Scottish Tar Distillers
(Formerly James Ross & Company of Falkirk)

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This article was prepared by Geoff Bailey using lecture notes prepared by Mr. Alex Campbell of Glasgow, whose untimely death prevented him from completing a full study of the firm and its history.

Around Falkirk there is an abundance of places to excite the imagination of any industrial archaeologist or historian. Perhaps one of the more unusual places was that at Limewharf where tar distillation was started by one of the pioneers of the chemical industry. James Ross was born in September 1820 at North Greens Farm in the parish of Airth, the son of William Ross, farmer. This farm lay on the southern shore of the Fourth Estuary adjacent to a small boatyard and the harbour of Airth. He went to Airth public school where he is said to have shown considerable promise. At an early age he and his brother, Andrew went as seamen on board a vessel plying between Port Dundas and Hull. However, a few months satisfied him that this was not to be his career. He joined his brother Andrew Ross who had started the building of small vessels at the basin of Loch 16. In 1843 Andrew died, leaving some unfinished contracts. James completed these contracts and afterwards continued the business on his own account.

Having worked with pitch for some time James seems to have been very far-sighted and recognised the tremendous potential offered by the chemical industry. In 1845 he sole the boat building business and entered into partnership with two companions as chemical manufacturers on a limited scale. The three partners leased a small piece of land on the bank of the Forth and Clyde Canal at the east end of Camelon near the West Burn. Here the business slowly prospered.

In this period a number of important discoveries were made that changed tar from being little more than a nuisance to a very important raw material for industry. These included Hofman's work on light oils as a source of benzene in 1845, and Mansfield's analysis in 1845 of the composition of light oils with his description of the methods of preparing pure benzene and toluene from them.

James Ross wanted to take up tar distillation and to extend the existing works. His two partners were not convinced about the potential of the proposed alterations and were unwilling to put forward the necessary capital. They sold out to him and in 1847 he boldly entered into a 99 year lease with William Forbes, heritable proprietor of the estate of Callendar, for land at Limewharf, which offered more room for expansion. Water for the new works was obtained from Bonnie Prince Charlie's Well and the Lightwater Burn.

It was not until the discovery in 1856 by William Perkin of the synthetic dyestuff mauvine that tar distillation really expanded. Initially the works consisted of a bench of three stills with a 15-ton working capacity, a wooden tank as a condenser beside a water pond, and a pitch bed. The pitch was shipped by canal and run to the bed by open troughs. Later expansion saw six stills being built on the 'topside' of the site, only to be replaced in their turn by a bench of fourteen with a 30 ton capacity. The original six were then used as steam stills, charged with crude tar, the naphtha steamed off and the resultant boiled tar run to the tar pond. The boiled tar was either sold as such, or distilled to pitch in the new stills.

In 1876 receiving tanks were installed for Edinburgh Gas Works crude tar, a contract for the purchase of which was retained until the closure of the Edinburgh works. Crude tar also came to Limewharf from Lerwick, Stornaway, and the border of Scotland as well as England. At this time the works had no internal railway. The raw materials arriving by rail had to be unloaded from the sidings of the North British and Caledonian Railways at the Lime Road Goods Station owned by the company. From there it was conveyed by horse drawn wagons called puncheons, with a capacity of 80-90 gallons, to the works. At the same time, all manufactured products had to be hauled up the same road for shipment. This road is known as Lime Road, not because of the spillage of lime when carted from the railroad to the works as is sometimes asserted, but due to the use on the neighbouring fields of lime shipped to Limewharf by the Callendar Estates.

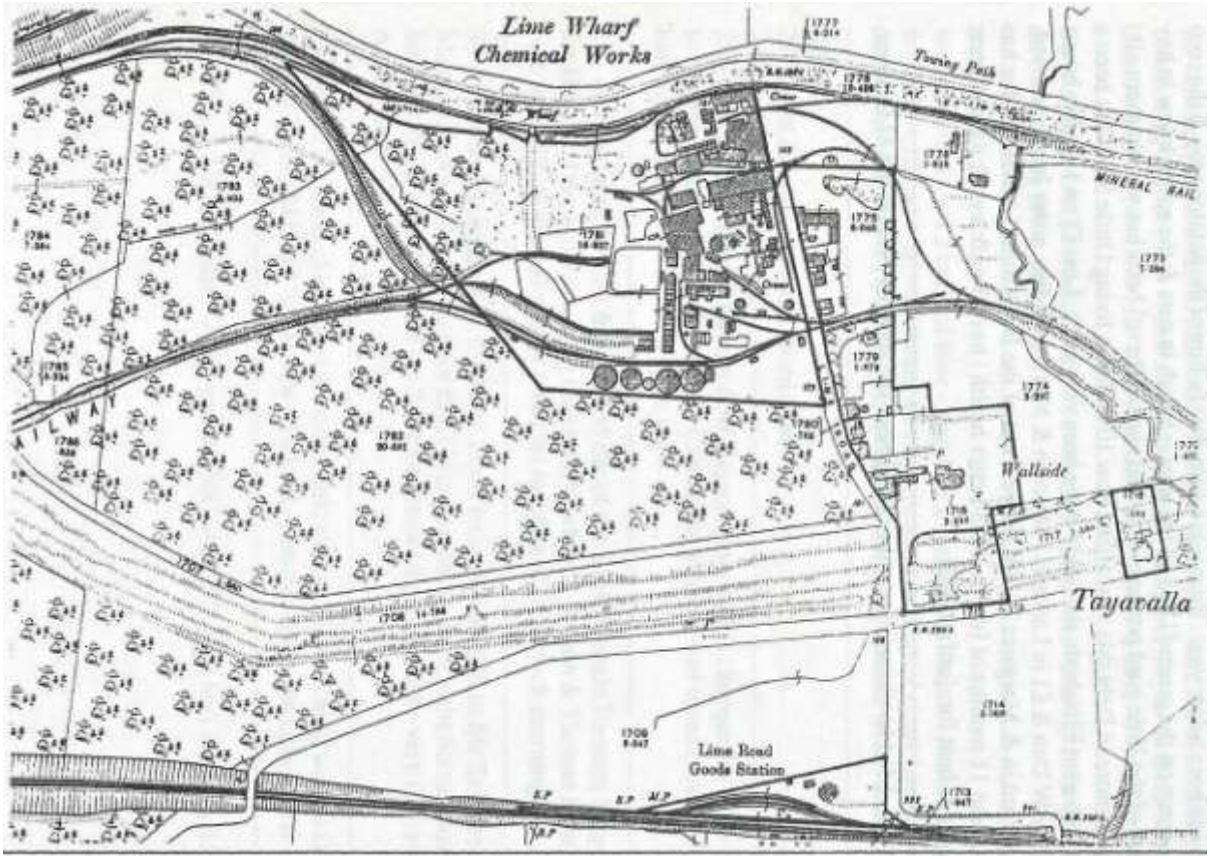


Fig. 1: Ordnance Survey Plan of the Lime Wharf Chemical Works in 1890.

With the increase in business some other method had to be evolved. Bulk tanks were built and a pipeline led from the reception tank at Lime Road Goods Station to them. To facilitate the loading of pitch into barges on the canal a 'couper' was installed. Pitch was hauled by horse in hutches along a light railway to a slope above the canal where the horse was unhitched, the hutch ran down the slope to a platform over a weighbridge and was tipped into the barge. The barges then proceeded to Grangemouth or Bowling for the pitch to be transhipped. In 1887 the steam tanker "Analine" was built for James Ross and Company for the purpose of collecting the crude tar from gas works adjacent to the inland waterways system. Later, a second ship, named the "Ammonia" was acquired.

James Ross ceased to take an active part in the business in 1878 and in March 1879 a deed of co-partnership was entered into between Robert M Sutherland, who had been with Ross since boyhood, and Robert Orr of Glasgow. At this time the works were being assessed at £7,065 for the buildings, £60 for the ground and £5,094 for the fixed machinery. With his profits James Ross had been able to build Wallside House at the corner of Lime Road and Tamfourhill Road for his family. The house, now a nursing home, still bears his initials carved as an enduring monument to his successful venture in tar distillation. Wallside allowed him to be nearer to his works than his previous residence at Glenfuir. James Ross died at Arnotdale House in June 1893 at the age of 73 and was buried in Camelon Cemetery. He left two sons and a daughter by his second marriage, none of whom entered the business.

James Ross had been comparatively young when he established his chemical works. Always adventurous in business, he had taken up large scale tar distillation in the late 1850s soon after the discovery of mauvine. He is also reputed to have tried his hand at establishing a small nail making plant. Later, he became interested in the refining of crude petroleum from shale rock, founding James Ross and Co, Philpstoun Oil Works near Linlithgow. He also acquired the Waverley Chemical Works at Leith, and obtained a lease of the important chemical works at Dawsholm in Maryhill from the Glasgow Corporation.

Robert Sutherland had been manager of the Limewharf works for Ross, and under his partnership with Robert Orr the business expanded yet further. Around this time an internal railway was led into the works from the mainline: a sulphate of ammonia plant was set up: a naphtha refinery was built: and the production of benzene extended. The naphtha refinery consisted of five 800-gallon steal heated pot stills, with a wooden lead lined tank complete with a hand wielded wooden paddle for the agitator. The refined products were collected in five gallon glass bottles. Benzene was an extremely valuable product at this time - in 1883 it sold for as much as 14/- per gallon. Later, three more pot stills were added and a Heckmann still erected for the manufacture of pure benzene and toluene. The whole plant was enclosed and three lead lined mechanical agitators added. In 1897 a Leonard still was installed. This plant burned liquid fuel: first black furnace creosote, then, when that became too expensive, liquid petroleum fuel.

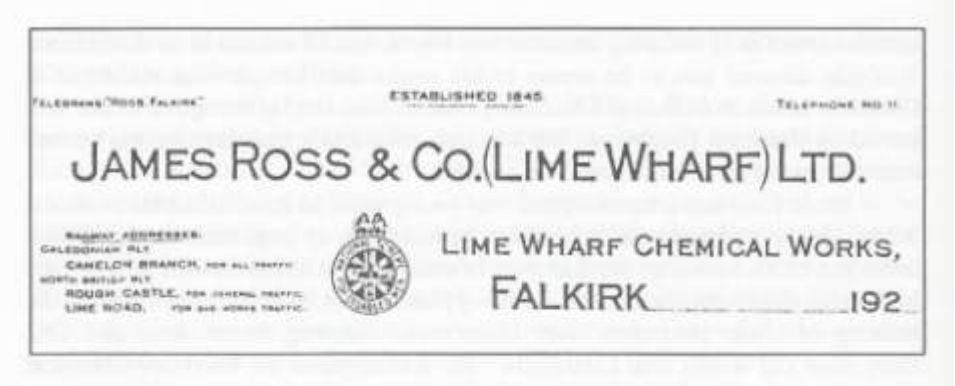


Fig 2: Letterhead of James Ross & Co, 1921.

In the partnership between Sutherland and Orr provision was made whereby each could nominate one son as partner. Under this, Orr's eldest son, Major R Dundas Orr joined the company in 1900. Orr senior died in 1906, and Sutherland and Major Orr carried on the business until 1911 when Robert Sutherland's son, James Fleming Sutherland became a partner. Major Orr died in January 1914, and in August of the same year James Sutherland joined the Royal Artillery until August 1916, when he was recalled to take control of the company after his father's death. Robert Sutherland had lived at Tay-a-valla until Ross's retirement when he had taken over Wallside, and then to Solsgirth in Dollar upon retirement.

The refinery was extensively rebuilt during 1914-18. Coal tar products were invaluable to the war effort, none of them could be disposed of without a War Office licence, and it was therefore essential that the distillation of crude tar be uninterrupted. (Toluene was used in the manufacture of explosives. As James Sutherland did not enjoy good health he asked his brother-in-law, F.C.T. Tudsbery, a barrister from London, to join him. In 1920 a limited company was floated under the name of James Ross and Co. (Lime Wharf) Ltd., with Sutherland as the chief shareholder. At the same time the petroleum works at Philpstoun became known as James Ross and Co. (Philpstoun Oil Works) Ltd. This left it free to be absorbed into one of the petroleum combines. Tudsbery became a director of the Limewharf works in 1921 and James Sutherland retired a few years later and died in 1932.

In the 1920s the company made an unsuccessful attempt to undertake road construction contracts to diversify its business. Competition throughout Great Britain was becoming exceptionally keen, and many tar distilling companies in England amalgamated and formed co-operative groups. The aim was to eliminate competition as far as possible, and give the crude tar producers the fairest price that market prices for end products could support. The Ross firm followed suit, amalgamating with Henry Ellison Ltd and Gas Residuals Ltd., both of Glasgow, in 1929. The new company was named the Scottish Tar Distillers Ltd, and became a public liability company in 1950.

Despite the name, not all the tar distillers in Scotland joined, notably William Briggs and Sons Ltd, Dundee and John Miller and Co Ltd, Aberdeen were missing. Richard Smith Ltd and Shettleston Oil & Chemical Co, both of Glasgow, finally joined in 1946. In 1959 Miller of Aberdeen ceased Distillation. Scottish Tar Distillers Ltd were then asked by the Scottish Gas Board to accept crude tar from the majority of gas works in the north of Scotland, including that from Aberdeen Gas Works, the largest producer in the area. In 1953 the Scottish Gas Board acquired 25% of the company's capital. Early in the 1970's they sold this to Hay's Wharf Ltd., London.

At the beginning of the 1960s the firm foresaw a drop in crude tar supplied and diversified again. They bought the chemical stockholding part of Richard Smiths Ltd, Glasgow, following this by buying James A Beck and Sons Ltd, Belfast and Dunn Brothers (Manchester) Ltd allowing them to expand into inorganic chemicals. Later they acquired Traffic Services Ltd, London, which specialised in bulk liquid containers for transporting liquid chemicals. Unfortunately, the purchase of Frazer and Borthwick Ltd, Ayrshire, for the manufacture of plastics was not a success. To ensure the availability of bulk storage tanks at Grangemouth they purchased the bulk oil depot there from Fina Petroleum Ltd. This depot had originally been founded by R M Sutherland and Thomas Ramsay of Glasgow as the Ross Creosote and Fuel Oils Ltd. Having been brought again under the control of the company it became known as the Ross Chemical and Storage Co. Ltd.

Now that the company had branched into other fields besides tar distillation, it was decided to change its name. As it was wished to retain the historic associations of the name "Ross", in February 1971 Ross Chemical and Services Co Ltd was born, and Scottish Tar Distillers Ltd became a subsidiary company.

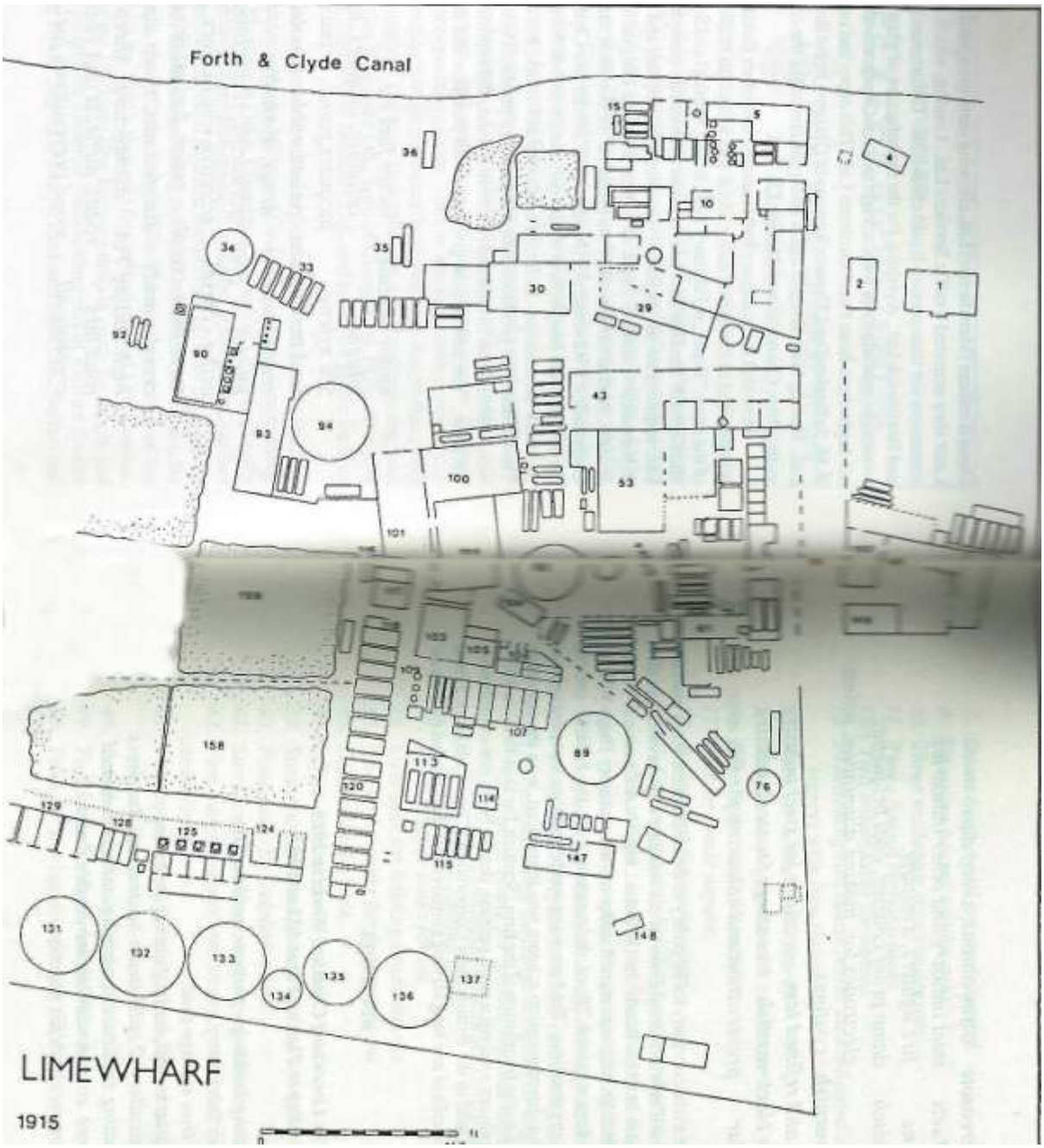
In 1972 Hay's Wharf Ltd acquired the major part of the company's capital, and in the following year sold it to Kuwait Investment. In the same year a serious fire gutted most of the Lime Wharf Works. At that time most of the crude tar for the plant came from the British Steel Corporation's Ravenscraig (Motherwell) Works and Clyde Iron Works, Tollcross. So British Steel bought over the tar distillation part of the company's business to do the work themselves. Refining continued at Falkirk, but on a much reduced scale.

The tar distillers produced a large number of products with a variety of uses. These products were sold in Great Britain and Northern Ireland, and exported to America, France and Belgium.

Product	Uses
motor benzole	motor fuel etc.
toluene	cellulose, lacquers, explosives.
5% xylene	lacquers, paints, printing inks.
coal tar napthas	paints, rubber, linoleum.
crude pyridene	drugs, dyestuffs.
Tar Acids	
Phenol	pharmaceuticals, resins, insecticides, explosives.
ortho - Cresol	selective weed killers, perfumes.
meta-para-cresols	resins, fuel additives.
cresylic acids	disinfectants, sheep dips.
high boiling T.A.	disinfectants, sheep dips.
road tars	roads, airfields and general tarmacadam.
creosote oil	wood preservatives, fuel, bitumen solvent.
cresylic creosote	disinfectants, sheep dips.
coal tar fuels	steel industry and other industries.
Napthalene	fire lighters, dyestuffs.
coal tar pitch	house and other damp proof courses, coal briquettes, electrodes for aluminium manufacture and paints.
coal tar varnish	coatings.
painting and refined tars	coatings for iron and steel industries.
bitumous black varnish	coatings for iron and steel industries.
fish net tar	preservation and colouring for fish nets.

Tribute should be paid to the company for its policy to the employees. Ross built not only the home for himself at Wallside, and one for his manager at Tayavalla, but also cottages for his workers in Lime Road. In 1872 the Limewharf Chemical Works Friendly Society (L.W.C.W.F.S.) was started under its first secretary Hugh Wilkie. In the 1920s the workers received 2% of their earnings for the holiday period, including, until 1929, any overtime. The base wage was higher than that paid to local ironworkers. In 1939 a superannuation scheme was introduced, with the company paying their share back to the foundation of the firm (Scottish Tar Distillers) in 1929. Even the non-staff employees received a small pension, despite being non-contributors. When the works were sold to the British Steel Corporation (Chemicals) Ltd. A fund was provided for the benefit of any long serving employees still employed by the new owners.

APPENDIX



Plan of the Limewharf Chemical Works in 1915.

Key to Plan:

1. Large oblong building – purpose unidentified
2. Two storey laboratory.
3. Wrought iron storage tank.
4. Open despatch shed, built of corrugated iron.
5. Naptha distillery (two stills steam-heated) and Receivers.
   5a. Fractionating still house containing one steam-heated still, of three storeys with incombustable floors.
6. Three iron receivers for naptha.

7. Steam-heated still for crude benzol.
8. Six steam-heated naptha stills.
10. Three malleable iron condensors.
11. Three benzol receiving tanks.
11a. Two boiler tanks for benzol.
12. Fractioning still house (three steam-heated stills), four storeys with iron floors.
13. Receiver house of one storey.
14. Still for crude naptha with condensor.
15. Five boiler tanks for naptha.
17. Still for crude naptha.
18. Boiler tank for waste water.
19-27. Communicating buildings occupied as stores for furnishings, disused anthracene press-house, steam engine, air-compressor, pumps and dynamo houses, suction gas plant (disused), chimney stalk, mechanics' shop, and refrigerator house containing ammonia plant.
28-32. Communicating buildings occupied as engineer's stores, filter press house for anthracene and napthaline, and as stores for napthaline (containing centrifugal), and as metal store and oil cooling tanks.
33. Fifteen boiler tanks for oil.
34. Steel tank for holding crude naptha.
35. Two boiler tanks for anthracene oil.
36. Disused boiler tank.
37-8. Two iron receivers for oil.
39. Steam boiler house, partly built of corrugated iron.
40. Four tanks for sulphuric acid.
41. Store for furnishings, with wooden water tank over.
42. Fire pump house of one storey, containing Shand & Mason steam fire pump.
43-7. Communicating buildings occupied as cask filling shed, plumber's shop, and store, oil gas retort house, and oil and paint store.
48. Seventeen boiler tanks for oil.
49. Two boiler tanks for oil for retorts.
50. Tank for storing disinfecting fluid.
51. Saddle boiler, for storing watery solution of pyridine.
52-53. Communicating buildings of one storey occupied for the manufacture and storage of carbolic and cresylic acid and pyridine.
54. Five pans in the open for melting caustic soda by steam heat.
55. Two boiler tanks for storing caustic soda.
56. Seven boiler tanks for storing caustic soda.
57. Pump house, one storey.
58. Still for pyridine, set in brick-work.
59-60. One storey building occupied as steam engine and boiler houses and fan house.
61-62. One storey building occupied as recausticising house and containing sulphuric acid tank, and as caustic soda recovery plant.
63-64. Five boiler tanks for storing carbolic acid.
65. Lead lined wooden tank for recovering sulphuric acid from naptha by washing with water, also two boiler tanks for feeding soda recovery plant
66. Four iron stills set in brickwork (steam-heated), for steaming off naptha from carbolate of soda.
67. Seven iron stills set in brickwork (fire-heated), for carbolic and cresylic acid.

68-70 Condensing and storage tanks from above stills.
71. Two condensing tanks for cresylic acid.
72. Steam engine house, one storey.
73. Store for sawdust, one storey, part timber built.
74. Two stills (steam-heated) for pyridine, set in brickwork.
75. Three open iron tanks for lime draining.
76. Water tank.
77. Three boiler receivers for storing caustic soda.
78. Platform for disloading tar.
79. Iron built lime chip drainer.
80. Two iron boiler tanks.
81. Saddle boiler tank for storing ammoniacal liquor.
82. Nine iron boiler tanks for storing benzol.
83. Underground tar tank.
84. Gasometer.
85. Pump house, built of corrugated iron.
86. Two iron boiler tanks for creosote oil.
87. Iron boiler tank for loading railway trucks.
88. Iron boiler tank for storing oil sludge.
89. Brick built tar receiver for charging tar stills, with underground creosote oil tank.
90-91. Tar distillery building silent.
92. Empty oil boiler tanks for firing tar distillery.
93. Eleven underground oil boiler tanks for storing benzol.
94. Cast iron tank for storing creosote oil.
95. Three boiler tanks for oil from tar stills.
96. Boiler tank for storing ammoniacal liquor.
97. Store for sand, resin and coke, one storey.
98-99. Two iron boiler tanks for storing naptha.
100-102. Communicating buildings of one storey occupied as stores for sulphate of ammonia.
103. One storey building for the manufacture of sulphate of ammonia.
104. Vitriol tank.
105. Nine condensers and lime purifier.
106. Three vitriol storage tanks, with neutralising boxes for waste acid and two condensing tanks.
107. Seven tar stills, set in brickwork and steam-heated.
108. Three boiler tanks for waste steam.
109. Three ammonia stills, steam-heated.
110. Ammonia pump house, one storey.
111. Two iron boilers, disused.
112. Steam engine and air compressor house, one storey.
113. Steam boiler house.
114. Pump house.
115. Five boiler tanks for ammoniacal liquor.
116. Condensors for pitch stills.
117. Condensors for pitch stills.
118. Men's bothy.
119. Pump house, corrugated iron built.
120. Fourteen pitch stills (furnace heated).

121. Pump house, corrugated iron built.
122. Tar tank.
123. Men's shelter shed, with secure stove.
124. Condensors for tar stills.
125. Five vertical tar stills.
126. Men's bothy, one storey.
127. Tar purifier.
128. Cooling tanks for distillate off pitch stills.
129. Six pitch stills heated by furnaces.
130. Tar tank.
131. Cast iron tar tank.
132. Steel creosote tank.
133-6. Cast iron tar tanks.
137. Lime shed, one storey wooden structure with sheet iron roof.
138. Fitting shop and open cart shed, one storey of corrugated iron.
139. Cart weigh house, one storey of timber and slate.
140. Waggon weigh house, one storey of timber and slate.
141. Hand fire engine house, one storey of timber and slate.
142-3. Sand shed, one storey of corrugated iron on dwarf brick walls.
144. Four gas purifiers.
145-6 Two boiler tanks used as a gas scrubber and a storage for surplus water.
147. Sand shed.
148. Weigh house.
149. Cask drying house, the drying being done by hot air heated by steam, one storey.
150-3. Communicating buildings of one storey occupied as store for casks and steam engine house; cooperage; cask store, containing pans for heating glue by steam; stores for casks and hoops and for oil and tar.
154. Three boiler tanks for pyridine.
155. Six boiler tanks for road tar.
156. Eight boiler tanks for storing creosote oil or cresylic acid.
157. Nine boiler tanks for storing benzol.
158. Pitch bed.
159. Tar-pond.