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MADRAS RECORD OFFICE

Government of Madras

Public Works DEPARTMENT

G.O. No.	1056	(W)	Press
~~B.P. No.~~			~~Mis.~~
Dated	27-4-	1876	

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No. 395.

Read the following papers :—

HARBOUR WORKS, MADRAS.

No. 5) W.

REPORT OF PROGRESS FROM COMMENCEMENT OF WORKS TO END OF 1875.

I HAVE the honor to report that, in accordance with a letter addressed to me on 17th March 1875, by Sir Louis Mallet of the India Office, in which I was informed that the Secretary of State offered me the appointment of Superintendent of the Works at Madras Harbour, I left England on 12th May and arrived here on 9th June last. Copies of Sir Louis Mallet's letter and of my reply appear in the printed Proceedings of this Government, No. 1,857, 2nd July 1875.

2. Before leaving England I had been in personal communication with Mr. Parkes, of Westminster, on the subject of Madras Harbour as designed by him, and thus described in his printed Report to the Madras Government of 4th November 1873 :—

"The Harbour is intended to be formed by piers running out from the shore 500 yards north and south respectively of the present screw pile pier, enclosing a rectangular space of 1,000 yards long by 830 yards wide, or 170 acres, with a depth at low-water of from 3 to 7 fathoms, and consequently available for European Ships of all sizes, with a further space of a quarter of that area with a depth less than 3 fathoms, available for boats, lighters, and Native Craft."

3. My instructions were of a general nature, to commence the works at once, and to carry them out as expeditiously as possible, in accordance with Mr. Parkes' design, as drawn on a plan and section attached to his printed Report of 4th November 1873. No plant or materials of any kind had been sent out from England preparatory to such commencement, but there was reason to believe that some assistance would be rendered by the Madras Railway Company.

4. The first operation required was the formation of a bank of rubble laterite for the approach to the north pier at North Pier, Surf Bank. Laterite, Ambatoor. Ryyapooram, for which the stone was to be obtained from a moor known as the Red Hills, near the native village of Ambatoor, 10 miles from Madras, on the main line of the Madras Railway. On 18th June last I first examined the laterite at the Red Hills, in which a series of pits or borings had been made by Mr. Milbourne Ross, Sub-Engineer, employed by you for the purpose two or three months before.

5. That and future inspections convinced me that the Ambatoor laterite, although not the best stone for the purpose, was sufficiently good in quality and sufficiently abundant in quantity to serve for the rubble deposits in the M. piers, or for a great part of them. The stone seemed to be specially adapted for the

submarine deposits under the artificial blocks of the piers, in consequence of its high specific gravity and closely packing nature when deposited in the form of rubble.

6. The beds of laterite rock at Ambatoor are not spread uniformly over the moor, but are scattered in different places, the rock varying from 1 yard or less to about 3 yards in depth, and the best of it cropping up above the surface. For the reason stated, the quarrying operations at Ambatoor cannot assume the form of a common quarry worked from a face on one or more sides, but will consist of a series of pits 2 or 3 yards in depth, following the rock wherever it may be found. For the same reason the rock cannot be approached in all cases by a railway, and this involves the necessity of carting the stone, or some of it, to the railway on bullock carts.

7. A plan of the Royapooram Station-yard and of Mr. Parkes' approach to the north pier accompanies this. It will be seen from the plan that there are four lines of railway, colored blue, leading into the platforms at the station. These four lines converge into three lines at a point 457 yards west of the terminus, and into a single line at a point 1,000 yards west. Thence the line is single to Vasarapaudy Junction, about $2\frac{1}{2}$ miles west; thence double for 1 mile to Perambore, $3\frac{1}{2}$ miles west; and thence a single line of railway throughout.

8. It was arranged from the beginning that the stone for the Harbour should be conveyed by the Railway Company along their main line, in their own wagons, and delivered at Royapooram to the Harbour Authorities. This arrangement has prevailed from the commencement, and none of the Harbour Works wagons are allowed to travel on the main line of the Madras Railway.

9. Being satisfied on 18th June last that stone existed at Ambatoor, I applied on the following day to the Railway Authorities, the Consulting Engineer, the Agent, the Chief Engineer, and the Traffic Manager, to lay in a branch from the moor to the Company's line, to which they assented.

10. On 19th June last arrangements were also made with the Railway Authorities for extending their northernmost pair of metals at Royapooram terminus across the beach road and tramway into the sea.

11. One of the first difficulties in commencing the works of the Harbour was the 10 feet sewer at Royapooram, which falls into the sea within the lines of Mr. Parkes' Harbour. Several plans for dealing with the sewer were proposed last summer and autumn, such as extending it into the sea through the north pier works, and diverting it parallel to the shore to a point outside the Harbour. Each of them was in its turn abandoned in the expectation that Mr. Clark's general scheme for draining Madras would remove this outfall. The north pier was commenced by laying the railway

across the beach at point A on the accompanying plan on 12th July 1875. The assent of the President of the Municipal Commission to the beach crossing at B was obtained on 10th July.

12. On 12th July 1875 I employed a native quarryman Donadhee Vurdiah, recommended to me by the Railway Authorities, to open the ground at Ambatoor Quarry opened, first train of laterite. for the production of laterite, and on 3rd August the first train of laterite was deposited in the surf bank of the north pier, A, B, C, on the accompanying plan.

13. The work of depositing rubble laterite in the pier proceeded with occasional interruptions from 3rd August to 7th December 1875, when the work was suspended on account of the Royapooram sewer. The particulars of this appear in the printed Proceedings of the Madras Government, No. 3,326, dated 22nd November 1875, and, as the work of depositing rubble into the pier was not resumed until January 1876, they will not be further referred to in this report. On 7th December 1875 a total quantity of 12,999 tons of laterite had been deposited on the line A B C. The surf bank was then advanced 600 feet on the average from B to C, 34 feet in width on the top, 13 feet above mean sea level, with natural slopes on each side. A longitudinal section and four cross sections of the bank A B C are enclosed.

14. The following are the prices which were paid for the laterite deposits during 1875:—

	RS.	A.	P.
Donadhee Vurdiah, for quarrying stone and carting it to the railway at Ambatoor	0	10	0
Donadhee Vurdiah, for loading into Railway Company's wagons at Ambatoor	0	3	0
Madras Railway Company, for hauling stone 10 miles from quarry to Royapooram	0	5	0
Sundry persons, for discharging stone from Railway Company's wagons into Harbour Works wagons, and depositing it in north pier	0	2	11
Total cost of deposits	1	4	11
Mr. Parkes' estimate of 3, taking a Rupee at 2	1	8	0

15. The saving of 3 Annas 1 Pie per ton on the cost of the work as compared with the estimate is partly apparent only, not real, because Mr. Parkes' estimate of 3 per ton applies to the whole of the laterite in the piers, the greater part of which has to be shipped from a jetty into screw hopper barges and dropped on the sea bottom to form a base for the blocks. The operations of shipping the stone into hoppers and depositing it in deep water may cost together about 2 Annas per ton.

16. In the course of last summer, it became necessary to have a stock of railway sleepers, each 10 feet in length by 10 inches by 5 inches, adzed half square, Junglewod sleepers.

*Proceedings of the Madras Government, Public Works Department,
27th April 1876.*

the length of these sleepers being the same as those used by the Madras Railway Company. I applied to Messrs. Hinde, Massey and Co., of Calicut, for an offer to supply 1,000 junglewood sleepers of these dimensions, and the result was their delivery at Royapooram for $3\frac{1}{2}$ Rupees per sleeper, being about the rate of 1 Rupee per cubic foot of timber.

17. The quantity of permanent metals, including sleepers, chairs, and fastenings, lent for the use of the work by the Madras Railway Company was about two-thirds of a mile of single way, with the understanding that these metals are to be given back to the Company after they have served their turn on the Harbour sidings.

18. On 19th August last you asked me a question from Sir William Robinson, then Acting Governor, whether any means existed of connecting the name of the Prince of Wales with the commencement of the works on the occasion of the expected visit of His Royal Highness to Madras in the following December, to which I replied that the works would not be sufficiently advanced for placing a foundation stone or block in the line of the north pier, but that a date-stone to commemorate the commencement of the Harbour, might be prepared to be laid by the Prince on the shore. Arrangements were made accordingly. The site selected for the stone was on the north beach opposite the middle of the High Court buildings; a platform of grass sodding, protected from the sea by an apron of masonry was prepared for its reception; four blocks of granite were procured from Sholinghur and dressed to the form required; raised benches were erected for spectators; and the stone was placed on its bed by His Royal Highness on the evening of 15th December last. The expenditure from this office for the Prince's stone up to the end of the year amounted to Rupees 5,518-7-6, and further disbursements followed early in this year. There was also some expense incurred by the District Engineer of the Presidency, who erected and afterwards took down the benches for the ceremony.

19. The Christmas holidays having followed the Prince's week in December, little work was done between the 13th of the month and the end of the year.

20. Referring to the cost of the laterite rubble deposited in the north pier as stated on page 7, none of the works therein specified have been advertised for public tender. The following practical difficulty has prevented me throughout from advertising the laterite supplies. I never had the means of knowing for a sufficient period beforehand the quantity of rock that could be deposited in the pier, every week I receive offers from contractors, or supposed contractors, for supplying the stone, but none of them at lower rates than those shown by the figures on page 7. The price of 2 Annas 11 Pies for delivering the stone at the pier was lowered in January to 2½ Annas per ton.

21. The following is a statement of the total expenditure incurred on the work from the commencement to the end of 1875. The estimated amounts for the

*Proceedings of the Madras Government, Public Works Department,
27th April 1876.*

different items are placed opposite to them in red figures. The accounts and vouchers are sent from month to month to the Examiner of Public Works Accounts:—

Heads of Estimate.	Cost to end of 1875.			Estimated Amount, new Estimate.		
	RS.	A.	P.	RS.	A.	P.
Detailed survey	138	1	3	5,000	0	0
Forming railways, &c.	14,829	2	11	1,50,000	0	0
Opening quarries	1,756	6	1	10,000	0	0
Preparing block ground	421	7	7	65,000	0	0
Rubble stone deposits per ton (1-4-11)	16,942	7	10	Per ton 1	8	0
Buildings	1,612	10	11	75,000	0	0
Rolling stock	1,459	10	0	85,000	0	0
Quarry and general tools	50	11	10	50,000	0	0
Office furniture	578	0	0	2,000	0	0
Salaries	13,661	13	7	2,12,000	0	0
Office contingencies	278	13	4	6,000	0	0
Travelling allowances	1,782	10	11	20,000	0	0
Contingencies at 5 per cent.	5,548	7	6	2,12,000	0	0
Total ...	59,060	7	9			

22. The following is a list of the office establishment up to the end of 1875, giving the dates of officers' appointments and the rates of their pay:—

Name.	Office.	Date of Appointment.	Rate of pay per Month.
			RS.
Milbourne Ross	Sub-Engineer	1st April 1875	200
James May	Superintendent	1st " "	1,250
Edward DeCaster	Assistant Accountant	1st July "	30
P. Loganathan	Draftsman	20th " "	30
George William Lowe	Foreman Mason	28th " "	420
E. C. Somasundara	Head Accountant	29th " "	60
Edmond D'Vaz	Assistant Accountant	6th Sept. "	20
John Henry Dennison	Storekeeper	5th Oct. "	200
N. St. B. Beardmore	Assistant Engineer	28th " "	500

23. The following tracings accompany this:—

1. Plan of Royapooram Station-yard and approach to north pier.
2. Longitudinal sections of approach.
3. Four cross sections of approach.

31st March 1876. (Signed) JAMES MAY,
Superintendent, Madras Harbour Works.

To the Secretary to Government, Public Works Department, Fort St. George.

HARBOUR WORKS, MADRAS

No. 396.

No. 1 W.

REPORT OF PROGRESS FROM 1ST JANUARY to 31st MARCH 1876.

It was stated in last report of progress to the end of 1875 that the work of depositing rubble laterite in the surf bank of the north pier was suspended on 7th

Suspension of work in December 1875.

December last on account of the Royapooram 10 feet sewer, which falls into the sea within the lines originally proposed for this Harbour. The attention of the Government was called to the question of the sewer by the Master Attendant in October last, and at the end of that month I was instructed to report on the means of discontinuing for a time the approach from the passenger terminus at Royapooram commenced last year, and of approaching the pier by a different route, leaving the outfall of the sewer to the north of the work.

2. I reported to the Government accordingly on 8th November last, and a copy of that report appears in the printed Report to Government on Town Sewers. Proceedings of the Government, Public Works Department, No. 3,326, dated 22nd November 1875. The Government Order thereon states that "His Excellency the Governor in Council has no doubt whatever as to the necessity for adoption of the course proposed by the Master Attendant for avoidance of the nuisance that would be caused by including the main sewer within the new Harbour, pending the execution of Mr. Clark's drainage works."

"The bank at present in progress will, therefore, be temporarily stopped, and one of the three alternative new lines of rail adopted for conveyance of the Harbour material. His Excellency the Governor in Council would prefer that described in paragraph 14 of Mr. May's letter, as avoiding an additional level road crossing. But in deference to the interests of the Madras Railway Company, through whose coal-yard it would run, will accept the third line described in paragraph 15; arrangements for laying which he requests may be carried out without delay."

3. At the end of November 250 tons of iron rails and 20 tipping wagons were delivered on the works from England. New Approach Railway commenced. Nearly all December these rails, like the other rails in Madras, did duty in the form of seats or benches at the ceremonies prepared for the Prince of Wales. On 28th December we commenced to lay the new Approach Railway 1,600 yards in length, D F P H on the accompanying plan, running up from the beach parallel to, and to the southward of, the Railway Company's south boundary wall, parallel to, and to the southward of, the Royapooram sewer, through the proposed block ground, crossing the beach road, the Royapooram Station road and Munnarsawmy Covel Street on the level, and joining the Railway Company's line at H.

4. The President of the Municipal Commission was informed that we proposed to abandon for a time the crossing of the beach road laid down in July last opposite the terminus at Royapooram, and to substitute the three level crossings above described. Mr. Burrows assented.

5. The new railway, D F P H, was completed, except ballasting on 24th January. Between 24th and 28th January 1,768 tons of laterite ballasting were brought down from Ambatoor and laid on the line, and on 28th January a commencement was made in depositing rubble laterite in the new surf bank, E G K on the accompanying plan.

6. Twenty thousand two hundred and ninety-eight tons of rubble laterite were thrown into the new surf bank from 28th January to last evening. The present rate of progress is 567 tons of stone per day, and I hope soon to see some increase in this quantity.

Progress of Bank.

7. The following are the prices paid for the laterite deposits during the period to which this report refers:—

	RS.	A.	P.
Donadhee Vurdiah, for quarrying stone and carting it to the Railway at Ambatoor	0	10	0
Donadhee Vurdiah, for loading into Railway Company's wagons at Ambatoor	0	3	0
Madras Railway Company, for hauling stone 10 miles from quarry to Royapooram	0	5	0
Annamalay Chetty, for discharging stone from Railway Company's wagons into Harbour Works wagons and depositing it in north pier	0	2	6
Total cost of deposits...	1	4	6

Mr. Parkes' estimate of 3 Shillings, taking a Rupee at 2 Shillings... 1 8 0

8. The cost of the laterite deposits during the last three months is thus 5 Pies per ton less than the cost of the same deposits last year. The reduction is on one item only discharging the stone from Railway Company's wagons into the sea, formerly 2 Annas 11 Pies per ton, now 2½ Annas per ton.

9. There is thus an apparent saving of 3½ Annas per ton in the cost of the laterite deposits for January, February, and March, as compared with Mr. Parkes' estimate; but, as stated in last report, his estimate applies to all the rubble in the piers, and not to the surf bank only which is now being formed. The item "barging" will have to be added to by far the largest part of the rubble deposits.

10. The length of the surf bank E G K last evening was 636 feet in advance of point G on the average, 30 feet in width on the top, 13 feet above mean sea level, with natural slopes on each side.

11. None of the works above described have been advertised for contract, nor can I conceive that contracts are yet applicable to them or any of them. I am satisfied that the prices are as cheap as can be got; and the price of the work falls within Mr. Parkes' estimate of 3 per ton, converting Mr. Parkes' figure at the most unfavorable rate of exchange, two Shillings to a Rupee.

12. Before leaving England and ever since my arrival in this country, I have been urging on Mr. Parkes the necessity of strengthening the surf bank E G K, Securing Surf Bank.

which is the most important point of the whole work, because it must be the road to all the rest; and no one would say that the rubble bank of laterite now being thrown into the sea at Royapooram could pass uninjured through a cyclone in the Bay of Bengal. The method proposed was to make a series of large Portland cement blocks (about 8 feet cubes) on the top of the bank, to leave them there a month to harden, and then to throw them over, so as to form a rough slope of heavy materials, particularly on the northern or sea side of the surf bank. Mr. Parkes has not yet assented to the strengthening of the bank, for which no sum appears in his estimate. His letters to me are to this effect: wait for bad weather, see the result, and then provide a remedy.

13. Yesterday morning, for the first time here, the surf being heavier than usual, the sea undermined the foot of the north slope for a length of 140 feet near the outer end of the bank, drawing off the stone from the top, and forming a flatter slope there, as shown by the accompanying cross section at 565 feet. The quantity of stone displaced by the sea yesterday was 600 tons. It so happens that yesterday also brought out the means of meeting this damage, in the shape of 250 tons of Portland cement from the Thames, by the Steamers *Sultan* and *Tenedos*. I propose at once to proceed with the manufacture of blocks for the slope of the surf bank in the manner described.

14. At the end of February -I inserted an advertisement in the Gazette and other Newspapers, inviting tenders for the delivery of 2,000 junglewood railway sleepers at Royapooram, each sleeper measuring 8 feet 6 inches in length by 10 inches by 5 inches, neatly adzed half square, and equal in quality to a sample sleeper to be seen at this office. The result was four tenders, with deposits of 500 Rupees each.—

								RS.	A.	P.
No. 1.	Per Sleeper	...	...	...	...	...	...	4	0	0
„ 2.	Do.	...	...	...	...	...	...	3	8	0
„ 3.	Do.	...	..	...	...	...	...	2	14	0
„ 4.	Do.	...	...	...	...	...	...	2	12	0

No. 4 tender was accepted, and a formal contract executed thereon. The price of the accepted tender amounts to 15 Annas per cubic foot of timber, or 15½ Annas per foot, including the expense of advertising. On comparing this price with the price of 1 Rupee per foot paid last year to Messrs. Hinde and Co., of Calicut, the contract shows a saving of half an Anna per cubic foot. Before inserting the advertisement for sleepers, I made some small purchases of sleepers in the market at Rupees 2-12-0 per sleeper, and we knew that was the lowest figure at which they could be purchased.

15. On 22nd January an instruction was first sent to me to advertise in the Gazette and other Newspapers, inviting tenders from the public for any work to be done in my department. The question of contracts has appeared again in various forms, and I receive so many applications from persons desiring employment in the

capacity of contractors that some misunderstanding must exist on the subject. As first instructed, I am not aware that any contract at all was intended here.

16. The works of the piers consist but of two items, rubble stone and cement blocks, simple as these items appear, the manner of dealing with them is extremely complicated.

17. The rubble stone is first to be quarried at Ambatoor, then carted to the railway, then loaded into Railway Company's wagons, then conveyed by the Railway Company's engines to Royapooram, then weighed, then transferred to Harbour Works wagons, then transported to a shipping jetty, then loaded into hopper barges, and ultimately deposited in its destination, the sea. Such will be the process with every wagon of stone in the course of two or three months. A certain balance must be observed in the quantity of rock produced at the quarry, thus, if the quarrying power exceeds the carrying power, the stone must accumulate at Ambatoor: if the carrying power exceeds the depositing power, the stone must accumulate at Royapooram. Occasionally the work of depositing may be stopped altogether for a week or two by bad weather, or for a longer period by unforeseen accidents of the sea, and all this must be kept in view in any contract for the delivery of stone. Even at this moment the weighing of the stone at Royapooram is attended with considerable inconvenience, because the Engine-drivers who bring it in for delivery, are the Railway Company's servants and not ours.

18. The blocks proposed to be used in the pier walls, each of these blocks weighing 27 tons, resemble nothing else in the world except a few blocks in the Blocks.
- Manora Pier at Kurrachee, and the machines to be employed for moving them are so peculiarly made that no duplicates exist. That the important operation of mixing concrete may be faithfully performed, steam power will be applied to it, the stone will be broken to the required sizes by steam; and every care must be taken that the blocks produced shall be the most perfect that it is possible to produce from the materials used, considering the immense importance of the work and the heavy weights which these blocks are destined to carry, *namely*, the storm waves of the Coromandel Coast. There is nothing connected with block-making or moving suitable for a Sub-contractor. Each step to be taken there is a special step, and it will require a special man to take it. Mr. Parkes writes to say that he is arranging to send out 600 tons of Portland cement per month for block-making; and I, on this side, would be glad to see the means of delivering stone and sand for a corresponding number of blocks (about thirteen per day), but it is too early to advertise for them.
- the last two or three weeks, that which has limited the delivery of

19. During the last two or three weeks, that which has limited the delivery of laterite at Royapooram is the inadequate quarrying power of Vurdiah, the quarryman at Ambatoor. He cannot produce more stone than he is producing, until the railway branch leading into his quarry is extended in length so as to contain a larger number of wagons. The branch is being extended, but delay occurs at the present

Proceedings of the Madras Government, Public Works Department,
27th April 1876.

time, because the branch is in deep cutting. I press Vurdiah every day for more stone; it might be easy to displace him and try another Contractor by advertisement. I do not know a better quarryman in this country; I have nothing against the man, and he has embarked a certain capital on his work.

20. To the question whether we can ever work up to the depositing of 2,000 tons of stone per day, as originally named to the Madras Railway Company, I would reply in the negative. A delivery of 2,000 tons of stone per day means stone and blocks enough to complete the north pier in twelve months (April 1877), or it means stone and blocks enough to complete both piers in twenty-four months (April 1878). There will be no occasion for anything like this, excessive speed of stone deliveries; it would inevitably accumulate and form a mountain on the shore at Royapooram.

21. When the last Overland Mail left England (10th ultimo), one of our two Hopper Barges, screw hopper barges, named the *Salisbury*, was at anchor in the Clide waiting for the end of an Atlantic gale then blowing to proceed to her destination *via* the Suez Canal; and the other barge, the *Lady Hobart*, was preparing to follow. Supposing them to have cleared the channel on 20th March, they would be due here about the 20th June. It was the absence of all natural shelter for marine plant at Madras that induced the idea of the screw hoppers, in the form of wholesome sea boats, and that the number of craft might be as small as possible. With the help of good moorings, we hope the crews who bring the hoppers from England will take care of them here.

22. On the question of commencing the south pier, I have already reported that it would be more economical, particularly as regards plant, to push out the north pier for some distance before beginning the south pier. As the Government has expressed a wish for the latter, it may be commenced in the autumn. Several sewers fall into the south corner of the Harbour, on which I will at once report, that a false start from the shore, as at Royapooram, may be avoided near the Stamp Office.

23. We have commenced to prepare the block ground at Royapooram. The Block-making ground may be ready for the manufacture of blocks about the end of May, and the first block may be set in its place as thereafter as a moderate length of base to receive it is brought up by the screw hopper barges.

24. The ship *Jubilee* sailed from Kurrachee for this port on 14th ultimo with plant and materials.

25. The following is a statement of the total expenditure incurred on the work from the commencement to last evening. The estimated amounts for the different items are placed opposite to them in red figures. The accounts and vouchers are sent from month to month to the Examiner of Public Works Accounts.

Proceedings of the Madras Government, Public Works Department,
27th April 1876.

Heads of Estimate.	Cost to end of March 1876.			Estimated Amount, new Estimate.		
	RS.	A.	P.	RS.	A.	P.
Detailed survey	498	6	4	5,000	0	0
Railways, &c.	26,054	8	10	1,50,000	0	0
Opening quarries	1,770	14	1	10,000	0	0
Preparing block ground	969	6	1	65,000	0	0
Rubble deposits (1-4-8) per ton	36,852	9	11	Per ton 1	8	0
Buildings	2,349	8	0	75,000	0	0
Locomotive engines	429	1	1	60,000	0	0
Rolling stock	1,776	11	6	35,000	0	0
Engines, cranes, &c.	17,152	10	1	1,25,000	0	0
Quarry and general tools	3,766	10	0	50,000	0	0
Buoys and beacons	509	0	7	3,000	0	0
Office furniture	578	0	0	2,000	0	0
Salaries	22,604	8	4	212,800	0	0
Office contingencies	401	7	5	5,000	0	0
Travelling allowances	2,808	2	7	50,000	0	0
Contingencies at 5 per cent.	7,184	10	11	212,800	0	0
Total	1,25,706	3	9			

26. The following is a list of the Office Establishment up to last evening, giving the dates of officers' appointments and the rates of their pay:—

Name.	Office.	Date of Appointment.	Rate of Pay per Month.
			RS.
Milbourne Ross	Sub-Engineer	1st April 1875	200
James May	Superintendent	Do. "	1,250
Edward DeCaster	Assistant Accountant	1st July "	30
P. Loganathan	Draftsman	20th " "	30
George William Lowe	Foreman Mason	28th " "	420
E. C. Somasoodara	Head Accountant	29th " "	60
Edmond D'Vaz	Assistant Accountant	6th Sept. "	20
John Henry Dennison	Storekeeper	5th Oct. "	200
N. St. B. Beardmore	Assistant Engineer	28th " "	500
Bhimmaya Saenna	Sub-Engineer	3rd Jan. 1876	370
John Chicken	Foreman Mechanic	15th Feb. "	340
B. Ethersajooloo	Clerk	Do. "	20
J. D'Silva	Draftsman	23rd March "	35

27. The following tracings accompany this:—

1. Plan of Royapooram Station-yard and approach to north pier.
2. Longitudinal section and five cross sections of approach.

(Signed) JAMES MAY,
Superintendent, Madras Harbour Works.

1st April 1876.

To the Secretary to Government, Public Works Department, Fort St. George.

MEMORANDUM.

No. 397.
THE Chief Engineer has the honor to report that on receipt of G.O., No. 663, of 14th March, he requested the Superintendent of the Harbour Works to submit at once

*Proceedings of the Madras Government, Public Works Department,
27th April 1876.*

a statement of the progress made, and expenditure incurred, up to the end of 1875. And to complete the information up to the end of the official year as soon after the 31st March as possible. Mr. May was supplied with notes of all the different points regarding which it was desirable that the Government should be fully and accurately informed; and he has responded most promptly to the call in the two separate reports illustrated by five sets of tracings, now submitted. The Chief Engineer takes this opportunity of pointing out that he was absent on three months' leave when Mr. May arrived at Madras, commenced operations, and received his instructions as to the preparation of monthly accounts, &c. These instructions did not apparently include the submission of monthly reports of progress and outlay, which will now be prepared regularly.

2. In the reports now submitted, in Mr. May's former report, No. 33, of 21st December 1875, and in the Chief Engineer's memorandum of 6th April, drawn up under instructions of the Honorable Mr. Ellis, full information is given as to the rates at which work has been carried out, which so far compare well with estimate rates.

3. The progress of the work has been considerably retarded by two causes, *viz.*, the visit of His Royal Highness the Prince of Wales, and the change of plan necessitated to avoid including the northern main drain within the Harbour limits. The rate of progress in quarrying and depositing laterite rubble is now nearly 600 tons a day, and this will be increased as soon as a certain necessary extension of the railway quarry branch has been completed. The preparation of the block ground has been commenced; stone-breaking machinery, &c., has been received from England; a locomotive steam engine for hauling the blocks has been set up; several hundred tons of Portland cement are in store; the Kurrachee plant and materials are well on their way round by ship; and it is hoped that the manufacture of blocks will be commenced by the third month of the current official year.

It will be observed from paragraphs 12 and 13 of Mr. May's second report that he proposes to use his first blocks for the protection of the sea face of the northern surf bank against the effects of the north-east monsoon. This work is not contemplated, or as yet approved, by Mr. Parkes; but its necessity is concurred in by the Chief Engineer, and he has assured Mr. May of the sanction of Government; its cost being charged against the item of two lakhs for additional work to the rubble bank, which was added to Mr. Parkes' estimate, as a precautionary measure.

It will be observed that two screw hopper barges for deposit of rubble beyond the 2½ fathom line, where block superstructure commences, are on their way from England.

FORT ST. GEORGE,
7th April 1876.

(Signed) G. W. WALKER, Major-General, R.E.,
Chief Engineer, Public Works Department.

- No. 328. Note by the Hon. R. S. ELLIS, C.B., dated 10th and 20th April 1876.
No. 329. " by His Grace the Governor, dated 12th April 1876.
No. 400. " by the Hon. Sir W. ROBINSON, K.C.S.I., dated 21st April 1876.

*Proceedings of the Madras Government, Public Works Department,
27th April 1876.*

No. 401.

ORDER THEREON, 27th April 1876, No. 1,056.

CIVIL WORKS, No. 26.

ORDERED that these reports be recorded with reference to G.O., No. 663, of 14th March.

2. The Harbour Superintendent will be expected strictly to conform to the rules for contracting by public tender, of which he was advised in the Chief Engineer's memorandum, No. 141, of 22nd January 1876. And he will apply those rules to the supply of materials, such as cement, timber, iron barges, &c., and granite stone and sand. The delivery of laterite stone under present circumstances may be more difficult to obtain by contract on public tender, in consequence of the peculiarity of conditions arising from the supply of wagons and moving power being in the hands of the Railway Company. On this point the Governor in Council desires further information before absolutely directing that this delivery should be contracted for in accordance with the Public Works Code. Mr. May will therefore report specially upon this point, bearing in mind that, in the opinion of Government, it is very desirable that advantage be taken, in this as in other supplies, of public competition, as soon as the quarries are fully open and equipped with convenient sidings. Should it be found necessary to continue temporarily the present arrangement for the delivery of laterite, the terms of the agreement should be distinctly laid down and recorded.

3. With reference to paragraphs 20 to 22 of Mr. May's 2nd report, His Grace the Governor in Council has to observe that he sees no reason why the south pier should not be commenced at once and pushed forward with at least the same rate of progress as the north pier. It is a great object that the work should proceed rapidly, in order that the Harbour may come into use as speedily as possible; and so far back as 12th October 1875, in G.O., No. 2,910, the Harbour Superintendent was, on the Chief Engineer's suggestion, called on to report why the two piers should not be carried out simultaneously. Arrangements should be made for fully opening the quarry ground at Ambatoor, and laying down a sufficiency of railway sidings to enable it to be worked to the best advantage, by more than one supplier; so that a daily delivery of some 1,500 tons of laterite material for both piers may be reckoned on. And the arrangements for supply of granite or hard stone for the cement blocks should be on a scale calculated to admit of supply of 500 tons daily; so that the rate of working originally laid down in the Proceedings recorded with G.O., No. 2,036, of 17th July, may be attained. His Grace the Governor in Council is not prepared to rest satisfied with the rate of progress already attained since the 3rd August 1875, when a commencement was made by deposit of 160 tons at the north pier.

4. Mr. May will distinctly understand that it is the object of Government to have the Harbour complete at the earliest practicable date. And if it be found that the Ambatoor quarries fail either as to quantity or quality, he will give his early attention to other sites, such as the ground near Palaveram, for conveyance of which the South Indian line of rail will be available.

5. It is understood from the letter recorded with G.O., No. 46, of 8th January 1876, that all plant and materials sent out for the works by Mr. Parkes are subject to supervision by officers appointed by the Secretary of State for India. His Lordship's attention will be called to the fact stated by Mr. May, that two screw hopper barges

Proceedings of the Madras Government, Public Works Department,
27th April 1876.

were to have started for Madras in all March. And he will be requested to obtain all information regarding the conditions on which they were ordered; whether they are insured; and, if so, whether the insurance covers the special risks to which the nature of their intended duty will expose them.

(True Extract.)

(Signed) G. W. WALKER, Major-General, R.E.,
Secretary to Government.

To the Superintendent, Harbour Works.
To Mr. Parkes.
To the Consulting Engineer for Railways.

Harbour Works, Madras.

N. 50. W. ... Report of Progress from commencement of Works to end of 1875.

Sir,

I have the honour to report that in accordance with a letter addressed to me on 17th March 1875 by Sir Louis Mallet of the India Office, in which I was informed that the Secretary of State offered me the appointment of Superintendent of the Works at Madras Harbour. I left England on 12th May, and arrived here on 9th June last. Copies of Sir Louis Mallet's letter and of my reply appear in the printed Proceedings of this Government, N. 1857, 2nd July 1875.

Mr. Parkes's Design.

Before leaving England, I had been in personal communication with Mr. Parkes of Westminster, on the subject of Madras Harbour, as designed by him and thus described in his printed Report to the Madras Government of 4th November 1873:-

"The Harbour is intended to be formed by piers running out from the shore

" 500 yards north and south respectively.

" by of the present screw-pile pier, enclosing a rectangular space of 1000

" yards long by 830 yards wide, or

" 170 acres, with a depth at low water

" of from 3 to 7 fathoms, and consequently available for European ships

" of all sizes, with a further space

" of a quarter of that area with a depth

" less than 3 fathoms, available for boats

" lighters, and native craft."

3. My instructions were of a general

" nature, to commence the works at once

" and to carry them out as expeditiously

" as possible, in accordance with Mr

" Parkes' design, as drawn on a Plan

" and Section attached to his printed

" Report of 4th November 1873. No

" plant or materials of any kind had

" been sent out from England preparatory

" to such commencement but there was no

" son to believe that some assistance would

" be rendered by the Madras Railway Com-

" pany."

4. The first operation required was the

" formation of a bank of rubble laterite

Instructions
to commence

North Pier
Surf Bank.

Laterite
Ambatoor

for the approach to the North Pier at

Rajahmundry, for which the stone was to be

obtained from a moor known as the Red

Hills, near the native village of Ambatoor

10 miles from Madras on the main line

of the Madras Railway. - On 18th June

last I first examined the laterite at the Red

Hills, in which a series of pits or borings

had been made by Mr. Melbourne Ross,

Sub-Engineer, employed by you for the

purpose two or three months before. -

5. That and future inspections con-

vinced me that the Ambatoor laterite,

although not the best stone for the purpose,

was sufficiently good in quality, and

sufficiently abundant in quantity to serve

for the rubble deposits in the Madras

Piers, or for a great part of them. - The

stone seemed to be specially adapted for

the submarine deposits under the artificial

blocks of the Piers in consequence of its

high specific gravity and closely packing

nature when deposited in the form of

rubble.

Rock at Ambatoor. The beds of laterite rock at Ambatoor

are not spread uniformly over the moor

but are scattered in different places, the

rock varying from one yard or ten to about three yards in depth, and the best of it rising up above the surface. - For the reasons stated, the quarrying operations at Ambator cannot assume the form of a common quarry worked from a face on one or more sides but will consist of a series of pits two or three yards in depth following the rock wherever it may be found. For the same reason, the rock cannot be approached in all cases by a railway, and this involves the necessity of carting the stone or some of it, to the railway or bullock carts.

7. A Plan of the Royapuram Station yard and of Mr. Parker's approach to the North Pier accompanied this. It will be seen from the Plan that there are four lines of Railway, coloured blue, leading into the platforms at the Station. These four lines converge into three lines at a point 457 yards West of the terminus and into a single line at a point 1000 yards west. - Thence the line is single to Vasarapandy Junction, about 2 1/2 miles west; thence double for one mile to Perambore, 3 1/2 miles west; and thence

Madras Railway Station Yard.

to the Sea.

Stone to be conveyed by Railway from company's vehicles.

Is this the best plan - for as it is to be conveyed by Railway - Application to Railway Authorities to lay Harbour sidings.

1200 yards from terminus
to the Sea.

Royapuram 10 feet sewer.

a single line of railway throughout. - 8. It was arranged from the beginning that the stone for the Harbour should be conveyed by the Railway Company along their main line, in their own waggons, and delivered at Royapuram to the Harbour Authorities. This arrangement had prevailed from the commencement, and none of the Harbour Works waggons are allowed to travel on the main line of the Madras Railway.

9. Being satisfied on 18th June last that stone existed at Ambator, I applied on the following day to the Railway Authorities, the Consulting Engineer, the Agent, the Chief Engineer, and the Traffic Manager, to lay in a branch from the moor to the Company's line, to which they assented.

10. On 19th June last arrangements were also made with the Railway Authorities for extending their northernmost pair of metals at Royapuram Terminus across the beach road and tramway into the sea.

11. One of the first difficulties in commencing the works of the Harbour was the 10 feet sewer at Royapuram, which

falls into the sea within the limits of Mr. Parker's Harbour. Several plans for dealing with the sewer were proposed last summer and autumn, such as extending it into the sea through the North Pier works, and diverting it parallel to the shore to a point outside the Harbour. Each of them was in its turn abandoned in the expectation that Mr. Parker's general scheme for draining Madras would remove this outfall. The North Pier was commenced

by laying the Railway across the Beach at point A on the accompanying Plan on 12th July 1875. The assent of the President of the Municipal Commission to the beach crossing at B was obtained on 10th July.

On 12th July 1875, I employed a native quarryman, Donadhe Vardiah, recommended to me by the Railway Authorities, to open the ground at Ambatoor for the production of laterite, and on 3rd August the first train of laterite was deposited in the Surf Bank of the North Pier, A B C, on the accompanying Plan.

The work of depositing rubble laterite in the Pier proceeded with occasional interruptions from 3rd August to 7th December.

Commencement
of North Pier
works

Ambatoor
Quarry opened.
First Train of
Laterite.

Progress of
Work

Works sus-
pended on ac-
count of Sewer

Cost of Laterite
Deposits.

Sum
Total

1875, when the work was suspended on account of the Royapuram Sewer. The particulars of this, appear in the printed Proceedings of the Madras Government, No. 3326, dated 22nd November 1875, and as the work of depositing rubble into the Pier was not resumed until January 1876, they will not be further referred to in this report. On 7th December 1875, a total quantity of 12,999 tons of laterite had been deposited on the line A B C. The Surf Bank was then advanced 600 feet on the average from B to C, 34 feet in width on the top, 13 feet above mean sea level, with natural slopes on each side. A Longitudinal section and four cross sections of the bank A B C are enclosed.

The following are the prices which were paid for the laterite deposits during 1875:

Donadhe Vardiah, for quarrying	Rs.	a.	p.
Stone and carting it to the			
Railway at Ambatoor	0.	10.	0
Do, for loading into Railway			
Company's wagons at			
Ambatoor	0.	3.	0
Madras Railway Company, for			
hauling stone 10 miles from			
quarry to Royapuram	0.	5.	0
undry persons, for discharging			
stone from Railway Company's			
wagons into Harbour Works			
wagons, and depositing it in			
North Pier	0.	2.	11
Total cost of deposits	1.	4.	11
Mr. Parker's Estimator of 3/4, taking			
a Rupee at 2/.	1.	8.	0

Sum
Total

15. The saving of 3 annas 1 pie per ton on the cost of the work as compared with the Estimate is partly apparent only, not real, because Mr. Parker's Estimate of 3 1/2 pice per ton applies to the whole of the laterite in the Pier, the greater part of which has to be shipped from a jetty into screw Hopper barges and dropped on the sea bottom to form a base for the blocks. The operations of shipping the stone into Hoppers and depositing it in deep water may cost together about 2 annas per ton.

Cost of work compared with Estimate

The saving is due to the fact that the stone is not shipped to the pier but is dropped on the sea bottom to form a base for the blocks.

16. In the course of last summer, it became necessary to have a stock of railway sleepers, each 10 feet in length by 10 inches by 5 inches, sized half square, the length of these sleepers being the same as those used by the Madras Railway Company. I applied to Messrs. Binde, Massey, & Co., of Calicut, for an offer to supply 1000 jungle wood sleepers of these dimensions, and the result was their delivery at Royapuram for 3 1/2 Rupees per sleeper being about the rate of one Rupee per cubic foot of timber.

Jungle wood Sleepers.

The length of these sleepers being the same as those used by the Madras Railway Company.

17. The quantity of permanent metals including sleepers, chairs, and fastenings.

Railway Company's Plant.

but for the use of the work by the Madras Railway Company was about two-thirds of a mile of single way, with the understanding that these metals are to be given back to the Company after they have served their turn on the Harbour sidings.

Prince of Wales.

18. On 19th August last you asked me a question from Sir William Robinson, then Acting Governor, whether any means existed of connecting the name of the Prince of Wales with the commencement of the works on the occasion of the projected visit of His Royal Highness to Madras in the following December, to which I replied that the works would not be sufficiently advanced for placing a foundation stone or block in the line of the North Pier, but that a date-stone to commemorate the commencement of the Harbour might be prepared to be laid by the Prince on the shore? - Arrangements were made accordingly. - The site selected for the stone was on the North beach opposite the middle of the High Court Buildings; - a platform of grass sodding, protected from the sea by an apron of masonry was prepared for its reception;

four blocks of granite were procured from Sholinghur and dressed to the form required; raised benches were erected for spectators; and the stone was placed on its bed. By His Royal Highness on the evening of 15th December last. The expenditure from this Office for the Prince's Stone up to the end of the year amounted to Rs 554.8. 7. 6; and further disbursements followed early in this year. There was also some expenditure by the District Engineer of the Presidency, who erected, and afterwards took down the benches for the ceremony.

19. The Christmas holidays having followed the Prince's work in December, little work was done between the 1st of the month and the end of the year.

20. Referring to the cost of the laterite deposited in the North Pier, it is stated on page 7; none of the works there specified have been advertised for public tender. The following practical difficulty has troubled me, throughout, from advertising the laterite supplies: I never had the means of knowing for a sufficient period before hand the quantity of rock that could be deposited

Wall, and

Close of
1875.

Cost of
Laterite deposits

in the Pier. Every week I receive offers from contractors, or supposed contractors, for supplying the stone, but none of them at lower rates than those shown by the figures on page 7. The price of 2. 11 for delivering the stone at the Pier was lowered in January to 2½ annas per ton.

Expenditure

21. The following is a statement of the total expenditure incurred on the work from the commencement to the end of 1875. The estimated amounts for the different items are placed opposite to them in Red figures. The accounts and vouchers are sent from month to month to the Examiner of Public Works Accounts.

Head of Estimate	Cost to end of 1875	Estimated
Detailed Survey	738 13	5000 0 0
Forming Railways, &c.	14,829 2 8	50000 0 0
Opening Quarries	1756 6 1	10000 0 0
Preparing Block Ground	1421 7 7	50000 0 0
Rubble Stone deposits (per ton)	16942 7 10	10000 0 0
Buildings	1612 10 11	5000 0 0
Rolling Stock	1459 10 0	5000 0 0
Quarry and General Tools	50 11 0	5000 0 0
Office Furniture	578 0 0	5000 0 0
Salaries	13661 13 7	5000 0 0
Office Contingencies	278 13 4	5000 0 0
Travelling allowances	1782 10 11	5000 0 0
Contingencies at 5 per cent.	5348 7 6	5000 0 0
Total	59060 7 9	

12.

Names	Office	Date of appointment	Rate of pay per month
James May	Sub Engineer	April 1. 1875	200
Edmund Selcater	Superintendent	April 1. 1875	1250
P. Logana Han	Assistant Accountant	July 1. 1875	30
George William Lowe	Draftsman	July 20. 1875	30
E. L. Comassondare	Foreman Mason	July 28. 1875	420
Edmund D. Vaz	Head Accountant	July 29. 1875	60
John Henry Perryman	Assistant Accountant	September 6. 1875	20
N. H. B. Beardmore	Storekeeper	October 5. 1875	200
	Assistant Engineer	October 28. 1875	500

23. The following

Tracing.

石

3816-Annex 76 No 663
Ch: Engrs 68 of 16/1/76.
1 printed copy of Estimate of Harbour
Memo: No 7809 30/1/76.

W. 1895 Sept
The Superintendent
Madras Harbour Works
No: 2541
To The Secretary to Government,
Public Works Department,
Port Saint George

Dated 31st March 1896.
Recd 7 April 76.
No 50 W. 7th Sept 1896

Report of Progress
from commencement of
work to the end of 1895.

1895

Harbour Works Madras.

Report of Progress from
1st January to 31st March,
1896

Sir, It was stated in last Report of Progress
to the end of 1895 that the work of depositing
rubble & waste in the Surf Bank of the North
Pier was suspended on 7th December last on
account of the Royapuram S.W. Sewer, which
falls into the sea within the lines originally
proposed for this Harbour. The attention
of the Government was called to the question
of the Sewer by the Master Attendant in
October last, and at the end of that month I
was instructed to report on the means of dis-
continuing for a time the approach from the
Passenger Terminal at Royapuram commenced
last year and of approaching the Pier by a
different route, leaving the outfall of the sewer
to the north of the works.

Report to Government on 8th November last, and a copy of that report
on Royapuram Sewer appears in the printed Proceedings of the
Government, Public Works Department, No 3326,
dated 22nd November 1895. The Government
Order thereon states that "His Excellency

"the Governor in Council has no doubt
whatever as to the necessity for adop-
tion of the course proposed by the
Master Attendant for avoidance of the
nuisance that would be caused by in-
cluding the main sewer within the new
Harbour ponding the retention of Mr. Clark's
drainage works."

"The bank at present in progress
will therefore be temporarily stopped and
one of the three alternative new lines of
rail adopted for conveyance of the Har-
bour material. This Excellency the
Governor in Council would prefer that
described in paragraph 14 of Mr. May's
letter, as avoiding an additional level
road crossing. But in deference to the
interests of the Madras Railway Com-
pany, through whose coal-yard it would
run, will accept the third line described
in paragraph 15; arrangements for lay-
ing which he requests may be carried
out without delay."

3. At the end of November 250 tons of
iron rails and 20 tipping wagons were delivered
on the works from England. - Shortly after
December these rails like the other rails in
Madras did duty in the form of scots or
benches at the various prepared for the

New Approach
Railway
commenced

Prince of Wales. On 28th December we com-
menced to lay the new approach Railway
1600 yards in length, D.F.P.H. on the accom-
panying Plan, running up from the beach
parallel to, and to the southward of the Rail-
way Company's South boundary wall, parallel
to and to the southward of the Royapooram
Sewer, through the proposed Block Ground,
crossing the beach road, the Royapooram
Station Road and Madanavaram,
Levil Street on the level, and joining
the Railway Company's line at H. -

Level Street crossings.

4. The President of the Municipal
Commission was informed that we
proposed to abandon for a time the cross-
ing of the Beach road laid down in
July last opposite the Terminus at
Royapooram and to substitute the three
level crossings above described. Mr Burrows
assented. -

New Railway Completed.

5. The new railway, D.F.P.H. was com-
pleted, except ballasting, on 24th January. -
Between 24th and 28th January, 1768 tons of
laterite ballasting were brought down from
Ambatour, and laid on the line, and on
28th January a commencement was made
in depositing rubble laterite in the new surf
bank, E.C.K. on the accompanying Plan.

New Surf Bank E.C.K.

6. Twenty thousand two hundred and ninety eight tons of rubble laterite were thrown into the new Surf bank from 28th January to last evening. The present rate of progress is 567 tons of stone per day, and I hope soon to see some increase in this quantity.

7. The following are the prices paid for the laterite deposits during the period to which this report refers:-

Ohmadee Vardial, for quarrying stone and carting it to the rail-way at Ambatoo.	Rs. 10.00
Ohmadee Vardial for loading into Railway Company's wagons at Ambatoo.	Rs. 3.00
Madras Railway Company for hauling stone 10 miles from quarry to Royapuram.	Rs. 1.00
Ammamallay Chetty, for discharging stone from Railway Company's wagons into Harbour M/s. wagons and depositing it in North Pier.	Rs. 2.60
Total cost of deposits.	Rs. 16.60

Mr. Parkes's Estimate of three shillings taking a rupee at 2/-

8. The cost of the laterite deposits during the last three months is thus 5 pices per ton less than the cost of the same deposits last year. The reduction is on one item only: discharging

Progress of Bank.

Cost of Laterite Deposits.

Cost of Deposits compared with Previous Costs.

Cost compared with Estimate.

Extent of Surf Bank E. G. K.

Works not advertised for contracts.

Securing Surf Bank.

the stone from Railway Company's wagons into the sea, formerly 2 annas 11 pices per ton, now 2 1/2 annas per ton.

9. There is thus an apparent saving of 3 1/2 annas per ton in the cost of the laterite deposits for January, February, and March, as compared with Mr. Parkes's Estimate, but as stated in last report, his Estimate applies to all the rubble in the Piers, and not to the Surf bank only which is now being formed. The item barging will have to be added to by far the largest part of the rubble deposits.

10. The length of the Surf Bank E. G. K. last evening was 636 feet in advance of point C, on the average, 30 feet in width on the top, 13 feet above mean sea level, with natural slopes on each side.

11. None of the works above described have been advertised for contract, nor can I conceive that contracts are yet applicable to them or any of them. I am satisfied that the prices are as cheap as can be got, and the price of the work falls within Mr. Parkes's Estimate of 3/- per ton, converting Mr. Parkes's figure at the most unfavourable rate of Exchange, two shillings to a Rupee.

12. Before leaving England, and

Since my arrival in this country, I have been urging on Mr. Parker the necessity of strengthening the Surf bank N. G. R. which is the most important point of the whole work because it must be the road to all the rest, and no one would say that the rubble bank of latite now being thrown into the sea at Poyasooram could have imagined through any lay done in the Bay of Bengal. The method proposed was to make a series of large Portland Cement blocks (about 8 feet cubes) on the top of the bank, to leave them there a month to harden, and then to throw them over so as to form a rough slope of heavy materials particularly on the northern or sea side of the surf bank. Mr. Parker has not yet assented to the strengthening of the bank, for which I am anxious to see the latite. His letter to me is to this effect: "I am sorry for bad weather, the result is that I cannot provide a satisfactory answer. Yesterday morning for the first time I heard the surf being broken with a great noise. The sea undermined the foot of the bank on the slope. For a length of 50 feet down the outer end of the bank a drain of water and stone from the top of the bank has been made. A flatter slope there as shown by the

Curdy
Dum

March 31

Sea Damage
March 31.

accompanying cross section at 25 feet. The quantity of stone displaced by the sea yesterday was 600 tons and it was happened that yesterday also brought out the means of meeting this damage, in the shape of 250 tons of Portland Cement from the Thames, by the Steamers "Hiltan" and "Tindoo". I propose at once to proceed with the manufacture of blocks for the slope of the Surf Bank in the manner described.

Railway Sleepers.

14. At the end of February I inserted an advertisement in the Gazette and other newspapers, inviting tenders for the delivery of 2000 jungle wood Railway Sleepers at Poyasooram, each sleeper measuring 8 feet 6 inches in length by 10 inches by 5 inches, neatly wedged half square and equal in quantity to a sample sleeper to be seen at this office. The result was four tenders, with deposits of 500 Rupees each:-

March 31

Rupees	
1st	1000
2nd	300
3rd	200
4th	200

As the tender was accepted and the contract executed thereon. The price of the accepted tender amounts to 15 annas.

8
per cubic foot of timber, or 15 per cubic foot
including the expense of advertising. - In
comparing this price with the price of the
rupee per foot paid last year to Messrs.
Wanda & Co. of Calcutta, the contract shows
savings of 2 rupees per cubic foot. Before
inserting the advertisement for sleepers I
made some small purchases of sleepers in
the market at Rs. 12.0 per sleeper and
in knew that was the lowest figure at which
they could be purchased.

15. On 22nd January, an instruction was
first sent to me to advertise in the Gazette
and other newspapers inviting tenders from
the public for work to be done in my
Department. The question of contracts has
appeared again in various forms and I
receive so many applications from persons
desiring employment in the capacity of con-
tractors that some misunderstanding must
exist on the subject. As first indicated
I am not aware that any contract at
all was intended here.

16 The works of the Piers consist but of
two items, rubble stone and cement blocks.
Simple as these items appear, the manner
of dealing with them is extremely com-
plicated.

Contracts.

12/1/11
12/1/11

Works in Piers.

Rubble Stone.

9
17 The rubble stone is first to be quarried
at Ambator, then carted to the Railway,
then loaded into Railway Company's wagons,
then conveyed by the Railway Company's Engines
to Royapuram, then weighed, then transferred to
Narrow Gauge wagons, then transported to a
Shipping Jetty, then loaded into Hopkin Barges,
and ultimately deposited in its destination,
the sea. Such will be the process with every
wagon of stone in the course of two or three
months. A certain balance must be ob-
served in the quantity of rock produced at
the quarry, thus: if the quarrying power ex-
ceeds the carrying power, the stone must ac-
cumulate at Ambator; if the carrying
power exceeds the depositing power, the
stone must accumulate at Royapuram.
Occasionally the work of depositing may be
stopped altogether for a week or two by bad
weather, or for a longer period by unforeseen
accidents of the sea and all this must be
kept in view in any contract for the delivery
of stone. - Even at this moment the
weighing of the stone at Royapuram is
attended with considerable inconvenience

18
because the Engine drivers who bring it in for delivery, are the Railway Company's servants, and not ours.

18. The blocks proposed to be used in the Pier walls, each of these blocks weighing 27 tons, resemble nothing else in the world except a few blocks in the Manora Pier at Kurrachee, and the machines to be employed for moving them are so peculiarly made that no duplicates exist. That the important operation of mixing concrete may be faithfully performed, steam power will be applied to it; the stone will be broken to the required sizes by steam; and every care must be taken that the blocks produced shall be the most perfect that it is possible to produce from the materials used, - considering the immense importance of the work and the heavy weights which these

Blocks are destined to carry, namely: the storm waves of the Koromandel coast. There is nothing connected with block-making or moving suitable for a sub contractor. - Each step to be taken there is a special step, and it will require a special man to take it. Mr. Parker writes to say that he is arranging to send out 600 tons of Portland Cement

Blocks.

Limited supply
of Laterite.
Virdial.

11. 20 13
per month for block-making; and I on this side would be glad to see the means of delivering stone and sand for a corresponding number of blocks (about thirteen per day), but it is too early to advertise for them.

19. During the last two or three weeks, that which has limited the delivery of laterite at Royapuram is the inadequate quarrying power of Virdial, the quarryman at Ambatour. He cannot produce more stone than he is producing until the Railway branch leading into his Quarry is extended in length so as to contain a larger number of wagons. The branch is being extended, but delay occurs at the present time because the branch is in deep cutting. I press Virdial every day for more stone; it might be easy to displace him, and try another contractor by advertisement. I do not know a better quarryman in this country. I have nothing against the man, and he has embarked a certain capital on his work.

Future delivery 20. To the question whether we can
of Stone.

3
1
1
1

even work up to the depositing of 2000 tons of stone per day, as originally named to the Madras Railway Company. I would reply in the negative. A delivery of 2000 tons of stone per day means stone and blocks enough to complete the North Pier in twelve months (April 1877). - It means stone and blocks enough to complete both Piers in twenty four months (April 1878). - There will be no occasion for anything like this exceptive speed of stone deliveries: it would inevitably accumulate and form a mountain on the shore at Royapootam.

21. When the last Overland Mail left England (10th ultimo), one of our two screw Hopper barges, named the "Salisbury", was at anchor in the Clyde waiting for the end of an Atlantic gale then blowing to proceed to her destination via the Suez Canal; and the other barge the "Lady Hobart" was preparing to follow. Supposing them to have cleared the Channel on 20th March, they would be due here about 20th June. It was the absence

Hopper
Barges

Madras
India

South Pier

of all natural shelter for marine plant at Madras that induced the idea of the screw Hoppers, in the form of wholesome sea boats, and that the number of craft might be as small as possible. With the help of good moorings, we hope the crews who bring the Hoppers from England will take care of them here.

22. On the question of commencing the South Pier, I have already reported that it would be more economical, particularly as regards plant, to push out the North Pier for some distance before beginning the South Pier. - As the Government has expressed a wish for the latter, it may be commenced in the autumn. Several sewers fall into the South corner of the Harbour on which I will at once report. That a false start from the shore at Royapootam, may be avoided by the Stamp Office.

Block making

23. We have commenced to prepare the block ground at Royapootam. The ground may be ready for the manufacture of blocks about the end of May, and the first block may be set in its place as

thereafter as a moderate length of time to receive it is brought up by the Secretary

24. The ship which sailed from the material.

25. The following is a statement of the total expenditure incurred on the work from the commencement to last evening. The estimated amount for the different items is explained opposite to them in Red figures. The actual and vouchers are sent to the Accountant General of Public Works.

Detention of Surveyors	199 6 4
Preparing Plans	2654 8 10
Measuring Block Ground	2710 10 0
Measuring Earths	969 6 1
Locomotive Engines	3852 9 8
Rolling Stock	249 10 0
Quarries and General Tools	177 10 0
Office and General	1766 10 0
Salaries	599 0 7
Office contingencies	246 10 0
Travelling Allowances	401 7 5
Contingencies at	288 10 0

Revenue
Plant

Expenditure

paid

26. The following is a list of the Office Establishment up to last evening, giving the dates of Officers' appointments and the rates of their pay.

Name.	Office.	Date of appointment.	Rate of Pay per month.
Milbourne Ross	Sub Engineer	April 1. 1875	200
James May	Superintendent	April 1. 1875	1250
Edward Deuster	Assistant Accountant	July 1. 1875	30
P. Loganathan	Draftsman	July 20. 1875	30
George William Lowe	Foreman Mason	July 28. 1875	1.20.
K. C. Somasundara	Head Accountant	July 29. 1875	60
Edmund D'Vay	Assistant Accountant	September 6. 1875	20
John Henry Dunning	Store keeper	October 5. 1875	200
N. H. B. Beardmore	Assistant Engineer	October 28. 1875	500.
Bhimaya Saenna	Sub Engineer	January 3. 1876	370
John Leichen	Foreman Mechanic	February 15. 1876	240
B. Etherajooloo	clerk	—	20
J. P. Silva	Draftsman	March 27. 1876	35

27. The following tracings accompany this:-

1. Plan of Royapuram Station yard and approach to North Pier.
2. Longitudinal Section and five cross sections of approach.

I have the honor to be
Sir,
Your most Obedient Servant,

The Secretary to Government
Public Works Department

James May,
Superintendent,
April 1. 1876.

W. 1896 Deph
Madras Harbour

101 W.

April 1. 1876
From W: 2542
The Superintendent.

To
The Secretary to Government
Public Works Department
Fort Saint George

22 April 1876
W. 7
E. 2 x 1000

Report of Royce
of the works from 1st Janu-
ary to 31st March, 1876.

27 April 76 1056

No 396

W.L.S. 15. 1876

Cir 7-4-76. Cw 24/5-27-4-76

quarrying and depositing. Latent rubble
is now nearly 600 tons a day; and this
will be increased as soon as a certain
necessary extension of the Railway and
branch has been completed. The preparation
of the Black ground has been commenced
stone breaking machinery. It has been
received from England; a Locomotive
Steam Engine for hauling the Blocks
has been set up; several hundred tons
of Portland Cement, and stone, the
Kurrachee Plant and materials are all
on their way round by ship; and it is
hoped that the manufacture of Blocks
will be commenced by the 3rd month of the
current official year.

It will be observed from paragraph
and 13 of Mr. May's 2nd Report that
he proposes to use his first Blocks for
the protection of the sea face of the
Northern Surf Bank against the effects
of the North East Monsoon. This is
work not contemplated, or as yet approved,

by Mr. Parker, but its necessity is con-
curred in by the Chief Engineer and he
has assured Mr. May of the sanction
of Govt., its cost being charged against
the item of 2 lakhs for additional work
to the Rubble bank, which was added
to Mr. Parker's Estimate, as a precaution-
ary measure.

It will be observed that 2 sets
of Barges for deposits of Rubble
beyond the $2\frac{1}{2}$ fathom line, where
Block superstructure commences, are in
their way from England.

C. M. Walker Major Genl. R.E.
Chief Engineer
P.W.D.

Sub. to George
7th April 1890

N^o 397

8th April

Memorandum.

The Chief Engineer has the honor
to report that in receipt of G.O. N^o 663 of
14th March, he requested the Superintendent
of the Harbour Works to submit at once
a statement of the progress made, and
expenditure incurred, up to the end of
1895. And to complete the information up
to the end of the official year, as soon
after the 31st March as possible. Mr.
May was supplied with notes of all the
different points regarding which it was
desirable that the Govt. should be fully
and accurately informed, and he has
responded most promptly to the call in
the 2 separate Reports illustrated by
5 sets of Drawings now submitted. The
Chief Engineer takes this opportunity of
pointing out that he was absent on three
months leave when Mr. May arrived at
Madras commenced operations, and
received

received his instructions as to the preparation of monthly accounts &c. These instructions did not apparently include the submission of monthly reports of progress with outlay, which will now be prepared regularly.

In the Reports now submitted, in Mr. May's former Report No 33 of 21st December 1875, and in the Chief Engineer's Memorandum of 6th April drawn up under instructions of the Honble Mr. Elliot, full information is given as to the rates at which work has been carried out; which so far compare well with Estimate rates.

The progress of the work has been considerably retarded by two causes, viz. the arrest of His Royal Highness of Wales, and the change of plan necessitated to avoid including the Northern Main Drain within the Harbour limits. The rate of progress in quarrying

to making pretty, &
by Mr Carter of
Hillsong -

The agreement
terminable at 1 M
on either side -
Security is hedge
advances being
These are always
delivered on what
are done; which
would be with the
agreement? I suppose
suddenly broke

II. The only
Mr. May has had
to make, and
ment, was for
word Sleepers,
by 5 inches - 4
made accompa-
deposits of the 50
current viz B
was accepted;
Contract executed

[illegible]

Amorale - benevolent
Chastity - temperance

The Madras Railway Co.
 They have the money to buy
 carriages if wanted. I have
 all the work in hand
 but designed to stop
 at 6 per cent. Fixed
 is this? Has got sanctioned
 right?

I. That no Contract
drawn up in a legal
in writing, previous
date of ^{Admission}~~the~~ Memo.
noted as Vol. 161 of 2
Verbal agreements have
been made for

1. Unloading Late
Carriage at the River
Entrance - at 10 hrs
2. Loading into
Wagons - at 3 hrs
3. Unloading for
redepositing in
at 3 hrs per Ton; with
reduced to 2 hrs. 11 per
to 2½ hrs.

Beside the above
4. Application to
Wm. H. Hinde, from
for an open station.

Seems high

more effective
for than the
officials at a
low rate

PROCEEDINGS of the MADRAS GOVERNMENT.

UNDER date the

Read the full

Дарбаи ноки

I had a long conversation with Mr. May before leaving Madras. Considering the statements in the reports as well as what the information I obtained in conversation. I have no hesitation in expressing my opinion that all supplies & materials such as cement timber iron - bays - &c. should be obtained only under contract with the conditions carefully prescribed rigidly enforced.

Engineer
No. 141

single Wood Sleepers, each 10
ft. by 10 inches, by 5 inches -
and their offer of \$1.37 per
cipes being in line with
prevalent in Madison was
accepted -
5. There is also an order
pending with General
Morgan that if he succeed
making cement of good
quality 2000 Tons of it will
be taken at \$1.40 per Ton,
which is 20 per cent under
the price at which Portland
cement can be delivered
to Madison - The promise
is in writing, but some
little more dependance is
needed re. General Morgan
supply -
The Supplies in cases No.
2 is one thousand Madison
turned in the supply of
Madison Building Com.
pany, & recommended by
the Messrs. Madison -
The 3rd case, one

PROCEEDINGS of the MADRAS GOVERNMENT.

Under date the

Read the

getting this work and the
depositing done at any rate
until the granaries are
fully open - & re-equipped
with convenient sidings &
by steady men. at 1/6 on
small payment
Popilly the Indian law
may render a written
contract for such work
desirable - but if proper
receipts are taken each
payment specifying
that the amount of
is received in full payment
for ... tons of latitudes
delivered (or deposited) at
for ton - between
day March and ... day

Engineer's Memorandum
No. 141 of 22nd January 1876.

PROCEEDINGS of the MADRAS GOVERNMENT.

Under date the

Read the

single Wood Sleepers, each 10
ft. by 10 inches, by 5 inches -
and their offer of Rs 3 1/2 per
1000 in low rate

April... and payments
are made at fixed days. The
amount in dispute can be
paid at any time.

That H. W. Co. with books will
of course check the weight -

as regards the price. The
only test probably is to

check the actual number
of men labour for a

complete week. As the
men are saved.

Whether after allowing due
profit - an excessive rate

has been saved by the men.

I should anticipate a
diminution in price of

deposit when necessary.
- agents are obtained. &

in saving in price of delivery
into H. W. wagons when

²
The quarries are fully
opened & proper sidings
laid so as to get rid of
a great part of the cartage.

with respect to blocks
making - while the sand
stone &c. would be delivered
under contract - I think

it will be prudent in
the first instance to have

the blocks made by day
labour - which as the men

become handy & experience
is gained may be

readily developed into a
system of task work -

but the value of good
& careful work in the

Engineers' Memorandum
No. 141 of 22nd January 1876

PROCEEDINGS of the MADRAS GOVERNMENT.

UNDER date the

READ the following

37

single Wood Sleepers, each 10
by 10 inches, by 5 inches -
and their offer of Rs 3 1/2 per
1000 in low water

Work is of the greatest
importance.

Now in 2 important items
then does not appear
to have been any ~~tender~~
Public tender - or any
good reason for departing
from that principle -
written known under
Mr May's direction. but
of Mr Parker -

Supply of steam barges
Supply of cement -

As regards the 1st I
have seen no particulars
of any sort. or charge
for them. or estimate
of it seems essential.

Mr. Messrs Fred. Bradburn
L. 30

that sort: shd at once be
improved. on what conditions
ordered - if belonging
to Govt. are they insured
and does the insurance
cover the special risk of
having to work on a coast
where there is no shelter in
shoal water. & especially
to ride out any cyclones
that may visit the coast.

As regards the cement -
I see no particulars of
any contract. & yet the
certain & regular supply
is of the utmost importance.
I cannot understand the
agreement with General

4/76

1/76

1/76

not
recorded
1-0

per.

ex -

on -

for

the

was

chief

him

No. 141 of 22 Jan. 1876.

single Wood Sleepers, each 10
by 10 inches, by 5 inches -
and their offer of Rs 3 1/2 per
foot - as is usual

Myan. what are the
conditions as to test of
quality which his cement
must stand. why was
he singled out to make
an experiment - what
are the conditions of the
promise as it is termed -?

In written of these 2
cases do I find anything
to justify departure from
the ordinary rule of public
tender under proper
conditions -

I now turn to the question
of the progress of the work
there appears to me to
be an hesitation in

the progress, & I am concerned
that the progress of the work
is slow 30 days

PROCEEDINGS of the MADRAS GOVERNMENT.

Under date the

Read the following: -

37

presenting³ with all
expectation this work -
It may appear in common
to think that the Southern
Breakwater should not be
commenced yet -
That it was not desirable to
limit at once the width of the
harbour -

On the other hand it seems
to me that every reason
is in favour of immediate
progress at a rapid
rate as the
work can be decided forward
with reference to the commencement
of the Southern Pier depending
the size of the harbour -
The size fixed upon has
been deliberately decided
upon - if more area is

No. 141 of 22nd January 1870

10

1-6

100

single Wood Sleepers, each 10
x 10 inches, by 5 inches -
and their offer of Rs. 3½ per
cwt. being a low rate

wanted it will be wanted
in the form of docks &
harbors excavated in shore
or in deep water and
obeyed by extended
length. & not in shallow
water of no avail for
ships —

There being then no reason
in uncertainty of position
for delay - what is to be
gained by not working to
the utmost power.?

Mr. May says para 20
of April 1 - that
"there will be ~~nothing~~ no
occasion for any thing like
this excessive speed of

W. H. Hensford, Providence, R. I.
 Jan. 23rd 1881

Stone delivery" i.e.

2000 tons per day which
was originally planned
to the Madras N.W. Co.
he says this "means stone
& blocki enough to complete
the North Pier in 12 months
& both Piers in 24 months

Prof. This latter alternative
is just what is needed.

The two piers must
both be finished before
an Harbour in any
shape is obtained - &
Till the Harbour is made
No return on the outlay
can be forthcoming.

Engineers' room
No. 141 of 22^d January 1876.

single Wood Sleepers, each 10
ft. by 10 inches, by 5 inches -
and their offer of Rs 3 1/2 per
cwt. for the same -
wanted it will be wanted.

I am quite at a loss to
receive any gain or
advantage from delay.
We may say materials
will accumulate at
Noyapooram - the
remedy for that is to
prepare another work
ground at the Southern
pier - on the present shore
or on the vacant space
outside the town -

The present rate of
deposit is stated at
567. per day on the
Southern pier - If the Southern
pier was commenced

PROCEEDINGS of the MADRAS GOVERNMENT.

Under date the

Read the following:—

at a similar rate
The deposit would be
= 1134 tons for direct
inspection of the material
needed for block making

This rate of deposit only
needs 60 wagons to
each pier daily - or 5
wagons for horse, nothing
except to unload - or
for the Railway to bring -
and which with good
arrangements at the
quarry ground - and the
use of suitable wagons
ought to be materially
increased —

4/76
5/76
6/76
not
to
be
in
her
ex-
cise
for
this
was
chief
mandate
May 1876

The Harbour can
 be completed in 2
 years instead of 4
 years. The expense of
 supervision will be
 lessened - the cost of
 of sickness in the staff
 and a very important
 consideration. The
 risk of the 2 barges
 will be reduced -
 while the small will
 be known and the
 success or contrary
 ascertained - a
 very important consideration
 may be the opening

31

The May is having 22
uprs to economy in
plant. & not commencing
the Southern pier until
the Northern had been

4/76

176.

638

is not recorded

per-
2x -
lc.

in for
-lic.
-ma
-chief
-in
-ary (18)

Sec. 141

PROCEEDINGS of the MADRAS GOVERNMENT.

UNDER date the

Read the following:—

single Wood Sleepers, each 10
by 10 inches, by 5 inches —
and their offer of Rs. 3½ per
cent. on the value of the material

carried out some distance
If this were a case where
one break water would
give practical valuable
shelter - I would attach
more weight to this argument,
although even then I should
think it a shortsighted policy
to delay by a year the
completion of an important
work - but in this case
until both are complete
there is no shelter at all -
and the saving in supervision
& in risk will probably quite
equal the possible economy
spoken of -
As this is the first time I
have seen a disposition
to go to work questioning
on at the best speed

59
I have written at some
length on the point & I
would suggest that
the minute after laying
down the opinions of
Govt. as to the manner
of ordinary rules for
public tenders - should
be used to notice the
para. 20. & 22. of
Mr. May's report - and
observe that the Govt.
see no reason why the
commencement of the
South pier should be delayed
until autumn -

4/76
6/76
6/76
circled
per-
ex-
ad-
in for
le-lic
les was
e chief
mandate
may 1876

PROCEEDINGS of the MADRAS GOVERNMENT.

UNDER date the

Read the following:—

That that properly
material may be
found available on
the S. Indian line in
the direction of Palawan
so as to bring ~~the~~ in
aid of the Harbour works
the resources of ~~the~~ railway.

Per. April 2/76

56
56
56
56
circled
her.
ix -
m -
for
lic.
was
chief
January 1876

single Wood Sleepers, each 10
ft. by 10 inches, by 5 inches -
and their offer of Rs. 3 1/2 per
cwt. in low season.

knowing ~~the~~ very
means had not been
taken to bring up the
delivery of stone to
the point at which was
originally mentioned to
the R. W. Co. - That
the object of the Govt. is
to have the Harbour
complete at the earliest
practicable date. &
that if for this purpose
it be necessary to
bring some extensive
quarries into use

May I be allowed
to draw your attention

entirely agree with
H. J. as not a or two
S.B. alone in this sense
On two points or
at least some b
an understanding

We be debarred
 from using the North
 Railway & Glasgow
 &c? What is the Sys-
 tem & understands
 a direct cargo supply
 &c are sent from Eng-
 land?

21/4

ep 27 April / 76 N-1056

I am quite satisfied with the view taken by His Grace the Governor regarding a portion of the Contracts for the present, and I entirely concur in his opinion as to the advantage of pushing on the work. A Co. should be prepared accordingly.

20/4/76 P.T.E.
We must settle the question
of how far we are implicated
with the Madras Railway Co. —

UNDER date the

READ the following:—

Note.

I forward for
the information of
my Honble. Colleagues
Mr. May's two reports
of the progress of the
Harbour works up to
date. They are in
sufficiently detailed
to enable us to judge
of the progress made.
These reports will in
future be made
monthly and under
the

Century concave
these new

Re 141 of 22 June 1876

PROCEEDINGS of the MADRAS GOVERNMENT.

UNDER date the

Read the following:—

single Wood Sleepers, each 10
by 10 inches, by 5 inches -
and their offer of Rs 3 1/2 per
unit.

the instructions lately
issued he accompanied
by the report of
Inspecting Officer, who
will give ^{us} his opinion
on the quality of the
materials and the
progress of the work
and the continued
success or otherwise
of Mr Parker's original
design and the
deviations considered
necessary.

There is already
an addition which
is considered necessary
of which

Mr Alfred Woodman -
Jan 3rd 1876

which was made
provided by
Mr Parker, namely -
the protection of the
Sea Face of the Northern
Surf Bank against
the effects of the North
East Monsoon.

I think it important
that the Govt.
should receive
separate Note by the
Inspecting Engineer
giving the results of
his constant inspections
and that it should be
understood that such

Engineers Memorandum
No 141 of 22nd January 1876.

PROCEEDINGS of the MADRAS GOVERNMENT.

Under date the

Read the following

single Wood Sleepers, each 10
ft. by 10 inches, by 5 inches -
and their offer of Rs. 3 1/2 per
ton for the same as per rates

of Mr. May makes
it essential that
we should be fully
informed of the nature
of his Engagements.

The principal works
carried out by verbal
agreement are

1. Quarrying laterite
and carting it to
the Railway at
Ambaloor - 10 Rs.
per ton.
2. Loading into Railway
waggons at 3 Rs. per
ton.
3. Unloading from
waggons and deposit-
ing in the Pier at

M. Messrs. Messrs.

3 Rs. per ton. Subsequently
reduced to 2 Rs. 11 pice
and latterly to 2 Rs. 10 pice.

The persons who
have agreed to do
this work at these
rates are Othoade,
Vardiah & Annamalai
Chetty both formerly
employed on the
Railway & recommended
to Mr. May by the Senior
Railway Employe -
Messrs. Messrs.
Anderson & Carter

The agreements
are terminable at

No. 141 of 22nd January 1876.

PROCEEDINGS of the MADRAS GOVERNMENT.

UNDER date the

READ the following

that inconvenience
may result in this
country, from having
no written agreement.
Verbal contracts are
sometimes difficult
to establish on dispute
arising - and I
venture to recommend
that all important
agreements should
be formally recorded.
The other objection
that occurs to me
regarding the present
system is that the
Govt.

Re. 141 of 22nd January 1870

single Wood Sleepers, each 10
by 10 inches, by 5 inches -
and their offer of Rs. 3 1/2 per
1000 in low waste

one month's notice
on either side. No
money security is
lodged but no
advances being made
there are always
materials delivered
on which payments
are due, which pay-
ments would be
withheld if the
agreement to supply
were suddenly
broken.

In considering
this arrangement
I am led to fear
that

Mr. James Fred. Proctor -
Jan 3rd 1870

PROCEEDINGS of the MADRAS GOVERNMENT.

UNDER date the

single Wood Sleepers, each 10
by 10 inches, by 5 inches -
and their offer of Rs 3 1/2 per
ton in low water

Govt. have no means
of judging if the
work is being done
as cheaply as is
compatible with good
work. We cannot
under the present
system gauge the
market rate for this
kind of labor. I
am not in a position
to pronounce an
opinion as to whether
Mr May is getting
his rubble stone quarried
and deposited in situ
cheaply

Mr. Hedgesford, Master
Jan 3rd 1876

cheaply or not. The same
rates are below 1/6
Mr Parker's estimate, 1/6.
But it must be
remembered that
the early part of the
work is the easiest
and that as further
progress is made
the work of depositing
will probably be
more costly. This
is acknowledged by
Mr May - see Para 9.
I do not quite understand
the difficulty
apprehended by
Mr. Chief

Engineer's Memorandum
No. 141 of 22nd January 1876.

PROCEEDINGS of the MADRAS GOVERNMENT.

Under date the

43

fronched on Experiene
in this Country and h/76
prescribed by the 1/76.
Public Works Code.
Mr. May may have 1/76-
discovered the lowest
market rate and the
best Contractor, but
it is improbable and
there should be no
room for doubt on
this matter. I observe per-
that there is already
some difficulty arising
as to Vardick's power for
of quarrying. I think this
the subject of what was
quarries chief

Engineer's Memorandum
No. 141 of 22nd January 1876

single Road Sleepers, each 10
by 10 inches, by 5 inches -
and their offer of Rs 3 1/2 per
ton in low season

Mr. May in advert.
tising for Contracts
to deliver a certain
quantity of rubble
Stone and to deposit
it 'in situ' within a
certain time - size
and character of
Stone being strictly
defined and reserving
right of accepting or
rejecting tenders in
without assigning
Reason - in short
Why Mr. May should
not, as ordered, in
Conform to the Rules
fronched

Mr. Alfred Protheroe -
Jan 3rd 1876

PROCEEDINGS of the MADRAS GOVERNMENT.

UNDER date the

Read the following:—

441

The preparation of
Cement Blocks requires
separate consideration.
I understand that
Mr. May proposes
to prepare the blocks
departmentally, but
I conclude contracts
can be made for
bringing the stone
and sand to the
Block ground. I
have not noticed
the other contracts for
two for sleepers and
one for Cement made
with

Engineers' Memorandum
No. 141 of 22nd January 1876.

single Wood Sleepers, each 10
by 10 inches, by 5 inches -
and their offer of Rs 3 1/2 per
ton in low water

quarries are to be
worked for rubble
stone and the means
of employing more
than one Contractor
are deserving of
consideration. I think
as we should, for reference,
have a map showing
the proposed quarries
along the line of
the Railway and it
should be considered
what means there are
for facilitating working
by selection of sidings,
opening new quarries &c.

Approved
The
3rd

PROCEEDINGS of the MADRAS GOVERNMENT.

Under date the

Read the following.

drawn up in precise
terms and time fixed 4/76
for delivery. 1/76.
I am very desirous
that in writing on 1/76.
my Honble. Colleagues
what seems to me
necessary as regards
Contracts I should circled
not be misunderstood. 20.
I am not in any
way finding fault
with Mr. May's proceeding her.
which may be perfectly ex-
in accordance with con-
usage in other countries for
but it must be borne in
in mind that the was
Harbour Chief

Engineer's Memorandum
No. 141 of 22nd January 1876

single Wood Sleepers, each 10
by 10 inches, by 5 inches -
and their offer of Rs 3 1/2 per
ton in low water

with General Morgan.

I understand from
General Walker that
although General Morgan
has been told that
a certain quantity
of Cement of a particular
quality will be
accepted at a
particular rate, Mr.
Morgan is not dependent
on him for Cement. But
the same rule should
I think be observed
with regard to this
agreement i.e. the
Contract should be
drawn

by
H. H. G. Fred. Protherman -
Jan 3rd 1876

PROCEEDINGS of the MADRAS GOVERNMENT.

Under date the

Read the following

2 April 1876

checks that have been found necessary in carrying all other large Government works in this country.

W.S.C.

10/4/76

at recorded

Super. ex-Com. for public works Chief

Engineers' Memorandum No. 141 of 22nd January 1876.

single Road Sleepers, each 10 ft. by 10 inches, by 5 inches - and their offer of Rs 3 1/2 per

Harbour work is not being done by a Contractor who would be personally interested in working within the Estimate. The work is being carried out by the Govt. staff on a plan furnished by Mr. Parker, our Consulting Engineer - at whose recommendation we employ Mr. May as our Engineer in immediate charge of the work. It seems essential therefore that we should use all the

the necessary funds -

single Wood Sleepers, each 10
 ft. by 10 inches, by 5 inches -
 and their offer of Rs 3 1/2 per
 hundred as per estimate

[Faint handwritten notes, mostly illegible]

Public Works Dep^t
 1976
 27 April 1976
 No 398 @ 400 -
 Harbour Works.

Note by the Honble
 R. S. S. M.

C.E. - 27 April 76
 12 1056

No 398

Received from Mr. ...
 Rs 3000

PROCEEDINGS of the MADRAS GOVERNMENT.

Under date the

Read the following:—

From Superintendent, } H.E. No. 50 of 31 March 76
 Harbour Works }
 No. - - - - - 171 April 76.
 Chief Engineer's Memorandum - 7 April 76.

Ordered that
 these Reports be recorded
 with reference to G.O.
 No. 663 of 14 March.
 2. The Harbour Super-
 intendent will be ex-
 pected strictly to con-
 form to the rules for
 Contracting by public
 tender, of which he was
 advised in the Chief
 Engineer's Memorandum
 No. 141 of 22 January 1976.

And he will apply
 those rules to the
 supply of latite
 and granite stone,
 as far as practicable,
 before entering into
 engagements with
 fresh suppliers;
 present suppliers
 being required to
 conform to the con-
 ditions of such tender
 as may be accepted.

3. With reference to
 paras 20 to 22 of
 Mr. May's 2^d report
 on this point the Governor
 in Council has to
 observe that he sees
 no reason why the
 South Pier should not

Whence the other...
 improved in the...
 with the present...
 RK

of materials such as cement,
 timber, iron, barges &c. &
 granite stone & sand. -
 The delivery of latite ^{stone}
 present circumstances may
 perhaps be ^{more} difficult
 to obtain by contract or
 public tender, in consequence
 of the peculiarity of conditions
 arising from the supply
 of material being in the
 hands of the Railway
 Company. On this point
 the Governor in Council
 desires further information,
 before ^{absolutely} directing that this
 delivery should be contracted
 for in accordance with the
 Public Works Code. - Mr.
 May will therefore report
 specially upon this point
 bearing in mind that

in the opinion of Govt it
 is very desirable that advantage
 be taken, in this as in
 other supplies, of public
 competition, as soon
 as the quarries are fully
 open & equipped with
 convenient sidings -
~~that like any other~~
~~arrangement~~
~~made with regard to~~
~~the matter of~~
~~the pier~~

Should it be found necessary
 to continue temporarily
 the present arrangement for
 the delivery of latite the
 terms of the agreement
 should be distinctly laid
 down, & ~~renewed~~
 recorded ~~carefully~~ -
 RK

be commenced at once
 and pushed forward with
 at least the same rate
 of progress as the North
 Pier. It is a great
 object that the work
 should proceed rapidly
 in order that the Harbour
 may come into use as
 speedily as possible;
 and so far back as
 12th October 1875 in
 J.O. No 2910, the
 Harbour Superintendent
 was, on the Chief
 Engineer's suggestion,
 called on to report
 why the 2 piers should
 not be carried out
 simultaneously -
 Arrangements should be
 made for fully opening

the Quarry found
at Rubahoor, and
laying down a suf-
ficiency of railway
ridings to enable it
to be worked to the
best advantage, by
more than one supplier;
so that a daily delivery
of some 1500 tons of
laterite material
for both piers may
be reckoned on.
And the arrange-
ments for supply of
pauke ^{or hard stone} for the Ce-
ment blocks should
be on a scale cal-
culated to admit
of supply of 500 tons
daily; so that the
rate of working

originally laid down
in the Proceedings
recorded with G.O.
No. 2336 of 17 July
may be attained.
~~It will never do~~ His
Grace the Governor in
Council ^{is not prepared} ~~is not prepared~~
to rest satisfied with
the rate of progress
already attained
since the 3rd August
1875; when a com-
mencement was
made by deposit
of 160 tons at the
North Pier. ~~The only~~
valid reason for de-
laying the commence-
ment of the South Pier

is that Mr May is
apprehensive of
it as well as the
North Pier being
considerably damaged
in the monsoon. But
that is not the reason
Reason for pushing
on with the block
work so as to have a
sufficiency of heavy
material ready be-
fore the monsoon
for casing the exposed
portions of the laterite
ship banks. There is
evidently no possi-
bility of pushing against
possible damage
from cyclones in

50
May; but the interval
between the season of
cyclones and the regular
monsoon must be
utilized to the utmost.

Mr. Gray will ~~in~~ to
~~be~~ distinctly under-
stand that it is the
object of government to
have the Harbour
complete at the
earliest practicable
date. And if it be
found that the
Ambakur Quarries
fail either as to
quantity or quality,
he will give his early
attention to other sites,
such as the promontory

Near Patavaram

for conveyance of

which the South

Indian line of Rail

will be available.

It is understood

from the letter received

with P.O. No. 46 of

8th January 1896 that

all Plant and Ma-

terials sent out for

the works by Mr.

Parkes are subject

to supervision by

Officers appointed

by the Secretary

of State for India.

His ^{Lordship's} attention will

be called to the

fact, stated by Mr.

This will probably be

the same as the

one mentioned in the

letter of the 11th inst.

and the other letter of the

11th inst. - he should be

not to be in any way

connected with the

works.

He should be

informed of the

fact that the

works are

under the

supervision of

the Secretary

of State for India.

His attention will

be called to the

fact, stated by Mr.

It is directly stated by Mr. Parkes that the works are under the supervision of the Secretary of State for India. His attention will be called to the fact, stated by Mr. Parkes, that the works are under the supervision of the Secretary of State for India.

I have written the above for you

I don't think this map may much so for shelter to Simon or he may ask him if there is any

Supt. Harbour Works.
Mr. Parkes.
C. E. for Reg.

May, that 2 Screw

Steamer Barps were

to have started for

Madras in all

March. And he

will be requested to

obtain all informa-

tion regarding the

conditions on which

they were ordered;

whether they are in-

jured; and, if so,

whether the insurance

Covers ^{the special} risks of

which the nature of their intended

workings in a shelter

will expose them

less coast, where they

must necessarily

ride out any cyclones

or other foul weather

that may occur.

C.M.W.

N^o 1056

Public Works Department.

PROCEEDINGS of the MADRAS GOVERNMENT.

UNDER date the 27th April 1876.

READ the following:—

From Superintendent
Harbour Works } G.O. No. 50 of 31st March/76
Do Do } G.O. No. 1 of 1st April -

Chief Engineer's Memo: (H.E. - 810th of 20th April 1876)
Note by the Hon. R. S. Ellis C.B. (H.E. - 812th April 1876)
do by his grace the Governor (H.E. - 812th April 1876)
do by Hon. Sir W. Robinson K.C.S.I. (H.E. - 812th April 1876)

Reports to be recorded with
reference to G.O. No. 663 of
14th March.

2. The Harbour Super-
intendent will be expected
strictly to conform to the
rules for contracting by
public tender, of which
he was advised in the
Chief Engineer's Memo-
randum No. 141 of 22nd
January 1876. And he will
apply those rules to the
supply

G.O. 27 April/76 N^o 1056

supply of materials, such
as cement, timber, iron-burgs
8th, and granite stone and
sand. The delivery of latite
stone under present circum-
stances may be more
difficult to obtain by
contract or public tender,
in consequence of the peculiar-
ity of conditions arising
from the supply of wagons
and moving power being
in the hands of the Railway
Company. On this point
the Governor in Council
desires further information
before absolutely directing
that this delivery should
be contracted for in ac-
cordance with the Public
Works Code. Mr. Meay
will therefore report
specially upon this point
bearing in mind that in
the opinion of Gov^t. it is
very desirable that advantage
be

51 19
be taken, in this as in
other supplies, of public
competition, as soon as
the quarries are fully
open and equipped
with convenient sidings.
Should it be found
necessary to continue tem-
porarily the present
arrangement for the
delivery of Latite the
terms of the agreement
should be distinctly laid
down, and recorded.
3 With reference to
paras 20 to 22 of Mr.
Meay's 2nd Report to
Grace the Governor in
Council has to observe
that he sees no reason
why the South Island
should not be commensurate
it will and pushed
forward with at least
the same rate of progress

as the North Pier. It is a great object that the work should proceed rapidly in order that the Harbour may come into use as speedily as possible, and so far back as 12th October 1875 in G.O. N^o 2910, the Harbour Superintendent was, on the Chief Engineer's suggestion, called on to report why the 2 piers should not be carried out simultaneously -

Arrangements should be made for fully opening the Quarry ground at Ambatoor, and laying down a sufficiency of Railway sidings to enable it to be worked to the best advantage, by more than one Supplier; so

that

55 20
that a daily delivery of some 1500 tons of latent material for both piers may be reckoned on. And the arrangements for supply of granite or hard stone for the Cement Blocks should be on a scale calculated to admit of supply of 500 tons daily; so that the rate of working originally laid down in proceedings recorded with G.O. N^o 2036 of 17th July may be attained. His Grace the Governor in Council is not prepared to rest satisfied with the rate of progress already attained since the 3^d August 1875, when

a

a commencement was made by deposit of 100 tons at the North Pier.

4. Mr. May will distinctly understand that it is the object of Govt to have the Harbour complete at the earliest practicable date. And if it be found that the Ambator Quarries fail either as to quantity or quality, he will give his early attention to other sites, such as the ground near Palaveram for conveyance of which the South Indian line of Rail will be available.

5. It is understood from the letter recorded with

with G.O. No 46 of 8th January 1876 that all Plant and materials put out for the works by Mr. Parkes are subject to supervision by officers appointed by the Secretary of State for India. His Lordships attention will be called to the fact, stated by Mr. May, that 2 screw Hopper Barges were to have started for Madras in all March and he will be requested to obtain all information regarding the conditions on which they were ordered; whether they are insured; and, if so, whether the insurance covers the special risks to

to which the nature of
their intended duty will
expose them.

Amor

very

W. V. S.

29/4

Received from
29/4/76, but the
the same amount
has been sent to
the Public Works
Department. The
same has been
sent to the Public
Works Department.

N. 395-401

Xth 1876

Supt. Harbour Works

M^r. Parker

C. E. for Rys.

Marine Dept. Dtd 5/5/76

To

The Most Honble
the Secretary of State
for India

My Lord Marquis.

G.O. 1056 dated
27 April, 1876, in the Works has brought the
Public Works Department. notice that two screw

Pol

hopper barges have
been ordered in England
and were to have started
for Madras in all
March. We have the
honour to request that
your Lordship will
be good enough to
obtain and furnish

58
us with full information
as to the conditions on
which they were ordered,
whether they are insured,
and if so, whether the
insurance covers the
special risks to which
the nature of their in-
tended duty will ex-
pose them.

It is understood
that all Plant and
Materials sent out
for the works by Mr.
Parkes are subject
to supervision by
Officers appointed
by your Lordship.

C.M.W.

Requesting to be furnished with certain information in connection with two Screw Hopper Barges ordered out from England for the Madras Harbour Works.

28-4-76 Dec 29-4-76
1876

25415
25425

Govt. of Madras.

PUBLIC WORKS.

To

Dated

Issued

Recd

Encl.

G. O., 29th April 1876, No. 1086

Nos. 395 (C101).

Madras Harbour

Passing orders
on the Reports sub-
mitted by Mr. May
of the progress of
the ——— up to date

Cont. in file
5-4-76

25426 Date 29-4-76
25426