

12111 1/27
Public Works (1898) Department.

G.O., No. 240 W

DATED 28 June 1898

[Despatch Abstract.]
Coimbatore Public Library: Estimate of Rs 10,490
for providing an installation of gas for illuminating
the Lecture Theatre and the — at Madras,
Sanctioned with remarks.

100
/

28-1-98

BACK PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.
Memo	5102C	Ord	29.11.97				
	3878C	"	16.9.97				
G.O.	1172W	"	6.5.97				

FURTHER PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.
A question asked in the Leg. Council in connection with this subject 1984C 31.3.98.							

BUILDINGS AND ROADS.
CIVIL WORKS.

Government (1898) of Madras. PUBLIC WORKS.

Recd.

Enclosures

Regd.

1898.

Spare copies

G.O., No. 240 W., 28th January 1898.

JANUARY.

Connemara Public Library

Estimate of Rs. 10,490 for providing an installation of gas for illuminating the
Lecture Theatre and the — at Madras, sanctioned with remarks.

No. 240 W., 28TH JANUARY 1898.

GOVERNMENT OF MADRAS.
PUBLIC WORKS DEPARTMENT.

Buildings and Roads.
Civil Works.

READ—the following papers:—

From A. G. BOURNE, Esq., D.Sc., F.R.S., Acting Superintendent, Government Museum, to the Secretary to Government, Educational Department, dated Madras, 13th September 1897, No. 640.

With reference to G.O., No. 204, Educational, dated 7th April 1897, I have the honour to forward, for sanction, plans and estimates for providing an installation of gas for illuminating the Lecture Theatre and the Connemara Public Library, received from the Consulting Architect.

No. 1064, Educational.

Approved and transferred to the Public Works Department.

30th September 1897.

(Signed) G. S. FORBES,
Secretary to Government.

From the Consulting Architect to Government, dated 6th December 1897, No. 2363.

Note by the Chief Engineer, Public Works Department.

The width of concrete foundations has been altered to $3\frac{1}{2}$ feet, and the amount of the estimate increased from Rs. 10,476 to Rs. 10,490.

24th January 1898.

(Signed) W. B. DEWINTON,
Ag. Chief Engineer.

ORDER—No. 240 W., dated 28th January 1898.

The estimate amounting to Rs. 10,490, as altered by the Chief Engineer, Public Works Department, for providing an installation of gas for illuminating the Lecture Theatre and the Connemara Public Library at Madras is sanctioned for execution when funds are available.

2. Attention is drawn to the Chief Engineer's note recorded above.

3. This sanction has been registered as Provincial No. 79 W. of 1897-98, and classified as Civil Buildings—Original works.

(True Extract.)

Under Secretary to Government.

To the Consulting Architect to Government, with ten enclosures.
" Examiner, Public Works Accounts.
" Educational Department.

Exd. T. K. Narayana Aiyangar.

P.W. DEPARTMENT.

Papers to be read in proceedings:—

Again G.O., dated

189 , No.

Again G.O., dated

189 , No.

Current No. 9825 of 1897, dated 30th September 1897, from the Educational Dept.
" " 12111 " 1897, " 6th December 1897, " the C.A. to Govt No 2363
" " " 189 , " " " the Chief Engineer P.W.D.
" " " 189 , " " " 24-1-98

ORDER.

The estimate amounting to Rs 10,490, as altered by the Chief Engineer P.W.D. for providing an installation of gas for illuminating the lecture theatre and the Connemara Public Library at Madras is sanctioned for execution when funds are available.

2. Attention is drawn to the Chief Engineer's note recorded above.

3. This sanction has been registered as Provincial No 79 W of 1897-98, and classified as Civil Buildings, Original Works.

The C.A. to Govt with 10 enclos.
" Exd. P.W. Accts.
" Educational Dept.
P.W. 1/15

Cm

May

Note

24-1-98

The estimate has been dealt

dealt with in the accompanying technical notes.

C. W. M. J.
 24.1.98
 24.1.98

Public Works Department.

Current No. 9825
 Letter No. 1064
 Dated 30. Sept. 1937
 From the Public Works Dept.

TECHNICAL NOTE.

Name of Work Installation of gas works to the
 Lecture Theatre & Commemorative Public Library

Amount of Estimate, Rs. 10,476.

PARTICULARS OF ESTIMATE.

Main Building	Work for gas pipes & 673
Costs for gas holder	5,922
Subsidiary Buildings	
Costs for Lecture & Commemorative Library	926
- do - Library	2,825
Contingencies	5% 486
Petty Supervision	2 1/2% 244
Land Compensation	" "

Total Rupees ... 10,476.

PARTICULARS OF CONSTRUCTION.

Surface soil sandy loam one foot.
 Sub-soil loam less sandy 2 ft below & fat clay
 is another 8 ft below or making 11 ft to reach
 Foundations sand.
 The foundations are proposed to
 be sunk to a depth of 11 feet. The lower
 4 ft will be filled with sand. Then 1 1/2 ft
 with 6 inches of brick masonry above.
 Basement will be raised 1' 6" and built
 with common brick in mortar.
 Walls will be raised 12 ft and built of
 stock bricks in mortar with arches
 over windows.
 The clay for the brick will be obtained from the
 local source. I think it will be better to sink a 15" well.
 Estimate should be returned
 to the consideration of above remarks.

1. The proposal to excavate
 the foundations 11' deep & then
 fill in 9' with sand
 does not commend itself to
 me. 11' extensive having a
 shoring will be required & the
 surrounding strata cause
 great disturbance -
 I don't think a satisfactory job
 can be made of it. I should
 prefer the foundations 4' of
 concrete 2' thick, of such
 area that it will not
 have to carry more than
 1/2 ton per sq. ft.

2. The capacity of gasometer
 does not appear to me
 to be sufficient margin
 for half requirements. I
 should have thought 25-40%
 addition should be allowed.

3. The pit for gasometer will have
 to be excavated at lowest
 point, 13' below ground level.
 This will mean a lot of hauling
 & ample extra dimensions for
 shoring. At this stage
 I am provided for in the ratio
 with common brick in mortar.

P. W. 55
250-5-8-196.

de
te

Plastering or Pointing

lime mortar.

Flooring

will be of Cuddalore slate laid over 4" of concrete & painted with asphalt.

Roofing

will be of Bangalore tiles laid over teak rafters & teak gables.

Doors and Windows

will be of teakwood of the descriptions noted in the estimate. also painted with 3 coats of oil paint.

Roof timbers

teakwood

Scantlings

are correct.

Rates

are fair.

The plinth area of the main building is

273 square feet, and the cost per square foot will be Rs. 2.10.2.

The plans and estimates have been countersigned

by the Supdt. Govt. Museum.

and approved in the Public Dept.

REMARKS.

The plans & estimates under review, amounting to Rs 10,476, have been prepared with reference to G.O. No. 1192 of dated 6th May 1937 and provide for erecting a gas installation for the Theatre & Library of the new Museum building at Madras.

The estimate provides for the following:-

(a) Room for gas producer.

(b) Tank for gas holder.

(c) Lamps for Theatre & Library.

Item (a) will consist of a room 16' x 12' inner dimensions, which will contain the gas apparatus. for details of construction please see above.

Papers for Council

tomorrow

Papers relating to the lighting of the Commemorative Library & Museum Theatre submitted.

Memorandum No. 1984 C

of 31.3.98. has been despatched to the Educl. Dept.

Per

31.3.98.

Returned to W

W

W

Taking Q the discharge in one

$$\text{hour} = \frac{905}{5} = 197. \text{ say } 200 \text{ cft}$$

$$L = \text{length of main} = 13 \frac{1}{2} \text{ yards}$$

$$H = \text{head of water pressure} = \text{about } 1'$$

$$Q = \text{specific gravity of gas} = 45.$$

$$\text{then by formula } D (\text{the diameter of the pipe in inches}) = .063 \sqrt[5]{\frac{Q^2 L}{H}}$$

$$D = .063 \sqrt[5]{\frac{200^2 \times 45 \times 13}{1}}$$

$$\therefore \log D = \log .063 + \frac{1}{5} (2 \log 200 + \log 45 + \log 13)$$

$$= 2.79934 + \frac{1}{5} (4.60206 + 1.65321 + 1.11394)$$

$$= 2.79934 + \frac{1}{5} (7.36921)$$

$$= 2.79934 + 1.47384 = 4.27318$$

$$\therefore \log D = 0.27318$$

$$\therefore D = 1.73 \text{ say } 1 \frac{3}{4}'' \text{ but the Consulting architect has allowed } 2 \frac{1}{2}'' \text{ which is well within safe limits allowing for losses etc.}$$

$$\text{The proportion required for the Lecture Theatre} = \frac{78}{197} \times 197 = 78 \text{ cft per hour}$$

$$\text{then } \log D' = 2.79934 + \frac{1}{5} (2 \times 1.89209 + 1.65321 + 1.11394)$$

$$= 2.79934 + \frac{1}{5} (5.95944) = 2.79934 + 1.19189 = 3.99123$$

$$\therefore \log D' = 0.99123$$

$$\therefore D' = 1.28 \text{ say } 1 \frac{1}{4}''$$

$$\text{for in this case } L = 23 \text{ yards or } 21 \text{ yards}$$

$$\text{then } \log D' = 2.79934 + \frac{1}{5} (2 \times 1.89209 + 1.65321 + 1.11394)$$

$$= 2.79934 + \frac{1}{5} (5.95944) = 2.79934 + 1.19189 = 3.99123$$

$$\therefore \log D' = 0.99123$$

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$$\text{then } \log D' = 2.79934 + \frac{1}{5} (2 \times 1.89209 + 1.65321 + 1.11394)$$

$$= 2.79934 + \frac{1}{5} (5.95944) = 2.79934 + 1.19189 = 3.99123$$

$$\therefore \log D' = 0.99123$$

Item (b) provides for a brick tank or cistern for gas holder. The cistern will be 13 1/2 feet in diameter (interior) and 8 1/4 feet deep, lined with 9 inches of brick walling with clay puddle in rear 18 inches thick all round to prevent percolation. The floor will be of 9" concrete laid over 9" of clay puddle, as per plan.

Item (c) provides for 78 lamps for the Theatre & verandah connected with it and 119 lamps to the library reading rooms, making in all 197 lights. The gas holder will have a capacity of 1020 cft. it will be 12 3/4 ft. in diam. & 8 feet deep, quite sufficient to burn 197 lamps for 5 hours. Each lamp or burner is of 60 candle power & will consume one cft. of gas per hour. Therefore 197 burners will require 197 x 5 = 985 cft. of gas to burn for 5 hours. The capacity of the holder is there for ample.

A lump sum provision of Rs 4,620 is made for gas apparatus including setting complete, but for the accompanying cable. By order of Messrs. P. S. & Sons who are the agents of Messrs. Mansfield's patent oil-gas apparatus it will be observed that the lump sum tendered, viz Rs 4,620, is only for the apparatus for 200

BACK PAPERS.

G.O.	No.	Department.	Date.
	204 his 250		7-4-97
	91-a - u -		15-2-97

FURTHER PAPERS.

G.O.	No.	Department.	Date.

No. 640

GOVERNMENT MUSEUM,

PANTHEON ROAD, EGMORE,

Madras, 13th September 1897.

idea /

From A. G. Bowyer Esq. B.A., F.R.S.,
EDGAR THURSTON, Esq.,

Superintendent.

To

The Secretary to Government,
Local and Municipal Departments.

Sir,

With reference to G.O. No. 204, Educational, dated
7th April 1897, I have the honour to forward, for sanction,
plans and estimates for providing an installation of
gas for illuminating the Lecture Theatre and the
Connemara Public Library, received from the
Consulting Architect.

I have the honour to be,

Sir,

Your most obedient Servant,

A. G. Bowyer

Superintendent,
Government Museum.

Public Works (1897) Department.

CURRENT No. 1211

From

The Consulting Architect
to the Government
of Madras

No. 2363

Dated 6th December 1897

Received 37.12.97
Registered

Enclosures 16 15 (3 plans)

Spare copies

SUBJECT.

Returning with remarks
certain papers re regarding
providing an installation
of gas for illuminating the
Lecture Theatre & the
Commons Public Library

Order

1. To alter width of
concrete to 3 1/2 ft
submit for sanction
H.B. 21.1.98

2. The width of concrete foundation
has been altered to 3 1/2 ft.
& the amount of work
increased from Rs 10476 to Rs
10490.

207.108

on 21/12/97

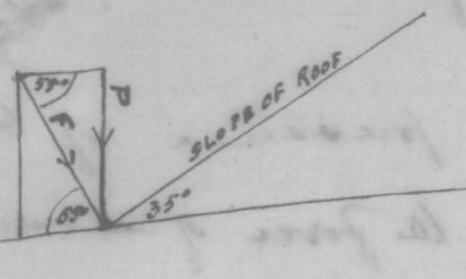
W. with note
26.12.97

048.2
2825/97
12/11/97

BACK PAPERS.

FURTHER PAPER

Ch's W.C. 2^d 2363 dated 6-12-97



Wind pressure. I get a result different from the Consulting Architect - I dare say he is right.

Let H = horizontal pressure assumed by A as 60.
 F = Normal pressure on roof which measured by a protractor has an angle of 35° to the horizon.
 P = pressure on wall due to normal pressure on roof.

$$\text{Then } 60 = F \cos 55^\circ \therefore F = \frac{60}{\cos 55^\circ} = \frac{60}{0.57358}$$

$$\therefore \log F = \log 60 - \log 0.57358 = \frac{1.77818 \text{ minus } 7.75891}{2.01924}$$

$$\therefore F = 105 \text{ - taking } 2.02119.$$

$$\text{Again - } P = F \sin 55^\circ \therefore \log P = \log F + \log \sin 55^\circ$$

$$= \log 105 + 0.81915 = \frac{2.01924 \text{ plus } 7.90956}{1.92880}$$

$$\therefore P = 84.9 \text{ say } 85.$$

$\therefore$ Additional load on wall due to wind pressure.

$$= \frac{223 + 85}{2240} \text{ lbs}$$

$$\therefore \log \text{ load} = \log 223 + \log 85 - \log 2240$$

$$= \frac{2.34830 \text{ plus } 1.92942}{4.27772 \text{ minus } 3.35028}$$

$$\therefore \log \text{ load} = 0.92747$$

$\therefore$ Load = 8.46 lbs which added to

the 20.6 lbs due to weight of materials gives a total

Load of 29.06 tons distributed over $16 \times 3 = 48$ square feet = 0.6 ton per square foot of area. This exceeds the $\frac{1}{2}$ ton limits prescribed.

But why should a horizontal pressure of 60 lbs be assumed? Hurricane gives the force of a hurricane at 49.2 lbs per square foot.

If therefore a hurricane impinges in a direction F normal to the slope of the roof,

$$P' = 42.9 \cos 35^\circ$$

$$\therefore \log P' = \log 42.9 + \log \cos 35^\circ$$

$$= \begin{array}{r} 1.63246 \text{ plus} \\ 7.90956 \\ \hline 1.54202 \end{array}$$

$$\therefore P' = 34.9 \quad \therefore \text{log add. load}$$

$$\text{And additional load} = \frac{223 \times 34.9}{2240} = 2.34830 + 1.54283 =$$

$$3.35028 = 0.54088$$

$$\therefore \text{Additional load} = 3.47 \text{ tons}$$

$$\text{Load due to materials} = 20.6$$

$$\therefore \text{Total load, } L' = 23.07 = 0.52 \text{ ton per}$$

square foot or rather in excess of the prescribed limit of $\frac{1}{2}$ ton. If Ch's concrete be increased to 3'6" in breadth it will nearly suffice for a load L and more than suffice for a load L' allowing half a ton per square foot of area of soil, provided the weight 120 lbs per cubic foot provided for the concrete is sufficient. Bequaert concrete weighs 140 lbs if I remember right, and it was underestimating its weight that led to the failure of the Manipalutani Cut during a few years back.

2. Pages 2 & 3 of the Chief Engineer's note seem to be satisfactorily answered by Ch. but the latter was not directed to alter the size of the pipes - vide remarks at end of my calculations dated 25-11-97.

CHMS.

26 97.

No. 2363 dated 6th December 1897

C. Eng's remarks:-

(i) at 11 ft. sand is reached:- the stuff is stiff, & found can be cut vertical - the building is only a little shed, & I think the foundation given will be ample - the clay is cut this since it splits up & cracks buildings - filling the sand, or the sand at 13 ft will prevent this.

Calculation here with
shows 2.84 ft. to
suffice for $\frac{1}{2}$ ton
it is made 3 ft.

N. H. H.

(ii) If both library & Theatre are in full glass the same evening - the gasometer will feed them for over 5 hours - but as it will always be running there are entertainers to come on, the gasometers will be kept to change the words & fill the gasometer as the gas is used up - this will keep matters going longer - I will advise the estimate for the next days - but hardly think it worth the extra cost if it is as much.

not necessary

Apparatus - 6780.

Crating same. 510

Extra cost of } 570

Masonry. }

Rs 7860/-

The total amt will be.

10584

7860

Rs 18,444

Note by the Chief Engineer.

The width of concrete foundations has been altered to 3½ ft and the amount of the estimate increased from Rs 10476 to Rs 10490.

From 24.1.58
Cm
May
H. H. S.
M. I. S.
E. A.

(iii) As the soil is hard as already stated excavation will be vertical with no bulging - The much layer will later mass has given no trouble - depth 0.5 m. Mr. Mansfield says it is a fine well: -

10.11.57

when
com
25.9

Lays of pipes have been altered as directed - Will be as provided in estimate for the well well.

Not necessary but can stand

6/12/57
H. H. S.

I think height of the brickwork & concrete should be 125 lbs per sq ft. Please make concrete 3½" wide
H. H. S.