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TAMIL NADU ARCHIVES

GOVERNMENT OF TAMIL NADU

P. W. D. DEPARTMENT

G.O. No.	3088. W. 7	Press.
B.P. No.	3089 W. 3	Mis.
Dated	12.12.1881	<i>197.</i>

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3088
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GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

12th December 1881, No. 3088 W.

General
Establishment.

Read the following paper :—

No. 47. From F. N. THOROWGOOD, Esq., M. Inst. C.E., Superintendent of the Madras Harbour Works, to the Secretary to Government, Public Works Department, dated Madras, 30th November 1881, No. 66 W.

I HAVE the honor to place before Government an application for leave of absence from Madras, a request which I make with much regret, but which I feel to be absolutely necessary, and the enclosed paper written by Surgeon-Major R. W. Cockerill will uphold this view.

2. In asking for twelve months' leave of absence, I am aware that I am asking a favor which I did not anticipate requiring when I was appointed to this post on 6th July 1876. I therefore must briefly state what I have to say in support of my request.

3. The whole circumstances of my appointment are to be found in the Proceedings of Government, No. 2211, dated 21st August 1876, and it will be seen that no specified time was mentioned for my remaining Superintendent of these works. Mr. Parkes, however, gave me to understand that four years was the utmost that I should have to spend in India. In February next I shall have been here five years and a half.

4. During that time my work has been as much out of doors as in my office, and I feel sure that I need not mention that, from the date of assuming charge in August 1876 until now, I have not had an easy time. My position has at times been somewhat embarrassing owing to my having, as it were, two masters to serve, viz., the Government of Madras here, and Mr. Parkes at home. I was very anxious early in this year to ask for three or four months' leave to England, as I felt that my energy was disappearing, but Mr. Parkes would not hear of it.

5. I have no idea what the future of this great work is to be, and it is not encouraging to see it so nearly demolished in six hours after having watched its growth for nearly as many years. But I cannot believe that it will be left as it is at present, and I even venture to hope that my past services for Government may make it appear desirable that, if building work is to be resumed, I may have charge of such work.

6. But whatever the ultimate future may be, I very respectfully submit that no better opportunity for my absence can present itself than early in February next. I shall then have had five or six weeks with Mr. Parkes here, and shall be able to confer with him further, if desirable, in England.

7. When in May 1880 I applied to Government on behalf of Mr. Beardmore, my Assistant, he obtained leave of absence for eight months in England, four of which were granted by the Madras Government and the remainder by the Secretary of State. He has since been granted special leave for thirty days on full pay on account of his health.

8. The Head Foreman also, Mr. G. Lowe, has been granted four months' sick leave to England, a free passage home in terms of his agreement, and a month's salary as a gratuity at the end of his five years.

9. I quote these cases to show that, on my pleading for others, Government has been pleased to accede to my request. I have no one immediately above me to represent my case, and I trust that this will be borne in mind if I appear to commend myself in any way.

10. As my appointment is actually by the Secretary of State (*vide* G.O., No. 2211, of 21st August 1876), I imagine that the terms of my taking twelve months' leave must be approved by him. But I would earnestly beg that they may be in the meantime sanctioned, in anticipation, by the Madras Government.

11. I have practically finished the work that I came out to do, viz., to build the two piers on a specified design at a certain cost. To build the return walls or horns and to screw the moorings were works never mentioned to me until 1879, and it is these works only that are incomplete. I have done the work so far just within the estimate, and not greatly in excess of the estimated time. With what degree of diligence or ability I have managed the work I cannot say, but I leave to the judgment of those over me. That it has been so severely damaged by the seas of 12th November I can conscientiously say is not my fault, although to a great extent it is to me a misfortune.

12. I therefore venture to ask that I may have my passage paid home first class. That I may have twelve months' leave of absence on half-pay or such pay as the Secretary of State may decide, and that I also may receive a gratuity of one month's pay, as has been granted to two of the Europeans under me.

13. I would ask for leave from the first week in February 1882, and I need hardly say that, if I can receive early intimation of whether Government are kindly pleased to accede to my request, it will be making a serious addition to the favors asked.

No. 48. ORDER THEREON, 12th December 1881, No. 3088 W.

ORDERED that Mr. Thorowgood's application be forwarded for the favorable consideration of the Secretary of State for India.

(True Extract.)

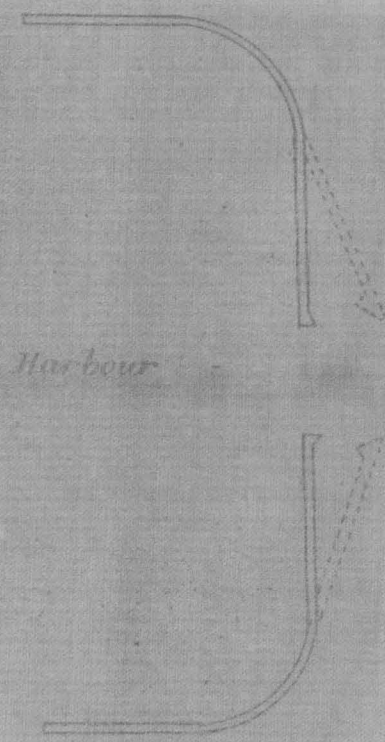
(Signed) R. H. SANKEY, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Superintendent, Madras Harbour Works.

Exd. E. C. Shunker.
Spare Copies

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22. The result is that I am rather disposed to favor a change of the design to the form shown in red on the accompanying tracing and by dotted lines in the marginal sketch. The main argument in favor of the originally proposed straight eastern front is that if the present Harbour should be followed by a series of similar basins ranged along the coast, a series of re-entering angles would be formed in which converging waves would be concentrated to an inconvenient extent. On the other hand the projecting entrance though more in accordance with precedent and undoubtedly more convenient for the entrance of vessels under sail did not appear to have so much superiority for steamers.



23. I find, however, that Commanders of steamers would generally prefer the projecting entrance as leading the cross current off from acting on the after part of a long ship while the fore-part is in still water, and with little way on her; also it would give a greater space to bring up in without danger of fouling ships at moorings. Captain Taylor, the Master Attendant, prefers this form.

24. Theoretically it is rather inferior to the original line for calming the interior of the Harbour, but I do not think the difference would be appreciable in practice. The future difficulty of the re-entering angles may, I think, be left to be dealt with when it arises, and thus both these points may fairly give way to the immediate nautical advantage of the modified form. The cost will not be appreciably affected by the change, as the width of entrance is proposed to be increased to 550 feet, so as to compensate for the increased length of the two sides of the triangle.

25. I would therefore beg to recommend this modification for consideration. An immediate final decision is not necessary if the Government should think it desirable to obtain more nautical evidence upon the question.

26. Another question is even more urgently requiring early action, viz., that of providing fixed moorings for ships in the new Harbour. These will be absolutely necessary before the Harbour can be fairly utilised, because only a very limited number of ships could be accommodated swinging to their own anchors. There is little doubt that in the north-east monsoon of 1880-81 if moorings are laid down under the lee of the north pier, ships may be secured to them. For this purpose they should be fixed in the previous fair season of January and February.

27. I have conferred with Captain Taylor on this subject, and we are agreed upon an arrangement which will, I think, give the maximum of accommodation and security at a minimum cost. He will bring the matter before the Government more suitably than I can, and I have therefore left the nautical part of the question in his hands.

28. With regard to its engineering and financial aspects, however, I may state that the cost will be about £40,000. The exact amount may be affected by such modifications of detail as Captain Taylor may recommend. This is not included in my estimate for the Harbour Works, and it will probably be treated as a distinct financial question, and a charge made on *shipping* to cover the interest on first cost and maintenance independent of the Harbour dues on *cargo* inwards and outwards.

29. But I would venture to raise the question whether the funds may not be considered to be already in the hands of the Government by a reappropriation of the

savings already effected on the estimate for the Harbour Works. The Government had sanctioned £20,000 over and above my estimate for purposes for which it has not been and never will be required; and a further £20,000 has, as shown in my letter, dated 24th January, been saved upon my estimate on works already completed. Such excesses as have occurred on other items are well under the 10 per cent. on actual past expenditure estimated for contingencies, so that if these £40,000 were transferred to the charge for moorings, the Harbour Works expenditure up to the present time would still be within the estimate.

30. The screw moorings, cables, and buoys will have to be procured from England, so that it will be seen that in order to ensure their being laid down this time next year, early action should be taken.

31. In my letter to the Under Secretary of State, dated 18th October 1878, I raised the question of considering the details of the modification which the Harbour revenue should be raised. My only concern with this subject was to see that any proposals were consistent with the engineering and physical features of the future Harbour. I found on arrival at Madras that the subject was already under the consideration of some leading members of the Chamber of Commerce to whom I gave what information I could relating to my own share of the question. I believe that proposals to Government may be expected as the result of this movement. It may perhaps be as well to state that I am no party to the proposals themselves, having only assisted in giving them a practical form.

32. I would beg to conclude by stating generally my belief that this important undertaking is now in a state which gives promise of an early and successful accomplishment.

No. 45. ORDER THEREON, 5th March 1879, No. 657 W.

MR. PARKES in this letter reviews the present state and prospects of the Harbour Works, and brings to the notice of Government the following questions which will before long require to be settled:—

- (1) The form of the seaward side of the Harbour and of the entrance.
- (2) The provision of fixed moorings for ships in the new Harbour.

2. His Grace the Governor in Council considers that it will be satisfactory to obtain the best professional opinion as to the form of entrance of the Harbour Works, and the Secretary of State will therefore be requested to refer the question to some English Engineer of eminence possessing experience in Harbour Works.

3. The proposed change of form is apparently approved from a nautical point of view by the Master Attendant and by the majority of the Steamer Commanders whom Mr. Parkes has been able to consult. His Grace in Council resolves to request Captain A. D. Taylor, the Superintendent of Marine Surveys, to favor him with his views on the matter.

4. Copies of these Proceedings will also be furnished to the Directors of the Peninsula and Oriental Steam Navigation Company, and of the British India Steam Navigation Company, through their local agents, with a request that this Government may be favored with an opinion upon the proposed modification in the form of Harbour entrance from such of the Commanders in the service of those Companies as may be possessed of the greatest experience in such matters.

5. The report on the provision of moorings should be expedited by the Master Attendant. It is desirable that no time should be lost in fixing them.

6. The Government note that some further expression of views of the Chamber of Commerce, as regards the details of the mode of raising the Harbour revenues, may be shortly expected.

7. The Government understand that the Consulting Engineer for Railways is in communication with the South Indian Railway authorities with respect to the irregularity in the running of the stone trains noticed in paragraph 10 of Mr. Parkes' report.

(True Extract.)

(Signed) J. H. M. SHAW-STEWART, Colonel, R.E.,
Ag. Secy. to Govt., P.W.D.

To the Superintendent, Madras Harbour Works.

" Marine Department.
" Master Attendant.
" Chairman, Chamber of Commerce.
" Consulting Engineer for Railways.

No. 46. (DOCKET No. 658 W, dated 5th March 1879).

COPY of the above forwarded to the Government of India.

(Signed) J. H. M. SHAW-STEWART, Colonel, R.E.,
Ag. Secy. to Govt., P.W.D.

Exd. C. Howarth.

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BUILDINGS AND ROADS
CIVIL WORKS.

Gabt. of (1879) Madras.
PUBLIC WORKS.

To

THE SECRETARY TO THE
GOVERNMENT OF INDIA

Dated March 5th.

Issued.

Recd.

G. O. 5th March 1879, No. 657 W.

MARCH

Nos. 44-48.

Forwards copy of Proceedings of the
Madras Government on letter from Mr.
Parkes reviewing the present state and
prospects of the Harbour Works.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

22nd March 1879, No. 862 W.

Buildings and Roads.
Civil Works.

Read the following paper :—

No. 262. Endorsement of the Officiating Chief Secretary to Government in the
Marine Department, dated Fort St. George, 13th March 1879, No. 631.

From J. H. TAYLOR, Esq., Lieutenant, R.N.R., Master Attendant, Administrative
Department, Madras, to the Acting Chief Secretary to Government, Marine
Department, dated Madras, 11th March 1879, No. 2,017.

I HAVE the honor to forward, for the information of His Grace the Governor in
Council, a tracing of the plan of moorings proposed by Mr. Parkes for the Madras
Harbour. It will be observed that to berth the number of ships proposed by Mr.
Parkes the moorings are placed as close, and the vessels placed with relation to one
another, as if in a London Dock or tidal river. The plan of mooring is undoubtedly
good, and the cost seems very reasonable, including as it does the driving of the screw
moorings, and it is impossible to say but that an emergency might bring a large
number of ships to Madras (as we have lately had occasion to observe) when in fine
weather the whole of the moorings might possibly be brought into use. It is in view
of such a possibility I have recommended the plan to the favorable consideration of
Government; It being represented to me by Mr. Parkes that the buoys not wanted for
use in bad weather, or found inconveniently placed in ordinary Madras weather, can
be easily disconnected from the cables and removed to a place of security, the cables
remaining on the ground until wanted. Otherwise I should have considered half
the number more suitable to the area, and the difficulty of warping in the Harbour,
with no tide to steady vessels, and no wind shelter; but if moorings on a wider
system were adopted no subsequent change would be convenient if possible in order
to meet sudden requirements. The unusually fine seasons of the last three years
have, I am disposed to think, given the Harbour Works Engineers and officers too
favorable an opinion of Madras weather which can be very disagreeable at times.
The moorings, Mr. Parkes informs me, are to be screwed twenty feet into the sand,
and will require workmen and appliances specially trained and adapted to the duty,
such as would not be available in Madras. Under these circumstances I beg respect-
fully to recommend the system and estimate furnished by Mr. Parkes.

TRANSFERRED to the Public Works Department with reference to paragraph 5 of
that Department Order, dated 5th March 1879, No. 657 W.

(Signed) C. G. MASTER,
Offg. Chief Secretary.

No. 262-A. Proceedings of the Harbour Works Committee at a meeting held on
the 3rd March 1879.

No. 262-B. Endorsement of the Officiating Chief Secretary to Government in the Marine Department, dated Fort St. George, 14th March 1879, No. 648.

From J. H. TAYLOR, Esq., Lieutenant, R.N.R., Master Attendant, Administrative Department, Madras, to the Acting Chief Secretary to Government, Marine Department, dated Madras, 13th March 1879, No. 2,127.

In continuation of my letter, No. 2,017, dated the 11th instant, I have the honor to forward the accompanying two covers and paper just handed to me by Mr. F. N. Thorowgood, Superintendent of the Madras Harbour Works.

MADRAS HARBOUR MOORINGS.

Seven lines of Buoys A, B, C, D, E, Buoys in each line 200 feet apart 1, 2, 3, 4, &c.

Large ships length 300 feet and over.
Small do. under 300 feet.

In north-east monsoon—

Maximum of large ships.			
A 1, 2, 3, 4, 5, 6, 7, 8, 9	=	9 berths	10 light draught.
B quarter moorings for A	=	6 "	7 do.
C 1, 2, 3, 4, 5, 6	=	6 "	7 do.
D 1, 2, 3, 4, 5, 6	=	6 "	7 do.
E quarter moorings for D	=	9 "	10 do.
F 1, 2, 3, 4, 5, 6, 7, 8, 9	=	9 "	10 do.
G quarter moorings for F	=	30 large	3 light draught.

Maximum of small ships.

A 1, 2, 3, 4, 5, 6, 7, 8, 9, 10	=	10 berths	1, 2, 3 may be large.
B 4, 5, 6, 7, 8, 9, 10	=	7 "	1—6 may be large.
C 1, 2, 3, 4, 5, 6, 7	=	7 "	
D 1, 2, 3, 4, 5, 6, 7	=	7 "	
E 1, 2, 3, 4, 5, 6, 7	=	7 "	
F 1, 2, 3, 4, 5, 6, 7, 8, 9, 10	=	10 "	1—9 may be large.
G quarter moorings for F	=	48 "	of which 18 may be large.

In south-west monsoon—

The same arrangement except that ship's heads reversed so that A and F become quarter moorings for B and G, and for large ships C becomes quarter mooring for D.

In cyclone seasons the following berths to be kept for vessels that cannot be sent to sea at 12 hours' notice:—

- (1).—B 1, 4, 7. D 1, 4. F 1, 4, 7 = 8 berths for large ships, or
- (2).—B 1, 3, 5, 7, 9. C 1, 3, 5. D 1, 3, 5. E 1, 3, 5. F 1, 3, 5, 7, 9 = 19 for small ships, or for mixed large and small.
- (3).—B 1, 4. D 1. F 1, 4 = 5 berths for large and B 7, 9. C 4, 6. D 5. E 4, 6. F 7, 9 = 9 berths for small.

FORWARDED to the Public Works Department in continuation of endorsement, No. 631, dated 13th March 1879.

(Signed) C. G. MASTER,
Offg. Chief Secretary.

No. 262-C. From the Master Attendant, Administrative Department, Madras, to the Under Secretary to Government, Public Works Department, dated Madras, 14th March 1879, No. 2,149.

With reference to your demi-official letter of yesterday's date, I have the honor to inform you that the Proceedings of the Harbour Works Committee, dated 3rd instant, relating to the moorings, was forwarded by the Master Attendant, as

Secretary to the Committee, to the Chief Secretary to Government, Marine Department, and a copy of the same is herewith forwarded.

Proceedings of a Meeting of the Harbour Works Committee held on Monday, the 3rd March 1879, at 5 P.M.

PRESENT.

Colonel W. FAREWELL.

Captain J. H. TAYLOR.

R. C. WALKER, Esq.

A. MACKENZIE, Esq.

Mr. Thorowgood reports that the Government has desired him to apply to the Forest Department for sleepers, that he has done so, but not received an answer. In the mean time he is buying sleepers for immediate wants from Palghat at Rupees 3-1-0 delivered in Madras.

RESOLVED.—The Committee approves of these temporary purchases, pending reply from Forest Department.

Mr. Thorowgood reports that he will shortly be in want of cement, and that 3,000 tons has been ordered from England by telegram. That he has 400 tons of General Morgan's cement, but which is not sufficiently weathered to use; that he made up 20 blocks of this cement the other day, and all fell to pieces. The cost of cement and labor on those 20 blocks is about Rupees 3,000. Mr. Thorowgood suggests that this cost shall be deducted from General Morgan's bills.

RESOLVED.—Mr. Thorowgood to inform General Morgan that the Committee propose to deduct the cost of cement and labor in respect of above 20 spoiled blocks from the bills now unadjusted, unless he can give satisfactory explanation, or show good grounds for exemption from the charge.

Captain Taylor mentions that Mr. Parkes has requested him to bring forward the question of moorings and lays plan on the table. The system shown in the plan has been approved in the Marine Department. The estimated cost is 3½ to 4 lakhs.

Mr. Parkes having personally attended and explained the plan.

RESOLVED.—That this plan be forwarded to Government through the Marine Department for favorable consideration.

No. 263. ORDER THEREON, 22nd March 1879, No. 862 W.

THE Government are of opinion that it will be desirable to lay down, in the first instance, only half of the proposed number of moorings, in such positions that the others could be hereafter added, if required.

2. Mr. Parkes will be requested to report upon this point, and to submit the estimate for the moorings as soon as possible.

3. Inquiry will be made in the Marine Department whether any, and what, moorings are in store at Calcutta.

(True Extract.)

(Signed) J. H. M. SHAW-STEWART, Colonel, R.E.,
Ag. Secy. to Govt., P.W.D.

To the Superintendent, Madras Harbour Works.
" the Marine Department.
" Mr. W. Parkes, M.I.C.E.

Exd. C. Howarth.
Spare Copies

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BUILDINGS AND ROADS
CIVIL WORKS

Govt. of 1879 Madras

PUBLIC WORKS.

THE SUPERINTENDENT,
MADRAS HARBOUR WORKS.

Dated March 22nd

Recd. Encl.

G. O., 22nd March 1879, No. 863 W.

MARCH

Nos. 18223

Mooring for the Madras Harbour—Mr. Parkes to report on the subject of— and submit the estimate

3/8/9

GOVERNMENT OF MADRAS.
PUBLIC WORKS DEPARTMENT.

15th August 1879, No. 2,145-A W.

Buildings and Roads.
Civil Works.

Read the following:—

No. 99-A. Despatch from the Right Honorable the Secretary of State for India.

Public Works.
No. 15.

INDIA OFFICE, LONDON,
26th June 1879.

MY LORD DUKE,—With reference to a report on proposed moorings for the Madras Harbour, recently submitted to your Government by Mr. Parkes, I forward herewith copy of a letter* from that gentleman applying for special remuneration for his services in connection with the work.

2. I shall be glad to be furnished as early as possible with your opinion on this application.

I have, &c.,
CRANBROOK.

His Excellency the Most Noble
The Governor in Council, Fort St. George.

From W. PARKES, Esq., to the Under Secretary of State for India, dated 23, Abingdon Street, 29th May 1879.

Madras Harbour Moorings.

IN accordance with the General Order contained in your letter to me of 1st October 1875, I have the honor to enclose, herewith, for transmission to Madras, a letter* addressed to the Government of Madras (with two plans attached) in response to a requisition conveyed to me in a Government Order of 22nd March last. I would request that it may be forwarded by the next mail.

2. I also enclose, for the information of the Secretary of State in Council, duplicates of the above letter and plans, and for convenience of reference copies of the printed correspondence on which it is based, viz., my report of 25th February, of which paragraphs 26 to 30 refer to this subject, and the Proceedings of Government containing the order.

3. I would, however, at the same time beg to call your attention to two points with which the India Office is more especially concerned.

4. The first is with reference to the communications I have had with Mr. Wells referred to in paragraph 5 of my letter. I found it desirable to consult some one who had more special experience than myself in the details of screw moorings, and I considered there was no one better qualified to assist me than Mr. Wells who has been largely employed by the Government on similar works. Mr. Wells gave me the required information on the distinct understanding that the Government is under no pledge to give him the order for the materials, though no doubt his proposals will at the proper time be considered in their merits.



BUILDINGS AND ROADS
CIVIL WORKS.

Govt. of (1879) Madras
PUBLIC WORKS.

Dated August 15th

To

From

By

G. O., 15th August 1879, No. 2,145-A W.

AUGUST.

Nos. 99-A-99-B.

Madras Harbour.—The Secretary of State
addressed on the subject of Mr. Parkes
application for special remuneration for his
services in connection with the proposed
moorings for the —.

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PUBLIC WORKS DEPARTMENT.

No. 47.

TO THE RIGHT HONORABLE THE SECRETARY OF STATE FOR INDIA.

MY LORD,—We have the honor to acknowledge your Public Works Despatch, of the 26th June, No. 15, and in reply to state that Mr. Parkes is not, in our opinion, entitled to receive any special remuneration for his past services in connection with the plan of moorings proposed by him for the Madras Harbour.

2. Were he to be employed in supervising the construction and provision of the mooring apparatus it would be necessary to remunerate him for performing services outside of his duties as Engineer-in-Chief, but we do not see that there is any need for so employing him.

3. In consequence of a telegram lately received from the Viceroy, we refrain for the present from giving any orders for the moorings.

We have the honor to be,

My Lord,

Your Lordship's most obedient, humble servants,

OOTACAMUND,
15th August 1879.

Edw. C. Howarth.

OOTACAMUND.
PUBLIC WORKS DEPARTMENT.

*Letter to the Right Honorable the
Secretary of State for India.*

*Dated 15th August,
No. 47 of 1879.*

STATES that Mr. Parkes is not entitled to receive any special remuneration for his past services in connection with the plan of moorings proposed by him for the Madras Harbour.

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GOVERNMENT OF MADRAS.
PUBLIC WORKS DEPARTMENT.

3rd April 1880, No. 854 W.

Buildings and Roads.
Civil Works.

Read the following papers:—

No. 9. From W. PARKES, Esq., to the Secretary to the Government of Madras, Public Works Department, dated 23 Abingdon Street, 29th May 1879.

Madras Harbour Moorings.

In the G.O. No. 862 W., of 22nd March 1879, I am requested to submit a plan of moorings with only half the number of buoys originally proposed, but in such positions that the others can be added hereafter if required.

2. Referring to the letter of the Master Attendant on which the above order is founded, I find that he considers it desirable, in the first instance at any rate, to place the buoys at greater distances apart than was originally proposed, so as to give more room for working the ships to and from their berths. In this I entirely concur, and the system proposed lends itself very advantageously to such an arrangement, but it will, I think, be readily understood that if a greater distance is allowed between the berths, the cost of half the number of berths will be more than half that of the whole system.

3. I beg to submit herewith two charts, "No. 1 Close system," being with the exception of a slight modification identical with that which I originally proposed to Captain Taylor, and "No. 2 Open system," that which I now recommend as the first step towards the ultimate accomplishment of No. 1 in accordance with the instructions quoted above.

4. The modification of the original plan above alluded to consists in the suppression of the row of six buoys nearest the shore, which being in shallow water would only be available for light and small ships, and substituting for them twelve smaller buoys attached directly to the innermost row of screw moorings which would be equally useful for such vessels as steam tugs, native craft, large cargo boats, &c., which would have room to swing freely to the wind in the space between the buoys.

5. The total cost of this complete system would be £28,065 or, taking the rupee at 1/7½, rupees 3,45,415. The details are given in the accompanying estimate, and are based on information furnished by Mr. G. Wells, who having laid down the

screw moorings in the Hooghly, and also erected the screw pile pier at Madras, has had an exceptional amount of local experience in this class of work. The prices are those at which Mr. Wells would be prepared at the present time to supply the materials, but they are of course ruled by the market price of iron and the cost of labour.

6. The plan "No. 2, Open system," may be generally described as consisting of every alternate buoy of No. 1. The number of screws is the same as in No. 1 and the whole of them would be immediately required except six, viz., the outer ones in the rows C, D and E. These would lie idle until it becomes desirable to attach the ground chains and buoys to them, but I should recommend them to be fixed at the same time as the others, as the cost would be small, while the special screwing machinery and staff are at work, and I think the berths which would depend upon them would not improbably be among the first to be added when further accommodation is wanted.

7. The accommodation in the first instance afforded by this system would be as follows:—For ships up to 360 feet long there would be in rows B, C, D, E and F, fourteen free swinging berths, and for shorter ships five more besides the twelve inshore berths for small craft. Ships of greater length than 360 feet must be moored head and stern in ordinary times, and for these the combination of rows A and C with B and F respectively would provide fixed berths at the expense of course of an equal number of swinging berths.

8. The cost of this scheme would be £17,936 or Rs. 2,20,752 rather less than two-thirds of No. 1. Additions could be made at any time by merely attaching the ground chains and buoys to the screws already fixed, which can be done by an ordinary diver. The ultimate cost of completing the scheme would not be enhanced by deferring the attachment of the alternate buoys till they are required, as the whole of the work involving special machinery and skilled superintendence would have been completed as part of the open system first carried out.

9. It will be seen that the essential difference of these two schemes is that while in No. 1, the close system, every ship must be moored head and stern, in No. 2, the open system, all ships below a limit of length, which would at present include the great majority, may swing freely at all times. There are few harbours in which ships of exceptional length can lie at swinging berths, so that Madras will not be peculiar in requiring such ships to be moored head and stern under ordinary circumstances. In case of necessity however seven berths (B, 1, 5—C, 4—D, 2—E, 4—F, 1, 5) could, by the removal of such of the buoys as are within the radius of the ship's length, be made available for such ships to swing freely round them.

10. This would be provided for in the construction of the buoys, which could be instantly freed by driving out a steel key on the top of the buoy. By this means the bridle-chain would drop to the bottom, and the buoy could be floated away. The bridle-chain would have to be afterwards recovered by a diver.

11. The change from the system of swinging moorings to that of fixed moorings for ships of moderate length would be made gradually, as the requirement for it arises. In order to give the full amount of accommodation to such vessels however special arrangements for stern moorings will have to be made. The distances between the rows of buoys are 430 feet. The whole of this space would be occupied by a tier of very long ships, so that to maintain a free passage between their sterns and the heads of the next tier of ships the adjoining space of 430 feet must be left unoccupied. But in the case of shorter vessels there would be ample space for passage between their sterns and the next row of buoys if it be not obstructed by their stern moorings.

12. To obviate such obstruction I propose to attach to each screw, where suitably situated for the purpose, a light supplementary chain cable of 12 fathoms in length continued by a still lighter hand chain of 20 fathoms, the end of which when it is out of use would be hung on the neighbouring buoy. When in use this hand chain would be taken on board the ship, and the ship's own tackle made fast to the light chain cable

on either side, thus securing her stern in any required direction. By this means a passage of 130 feet wide would be left between the stern of a ship 300 feet long and the heads of the ships secured to the buoys in the next row. Provision for 120 such supplementary stern chains is made in the estimate for Plan No. 1 at a cost of £1,244.

13. It may be desirable to give a few particulars of the construction of the proposed moorings. The ground attachments of each buoy will consist of four screws, 4 feet diameter, sunk 20 feet in the ground at the four corners of a square of 200 feet. To each screw will be attached 21 feet of open link $2\frac{1}{4}$ -inch chain, the last link of which will therefore remain above the surface of the ground. To each of these last links will be attached by means of a suitable shackle the end of a "ground chain," a $2\frac{1}{4}$ -inch stud link cable, $24\frac{1}{2}$ fathoms long, the other ends of which will meet in the centre of the square. To these four ends will be attached one end of a $2\frac{1}{2}$ -inch stud link chain (the bridle) of a length one fathom less than the depth of water at mean tide, the other end being attached to a spindle of round iron $3\frac{1}{2}$ -inches diameter, which will pass through the buoy and be secured on the top by a steel key, which will also connect it to a strong ring or eye to which the ship's tackle will be made fast. On this key being driven out, as described in paragraph 10, the buoy will be detached from its moorings.

14. The length allowed for the ground chains, $24\frac{1}{2}$ fathoms, is one fathom more than the actual distance from the angle to the centre of the square, so that there will be a fathom of slack in each of the four. This will allow the buoy to rise and fall with the tide or with such waves as there may be within the harbour. The strain of a ship upon the mooring will first lift this slack, and then lift the one or two of the ground chains which may lie to windward, off the ground, and ultimately under a force sufficient to lift the whole length of chain, the strain will be thrown upon the screw or divided between two screws some 30 fathoms distant and buried 20 feet in the ground. The result of the greatest possible strain upon the chains will be to allow the buoy to describe a circle of about 42 feet radius round the central point of the square which is its normal position. Thus 42 feet added to the length of the ship will give the radius of the circle which a ship can describe under the influence of a gale of wind veering all round the compass, though the actual attachment to the ground will never be at a less distance than 30 fathoms.

15. The strength given to every detail of the parts of these moorings which are liable to the greatest strain is in excess of that specified by Lloyd's rules for the tackle to be carried by the largest class of merchant ships, steamers of 5,000 and sailing vessels of 3,000 gross tonnage. Thus the weakest link in the chain of attachment will be that which is on board the ship itself and under constant authoritative inspection. For vessels of a size beyond the limits of the scale recognized by Lloyd's, if such should visit the port, exceptional arrangements will have to be made.

16. In the charts showing the proposed arrangement of the berths I have indicated the depths by the contours taken from the survey of February 1878. The disturbance of the bottom in the following south-west monsoon would affect a few of the berths for small vessels in the extreme south-west angle of the harbour, but as I anticipate further changes in this locality, and that the ultimate form of the bottom will probably be more like that shown by the contours of February 1878 than by those of more recent surveys, I have thought it would only complicate the question to show an exceptional state of things which will certainly change if it do not entirely pass away. It will of course be understood that the moorings should not be laid down till there is good evidence that no further important disturbance of the bottom is likely to occur, but I hope the present south-west monsoon will afford materials for a final settlement of that question.

17. I may be permitted to request that this matter should have early attention. Three months from the date of order will be required for the preparation and shipment of the materials required to commence operations, and if the moorings are

to be ready for use in November 1880 advantage should be taken of the favorable season of January and February next for laying them down.

ESTIMATE OF MOORINGS.

No. 1, Close System.

	£	s.	d.
134 screws 4 feet diameter with 21 feet of 2½" open link chain at £22 each	2,948	0	0
180 lengths of 2½" stud ground chain, each 2½ fathoms—560 tons at £17	9,520	0	0
36 lengths of 1½" stud ground chain for Harbour side moorings of lines A and C, each 2½ fathoms—52½ tons at £16	840	0	0
54 lengths of 2½" stud bridle-chain, from 3 to 6½ fathoms—42 tons at £17	714	0	0
12 lengths of 1½" stud bridle-chain, each 4½ fathoms, for inner line of buoys—3½ tons at £16	52	0	0
Shackles for connections—15½ tons at £35	542	10	0
54 wrought iron buoys 10' x 9'—126 tons at £35	4,410	0	0
12 do. do. 6' x 5' 8½" do. £40	350	0	0
120 lengths of 1½" stud chain for stern moorings, each 12 fathoms, 1,440 fathoms at ½ cwt.—54 tons at £16	864	0	0
120 lengths of ½" hand chain for do., each 20 fathoms, 2,400 fathoms—24 tons at £15	360	0	0
Screwing machinery	600	0	0
Portable engine and boiler	290	0	0
Contingencies and extras 5 per cent.	1,074	10	0
Total cost of materials shipped f.o.b. in the Tyne	22,565	0	0
Freight for 1,000 tons at 60'	3,000	0	0
Local materials and labour, say	2,000	0	0
Special superintendence	500	0	0
	28,065	0	0

or Rs. at 1/7½, Rs. 3,45,415.

(Signed) W. PARKES.

No. 2, Open System.

	£	s.	d.
134 screws 4 feet diameter with 21 feet of 2½" open link chain at £22 each	2,948	0	0
96 lengths of 2½" stud ground chain, each 2½ fathoms—300 tons at £17	5,100	0	0
20 lengths of 1½" stud ground chain for Harbour side moorings of lines A and C, each 2½ fathoms—29½ tons at £16	472	0	0
29 lengths of 2½" stud bridle-chains, from 3 to 6½ fathoms—22 tons at £17	374	0	0
12 lengths of 1½" stud bridle-chains each 4½ fathoms for inner line of buoys—3½ tons at £16	52	0	0
Shackles for connections, 12 tons at £35	420	0	0
29 wrought iron boys 10' x 9' 68 tons at £35	2,380	0	0
12 " " 6' x 5' 8½" " at £40	350	0	0
Screwing machinery	600	0	0
Portable engine and boiler	290	0	0
Contingencies and extras 5 per cent.	650	0	0

Total cost of materials shipped f.o.b. in the Tyne	13,636	0	0
Freight for 600 tons at 60'	1,800	0	0
Local materials and labour, say	2,000	0	0
Special superintendence	500	0	0

17,936 0 0

or Rs. at 1/7½, Rs. 2,20,752.

(Signed) W. PARKES.

No. 2,377.

REFERRED to the Harbour Committee for early remarks.

(By Order.)

(Signed) J. PENNYCUICK, Major, R.E.,
Under Secy. to Govt., P.W.D.

27th June 1879.

To the President, Harbour Committee.

No. 9-A. Proceedings of the Madras Harbour Works Committee in circulation, dated 10th July 1879.

Read letter from Mr. Marshall, Port Conservator, regarding Mr. Parkes' system of moorings suggesting certain modifications.

Letter referred to Captain Taylor and Mr. Thorowgood for careful consideration. On the explanation offered by these officers the Committee beg to recommend that

* B.

Mr. Parkes' open system of moorings, "vide plan" and description, be adopted by Government as a commencement. If it should be found afterwards that a still more open style as advice by Mr. Marshall is necessary, the removal and return of the tier of buoys adjoining the harbour wall in either monsoon can be effected without assistance from England, and if the close system of Mr. Parkes is even brought into action the screws being already in position it will only be necessary to attach chains and buoys.

(Signed) P. MACFADYEN.
(") J. H. TAYLOR.
(") R. C. WALKER.
(") J. PENNYCUICK.

No. 9-B. From F. N. THOROWGOOD, Esq., M. INST. C.E., Superintendent, Madras Harbour Works, to the Secretary to Government, Public Works Department, Buildings and Roads, dated Madras, 23rd March 1880, No. 68 W.

I HAVE the honor to submit the following reply to your memorandum No. 933, of yesterday's date, in which you ask me whether I believe the savings on the estimate of Rs. 58,50,790 for these works will be sufficient to cover the cost of the lesser scheme of moorings estimated by Mr. Parkes to cost Rs. 2,20,752, (vide his letter to the Madras Government, May 29th, paragraph 7.)

2. I have now gone carefully through the whole items of expenditure up to the end of February, and am able to estimate very fairly what the work will cost apart from serious accidents. I am able to show that the saving will be very nearly sufficient to cover the cost of the moorings.

3. The main heads under which excess or saving occur are as follow:—

Excesses.			Savings.		
		RS.			RS.
Preliminary works	...	68,258	Block-making	...	1,27,790
Rubble bases	...	1,00,000	Block setting	...	2,62,246
Establishment	...	1,36,077	Contingencies	...	1,34,472
Total Excesses	...	3,04,335	Total Savings	...	5,24,508

4. In all the above items I have estimated quite fairly, the calculations being based on what has gone before. The large excess estimated to occur in "Establishment" arises from my allowing for twenty-four months more to run at the present rates of pay, but Rs. 20,000 of the amount should by Mr. Parkes's estimate go to "Works" and not to Establishment. It is charged to the latter in obedience to G.O., 2,254 W., of 3rd September 1879.

5. In the items on which there are to be savings it will be observed that I have allowed Rs. 1,34,472 to be saved from "Contingencies." I arrive at this by taking the total amount now expended on contingencies and adding to it *twice as much* again, which I think to be giving a liberal margin.

6. It will be seen then the total probable excesses over estimate amount to Rs. 3,04,335, while the probable savings will be Rs. 5,24,508, giving a nett saving of Rs. 2,20,173 against Rs. 2,20,752, the estimated cost of the moorings allowing for exchange at 1s. 7½d. per rupee.

No. 10. ORDER THEREON, 3rd April 1880, No. 854 W.

ORDERED that the Government of India be addressed on the subject of the moorings, a copy of the letter being forwarded to the Secretary of State for information.

(Here enter No. 855 W., dated 3rd April 1880.)

(True Extract.)

(Signed) R. H. SANKEY, Colonel, R.E.,
Secretary to Govt., P.W.D.

Letter to H. Works

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★
BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of (1880) Madras.
PUBLIC WORKS.

To

Dated April, 3rd.

Issued

Recd.

Encl.

G. O., 3rd April 1880, No. 854-W.

APRIL.
Nos. 9-10.

Moorings for the Madras Harbour Works.
—The Government of India addressed on
the subject of the —.

PUBLIC WORKS DEPARTMENT.

Buildings and Roads.
Civil Works.

No. 855 W.

No. 11.

FROM

THE SECRETARY TO THE GOVERNMENT OF MADRAS,

Public Works Department,

To

THE SECRETARY TO THE GOVERNMENT OF INDIA,

Public Works Department.

SIR,—I am directed to forward correspondence relating to the provision of mooring apparatus for the Madras Harbour.

2. On the recommendation of the Madras Harbour Committee, this Government have resolved on the adoption, as a commencement, of the open system of mooring proposed by Mr. Parkes. It has been ascertained that the Calcutta and Bombay dockyards are unable to supply any of the requisite gear, and it will therefore be necessary that the Secretary of State invite tenders in the open market for the whole of the apparatus, such tenders being submitted for choice to the ordinary Engineering advisers of the India Office.

3. The cost of the moorings will amount to about £18,000; and as this Government are of opinion that the item might properly have been included in the general estimate for the Harbour Works, it appears desirable to adopt the suggestion made in the 29th paragraph of Mr. Parkes' report, dated 25th February last, and to

provide for the mooring from the sanctioned estimate of £628,000.*

4. It is considered by the Superintendent that there is no reasonable ground for doubting that such provision may with safety be made. On this point I am directed to invite attention to his letter bearing date the 23rd March, No. 68 W.

5. His Grace the Governor in Council would be glad to have early sanction to this proposal communicated, and I am to request that, as the matter is very pressing, the Secretary of State, to whom a copy of this letter has been sent for information, may be advised by telegraph of the approval of His Excellency the Governor-General in Council to the proposal.

I have the honor to be,

Sir,

Your most obedient servant,

(Signed) R. H. SANKEY, Colonel, R.E.,
Secretary to Govt., P.W.D.

FORT ST. GEORGE,
3rd April 1880.

Exd. S. T. Austin.
Spare Copies



BUILDINGS AND ROADS.
CIVIL WORKS.

Gobt. of (1880) Madras.
PUBLIC WORKS.

To

THE SECRETARY TO THE
GOVERNMENT OF INDIA.

Dated April, 3rd.

Issued

Recd.

Encl.

G. O., 3rd April 1880, No. 855 W.

APRIL.

No. 11.

MOORING APPARATUS FOR THE MAR-
HARBOUR WORKS.

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PUBLIC WORKS DEPARTMENT.

No. 19 A

TO THE RIGHT HONORABLE THE SECRETARY OF STATE FOR INDIA.

MY LORD,—We have the honor to forward, for your Lordship's information, a copy of a letter that has been addressed by us to the Government of India.

2. We would request that, on receipt of the approval of the Government of India to our proposal in regard to the provision of funds for the moorings from the sanctioned estimate of £623,000, you will have tenders for the supply of the moorings invited and approved by the Engineering advisers of the India Office.

3. It will be necessary that specially trained men be sent out to fix the moorings, and we presume, though the point is doubtful, that the sum named by Mr. Parkes (£18,000) will cover all expenses connected with such workmen, including their passage to and from Madras, and their pay while employed here.

We have the honor to be,

My Lord,

Your Lordship's most obedient, humble servants,

(Signed) BUCKINGHAM AND CHANDOS.

(") W. HUDLESTON.

(") DAVID F. CARMICHAEL.

FORT ST. GEORGE,

20th April 1880.

Ed. S. T. Austin.

FORT ST. GEORGE.
PUBLIC WORKS DEPARTMENT.

*Letter to the Right Honorable the
Secretary of State for India.*

*Dated 20th April.
No. 19A of 1880.*

MOORING APPARATUS FOR THE MADRAS HARBOUR
WORKS.

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GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

4th June 1880, No. 1,315 W.

Buildings and Roads.
Civil Works.

Read the following paper:—

No. 3. From the Secretary to the Government of India, Public Works Department, (Civil Works—Miscellaneous,) to the Secretary to the Government of Madras, Public Works Department, dated Simla, 20th May 1880, No. 141 M.

REFERRING to your letter No. 855 W., dated the 3rd April 1880, I am directed to state that the Government of India approves of the proposal of the Madras Government to adopt Mr. Parkes' open system of mooring for the Madras Harbour, and accordingly sanctions these materials being procured at an estimated cost of £18,000. I am to request that the Madras Government will set aside the necessary funds to cover the outlay on this account from the current year's grant, as it is not probable that any addition can be made to the grant already assigned for outlay on the harbour works during the current year.

2. I am to add that the Secretary of State has been advised by telegram of the approval of His Excellency the Governor-General in Council of the estimate for providing mooring apparatus for the Madras Harbour.

No. 4. ORDER THEREON, 4th June 1880, No. 1,315 W.

COMMUNICATED to the Superintendent of the Madras Harbour Works.

2. As serious delay to the progress of the works would be caused by setting aside two lakhs out of the budget grant for the current year, in which no provision for the moorings was included, the Secretary of State will be requested so to time the despatch of the gear as to allow of the payments on its account falling in 1881-82 instead of the current official year.

3. Ordered that a copy of these Proceedings and of the despatch to the Secretary of State be forwarded to the Government of India for information.

(True Extract.)

(Signed) R. H. SANKEY, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Superintendent, Madras Harbour Works.
" Marine Department.
" Examiner of Public Works Accounts.
" Secretary, Harbour Committee.

Exd. E. C. Shunker.
Spare Copies

BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of (1880) Madras.
PUBLIC WORKS.

To

THE SUPERINTENDENT, MADRAS
HARBOUR WORKS.

&c., &c., &c.

Dated June, 4th.

Issued

Recd.

Encl.

G. O., 4th June 1880, No. 1,315 W.

JUNE.

Nos. 3-4.

Madras Harbour Works.—Letter from the Government of India approving Mr. Parkes' open system of moorings for the — and sanctioning the purchase of the same at an estimated cost of £18,000; the Government of Madras to provide the amount from the current year's grant, communicated to the Superintendent with observations.

288/01
GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

28th December 1880, No. 2,949 W.

General
Establishment.

Read the following paper:—

No. 97. From F. N. THOROWGOOD, Esq., M. Inst. C.E., Superintendent of Madras Harbour Works, to the Secretary to Government, Public Works Department, Buildings and Roads, dated Madras, 15th December 1880, No. 71 W.

I HAVE the honor to state that from what I have learnt to-day from Mr. Parkes it will be necessary for me to request Government to sanction the entertainment of a special leading workman to put down the screw moorings for this harbour.

2. I was under the impression that such a man would be sent out by the contractor for the moorings, but this is not the case. The salary of the man is allowed for in the cost of the moorings, and would be arranged in England.

3. I have no one on the works who has had charge of the details of fixing moorings, and I have told Mr. Parkes that I must have a special workman for this. No action can be taken, however, until the request for such assistance be transmitted through the Madras Government.

4. Mr. Parkes leaves on the 17th for Madras, but he has made all arrangements for securing the services of an experienced man, and all that is now needed is sanction of this Government for the appointment. I therefore request that this sanction may be given at as early a date as possible.

No. 98. ORDER THEREON, 28th December 1880, No. 2,949 W.

SANCTION is accorded to the engagement of a Moorings Superintendent. The precise terms of the engagement should be reported for formal approval.

(True Extract.)

(Signed) R. H. SANKEY, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Superintendent of Madras Harbour Works.
" Examiner of Public Works Accounts.

Exd. F. C. Shunker.
Spare Copies

GENERAL
ESTABLISHMENT.

Govt. of (1880) Madras
PUBLIC WORKS

To
The SUPERINTENDENT, OF
MADRAS HARBOUR WORKS,
&c. &c. &c.

Dated December, 28th.

Issued

Recd.

Encl.

G. O., 28th December 1880, No. 2,949 W.

DECEMBER.

Nos. 97-98.

Moorings Superintendent for the Madras
Harbour Works.—Sanctions the engagement
of a — reporting the terms for formal
approval.

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3/92

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

2nd February 1881, No. 284 W.

General
Establishment.

Read the following paper :—

No. 8. From F. N. THOROWGOOD, M. Inst. C.E., Superintendent, Madras Harbour Works, to the Secretary to Government, Public Works Department, dated Madras, 10th January 1881, No. 79 W.

ADVERTING to the orders of Government, No. 2,949 W. of 28th December 1880, I have the honor to state that it will be necessary that the Secretary of State be addressed on the subject of the appointment of a leading hand for screwing down the Harbour moorings.

2. I cannot give the precise terms for the engagement of such a man, but Mr. Parkes has left clear instructions on the subject in England, and from the India Office reference will at once be made to Mr. Parkes's office on receipt of a requisition for the man from the Government of Madras.

3. I would venture to suggest that a telegram be despatched asking for a Foreman for screw moorings, so that he may arrive nearly at the same time as the moorings themselves.

No. 8-A. Telegram from the Secretary to the Government of India, Public Works Department, Calcutta, to the Secretary to Government, Public Works Department, Madras, dated 28th January 1881.

AFTER inquiry no Mechanical Engineer can be found for Madras Harbour moorings.

No. 9. ORDER THEREON, 2nd February 1881, No. 284 W.

ORDERED that the following telegram be despatched, and copy of the foregoing correspondence, with a copy of G.O., No. 2,949 W., dated 28th December 1880, forwarded to the Secretary of State for India :—

"Foreman required for screw moorings Madras Harbour. Please engage and send out a man. Terms on record in Mr. Parkes's office. Calcutta cannot supply."

(True Extract.)

(Signed) R. H. SANKEY, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Superintendent, Madras Harbour Works.
" Examiner of Public Works Accounts.

Exd. S. T. Austin.
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★
GENERAL
ESTABLISHMENT.

Govt. of (1881) Madras.
PUBLIC WORKS.

To

THE SUPERINTENDENT, MADRAS
HARBOUR WORKS.

&c. &c. &c.

Dated February, 2nd.

Issued

Recd.

Encl.

G. O., 2nd February 1881, No. 284 W.

FEBRUARY.
Nos. 8-9.

*Moorings Foreman, Madras Harbour
Works.—Telegram to the Secretary of State
or India to engage a —.*

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PUBLIC WORKS DEPARTMENT.

No. 7

TO THE MOST HONORABLE THE MARQUIS OF HARTINGTON,
SECRETARY OF STATE FOR INDIA.

My Lord MARQUIS,—In continuation of our telegram of the 2nd instant, we have the honor to forward the accompanying correspondence* relative to the engagement of a special leading workman to put down the screw moorings for the Madras Harbour.

We have the honor to be,

My Lord Marquis,

Your Lordship's most obedient, humble servants,

(Signed) W. P. ADAM.

() ~~N. B. CHAMBERLAIN.~~

(") W. HUDLESTON.

() ~~DAVID F. CARMICHAEL.~~

FORT ST. GEORGE,
15 February 1881.

Exd. S. T. Austin.

FORT ST. GEORGE.
PUBLIC WORKS DEPARTMENT.

*Letter to the Most Honorable the
Secretary of State for India.*

*Dated 15th February.
No. 7 of 1881.*

FORWARDING correspondence relative to the
engagement of a Moorings Foreman for the
Madras Harbour Works.

308/85
GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

21st July 1881, No. 1,797 W.

Buildings and Roads.
Civil Works.

Read the following paper :—

No. 44. Endorsement of the Officiating Chief Secretary to Government in the
Marine Department, dated Ootacamund, 15th July 1881, No. 1,218.

From J. H. TAYLOR, Esq., Lieutenant R.N.R., Master Attendant, Administrative
Department, to the Officiating Chief Secretary to Government, Marine
Department, dated Madras, 12th July 1881, No. 6,260.

I HAVE the honor to state, for the information of His Excellency the Governor in
Council, that our increased experience of the capabilities of the Madras Harbour has
convinced myself and the Officers of this Department that the system of buoys which
was prepared in consultation with Messrs. Parkes and Thorowgood, and submitted for
orders of Government with my letter No. 2,017, dated 11th March 1879, requires
revision, and the substitution of a smaller number than was then considered practi-
cable, and a different disposition of them.

2. In fine weather, such as usually obtains in Madras, a very large number of
vessels of ordinary size will undoubtedly be accommodated, but it is necessary to
provide swinging berths for a certain proportion of the very large steamers that visit
the port. It is found that when secured by sternfasts they often snap the strongest
warps, even in the present land winds and sea breezes, and the danger of collision
becomes very great. As the screw moorings and chains once placed can never be
recovered, and preparations for placing them are nearly completed, it is advisable to
re-open the question as soon as possible, in order that it may be referred to Mr. Parkes,
who it is understood retains his former opinion, and is not agreeable to any departure
from it, if such departure entails lessening the number of screw moorings. I am, how-
ever, of opinion that an alteration is imperative in the interests of the harbour, and
therefore respectfully advise that Mr. Thorowgood and Mr. Beardmore and myself,
aided by the Executive Officer of the Port and Harbour Master, be instructed to
prepare a new scale to be resubmitted for orders of Government. No delay will occur
for some time as the inshore buoys are not to be interfered with and they can be
attended to at once.

TRANSFERRED to the Public Works Department.

(Signed) C. G. MASTER,
Officiating Chief Secretary.

No. 45. ORDER THEREON, 21st July 1881, No. 1,797 W.

ON the recommendation of the Master Attendant, the Honorable the Governor in
Council assents to the re-opening of the question of the system of mooring to be adopted
in the Madras Harbour.

2. The matter will accordingly be taken into consideration by a Committee composed of the Master Attendant, Administrative Department, the Superintendent and Assistant Superintendent, Madras Harbour Works, aided by the Executive Officer of the Port and Harbour Master. The Committee will have power to add to their number one or more experienced Masters of vessels who may be willing to act with them.

3. The proposals of the Committee should be submitted to Government at as early a date as practicable, with any remarks which the Engineer-in-Chief of the Harbour Works may wish to make.

(True Extract.)

(Signed) R. H. SANKEY, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Master Attendant, Administrative Department, Madras.
" Superintendent, Madras Harbour Works.
" Engineer-in-Chief, Madras Harbour Works.
" Marine Department.

Exd. S. T. Austin.
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35-88
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BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of (1881) Madras.
PUBLIC WORKS.

To

THE MASTER ATTENDANT,
MADRAS.

&c. &c. &c.

Dated July, 21st.

Issued

Recd.

Encl.

G. O., 21st July 1881, No. 1,797 W.

JULY.

Nos. 44-45.

System of Mooring to be adopted in the
Madras Harbour. Appointment of a Com-
mittee to consider the —.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

3088
3727

3rd September 1881, No. 2,184 W.

Buildings and Roads.
Civil Works.

Read the following paper:—

No. 15. From J. H. TAYLOR, Esq., Lieut., R.N.R., Master Attendant, Adminis-
trative Department, to the Secretary to Government, Public Works Department,
dated Madras, 26th August 1881, No. 7,691.

With reference to the Proceedings of Government, Public Works Department,
No. 1,797 W., dated 21st July last, I have the honor to forward the accompanying
Proceedings of the Committee appointed to consider the question of harbour moorings,
dated 12th instant.

PROCEEDINGS of the Committee appointed under G.O., No. 1,797 W., dated 21st July 1881, to
consider the question of Harbour Moorings.

THE Committee met at the Harbour Works Office on Friday the 12th August.

PRESENT.

The Master Attendant
" Superintendent, Madras Harbour Works.
" Deputy Master Attendant.
" Assistant Superintendent of the Madras Harbour Works.

The Committee consider that it is highly desirable that as much experience as can possibly
be obtained should be brought to bear upon this subject, so important to the interests of the
port, and with that view have not proceeded to a present recommendation of any rigid principle.
The number of buoys proposed by Mr. Parkes, and sanctioned by Government, seems now to
the Committee to be in excess of what can be laid down with safety to the shipping and to the
buoys. The approaching monsoon may be expected to throw more light upon the matter, and
meanwhile the Committee recommend that the inner row of small buoys be proceeded with, to be
followed by the first five central buoys of the inner large row of Mr. Parkes's plan in 4½ fathoms
water. Before that portion of the work is finished the Committee will re-assemble, and forward
to Government their further recommendations.

(Signed) J. H. TAYLOR,
Master Attendant.
(") F. N. THOROWGOOD, M. Inst., C.E.,
Supt., Madras Harbour Works.
(") T. E. MARSHALL,
Deputy Master Attendant.
(") N. St. B. BEARDMORE, A.M. Inst., C.E.,
Asst. Supt., Madras Harbour Works.

No. 16. ORDER THEREON, 3rd September 1881, No. 2,184 W.

THE Proceedings of the Committee will be referred to the Engineer-in-Chief, Madras
Harbour Works, for any remarks he may wish to offer.

2. Mr. Parkes has, it is observed, already been supplied with G.O., No. 1,797 W.,
dated 21st July 1881, constituting the Committee.

(True Extract.)

(Signed) R. H. SANKEY, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Engineer-in-Chief, Madras Harbour Works.
" Superintendent " "
" Master Attendant. " "
" Marine Department.

Exd. S. T. Austin.
Spare Copies

BUILDINGS AND ROADS.
CIVIL WORKS.

Gobt. of (1881) Madras
PUBLIC WORKS

To

THE ENGINEER-IN-CHIEF,
MADRAS HARBOUR WORKS.

cc. cc. cc.

Dated September, 3rd.

Issued

Recd.

Encl.

G. O., 3rd September 1881, No. 2,184 W.

SEPTEMBER.

Nos. 15-16.

Harbour Moorings.—Proceedings of the
Committee held to consider the question of
—, referred to the Engineer-in-Chief
Madras Harbour Works, for any remarks
he may wish to offer.

3088/98
GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

3rd October 1881, No. 2426 W.

Buildings and Roads.
Civil Works.

Read the following paper:—

No. 5. From F. N. THOROWGOOD, Esq., M. INST., C.E., Superintendent,
Madras Harbour Works, to the Secretary to Government, Public Works
Department, dated Madras, 21st September 1881, No. 46 W.

I have the honor to submit a further report in continuation of my letter No. 38 W.,
of August 25th, with reference to the difficulties met with in fixing the screw
moorings.

2. I enclose a skeleton drawing showing the general features of the process of
fixing the screws, which will make the matter more clear.

3. The two steamers, *Hobart* and *Salisbury*, are firmly connected together
by teak timbers, as shown on the section, and from the starboard side of the *Hobart*
there projects the collar or socket which serves as a guide to the screwing tube. The
tube is of wrought iron, in pieces 18 feet long, which are firmly bolted together and
accurately fitted. The screw-mooring is so attached to the tube that one cannot
revolve without the other, yet the tube can be lifted vertically from the screw at
pleasure. The mooring chain passes up through the tube and is held fast at the top by
means of a pin. The tube and screw are made to revolve by means of a capstan, as
shown in the drawing, the bars of which are of good English ash, seven inches square
in section. The capstan is turned by a continuous rope, which is wound up on a bollard
driven by a steam-engine on the *Salisbury* steamer, and when the screw has been
twisted down to the required depth the tube is drawn up, leaving the chain free.
These are the general features of the gearing, which is similar to what is frequently
used elsewhere for the same purpose, but is entirely different from what I have seen
used for the moorings on the River Tyne and Tynemouth Harbour.

4. It is intended, and we have always attempted, to screw the moorings down
20 feet below the surface of the sand. Therefore in water 27 feet deep it must be
remembered that the distance from the screw to the capstan is 56 feet, allowing the
tube to project 9 feet out of water. The two steamers then are able to act with great
violence on a hollow iron tube 56 feet long and $10\frac{1}{2}$ inches in diameter, when any swell
moves them backwards and forwards.

5. As a matter of fact the bottom length of tube has twice been bent already,
and once the bolts, by which one 18 feet length is connected to the other, have
been sheared clean off. It was on account of this that I urgently recommended the
procuring of two extra lengths from England.

6. The chain which passes up through the tube is so nearly the same size as the
tube itself, that with the smallest irregularity on the inner surface the chain gets
jammed. I find, however, that every case of jamming has occurred at either A or B,
on the drawing, near the mouth of the tubes. To remedy this I have had the inner

BUILDINGS AND ROADS.
CIVIL WORKS.

Gobd. of [1881] Madras.
PUBLIC WORKS.

To

THE SUPERINTENDENT, MADRAS
HARBOUR WORKS.

&c., &c., &c.

Dated October, 3rd.

Signed

Recd.

Encl.

G. O., 3rd October 1881, No. 2426 W.

OCTOBER.

Nos. 5-6.

Madras Harbour Moorings.—Letter from
the Superintendent forwarding plan showing
the system adopted with respect to the—
recorded.

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GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

25th November 1881, No. 2954 W.

Buildings and Roads.
Civil Works.

Read again :—

No. 118. From Colonel W. S. TREVOR, R.E., Officiating Secretary to the Govern-
ment of India, Public Works Department (Account—General), to the Secre-
tary to the Government of Madras, Public Works Department, dated Simla,
22nd October 1881, No. 379 A.G.

I AM directed to request that you will furnish the Government of India at a very
early date with a special report on the present state of the Harbour Works, the suffi-
ciency of the grant already assigned for the work for the current year, and the probable
amount, if any, that will be needed next year.

No. 118-A. From W. PARKES, Esq., M. Inst. C.E., Engineer-in-Chief, Madras
Harbour Works, to the Secretary to Government, Public Works Department,
dated 23, Abingdon Street, 12th October 1881.

Madras Harbour Moorings.

THE orders of the Government of Madras, No. 1797 W. of 21st July, and
No. 2184 W. of 3rd September, having been referred to me for remarks, I beg to
submit the following.

2. The former is based upon a letter from the Master Attendant in which he
says "our increased experience of the capabilities of the Madras Harbour has con-
vinced myself and the officers of this department that the system of buoys which was
prepared in consultation with Messrs. Parkes and Thorowgood and submitted for orders
of Government with my letter No. 2017, dated 11th March 1879, requires revision,
and the substitution of a smaller number than was then considered practicable and a
different disposition of them."

3. The question here raised was referred by the Government to a Committee,
and that Committee has made an *ad interim* report, on which the second order above
noted is based, simply recommending that the first steps in carrying out the sanctioned
scheme be proceeded with.

4. I am bound to confess that I do not understand why the Master Attendant
considered it necessary to bring this question before the Government at all. I presume
that he has discretion, by the very nature of his office, to lay down as many or as few
buoys as he thinks desirable, and he is in no way bound to the 29 sites shown on the
plan, but has the choice of 96 sites.

5. The principle of the system is to distribute over the whole area of the harbour
(except the space near the entrance, which must always be kept free for ships to bring
up in) 134 points of attachment for mooring chains. These points of attachment
consist of screws sunk in the ground 20 feet, with chains attached, of which only the
last link is to remain above ground. Four of these are to form the attachment for a
buoy, but if they are not immediately required for that purpose, they may be left for
an indefinite time, during which they will be no obstruction to shipping. They will
only require that some small object, such as a log of wood more conspicuous at the
bottom of the harbour than the end link of a chain, be attached to each that they may
be found by a diver when required.

6. I cannot imagine any distribution of these screws which would give a greater
latitude of choice to the harbour authorities for the positions of the buoys than that
adopted, and I consider it of great importance that there should be this latitude of

choice, not only for present, but for future, arrangements. It may be that the number of screws is unnecessarily great for present requirements, but their fixing requires special appliances which may not be available when an extension of accommodation is required, and as the whole expenditure upon their purchase and fixing is only about Rs. 50,000, there does not appear to be much object in deferring the fixing of such portion as might, so far as immediate arrangements are concerned, be dispensed with, to be hereafter fixed at a much increased cost.

7. I would therefore express a hope that these considerations be weighed before any departure is permitted from the arrangement of the *screws* already sanctioned (with one small modification which I have already suggested to Mr. Thorowgood), but the number and position of the *buoys* is a question on which I have no opinion to offer.

Read also—

No. 118-B. From F. N. THOROWGOOD, Esq., M. Inst. C.E., Superintendent, Madras Harbour Works, to the Secretary to Government, Public Works Department, dated Madras, 9th November 1881, No. 58 W.

I HAVE the honor to submit the following report in reply to the Order of Government No. 2701 W. of the 2nd November, on a letter* from the Government of India.

* No. 379 A-C, 22nd October 1881.

2. I forwarded for the Government of India, with my letter No. 54 W. of 24th October 1881, a plan showing the state of the harbour at the end of September, and this may be taken practically to represent the present state of affairs as regards the lengths of the piers, the depths of water, and the state of the shore within and without the harbour.

3. STATE OF THE PIERS.—The two piers are now completed in length, and terminate in water eight fathoms deep below mean sea level, with an opening of 550 feet between their terminations. There yet remains to be built on each pier a return wall or horn, the object of which is to prevent the waves from running round the curved walls, by deflecting them off at first starting.

4. DATE OF COMPLETION.—These horns are only 70 feet in length, but they are designed on so sharp a curve that it will be necessary to alter the wheels of the Titan cranes before any blocks can be set. The two cranes have likewise to be turned completely round in their own length, which will probably be a risky and difficult undertaking. I do not therefore think that the piers will be actually and finally completed before April of next year.

5. CONCRETE BLOCK-WORK.—The length of the concrete block-work of the north pier is 3,870 lineal feet, and this has been built in $4\frac{1}{2}$ years. The length of the block-work of the south pier is 3,972 feet, and this has been built in 4 years. The estimated quantity of concrete blocks for the piers was 2,00,100 cubic yards; the quantity actually used has been 2,06,581 cubic yards, and it is possible that about 80 cubic yards additional will still be required.

6. SETTLEMENT.—Towards the ends of the two piers, where the rubble foundation is deep, there has been in some places an excess of settlement by the compression of the underlying rubble. This settlement has, however, never brought the work down to more than 9 inches lower than the designed height of 3 feet 6 inches above high water. The general appearance of the upper surface of the whole 7,842 feet of block-work is fairly regular, although irregularities are conspicuous at some places on close inspection. During the construction of the piers no block has ever been bodily displaced by the sea, but in November 1880 one block at the extreme end of the north pier (as it was then) was undermined and sunk down 3 feet. The shallow-water portions of the piers also suffered during construction, owing to the foundations being buried in sand. Some repairs will be necessary to those portions when the piers are completed, but I have not judged it necessary to carry these out yet because of the traffic along the piers.

7. SHELTER AFFORDED.—The harbour affords excellent shelter now during all winds except those from due east, and with the wind in this quarter the surf is greatly reduced, but not entirely abolished. All steamers calling at Madras now enter

the harbour, and there can be no doubt as to the immense benefit derived from the work. Large full-rigged sailing ships also come inside during the fair season, and are at present only excluded during the storm months on account of the absence of a steam tug and the backward state of the moorings.

8. MOORINGS.—The fixing of the moorings is proceeding but slowly, the executive difficulties having proved heavier than was anticipated. These, however, are diminishing as we gain more experience. There are now nine shallow water moorings fixed in position, and one buoy attached to four screws is fixed in nearly $4\frac{1}{2}$ fathom water. These buoys are used freely by vessels, but the moorings in deeper water are what are more needed at present, and these will now be proceeded with whenever the sea is sufficiently smooth, for the surface has to be perfectly calm to allow of the screwing apparatus to be worked.

9. DEPTH OF WATER.—The bottom of the harbour was surveyed by the Harbour Works staff in September last with the utmost care and accuracy, and the result has been submitted to Government with approval.* There is absolutely no silting up except in the south corner, and this is easily accounted for. The depths were compared with those of September 1879, and in both instances are reduced to what is called DeHavilland's mean sea level, which seems to be in reality about 1 foot below high water.

10. With reference to the probable expenditure during the current year, I have carefully gone into each head of account, and I believe that the total sum granted for the current year will be sufficient.

11. EXPENDITURE.—The following table will place the figures more clearly:—

	RS.
Amount allotted as per budget estimate, 1881-82 ...	3,78,247
First supplemental grant—G.O., No. 1483 W., 14th June 1881 ...	73,822
Second " " " " 1997 W., of 13th August 1881 ...	2,00,000
Third " " " " 2475 W., 8th October 1881 ...	74,000
(This was on account of the Madras Railway). Total ...	7,26,069
Expenditure up to 31st October (approximate) ...	5,14,225
Balance for remaining five months ...	2,11,844
Estimated in detail to be expended up to 31st March 1882 ...	2,02,724
Balance ...	9,120

I have allowed for payments to be made in England for moorings and for all other expenses that I can think of as likely to occur, but not for any very heavy charge on account of purchase of land to the north of the harbour, as I do not know how that matter stands. It seems therefore that for the remainder of the current year no extra funds will be needed.

12. For the ensuing year 1882-83 the executive work will be confined to completing the moorings, fixing a lighthouse and generally closing the work, and possibly for purchasing land to the north or carrying on heavy protective works. It is hard to estimate at this date what will be required, as the months of November and December may bring such seas as will do more damage to property than has yet occurred. With such a possibility in view I think Rs. 2,00,000 ought to be available for next year. It must, however, be borne in mind that Rs. 80,000 may pretty safely be reckoned upon for the sale of plant, and that possibly some gain may accrue from the land newly formed to the south of the harbour.

No. 2661.

REFERRED to the Master Attendant, Administrative Department, Madras, for any observations he may wish to offer, particularly on the subject of paragraph 7.

(Signed) R. H. SANKEY, Col., R.E.,
Secy. to Govt., P.W.D.

14th November 1881.

No. 118-C. From J. H. TAYLOR, Esq., Lieutenant, R.N.R., Master Attendant, Administrative Department, to the Secretary to Government, Public Works Department, dated Madras, 19th November 1881, No. 10176.

THE altered conditions of the harbour render it unnecessary to notice any portion of the letter, No. 58 W., dated 9th November 1881, from the Superintendent of the Madras Harbour Works, except paragraph 7, and on that I have the honor to forward the following remarks.

2. A very considerable amount of shelter is still given to steamers in respect of landing and shipping operations, and so far the use of the harbour is of great benefit to the port; but owing to the large space occupied by the wrecks of the *Hobart* and *Salisbury*, and the necessity of giving the injured walls a wide berth, I have felt it necessary to limit the entry of steamers to three at one time. It is possible, therefore, though at this season not probable, that vessels might have to wait their turns for a few hours. The distribution of the mooring chains already laid down in the south corner also limits the practicable space on that side. The subject of the moorings will have to be carefully reconsidered. Mr. Thorowgood in a letter to me says it is imperatively necessary that the buoys should keep the ground shackle well

off the ground. Mr. Parkes in a letter,*
* Dated 12th October 1881, herewith returned. recently forwarded to me by Government for report on the same subject, says that the cables and bridles may be allowed to lie on the ground for an indefinite period. One thing is certain that an ample amount of play must be given to the buoys, without which the moorings cannot be safe. I am informed, though not officially, that the large buoy which parted its fastening without any ship at it, was hove down to the upper shackle with a force equal to six tons. It is obvious that with a sea running 10 or 12 feet high something must go. I expected the buoy, which is very thin material, would have collapsed, but it seems the chain broke. All doubts about the safety of these moorings must be removed before they can be brought into general use. I suppose they were tested in England, but information on that head should be sought from the India Office.

3. As regards the steam tug, Mr. Green, who I had hoped would have carried out the order for me, informs me that the India Office declined his interference, and deputed the work to their broker. The tug would doubtless have been here before the accident, if the former arrangement had been uninterrupted, and the choice would have that of practical men. The want of success that has attended all indents for steam vessels for this Presidency hitherto makes me anxious for this one. It is unnecessary to say she would be of great use now.

No. 119. ORDER THEREON, 25th November 1881, No. 2954 W.

ORDERED that the reports above recorded from the Superintendent, Madras Harbour Works, and the Master Attendant, Madras, be forwarded to the Government of India, with reference to their letter of the 22nd October, No. 379 A.G.

2. The Government of India will also be furnished with the subsequent reports made by the Chief Engineer, Public Works Department, and the Superintendent of the Madras Harbour Works, detailing the damage sustained by the harbour by the recent storm.

(Here enter No. 2955 W., dated 25th November 1881.)

(True Extract.)

(Signed) R. H. SANKEY, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Superintendent, Madras Harbour Works.

„ Marine Department, with copy of Note by the Honorable W. Hudleston.
„ Master Attendant.

Exd. E. C. Shunker.

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BUILDINGS AND ROADS
CIVIL WORKS

Govt. of Madras
PUBLIC WORKS

SUPERINTENDENT
MADRAS HARBOUR WORKS

NOVEMBER
Nos. 118-119

PUBLIC WORKS DEPARTMENT.

Buildings and Roads.
Civil Works.

No. 2955 W.

No. 120.

FROM THE SECRETARY TO THE GOVERNMENT OF MADRAS,
Public Works Department,
TO THE SECRETARY TO THE GOVERNMENT OF INDIA,
Public Works Department.

SIR,—In your letter, No. 379 A.G., dated 22nd October 1881, the Madras Government were requested to supply a special report on the present state of the Harbour Works, the sufficiency of the grant already assigned for the work for the current official year, and the probable amount, if any, that will be required next year.

2. The report recorded with G.O., No. 2954 W., 25th November 1881, was accordingly drawn up by the Superintendent of the Harbour Works; but the Government of India are aware that since the date of that paper the works have sustained severe damage, the details of which, so far as they have yet been ascertained, are described in the two reports quoted in the margin, copies of which are also forwarded with this letter. The figures given by the Superintendent of the Harbour Works in

Vide G.O., No. 2854 W., dated 15th November 1881, and G.O., No. 2927 W., dated 23rd November 1881.

his report of the 9th November will now require modification. But the exact sums that will be necessary for expenditure during the present and ensuing official years cannot be stated till a decision has been arrived at as to the nature and extent of the works of restoration that it will be desirable to sanction. A report on this point will in due course be laid before the Government of India after proper surveys and soundings have been completed and the works inspected by Mr. Parkes, who is expected in this country in December.

I have the honor to be,

Sir,

Your most obedient servant,

(Signed) R. H. SANKEY, Colonel, R.E.,
Secretary to Govt., P.W.D.

FORT ST. GEORGE,
25th November 1881.

Exd. E. C. Shunker.
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BUILDINGS AND ROADS.
CIVIL WORKS.

Gt. of (1881) Madras.

PUBLIC WORKS.

To

THE SECRETARY TO THE
GOVERNMENT OF INDIA.

Dated November, 25th.

Janet

Recd.

Recd.

25th November 1881, No. 2955 W.

NOVEMBER.

No. 120.

INTIMATING that the exact amount of expenditure on the Harbour Works during the present and ensuing financial years cannot be stated until the extent of the works of restoration that will be desirable to sanction on account of the damages to the works caused by the late cyclone has been ascertained.

3288
3/34

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

9th December 1881, No. 3056 W.

Buildings and Roads.
Civil Works.

Read the following paper:—

No. 27. Despatch from the Most Honorable the Secretary of State for India.

Public Works,
No. 36.

INDIA OFFICE, LONDON,
10th November 1881.

SIR,—Herewith is forwarded copy of a report by Mr. Parkes on the mooring apparatus in the Madras Harbour Works, with reference to the points raised by the

Dated 12th October 1881.
Order of your Government in the Public Works Department, No. 2184 W., dated 3rd September last.

I have, &c.,
(Signed) HARTINGTON.

His Excellency the Right Honorable
The Governor in Council, Fort St. George.

From W. PARKES, Esq., M. INST. C.E., Engineer-in-Chief, Madras Harbour Works, to the Secretary to Government, Public Works Department, dated 23, Abingdon Street, 12th October 1881.

Madras Harbour Moorings.

THE orders of the Government of Madras, No. 1797 W., of 21st July, and No. 2184 W., of 3rd September, having been referred to me for remarks I beg to submit the following.

2. The former is based upon a letter from the Master Attendant, in which he says: "Our increased experience of the capabilities of the Madras Harbour has convinced myself and the officers of this department that the system of buoys, which was prepared in consultation with Messrs. Parkes and Thorowgood and submitted for orders of Government with my letter, No. 2017, dated 11th March 1879, requires revision, and the substitution of a smaller number than was then considered practicable, and a different disposition of them."

3. The question here raised was referred by the Government to a Committee, and that Committee has made an *ad interim* report on which the second order above noted is based, simply recommending that the first steps in carrying out the sanctioned scheme be proceeded with.

4. I am bound to confess that I do not understand why the Master Attendant considered it necessary to bring this question before the Government at all. I presume that he has discretion, by the very nature of his office, to lay down as many or as few buoys as he thinks desirable, and he is in no way bound to the twenty-nine sites shown on the plan, but has the choice of ninety-six sites.

5. The principle of the system is to distribute over the whole area of the harbour (except the space near the entrance, which must always be kept free for ships to bring up in) 134 points of attachment for mooring chains. These points of attachment consist of screws sunk in the ground 20 feet, with chains attached, of which only the last link is to remain above ground. Four of these are to form the attachment for a buoy, but if they are not immediately required for that purpose, they may be left for an indefinite time, during which they will be no obstruction to shipping. They will only require that some small object, such as a log of wood, more conspicuous at the bottom of the harbour, than the end link of a chain, be attached to each, that they may be found by a diver when required.

6. I cannot imagine any distribution of these screws which would give a greater latitude of choice to the harbour authorities for the positions of the buoys than that adopted, and I consider it of great importance that there should be this latitude of choice, not only for present, but for future, arrangements. It may be that the number of screws is unnecessarily great for present requirements, but their fixing requires special appliances which may not be available when an extension of accommodation is required, and as the whole expenditure upon their purchase and fixing is only about Rs. 50,000, there does not appear to be much object in deferring the fixing of such portion as might, so far as immediate arrangements are concerned, be dispensed with to be hereafter fixed at a much increased cost.

7. I would therefore express a hope that these considerations be weighed before any departure is permitted from the arrangement of the screws already sanctioned (with one small modification which I have already suggested to Mr. Thorowgood), but the number and position of the buoys is a question on which I have no opinion to offer.

No. 28.

ORDER THEREON, 9th December 1881, No. 3056 W.

RECORDED. An immediate decision on this question is not now necessary.

(True Extract.)

(Signed) R. H. SANKEY, Colonel, R.E.,
Secretary to Govt., P.W.D.To the Superintendent, Madras Harbour Works.
„ Marine Department.Exd. E. C. Shunker.
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I think that W. F. request
for 12 months leave
at $\frac{1}{2}$ pay (\$625 monthly)
is most reasonable.
but this implies that
his engagement is not
terminated & that he
will return at the end
of the leave on much
his post. the necessity
for it. I regard as
unquestionable.

If this be so. the
request from a passenger
house (L.B. L.W. be
entitled if his Engag^t
be at an end) for
a gratuity of only
two shillings - appears

Cue 112-87 Ref. 9-11

The accompanying
request of Mr. Turn-
good Sup^t of the
harbour works for
a year's leave from
next February is
submitted in early
order, under the
circumstances explained
in the letter, and an
allocation order is
passed will need the
confirmation of the
S. & S. a despatch will
have to be prepared

It is almost needless
to Supplement the claim
in the indulgence now
requested by Mr. Thomas
-Dodd. by any expression
of personal opinion as
to the any excellent &
devoted manner in
which he has carried

on the great public
work in which he
has been engaged more
intensely in more
than five years. It
is the universal opinion
that no Engineer ~~could~~
could possibly have shown
greater zeal or brought
higher qualifications to
the task.

That all his labor and
those of the Harbor
works staff should in
great measure have been
in vain is due to no
fault of his. As he himself
observes he never carried
out a specified design
in which he was personally
by no means answerable.

I have also every reason
to think that Mr.
Parker, were he here
would himself admit
that to Mr. Lumsford
suggesting many valuable
changes in construction
matters were introduced
as the works advanced.

In the premature
unless Mr. T. is ready to
accept these ^{conditions} ~~assessing~~
all claims that might be
prepared at the close of
his engagement. I do
so. I think he is justified
in his perspective in ~~terms~~
at least as regards the
fraternity.

The term was fixed
for the duration of Mr.
T's engagement. I
accept that it was
fixed it will continue
"for the whole duration
of the works". He has
to decide on the terms
of its cancellation. It
is desirable to
terminate it at an
earlier date.

I gather from his

letter that Mr. T. has no
wish to terminate it. I
am sure we can have
done. But I quite think
it will be reasonable to
reconsider the terms in
order to improve it in Mr. T's
interest. He having a ~~large~~
large longer than he has
led to expect he will be
required to abide by the
original condition. viz.
\$1250 monthly. ~~from~~
a week before his actual
departure, ~~to~~ until the
day of his return. I suppose
he is travelling necessary
hotel & purse. I suppose
Madras.

Now that considerable
prolongation of his service
seems certain. The desired
I think the date of pay might
properly be reconsidered.
But if Mr. T. desires to

The main question for
prominent ~~to~~ to
decide is whether looking
to the present condition of
the works it would be
in any way convenient to
oppose Mr. Lumsford in
the time mentioned.

That if in good health
he could carry on without
interruption does of course
intermit saying; but as it
seems clear from Surgeon
Major Cockenill's Certificate
that it would be risky
for Mr. Lumsford to
remain without the change
he seeks I may remark
that his absence during
the first year will be of
less importance than
later on.

It will probably take
Mr. Parker a month or two
to decide in the course to
be followed & frame his
revised estimate in a
form capable of submission
through the S of S to the
S of S - It can also hardly

be doubted that your
minutes at least will
be occupied in obtaining
final sanction from the
S of S — After that will
come the preparation of
material, sending out and
titan cranes, manufacturing
of a stock of blocks (each
one of which should leave
at least 3 months to set
before use) &c

Altogether it is improbable
that work could be fairly
recommended before 1st

January 1883, and whatever
operations have meanwhile
to be put in hand could
no doubt be entrusted to
Mr. Beardmore who went
to Mr. Lumsford has the
most complete acquaintance
with the ~~work~~ operations

Instructions are desired
as to returning a despatch
recommending the above should
be sent to the S of S — and
also if any telegram on
the subject be considered
necessary

1/12/81

Att

Upon his first term of
engagement completed
that the future will be
subject to his
consideration: then the
passage could be provided
for the gratifying of economic
but the 1/2 for 12
months out of £10000

Some 2 or 3 months for
in charge in the hands
of the United Empire

I write in that I think
of the 1st W. 7th in hand
but I consider him
entitled to the utmost
consideration & I shall readily
concur in any more
favorable view of his
conduct itself being

Mr. colleagues: I do not think that
the whole of the 1st W. 7th is
acquisition of W. 7th is
Only I think they rather conflict
with each other. I must therefore
determine that W. 7th is only a
temporary measure. I shall
no provision of the 1st W. 7th is
the whole of the 1st W. 7th is
the whole of the 1st W. 7th is

308/28

I have been most favorably impressed
by Mr. Thoroughgood & there seems
but one opinion in Madras as to
his merits. I hope the Secretary of State
may grant him advantages equivalent
to those which he desires, but Mr. Huddleston
objections to the precise form of the proposals
made by him appear to me valid. I think
we should address the Secretary of State
in that sense, & let him hear what can
be done so.

Alf

Dec 3. 1881

GOVT.
OF MADRAS.

2088
318829.

{ P. W.
{ DEPT.

SECRETARY.

Chepauk, 6. December 1881.

OFFICE NOTE.

3088
3089 3/4

To Supt. M. H. Works.

With reference to your
letter No 66W of 30 Nov 81,
the Govt. are willing to
support your application
for 12 months leave on
half pay, but they
consider that this im-
plies that your engage-
ment is not terminated
and that you will return
at the end of the leave
and resume your post,
the necessity for which
is regarded as unques-
tionable.

If this be so, your
request for a pecuniary
allowance

Admin Council that
the Shole of M. Therozood
request be recommended
to Govt. for sanction.
The question of future rate
of pay remaining unfixed
by Govt. L.B. 7/2/81

Home (to which you would
be entitled if your en-
gagement were at an end)
and for a gratuity of one
month's pay appears to be
premature unless you
are ready to accept
these concessions as satis-
fying all claims that
might be preferred at
the close of your engage-
ment.

Ne fort. further from
your letter that you
have no wish to ter-
minate your engage-
ment, & as you have
already served longer
than you were led to
expect you would be
required to abide by
the terms of your original
appointment, and as
considerable prolongation
of

of your services seems
certain to be desired,
they will be glad to
recommend a reconsidera-
tion of the rate of pay
now allowed to you.
But if you wish to
regard your first term
of engagement completed,
and that the future
should be the subject
of distinct consideration,
then the passage can
be provided & the
gratuity recommended,
^{but} the half pay for
12 months out of India
must be a matter for
inclusion in the terms
of the renewed engage-
ment.

Please say what
maybe
your wishes and in-
tentions ^{in the light of the}
above remarks. Att
6/12/51 W.

No. 66111.

FROM

THE SUPERINTENDENT,
MADRAS HARBOUR WORKS.

TO

Colonel R. H. Sankey, C. B. R. S.
Secretary to Government,
Public Works Department.

MADRAS, 30th March 1881.

Sir,

I have the honor to place before Government an application for leave of absence from Madras, a request which I make with much regret, but which I feel to be absolutely necessary, and the enclosed paper written by Surgeon Major R. W. Crockerill will uphold this view.

2. In asking for 12 months leave of absence I am aware that I am asking a favour which I did not anticipate requiring when I was appointed to this post on July 6th 1876. - I therefore must briefly state what I have to say in support of my request.

3. The whole circumstances of my appointment are to be found in the

Recordings

1 Enclosure

Proceedings of Government No 2211 dated
August 21st 1876 and it will be seen
that no specified time was mentioned for
my remaining Superintendent of these
works. Mr. Parkes, however, gave me
to understand that 4 years was the ut-
most that I should have to spend in
India. ^{In} February next I shall
have been here 5 years and a half.
During that time my work has
been as much out of doors as in my
office, and I feel sure that I need not
mention that from the date of assuming
charge in August 1876 until now I have
not had an easy time. My position has
at times been somewhat embarrassing
owing to my having, as it were, two
masters to serve, viz; the Government
of Madras here, and Mr. Parkes at
home. I was very anxious early in
this year to ask for 3 or 4 months leave
to

to England, as I felt that my energy was
disappearing, but Mr. Parkes would not
hear of it. - 30/11

5. I have no idea what the future
of this great work is to be, and it is not
encouraging to see it so nearly de-
stroyed in 6 hours after having watched
its growth for nearly as many years.
But I cannot believe that it will be
left as it is at present, and I even
venture to hope that my past services
for Government may make it appear
desirable that if building work is to
be resumed, I may have charge of
such work. -

6. But whatever the ultimate future
may be I very respectfully submit that
no better opportunity for my absence
can present itself than early in February
next. I shall then have had five or
six weeks with Mr. Parkes here, and

shall

shall be able to confer with him further,
if desirable, in England.

th. 7. When in May 1880 I applied to
the Government on behalf of Mr. Beaudouin,
my assistant, he obtained leave of absence
for eight months in England, four of
which were granted by the Madras Govern-
ment and the remainder by the Secretary
of State. He has since been granted
special leave for 30 days on full pay
on account of his health.

8. The Head Foreman also, Mr. G. Lowe,
has been granted 12 months sick leave
to England, a free passage home in terms
of his agreement, and a month's salary
as a gratuity at the end of his five
years.

9. I quote these cases to show that
on my pleading for others, Government
has been pleased to accede to my request.

I

I have no one immediately before me
to represent my case, and I trust that
this will be borne in mind if I appear
to commend myself in any way.

10. As my appointment is actually
by the Secretary of State (vide G.O. No. 2211
of August 25th 1876) I imagine that the
terms of my taking 12 months leave must
be approved by him. But I would ear-
nestly beg that they may be in the mean-
time sanctioned in anticipation by the
Madras Government.

11. I have practically finished the
work that I came out to do - namely
to build the two piers on a specified de-
sign at a certain cost. To build the
return walls or horns, and to screw the
moorings were works never mentioned
to me until 1879, and it is these works
only that are incomplete. I have done
the

12. I therefore venture to ask that I may have my passage paid home first class. That I may have twelve months leave of absence on half pay or such pay as the Secretary of State may decide, and that I also may receive a gratuity of one month's pay, as has been granted to two of the Euro-peans under me.

hardly

J. H. Harrowood, M.D. & C.
Superintendent
Madras Harbour Works

G.O. N^o 2211 of 21.8.76
 " " 1142 W of 14.5.80
 " " 1143 W of 14.5.80
 " " 1826 W of 2.8.80
 " " 1827 W of 2.8.80
 " " 2132 W of 10.9.80
 B " 2160 W of 14.9.80
 A " 2702 W of 24.10.80
 " " 2335 W of 22.10.81
 " " 2336 W of 22.10.81
 B " 2828-9 W of 14.11.81

G.O. N^o 1844 W of 27.7.81
 B " " 1917 W of 3.8.81
 " " 1968 W of 10.8.81
 Despatched to the Secy of State N^o 49 of 1968 W
 G.O. N^o 2063 W of 20.8.81
 Despatched to the Secy N^o 53 of 2063 W
 G.O. N^o 2746 W of 7.10.81

CWC 1.12.81 Rel. gill
 R.S. 12.12

Leave

From
 The Superintendent
 Madras Harbour Works

N^o 66 W
 Dated 30th November 1881

N^o of Enclosures one

Solicits one years Leave to
 England - on account of ill
 health -

N^o 3088 W

PUBLIC WORKS DEPARTMENT.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

Under date the 12th Dec 81
 Read the following -

3088 W
 12/11/81

From
 The Superintendent, Madras
 Harbour Works } (N^o 66 W of 30th November 81)

Ordered that Mr.

Shriwanga's application be
 forwarded for the favorable
 consideration of the Secretary of
 State for India.

(N^o 75 of 15th Dec 81)
 3089 W

To,
 The Most Honorable the
 Secretary of State for India.

My Lord Marquis

To,
 The Supt. Madras Harbour Works.
 despts 15-12-81-

We have the honor to
 forward, for your Lordships

favorable consideration, the
accompanying copy of a
letter from Mr. J. M. Thoro-
good, Superintendent, Madras
Marham Works, begging to
be allowed twelve months
leave on half pay from
February next and to be
granted a free first class
passage to England and a
gratuity of one month's pay.

2. This officer has carried
on the great public work,
on which he has been engaged,
unremittingly for more than
five years in a most intelligent
and devoted manner, and
it is the universal opinion
that few engineers could
have shown greater zeal

It is our opinion that
these concessions will
be awarded because
of Mr. Thoroughgood's
prolonged & zealous
services in the
of the Madras
him -

or brought higher qualifications
to the task. That all
his labour ^{and that of his}
staff should in a great
measure have been ^{frustrated}
is due to no fault of his.
As he himself observes, he
merely carried out a specified
design for which he was
personally not responsible.

3. The question whether looking
to the present condition of
the work, it would be in
any way convenient to spare
Mr. Thoroughgood for the
time mentioned has been
considered by us, and although
it would doubtless be
advantageous if he could
remain at his post without

interruption, yet as it is
improbable that considering
the time required for maturing
the revised design, replacing
the titans, manufacturing a
stock of concrete blocks &c.
work can be fairly recom-
menced before January 1853
and as it would appear
from the Medical Certificate
submitted by Mr. Thorne-
good that his health
would be endangered if
he were deprived of the
change he seeks, we think
that his absence during
next year will prove less
prejudicial towards the
progress of the work than
if it occurred later. &c.

4. We are therefore induced
to give our strong support
to Mr. Thornegood's requests
~~for your Lordships' acceptance,~~
and as he is desirous of
leaving Madras early in
February next by which
time ^{he} ~~we~~ will have had
ample opportunity for conferring
with Mr. Parker and
rendering him all the useful
assistance in preparing his
revised design, we beg
that your Lordships' orders
may be conveyed by telegraph.

5. Mr. Beardmore, who
as Mr. Thornegood's Assistant
has had now considerable
experience in all the operations

and has on one or two
occasions acted for him,
might, in our opinion,
be safely entrusted with
the preliminary operations
during Mr. Thoroughgood's
absence on leave.

Thos W. Hurd
H. P. Hurd

W. G. Hurd

308
H8

Att

9/12/81

Kept with
a copy of post
and C. C. Hurd's 2/9/82

Encl 9. 12. 81 4-12-12

7031.

Gt. of 1881 Madras.
PUBLIC WORKS.

To

Dated

Issued

Recd.

Encl.

G. O., 17th Dec 1881, No. 3088-96.

Nos. 48 to 50

Mr. F. H. Thompson
Suptt in the works.

Ordered that the applica-
tion of — for 12 months
leave of absence be
forwarded for the favorable
consideration of the
Suptt of State for India.

Forward an application
from Mr. F. H. Thompson
Suptt in the works
for 12 months leave
of absence.