


S. S. W. W.  
  
DESCRIPTION OF PUMPING STATIONS  
1921.

VOL. I

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ENGINEER.



SOUTH STAFFORDSHIRE WATERWORKS COMPANY.

PUMPING STATIONS.

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and supplementary  
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situate at

CAWNEY HILL, DUDLEY, in the County  
of WORCESTER

S U M M A R Y  
- - - - -

Total Engine Power at Station is

equal to 153,618 gallons per

24 hours.

No. 1. Engine. Power per 24 hours = 76,809 Gallons.  
No. 2. Engine ditto = 76,809 "

TOTAL SPECIFIED HEAD = 132 Feet.

C O S T S

	<u>£.</u>	<u>s.</u>	<u>d.</u>
Land and Law Charges ...	106.	10.	8.
Engine House ...	152.	2.	3.
Two Engines ...	430.	1.	1.
Sundries ....	45.	0.	6.

TOTAL COST £ 733. 14. 6.

Cost of Pumping Main ... £ 730. 6. 3.

Station Commenced - 1910.

Station Completed - 1911.



LAND. ( 33 Poles).Purchased in June, 1884 fromA.E.Woodall and J.G.Wright.This land includes that upon  
which the Tank is erected.

Level of E.H.F. above Ordnance Datum .. 807 Feet.

CONTRACTORS.BUILDINGS.Engine House - 1910.Harrison Smith Buildings Ltd,  
Birmingham.GAS ENGINES - - 1911.

Tangyes Ltd, Birmingham.

COSTS

	£.	s.	d.
Land and Law Charges	106.	10.	8.
Engine House ...	152.	2.	3.
Two Engines ...	430.	1.	1.
Sundries ...	45.	0.	6.
	<hr/>		
<u>TOTAL COST</u>	£ 733.	14.	6.
	<hr/>		
Pumping Main ...	£ 730.	6.	3.

This is a Re-pumping Station.

The Pumps draw their water from  
the Tank at Cawney Hill and  
deliver same into a Ferro-Concrete  
Tower at Turner's Hill, the top  
water level of which is about  
125 Ft. above E.H.F.

ENGINE HOUSE.

Internal Dimensions. Length	...	19 Feet.
Width	...	13 Feet
Height to top of Wall Plate	...	9 Ft - 6 Ins.

ENGINES NOS 1 AND 2.

Horizontal Gas Engines, driven  
through Gearing Treble Vertical  
Ram Pumps.

CAPACITY

Net Quantity of each Unit equals  
76,809 gallons per 24 hours, with  
Pumps running 42 revolutions per  
minute.

SPECIFIED HEAD.

Specified head on Pumping Main (including friction)	...	132 Feet.
Pump Horse Power of each Unit	...	2
Revolutions of Pumps per minute	...	42
Brake Horse Power of each Unit	...	6½
Maker's Order Number	..	... G.4075.

GAS ENGINES.

Each Engine is a Tangye Gas  
Engine, Horizontal "AA" type, 6½  
B.H.P. Size to give 3 B.H.P. at a  
speed of 231 revolutions per minute.

Maker's No.	No. 1. Engine -	18821 B.R.
	No. 2. Engine -	18822 B.R.

Centre line of Engines from E.H.F.		2 Feet.
Diameter, Pistons	...	5¼ Ins.
Stroke, Engines	...	12 Ins.
Diameter, Crank Shaft Bearings,		2½ Ins.
" Flywheels	...	3 Ft - 3 Ins.



GAS ENGINES (Continued)

Flywheels, Width of Rims	...	3½	Ins.
do Internal diameter, Boss.		2½	Ins.
Wheel in one Casting with	...	6	Arms
Diameter, Crank Pin	...	2½	Ins.

PUMPS.

Tangyes Vertical Treble Ram Pumps  
driven through Cast Iron Machine  
Cut Gearing by Gas Engines.

Maker's No. No. 1. Engine Pumps	2006
No. 2. do	2007.

Diameter, Pump Rams	...	5	Ins.
Stroke do	...	6	Ins.
Gallons pumped per revolution ..		1.273	
Multiplier given to Foreman ...		1.25	
Revolutions per minute	...	42	

FORCE PUMP VALVES. (CUNMETAL)

Number Suction Valves to each Pump,		3	
" Delivery Valves do		3	
Seats of Valves are drawn in with a Taper. Dia. at top of Taper,		4½	Ins.
Gutta Percha Beats are fixed in the Valves and not in Seats.			
Diameter of Suctions to Pumps ...		4	Ins.
" Deliveries from Pumps .		4	Ins.

LEVER LOADED RELIEF VALVESOn each Delivery Pipe from Pumps.

Diameter	...	...	2	Ins.
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SUCTION AIR VESSELOn Suction Main.

Approximate diameter	...	8. Ins.
Total inside Length	...	2 Ft - 4 Ins.
Thickness of Metal	...	1 In.
Diameter, Branch on bottom	...	3 Ins.

DELIVERY AIR VESSEL.

Approximate diameter	...	13 Ins.
" Total inside Length	...	4 Ft - 6 Ins.
" Thickness of Metal	...	1 In.
Inlet and Outlet Branches	...	4 Ins.

WATER GAUGE GLASSES ON DELIVERY AIR VESSEL.

Made by Dewrance & Co., London.

Standard Patent Water Gauge with  
flanged ends, fitted with Sight  
Slot Shield.

Diameter of Glass	...	$\frac{3}{4}$ Inch.
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One Air Valve fitted to Air  
Vessel.

WHEEL GEARING ON PUMPSMachine Cut Gear.

Spur Wheels	...	159 Teeth.
Revolutions of Wheel per minute	...	42
Width across face	...	3 Ins
Number, Teeth in Pinion	...	29
Width across face, "	...	$3\frac{1}{4}$ Ins.
Pitch of Teeth	...	No. 4.

Pinions of Compressed Paper.

FITTINGS

One Electric Alarm Delivery Pressure Gauge.	10 ins dia.
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FITTINGS (Continued)

Made by - Schaffer & Budenburg  
Manchester.

ENGINE COUNTERS.

Harding's Seven Figure Circular Make.

One on each Engine

OFFICIAL TESTS

5th APRIL, 1911.

NO. 1. ENGINE. ( 3 HOURS TRIAL)

Total Head on Main	...	128 Feet.
Revolutions, Pump per minute,		42.1
Water discharged, gallons per hour,		3220.
Gas consumed per hour	...	72.7 C. Ft.
Mean Effective Pressure ( in Cylinder )	...	73.9 lbs per sq. in
Number, Explosions per Minute,		81.5
Pump Horse Power	...	2.08
Indicated Horse Power	...	3.96
Mechanical Efficiency	...	52.5%
Engine Efficiency (Tangye Fig.)		69%
Brake Horse Power	...	2.74
Efficiency, Pump and Gearing		76%

NO. 2. ENGINE ( 3 HOURS TRIAL)

Total Head on Main	...	133 Feet
Revolutions, Pump per Minute,		42.2
Water discharged, Gallons per Minute)		3230
Gas consumed per hour	...	73.7 C. Ft.



NO. 2. ENGINE (Trial Continued).

Mean Effective Pressure in Cylinder,	78.4 lbs per sq. in.
Number, Explosions per Minute ..	78.6
Pump Horse Power ...	2.16
Indicated Horse Power ...	4.05
Mechanical Efficiency ...	53.3 %
Engine Efficiency (Tangye Figure)	69 %
Brake Horse Power ...	2.8
Efficiency, Pump and Gearing ...	77.1

Messrs Tangye guaranteed to pump  
3,000 Gallons against 132 Ft. Head  
per hour with 75 C. Ft. of 600  
British Thermal Unit Gas.

Heat Value of Dudley Gas was  
unknown.