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(2) Date of repair _____

(3) Initials of the Referencer _____

MADRAS RECORD OFFICE.

Government of Madras.

Public works DEPARTMENT.

G.O. No. 744	Press Mis-
319-22	
Dated 13. 3. 1871.	

Not to be folded or roughly handled

[Signature]

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*Proceedings of the Madras Government, Public Works Department,
13th March 1871.*

Read the following papers :—

No. 319. From the Acting Superintending Engineer, 1st Division, to the Secretary to Government, Public Works Department, dated Dowlaiswaram, 20th January 1871, No. 3,563.

With reference to G. O. of the 24th November 1870, No. 2,834, I have the honour to forward a design of a boat adapted for the engines of the "Frank and Ada," and suitable for river navigation, together with an estimate, amounting to

- 1 Plan.
- 1 Estimate.
- 1 Specification.

Rupees 15,000, for carrying out the design. It is estimated we can sell the hull of the "Frank and Ada" for Rupees 7,000, so that the probable outlay on this account will be only Rupees 8,000.

2. At 2 feet draught of water I calculate the new boat would displace about 70 tons of water, her total weight, with machinery, fuel, and crew, would be under 50 tons, so that she would then be drawing less than 18 inches of water. The only alteration required is to reef the floats of the paddles 6 inches lower, and this can be done without any difficulty; in all other respects the machinery, etc., remains unaltered.

3. In my letter printed with the G. O. above referred to, I find I had noted these engines were 40-horse power nominal, and so they appear to be entered in the records here, but this, I think, must be an error; the cylinders are only 18 inches diameter and the stroke $4\frac{1}{2}$ feet, hence, from Bournes' tables, the nominal horse power would be only 22, or about that figure, and this, I believe, is really the case.

4. Adverting to paragraph 2 of this G. O., I beg to observe the engines of the "Fred and May" can hardly deteriorate more than they are doing by lying idle; in fact, the late trials made with her by the Chief Engineer for Irrigation showed the engines to be in any thing but a satisfactory condition, and I cannot but think that if she were used in the harbour under careful supervision her machinery would be far better preserved.

5. A tug in Cocanada harbour would not only be of the greatest use in towing vessels requiring repairs in and out of Coringa, and in assisting cargo and passenger boats, but she would be of great use to any of the large ships now frequenting the port, in towing them out after they had taken in their freight. At present, on account of the numbers of small craft in the harbour, a large ship has to anchor out in such a position that, when her freight is on board and she heaves her anchor, she may have room enough to work in to get out of the bay; if she came further into the harbour for the convenience of loading and unloading she would run the risk of being detained by the weather, until a fair wind gave her the chance to run out; now, with a tug available, these serious drawbacks and inconveniences to the port could be at once done away with, and as the mercantile community would benefit largely by the measure, I have no doubt we could easily earn enough, at least to keep the steamer from deteriorating by idleness.

No. 320. From the same Officer, dated Dowlaiswaram, 6th February 1871, No. 3,730.

With reference to paragraph 3 of my letter, No. 3,563, dated 20th January 1871, I beg to observe there was a mistake made in giving me the dimensions of

the cylinders of the "Frank and Ada" steam engines. These are 24 inches, and not 18 inches as stated by me, and the engines consequently are 40-horse power as before described.

No. 23.

No. 321.

Note by the Chief Engineer for Irrigation.

I THINK the condition of the steam plant, whether intended for use in the river and canals, or at Cocanada, together with the measures to be taken for maintaining it in proper and serviceable order needs consideration. I have lately examined nearly the whole of it, and I regret to be obliged to say that its state is for the most part the reverse of efficient, and that it is a discredit to the Government to which it belongs.

2. At Dowlaisweram, the Government vessels should be an example to the owners of the many hundreds of boats which ply on the canals, and the recent authority given to the Superintending Engineer, by no means before it was wanted, to insist upon passenger boats being clean and efficient is inconsistent with the state of the Government boats.

At Cocanada the steamers, steam dredges, and punts look extremely disreputable, and one could not but feel ashamed to have anything to do with them. They represent waste of money, and either a great mistake was made in their purchase, and the work which they were obtained to perform was unnecessary or, if necessary, it has for too long been left undone. As matters stand, or are progressing, at present, by the time Cocanada harbour improvements and river maintenance again attract sufficient attention to secure funds, the plant which was obtained to carry them out will have ceased to exist. The course followed at Cocanada is not the only case where action has ceased at the time when the means of carrying out improvements had just been procured. At Negapatam steam dredges, punts, and coal were provided, and after that not a day's useful work was done. I write plainly because I feel sure that the Government desire earnestly to prevent waste, and to secure efficiency, and this would not be possible were officers, who move about the country and see, and examine into, what is going on, not to report faithfully, and thus place the Government in a position to deal with facts as they exist.

3. COCANADA PLANT. *Tug steamers.*—Three* of these were sent out from England some years ago, at a time when more extensive improvements of the Cocanada harbour than are now perhaps ever likely to be carried out, were in contemplation. One, the "Godavery," was subsequently sent to Pamban, and was returned in a state, as regards the hull and boiler, which will prevent the vessel ever being of any use again. The engines are apparently in good order, at least they are kept clean and are preserved as well as they can be when steam cannot be got up. It is useless to keep a vessel in such a state, and she cannot be sent elsewhere as she is altogether unseaworthy. I would recommend therefore that she be offered for sale by auction, first with her engines at an upset price a little in excess of the value of the latter, and if not thus disposed of that she be sold outright without the engines, which latter can be taken by

* Length, 91 feet.

Beam, 16 feet, over all 23 feet.

Engines 40-horse power, condensing, with oscillating cylinders.

"Godavery."

canal to Dowlaisweram, and there preserved. Probably the engines are worth 8,000 to 10,000 Rupees; it might be well to take 7,500 Rupees for the vessel as she is, if that sum can be obtained. A sister vessel is valued in the books at Rupees 38,060. The "Fred and May," another of these steamers, is also at Cocanada.

"Fred and May."

It is but seldom that she is used, and she is daily deteriorating, though a comparatively moderate expenditure would prevent this. The hull wants scraping and painting, and the superstructure and fittings generally are in bad order and require thorough overhauling. The boiler has deteriorated a good deal, but it is still capable of some years' work if used occasionally, and properly cleaned and taken care of. The engines are in very good order, except as regards packing of glands, air pump, etc., which cannot be kept in order when out of work. Steam was got up two or three times while I was at Cocanada: at first the engines could hardly be got to work, but afterwards they went fairly, though hardly half the proper power could be developed. The steamer is handy and well adapted to the work for which she was intended, namely, the towing of the dredge punts out to beyond the harbour. I was informed that the necessary repairs had been estimated for, and that 600 Rupees are needed to render her efficient.

Steam Dredge No. 1.—There are two steam dredges, No. 1 requires only such repairs as are represented by an estimate of Rupees 480. The engines have been taken care of; the boiler has suffered from drip from the deck, owing to deterioration of the cover. Paint is the most pressing necessity, and without it deterioration of iron and wood work will be rapid.

Dredge No. 2.—Steam Dredge No. 2 has no boiler, but I was told that one had been indented for. The hull is greatly in need of scraping and painting, and minor repairs. Such are unavoidable without great waste of money, whether in or out of work. Rupees 400 should be sanctioned for urgent repairs. Were it not

Cocanada Lattice Bridge.

that the iron lattice bridge across the river is so low, all this plant might be kept in fresh water, in a dock which could be constructed at a small expense near the Cavour lock and be filled from the canal. Perhaps it might still be practicable to construct a movable bay to that bridge, which, apart from such considerations as those referred to, is a very great nuisance to the navigation, and the best excuse that I have heard a lance for its construction at its present level is that it is much better than the old bridge which it replaced.

Dredge Punts.—There are twelve of these. One has deteriorated too much to admit of repair, and the remaining eleven require an outlay of Rupees 400 each to put them in proper order. The number repairable will rapidly diminish if they are not put to rights without delay. I have pointed out that these punts should never be left in salt water when they are not required for use at Cocanada. They are too heavy to be profitably employed generally on delta work, but they should be taken up to Dowlaisweram for repairs, and thereafter they should be kept in fresh water until required on the coast; and then, as soon as done with, they should be returned to fresh water. The cost of transfer should be charged to repairs of tools and plant, and their up-keep will then cost but a fraction of what would be necessary if they be allowed to lie at Cocanada.

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4. PLANT AT DENLAISHWERAM.—Belonging to Cocanada, but for some time past laid up at Denlaishweram, is the "Frank and Ada," a sister vessel to the

steam tugs already noticed. Her iron is in better order from her having been kept in fresh water; she has a new boiler which has not yet been fixed, but this should be attended to; the engines are believed to be in good order. I was told that about five years ago she went about 24 miles up the river to bring down stone for raising the anicut, but for a long time past she has not been used at all. This steamer was not built for, and is not adapted for river navigation. She has a high free board; when ballasted to a proper load she draws too much water, and for ordinary work her engines of 40 horse power cost too much for fuel. It is not likely that she will be of more use on the river in the future than she has been in the past; her wood work and fittings are much in need of repair, and the iron work requires to be painted. I think it will be well to dispose of her if a purchaser can be found, but, so long as she is retained by Government, provision should be made for her upkeep. Her value on the books is Rs. 35,000, and she is probably worth not less than 30,000 Rupees. The Superintendent Engineer has asked for sanction for the construction of a new hull for a river steamer, and to transfer the engines of the "Frank and Ada" thereto. Major Fincher thinks that the hull of the latter, without the engines, might be sold at a fair price for use as a sailing vessel. There appear to me to be several objections to this proposition. In the first place if engines of this class were suitable for a river boat there would be those of the "Godavery" available, and under such circumstances it could hardly be good economy to dismantle the "Frank and Ada." It is my impression that were the "Fred and May" made available on reasonable terms for facilitating the trade of the port of Cocanada, it would not be long before the Government would be able to sell one of these vessels at a fair price. The experiment will at any rate cost nothing, but rather the reverse. A supply of coal would be needed, as wood alone will not do for fuel; perhaps half wood and half coal would do. The question as to whether another river steamer is wanted will be referred to after noticing the steamers of this class which are at present available.

5. FUND REVENUE FOR HARBOUR PLANT.—For preserving the harbour plant a present grant of for the

"Godavery"	Rs. 150
"Fred and May"	600
"Frank and Ada"	450
Steam Dredge No. 1	450
Do. do. No. 2	450
11 Puntas	4,000
Total Rs.	6,100

is required. I have entered a small sum for the "Godavery," merely to preserve the engines and a few of the fittings. For each steamer at least 200 Rupees annually would be needed, and a like sum for each steam dredge; 150 Rupees each would suffice for the puntas when out of work. Of course, when regular work is going on, all charges could be met from the allotments for that work; but, on the whole, I believe that it is better to ensure the regular upkeep of all such plant by

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special annual allotments, as otherwise all the funds available might and, probably would, be worked out leaving the vessels and their machinery in a dilapidated condition.

6. RIVER PLANT, STEAMERS.—There are three river steamers belonging to the Godavery Delta, namely, the

"Little Nell."
"Pioneer."
"Thistle."

The two first are sister vessels. To enable them to get through the locks their paddle floats are very short, and in this way a good deal of power is lost. The "Little Nell" has good cabin accommodation, and she in consequence earns a good deal of money by being hired. She requires a new boiler, though I understand that the present one is but twelve years old, and she has been under steam but a small part of that time. It has been deemed necessary to put stops on the safety valve levers to prevent the pressure exceeding 50lbs., and with this, with short floats, and with engines out of order, she is not of much use. On the Samulcotta canal, which is almost still-water, she averages 4 to 4½ miles an hour. The engines require a thorough overhauling and putting to rights; her funnel is worn through from bottom to top, and hull and wood work want complete re-painting, and in all probability some of her plates will require to be replaced. With a boiler capable of supplying steam at 75lbs., and with engines in proper order, this vessel would, I think, be very efficient.

The "Pioneer" requires a new boiler, otherwise she needs a somewhat less outlay on general repairs than the "Little Nell," and re-painting is one of the most important.

The two vessels above mentioned can navigate the Godavery above the anicut so long as there are not more than 5 or 6 feet of water going over the crest. The "Thistle" is a vessel of a different class; she has longer paddles and is more powerful, and she can be used until the river rises to 9 feet on the crest of the anicut. She cannot pass through the head locks, and she is therefore used only on the river. If thoroughly repaired she would do very well. She requires a new boiler; the bed plate of the engine on the larboard side was broken some years ago and patched, it is very weak, and gives at every stroke of the piston, and the result has been great wear and tear. A new bed plate and new cylinders are needed, and the latter have been cast.

7. STEAMER CREWS.—Want of funds has prevented the maintenance of crews for these steamers. One full crew is maintained, and if two steamers are in use at the same time, this is divided, and boat lascars are used to make up the number required. There should be an engine-man for each steamer, for unless one man has charge of, and is responsible for, the good order of the engines, it must be impracticable to make the most of them. When the steamers are not in use, and when there is nothing required to be done to the engines, the engine-driver can always be employed in the shops, and so his time need not be wasted. I attribute much of the want of efficiency of the engines to the arrangements which want of funds have necessitated; they all rattle greatly, and the packing of the pistons, glands, etc., looseness of framing, and other slight, but important, matters are the

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natural result of there being no one who can be required constantly and regularly to attend to such points.

8. PAST EXPENDITURE AND ESTIMATE OF PRESENT AND ANNUAL REQUIREMENTS.—
The expenditure on these steamers from 1862-63 up to the 30th November 1870, or for 8½ years, has been on the average per annum as follows:—

"Little Nell"	Rs.	
"Pioneer"	417	
"Thistle"	365	
The present requirements are—	629	
"LITTLE NELL."—Repairing and refitting engine ...	300	
New plates	200	
Scraping and painting	95	
Docking	50	
"PIONEER."—Repairing and refitting engine ...	300	615
One new cylinder	100	
Scraping and painting	95	
Docking	50	
"THISTLE."—Two new cylinders	200	515
Repairing and refitting machinery with slide blocks and new bed frames ...	150	
Repairing hull	125	
Painting	95	
Docking	50	
	620	
Annual requirements—		Total present requirements ... 1,810
"LITTLE NELL."—Sundry repairs	225	
Painting	95	
Docking twice a year	100	
Engine-driver, at 15 Rupees	150	
"PIONEER."—		
Do.	600	
do.	600	
"THISTLE."—Sundry repairs	1,200	
Painting	250	
Docking twice	95	
Engine-driver	100	
	150	
	625	
	1,825	

With this provision the steamers can be placed in proper order, and I would recommend, therefore, that Rupees 1,810 be granted under tools and plant for their immediate repair, and that annual grants for the three steamers be made as shown.

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9. CURRENT CHARGES FOR CREW AND FUEL, ETC.—The engine-drivers should be permanently attached to the several steamers, the rest of the crews, including the syrangs, should be entertained as required, and their cost, together with that of the fuel, should be charged to the work or service which they may perform. I have ascertained that with the aid I have recommended to be given in the shape of specific grants, and the amount is, I think, moderate, all other expenses can be met without difficulty by a change in the rates of charge, which has been rendered necessary in a great measure by the enhanced cost of fuel. Hitherto the charge for a steamer per day has been 15 Rupees when hired by any Government officer on duty, and Rupees 25 when engaged for private purposes; but from enquiries made I am of opinion that Rupees 25 are as little as should be charged, and I think, moreover, that while officers on duty should have the first claim to the use of the steamers, there should be no difference in the charge made to them and to others. It has also been customary to take officers to the heads of the several deltas free of charge, and the expense has been considerable. The cost of sending a special steamer to Vizeshweram is about 7½ Rupees, and to Bobber Lunka perhaps 5 Rupees, even when there is no delay. If Government sanction the allotments above recommended, I would allow the practice to be continued, on the condition however that officers ordering the steamers be required to pay for their detention under steam for more than half an hour, at the rate of 2½ Rupees an hour. It takes from one to two hours, according to the state of the river, and consequently the distance to be traversed, to steam from the one side to the other. Range boats, without the aid of a steamer, cannot go across at all on the line the steamers take, but they must go several miles up the river and then drop down on the other side. If some portion of the cost of maintaining the steamers be not specially provided for, free passages must be given up and, unless the charges be allowed to be entered as extras in the travelling allowance bills, no doubt the steamers will be but little used for this purpose, and officers will waste several hours on the long passage.

10. NUMBER OF STEAMERS REQUIRED.—The principal work that the steamers have to perform is the towing of boats, containing stone and other materials for the Centre and Western Deltas, across the river. From a statement prepared in abstract for me by the Executive Engineer I find that, exclusive of Sundays, the time of these steamers was from April 1869 to March 1870 disposed of as follows:—

"Little Nell" ...	Worked 80 days.	Idle 180* days.
* April and May 1869 not given.	"Pioneer"	163 " " 149 "
† May 1869	do. "Thistle"	138 " " 147† "

This shows that there is not regular work for three steamers, and enquiries made at Dowlaishweram confirm this opinion. When the steamers have been properly repaired, the "Pioneer" might be transferred to the Kistna, where probably one steamer might frequently be usefully employed. Should this not be the case, one engine-driver might be dispensed with. Two efficient steamers would not only suffice for all the work that is at present done in this way at Dowlaishweram and on the canals, but were their power sufficient they would do a great deal more, for no canal is more suitable for steam traffic than that between the Godavery and the Kistna rivers, it having but one lock in a distance of 90 miles, a very moderate current,

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and a very considerable traffic both in goods and passengers. The steamers we have are, compared with what might be obtained, failures. I do not recommend the designing and construction of a more powerful steamer at Dowlaiswaram, because steamers with side paddles are out of date, and not adapted to canals with locks, and the designing of a canal and river steamer, and especially one of a new kind, requires more skill than is there available. Moreover, condensing engines are not convenient for small boats, nor would engines designed for side-paddles do for a different arrangement. The choice must be between stern-paddles and twin screws, and probably the latter would be the best, because the engines can be placed nearly amidships and the weights would thus be better distributed; the overhanging wheels of the stern-paddles and the engines at the very end of the boat make it necessary to place the boiler at the other end, and this is not a convenient arrangement. I hope that ere long a twin-screw steamer, not exceeding 101 feet in length, and with about 14 feet beam, will be ordered from some firm in England accustomed to construct river boats, as I am sure that one capable of doing more work than the three which the Government possess could be constructed without difficulty. I may add that I have seen at Cuttack two small steamers with twin screws, which, though built of heavy plate for use as gunboats during the mutiny, are handier and better in all respects and able to do more than anything we have in this Presidency.

11. CANAL STEAM DREDGES.—One of these dredges has had in the past year extensive repairs executed from Agricultural Repair Funds, and certainly this arrangement is very much better than allowing them to get out of repair and unserviceable. It seems necessary to notice, however, that they are used almost entirely in the interest of navigation, that properly therefore the cost of the work done by them and of their repairs is debitable to Communications, and that as a surplus income is derived from boat licences, over and above the cost of navigation establishments, there appears to be no reason why budget provision should not be made under "Repairs, Communications," for these dredges.

12. I see that on a former occasion, G. O., 24th November last, No. 2,831, the Government were not disposed to sanction the Superintending Engineer's proposition, that one of the tugs should be employed at Cocanada Harbour in aid of the trade at that place, because it was thought that its condition would be deteriorated by being so employed.

Major Fischer has in his later letter* again advocated this arrangement, and it is so satisfactory to see a valuable plant lying idle, as I simply rotting away, that I hope, if the steamers be retained, they will be made available for any work which can be found for them to do, always supposing that, if merchants or others want them, such charges be made as will cover all expenses during the time they are so employed. I believe that, in this way, they will not suffer more than they now do from neglect, and that perhaps means will thus be obtained of keeping at least one steamer in repair and in good working order. There are two ways in which the proposed arrangement might be carried out. I have already mentioned that probably half coal and half wood will enable steam to be maintained in the

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boilers of these tugs at a proper pressure, and I would instruct the Superintending Engineer to draw up a memorandum, showing in detail the cost per day of working, say, the "Fred and May," which is now lying at Cocanada. This cost will include.

- 1st.—The pay of the Syrang, who is already regularly employed.
- 2nd.—That of the engine-driver, who might receive, I think, Rupees 25 per mensem
- 3rd.—That of the rest of the crew, fireman, etc.
- 4th.—Fuel for ten hours.
- 5th.—Deterioration of engines and boiler at 15 per cent. per annum.
- 6th.—Deterioration of hull at 10 per cent. per annum.
- 7th.—Deterioration of ropes and small gear at 200 per cent. per annum.
- 8th.—Cost of painting and docking twice a year.
- 9th.—Sundries, such as oil for machinery, material for packing the glands, renewing rubber, valves of air pumps, etc.

10th.—A per-centage on the whole of the above.

I may here mention that the spare rubbers require to be kept in some liquid, which will enable them to retain their elasticity. This might probably easily be managed. The charges thus ascertained would be those to be made for the use of the steamer for one day, and supposing this to be A rupees, the proportionate charge for any less number (x) of hours than 10, might be $\frac{x}{10}A$. It will be noticed that I do not suppose the steamer can be worked in this way so as to make a clear profit, but I hope that it may be used sufficiently frequently to keep everything in good order at an outlay, on the part of Government, not exceeding that which would be needed for mere painting, which arrangement would entail considerable expenditure, whenever the steamer happened to be required for Government work, before that work could be efficiently performed. The steamer is at present in charge of the Executive Engineer, Eastern and Central Deltas, and this officer might be authorized to notify to the merchants at Cocanada on what terms the steamer can be hired for towing cargo boats or ships, and, so long as the demand is only occasional, this would probably be the best arrangement. If however there should be tolerably constant work in connection with the trade of the port, the Marine Department might desire to have one of the steamers, and to work it under the orders of the Master Attendant.

13. Care should be taken that the tug steamers are properly ballasted when in use. The "Fred and May" was, when I saw her, at least one foot too high out of the water.

FORT SAINT GEORGE.
4th February 1871.

(Signed) J. MULLINS, Major, R.E.,
Chief Engineer for Irrigation.

No. 322.

ORDER THEREON, 13th March 1871, No. 744.

CIVIL WORKS, No. 14.

O., No. 2,831, of the 24th November last, submitted a design and estimate* for the hull of a new steamer for river work, to be engined by dismantling the "Frank

*Rupees 15,000.

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and Ada," a harbour tug now lying at Dowlaishweram, the Chief Engineer for Irrigation, who has recently visited the Godavery Delta and inspected the steam plant belonging to Government, has submitted a note in which he describes the present condition of the steamers, etc., and suggests measures for ensuring their being kept in efficient working order.

2. Taking first the subject of the Superintending Engineer's letter, the Chief Engineer is averse to the sanction of the estimate for the steamer designed by Major Fischer, and to the transfer to it of the machinery of the "Frank and Ada."

1stly.—Because this steamer would measure 28 feet over the paddle-beat, and could not therefore be passed through even the first class locks.

2ndly.—The "Frank and Ada" is now complete and, with the exception of needing ordinary repairs, is a serviceable steamer. Consequently, were engines of this class wanted for a new steamer, it would be better to take those of the "Godavery," a sister vessel, the hull of which is altogether unserviceable, and to obtain for them a new boiler in place of that which is worn out.

3rdly.—Side paddle steamers for inland navigation are out of date, and the choice now lies between stern paddles and twin screws, and reasons are adduced for preferring the latter mode of propulsion.

The principal objection to twin screws for shallow draught steamers is that the diameter of the screws is necessarily very small, and possibly the reaction of a jet of water may be a preferable propeller, if this system can be economically worked.

4thly.—It is doubtful whether the designing and construction of a steamer can be as well performed at Dowlaishweram as by Engineers in England who have had experience of this class of work.

3. The Government observe that, if the value of the engines and boiler of the "Frank and Ada" be added to the estimate for the hull of a new steamer, the total will not be very far short of 40,000 Rupees, and it is probable that a much more efficient steamer than could be obtained by carrying out the Superintending Engineer's design could be obtained from England for this sum, and at the same time such a steamer, while equally, or more, useful for river work at Dowlaishweram might be so constructed as to pass through most of the locks.

4. Under these circumstances the Government are not disposed to sanction the estimate submitted by the Superintending Engineer.

5. The state of both the harbour and river plant, as described in detail by the Chief Engineer, is highly unsatisfactory. The former has had little or no work to do of late, and it is clear that whether in or out of work it is necessary that provision should be made for its preservation by a suitable allotment under the head of repairs of "Tools and Plant." The "Godavery," one of the three steam tugs, is so much deteriorated as to be altogether unserviceable and unrepairable, and the Government sanction its being offered for sale by auction at an upset price of 7,500 Rupees, including the engines, or, if this sum cannot be obtained, the hull, exclusive of the engines, and of any fittings which can advantageously be transferred to the sister vessels, should be sold outright. In the latter case the engines should be taken to Dowlaishweram, and there kept until further orders. The sale proceeds will, under the rules, be credited to Public Works Revenue under the head

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of "Sales of Tools and Plant." For the repair of the two serviceable steam tugs, of two steam* dredges, and of eleven iron

* Exclusive of a new boiler for No. 2 Dredge. punts, the Chief Engineer reports Rupees 6,330 to be required and he adds Rupees 100 for the "Godavery," for cleaning the engines, etc. Of the total sum Rupees 6,430 thus shown to be necessary, the Government resolve to grant Rupees 2,000 out of the current year's allotment for the repair of Tools and Plant, and the balance will be made available out of the grant for 1871-72 in due course. Also for the up-keep of this plant in 1871-72 Rupees 2,850 will be allotted, namely:—

2 Steamers, at Rupees 300 each	...	...	...	...	...	600
2 Steam Dredges, do. do.	...	...	...	...	...	600
11 Punts, at Rupees 150 each	...	...	...	...	...	1,650

and the Superintending Engineer will take care that for the future all necessary repairs required for maintaining this plant in serviceable order, and for preventing deterioration, are regularly carried out.

6. With regard to the river plant the Chief Engineer reports that there are now three steamers, for which there is no regular provision made, which are all very much in need of re-fitting and repair, and which are consequently of far less use than they might be. All expenses connected with these boats, which are not recovered from private persons, are charged to the quarries, and the result is that, as the latter cannot afford to pay for the proper up-keep of the steamers, they are very much neglected. It appears, moreover, to be quite evident that two efficient river steamers are as many as are required at Dowlaishweram, and either the "Pioneer" should be transferred to the Kistna, if it can be made use of there, or it should be taken out of the river and housed until it may at some future time be needed to replace one of the other boats. The funds at present needed for the repair of these steamers are—

For the "Little Nell"	...	...	...	...	...	...	645
"Pioneer"	...	...	...	...	...	...	545
"Thistle"	...	...	...	...	...	...	620
							1,810

and of this sum Rupees 1,000 are sanctioned for immediate expenditure, and the balance will be made available after the 1st April. Moreover, Major Mullins recommends that such part of the annual cost of maintaining these steamers as is requisite to prevent deterioration should be provided for by a regular grant, and he names for the—

"Little Nell"	...	...	...	...	...	...	600
"Pioneer"	...	...	...	...	...	...	600
"Thistle"	...	...	...	...	...	...	625
							1,825

This sum is accordingly sanctioned for 1871-72: but it will be understood that, if the "Pioneer" be not transferred to the Kistna its annual grant is to be reduced to Rupees 150, which will suffice for cleaning and such painting as will then be requisite.

*Proceedings of the Madras Government, Public Works Department,
13th March 1871.*

7. The current charges other than those above provided for will be charged to the work or service on which the steamers may be employed, and the officer in charge of the steamers will raise the hire sufficiently to provide amply for all such expenditure. The Government approve also of officers who may engage the steamers for crossing the river being charged at the rate of 2½ Rupees an hour, whenever the vessels are detained, through want of punctuality, for more than half an hour.

8. The Chief Engineer brings to notice that extensive repairs to one of the canal steam dredges have been charged to Agricultural Repairs, although this plant is used almost exclusively in the interests of navigation. The Superintending Engineer will report what annual amount will be required for the upkeep of these dredges with a view to provision being made in the Budget of 1872-73 under Communications for their regular maintenance.

9. The latter part of Major Mullins' Note relates to the use of the steam tug at Cocanada by merchants or others, when not required for Government work. The Superintending Engineer will report what charges would be requisite to cover all expenses, should such an arrangement be sanctioned; he will then endeavour to ascertain, first, to what extent a steamer would be likely to be used if so charged for, and secondly, he will state what immediate outlay for coals, wood, engine driver, etc., would be requisite to make an experiment for, say, three months.

10. The Government trust that the orders now passed will result in the whole of the valuable steam and other floating plant being placed and kept in an efficient state. The Superintending Engineer will be specially careful that iron vessels are not allowed to remain, unemployed, in salt water. The main Godavery is only a few hours' steam from Cocanada by the Coringa river, and no doubt suitable berths for the vessels can be obtained in the lower part of the Godavery, within reach of the tide, where the water is nevertheless quite fresh, and where the rise in floods is so slight * as not to endanger the safety of the vessels when there moored.

* 6 to 10 feet.

11. Of the 3,600 Rupees required for expenditure on the harbour and river plant during the current year it would appear from the expenditure on the repair of tools and plant in the 1st Division up to the 31st December last that Rupees 1,600 can be met from the allotments at the Superintending Engineer's disposal, and His Excellency the Governor in Council resolves to provide for the balance by transfers from the following districts, in which the outlay up to the end of the third quarter was below the full proportion of the allotments:—

From the Kistna District						Rs.
Do.	Nellore	do.	...	...	...	450
Do.	Cuddapah	do.	...	...	...	100
Do.	Bellary	do.	...	...	...	50
Do.	Kurnool	do.	...	...	...	50
Do.	Tanjore	do.	...	...	...	50
Do.	Coimbatore	do.	...	...	...	50
Do.	Malabar	do.	...	...	...	330
			...	...	...	70

*Proceedings of the Madras Government, Public Works Department,
13th March 1871.*

From the South Canara District	...	...	...	...	50
Do. Tinnevely	do.	...	...	...	200
					1,400

12. The Superintending Engineer will, in submitting a statement of the requirements of the Godavery Delta under Repairs of Tools and Plant for 1871-72, show fully and clearly what proportion of the charges for maintaining river plant should be debited to the Extraordinary grant, and the sanction of the Government of India will then be obtained to the outlay chargeable to this head.

(True Extract.)
(Signed) J. MULLINS, Major, R. E.,
Joint-Secretary to Government.

To the Superintending Engineers, 1st, 2nd, 3rd, 6th, 7th, and 8th Divisions.
.. Controller of Public Works Accounts.
.. Chief Engineer for Irrigation.

L. A. T. Augusta.

PUBLIC WORKS.

20

THE SUPERINTENDING ENGINEERS.

10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220, 230, 240, 250, 260, 270, 280, 290, 300, 310, 320, 330, 340, 350, 360, 370, 380, 390, 400, 410, 420, 430, 440, 450, 460, 470, 480, 490, 500, 510, 520, 530, 540, 550, 560, 570, 580, 590, 600, 610, 620, 630, 640, 650, 660, 670, 680, 690, 700, 710, 720, 730, 740, 750, 760, 770, 780, 790, 800, 810, 820, 830, 840, 850, 860, 870, 880, 890, 900, 910, 920, 930, 940, 950, 960, 970, 980, 990, 1000, 1010, 1020, 1030, 1040, 1050, 1060, 1070, 1080, 1090, 1100, 1110, 1120, 1130, 1140, 1150, 1160, 1170, 1180, 1190, 1200, 1210, 1220, 1230, 1240, 1250, 1260, 1270, 1280, 1290, 1300, 1310, 1320, 1330, 1340, 1350, 1360, 1370, 1380, 1390, 1400, 1410, 1420, 1430, 1440, 1450, 1460, 1470, 1480, 1490, 1500, 1510, 1520, 1530, 1540, 1550, 1560, 1570, 1580, 1590, 1600, 1610, 1620, 1630, 1640, 1650, 1660, 1670, 1680, 1690, 1700, 1710, 1720, 1730, 1740, 1750, 1760, 1770, 1780, 1790, 1800, 1810, 1820, 1830, 1840, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000, 2010, 2020, 2030, 2040, 2050, 2060, 2070, 2080, 2090, 2100, 2110, 2120, 2130, 2140, 2150, 2160, 2170, 2180, 2190, 2200, 2210, 2220, 2230, 2240, 2250, 2260, 2270, 2280, 2290, 2300, 2310, 2320, 2330, 2340, 2350, 2360, 2370, 2380, 2390, 2400, 2410, 2420, 2430, 2440, 2450, 2460, 2470, 2480, 2490, 2500, 2510, 2520, 2530, 2540, 2550, 2560, 2570, 2580, 2590, 2600, 2610, 2620, 2630, 2640, 2650, 2660, 2670, 2680, 2690, 2700, 2710, 2720, 2730, 2740, 2750, 2760, 2770, 2780, 2790, 2800, 2810, 2820, 2830, 2840, 2850, 2860, 2870, 2880, 2890, 2900, 2910, 2920, 2930, 2940, 2950, 2960, 2970, 2980, 2990, 3000, 3010, 3020, 3030, 3040, 3050, 3060, 3070, 3080, 3090, 3100, 3110, 3120, 3130, 3140, 3150, 3160, 3170, 3180, 3190, 3200, 3210, 3220, 3230, 3240, 3250, 3260, 3270, 3280, 3290, 3300, 3310, 3320, 3330, 3340, 3350, 3360, 3370, 3380, 3390, 3400, 3410, 3420, 3430, 3440, 3450, 3460, 3470, 3480, 3490, 3500, 3510, 3520, 3530, 3540, 3550, 3560, 3570, 3580, 3590, 3600, 3610, 3620, 3630, 3640, 3650, 3660, 3670, 3680, 3690, 3700, 3710, 3720, 3730, 3740, 3750, 3760, 3770, 3780, 3790, 3800, 3810, 3820, 3830, 3840, 3850, 3860, 3870, 3880, 3890, 3900, 3910, 3920, 3930, 3940, 3950, 3960, 3970, 3980, 3990, 4000, 4010, 4020, 4030, 4040, 4050, 4060, 4070, 4080, 4090, 4100, 4110, 4120, 4130, 4140, 4150, 4160, 4170, 4180, 4190, 4200, 4210, 4220, 4230, 4240, 4250, 4260, 4270, 4280, 4290, 4300, 4310, 4320, 4330, 4340, 4350, 4360, 4370, 4380, 4390, 4400, 4410, 4420, 4430, 4440, 4450, 4460, 4470, 4480, 4490, 4500, 4510, 4520, 4530, 4540, 4550, 4560, 4570, 4580, 4590, 4600, 4610, 4620, 4630, 4640, 4650, 4660, 4670, 4680, 4690, 4700, 4710, 4720, 4730, 4740, 4750, 4760, 4770, 4780, 4790, 4800, 4810, 4820, 4830, 4840, 4850, 4860, 4870, 4880, 4890, 4900, 4910, 4920, 4930, 4940, 4950, 4960, 4970, 4980, 4990, 5000, 5010, 5020, 5030, 5040, 5050, 5060, 5070, 5080, 5090, 5100, 5110, 5120, 5130, 5140, 5150, 5160, 5170, 5180, 5190, 5200, 5210, 5220, 5230, 5240, 5250, 5260, 5270, 5280, 5290, 5300, 5310, 5320, 5330, 5340, 5350, 5360, 5370, 5380, 5390, 5400, 5410, 5420, 5430, 5440, 5450, 5460, 5470, 5480, 5490, 5500, 5510, 5520, 5530, 5540, 5550, 5560, 5570, 5580, 5590, 5600, 5610, 5620, 5630, 5640, 5650, 5660, 5670, 5680, 5690, 5700, 5710, 5720, 5730, 5740, 5750, 5760, 5770, 5780, 5790, 5800, 5810, 5820, 5830, 5840, 5850, 5860, 5870, 5880, 5890, 5900, 5910, 5920, 5930, 5940, 5950, 5960, 5970, 5980, 5990, 6000, 6010, 6020, 6030, 6040, 6050, 6060, 6070, 6080, 6090, 6100, 6110, 6120, 6130, 6140, 6150, 6160, 6170, 6180, 6190, 6200, 6210, 6220, 6230, 6240, 6250, 6260, 6270, 6280, 6290, 6300, 6310, 6320, 6330, 6340, 6350, 6360, 6370, 6380, 6390, 6400, 6410, 6420, 6430, 6440, 6450, 6460, 6470, 6480, 6490, 6500, 6510, 6520, 6530, 6540, 6550, 6560, 6570, 6580, 6590, 6600, 6610, 6620, 6630, 6640, 6650, 6660, 6670, 6680, 6690, 6700, 6710, 6720, 6730, 6740, 6750, 6760, 6770, 6780, 6790, 6800, 6810, 6820, 6830, 6840, 6850, 6860, 6870, 6880, 6890, 6900, 6910, 6920, 6930, 6940, 6950, 6960, 6970, 6980, 6990, 7000, 70

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incl.

G. O. 1344 March 1871, No. 744.

MARCH.

Nov. 319.320

Some of the Papers - Papers are on papers relating to the present history of the Government dredges in the City very District.

1/5381 You may find it in the 166

Note by the Chief Engineer for Irrigation.

I think the condition of the steam plant, whether intended for use in the rivers and canals at Cocanada, together with the measures for his-
tation for maintaining it in proper and services,
all other needs consideration. I have lately ex-
-amined nearly the whole of it, and I regret
to be obliged to say that its state is for the
most part the reverse of efficient, and that it
is a discredit to the Government to which it be-
-longe

2. To Dowlaishevaram the Government vessels should be an example to the owners of the many hundreds of boats which ply on the canals, and the recent authority given to the Superintending Engineer, by no means before it, was revivied, to insist upon passengers boats being clean and efficient is inconsistent with the state of the Government boats.

St. Canada the steamer, steam dredges & pumps.

look extremely disreputable & we could not but
feel ashamed to have anything to do with them.
They represent waste of money, and either a great
mistake was made in their purchase, and the
work which they were obtained to perform was
unnecessary, or, if necessary, it has for too long been
left undone. As matters stand, or are progressing
at present, by the time Pecosada Harbor im-
provements & river maintenance again attract suf-
ficient attention to secure funds, the plants which
were obtained to carry them out will have ceased
to exist. The course followed at Pecosada is not
the only case where action has ceased at the time
when the means of carrying out improvements had
just been procured. The Begapatam steam dredge,
pumps and coal were provided, and after that not
a day's useful work was done. I write plainly
because I feel sure that the Government desire
earnestly to prevent waste, & to secure efficiency, and
this would not be possible were officers, who were
about the country, & see, & examine, into what is
going on, not to report faithfully & thus place the
Government in a position to deal with facts as
they exist.

3. Three of these were sent out from England. (Pecosada Har-
bor) some time ago. Long 12 91 feet

Beam 16 feet
over all 28 "
Engines 160 HP
condensing, with
oscillating cylinders

some years ago, at a time when more extensive
improvements of the Pecosada Harbor, than are
now perhaps ever likely to be carried out, were in
contemplation. One, the "Godavari", was subsequently
sent to Ponnambet, & was returned in a state,
as regards the hull and boiler, which will pre-
vent the vessel from being of any use again. The
engines are apparently in good order, at least they
are kept clean & are preserved as well as they can
be when steam cannot be got up. It is useless
to keep a vessel in such a state, & she cannot be
sent elsewhere as she is altogether uneconomical.
I would recommend therefore that she be offered
for sale by auction, first with her engines at an
upper price a little in excess of the value of the
hull, and if not thus disposed of that she be sold
entirely without the engines, which latter can be
taken by canal to Dindraishuram, and there
preserved. Probably the engines are worth good
10000 Rupees. It might be well to take 7500 Rupees
for the vessel as she is, if that sum can be obtained.

a submersible is valued in the port at Repulse
The "Fred & May" another of these steamers is also "Fred & May"
at Oceanada. It is but seldom that she is used
and she is daily deteriorating though a comparatively
moderate expenditure would prevent this. The hull
wants scraping and painting, and the super-
structure & fittings generally are in bad order and
require thorough overhauling. The boiler has de-
teriorated a good deal, but it is still capable of
some years work if used occasionally & properly
cleaned & taken care of. The engines are in very
good order, except as regards packing of glands,
air pump &c, which cannot be kept in order
when out of work. Steam was got up twice or three
times while I was at Oceanada at first the
engines could hardly be got to work, but after-
wards they went fairly though hardly half the
proper power could be developed. The steamer
is handy & well adapted to the work for which
she was intended, viz the towing of the dredge &
punts out to beyond the harbour. I was informed
that the necessary repairs had been estimated for
and

Steam Dredge
No. 1

Dredge No. 2

Oceanada Lagoon
bridge

10. 10
and that some repairs are needed to render her
efficient. There are two steam dredges, No. 1 requires only
such repairs as are represented by an estimate
of Repulse 1880. The engines have been taken care
of: the boiler has suffered from drip from the deck,
owing to deterioration of the cover. Paint is the most
pressing necessity, & without it deterioration of iron
& wood work will be rapid.

Steam Dredge No. 2 has no boiler, but it was told
that one had been indicated for. The hull is greatly
in need of scraping and painting, and minor
repairs. Such are unavoidable without great waste
of money, whether in or out of work. Repulse 1880
should be sanctioned for urgent repairs.
Were it not that the iron lattice bridge across
the river is so low, all this plant might be kept
in fresh water in a dock which could be con-
structed at a small expense near the Covered
lock & be filled from the canal. Perhaps it may
still be practicable to construct a movable bay

to that bridge, which, apart from such con-
siderations as those referred to, is a ^{very} great nuisance
to the navigation, & the last excuse that I have
heard advanced for its construction at its present
level is that it is much better than the old bridge
which it replaced.

There are 12 of these. One has deteriorated so much Delta but
to admit of repair, and the remaining 11 require
an outlay of Rupees 400 each to put them in proper
order. The number repairable will rapidly diminish
if they are not put to rights without delay. I have
pointed out that these punts should never be left
in salt water when they are not required for use
at Cocanada. They are too heavy to be frequently
employed generally on Delta work, but they
should be taken up to Barlaichwarain for repairs
& thereafter they should be kept in fresh water
until required on the coast; & then, as soon as
done with, they should be returned to fresh
water. The cost of transfer should be charged
to repairs of tools & plant, & their upkeep will
then

Plant at
Barlaichwarain

"Frank & Ada"

11-9
then cost but a fraction of what would be necessary
if they be allowed to lie at Cocanada.

4. Relinquishing to Cocanada, but for some
time past laid up at Barlaichwarain is the
"Frank & Ada" a sister vessel to the steam tug
already noticed. Her iron is in better order than her
hull, having been kept in fresh water. She has a new boiler
which has not yet been fixed, but this should be
attended to. The engines are believed to be in good
order. I was told that about 5 years ago she went
about 2 1/2 miles up the river plowing down stone for
raising the canal, but for a long time past she
has not been used at all. This steamer was not
built for, and is not adapted for river navigation.
She has a high free board; when ballasted to a
proper level she draws too much water, & for a
day's work her engines of 40 horsepower cost too
much for fuel. It is not likely that she will be
of much use on the river in the future than she has
been in the past. Her woodwork & fittings are much
in need of repairs & the iron work requires to be painted.

I think it would be well to dispose of her if a purchaser can be found, but, so long as she is retained by Government, provision should be made for her upkeep. Her value in the books is Rupees 38060, and she is probably worth not less than 30000 Rupees. The Superintendent Engineer has ^{asked for} sanction for the construction of a new hull for a river steamer, & to transfer the engines of the "Frank & Ada" to her. Major Macleod thinks that the hull of the latter, without the engines, might be sold at a fair price for use as a sailing vessel. There appear to me to be several objections to this proposition. In the first place if engines of this class were suitable for a river boat there would be those of the "Godavari" available, and under such circumstances it could hardly be good economy to dismantle the "Frank & Ada". It is my impression that to purchase the "Fred & May" made available, on reasonable terms for facilitating the trade of the port of Coarada, it would not be long before the Government would be able to sell one of these vessels at a fair price. The

experiment

Funds required
for harbour plant

* in addition to
a new boiler the
value of which
I do not know

experiment will at any rate cost nothing but rather the reverse. A supply of coal would be needed, as wood alone will not do for fuel. Perhaps half wood & half coal would do. The question as to whether another river steamer is wanted will be referred to after noticing the steamers of this class which are at present available.

Funds required for harbour plant		5	For preserving the harbour plant a present grant of for the "Godavari"		Rupees 100
			"Fred & May"		600
			"Frank & Ada"		460
			Steam Dredge No. 1		480
			"do do" No. 2		400
			11 Punks		4400
			Total Rupees		6430

inquired.

I have entered a small sum for the "Godavari" to preserve the engines & a few of the fittings. For each steamer at least 300 Rupees annually would be needed, and a like sum for each steam dredge, 150 Rupees each would suffice for the punts when out of work. Of course, when regular work is going

going in, all charges could be met from the allotment for that work; but in the whole I think that it is better to ensure the regular upkeep of all such plants by special annual allotments, as otherwise all the funds available might & probably would be worked out leaving the vessels and their machinery in a dilapidated condition.

6. There are 3 river steamers belonging to the Godavari Delta viz the
"Vellore"
"Ponner"
"Thottle"

river
steamers

The two first are sister vessels. So small that to get through the locks their paddle floats are very short and in this way a good deal of power is lost. The "Vellore" has good cabin accommodation and she in consequence earns a good deal of money by being hired. She requires a new boiler though I understand that the present one is being ordered.

one is but 12 years old, and she has been under steam but a small part of that time. It has been deemed necessary to put stops in the safety valve levers to prevent the pressure exceeding 30 lbs and with this, with shot floats, & with engines out of order, she is not of much use. On the Godavari canal which is almost still water she averages 4 1/2 miles an hour. The engines require a thorough overhauling and putting to rights; her funnel is worn through from bottom to top; and hull & gunwale want complete repainting; and in all probability some of the plates will require to be replaced with plates capable of supplying steam at 70 lbs and with engines in proper order this vessel would I think be very efficient.

The Ponner requires a new boiler, otherwise she needs a somewhat less outlay in general repairs than

than the "Little Nell"; & repainting is one of the most important.

The two vessels above mentioned can navigate the Godavari along the current so long as there are not more than 5 or 6 feet of water going over the crest.

The "Thistle" is a vessel of a different class, & has longer paddles & is more powerful, and she can be used until the high floods to get on the crest of the current. She cannot pass through the headlocks, and she is therefore used only on the river. If thought repaired, she would do very well. She requires a new boiler; the bed plate of the engine on the larboard side was broken some years ago and patched, it is very weak & gives out every stroke of the piston, and the result has been great wear & tear. A new bed plate & new cylinder are needed & the latter have been cast.

Want of funds has prevented the maintenance of crews for these steamers. Our full crew is

Steamer crew

Estimated expenditure
returnable at present
annual requirements

11000
is maintained, & if two steamers are in use at the same time, this is divided & but two are used to make up the number required. There should be an engine man for each steamer, for unless one man has charge of & is responsible for the good order of the engines, it must be impracticable to make the most of them. When the steamers are not in use & when there is nothing required to be done to the engines, the engine driver can always be employed in the ships, and so his time need not be wasted. I attribute much of the want of efficiency of the engines to the want of funds & the want of funds has necessitated: 1st, all rattles, greases & the packing of the pistons, glands &c, & the want of greasing & other slight but important matters are the natural result of there being no one who can be required constantly & regularly to attend to such points.

The expenditure on these steamers from Nov 2-1873 up to the 30th November 1870 is for 8 1/2 years has been on the average per annum as follows

Little Nell	Rs 417
Thistle	365
	629

11000

The special requirements are

Little Nell - Repairing & refitting engine	500	
new plates	300	
scrapping & painting	95	
boiling	50	645

Power - Repairing & refitting engine	500	
one new cylinder	100	
scrapping & painting	95	
boiling	50	645

Thistle - 2 new cylinders	500	
Repairing & refitting machinery with slide blocks & new bed frames	100	
Repairing hull	100	
Painting	95	
boiling	50	645
Total special requirements		1810

Annual requirements

Little Nell - Sundry repairs	225	
Painting	95	
boiling twice a year	100	
Engine driven at 10 H.P.	150	
Power - do do		600
		600
		1200

1150 P. 1200

Thistle - Sundry repairs	250	
Painting	95	
boiling twice	100	
Engine driven	150	
		625
		1825

With this provision the steamers can be placed in proper order, and I would recommend therefore that a sum of 1810 be granted under Vote 1st plant for their immediate repair, & that annual grant for the 3 steamers be made as shown.

The engine drivers should be permanently attached to the several steamers, the rest of the crew & public crew including the Syrians should be entertained as heretofore, & their cost together with that of the fuel should be charged to the work & service which they may perform. I have ascertained that with the aid of that recommended to be given in the shape of specific grants, and the amount is I think moderate, all other expenses can be met without difficulty by a change in the rates of charge, which has been gradually increasing in a great measure by the increase of cost.

cost of fuel. Hitherto the charge for a steamer per day has been 15 Rupees when hired by any Government officers on duty, and 25 Rupees when engaged for private purposes, but from suggestions made them of opinion that 25 Rupees was as little as should be charged & I think moves that while officers on duty should have the first claim to the use of the steamers there should be no difference in the charge made to them and to others. It has also been customary to take officers to the heads of the several deltas free of charge, and the expense has been considerable. The cost of sending a special steamer to Vizianagaram is about 7 1/2 Rupees, & to Bellar, Lanka, Portugo, Nagpur even when there is no delay. If Government sanction be allotted as above recommended, I would allow the practice to be continued, on the condition however that officers ordering the steamer be required to pay for their detention under steam for more than half an hour at the rate of 2 1/2 Rupees an hour. It takes from 1 1/2 to 2 hours, according to the state of the river & consequently

steamers require

16 1/2
consequently the distance to be traversed, to steam from one side to the other. Range boats without the aid of a steamer cannot go across at all on the line the steamer take, but they must go several miles up the river then dig down on the other side. A considerable portion of the cost of maintaining the steamers has not specially provided for, free passage must be given up and, unless the charges be allowed to be entered as extras in the Travelling Allowance bill, no doubt the steamers will be but little used for this purpose, and officers will waste several hours in the long passage.

10. The principal work that the steamers have to perform is the towing of boats, containing stone and other materials for the centre & western Deltas, across the river. I have a statement prepared in abstract for me by the Executive Engineer. I find that, exclusive of Sundays, the time of these steamers was from April 1869 to March 1870 as disposed

disposed of as follows

Little Hill	worked 80	in 1807
Pinner	" 163	" 1809
Thistle	" 138	" 1817

+ 17/11/1817

+ 18/11/1817

This shows that there is not regular work for steamers, and enquiries made at Darlaishwarum confirm this opinion. When the steamers have been properly re-
 paired, the Pinner might be transferred to the
 Kistna, where probably one steamer might frequently
 be usefully employed. Should this not be the case,
 one engine driver might be dispensed with. One
 efficient steamer would not only suffice for all
 the work that is at present done in this way at
 Darlaishwarum & on the canals, but were their
 power sufficient they would do a great deal more.
 For no canal is more suitable for steam traffic
 than that between the Godavari & the Kistna
 rivers, it having but one lock in a distance of
 90 miles, a very moderate current, & a very con-
 siderable traffic both in goods & passengers. The
 steamers we have now compared with the
 might

17/11 18
 might be obtained, facilities. It is not recom-
 mended the designing & construction of a more power-
 ful steamer at Darlaishwarum, because steamers
 with side paddles are out of date, & not adapted
 to canals with locks, and the designing of a
 canal & river steamer especially one of a new kind
 requires more skill than is there available. &
 Moreover condensing engines are not convenient
 for small boats nor would engines designed for
 side paddles do for a different arrangement.
 The choice must be between stern paddles
 turn screws, and probably the latter would be the
 best because the engines can be placed nearly
 amidships and the weights would thus be better
 distributed. The overhanging wheels of the stern
 paddles & the engines at the very end of the boat
 make it necessary to place the boilers at the other
 end & this is not a convenient arrangement.
 I hope that ere long a twin screw steamer
 not exceeding 100 feet in length & with about 14
 feet beam will be ordered from some firm in England
 accustomed

accustomed to construct gun boats, as I am sure
that we are capable of doing more work than the three
which the Government possess could be constructed
and without difficulty. I may add that I
have seen at Cuttack two small steamers with
twin screws, which, though built of heavy plate
for use as gun boats during the mutiny, are
handier & better in all respects & will do more
than anything we have in this Presidency.

11. Out of these dredges has had in the
past year extensive repairs executed from the
annual repair funds and certainly this arrange-
ment is very much better than allowing them
to get out of repair and unseaworthy. It seems
necessary to notice however that they are used
almost entirely in the interest of navigation,
that properly therefore the cost of the work done by
them & of their repairs is debitable to communi-
cations, and that as a surplus income is derived
from boat licenses, and also the cost of naviga-
tion establishment.

12. In the establishment, there appears to be no reason why
Budget provision should not be made under
"Repairs, communications" for these dredges.

13. I see that on a former occasion, C.O.
24 November 1871, the Government were
not disposed to sanction the Superintendent
Engineer's proposition that one of the tugs should
be employed at Oceanada Harbour in aid of the
trade at that place, because it was thought that
its condition would be deteriorated by being
so employed.

Let 2 sets
dated 20 Jan 1871

Major Fischer has in his later letter again
created this arrangement, and it is so unsatis-
fying to see valuable plant lying idle, and simply
rotting away, that I hope, if the steamers be re-
tained, they will be made available for any work
which can be found for them to do, always sup-
posing that if merchants or others want them
such charges be made as will cover all expenses
during

during the time they are so employed. I believe that
in this way they will not suffer more than they now
do from neglect, and that perhaps means will thus
be obtained of keeping at least one steamer in re-
-pair and in good working order. There are two
ways in which the proposed arrangement might
be carried out. I have already mentioned that fuel of
half coal & half wood will enable steam to be maintained
in the boilers of these tugs at a proper pressure, and
I would instruct the Superintending Engineer to
draw up a memorandum showing in detail the
cost per day of working, say, the "Fred & Mary",
which is now laying at Esplanade. This cost
will include

- 1st the pay of the Serang, who is already regularly
employed
- 2nd that of the engine driver, who might receive,
I think, Rupees 25 per month
- 3rd that of the rest of the crew, fireman &c

- 4th fuel for the boiler, &c. &c. &c.
- 5th deterioration of rigging & sails at 10 per cent
per annum
- 6th deterioration of hull 10 per cent per annum
- 7th deterioration of ropes & small gear at 20 per
cent per annum
- 8th cost of painting & and dishing twice a year
- 9th Sundries such as oil for machinery, material
for packing the glands, renewing pulley valves
of air pumps &c
- 10th a percentage on the whole of the above
may be mentioned that the spail mallow re-
-quire to be kept in some liquid which will
enable them to retain their elasticity. This might
probably easily be managed. The charges thus as-
-certained would be those to be made for the use
of the steamer for one day, and supposing the
to be a Rupee, the proportionate charge for any
less

1. If number of hours than 10, the charge might be
2. X.A. It will be noticed that I do not suppose
3. the steamer can be worked in this way so as to
4. make a clear profit, but I hope that it may
5. be used sufficiently frequently to keep everything
6. in good order at an outlay on the part of Govern-
7. ment, not exceeding that which would be needed
8. for mere painting, which arrangement would
9. entail considerable expenditure, whenever the
10. steamer happened to be required for Government
11. work, before that work could be efficiently performed
12. The steamer is at present in charge of the Ex-
13. ecutive Engineer Customs & Central India, and
14. this officer might be authorized to negotiate with the
15. merchants at Creanada on what terms the
16. steamer can be hired for towing cargo boats or
17. ships and, so long as the demand is only occasional
18. this would probably be the best arrangement.
19. If however there should be tolerably constant
20. work

21. 16.
22. work in connection with the trade of the port, the
23. Marine Department might desire to have one of the
24. steamers, and to work it under the orders of the
25. Master Attendant.

26. 13. One should be taken that the tug
27. steamers are properly ballasted when in use. The
28. "Red" May was when I saw her at least 1 foot
29. too high out of the water.

30. 14. S. George } Volundullins Major R.
31. 15. Henry } Chief Engineer for Navigation
32. 16. The Secretary Government
33. J. H. D.

1
Sd Engineer (Chief Division)
Bombay 27 January 1871

From
Major J. P. Fisher M.E.
Sd Engineer 1st Lt.
Colonel C. F. Orr M.E.
Secretary to Government M.E.
Bombay.

With reference to G.O. of the 24th Nov.
1870 & 102834, I have the honor to forward a
design of a boat adapted for the Engines of the
"Frank and Oda", and suitable for River
navigation, together with an Estimate amounting
to Rs. 15,000 for carrying out the design. This
estimated, we can sell the hull of the "Frank
and Oda" for Rs. 7,000, so that the probable
outlay on this account will be only Rs. 8,000
if.
At 2 ft draught of water, I cal-
-culate the new boat would displace about 70
tons of water, her total weight, with machinery
fuel, and crew, would be under 50 tons, so
that, she would then be drawing less than 18
inches of water. The only alteration required is
to keep the floats of the paddles 6 inches lower.

And

Bo 24 Nov 70 No 452
453

1871, 102834
No. of 1000th Regt
J. P. Fisher M.E.
The Chief Engineer
for Navigation

To
The Secretary to
Government M.E.

Sdlt M. J. F. Fisher
Capt 15th 1870
Recd 18th 1870
No 28-

Note on the present
condition of the steamer
"Frank and Oda".

1874-75 March 71

25 Feb 1871

and this can be done without any difficulty;
in all other respects, the Machinery &c. re-
mains unaltered.

3/. In my letter printed with the
G.O. above referred to, I find I had stated,
these Engines were 40 H.P. Nominal, and
so they appear to be entered in the records
here, but this I think must be an error, the
cylinders are only 18 inches diameter, and
the stroke $4\frac{1}{2}$ feet, hence from Bournes
tables, the Nominal Horse Power would be
only 22 or about that figure, and this I believe
is really the case.

4/. Referring to para 2 of this G.O.,
I beg to observe, the Engines of the "Fred and Mary"
can hardly deteriorate more than they are doing
by lying idle, in fact the ^{late} trials made with her
by the Chief Engineer for Irrigation, showed
the Engines to be in any thing but a satisfactory
condition, and I cannot but think that, if she
were used in the harbour under careful super-
-vision, her machinery would be far better
preserved.

5/. A tug in Cocanada harbour,
would not only be of the greatest use in towing
vessels requiring repairs, in, and out of, Coringa

and in assisting cargo and passenger boats, but
she would be of great use to any of the larger
ships now frequenting the Port, in towing
them out after they had taken in their freight.
At present, on account of the numbers of small
craft in the harbour, a large ship has to
anchor out in such a position, that, when her
freight is on board, and she heaves her
anchor, she may have room enough to work
in to get out of the Bar: if she came farther
into the harbour for the convenience of loading
and unloading, she would run the risk of
being detained by the weather until a fair wind
gave her the chance to run out; and in some
available, these serious drawbacks and incon-
-veniences to the Port could be at once done away
with, and as the mercantile community would
benefit largely by the measure, I have no doubt
we could easily earn enough, at least to keep
the steamer from deteriorating by idleness.

I have the honor to be
Sir

Your Most Obedt. Servant

W. T. Tucker Esq. R. L.

Off. Chief Engineer 1st Div.

Probable Estimate for Constructing an Iron Barge 112 ft long
18 ft about midships & 12 ft at Stern

Number	Length	Breadth	Height or Depth	Weight in Pounds	Grain in Bushels	Total Cts.
1	12	4 1/2	1/4	54	"	
2	4 3/4	3 1/2	1/4	77	"	
2	14 1/2	1	1/4	29	"	
2	13 1/2	1 3/4	1/4	47	3	
2	9	2	1/4	36	"	
1	15	2	1/4	30	"	
2	8	2	1/4	32	"	
27	12	2	1/4	648	"	
2	6	1 1/4	1/4	15	"	
2	10	1 1/4	1/4	25	"	
2	10	2	1/4	40	"	
4	8	2	1/4	64	"	
2	8 1/2	1 1/4	1/4	21	3	
4	6	2	1/4	48	"	
2	10	2	1/4	40	"	
2	10 1/2	1 1/2	1/4	31	6	
2	6 3/4	1 1/4	1/4	16	10 1/2	
2	6	1	1/4	12	"	
1	4	2 1/2	1/4	10	"	
1	5	2 1/2	1/4	12	6	
15	12	3 1/3	1/4	630	"	
2	4	3 1/3	1/4	28	"	
12	7	3	1/4	252	"	
16	8	2	1/4	256	"	
1	23 1/2	4	1/4	79	8	

Particulars of Work Rate & Amount

For Hull
Plate Iron.

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1st District

The Secretary to Government

Sept 18 1874

Received of
 \$20.00
 25 Jan 1871
 2-8-71

With reference to S.C.
No 2834 (Dec 24, 1979)

towards a design for a book
 selected for the Congress of 1874.
 "What an edition was
 made for 'our program'
 by following it in Baltimore
 (conferences to Nov. 1873)
 for Congress and the design -

Feb 698/71
No 744-15 made by

2019-28

3249 1/2 32490 Brought forward
 18 12 2 3/8 432
 2 3 2 3/8 12
 444 0 6660 lbs at 15 lbs P Dft
 56 6 2 1/8 672 3360 5 do
 62570
 For 16 ribs
 3" 3" 1/4 256 Pft 14102 Angle Iron at 5 1/2 Pft
 3" 3" 1/4 236 1298 Gunnel or Deck
 Angle Iron at 5 1/2 Pft
 For 5 Warner fenders
 2" 2" 1/4 95 Angle Iron
 2" 2" 1/4 280 For Struts between of Keel
 Angle Iron
 For Paddle boxes
 2" 2" 1/4 28 Angle Iron
 1403 1813 1/2 lbs at 4 1/2 Pft
 For Steel & buldge
 4" 2" 3/8 344 2408 T Iron at 7 Pft
 4" 1" 1/4 315 1575 do at 5 do
 For 5 Warner fenders
 4" 2" 1/4 109 L Iron
 For Paddle boxes
 4" 2" 1/4 112 T Iron
 221 1326 do at 6 lbs Pft
 6" 3 1/2 164 2952 do for Spontoon beams
 4" 3 1/2 56 872 do at 18 Pft
 1500 1/2 2500 1875 Rod iron for rivets @ 3/4 lb Pft
 69740 1/2
 Glass panes
 Wood work
 320 cft For deck & Stays lights & Cabin floor &c
 25 " For Bulkheads
 345

Abstract of Estimate

Quantities	Description	Rate	Amount
69740 1/2	lbs Wrought iron Work @	2 6	11684 15 3
345	cft Wood work @	3	1035
60	Glass Panes @	4	15
			12070 8 9
	Centage at 25		3017 7 3
	Total Papers		15088

Don Luceviraam
 27 January 171

[Signature]
 [Text]

W. T. Trichin Major R.E.
 Coy. Supply Gunner R.A.

Extra

2512
Specification for the Steamer to be constructed to carry
the Engine of Frank and Ada so as to be more useful
for the Godavari fisheries and to work during the dry season.

The length of Steamer 112 feet, from bow
to stern and breadth 16 ft. at the 8th rib from
the bow and 12 feet at the stern, the bow is to
be terminated to thickness of materials.

The keel is to be τ Iron 6" table and 2"
rib and to run right through from bow to stern
which is welded and bent for the slope of the
bow, 2 more τ irons are fixed to the bridge
from stern to the ending of the bridge at bow
where to be rivetted on with $\frac{5}{8}$ " rivets to the
keel.

There are to be 16 ribs, the 8th rib from the
bow is to be 16 feet beam and they are to be
fixed at 8 feet apart from this point up to the
bow, the remainder 8 ribs are fixed at 8 feet
apart from the 16 ft. beam which will fix 12 ft
beam at stern.

Out of the 16 ribs there are 5 ribs made
into wainers girders to support the Engine
and Machinery with τ iron cross beams for
deck to strengthen the sides of vessel, τ irons are
fixed between ribs and struts with angle irons
2" x 2" x $\frac{1}{4}$ " to form struts from the hull to support
deck and to carry beams for the Machinery.

There are 2 cabins of 9 ft. length
each and water closet of 4 feet, the space the
Anchor chain and Capstan will occupy 12 ft.
there

698
11/23/71

2002



Hyu

Antitachin Major AS
Cybergraphica

Цзлапсгупп

698
PW 352/71

Enclosure in a
letter No. 3563
dated 20th Inst
from the Sup^r Engr
1st Division to the
Secretary to Govt
S. M. Madras

44 P. M. D.
Proceedings of the Madras Government
Read the following
From
The Sup^r Engineer } (H. E. No. 3563 of 20 July 71)
do } (H. E. No. 3730 of 6 Aug 71)
do } (H. E. No. 28 of 4 Aug 71)
Chief Engr for Irrig (H. E. No. 28 of 4 Aug 71)

Rupess 15,000

NP

The Sup^r Engineer of
the 1st Division having in
accordance with the
instructions conveyed in
H. E. No. 2832 of the 24th
November last submitted
a design and estimate for
the hull of a new steamer
for river work, to be
engineered by dismantling
the "Frank and Ada", a
harbour tug now lying
at Cocanada, the Chief
Engineer for Irrigation,
who has recently visited
the

the Godavery Deltas and inspected the steam plant belonging to Govt. has submitted a note in which he describes the present condition of the steamers &c., and suggests measures for ensuring their being kept in efficient working order.

2. Taking first the subject of the Sup^r Engineer's letter, the Chief Engineer is averse to the sanction of the estimate for the steamer designed by Major Föcher, and to the transfer to it of the machinery of the "Frank and Ada".

1st

1st because this steamer would measure 28 feet over the paddle boxes and could not therefore be passed through even the first class lock.

2nd the "Frank and Ada" is now complete and, with the exception of needing ordinary repairs, is a serviceable steamer. Consequently were engines of this class wanted for a new steamer, it would be better to take those of the "Godavery" a sister vessel, the hull of which is altogether unserviceable and to obtain for them a new boiler in place of that which is worn out.

3rd side paddle steamers for inland navigation are out of date, and the choice now lies between stern paddles and twin screws, and reasons are adduced for preferring the latter mode of propulsion.

The principal objection to twin screws for shallow draught steamers is that the diameter of the screws is necessarily very small, and possibly the reaction of a jet of water may be a preferable propeller.

propeller, if this system can be economically worked.

2. It is doubtful whether the designing and construction of a steamer can be as well performed at Bowlaichuram as by Engineers in England who have had experience of this class of work.

3. The Government observe that ^{if} the value of the engines and boiler of the Frank and Ada be added to the estimate for the hull of a new steamer, the total will not be very far short of 10,000 Rupees, and it is probable that a much more efficient steamer than could be obtained by carrying out the Supr Engineer's design could be obtained from England for this sum, and at the same

290 19
same time such a steamer, while equally, or more, useful for river work at Bowlaichuram might be so constructed as to pass through most of the locks. Under these circumstances the Govt are not disposed to sanction the estimate submitted by the Supr Engineer.
5. The state of both the harbour and river plant, as described in detail by the Chief Engineer, is highly unsatisfactory. The former has had little or no work to do of late, and it is clear that whether in or out of work it is necessary that provision should be made for

for its preservation by a
suitable allotment under
the head of repairs of tools
and plant. The Godavery,
one of the 3 steam tugs, is
so much deteriorated as
to be altogether unserviceable
and unrepairable; and
the Government sanction
its being offered for sale
by auction at an upset
price of Rs 500, including
the engine, or, if this sum
cannot be obtained, the
hull, exclusive of the
engine and of any fittings
which can advantageously
be transferred to the
other vessels, should be
sold outright. In the
latter case the engine
should be taken to

Dowlaiswam

exclusive of a new boiler
for No. 2 dredge.

3000
Dowlaiswam, and then
kept until further order.
The sale proceeds will,
under the rules, be cre-
dited to Public Works
Revenue under the head
of Sales of tools and plant.
For the repair of the two
serviceable steam tugs,
of 2 steam dredges, and
of 11 Iron Ponto, the Chief
Engineer reports Rs 6,330
to be required and he
adds Rs 100 for the Goda-
very, for cleaning the
engines &c. of the total
sum Rs 6,430 thus
shown to be necessary.
The Govt resolve to grant
Rs 2,000 out of the cur-
rent year's allotment
for the repair of tools and
plant.

plant, and the balance
 will be made available
 out of the grant for 1871/72
 in due course. Also for
 the upkeep of this plant
 in 1871/72 Rupees 2,850
 will be allotted, viz

2 Steamers at Rs 300 each	600
2 Steam dredges	600
11 Puntas	150
	1650

and the Super Engineer
 will take care that for
 the future all necessary
 repairs required for main-
 taining this plant in
 serviceable order, and
 for preventing deteriora-
 tion, are regularly car-
 ried out.

6. With regard to the
 river plant the Chief
 Engineer

310 21

Engineer reports that there
 are now 3 steamers, for
 which there is no regular
 provision made, which
 are all very much in
 need of refitting and repair,
 and which are consequently
 of far less use than they
 might be. All expenses
 connected with these
 boats, which are not
 recovered from private
 persons, are charged to
 the quarries and the re-
 -sult is that, as the latter
 cannot afford to pay for
 the proper upkeep of the
 steamers, they are very
 much neglected. It ap-
 -pears moreover to be
 quite evident that two
 efficient river steamers
 are

are as many as are required at Dowlaisweram, and either the Pioneer should be transferred to the Kistna, if it can be made use of there, or it should be taken out of the river and housed until it may at some future time be needed to replace one of the other boats. The funds at present needed for the repair of these steamers are

for the Little Nell	Ruppes 645
Pioneer	" 545
Thistle	" 620
<u>Total</u>	<u>" 1810</u>

and of this sum Rs 1,000 are sanctioned for immediate expenditure, and the balance will

be made available after the 1st April. Moreover Major Mullins recommends that such part of the annual cost of maintaining these steamers as is requisite to prevent deterioration should be provided for by a regular grant, and he names for the

Little Nell	Rs 600
Pioneer	" 600
Thistle	" 625

Total Rs 1825

This sum is accordingly sanctioned for 1871-72: but it will be understood that, if the Pioneer be not transferred to the Kistna its annual grant

is to be reduced to Rs 150,
which will suffice for
cleaning and such painting
as will then be requisite.

7. The current charges
other than those above
provided for will be
charged to the work or
service on which the
steamers may be employed,
and the Officer in charge
of the steamers will raise the
hire sufficiently to provide
amply for all such expen-
-diture. The Govt. approve
also of Officers who may
engage the steamers for
crossing the river being
charged at the rate of $2\frac{1}{2}$ Rs
an hour, whenever the
vessels are detained through
want of punctuality, for
more

32 23
more than half an hour.
8. The Chief Engineer
brings to notice that ex-
-tensive repairs to one of
the Canal steam dredges
have been charged to
Agricultural repairs,
although this plant is
used almost exclu-
-sively in the interests
of navigation. The
Superintending Engineer
will report what
annual amount will
be required for the upkeep
of these dredges with a
view to provision being
made in the Budget
of 1872-73 under com-
-munications for their
regular maintenance.
The

9. The latter part of
Major Mullins' note re-
lates to the use of the
steam tugs at Cocanada
by merchants or others
when not required for
Govt. work. The Super-
intending Engineer will
report what charges would
be requisite to cover all
expenses should such
an arrangement be
sanctioned; he will
then endeavour to ascer-
tain first to what
extent a steamer would
be likely to be used if
so charged for, and secondly
he will state what im-
mediate outlay for coals,
wood, engine driver &c.
would be requisite to
make

3114 24
make an experiment
for say 3 months.
10. The Government
trust that the order
now passed will result
in the whole of the
valuable steam and
other floating plant
being placed and kept
in an efficient state.
The Sup^r Engineer will
be specially careful
that iron vessels are
not allowed to remain
unemployed in salt
water. The main ho-
davery is only a few
hours steam from Co-
canada by the Corriga
river and no doubt
suitable berths for the
vessels can be obtained

in the lower part of the Godavary, within reach of the tide, where the water is nevertheless quite fresh, and where the rise in floods is so slight as not to endanger the safety of the vessels when there moored.

* 6 to 10 feet

H. Of the 3000 Rupees required for expenditure on the Harbour and river plant during the current year it would appear from the expenditure on the repair tools and plant in the 1st Division up to the 31st December last that Rs 1600 can be met from the allotments at the Sup^r Engineers disposal.

and His Excellency the Governor in Council resolved to provide for the balance by transfers from the following Districts, in which the outlay up to the end of the 3rd quarter was below the full proportion of the allotments:

from the Krishna District	Rs 450
" Bellary "	100
" Chiddasah "	50
" Bellary "	50
" Kurnool "	50
" Tanjore "	50
" Coimbatore "	300
" Malabar "	70
" South Canara "	50
" Srinacally "	30

1400

12. The Sup Engineer
will in submitting a
statement of the require-
ments of the Godavery
Delta under repairs of
tools and plant for 1871-72
show fully and clearly
what proportion of the
charges for maintaining
river plant should be
debited to the Extraordi-
nary grant and the
sanction of the Govt of
India will then be
obtained to the outlay
chargeable to this head.

My 24/2/71

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1. The Sup Engr. 1, 2, 3, 6, 7, 8, 8, 0, 0, 0
2. Contoller P. Dr. Acct.
3. Chief Engr. for Irrig.

12.

W.

or

Q

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OK

Govt. of Ill.

PUBLIC W.

To the Superintendent
of the 2nd 3rd 6th
8th (Ct.)

Very truly
yours

Delivered

Recd.

Encl. 4

G. O. 13th March No. 744.

No. 219-322

Steamers & Bridges. Papering
in papers relating to
condition of the steamers &
bridges in the Godavery
district.