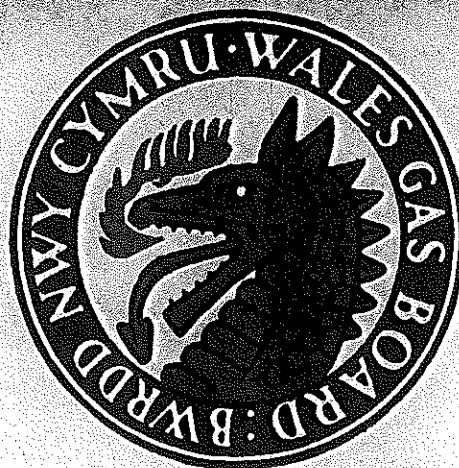




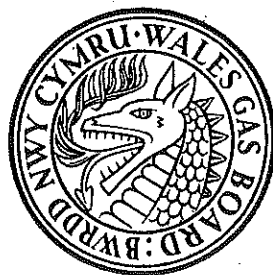
WREXHAM UNDERTAKING

OFFICIAL OPENING
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MAELOR GAS WORKS

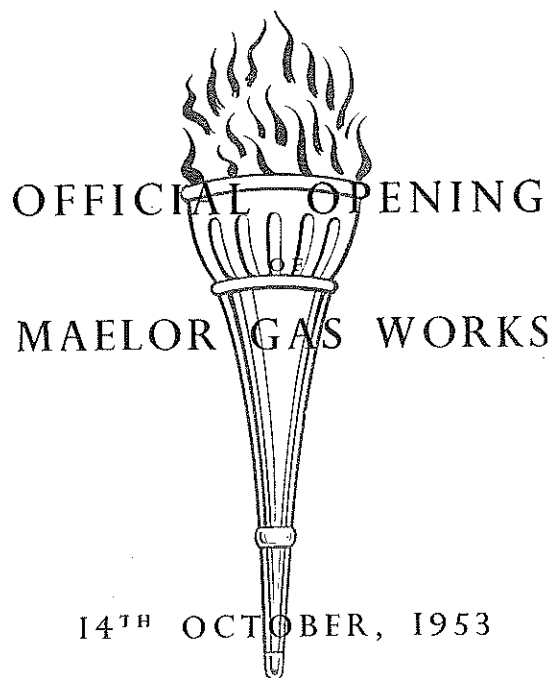
BY THE
LORD LLOYD, M.B.E.
Parliamentary Under Secretary of State for
the Home Department and Welsh Affairs



14TH OCTOBER, 1953



WREXHAM UNDERTAKING



14TH OCTOBER, 1953

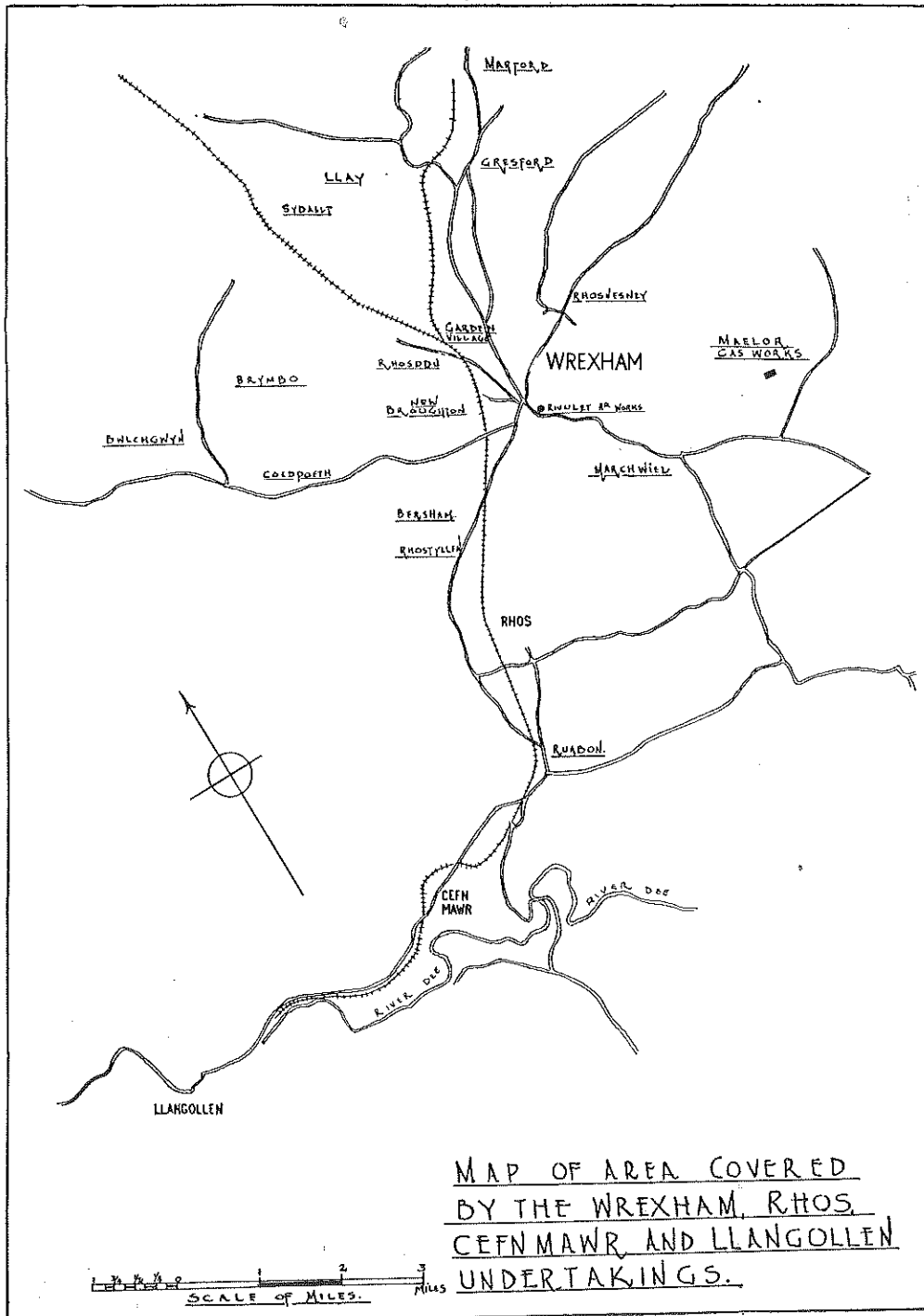
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THE LORD LLOYD, M.B.E.
Parliamentary Under Secretary of State for the Home Department and Welsh Affairs



MR. J. F. LLOYD, M. INST. GAS. E.
Engineer and Manager, Wrexham Undertaking



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HISTORY

GAS was first introduced in Wrexham in 1827 when Messrs. Keay, Edwards and Company provided gas lighting. In 1839 the Wrexham Gas and Coke Company was formed and took over the assets of the original suppliers at a cost of £705. A new works was then erected in Willow Road, total cost of various buildings amounting to £507.

The output of the works increased steadily and in 1869 a larger site was necessary. During the period 1869-70 the whole of the works was transferred to the present site in Rivulet Road. At this time the Company obtained its first Act of Parliament and became a Statutory Company under the name of the Wrexham Gaslight Co., the capital involved being £15,000 and the manufacturing plant consisting of 56 hand-charged horizontal retorts. The second Act of Parliament in 1905 changed its name to the Wrexham Gas Company.

During the years 1902-1907, the works were almost wholly rebuilt, new carbonising plant comprising 72 machine-charged horizontal retorts, purifying plant and a new gasholder of 500,000 cu. ft. capacity being installed.

The distribution side of the Undertaking was expanding rapidly and supplies were now made available to Coedpoeth and Rhostyllen. In 1912 the then new method of high pressure distribution was adopted for supplying outlying villages. By this means Rhosnessey and Gresford were supplied before the outbreak of the 1914-1918 War, whilst the supply to Brymbo was completed shortly after cessation of hostilities.

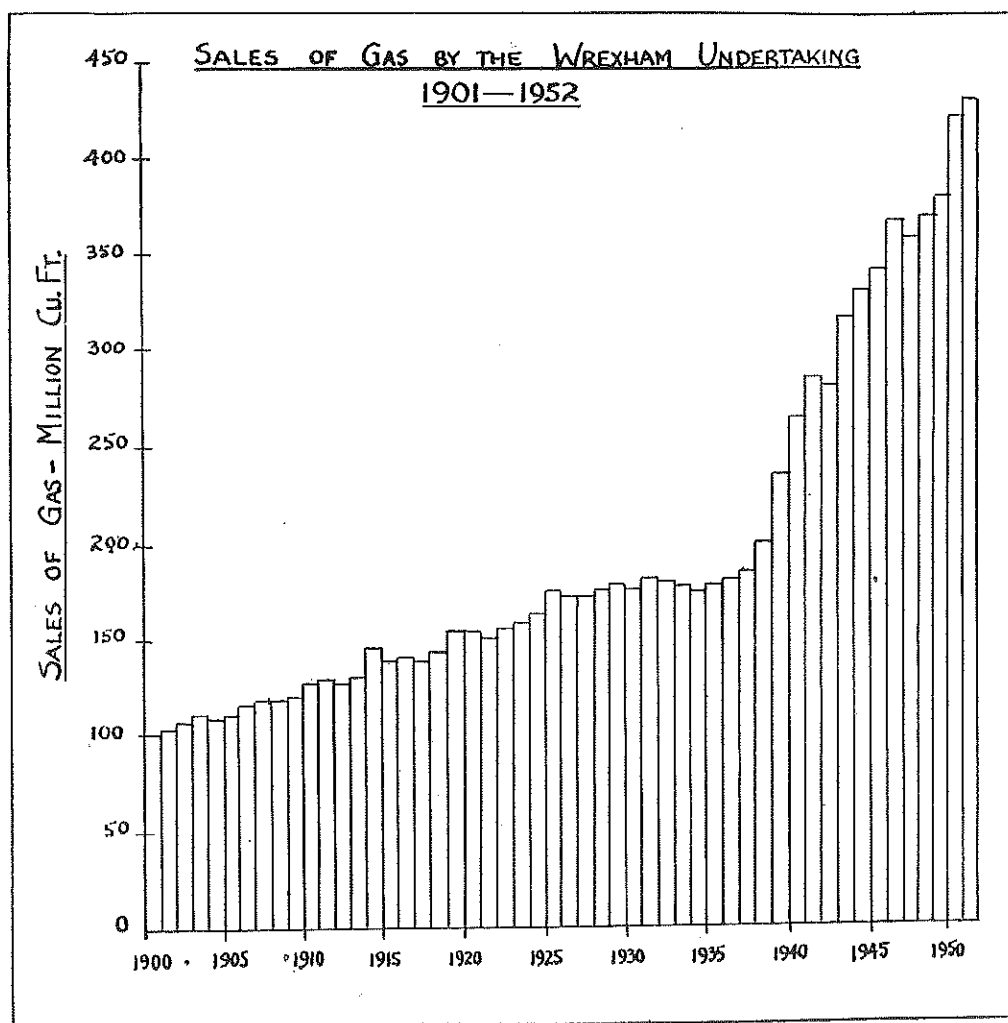
By 1938 the make of gas had increased from the 1900 figure of 100,000,000 cu. ft. per annum to 223,000,000 cu. ft.

The second World War brought about a rapid increase in gas consumption and new carburetted water gas plants were installed in 1943 and 1947 by which time the annual make of gas had increased to 406,000,000 cu. ft. Requests were also being received for bulk supplies of gas to the neighbouring Undertakings of Rhos, Cefn Mawr and Llangollen.

By reason of the state of the manufacturing plant, now forty years old, and of the continuing increasing demand for gas supplies, it became obvious that new plant was urgently required and permission was sought by the Company,

and obtained from the Ministry of Fuel and Power, for the construction of a modern Intermittent Vertical Chamber Oven Plant of 25 Chambers, with a capacity of 2,250,000 cu. ft. per day, on a site adjacent to the existing works. This plant was to be so arranged that a duplicate setting could be later added to give a total output of 4,500,000 cu.ft. per day. With the existing water gas plants a total maximum daily output from the present site of 6,000,000 cu. ft. was to have been possible.

This then was the position on 1st May, 1949, when the Wrexham Gas Company became vested in the Wales Gas Board under the Gas Act, 1948.



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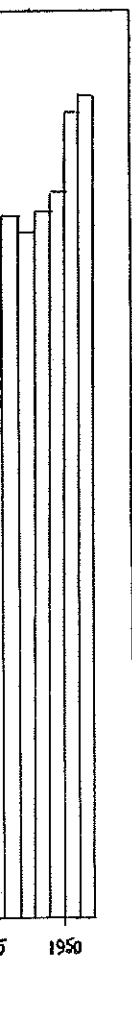
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It was now possible to review the gas supplies in the North Wales Area with a wider outlook, and as a result it was decided to choose a new site for the erection of the carbonising plant and to expand the proposals of the former Company to include the provision of the necessary purification, compressing, storage, steam raising, electricity generation and other ancillary plant on a new works which should not only supply gas southwards in the Rhos—Cefn Mawr—Llangollen area but also northwards to Mold, Buckley and Deeside.

In the Autumn of 1949 the Wales Gas Board acquired a site of 27 acres on the Wrexham Trading Estate some $3\frac{1}{2}$ miles south-east of the centre of the town for the purpose of erecting the Maelor Works.

NORTH WALES GAS GRID

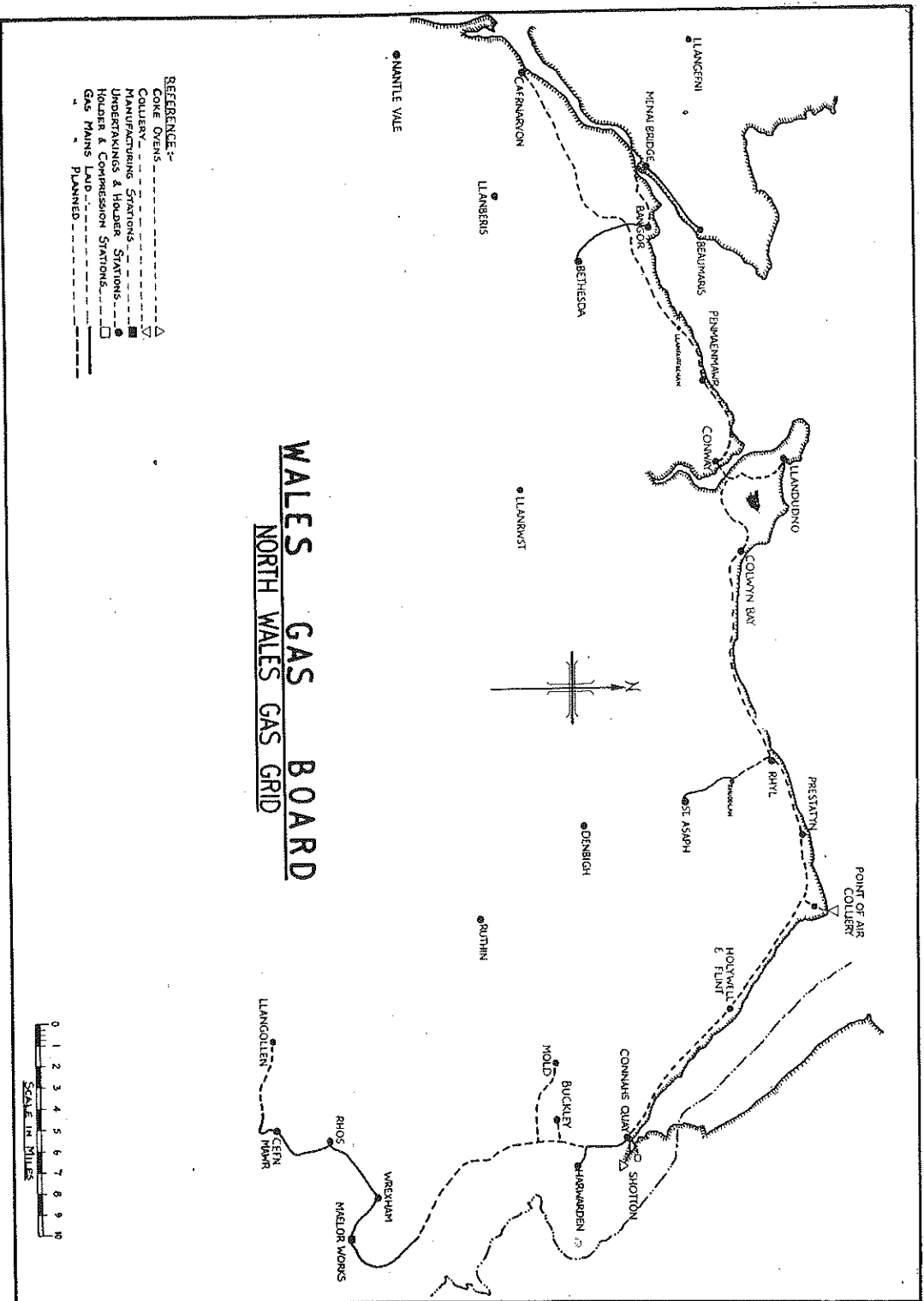
THE new gasworks at Maelor is an important part of the co-ordinated scheme that has been prepared for the integration of gas supplies in the North Wales area.

Initially the gas produced at Maelor will supply the needs of consumers in the Wrexham, Rhos, Cefn Mawr and Llangollen areas. The construction of mains for Rhos and Cefn Mawr has been completed, and the mains to Llangollen are well advanced.

When the main north from Wrexham—which is in process of being laid—is ready, gas from Maelor will meet part of the requirements of the consumers at Mold, Buckley and Deeside.

Reference to the drawing on page 10 will indicate the extent of the gas grid planned up to the present time : local sections of this grid have already been laid. It will be seen that the grid planned will be supplied with gas from three principal sources of supply, viz. Maelor Works, coke oven gas from the Shotton Works of Messrs. John Summers and Sons, Ltd., and Methane (or 'firedamp') drained from Point of Ayr Colliery and subsequently treated to render it suitable as Town's gas. The latter project is the first large scale development of a process new to Great Britain, and the use of Methane from Point of Ayr will save the Nation some 30,000 tons of coal annually. This large scale commercial experiment will assist in determining the extent of similar development elsewhere.

The planned grid system, extending through the Counties of Denbighshire, Flintshire and Caernarvonshire, and into Anglesey, will serve not only the



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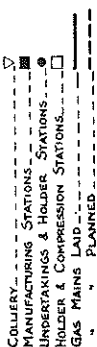
important developing industrial districts of Wrexham and Deeside, but also the North Wales coastal resorts as far as Caernarvon, with supplies to other communities. The system is designed so that further development can later proceed.

STATISTICAL INFORMATION

It is estimated that the Maelor Works will carbonise some 36,000 tons of coal per annum, producing 2,900,000 therms of gas, 18,000 tons of coke and 435,000 gallons of tar.

The area of supply of the Wrexham Undertaking alone covers approximately 38 square miles, some 80 miles of main being laid to serve 14,500 gas consumers. A further 8.5 miles of main have been laid to supply gas from Maelor to an additional 4,300 consumers in the areas served by the Rhos and Cefn Mawr Undertakings.

Extension of mains to serve Llangollen and the Deeside area north of Wrexham will add another 12,000 consumers to the mains system supplied from Maelor.



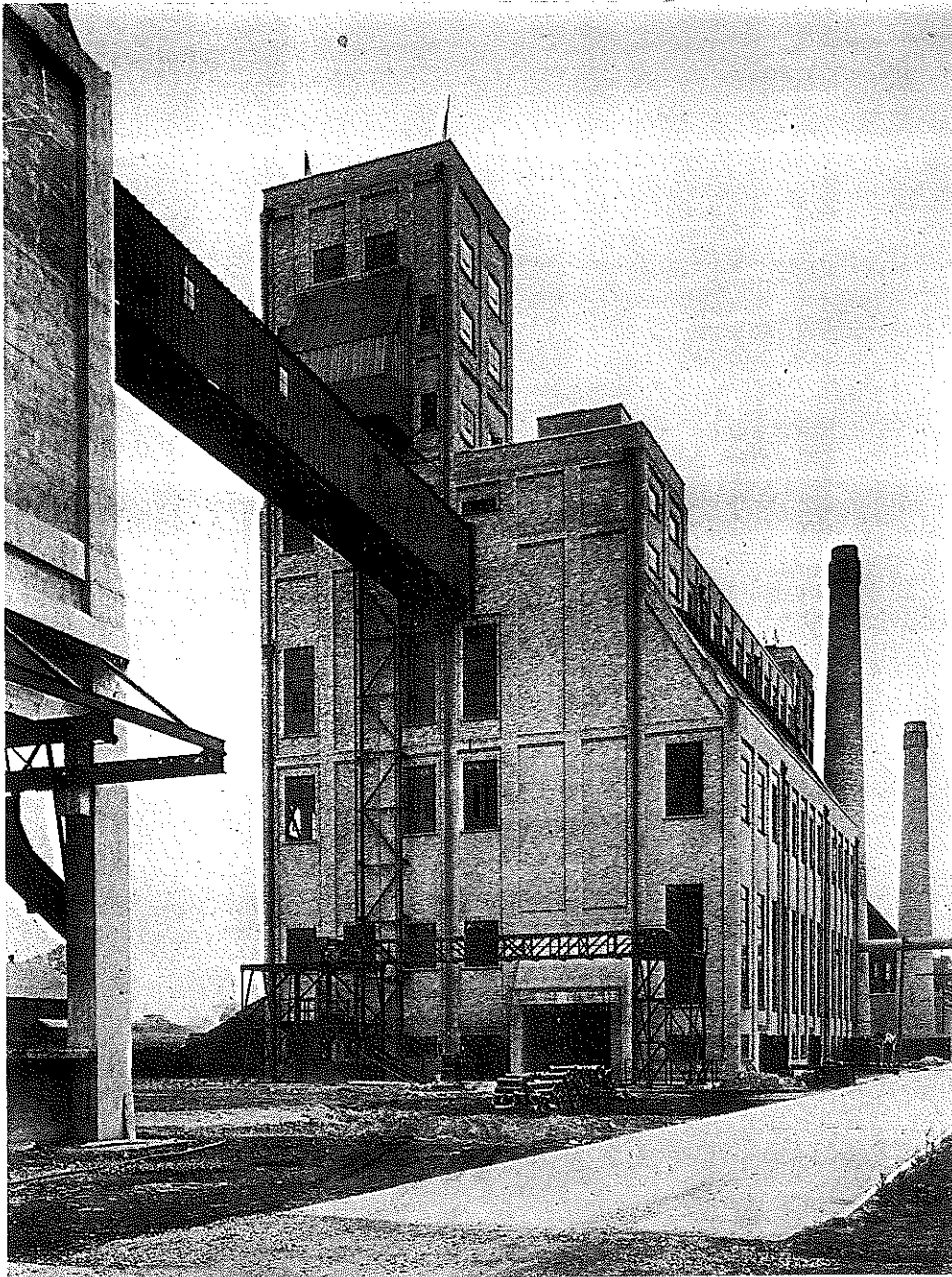


PLATE 1

General View of the Intermittent Vertical Chamber Oven Plant on the Coke Quenching and Handling Gable end; Belt Conveyor gantry and corner of R.C. coke screening and storage plant are shown.

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DESCRIPTION OF PLANT AND BUILDINGS

INTERMITTENT VERTICAL CHAMBER OVEN PLANT

THE Carbonising Plant is the fourth of its type to be installed in Wales, the others being Holywell (1933), Milford Haven (1936), and Abertillery (1937) ; selection of this type has been steadily growing in Great Britain over the last 20 years and particularly since the end of the World War II.

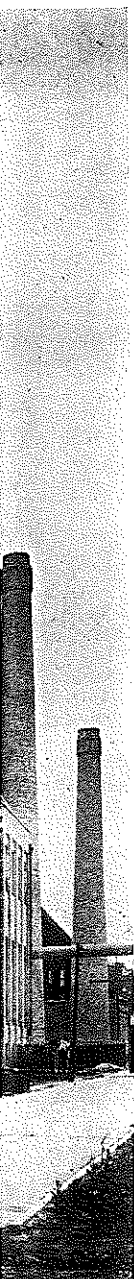
Intermittent Chambers are not limited to selected high grade coals but will deal adequately with a wide range, and particularly those of lower coking value, at the same time producing good yields of gas with a high degree of flexibility of output, and in particular a strong coke of low breeze content suitable for both domestic and industrial use.

The Carbonising Plant, complete with the necessary Coal and Coke handling equipment and Coke Grading, Storage and Loading plant has been designed and built by Messrs. W. J. Jenkins and Co., Ltd., of Retford, Notts.

The new installation consists of 25 chambers each of 3.65 tons capacity, arranged in one bench of five equal settings, and has a nominal maximum output of 2,250,000 cu. ft. per day. It is housed in a modern steel-frame brick-embellished building of pleasing architectural appearance and is designed for extension to double the present size in one or more stages. (See Plate 1).

COAL HANDLING PLANT

Coal brought to the site by road vehicles is discharged into an underground Receiving Hopper, from which it is extracted by means of a Feeder Conveyor of the De Brouwer type, either into a Coal Crusher or, in the case of small coal, into a by-pass chute, both of which discharge into a 40-ton per hour Elevator. From the Elevator the coal is discharged on to the first of two rubber belt conveyors, the second one running the full length of the overhead bunkers from which it is discharged by a travelling throw-off carriage. (See Plate 2). The overhead bunkers have a total storage capacity to cover 72 hours working and are completely enclosed to minimise dust nuisance and fire. Feeding doors in the bunker cover platforms are automatically opened and closed by a plough on the travelling throw-off carriage. Integral with these bunkers and extending



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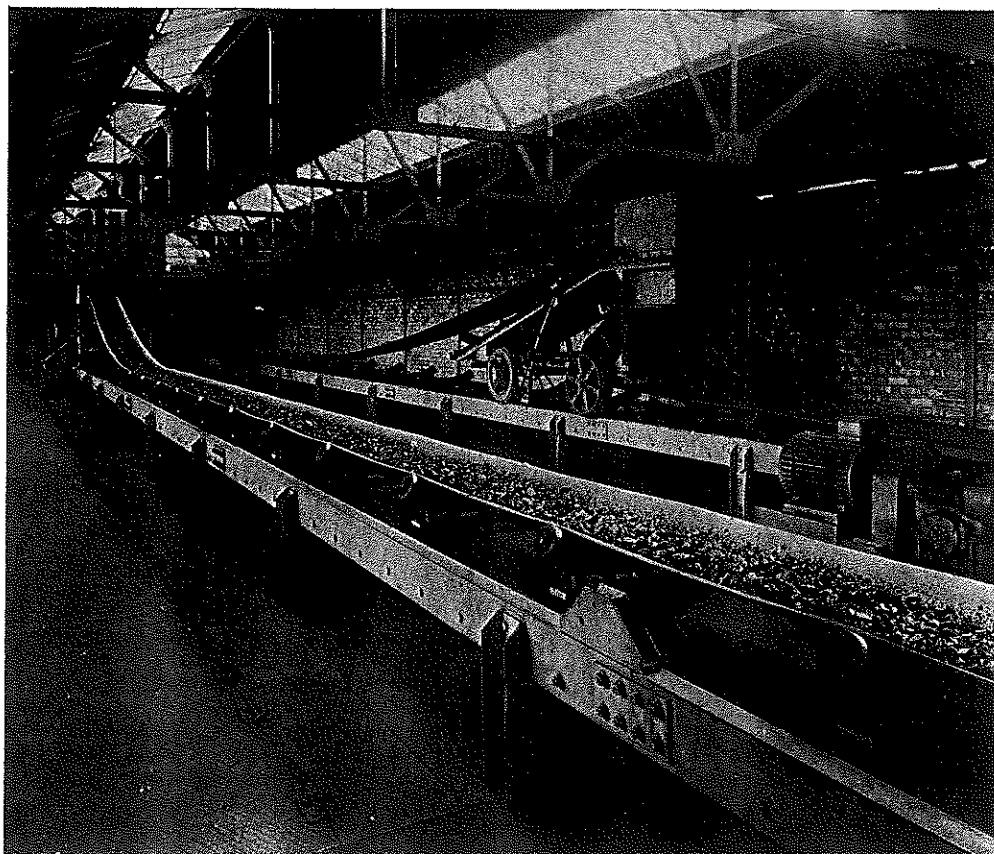


PLATE 2

Distributing Conveyors for Coal (foreground) and Coke (background), showing travelling throw-off carriages and the design of bunker top platform with plough operated filling doors.

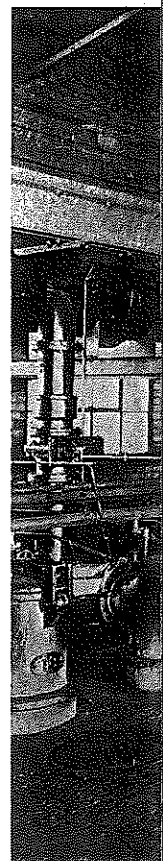
the full length of the bench are Coke Hoppers, also 72 hours storage capacity, for Producer fuel. The bunkers feed fuel through a series of outlets into a charging car which carries a measured quantity of coal for the charging of each chamber. This charging car is electrically propelled on an overhead track and is of special design to ensure uniform filling of each chamber to a pre-determined height. A compartment of the car contains small coke which is fed to each chamber to protect the bottom door ; interlocked levers ensure that this breeze feed is dropped in before the coal charge. (See Plate 3).

Provision has been made for the installation of a duplicate Coal Elevator ; either Elevator will feed the present bench or the future extension.

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BENCH AND BRICKWORK

The bench is made up of 5 equal settings each of 5 chambers ; each setting is heated by a built-in step grate producer and has its own secondary air recuperator. The whole is rigidly braced by massive vertical side and end buckstays with horizontal members, and longitudinal and transverse tierods which are spring loaded to control expansion.

The chambers are constructed of 95% silica and measure approximately 19 ft. 2 in. high by 9 ft. 10 in. wide and are tapered $10\frac{1}{4}$ "—13" on the minor axis. The chamber heating flues are formed by continuous tongued and grooved key tiles bonding adjacent chambers throughout the full width, thus forming an entirely monolithic structure which gives maximum strength in the oven walls

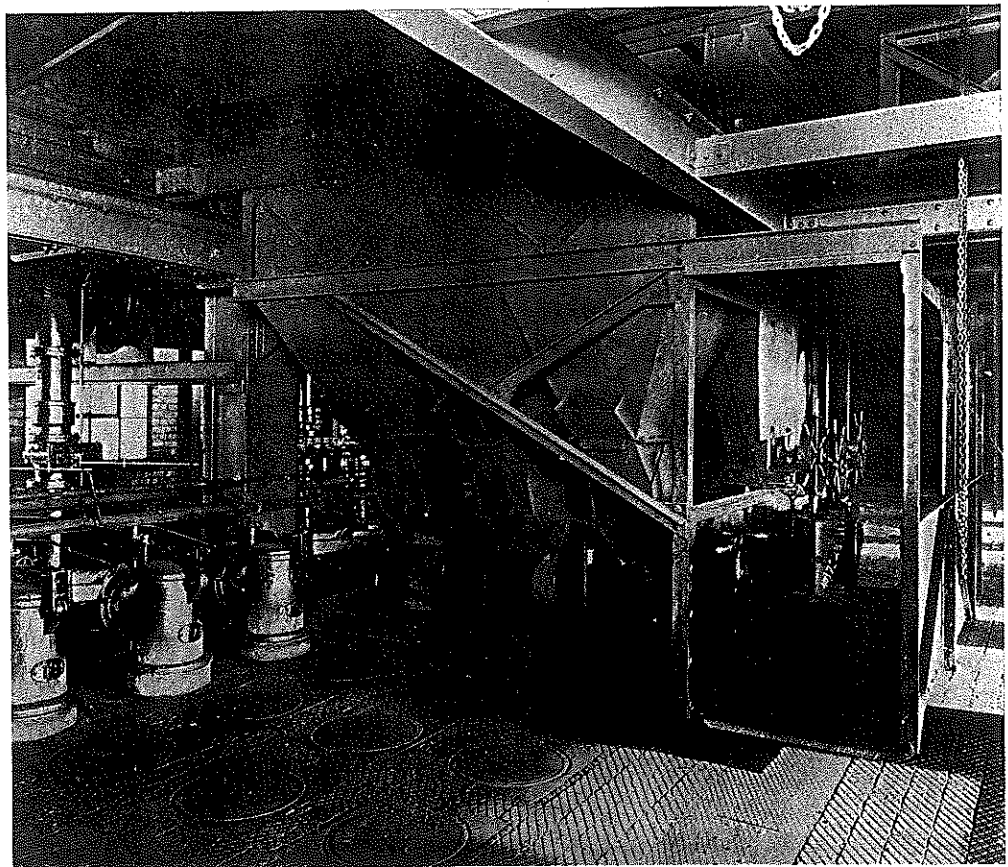


PLATE 3

Top of bench showing chamber charging car.

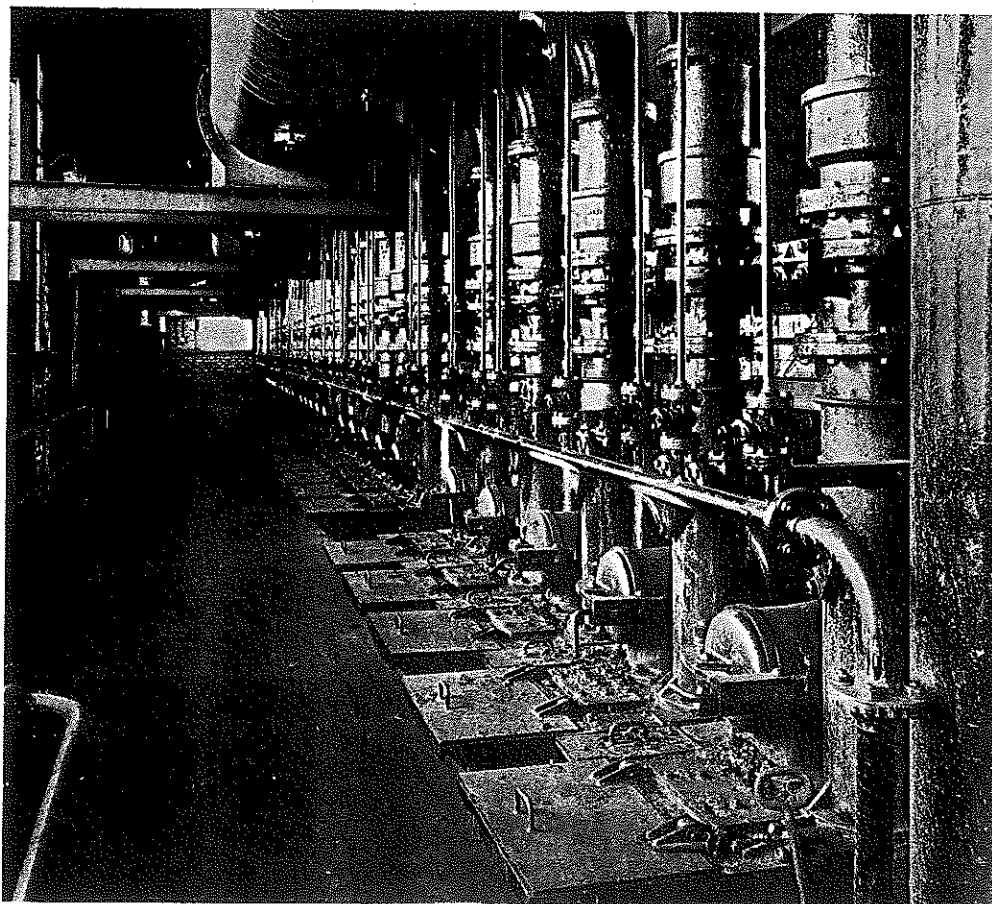


PLATE 4

Top Mains platform showing individual hydraulic mains.

to withstand the pressures exerted by strongly swelling coals. Expansion of the silica materials is provided for on the periphery of the silica work and this avoids the possibility of distortion thereby ensuring a long working life. The producer fittings are of the loose type to allow for expansion and to permit easy renewal. The recuperators are of the contra-flow type and a feature of this design, which gives absolute and easy control of temperature, is that each secondary air flue is entirely independent from the inlet slide to the combustion chamber. The settings are adequately insulated on bench top and side walls

GAS OFFTAKES AND DISCHARGE DOORS

Gas is taken away from the chambers by offtakes fitted at both top and bottom. Each top offtake feeds an individual hydraulic main from which the

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gas passes into a common collecting main (See Plate 4). The bottom gas offtake is of patented type and is actually formed in the dome of the bottom discharge doors. Along the length of the dome, which is virtually a semi-circular section pipe, there are a number of slots through which the gas flows to the collecting mains. (See Plate 5). Pressure in the lower part of the chamber is eliminated, thus permitting the use of water-sealed bottom doors. Counter balanced hand-operated closing gear is fitted to the bottom doors.

The gas offtakes, hydraulic mains, valves and collecting mains are continuously sprayed with hot ammoniacal liquor. Liquor is circulated by one of two pumps, one centrifugal type electrically driven, the other a reciprocating type steam driven which acts as a standby.

COKE QUENCHING AND HANDLING

At the conclusion of the carbonising period, coke is discharged from the chambers by manual opening of the bottom doors into a flat bottomed hot coke wagon which is traversed under the bench to the quenching tower by means of push button operated electrically-driven haulage gear. After quenching by a predetermined quantity of water, the wagon is removed from the quenching chamber and the coke discharged by hydraulically tipping the pivotted body of the wagon into a Receiving Hopper, from which it is extracted by means of a De Brouwer Conveyor, on which additional quenching can be carried out. This Conveyor discharges into a second hopper which feeds an electrically driven automatic Skip Hoist elevating the coke to a hopper in the Chamber House. From this hopper a reciprocating feeder delivers the coke onto a high speed vibratory screen where all material below $\frac{1}{2}$ " is removed, this being directed into a compartment of the overhead bunkers for use as the protecting pad for the bottom doors of the chambers before coal is charged into them.

The coke passing over the screen can then be either taken to the distributing conveyor over the bunkers in the Chamber House, for producer fuel, shown in Plate 2, or directly to the coke grading and storage plant.

COKE GRADING AND STORAGE PLANT

A Belt Conveyor from the Chamber House conveys this coke to a reinforced concrete building composed of screen house and bunkers of 350 tons capacity. On reaching the screening house, the coke first passes over a scalping screen which removes the fraction over 3" which flows via a spiral anti-breakage chute directly into the large coke compartment.

The coke below 3" passes on to a main grading screen of the balanced reciprocating type, which grades into four sizes :— $0-\frac{1}{2}$ ", $\frac{1}{2}-1\frac{1}{4}$ ", $1\frac{1}{4}-2$ ", $2-3$ ", spiral anti-breakage chutes again being employed for the two larger sizes of coke.

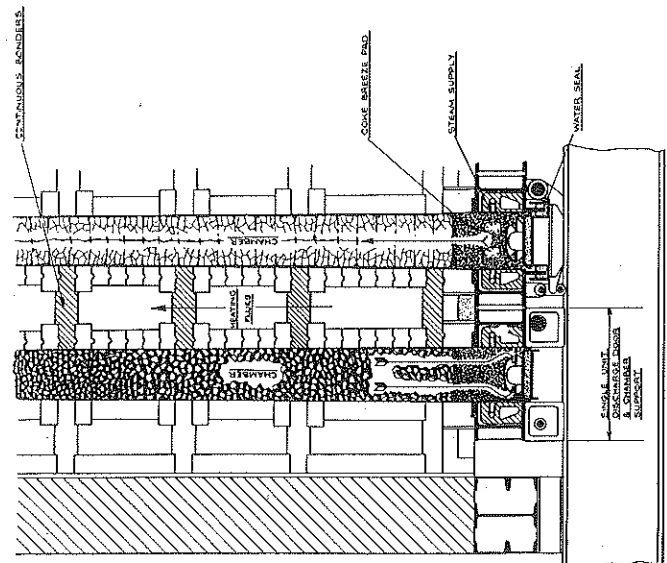
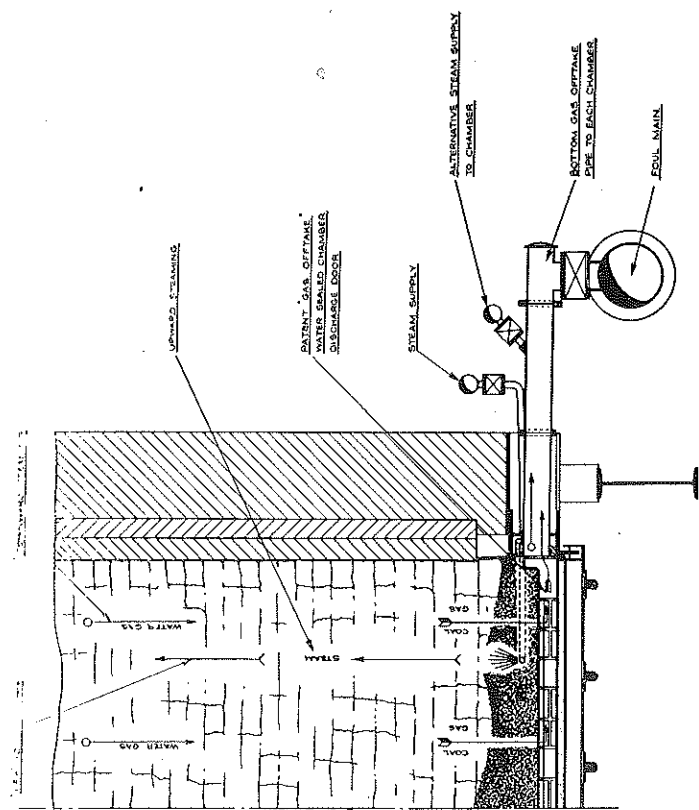


PLATE 5
Sections shewing combined chamber discharge door and support, one piece all welded steel design (water seal).

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The cones of the bunker are lined with special hard burnt tiles and are fitted with discharge doors below which are vibratory screens and loading chutes. All sizes of coke (except breeze) are re-screened to remove breeze and smalls, before being loaded to road or rail vehicles or into bags.

WASTE HEAT RECOVERY

The bench is equipped with a Spencer Bonecourt Waste Heat Boiler generating steam at a pressure of 150 lbs. per sq. in., the boiler being complete with electrically driven draught fan, feed pump and automatic boiler feed controls. This Boiler deals with the full output of waste gas from the bench ; a brick chimney deals with the waste gas during the boiler overhaul but provision has been made for the later addition of two more boilers.

GENERAL

The whole plant has been designed to ensure economical working as regards fuel and power and labour requirements and is very fully instrumented for ease of control.

Much thought has been given to the ease of operation and comfort of the stokers ; adequate natural and artificial lighting is ensured with roomy platforms and staircases and a goods/passenger lift gives access to all levels. Mess, locker and bathing and lavatory accommodation have all been provided in the building.

BUILDINGS

When the site was taken over it held several buildings that had been erected during the War while the site was part of the Ordnance Factory. These are mostly in fair condition and a serious endeavour was made to use some or all of them for works' purposes. They had been erected for a special purpose and it was found that, except as stores and one building to be made into a repair shop, they were unsuitable for gas works' purposes.

Four of these buildings have had to be removed.

Four new buildings have been erected ; the Retort House which has already been described, the Carburetted Water Gas House, Compressor and Power House, and the block containing the laboratory and offices, which are all described in later sections.

ROADWAYS AND YARDS

The site has a clay subsoil and in wet weather is impassable to vehicles.

The whole of roadways and yards where vehicular traffic is expected have been covered with an 8" layer of reinforced concrete, carefully laid and drained.

CARBURETTED WATER GAS HOUSE

This is a sheeted building of brick and steel frame construction and is so designed that protection is given to overhead bunkers for water gas plant and boiler fuel within the building.

The building houses two solid fuel boilers and is intended to accommodate Two-750,000 cu. ft. per day capacity carburetted water gas sets that are to be transferred to Maelor from the existing Rivulet Road Works in Wrexham.

A separate blower room for the water gas plant is provided in the building.

The building is designed to hold a third boiler and Two-1,750,000 cu. ft. per day capacity carburetted water gas sets (in place of the present 750,000 cu. ft. sets), and for extension if required.

SOLID FUEL BOILERS

The boiler installation in the carburetted water gas house consists of 2 Economic Boilers, 16' long $\times$ 10' 6" dia., fitted with Oldbury Chain Grate Stokers for firing Coke Breeze. Automatic control of feed water level is provided, together with comprehensive panel of recording instruments. The boilers are fitted with forced draught and induced draught fans, grit arresters and superheaters. Each boiler is rated at 6,000 lbs. of steam per hour when firing Coke Breeze. Steam is generated at 150 lbs. per sq. in. and superheated, as in the case of the Retort House waste heat boiler.

COMPRESSOR AND POWER HOUSE

This new brick building of modern design houses gas exhausting and compressing plant and a bulk supply gas meter in one section, and in an entirely separate section electricity generating plant, switchboard and high tension equipment for the electro-detarrer.

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EXHAUSTERS AND COMPRESSORS

Two steam driven Rootes type exhausters, each of 200,000 cu. ft. per hour capacity, are installed for handling coal gas or carburetted water gas, or a mixture of these gases.

Overhead gas connections are so arranged that the present units can be replaced by larger machines at some future date if required.

COMPRESSORS

The compressor installation consists of two steam-driven Rootes type compressors, capable of handling 120,000 cu. ft. of gas per hour against 7 lbs./p.s.i. pressure, for supplying gas to the Wrexham district and into the grid main supplying gas to Rhos, Cefn Mawr and Llangollen.

One steam-driven vertical reciprocating compressor, capable of handling 70,000 cu. ft. of gas per hour against 15 lbs. p.s.i. pressure, is also provided for supplying gas north to the Deeside Undertakings.

A Connersville meter with a rating of 150,000 cu. ft. per hour, is installed for metering under pressure the gas supplied into the grid main running north from Wrexham.

There is room in this section of the compressor and power house for the installation of two more exhausters and an additional compressor, at some future date.

ELECTRICITY GENERATING PLANT

Two 250 kilowatt alternator sets, driven by 365 B.H.P. compound condensing steam engine are provided.

A small diesel engine-driven alternator set is provided for emergency use.

A 10-ton overhead travelling crane is installed.

LABORATORY AND OFFICE BLOCK

This is a flat-roofed brick building, adjacent to the purification plant, which will contain Laboratories, Fairweather Calorimeter Room and offices for Works' Management and Technical Staff.

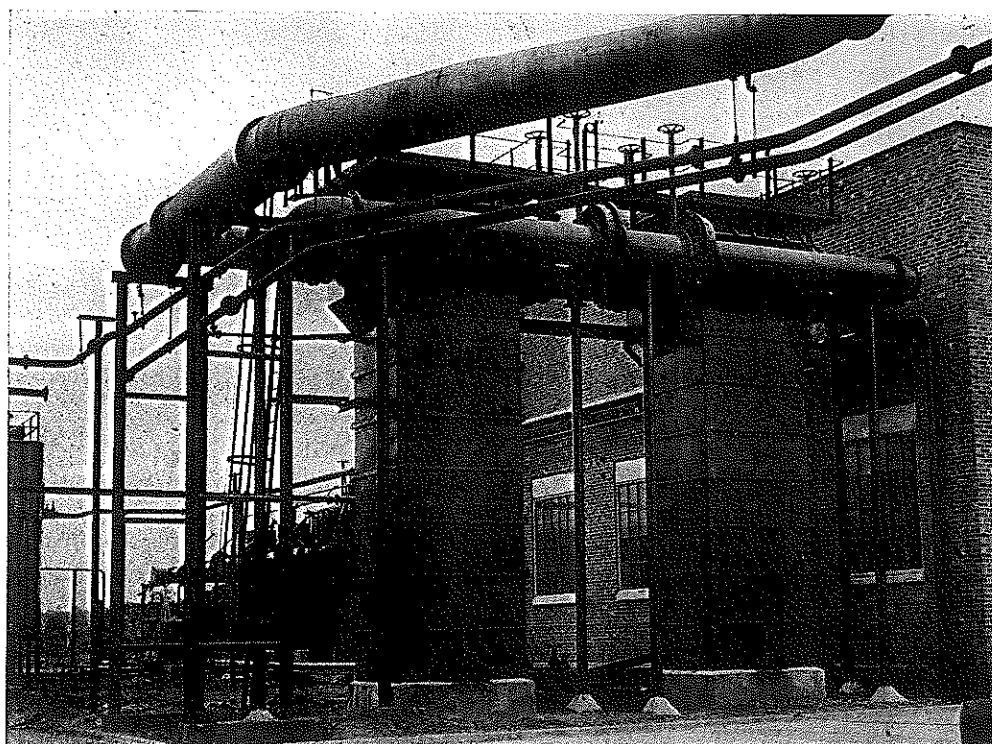


PLATE 6 — CONDENSERS

ANCILLARY PLANT

CONDENSERS

Two vertical water-cooled condensers, of 5,000,000 cu. ft. per day capacity, are provided. (See Plate 6).

Each condenser consists of a mild steel vertical chamber measuring $6' 7\frac{1}{2}"$ x $5' 6\frac{3}{4}"$ x $25' 6"$ high with vertical water tubes and 24" dia. gas connections.

Automatic control of the outlet gas temperature is provided by means of thermostatically-operated cooling water supply valve.

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DETARRER

The detarrer is installed in the gas stream at outlet of exhausters and is designed to handle 5,000,000 cu. ft. of gas per day with 99% efficiency of removal of tar fog. (See Plate 7).

The detarrer consists of a mild steel circular vessel, 6' dia. x 26' high and is fitted with 24" gas connections.

The electrical equipment is fitted with safety interlocking gear and consists of transformer, rectifier and control panel situated in the power house.

AMMONIA WASHER

The ammonia washer consists of a static type washer in two sections, of all steel construction, with 24" valves and connections, designed for a capacity of 5,000,000 cu. ft. per day. Each section measures 10' 8" x 5' 4" x 13' 1" high and contains 4 washing bays packed with board filling.

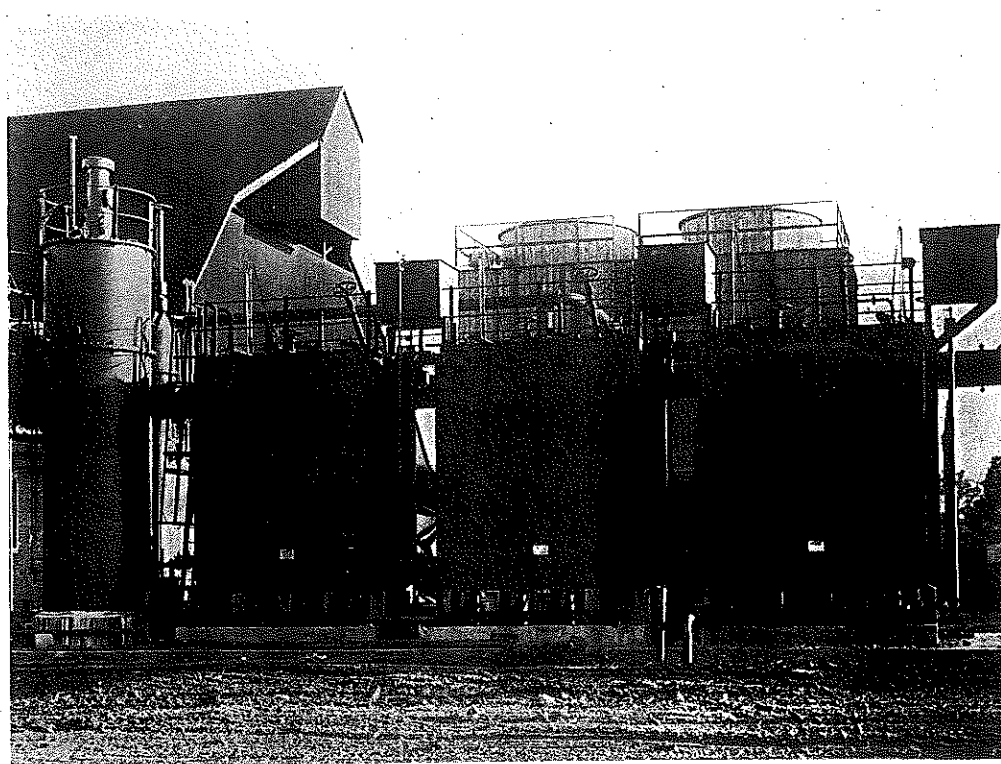


PLATE 7—DETARRER AND STATIC WASHERS

Individual liquor circulating pumps are provided for each bay, there being a separate electric motor and counter-shaft for each section.

NAPHTHALENE WASHER

This consists of a single mild steel rectangular vessel, board filled, with 4 bays, overall dimensions being 10' 8" x 5' 4" x 13' 1" high, designed for a capacity of 5,000,000 cu. ft. per day. Valves and connections of 24" dia. are provided with electric motor and circulating pumps as for the Ammonia washers.

This washer stands in line with and is of similar design to the ammonia washers.

PURIFIERS

Five reinforced concrete ground level purifiers are installed with suitably braced steel lids, each box measuring 35' x 35' x 6' deep. There are two lids to each box and the purifying material is carried on two layers of grids.

The five boxes are arranged for series rotation through 20" dia. valves and connections, with split flow to each box. A gas heater is provided on the main inlet to the purifiers.

A travelling gantry is provided for lifting the lids when the purifiers are to be emptied and filled.

Oxide handling will be by means of a 24 R.B. Diesel-driven crane with special bucket.

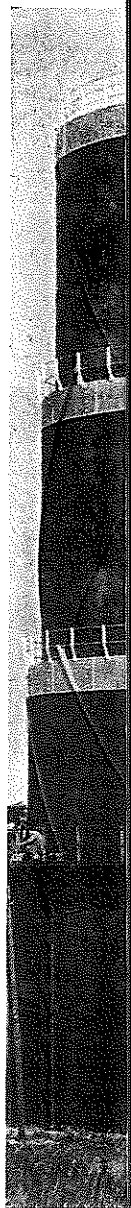
STATION METER

A Connersville Station Meter with a rated capacity of 200,000 cu. ft. per hour is provided on inlet holder, with valves and connections of 20" dia.

TOWN'S GASHOLDER

The main gasholder has three spirally guided lifts in a steel tank and when fully inflated has a capacity of 500,000 cu. ft. It is equipped with 30" dia. valves and connections and is of rivetted construction. (See Plate 8).

Anti-flood pipes are provided on the inlet and outlet mains, as well as a safety by-pass governor between inlet and outlet.



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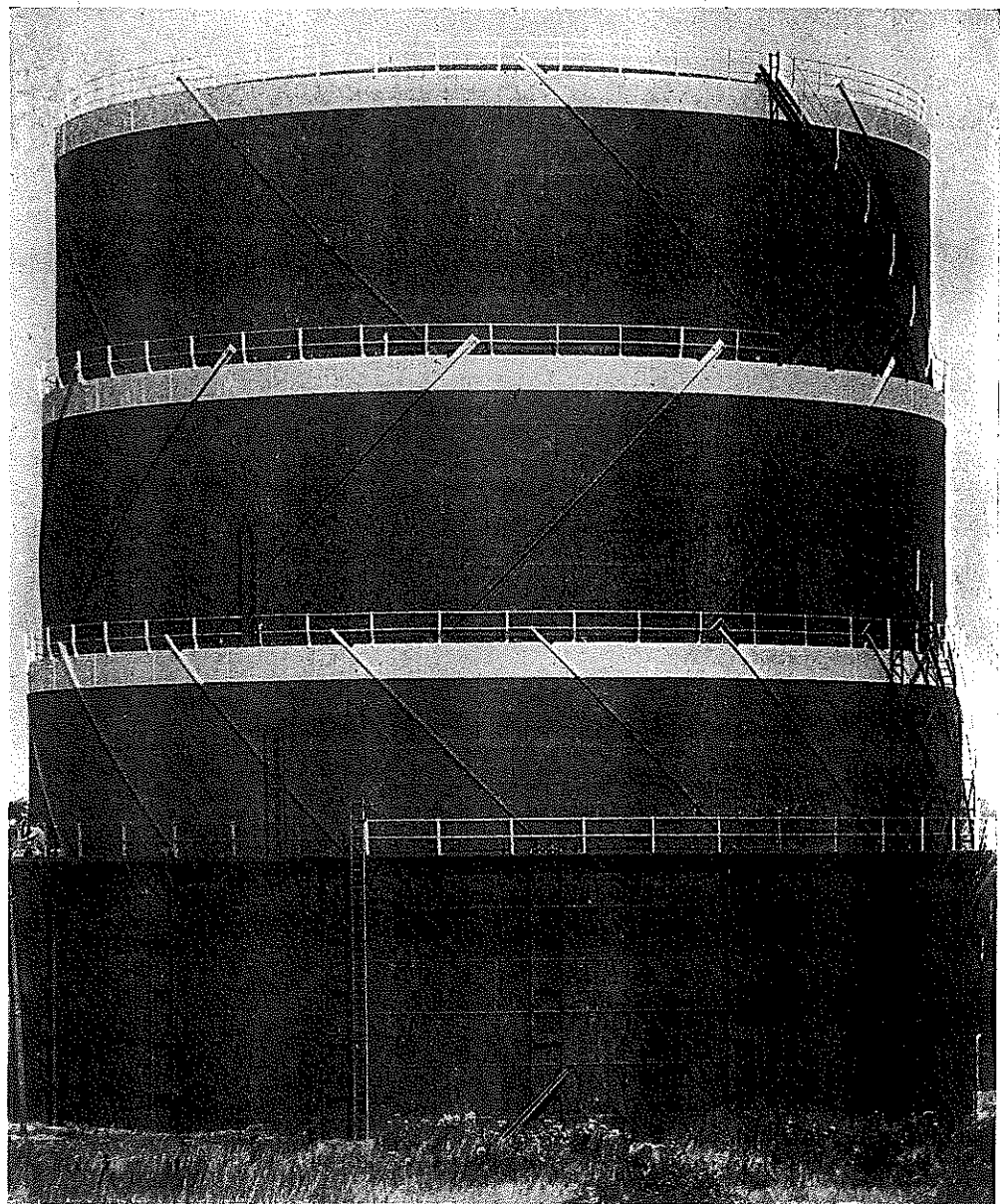


PLATE 8 — 500,000 CU. FT. GASHOLDER

The practice of using hot enamel for protecting parts of the holder exceptionally liable to corrosion, as adopted at Pontypool has been repeated in the case of this holder.

The principal dimensions of the holder are :—

Inner Lift	88' 2" dia.	x 27' 9" deep.
Middle Lift	90' 10" „	x 27' 9" „
Outer Lift	93' 6" „	x 27' 9" „
Steel Tank	96' 0" „	x 28' 6" „

The pressure thrown by the holder is 13.4" when fully inflated.

CARBURETTED WATER GAS RELIEF HOLDER

A two-lift spirally guided holder in steel tank, of all welded construction, with a capacity of 250,000 cu. ft. is provided for storage of carburetted water gas prior to its being mixed with the coal gas stream.

The following are the principal dimensions :—

Inner Lift	77' 0" dia.	x 27' 3" deep.
Outer Lift	79' 8" „	x 27' 3" „
Steel Tank	81' 11" „	x 27' 9" „

GAS DEHYDRATION PLANT

A calcium chloride gas-drying plant is provided on outlet holder, having a capacity of 5,000,000 cu. ft. per day. Valves and connections are 24" dia. The plant consists of a cast iron static washer of 4 chambers, brush-filled, dimensions 4' 6" x 10' x 15' high. The plant is provided with rack cooler, pumps, storage tanks and concentrator for calcium chloride.

WATER COOLING TOWER

An induced draught water cooling tower, capable of dealing with 45,000 gallons of water per hour, is installed to allow for re-circulation of condenser cooling water. The tower is of rectangular timber construction, with board filling, and stands over a reinforced concrete water basin which forms its foundation.

Two electrically-driven centrifugal water circulating pumps with 9" water connections are provided.

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LIQUOR CONCENTRATION PLANT

A liquor concentration plant for the automatic production of concentrated liquor of 20% ammonia content, and capable of dealing with 20,000 gallons per hour of crude liquor, is provided.

A cylindrical storage tank of 11,000 gallons capacity is provided for storing the concentrated liquor.

TAR AND LIQUOR STORAGE

Underground storage for the tar, crude liquor and the effluent from the concentrated liquor plant, is provided by an underground reinforced concrete tank, having a total capacity of 280,000 gallons.

A mass concrete foundation forms the bottom of the tank and the tank is covered by a reinforced concrete roof which carries the detarrer and static washers for removal of ammonia and naphthalene.

Tar and liquor pumps and necessary connections are also carried on the tank top.

Incoming tar and liquor passes through an underground separating tank, capacity 6,000 galls., adjacent to the main storage tank.

WEIGHBRIDGE

A 30-ton platform road vehicle weighbridge is provided at the entrance to the works.

STEAM AND POWER

Works' steam requirements will be met by recovery of heat from the flue gases leaving the retort bench by means of waste heat boiler in the Retort House.

This boiler has a rated capacity of 7,500 lbs. of steam per hour at 150 lbs. p.s.i., and superheated to 500°F.

An alternative and supplementary source of steam supply will be provided by two Economic Boilers in the water gas plant house which are equipped with chain grate mechanical stokers for Breeze firing.

These boilers are each rated at 6,000 lbs. of steam per hour when firing Breeze, also at 150 lbs. p.s.i. and 500°F. superheat.

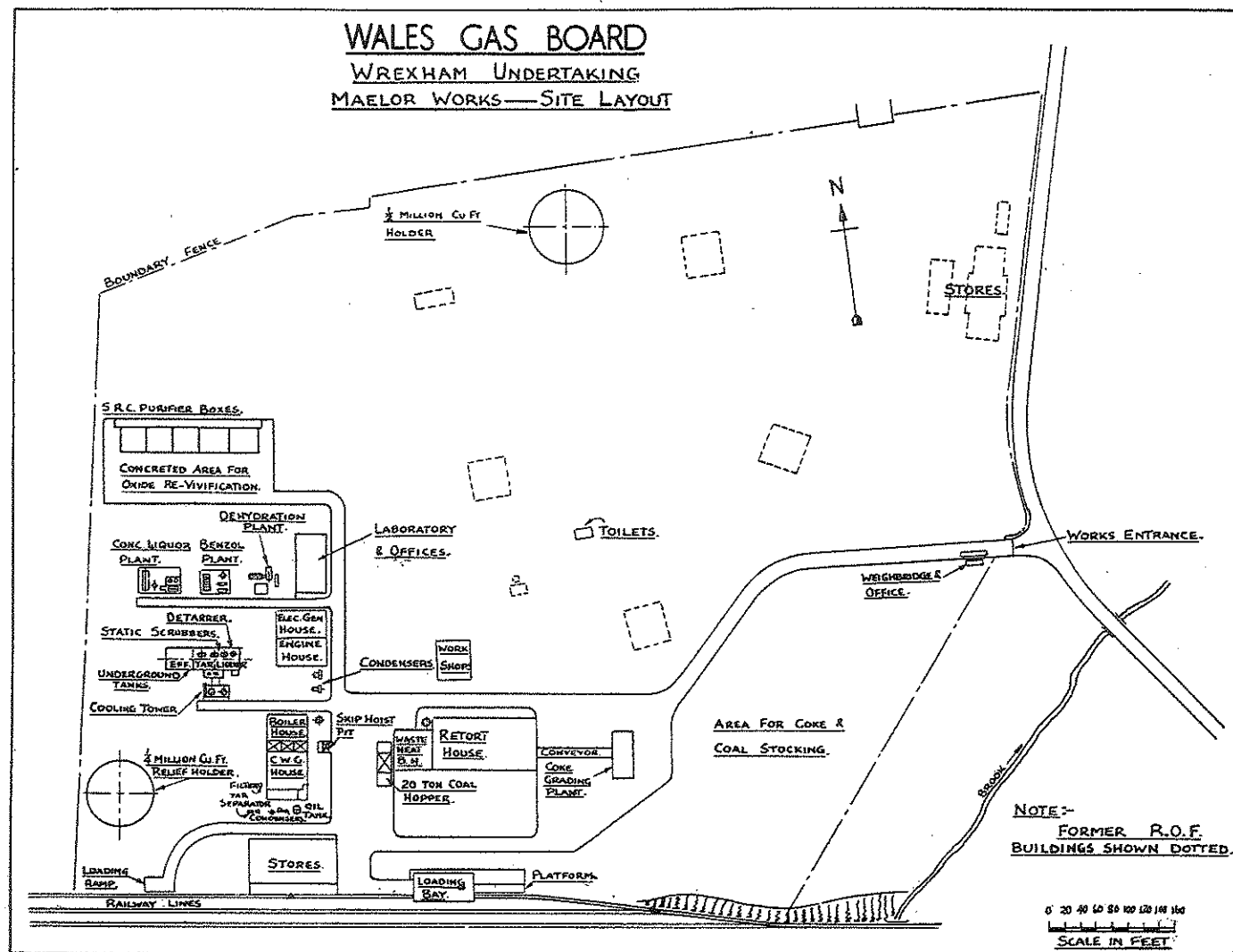
Steam used for driving exhausters, compressors and boiler feed pumps is exhausted at 30 lbs. p.s.i. to provide a supply of low pressure steam for process work.

Electricity is generated by alternators driven by compound steam engines which are condensing.

All other machinery on the works is electrically driven.

WALES GAS BOARD
WREXHAM UNDERTAKING
MAELOR WORKS — SITE LAYOUT

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process
engines



LIST OF MAIN CONTRACTORS

Intermittent Vertical Chamber	
Oven Plant	W. J. JENKINS & Co., LTD.
Coke Grading Plant	W. J. JENKINS & Co., LTD.
Condensers	WHESOE, LTD.
Detarrer	WHESOE, LTD.
Ammonia Washer	WHESOE, LTD.
Naphthalene Washer	WHESOE, LTD.
Purifiers	PETER LIND & Co., LTD.
Station Meter	W. C. HOLMES & Co., LTD.
Gas Dehydration Plant	W. C. HOLMES & Co., LTD.
Concentrated Liquor Plant	W. C. HOLMES & Co., LTD.
Gas Holders	DRUMMOND & Co. WHESOE, LTD.
Economic Boilers	FOSTER, YATE & THOM, LTD. EDWIN DANKS & Co., LTD. (Chain Grate Stokers). UNIT SUPERHEATER & PIPE Co., LTD. (Superheaters). CLYDE BLOWERS, LTD. (Soot Blowing Equipment). DAVIDSON & Co., LTD. (Induced Draught Fans and Grit Arresters).
Carburetted Water Gas House	G. & J. WEIR, LTD. (Feed Pumps). T. C. JONES, LTD. (Steelwork). WM. HALL & SON, LTD. (Brickwork). HUMPHREYS & GLASGOW, LTD. (Skip Hoist and Coke Chutes).
Compressor and Power House	T. E. WARRINGTON, LTD. (Chimney). T. C. JONES, LTD. (Steelwork). WM. HALL & SON, LTD. (Brickwork). GEO. WALLER & SON. BRYAN DONKIN Co., LTD. BELLIS & MORCOM, LTD. BELLIS & MORCOM, LTD. THORNTONS, WREXHAM. UNIT SUPERHEATER & PIPE Co., LTD. VERSIL LTD. (Insulation).
Exhausters and Compressors	STEWARTS & LLOYDS, LTD. WESTWOOD & WRIGHTS, LTD.
Steam Engines	WHITLEY BROS.
Alternator Sets	W. J. JENKINS & Co., LTD. (F.C. Construction Co.)
Electrical switchgear and cables	PETER LIND & Co., LTD.
Steam Pipe Lines	A. MONK & Co., LTD.
Gas Mains	
Gas Valves	
Site Preparation, Roads, Fencing and Drainage	
Foundations	

Bricks	.	.	.	LONDON BRICK COMPANY, LTD.
Cement	.	.	.	TUNNEL PORTLAND CEMENT CO.
Roof Sheetting	.	.	.	ROBERTSON THAIN, LTD.
Consultants	.	.	.	SOIL MECHANICS, LTD.
				SCOTT & WILSON.
				VULCAN BOILER & GENERAL INSURANCE CO., LTD.
				BRITISH ENGINE BOILER & ELECTRICAL INSURANCE, CO.,
				LTD.
Architects	.	.	.	W. J. JENKINS, LTD.
				E. COLWYN FOULKES, Colwyn Bay.

A large amount of work has been carried out by the Board's own staff. This includes pipe fitting and plumbing work on gas, water and liquor services and other general pipework, together with painting and final preparation of the site and plant for full operation.