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MADRAS RECORD OFFICE.

Government of Madras.

Public Works DEPARTMENT.

G.O. No. 466-A	Press ~~Mis.~~
182-183	
Dated 7-2	1866.

Not to be folded or roughly handled

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*Proceedings of the Madras Government, Public Works Department,
7th February 1866.*

No. 182. Read the following Proceedings of the Madras Government in the
Public Department:—

Observing that the works which are required for
lighting the whole of Fort Saint George with
gas should be completed, and requesting that
steps may be taken for procuring from Eng-
land, the requisite piping, &c. } (Here enter 26th January 1866, No. 83.)

No. 133. ORDER THEREON, 7th February 1866, No. 466 A

MILITARY WORKS, No. 19.

Communicated to the Superintend-
ing Engineer of the 4th Division, and to
the Officer in charge of the Store Depart-
ment for information and guidance.

(True Extract.)

(Signed) CHARLES A. ORR, Colonel, R. E.,
Secretary to Government.

To the Superintending Engineer, 4th Division, with nineteen Enclosures.
,, Officer in charge of the Store Department.
,, Accountant General.
,, Controller of Public Works Accounts.

Exd. S. T. Augustin.

Proceedings of the Madras Government, Public Department,
26th January 1866.

Read the following papers :—

No. 84. Proceedings of Government in the Military Department.

Communicating a letter from the Officer }
Commanding Her Majesty's 76th Regi- } (Dated 30th October 1865, No. 4032).
ment, stationed in Fort Saint George, }
on the Gas-lights used in the Barracks }
of the Regiment.

Referred to Dr. Wyndowe, for report, with reference to the Order of Govern-
ment, of the 20th September 1865, No. 977.

FORT SAINT GEORGE, (Signed) A. J. ARBUTHNOT,
7th November 1865. Chief Secretary.

No. 85. From the Superintending Engineer, 4th Division, to the Secretary to
Government, Public Works Department, Fort Saint George; dated
Madras, 7th November 1865, No. 2627.

With reference to the Order of Government, No. 507, dated 20th March 1862,

Enclosures,
5 Plans,
5 Estimates (abstract),
5 Specifications.

I have the honor to submit, for sanction,
and for permission to enter in my Bud-
get of 1866-67, five estimates as below,

amounting in the aggregate to Rupees 55,000, together with plans and specifica-
tions, for laying down pipes for the purpose of supplying gas in the buildings and
streets of Fort Saint George.

	RS.
Laying down wrought iron branch pipes, &c., for supplying gas light to the Mess House.....	2300
Do. do. do. to Saint Mary's Church.....	2900
Do. do. do. to Government Office.....	6400
Do. do. do. to the new Family Barracks... ..	12,000
Do. cast wrought iron main and branch gas pipes in the street of the Fort, for supplying gas to the light in the buildings and streets.	31,400
Total...	55,000

These estimates have been approved by the Superintendent of Gas works.

2. Paragraph 7 of the Order in the Public Department, No. 348, dated 18th
March 1862, directed that measures should be then taken for procuring the neces-
sary piping, but until the plans were matured, it was not known exactly what
would be required, and so nothing has been yet effected in that direction; but the
pipes, &c., will now be entered in the Indents, shortly to be submitted, of stores
required from England.

Referred to the Public Department.

FORT SAINT GEORGE, (Signed) C. A. ORR, Col., R. E.,
10th November 1865. Secy. to Govt., P. W. D.

No. 86. From Assistant Surgeon S. J. WYNDOWE, M. D., Superintendent Gas
Works, to the Chief Secretary to Government, Fort Saint George; dated
Madras, 4th December 1865, No. 65.

With reference to the Proceedings of Government Nos. 111 and 112, and Order
thereon, dated 20th September 1865, No. 977, I have the honor to submit, herewith,
the information therein called for in paragraph 3.

1. Appendix A (prepared from the specifications and estimates for the necessary extension for gas lighting to the whole Fort, furnished by the Executive Engineer Fort Range, and already submitted to Government) shows the contemplated extensions will increase the number of lights burnt nightly to nearly 800, and will require a daily supply of gas of about 10,000 cubic feet. The capacity of the present gas holders is only 3,240 cubic feet; it becomes necessary, therefore, to estimate for the erection of a new tank and bell.

2. Appendix B shows the probable cost of the required extensions, including the Executive Engineer's estimate for Mains, Pipes, Fittings, &c., and also an Estimate furnished by a contractor, Mr. Bennett, for the additions required at the works themselves, including the new tank and bell referred to in the previous paragraph—vide estimate marked C and D.

3. Appendix E is the statement of the expenditure actually incurred in the construction of the works up to the present time, the larger amount of this item being for the oil works originally constructed.

4. Accepting these estimates to represent the increased expenditure required, and adding to it the sums already expended in construction, the total amount in round numbers will be, say, 80,000 Rupees; interest upon which, per annum, at 7 per cent., *i. e.* 5 per cent. interest on capital and 2 per cent. for wear and tear, will be 5,600, or Rupees 460-10-8 a month. Then

	RS.	A.	P.
Interest on Capital	460	10	8
Salary of Superintendent	100	0	0
Cost of Establishment	91	0	0
Monthly expenditure for coal—35 Tons at 20 Rupees a ton—sufficient to produce 3,00,000 cubic feet of gas...	700	0	0
Ditto for oil—64 maunds, at 3½ Rupees a maund.	231	0	0
Total Rupees	1,581	10	8

at this rate, the cost for the 800 lights will be Rupees 1581-10-8, nearly 2 Rupees for each light per mensem.

In this calculation, no allowance is made for the profits from sale of residual products. The experience of English Gas Works shows the Coke left on the distillation of a ton of coal is from 13 to 14 cwt., of which one-third is required to be burnt under the retorts for each ton of coal carbonized. Allowing the yield of coke to be in the same proportion, and calculating half to be consumed, about 12 tons of coker worth 25 Rupees a ton, or 300 Rupees per mensem, will probably be produced from this source. The ammoniacal liquor and tar will also be a source of profit.

5. In paragraph 4 of the Proceedings of Government, a report is called for, in the Military Department, with reference to a statement of the President of the Sanitary Commission, that the lights were too faint for the men to read by. In the Proceedings of Government, Military Department, No. 4032, dated 30th October 1865, this statement is corroborated. I have the honor to return these Proceedings, with the following explanation:—The dimness of the lights complained of is due to the inefficiency of the burners, and also in a measure to the arrangement of the pendants, the latter being fixed in their present high position to be beyond the influence

of the Pankahs. The lights even at present are, however, much more brilliant than under the old arrangement of oil lights.

The average consumption to each light during the past year has been eight cubic feet per night, the lights being burnt from 6 P. M. to 6 A. M. Now as the usual average consumption to each burner is 3-4 cubic feet per hour, it will be evident that the dimness is due to the consumption of a minimum of gas, and can easily be improved, if so desired, by a larger consumption, but, of course, at a proportionably increased expenditure. I have not been able, hitherto, to procure the proper burners for coal gas, although I have made several attempts to get them made here, but I will endeavour to get them from Calcutta, if Government sanction this arrangement. Argand burners give the most brilliant light, but require a supply of 5 cubic feet per hour. Perhaps one might be allowed to each room, the reading room being entirely supplied with them.

The re-arrangement of the pendant and providing new burners involving increased expenditure, I have not attempted these alterations hitherto, pending the sanction of Government to the extension of the lighting by coal gas to the whole Fort, the present works being only experimental.

APPENDIX A.

STATEMENT shewing the number of lights, and the probable expenditure of Gas, when the contemplated extensions are completed.

	Cubic feet required daily.
Soldier's Barracks. 150 lights at 10 cubic feet for each light per night.....	1,500
Family Barracks. 230 lights at 10 cubic feet for each light per night.....	2,300
Government Offices. 156 lights at 3 cubic feet per hour, for 2 hours, 936 say....	1,000
Street lamps. 70 lights burning 4 cubic feet per hour, for 8 hours 240 round numbers....	2,300
Mess-house. 111 lights burning 3 cubic feet per hour for each light, for 6 hours 1998 say....	2,000
Saint Mary's Church. 72 lights 3 evenings in the week at 4 cubic feet for each light per hour, for 2 hours 576....	600
Total...789 lights.	Total... 9,700

APPENDIX B.

ESTIMATE of Cost of extending the lighting with Coal Gas throughout the whole Fort.

	RS.	A.	P.
1 Executive Engineer's estimate for extensions to Mess-house in Fort...	2,300	0	0
Do. do. to Government Offices...	6,400	0	0
Do. do. to buildings and streets in Fort...	31,400	0	0
Do. do. to New Family Barracks...	12,000	0	0
Do. do. to Saint Mary's Church...	2,900	0	0
2 Cost of setting a bench of 10 Retorts, 2 in a bench, as per estimate and plan appended, marked C, 130 x 5 = 650	55,000	0	0
3 Cost of constructing a new tank and bell for holding 10,000 cubic feet of Gas— estimate and plan attached, marked D...	650	0	0
	6,984	15	3
Total...	62,634	15	3

APPENDIX E.

STATEMENT shewing the expenditure actually incurred in the construction of the works up to the present time.

			RS.	A.	P.
		Sanctioned on account of the erection of the necessary building, and for providing the apparatus for introducing the Oil Gas for lighting the Barracks—Vide Government Order, dated 25th August 1858, No. 1062 ...	12,000	0	0
		Sanctioned the lighting of the upper story of the European Barracks—Vide Government Order, dated 23rd January 1861, No. 107 ...	2,140	0	0
1862.	April... 30th	Paid to Mr. Tonkin for Lime Purifier ...	130	0	0
1863.	Dec.... 8th	„ to do. for Hydraulic and Condenser ...	949	7	0
	Nov.... 5th	„ to do. for alterations ...	200	0	0
1864.	Aug.... 15th	„ balance of above account, as settled by Government Solicitor ...	526	0	0
1862.	July... 8th	„ to the Mint for 2 Cast-iron Coal Gas Retorts ...	152	9	4
	Sep.... 25th	„ to the do. for 2 Elliptical Retorts, &c. ...	254	8	6
1863.	April... 20th	„ to the do. for 4 Coal Gas Retorts, and 40 Balance Weights ...	422	0	0
1864.	June... 16th	„ to the do. for additional pipes and Condenser ...	47	1	9
1863.	Dec.... 7th	„ to the Commissary of Ordnance for Scrubber ...	81	10	9
	July... 13th	„ to Mr. Boutell for superintending Coal Gas Manufactory ...	100	0	0
1864.	July... 9th	„ to the Gun Carriage Manufactory for repairing Lime Purifier ...	29	11	2
	Oct.... 15th	„ to the do. for do. ...	39	4	10
1865.	Feb.... 18th	„ to the do. for 1 Brass Cock and Brass Pipe ...	52	8	4
1864.	Sep.... 2nd	„ to Engineer for re-setting Retorts ...	71	14	5
	Jan.... 31st	„ to do. for do. ...	45	6	0
1862.	Oct.... 3rd	„ to Mootosawmy Moodelly, for 9000 thick wall Bricks ...	150	0	5
1863.	May... 6th	„ to do. for 800 thick wall Bricks ...	16	1	0
	Jan.... 27th	„ to Dr. Hunter for 117 Fire Bricks, &c. ...	13	8	0
1862.	Aug... 9th	„ to Messrs. Simpson and Co., for 1250 Fire Bricks ...	150	0	0
1864.	July... 7th	„ for Apparatus for Cooling Condenser ...	39	3	0
		Total ...	17,610	14	6

No. 87.

ORDER THEREON, 26th January 1866, No. 83.

In the Proceedings of Government under date the 20th September last, No. 977, Dr. Wyndowe was instructed to submit an accurate statement of the expenditure actually incurred in the construction of the Gas Works in Fort Saint George, and an estimate of the cost of so extending them as to admit of the whole Fort being lighted with Gas. This information is furnished in Dr. Wyndowe's letter above recorded, from which it appears that the expenditure incurred up to the present time, in the construction of the works, is Rupees 17,610-14-6, and that the work remaining to be done, in order to admit of the whole of the Fort being lighted with Gas, is Rupees 62,634-15-3, so that the aggregate cost of the construction of the

work will be Rupees 80,245-11-9, or, in round numbers, Rupees 80,000. Allowing for interest on the capital thus expended, and for wear and tear, viz., 5 per cent. interest, and 2 per cent. for wear and tear, the cost of 800 lights, the number required to light the Fort, is estimated at Rupees 1581-10-8 per mensem, or nearly Rupees 2 per mensem for each light; the cost of oil lamps, as shown in the Proceedings above referred to, being Rupees 3-8-0 per mensem.

2. It seems questionable whether the per centage allowed for wear and tear is sufficient, but even if it be put considerably higher, there will still be a considerable saving from the use of coal gas, as compared with the cost of oil. The Governor in Council is, therefore, of opinion that the experiment should be proceeded with, and that the works requisite for lighting the whole Fort with coal gas should be completed.

3. Steps will be taken in the Public Works Department to procure the necessary piping, &c., from England. Dr. Wyndowe's proposal to allow an Argand burner to each barrack room, and supply the reading room entirely with burners of this description, is approved. It is understood that the provision made in the estimate will be sufficient to cover the cost of this arrangement.

(True Extract).

G. J. Wyndowe
Chief Secretary

To the Public Works Department, with 7 Plans,

7 Estimates, and 5 Specifications.

„ Military Department.

„ Superintendent Gas Works, Fort Saint George.

„ Accountant General.

Exd. J. H. Burns.

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For of course
of Tuesday 1861
the circumference

of the circumstances

the undersigned Engineer
H. Robinson, M. E. of Louisville, Ky.
Officers in charge of the
State Department.

Officers in charge of the

John D. Hunter

Accountant General

Contractor of P. H. A. I.

3rd 11.8 in 1906

24 " Sept 1865 no.
2869-

Copies in Letters to England
2/5 March 10 of 1867

1866 Depo
Proc of Govt for February
No 520

7 Mo of Govt in the
Public Depo

Of 20 Aug 1866
Recd. 8/8 May 1866

B.19 No.

Observing that
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and gas

No. 182. 1863.

20/4/66. 7th July 1866
with an order