 1120mmx190mmx10mm, square headed bolts, 50x55m head, middle 40mm square, end 45x45mm (end with multiple bolts). Bolts 22mm diameter, 4 holes in plate, 30mm diameter, other plate 1060mmx190mmx10mm, also 4 holes. end bolt square nut no washers, middle bolt, 13 washers, from 55mm o/d (9 of), 70mm (3 of), 100mm (1 of) big washer 9mm, medium, 5mm , small 4mm, isolate bolt has three washers 70mm and 2 55mm ones. bolt lengths 330mm head-nut, 370mm, 270mm (in reverse order). nuts are square,40mm sq x 15mm isolated, 50x50x25mm middle and end is 40mmx15.		
314	400	scrap pile	wrought iron strapping , two half squares, 102cm long, 30cm tall, section 60mm x 12mm thick, attached by bolts with square head, hex nut and square washer, through flanges which turn out 80mm		

no	photos	context	notes	location	draw?
315	256	2251	rectangular wrought iron frame or binding: widens on side with drifted hole and has welded-on external ring as collar. 24mm x 7mm section, rectangle 190mm x 105mm, circular collar is 42mm with central hole roughly 20mm, centrally placed on one long side		
316	268-269	none	sheet iron construction: highly deformed objected, comprising length of angle iron bolted to series of iron plates; 3.55m long angle iron, folded in right angle 2.20m from one end; the angle iron is 70mmx70mm and 9mm thick; bolts come from under the main sheet and are secured with square nuts and washers on top of the angle iron, these bolts have very small heads on lower side; in the other direction rivets pass out with their heads on the inner side of the angle iron and are hammered flush on the outer side of the attached sheet. The attached sheets show a rough edge along the angle iron possibly suggesting the sheet originally continued in the opposite direction to the angle iron flange. Spacing and size of the bolts seems irregular; the size of the sheets also seems irregular, but more complete sheet seems to be 600mm by 1110mm and 2-3mm thick.		
317	249	2066	angle iron: 90mm x 90mm, 15mm thickness, 2.16m long		
318	257-258	none	iron 'door' or hatch: maximum length 1980mm centrally, long sides 1840mm, width 740mm. thickness of sheet is 10mm; hole 70mm down from pointed end, 20mm diameter; attachment for iron ring is 760mm down from pointed end, attachment for ring is 70mm at base, 105mm tall, interlinked with ring 150mm diameter and 26mm round section.	keep	
319	319	none	wrought iron bar: 770mm long iron bar, 85mm x 20mm section, with 150mm of 30mm round threaded bar on one end; bar shows mortar, roughly central 29mm diameter hole		
320	324-325	none	wrought iron connector: paddle shaped object - round ended wrought iron bar with two holes, 360mm x 90mm x 20mm, welded to stout rod protruding 480mm at 45° to plane of bar, and 30mm diameter, threaded for 70mm		
321	405-406	scrap pile	valve labelled Blakeborough & sons makers Brighouse, square brass mechanism. Overall length 78cm long, including valve, attached by bolts to short flanged section, 380mm from mid flange to disappearance into socket, fragment of socketed and leaded pipe. Connection 110mm o/d end section 95mm o/d and 75mm i/d, overall 460mm tall.		
322	408-409	scrap pile	T shaped pipe, with valve on side arm, overall length 147cm, 170mm ext 150mm int, socketed pipe, flange and bolts on side arm side, inscription BLAKE / MANUFAC /BRIGH. Side arm 140mm i/d 240mm flange, but broken, overall valve length 82cm, flange just below square brass adjuster.. Adjuster parallel to one side of long part of T		
323	416-417	scrap pile	BLAKEBOROUGH / & SONS /MAKERS / BRIGHOUSE valve itself 225mm between bolted flanges, overall height 550mm, bolted to pipe with id 80mm one side ext 100mm, collar 190mm, on both sides, on side then has curving pipe inserted into socket 340mm long,		
324	280	2055	valve control wheel: spoked wheel with round-sectioned rim and remains of six spokes, centre missing; 310mm diameter, 32mm diameter rim, 28mm x 17mm flattened-section spokes		
325	250	2066	cast iron pipe fragment: has bolted union near one end, both ends fractured, 800mm overall length, 50mm thick collars together, collar diameter 225mm, pipe o/d 110mm, 75mm i/d; 4 bolts with square nuts on union.		
326	412	scrap pile	1580mm long pipe fragment, has one central ring in this length od 125 10mm thick mainly,		
327	383-384	scrap pile	cast iron pipe, 680mm between flanges, 140mm o/d 90mm i/d o/d flanges 250mm, flanges 25mm thick, 4 bolt holes in each flange, square 30mm		
328	413	scrap pile	102cm pipe section, i/d 144mm, ext 168mm		
329	414	scrap pile	1560mm long fragment, no ends, ext 180mm, i/d 152mm		
330	415	scrap pile	two jointed pipe fragments, 1360mm overall, ext 130mm, i/d 95mm, collar on socket to195mm		
331	410	scrap pile	92cm pipe fragment with socketed join, 140mm internal, 170mm outside, lead sealing, outer diameter of socketed end, 240mm, from edge of flange 335mm to centre of broken off side branch, 100mm i/d		

no	photos	context	notes	location	draw?
332	397	scrap pile	composite pipe, wrought iron tune attached to cast end plates, 1520 mm long, rubber gasket, end plates secured to each other with four square nut and bolts, flange 210mm diameter, i/d 70mm, flange 20mm, boss on flange to take pipe, 25mm long and 140mm diameter, flange holes 22mm square, pipe 100mm diameter, section 5mm		
333	301-302	none	cast iron pipe junction fragment: pipe i/d 52mm o/d 100mm, flange diameter 192mm, 4 fastening bolts, double thickness of flange is 44mm		
334	411-412	scrap	150, 185 pipe with fractured side branch, expands in collar with rim 270mm, rim to start of branch 390mm, short length of pipe 180mm, with 280mm flange, small pipe 150mm internal, outside 180, central pipe has 232mm showing.		
335	277-278	2055	cast angled pipe union with bolted cover: 50mm i/d pipe, one flange angled by about 20 degrees, rubber seals, 4 square bolt holes on each flange, 2 bolts secure angularly oval inspection cover.		
336	226	none	deformed lead strip or gasket fragment		
337	317	2132	galvanised pipe: 750mm of 25mm o/d galvanised pipe with expanded socket fitting one end		
338	317	2066	wrought iron pipe: 660mm of 30mm o/d pipe		
339	317	none	wrought iron pipe: 480mm of 42mm o/d pipe		
340	317	none	wrought iron pipe: 340mm of 42mm o/d pipe		
341	340	none	wrought iron pipe: 940mm long, 41mm diameter, pinched closed one end, 2mm thick		
342	334	none	wrought iron pipe: 890mm long, 44mm diameter o/d, 1mm thick		
343	362	2312	iron pipe 455 long, 23mm diameter, id c. 11mm?		
344	339	none	iron pipe: two joined pipe sections with threaded end; overall length 420mm, diameter 28mm, thickness 2 mm, threaded externally on long end, join 45mm long.		
345	354	2332	short section of pipe with internal thread, 45mm long, 40mm od, jointing section, metal 5mm		
346	364	2132	steel pipe, crushed, 145 long, 27mm od, id of approx. 17mm		
347	353	u/s bag	iron pipe: short length of possibly just corrosion from inside a now-vanished pipe, 110mm long, 23mm diameter and mineral is 3mm thick		
348		WB	cast iron trough, 20mm thick casting, external dimensions 380-400mm tall, 1820mm long, 590mm wide. Each narrow side has an approximately semi-circular notch in rim – 70mm deep and 100mm wide. The trough contained the prise bar #273.	store	
349	211-213	none	small cogged wheel: planar faces, 340mm o/d, central round hole approximately 70mm diameter, teeth 28 mm wide at base, 30mm tall, 15mm wide at top, sides radial to 10mm then slope in as a facet, gaps 20mm wide; 17 teeth; 120mm thick.		
350	217-218	none	medium cogged wheel: 155mm thick outer section, 180mm central section, c.135mm central hole; teeth 40mm wide at base, 30mm tall, gap 35mm, would have had 22 teeth,; 560mm o/d, outer face of recess 390mm diameter, inner face 270mm diameter, recess 70mm below centre face, with flange 40mm thick.		
351	215-216	none	medium cogged wheel: as #350 but broken, with half of outer tooth section missing 11 preserved	keep	draw
352	214	none	large cogged wheel: sides with annular recess, 625mm o/d, 440mm diameter to outer edge of recess, 260mm to inner face of recess, 135mm central hole; recess 60mm deep; teeth c. 45mm wide at base, 40mm tall, 25mm wide at top, gaps c.27mm, 25 teeth; heavily accreted in coal dust; 150mm thick on margin, c. 170mm thick central section.	keep	draw
353	287-288	none	gas burner base: 3 footed base from ?gas ring, dished inside, brass insert for supply 20m o/d, 14mm i/d, threaded, dish 220mm diameter, feet protrude slightly; 60mm high, upper side of bowl 170mm diameter, then flat lip with raised rim, 3 lugs on rim just off-set from feet carry small slot-headed screws for attachment of (missing) top	keep	

no	photos	context	notes	location	draw?
354	300	none	gas burner base: fragment of gas burner as #353, with one leg and one attachment lug surviving		
355		WB	60mm diameter and 70mm tall rounded lead cone with central iron rod,	store	
356	301-302	none	brass bearing?: slightly curved brass block with central threaded hole, 76mm x 46mm wide, 26mm thick, hole is 21mm diameter, curved shape irregular true thickness is variable - possibly through wear	keep	
357	333	none	copper alloy plate: almost square 440x460mm, 11mm thick; 9 holes on long side, each 18mm diameter not quite evenly spaced, on shorter side 2 threaded holes 19-20mm, third threaded hole in other corner; has attached strap 250mm long, 37mm wide, 2mm thick, free end folded back 80mm, riveted to min piece at inner end	keep	draw
358	341	none	pressed ferrous sheet object: 185mm x 180mm, 1mm thick, shows forming into facetted bowl shape?		
359	349	u/s bag	composite object: two springs joined by two external wrought iron rods; 180mm long, 7 coils in each spring, 17mm o/d of 3mm diameter wire, two bars each 125mm long and 5mm diameter, gap between springs 77mm, gap between bars 18mm	keep	
360	365	2241	snapped end of iron bar 32x7, turns though right angle, 85mm long then turns for 80. turned end bears bolt with large square curved head, bolt is 72mm long, shaft is 15mm, dished head of bolt is 56 x 46mm and is 5mm thick. Nut is square, 30mm and 12mm thick		
361	353	u/s bag	hand forged stout spring 85mm tall, square sectioned bar 15mm square, tapers to chisel tip either end, 3 turns, outer diameter 72mm		
362	361	2071	brass rod with narrow end, 58mm long, 3mm diameter, end 2mm diameter for 2mm end length		
363	362	2312	slab of lead, 369mm x 82mm x 11mm, one fairly planar surface the other slightly wrinkled		
364	364	2132	corroded battery, 77mm long, 18mm diameter, copper alloy contact in centre of face 5mm diameter. very decayed		
365		WB	handled plate overall 330mm long; 95mm wide in the centre of the plate, which is 230mm long. At each end the plate curves around a possible rivet - that at the proximal end has a 35mm head, that at the distal end a 45mm head; the handle swells towards tip to a maximum of 30mm diameter, just before the end.	store	
366	342	2066	wrought iron piece: irregular half ring of iron, 215mm maximum width, internal diameter 120mm, varies 70-50mm wide, 2mm thick		

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