M.R.O. 1—10,006—28-2-50.

(1) Number of pages_____

(2) Date of repair_____

(3) Initials of the Referencer_____

MADRAS RECORD OFFICE

Government of Madras

Public works. DEPARTMENT

G.O. No.	2420	Press
~~B.P.—No.—~~ 94-959 97.		~~Mis.~~
Dated	7 - 11 -	~~195~~ 1873

Not to be folded or roughly handled

Read the following papers :—

No. 94. Endorsement of the Chief Secretary to Government, Marine Department, dated 9th August 1873.

From H. D. E. DALRYMPLE, Esq., Master Attendant, Administrative Department, Madras, to the Honourable W. HUDLESTON, Chief Secretary to Government, Marine Department, dated Madras, 6th August 1873, No. 4,974.

On the 1st of this month I informed Government by telegram that the pier was completed and open for general traffic.

2. I have now the honour to state that the accomplishment of this work has given universal satisfaction, and that a brisk trade ever since the 1st instant has been carried on over the pier.

3. In sending in this brief report I cannot omit bringing the services of Mr. Sadler, the Pier Master, to the notice of Government. Since the 2nd of May, Mr. Sadler has, under the orders of Lieutenant-Colonel Goddard, R.E., been the Executive Officer in charge of the Pier Works, and from his great experience of similar works in different parts of the world, combined with his indomitable energy and perseverance, he has at last surmounted numerous difficulties, and restored the pier in less than three months since he took charge.

4. It is also a pleasing duty to notice the services of the Pier Boatswains, who have acted as Foremen under Mr. Sadler, carrying out the Pier repairs, working along with him in the heat of the sun nine hours a day, during the three hottest months of the year.

Note.—Working hours from 6 A. M. to 5 P. M., out of which two hours allowed for meals.

5. As Mr. Sadler is away in Bangalore for a few days' casual leave to enable him to recruit and see his family, and as I shall be absent for nearly a fortnight on a visit to the Northern Ports, I am not at present prepared to furnish so detailed a report as I propose to send in on my return.

6. In the meantime I have no doubt a report will be sent in by Colonel Goddard, who is much pleased with the work. Prompt attention has always been paid by that officer to requisitions for assistance in any way in carrying out these operations, and it has been a pleasure to be associated with him in this work.

Transferred to the Department Public Works.

(Signed) W. HUDLESTON,
Chief Secretary.

No. 95. Endorsement of the Chief Secretary to Government, Marine Department, dated 1st September 1873.

From H. D. E. DALRYMPLE, Esq., Master Attendant, Administrative Department, Madras, to the Honourable W. HUDLESTON, Chief Secretary to Government, Marine Department, dated Madras, 28th August 1873, No. 5,316.

With reference to my letter of the 6th August 1873, No. 4,974, I have now the honour to address Government on the subject of the good services performed by Mr. Sadler, the Pier Master, and by the Pier Establishment under him, in restoring the Madras Pier.

Mr. Sadler	Pier Master.
D. P. Anthony	Boatswains.
G. Spartaro	
P. Baluvisto	
H. Roberts	
O. Mahomed	Syrang.
Lazer	Sea Lascars.
Thomoo	
Puckey	
Anthony	Pier Fitter.

2. For nearly three months, as already stated, the establishment, as enumerated in the margin, worked laboriously for nine hours daily, without any protection whatever from the sun; screwing down the piles, laying the beams, fixing the braces, etc., etc., etc., and on the 1st of this month the pier was again opened for traffic.

3. Great difficulties were encountered in getting some of the piles down; nearly 50 fan screws were broken; numerous capstan bars carried away; chains snapped as if they had been pack thread a hundred times, and one of the steam engines disabled; yet, thanks to the indomitable energy and mechanical knowledge of Mr. Sadler, the work was at length completed.

4. Much time was latterly lost in raising piles which could not be got down beyond a certain depth, in groping for clear ground and repointing them; one, for instance, having to be got up seven times before being finally screwed down.

5. I regret to state that the Pier Establishment, in carrying out these works, did not escape altogether unscathed, two of the lascars being now in hospital* on account of injuries received in the execution of their duty.

* Lazer and Puckey.

6. Mr. Sadler and the Boatswains, though severely punished by the sun, are now I am glad to say none the worse of the three months' severe work and exposure at the hottest season of the year, which I should hardly have believed it possible for any Europeans to stand.

7. After bringing the good services of the Pier Establishment to the notice of Government, I trust those who, under great difficulties worked so well, may be considered worthy of reward.

8. I subjoin a memorandum of the rates of pay drawn by them.

9. I am glad, in conclusion, to be able to report, for the information of Government, that since the pier was opened for traffic on the 1st of this month 7,450 tons of cargo have passed over it.

Memorandum.

	Rs.
Mr. Sadler, Pier Master	300
D. P. Anthony, Boatswain	60
G. Spartaro, do.	60
P. Baluvisto, do.	60
H. Roberts, do.	45
O. Mahomed, Syrang	20
Lazer, Sea Lascar.	14
Thomoo, do.	12
Puckey, do.	12
Anthony, Pier Fitter.	14

(Signed) H. D. E. DALRYMPLE,
Master Attendant, Administrative Department.

TRANSFERRED to the Department Public Works, for disposal.

(Signed) W. HUDLESTON,
Chief Secretary.

No. 96. From Lieutenant-Colonel J. GODDARD, R.E., District Engineer, Presidency, to Colonel G. W. WALKER, R.E., Secretary to Government, Public Works Department, dated Fort St. George, 11th September 1873, No. 2,761.

IN continuation of my letter, No. 2,085, dated 4th August 1873, reporting the completion of the pier, I have now the honour to submit a report in detail, more particularly with reference to the circumstances under which I recommended the pier repairs to be stopped.

1 Original letter
1 Covenant.

2. In G. O, dated 12th June 1872, No. 1,457, Government appointed a Committee for the purpose of making experiments and reporting upon the possibility of restoring the pier along the line orginally occupied by it.

3. The cost of the experiment was Rupees 1,616-10 6, and the Committee arrived at the conclusion that no great difficulty would be experienced in screwing piles along the whole of the gap. In addition to the experiments made they placed one row of four piles at the west end of the gap.

4. They submitted plans and estimates along with their report, viz:—

	Rs.
1. For closing the gap	1,33,374
2. Protective works	30,940
3. Strengthening Pier head	39,110
Total...	2,03,424

5. The Committee recorded their opinion that Mr. Grainger's estimated amount for labour and contingencies, viz., Rupees 94,931, was excessive. They thought the work should be completed in six months, at not more than 5,000 Rs. per month, against Mr. Grainger's estimate of Rupees 94,931.

6. In his memorandum, No. 137, dated 5th October 1872, the Chief Engineer called for certain explanations from Mr. Grainger, and requested that possible reductions should be made in the estimate which was to be returned corrected.

7. Mr. Grainger, through the Superintending Engineer, 4th Division, re-submitted the estimate unaltered with an explanatory letter, which was submitted to Government by the late Superintending Engineer, 4th Division, with his letter of 7th November 1872, No. 3,442. In their order thereon Government sanctioned a sum of Rupees 98,400 for closing the gap, less Rupees 32,744-13-7 the value of materials in hand.

8. Those portions of the estimate providing for protective works, and for strengthening the pier head were ordered to be deferred till after the restoration of the pier.

9. Government further directed the Presidency District Engineer to carry out the work by means of all his departmental resources, those of the Marine Department being made available to co-operate in the work, and to bring it speedily and economically to a conclusion.

10. In G. O., Public Works Department, dated 18th January 1873, No. 135, an allotment of Rupees 30,000 was set apart for the work, and it was in contemplation to give one portion of the work to Mr. Grainger, and the other portion to the Master Attendant.

11. About this period Mr. Grainger, under whose immediate personal superintendence the work was to be executed, on the part of this department, called upon me more than once and urged the advisability of having the work wholly entrusted to himself, as the Marine Department were not considered by him equal to the task allotted to them.

12. The Master Attendant, Administrative Department, was naturally most averse to the proposal, as he had the utmost confidence in the experience and proved intelligence and ability of his henchman, Mr. Sadler, who had done good work of the same sort on a former occasion.

13. It was eventually decided under authority that Mr. Grainger and his Foreman Mr. Harris should work at the west side of the gap, and Mr. Sadler and his gang on the east side.

14. Mr. Grainger was unable to proceed with the work on his side, and he stated, in determined contravention to the reports of the Master Attendant, that Mr. Sadler's party was doing no practical good.

15. I was personally most unfortunately prevented by circumstances quite beyond my control from giving the smallest personal attendance at the pier.

16. From subsequent examination of boring apparatus employed by Mr. Grainger to bore preparatory to screwing down his piles, I am not surprised at the opinion he arrived at that piles could not be driven. He had manufactured the most unreasonable apparatus which I don't think would have bored even soft mud; at all events he effected nothing on his side of the gap, and communicated a verbal report to me which I repeated nearly word for word in my letter No. 3,785, dated 17th March 1873, in consequence of which the Pier work was suspended as per G. O., No. 933, dated 25th March 1873.

17. Mr. Grainger distinctly and undoubtedly stated that his recommendation that the work should be stopped applied equally to the work in progress under him and that under execution by Mr. Sadler.

18. Mr. Dalrymple strongly protested against suspension of work, as he *stated he was making* satisfactory progress; but Mr. Grainger would not admit his statement, and *I was unable personally to settle the matter* by inspection.

19. As Mr. Grainger's Foreman, Mr. Harris, *had been specially* sent out from England, under covenant with Government, for this particular work under consideration, I was the more induced to give credence to Mr. Grainger's report. *Subsequently, however, it appeared* from my own observations that Mr. Harris, the Foreman under Mr. Grainger, was too much given to habitual excessive indulgence in stimulants to be depended upon.

20. I regret to say that it appears to me that Mr. Grainger was bitterly and unreasonably opposed to the Master Attendant and his subordinates, and his report recommending suspension of work appears to me to have been wholly unwarrantable in the face of the fact that the repairs of the pier were at the time his report was made being carried on without interruption by Mr. Sadler. All Mr. Grainger's apprehensions were utterly devoid of real foundation. They were in direct opposition to the result of operations in progress, and to the recorded evidence of the Committee as the result of their experiments on the gap preparatory to writing their report.

21. In G. O., No. 1,153, dated 21st April 1873, Government communicated a second report (prepared after suspension of repairs) by the Pier Committee, and directed the resumption by the District Engineer of the repair work, holding him responsible that it should not again be interrupted by his undue reliance on reports of which there does not even appear to be any written record.

22. Upon receipt of G. O., No. 1,153, dated 21st April 1873, Mr. Grainger and Mr. Harris were by me both removed from the pier, and the gap has been closed economically and successfully by Mr. Sadler, unaided, in a period of seven months. The work was most steadily and uninterruptedly carried out by Mr. Sadler from beginning to end.

23. The contract with Mr. Harris terminates with the completion of the pier repairs, and I think his services may be dispensed with. Covenant enclosed for reference. But putting the completion of the pier out of the question, I think he has failed to fulfil the conditions of his Covenant most unmistakably.

24. I called upon Mr. Grainger to account for his report recommending suspension of operations, and at the same time to state, in reference to your order quoted in paragraph 6 of this letter, why he did not deduct from the estimate the value of a considerable amount of stock on hand at the time, and have the honour to enclose his reply.

25. The first four paragraphs of Mr. Grainger's letter are devoted to the suspension of pier work, and the remainder is in explanation of his omission to deduct value of old stores on hand which were paid for in 1869.

26. Paragraph 2 of Mr. Grainger's letter seems to carry no weight, as the gap had been carefully examined by the Pier Committee, upon whose report the work was undertaken, and subsequent facts have fully corroborated the correctness of their conclusions.

27. In reference to paragraph 4 it appears to me that there were no grounds to recommend the suspension of the pier repairs, of which Mr. Grainger might have easily satisfied himself had he chosen to inter-communicate with the Master Attendant and his party, to whom however he exhibited a spirit of antagonism, for which he was officially reprimanded by me, but in vain.

28. As the information relative to omission to deduct value of old materials from the Pier repair estimate is incomplete, I have called upon Mr. Grainger for fullet information, which will follow when received, as I desire no longer to delay my report.

From J. N. GRAINGER, Esq., Assistant Engineer in charge, Madras Pier Works, to Lieutenant-Colonel J. GODDARD, R.E., District Engineer, Presidency, dated Madras Pier Works, 4th September 1873, No. 163.

WITH reference to your letters marginally noted, calling on me to report the reason which induced me to recommend a stoppage of the pier repairs, I have the honour to state that I was principally induced to recommend the suspension and re-consideration of the work by the large outlay of Rupees 6,000 that had been spent only on labour and contingencies in screwing down these piles. I considered that I had no alternative but to recommend a stoppage of the work, and submit the matter to you for the orders of Government.

Three Statements, A, B, and C.
One Diary.

No. 2,201, dated 11th Aug. 1873.
„ 2,472, „ 25th „ „
„ 2,505, „ 26th „ „
„ 2,565, „ 1st Sept. „

2. It will be borne in mind that difficulties were to be apprehended in working in a direct line from the circumstance of the wreck of the *Saint Bernard* supposed to be lying in the gap; and as sufficient evidence of the obstacles to be met with presented themselves while screwing down the piles by the breaking of the capstans and bars, the carrying away of the fans or screws, and the resistance offered by wreck, etc., lying in the bed, which could not be overcome, were matters to cause serious misapprehension in regard to the expenditure over the estimate, which, to my mind, appeared inevitable, and sooner than incur the risk of a wasteful expenditure, I deemed it right to lay the whole matter before you for further orders.

3. I beg further to state that Mr. Harris, the Foreman specially sent out by the Home Government for the work of repairing the pier, represented to me the obstacles to be overcome as insurmountable, and from my own personal daily supervision at the work,* I judged that his reports were reliable.

* *Vide* copy of diary enclosed.

4. Under the foregoing circumstances, I trust that the Government will see that there was sufficient grounds for recommending a suspension of the repairs to the pier at that date.

5. With reference to paragraph 2 of your No. 2,565, above quoted, I beg to state that the whole invoice of piles, etc., received by the Public Works Store Department in February 1869 per *Clarence*, amounting to Rupees 64,814-9-4, were indented and charged off against the estimate for repairing the damage caused by the *Saint Bernard*.

6. The southern portion of the repairs only having been completed and opened to traffic, the extension of the northern portion was suspended.

7. The balance of stores remaining from the above invoice* were retained, pending orders for resuming work on the northern side, but, before sanction was accorded, the portion that was repaired was carried away during the cyclone in April 1872.

* Statement A.

In estimating for these repairs I had lost sight of the remains of the above consignment per *Clarence*, which have been charged off to the Pier Repairs in 1869-70.

8. The accompanying list* shows the items of stores received per *Hotspur* in March 1870 from England, the quantity issued therefrom for the present repairs, and the balance remaining in the Public Works Store Stock Books.

* Statement B.

Statement C. shows list of Stores, with their valuation, remaining in the Pier Accounts on 1st September 1873, not likely to be used now.

No. 97. ORDER THEREON, 7th November 1873, No. 2,720.

CIVIL WORKS, No. 10.

THE first two letters above recorded announce the restoration of the Madras Pier, and its re-opening for general traffic from the 1st August, little more than three months from the date of the order authorizing the final resumption of the work. They also record the services of the Pier Master, Mr. Sadler, and the Pier Establishment under him, as the executive agency by means of which the Presidency District Engineer, in co-operation with the Master Attendant, was enabled to carry out the work successfully. The third letter details the circumstances under which the work of restoration was for a month suspended, and the action of the usual departmental agency at the disposal of the District Engineer paralyzed.

2. It appears that Lieutenant-Colonel Goddard was completely laid aside by dangerous illness when the pier repairs were first undertaken; and that he was compelled to rely entirely upon the statements of his Assistant, Mr. Grainger, the Superintendent of the Public Works Workshops and Stores, who was immediately answerable for the execution of the repairs. On that officer's report, entirely and unhesitatingly adopted by Lieutenant-Colonel Goddard, though (now it appears) in the face of successful action by Mr. Sadler, and strong protest by the Master Attendant, work was stopped until after further inquiry and report by the Committee who originally reported on its feasibility, with whom the Inspecting Engineer for Ports and Communications was then associated. They did not report in detail on Mr. Grainger's evidence in support of his reasons for stopping the work, but simply set them aside as unsatisfactory.

3. His Excellency the Governor in Council regrets to record his opinion that Mr. Grainger has failed to furnish a satisfactory explanation of the grounds upon which he recommended the suspension of the works. Such suspension is now proved to have been wholly unnecessary; and the Government must express their extreme disapproval of the course adopted by Mr. Grainger in this respect. He has been unfortunate in the Foreman working under him, but he must long have been cognizant of his habits, and is to blame for having tolerated them. Mr. Harris having been reported as unreliable owing to habitual excessive indulgence in drink, the District Engineer will proceed to enforce the terms of his contract, by which he is liable to immediate discharge and fine of one year's salary.

4. It is with pleasure that the Governor in Council turns to applaud the hearty zeal with which Mr. Sadler placed all his practical skill and resources at the disposal of Government, and with his worthy boatswains and crew achieved the work on which he had set his heart, regardless of the peculiar heat of the season and of the amount of responsibility involved under the circumstances. Mr. Dalrymple is congratulated on the success that has attended his subordinates' efforts, to which he has given every encouragement; and the Government are indebted to him for the cordial co-operation without which their orders could not have been carried out. He is authorized to present to each of the persons named in his report three months' salary, as a reward for their exemplary behaviour.

5. The statements which accompanied the District Engineer's Report will be forwarded to the Inspecting Engineer for Ports and Communications, who is directed to lay before the Government clear statements of the expenditure of cash and of stores already paid for, on the work already sanctioned and completed, in the past and current official years. It will then be considered what steps shall be taken towards the execution of the further measures proposed by the Committee

Proceedings of the Madras Government, Public Works Department, 7th November 1873.

for protecting and strengthening the pier. Meanwhile, these gentlemen will accept the cordial thanks of His Excellency the Governor in Council for their most useful advice, and patient consideration of the subject laid before them.

(True Extract.)

(Signed) G. W. WALKER, Colonel, R.E.,
Secretary to Government.

To the District Engineer, Presidency.
" Inspecting Engineer for Ports and Communications.
" Master Attendant, Madras.
" Pier Committee.
" Marine Department.

Administrative Department.

Madras P. 1
Marine Office
6th August 1873.

No 4974.

From
H. D. E. Dalrymple Esqre
Master Attendant
Administrative Department
Madras.

To
The Honourable W Huddleston
Chief Secretary to Government
Marine Department
Fort Saint George

Sir

On the 1st of this month I informed Government by Telegram that the Pier was completed and open for general traffic.

2 I have now the honour to state that the accomplishment of this work has given universal satisfaction, and that a brisk trade ever since the 1st instant has been carried on over the Pier.

3 In sending in this brief report, I cannot omit bringing the services of Mr Sadler, the

the Pier Master, to the notice of Government. Since the 2nd of May, Mr. Sadler has, under the orders of Lieutenant Colonel Goddard R.E., been the Executive Officer in charge of the Pier works, and from his great experience of similar works in different parts of the world, combined with his indomitable energy and perseverance, he has at last surmounted numerous difficulties, and restored the Pier in less than three months since he took charge.

4. It is also a pleasing duty to notice the services of the Pier Boatswains, who have acted as Foremen under Mr. Sadler carrying out the Pier repairs, — working along with him in the heat of the Sun 9 hours a day, during the 3 hottest months of the year.

Note.
Working hours from 6 A.M. to 5 P.M. out of which 2 hours allowed for meals.

5 As Mr. Sadler is away in Bangalore for a few days casual leave to enable him to recruit and see his family, and as I shall be absent for nearly a fortnight on a visit to the Northern Ports, I am not at present prepared to furnish so detailed a report as I propose to send in on my return.

6. In the meantime I have no doubt a report will be sent in by Colonel Goddard, who is much pleased with the work. Prompt attention has always been paid by that Officer to requisitions for assistance in any way in carrying out these operations, and it has been a pleasure to be associated with him in this work.

I have the honour to be
Sir
Your most obedient Servt

W. D. S. Dalrymple
Master Attendant
Administrative Deptt

Administrative Department.

Madras
Marine Office
28th August 1873.

No. 5316.

From

H. D. E. Dalrymple Esqre
Master Attendant
Administrative Department
Madras.

To

The Honourable W. Hudleston
Chief Secretary to Government
Marine Department
Fort Saint George

Sir

With reference to my letter
× No. 4974 of the 6th August 1873, † I have now the
honour to address Government on the
subject of the good services perform
-ed by Mr Sadler, the Pier Master,
and by the Pier Establishment under
him, in restoring the Madras Pier.

2. For nearly three months,
as already stated, the
Establishment, as enume-
-rated in the margin,
worked laboriously for

9

Mr Sadler — Pier Master
D. P. Anthony, G. Spartaro, P. Balwin, H. Roberts — Boatswains
C. Mahomed — Sypang
Lazer, Thomas, Packey — Sea Lascars
Anthony — Pier Fitter

Rd. 29th Aug. 1873
Mr. Sadler
Pier Master
Madras

Rd. 1st Sept. 1873
Lieutenant Colonel
Superintendent of Police
Madras
Forwarded for information
and return.
No. 5816 dated 29th August 1873.
The Master Attendant
Administrative Dept.
Madras

To
The Chief Secy. to Govt.
Marine Department
Fort St. George

Dated 6th August 1873
Recd 29th "
Regd 2nd Sept.
No. 4974

Regarding the completion
of the repairs of the Pier
of the Lighthouse. Encloses 6
notes, the very valuable
services of the Master Attendant
Mr Sadler, the Pier Master
during the Cyclone Oct.
1871 3 months, and all the
Establishment with the latter
connected.

No. 2756 Dated 7th Sept. 1873.

9 hours daily, without any protection whatever from the Sun - screwing down the piles - laying the beams - fixing the braces &c. &c. &c. and on the 1st. of this month the Pier was again opened for traffic.

3. Great difficulties were encountered in getting some of the piles down - nearly 50 fan screws were broken - numerous Capstan bars carried away - chains snapped, as if they had been pack thread, a hundred times, and one of the Steam engines disabled; yet thanks to the indomi-table energy and mechanical knowledge of Mr. Sadler, the work was at length completed.

4. Much time was latterly lost in raising piles, which could not be got down beyond a certain depth; - in groping for clear ground and repointing them - one for instance having to be got up Seven times before being finally screwed down.

5 I regret to state that the Pier Establishment, in carrying out these works, did not escape altogether unscathed; - two of the Lascars being now in Hospital* on account of injuries received in the execution of their duty.

* Lazer and Pukey.

6 Mr. Sadler and the Boat-swains, though severely punished by the Sun, are now I am glad to say none the worse of the three months' severe work and exposure, at the hottest sea-son of the year, which I should hardly have believed it possible for any Europeans to stand.

7. After bringing the good services of the Pier Establishment to the notice of Government, I trust those who - under great difficulties worked so well - may be consider-ed worthy of reward.

8 I subjoin a memoran-dum of the rates of pay drawn by

61 1

by them.

9. I am glad in conclusion, to be able to report, for the information of Government, that since the Pier was opened for traffic on the 1st of this month 7,450 tons of cargo have passed over it.

I have the honour to be
Sir
Your most obedient Servt

H. D. E. Dalrymple
Master Attendant
Administrative Departt

Memorandum.

		Rs.
Mr. Sadler	Pier Master	300
D. P. Anthony	Boatswain	60
G. Spartara	Do.	60
P. Balwisto	Do.	60
H. Roberts	Do.	60
O. Mahomed	Syrang	45
Lazer	Sea lascar	20
Thomoo	Do.	14
Puckey	Do.	12
Anthony	Pier Filter	12
		14

9/

H. D. E. Dalrymple
Master Attendant
Administrative Dept.

9/

507
92

by them.

P.W. 1873 Depart.t
Pro. of the Madras Govt
Marine 1873 Depart.t

From No 5875.
The Master Attendant
Administrative Dept.
Madras.

To
The Chief Secretary to Govt.
Marine Department
Fort Saint George.

Sir,

dated 28th August 1873.
recd
Rec.d 29 October 73.
No. 5316.

C285

Submitting that the Pier Master and such of the establishment as worked under him in restoring the Madras Pier, are entitled to reward for the good services performed by them.

No 2720-7 Nov.r 73.
Transmitted to the S. of S. for
his consd. Order.
Chancery
1 Sept.r 1873. Chiefsley

No 95

Articles of Agreement made the Eighteenth day of February in the year of our Lord One thousand eight hundred and sixty nine Between Frederick Harris of 10 Stanmore Street Pancras in the County of Middlesex of the one part and The Secretary of State in Council of the other part Whereas the Secretary of State in Council has engaged the said Frederick Harris as an Assistant at the Works in connection with the intended repairs of the Madras Pier and otherwise as hereinafter appearing Now these Presents Witness that for and in consideration of a second class passage to Madras aforesaid being provided for him and of the salary hereinafter agreed to be paid to him. He the said Frederick Harris for himself his executors and administrators Doth hereby promise and agree with and to the said Secretary of State in Council in manner following that is to say That he the said Frederick Harris shall and will at such time and in such manner as he shall be directed by the Secretary of State in Council (who shall for that purpose provide him with a second class passage and accomodation at Sea but not Hotel accomodation or any other expences incurred on land in the course of his travel) proceed to Madras aforesaid and when he shall have arrived there shall and will report himself to the Government or Chief Government Agent there and submit himself to the orders of the said Government or of the properly authorized Officer or Officers under whom he shall from time to time be placed and shall remain and continue there in the service of Government to assist at the work of repairing the Madras Pier and such other works if any as the Government of Madras may determine upon until he shall receive from Government one months notice that his service is no longer required by Government Provided always that upon the completion of the works of the said Pier it shall be competent to him to determine the said service on his giving the Government one months notice of his desire so to do And the said Frederick Harris shall and will at all times to the best of his skill and

ability discharge the duties for which he is engaged and also make himself otherwise generally useful and as may be required by the Government or any Officer thereof. And he shall not nor will on any pretence whatsoever absent himself from his said service without having first obtained the permission of the Officer under whom he shall be placed or in case of sickness or unavoidable accident without a sufficient Medical Certificate that he is unable and unfit to leave his quarters and shall not nor will during his engagement on his own account or otherwise either directly or indirectly carry on or be concerned in any trade traffic or business whatsoever but devote his whole time and attention to the duties for which he is engaged. And Also shall and will well truly and faithfully account for and pay over or deliver to the proper Agent or Agents of the Government authorized to receive the same all moneys goods wares merchandizes materials and effects which shall at any time come to his hands or be under his charge on account of the said Government And Also shall and will during his continuance in the East Indies will and truly conform to all the rules and regulations of the Department of the Service to which he shall belong and also conform to and obey all such orders and directions as he shall from time to time receive from any properly authorized Officer or Officers of the Government at the place where he shall from time to time be stationed Provided always And it is hereby agreed that in case he shall be guilty of any insubordination drunkenness or other intemperance misconduct or disobedience of orders or shall be guilty of any breach or nonperformance of any of the matters herein contained then and in any of the said case it shall be lawful for the Government or their Officers having authority from the said Government for that purpose to discharge him from the said service and he shall and will thereupon forthwith upon being so discharged peaceably and quietly in an orderly manner leave the service. And these presents further Witness that the said Secretary of State in Council doth hereby promise and agree that in case and upon condition that he the said Frederick Harris shall observe and keep all the agreements and provisions herein contained and on his part to be observed and shall be able to perform and

actually perform such service and not otherwise shall be paid unto him for so long time as he shall be actually in the said service a rate at and after the rate of Twenty pounds per month payable in the East Indies commencing from the day of the date of these presents and ceasing on the day of his arrival in England and if he shall die while in such service then such salary shall cease upon the day of his death. And it is agreed that in all payments to be made in India under these presents the pound Sterling shall be considered equal to and calculated after the rate of ten Rupees. And the said Secretary of State in Council also agrees that the said Government shall and will in addition to the before mentioned Salary upon his arrival in Madras aforesaid make such allowance to the said Frederick Harris for his house rent as they shall deem adequate or otherwise at their discretion find him quarters and also provide him with all medicine and medicinal attendance during such time as he shall remain in India in the service of the said Government. And it is also agreed that if at the expiration of his said service the said Frederick Harris shall have at all times performed the duties of his Office to the satisfaction of the Government or in case he shall be compelled from ill health not brought on by his own neglect or carelessness (of which the certificate of the proper Medical Officer of the Government shall be conclusive) sooner to quit such service and shall actually quit the same in India and shall have up to that time performed the duties of his Office to the satisfaction of the Government the said Government shall and will find and provide him with a like passage to England and necessaries at sea as aforesaid. Provided always And it is hereby expressly declared and agreed that in case the said Frederick Harris shall be discharged from the said service on account of insubordination drunkenness or other intemperance or misconduct or by reason

any breach or nonobservance of any of the matters herein contained he shall and will pay to the said Secretary of State in Council a sum equal to one years salary calculated as aforesaid as liquidated damages And in case he shall absent himself from his said Service without first obtaining permission as aforesaid or in case of sickness without forwarding the required Medical Certificate of the fact to the Officer under whom he shall be placed there he shall pay to or for the use of the said Secretary of State in Council the sum of Twenty Shillings per diem for every day he shall be so absent or in case he shall at any time before the expiration of his said service quit the same without the permission of the Government there he shall and will pay to the Government the like sum of Twenty Shillings per diem for every day between the day when he shall so quit the said service and the day when his said service would have expired all which said several sums shall become due and be paid as and by way of liquidated damages And he shall and will upon demand forthwith pay such liquidated damages to such person as may be directed by the said Government or it shall be lawful for the said Government to deduct the same out of any money which may be due to the said Fredrick Harris and the same shall be deducted accordingly And IT IS ALSO AGREED by and between the parties to these presents that the proceedings Letters and Reports of the Governor General of India in Council or of any of the Governors in Council or other Governor or Government in India or any of them or of any of their Agents or Officers or any copies or Extracts thereof which shall be sent to the Secretary of State in Council or Officially to any of the Officers or Servants on the Establishment of the Secretary of State in Council in England or to any Officers in the Judicial Service of Her Majesty in the East Indies or elsewhere in any way relating to the sums of money paid or to be paid to the said Fredrick Harris under these Presents or relating to his conduct in the East Indies or to any matter in any way relating to the premises shall be received as conclusive evidence of any matter therein contained or referred to in any action or suit at law or [illegible] any legal proceedings by or between

the parties to these Presents or in any way relating thereto In witness whereof the said Frederick Harris and Sir Robert Montgomery K.C.B. G.C.S.I. and Sir Henry Bartle Edward de Frere G.C.S.I. K.C.B. being two members of the Council of India have hereunto set their hands the day and year first above written.

Signed by the above named Fredrick Harris in the presence of } (Signed) Fredrick Harris

(Signed) Jas. L. Bradley
Drapers Hall
London.

Signed by the above named Sir Robert Montgomery and Sir Henry Bartle Edward de Frere being two members of the Council of India in the presence of } (Signed) Robert Montgomery
" H.B. Frere

Signed Robt. Wickenden
Drapers Hall
London

Dated 15th Feb. 1869

Mr. Fred. Harris

Agreement

on his proceeding to Madras as an Assistant at the Works in connection with the Repairs of the Madras Rly &c.

P.W. 5012/73.

"Claud Hamilton" supposed to be lying
in the Cap; and as sufficient evidence
of the obstacles to be met with pre-
vented themselves while pursuing
down the piles by the hearing of the
Capstans and Gear, the Carriage was
of the Laws or Crews, and the resistance
offered by piles &c lying in the bed,
which could not be overcome, except
matters to cause serious misapprehension
in regard to the expenditure over the
estimate, which, to my mind, appeared
risk of a wasteful expenditure, I deemed
it right to lay the whole matter
before now for further orders

3. I beg further to state that Mr. Evans,
the Foreman specially sent out by the
Home Government for the work of
repairing the pier represented to me
the obstacles to be overcome as serious
daily supervision of the work, I
Judged that his reports were reliable -

4. Under the foregoing circumstances
I trust that the Government will see
that there was sufficient grounds for
recommending a suspension of the
repairs to the Pier at that date.

5. With reference to para 2 of your
No 2565 above quoted, I beg to state
that the whole Invoice of piles &c
received by the P.W. Store Department

in

[illegible] or repairs

in February 1869 per "Clarence",
amounting to Rupees 84814. 9. 4. were
included and charged off against
the estimate for Repairing the damage
caused by the Great Gemaud"

6. The Eastern portion of the
repairs only having been completed and
opened to traffic, the extension of the
Northern portion was suspended.

7. The balance of stores remaining
from the above Invoice were returned,
pending orders for resuming work on the
Northern side, but before sanction was
accorded, the portion that was repaired
was carried away during the cyclone
in April 1872.

In estimating for these repairs,
I had lost sight of the receipt of
the above Consignment per "Clarence",
which have been charged off to the
Pier repairs in 1869. 70.

8. The accompanying list shows
the items of stores received per "Hotspur"
in March 1870 from England, the
Monthly issued thereon for the present
Repairs, and the balance remaining
in the P.W. Store Stock Books.

Statement C. shows list of
Stores, with their valuation, remain-
ing in the Pier Account on 1st

September

September 1873, not letting to be read now:—

I have the honor to be
Sir,
your most Obedient Servant
J. H. Cumper
Asst Engineer in Charge.

No 2761

From

Lieutenant Colonel I. Goddard R.E.
Distnct Engineer Presidency.

To,

Colonel G. H. Walker R.E.
Chief Engineer & Secre to Govt. P.W.

Sir,

In continuation of my letter No 2086 of 4 August 1873, reporting the completion of the Pier, I have now the honor to submit a report in detail more particularly with reference to the circumstances under which I recommended the Pier repairs to be stopped.

2. In G.O. dated 12 June 1872 No 1457 Government appointed a Committee for the purpose of making experiments and reporting upon the possibility of restoring the Pier along the line originally occupied by it.

3. The cost of the experiment was Rs 1616. 10. 6, and the Committee arrived at the conclusion that no great difficulty would be experienced in screwing piles along the whole of the Gap. In addition to the experiments made, they placed one row of 14 piles at the west end of the gap.

4. They submitted plans and estimates along with their report viz:—

X C 1343/1
Encls 4
1. original letter
1. Covenant

Name
The Light
Pier and
Rec. 3 Sept 73.
Reg. 3 Sept 73.
Dft. 4.
Pier
the Channel
the Entrance under
which he examined
the Entrance of
Pier
P.W. 5772/73.

1.

1. For closing the gap Rs 133,374
2. Protective Works " 30,940
3. Strengthening Pier Head " 39,110

Total Rs 2,03,424

5. The Committee recorded their opinion that Mr Grainger's estimated amount for labor and contingencies, viz: Rs 94,931 was excessive. They thought the work should be completed in six months, at not more than 5,000 Rs per month against Mr Grainger's Estimate of Rs 94,931.

6. In his Memo No 137 of 5 October 1872 the Chief Engineer called for certain explanations from Mr Grainger and requested that possible reductions should be made in the Estimate which was to be returned corrected.

7. Mr Grainger through the Supt Engr & Draw submitted the Estimate unaltered with an explanatory letter, which was submitted to Govt by the late Supt Engr & Draw with his letter of 7th Nov 1872 No 3442. In their order thereon Govt sanctioned a sum of Rupees 98,400 for closing the gap less the value of materials in hand Rs 32,744.13.7

8. Those portions of the Estimate providing for protective works, and for strengthening the Pier head were ordered to be deferred till after the restoration of the Pier.

9. Govt further directed the Presidency District Engineer to carry out the work by means of all his departmental resources, three of the Marine department being made available to co-operate in the work, and to bring it speedily and economically to a conclusion.

10. In G.O. Pro. of 18 January 1873 No 135 an allotment of Rs 30,000 was set apart for the work, and it was in contemplation to give one portion of the work to Mr Grainger, and the other portion to the Master Attendant.

11. About this period Mr Grainger under whose immediate personal superintendence the work was to be executed on the part of this department called upon me more than once, and urged the advisability of having the work wholly entrusted to himself, as the Marine Deptt were not considered by him equal to the task allotted to them.

12. The Master Attendant Administrative Deptt was naturally most averse to the proposal as he had the utmost confidence in the experience and proved intelligence and ability of his henchman Mr Sadler who had done good work of the same sort on a former occasion.

13. It was eventually decided under authority that Mr Grainger and his foreman Mr Harris should work at the west side of the gap, and Mr Sadler and his gang on the east side.

14. Mr Grainger was unable to proceed with the work on his side and he stated in determined contravention to the reports of the Master Attendant that Mr Sadler's party was doing no practical good.

15. I was personally most unfortunately pre-

vented

prevented by circumstances quite beyond my control from giving the smallest personal attendance at the Pier.

16. From subsequent examination of boring apparatus employed by Mr Grainger to bore preparatory to screwing down his piles, I am not surprised at the opinion he arrived at that piles could not be driven. He had manufactured the most unreasonable apparatus which I dont think would have bored even soft mud, at all events he effected nothing on his side of the gap, and communicated a verbal report to me which I repeated nearly word for word in my letter No 3785 of 17th March 1873 in consequence of which the Pier work was suspended as per G.O. No 933 of 25 March 1873.

17. Mr Grainger distinctly and undoubtedly stated that his recommendation that the work should be stopped applied equally to the work in progress under him, and that under execution by Mr Sadler.

18. Mr Dalrymple strongly protested against suspension of work, as he stated he was making satisfactory progress, but Mr Grainger would not admit his statement and I was unable personally to settle the matter by inspection.

19. As Mr Graingers foreman Mr Harris had been specially sent out from England under covenant with Govt for this particular work under consideration, I was the more induced to give credence to Mr Graingers report. Subsequently however it appeared from my own observations that Mr Harris

the foreman under Mr Grainger was too much given to habitual excessive indulgence in stimulants to be depended upon.

20. I regret to say that it appears to me that Mr Grainger was bitterly and unreasonably opposed to the master Attendant and his subordinates, and his report recommending suspension of work appears to me to have been wholly unwarrantable in the face of the fact that the repairs of the pier were at the time his report was made being carried on without interruption by Mr Sadler. All Mr Graingers apprehensions were utterly devoid of real foundation. They were in direct opposition to the result of operations in progress and to the recorded evidence of the Committee as the result of their experiments on the gap preparatory to writing their report.

21. In G.O. No 1153 of 21st April 1873 Government communicated a second report (prepared after suspension of repairs) by the Pier Committee and directed the resumption by the Dist. Engr of the repair work holding him responsible that it should not again be interrupted by his undue reliance on reports of which there does not even appear to be any written record.

22. Upon receipt of G.O. No 1153 of 21st April 1873 Mr Grainger and Mr Harris were by me both removed from the Pier, and the gap has been closed economically and successfully by Mr Sadler unaided in a period of seven months. The work was most steadily and uninterruptedly carried

out

out by Mr Sadler from beginning to End.

23. The contract with Mr Harris terminates with the completion of the Pier Repairs, and I think his services may be dispensed with. Covenant enclosed for reference. But putting the completion of the Pier out of the question I think he has failed to fulfil the conditions of his Covenant most un-mistakeably.

24. I called upon Mr Grainger to account for his report recommending suspension of operations, and at the same time to state in reference to your order quoted in para 6 of this letter, why he did not deduct from the Estimate the value of a considerable amount of stock on hands at the time and have the honor to enclose his reply.

25. The first 4 paras of Mr Graingers letter are devoted to the suspension of Pier work and the remainder is in explanation of his omission to deduct value of old stones on hand which were paid for in 1869.

26. Para 2 of Mr Graingers letter seems to carry no weight as the gap had been carefully examined by the Pier Committee upon whose report the work was undertaken, and subsequent facts have fully corroborated the correctness of their conclusions.

27. In reference to para 4 it appears to me that there were no grounds to recommend the suspension of the Pier repairs of which

Mr Grainger might have easily satisfied himself had he chosen to inter-communicate with the Master Attendant and his party to whom however he exhibited a spirit of antogonism, for which he was officially reprimanded by me but in vain.

28. As the information relative to omission to deduct value of old materials from the Pier repairs Estimate is incomplete I have called upon Mr Grainger for fuller information which will follow when received, as I desire no longer to delay my report.

I have the honor to be
Sir,
Your most obedient servant.

Jno Goodwin Lt Col R.E.

Virtuel Engineer
Presidency.

Fort Saint George
11th September 1873.

Lodh

No. 1785.

MASTER ATTENDANT'S OFFICE
RECD
JUN 25
187 COS

FROM J. GARLICK, Esq.,

Offg. Under-Secy. to the Govt. of Bengal,

TO THE OFFG. MASTER ATTENDANT.

GENERAL DEPARTMENT.
Marine.

Fort William, the 20th June 1870.

SIR,

I AM directed to acknowledge the receipt of your predecessor's letter No. 2190 dated the 13th ultimo, submitting a detailed report of the operations of the Orissa coast and river survey, from the 1st of September 1868 to the 30th of April 1870, and in reply to request that you will be good enough to convey to Mr. Harris, the officer in charge of the survey, an expression of the Lieutenant-Governor's thanks for the trouble he has taken in preparing the interesting report furnished by him.

2. The Lieutenant-Governor notices with satisfaction the services rendered by Messrs. Harris, Nickels, and Barr in connection with the survey operations.

3. Six printed copies of the report and of Colonel Rundall's note thereon, are herewith forwarded for the use of your office.

I have the honor to be,
SIR,
Your most obedient servant,

Offg. Under-Secy. to the Govt. of Bengal.

W. H.

A vessel making the port should g... steer up midway between the buoys until in a proper depth between two ... be gone, she should keep False Point light-house midway between two ... Plowden's Island; this is a fair mid-channel track; vessels drawing 18 to 20 feet should anchor near the B and C buoys, unless it is intended to discharge cargo, when they may with perfect safety stand up the anchorage until they ground, as the bottom is a very soft olive-coloured mud.

Public Works 1870 Department
No. 2190 dated 13th May 1870
From Captain J. Garlick
To the Officiating Secretary to the Government of Bengal
Received 12th September 1870
Rec. 2.
Submits a report with reference to the circumstances under which Mr. Harris requires to be rewarded.

No. 2420. 7 Nov 1870.

Under Secy's letter

From CAPTAIN A. BAKER, Officiating 1st Assistant Master Attendant, in charge, to the Secretary to the Government of Bengal, General Department,—(No. 2490, dated Fort William, the 13th May 1870.)

SIR,

I HAVE the honor to submit, for the information of His Honor the Lieutenant-Governor, a detailed report of the operations of the Orissa coast and river survey from 1st September 1868 to 30th April 1870, compiled by Mr. Harris, late in charge of that survey.

2. I would beg to solicit the favor of being furnished with six copies of the report for the use of this office when the same has been printed.

From C. A. HARRIS, Esq., Orissa Survey, to CAPTAIN T. M. PHILBRICK, Officiating Master Attendant,—(No. 315, dated Calcutta, the 10th May 1870.)

SIR,

I HAVE the honor herewith to submit a detailed report of the operations of the Orissa coast and river survey from 1st September 1868 to 30th April 1870.

On the 2nd September 1868 I left Calcutta for Orissa, taking with me Mr. J. H. Nickels as assistant surveyor, and four natives, being a portion only of the sanctioned establishment; it being arranged that a small screw steamer was to be sent down to me as soon as possible, and that in the meantime I was to work with boats and such assistance as I could get from the *Teesta* in the intervals of her regular work.

On arriving at False Point, Mr. Nickels was left on board the hulk to prepare for the survey, while I proceeded up to Cuttack to communicate with the authorities there, and obtain all possible information about the various creeks and rivers to be surveyed.

On arrival in Cuttack I was treated with the greatest courtesy, and met with every assistance in the way of maps and records of former reports on the "Orissa rivers" from both the commissioner and collector, the latter gentleman also placing the *Teesta* at my disposal. Mr. Levinge, C.E., of the East India Transit and Canal Co., also placed his lithographic press at my service. This proved of great assistance to me.

After arranging everything in Cuttack, I proceeded down to False Point *via* "Taldunda," and on the 18th September commenced the operations of the survey by measuring two base lines on Dowdswell's Island and working from them, thus rendering my work totally independent of all former surveys.

The survey of False Point anchorage fully employed us till the end of October; very little if any change had taken place in the anchorage proper; in fact, from charts in my possession, it has been nearly the same for the last 15 or 20 years.

The channels from the anchorage to the light-house, Bacood and Jumboo, were triangulated and surveyed for the first time.

False Point anchorage is formed by a long low sandy island called Dowdswell's, extending to about six miles north north-east of the light-house; the anchorage is inside the extreme north point of the island, and is well marked off by buoys and beacons as follows:—

1*st*, Point Reddie beacon on the north end of the island, visible ten miles, and a most useful mark for making the port from sea; a wooden spire buoy in about 25 feet water, bearing north by west, distant three-quarters of a mile from Point Reddie, and shewing the entrance to the anchorage, marked and called the A buoy; the C buoy, small iron, marking the edge of the sand inside of Point, in 16 feet reduced; the B buoy, also iron, 700 yards north-west of the C, in 14 feet reduced, and marking the western limit of the anchorage for deep vessels; and the E buoy to the east and the D buoy to the west, marking the limit of anchorage for vessels of 12 to 13 feet draught.

A vessel making the port should give Point Reddie a berth of about half a mile, and then steer up midway between the buoys until in a proper depth for anchoring. Should the buoys be gone, she should keep False Point light-house midway between two small beacons on Plowden's Island; this is a fair mid-channel track; vessels drawing 18 to 20 feet should anchor near the B and C buoys, unless it is intended to discharge cargo, when they may with perfect safety stand up the anchorage until they ground, as the bottom is a very soft olive-coloured mud.

Plowden's Island is a small low one, covered with jungle, in the centre of the bay formed by Dowdswell's, and having extensive mud flats all round it.

From the anchorage to the Light-house, about six and a half miles, there is a small boat channel with one or two feet of water in it, passing close to the east side of Plowden's Island, nearly up to the plantation; above that it is for the most part dry at low-water. This channel is marked by bamboos on each side, kept in order by the superintendent, Light-house. A boat wishing to go up to the light-house, should leave the anchorage at first-quarter flood, and to return, should leave the Light-house immediately the tide falls.

It is high water at the Light-house one hour later than at the anchorage.

West by south from the anchorage lies the mouth of the Jumboo river, accessible on a flood-tide only, there being a bad bar between it and the anchorage, with only one or two feet of water on it at low tide.

From the anchorage a small channel runs to the south-west, passing a short distance to the west of Plowden's Island and called "Bacood channel." A bar of very soft mud and sand, dry at low water, lies off the south-west point of the island, after passing which there is a tortuous channel of four to six feet leading into Bacood creek. This is the present route used by the steamer running from the anchorage to the canal, and will, I believe, remain the principal means of communication with the interior, as it will afford ready access to both the Kendraparah and Taldunda canals. I would therefore strongly recommend that something be done to improve the bar by means of spurs, &c. I may add that 1,500 piles and 1,500 fascines are ready at the Kurrumnassie rice golahs for this purpose.

Bacood Creek.—With the exception of a bar of two feet near the entrance, this creek possesses a good channel throughout, to its junction with the river Mahanuddy, and calls for no special remarks.

The survey of Bacood creek was completed in the early part of December 1868, after which the work was much delayed by the non-arrival of the steamer *Gemini*. As the *Teesta* could not be taken any distance from her regular work, the interval, or up to 12th January 1869, was employed by me in making a tour through the Pattakoond river, Paradeep creeks, Jumboo, Boronee, &c., and ascertaining what was worth the expense of a survey. On the 12th the *Gemini* arrived from Calcutta, and the survey of the Jumboo was immediately proceeded with.

The Jumboo river, from the anchorage to Deolparrah, was closely surveyed in eight sheets, and was found navigable for an inland steamer up to the latter point, but with several very sharp turns, which would make it difficult for a vessel to navigate in strong floods, and this, with the bad state of the Jumboo or canal creek (between Deolparrah and the tidal locks of the canal at Marsaghye), and it being two and a half miles longer than the Bacood creek and Noona route, led to the preference being given to the latter.

The Jumboo or canal creek was surveyed in four sheets and was found almost useless, there being several bars dry at low-water. This route was therefore abandoned, the surveys being completed early in May 1869.

I then proceeded to Calcutta and got down a fresh supply of stores, &c, returning to False Point on the 22nd May, and commenced the survey of the "Noona route."

The Noona route to the Kendraparah canal.—A good navigable channel for inland steamers was found throughout, from the junction of the Bacood creek with the Mahanuddy to Kurmkool, about one and a half miles below the canal. From Kurmkool to the canal was found to be bad, full of shifting sands, and with a bar of only two to three feet reduced.

Great changes have taken place in this portion of the river since the survey was completed; the high dry sand shewn off Marsaghye has gone down on to the point, blocking up the small channel there, and a great portion of the Noona freshet is thus forced down the canal creek to the Jumboo. I found on my last trip there that this had had a bad effect on the "Noona channels" for some miles down, and I would suggest something be done to prevent it in future.

The tidal locks of the Kendraparah canal are very unfortunately placed: a boat drawing four feet has to wait for high water to get into them owing to the shoals about here.

The survey of the Noona route was completed by the 31st July; the *Gemini* was then beached, scraped, and painted, all boats were overhauled, screw pile beacons put up to mark the various channels from False Point anchorage, and on the 17th August was commenced the survey of the river Mahanuddy from sea to the Kenreddia or Taldunda anchorage.

The Mahanuddy.—If it was not for the bar and heavy surf at the mouth, this would be one of the finest rivers on this coast. A good channel, with two fathoms at low water in the shoalest part; extends from the junction with the "Noona" to close alongside the surf on the bar. If this bar could be removed a vessel of 500 tons burden could get 15 miles into the interior. Above the "Noona" the Mahanuddy has a good channel for an inland steamer up as far as Kenreddia creek, or junction with the Pilla river. Above this the river rapidly becomes shoal, and useless for the purposes of navigation.

The Taldunda canal (now in course of construction) will, I believe, join the Mahanuddy somewhere near the village of Bhootmoondie. When this canal is completed this will be the best and quickest mode of communication with Cuttack from False Point anchorage, and will draw all except a small local trade from the Kendraparah route. The crossing of the Mahanuddy above the Jobra anicut (which is dangerous in heavy freshets) will also be avoided.

After careful consideration of all the advantages and disadvantages of the different routes to and from Cuttack *vid* False Point, I have come to the conclusion that it would be waste of money to spend anything on the "Jumboo;" and the principal and first thing to be done is to improve the Bacood bar, so that the *Teesta* could run in and out at any time of the tide. This I should think could easily be done, and I much regret that, owing to circumstances beyond my control, I had no opportunity of trying the effect of one or two good spurs, materials for which, as I before stated, have been collected at Kurrumnassie. The improvement of this bar I consider of vital importance to the well-being of False Point as a port, and no other work of improvement, such as building golahs, &c., should be undertaken until this experiment has been tried. If it succeeds, the *Teesta* could run from the Taldunda canal to the anchorage and *vice versa* in two and a half hours, and in cases of emergency make three or more trips in the day.

The small tidal creeks along the coast.—There is water communication between the Jumboo and Bacood through a small creek called "Ramchundra Gullia," which runs out of Bacood creek a little above the old rice golahs, and joins the "Jumboo" about one mile from its mouth; it is very narrow and tortuous and can only be used by boats.

A creek also runs along the coast from the Jumboo to the Boronee, and from thence by a very winding course to Hunsoah on the Brahmunnee river. This is also very narrow, and can only be used by boats.

Water communication inland also exists between the Mahanuddy and Davy rivers, leaving the former *vid* Paradeep creek, passing Cojung and Hurrichpoor, and joining the Davy near the village of "Nogoro." This route is however of very little use, as my boats drawing two feet had to wait for spring-tides to pass a bad shoal near Hurrichpoor.

Small rivers on the coast of Orissa are: 1*st*.—The Boronee, a small stream running into False Bay to the north-west of "Point Reddie." A boat blown out of the anchorage might find shelter inside this river.

2*nd*.—The Pattakoond river, the old sea entrance to which is closed, and the water from it discharged by the Mahanuddy mouth.

The Jotadur, with a bar nearly dry at the mouth, and the "Katoe," with a dry bar also. This river was reported on by Mr. Macmillan, C.E., who said it appeared to have a good sea entrance. He could have only seen it during a heavy freshet, as in January it was dry across the mouth, and the natives round Hurrichpoor say that they can nearly always wade across it.

Lastly, the Moogrand and Godakond, small streams not worthy of note.

The surveys and explorations in the vicinity of False Point anchorage were all completed by the end of September 1869. During October I was employed going round with the commissioner, collector, &c., in order to determine on the best means of opening out a trade at False Point, &c., putting up marks that had been blown down, erecting screw beacons, &c. At the end of the month I proceeded to Calcutta on leave. Returning to False Point on the 15th November, went into Cuttack to arrange for survey of the Davy river. Back to False Point on the 26th, caulked and painted vessel, and on the 1st December left for Point Palmiras shoals. Erected Shortt's tripod beacon there, completed this by the 6th, returned to False Point, repaired boiler which had given way, and on the 10th left for the Davy river, running down along the coast in the steamer, and sending out boats *vid* the creeks.

Davy river.—The survey of this river commenced on the 12th December 1869. Great changes had taken place in it since the former survey in 1860, especially off the upper end of Tandah creek. This river was completed (in three sheets) by the end of January 1870. A permanent beacon was erected at the mouth in latitude 19°, 58′, 0″ north; only four feet reduced was found on the entrance bar, with a nasty swell breaking into surf at times on the ebb-tide. After passing this bar a fair channel was found up to the village of Nogoro, where the Machgong canal will join the Davy. Above this the river rapidly becomes shoal, and off Machgong people wade across at low-tide. This river is of little use, as there is only a 6-feet range of tide on the springs, and even native craft prefer to load by means of massulah boats through the surf at Tandah to entering the river.

On completion of the Davy survey we sent out boats to the Dumrah through the creeks, returning up the coast with the steamer to False Point.

After arranging with the Collector, Cuttack, for postal communication, &c, we filled up coal at the bulk and proceeded to Dumrah, commencing the survey of that river on the 10th February 1870.

The Dumrah river, by far the best of any on the coast of Orissa, lies close to the northward of the point Palmiras shoals. The entrance is marked by the Kannaka buoy in 21 feet reduced

and Shortt's tripod beacon on the extreme north-east dry portion of point Palmiras Reef. The entrance to this river has much improved since last surveyed in 1866; the old outer bar of nine feet still remains, but a second channel has opened out about a mile to the south of it, with not less than ten feet on it. From this to the inner bar remains the same. The inner bar has much improved, there being not eight feet on it. This part appears liable to great changes. In 1859 there were 12 feet on this bar, in 1866 only three feet, and now, 1870, there are again eight feet. From Chandepaul there is a fair navigable channel with no serious obstruction up to the mouth of the "Byturnee." Above the Byturnee the river changes its name from Dumrah to "Brahmunee river," and has a fair channel without obstruction to off "Mow." Between "Mow" and "Dusseedpore" there is a bad reach, with bars of only two and three feet reduced, and from Dusseedpore to Albha a middling channel with four feet. In places above Albha the river rapidly becomes unnavigable.

The intention at present I believe is to bring the Pattamoondie canal into the Brahmunnee at Albha. I am afraid that this will only prove a source of trouble hereafter, and that it would be advisable to carry it down past the bad shoals between "Dusseedpore" and "Mow," and enter the river near "Rajpoor." A vessel drawing ten feet could then always get to the canal from sea without difficulty, and a vessel drawing 14 or 15 feet could reach it by taking the proper time of tide.

Branches or tributaries of the Dumrah and Brahmunnee rivers.—A little above the Custom House the Mutie strikes off to the northward. This river is navigable for native sloops to south Balliapol, and for boats to near Rookanaidapoor. About six miles above the "Mutie" is the Byturnee, running to the westward, and navigable to Chandbally, a fine river with well-defined channels.

Near Hunsooah the Mypurra river runs to the east and empties itself into the sea close under point Palmiras; useless for navigation, it being shoal at both entrances. A few miles above this the Kursooa river runs off to the west north-west, navigable up to the town of Aul, a place of some small trade.

It will be seen from the above that the Dumrah river is therefore the best on the coast and has communication with a larger extent of country than any of the others through its numerous tributaries, &c.

Above "Mow" the water is perfectly fresh at all times, and might be used advantageously for irrigation purposes. A cheap windmill pump would be much appreciated by the natives here, instead of their slow method of taking up water.

From the above report you will see that about 150 miles of rivers have been surveyed, mostly through dense jungle, and with no former triangulation or data to rely on, necessitating constant care to prevent errors creeping in. Charts of the above have been sent in, and about 300 miles more of rivers and creeks have been examined. Numerous useful marks and beacons have been erected, and most valuable information acquired about the water communication in Orissa,—information that would have been invaluable in the famine of 1866. Proper sites have also been pointed out for the junctions of the great canal scheme with tidal water, by which the errors of the Kendraparrah canal will be avoided. Some knowledge of the tides on the coast obtained by registers (see tables), and the whole has been completed in 20 months, and at an expense of not more that from Rs. 1,600 to 1,700 per mensem. I trust therefore that my work in Orissa may meet with the approbation of the Government I serve. I would beg to bring to your notice the excellent conduct of Mr. J. H. Nickles, assistant on survey, who did his work cheerfully and well in all weathers, and of Mr. D. L. Barr, who deserves great credit for the way he kept the *Gemini* running till the work was finished, with a sadly defective boiler.

To shew that the work was well done, I may add that after triangulating *with sextant only* for nearly 40 miles up the Brahmunnee and partly through dense jungle, the difference between the measured and calculated base was only five yards, and in the Jumboo after ten miles through jungle was only 14 inches.

Could time have been allowed me, a map of all the rivers surveyed, on a scale of one mile to the inch, could have been compiled, with a short memorandum of directions for navigating each. This would have been very useful, and would, I think, almost pay for the expense of publishing it by the sale of copies, as I have had many applications for something of the sort. If it had to be done, it would however be necessary for me to superintend it, as our marine survey books would not be understood except by one accustomed to that work.

List of charts published.

False Point anchorage ...	1 sheet.	Canal creek	4 sheets.
Bacood creek	3 sheets.	Mahanuddy	5 „
Noona route to canal ...	6 „	Davy river	3 „
Jumboo river	8 „	Dumrah	2 „

and the Brahmunnee 5 sheets, or a total of (37) thirty-seven charts in all.

List of rivers and creeks examined.

Ramchundra Gullia.	Mutie river.
Bamcha nulla.	Byturnee river.
Boicha nulla.	Kursooa river.
Hunsooah nulla.	Brahmunnee river, upper.
Paradeep creeks.	Chota Brahmunnee.
Lamagole creek.	Noona river, upper part.
Moogrand river.	Pattakoond river.
Godakond river.	Mahanuddee river, upper.
Cojung creeks.	Kaloe river mouth.
Jotadur river.	Boronee river.
Mypurra river.	Bansghur river.

and several others too small to prove of any service.

Tidal Registers.—Tide registers at Davy, False Point and Dumrah are appended, as they may be interesting to those studying the tidal wave. The range at the Davy is six feet, at False Point eight feet, at the Dumrah ten feet, and at Balasore thirteen feet; on spring tides the range steadily increasing as you get to the northward.

I will now draw this report to a close, with a request that the Commissioner of Cuttack be supplied with a copy of it, and trusting it will meet with your approbation.

Tidal Register.—Plowden's Island, False Point, 1869.

Dates.	Time.	H. W.	Time.	L. W.	Range.	Mean level.	D	Remarks.
		Ft. Ins.		Ft. Ins.	Ft. Ins.	Ft. Ins.		
1st January ...	... ...	7 5	... ...	1 5	6 0	4 5	... ...	Ordinary N. E. monsoon weather.
2nd „				1 6	5 8	4 4	... ...	Ditto
3rd „ ...	... ...	7 2	... ...	1 8	5 3	4 3½	... ...	Ditto
4th „ ...	... ...	6 11	... ...	1 11	4 9	4 3½	... ...	Ditto
5th „ ...	... ...	6 8	... ...	2 2	4 2	4 3	... ...	Ditto
6th „ ...	... ...	6 4	... ...	2 6	4 0	4 6	... ...	Ditto
7th „ ...	... ...	6 6	... ...	2 9	3 11	4 8½	... ...	Ditto
8th „ ...	... ...	6 8	... ...	2 7	4 3	4 8½	... ...	Ditto
9th „ ...	... ...	6 10	... ...	2 6	4 5	4 8½	... ...	Ditto
10th „ ...	... ...	6 11	... ...	2 4	4 8	4 8	... ...	Ditto
11th „ ...	... ...	7 0	... ...	2 0	5 0	4 6	... ...	Ditto
12th „ ...	... ...	7 0	... ...	1 9	5 4	4 5	... ...	
	A M.		P M.					
13th „	8-15	7 2	3-15	1 6	5 8	4 4	Full	Ditto
14th „ ...	... ...	7 3	... ...	1 5	5 10	4 4	... ...	Ditto
15th „ ...	... ...	7 1	... ...	1 8	5 5	4 4½	... ...	Ditto
16th „ ...	... ...	7 0	... ...	1 11	5 1	4 5½	... ...	Ditto
17th „ ...	... ...	6 11	... ...	2 1	4 10	4 6	... ...	Ditto
18th „ ...	... ...	6 9	... ...	2 3	4 6	4 6	... ...	Ditto
19th „ ...	... ...	6 6	... ...	2 5	4 1	4 5½	... ...	Ditto
20th „ ...	... ...	6 3	... ...	2 6	3 9	4 4½	... ...	Ditto
21st „ ...	... ...	6 1	... ...	2 8	3 5	4 4½	... ...	Ditto
22nd „ ...	... ...	6 0	... ...	2 10	3 2	4 5	... ...	Ditto
23rd „ ...	... ...	6 1	... ...	2 11	3 2	4 6	... ...	Ditto
24th „ ...	... ...	6 2	... ...	2 9	3 5	4 5½	... ...	Ditto
25th „ ...	... ...	6 3	... ...	3 5	3 10	4 4	... ...	Ditto
26th „ ...	... ...	6 5	... ...	1 10	4 7	4 1½	... ...	
					Mean ...	4 5		

This gauge was the basis of all the reductions to low-water of the Orissa survey.

N. B.—The zero of this gauge is 10 feet 3 inches below sill of well on Dowdswell's Island.

Gauge still standing on N. E. point of island.

Tidal Register.—Plowden's Island Gauge.

Dates.	H. W.	L. W.	Range.	Mean level	D	Remarks.
	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.		
Sept. 25th, 1868 ...	6 2	5 4	0 10	5 9	... ...	Least range of tide ever observed here.
Nov. 14th „ ...	9 8	2 9	6 11	6 2½	... ...	Highest rise observed here. Wind east.
Aug. 9th, 1869 ...	9 5	1 6	7 11	5 5½	... ...	Greatest observed range at False Point.
Aug. 10th „ ...	9 5	1 6	7 11	5 5½	... ...	Tide fell to the lowest observed level.
Dec. 30th, 1868 ...	7 9	1 3	6 6	4 6	... ...	

The above shews a few of the peculiarities of the tides in the vicinity of False Point.

Tidal Register.—Off Bacood village, 1869.

Dates.	Time.	H. W.	Time.	L. W.	Range.	Mean level.	D	Remarks.
		Ft. Ins.		Ft. Ins	Ft. Ins.			
21st August ...	... ...	7 6	... ...	3 7	3 11	... ...	... ...	Ordinary weather.
	A.M.							
22nd " ...	10-15	7 8	... ...	3 7	4 1	... ...	Full	Ditto
23rd " ...	... ...	7 7	... ...	3 3	4 4	... ...	... ...	Ditto
24th " ...	... ...	7 5	... ...	3 0	4 5	... ...	... ...	Ditto
25th " ...	... ...	7 5	... ...	2 10	4 7	... ...	... ...	Ditto
26th " ...	... ...	7 5	... ...	3 2	4 3	... ...	... ...	Ditto
27th " ...	... ...	7 7	... ...	3 10	3 9	... ...	... ...	Ditto
	P.M.							
28th " ...	2-0	7 9	... ...	5 11	1 10	... ...	... ...	Strong fresh running down.
			A.M.					
29th " ...	... ...	7 10	9-0	6 9	1 1	... ...	... ...	Ditto
30th " ...	... ...	8 2	... ...	7 6	0 8	... ...	... ...	Ditto
31st " ...	... ...	8 3	... ...	8 1	0 2	... ...	... ...	Ditto
1st September ...	... ...	8 3	... ...	7 11	0 4	... ...	... ...	Ditto
2nd " ...	... ...	8 3	... ...	7 10	0 5	... ...	... ...	Ditto
3rd " ...	... ...	8 10	... ...	8 0	0 10	... ...	... ...	Ditto
4th " ...	... ...	9 1	... ...	8 0	1 1	... ...	... ...	Ditto
5th " ...	... ...	9 1	... ...	7 8	1 5	... ...	... ...	Ditto
6th " ...	... ...	8 9	... ...	6 6	2 3	... ...	New	Fresh taking off.
7th " ...	... ...	8 6	... ...	5 7	2 11	... ...	... ...	Ditto
8th " ...	... ...	8 4	... ...	5 1	3 3	... ...	... ...	Ditto
9th " ...	... ...	8 3	... ...	5 0	3 3	... ...	... ...	Ditto
10th " ...	... ...	7 10	... ...	5 1	2 9	... ...	... ...	Ditto
11th " ...	... ...	7 4	... ...	4 11	2 5	... ...	... ...	Ditto

This table shews influence of fresh on the tides.

Tidal Register.—Jumboo Godown Gauge, 1869.

Dates.	H. W. Time.	H. W. Day.	L. W. Day.	H. W. Night.	L. W. Night.	Range. Day.	Range. Night.	Difference.	Remarks.
		Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	
11th January ...	... ...	6 5	1 9	7 6	2 0	4 8	5 6	0 10	
12th " ...	... ...	6 6	1 7	7 8	1 11	4 11	5 9	0 10	Full moon.
13th " ...	A.M. 8-45	6 8	1 6	7 10	1 10	5 2	6 0	0 10	

This shews that, to obtain a correct knowledge of the tides, observations should be recorded day and night.

Tidal Register.—Davy River, 1870.

Dates.	Time.	H. W.	Time.	L. W.	Range.	Mean level.	D	Remarks.
	A.M.	Ft. Ins.	P.M.	Ft. Ins.	Ft. Ins.	Ft. Ins.		
1st January ...	9-30	6 8	3-15	2 1	4 7	4 4½	... ...	Ordinary N. E. monsoon.
2nd " ...	10-00	6 8	4-15	2 2	4 6	4 5	New	Ditto
3rd " ...	10-30	6 8	4-45	2 4	4 4	4 6	... ...	Ditto
4th " ...	11-22	6 9	5-30	2 5	4 4	4 7	... ...	
			A.M.					Ditto
5th " ...	11-45	6 7	6-00	2 7	4 0	4 7	... ...	
	P.M.							Ditto
6th " ...	0-45	6 4	6-37	2 10	3 6	4 7	... ...	Ditto
7th " ...	1-00	6 1	7-15	2 10	3 3	4 5½	... ...	Ditto
8th " ...	1-15	6 1	8-00	3 0	3 1	4 6½	... ...	Ditto
9th " ...	2-30	5 10	8-45	3 1	2 9	4 5½	... ...	Ditto
10th " ...	3-15	5 8	9-30	3 3	2 5	4 5½	1st qr.	Ditto
11th " ...	4-00	5 8	10-15	3 4	2 4	4 6	... ...	Fresh N. E. wind.
12th " ...	5-15	6 2	10-45	3 6	2 8	4 10	... ...	Ditto
13th " ...	5-45	6 5	Noon.	3 6	2 11	4 11½	... ...	
	A.M.		P.M.					Ordinary weather.
14th " ...	6-45	6 1	1-15	3 2	2 11	4 7½	... ...	Ditto
15th " ...	7-45	6 3	2-0	3 0	3 3	4 7½	... ...	Ditto
16th " ...	8-30	6 9	3-30	2 11	3 10	4 10	... ...	Total eclipse of D
17th " ...	9-15	7 2	4-00	2 8	4 6	4 11	Full	Fresh breeze.
18th " ...	9-45	7 3	4-30	2 6	4 9	4 10½	... ...	Ditto
19th " ...	10-30	7 4	5-00	2 6	4 10	4 11	... ...	Ditto
20th " ...	11-30	7 6	5-30	2 10	4 8	5 2	... ...	
			A.M.					Ditto
21st " ...	Noon	7 4	6-45	2 11	4 5	5 1½	... ...	
					Mean ...	4 8		

This gauge was a little below Nogoro.
N. B.—The zero of this gauge was 12 feet 8 inches below D. P. W., B. M., P. F., No. 30.
Gauge removed.

Office Note by Colonel F. H. Rundall, R.E., *Chief Engineer, Bengal, Irrigation Branch, on the*

Tidal Register.—Dumrah Gauge, 1870.

Dates.	Time.	H. W.	Time.	L. W.	Range.	Mean level.	D	Remarks.
	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.		
	A.M.		P.M.					
16th February ...	10-15	10 2	5-30	1 6	8 8	5 10	Full	Ordinary N. E. monsoon.
			A.M.					Ditto.
17th " ...	11-10	10 6	6-00	1 4	9 2	5 11	... ...	
18th " ...	Noon	10 2	6-45	1 3	8 11	5 8½	... ...	Ditto
	P.M.							Ditto
19th " ...	0-30	10 0	7-35	1 2	8 10	5 7	... ...	Ditto
20th " ...	1-30	10 0	8-15	1 6	8 6	5 9	... ...	Ditto
21st " ...	2-30	9 4	9-0	1 7	7 9	5 5½	... ...	Ditto
22nd " ...	3-0	8 8	9-30	2 4	6 4	5 6	... ...	Ditto
23rd " ...	3-30	8 0	10-15	2 6	5 6	5 3	Last qr.	Ditto
24th " ...	4-0	7 2	10-45	3 0	4 2	5 1	... ...	Ditto
25th " ...	5-0	6 10	11-15	3 2	3 8	5 0	... ...	
	A.M.		P.M.					Ditto
26th " ...	7-30	7 2	1-0	2 10	4 4	5 0	... ...	Ditto
27th " ...	8-30	7 9	2-0	2 5	5 4	5 1	... ...	Ditto
28th " ...	9-30	8 3	3-30	2 4	5 11	5 3½	... ...	Ditto
1st March ...	10-00	9 2	4-30	1 10	7 4	5 6	... ...	Ditto
2nd " ...	10-50	9 7	5-30	2 0	7 7	5 9½	New	

C. A. Harris,
Orissa Survey.

W. H.

Office Note by COLONEL F. H. RUNDALL, R.E., *Chief Engineer, Bengal, Irrigation Branch, on the report of the Orissa Coast and Tidal River Survey by* H. N. HARRIS, ESQ.

ON reading this report, I find a few points on which Mr. Harris has expressed an opinion different from what I have in other places recorded, and I therefore think it necessary to offer the following remarks.

2. I was told when last at False Point that a very decided change had taken place in the extension of Point Reddie, and in the formation of what was termed a second boat-bay. This change has, I believe, occurred since Mr. Harris's survey has commenced. This is quite in accordance with the changes that take place in similar localities; Point Godavery, which is precisely similarly situated, having extended 9 *miles* to the north in thirty years.

3. It is important to notice that with the extension of that point, the anchorage itself, owing to the silting up of Coconada Bay, has moved also to the north, and unless measures are taken to prevent it the same process will undoubtedly take place in the shifting of the anchorage at False Point. It is important that this fact is not lost sight of, as it has an essential bearing on the routes for boats from the interior and the ultimate permanent location of the sea-port town.

4. *Bakood Creek.*—This will form *one* of the routes into the interior, but I do not feel at all sure that it will "remain the principal means of communication," certainly not with the Kendrapara canal, although it may do so with the Taldundah canal, for this reason, that being a broad, open and deep river the ordinary boats of the country cannot venture on it during very high winds, and cannot make head against the strong current of the freshes between the months of June and October. Moreover, there is no tow-path, and it would be difficult to make one which would be effective at all times.

5. For this reason the Jumboo river route is *now* actually used in preference by the country craft. There is plenty of water for these boats from the canal to the anchorage at high tide, and during the freshes, of course, there is no want of water at any part of the twenty-four hours. The land is all cultivated to within four miles of the mouth, and therefore a tracking path is ready to hand, and boats can be easily towed back against the current. Moreover being narrow and sheltered it is quite safe for country boats. Mr. Harris's remarks are apparently made with reference to the navigable facilities of the two routes for *steamers*. The very reasons why Mr. Harris depreciates the Jumboo river route are those which make it valuable for *boat* traffic. He is evidently unaware that as soon as the trade to the port begins to be *large*, the means of conveyance *must* be by the ordinary boats of the country. The steamer which plies now (the *Teesta*) is for the purpose of assisting the traffic until it becomes firmly established, after which either private parties will start their own steamers and fit them for the routes along which they will ply, or else the trade will be carried on without the aid of steam.

6. Mr. Harris next observes—"The Jumboo or Canal Creek was surveyed in four sheets "and was found almost useless, there being several bars dry at low water. This route was "therefore abandoned." I presume Mr. Harris means "abandoned" by himself as a route for steamers; for, as said above, it is the route which is now pursued by the great proportion of the country boats.

7. With reference to Mr. Harris's observations that "the tidal locks of the Kendra- "parah canal are very unfortunately placed, a boat drawing four feet has to wait for high "water to get into them, owing to the shoals about here," I would point out that, in the first place, as *boats* only navigate tidal water *with* the tide they almost invariably reach the canal terminus at the top of high water or on the rising tide, and therefore the time of detention is reduced to a minimum; besides which, the terminus of the canal under any circumstances becomes a halting place, for boats *will* always wait for the tide. There was no use therefore in taking the canal beyond the limit which boats could reach by the tide, and when the terminus was fixed upon and the locks commenced there were no shoals which impeded navigation; these shoals can be remedied by groynes, and may possibly, in the next freshes, disappear.

8. Again, Mr. Harris is wrong in supposing that "the Taldundah canal will draw all "except a small local trade from the Kendraparah route."

9. The Taldundah canal will take all that comes to Cuttack from the *south*, but the traffic from the north and much from the Gurjats *vid* both the Mahanuddy and the Brahminee and Byturnee will take the Kendraparah canal. Already some of the Gurjat trade goes straight to the canal without touching at Cuttack.

10. Hence Mr. Harris's "conclusion that it would be waste of money to spend anything "on the Jumboo" is quite a wrong one. The bar at the Jumboo is just as easily improveable as the Bakood bar, and both should be carried out simultaneously, for neither will be expensive.

11. Similarly his recommendations "that no other work of improvement, such as "building golahs, &c., should be undertaken until this experiment has been tried" is entirely

a mistake, for the simple reason that the bar *is* practicable even now for the *Teesta* itself at three-quarter tide, and hence there is nothing to affect the interests of the port, whether the experiment of improving it is successful or not, any more than there is to affect Calcutta, because ships have to wait for the rise of tide over the various bars of the Hooghly. The point of greatest immediate importance is the creation of some facilities in the way of storing goods and shipping and landing cargo, together with a suitable port establishment. The removal of the bars is a very desirable work in itself, but is nevertheless more of an *improvement* than an absolute *necessity* at the outset of operations.

12. Though all the inferences which Mr. Harris has drawn from his recent labours are such as I cannot subscribe to, yet the surveys which he has so ably completed are exceedingly valuable, and I am sure he has well earned the commendation of the Government.

F. H. RUNDALL, *Colonel*, R.E.,
Chief Engineer, Bengal, Irrigation Branch.

The 10th June 1870.

a mistake, for the simple reason that the bar *is* practicable even now for the *Teesta* itself at three-quarter tide, and hence there is nothing to affect the interests of the port, whether the experiment of improving it is successful or not, any more than there is to affect Calcutta,

Form No. 42

DIARY No. 407

Master Attendant's 1870 Office.

FROM Offg Com: Secy to the Govt of Bengal

Dated 20th June No. 1785

Received 25th June 2 Enclosure

SUBJECT.

In reply to Dr. 2490 of 13th Ultimo: Requests to convey to Lieut. Harris an expression of the Lieut Governors thanks for the trouble & time by him in preparing the interesting Report of the operations of the Orissa Coast Survey from 1st Sept 68 to 30th April 70 - and that His Honor notices with satisfaction the services rendered by Lieut Harris Nickels and Barr in connection with the survey operations - Forwards for the use of this office Two printed Copies of the Report and of Colonel Rundall's note thereon

Ch. No. 33/8 dated 26th July

Returned by Public Works Department with Dr. No. 2490 of 13th Ultimo: Requests to convey to Lieut. Harris an expression of the Lieut Governors thanks for the trouble & time by him in preparing the interesting Report of the operations of the Orissa Coast Survey from 1st Sept 68 to 30th April 70 - and that His Honor notices with satisfaction the services rendered by Lieut Harris Nickels and Barr in connection with the survey operations - Forwards for the use of this office Two printed Copies of the Report and of Colonel Rundall's note thereon

Public Works Department

Proceedings of the Madras Govt

Read the following:-

From

The Master Attendant Administrative Department Madras through the Marine Department (H. E. Dr. 497 dated 26th June 1871)

Do Do (" " 516 " 28th Do)

District Engineer Presidency (" " 761 " 11th Sept 1871)

The first two letters above recorded announce the restoration of the Madras Pier, and its re-opening for general traffic from the 1st August; little more than 3 months from the date of the order authorizing the final resumption of the work - They also

but as I do not find that I do not think that there is any sufficient reason for dealing with him as proposed in this draft.

I would rather see him & understand that Govt do not consider that he has proceeded

record the services of the Pier Master Mr Sadler and the Pier Establishment under him, as the Executive Agency by means of which the Presidency District Engineer in cooperation with the Master Attendant was enabled to carry out the work successfully.

The third letter details the circumstances under which the work of restoration was for a month suspended, and the action of the usual Departmental Agency at the disposal of the District Engineer paralyzed.

It appears that Lieutenant Colonel Goddard, an officer whose Executive Zeal and efficiency are beyond doubt was completely laid aside during dangerous illness when the Pier repairs were first undertaken and that he was compelled to rely entirely upon the statements of his Assistant Mr Grainger the Superintendent of the Public Dock Yard Bombay and Store who was immediately answerable for the execution of the Repairs. On that officer's report,

[illegible] with satisfactory explanation of the [illegible] pounds [illegible] [illegible] [illegible] upon which he recommended the suspension of the works: - that such suspension is now proved to have been wholly unnecessary: and that the Govt must refuse [illegible] reimbursement of the sum expended by the Govt of India.

He should be held responsible for any loss or damage occasioned by delay or by desire for economy beyond what was prudent. He must be guided by the Master Attendant in the letter of the Government of the Presidency against suspension of the works. But he must not attempt matters, or go any more than I suggested above.

report entirely and unhesitatingly adopted by Lieutenant Colonel Goddard, though (now it appears) in the face of successful action by Mr Sadler and strong protest by the Master Attendant, work was stopped until after further inquiry and report by the Committee who originally reported on its feasibility; with whom the Inspecting Engineer for Ports and Communications was then associated. They did not report in detail on Mr Grainger's evidence in support of

Lt. Goddard was not only disallowed by illness, but (as it appears) made known his illness to the Head of his Department: and it was impossible to submit any one to the test in his stead. Under these circumstances I do not see any reason for not referring the terms of his contract: but every reason for doing what can be done to deter public officers from injuring the public service by disgraceful self-indulgence.

I quite agree in all that is said in this Draft in commendation of the conduct of the Pier & successful completion of the Pier is due.

27/73

I see 3 months, but no months pay,

I concur with Lt Goddard and think this letter does not exhibit his

J.O.L.

of his reasons for stopping the work, but simply set them aside as unsatisfactory: and he has now failed, when called on, to shew sufficient cause for the action he took in the matter.

His Excellency the Governor in Council cannot but attribute it to a spirit of factious opposition to the restoration of the Iron Pier from first to last, which led him in the first instance recklessly to disregard the remonstrances of the Pier Committee against

against his excessive rates for labour and contingencies; and threw on the Government the responsibility of reducing his estimate of Civil outlay by such a sum as to bring it within an amount commensurate with their resources and the value of the work. Such spirit of opposition further manifesting itself in ~~and~~ jealousy of the Agency associated with him in the work to an extent which overcame all regard for the interests of the Government and the public and for the credit of his own profession. An officer capable of taking such a low view of his responsibilities cannot be tolerated in the position held by Mr. Grainger, and the Chief Engineer is directed to call on District Engineers to report what officers under their orders may be known by them as competent for charge of the Workshop and Stores at the Presidency. Failing satisfactory reports of such the Govt. of India will be requested to

to provide a successor
to Mr. Grainger, who will
revert to ordinary
District duty on relief.
The Foreman Mr Harris
having been reported
as unreliable owing
to habitual excessive
indulgence in drink
is liable by the terms
of his contract to
immediate discharge
and fine of one years
salary: but in con-
sideration of his in-
capacity, which must
have been well known
having been long tolerated
His Excellency the
Governor in Council
is pleased to permit
of a free passage
being

being found for him
to England by as early
an opportunity as pos-
sible after the 30th
September on which
date his engagement
will cease and
terminate.

It is with pleasure
that the Governor in
Council turns to ap-
plaud the hearty
zeal with which Mr.
Ladder placed all his
practical skill and
resources at the dis-
posal of Government,
and with his worthy
Boatswains and Crew,
achieved the work on
which he had set
his heart; regardless

of the peculiar heat of the season and of the amount of responsibility involved under the circumstances. Mr. Dalrymple is congratulated on the success that has attended his subordinates efforts to which he has given every encouragement; and the Government are indebted thinn for the cordial cooperation without which their orders could not have been carried out. He is authorized to present to each of the persons named in his Report

two months Salary, as a reward for their exemplary behaviour.

The statements which accompanied the District Engineers Report will be forwarded to the Inspecting Engineer for Porto and communications; who is directed to lay before the Government clear statements of the expenditure of cash and of stores already paid for, on the work already sanctioned and completed in the past and current official years

years. It will then be considered what further steps shall be taken towards the execution of the further measures proposed by the Committee for protecting and strengthening the Pier. Meanwhile these Gentlemen will accept the cordial thanks of His Excellency the Governor in Council for their most useful advice and patient consideration of the subject laid before them.

Gmw

I have examined these papers with great care and certify [illegible] in the draft as respects the satisfaction with which the Government may [illegible] receive the communication that the Madras Pier has been restored with remarkable [illegible] expedition at a very moderate cost.

I think that the Pier Committee deserve the special thanks of the Government for their sound judgment displayed [illegible] system from beginning to end & Mr Dalrymples [illegible] for his ability

chief and untiring care with which he has superintended this successful work and encouraged the establishment at his disposal. To the practical skill and experience and personal devotion and energy of Mr. Sadler — and to the efficient subordinates named in Mr. Dalrymple's letter dated 28th August — the Government is exceptionally indebted for the happy results. I would willingly see the bonus, which it is proposed shall be given Each in recognition of good service, raised to 3 months' salary Each — in all Rs 1791.

But I am quite unable

unable to gather from the papers any sufficient reason for the very severe animadversion, disgrace and punishment proposed (in the draft) to be inflicted on Mr. Grainger the Superintendent of the Workshops D.P.W. The action proposed to be taken could scarcely be deemed had he stood convicted of moral turpitude and will be felt as a terrible degradation. I should think.

The papers show that he has been an unsuccessful man and that his incapacity resulted in the practical transfer of the duty and credit of promptly Restoring the Pier from the D.P.W. — in which he has practically held a high reputation as respects his own Specialty — to the Harbour and now professional Department

Department - But there
is no Evidence whatever
or kind of "factions
opposition to the restoration
of the Pier".

So far as the papers
show, his large Estimate
- though found far more
than was requisite by
practical men - admit
of fair explanation with
reference to past experience.
Mr. Grainger prepared
the original Estimates
for the Pier signed by
Mr. Black as I gather
from the papers - Mr. Grainger
appears to have done his
best - with the assistance
(or not) of an intemperate
European who had been sent
out from England - to carry
out the work entrusted to

6

him - The result of
his experience in the
work was Endurance
difficulty and a cost
that threatened to swallow
up a sum far beyond
the probable Estimate -
he had prepared - And
a clerk became his
duty to represent his
views to his superior
officer and through him
to Government.

His representations
were endorsed by
Colonel Goddard and
he could not allow this
officer to get rid of the
responsibility of doing
so without satisfying
himself that he was
properly advising Government
If ill or sick he attended his
duties, he ought to have
let Government know
that

that that was the case;
and under the circumstances
Colonel Goddard's letter
was unjustifiable. I
cannot endorse the
almost laudatory manner
in which the draft would
deal with the Officers. It seems to me that an ineffective Officer was allowed to be doing but nominal duty?

The action of Government
was natural. The work
was temporarily suspended
pending reference to the
Pier Committee, whose
recommendation Government
to authorize the
prosecution of the work
under non professional
Superintendents & Engineers

Mr Grainger had not
of course given sufficient
credit for the example
set him at the Storehouse
of the Sapi & want of
appreciation, not unnatural
in a professional man;
but I do not see that
he

he could have acted
otherwise than represented
his experienced difficulties
and natural — though as the
Event has shown Exaggerated —
fears. Mr Grainger Commits
a grave error of judgment,
should Executive incapacity for the work,
but there is no Evidence
to show that he was either
obstructive or acting
otherwise than to the best
of his judgment and in
Entire good faith. His
Explanation is frank
and reasonable and may
be accepted.

But Mr Grainger
appears to me to have
been placed in Circum-
stances of great embarrass-
Whatever he may have
been as Pier Engineer
at Singapore, as this office
he has for 2 years been
a Storekeeper and
Measurer of Engineers
&c

he was deprived of the personal aid of the Assistant Engineer Colonel Goddard and had a difficult task under any circumstances to perform and I think that the real error he has been employed at all on a work for which it is clear he had not the capacity or experience.

I think that the proper course to be observed is to dispense with his services. I much regret for his want of judgment and future as he has employed him beyond the scope of his special abilities. The State has lost nothing by Mr Granger's failure

I think that it would be wrong to remove him from his proper duties at present under the possible contingency of having to apply to the Government of India for a mechanical Engineer to supply his place

25/9

2720 Proceedings

No 2720

Public Works Departt

Proceedings of the Madras Government

Read the following:-

From,

The Master Attendant Administrative Departt Madras through the Marine Departt } (M.E. No 4954 dated 26th Aug 1873.

" do do do. (" " " 5316 " 28th " do.

" District Engineer Presidency } (" " " 2761 " 11th Sept 1873)

Section No 5018

No 2720

The first two letters above recorded announce the restoration of the Madras Pier, and its re-opening for general traffic from the 1st August; little more than three months from the date of the order authorizing the final execution of the work. They also record the services of

of the Pier Master Mr. Sadler, and the Pier Establishment under him, as the Executive Agency by means of which the Presidency District Engineer in co-operation with the Master Attendant, was enabled to carry out the work successfully.

The third letter details the circumstances under which the work of restoration was for a months suspended, and the action of the usual Departmental Agency at the disposal of the District Engineer paralyzed.

2- It appears that Lieutenant Colonel Goddard, was completely laid aside by dangerous illness when the Pier repairs were first undertaken; and that he was compelled to rely entirely upon the statements of his Assistant Mr. Grainger the Superintendent of the Public Boats Workshops and Stores, who was immediately answerable for the execution of the repairs. On that officers report entirely and unhesitatingly adopted by Lieutenant Colonel Goddard, though (now it appears) in the face of successful action by Mr. Sadler, and strong protest by the Master Attendant, work was stopped until after further enquiry and report

report by the Committee who originally reported on its feasibility; with whom the Inspecting Engineer for Ports and Communications was then associated. They did not report in detail on Mr. Grainger's evidence in support of his reasons for stopping the work but simply set them aside as unsatisfactory.

3. His Excellency the Governor-in-Council regrets to record his opinion that Mr. Grainger has failed to furnish a satisfactory explanation of the grounds upon which he recommended the suspension of the work &c. Such

such suspension to have proved to have been wholly unnecessary; and the Government must express their extreme disapproval of the course adopted by Mr. Grainger in this respect. He has been unfortunate in the Foreman working under him, but he must long have been cognizant of his habits, and is to blame for having tolerated them. Mr. Harris having been reported as unreliable owing to habitual excessive indulgence in drink the District Engineer will proceed to enforce the terms of his

his contract by which he is liable to immediate discharge, and fine of one year's salary.

4. It is with pleasure that the Governor in Council turns to applaud the hearty zeal with which Mr. Sadler placed all his practical skill and resources at the disposal of Government; and with his worthy Boatswain and Crew achieved the work on which he had set his heart; regardless of the peculiar heat of the season and of the amount of responsibility involved under the

the circumstances. His Excellency Dalrymple is congratulated on the success that has attended his subordinates efforts, to which he has given every encouragement; and the Government are indebted to him for the cordial cooperation without which their orders could not have been carried out. He is authorized to present to each of the persons named in his Report three months salary, as a reward for their exemplary behaviour.

The statements which accompanied the

the District Engineer's Report will be forwarded to the Inspecting Engineer for Ports and Communications; who is directed to lay before the Government clear statements of the expenditure of cash and of stores already paid for, on the work already sanctioned and completed, in the past and current official years. It will then be considered what steps shall be taken towards the execution of the further measures proposed by the Committee for protecting and

and strengthening the Pier. Meanwhile these Gentlemen will accept the cordial thanks of His Excellency the Governor in Council for their most useful advice, and patient consideration of the subject laid before them.

G.W.W.

45
6

D.E. Residency
4 Engs for Ports & Comms with 3 Subs each
Master Attendant Karachi
Port Committee
Custom
Marine Dept

D.C. dated 14/11/75

3 Copies sent to P. Dept 13-10-75

F. 5012, 5874 & 5875

Rept. of {1873} Madras.

PUBLIC WORKS.

To The District Engineer
Pamban

Encl. 2

G. O. 7 Nov. No. 2720.

Nos. 94-95-96 & 97

Rail Pier. Papers

Orders on reports on
Completion of the
Repair of the Pier
The Services rendered
the Working Establ.