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TAMIL NADU ARCHIVES

GOVERNMENT OF TAMIL NADU

Public works DEPARTMENT

G.O. No. / B.P. No.	598 W	Press. / Mis.
Dated	8-3-1882	19 .

Not to be folded or roughly handled

598

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

8th March 1882, No. 598 W.

Buildings and Roads.
Civil Works.

Read the following paper:—

No. 71. From the Harbour Works Committee, to the Secretary to Government, Public Works Department, dated Madras, 24th February 1882.

We have the honor to report that, in accordance with the instructions contained in G.O., No. 227 W. of the 26th January, we have inquired into the facts connected with the breaking away of the harbour buoys on the 12th November last.

2. We find that, with one exception, all the buoys that came on shore had lost their shackle pins, and we can come to no other conclusion than that this loss was the cause of the buoys getting away from their moorings. We are further of opinion that the shackle pins dropped out, owing to the omission to drive in the leaden plugs which are intended to keep these pins in position.

3. One buoy came on shore with its spindle broken, but we have no evidence as to how this occurred, and we are not prepared to adopt any of the conjectural causes that have been named to us.

4. We would recommend (and to this Mr. Parkes does not object) that the position of the jaws connecting the large buoys to the bridle chains should be reversed, and that in future they be turned down instead of turned up.

5. We further think that it would probably be better that the large buoys should have a greater length of free bridle chain than at present, and that in consequence another swivel should be inserted near the buoy. We are aware that this means each ship would require more room to swing in than at present, but we see no objection to this being the case.

6. At Mr. Parkes's request we forward herewith his letter to our Chairman, dated the 9th instant.

(Signed) P. MACFADYEN.
(,,) ERNEST BARCLAY.
(,,) G. D. LEMAN.
(,,) J. H. TAYLOR.
(,,) ARTHUR M. SAUNDERS.
(,,) NATH. St. B. BEARDMORE.
(,,) J. G. COLEMAN.
(,,) ROBT. C. ORR.
(,,) ROBT. C. WALKER.

From W. PARKES, Esq., M. Inst. C.E., Engineer-in-Chief, Madras Harbour Works, to the Chairman, Harbour Works Committee, Madras, dated 9th February 1882, No. 2 M.

In the Proceedings of Government, No. 227 W., of the 26th January last, which are referred to the Harbour Works Committee for report, there appears a letter from the Master Attendant, dated 9th January, which I saw for the first time on receipt of a copy of the Proceedings a few days ago.

2. This letter contains certain statements which are so misleading that I think it right to bring them to your notice, with a view to their correction being put prominently on record.

3. Captain Taylor admits that the omission of the lead pellet may "account for much of the mischief to the smaller buoys where the pins of the shackles appear to have worked out, but adds that "it does not clear up the mystery connected with the large buoy, which was too tightly (misprinted *lightly*) moored to admit of any shaking."

4. This buoy was not tightly moored as stated by Captain Taylor. It was connected by four chains to screws placed at the four corners of a square of 200 feet side, and these chains are of such a length as to allow of 7 feet slack on each. The junction of the four chains at the centre of the square would require to be lifted 50 feet from the ground before the chains became tight. There was therefore ample freedom for the buoy to rise and fall with the waves.

5. Captain Taylor goes on to say, "a more reasonable explanation" (though he does not say why an explanation which satisfied him in respect of the small buoys is less reasonable in respect of the large one) "is in my opinion afforded by the position of the shackle which directly connects the buoys to the moorings, the jaws of which were turned up and in this situation enabled the long spindle of the buoy to exercise a powerful leverage sufficient *as is now shown* to extend the jaws of the shackle and cause the separation from the buoy."

6. I am not aware on what fact Captain Taylor can justify the words I have underlined. The shackle in question is still in the bottom of the sea, neither it nor the chain attached to it having been found. On the other hand, one of the shackles which connected two of the ground chains to the vertical bridle chain has been found by the divers *without the pin in it*. "It appeared to have worked out" in precisely the same manner as in the case of the shackles of the smaller buoys. His objection to the position of the upper shackle with the jaws uppermost may or may not be sound on principle, but it derives no support whatever from any facts connected with the breaking away of the buoy on the 12th November. I respectfully submit that this question therefore is not within the scope of the reference to the Committee, which is confined to the evidence bearing on the "failure of the moorings."

7. Captain Taylor then suggests that "the subject of moorings belongs appropriately to the Marine Department and that this Department should be invited to co-operate with the Harbour Works in laying them, if not entirely to control the operation." This subject is again beyond the scope of the reference to the Committee, and I only notice it to say that the Government records appear to me to show that the Marine Department were consulted at every possible stage of the proceedings, and their advice on all nautical points adopted without question.

From J. H. TAYLOR, Esq., Lieutenant, R.N.R., Master Attendant, Administrative Department, to the President, Harbour Committee, dated Madras, 20th February 1882, No. 1422.

WHILE agreeing with the Committee generally in their opinion, yet as the only professional officer present, and the question involving technicalities, I consider that Mr. Parkes having requested that a letter of his relating to the moorings may be attached to the report, and the Committee having consented, I am under the necessity of asking that a short reply on my part may also be appended.

2. Neither Mr. Parkes nor the Harbour authorities produced the slightest *evidence* as to the actual cause of the moorings coming away, but attributed it to the omission of the lead pellets, a grave omission I am willing to admit, but not a satisfactory explanation of the entire accident.

3. Even without the pellets the usual resistance offered by the tightness of the pin, and the insertion of the key, should have kept the shackles secure for a long time. It was the injudicious tight mooring that produced the extraordinary result. A bare sufficiency of bridle chain seems to have been in all cases allowed to enable the buoys to float at a proper level in fine weather, immediately over the screw in the case of the single buoys, and immediately over the centre of the four ground chains in the case of the large buoy. The effect of a sea rising about 18 feet, and of causing the buoy to rise and fall to that extent, created an abnormal state of things, in which something was bound to give way. Mr. Thorowgood's attention to this matter was drawn by me through the Chief Engineer some time before the accident, and the event showed my judgment to have been right. Mr. Thorowgood admitted the fact of the tight mooring being objectionable, but said he was only carrying out Mr. Parkes's idea, who would not be interfered with. Let any reasonable person consider what the effect of the large buoy lifting the four great chains, to which the ring and swivel are attached, to any height of which the buoy was capable of floating, then and there letting the whole mass fall to the bottom in one confused lump, its own bridle chain also falling slack to the depth caused by the hollow of the wave, and this rise and fall occurring about every 20 seconds during the whole bad weather, and then say if that was not enough to shake anything adrift; shackles were never meant to be subject to such treatment. Under any circumstances it will not take long for the key to rust, and danger be incurred from that source. The remedy offered by the Committee of a sufficient bridle chain with a swivel in the proper place will, if the Marine Department is allowed its proper voice in this matter, restore my confidence and through me that of the public.

4. I object to the constitution of the small buoys owing to the leverage exerted by the buoy on its spindle, which is tightly placed in the swivel. One spindle has broken from this cause. Moreover, the spindle arrangement is unnecessary, and a useless danger, for after passing through the swivel and a nut having been screwed on above and below the swivel, the end of the spindle seems to be clenched over the lower nut, and so cannot be undone again for purposes of removal or cleaning. Moreover, the whole strain of the buoy with slip or other attachment above rests upon the threads of the two screws, and the small portion of end clenched over. I would far rather have a simple buoy with a ring at top and bottom, like the Marine Department buoys, which have been several years in service, without any attempt to release themselves.

5. Mr. Parkes's attempt to show that consultation was held between the Marine and Harbour authorities is entirely misleading. The only consultations were about the number of buoys and the sites to be selected for them, and Mr. Thorowgood agreed with the Marine Department about the necessity of a smaller number being placed than Mr. Parkes had insisted on. Corrosion is so extensive under water here that it would be nothing but profligate waste to cover the whole bottom of the harbour with screws and chains on the chance of some of them at some time coming into use.

6. Under judicious management the moorings are sufficient for the situation, though great care will always be imperative when rough days ensue, and ships are depending on them.

No. 72. ORDER THEREON, 8th March 1882, No. 598 W.

THE Harbour Committee has now submitted its report as called for in G.O., 26th January 1882, No. 227 W., regarding the causes which led to the parting of six of the new buoys during the storm of the 12th November 1881.

2. The Right Honorable the Governor in Council while seeing no reason to dissent from the opinion expressed by the Committee, that the accident was due to the dropping out of the shackle pins in the manner described by Mr. Parkes, considers that the precaution on which so much depended of securing the pin by means of a lead pellet should have been carefully explained in the specification originally furnished for the guidance of the officer charged with the execution of work.

3. As the fixing of the pellet in question apparently devolves on a diver not under the immediate eye of the responsible officer, it seems doubtful whether there exist adequate securities for the due performance of an operation at once so delicate and so important, the Government therefore desire that they may be furnished with further information on this point by the Engineer-in-Chief of the Harbour Works.

4. The other questions which have come up for consideration are—

(1) the position of the shackle at the top of the bridle chain;
(2) whether a swivel should not be placed immediately below the shackle in addition to the one at the bottom of the bridle chain;
(3) whether the bridle chains are of sufficient length to allow of the buoys rising and falling with the waves without having too much work thrown on them in lifting the ground chains, and
(4) whether the attachment of the spindle of the small buoys to the swivel is of sufficient strength.

5. As regards the first of these, it is understood that Mr. Parkes has recognised the desirability of reversing the position of the shackle jaws, and that no further question on the subject is likely to arise.

6. With reference to the second, the Government are of opinion that although some extra expense may be caused by the placing of the additional swivel immediately below the shackle, it will on the whole be desirable to incur this as recommended by the Master Attendant.

7. Similarly, in reference to the third point, viz., the lengthening of the bridle chains, the Government accept the opinion of the Committee which has been agreed to by the Master Attendant. The additional length of chain to be given will be decided by the latter officer in communication with the Engineer-in-Chief of the Harbour Works.

8. On the fourth point the Government would wish to receive suggestions for strengthening the attachment of the spindle from the Engineer-in-Chief, as these, if

concurred in by the Master Attendant, may admit of a settlement of the question without requiring a reference to the Secretary of State.

9. As there seems to be some misapprehension regarding the relative responsibilities of the Engineer-in-Chief and the Master Attendant in regard to the putting down of the moorings, the Right Honorable the Governor in Council is clearly of opinion that the last-named officer should invariably be consulted on all points connected with the details of this work and his assent obtained.

(True Extract.)

Lieut.-Col., R.E.,
Ag. Under Secy. to Govt., P.W.D.

To the Harbour Committee.
" Superintendent of Madras Harbour Works.
" Engineer-in-Chief " "
" Marine Department. " "

Exd. S. T. Austin.
Spare Copies

BUILDINGS AND ROADS
CIVIL WORKS.

Govt. of {1882} Madras

PUBLIC WORKS.

To

THE HARBOUR COMMITTEE.

&c., &c. &c.

Dated March, 8th.

Issued

Recd. *Encl.*

G.O., 8th March 1882, No. 598 W.

MARCH.

Nos. 71-72.

Parting of the buoys from their mooring chains in the Madras Harbour.—Passing orders on the Report of the Harbour Committee regarding the —.

598

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 Government of India, Public Works Department (Account—General), to the Secretary 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 sufficiency 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 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 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 $4\frac{3}{4}$ 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.

* G.O., No. 2521 W., dated 15th October 1881.

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,* 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.

* Dated 12th October 1881, herewith returned.

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.
Spare Copies

7/596

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 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.

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

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.
Spare Copies

8/598

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

21st December 1881, No. 3169 W.

Buildings and Roads.
Civil Works.

Read the following paper :—

No. 81. From F. N. THOROWGOOD, Esq., M. Inst. C.E., Superintendent, Madras Harbour Works, to the Secretary to Government, Public Works Department, dated Madras, 10th December 1881, No. 72 W.

I have yesterday received G.O., No. 2954 W., of November 25th, 1881, in which appears a letter from the Master Attendant to Government referring to the Harbour buoys.

2. I must beg to be allowed to correct Captain Taylor in what he has represented me as saying, Mr. Parkes's written instructions to me regarding the large buoys were that "you must keep the swivels of the bridle chains clear of the ground." The necessity of this is obvious, as it is to allow the buoy and chain to revolve freely on the swivel, which would not be the case if the swivel lay on the ground.

3. When I found that Captain Taylor thought the large buoy was moored too taut, I wrote to him and drew his attention to the necessity of keeping "the swivel of the bridle chain clear of the ground." I was perfectly aware that the *ground shackles* might be anywhere, and had received Mr. Parkes's views on that point also.

4. As Captain Taylor's letter now reads, it would seem that I insist on lifting the "ground shackles," and that Mr. Parkes does not so insist, which places me in the apparent position of insisting on an absurdity and of going counter to Mr. Parkes's orders. What I in reality have done is to carry out his instructions by hanging the swivel clear of the bottom.

5. With reference to the strain on the buoy referred to by Captain Taylor, I cannot tell how he arrived at 6 tons load, but I must remark that the load was not sufficient to sink the buoy to its proper line of floatation, so the strain was less than was intended for similar buoys in $7\frac{1}{2}$ fathoms of water.

6. I would also remark that the chain did not break, but the shackle pin came out owing, as I believe, to the peculiar method of fastening.

7. I would very respectfully ask that these corrections may be recorded.

No. 3018.

Referred* to the Master Attendant, Administrative Department, Madras, for any remarks he may wish to offer.

* To be returned.

14th December 1881. (Signed) R. H. SANKEY, Col., R.E., Secretary to Govt., P.W.D.

No. 81-A. From J. H. TAYLOR, Esq., Lieutenant, R.N.R., Master Attendant, Administrative Department, to the Secretary to Government, Public Works Department, dated Madras, 16th December 1881, No. 11235.

Mr. Thorowgood having forwarded me a copy of a letter he has addressed to Government, in the Public Works Department, regarding the swivels of the bridle chain attached to the moorings, I beg to acknowledge that I had not read his letter aright, and that, when I considered that his letter and Mr. Parkes's instructions were at variance, I made a mistake. I have now been furnished with a rough sketch of

the connection, and I see the swivel is attached to the large ring to which the four chains are united. But while admitting my mistake, I must be allowed to say that it does not in any way interfere with the important question of tight mooring, to which I attribute the accident on the 12th, and the evil reputation that hangs over the moorings, which reputation must be cleared up before any use can be made of them. The swivel is certainly in the wrong place, it should be near the buoy. Of course being where it is no change is worth making now, but another swivel must be introduced higher up, and the buoy allowed fair play. The drawing of the pin of the upper shackle, if that was the fault, must be gone into. I consider the question of the mooring to be of vital importance, and beg to suggest that an inquiry be held as soon as convenient while what evidence can be procured is still available.

2. The original letter from Mr. Thorowgood referred to me for remarks is herewith returned.

No. 82. ORDER THEREON, 21st December 1881, No. 3169 W.

MR. PARKES will, as early as possible after his arrival from England, submit a report on the Harbour Works, with special reference to the effects of the storm of the 12th and 13th November 1881.

2. In doing so he should deal with the subject in generally the following order :—

1*st*, the effects of the storm on the works ;
2*nd*, the points of the original design which having proved defective now call for modification ;
3*rd*, whether the shelter against wave disturbance within the Harbour has been sufficiently provided for in the original design ;
4*th*, whether the details of the mooring arrangements require modification with reference to the objections urged by the Master Attendant in the marginally quoted correspondence ;

G.O., No. 1797 W., dated 21st July 1881.
„ „ 2484 W., „ 3rd Sept. „

5*th*, the condition of the foreshore north of the Harbour ;
6*th*, the foreshore within the Harbour, and whether the plan of jetties now under execution is in all respects suitable ;
7*th*, the plan which under each of the foregoing heads it would now seem best to adopt for completion of the works, with a statement of the approximate outlay and time required for execution.

3. To enable Mr. Parkes fully to prosecute his inquiries such of the past correspondence in the office of the Chief Engineer and Secretary as he may require will be placed at his disposal. He will also be authorised to call on any Government officer for information likely to be of service to him.

(True Extract.)

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

To the Engineer-in-Chief, Madras Harbour Works.
„ Superintendent, Madras Harbour Works.
„ Marine Department.

Exd. S. T. Austin.
Spare Copies

BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of {1881} Madras.

PUBLIC WORKS.

To

THE ENGINEER-IN-CHIEF, MADRAS HARBOUR WORKS,

&c., &c., &c.

Dated December, 21st.

Issued

Read. *Encl.*

G.O., 21st December 1881, No. 3169 W.

DECEMBER.

No. 81-82.

Madras Harbour Works.—Mr. Parkes requested to submit, as early as possible after his arrival from England, a report on the —, with special reference to the effects of the storm of the 12th and 13th November 1881.

Madras
24th February 1882.

To

10/598

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

Sir

We have the honour to report that, in accordance with the instructions contained in G.O. No. 227 W, of the 26th January, we have enquired into the facts connected with the breaking away of the Harbour buoys on the 12th November last.

2 We find that, with one exception, all the buoys that came on shore had lost their shackle pins, and we can come to no other conclusion than that this loss was the cause of the buoys getting away from their moorings. We are further of opinion that the shackle pins dropped out, owing to the omission to drive in the leaden plugs, which are intended to keep these pins in position.

3 One buoy came on shore with its spindle broken, but we have no evidence

as

as to how this occurred, and we are not prepared to adopt any of the conjectural causes that have been named to us.

4 We would recommend (and to this Mr Parkes does not object) that the position of the jaws connecting the large buoys to the bridle chains should be reversed, and that in future they be turned down instead of turned up.

5 We further think that it would probably be better that the large buoys should have a greater length of free bridle chain than at present, and that in consequence another swivel should be inserted near the buoy. We are aware that this means each ship would require more room to swing in than at present, but we see no objection to this being the case

5 At Mr Parkes' request, we forward herewith his letter to our Chairman, dated the 9th instant.

We have the honor to be
Sir
Your obedt Obedient Servants.

Reed Fadeyev

11/96

Ernest Barlow
R B Evans
W Hayes
Captain in Command
Nath. A B Beardmore
H Coleman
Robt. Ower
R. B. Parker

Go (Orgl) No 227 Way 26/1/82.
" —— " 3169 Way 21/12/81
" —— " 2953 Way 25/11/81
" —— " 2954 Way —

P. W. C. No. 1282

From
The Harbour Committee
Madras

Dated 24th Feby 1882
Rec'd " 27th "

E. 2.

Submits a Report on the facts connected with the breaking away of the Harbour buoys on the 12th November last.

Circ 6/3.

No. M. 12/598 1882

From
The Engineer in Chief
Madras Harbour Works

To
The Chairman
Harbour Works Committee.

Madras
9th February 1882

Sir,

In the proceedings of Government No 227 W of the 26th January last, which are referred to the Harbour Works Committee for report, there appears a letter from the Master Attendant dated 9th January which I saw for the first time on receipt of a copy of the Proceedings a few days ago.

2 This letter contains certain statements which are so misleading that I think it right to bring them to your notice with a view to their correction being put prominently on record.

3 Captain Taylor admits that the omission of the lead pellets may "account for much of the "mischief to the smaller buoys where the pins of the "shackles appear to have worked out" but adds that "it does not clear up the mystery connected with the "large buoy, which was too lightly (misprinted "lightly) moored to admit of any shaking."

4 This buoy was not lightly moored as stated

by

by Captain Taylor - It was connected by four chains to screws placed at the four corners of a square of 200 feet side, and these chains are of such a length as to allow of 7 feet slack on each - The junction of the four chains at the centre of the square would require to be lifted 50 feet from the ground before the chains became tight. There was therefore ample freedom for the buoy to rise and fall with the waves.

5 Captain Taylor goes on to say "A more "reasonable explanation" (though he does not say why an explanation which satisfied him in respect of the small buoys is less reasonable in respect of the large one) is in my opinion "afforded by the position of the shackle which "directly connects the buoys to the moorings, "the jaws of which were turned up and in this "situation enabled the long spindle of the buoy "to exercise a powerful leverage sufficient "as is now shown to extend the jaws of the "shackle and cause the separation from the buoy."

6 I am not aware on what fact Captain Taylor can justify the words I have underlined - The shackle in question is still in the bottom of the sea, neither it nor the chain attached to it having been found - On the other hand one of the shackles which connected two of the ground chains to the vertical bridle chain has been found by the divers without the pin in it - "It appeared

13/99 Ref 3

"to have worked out" precisely the same manner as in the case of the shackles of the smaller buoys. His objection to the position of the upper shackle with the jaws uppermost may or may not be sound on principle, but it derives no support whatever from any facts connected with the breaking away of the buoy on the 12th November - I respectfully submit that this question therefore is not within the scope of the reference to the Committee which is confined to the evidence bearing on the "failure of the moorings".

7 Captain Taylor then suggests that "the subject of moorings belongs appropriately to the "Marine Department and that this Department "should be invited to co-operate with the Harbour "Works in laying them, if not entirely to control "the operation" - This subject is again beyond the scope of the reference to the Committee, and I only notice it to say that the Government records appear to me to show that the Marine Department were consulted at every possible stage of the proceedings, and their advice on all nautical points adopted without question.

I have &c

Signed W. Parkes M. Inst. C.E.
Engineer in Chief
Mr. Harbour Works.

True Copy W Parkes

Administrative Department

19/598/1884

No. 1422.

Madras Marine Office
20th February 1882.

From

The President Harbour Committee
Madras.

Sir,

While agreeing with the Committee generally in their opinion, yet as the only professional officer present, and the question involving technicalities, I consider that, Mr. Parkes having requested that a letter of his relating to the moorings may be attached to the report, and the Committee having consented, I am under the necessity of asking that a short reply on my part may also be appended.

2. Neither Mr. Parkes nor the Harbour Authorities produced the slightest evidence as to the actual cause of the moorings coming away but attributed it to the omission of the lead pellets - a grave omission I am willing to admit, but not a satisfactory explanation of the entire accident.

3 Even without the pellets the usual resistance offered by the tightness of the Pin and the insertion of the Key, should have kept the shackles secure for a long time. It was the injudicious

injudicious light mooring that produced the extraordinary result. A bare sufficiency of bridle chain seems to have been in all cases allowed to enable the buoys to float at a proper level in fine weather, immediately over the screw in the case of the single buoys, and immediately over the centre of the four ground chains in the case of the large buoy. The effect of a sea rising about 18 feet, and of causing the buoy to rise and fall to that extent, created an abnormal state of things, in which something was bound to give way. Mr. Thorowgood's attention to this matter was drawn by me through the Chief Engineer some time before the accident, and the event showed my judgement to have been right. Mr. Thorowgood admitted the fact of the tight mooring being objectionable, but said he was only carrying out Mr. Parkes' idea, who would not be interfered with. Let any reasonable person consider what the effect of the large buoy lifting the four great chains, to which the ring and swivel are attached, to any height of which the buoy was capable of floating, then and there letting the whole mass fall to the bottom in one confused lump, its own bridle chain also falling slack to the depth caused by the hollow of the wave, and

this

15/196

this rise and fall occurring about every 20 seconds during the whole bad weather, and then say if that was not enough to shake anything — adrift: shackles were never meant to be subject to such treatment. Under any circumstances it will not take long for the key to rust, and danger be incurred from that source. The remedy offered by the Committee of a sufficient bridle chain with a swivel in the proper place will, if the Marine Department is allowed its proper voice in this matter, restore my confidence and through me that of the Public.

4. I object to the constitution of the small buoys owing to the leverage exerted by the buoy on its spindle, which is tightly placed in the swivel. One spindle has broken from this cause. Moreover, the spindle arrangement is unnecessary, and a useless danger, for after passing through the swivel and a nut having been screwed on above and below the swivel, the end of the spindle seems to be clenched over the lower nut, and so cannot be undone again for purposes of removal or cleaning. Moreover, the whole strain of the buoy with ship or other attachment above rests upon the threads of the two screws, and the small portion of end clenched over. I would far rather have a simple buoy with a ring at top and bottom, like the Marine Department buoys, which have been several years in service, without any attempt

to

release themselves.

5. Mr Parkes' attempt to show that consultation was held between the Marine and Harbour Authorities is entirely misleading. The only consultations were about the number of buoys and the sites to be selected for them, and Mr Thorowgood agreed with the Marine Department about the necessity of a smaller number being placed than Mr Parkes had insisted on. Corrosion is so extensive under water here that it would be nothing but profligate waste to cover the whole bottom of the harbour with screws and chains on the chance of some of them at some time coming into use.

6. Under judicious management the moorings are sufficient for the situation, though great care will always be imperative when rough days ensue, and ships are depending on them

I have the honor to be

Sir

Your Most Obedient Servant

W Taylor

Master Attendant

Administrative Department

P.W. £2 / 1282 / 82

Cuttack

No 598 W 16/594

PUBLIC WORKS DEPARTMENT.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

UNDER date the 8th March 82

Read the following:—

Letter from the Harbour Works Committee, Madras (A.E. No — dated 24th Feby 1882)

The Harbour Committee has now submitted its report as called for in G.O. 26th January 1882 No 227W regarding the causes which led to the parting of six of the new buoys during the storm of the 12th Nov 1881.

2. The Rt Hon'ble the Governor in Council while seeing no reason to dissent from the opinion expressed by the Committee that the accident was due to the

dropping out of the shackle
pins in the manner described
by Mr Parke considers
that the precaution on
which so much depended
of securing the pin by means
of a lead pellet should
have been carefully explained
in the specification
originally furnished for
the guidance of the officer
charged with the execution
of work.

3. As the fixing of the
pellet in question appa-
-rently devolves on a
diver not under the imme-
-diate eye of the responsible
officer it seems doubtful
whether there exist

17686

adequate securities for the
due performance of an
operation at once so delicate
and so important, the
Government therefore desire
that they may be furnished
with further information on
this point by the Engineer-
-in-Chief of the Harbour
Works.

4. The other questions which
have come up for consideration
are

(1) the position of the shackle
at the top of the bridle chain

(2) whether a swivel
should not be placed
immediately below the
shackle in addition to
the one at the bottom
of the bridle chain

(3) whether the bridle chains are of sufficient length to allow of the buoys rising and falling with the waves without having too much work thrown on them in lifting the ground chains, and

(4) whether the attachment of the spindle of the small buoys to the swivels is of sufficient strength.

5 As regards the first of these it is understood that Mr Sarkes has recognized the desirability of reversing the position of the shackle jaws, and that no further question

on the subject is likely to arise.

6. With reference to the second the Government are of opinion that although some extra expense may be caused by the placing of the additional swivel immediately below the shackle it will on the whole be desirable to insure this as recommended by the Master Attendant.

7. Similarly in reference to the third point, viz: the lengthening of the bridle chains the Government accept the opinion of the Committee which has been agreed to by the Master Attendant.

The additional length of chain to be given will be decided by the latter officer in communication with the Engineer-in-Chief of the Harbour Works.

8. On the fourth point the Government would wish to receive suggestions for strengthening the attachment of the spindle from the Engineer-in-Chief as these, if concurred in by the Master Attendant, may admit of a settlement of the question without requiring a reference to the Secretary of State.

9. As there seems to be some misapprehension

12/598 98

regarding the relative responsibilities of the Engineer-in-Chief and the Master Attendant in regard to the putting down of the moorings, the R.t. Honble the Governor in Council is clearly of opinion that the last named officer should invariably be consulted on all points connected with the details of the work and his assent obtained.

The Harbour Committee.
Secpt. Mr. H. Works
Engr C. — do —
Marine Dept.

Accepted 31-3-82.

6/3/82

Ha Hm to Studies

Cine 8/3 12

1282.

Govt. of {1882} Madras.

PUBLIC WORKS.

To

Dated 5-3-82

Issued

Recd. Encl.

G. O., 8th March 1882, No. 598 W.

Nos. 71 to 72

Painting of the buoys from their moorings Chains in the Madras Harbour.

Passing orders on the report of the Harbour Committee regarding the ——.