~~10~~
~~26 95~~

~~9599~~
~~RH - 95~~

1697

Public Works (1896) Department.

G.O., No. 7702

DATED 19th September 1896

[Despatch Abstract.]

Wharfage fees: Re arrangement proposed by the Board of Revenue and the Chief Engineer for Mrs. Ross & Co. — a Salt boats loading & unloading at the Madras Salt Golaun wharf by annual book adjustments, approved.

D.E. 19/9

INDEXED 19/9

BACK PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

IRRIGATION.

Government {1896} of Madras.

PUBLIC WORKS.

Recd. } 1896. *Enclosures*

Regd. } *Spare copies*

G.O., No. 770 I., 19th September 1896.

SEPTEMBER.

Wharfage fees

The arrangement proposed by the Board of Revenue and the Chief Engineer for Irrigation to levy — on salt boats loading and unloading at the Madras Salt Cotaur wharf by annual book-adjustments, approved.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following paper :—

Proceedings of the Board of Revenue (Separate Revenue), No. 285, dated 18th July 1896.

Read—the following G.O., Mis. No. 1421, Revenue, dated 9th April 1896 :—

Read—the following G.O., No. 226 I., dated 4th March 1896 :—

Read—the following papers :—

From A. S. RUSSELL, Esq., Executive Engineer, Buckingham Canal Division, to the Superintending Engineer, II Circle, dated Pulicat, 9th March 1895, No. 3017 :—

I have the honour to bring to your notice that the Salt Department are apparently beginning to abandon (*vide* accompanying original report *) the out-storage system introduced in the year 1890–91, have commenced to transport salt from Vayalur to the Salt Cotaurs at Madras and claim exemption from wharfage fees under the operation of G.O., No. 798 I., dated 21st December 1887. This Government Order has been a dead letter for many years past, and its provisions are, I imagine, practically cancelled by G.O., No. 632 I., dated 17th July 1893. Pending orders, however, on this reference I am permitting the salt boats to pass to the Salt Cotaurs without paying wharfage, as it is not very clear to me what the intentions of Government may be on the matter.

* No. 165, dated 7th March 1895, from Wharf Superintendent, Madras, with its 1 enclosure.

2. After G.O., No. 798 I., dated 21st December 1887, was passed, all salt boats loading or unloading at the Salt Cotaurs were not charged wharfage fees by the canal authorities, but salt boats loading or unloading at other wharves were so charged, though as the order stands it rules in comprehensive terms "that all licensed boats entering or leaving Madras laden with salt shall be exempt from wharfage fees." This order if acted upon in its literal sense would have gone far beyond the contention of the Board, and would have exempted all boats carrying salt, even for private individuals, from paying wharfage fees at all the wharves within the limits of the Shadayankuppam and Adyar locks. In 1890–91, the outstorage system was adopted and salt ceased to be stored at the salt Cotaurs, and when I took charge of the division in 1891 all salt boats were duly paying wharfage fees, and have continued to do so up to the present time. Now that the in-storage system has apparently again been started, the question has come before me for the first time of the precise meaning of G.O., No. 798 I., dated 21st December 1887, and whether it is still to be considered to be in force.

3. When G.O., No. 798 I., dated 21st December 1887, was passed, wharfage fees were a recent introduction, and no clear rules regarding wharves, or the levy of fees thereat, were in existence. In G.O., No. 632 I., dated 17th July 1893, Government approved a set of wharf rules, and under rule II, for regulation of traffic at the Madras wharf, boats that load or unload within the limit of one mile of the Madras wharf must pay the prescribed wharfage fees. The Salt Cotaurs are within this one mile limit, and the Government Order contains no mention of any exemption for any class of boats whatever.

4. The Board of Revenue in protesting in its resolution, printed with G.O., No. 798 I., dated 21st December 1887, against the levy of fees on salt boats loading

or unloading at the Salt Cotaurs, proceeded on principles which are not applicable to the present time, and in no way regulate the levy of wharfage fees. The following instances may be cited by way of example :—

(1) The object of wharfage fees as now recognised is *not* "to prevent boats loading and unloading goods except at authorized places." If such a principle were generally acted upon, the canal would become next to useless, and the traffic in firewood, grain and other produce would be absolutely killed, since it is idle to suppose that such goods could stand the cost of transport by road to the nearest wharf instead of being loaded or unloaded wherever wanted, as they are of course allowed to do. Both the navigation and the wharf rules give discretion to Executive Engineers to forbid loading or unloading except at wharves, but this power was conferred in order to check abuses and not to hamper legitimate traffic.

(2) The Board rightly state that one object of wharfage fees is to place all boats on the same footing. It is therefore perfectly anomalous at the present time to claim exemption for *salt boats alone*, since no other boats are so exempted. It is altogether contrary to fact, as things now exist, to say that the effect of wharfage fees "is to place a tax upon salt alone." It is, however, absolutely true to say that to exempt salt from paying fees which every other commodity now pays is to bolster up the salt trade at the expense of the Buckingham canal, a work on which Government has incurred enormous outlay, and on which Capital and Revenue accounts are kept up.

(3) The various contentions of the Board that (*a*) because it is convenient for salt to continue to be loaded at the Salt Cotaurs, (*b*) because the conservancy of the banks is attended to, and (*c*) because a very short length of side channel is maintained by the Salt Department, salt boats at Salt Cotaurs should be exempted from wharfage fees, form no valid ground for such exemption. On a similar line of argument, coal, shells, firewood and other goods might just as well claim exemption. In all such cases, it is clearly for the private convenience of the trade in question that the Government wharves are not used, and such convenience forms no ground whatever for exemption. If such principles were admitted and exemption from wharfage allowed on grounds so inadequate, the Government wharves would soon be deserted altogether.

5. If the in-storage system is to be again introduced, and salt boats using the Salt Cotaurs are still to be exempted from payment of wharfage, the canal will lose annually considerable sums in wharfage fees, as salt will again become a principal item of traffic—*vide* paragraph 7 of note, printed with G.O., No. 619 I., dated 14th July 1893. In case of the exemption from wharfage being still allowed to salt boats using Salt Cotaurs, some arrangement should therefore be made providing that this lost revenue is adjusted by book transaction to the revenue account of the canal, and that the Salt Department furnish to the canal staff proper checks to show that the boats *do* actually load or unload at the Salt Cotaurs. By means of wharf clearance tickets, &c., the canal staff have at present a perfect check upon the movements of all boats except specially exempted salt boats using Salt Cotaurs.

6. It is difficult to see any logical or even intelligible ground upon which salt boats using the Salt Cotaurs can continue to be exempted from payment of wharfage—

(1) The boats are *not* the property of Government, but of private owners, and it is only reasonable that these owners should pay wharfage fees, since, as I have already shown in paragraph 4 of my letter, printed with G.O., No. 632 I., dated 17th July 1893, such levy of fees is strictly proportionate to profits, and is the only way of touching boats doing an exceptionally good business.

(2) It is ridiculous to suppose that the levy of so small a fee as one anna per ton for wharfage can make any material difference in the cost of so highly priced an article as salt. The exemption of such fees on salt boats makes, however, a great difference to the annual revenue of the canal and enables the Salt Department to make arrangements with its contractors to transport salt to Madras at slightly reduced rate, and one that is, moreover, wholly fictitious, *i.e.*, is specially relieved by Government from an impost that every other class of goods has to pay.

(3) Even if Government boats were used to transport salt to the Salt Cotaurs, it would form no valid ground for exemption, since the Government boats of the Forest Department conveying firewood have never been allowed any such exemption from payment of wharfage fees.

7. A great deal has been done to improve the canal of late years; the traffic is steadily increasing, and the blocks to traffic that occurred during the drought of 1891, and frequently in former years are rapidly, if proper precautions are taken, becoming an impossibility. The canal will, ere long, when the license and wharfage fees have been raised, show a very much better return than it has ever yet done, and as the cost of carriage along it is extremely low, the officers in charge of it may well bring to notice that its earnings will be unduly knocked down by special exemption from wharfage fees being allowed to any cargo boats whatever.

8. I therefore request to be favoured at an early date with orders whether G.O., No. 798 I., dated 21st December 1887, is to be still held to be in force; if so, whether it is only intended to apply to salt boats using Salt Cotaurs; or whether this Government Order is superseded by G.O., No. 632 I., dated 17th July 1893, which lays down detailed rules for wharves.

Enclosures.

From the Wharf Superintendent, to the Executive Engineer, Buckingham Canal, dated 7th March 1895, No. 165.

I beg to report that the Government salt has this day commenced to be transported from Vayalur to Madras Depôt by canal.

2. Wharfage fee for unloading at Salt Cotaurs has not been collected under G.O., No. 798 I. of 21st December 1887.

3. The salt here transported has been ascertained from the enclosed letter of the Inspector of Salt and Abkári Revenue, Madras Depôt, to be the Government property and not one of private merchants.

From the Inspector, to the Wharf Superintendent, Madras Basin, dated 7th March 1895.

With reference to your letter, dated 7th March 1895, I have the honour to inform you that the salt from Vayalur is Government property and is being transported to Madras under contract by Abdul Khadar Mustan Sahib.

No. 457 B-C.

Forwarded to the Chief Engineer for Irrigation for favour of very early orders. It would appear that G.O., No. 798 I., dated 21st December 1887, has been cancelled by G.O., No. 632 I., dated 17th July 1893.

(Signed) W. L. C. BADDELEY, Major, R.E.,
30th March 1895. Superintending Engineer, II Circle.

From Colonel R. R. E. DRAKE-BROCKMAN, R.E., Chief Engineer for Irrigation, to the Secretary to the Board of Revenue (Separate Revenue), dated 13th April 1895, No. 178 M.

I have the honour to forward endorsement No. 457-B.C., dated 30th March 1895, from the Superintending Engineer, II Circle, with its enclosures (to be returned), and request to be favoured with the Board's remarks on the question therein raised whether salt boats passing to the Salt Cotaurs should be still exempted from paying wharfage fees.

2. Up to the present time, salt has been paying wharfage fee, as it was bought by the contractors at Ennore. It is unreasonable that the alteration of rules in the Salt and Abkári Department as to where the contractors should buy salt should affect

the receipts of the canal. If this be allowed, it is impossible to tell whether the receipts of the canal are improving or not, and to make fair comparison between different years.

3. There seems to be no valid reason why salt should escape wharfage fees any more than firewood and the tax in the latter case is relatively much heavier than in the former, as the value of the goods is so much less.

4. The Buckingham canal is on a fair way to show receipts exceeding expenditure, and the salt trade, being benefited largely by it, should not be exempted from such taxes as are generally imposed and found by experience to be not more than the traffic can well bear.

5. If suitable to the Salt and Abkári Department, the charges may be made a book-transfer between the departments, or they may be levied on the boats which are, it is believed, private boats engaged by that department.

Read—the following Proceedings of the Board of Revenue (Separate Revenue), Mis. No. 3009, dated 17th July 1895:—

Read—again the following Proceedings of the Board of Revenue (Separate Revenue), Mis. No. 1207, dated 16th May 1895:—

Read—letter from the Chief Engineer for Irrigation, dated 13th April 1895, No. 178 M.

Resolution—Mis. No. 1207, dated 16th May 1895.

The Deputy Commissioner, Central Division, is requested to report what arrangements have been made for the payment of wharfage fees on boats conveying salt for storage at the Madras Depôt and if, by the terms of the contract, the transport contractor is not to bear the charge, whether a case for an application to Government for exemption can be made out under present circumstances.

Read—also letter from the Deputy Commissioner, Central Division, dated 8th June 1895, No. 2507.

Abstract.—Reporting that no arrangements have been made for the payment of wharfage fees on boats conveying salt for storage at the Madras Salt Depôt and expressing his opinion that if any fees are to be levied at all, they should be borne by Government.

Resolution—Mis. No. 3009, dated 17th July 1895.

Prior to the introduction of the outstorage system in 1890, the excise salt manufactured in the factories of the Vayalur, Ennore and Covelong Circles was transported in boats and stored at the Madras Salt Depôt, and the boats carrying such salt paid no wharfage fees until 1887. In that year the Salt Cotaurs, including the salt depôt premises, were declared to be a wharf. The question of the levy of wharfage fees was then raised by the canal authorities, and Government, after considering the arguments put forward by the Board against the proposed levy of wharfage fees on salt boats, was pleased in its order, No. 798 I., dated 21st December 1887, to sanction an exemption in favour of all licensed boats entering or leaving Madras laden with salt.

2. As long as the salt of the outlying factories was stored at the depôt, this order was observed, but since the introduction of the outstorage system, the rule has not been taken advantage of. The salt brought by licensees from the factories to Madras (not to the depôt) has paid wharfage, apparently because (although the wording of

the Government Order above referred to is such as to render it applicable to all salt boats entering and leaving Madras), the intention of the Government was considered to be to exempt only boats carrying salt from the out-factories *for storage at the depôt.* No objection was raised by the licensees as they were using the banks of the canal for loading and unloading, as it is used for other articles.

3. After the passing of the Canals and Ferries Act (II of 1890), Government in its order, dated 17th July 1893, No. 632 I., notified under section 16 (IV) thereof, a set of rules for the regulation of traffic at the wharves on the canal in general and at the Madras wharf in particular. Rule II of the rules relating to the latter requires all boats that load or unload within the limit of one mile from the Madras wharf to pay the prescribed wharfage. No mention was made in these rules of the exemption accorded in G.O., No. 798 I., dated 21st December 1887, to boats carrying salt, the reason presumably being that there was not the same necessity to do so inasmuch as at that time no salt was going to Madras for storage at the depôt. Now that the monopoly system has been ordered to be re-introduced into the factories of the Vayalur and Ennore Circles, the existing stocks of the licensees' salt are being purchased by Government and transported to the Madras depôt for storage, and Government salt will, from the season of 1896, be likewise sent there. The Board has therefore again to address Government on the subject of wharfage fees and, to request orders for the continuance of the exemption accorded in G.O., No. 798 I., dated 21st December 1887, in the case of the boats carrying salt to the Madras depôt for storage.

4. The Executive Engineer, Buckingham Canal Sub-division, supported by the Chief Engineer, considers that wharfage fees should be paid. He details at length his arguments in favour of the imposition of the fees, but as most of them were before Government when it passed its order of 1887, the Board does not consider it necessary to traverse them in detail. It will simply remark that, highly taxed as it is, salt is entitled to exceptional treatment as compared with the other articles of trade, firewood, &c., referred to by the Executive Engineer, if it can possibly be accorded. His main objection to the exemption claimed is the loss to the canal funds of "considerable sums in wharfage fees," a canal on which Government has incurred enormous outlay and on which Capital and Revenue accounts are kept. In reply to this, the Board would raise the question of whether wharfage fees were originally intended as a means of augmenting the general revenue of the canal or to cover the interest on the capital cost and expenditure connected with the maintenance of wharves for the convenience of the public. If the latter be the case, it would point out that the canal authorities have been put to no expense whatever either in the original construction or subsequent upkeep of the salt depôt wharf and the side channels which are maintained exclusively by this department. The Deputy Commissioner, Central Division, to whom the Board made a reference on the subject, states that at an expenditure of less than one year's wharfage fees on salt boats, he is prepared to dig other side channels which will render it quite unnecessary for such boats to unload from the Buckingham canal at all.

5. It may be added that no arrangements were made by the Board with the boat contractors who are transporting salt to the depôt on behalf of Government for the payment of the wharfage fees and that the fees, if levied, will have to be borne by Government and paid by book-transfer.

6. It may be urged that if the exemption be granted in favour of boats unloading Government salt at the depôt, Government salt will compete at an advantage over excise salt brought for sale to Madras in so far as the wharfage fees exceed the cost of upkeep of the depôt wharves and channels, but the Board submits that ere long all the licensees of the Vayalur and Ennore Circles will revert to the monopoly system and there will be no more excise salt sold at the local platforms and brought to Madras.

(True Copy and Extract.)

(Signed) EDMUND MILLETT,
Assistant Secretary.

Mis. No. 3492, Revenue.

Transferred to the Public Works Department with copy of note by the Honourable Mr. Bliss.

Ootacamund,
28th August 1895.

(Signed) W. B. AYLING,
Ag. Asst. Secretary to Government.

No. 21 I.

Note by the Chief Engineer for Irrigation.

With his endorsement, No. 457-B.C., dated 30th March 1895, the Superintending Engineer, II Circle, forwarded for orders a copy of letter, No. 3017, dated 9th March 1895, from the Executive Engineer, Buckingham Canal division, in which he raised the question whether paragraph 2 of the rules passed in G.O., No. 632 I., dated 17th July 1893, for regulation of traffic at the Madras wharf, ordering that boats which load or unload within the limit of one mile of the Madras wharf, should pay the prescribed wharfage fee, cancels G.O., No. 798 I., dated 21st December 1887 or not. Under this latter order the Salt Department claims exemption from payment of the fees, that department having commenced to transport salt from Vayalur to the Salt Cotaurs at Madras in supersession of the outstorage system introduced in 1890–91 under which the fees were levied on the salt contractors and paid, it may be remarked, without demur.

2. The Executive Engineer explains at length his reasons why the exemption should not be allowed, and the Board of Revenue in its Proceedings, No. 3009, dated 17th July 1895, brings forward its reasons to the contrary which, in the opinion of the Chief Engineer for Irrigation, are based on a misconception of the actual state of affairs which is totally different from what it was in 1887.

3. The first argument brought forward by the Board is that it is not considered necessary to traverse the arguments of the Executive Engineer, Buckingham Canal division, in his letter, as most of them were before Government when it passed its order of 1887 and which are detailed in Board's Resolution, dated 3rd October 1887, No. 535, printed with G.O., No. 798 I., dated 21st December 1887.

4. In paragraph 2 of this resolution, the object of imposing wharfage fees is given but not at all fully. The reasons may be described as follows:—

(*a*) To bring the receipts and disbursements into equilibrium (*vide* note by the Chief Engineer, Public Works Department, printed with G.O., No. 562 W., dated 20th February 1883).

(*b*) To meet the cost of construction and maintenance of wharves.

(*c*) To regulate the traffic and provide establishment for the conservancy of the canal.

(*d*) To provide means of collecting the necessary statistics for submission to the Government of India.

5. In paragraph 3 of the same resolution, the Board submits that the avowed objects of the tax will not be attained in the case of the Salt Cotaurs and suggests that salt boats are called upon to pay a fee for which they obtain no convenience and that the object of the fees would be attained by enhancing the canal tolls. As remarked in paragraph 2, these arguments could only be brought forward in ignorance of the real objects of wharfage fees as detailed in paragraph 4 *supra*, as the chief object of introducing wharfage fees was originally to bring the receipts and disbursements into equilibrium. The imposition of this tax did not enhance the charge, the tolls having been considerably reduced. Prior to the assumption by the Public Works Department in October 1879 of the duty of levying tolls on the Buckingham canal, the Collector of Chingleput was accustomed to levy, under the orders of the Board of Revenue, a toll of As. 4 per ton upon every cargo boat and As. 4 per trip on every passenger boat passed through the Shadyankuppam lock towards Madras. From this toll it is believed that salt boats were not exempted and in paragraph 10 of the memorandum on the Cochrane canal, printed as appendix 11 to the first report of the Commissioners appointed to enquire into and report upon the system of superintending and executing Public Works

in the Madras Presidency, it is specially mentioned that tolls were at that time levied on every description of goods which entered Madras. Again in paragraph 5 of Memorandum, dated 11th March 1878, by the Collector of Chingleput, printed with G.O., No. 1801-A.W., dated 8th July 1878, it is stated that Government do pay tolls on salt boats using the northern canal, but nothing towards licenses on the south canal which was at that time in a very undeveloped state.

6. From the earliest days of the canal, therefore, no mention can be found of any exemption of salt traffic from tolls except for a short period in 1887.

7. In paragraph 4 of its proceedings of 1887, it is stated that the tax is on salt alone. This statement is possibly based on the idea that salt gets but little benefit in return and this may have been partially true in 1887 when the canal was incomplete and in admittedly bad order but since navigation has been so much improved is no longer the case. It is certainly not a tax on salt alone neither is salt an exceptional case as if salt is to be exempted, because it does not actually use a warf why should not a similar concession be granted to Messrs. Arbuthnot and Co., Messrs. Binny and Co., and other firms with factories alongside the canal and who do not actually use the wharves. These firms do not seek to evade wharfage fees on this account.

8. The argument that wharfage fees can be evaded by constructing side channels to the Salt Cotaurs is one which regularly does duty, but the Board does not apparently realize that if this was allowed salt boats would get the full benefit of the improved line of navigation without paying the ordinary fees whether called wharfage fees or tolls. No railway would ever permit sidings to be constructed from their line to enable consignees to avoid terminal charges and it is inconceivable that Government would go to the trouble and expense of constructing side channels merely to evade their own tolls and in order to benefit Imperial at the expense of Provincial funds.

9. Having assumed that the arguments brought forward when the question was last before Government, but which it is submitted no longer apply, would still hold good, the Board in paragraph 4 of its Proceedings of 17th July 1895, Mis. No. 300?, remarks that salt, highly taxed as it is, is entitled to exceptional treatment as compared with other articles of trade, but does not explain why it should receive this exceptional treatment in the shape of what practically amounts to a grant from Provincial to Imperial funds—a grant which was not considered necessary when the outstorage system was still in force. The Government of India insist on statistics of canal borne traffic and so long as capital and revenue accounts are maintained, it is submitted that the financial results attained should not be partially concealed as they would be if salt received a bounty from canal funds.

10. Another reason given by the Board which has not already been dealt with is that no arrangements were made by the Board with the boat contractors for payment of wharfage fees, but this seems hardly a reason why these fees should be remitted as the rules were published in the Fort St. George and District Gazettes so long ago as 1893, and therefore, there is no reason why proper arrangements should not have been made. A simple way out of this difficulty will be, as the Board suggests, for Government to pay the charges from salt revenue as then they will be paid from Imperial funds to which they are a legitimate charge.

11. The question of wharfage fees having been raised, the Chief Engineer for Irrigation would suggest that the present time is a convenient opportunity to settle once for all the position of the Public Works and Salt Departments with regard to the East Coast canal system. At present the Salt Department construct new and improve and maintain existing channels at the cost of Salt funds when, in the opinion of the Chief Engineer for Irrigation, these channels should be carried out and maintained by the Public Works Department from Navigation funds. It is suggested therefore that all channels connected with any line of navigation, outside the limits of salt factories, should be constructed and maintained by the Public Works Department as ordinary component parts of the system. If this is done and the Salt Department are accorded every legitimate facility for their traffic, salt boats should, it is thought, pay the ordinary navigation charges without demur. Salt is a very considerable item in the traffic on the canals and when the new canal to the Madras harbour has been constructed, is likely to increase. This traffic should therefore be granted any concession which does not lead to complications and increased difficulty in the management of the canals.

The proposal that the Public Works Department should construct and maintain salt channels outside the limits of factories is not new, as the principle has already been accepted by Government in G.O., No. 3381, Revenue, dated 14th September 1893, No. 927 I., dated 26th November 1894, and No. 743 I., dated 12th September 1895.

12. If the proposals in the preceding paragraphs meet with the approval of Government, the Chief Engineer for Irrigation has no objection to the Salt Department being allowed to pay wharfage fees in Madras in one sum at the end of the year at the ordinary rate on condition that the Salt Department will collect and forward to this department the statistics required for communication to the Government of India and will also furnish a monthly statement of traffic in a form to be obtained from the Executive Engineer. This will obviate the necessity of salt boats being stopped at the locks going and coming from Madras which will otherwise be necessary if this information is to be collected in this department. The Salt Department must, of course, furnish their boatmen with tickets certifying that their boats are empty salt boats actually employed for salt traffic and must impress on them that no other return cargo must be carried. If the return cargo is carried the boats must be stopped to obtain the necessary statistical information.

13. The Chief Engineer for Irrigation would remind Government that the south canal is shortly to be improved specially to meet the requirements of salt traffic and this appears to be an additional reason why the Salt Department (Imperial funds) should pay ordinary fees (Provincial funds).

14. This reference has not been disposed of sooner owing to the revision of the navigation rules.

(Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
29th Jan. 1896. Chief Engineer for Irrigation.

Order—No. 226 I., dated 4th March 1896.

The landing place at the salt depôt being within a mile of the canal wharf at Madras will be treated as a wharf, and wharfage fees as prescribed in the rules for the regulation of traffic at wharves on the Buckingham canal will be levied on boats loading or unloading there.

2. The Board of Revenue will arrange with the Chief Engineer for Irrigation regarding the method of paying wharfage fees, and submit the arrangement arrived at for the approval of Government.

3. The wharf rules will not apply to the cases of salt factories and salt channels already under the control of the Salt Department, but in future, no private wharves or landing stages will be allowed to be constructed in connection with navigable canals without the sanction of Government.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Secretary to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ all Superintending Engineers of Circles.
„ the Examiner, Public Works Accounts.
„ the Revenue Department.

Order—Mis. No. 1421, Revenue, dated 9th April 1896.

Communicated to the Board of Revenue (Separate Revenue).

(True Extract.)

(Signed) LIONEL DAVIDSON,
Ag. Under Secy. to Govt.

To the Board of Revenue (Separate Revenue).

Reference on the above, dated 12th May 1896.

With reference to paragraph 12 of his note embodied in G.O., No. 226 I., dated 4th March 1896, the Chief Engineer for Irrigation is requested to be so good as to state what statistics are required from the Salt Department for communication to the Government of India, and whether they are to be submitted monthly or annually; and also to furnish the Board with a form of the monthly statement of traffic therein referred to. He is also requested to state the practice followed in the collection of wharfage fees prior to the exemption of salt boats from the payment of such fees in 1887, and to suggest a method by which the fees may be adjusted in future.

(Signed) D. D. MURDOCH,
Secretary.

To the Chief Engineer for Irrigation.

Copy to the Deputy Commissioner, Central Division.

Read—the following letter from Colonel R. R. E. DRAKE-BROCKMAN, R.E., Chief Engineer for Irrigation, to the Secretary to the Board of Revenue (Separate Revenue), dated Ootacamund, 29th June 1896, No. 284-M. :—

In reply to your reference, dated 12th May 1896, on Government register No. 415 of 1896, I have the honour to suggest the adoption of the accompanying two forms for recording statistics of salt traffic at the Madras Salt Cotaurs—one for the register to be maintained by the Salt Department and the other for the annual statement to be furnished to the Executive Engineer of the Buckingham Canal division. These forms will furnish all the information required, provided the Salt Department boats carry nothing but salt either in their first or return journey. Extracts from the first form, that is the register, should be submitted to the Executive Engineer, Buckingham Canal division, at the end of every month.

2. Prior to the exemption of salt boats from payment of wharfage fees in 1887, the salt boats used to pay fees on demand, but a great deal of trouble and loss of time will be obviated if the wharfage fees shown in the annual statement be adjusted through exchange accounts to the credit of the canal in a lump sum annually.

Enclosures.

Register of statistics of Salt traffic at the Madras Salt Cotaurs from 1st April 189 to 31st March 189 .

Month and Date.	Register number of boat.	Registered tonnage.	Actual tonnage.	From what place.	Distance in miles to Madras Salt Cotaurs.	Tow mileage.	Value.	Number of days boat stopped at the Salt Cotaurs.	Rate of wharfage fees in annas per ton.	Amount of wharfage fees.			Remarks.
1	2	3	4	5	6	7	8	9	10	11			12
		Tons.	Tons.		Miles.	Tow miles.	Rs.	Days.	Annas.	Rs.	A.	P.	
				Monthly extracts from this register to be sent to the Executive Engineer, Buckingham Canal Division.									

Annual statement of statistics of Salt traffic at the Madras Salt Cotaurs for 189 –9 , as compared with the previous year.

Year.	Total number of salt boats.	Total registered tonnage.	Total actual tonnage.	Total tow mileage.	Value.	Registered tonnage for which wharfage fee is chargeable at each rate per ton.*					Total amount of wharfage fees.			Remarks.
						One anna.	Two annas.	Three annas.	Four annas.	Total.				
1	2	3	4	5	6	7	8	9	10	11	12			13
	No.	Tons.	Tons.	Tow miles.	Rs.	Tons.	Tons.	Tons.	Tons.	Tons.	Rs.	A.	P.	
189 –9 ..														
189 –9 ..														
			To be sent to the Executive Engineer of the Buckingham Canal Division annually.											

*According to the number of days each boat stopped at the Salt Cotaurs.

Resolution—No. 285, dated 18th July 1896.

Communicated to the Deputy Commissioner, Central Division, for information and guidance. He is requested to issue the necessary instructions in regard to the preparation and submission of the monthly and annual statistics referred to by the Chief Engineer for Irrigation. The Deputy Commissioner's attention is also drawn to the last two sentences of paragraph 12 of the note by the Chief Engineer for Irrigation.

2. With reference to paragraph 2 of G.O., No. 226 I., dated 4th March 1896, the Board begs leave to state that it accepts the suggestion of the Chief Engineer for Irrigation contained in his letter read above in regard to the levy of wharfage fees by annual book-adjustment, and solicits the approval of Government.

(True Copies and Extract.)

(Signed) D. D. MURDOCH,
Secretary.

Mis. No. 3342, Revenue.

Transferred to the Public Works Department (Irrigation Branch).

Ootacamund,
19th August 1896.

(Signed) A. T. ARUNDEL,
Acting Secretary to Government.

Order—No. 770 I., dated 19th September 1896.

The arrangement proposed by the Board of Revenue and the Chief Engineer for Irrigation to levy wharfage fees on salt boats by annual book-adjustments, is approved.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Secretary to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineers of Circles.
" the Examiner, Public Works Accounts.
" the Revenue Department.

Exd. T. K. Narayana Aiyangar.

Public Works (1896) Department.

CURRENT No. 7697.

No. 770 I, dt 19th September 1896.

Order

The arrangement proposed by the Board of Revenue and the Chief Engineer for Irrigation, to levy wharfage fees on salt boats by annual book-adjustments is approved.

From The Revenue Department.

No. 3342.

Dated 19 August 1896.

Received 25 —do—.

Enclosures

Spare copies

SUBJECT.

Transferring to the P.W.D, Irrign Branch, Rev. Bds Procs (Separate Revenue) No. 285 dated 18 July 1896 conveying approval of Govt to the levy of wharfage fees on salt boats by annual book-adjustment.

To The Chief Engineer for Irrigation
Supdg. Engineers of Circles
The Examiner, P. W. Accts.
" Revenue Dept.

To The Secretary to Govt Revenue Dept for favor of comn.

P. W. 29
1,000—5-8-96.

BACK PAPERS.

G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.

Public works (1896) Department.

~~REVENUE DEPARTMENT.~~

Current Numbers 769

1896.

Board of Revenue

(Separate Revenue),

MADRAS.

Recd: 25. 8. 96

SECY. GOVT. MADRAS
12 AUG 96
REV. DEPT.

Printed August th.

Recd 12-8-96

Proceedings, No. 285, *18th July* 1896.

Endorsement No. 3342

Transferred to the P. W. Dept. (Irrigation Branch).

A Arundell
Actg Secretary to Govt

KD 1710 Cotacamund 19th Aug: 1896

Communicating, with remarks, to the Deputy Commissioner, Central Division, for information and guidance, Government Order regarding the levy of wharfage fees on salt boats loading and unloading at the Madras Salt Cotaur wharf on the Buckingham Canal, and soliciting the approval of Government to the levy of such fees by annual book-adjustment as suggested by the Chief Engineer for Irrigation.

Recd 12.8

PROCEEDINGS OF THE BOARD OF REVENUE

(SEPARATE REVENUE).

READ—the following G.O., Mis. No. 1421, Revenue, dated 9th April 1896:—

Read—the following G.O., No. 226 I., dated 4th March 1896:—

Read—the following letter from A. S. RUSSELL, Esq., Executive Engineer, Buckingham Canal Division, to the Superintending Engineer, II Circle, dated Pulicat, 9th March 1895, No. 3017:—

I have the honour to bring to your notice that the Salt Department are apparently beginning to abandon (*vide* accompanying original report *) the outstorage system introduced in the year 1890–91, have commenced to transport salt from Vayalur to the Salt Cotaurs at Madras and claim exemption from wharfage fees under the operation of G.O., No. 798 I., dated 21st December 1887. This Government Order has been a dead letter for many years past, and its provisions are, I imagine, practically cancelled by G.O., No. 632 I., dated 17th July 1893. Pending orders, however, on this reference I am permitting the salt boats to pass to the Salt Cotaurs without paying wharfage, as it is not very clear to me what the intentions of Government may be on the matter.

* No. 165, dated 7th March 1895, from Wharf Superintendent, Madras, with its 1 enclosure.

2. After G.O., No. 798 I., dated 21st December 1887, was passed, all salt boats loading or unloading at the Salt Cotaurs were not charged wharfage fees by the canal authorities, but salt boats loading or unloading at other wharves were so charged, though as the order stands it rules in comprehensive terms "that all licensed boats entering or leaving Madras laden with salt shall be exempt from wharfage fees." This order if acted upon in its literal sense would have gone far beyond the contention of the Board, and would have exempted all boats carrying salt, even for private individuals, from paying wharfage fees at all the wharves within the limits of the Shadayankuppam and Adyar locks. In 1890–91, the outstorage system was adopted and salt ceased to be stored at the salt Cotaurs, and when I took charge of the division in 1891 all salt boats were duly paying wharfage fees, and have continued to do so up to the present time. Now that the in-storage system has apparently again been started, the question has come before me for the first time of the precise meaning of G.O., No. 798 I., dated 21st December 1887, and whether it is still to be considered to be in force.

3. When G.O., No. 798 I., dated 21st December 1887, was passed, wharfage fees were a recent introduction, and no clear rules regarding wharves, or the levy of fees thereat, were in existence. In G.O., No. 632 I., dated 17th July 1893, Government approved a set of wharf rules, and under rule II, for regulation of traffic at the Madras wharf, boats that load or unload within the limit of one mile of the Madras wharf must pay the prescribed wharfage fees. The Salt Cotaurs are within this one mile limit, and the Government Order contains no mention of any exemption for any class of boats whatever.

4. The Board of Revenue in protesting in its resolution, printed with G.O., No. 798 I., dated 21st December 1887, against the levy of fees on salt boats loading or unloading at the Salt Cotaurs, proceeded on principles which are not applicable to

the present time, and in no way regulate the levy of wharfage fees. The following instances may be cited by way of example:—

(1) The object of wharfage fees as now recognised is *not* "to prevent boats loading and unloading goods except at authorized places." If such a principle were generally acted upon, the canal would become next to useless, and the traffic in firewood, grain and other produce would be absolutely killed, since it is idle to suppose that such goods could stand the cost of transport by road to the nearest wharf instead of being loaded or unloaded wherever wanted, as they are of course allowed to do. Both the navigation and the wharf rules give discretion to Executive Engineers to forbid loading or unloading except at wharves, but this power was conferred in order to check abuses and not to hamper legitimate traffic.

(2) The Board rightly state that one object of wharfage fees is to place all boats on the same footing. It is therefore perfectly anomalous at the present time to claim exemption for *salt boats alone*, since no other boats are so exempted. It is altogether contrary to fact, as things now exist, to say that the effect of wharfage fees "is to place a tax upon salt alone." It is, however, absolutely true to say that to exempt salt from paying fees which every other commodity now pays is to bolster up the salt trade at the expense of the Buckingham canal, a work on which Government has incurred enormous outlay, and on which Capital and Revenue accounts are kept up.

(3) The various contentions of the Board that (*a*) because it is convenient for salt to continue to be loaded at the Salt Cotaurs, (*b*) because the conservancy of the banks is attended to, and (*c*) because a very short length of side channel is maintained by the Salt Department, salt boats at Salt Cotaurs should be exempted from wharfage fees, form no valid ground for such exemption. On a similar line of argument, coal, shells, firewood and other goods might just as well claim exemption. In all such cases, it is clearly for the private convenience of the trade in question that the Government wharves are not used, and such convenience forms no ground whatever for exemption. If such principles were admitted and exemption from wharfage allowed on grounds so inadequate, the Government wharves would soon be deserted altogether.

5. If the in-storage system is to be again introduced, and salt boats using the Salt Cotaurs are still to be exempted from payment of wharfage, the canal will lose annually considerable sums in wharfage fees, as salt will again become a principal item of traffic—*vide* paragraph 7 of note, printed with G.O., No. 619 I., dated 14th July 1893. In case of the exemption from wharfage being still allowed to salt boats using Salt Cotaurs, some arrangement should therefore be made providing that this lost revenue is adjusted by book transaction to the revenue account of the canal, and that the Salt Department furnish to the canal staff proper checks to show that the boats *do* actually load or unload at the Salt Cotaurs. By means of wharf clearance tickets, &c., the canal staff have at present a perfect check upon the movements of all boats except specially exempted salt boats using Salt Cotaurs.

6. It is difficult to see any logical or even intelligible ground upon which salt boats using the Salt Cotaurs can continue to be exempted from payment of wharfage—

(1) The boats are *not* the property of Government, but of private owners, and it is only reasonable that these owners should pay wharfage fees, since, as I have already shown in paragraph 4 of my letter, printed with G.O., No. 632 I., dated 17th July 1893, such levy of fees is strictly proportionate to profits, and is the only way of touching boats doing an exceptionally good business.

(2) It is ridiculous to suppose that the levy of so small a fee as one anna per ton for wharfage can make any material difference in the cost of so highly priced an article as salt. The exemption of such fees on salt boats makes, however, a great difference to the annual revenue of the canal and enables the Salt Department to make arrangements with its contractors to transport salt to Madras at slightly reduced rate, and one that is, moreover, wholly fictitious, *i.e.*, is specially relieved by Government from an impost that every other class of goods has to pay.

(3) Even if Government boats were used to transport salt to the Salt Cotaurs, it would form no valid ground for exemption, since the Government boats of the Forest Department conveying firewood have never been allowed any such exemption from payment of wharfage fees.

7. A great deal has been done to improve the canal of late years; the traffic is steadily increasing, and the blocks to traffic that occurred during the drought of 1891, and frequently in former years arerapidly, if proper precautions are taken, becoming an impossibility. The canal will, ere long, when the license and wharfage fees have been raised, show a very much better return than it has ever yet done, and as the cost of carriage along it is extremely low, the officers in charge of it may well bring to notice that its earnings will be unduly knocked down by special exemption from wharfage fees being allowed to any cargo boats whatever.

8. I therefore request to be favoured at an early date with orders whether G.O., No. 798 I., dated 21st December 1887, is to be still held to be in force; if so, whether it is only intended to apply to salt boats using Salt Cotaurs; or whether this Government Order is superseded by G.O., No. 632 I., dated 17th July 1893, which lays down detailed rules for wharves.

ENCLOSURES.

From the Wharf Superintendent, to the Executive Engineer, Buckingham Canal, dated 7th March 1895, No. 165.

I beg to report that the Government salt has this day commenced to be transported from Vayalur to Madras Depôt by canal.

2. Wharfage fee for unloading at Salt Cotaurs has not been collected under G.O., No. 798 I. of 21st December 1887.

3. The salt here transported has been ascertained from the enclosed letter of the Inspector of Salt and Abkári Revenue, Madras Depôt, to be the Government property and not one of private merchants.

From the Inspector, to the Wharf Superintendent, Madras Basin, dated 7th March 1895.

With reference to your letter, dated 7th March 1895, I have the honour to inform you that the salt from Vayalur is Government property and is being transported to Madras under contract by Abdul Khadar Mustan Sahib.

No. 457 B-C.

Forwarded to the Chief Engineer for Irrigation for favour of very early orders. It would appear that G.O., No. 798 I., dated 21st December 1887, has been cancelled by G.O., No. 632 I., dated 17th July 1893.

(Signed) W. L. C. BADDELEY, Major, R.E.,
Superintending Engineer, II Circle.

30th March 1895.

From Colonel R. R. E. DRAKE-BROCKMAN, R.E., Chief Engineer for Irrigation, to the Secretary to the Board of Revenue (Separate Revenue), dated 13th April 1895, No. 178 M.

I have the honour to forward endorsement No. 457-B.C., dated 30th March 1895, from the Superintending Engineer, II Circle, with its enclosures (to be returned), and request to be favoured with the Board's remarks on the question therein raised whether salt boats passing to the Salt Cotaurs should be still exempted from paying wharfage fees.

2. Up to the present time, salt has been paying wharfage fee, as it was bought by the contractors at Ennore. It is unreasonable that the alteration of rules in the Salt and Abkári Department as to where the contractors should buy salt should affect

the receipts of the canal. If this be allowed, it is impossible to tell whether the receipts of the canal are improving or not, and to make fair comparison between different years.

3. There seems to be no valid reason why salt should escape wharfage fees any more than firewood and the tax in the latter case is relatively much heavier than in the former, as the value of the goods is so much less.

4. The Buckingham canal is on a fair way to show receipts exceeding expenditure, and the salt trade, being benefited largely by it, should not be exempted from such taxes as are generally imposed and found by experience to be not more than the traffic can well bear.

5. If suitable to the Salt and Abkári Department, the charges may be made a book-transfer between the departments, or they may be levied on the boats which are, it is believed, private boats engaged by that department.

———

Read—the following Proceedings of the Board of Revenue (Separate Revenue), Mis. No. 3009, dated 17th July 1895 :—

Read—again the following Proceedings of the Board of Revenue (Separate Revenue), Mis. No. 1207, dated 16th May 1895 :—

Read—letter from the Chief Engineer for Irrigation, dated 13th April 1895, No. 178 M.

———

Resolution—Mis. No. 1207, dated 16th May 1895.

The Deputy Commissioner, Central Division, is requested to report what arrangements have been made for the payment of wharfage fees on boats conveying salt for storage at the Madras Depôt and if, by the terms of the contract, the transport contractor is not to bear the charge, whether a case for an application to Government for exemption can be made out under present circumstances.

———

Read—also letter from the Deputy Commissioner, Central Division, dated 8th June 1895, No. 2507.

ABSTRACT.—Reporting that no arrangements have been made for the payment of wharfage fees on boats conveying salt for storage at the Madras Salt Depôt and expressing his opinion that if any fees are to be levied at all, they should be borne by Government.

———

Resolution—Mis. No. 3009, dated 17th July 1895.

Prior to the introduction of the outstorage system in 1890, the excise salt manufactured in the factories of the Vayalur, Ennore and Covelong Circles was transported in boats and stored at the Madras Salt Depôt, and the boats carrying such salt paid no wharfage fees until 1887. In that year the Salt Cotaurs, including the salt depôt premises, were declared to be a wharf. The question of the levy of wharfage fees was then raised by the canal authorities, and Government, after considering the arguments put forward by the Board against the proposed levy of wharfage fees on salt-boats, was pleased in its order, No. 798 I., dated 21st December 1887, to sanction an exemption in favour of all licensed boats entering or leaving Madras laden with salt.

2. As long as the salt of the outlying factories was stored at the depôt, this order was observed, but since the introduction of the outstorage system, the rule has not been taken advantage of. The salt brought by licensees from the factories to Madras (not to the depôt) has paid wharfage, apparently because (although the wording of

the Government Order above referred to is such as to render it applicable to all salt boats entering and leaving Madras), the intention of the Government was considered to be to exempt only boats carrying salt from the out-factories *for storage at the depôt*. No objection was raised by the licensees as they were using the banks of the canal for loading and unloading, as it is used for other articles.

3. After the passing of the Canals and Ferries Act (II of 1890), Government in its order, dated 17th July 1893, No. 632 I., notified under section 16 (IV) thereof, a set of rules for the regulation of traffic at the wharves on the canal in general and at the Madras wharf in particular. Rule II of the rules relating to the latter requires all boats that load or unload within the limit of one mile from the Madras wharf to pay the prescribed wharfage. No mention was made in these rules of the exemption accorded in G.O., No. 798 I., dated 21st December 1887, to boats carrying salt, the reason presumably being that there was not the same necessity to do so inasmuch as at that time no salt was going to Madras for storage at the depôt. Now that the monopoly system has been ordered to be re-introduced into the factories of the Vayalur and Ennore Circles, the existing stocks of the licensees' salt are being purchased by Government and transported to the Madras depôt for storage, and Government salt will, from the season of 1896, be likewise sent there. The Board has therefore again to address Government on the subject of wharfage fees and to request orders for the continuance of the exemption accorded in G.O., No. 798 I., dated 21st December 1887, in the case of the boats carrying salt to the Madras depôt for storage.

4. The Executive Engineer, Buckingham Canal Sub-division, supported by the Chief Engineer, considers that wharfage fees should be paid. He details at length his arguments in favour of the imposition of the fees, but as most of them were before Government when it passed its order of 1887, the Board does not consider it necessary to traverse them in detail. It will simply remark that, highly taxed as it is, salt is entitled to exceptional treatment as compared with the other articles of trade, firewood, &c., referred to by the Executive Engineer, if it can possibly be accorded. His main objection to the exemption claimed is the loss to the canal funds of "considerable sums in wharfage fees," a canal on which Government has incurred enormous outlay and on which Capital and Revenue accounts are kept. In reply to this, the Board would raise the question of whether wharfage fees were originally intended as a means of augmenting the general revenue of the canal or to cover the interest on the capital cost and expenditure connected with the maintenance of wharves for the convenience of the public. If the latter be the case, it would point out that the canal authorities have been put to no expense whatever either in the original construction or subsequent upkeep of the salt depôt wharf and the side channels which are maintained exclusively by this department. The Deputy Commissioner, Central Division, to whom the Board made a reference on the subject, states that at an expenditure of less than one year's wharfage fees on salt boats, he is prepared to dig other side channels which will render it quite unnecessary for such boats to unload from the Buckingham canal at all.

5. It may be added that no arrangements were made by the Board with the boat contractors who are transporting salt to the depôt on behalf of Government for the payment of the wharfage fees and that the fees, if levied, will have to be borne by Government and paid by book-transfer.

6. It may be urged that if the exemption be granted in favour of boats unloading Government salt at the depôt, Government salt will compete at an advantage over excise salt brought for sale to Madras in so far as the wharfage fees exceed the cost of upkeep of the depôt wharves and channels, but the Board submits that ere long all the licensees of the Vayalur and Ennore Circles will revert to the monopoly system and there will be no more excise salt sold at the local platforms and brought to Madras.

(True Copy and Extract.)

(Signed) EDMUND MILLETT,
Assistant Secretary.

Mis. No. 3492, Revenue.

Transferred to the Public Works Department with copy of note by the Honourable Mr. Bliss.

OOTACAMUND,
28th August 1895.

(Signed) W. B. AYLING,
Ag. Asst. Secretary to Government.

No. 21 I.

Note by the Chief Engineer for Irrigation.

With his endorsement, No. 457-B.C., dated 30th March 1895, the Superintending Engineer, II Circle, forwarded for orders a copy of letter, No. 3017, dated 9th March 1895, from the Executive Engineer, Buckingham Canal division, in which he raised the question whether paragraph 2 of the rules passed in G.O., No. 632 I., dated 17th July 1893, for regulation of traffic at the Madras wharf, ordering that boats which load or unload within the limit of one mile of the Madras wharf, should pay the prescribed wharfage fee, cancels G.O., No. 798 I., dated 21st December 1887 or not. Under this latter order the Salt Department claims exemption from payment of the fees, that department having commenced to transport salt from Vayalur to the Salt Cotaurs at Madras in supersession of the outstorage system introduced in 1890-91 under which the fees were levied on the salt contractors and paid, it may be remarked, without demur.

2. The Executive Engineer explains at length his reasons why the exemption should not be allowed, and the Board of Revenue in its Proceedings, No. 3009, dated 17th July 1895, brings forward its reasons to the contrary which, in the opinion of the Chief Engineer for Irrigation, are based on a misconception of the actual state of affairs which is totally different from what it was in 1887.

3. The first argument brought forward by the Board is that it is not considered necessary to traverse the arguments of the Executive Engineer, Buckingham Canal division, in his letter, as most of them were before Government when it passed its order of 1887 and which are detailed in Board's Resolution, dated 3rd October 1887, No. 535, printed with G.O., No. 798 I., dated 21st December 1887.

4. In paragraph 2 of this resolution, the object of imposing wharfage fees is given but not at all fully. The reasons may be described as follows:—

(*a*) To bring the receipts and disbursements into equilibrium (*vide* note by the Chief Engineer, Public Works Department, printed with G.O., No. 562 W., dated 20th February 1883).

(*b*) To meet the cost of construction and maintenance of wharves.

(*c*) To regulate the traffic and provide establishment for the conservancy of the canal.

(*d*) To provide means of collecting the necessary statistics for submission to the Government of India.

5. In paragraph 3 of the same resolution, the Board submits that the avowed objects of the tax will not be attained in the case of the Salt Cotaurs and suggests that salt boats are called upon to pay a fee for which they obtain no convenience and that the object of the fees would be attained by enhancing the canal tolls. As remarked in paragraph 2, these arguments could only be brought forward in ignorance of the real objects of wharfage fees as detailed in paragraph 4 *supra*, as the chief object of introducing wharfage fees was originally to bring the receipts and disbursements into equilibrium. The imposition of this tax did not enhance the charge, the tolls having been considerably reduced. Prior to the assumption by the Public Works Department in October 1879 of the duty of levying tolls on the Buckingham canal, the Collector of Chingleput was accustomed to levy, under the orders of the Board of Revenue, a toll of As. 4 per ton upon every cargo boat and As. 4 per trip on every passenger boat passed through the Shadyankuppam lock towards Madras. From this toll it is believed that salt boats were not exempted and in paragraph 10 of the memorandum on the Cochrane canal, printed as appendix 11 to the first report of the Commissioners appointed to enquire into and report upon the system of superintending and executing Public Works

in the Madras Presidency, it is specially mentioned that tolls were at that time levied on every description of goods which entered Madras. Again in paragraph 5 of Memorandum, dated 11th March 1878, by the Collector of Chingleput, printed with G.O., No. 1801-A.W., dated 8th July 1878, it is stated that Government do pay tolls on salt boats using the northern canal, but nothing towards licenses on the south canal which was at that time in a very undeveloped state.

6. From the earliest days of the canal, therefore, no mention can be found of any exemption of salt traffic from tolls except for a short period in 1887.

7. In paragraph 4 of its proceedings of 1887, it is stated that the tax is on salt alone. This statement is possibly based on the idea that salt gets but little benefit in return and this may have been partially true in 1887 when the canal was incomplete and in admittedly bad order but since navigation has been so much improved is no longer the case. It is certainly not a tax on salt alone neither is salt an exceptional case as if salt is to be exempted, because it does not actually use a warf why should not a similar concession be granted to Messrs. Arbuthnot and Co., Messrs. Binny and Co., and other firms with factories alongside the canal and who do not actually use the wharves. These firms do not seek to evade wharfage fees on this account.

8. The argument that wharfage fees can be evaded by constructing side channels to the Salt Cotaurs is one which regularly does duty, but the Board does not apparently realize that if this was allowed salt boats would get the full benefit of the improved line of navigation without paying the ordinary fees whether called wharfage fees or tolls. No railway would ever permit sidings to be constructed from their line to enable consignees to avoid terminal charges and it is inconceivable that Government would go to the trouble and expense of constructing side channels merely to evade their own tolls and in order to benefit Imperial at the expense of Provincial funds.

9. Having assumed that the arguments brought forward when the question was last before Government, but which it is submitted no longer apply, would still hold good, the Board in paragraph 4 of its Proceedings of 17th July 1895, Mis. No. 3009, remarks that salt, highly taxed as it is, is entitled to exceptional treatment as compared with other articles of trade, but does not explain why it should receive this exceptional treatment in the shape of what practically amounts to a grant from Provincial to Imperial funds—a grant which was not considered necessary when the outstorage system was still in force. The Government of India insist on statistics of canal borne traffic and so long as capital and revenue accounts are maintained, it is submitted that the financial results attained should not be partially concealed as they would be if salt received a bounty from canal funds.

10. Another reason given by the Board which has not already been dealt with is that no arrangements were made by the Board with the boat contractors for payment of wharfage fees, but this seems hardly a reason why these fees should be remitted as the rules were published in the Fort St. George and District Gazettes so long ago as 1893, and therefore, there is no reason why proper arrangements should not have been made. A simple way out of this difficulty will be, as the Board suggests, for Government to pay the charges from salt revenue as then they will be paid from Imperial funds to which they are a legitimate charge.

11. The question of wharfage fees having been raised, the Chief Engineer for Irrigation would suggest that the present time is a convenient opportunity to settle once for all the position of the Public Works and Salt Departments with regard to the East Coast canal system. At present the Salt Department construct new and improve and maintain existing channels at the cost of Salt funds when, in the opinion of the Chief Engineer for Irrigation, these channels should be carried out and maintained by the Public Works Department from Navigation funds. It is suggested therefore that all channels connected with any line of navigation, outside the limits of salt factories, should be constructed and maintained by the Public Works Department as ordinary component parts of the system. If this is done and the Salt Department are accorded every legitimate facility for their traffic, salt boats should, it is thought, pay the ordinary navigation charges without demur. Salt is a very considerable item in the traffic on the canals and when the new canal to the Madras harbour has been constructed, is likely to increase. This traffic should therefore be granted any concession which does not lead to complications and increased difficulty in the management of the canals.

The proposal that the Public Works Department should construct and maintain salt channels outside the limits of factories is not new, as the principle has already been accepted by Government in G.O., No. 3381, Revenue, dated 14th September 1893, No. 927 I, dated 26th November 1894, and No. 743 I, dated 12th September 1895.

12. If the proposals in the preceding paragraphs meet with the approval of Government, the Chief Engineer for Irrigation has no objection to the Salt Department being allowed to pay wharfage fees in Madras in one sum at the end of the year at the ordinary rate on condition that the Salt Department will collect and forward to this department the statistics required for communication to the Government of India and will also furnish a monthly statement of traffic in a form to be obtained from the Executive Engineer. This will obviate the necessity of salt boats being stopped at the locks going and coming from Madras which will otherwise be necessary if this information is to be collected in this department. The Salt Department must, of course, furnish their boatmen with tickets certifying that their boats are empty salt boats actually employed for salt traffic and must impress on them that no other return cargo must be carried. If the return cargo is carried the boats must be stopped to obtain the necessary statistical information.

13. The Chief Engineer for Irrigation would remind Government that the south canal is shortly to be improved specially to meet the requirements of salt traffic and this appears to be an additional reason why the Salt Department (Imperial funds) should pay ordinary fees (Provincial funds).

14. This reference has not been disposed of sooner owing to the revision of the navigation rules.

(Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
29th Jan. 1896. Chief Engineer for Irrigation.

Order—No. 226 I, dated 4th March 1896.

The landing place at the salt depôt being within a mile of the canal wharf at Madras will be treated as a wharf, and wharfage fees as prescribed in the rules for the regulation of traffic at wharves on the Buckingham canal will be levied on boats loading or unloading there.

2. The Board of Revenue will arrange with the Chief Engineer for Irrigation regarding the method of paying wharfage fees, and submit the arrangement arrived at for the approval of Government.

3. The wharf rules will not apply to the cases of salt factories and salt channels already under the control of the Salt Department, but in future, no private wharves or landing stages will be allowed to be constructed in connection with navigable canals without the sanction of Government.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Secretary to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ all Superintending Engineers of Circles.
„ the Examiner, Public Works Accounts.
„ the Revenue Department.

Order—Mis. No. 1421, Revenue, dated 9th April 1896.

Communicated to the Board of Revenue (Separate Revenue).

(True Extract.)

(Signed) LIONEL DAVIDSON,
Ag. Under Secy. to Govt.

To the Board of Revenue (Separate Revenue).

Reference on the above, dated 12th May 1896.

With reference to paragraph 12 of his note embodied in G.O., No. 226 I., dated 4th March 1896, the Chief Engineer for Irrigation is requested to be so good as to state what statistics are required from the Salt Department for communication to the Government of India, and whether they are to be submitted monthly or annually; and also to furnish the Board with a form of the monthly statement of traffic therein referred to. He is also requested to state the practice followed in the collection of wharfage fees prior to the exemption of salt boats from the payment of such fees in 1887, and to suggest a method by which the fees may be adjusted in future.

(Signed) D. D. MURDOCH,
Secretary.

To the Chief Engineer for Irrigation.

Copy to the Deputy Commissioner, Central Division.

READ—the following letter from Colonel R. R. E. DRAKE-BROCKMAN, R.E., Chief Engineer for Irrigation, to the Secretary to the Board of Revenue (Separate Revenue), dated Ootacamund, 29th June 1896, No. 284-M. :—

In reply to your reference, dated 12th May 1896, on Government register No. 415 of 1896, I have the honour to suggest the adoption of the accompanying two forms for recording statistics of salt traffic at the Madras Salt Cotaurs—one for the register to be maintained by the Salt Department and the other for the annual statement to be furnished to the Executive Engineer of the Buckingham Canal division. These forms will furnish all the information required, provided the Salt Department boats carry nothing but salt either in their first or return journey. Extracts from the first form, that is the register, should be submitted to the Executive Engineer, Buckingham Canal division, at the end of every month.

2. Prior to the exemption of salt boats from payment of wharfage fees in 1887, the salt boats used to pay fees on demand, but a great deal of trouble and loss of time will be obviated if the wharfage fees shown in the annual statement be adjusted through exchange accounts to the credit of the canal in a lump sum annually.

ENCLOSURES.

Register of statistics of Salt traffic at the Madras Salt Cotaurs from 1st April 189 to 31st March 189 .

Month and Date.	Register number of boat.	Registered tonnage.	Actual tonnage.	From what place.	Distance in miles to Madras Salt Cotaurs.	Tow mileage.	Value.	Number of days boat stopped at the Salt Cotaurs.	Rate of wharfage fees in annas per ton.	Amount of wharfage fees.			Remarks.
1	2	3	4	5	6	7	8	9	10	11			12
		Tons.	Tons.		Miles.	Tow miles.	Rs.	Days.	Annas.	Rs.	A.	P.	
Monthly extracts from this register to be sent to the Executive Engineer, Buckingham Canal Division.													

Annual statement of statistics of Salt traffic at the Madras Salt Cotaurs for 189 -9 , as compared with the previous year.

Year.	Total number of salt boats.	Total registered tonnage.	Total actual tonnage.	Total tow mileage.	Value.	Registered tonnage for which wharfage fee is chargeable at each rate per ton.*					Total amount of wharfage fees.			Remarks.
						One anna.	Two annas.	Three annas.	Four annas.	Total.				
1	2	3	4	5	6	7	8	9	10	11	12			13
	No.	Tons.	Tons.	Tow miles.	Rs.	Tons.	Tons.	Tons.	Tons.	Tons.	Rs.	A.	P.	
189 -9 ..														
189 -9 ..														

To be sent to the Executive Engineer of the Buckingham Canal Division annually.

* According to the number of days each boat stopped at the Salt Cotaurs.

RESOLUTION—No. 285, dated 18th July 1896.

Communicated to the Deputy Commissioner, Central Division, for information and guidance. He is requested to issue the necessary instructions in regard to the preparation and submission of the monthly and annual statistics referred to by the Chief Engineer for Irrigation. The Deputy Commissioner's attention is also drawn to the last two sentences of paragraph 12 of the note by the Chief Engineer for Irrigation.

2. With reference to paragraph 2 of G.O., No. 226 I., dated 4th March 1896, the Board begs leave to state that it accepts the suggestion of the Chief Engineer for Irrigation contained in his letter read above in regard to the levy of wharfage fees by annual book-adjustment, and solicits the approval of Government.

(True Copies and Extract.)

(Signed) D. D. MURDOCH,
Secretary.

(True Copy.)

Assistant Secretary.

To the Deputy Commissioner, Central Division.
" Secretary to Government, Revenue Department.
" Chief Engineer for Irrigation.

Copy to the Accountant-General, Madras.
" " Assistant Commissioner, Chingleput Sub-Division.
" to Inspectors, Vayalur, Ennore, Madras Depôt and Covelong Circles.

Exd. Shaik Kariem.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following papers:—

From A. S. RUSSELL, Esq., Executive Engineer, Buckingham Canal Division, to the Superintending Engineer, II Circle, dated Pulicat, 9th March 1895, No. 3017.

I have the honour to bring to your notice that the Salt Department are apparently beginning to abandon (*vide* accompanying original report *) the outstorage system introduced in the year 1890–91, have commenced to transport salt from Vayalur to the Salt Cotaurs at Madras and claim exemption from wharfage fees under the operation of G.O. No. 798 I., dated 21st December 1887. This Government Order has been a dead letter for many years past, and its provisions are, I imagine, practically cancelled by G.O. No. 632 I., dated 17th July 1893. Pending orders, however, on this reference I am permitting the salt boats to pass to the Salt Cotaurs without paying wharfage, as it is not very clear to me what the intentions of Government may be on the matter.

* No. 165, dated 7th March 1895, from Wharf Superintendent, Madras, with its 1 enclosure.

2. After G.O. No. 798 I., dated 21st December 1887, was passed, all salt boats loading or unloading at the Salt Cotaurs were not charged wharfage fees by the canal authorities, but salt boats loading or unloading at other wharves were so charged, though as the order stands it rules in comprehensive terms "that all licensed boats entering or leaving Madras laden with salt shall be exempt from wharfage fees." This order if acted upon in its literal sense would have gone far beyond the contention of the Board, and would have exempted all boats carrying salt, even for private individuals, from paying wharfage fees at all the wharves within the limits of the Shadayankuppam and Adyar locks. In 1890–91, the outstorage system was adopted and salt ceased to be stored at the Salt Cotaurs, and when I took charge of the division in 1891 all salt boats were duly paying wharfage fees, and have continued to do so up to the present time. Now that the instorage system has apparently again been started, the question has come before me for the first time of the precise meaning of G.O. No. 798 I., dated 21st December 1887, and whether it is still to be considered to be in force.

3. When G.O. No. 798 I., dated 21st December 1887, was passed, wharfage fees were a recent introduction, and no clear rules regarding wharves, or the levy of fees thereat, were in existence. In G.O. No. 632 I., dated 17th July 1893, Government approved a set of wharf rules, and under rule II, for regulation of traffic at the Madras wharf, boats that load or unload within the limit of one mile of the Madras wharf must pay the prescribed wharfage fees. The Salt Cotaurs are within this one mile limit, and the Government Order contains no mention of any exemption for any class of boats whatever.

4. The Board of Revenue in protesting in its resolution, printed with G.O. No. 798 I., dated 21st December 1887, against the levy of fees on salt boats loading or unloading at the Salt Cotaurs, proceeded on principles which are not applicable to

the present time, and in no way regulate the levy of wharfage fees. The following instances may be cited by way of example :—

(1) The object of wharfage fees as now recognised is *not* "to prevent boats loading and unloading goods except at authorized places." If such a principle were generally acted upon, the canal would become next to useless, and the traffic in firewood, grain and other produce would be absolutely killed, since it is idle to suppose that such goods could stand the cost of transport by road to the nearest wharf instead of being loaded or unloaded wherever wanted, as they are of course allowed to do. Both the navigation and the wharf rules give discretion to Executive Engineers to forbid loading or unloading except at wharves, but this power was conferred in order to check abuses and not to hamper legitimate traffic.

(2) The Board rightly state that one object of wharfage fees is to place all boats on the same footing. It is therefore perfectly anomalous at the present time to claim exemption for *salt boats alone*, since no other boats are so exempted. It is altogether contrary to fact, as things now exist, to say that the effect of wharfage fees "is to place a tax upon salt alone." It is, however, absolutely true to say that to exempt salt from paying fees which every other commodity now pays is to bolster up the salt trade at the expense of the Buckingham canal, a work on which Government has incurred enormous outlay, and on which Capital and Revenue accounts are kept up.

(3) The various contentions of the Board that (*a*) because it is convenient for salt to continue to be loaded at the Salt Cotaurs, (*b*) because the conservancy of the banks is attended to, and (*c*) because a very short length of side channel is maintained by the Salt Department, salt boats at Salt Cotaurs should be exempted from wharfage fees, form no valid ground for such exemption. On a similar line of argument, coal, shells, firewood and other goods might just as well claim exemption. In all such cases, it is clearly for the private convenience of the trade in question that the Government wharves are not used, and such convenience forms no ground whatever for exemption. If such principles were admitted and exemption from wharfage allowed on grounds so inadequate, the Government wharves would soon be deserted altogether.

5. If the instorage system is to be again introduced, and salt boats using the Salt Cotaurs are still to be exempted from payment of wharfage, the canal will lose annually considerable sums in wharfage fees, as salt will again become a principal item of traffic—*vide* paragraph 7 of note, printed with G.O. No. 619 I., dated 14th July 1893. In case of the exemption from wharfage being still allowed to salt boats using Salt Cotaurs, some arrangement should therefore be made providing that this lost revenue is adjusted by book transaction to the revenue account of the canal, and that the Salt Department furnish to the canal staff proper checks to show that the boats *do* actually load or unload at the Salt Cotaurs. By means of wharf clearance tickets, &c., the canal staff have at present a perfect check upon the movements of all boats except specially exempted salt boats using Salt Cotaurs.

6. It is difficult to see any logical or even intelligible ground upon which salt boats using the Salt Cotaurs can continue to be exempted from payment of wharfage—

(1) The boats are *not* the property of Government, but of private owners, and it is only reasonable that these owners should pay wharfage fees, since, as I have already shown in paragraph 4 of my letter, printed with G.O. No. 632 I., dated 17th July 1893, such levy of fees is strictly proportionate to profits, and is the only way of touching boats doing an exceptionally good business.

(2) It is ridiculous to suppose that the levy of so small a fee as one anna per ton for wharfage can make any material difference in the cost of so highly priced an article as salt. The exemption of such fees on salt boats makes, however, a great difference to the annual revenue of the canal and enables the Salt Department to make arrangements with its contractors to transport salt to Madras at a slightly reduced rate, and one that is, moreover, wholly fictitious, *i.e.*, is specially relieved by Government from an impost that every other class of goods has to pay.

(3) Even if Government boats were used to transport salt to the Salt Cotaurs, it would form no valid ground for exemption, since the Government boats of the Forest Department conveying firewood have never been allowed any such exemption from payment of wharfage fees.

7. A great deal has been done to improve the canal of late years; the traffic is steadily increasing, and the blocks to traffic that occurred during the drought of 1891, and frequently in former years are rapidly, if proper precautions are taken, becoming an impossibility. The canal will, ere long, when the license and wharfage fees have been raised, show a very much better return than it has ever yet done, and as the cost of carriage along it is extremely low, the officers in charge of it may well bring to notice that its earnings will be unduly knocked down by special exemption from wharfage fees being allowed to any cargo boats whatever.

8. I therefore request to be favoured at an early date with orders whether G.O. No. 798 I., dated 21st December 1887, is to be still held to be in force; if so, whether it is only intended to apply to salt boats using Salt Cotaurs; or whether this Government Order is superseded by G.O. No. 632 I., dated 17th July 1893, which lays down detailed rules for wharves.

Enclosures.

From the Wharf Superintendent, to the Executive Engineer, Buckingham Canal, dated 7th March 1895, No. 165.

I beg to report that the Government salt has this day commenced to be transported from Vayalur to Madras Depôt by canal.

2. Wharfage fee for unloading at Salt Cotaurs has not been collected under G.O. No. 798 I. of 21st December 1887.

3. The salt here transported has been ascertained from the enclosed letter of the Inspector of Salt and Abkári Revenue, Madras Depôt, to be the Government property and not one of private merchants.

From the Inspector, to the Wharf Superintendent, Madras Basin, dated 7th March 1895.

With reference to your letter, dated 7th March 1895, I have the honour to inform you that the salt from Vayalur is Government property and is being transported to Madras under contract by Abdul Khadar Mustan Sahib.

No. 457 B.C.

Forwarded to the Chief Engineer for Irrigation for favour of very early orders. It would appear that G.O. No. 798 I., dated 21st December 1887, has been cancelled by G.O. No. 632 I., dated 17th July 1893.

(Signed) W. L. C. BADDELEY, Major, R.E.,
30th March 1895. Superintending Engineer, II Circle.

From Colonel R. R. E. DRAKE-BROCKMAN, R.E., Chief Engineer for Irrigation, to the Secretary to the Board of Revenue (Separate Revenue), dated 13th April 1895, No. 178 M.

I have the honour to forward endorsement No. 457 B.C., dated 30th March 1895, from the Superintending Engineer, II Circle, with its enclosures (to be returned), and request to be favoured with the Board's remarks on the question therein raised whether salt boats passing to the Salt Cotaurs should be still exempted from paying wharfage fees.

2. Up to the present time, salt has been paying wharfage fee, as it was bought by the contractors at Ennore. It is unreasonable that the alteration of rules in the

Salt and Abkári Department as to where the contractors should buy salt should affect the receipts of the canal. If this be allowed, it is impossible to tell whether the receipts of the canal are improving or not, and to make fair comparison between different years.

3. There seems to be no valid reason why salt should escape wharfage fees any more than firewood and the tax in the latter case is relatively much heavier than in the former, as the value of the goods is so much less.

4. The Buckingham canal is on a fair way to show receipts exceeding expenditure, and the salt trade, being benefited largely by it, should not be exempted from such taxes as are generally imposed and found by experience to be not more than the traffic can well bear.

5. If suitable to the Salt and Abkári Department, the charges may be made a book-transfer between the departments, or they may be levied on the boats which are, it is believed, private boats engaged by that department.

READ—Proceedings of the Board of Revenue (Separate Revenue), dated 17th July 1895, Mis. No. 3009.

Read—again the following Proceedings of the Board of Revenue (Separate Revenue), dated 16th May 1895, Mis. No. 1207 :—

Read—letter from the Chief Engineer for Irrigation, dated 13th April 1895, No. 178 M.

Resolution—Mis. No. 1207, dated 16th May 1895.

The Deputy Commissioner, Central Division, is requested to report what arrangements have been made for the payment of wharfage fees on boats conveying salt for storage at the Madras Depôt and if, by the terms of the contract, the transport contractor is not to bear the charge, whether a case for an application to Government for exemption can be made out under present circumstances.

Read—also letter from the Deputy Commissioner, Central Division, dated 8th June 1895, No. 2507.

ABSTRACT.—Reporting that no arrangements have been made for the payment of wharfage fees on boats conveying salt for storage at the Madras Salt Depôt and expressing his opinion that if any fees are to be levied at all, they should be borne by Government.

Resolution—Mis. No. 3009, dated 17th July 1895.

Prior to the introduction of the outstorage system in 1890, the excise salt manufactured in the factories of the Vayalur, Ennore and Covelong Circles was transported in boats and stored at the Madras Salt Depôt, and the boats carrying such salt paid no wharfage fees until 1887. In that year the Salt Cotaurs, including the salt depôt premises, were declared to be a wharf. The question of the levy of wharfage fees was then raised by the canal authorities, and Government, after considering the arguments put forward by the Board against the proposed levy of wharfage fees on salt boats, was pleased in its order, dated 21st December 1887, No. 798 I., Public Works, to sanction an exemption in favour of all licensed boats entering or leaving Madras laden with salt.

2. As long as the salt of the outlying factories was stored at the depôt, this order was observed, but since the introduction of the outstorage system, the rule has not been taken advantage of. The salt brought by licensees from the factories to Madras (not to the depôt) has paid wharfage, apparently because (although the wording of

the Government Order above referred to is such as to render it applicable to all salt boats entering and leaving Madras), the intention of the Government was considered to be to exempt only boats carrying salt from the out-factories *for storage at the depôt.* No objection was raised by the licensees as they were using the banks of the canal for loading and unloading, as it is used for other articles.

3. After the passing of the Canals and Ferries Act (II of 1890), Government in its Order, dated 17th July 1893, No. 632 I., Public Works, notified under section 16 (IV) thereof, a set of rules for the regulation of traffic at the wharves on the canal in general and at the Madras wharf in particular. Rule II of the rules relating to the latter requires all boats that load or unload within the limit of one mile from the Madras wharf to pay the prescribed wharfage. No mention was made in these rules of the exemption accorded in G.O. No. 798 I., Public Works, dated 21st December 1887, to boats carrying salt, the reason presumably being that there was not the same necessity to do so inasmuch as at that time no salt was going to Madras for storage at the depôt. Now that the monopoly system has been ordered to be re-introduced into the factories of the Vayalur and Ennore Circles, the existing stocks of the licensees' salt are being purchased by Government and transported to the Madras depôt for storage, and Government salt will, from the season of 1896, be likewise sent there. The Board has therefore again to address Government on the subject of wharfage fees and to request orders for the continuance of the exemption accorded in G.O. No. 798 I., Public Works, dated 21st December 1887, in the case of the boats carrying salt to the Madras depôt for storage.

4. The Executive Engineer, Buckingham Canal sub-division, supported by the Chief Engineer, considers that wharfage fees should be paid. He details at length his arguments in favour of the imposition of the fees, but as most of them were before Government when it passed its order of 1887, the Board does not consider it necessary to traverse them in detail. It will simply remark that, highly taxed as it is, salt is entitled to exceptional treatment as compared with the other articles of trade, firewood, &c., referred to by the Executive Engineer, if it can possibly be accorded. His main objection to the exemption claimed is the loss to the canal funds of "considerable sums in wharfage fees," a canal on which Government has incurred enormous outlay and on which Capital and Revenue accounts are kept. In reply to this, the Board would raise the question of whether wharfage fees were originally intended as a means of augmenting the general revenue of the canal or to cover the interest on the capital cost and expenditure connected with the maintenance of wharves for the convenience of the public. If the latter be the case, it would point out that the canal authorities have been put to no expense whatever either in the original construction or subsequent upkeep of the salt depôt wharf and the side channels which are maintained exclusively by this department. The Deputy Commissioner, Central Division, to whom the Board made a reference on the subject, states that at an expenditure of less than one year's wharfage fees on salt boats, he is prepared to dig other side channels which will render it quite unnecessary for such boats to unload from the Buckingham canal at all.

5. It may be added that no arrangements were made by the Board with the boat contractors who are transporting salt to the depôt on behalf of Government for the payment of the wharfage fees and that the fees, if levied, will have to be borne by Government and paid by book-transfer.

6. It may be urged that if the exemption be granted in favour of boats unloading Government salt at the depôt, Government salt will compete at an advantage over excise salt brought for sale to Madras in so far as the wharfage fees exceed the cost of upkeep of the depôt wharves and channels, but the Board submits that ere long all the licensees of the Vayalur and Ennore Circles will revert to the monopoly system and there will be no more excise salt sold at the local platforms and brought to Madras.

(True Copy and Extract.)

(Signed) EDMUND MILLETT,
Assistant Secretary.

Mis. No. 3492, Revenue.

Transferred to the Public Works Department with copy of note by the Honourable Mr. Bliss.

(Signed) W. B. AYLING,
Ag. Asst. Secy. to Government.

OOTACAMUND,
28th August 1895.

No. 21 I.

Note by the Chief Engineer for Irrigation.

With his endorsement, No. 457 B.C., dated 30th March 1895, the Superintending Engineer, II Circle, forwarded for orders a copy of letter, No. 3017, dated 9th March 1895, from the Executive Engineer, Buckingham Canal division, in which he raised the question whether paragraph 2 of the rules passed in G.O. No. 632 I., dated 17th July 1893, for regulation of traffic at the Madras wharf, ordering that boats which load or unload within the limit of one mile of the Madras wharf, should pay the prescribed wharfage fee, cancels G.O. No. 798 I., dated 21st December 1887 or not. Under this latter order the Salt Department claims exemption from payment of the fees, that department having commenced to transport salt from Vayalur to the Salt Cotaurs at Madras in supersession of the outstorage system introduced in 1890–91 under which the fees were levied on the salt contractors and paid, it may be remarked, without demur.

2. The Executive Engineer explains at length his reasons why the exemption should not be allowed, and the Board of Revenue in its Proceedings, No. 3009, dated 17th July 1895, brings forward its reasons to the contrary which, in the opinion of the Chief Engineer for Irrigation, are based on a misconception of the actual state of affairs which is totally different from what it was in 1887.

3. The first argument brought forward by the Board is that it is not considered necessary to traverse the arguments of the Executive Engineer, Buckingham Canal division, in his letter, as most of them were before Government when it passed its order of 1887 and which are detailed in Board's Resolution, dated 3rd October 1887, No. 535, printed with G.O. No. 798 I., dated 21st December 1887.

4. In paragraph 2 of this resolution the object of imposing wharfage fees is given but not at all fully. The reasons may be described as follows :—

(*a*) To bring the receipts and disbursements into equilibrium (*vide* note by the Chief Engineer, Public Works Department, printed with G.O. No. 562 W., dated 20th February 1883).

(*b*) To meet the cost of construction and maintenance of wharves.

(*c*) To regulate the traffic and provide establishment for the conservancy of the canal.

(*d*) To provide means of collecting the necessary statistics for submission to the Government of India.

5. In paragraph 3 of the same resolution the Board submits that the avowed objects of the tax will not be attained in the case of the Salt Cotaurs and suggests that salt boats are called upon to pay a fee for which they obtain no convenience and that the object of the fees would be attained by enhancing the canal tolls. As remarked in paragraph 2 these arguments could only be brought forward in ignorance of the real objects of wharfage fees as detailed in paragraph 4 *supra*, as the chief object of introducing wharfage fees was originally to bring the receipts and disbursements into equilibrium. The imposition of this tax did not enhance the charge, the tolls having been considerably reduced. Prior to the assumption by the Public Works Department in October 1879 of the duty of levying tolls on the Buckingham canal, the Collector of Chingleput was accustomed to levy, under the orders of the Board of Revenue, a toll of As. 4 per ton upon every cargo boat and As. 4 per trip on every passenger boat passed through the Shadyankuppam lock towards Madras. From this toll it is believed that salt boats were not exempted and in paragraph 10 of the memorandum on the Cochrane

canal, printed as appendix 11 to the first report of the Commissioners appointed to enquire into and report upon the system of superintending and executing Public Works in the Madras Presidency, it is specially mentioned that tolls were at that time levied on every description of goods which entered Madras. Again in paragraph 5 of Memorandum, dated 11th March 1878, by the Collector of Chingleput, printed with G.O. No. 1801 A.W., dated 8th July 1878, it is stated that Government do pay tolls on salt boats using the northern canal, but nothing towards licenses on the south canal which was at that time in a very undeveloped state.

6. From the earliest days of the canal, therefore, no mention can be found of any exemption of salt traffic from tolls except for a short period in 1887.

7. In paragraph 4 of its proceedings of 1887, it is stated that the tax is on salt alone. This statement is possibly based on the idea that salt gets but little benefit in return and this may have been partially true in 1887 when the canal was incomplete and in admittedly bad order, but since navigation has been so much improved is no longer the case. It is certainly not a tax on salt alone neither is salt an exceptional case as if salt is to be exempted, because it does not actually use a wharf why should not a similar concession be granted to Messrs. Arbuthnot and Co., Messrs Binny and Co., and other firms with factories alongside the canal and who do not actually use the wharves. These firms do not seek to evade wharfage fees on this account.

8. The argument that wharfage fees can be evaded by constructing side channels to the Salt Cotaurs is one which regularly does duty, but the Board does not apparently realize that if this was allowed salt boats would get the full benefit of the improved line of navigation without paying the ordinary fees whether called wharfage fees or tolls. No railway would ever permit sidings to be constructed from their line to enable consignees to avoid terminal charges and it is inconceivable that Government would go to the trouble and expense of constructing side channels merely to evade their own tolls and in order to benefit Imperial at the expense of Provincial funds.

9. Having assumed that the arguments brought forward when the question was last before Government, but which it is submitted no longer apply, would still hold good, the Board in paragraph 4 of its Proceedings of 17th July 1895, Mis. No. 3009, remarks that salt, highly taxed as it is, is entitled to exceptional treatment as compared with other articles of trade, but does not explain why it should receive this exceptional treatment in the shape of what practically amounts to a grant from Provincial to Imperial funds—a grant which was not considered necessary when the outstoarge system was still in force. The Government of India insist on statistics of canal borne traffic and so long as capital and revenue accounts are maintained, it is submitted that the financial results attained should not be partially concealed as they would be if salt received a bounty from canal funds.

10. Another reason given by the Board which has not already been dealt with is that no arrangements were made by the Board with the boat contractors for payment of wharfage fees, but this seems hardly a reason why these fees should be remitted as the rules were published in the Fort St. George and District Gazettes so long ago as 1893, and therefore, there is no reason why proper arrangements should not have been made. A simple way out of this difficulty will be, as the Board suggests, for Government to pay the charges from salt revenue as then they will be paid from Imperial funds to which they are a legitimate charge.

11. The question of wharfage fees having been raised the Chief Engineer for Irrigation would suggest that the present time is a convenient oppertunity to settle once for all the position of the Public Works and Salt Departments with regard to the East Coast canal system. At present the Salt Department construct new and improve and maintain existing channels at the cost of Salt funds when, in the opinion of the Chief Engineer for Irrigation, these channels should be carried out and maintained by the Public Works Department from Navigation funds. It is suggested therefore that all channels connected with any line of navigation, outside the limits of salt factories, should be constructed and maintained by the Public Works Department as ordinary component parts of the system. If this is done and the Salt Department

are accorded every legitimate facility for their traffic, salt boats should, it is thought, pay the ordinary navigation charges without demur. Salt is a very considerable item in the traffic on the canals and, when the new canal to the Madras harbour has been constructed, is likely to increase. This traffic should therefore be granted any concession which does not lead to complications and increased difficulty in the management of the canals. The proposal that the Public Works Department should construct and maintain salt channels outside the limits of factories is not new, as the principle has already been accepted by Government in G.Os. No. 3381, Revenue, dated 14th September 1893, No. 927 I., dated 26th November 1894, and No. 743 I., dated 12th September 1895.

12. If the proposals in the preceding paragraphs meet with the approval of Government, the Chief Engineer for Irrigation has no objection to the Salt Department being allowed to pay wharfage fees in Madras in one sum at the end of the year at the ordinary rate on condition that the Salt Department will collect and forward to this department the statistics required for communication to the Government of India and will also furnish a monthly statement of traffic in a form to be obtained from the Executive Engineer. This will obviate the necessity of salt boats being stopped at the locks going and coming from Madras which will otherwise be necessary if this information is to be collected in this department. The Salt Department must, of course, furnish their boatmen with tickets certifying that their boats are empty salt boats actually employed for salt traffic and must impress on them that no other return cargo must be carried. If the return cargo is carried the boats must be stopped to obtain the necessary statistical information.

13. The Chief Engineer for Irrigation would remind Government that the south canal is shortly to be improved specially to meet the requirements of salt traffic and this appears to be an additional reason why the Salt Department (Imperial funds) should pay ordinary fees (Provincial funds).

14. This reference has not been disposed of sooner owing to the revision of the navigation rules.

(Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
29th Jan. 1896. Chief Engineer for Irrigation.

Order—No. 226 I., dated 4th March 1896.

The landing place at the salt depôt being within a mile of the canal wharf at Madras will be treated as a wharf, and wharfage fees as prescribed in the rules for the regulation of traffic at wharves on the Buckingham canal will be levied on boats loading or unloading there.

2. The Board of Revenue will arrange with the Chief Engineer for Irrigation regarding the method of paying wharfage fees, and submit the arrangement arrived at for the approval of Government.

3. The wharf rules will not apply to the cases of salt factories and salt channels already under the control of the Salt Department, but in future, no private wharves or landing stages will be allowed to be constructed in connection with navigable canals without the sanction of Government.

(True Extract.)

Under Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ all Superintending Engineers of Circles.
„ the Examiner, Public Works Accounts.
„ the Revenue Department.

Exd. Shaik Karim.
Spare Copies

IRRIGATION.

Govt. of {1896} Madras.

PUBLIC WORKS.

Dated March, 4th.

Recd. *Encl.*

G.O. No. 226 I., 4th Mar. 1896.

MARCH.

Wharf

Directing, with remarks, that the landing place at the salt depôt within a mile of the canal wharf at Madras be treated as a — under the rules for the regulation of traffic at wharves on the Buckingham canal, and that the prescribed fees be levied, and stating that no private wharves or landing stages will be allowed to be constructed in connection with navigable canals without the sanction of Government.

Proc

No 3017.

Office of the Executive Engineer
Buckingham Canal
Camp Pulicat
Madras Basin 7th March 1895.

From
A. S. Russel Esquire.
Executive Engineer,
Buckingham Canal Division

To
The Superintending Engineer
Second Circle

Sir,

I have the honour to bring to your notice that the Salt Department are apparently beginning to abandon (vide accompanying original report) the outstorage system introduced in the year 1890-91; have commenced to transport salt from Vayalur to the Salt Cotaurs at Madras, and claim exemption from wharfage fees under the operation of G. O. No 798 I, dated 21st December 1887. This G. O. has been a dead letter for many years past, and its provisions

* No 165, dated 7th March 1895 from Wharf-Superintendent, Madras, with its enclosure.

provisions are, I imagine, practically cancelled by G.O. 632 I, dated 17th July 1893. Pending orders, however, on this reference I am permitting the Salt-boats to pass to the Salt Cotaurs without paying wharfage, as it is not very clear to me what the intentions of Government may be on the matter.

2. After G.O. 798 I, dated 21st December 1887, was passed, all salt-boats loading or unloading at the Salt Cotaurs were not charged wharfage fees by the canal authorities, but salt boats loading or unloading at other wharves were so charged, though as the order stands it rules in comprehensive terms "that all licensed boats entering or leaving Madras laden with Salt shall be exempt from wharfage

wharfage fees". This order if acted upon in its literal sense, would have gone far beyond the contention of the Board, and would have exempted salt-boat carrying salt, even for private individuals, from paying wharfage fees at all the wharves within the limits of the Shadayankuppam and Adyar locks. In 1890-91 the out-storage system was adopted, and salt ceased to be stored at the Salt Cotaurs, and when I took charge of the Division in 1891 all salt-boats were duly paying wharfage fees, and have continued to do so up to the present time. Now that the in-storage system has apparently again been started, the question has come before me for the first

first time of the precise meaning of G.O. No 798 I, dated 21st December 1887, and whether it is still to be considered to be in force.

3. When G.O. No 798 I, dated 21st December 1887 was passed, wharfage fees were a recent introduction, and no clear rules regarding wharves, or the levy of fees thereat, were in existence. In G.O. No 632 I, dated 17th July 1893, Government approved a set of wharf rules, and under Rule II, for regulation of traffic at the Madras wharf, boats that load or unload within the limit of one mile of the Madras wharf must pay the prescribed wharfage fees. The Salt Godowns are within this one mile limit, and the G.O. contains no mention of any exemption for any class of boats whatever.

4.

4. The Board of Revenue in protesting, in its Resolution printed with G.O. No 798 I, dated 21st December 1887, against the levy of fees on Salt boats loading or unloading at the Salt Godowns, proceeded on principles which are not applicable to the present time, and in no way regulate the levy of wharfage fees. The following instances may be cited by way of example.

(1) The object of wharfage fees, as now recognised, is not "to prevent boats loading and unloading goods except at authorized places." If such a principle were generally acted upon, the canal would become next to useless, and the traffic in firewood, grain, and other produce would be absolutely killed, since it is idle to suppose that

that such goods could stand the cost of transport by road to the nearest wharf instead of being loaded or unloaded wherever wanted, as they are of course allowed to do. Both the navigation and the wharf rules give discretion to Executive Engineers to forbid loading or unloading except at wharves, but this power was conferred in order to check abuses and not to hamper legitimate traffic.

(2) The Board rightly state that one object of wharfage fees is to place all boats on the same footing. It is therefore perfectly anomalous at the present time to claim exemption for salt boats alone, since no other boats are so exempted. It is altogether contrary to fact, as things now exist, to say that the effect of

of wharfage fees "is to place a tax upon salt alone." It is however absolutely true to say that to exempt salt from paying fees which every other commodity now pays is to bolster up the salt trade at the expense of the Buckingham Canal - a work on which Government has incurred enormous outlay, and on which capital and Revenue accounts are kept up.

(3) The various contentions of the Board that (a) because it is convenient for salt to continue to be loaded at the Salt Cotaurs, (b) because the conservancy of the banks is attended to, and (c) because a very short length of side-channel is maintained by the Salt Department, Salt boats at Salt Cotaurs should be

exempted

exempted from wharfage fees, for there no valid ground for such exemption. On a similar line of argument, coal, shells, firewood, and other goods might just as well claim exemption. In all such cases, it is clearly for the private convenience of the trade in question that the Government wharves are not used, and such convenience forms no ground whatever for exemption. If such principles were admitted, and exemption from wharfage allowed on grounds so inadequate, the Government wharves would soon be deserted altogether.

5. If the in-storage system is to be again introduced, and Salt-boats using the Salt Cotaurs are still to be exempted from payment of wharfage, the Canal will lose annually considerable sums

sums in wharfage fees, as salt will again become a principal item of traffic, vide para 7 of note printed with G.O. No 619 I, dated 14th July 1893. In case of the exemption from wharfage being still allowed to salt-boats using salt-Cotaurs, some arrangement should therefore be made providing that this lost revenue is adjusted by book transaction to the Revenue account of the Canal, and that the Salt department furnish to the Canal staff proper checks to show that the boats do actually load or unload at the Salt-Cotaurs. By means of wharf clearance tickets, etc, the Canal staff have at present a perfect check upon the movements of all boats except specially exempted salt boats using salt-Cotaurs.

6.

6. It is difficult to see any logical, or even intelligible ground, upon which Salt boats using the Salt Cotaurs can continue to be exempted from payment of wharfage. The boats are not the property of Government, but of private owners, and it is only reasonable that these owners should pay wharfage fees, since, as I have already shown in para 4 of my letter printed with G. O. 632 J, dated 17th July 1893, such levy of fees is strictly proportionate to profits, and is the only way of touching boats doing an exceptionally good business.

Second. It is ridiculous to suppose that the levy of so small a fee as one anna per ton for wharfage can make any material difference in the cost of so highly priced an article

as salt. The exemption of such fees on Salt boats makes, however, a great difference to the annual revenue of the Canal and enables the Salt Department to make arrangements with its contractors to transport salt to Madras at a slightly reduced rate, and one that is moreover wholly fictitious, i.e, is specially relieved by Government from an impost that every other class of goods has to pay.

Third: Even if Government boats were used to transport salt to the Salt Cotaurs it would form no valid ground for exemption, since the Government boats of the Forest Department conveying firewood have never been allowed any such exemption from payment of wharfage fees.

7. A great deal has been done to improve the Canal of late years; the traffic is steadily

steadily increasing; and the blocks to traffic that occured during the drought of 1891, and frequently in former years are rapidly, if proper precautions are taken, becoming an impossibility. The canal will, ere long, when the license and wharfage fees have been raised, show a very much better return than it has ever yet done, and as the cost of carriage along it is extremely low, the officers in charge of it may well bring to notice that its earnings will be unduly knocked down by special exemption from wharfage fees being allowed to any Cargo boats whatever.

5. I therefore request to be favoured at an early date with orders whether G. O. No 798 I, dated 21st December 1887 is to be still held to be in force; if so, whether it is only intended to apply to

07

Salt-boats using Salt-canals; or whether this G. O. is superseded by G. O. No 632 I, dated 17th July 1893, which lays down detailed rules for wharves.

I have etc.
Sd/ A.S. Russell
Executive Engineer
Buckingham Canal.

No 457 BC / 30-3-95

Enclosure 1. (Wharf Superintendents letter with its accompaniment.)

Forwarded to the Chief Engineer for Irrigation for favour of early orders. It would appear that G.O. No 798 I dated 21st December 1887, has been cancelled by G.O. No 632 I dated 17th July 1893.

Sd/ W.L.C. Baddeley
Major R.E.
Superintending Engineer.
II Circle.

(True copy)

Examiner
Assistant Secretary.

Endorsement to Madras Basin. Pier

No 165

7th March 1895

To

The Executive Engineer, Buckingham Canal

Madras, Basin.

Sir,

I beg to report that the Government salt has this day commenced to be transported from Vayalur to Madras Depot by canals.

2. Wharfage fee for unloading at Salt Godowns has not been collected under G. O. No 798 I, of 2nd December 1887.

3. The Salt now transported has been ascertained from the enclosed letter of the Inspector of Salt and Abkari Revenue, Madras Depot, to be the Government property, and not one of private merchants.

I beg to remain etc

sd/ Illegible

Wharf Superintendent

(True copy)

Examining Assistant Secretary

24/3

Dis. 1

6746/95

1895

REVENUE DEPARTMENT.

Enclosure No. 3

To Current No. 3709

Salt and abkari Inspector's
office
Madras Depôt Circle
Dated 7-3-95.

To
The Wharf Superintendent
Madras Basin.

Sir,

With reference to your letter dated 7th
March 1895, I have the honour to inform
you that the Salt from Vayalur is
Government Property and is being
transported to Madras under contract by
Abdul Khadar Mustan Sahib.

I have etc
c/s I.G. Emerson.
Inspector.

(True Copy)

Examiner
Assistant Secretary.

Ex. D
24/7

Rev. 3.
6746/95

1895
REVENUE DEPARTMENT.
Enclosure No. 1
To Current No. 5447

No 178 dtd 4-5-95

To

The Secretary, Board of Revenue,
Separate Revenue.
Chepâk.

Sir,

I have the honor to forward
endorsement No 407. BC dtd 30.3.95
from the Supdg. Engineer, Second Circle,
with its enclosures, and request to be
favored with the Board's remarks
on the question therein raised whether
Salt-boats passing to the Salt-Godowns
should be still exempted from paying
wharfage fees.

2. Up to the present time, Salt
has been paying wharfage fees, as
it was brought by the Contractors at
Ennore. It is unreasonable that
the alteration of rules in the Salt &
Abkari dept. as to where the Contractors
should buy salt, should affect the
receipts of the Canal. If this be
allowed, it is impossible to tell
whether the receipts of the Canal
are improving or not, and to
make

Enclosures. 4.

Sl. No. Encl. No. 407 BC dtd 30.3.95.
Copy of Ex Engr/Buckingham Canal Div./ Letter
No. 3017 dtd 9.3.95 - with its
two Enclosures.
To be returned

Encl 2
6 Aug 95

1895
REVENUE DEPARTMENT.
Enclosure No. 2
Current No. 5749

make fair comparison between different years.

3. There seems to be no valid reason why salt should escape Wharfage fees any more than firewood and the tax in the latter case is relatively much heavier than in the former as the value of the goods is so much less.

4. The Buckingham Canal is in a fair way to show receipts exceeding expenditure, & the salt trade being benefited largely by it, should ~~the~~ not be exempted from such taxes as are generally imposed and found by experience to be not more than the traffic can well bear.

5. If suitable to the Salt and Abkari department, the charges may be made a book-transfer between the departments, or they may be levied on the boats

12P

it is believed
boats which are private boats engaged by that department.

9/4 Revds 13/4

REVENUE BOARD OFFICE MADRAS

Proceedings of the Board of Revenue

(Separate Revenue.)

Dated 17th July 1895.

No. 3009 mis

Read again the following Proceedings of the Board of Revenue, Separate Revenue, dated 16th May 1895 No 1207 mis

Read the following letter from the Chief Engineer for Irrigation dated 13th April 1895 No 178 m.

I have the honor to forward endorsement No 457 B.C dated 30th March 1895 from the Superintending Engineer, II Circle, * to be returned. with its enclosures and request to be favoured with the Board's remarks on the question therein raised whether Salt boats passing to the Salt Cotaurs should be

Still

Still exempted from paying wharfage fees.

2 Upto the present time, Salt has been paying wharfage fee, as it was bought by the Contractors at Ennore. It is unreasonable that the alteration of rules in the Salt and Abkari Department as to where the contractors should buy salt, should affect the receipts of the Canal. If this be allowed it is impossible to tell whether the receipts of the Canal are improving or not, and to make fair Comparison between different years.

3 There seems to be no valid reason why salt should escape wharfage fees any more than firewood and to tax in the latter case is relatively much heavier than in the former as the value of the goods is so much less.

4. The Buckingham canal is on a fair way to show receipts exceeding expenditure, and the salt trade being benefited largely by it should not be exempted from such taxes as are generally imposed and found by experience to be not more than the traffic can well bear

5. If suitable to the Salt and Abkari Department, the charges may be made a book transfer between the departments or they may be levied on the boats which are, it is believed, private boats engaged by that department

Resolution:

The Deputy Commissioner, Central Division is requested to report what arrangements have been made for the payment of wharfage

wharfage fees on boats conveying salt for storage at the Madras Depôt and if, by the terms of the contract, the transport Contractor is not to bear the charge, whether a case for an application to Government for exemption can be made out under present Circumstances.

Read also letter from the Deputy Commissioner Central Division dated 8th June 1895 No 2507 reporting that no arrangements have been made for the payment of wharfage fees on boats conveying salt for storage at the Madras Salt Depôt and expressing his opinion that if any fees are to be levied at all they should be borne by Government.

Resolution: -

15 P 94

Resolution: - Mis. No 3009, dated 17th July 1895

Prior to the introduction of the out-storage System in 1890, the excise salt manufactured in the factories of the Vayalur, Ennore and Cuddalore circles was transported in boats and stored at the Madras Salt Depôt, and the boats carrying such salt paid no wharfage fees until 1887. In that year the Salt Cotaurs in clearing the Salt Depôt premises were declared to be a wharf. The question of the levy of wharfage fees was then raised by the Canal authorities, and Government, after considering the arguments put forward by the Board against the proposed levy of wharfage fees on salt boats, was pleased in its order dated 21st December 1887, No 798 I Public Works, to sanction an exemption

exemption in favour of all licensed boats entering & leaving Madras laden with salt.

2 As long as the salt of the outlying factories was stored at the Depôt this rule was observed but since the introduction of the outstorage system the rule has not been taken advantage of. The salt brought by Licensees from the factories to Madras (not to the Depôt) has paid wharfage, apparently because although the wording of the Government Order above referred to is such as to render it applicable to all salt boats entering and leaving Madras) the intention of the Government was considered to be to exempt only boats carrying salt from the outfactories for storage at the Depot. No objection was raised by the

16P #2

the licensees as they were using the banks of the canal for loading and unloading as it is need for other articles.

3. After the passing of the Canals and Ferries Act (II of 1890), Government in its order dated 14th July 1893, No 632 I P.W., notified under section 16(IV) thereof a set of rules for the regulation of traffic at the wharves on the canal in general and at the Madras Wharf in particular. Rule II of the rules relating to the latter requires all boats that load or unload within the limit of one mile from the Madras Wharf to pay the prescribed wharfage. No mention was made in these rules of the exemption accorded in Government Order 798 I

P.O. 2936/1893

Public

Public Works, dated 21st December 1887
to boats carrying salt, the reason —
presumably being that there was
not the same necessity to do so in as
much as at that time no salt was
going to Madras for storage at the Depôt.
Now that the monopoly system has
been ordered to be reintroduced into the
factories of the Vayalur and Ennore Circles
the existing stocks of the licensees' salt
are being purchased by Government
and transported to the Madras Depôt for
storage, and Government salt will from
the season of 1896 be likewise sent
there. The Board has therefore again
to address Government on the
subject of wharfage fees and to
request orders for the continuance of
the

178 P 13

the exemption accorded in Government order
798 I P.W dated 21. December 1887 in the
case of the boats carrying salt to the Madras
Depôt for storage

4. The Executive Engineer, Buckingham
Canal Sub Division, supported by the
Chief Engineer, considers that wharfage
fees should be paid. He details at
length his arguments in favor of the
imposition of the fees, but as most of
them were before Government when
it passed its order of 1887, the Board
does not consider it necessary to
traverse them in detail. It will
simply remark that, highly taxed
as it is salt is entitled to exceptional
treatment as compared with the other
articles

articles of trade, firewood etc, referred to by the executive Engineer, if it can possibly be accorded. His main objection to the exemption claimed is the loss to the canal funds of "Considerable Sums in wharfage fees" a canal on which Government has incurred Enormous outlay and on which Capital and Revenue accounts are kept. In reply to this the Board would raise the question of whether Wharfage fees were originally intended as a means of augmenting the general revenue of the Canal or to cover the interest on the Capital Cost and expenditure connected with the maintenance of wharves for the convenience of the Public. If the latter be the case, it would point out that the canal authorities have

have been put to no expense whatever either in the original construction or subsequent upkeep of the Salt Depot wharf and the side channels which are maintained exclusively by this department. The Deputy Commissioner, Central Division, to whom the Board make a reference on the subject, states that at an expenditure of less than One year's wharfage fees on Salt boats, he is prepared to dig other Side Channels which will render it quite unnecessary for such boats to unload from the Buckingham Canal at all.

5. It may be added that no arrangements were made by the Board with the boat Contractors who are transporting Salt to the Depot on behalf of Government for the payment of the wharfage fees

and

and that the fees, if levied, will
have to be borne by Government
and paid by book-transfer

6. It may be urged that if
the exemption be granted in favor
of boats unloading Government salt
at the Depôt, Government Salt will
compete at an advantage over excise
Salt brought for sale to Madras
in so far as the wharfage fees exceed
the cost of upkeep of the Depôt wharves
and channels, but the Board submits
that ere long all the licensees of
the Vayalur and Ennore Circles
will resort to the monopoly
System and there will be no more
excise salt sold at the local
platforms

platforms and brought to Madras

(True copy and Extract)

(signed) Edmund Millett
Assistant secretary

198

To

The secretary to Government
Revenue Department

Copy to
The Chief Engineer for Irrigation
with the Enclosures returned

O/18 10,000—25-3-95.

(1895.)

REVENUE DEPARTMENT.

Current Number. 5489.

From

The Board of Revenue,
Separate Revenue

Dated 17-7-1895

Received 26-7-1895

Enclosures 3

Proc No. 3009

SUBJECT.

Soliciting the orders of Government on the question raised by the Chief Engineer for irrigation, whether, under the notification published under section 16 (iii) of the Canals and Ferries Act for the regulation of traffic at the Madras wharf of the Buckingham canal wharfage fees should not be levied on boats unloading Government salt at the Madras Salt cotaurs wharf for storage at the depot.

P. T. O.

P. W. CURRENT No. 6746

ABSTRACT.

Endorsement Mis No 3492

Transferred to the Public Works Department with copy of note by the Honorable Mr Bliss

W K Lawton
Ag Asst Secretary to Govt

Ootacamund 28th August 1895 } Recd: 3.9.95

To

The Public Works Department

21 Dec 17

Note by the Chief Engineer for Irrigation

NO: 21 J dated 29 January 1896.

With his endorsement, NO:457. B. C. dated 30th March 1895, the Superintending Engineer, Second Circle, forwarded for orders a copy of letter, NO:3017, dated 9th March 1895, from the Executive Engineer, Buckingham Canal Division in which he raised the question whether para 2 of the rules passed in G.O. NO632. I dated 17th July 1893 for regulation of traffic at the Madras wharf, ordering that boats which load or unload within the limit of one mile of the Madras wharf, should pay the prescribed wharfage fee, cancels G.O. NO:798-I dated 21st December 1887 or not. Under this latter order the Salt Department claims exemption from payment of the fees, that Department having commenced to transport salt from Vayalur to the Salt Cotaurs at Madras in supersession of the outstorage system introduced in 1890-91 under which the fees were levied on the salt contractors and paid it may be remarked without demur.

2 The Executive Engineer explains at length his reasons why the exemption should not be allowed and the Board of Revenue in its Proceedings NO:3009 dated 17th July 1895 brings forward its reasons to the contrary which in the opinion of the Chief Engineer for Ir-rigation are based on a misconception of the actual state of affairs which is totally different from what it was in 1887.

3 The first argument brought forward by the Board is, that it is not considered necessary to traverse the arguments of the Executive Engineer, Buckingham Canal division, in his letter as most of them were before Government when it passed its order of 1887 and which are detailed in Board's Resolution, dated 3rd October 1887, NO:535 printed with G.O. NO:798-I dated 21st December 1887.

4 In para 2 of this resolution the object of imposing wharfage fees is given but not at all fully. The reasons may be described as follows.

(a) To bring the receipts and disbursements into Equilibrium

VIDE

Vide Note by the Chief Engineer P.W.D, printed with G.O.NO: 562.W. dated 20th February 1883.

(b) To meet the cost of construction and maintenance of wharves.

(c) To regulate the traffic and provide establishment for the conservancy of the canal.

(d) To provide means of collecting the necessary statistics for submission to the Government of India.

5 In para 3 of the same resolution the Board submits that the avowed objects of the tax will not be attained in the case of the Salt Cotaurs and suggests that salt boats are called upon to pay a fee for which they obtain no convenience and that the object of the fees would be attained by enhancing the canal tolls. As remarked in para 2 these arguments could only be brought forward in ignorance of the real objects of wharfagefees as detailed in para 4 supra as the chief object of introducing wharfage fees was originally to bring the receipts and dis--bursements into equilibrium. The imposition of this tax does not enhance the charge, the tolls having been considerably reduced. Prior to the assumption by the P.W.D. in October 1879 of the duty of levying tolls on the Buckingham Canal, the Collector of Chingleput was accustomed to levy, under the orders of the Board of Revenue a toll of 4 annas per ton upon every cargo boat and 4 annas per trip on every passenger boat passed through the Shadyankuppam lock towards Madras. From this toll it is believed that salt boats were not exempted and in para 10 of the memorandum on the Cochrane canal printed as appendix 11 to the 1st report of the Commissioners appointed to enquire into & report upon the system of superintending & executing Public Works in the Madras Presidency, it is specially mentioned that tolls were at that time levied on every description of goods which entered Madras Again in para 5 of Memorandum d/ 11th March/78 by the Collector of Chingleput printed with G.O.NO1801 A.W.d/ 8th July 1878 it is stated that Govt do pay tolls on salt boats using the Northern canal but nothing towards licenses on the suoth canal which was at

228 of 18

that time in a very undeveloped state.

6 From the earliest days of the canal, therefore, no mention can be found of any exemption of salt traffic from tolls except for a short period in 1887.

7 In para 4 of its proceedings of 1887 it is stated that the tax is on salt alone. This statement is possibly based on the idea that salt gets but little benefit in return & this may have been partially true in 1887 when the canal was incomplete and in admittedly bad order but since navigation has been so much im--proved is no longer the case . It is certainly not a tax on salt alone neither is salt an exceptional case as if salt is to be ex--empted because it does not actually use a wharf why should not a similar concession be granted to Messrs Arbuthnot & Co, Messrs Binny & Co and other firms with factories along side the canaland who do not actually use the wharves. These firms do not seek to evade wharfage fees on this account.

8 The argument that wharfage fees can be evaded by con--structing side channels to the Salt Cotaurs is one which regular--ly does duty but the Board does not apparently realize that if this was allowed Salt boats would get the full benefit of the im--proved line of navigation without paying the ordinary fees whether called wharfage fees or tolls. No railway would ever permit sidings to be constructed from their line to enable con--signees to avoid terminal charges and it is inconceivable that that Government would go to the trouble and expense of construci--ing side channels merely to evade their own tolls and in order to benefit Imperial at the expense of Provincial Funds .

9 Having assumed that the arguments brought forward when the question was last before Government, but which it is submitted no longer apply, would still hold good the Board in para 4 of its Procs of 17th July 1895 NO:3009 Mis remarks that salt, highly tax--ed as it is, is entitled to exceptional treatment as compared with other articles of trade but does not explain why it should

receive

receive this exceptional treatment in the shape of what practically amounts to a grant from Provincial to Imperial Funds a grant which was not considered necessary when the out storage system was still in force. The Government of India insist on statistics of canal borne traffic and so long as capital and revenue accounts are maintained it is submitted that the financial results attained should not be partially concealed as they would be if salt received a bounty from canal funds.

10 Another reason given by the Board which has not al-ready been dealt with is that no arrangements were made by the Board with the boat contractors for payment of wharfage fees but this seems hardly a reason why these fees should be remitted as the rules were published in the Fort St George & District Gazettes so long ago as 1893 and therefore there is no reason why proper arrangements should not have been made. A simple way out of this difficulty will be, as the Board suggests, for Govt to pay the charges from salt revenue as then they will be paid from Imperial Funds to which they are a legitimate charge.

11 The question of wharfage fees having been raised the Chief Engineer for Irrigation would suggest that the present time is a convenient opportunity to settle once for all the position of the Public Works and Salt Departments with regard to the East coast canal system. At present the Salt Department construct new and improve and maintain existing channels at the cost of Salt funds when, in the opinion of the Chief Engineer for Irrigation, these channels should be carried out and main-tained by the D.P.W. from Navigation funds. It is suggested therefore that all channels connected with any line of navi-gation, outside the limits of Salt factories, should be con-structed and maintained by the P.W.D as ordinary component parts of the system. If this is done and the Salt Department are accorded every legitimate facility for their traffic, salt boats, should

should, it is thought, pay the ordinary navigation charges without demur. Salt is a very considerable item in the traffic on the canals and when the new canal to the Madras Harbour has been construct-ed is likely to increase. This traffic should therefore be grant-ed any concession which does not lead to complications and in-creased difficulty in the management of the canals. The proposal that the D.P.W. should construct and maintain salt channels out-side the limits of factories is not new as the principle has al-ready been accepted by Government in G.Os. dated 14th September 1893, NO:3381, Revenue and G.O. dated 26th November 1894, NO:927. I. and G.O. dated 12th September 1895. N° 743. I.

12. If the proposals in the preceeding paras meet with the approval of Government the Chief Engineer for Irrigation has no objection to the salt department being allowed to pay wharfage fees in Madras in one sum at the end of the year at the ordinary rate on condition that the salt department will collect and forward to this department the statistics required for communication to the Government of India and will also furnish a monthly statement of traffic in a form to be ob-tained from the Executive Engineer. This will obviate the necessity of salt boats being stopped at the locks going and coming from Madras which will otherwise be necessary if this information is to be collected in this department. The Salt department must of course furnish their boatmen with tickets certifying that their boats are empty salt boats actually employed for salt traffic and must impress on them that no other return cargo must be carried. If the return cargo is carried the boats must be stopped to obtain the ne-cessary statistical information.

13. The Chief Engineer for Irrigation would remind Government that the South canal is shortly to be improved specially to meet the requirements of salt traffic and this appears to be an additional reason why the Salt Department

Imperial

P. W. CURRENT No. 989

(Imperi l Funds) should pay ordin ry fees (Provinci l Funds)

14. This reference h s not been disposed of sooner owing to the revision of the navigation rules.

Rmedrake. Bruchman

Colonel R.E.

Chief Engineer for Irrigation

Encls 4

Recd. 31.1.96

To

The Secretary to Government,

P.W.D. Irrigation Branch.

No. 1801 A.W. dy 8-7-79 +
" 562 W " 20-2-83 +
" 841 W " 14-3-83 +
" 5069 " 16-8-87 +
" 7989 " 21-12-87 +
" 619 " 14-7-93 +
" 632 " 17-7-93 +
" 3519 " 23-4-94 +
" 927 " 26-11-94 +
" 423 " 17-5-95 +
" 743 " 12-9-95 +

Madras Act No. III of 1890. +
—" — No. IV of 1889 +
No. 2475 W " 26-9-93 +
First Report of the Comm. appointed to enquire on the system of Supply. &c. working P.W. in the Madras Proy. +

No. 226-I dy 4 march 96.

PUBLIC WORKS DEPARTMENT,
IRRIGATION BRANCH.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

UNDER date the 20

READ the following

From the Suptg Engineer, 2nd Circle (H.E. No 457. B.C. d/30th March 1895)
To the Board of Rev: Sep:Rev: --(H.E. No 178. M. ..13th April 1895)
From the Board of Rev:Separate Rev:(H.E. Procs No:3009 Mis d/17-7- 95)
From the Revenue Department . (H.E. No:3492 dated 28th August/95)
Note by the Chief Engineer for Irrgn. (H.E. No:21. I. dated 29th Jany/96)

The landing place at the Salt Depot being with -in a mile of the Canal Wharf at Madras will be treated as a wharf and wharfage fees as prescribed in the rules for the regulation of traffic at Wharves on the Bucking- -ham Canal will be levied on boats loading or unloading there.

2 The Board of Revenue will arrange with the Chief Engineer for Irrigation regarding the method of paying wharfage fees and submit the arrangement arrived at for the approval of Government.

3 The wharf rules will not apply to the cases of Salt factories and Salt channels already under the control of the Salt Department, but in future no private Wharves or landing stages will be allowed to be constructed in connection with navigable canals

canals without the sanction of
Government.

Rueds
19/2

18/2

Ch. 22/2

DESPATCHED
20 MAR. 96

To,

The Chief Engineer for Irrgn with one book. Return on Public work
All Suptg Engineers of Circles
The Examiner of P.W. Accounts

The Revenue Department.

Received
KD
21-3-96.

Revised draft ordr

To,

His Excellency the Governor

The Hon: Mr Bliss C.I.E.

The Hon: Mr Grose C.I.E.

Wharfage fees on Salt Boats.

To,

The Secretary to Government Revenue Department for favor of counter--initials.

Issue

Rec'd 3/5

E. I. Form No. 1—500—14-5-95

R.S. 20/2 circ 24/2 R 2-3-96.

Note by the Hon. Mr Bliss. dated 27.8.95.

The salt boats carrying Goderonment salt don't use any single one of the Canal wharves. Government salt was free from this charge dozens of years before the Buckingham canal was in-existence. I cannot see why any charge should now be imposed

(Sd) H.W13
27/8/95.

2269

Rws.4
6746/95

D
2 1,000—7-9-93.

REVENUE DEPARTMENT.

Current No.

From

Dated 189 .

FOR ORDERS.

This subject is so closely connected with the Salt Dept. as well as with Financial - that I should be obliged if the hon. Mr. Rivers - who is in charge of both these departments would kindly place his views on record. The D.P.W. naturally wish to present as favourable a picture as they can of their Buckingham Canal - and Provincial funds will I suppose be anxious to be relieved at the expense of Imperial - but there are other points to be considered.

W
12 Feb

Before then consideration I think that the charge of wharfage fees on Salt-laden boats arriving at Madras may be allowed - It is however, possible that some of the places in the Rams Salt factories, at which Salt will be shipped will be within a mile of a wharf. If so, I think the P.W.D. must be prepared, in regard to such places, to hold in abeyance Wharf Rule No. II (in G.O. 632 I / 17.7.93) - Infact must go with all of the

On his both of 27.8.95, forwarded to the P.W.D. with endorsement of this Dept. 3492 / 28.8.95, the Hon. Mr. Rivers objected to the levy of wharfage-fees on Salt Boats at the Kolair on the ground that when Government Salt boats do not use any of the Canal Wharves and that they now pay these same charges for years together Canal upkeep - The C.E. now proposes, as a set-off in the way of consideration, that the Canal Authorities shall undertake certain works - i.e., the construction & repair of all Salt Channels outside the factories - It does not appear what this will cost the Canal - but presumably the fees will more than cover the cost -

2. The original papers with G.O. 7981 / 21.12.87 show that on the ground

how

FOR ORDERS.

Taken by the Hon. Mr. Bliss, in P. Statutes in general, in his note of 8th Dec., how in the circumstances, the levy of wharfage fees on Salt Boats could be justified legally - The papers do not show what was done upon this note - but the result was the issue on Dec. 21st of the G.O. quoted - "The G. in C. is pleased to order that all licensed boats entering or leaving the areas taken with Salt shall be exempt from wharfage fees" - the ground being (on perusal of the G.O.) that "they only make use of the Salt Kolais (wharf which is maintained by the Salt Department -

3. The C.C. argues in his note that the position is altogether different from what it was in 1887 - I do not understand that there has been any radical change, but it is of course true that great improvements have been effected in the Canal & the Salt Dept gets its share of the benefit of these improvements

FOR ORDERS.

whereof Rules should be waived as respects these places. The Salt Dept being within a mile of the Port wharf at Madras, it is treated as a wharf and a fee of one anna per ton to be charged for unloading there - I think this is going quite far enough & that a similar charge for loading at a platform in the Salt Factory which may happen to be within a mile of a wharf should not be permitted - I will always arrange to keep an account of boats arriving at the M.S.D., but to keep an account of boats loading at each platform in the Salt Factories might cause a good deal of trouble - So again, in the case of boats waiting to load in the Salt Factory, altogether off the line of navn., Rule VIII will be absd; Rule IV in many places could not be worked as it would usually obstruct the despatch of the Salt to sea.

As to the proposal that all Salt Kolais outside the limits of Salt Factories, but connecting the same with the main line of navigation, should be constructed & maintained by the P.W.D., I am afraid that such cuts are used solely for Salt purposes & in any case had better be left under the control of the Salt Dept. In *

The Govt of India has been very pressing in its demands that lines of navigation should be made to pay their way, & whilst strenuous endeavour has been made on the part of this Dept to do as much as possible the maintenance charge of that Equitable Branch so much called for should be established.

This is just the Large expenditure has been incurred in constructing "Locks" in addition to flood Sluices & maintains a working depth of water in the several reaches all the year round. Recent

* cases in which (and there are instances) their maintenance is a charge against the Salt Cess, terrible confusion would result if any one but the officers of the Salt Dept had to do with them

BB 13/2/96 JS 14/2/96

improvement -

4. But altho' I cannot follow the C.C.'s argument here - there is a good deal of force in his objection to salt alone being exempted from a charge which is paid on other goods - and the Board's reference to cases being a highly Legislative nature to be altogether beside the mark -

5. As the draft G.O. proposes to cancel that of 1887 it is for Govt. Members to decide whether it should issue - I have not communicated it -

LG 6/2.

FOR ORDERS.

Govt.

Gl 6/1.

H E the Governor.

"J"

1st
14.2.96

Contractor

984

Govt. of 1896 Madras.

PUBLIC WORKS.

Dated

Rec. Encl.

G.O. 4/3/ 1896 No. 226 S

Wharf

=

ieeting with remarks that
Landing place at the Salt
pot within a mile of the Canal
ept at Madras be treated
a — under the rules for the
ula tion of traffic at Wharves
the Buckingham Canal & the
prescribed fees be levied, & stating
to private wharves or landing
es will be allowed to be constructed
Connection with Navigable
als without the sanction of
..

=

1196

Revenue Board Office Madras

6,000
25-3-95.

Proceedings of the Board of Revenue

(Separate Revenue),

Dated 17th July 1895.

No. 3009 Mis

Read again the following Proceedings of the Board of Revenue, Separate Revenue, dated 16th May 1895 No 1207 Rontris:

Read letter from the Chief Engineer for Irrigation dated 13th April 1895 No 178 M

Resolution:-

The Deputy Commissioner, Cuttack Division is requested to report what arrangements have been made for the payment of wharfage fees on boats conveying salt for storage at the Madras depôt and, if, by the terms of the contract, the transport Contractor

Contractor is not to bear the charge, whether a case for an application to Government for exemption can be made out under present circumstances.

Read also letter from the Deputy Commissioner, Central Division, dated 8th June 1895 No 2507 reporting that no arrangements have been made for the payment of wharfage fees on boats conveying salt for storage at the Madras Salt Depot Department and expressing his opinion that if any fees are to be levied at all they should be borne by Government.

Resolution:-

Prior to the introduction of the entrepôt system in 1890, the Excise salt manufactured in the factories of the Vayalur, Ennore, and Covelong circles was transported in boats and stored at the Madras Salt Depôt, and the boats carrying such salt paid no wharfage fees until 1887. In that year the Salt Colours including the Salt Depôt premises were declared to be a wharf. The question of the levy of wharfage fees was then raised by the canal authorities, and Government, after considering the arguments put forward by the Board against the proposed levy of wharfage fees on salt boats, was pleased, in its order dated 21st December 1887 No 7987 Public Works, to sanction an exemption in favour of all licensed boats entering or leaving Madras laden with salt.

2. As long as the salt of the outlying factories was stored at the Depôt this order was observed, but since the introduction of

of the outstorage system the rule has not been taken advantage of. The salt brought by licensees from the factories to Madras (not to the Depôt) has paid wharfage apparently because (although the wording of the Government Order above referred to is such as to render it applicable to all salt boats entering and leaving Madras) the intention of Government was considered to be to exempt only boats carrying salt from the outfactories for storage at the Depot. No objection was raised by the licensees as they were using the banks of the Canal for loading and unloading as it is used for other articles.

3. After the passing of the Canals and Ferries Act (II of 1890), Government in its order dated 17th July 1893, No 632 I Public Works, notified under Section 16 (iv) thereof a set of rules for the regulation of traffic at the wharves on the canal in general and at the Madras Wharf in particular. Rule II of the rules relating to the latter requires all boats that load or unload within the limit of one mile from the Madras Wharf to pay the prescribed wharfage. No mention was made in these rules of the exemption accorded in Government Order 798 I Public works dated 21st December 1887 to boats carrying Salt, the reason presumably being that there was not the same necessity to do so in as much as at that time no salt was going to Madras for storage at the Depôt. Now that the Monopoly System has been ordered to be reintroduced into the factories of the Vazhur and Ennore Circles

Circles
the existing stocks of the licensees' salt are being purchased by Government and transported to the Madras Depot for Storage, and Government salt will from the season of 1896 be likewise sent there. The Board has therefore again to address Government on the subject of wharfage fees and to request orders for the continuance of the exemption accorded in Government Order 798 I.P.W dated 21st December 1887 in the case of the boats carrying salt to the Madras Depot for storage.

4 The Executive Engineer, Buckingham Canal sub Division, supported by the Chief Engineer considers that wharfage fees should be paid. He details at length his arguments in favor of the imposition of the fees, but as most of them were before Government when it passed its order of 1887, the Board does not consider it necessary to traverse them in detail. It will simply remark that, highly taxed as it is salt is entitled to exceptional treatment as compared with the other articles of trade, firewood Etc, referred to by the Executive Engineer if it can possibly be accorded. His main objection to the exemption claimed is the loss to the Canal funds of "Considerable sums in Wharfage fees" a canal "on which Government has incurred enormous outlay and on which Capital and Revenue accounts are kept. In reply to this the Board would raise the question of whether Wharfage fees were originally intended as a means of augmenting the general revenue of the Canal or to

to cover the interest on the capital cost and expenditure connected with the maintenance of wharves for the convenience of the Public. If the latter be the case, it would point out that the canal authorities have been put to no expense whatever either in the original construction or subsequent upkeep of the salt depot wharf and the side channels which are maintained exclusively by this department. The Deputy Commissioner, Central Division, to whom the Board made a reference on the subject, states that at an expenditure of less than one year's wharfage fees on salt boats, he is prepared to dig other side channels which will render it quite unnecessary for such boats to unload from the Buckingham Canal at all.

5. It may also be added that no arrangements were made by the Board with the boat Contractors who are transporting Salt to the Depôt on behalf of Government for the payment of the Wharfage fees and that the fees, if levied, will have to be borne by Government and paid by book transfer.

6. It may be urged that if the exemption be granted in favor of boats unloading Government salt at the Depôt, Government salt will compete at an advantage over Excise salt brought for sale to Madras in so far as the wharfage fees exceed the cost of upkeep of the Depôt wharves and channels but the Board submits that ere long all the licensees of

of the Vayalur and Ennore Circles will revert to the Monopoly system and there will be no more Excise salt sold at the local platforms and brought to Madras.

(True Copy and Extract)

CHIEF ENGINEER FOR IRRIGATION. 2- JUL. 95 No.

Communicated

Assistant Secretary

To

The Secretary to Government,

Revenue Department.

Copy to

The Chief Engineer for Irrigation

with the enclosures returned.

Ex?/1889 24/7

3,000
9-8-94.

189.

Board of Revenue

(Separate Revenue),

MADRAS.

To

Proceedings, dated 189 ,
No.

Subject.

3,000
9-8-94.

1895.

Board of Revenue

(Separate Revenue),

MADRAS.

CHIEF ENGINEER
FOR IRRIGATION.
2- JUL. 95
No. 375 m

To

The Chief Engineer

for Irrigation

OLC 1
989/96

Proceedings, dated 17 July 1895,
No. 3009 Revn Sect—3

Subject.

Soliciting the orders of Government on the question raised by the Chief Engineer for Irrigation whether, under the Notification published under Section 16 (iv.) of the Canals and Ferries Act for the regulation of traffic at the Madras Wharf of the Buckingham Canal wharfage fees should not be levied on boats unloading Government Salt at the Madras Salt Cotaurs wharf for storage

Irrigation
Madras Basin
No. 165 7 March 1895

To

The Executive Engineer
Buckingham Canal
Madras Basin -

Sir,

I beg to report that the Government Salt has this day commenced to be transported from Vyasarpadi to Madras depot by Canal

(2) wharfage fee for unloading at Salt Cotaurs has not been collected under G. O. No. 798 I of 21 December 1887.

(3) The Salt now transported has been ascertained from the enclosed letter of the Inspector of Salt & Abkari Revenue,

Ltr BP 60/27-1-88.

Encl to No. 457 BC 30-3-95

16 20. 5-0 (4500
64 80

Madras Depot, to be the Government property, & not one of private merchants -

I beg to remain
Sir
Your most obedient Servt
Wharf-Supt &c -

Asstt Collector Inspection Office
Madras Roadstead
Dated 4-3-95

To
The Wharf Superintendent
Madras Basin,

Sir,

With reference to your letter dated 7th March 1895 I have the honor to inform you that the salt from Coyalpo is Government property and is being transported by Bandies under Contract by Abdul Khader Investee Sahib — I have the honor to be Sir, Your Most obedient Servt

Asstt Collector

CHIEF ENGINEER
3715
FOR IRRIGATION

SUPERINTENDING ENGINEER'S OFFICE
No. 325 Bdg
14 MAR 95
P.W.D.
SECOND CIRCLE

Qus. 3
1889/96

B.C. 500—13-7-94.
I

No. 3017

OFFICE OF THE EXECUTIVE ENGINEER,

Buckingham Canal,
Camp Pulicat
Madras Basin, 9th March 1895.

From

A. S. Russell, Regr.,
EXECUTIVE ENGINEER,

Buckingham Canal Division,

To

THE Superintending Engineer,
Second Circle.

SIR,

I have the honor to bring to your notice that the Salt department are apparently beginning to abandow (vide accompanying original* report) the out-storage system introduced in the year 1890-91; have commenced to transport salt from Vayalur to the Salt Cotaurs at Madras; and claim exemption from wharfage fees under the operation of G.O. No. 7989, dated 21st December 1887. This G.O has been a dead letter for many years past, and its provisions are, I imagine, practically cancelled by G.O 632 I, dated 17th July/93. Pending orders, however, on this reference I am permitting the Salt boats to pass to the Salt Cotaurs without paying wharfage, as it is not very clear to me what the ~~instructions~~ instructions

ENCLOSURE. 1

* No 165, dated 7 March/95, from Chief Supt. Marine to this 1 Enclosure

183-60
27-1-58

P.W.D. 4768 Mis
17-6-93

~~instructions~~ of Government may be on the matter.

2. After G.O 7983, dated 21st Decr/87, was passed, all salt boats loading or unloading at the Salt Cotaurs were not charged wharfage fees by the canal authorities, but salt boats loading or unloading at other wharves were so charged, though as the Order stands it rules in comprehensive terms "that all licensed "boats entering or leaving Madras laden "with Salt shall be exempt from wharfage fees". This order, if acted upon in its literal sense, would have gone far beyond the contention of the Board, and would have exempted all boats carrying Salt, even for private individuals, from paying wharfage fees at all the wharves within the limits of the Chadayankuppam and Royar Locks. In 1890-91 the out-Storage system was adopted, and Salt ceased to be stored at the Salt Cotaurs, and when I took charge of the Division in 1891 all Salt boats were duly paying wharfage fees, and have continued to do so up to the present time. Now that the in-Storage system has apparently again been started, the question has come before me for the first time of the precise meaning of G.O No. 7983, dated 21st

21st December, 1887, and whether it is still to be considered to be in force.

3. When G.O No. 7983, dated 21st Decr/87, was passed, wharfage fees were a recent introduction, and no clear rules regarding wharves, or the levy of fees thereat, were in existence. In G.O No. 632 T, dated 17th July/93, Government approved a set of wharf Rules, and under Rule II, for regulation of traffic at the Madras wharf, boats that load or unload within the limit of one mile of the Madras wharf must pay the prescribed wharfage fees. The Salt Cotaurs are within this one mile limit, and the G.O contains no mention of any exemption for any class of boats whatever.

4. The Board of Revenue in protesting, in its resolution printed with G.O No. 7983, dated 21st Decr/87, against the levy of fees on Salt boats loading or unloading at the Salt Cotaurs, proceeded on principles which are not applicable to the present time, and in no way regulate the levy of wharfage fees. The following instances may be cited by way of example.

(1) The object of wharfage fees, as now recognised, is not "to prevent boats load-"ing and unloading goods except at au-"thorised places". If such a principle were

were generally acted upon, the Canal would become next to useless, and the traffic in firewood, grain, and other produce would be absolutely killed, since it is idle to suppose that such goods could stand the cost of transport by road to the nearest wharf instead of being loaded on unloaded whenever wanted, as they are of course allowed to do. Both the Navigation and the wharf rules give discretion to Executive Engineers to forbid loading or unloading except at wharves, but this power was conferred in order to check abuses and not to hamper legitimate traffic.

(2). The Board rightly state that one object of wharfage fees is to place all boats on the same footing. It is therefore perfectly anomalous at the present time to claim exemption for salt boats alone, since no other boats are so exempted. It is altogether contrary to fact, as things now exist, to say that the effect of wharfage fees "is to place a tax upon salt alone." It is however absolutely true to say that to exempt Salt from paying fees which every other Commodity now pays is to bolster up the salt trade at the expense of the Buckingham Canal — a work on which Govt: has incurred enormous outlay,

and

and on which Capital and Revenue account are kept up.

(3) The various contentions of the Board that (a) because it is convenient for Salt to continue to be loaded at the Salt Cotaurs, (b) because the conservancy of the banks is attended to, and (c) because a very short length of side channel is maintained by the Salt department, Salt boats at Salt Cotaurs should be exempted from wharfage fees, form no valid ground for such exemption. On a similar line of argument, Coal, Shells, Firewood, and other goods might just as well claim exemption. In all such cases, it is clearly for the private convenience of the trade in question that the Govt: wharves are not used, and such convenience forms no ground whatever for exemption. If such principles were admitted, and exemption from wharfage allowed on grounds so inadequate, the Govt: wharves would soon be deserted altogether.

5. If the in-storage system is to be again introduced, and Salt boats using the Salt Cotaurs are still to be exempted from payment of wharfage, the Canal

1 mile

will lose annually considerable sums in wharfage fees, as Salt will again become a principal item of traffic, vide para 7 of note printed with G.O. No 6193, dated 14th July 1893. In case of the exemption from wharfage being still allowed to Salt boats using Salt Cotaurs, some arrangement should therefore be made providing that this lost revenue is adjusted by book transaction to the Revenue account of the Canal, and that the Salt department furnish to the canal staff proper checks to shew that the boats do actually load or unload at the Salt Cotaurs. By means of wharf clearance tickets, &c, the Canal staff have at present a perfect check upon the movements of all boats except specially exempted Salt boats using Salt Cotaurs.

6. It is difficult to see any logical, or even intelligible ground, upon which Salt boats using the Salt Cotaurs can continue to be exempted from payment of wharfage. The boats are not the property of Government, but of private owners, and it is only reasonable that these owners should pay wharfage fees, since, as I have already shewn in para 4 of my letter printed with G.O 6329, dated 17th July 1893, such levy of fees is strictly proportionate to profits, and is the only way of touching boats doing an exceptionally good business.

Second. It is ridiculous to suppose that the levy of so small a fee as one anna per ton for wharfage can make any material difference in the cost of so highly priced an article as Salt. The exemption of such fees on Salt boats makes, however, a great difference to the annual revenue of the Canal, and enables the Salt dept. to make arrangements with its Contractors to transport Salt to Madras at a slightly reduced rate, and one that is moreover wholly fictitious, i.e. is specially relieved by Govt from an impost that every other class of goods has to pay.

Third. Even if Govt. boats were used to transport Salt to the Salt Cotaurs, it would form no valid ground for exemption, since the Govt. boats of the Forest department conveying firewood have never been allowed any such exemption from

from payment of wharfage fees.

7. A great deal has been done to improve the canal of late years; the traffic is steadily increasing; and the blocks & traffic that occurred during the drought of 1891, and frequently in former years are rapidly, if proper precautions are taken, becoming an impossibility. The canal will ere long, when the license and wharfage fees have been raised, shew a very much better return than it has ever yet done, and as the cost of carriage along it is extremely low, the officers in charge of it may well bring to notice that its earnings will be unduly knocked down by special exemption from wharfage fees being allowed to any cargo boats whatever.

8. I therefore request to be favored at an early date with orders whether G.O. No. 7989, dated 21st Dec. /87, is to be still held to be in force; if so, whether it is only intended to apply to sail-boats using Sail Catauris; or whether this G.O is superseded by G.O. No. 632 I, dated 17th July /93, which lays down detailed rules for wharfages.

I have the honor to be,
Sir,
Your most obdt. Svt.

A S Russell.

Queen time Engineer
Buckingham Canal.

No. 457 BC
30. 3. 95

Encl 0 1.
(Wharf Supt's letter with its accompaniment)

Forwarded to the Chief Engineer for Irrigation for favour of very early orders. It would appear that G.O. No. 7989 of 21. 12. 1887 has been Cancelled by G.O. No. 632 I of 17th July 1893.

La 1888 P 60 27-1-88

La 1888 P 476 Bis 17-8-88

+ Ltr BP 60 27-1-88

+ Ltr BP 4768is 17-8-88

W. Batterbury
Major RE
Supg Engr: II Circle

CHIEF ENGINEER
3786
FOR IRRIGATION

From

The Supg Engr:
N Circle.

To

The Chief Engineer
For Irrigation
Madras.

CHIEF ENGINEER
FOR IRRIGATION.
2D JUL. 95
No. 3754

No. 4578/BC

Dated 30th March 95.

Encls: 1

Rect. 2
3 Aug 95

Salt boats at Colaun
— Forwards Ex. Engr's:
letter (B Canal) requesting
to know whether the —
are exempted from wharf
fees &c.

No. 3.664

From

The Deputy Commissioner
of Salt & Abkari, Revenue,
Central Division.

To,

The Executive Engineer,
Buckingham Canal Division,
Madras Basin.

Sir,

With reference to our personal and semi-official correspondence regarding Wharf clearance tickets, which resulted in your kindly issuing orders to do away with such tickets in the case of boats engaged on the transport of Government salt to the Salt Depôt at Madras, I have now the honour to ask officially that this arrangement may continue, as the benifits experienced has been very great indeed, as directly a boatman now gets his boat cleared at the Depôt, he is subject to no further check or stoppage till he reaches the Chadayan-Kuppam Lock, where by the united attention of your Lock-Kuper and my Line-Kuper, he is passed through on his way to the Factories, with the smallest

smallest possible delay.

2. I understand you require the list of inward and outward boats which pass the said Lock each day to be in your Basin Superintendents hands by 6 A.M. the following morning and this will be rigidly adhered to, in future.

3. As you are aware the question of Government Salt Boats paying wharfage fees is under Correspondence and if it is decided that such boats should not be exempt there will be no difficulty in, at any time, making out the exact amount due in a few hours from our books.

I have &c.

(Signed) Thomas Emerard.

For Depy. Commissioner.

(True copy).

(Signed) A.S. Russell.
Exec. Engineer.
Buckingham Canal Div.

(True copy)
Captain R.E.

CHIEF ENGINEER FOR IRRIGATION. 9 SEP 95 No. 69 Be

Letter from the Executive Engineer, Buckingham Canal Division, to the Superintending Engineer, 2nd circle, No. 1,275 dated 29th August 1895.

I have the honour to inform you that the Deputy Commissioner, Salt Revenue, Central Division, in his demi-official letter, dated 21st ultimo, requested me to "give orders to the "Shadayankuppam Lock Superintendent that "wharf clearance tickets are not needed" in the case of boats which "have entered Madras" with "Government salt on board," arrangements being made by the Salt Department to supply us with the necessary particulars of salt traffic. As boats conveying salt pay no wharfage fees at present vide my letter No. 3017 dated 5th March 1895, on which orders are still awaited, and as all that concerned the canal is information regarding salt traffic for incorporation in the Canal Traffic Register, I saw no serious objection to the grant of the request made by the Deputy Commissioner, and assured

Sent to E & S both orders with this office No 457/BC dated 30th March 1895
+ R37 30/95

agreed to comply with it.

2. Subsequently the Wharf Superintendent, Madras, reported that he was not receiving particulars of salt traffic from the Salt authorities; that the information for several days was had not been received at all, and that when it was sent, it was sent very late and irregularly. I hereupon addressed the Deputy Commissioner pointing out that I could not permanently continue, without the orders of Government, the change of System made at his request, and thus incur the responsibility of allowing the Canal Traffic Registers to fall into arrears and confusion, but that I was willing to do so temporarily, provided the Salt Department supplied us properly with the necessary figures of salt traffic, and that the Deputy Commissioner made a formal official reference on the matter at an early date. The result of my letter is letter No. 3664, dated 22nd instant, from the Deputy Commissioner, copy of which I enclose.

3. If the change of System introduced at the request of the Deputy Commissioner is to be continued, it must be borne in mind that the Canal Staff have no check over Salt traffic, and cannot be held responsible for collection of proper statistics thereof. I therefore request to be favoured, at an early date, with orders whether I am to continue this system.

4. I have also to day received another official request from the Assistant Commissioner Salt Revenue, stating that 40 or 50 Salt boats pass through the Chadayankuppam dock daily, and requesting me to grant such boats priority in passing through the lock. I shall be glad of orders also on this matter, as I do not see my way to grant this request in full, since the Canal is not wide enough to permit of boats getting out of line, confusion would be caused by boats not waiting in line for their turns to pass through the dock, and the boatmen of boats who are not allowed

Sued

such invidious privileges would probably get very unruly and difficult to manage - a thing that is by no means easy even at present.

In my opinion, the Salt Officers make a great deal too much of the occasional delays that occur at the Shadayankuppam dock. Such delays are unavoidable when a crowd of boats come up together to a lock at which both Municipal tolls and wharf clearance tickets are collected: I am, however, very willing to do all that I can to foster the salt traffic, which is now increasing by leaps and bounds, and will continue, so, Mr Merriman informs me, to travel by canal even after completion of the Madras-Ennore Bezwada Railway.

No. 1870 BC
6.9.95

Forwarded to the Chief Engineer, for Irrigation, for favour of orders.

Encl 1

2. It would not be possible to grant the request of the Deputy Commissioner of Salt and Abkari Revenue, regarding the right of priority for boats carrying Government salt, without considerable inconvenience and delay to other boats, and there does not appear to be any real necessity for drawing the distinction asked for.

J. H. Mis Captain, R.E.
For Superintending Engineer,
6/9. 6/9. N. Circle.

FOR ISSUE
6 SEP 95
No. 6918C

From

The Supdg Engineer,
1st Circle.
Bezwada.

To, The Chief Engineer,
for Irrigation.
Madras.

Dated 6th September 1895.

No 1876BC.
" Encls 1.

Subject:

Government Salt boats — Forwards for orders copy of BCDs letter together with a letter from Deputy Commissioner of Salt requesting to grant — priority in passing through Shadayankuppam Lock — with remarks.

3692

MADRAS ACT No. II OF 1890.

PASSED BY THE GOVERNOR OF FORT ST. GEORGE IN COUNCIL.

[*Received the assent of the Governor on the 1st April 1890 and of the Governor-General on the 9th May 1890.*]

An Act to make better provision for the establishment of Canals and Public Ferries in the Presidency of Madras and for the management thereof.

WHEREAS it is expedient to make better provision for the establishment of canals and public ferries in the Presidency of Madras and for the management thereof, it is enacted as follows:— Preamble.

Short title and local extent. **1.** This Act may be called the Canals and Public Ferries Act, 1890.

It extends to the whole of the Presidency of Madras.

Repeal. **2.** From and after the date when this Act comes into operation, Act I of 1870 (Madras) and Act IV of 1878 (Madras) shall be repealed.

Provided that all notifications issued, rules made, licenses granted and engagements entered into under the said Acts, shall continue in force and shall be deemed so far as may be to have been issued, made, granted and entered into under this Act.

Definitions. **3.** In this Act "vessel" includes any ship, barge, boat, raft, timber, bamboos or floating materials propelled in any manner.

"Channel" includes any waterway whether natural or artificial.

"Line of navigation" means any navigable channel, or series of connected navigable channels.

[PRICE, 1 ANNA AND 3 PIES.]

"Canal"

"Canal" means a line of navigation declared to be subject to the provisions of this Act.

"Ferry" means a place at which goods, animals, or passengers are conveyed across a channel by means of vessels.

"Public ferry" means a ferry declared to be subject to the provisions of this Act.

Power to apply Act to any line of navigation.

4. The Governor in Council may, by notification in the *Fort St. George Gazette*, declare any line of navigation to be subject to the provisions of this Act from a date to be named in such notification, and may in like manner cancel or modify any such notification.

Licensing and registration of vessels.

5. All vessels carrying goods, animals or passengers for hire on a canal shall be licensed; and all vessels otherwise using a canal shall, if the Governor in Council so directs, be registered.

Power to fix fees and rates of toll and to establish toll stations.

6. The Governor in Council may from time to time—

(*a*) fix rates of fees payable for the licensing or registration of vessels;

(*b*) establish stations at which tolls shall be levied on vessels passing along a canal or on passengers, vehicles, animals or goods landed therefrom, and fix the rates of such tolls;

(*c*) fix fees for the use of public landing places, wharves, piers, jetties, docks, basins, lie-byes, sidings, sheds or warehouses provided for the accommodation of vessels using a canal or of goods or passengers carried or to be carried thereon and for demurrage on vessels or goods detained therein.

A notification of such tolls or fees under clauses (*b*) and (*c*) of this section shall be exhibited to public view in English and in the vernacular language of the district at the places where such tolls or fees are leviable.

Power of person duly authorised to impose punishment for breach of condition of license and to deal with any obstruction or with navigation in contravention of Act.

7. Any person duly empowered by Government in this behalf may—

(i) suspend or cancel the license or registration of any vessel in case of breach of any condition thereof, or in lieu of such suspension or cancellation or of prosecution may recover from the person in charge of the vessel a penalty not exceeding five rupees for each such breach;

(ii) remove from the canal any vessel which may be sunk or abandoned therein, and may recover any expense incurred in so doing by the sale of the vessel. A vessel left for more than three days without a competent person in charge shall be held to be abandoned;

(iii) in case of emergency remove any other obstruction, or contrivance for fishing, or other thing which is an impediment to navigation, or in other cases serve notice upon the owner, if any, to remove any such thing within a reasonable time to be stated in the notice, failing which he may remove it himself. Expenses incurred under this clause shall be recoverable from the owner. Provided always that in cases of interference with private rights, reasonable compensation shall be payable;

(iv) prohibit

(iv) prohibit the construction of any contrivance for fishing or for any other purpose in the canal or any erection therein or on a tow-path or other land appurtenant thereto;

(v) stop any vessel navigating the canal in contravention of any of the provisions of this Act or of any rule made or any condition of license or registration prescribed thereunder, and may detain it until the same is complied with or until penalty has been paid or recovered under clause (i) of this section or until the offence, if any, has been enquired into and disposed of.

Powers under this section may be conferred either by name or in virtue of an office.

Power to apply Act to any ferry and define limits of ferry.

8. The Governor in Council may, by notification in the *Fort St. George Gazette*, declare any ferry to be subject to the provisions of this Act from a date to be named in such notification and may define the limits of such ferry. The Governor in Council may, in like manner, cancel or modify any such notification.

Upon such application existing rights of ferry to cease.

Proviso.

9. From such date all previously existing rights of ferry within the limits defined in the notification shall cease and determine, and it shall be unlawful for any person not duly authorised to convey goods, animals or passengers by means of vessels across a channel within such limits while such notification is in force. Provided that when rights of ferry are extinguished under this section, compensation shall be payable for such extinction and shall be assessed as near as may be under any law for the time being in force relating to the acquisition of land for public purposes.

Power to provide for management of ferries and fix fees and rates of toll.

10. The Governor in Council may provide for the management of public ferries or may authorize any person to convey goods, animals or passengers across a channel by means of vessels at a public ferry. All vessels so used by such person shall be licensed, and the Governor in Council may fix the fees payable for such license and also the tolls leviable upon passengers, animals, vehicles and goods conveyed across such ferry. A notification of such tolls shall be exhibited to public view in English and the vernacular of the district on each side of the ferry.

Power to assign management of ferry to Local Board or Municipal Council.

11. The management of any canal or public ferry may, by order of the Governor in Council, be assigned to a Local Board or Municipal Council, and thereupon in every such case the revenue accruing therefrom shall be credited to the funds of such managing authority, which shall exercise all the powers stated in section 7, and may, subject to the control of Government, confer such powers on its servants. All persons duly empowered under section 7 shall be deemed to be public servants within the meaning of the Indian Penal Code.

Power to appoint persons to collect tolls or fees and to lease out collection thereof.

12. The Governor in Council or the managing authority shall appoint persons to collect tolls or fees payable under this Act. The collection of such tolls or of fees other than license fees may, under such conditions as the Governor in Council may from time to time prescribe, be leased out, and in such case the lessee and his agents and servants shall be deemed to be so appointed.

13. In

Procedure in case of non-payment of toll, etc., on demand.

13. In case any tolls, fees other than license fees or penalties payable under this Act are not paid when demanded by a person duly appointed or empowered to collect or impose the same, such person may seize any vessel, goods, vehicles, or animals in respect of which such toll, fee or penalty is payable or anything in the possession of a passenger or person who is liable to such toll, fee or penalty, and any person empowered by Government or the managing authority in this behalf may sell the same by auction after 15 days' public notice of the sale if such toll, fee or penalty is still unpaid. After deduction of such toll, fee or penalty and of the expenses of sale, the surplus proceeds, if any, shall be paid to the person from whose possession the thing sold was taken.

What payments may be recovered as arrears of revenue.

14. All canal and ferry rents and expenses incurred under section 7 may be recovered by the Collector of the district in like manner as if they were arrears of land revenue.

Form, etc., of licenses and registrations.

15. All licenses granted and registrations effected under this Act shall be in such form, shall be valid for a voyage or for such time, and shall contain, or be subject to, such conditions as the Governor in Council may from time to time direct.

Power to make rules.

16. The Governor in Council may make rules in respect of any canal or public ferry for all or any of the following purposes:—

(i) declaring the powers to be exercised by any person employed under this Act;

(ii) providing for the grant of licenses, for the inspection of licensed vessels, and for their maintenance in good condition;

(iii) regulating the dimensions and free board of vessels using any canal or public ferry, the equipment of the same, and the number of passengers and the nature and quantity of cargo to be carried therein;

(iv) regulating the speed at which vessels shall be moved, the passing of vessels, the lights to be exhibited by vessels moving or at anchor, the working of locks, the mooring of vessels, and the use of landing-places, wharves, piers, jetties, docks, basins, lie-byes, sidings, sheds or warehouses.

(v) the disposal of vessels or other things confiscated or seized under this Act;

(vi) for the convenience of passengers; and generally for the purposes of this Act.

Penalty for breach of rule.

17. Any person who breaks any rule made under this Act shall be punishable on conviction by a criminal court with fine not exceeding fifty rupees in case of a single offence, and in case of a continuing offence, not exceeding ten rupees for every day during which such offence continues. If the offence is such as to endanger human life, the punishment may extend to imprisonment of either description for one year or to fine of Rs. 500 or both.

Penalty for navigating a canal or establishing or working a ferry in contravention of section 5 or 9.

18. Any person navigating a canal or establishing or working a ferry in contravention of section 5 or 9 of this Act shall be liable on conviction before a criminal court to fine not exceeding Rs. 500.

Penalty for evasion of toll or fee and for unauthorized levy of toll &c.

19. Any person who refuses or evades payment of any toll or fee payable under this Act, or without due authority levies any toll or fee under colour of this Act, or, being empowered to collect tolls or fees under this Act, collects or receives any sum in excess of the lawful

due, shall on conviction by a criminal court be punishable with imprisonment of either description not exceeding one month or with fine not exceeding Rs. 100 or with both.

Power of Court to order confiscation.

20. On conviction had of any offence under this Act, the Court may order that any vessel or other thing used in the commission of such offence shall be confiscated.

MADRAS: PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRESS.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following papers:—

Proceedings of the Board of Revenue (Separate Revenue), dated 31st May 1895, Mis. No. 2315.

Read—again Board's Proceedings, dated 14th April 1893, Mis. No. 1374.

ABSTRACT.—Ordering that only so much of the Ramannapalem channel as extends from platform No. II to the bridge over channel should be included within the limits of the Mogalturru Salt factory, and requesting the Collector of Gódávari to report whether the cost of upkeep of the channel beyond the bridge should not be borne equally, between the Salt and Public Works Departments.

Read—again Board's Proceedings, dated 17th March 1894, Mis. No. 1234.

ABSTRACT.—Requesting the Chief Engineer for Irrigation to inform the Board as to when and at what cost the Ramannapalem channel, a branch of the Narsapur canal, was dug, and as to the arrangements under which it was transferred to the Salt Department.

Read—again Board's Proceedings, dated 17th December 1894, Mis. No. 5524.

ABSTRACT.—Requesting the Collector of Gódávari to consider further the question of apportioning the cost of the upkeep of the Ramannapalem channel leading from the Mogalturru factory.

Read—also letter from the Collector of Gódávari, dated 8th April 1895, No. 1199-Ver.

ABSTRACT.—Submitting report regarding the contribution payable to the Salt Department by the Public Works Department on account of the Ramannapalem channel.

Read—also endorsement of the Collector of Gódávari, dated 30th April 1895, No. 1363-Ver.

ABSTRACT.—Submitting, in continuation of his letter, Dis. No. 1199-Ver., dated 8th April 1895, Narsapur Deputy Collector's communication reporting further in the matter of the apportionment of the cost of the upkeep of the Ramannapalem channel.

Resolution—dated 31st May 1895, Mis. No. 2315.

The Board begs leave to submit to Government for orders the question of apportioning the cost of maintaining the Ramannapalem channel near the Mogalturru factory in the Narsapur taluk of the Gódávari district.

2. The channel, as will be seen from the sketch enclosed, is a branch of the Narsapur main canal, extending to the platform of the factory. Its entire length is 5,163 yards. Prior to the re-opening of the Mogalturru factory in 1873, this channel existed only as far as A.B. (*vide* sketch), *i.e.*, a distance of 3,080 yards. In 1875–76 it was extended from B. to C., a distance of 1,717 yards at the expense of the Salt Department, and again in 1879–80 by the same department up to the platform, *i.e.*, from D. to E., 366 yards.

3. The channel in question has been extended and is being used by the Salt Department to facilitate transport of salt from the factory to the interior of the Gódávari district. Being a fresh-water channel throughout, it is also used by the Public Works Department for irrigation purposes; 1,021·63 acres are reported to be benefited by the channel, of which 188·23 acres are under the extensions to C. The main portion A.B. of the channel also serves the purpose of draining that part of the country.

4. Repairs to the portion A.B. of the channel since the re-opening of the Mogalturru factory in 1873, and to the extension, from the time of its excavation, have been executed at the cost of the Salt Department, but when the excise system was introduced into the factory in 1884–85 the upkeep of the whole devolved upon the licensees until the passing of the new Salt Act. As, under the provisions of section 31 of Act IV of 1889, the excise licensees are bound to maintain only such of the roads, channels, &c., as lie within the confines of the factory, the portion of the channel between the platform and the bridge, a distance of 700 yards, included in the factory limits, was classed as an excise work, while the upkeep of the rest had to be undertaken by Government. The question now for consideration is whether the cost of maintaining the portion beyond the bridge up to the Narsapur canal should not be borne at least in part by the Public Works Department. The Executive Engineer, Gódávari Western Division, is reported to be of opinion that the channel needs no alteration, and that a depth of one foot is sufficient for irrigation and drainage purposes, whereas for navigation the channel has to be kept at least 6 feet deep. It is not disputed, however, that the portion A.B. was in existence long before the opening of the Mogalturru factory; that it was intended for irrigation and drainage purposes apart from any use to which it might be put for salt traffic; that it was not widened by the Salt Department to facilitate navigation; and that the whole channel up to the bridge is at present actually used for irrigation. Moreover, the Public Works Department will be reimbursed the cost of maintaining the channel in a navigable state by the water-tax levied on account of the lands irrigated under the extension from B. to C., which would not exist but for the salt factory. The Board therefore considers that the whole cost of maintaining the channel outside factory limits should not be borne by the Salt Department. The cost of maintaining the section between B. and the factory is a proper charge against the Salt Department, and over the section A.B., so much of the cost as is necessary to maintain the increased depth of channel necessary for navigation. The Board requests that Government will be pleased to issue orders in the Public Works Department for such apportionment of the charge for the maintenance of the channel as may be decided on.

(True Extract.)

(Signed) EDMUND MILLETT,
Assistant Secretary.

Mis. No. 3295, Revenue.

Transferred to the Public Works Department with an expression of concurrence in the Board's views regarding the apportionment of the cost of maintaining the Ramannapalem channel in a condition fit for navigation.

Ootacamund,
15th August 1895.

(Signed) W. B. AYLING,
Ag. Asst. Secy. to Govt.

No. 149 I.

Note by the Chief Engineer for Irrigation.

From the papers it appears that the Ramannapalem canal (A.B. on the sketch-map) forms a part of the Gódávari anicut system and was originally excavated by the Public Works Department for irrigation and drainage.

2. When the Mogalturru salt factory was established and facilities were required for the transport of salt from the factory to the interior of the Gódávari district, the canal was made navigable and the Board of Revenue now ask for orders regarding the apportionment of the maintenance charges between the Salt and Public Works Departments.

3. In the opinion of the Chief Engineer for Irrigation the Ramannapalem canal should be considered as a part of the East Coast canal system and should be maintained by the Public Works Department, the Salt Department being required to maintain only the length of branch canal which is within the factory limits. To apportion the charges between the Salt and Public Works Departments is not necessary, as it is presumed that the salt boats ply under ordinary licenses and are in no way treated exceptionally.

Ootacamund,
29th August 1895.

(Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
Chief Engineer for Irrigation.

Order—dated 12th September 1895, No. 743 I., Public Works.

The proposal of the Chief Engineer for Irrigation is sanctioned.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, I Circle, with one sketch-map.
" Examiner, Public Works Accounts.
" Revenue Department.

Exd. Shaik Karim.
Spare Copies

3692

MADRAS ACT No. IV OF 1889.

THE MADRAS SALT ACT, 1889.

CONTENTS.

CHAPTER I.

PRELIMINARY.

SECTIONS.

1. Short title.
   Extent.
   Proviso.
2. Repeal.
   Saving of powers.
3. Interpretation clause.
   "Salt revenue."
   "Salt."
   "Saline substance."
   "Salt-earth."
   "Saltpetre."
   "Manufacture."
   "Circle."
   "Inspector."
   "Salt factory."
   "Salt-work."
   "Contraband salt."
   "Commissioner."
   "Licensee."
   "Magistrate."
   "Imprisonment."
   "Maund."
   "Place."

[PRICE, 1 ANNA AND 9 PIES.]

CHAPTER II.

THE APPOINTMENT OF OFFICERS.

SECTIONS.
4. Appointment of Commissioner.
5. Appointment of Deputy and Assistant Commissioners and Inspectors.
6. Subordinate Officers.
7. Delegation of powers by the Commissioner.

CHAPTER III.

OF THE MANUFACTURE OF SALT.

PART I.—*General.*

8. Manufacture without license illegal.
9. Commissioner may grant, alter or cancel licenses.
10. Two descriptions of licenses.
11. Transfer and relinquishment of licenses.
12. Licensee to be taken to be the owner of license and salt works.
13. Power to establish and close factories.
14. Power to substitute either system of manufacture for the other.
Proviso.
15. Notice to be given of intention to substitute.
Licenses to be re-called and new ones issued.
16. Commissioner to dispose of salt works for which licenses have been relinquished or cancelled.
Procedure where salt works are retained within the factory.
Procedure where they are not so retained.
Proviso.
17. Treatment of works pending disposal.
18. Rates of compensation.
19. Power to destroy salt.
20. Power to erect guard-sheds.

PART II.—*Of the Manufacture of Salt for sale to Government.*

21. To what factories the provisions of this part shall apply.
22. Commissioner to determine the quantity of salt to be manufactured, and to pay for all salt manufactured.
23. Obligations of licensees.

SECTIONS.
24. Power to enforce performance of obligations by several licensees.
25. Penalty for want of due diligence or default on the part of licensees.

PART III.—*Of the Manufacture of Salt for general sale.*

26. To what factories the provisions of this part shall apply.
27. Power to cancel license on failure to manufacture.
28. Removal of salt from closed factory.
29. Salt to be protected, re-heaped and secured, and storage-works constructed.
30. Refuse salt to be stored or destroyed.
31. Licensees to construct and maintain roads, channels, reservoirs, &c.
32. When works may be undertaken by the Salt Department.
33. Licensee and purchaser of salt legally bound to state price.
34. Liability of Government for loss or damage to salt in a factory.

CHAPTER IV.

MANUFACTURE AND REFINEMENT OF SALTPETRE.

35. Manufacture of saltpetre without license illegal.
36. Commissioner may grant licenses.
37. Two kinds of licenses.
38. Fees for licenses.
39. Conditions of license.
40. Disposal of materials on cancellation or suspension of license.
41. Payment of duty on salt when license is cancelled or suspended.
42. Licensee to fence premises and store materials.

CHAPTER V.

REMOVAL OF SALT AND PAYMENT OF DUTY AND CHARGES.

43. Salt not removable from factory except under permit and on payment of duty and other charges.
44. Weighment of salt removed.
45. Establishment of preventive stations.

CHAPTER VI.

OF THE POWERS OF PUBLIC OFFICERS FOR THE DETECTION AND PUNISHMENT OF OFFENCES AGAINST THE SALT LAW.

SECTIONS.

46. Magistrate may issue search-warrant on information.
47. When officer of Salt or other department may search without warrant; and the procedure to be observed.
48. Search by head of a village.
49. When offenders may be arrested without warrant and anything liable to confiscation seized.
50. Refusal to give name and residence.
51. Procedure in case of search.
52. Report of search or seizure.
53. Arrested person how dealt with.
54. Procedure by Station officer.
55. Procedure by Inspector.
56. Bond and sureties of accused.
57. Procedure on breach of bond for appearance.
58. Inspector may summon person suspected of offence.
59. Salt officer may summon witnesses.
60. Terms of summons.
61. Examination of witnesses summoned by Salt officers.
62. Examination of witnesses whose attendance is dispensed with.
63. Person summoned merely to produce a document.
64. Report of Inspector to Magistrate.
65. Powers of Inspector to cause attendance of witnesses before Magistrate.
66. Accused not to be detained in custody more than twenty-four hours.
67. Custody of things seized under the Act.
68. Officers of Salt and other departments to assist each other.
69. Prevention of, and information regarding, offences.
70. Zamindars and others to report manufacture of contraband salt.
71. Provisions regarding confiscation of things liable thereto.
72. Provisions as to disposal of things seized under the Act.
73. Power to cancel or suspend licenses on conviction, &c.

CHAPTER VII.

PENALTIES.

SECTIONS.

74. Penalties for removal of salt without or in excess of permits, &c.
75. Act or omission in contravention of section 44, or of any rule under clauses (*c*), (*e*) and (*g*) of section 85 or of any permit.
76. Vexatious abuse of power by officer of Salt or other department or by head of village.
77. Vexatious delay by officer exercising powers under this Act.
78. Salt officer refusing to perform his duties or offering violence to person in custody.
79. What things liable to confiscation.

CHAPTER VIII.

GENERAL PROVISIONS.

80. Rules and Notifications under the Act.
81. Mode of conferring powers, &c.
82. Service of summons, &c.
83. Presumption as to possession.
84. Recovery of sums due to Government.
85. Purposes for which Rules may be made.
86. Appeals against orders.
87. Limitation.

SCHEDULE.

REPEAL OF ENACTMENTS.

MADRAS ACT No. IV OF 1889.

PASSED BY THE GOVERNOR OF FORT ST. GEORGE IN COUNCIL.

[*Received the assent of the Governor on the* 21*st November* 1889 *and of the Governor-General on the* 30*th December* 1889.]

An Act to consolidate and amend the law relating to the Salt Revenue in the Presidency of Fort St. George.

WHEREAS it is expedient to consolidate and amend the law relating to the Salt Revenue in the Presidency of Fort St. George; it is hereby enacted as follows:— Preamble.

CHAPTER I.

PRELIMINARY.

Short title. **1.** This Act may be called "The Madras Salt Act, 1889:"

It extends to the whole of the Presidency of Fort St. George; Provided that the Governor in Council may, from time to time, by notification exempt any local area from the operation of all or any of the provisions of this Act other than this section and section 2. Extent. Proviso.

Enactments repealed. **2.** The Enactments specified in the schedule hereunto annexed are repealed to the extent shown in the third column of the said schedule.

Saving of Powers. All licenses granted, orders, rules and appointments made, notifications published, local limits defined, and powers conferred, under any of such enactments, or under any enactments thereby repealed, shall, so far as they are consistent herewith, be deemed to have been respectively granted, made, published, defined and conferred, under this Act.

Interpretation clause. **3.** In this Act, unless there be something repugnant in the subject or context—

"Salt Revenue." (*a*) "Salt Revenue" means revenue derived or derivable from any price, duty, fee, tax, fine, confiscation, or payment imposed or ordered under the provisions of this Act, or of any other law for the time being in force relating to salt.

"Salt." (*b*) "Salt" means chloride of sodium, and includes swamp salt, spontaneous salt, and salt or saline solutions made or produced from any saline substance or from salt-earth.

"Saline substance." (*c*) "Saline substance" means any substance naturally containing salt.

"Salt-earth." (*d*) "Salt-earth" means earth containing salt.

"Saltpetre." (*e*) "Saltpetre" means nitrate of potash, and in any local areas which may be defined in this behalf from time to time by the Governor in Council by notification shall include any or all kinds of carbonates, nitrates or sulphates of soda and potash specified in such notification.

"Manufacture." (*f*) "Manufacture" includes excavation, collection, removal, preparation, steeping, evaporation, boiling or any one or more of those processes; and also the separation of salt from any saline substance or from saltpetre.

"Circle." (*g*) "Circle" means a local area from time to time constituted as such by the Governor in Council by notification.

"Inspector." (*h*) "Inspector" means an officer in charge of a circle, and includes any officer who may be specially invested by Government with the powers of an Inspector under this Act.

"Salt Factory." (*i*) "Salt Factory" includes any place used or intended to be used for the manufacture of salt or for the storage or keeping of the same pending payment of duty, and all embankments, channels, reservoirs, lands, buildings, and waste places, situated within the limits thereof as defined from time to time by the Governor in Council; but does not include a warehouse appointed or licensed under the Sea Customs Act, 1878.

"Salt-work." (*j*) "Salt-work" means any defined area within a salt factory, which is used for the manufacture of salt and which is separately registered as such in the public accounts.

(*k*) "Contraband Salt" means salt, saline substances, salt-earth or saltpetre manufactured without license, or dealt with by any person in contravention of any enactment for the time being in force or of any order, permit or license issued thereunder, or of any Rule made in pursuance thereof.

"Contraband Salt."

But it shall not include salt-earth which has been merely excavated or collected, unless such salt-earth is found within the limits of any local area wherein such salt-earth is declared by a notification of the Governor in Council to be contraband salt, nor shall it include sea water.

(*l*) "Commissioner" means the officer appointed by the Governor in Council under section 4, clause (*a*).

"Commissioner."

(*m*) "Licensee" means a person to whom a license to manufacture salt or saltpetre is issued, and includes any person registered as the transferee of such license under the provisions hereinafter contained.

"Licensee."

(*n*) "Magistrate" means a Magistrate appointed under the Code of Criminal Procedure.

"Magistrate."

(*o*) "Imprisonment" means imprisonment of either description as defined in the Indian Penal Code.

"Imprisonment."

(*p*) "Maund" means a maund of eighty-two and two-sevenths pounds avoirdupois weight.

"Maund."

(*q*) "Place" includes a house, building, shop, tent, or vessel.

"Place."

CHAPTER II.

The Appointment of Officers.

4. Notwithstanding anything contained in Regulations I and II of 1803, the Governor in Council may, from time to time, by notification—

(*a*) appoint an officer, who shall, either as a Member of the Board of Revenue or subject to the orders of the Board of Revenue or independently of the Board of Revenue, as the Governor in Council may direct, have the control of the administration of the Salt Department and of the collection of the Salt Revenue; and

The Governor in Council may appoint an officer to control the administration of the Salt Department;

(*b*) withdraw from the Board of Revenue or the Collector of Land Revenue any or all of their or his powers in respect of the Salt Revenue.

may withdraw from Board of Revenue or Collectors of Land Revenue their powers in respect of Salt Revenue.

5. The Governor in Council may from time to time appoint officers of the Salt Department subordinate to the Commissioner, under the designation of Deputy and Assistant Commissioners and Inspectors of Salt Revenue, or under such other designations as may seem fit, and may suspend, reduce, transfer, or dismiss any officer so appointed.

Deputy and Assistant Commissioners and Inspectors.

The Governor in Council may delegate any of his powers under this section to the Commissioner.

6. The appointment of all other subordinate officers of the Salt Department shall, under such orders as the Governor in Council may from time to time prescribe, vest in the Commissioner, who may fine, suspend, reduce, transfer, or dismiss any subordinate officer so appointed.

Subordinate Officers.

7. The Commissioner may from time to time, with the sanction of the Governor in Council, by notification, authorise any officer subordinate to him to exercise any of the powers conferred on him by this Act, within such local area, and subject to such limitations as he may think fit.

Delegation of powers by the Commissioner.

CHAPTER III.

Of the Manufacture of Salt.

Part I.—*General.*

8. No person, not being a public servant manufacturing on behalf of Government, shall manufacture salt unless duly licensed as hereinafter provided.

Manufacture without license illegal.

9. The Commissioner may grant licenses for the manufacture of salt. Every license shall relate to specified salt works and shall contain such particulars and conditions as the Governor in Council may from time to time prescribe. The Commissioner may at any time call for any license and may amend or alter it or may tender to the licensee a new license

Commissioner may grant licenses;

may call for and alter them or tender new license,

in accordance with any further conditions which may be so prescribed.

and if new license refused, may cancel previous license.

If such new license is not accepted by the licensee, the Commissioner may direct that the previous license shall be cancelled.

Every person who is registered as a manufacturer of salt at any salt factory in existence when this Act comes into force, shall be deemed to be duly licensed to manufacture salt hereunder until a license shall be issued to him.

Two descriptions of licenses.

10. Licenses for the manufacture of salt may be either—

(i) for the manufacture of Salt for sale to Government,

or

(ii) for the manufacture of Salt for general sale.

11. Licenses shall be transferable and may be relinquished.

Transfer and relinquishment of licenses.

Provided that no transfer or relinquishment shall have any effect against the Commissioner unless and until it shall have been registered or accepted under such rules as the Governor in Council may from time to time prescribe.

12. For the purposes of this Act, the licensee shall be taken to be the owner of the license and of the salt works specified therein. Provided that nothing herein contained shall affect the liability of the licensee towards any person who may have an interest in, or lien upon, such license or salt works.

Licensee to be taken to be owner of license and salt works.

13. The Governor in Council may by notification establish a salt factory in any land which is the property of Government, or in which the owner thereof shall permit the establishment of a salt factory. Subject to the payment of compensation as hereinafter provided, the Governor in Council may in like manner close any salt factory or portion thereof by directing cancellation of the licenses relating to salt works therein comprised.

Power to establish and close factories.

14. The Governor in Council may direct that any salt factory or portion of a salt factory worked for sale of salt to Government shall be worked for general sale of salt, and that any factory or portion of a factory worked for general sale of salt, shall be worked for sale of salt to Government.

Power to substitute either system of manufacture for the other.

Proviso.

Provided that no such change shall be introduced during a manufacturing season.

15. The intention of the Governor in Council to effect such change shall be declared by a notification not later than the first day of June in the year preceding that in which the change is to take effect, and notice of such intention shall further be served on the general body of licensees at the factory affected. On or after the first day of December next ensuing and before the commencement of manufacture, the Commissioner shall cause all licensees to be summoned to receive new licenses, and if any of them fail to attend in person or by authorized agent at the time and place mentioned in the summons and to accept the licenses tendered, the Commissioner may declare the existing licenses cancelled.

Notice to be given of intention to substitute.

Power to recall licenses and issue new ones.

16. Salt works for which licenses have been relinquished under section 11 or cancelled under sections 9, 13, 15, 25, 27, or 73, shall be at the disposal of the Commissioner, who shall determine whether the salt works shall be retained within the salt factory or not.

Retention of salt works for which licenses have been relinquished or cancelled to be determined by Commissioner.

(*a*) If the Commissioner directs that the salt works shall be retained within the factory, the proprietary right of other persons therein, if any, shall thereupon vest in the Governor in Council and the Commissioner shall pay the value of such proprietary right to the late licensee. In calculating such value the value of the land as a site for salt manufacture shall not be taken into account. The Commissioner shall, if he admits the existence of such proprietary right, tender to the late licensee such sum as he considers to represent the value thereof, and if the sum tendered is not accepted or such proprietary right is not admitted by the Commissioner, he shall refer the late licensee to a court of competent jurisdiction. In the case of salt works for which licenses have been cancelled under sections 9, 13, or 15, the Commissioner shall also pay to the late licensee compensation at the rates fixed in section 18.

Procedure where salt works are retained within the factory.

(*b*) If the Commissioner directs that the salt works shall not be retained within the factory he shall exclude them from the limits thereof, and no payment for the value of any proprietary right shall be made, but in the case of salt works for which

Procedure where they are not retained.

licenses have been cancelled under sections 9, 13, or 15, the Commissioner shall pay the late licensees compensation at the rates fixed in section 18.

Proviso.

Provided that no compensation under this section shall be payable, if it is excluded by express stipulation in the conditions of the license.

Treatment of works pending disposal, in the case of dispute, or of suspension of license.

17. Pending the disposal of salt works under section 16, in case of dispute as to succession to a deceased licensee and whenever a license is suspended under this Act, the Commissioner may—

grant a temporary license for manufacture in the works in question; or

flood them with water; or

take any other measure he may think fit to prevent injury to manufacture in neighbouring salt works or the spontaneous generation of salt.

Compensation payable.

18. The compensation payable under section 16 to a licensee shall be at the rate of four annas for every maund of salt in the average quantity annually stored from the salt works to which the license cancelled or relinquished relates. In the case of a license to manufacture salt for sale to Government, such average quantity shall be calculated on the number of years in which the salt works have been worked during the five years last preceding. In the case of a license to manufacture salt for general sale, such average quantity shall be calculated on the period not exceeding five years last preceding during which the license has been in force.

Power to destroy salt.

19. The Commissioner may without payment authorize the immediate destruction of all salt manufactured by licensees otherwise than according to the conditions of their licenses.

Power to erect guard-sheds.

20. The Commissioner may cause guard-sheds to be erected at any place in any salt factory without payment of compensation for the use of the land occupied thereby.

Part II.—*Of the Manufacture of Salt for sale to Government.*

Factories for sale of salt to Government.

21. The provisions of this part shall apply only in salt factories or portions of factories worked for sale of salt to Government.

Power to determine quantity of salt to be manufactured.

22. The Commissioner shall determine the quantity of salt to be manufactured in each year by each licensee.

Commissioner to pay for salt manufactured.

The Commissioner shall pay licensees for all salt manufactured according to the conditions of their licenses and delivered into store by them, at such rates as the Governor in Council may from time to time prescribe.

Obligations and duties of licensees.

23. Licensees shall be bound at their own expense to maintain in repair their salt works and the minor irrigation channels which supply brine thereto, and to deliver all the salt manufactured by them into store at the place and in the manner appointed by the Commissioner for the factory or for the salt works of the licensee. They shall also be bound, when called upon by the Commissioner, to provide labor and materials for securing salt in store and for executing repairs to the platforms, main channels, roads, and other works of the factory, and shall be paid therefor at the rates usually paid in the neighbourhood for labor and materials of a similar description.

Power to enforce performance of obligations by licensees.

24. If the licensees fail to agree among themselves as to the proportion in which they shall execute, perform and do the several works, duties and things mentioned in the last preceding section, it shall be lawful for the Commissioner to determine such proportion by order to be affixed in a conspicuous place in the salt factory, and the licensees shall thereupon be bound to execute, perform and do such works, duties and things accordingly within a time to be named in the said order, and if any licensee shall fail so to do, the Commissioner may take such steps as he may think fit for the execution, performance and doing of such works, duties and things, and may recover from such licensee the amount of any expenditure which the Commissioner may have incurred owing to such refusal or neglect.

Powers of Commissioner in case of want of due diligence or default by licensee.

25. In case of a licensee failing to exercise due diligence in manufacture, or committing any default under section 23 or 24, the Commissioner may—

impose upon the licensee a fine not exceeding one-tenth of the sum payable at the prescribed rates on the quantity of salt determined under section 22; or

suspend the license for such period as he may think fit; or

one month after notice cancel the license.

PART III.—*Of the Manufacture of Salt for general sale.*

Factories for general sale of salt.

26. The provisions of this part shall apply only to salt factories or portions of factories worked for general sale of salt.

Power to cancel license on failure to manufacture.

27. The Commissioner may, after giving one month's notice, cancel the license for any salt work at which no salt shall have been manufactured during the two manufacturing seasons last preceding.

Removal of salt from closed factory.

28. Salt in store at any salt factory, or part of a factory, which may be closed in the manner hereinbefore provided, or the property of any licensee whose license may be cancelled or suspended, shall be removed within six months of the date of such closing or of the cancelment or suspension of such license, for which purpose only the license shall continue in force; and if the licensee shall fail so to remove the salt on payment of the duty thereon, it shall be forfeited to Government and disposed of as the Commissioner may think fit.

Salt to be protected, reheaped and secured and storage works constructed.

29. The Commissioner may, by order in writing, require a licensee to protect salt manufactured by him in such manner as the Commissioner shall consider sufficient in any place appointed by the Commissioner for the storage or keeping of salt for the factory or for the salt works of the licensee, to reheap and secure in such manner as he may direct any portion remaining out of a heap or store which has been opened, or to construct or repair to the Commissioner's satisfaction any embankment, platform, building, or works required or set apart for the purpose of storage, and if the licensee shall fail to comply with such order within ten days of the receipt thereof, the Commissioner may do what is required or may sell or destroy salt so left unprotected or unstored and may recover the cost from the licensee.

Refuse salt to be stored or destroyed.

30. The Commissioner may call on a licensee to store in such manner as he may direct any sifted or refuse salt manufactured by him which may be lying unstored, or, at the option of the licensee, to destroy the same; and if the licensee shall fail either to store or to destroy such salt within ten days of the receipt of the order so to do, the Commissioner may cause such salt to be destroyed and may recover the cost of such destruction from him. The Commissioner shall determine whether any salt is sifted or refuse for the purposes of this Act.

Licensees to maintain in good order roads, channels, reservoirs, &c.

31. The licensees at each salt factory shall be bound, at their own expense, to construct and maintain within the limits of the factory in good repair to the satisfaction of the Commissioner all roads and all channels, reservoirs, embankments, drying grounds, platforms, and other works used or intended to be used for the manufacture and storage of Salt, and also all works wherever situated for the protection of the Factory from inundation or for the supply of brine.

When works may be undertaken by Salt Department.

32. In case the licensees shall fail to execute the works specified in the last preceding section, or, with the sanction of the Governor in Council, whenever it appears desirable that any such work should be undertaken by the Salt Department, the Commissioner may cause such works to be executed and may recover the cost thereof, in such proportions as may seem fit, from the licensees.

Applicants for permit to remove salt legally bound to state price.

33. Every person applying for a permit to remove salt from a salt factory under this chapter shall be legally bound to declare in the application the price at which the salt has been sold and the full consideration given or agreed to be given therefor.

Liability of Government for loss or damages to salt in a factory.

34. No licensee shall be entitled to claim from Government compensation for any loss or damage to stored or unstored salt lying at any salt factory, unless it be proved that such loss or damage was caused by the wilful act or neglect of an officer of the Salt Department employed at the factory at which the salt was lying.

CHAPTER IV.

MANUFACTURE AND REFINEMENT OF SALTPETRE.

Manufacture of saltpetre without license illegal.

35. No person, not being a public servant manufacturing on behalf of Government, shall manufacture or refine saltpetre unless duly licensed as hereinafter provided.

Commissioner may grant licenses.

36. The Commissioner may grant licenses for the manufacture or refinement of saltpetre.

Two kinds of licenses.

37. Such licenses may be either—

A. For the manufacture only of saltpetre in its crude form, or

B. For the manufacture and refinement of saltpetre, and the separation and purification of salt in the process of such manufacture and refinement.

Fees for licenses.

38. The Governor in Council may from time to time by notification determine the fees to be paid for such licenses in any local area.

Conditions of license.

39. Licenses under this chapter shall be annual and shall contain such particulars and conditions as the Governor in Council may from time to time prescribe, and every license under clause B, section 37, shall relate to specified premises.

Disposal of materials on cancellation or suspension of license.

40. Whenever any license under this chapter is cancelled or suspended under section 73, the Commissioner may, by order in writing, require the licensee to destroy all materials in his possession capable of being used in the manufacture of salt or in the refinement of saltpetre; and in case the licensee shall fail so to do within ten days, the Commissioner may cause them to be destroyed, and may recover the cost from the licensee.

Payment of duty on salt on cancellation or suspension of license.

41. The Commissioner may, from time to time, and shall, whenever any license under clause B, section 37, is cancelled or suspended, by order in writing, call on the licensee to pay the duty leviable under section 43 on all salt found on the premises and to remove the salt. If the licensee without reasonable excuse fail so to do within ten days, the Commissioner may sell the salt on behalf of Government subject to payment of duty, or may destroy it and recover the cost of such destruction from the licensee.

Licensee to fence premises and store materials.

42. The Commissioner may, from time to time, by order in writing, call on any person licensed under clause B, section 37—

(1) to fence the premises to which the license relates,

(2) to keep the fences in repair,

(3) to store or protect the materials used or produced therein,

in such manner as he may direct. If the licensee fails to carry out such order within one month, the Commissioner may cancel his license or may suspend it or may himself do what is required and recover the cost thereof from the licensee.

CHAPTER V.

Removal of Salt and Payment of Duty and Charges.

Salt not removable from factory except under permit and on payment of duty and other charges.

43. Subject to any rules which may be framed by the Governor in Council under section 85, no salt shall be removed from any salt factory, otherwise than on account of Government, or for transport to a place of storage authorized by the Commissioner, and no salt shall be removed from such authorized place of storage, except under a permit and upon payment of duty at the rate fixed by the Governor-General in Council under the Indian Salt Act, 1882, and of the following charges:—

A—For every maund of salt sold on account of Government such sum as may be fixed under general or special order of the Governor in Council, or determined by auction sale, not being less than any minimum fixed under section 8 of the Indian Salt Act, 1882.

B—For every maund of salt sold by or on account of a licensee under section 10 (ii) such sum as the Commissioner, under such rules as the Governor in Council may from time to time prescribe, may fix as sufficient to cover all or any of the following charges or portions thereof:—

(1) The rent or assessment of the land occupied by the factory, and of the land or buildings on or in which the salt was stored.

(2) Interest at five per centum per annum on the capital cost of the works constructed at the expense of Government within the factory of any of the descriptions, or for any of the purposes, mentioned in section 31.

(3) The cost of any works executed under section 32 and not recovered thereunder.

(4) So much of the annual expenditure incurred by the Government on the establishments maintained at the factory or place of storage for the purposes of guarding the salt and of realizing the revenue thereon, as may exceed five per centum on the duty levied on the salt therein sold in preceding official years and as has not been recovered by Government.

44. Every holder of a permit for the removal of salt from a salt factory shall be bound to superintend either in person or by his servant or agent the weighing out of the same, and the person actually superintending such weighment shall be bound to prevent the removal of any quantity in excess of that for which the permit has been granted, and may test the weights and scales used in the weighment thereof.

Holder of permit to superintend weighment of salt and person superintending responsible for quantity removed.

45. The Commissioner may establish Preventive Stations at which all salt removed from any specified factory shall be detained and examined.

Establishment of Preventive Stations.

CHAPTER VI.

Of the Powers of Public Officers for the Detection and Punishment of Offences against the Salt Law.

46. Any Magistrate on information given that contraband salt is manufactured, sold, or kept in any place within his jurisdiction may issue a warrant to search for such salt. Before issuing such warrant the Magistrate shall examine the informant on oath or affirmation, and the examination shall be reduced into writing and be signed by the informant and by the Magistrate.

Magistrate may issue search warrant on information.

47. Whenever any officer of the Salt, Police, Land Revenue, Abkári, or Customs Departments, empowered by the Governor in Council in this behalf, has reason to believe that contraband salt is being manufactured, sold, or kept, in any place and that the delay in obtaining a search warrant will prevent the discovery thereof, such officer shall first record in writing (so far as may be practicable)—

When officer of Salt or other department may search without warrant; and the procedure to be observed.

(*a*) the name, residence and calling of the informant (if any);

(*b*) the locality and description of the place in which, and the name of the person for or by whom, the contraband salt is manufactured, sold or kept; and

(*c*) the supposed quantity and description of the contraband salt, with the grounds of believing the same to be contraband;

and may then between sunrise and sunset enter and search any such place and may seize and carry away all contraband salt and all things liable to confiscation under this Act which he may find, and may destroy any works constructed in such place for the manufacture of such salt or to cause or assist the spontaneous generation of salt;

and may also arrest any person concerned in the manufacture, sale, or keeping of such contraband salt or in dealing therewith. Any person arrested under this section shall be admitted to bail by the officer conducting the search if sufficient bail be tendered for the appearance of such person before the Inspector.

48. Whenever the Head of a village has credible information that contraband salt is manufactured, sold, or kept, in his village, he may between sunrise and sunset, search the place in which such salt is believed to be manufactured, sold, or kept, and shall seize and carry away all such salt and all things liable to confiscation under this Act which he may find; and he shall forthwith forward them with a report mentioning the circumstances under which, and the person in whose possession, they were found, to the nearest Salt Factory or Police Station.

When Head of village may search.

49. Any officer of the Salt, Police, Land Revenue, Abkári or Customs Departments may arrest without warrant in any public thoroughfare or open place other than a dwelling place any person found committing an offence under this Act and in any such thoroughfare or open place may seize and detain any thing which he has reason to believe to be liable to confiscation under this Act, and may search any person, vessel, vehicle, animal, package, or covering, upon whom or in or upon which he may have reasonable cause to suspect any such thing to be.

When offenders may be arrested, and anything liable to confiscation seized, without warrant.

50. Any person who may be accused or reasonably suspected of committing an offence under this Act, and who on demand of any officer of the Salt, Police, Land Revenue, Abkári or Customs Departments, or of any other person duly empowered, refuses to give his name and residence, or who gives a name or residence which such officer or person has reason to believe to be false, may be arrested by such officer or person in order that his name and residence may be ascertained.

Person refusing to give name and residence or giving false ones may be arrested.

51. All searches under this chapter shall be made in accordance with the provisions of the Criminal Procedure Code, so far as the same are consistent herewith, and where made by a Head of a village shall be reported within twenty-four hours to the Magistrate having jurisdiction.

Procedure in case of search.

52. Whenever any search or arrest or seizure is made under sections 47, 49, or 50, the officer making it shall, within twenty-four hours, make a full report of the particulars of such arrest or seizure to his immediate official superior.

Report of search or seizure.

53. Whenever any person is arrested under the provisions of this chapter and has not been admitted to bail under section 47, the person arresting him shall forthwith forward him to the Inspector of the Circle in which the arrest was made, or, if such Inspector be not within a distance of ten miles from the place at which such arrest took place, to the nearest Police Station, with a report of the circumstances under which such arrest was made.

Persons arrested, how to be dealt with.

54. On any such person being brought to a Police Station as aforesaid, the officer in charge thereof shall admit him to bail to appear when summoned before the Inspector of the Circle within the limits of which the offence with which he is charged is suspected to have been committed, and in default of bail shall forward him in custody to such Inspector.

Procedure by Police Station Officer.

55. Whenever any person charged with having committed an offence under this Act is brought before an Inspector or appears before him on bail, such Inspector shall after such inquiry as he may deem fit either release him or admit him to bail to appear before the Magistrate having jurisdiction or in default of bail forward him in custody to such Magistrate.

Procedure by Inspector.

56. Before any person is released on bail, a bond in such sufficient but not excessive sum of money as the officer admitting him to bail thinks proper shall be executed by such person and by one or more sureties conditioned that such person shall attend in accordance with the terms of the bond and shall continue to attend until otherwise directed by the Inspector before whom he was bailed to attend or the Magistrate as the case may be.

Bond and sureties of accused.

Provided that the officer admitting any such person to bail may dispense with the requirement of a surety or sureties to the bond executed by such person.

57. Whenever, by reason of default of appearance of a person bailed to appear before an Inspector, such Inspector is of opinion that proceedings should be had to compel payment of the penalty mentioned in the bond, he shall forward it to the Magistrate having jurisdiction to try the offence of which the person bailed was accused, and the Magistrate shall proceed to compel payment of the penalty in the manner provided by the Code of Criminal Procedure for the recovery of penalties in the like case of default of appearance by a person bailed to appear before his own Court.

Procedure in case of default of person admitted to bail to appear before Inspector.

58. Any Inspector may, after recording his reasons in writing, summon any person to appear before him whom he has reason to suspect of having committed an offence under this Act. On such person appearing before such Inspector he shall be dealt with under section 55.

Inspector may summon suspected persons.

59. Any officer of the Salt Department duly empowered in this behalf by the Governor in Council may summon any person to appear before himself to give evidence in any investigation relating to the Salt Revenue or to an offence under this Act or to produce any document relevant thereto which may be in his possession or under his control.

Salt Officers may summon witnesses.

Provided that no person shall be summoned to appear at a greater distance from his usual place of residence than the Governor in Council may from time to time by notification direct.

60. Summonses shall be in writing, shall require the persons summoned to appear at a stated time and place, and shall be signed by the officer issuing them. Summonses under section 59 shall state whether the person summoned is required to give evidence or to produce a document, or both.

Terms of summons.

61. Persons summoned under section 59 shall attend as required and shall answer all questions relating to such investigation put to them by such officer. Such answers shall be reduced into writing, and shall be signed by such officer.

Examination of witnesses summoned by Salt Officers.

62. Such officer may proceed to the residence of any person who from sickness or other infirmity may be unable to attend before him, or whom by reason of rank or sex it may not be proper to summon, and may there examine him instead of summoning him to appear; and the provisions of section 61 shall apply in such case.

When attendance to be dispensed with, and procedure in such cases.

63. Any person summoned merely to produce a document shall be deemed to have complied with the summons if he cause such document to be produced, instead of attending personally to produce the same.

Persons summoned to produce documents may send them.

64. Whenever an Inspector forwards in custody any person accused of an offence under this Act to the Magistrate having jurisdiction or admits any such person to bail to appear before such Magistrate, such Inspector shall also forward to such Magistrate a report setting forth the name of the accused person, the nature of the offence with which he is charged, and the names of the persons who appear to be acquainted with the circumstances of the case; and shall send to such Magistrate any article or samples which it may be necessary to produce before him. Upon the receipt of such report, the Magistrate shall proceed in like manner as if report had been made to him under clause (*b*), section 191, of the Code of Criminal Procedure.

Report of Inspector gives jurisdiction to a competent Magistrate.

65. Such Inspector shall exercise all the powers conferred by the Code of Criminal Procedure on an officer in charge of a Police Station in respect to causing the appearance before such Magistrate of such persons as he may consider necessary to be examined by the Magistrate.

Powers of Inspector to cause attendance of witnesses.

66. No person accused or suspected of having committed an offence under this Act shall be detained in custody for a longer period than under all the circumstances of the case is reasonable; and such period shall not, in the absence of the special order of a Magistrate, exceed twenty-four hours exclusive of the time necessary for the journey of such person to the place where the Inspector may be and from thence to the Magistrate having jurisdiction.

Accused not to be detained in custody for a longer period than twenty-four hours without special authority.

67. All officers in charge of Police Stations shall take charge of and keep in safe custody, pending the orders of the Magistrate or of an Inspector, all things seized under this

Police to take charge of articles seized.

Act which may be delivered to them; and shall allow any officer of the Salt Department who may accompany such things to the Police Station, or who may be deputed for the purpose by his superior officer, to affix his seal to such things or to take samples of and from them. All samples so taken shall also be sealed with the seal of the officer in charge of the Police Station.

68. All officers of the Salt, Police, Land Revenue, Abkári and Customs Departments and Village Officers of the Revenue and Police Departments, shall, upon notice given or request made, be legally bound to assist each other in carrying out the provisions of this Act.

Officers of Salt and other departments to assist each other.

69. All officers of the Police, Land Revenue, Abkári and Customs Departments shall be bound to give immediate information to an officer of the Salt Department, and every officer of the Salt Department shall be bound to give immediate information either to his immediate official superior or to an Inspector of all breaches of any of the provisions of this Act which may come to his knowledge; and all such officers shall be bound to take all reasonable measures in their power to prevent the commission of any such breaches which they may know or have reason to believe are about or likely to be committed.

Officers of Police and other departments bound to report offences against Act.

70. All Zamindars, proprietors, tenants, under-tenants and cultivators, or other persons who own or hold land on which there shall be any manufacture of contraband salt, shall in the absence of reasonable excuse be bound to give notice of the same to a Magistrate or to an officer of the Salt, Police, Land Revenue, Abkári or Customs Departments, immediately the same shall come to their knowledge.

Zamindars and others bound to report manufacture of contraband salt.

71. At the conclusion of any inquiry into or trial of an offence under this Act, the Court may order the confiscation of anything liable to confiscation under this Act in connection with such offence.

Whenever confiscation is so ordered, the Court may give the owner of such thing an option to pay, in lieu of confiscation, such sum of money as the Court may think fit.

In any other case when anything liable to confiscation under this Act has been seized, the Commissioner may, subject to such rules as the Governor in Council may prescribe, order the confiscation thereof.

By whom confiscations may be adjudged, &c.

Disposal of things seized.

72. The Governor in Council may by rule provide in regard to things liable to be seized under this Act—

(*a*) that the owner or person having the charge of any animal seized and detained shall provide from day to day for its keep while detained, and that, if he omits to do so, such animal may be sold by public auction, and the expenses (if any) incurred on account of it defrayed from the proceeds of the sale:

(*b*) that when anything is seized and an order for its release is subsequently passed, and the owner does not, within a period to be fixed by such rule, appear to claim such thing and tender the duties, penalties, and charges (if any) due in respect thereof, it may be sold by public auction, and such duties, penalties, and charges be defrayed from the proceeds of the sale:

(*c*) that the surplus proceeds of a sale under clause (*a*) or clause (*b*) of this section shall, if not claimed by the owner of the thing seized within a period to be fixed by such rule, be forfeited to Government.

Power to cancel and suspend licenses.

73. The Commissioner may cancel any license if the licensee shall have been convicted of any offence under this Act, or may suspend or cancel any license in case of breach of the conditions thereof.

CHAPTER VII.

PENALTIES.

74. Any person who—

Penalties for removal of salt without or in excess of permits, &c.

(*a*) removes any salt without or in excess of the permits rendered necessary by this Act; or

(*b*) except for agricultural or building purposes, excavates, collects or possesses salt-earth in any local area where it is contraband salt; or

(*c*) manufactures contraband salt in any other way than by excavating or collecting salt-earth; or

(*d*) purchases, obtains, possesses, sells, or weighs contraband salt other than salt-earth knowing or having reason to believe it to be contraband; or

(*e*) refines saltpetre without such license as is prescribed by Chapter IV of this Act; or

(*f*) attempts to commit or within the meaning of the Indian Penal Code abets the commission of any of the above acts,

shall on conviction be punishable for every such offence with imprisonment for a term not exceeding six months, or with fine not exceeding five hundred rupees, or with both.

Penalty for act or omission in contravention of section 44, or of any rule under clauses (*c*), (*e*) and (*g*) of section 85, or of any permit.

75. Any person who is guilty of any act or intentional omission in contravention of section 44 of this Act or of any rule framed by the Governor in Council under clauses (*c*), (*e*) and (*g*) of section 85 or of any permit granted under this Act, shall on conviction be punishable with fine which may extend to two hundred rupees.

Penalty for vexatious seizure or arrest by officer of Salt or other department or by village head.

76. Any officer of the Salt, Police, Land Revenue, Abkári or Customs Departments, or any head of a village, who enters for the purposes of search any house, building, vessel or enclosed place, without reasonable cause to believe that contraband salt is manufactured, sold, or kept therein; or who vexatiously and unnecessarily seizes any article on the pretence of seizing or searching for contraband salt, or who vexatiously and unnecessarily detains, searches or arrests any person or stops or detains any vehicles or vessels in transit, or who in any other way vexatiously exceeds his lawful powers, shall on conviction be punishable with fine which may extend to five hundred rupees, or with imprisonment for a term which may extend to six months, or with both.

Penalty for vexatious delay by officer of Salt or other department.

77. Any Salt or other officer exercising powers under this Act or any other person who vexatiously and unnecessarily delays forwarding to the Inspector or to the officer in charge of the nearest Police Station, as required by section 53 of this Act, any person arrested or any article seized under this Act, shall be punished with fine which may extend to two hundred rupees.

Penalty for Salt officer refusing to do duty, or using violence to person in his custody.

78. Any Salt officer who without lawful excuse shall cease or refuse to perform or shall withdraw himself from the duties of his office, unless expressly allowed to do so in writing by the Commissioner or unless he shall have

given to his superior officer two months' previous notice in writing of his intention to do so; or

who shall offer any unwarrantable violence to any person in his custody;

shall, on conviction, be punishable with fine which may extend to six months' pay, or with imprisonment which may extend to three months, or with both.

79. All contraband salt;

What things liable to confiscation.

all salt, saltpetre, saline substances or salt-earth in regard to which any offence relating to salt may be proved to have been committed;

all vessels, vehicles, materials, implements, utensils, animals, packages and coverings employed in the manufacture, purchase, sale, keeping, concealment or conveyance thereof, or in otherwise dealing therewith;

shall be liable to confiscation.

CHAPTER VIII.

General Provisions.

80. All Rules made and Notifications issued under this Act shall be made and issued by publication in the *Fort St. George Gazette*; provided that all such Rules and Notifications whereby any act or omission is made punishable shall be published in three successive issues of the *Fort St. George Gazette* and for at least two months in the Official Gazettes of the districts to which or to parts of or to places in which it may be determined that they shall apply. All such Rules and Notifications shall thereupon have the force of law and be read as part of this Act and may in like manner be varied, suspended or annulled.

Rules and Notifications how to be published.

81. All notifications and orders conferring powers, or imposing duties under this Act may refer to persons by name or by office or to classes of officials generally by their official titles.

Mode of conferring powers, &c.

82. Whenever under the provisions of this Act it may be necessary to serve any person with a summons or a notice, or to tender a license, such service or tender shall be made in accordance with the provisions of the Code of Criminal Procedure regarding the service of summons, so far as they may be applicable to the circumstances of the case.

Procedure as to service of summons, &c.

Provided that a registered letter addressed to the usual residence of any person may be substituted for any other mode of serving a summons or notice upon that person.

And provided also that when a notice has to be served upon the general body of the licensees of a salt factory it shall be sufficient to affix the notice to a prominent part of the factory office and to keep it so affixed for not less than seventy-two hours.

83. All contraband salt found in any house, building or enclosed place, shall be presumed, until the contrary is proved, to be in the possession of the occupier of such house, building or place.

Presumption as to possession.

84. All sums recoverable under this Act or in any way due to Government on account of the Salt Revenue may be deducted by the Commissioner from any money owing to the person from whom such sums may be recoverable or due which may be in the hands of the Commissioner or under his disposal or control or may be recovered by the Commissioner by attachment and sale of salt belonging to such person and remaining within the limits of a factory. If not so recovered, such sums may be recovered by Collectors of Districts on application from the Commissioner as if they were arrears of Land Revenue.

Recovery of sums due to Government.

85. The Governor in Council may from time to time make Rules consistent with this Act for regulating the following matters, namely—

Power to make Rules.

(*a*) the grant of licenses and permits and the particulars and conditions to be contained therein;

(*b*) the registry and acceptance of transfers and relinquishments of licenses;

(*c*) the manufacture, storage, sale and removal of salt or saltpetre in and from salt factories;

(*d*) the time for the payment of duty and other charges and the assessment of such charges;

(*e*) the manufacture and refinement of saltpetre;

(*f*) the grant of batta to witnesses and of compensation for loss of time to persons released by an Inspector on the ground that they have been improperly arrested, and to persons charged before a Magistrate with offences under this Act and acquitted;

(*g*) the routes by which salt shall be taken to a preventive station;

(*h*) the disposal of things seized or confiscated; and
(*i*) generally the carrying out of the provisions herein contained.

Appeal against orders.

86. An appeal shall lie from all proceedings and orders of officers appointed under this Act to their respective immediate superiors.

Limitation of suit or prosecution for anything done or ordered to be done under the Act.

87. No action shall lie against the Secretary of State for India in Council or against any officer in respect of any order passed or act *bonâ fide* done or ordered to be done under this Act.

No suit or prosecution shall be instituted for anything done or ordered to be done under this Act after the expiration of six months from the accrual of the cause of action or from the date of the act or order complained of.

SCHEDULE.

(*See section* 2.)

Number and Year.	Subject.	Extent of Repeal.
Regulation I of 1805 ..	Revenue derivable from salt.	The whole so far as it has not already been repealed.
Regulation II of 1807 ..	Salt monopoly in Canara and Malabar.	The whole so far as it is now in force in any local area.
Act XVII of 1840 ..	Penalties for breaches of Salt Laws.	Do. do.
Act VII of 1852 ..	Do. do. ..	Do. do.
Madras Act VI of 1871.	Excise duty on Salt.	The whole so far as it has not already been repealed.
Madras Act II of 1878 ..	Earth-Salt ..	The whole so far as it is now in force in any local area.
Madras Act VI of 1878.	Salt Commissioner.	The whole.
Madras Act I of 1882 ..	Protection of the Salt Revenue.	Do.
Madras Act IV of 1882.	Amending the Madras Act I of 1882.	Do.

MADRAS: PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRESS.

No. 149 I.

Note by the Chief Engineer for Irrigation.

From the papers it appears that the Ramannapalem canal (A.B. on the sketch-map) forms a part of the Gódávari anicut system and was originally excavated by the Public Works Department for irrigation and drainage.

2. When the Mogalturru salt factory was established and facilities were required for the transport of salt from the factory to the interior of the Gódávari district, the canal was made navigable and the Board of Revenue now ask for orders regarding the apportionment of the maintenance charges between the Salt and Public Works Departments.

3. In the opinion of the Chief Engineer for Irrigation the Ramannapalem canal should be considered as a part of the East Coast canal system and should be maintained by the Public Works Department, the Salt Department being required to maintain only the length of branch canal which is within the factory limits. To apportion the charges between the Salt and Public Works Departments is not necessary, as it is presumed that the salt boats ply under ordinary licenses and are in no way treated exceptionally.

OOTACAMUND, 29th August 1895. (Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E., Chief Engineer for Irrigation.

ORDER—dated 12th September 1895, No. 743 I., Public Works.

The proposal of the Chief Engineer for Irrigation is sanctioned.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E., Joint Secy. to Govt., P.W.D., Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, I Circle, with one sketch-map.
" Examiner, Public Works Accounts.
" Revenue Department.

Exd. Shaik Karim.

Spare Copies

IRRIGATION.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated September, 12th.

Recd. *Encl.*

G.O., 12th Sept. 1895, No. 743 I.

SEPTEMBER.

Ramannapalem Channel, Godavari District

The proposal of the Chief Engineer for Irrigation that the — should be maintained by the Public Works Department, the Salt Department being required to maintain only the length of branch channel which is within the Mogalturru factory limits, sanctioned.

17TH MAY 1895, No. 423 I., PUBLIC WORKS.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper:—

Endorsement of the Government of India, Public Works Department (Account—Irrigation), dated Simla, the 1st May 1895, No. 45 A.I.

The following is forwarded to the Secretary to the Government of Madras, Public Works Department, for information and guidance.

(By Order.)

(Signed) R. G. MACDONALD,
Dy. Secy. to the Govt. of India.

From the Government of India, Public Works Department, to the Accountant-General, Public Works Department, dated 1st May 1895, No. 44 A.I.

I am directed to acknowledge receipt of your letter No. 4 I., dated 4th February 1895, reporting that it is the practice on the Ganges canal to levy tolls on canal boats employed on canal works, "Revenue" being credited with the tolls levied and the works debited.

2. In reply, I am to state that the Government of India agree in the view taken by you that this procedure is open to objection as it amounts to an exaggeration of revenue and expenditure in the public accounts and are therefore pleased to rule that the present practice, which is contrary to the general principles of public accounting, should be discontinued.

3. There is, however, no objection to the actual outlay incurred in the working of the boat service being distributed over the works for which the boats are employed should this seem in any case preferable to a direct classification under Navigation, Establishment or Plant.

ORDER—dated 17th May 1895, No. 423 I., Public Works.

Communicated to the Chief Engineer for Irrigation for information and guidance.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Examiner, Public Works Accounts.
" Superintending Engineer, I Circle.
" " " II "
" " " III "
" " " V "
" Revenue Department.

Exd. C. A. Munisawmy.
Spare Copies

CHIEF ENGINEER
25 MAY 1895
FOR IRRIGATION.

415W

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated May, 17*th*.

Read. *Encl.*

G.O., 17th May 1895, No. 423 I.

MAY.

Tolls

Endorsement from the Government of India forwarding copy of their letter to the Accountant-General, Public Works Department, ruling that the practice on the Ganges canal to levy — on canal boats employed on canal works, "Revenue" being credited with the tolls levied and the works debited, should be discontinued, communicated to the Chief Engineer for Irrigation.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following papers:—

G.O., dated 24th September 1894, No. 3733, Revenue.

G.O., dated 10th November 1894, No. 4343, Revenue.

Read—the following Proceedings of the Board of Revenue (Separate Revenue), dated 8th June 1894, Mis. No. 2516:—

Read—the following letter from the Deputy Commissioner of Salt and Abkári Revenue, Central Division, dated 8th April 1894, No. 1543:—

With reference to paragraphs 10 and 11 of my No. C-257, dated 2nd December 1889, regarding canal communication with Pandraka, I have the honour to state that this communication has since been so much improved that, except when the canals are closed for annual clearance, salt boats can now come to within about two miles of platform No. II.

2. The cartage over this length costs traders 9 pies per maund, the whole of which would be saved if a branch canal were constructed from the Bantumalli canal to platform II.

3. At my request the Superintending Engineer has had a rough estimate prepared for this length which amounts, he tells me, to Rs. 7,700 with Rs. 400 for annual clearing. Such a canal would of course be an immense boon to the traders with Hyderabad *viâ* Bezwada, and as I believe that Mr. McMaster's scheme, as now being modified by me, for improving the salt manufacture at Pandraka is sure of success, I hope the Board may see its way to obtaining the sanction of Government to the construction of the proposed branch canal, in which case I will ask the Superintending Engineer for a detailed plan and estimate.

Resolution—

Submitted to Government with reference to the correspondence ending with G.O., dated 9th February 1891, Mis. No. 935, Revenue, and with the request that instructions may be issued to the Department of Public Works for the preparation of the necessary plan and estimate for the proposed canal.

2. In its Proceedings, dated 11th May 1890, Mis. No. 1398, the Board made reference to the causes that contributed to the decrease in the transport of salt from Pandraka to the Nizam's dominions and suggested remedial measures. Among other things, steps have been taken since then for the improvement of the quality of the salt by deep irrigation and facilities have also been afforded by the Department of Public Works for the transport of salt from the factory by deepening and improving the Bantumalli canal. According to the Superintending Engineer's report the canal runs within two miles of the factory. The Deputy Commissioner now reports that considerable difficulty is still felt by the traders in transporting their salt, as, before reaching Bantumalli canal, the salt has to be conveyed a distance of about two miles

from platform No. II along a cart track (*vide* plan enclosed). He suggests that a branch canal be constructed connecting the main canal with the platform. As the sales of the Pandraka factory are likely to improve if facility is afforded for the transport of salt, the Board recommends the proposal for the sanction of Government. The traders will then be able to convey the salt by canal directly from the platform and at less expense than they now incur. It is reported that at present they have to pay cartage of 9 pies per maund for the distance between the platform and the canal.

3. The estimated cost of the canal, as reported by the Superintending Engineer, II Circle, is Rs. 7,700 and the annual upkeep about Rs. 400. The latter, together with interest at 5 per cent. on the initial outlay, will amount to Rs. 785. This sum may be recovered by means of a toll or license fee on boats plying on the proposed canal, regarding which the Deputy Commissioner will be called upon to submit detailed proposals if the scheme is approved.

4. The canal may be treated as a branch of the Bantumalli canal and the cost met from Provincial funds as in the case of the Manginapudi canal (*vide* G.O., dated 14th September 1893, No. 3381), or, if Government so directs, the work will be included in the schedule of salt works to be executed by the Department of Public Works for 1895–96.

Read—office-note from the Secretary to Government, Revenue Department, dated 7th August 1894, No. 43.

Read—the following letter from Colonel R. R. E. DRAKE-BROCKMAN, R.E., Chief Engineer for Irrigation, to the Secretary to Government, Revenue Department, dated 24th October 1894, No. 45 W. :—

With reference to your office-note No. 43, dated 7th August 1894, I have the honour to forward herewith letter No. 1600 K.S., dated 15th October 1894, from the Superintending Engineer, II Circle, explaining the action taken and proposed to be taken by this department with regard to the Pandraka salt factory.

2. As the proposed canal will cost a comparatively small sum, I see no objection to its being carried out under minor works and navigation and included in the general system of canals. The East Coast canal system licenses would then cover this canal and this department would have to look to increase of traffic to pay interest on cost of construction and maintenance. This would apparently only amount to Rs. 785 *plus* establishment and tools and plant and is too small a sum to justify special tolls.

ENCLOSURE.

From Major W. L. C. BADDELEY, R.E., Superintending Engineer, II Circle, to the Chief Engineer for Irrigation, dated Bezwada, 15th October 1894, No. 1600 K.S.

In reference to your memo. No. II/130 K.S. of 4th September 1894, I have the honour to inform you that the Bantumalli canal is now navigable up to the Upputeru, with which it is connected by Lakshimipuram lock, for nine miles in the year.

2. The Pandraka salt factory is situated one mile distant in a direct line from the canal and there is no road to it, only a mud bank across a swamp and a short length of donka through a village.

The actual line of communication must be over two miles in length.

3. There would be no difficulty in making a canal to the factory, but as it is not required in the interests of irrigation, the cost should not be debited to the Kistna system. The factory consists of three sets of buildings some distance apart, and it would be necessary to select one set as the central depôt to which the canal should be brought.

4. In this office letter No. 564 K.S. of the 29th May 1890, the conversion of the Kaldindikodu into a drain and surplussing into the west side channel of the Bundar canal are referred to as measures calculated to relieve the Lazabanda from the drainage, which during the months of December and January causes injury to the salt swamps by weakening the brine.

The first of these arrangements is connected with the Peddalanka project which has lately been sanctioned; the other depends on the proposals for remodelling the irrigation from the Bundar canal below Kankipaud, which are now being put into shape.

5. The inconvenience caused by the admission of drainage into the Lazabanda is, I understand, no longer felt, as it is now customary for the Coutaram Sub-division officer to arrange that there shall be no great discharge of drainage into the Lazabanda during December and January. I will see that the matter is gone into during the coming rainy season, and if further remedial measures are required, a report will be sent to you on the subject.

Order—dated 10th November 1894, No. 4343, Revenue.

The Government concurs in the view expressed by the Chief Engineer for Irrigation in his letter last read above.

2. The necessary orders will issue in the Public Works Department.

(True Extract.)

(Signed) E. GIBSON,
Secretary to Government.

ORDER—dated 26th November 1894, No. 927 I., Public Works.

Communicated to the Superintending Engineer, II Circle, who will see that the continuation of a canal to the Pandraka salt factory is carried out as soon as possible, the outlay being charged to Provincial Minor Irrigation Works for which neither Capital nor Revenue Accounts are kept, Public Works Department. The Superintending Engineer will apply for the necessary allotment of funds.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, II Circle.
" Examiner, Public Works Accounts.
" Revenue Department, with one plan.

Exd. C. A. Munisawmy.

Spare Copies

886/V

IRRIGATION.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 26th.

Read. *Encl.*

G.O., 26th Nov. 1894, No. 927 I.

NOVEMBER.

Canal

Proceedings, Revenue Department, on the subject of constructing a branch — to the Pandraka salt factory in the Kistna district, communicated to the Superintending Engineer, II Circle, with remarks.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From J. W. MARTIN, Esq., Superintending Engineer, II Circle, to the Chief Engineer for Irrigation, dated Bezwada, 14th February 1894, No. 2712 K.S.

Adverting to your memorandum No. A., dated 1st February 1894, in regard to the conversion of the second reach of the Bantumilli canal into an irrigation canal, and so extending the irrigation under the Kistna anicut, I have the honour to forward, for approval and sanction of Government, the accompanying plans and estimate amounting to Rs. 24,800.

2. The second reach of the Bantumilli canal was originally intended for navigation only, and at present is almost a still-water reach, as only a small area of land is supplied direct from it, but the estimates now forwarded provide for bringing between 15,000 and 16,000 acres of additional land under wet cultivation. Converting the canal into an irrigation canal will not, I think, lead to much additional silt being deposited, for experience seems to prove that the so-called still-water canals in the Kistna district silt up more than those in which a continuous flow of water is maintained.

3. The estimate, as prepared by the Executive Engineer, provides Rs. 5,000 for making a navigation canal from the Bantumilli canal to the salt factory at Pandraka. I have, however, struck out the provision for this canal, as some time ago, at the request of the Deputy Commissioner of Salt Revenue, I reported to him that probably it would cost Rs. 7,700 to make the canal, but I have received no further communication from him on the subject, and therefore, I think, it may be postponed for the present.

4. In case the estimate now submitted is sanctioned, the amount must be debited to the balance available for unforeseen works of the Kistna delta system, as at the time the completion estimate sanctioned in G.O., No. 857 I., dated 11th November 1893, was prepared, the proposal to extend the irrigation under the Bantumilli canal had not been made.

ENCLOSURES.

REPORT to accompany estimates for the conversion of the Second Reach of the Bantumilli Canal into an Irrigation canal.

The Bantumilli canal starts from Cowtaram as a combined irrigation and navigation canal. At Kamalápuram, 5½ miles from the head, there is a lock, and above this lock it was intended that all the water for irrigation should be drawn off, and with this object in view the Bantumilli main distributary and two side channels, called respectively the Kamalápuram north and south side channels, have been designed and sanctioned, and only the north side channel remains to be completed. Before the construction of the lock, the canal extended as far as Pandraka, and at the extreme end there has been for many years a certain amount of irrigation which must still be supplied with water, and which can only be supplied from the main canal. When it was decided to make the second reach of the canal a still-water reach, the compulsory relinquishment of this irrigation was probably contemplated, but now that the area of irrigation is to be no longer confined to that proposed in the delta completion estimates, the circumstances have entirely changed, and it is not desirable to make ryots relinquish land and give them adequate compensation in order to maintain still-water in the Bantumilli canal, second reach. From Kamalápuram lock to Lakshmipuram lock on the margin of the Upputeru is 21 miles, and under the sanctioned arrangements this reach should be maintained with still-water at + 5·00, the bed of the canal being—0·50.

From a detailed examination of the country on both sides of the canal, I find that there is an area of 16,000 acres, which it will be possible to irrigate, and it is accordingly proposed to allow irrigation from the canal and to make such modifications in the sanctioned arrangements as may be necessary to supply water to this area of land.

The surplus weir at Kamalápuram lock is one vent 8 feet wide, and with the water at F. S. L. in the upper reach is capable of discharging 237 cubic feet per second, whilst the quantity of water required for 16,000 acres is 178 cubic feet per second, so that no alterations to this work will be necessary.

After the completion of the Kamalápuram north side channel, there will be no irrigation from the first 7 miles of the second reach of the canal, as all the direct irrigation will be brought under the two side channels, but beyond to supply the new irrigation it is proposed to take up, it will be necessary to construct a number of comparatively small channels, and to allow a large amount of irrigation direct from the canal through pipe sluices. This is rendered necessary by the fact that the country on both sides of the canal is a series of low wide sand ridges separated from one another by stretches of low swampy ground. The broken nature of the ground renders it impossible to supply any very large area from a single channel, and even if it were possible, it is not desirable to do so, as the level of water which can be maintained in the canal does not permit of long channels with a considerable surface fall being taken off. The section of the canal itself is very considerable, and the supply for the whole area which it is proposed to bring under it will be carried by a very small surface fall, so that it is better to take off a number of comparatively short channels, nearly at right angles to the canal than a few much longer, which will run more or less parallel to the canal. From the sketch-map submitted it will be seen that the greater portion of the irrigation will be on the left of the canal, and between it and the Pedalanka drain. Several of the proposed channels will have to cross arms of the great swamp which lies to the right of the Pedalanka, but care has been taken in every instance to so arrange them that the lines of drainage are in no way interfered with. These swamps are very shallow depressions usually not more than 2 or 3 feet deep, and as the soil is fertile and there is usually little or no water in them till the end of August, it is certain that a very large area round the margins will be gradually brought under cultivation. In Mulaparru, which has been supplied with a limited quantity of water for a long time past, a considerable area of swampy land has been gradually reclaimed.

As far as the 11th mile from Kamalápuram the banks of the canal are very high and there will not be the slightest difficulty in raising the water level in the canal. From experiments which have been recently made, I find that when the required quantity of water is passed into the canal, the water level rises 2 feet above the still-water level in Kamalápuram lock, and by keeping 4½ feet instead of 5½ feet on the upper sill of Lakshmipuram lock, there is a total surface fall of 3 feet in the entire length of the reach, which though less than two inches per mile is sufficient to enable the required quantity of water to be passed down. These changes will in no way interfere with navigation, as 4½ feet is enough water for any boats plying on the Kistna canals, and the rise of 2 feet in the rear of Kamalápuram lock still leave ample headway for the passage of boats under the lock tail bridge.

A detailed description of the proposed channels seems unnecessary, as they are all of the very simplest type. The side slopes are 1½ to 1 and the banks are 2 feet above F.S.L. with a top width of 3 feet. When the channels cross swamps, it is necessary to allow a greater section of bank, as the soil is inferior and exposed to the wash of the swamp water, accordingly the outer slopes will be 3 to 1 and inner slopes 2 to 1.

The masonry works are all of the ordinary type, and I have therefore arranged all the information regarding the masonry and earthwork in tabular form :—

Detail of earthwork of proposed channels, Bantumilli Canal, Second Reach.

Canal mileage.		Length of channels.		Name of channel.	Ayacut in acres.	Discharge required cubic feet per second.	Bed widths.	Side slopes.	Depth of water.	Surface fall per mile.	Velocity.	Calculated discharge.	Estimate amount.
MLS.	F.	MLS.	F.										Rs.
..		1	4	Mulaparru channel at head ..	·0132 750 | 11		5	1½ to 1	2·0	·75	·72	11·5	860
..		5	0	Chorampudi channel at head ..	·0111 2,550 | 28·3		7	,,	2·75	·75	·95	29	3,246
				At head of Ramanapudi branch.	·0111 1,850 | 20·5		6	,,	2·62	·75	·9	23·4	..
..		2	5	Ramanapudi branch of above ..	·0111 700 | 7·8		3	,,	2·0	·75	·66	7·9	1,141
49	1	1	0	Korlapad channel	·016 400 | 6·7		3	,,	2·0	·5	·54	6·5	530
50	1	1	6	Bantumilli channel	·085 800 | 12		3	,,	2·5	·75	·77	18	890
52	0	1	3	Penudurru channel	·015 1,000 | 15		7	,,	2·5	·5	·57	15·3	999
53	0	2	7	Munipedu channel	·0132 1,700 | 22·5		8	,,	2·5	·5	·75	22·0	1,621
56	6	0	6	Sangamudi channel at head ..	·0112 2,500 | 28		10	,,	2·5	·5	·8	27·5	1,413
				At head of Neelipudi and Komallapudi branches.	·011 2,000 | 22		10	,,	2·3	·5	·72	22·3	..
..		2	2	Neelipudi branch at head ..	·011 800 | 8·9		3	,,	2·3	·5	·59	8·8	570
..		2	3	Komallapudi branch at head ..	·011 1,200 | 13·3		6	,,	2·3	·5	·67	13·3	950
60	6	2	1	Mattam channel at head ..	·013 1,300 | 17		6	,,	2·5	·5	·71	17·4	2,223
62	1	1	7	Lakshmipuram channel at head.	·0146 750 | 11		6	,,	2·0	·5	·614	11·05	900
				Total ..	..	..	..	..	..	..	..	..	15,334

List of masonry work at heads of proposed channels, Bantumilli Canal, Second Reach.

Canal mileage. Miles.	Bank.	Name of channel.	Ayacut in acres.	Discharge required.	Calculated discharge.	Vent— Width. Height.	F. S. L. in front.	F. S. L. in rear.	Floor level of sluice.	Estimate amount.
										Rs.
..	Left.	Mulaparru channel	750	11	15·	3×2	+6·20	+5·95	+3·95	} 1,600
..	Right.	Chorampudi do.	2,250	29	34·38	5×2·75	+6·20	+5·95	+3·20	
..	Left.	Korlapad do.	400	7	10·	2×2	+6·30	+6·05	+4·05	427
49–1	,,	Bantumilli do.	800	12	12·5	2×2·5	+6·20	+5·95	+3·45	429
50–1	,,	Penudurru do.	1,000	15	18·75	3×2·5	+6·00	+5·75	+3·25	456
52–0	,,	Munipedu do.	1,700	23	25·	4×2·5	+5·90	+5·65	+3·15	482
53–0	,,	Sangamudi do.	2,500	28	31·25	5×2·5	+5·50	+5·25	+2·75	516
56–6	,,	Matlam do.	1,300	17	18·75	3×2·5	+5·10	+4·85	+2·35	476
60–6	,,	Lakshmipuram channel ..	750	11	15·	3×2	+5·00	+4·75	+2·75	484
62–1	Right.	Total ..	..	..	..	..	..	..	..	4,870
..	..									

List of pipe sluices for proposed direct irrigation from Bantumilli Canal, Second Reach.

Position. Canal mileage.		Bank.	Description.	Ultimate irrigation.	Discharge required.	Actual discharge with head of 1 foot.	Diameter of pipe.	Estimate amount.
MLS.	F.						FT. IN.	Rs.
49	4	Right.	Korlapad pipe-sluice	54	1·8	2·46	0 9	83
50	2	,,	Mudumeswaram do.	250	7·0	6·89	1 3	118
50	5	,,	Pandraka do.	250	7·0	6·89	1 3	118
52	0	,,	Cherukumilli do.	200	6·6	6·89	1 3	118
53	6	,,	Do. do.	210	7·0	6·89	1 3	118
53	6	Left.	Do. do.	60	2·0	2·46	0 9	83
54	2	,,	Endapalli do.	45	1·5	2·46	0 9	83
54	5	,,	Do. do.	80	2·7	2·46	0 9	83
54	7	,,	Do. do.	110	3·7	4·40	1 0	100
55	6	,,	Sangamudi do.	230	7·0	6·89	1 3	118
57	4	,,	Seetanapalu do.	160	5·3	4·40	1 0	100
58	1	Right.	Do. do.	170	5·7	4·40	1 0	100
58	1	Left.	Do. do.	230	7·0	6·89	1 3	118
58	5	Right.	Do. do.	190	6·3	6·89	1 3	118
58	6	Left.	Do. do.	150	5·0	4·40	1 0	100
60	6	Right.	Ganasapudi do.	110	3·7	2·46	0 9	83
62	2	Left.	Lakshmipuram do.	250	7·0	6·89	1 3	118
			Total ..	..	..	..	..	1,759

Before the extension of the Bantumilli canal to the Upputeru it terminated at Pandraka, and to control the water level in it a tail escape or surplus weir was built at the end of a short branch, which ended on the Bantumilli road. This work is still in good order and consists of 4 vents of 8 feet width closed by planks. It is much too large and it is therefore proposed to partly build up the two side vents and fit them with screw-gearing shutters to serve as head-sluices to the Mulaparru and Chorampudi channels. In the rear, side walls will be built to conduct the water into the channels. The two centre vents it is proposed to retain for surplusing purposes and to fit them with shutters raised by screw-gearing. This surplus work is very useful either for emptying the canal or for getting rid of surplus water during periods of heavy rain when it is impossible to prevent large quantities of water coming into the Pulleru which are not in the least required.

The Salt Department have requested that plans and estimates might be prepared for a branch navigation canal to their factory at Pandraka. The salt traffic is very considerable, and adds materially to the revenue derived from boat licenses, so that it seems to me desirable that this department should construct such works as are necessary to fully develop the traffic, and look to the extra receipts from navigation for a return on the capital outlay. Moreover, as this canal can only be made by modifying the existing arrangements for irrigation, I have considered it advisable to include it among the estimates now submitted. The salt factory lies some distance away from the canal, being separated from it by a wide strip of irrigated land, with the supply to which it would interfere if taken in the most direct line. After carefully examining the ground I find that the best line for the canal will be along the course of Pandraka channel for some distance, and then away to the right, and across the swamp to the factory. The Pandraka channel requires but little doing to it to make it navigable, as it has high banks on each side. The water level will be considerably raised and the open cuts for irrigation must be fitted with pipe sluices to control the supply, and at the point where the navigable canal turns off on the new line, a head-sluice must be built

A rough estimate was sent to Deputy Commissioner, Salt and Abkári Revenue, but he has not sent a reply.

to the head of the remaining portion of the irrigation channel. To have any irrigation on this branch is objectionable as the canal will rapidly silt up, and it is unavoidable unless two side channels were made, which would be much more expensive. I therefore think the canal should not be wider than absolutely necessary, and I have accordingly designed it to have a bottom width of 10 feet as far as there is any flowing water in it, and beyond that point with a bottom width of 15 feet in which boats can easily pass one another. As the irrigation portion of the canal is comparatively short, it will be easy to arrange the traffic to and from the factory so that boats going in opposite directions do not meet one another in the narrow portion of the canal, where there will not be room to pass. The platform of the salt factory is on the edge of the swamp, which the canal crosses, and as large a basin as may be necessary for the boats to lie in while loading up can be obtained by simply separating the two banks of the canal by the requisite distance. As the canal water always contains silt, and as from the constant fluctuations in level of the canal there will often be a current into or out of the salt canal, silt will slowly accumulate in the basin, and it is therefore desirable to keep it as small as is consistent with convenience in working the traffic.

* * * * *

(Signed) A. CHATTERTON,
Executive Engineer, Gudivada Division.

11th February 1894.

(Signed) J. W. MARTIN,
Superintending Engineer, II Circle.

Estimate Form—Abstract—Classified.

Sub-head.	Names of works.	Amount of estimate for individual work.	Total of sub-heads.	Total for each canal or distributary.	Total of each main head.
1	2	3	4	5	6
	Capital Expenditure not charged to Revenue.	Rs.	Rs.	Rs.	Rs.
	49. *Irrigation.*				
	Kistna Delta System.				
	Eastern Section—Gudivada Division.				
	I. Works.				
	Bantumilli Canal.				
	(3) Distributaries.				
	Mulaparru Channel.				
2 Land	1. Compensation for land	121	121		
4. Earthwork	2. Excavating channel	860	860		
5. Miscellaneous.	3. Demarcation stones	28	28		
				1,009	
	Chorampudy Channel.				
2. Land	4. Compensation for land	340	340		
3. Works	5. Surplus weir	1,900	1,900		
4. Earthwork	6. Excavating channel	3,246	3,246		
5. Miscellaneous.	7. Demarcation stones	85	85		
				5,571	
	Ramanamudi Channel.				
2. Land	8. Compensation for land	44	44		
4. Earthwork	9. Excavating channel	1,141	1,141		
5. Miscellaneous.	10. Demarcation stones	46	46		
				1,231	
	Korlapad Channel.				
2. Land	11. Compensation for land	83	83		
3. Works	12. Sluice	427	427		
4. Earthwork	13. Excavating channel	530	530		
5. Miscellaneous.	14. Demarcation stones	20	20		
				1,060	
	Bantumilli Channel.				
2. Land	15. Compensation for land	49	49		
3. Works	16. Sluice	429	429		
4. Earthwork	17. Excavating channel	890	890		
5. Miscellaneous.	18. Demarcation stones	32	32		
				1,400	
	Penudurru Channel.				
2. Land	19. Compensation for land	98	98		
3. Works	20. Sluice	456	456		
4. Earthwork	21. Excavating channel	990	990		
5. Miscellaneous.	22. Demarcation stones	26	26		
				1,570	
	Munipedu Channel.				
2. Land	23. Compensation for land	198	198		
3. Works	24. Sluice	482	482		
4. Earthwork	25. Excavating channel	1,621	1,620		
5. Miscellaneous.	26. Demarcation stones	50	50		
				2,350	

Estimate Form—Abstract—Classified—*cont.*

Sub-head.	Names of works.	Amount of estimate for individual work.	Total of sub-heads.	Total for each canal or distributary.	Total of each main head.
1	2	3	4	5	6
		Rs.	Rs.	Rs.	Rs.
	Sangamudy Channel.				
	27. Compensation for land	218	218		
2. Land	28. Sluice	516	516		
3. Works	29. Excavating channel	1,413	1,413		
4. Earthwork	30. Demarcation stones	16	16		
5. Miscellaneous.				2,163	
	Nulipudy Branch.				
	31. Compensation for land	344	344		
2. Land	32. Excavating channel	570	570		
4. Earthwork	33. Demarcation stones	28	28		
5. Miscellaneous.				942	
	Komallapudy Branch.				
	34. Compensation for land	409	409		
2 Land	35. Excavating channel	950	950		
4. Earthwork	36. Demarcation stones	42	42		
5. Miscellaneous.				1,401	
	Mutlum Channel.				
	37. Compensation for land	316	316		
2. Land	38. Sluice	476	476		
3. Works	39. Excavating channel	2,223	2,223		
4. Earthwork	40. Demarcation stones	38	38		
5. Miscellaneous.				3,053	
	Lakshmipuram Channel.				
	41. Compensation for land	172	172		
2. Land	42. Sluice	484	484		
3. Works	43. Excavating channel	900	900		
4. Earthwork	44. Demarcation stones	34	34		
5. Miscellaneous.				1,590	
	Pipe sluices for the following distributaries.				
	45. Korlapad at 49 miles 4 furlongs Right bank	88			
3. Works	46. Madumeswaram at 50 miles 2 furlongs Right bank	124			
Do.	47. Pandraka at 50 ,, 5 ,, ,,	124			
Do.	48. Chunkumilly at 52 ,, 5 ,, ,,	124			
Do.	49. Do. at 53 ,, 6 ,, Left bank.	88			
Do.	50. Do. at 53 ,, 6 ,, ,,	88			
Do.	51. Endupally at 54 ,, 2 ,, ,,	88			
Do.	52. Do. at 54 ,, 5 ,, ,,	107			
Do.	53. Do. at 54 ,, 7 ,, ,,	124			
Do.	54. Sangamudy at 55 ,, 6 ,, ,,	107			
Do.	55. Seetampally at 57 ,, 4 ,, Right bank.	107			
Do.	56. Do. at 58 ,, 1 ,, Left bank.	124			
Do.	57. Do. at 58 ,, 1 ,, Right bank.	124			
Do.	58. Do. at 58 ,, 5 ,, Left bank.	107			
Do.	59. Do. at 58 ,, 6 ,, Right bank.	88			
Do.	60. Gunsapudy at 60 ,, 6 ,, Left bank.	124			
Do.	61. Lakshmipuram at 62 ,, 2 ,,		1,860		
Do.				1,860	
					25,200

Bezwada,
11th February 1894.

(Signed) J. W. MARTIN,
Superintending Engineer, II Circle.

No. 57 I.

Submitted to Government. The amount of the estimate has been increased in this office from Rs. 24,800 to Rs. 25,200, the excess of Rs. 400 being chiefly due to its being considered desirable to increase the section of the proposed side walls of channels in rear of the surplus weir and to the provision of a rear wing for each pipe sluice to protect the end of the pipe which will otherwise be likely to be broken and displaced. When the undersigned inspected the works of the Kistna delta system in February last, the plans and estimate prepared by Mr. Chatterton were scrutinized, and the Superintending Engineer was authorized to proceed with the works necessary for the extension of irrigation under the Bantumilli canal in anticipation of sanction. The estimate, as modified, is recommended for sanction.

(Signed) R. R. E. DRAKE-BROCKMAN, Lt.-Col., R.E.,
Chief Engineer for Irrigation.

12th April 1894.

Order—dated 23rd April 1894, No. 351 I., Public Works.

The estimate, amounting to Rs. 25,200, for converting the second reach of the Bantumilli canal into an irrigation canal, is sanctioned from the balance of the amount reserved for unforeseen works of the Kistna delta system, which will then be reduced to Rs. 2,95,659.

2. This sanction is registered as No. 16 I. of 1894–95.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Lt.-Col., R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, II Circle.
" Examiner, Public Works Accounts.
" Revenue Department.
Editors' Table.

Exd. J. Moses.
Spare Copies

IRRIGATION.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated April, 23rd.

Read. *Encl.*

G.O., 23rd Apr. 1894, No. 351 I.

APRIL.

Bantumilli Canal, Kistna District

The estimate of Rs. 25,200 for converting the second reach of the — into an irrigation canal, sanctioned.

APPENDIX.

NOTIFICATION.

Under section 16 (iv) of the Canals and Ferries Act, No. II of 1890, His Excellency the Governor in Council is pleased to notify the following rules for the regulation of traffic at wharves on the Buckingham canal.

General Rules for the Regulation of Traffic at Wharves on the Buckingham Canal.

The following rules, for the regulation of traffic at all wharves on the Buckingham canal, except the Madras wharf, for which a separate set of rules has been framed, are notified for general information, but especially for the guidance of merchants, boat-owners, and boat-men engaged in the traffic of the canal. Any infringement thereof will subject boat-owners to suspension of their boat licenses for a period not exceeding three months :—

I. Wharfage fees at the rate of anna one per ton, as prescribed in the Navigation Rules, will be charged on all boats loading or unloading cargo or passengers at wharves.

II. No boat may load or unload on any part of the canal within one mile on either side of a wharf.

III. All boats stopping at a wharf to load or unload must moor along the wharf wall.

IV. Boats not exceeding 50 feet in length between perpendiculars shall load and unload lying across the canal; but boats exceeding that length shall lie broadside on, and the loading and unloading shall be done through the sides.

V. Laden boats coming to the wharf and finding it fully occupied shall moor wherever directed by the wharf clerk until room at the wharf is available.

VI. The fee of one anna per registered ton shall cover a period of seven days, and any boat remaining at the wharf for more than seven days shall pay a further fee of one anna per registered ton for each succeeding period of seven days or portion thereof.

VII. When there is pressure for landing room, boats which have unloaded and not commenced to load will not be allowed to lie at the wharf, but must moor where directed by the wharf clerk. The time during which a boat may be so prevented from lying at the wharf shall not be reckoned in the period for which fees have to be paid.

VIII. Every boat moored in and about the wharf must show a clear bright light during nights, as required by the Navigation Rules.

IX. All boats leaving the wharf, whether laden or empty, must obtain a wharf clearance ticket from the wharf clerk, and such ticket must be delivered up at the adjacent wharf or toll station.

X. All boats arriving and halting at a wharf shall be registered. Boats arriving at night shall be registered next day. Boats receiving clearance tickets shall leave the wharf the same day.

XI. Empty gunny-bags, empty casks, and all other articles filling, or partially filling a boat form cargo. All persons other than the boatmen necessary to work the boat, owners, or gumastahs, constitute passengers. The usual wharfage fees prescribed will be levied on all cargo and passengers as thus defined.

XII. Nothing in these rules applies to vessels, the private property of individuals, making use of the canals, but not carrying goods or passengers or plying for hire.

XIII. The use of the attached form A of bill of lading is optional but recommended. These forms may be obtained on application to the several wharf Superintendents.

Special rules for the regulation of Traffic at the Madras Wharf.

The following rules for the regulation of traffic at the Madras wharf are notified for general information, but especially for the guidance of merchants, boat owners, and boatmen engaged in the traffic of the canal. Any infringement thereof will subject boat owners to suspension of their boat licenses for a period not exceeding three months:—

I. Wharfage fees at the rate of one anna per ton, as prescribed in the Navigation Rules, will be charged on all boats loading or unloading cargo or passengers at the wharf.

II. No boat may load or unload on any part of the canal within one mile on either side of the wharf, except by special consent of the Executive Engineer, and on payment of the prescribed wharfage fees.

III. All boats stopping at the wharf to load or unload must moor along the wharf wall.

IV. Boats not exceeding 50 feet in length between perpendiculars shall load and unload lying across the canal; but boats exceeding that length shall lie broadside on, and the loading and unloading shall be done through the sides.

V. The landing place for boats bringing firewood is the portion of wharf opposite the wood depôt, *i.e.*, near the basin bridge. Boats with heavy cargo, such as iron and stones, &c., shall load and unload at the granite steps, instead of on the laterite steps which are apt to be damaged thereby.

VI. Boats conveying ordinary light cargo or food-grains, and also passenger boats, shall load and unload along the remaining portion of the wharf wall, where there is room for their so doing. Private boats and budgerows shall be moored at the south end of the wharf wall, as it is near the main road where carriages can drive up.

VII. Laden boats coming to the wharf, and finding it fully occupied, shall moor wherever directed by the wharf clerk until room at the wharf is available. The date of arrival of the boat at the Madras wharf will be reckoned, in charging fees from the date in which it is placed in position to load or to unload freely.

VIII. The fee of one anna per registered ton shall cover a period of seven days, and any boat remaining at the wharf for more than seven days shall pay a further fee of one anna per registered ton for each succeeding period of seven days or portion thereof.

IX. Where cargo is not discharged from a boat within seven days from the date of arrival of the boat at the Madras wharf, as defined above in rule 7, an additional demurrage charge of eight annas per ton, under note C, section 6, of Madras Act No. II of 1890, will have to be paid by the consignees, before they are allowed to remove goods, for each succeeding period of seven days or portion thereof that the boat remains laden. Notice of the charge of demurrage will be sent by the wharf Superintendent, two days before the charge is actually levied, to the consignee or his authorised agent at Madras.

X. Consignees may test measure, or test weigh goods, in the places reserved for the purpose at the Madras wharf, on paying fees of one rupee per day, per boat, under note C, section 6, of Madras Act No. II of 1890, but will not be permitted to keep goods lying on the Madras wharf beyond the time necessary for taking such test weight or measurement.

XI. When there is pressure for loading room, boats which have unloaded and not commenced to load will not be allowed to lie at the wharf, but must moor where directed by the wharf clerk. The time during which a boat may be so prevented from lying at the wharf shall not be reckoned in the period for which fees have to be paid.

XII. Every boat moored in and about the wharf must show a clear, bright light during nights as required by the Navigation Rules.

XIII. The working hours of the day at the wharf for loading and unloading cargo and passengers are limited to twelve hours, *i.e.*, from 6 A.M. to 6 P.M., and all boats before leaving the wharf, including empty boats, shall obtain from the wharf Superintendent a wharf clearance ticket, which should be delivered at the Shadayankuppam lock on the north, or Adyar lock on the south

XIV. All boats that pass the Shadayankuppam and Adyar locks towards Madras shall be registered at the office at the lock, for purposes of traffic, and the boatmen and boatowners shall under no circumstances refuse to furnish the lock establishment with the requisite information.

XV. Nothing in these rules applies to vessels, the private property of individuals, making use of the canals, but not carrying goods or passengers or plying for hire.

XVI. The use of the attached form A of bill of lading is optional but recommended. These forms may be obtained on application to the several wharf Superintendents.

FORM A.

BUCKINGHAM CANAL.

BILL OF LADING.

Date _____

From _____ To _____

Name and address of the consignor in full. _____

Name and address of the consignee in full. _____

Description of boat _____ Boat No. _____ Registered tonnage _____

Name of boat-owner _____

GOODS.

Item number.	Number of packages.*	Description and contents of packages.*	Marks and numbers on packages.	Weight or measurement.		Market value.		Freight.			Remarks.
				Packages of each kind.	Total.	Packages of each kind.	Total.	Rate for each kind of cargo.	Per.	Amount.	
1	2	3	4	5	6	7	8	9	10	11	12

* Where a boat is loaded with packages of various kinds, the number and description of packages of each kind of goods should be entered.
For cargo boats carrying coal, shells, firewood, or other goods in bulk, columns 2, 4, 5, 7 will be left blank.

Consignor.

Boat-owner.

Received at _____ Rs. _____ as part payment of the freight.

Boat-owner.

Received the articles as detailed above and balance of the freight Rs. _____ duly paid by me.

Consignee.

Received at _____ Rs. _____ in settlement of all demands of the freight.

Boat-owner.

NOTE.

1. Attention is drawn to the new Madras wharf rules laying down that a demurrage charge of annas eight per ton will have to be paid by the consignees on all goods not removed from a boat within 7 days of the arrival of the boat at the Madras wharf.

2. No forms, other than this bill of lading (in printed or manuscript form), shall be valid in the canal traffic. The original to be retained by the consignor or his agent and the duplicate to be furnished to the boat-owner or his agent.

3. Boat-owners and consignors may add other conditions of their own on this form as to the safe delivery of goods and the due payment of the freight, &c.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following paper:—

From A. S. RUSSELL, Esq., Executive Engineer, Buckingham Canal, to the Superintending Engineer, II Circle, dated Pálár River, 16th May 1893, No. 521.

I have the honour to bring to your notice that the rules for the regulation of traffic at the wharves of the Buckingham canal have hitherto been issued under the authority only of Executive Engineers, with the exception of the rules for the Maipad wharf, which were issued under the authority of Government. I forward, for reference, copies of these rules for the Madras wharf, Muthukur, Maipad and Kottapatam wharves.

2. With the exception of the Madras wharf, where the conditions are of a special character, the wharf rules at all wharves on the Buckingham canal can be codified into one set of rules. I forward accordingly, for sanction of Government, one general set of rules for wharves on the Buckingham canal and one special set of rules for the Madras wharf. I do not know why the Maipad wharf rules have hitherto been the only rules approved by Government. It is, I conclude, by mere inadvertence, but in order to enable penalties for infringement of rules to be inflicted it is necessary that the rules at all wharves be duly sanctioned by Government.

3. Owing to the steady development of traffic, the revenue realized from wharfage fees on the Buckingham canal is yearly increasing in a remarkable manner, particularly at the Madras wharf, where, at certain periods of the year, upwards of 500 boats are often discharging cargo at the same time over six furlongs in length. The increase in numbers of boats was so considerable last year at the Madras wharf that it will soon be necessary to extend the limits of the wharf. The total wharfage fees realized for the past five years are—

	Rs.
1888–89	18,876
1889–90	20,451
1890–91	24,061
1891–92	26,255
1892–93	28,389

which show a steady annual increase and more particularly during the last three years. The amount of wharfage fees for this year is estimated to exceed Rs. 30,000. Of the total sum of wharfage fees collected in 1892–93, viz., Rs. 28,389, no less than Rs. 19,960 were collected at the Madras wharf.

4. The Superintending Engineer, in correspondence with this office, has intimated at various times that wharfage fees are likely to be abolished. I believe that, if there was ever any intention to do this, the idea has since been abandoned, as I understand the Chief Engineer for Irrigation does not recommend it. It is therefore merely necessary to point out that to abolish such fees on the Buckingham canal would be to abandon a considerable source of revenue; that the wharfage fees are paid without demur and that the loss of revenue, if they were abolished, could not be made good without putting on some other impost which would give rise unnecessarily to popular discontent. Neither in principle nor in practice is such abolition advisable. It is a perfectly sound principle of levying fees that boats doing an exceptionally good business should pay fees in some proportion to their profits. This is met by wharfage fees and can only be so met.

5. I append, where necessary, explanations regarding the two sets of wharf rules referred to in paragraph 2 of this letter as submitted for approval of Government.

General Rules for all Wharves except Madras Wharf.

As will be seen by referring to the printed rules hitherto in use respectively at the Kottapatam, Maipad and Muthukur wharves, the three sets of rules are practically the same and can readily be codified as I have done without losing anything in point of clearness and gaining considerably in conciseness. It is, for instance, quite sufficient to lay down that boats must not load or unload within one mile of a wharf and must deliver their wharf clearance tickets at the adjacent wharf or toll station and it is not necessary to go to the expense of issuing separate rules for each wharf merely for the sake of emphasising distinctions without any real difference, such as that of paragraphs 6 and 7 of rules for Muthukur wharf and paragraphs 6 and 7 of rules for Kottapatam wharf.

Paragraph XI.—This addition to the rules is required as there are constant disputes on such matters.

Special Rules for Regulation of Traffic at the Madras Wharf.

Paragraph II.—For the convenience of the Madras Railway firewood is landed at the railway bridge one furlong north of the Madras wharf and coal is landed close to the railway line and one furlong south of the Madras wharf, the usual wharfage fees being charged in both cases. This is a great advantage both to Government and to the Railway as the latter would not take such materials unless they could land it where they wanted to and the congested state of traffic at the Madras wharf is thereby greatly relieved. It is advisable, therefore, that, in the interests of the public and of Government, discretion be given to the Executive Engineer, as proposed in the draft rules, to deal with such special cases from time to time.

Paragraph VII.—The addition at the end of this rule regarding the reckoning of date of arrival is necessary owing to the often crowded condition of the Madras wharf.

Paragraph IX.—The charging of demurrage at the Madras wharf is daily becoming more and more necessary. At present fully laden boats often lie up in the wharf for weeks together without cargo being discharged owing entirely to disputes between the boatmen and the consignees. It is the business of the latter to remove cargo within reasonable time, but this they at present neglect to do, as failure to do so involves no penalty whatever falling upon consignees. It is the boatmen or owner of the boat, whose natural object of course is to discharge cargo as soon as possible, who at present is alone made to pay for lying in the wharf for more than 7 days. Frequent disputes are the result. A prohibitive demurrage charge is necessary to prevent consignees keeping laden boats blocking up the Madras wharf for weeks together. At the same time, it is not advisable to forego the comparatively small charge of one anna per ton for every seven days now levied for boats now lying up in the wharf, as, if this were done, the boatmen would then have no object in clearing expeditiously out of the wharf and might on their part create delays. I have given the subject close attention and am convinced the great trouble and confusion often now so apparent can best be avoided by the adoption of prohibitive demurrage charges such as I recommend.

The traffic at the Madras wharf is now becoming so considerable that it is necessary, in the interests of the canal traffic and in the interests of all persons despatching, conveying, or receiving cargo, that some means be adopted to put a stop to the frequent and violent disputes now so common. Sometimes it is the boatmen who complain that they have been swindled by the consignor; in other cases the consignee declares that the boatmen have stolen goods while on transit. The adoption of a form of bill of lading would prevent such disputes and would supply the means (now wanting) of keeping a correct register of traffic on the canal. I enclose a form for approval. The form might be printed in Tamil and Telugu and circulated to boat-owners and to wharf superintendents for information of all concerned. I think, from

inquiries I have made, it would not be long before the form was in general use and more printed copies would then be applied for by the large carrying firms and might be supplied to them on payment. Manuscript forms would commonly be used by the small boat-owners.

Paragraph X.—When disputes rage high regarding the correct weight or measurements of goods, the parties concerned, after the usual prolonged wrangle, proceed to measure or weigh the goods and so block up the wharf in consequence. It is necessary to put a stop to such proceedings, but test weight or measurement at suitable places might in future be allowed as I have proposed.

No. 105 B.C.

Forwarded to the Chief Engineer for Irrigation with a recommendation that the rules, as revised by the Executive Engineer, Buckingham Canal, be approved and sanctioned by Government.

* * * * *

The Executive Engineer has also sent me revised navigation rules which he desires to introduce. The alterations proposed involve some important questions, with regard to which I am now in correspondence with the Executive Engineer.

(Signed) C. A. SMITH,
for Offg. Suptg. Engineer, II Circle.

29th May 1893.

Order—dated 17th July 1893, No. 632 I., Public Works.

Under section 16 (iv) of the Canals and Ferries Act (No. II of 1890), His Excellency the Governor in Council is pleased to approve and sanction the appended rules, general and special, dealing with the regulation of traffic at the wharves on the Buckingham canal. These rules will be duly published in the Fort St. George Gazette and in the District Gazettes of Nellore and Chingleput.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Lt.-Col., R.E.,
Ag. Secretary to Govt., P.W.D.

To the Chief Engineer for Irrigation.
" Superintending Engineer, II Circle.
" " " I "
" Revenue Department.
" Local and Municipal Department.
" Legislative Department.
" Superintendent, Government Press.
Editors' Table.

Exd. A. D. Xavier.
Spare Copies

IRRIGATION.

Govt. of {1893} Madras.

PUBLIC WORKS.

Dated July, 17*th*.

Read. *Encl.*

G.O., 17th July 1893, No. 632 I.

JULY.

Rules

The —, general and special, dealing with the regulation of traffic at the wharves on the Buckingham Canal approved and sanctioned and their publication in the Fort St. George and District Gazettes of Nellore and Chingleput, ordered.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

Read—the following paper :—

From A. S. RUSSELL, Esq., Executive Engineer, Buckingham Canal, to the Superintending Engineer, II Circle, dated 25th May 1893, No. 611.

There are at present no means of readily tracing the development of traffic and revenue on the Buckingham canal. The annual traffic returns compiled give a mass of figures which are hard to digest, and, though useful for reference, do not enable any proper comparison being made between the results of various years.

2. I have been asked at various times to supply figures showing the development of traffic on the canal and have been put to much trouble in order to comply with such requests. Companies that are being formed to carry cargo on the canal and private persons as well as officials have applied to me for such information.

3. I have therefore compiled a concise and careful note on the subject. This note represents the product of much labour and exhibits everything that is necessary to trace the development of traffic and revenue on the canal. I have purposely not crowded it too much with figures, but have given the results of my own laborious examination of figures.

4. I believe Government will be glad to have such information before them and I would ask that the note be printed and twenty copies supplied to this office. Similar notes might be prepared every four or five years.

Enclosure.

Note on the development of revenue and traffic on the Buckingham canal.

Revenue receipts.—The following statement shows the total revenue receipts for the last nine years :—

Year.	Total receipts. Rs.
1884–85	47,189
1885–86	54,593
1886–87	60,949
1887–88	69,140
1888–89	73,859
1889–90	78,869
1890–91	87,883
1891–92	98,326
1892–93	1,01,366

The revenue has therefore considerably more than doubled in the last nine years and the expansion in revenue has been steadily continued year by year. The large increase of Rs. 9,014 in revenue in 1890–91 and the still larger increase of Rs. 10,443 in the following year (1891–92) is remarkable. This ratio of increase in revenue was not maintained in 1892–93 when the increase in revenue only amounted

to Rs. 3,040. Such an increase, however, following on two years of rapid expansion of revenue, is very satisfactory and affords the best guarantee that, when the improvements necessary to make the canal thoroughly efficient have been carried out, a further remarkable expansion in revenue will result. At the present rate of progress in improvements to canal, viz., in construction of locks, the canal cannot be made thoroughly efficient throughout until the end of the year 1896 and a large expansion of revenue can then be looked for.

The individual sources from which the total canal receipts are derived are exhibited in the following statement :—

STATEMENT of individual items of receipt on the Buckingham canal from 1884–85 to 1892–93.

—	1884–85.	1885–86.	1886–87.	1887–88.	1888–89.	1889–90.	1890–91.	1891–92.	1892–93.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
License fees	32,172	32,962	38,013	40,441	43,084	48,223	51,135	57,302	59,938
Toll fees	4,878	4,977	6,118	6,465	7,332	6,423	9,346	11,030	10,176
Wharfage fees	6,957	13,547	12,764	18,562	18,876	20,451	24,061	26,254	28,389
Miscellaneous receipts	3,182	3,107	4,054	3,672	4,567	3,772	3,337	3,740	2,863
Total ..	47,189	54,593	60,949	69,140	73,859	78,869	87,883	98,326	1,01,366

The figures show that the great bulk of the revenue is derived from license and wharfage fees and that the revenue from these sources has steadily expanded year by year. The increase under the former head of course indicates that new boats are licensed every year and the increase under the latter head denotes expansion of traffic. The toll fees are subject to fluctuations, but form a fairly important item of revenue. Miscellaneous receipts are small in amount and fell off last year. There are special causes to account for this ; the falling off will only be temporary ; and it is probable that the sum realised from miscellaneous receipts can shortly be considerably increased.

The following figures show how the license fees for last year were made up :—

	1892–93.
	Rs.
License fees for top boats	40,995
Do. for cargo boats	18,440
Do. for miscellaneous	503
Total ...	59,938

from which it will be apparent that the revenue from license fees for top boats is over two-thirds of the total revenue derived from license fees.

2. *Numbers of boats licensed.*—The number and tonnage of boats licensed on the Buckingham canal since the year 1885–86 is as follows :—

Year.	Boats.	
	Number.	Tonnage.
1885–86	972	11,943
1886–87	1,144	13,693
1887–88	1,185	14,590
1888–89	1,214	15,515
1889–90	1,318	17,291
1890–91	1,343	18,310
1891–92	1,475	20,228
1892–93	1,539	20,991

From these figures it will be apparent that year by year there has been an increase in the number of licensed boats and that during the last two years the increase is approximately as much as during the four years preceding. This year the construction of new boats is being vigorously prosecuted and there is every sign of a continuous increase in the numbers of licensed boats plying on the canal.

3. *Wharfage fees.*—The amount realised from wharfage fees at the various wharves on the Buckingham canal are shown for the past five years in the following statement :—

STATEMENT showing wharfage fees collected at several wharves on the Buckingham canal from 1888–89 to 1892–93.

No.	Name of wharves.	WHARFAGE FEES COLLECTED DURING					Remarks.
		1888–89.	1889–90.	1890–91.	1891–92.	1892–93.	
		Rs.	Rs.	Rs.	Rs.	Rs.	
1	Papanchavady	..	..	..	1,410	1,300	This wharf only came into use from 1891–92.
2	Adyar lock	2,069	2,491	2,401	3,049	3,223	
3	Trevelyan basin	257	182	192	225	261	
4	Elephant gate	91	38	148	312	564	
5	Madras basin	13,409	14,306	17,682	17,042	19,960	
6	Muthukur	744	685	689	475	530	
7	Maipad	439	807	861	955	445	
8	Kottapatnam	1,867	1,942	2,088	2,083	1,789	
9	Pedda Ganjám	..	..	..	704	317	Only open for the three months the Kistna canals are closed.
	Total ..	18,876	20,451	24,061	26,255	28,389	

The steady expansion of traffic year by year can be to some extent gauged by the total wharfage receipts, which, as shown by the above statement, are increasing every year. Over two-thirds of the receipts are collected at the Madras wharf, but it should be noted that the receipts at this wharf include fees for boats from the north discharging cargo at the Trevelyan and Elephant gate wharves. The wharfage receipts at the Adyar lock come second in order of importance and include collection of wharfage fees for boats from the south discharging cargo at the Trevelyan and Elephant gate wharves. The receipts at the Kottapatnam and Papanchavady wharves come next in order of importance, there being at times a heavy import and export trade between the former wharf and the considerable town of Ongole, while the passengers' traffic from the Papanchavady wharf to the south is heavy during the time of native festivals. When the Covelong lock is constructed, the receipts from wharfage fees credited to the Papanchavady wharf will increase considerably since at present wharfage fees are evaded to a considerable extent owing to passengers to and from the Tripalore temple embarking or landing a little to the south of the Papanchavady wharf.

The fees collected at the remaining wharves on the canal are comparatively small, but at times the traffic there is heavy and it would be premature at present to abolish such wharves. The Muthukur and Maipad wharves serve the large town of Nellore, and the Pedda Ganjám wharf, which is only open during the three months that the Kistna canals are closed, is very useful, as boats from the Kistna deposit there grain and coal just previous to the closing of the Kistna canals. The goods thus stored at the Pedda Ganjám wharf are taken on to Madras or elsewhere as soon as boats are available to transport them, the demand for boats at such times of the year being usually greater than the supply.

4. *Particulars of traffic.*—Proper comparison of the particulars of traffic for more than two years past is not possible and would only give rise to misleading conclusions as explained below :—

First.—In the year 1891–92 greatly reduced rates were adopted for the valuation of some of the principal classes of goods carried on the canal and any accurate comparison of figures intended to exhibit value of goods carried previous to that year and in and after that year is thus impossible.

Second.—In 1889–90 salt was valued at an increased rate and proper comparison of value of salt carried before and after that year is impracticable.

Third.—From 1888–89 the actual quantity of goods carried has been approximately ascertained, but previous to that year the tonnage of the boat was assumed to be the quantity of goods carried.

The following statement shows the particulars of traffic for the past two years:—

STATEMENT showing particulars of traffic on the Buckingham canal for years 1891-92 and 1892-93.

Item No.	Description of goods.	1891-92.		1892-93.	
		Quantity.	Value.	Quantity.	Value.
			Rs.		Rs.
1	Firewood { South canal	19,949	1,19,694	21,240	1,27,440
	{ North do.	42,868	2,57,208	59,456	3,56,736
	Total	62,817	3,76,902	80,696	4,84,176
2	Food-grains { South canal	1,351	68,555	1,185	72,950
	{ North do.	46,058	18,00,300	61,118	20,05,935
	Total	47,409	18,68,855	62,303	20,78,885
3	Salt { South canal	10,299	8,23,920	14,724	11,77,920
	{ North do.	18,318	14,65,440	29,337	23,46,960
	Total	28,617	22,89,360	44,061	35,24,880
4	Building materials { South canal	667	13,914	497	12,493
	{ North do.	21,927	2,09,695	22,850	1,52,055
	Total	22,494	2,23,609	23,347	1,64,548
5	Provisions { South canal	3,803	3,73,335	1,917	1,82,545
	{ North do.	6,058	6,62,625	14,504	15,17,325
	Total	9,861	10,35,960	16,421	16,99,870
6	Coal { South canal	17	204	8	96
	{ North do.	8,125	97,500	12,256	1,47,072
	Total	8,142	97,704	12,264	1,47,168
7	Cotton, piece-goods, ironware, &c. { South canal	945	85,859	849	1,25,790
	{ North do.	24,797	54,57,338	14,340	45,87,151
	Total	25,742	55,43,197	15,219	47,12,941
	Grand Total	205,052	1,14,35,587	254,311	1,28,12,468

From this statement it will be observed that the principal items of traffic in order of importance are—

	Tonnage in 1892-93.
(1) Firewood	80,696
(2) Food-grains	62,303
(3) Salt	44,061
(4) Building materials	23,347
(5) Provisions	16,421

Coal is an item of traffic which is likely to become very important and has therefore been separately shown in the statement; but all other items of traffic, except the six items above mentioned, have been lumped up together, as no useful purpose is served by exhibiting the figures in detail. Although in the statement of traffic above given detailed figures for the past two years have only been shown, the general deductions to be drawn from an examination of figures for a considerably greater number of years will now be given for each of the items shown in the statement.

5. *Traffic in firewood.*—There was a remarkable increase in 1892-93 in the quantity of firewood carried, but previous to that year the quantity carried has been fairly uniform. The figures for the last five years are as follows:—

	Tonnage.
1888-89	58,785
1889-90	60,197
1890-91	66,558
1891-92	62,817
1892-93	80,696

6. *Traffic in food-grains.*—The traffic in food-grains is rapidly increasing and forms already the most important item of traffic on the canal north of Madras. In 1889-90 it only amounted to 31,963 and it has thus nearly doubled itself in three years. In all probability it will steadily develop, though it must be liable to fluctuations dependent on the character of the season, and was in 1891-92 subjected to a temporary check from such a cause.

7. *Traffic in salt.*—The fluctuations in this item of traffic are so great as to set calculation at defiance. The fluctuations are said to be due to the requirements of the trade and to the effect of the out-storage system adopted in the year 1890-91. In that year a great and sudden fall occurred in the quantity of salt carried by canal and since that year the recovery, though steady, has only been partial. The figures of tonnage of salt carried for the past five years are as follows:—

	Tonnage.
1888-89	76,466
1889-90	67,275
1890-91	8,279
1891-92	28,617
1892-93	44,061

8. *Traffic in coal.*—This item of traffic is increasing very rapidly. In 1890-91 it only amounted to 77 tons and in two years has risen to over 12,000 tons.

9. *Traffic in building materials and provisions, &c.*—A considerable traffic is carried on in these and other items not specially mentioned, but remarks in detail regarding them are unnecessary. With the development of the town of Bezwada and surrounding villages owing to the opening up of the railway system, many of these items of traffic are likely to be steadily progressive.

10. *General review of the total figures giving particulars of traffic.*—The tonnage of goods carried on the Buckingham canal last year amounted to 254,311 tons, valued at Rs. 1,28,12,468. The value of the canal to Government as a means of remarkably cheap carriage for goods, amounting in value to a very large sum, can thus be gauged. The figures of quantity and value of goods carried last year largely exceed those of the previous year and are considerably heavier than those of any year on record. Finally the increase under various important items of traffic more than compensates for the fall in salt traffic.

11. *General estimate of the future of the Buckingham canal.*—The revenue and traffic of the Buckingham canal have thus clearly been shown to be progressive. Whether the salt traffic continues to expand and again reaches its old figure is immaterial to the prosperity of the canal and will not affect the canal from a revenue point of view as will be quite clear from the figures of revenue given in paragraph 1. Boats exclusively engaged in conveying salt take very short trips, are therefore comparatively few in number, and if not required for carriage of salt would obtain other cargo. So far as I can learn, the check in the quantity of salt carried is only of a temporary nature and, for many years still, salt must continue to be transported by canal. On the south canal it must always do so and the East Coast Railway is hardly likely to be constructed for some little time to come.

12. *Relative value of the north and south canals.*—The canal north of Madras is in communication with large towns and opens up to Madras cheap carriage from a long length of country. It may be said on the average to carry about six times the bulk and value of goods that the south canal does and to be therefore about six times more valuable than the south canal. Its value is also on the increase, as trade on it is rapidly expanding, whereas trade on the south canal is not likely to expand to any considerable extent. The only important items of traffic on the south canal are firewood and salt, which between them comprise about $\frac{5}{6}$th to $\frac{6}{7}$th of the total produce carried on the south canal.

13. *Efficiency of the Buckingham canal.*—The canal north of Madras is now maintained in a far more efficient state than it has hitherto been, and, as the locks so necessary to make it thoroughly efficient are in rapid progress, it should by the end of the year 1895 have been made thoroughly efficient even for fast traffic by steamers.

Such crafts are already proposing to ply on it. The canal south of Madras is far less efficient and cannot be used by steamers or by the large craft that ply on the north canal. Until locks have been constructed at Covelong and on the north bank of the Pálár, its condition cannot be improved. These works, it is hoped, will be finished by the end of the year 1896.

No. 120 B.C.

Forwarded to the Chief Engineer for Irrigation for favour of having the note printed and copies supplied as requested by the Executive Engineer. The note contains much useful information.

(Signed) C. A. SMITH,
for Offg. Suptg. Engr., II Circle.

7th June 1893.

No. 107 I.

Submitted to Government with a recommendation that the note drawn up by Mr. Russell may be printed and put on record. It will serve a useful purpose for comparison with similar reports in the future.

(Signed) R. R. E. DRAKE-BROCKMAN, Lt.-Col., R.E.,
Chief Engineer for Irrigation.

Ootacamund,
5th July 1893.

To the Acting Secretary to Government,
Public Works Department, Irrigation Branch.

Order—dated 14th July 1893, No. 619 I., Public Works.

The recommendation of the Chief Engineer for Irrigation is approved.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Lt.-Col., R.E.,
Ag. Secretary to Govt., P.W.D.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, II Circle.
„ Revenue Department.

Exd. A. D. Xavier.
Spare Copies

6401

IRRIGATION.

Govt. of {1893} Madras.

PUBLIC WORKS.

Dated July, 14th.

Read. *Encl.*

G.O., 14th July 1893, No. 619 I.

JULY.

Buckingham Canal

Approving of the recommendation of the Chief Engineer for Irrigation that the note drawn up by Mr. Russell on the development of traffic and revenue on the — be printed and put on record.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

READ the following

Revenue Department.
Proceedings of the Madras Government
Read the following
Letter from the Government of India
Finance and Commerce Dept. dt/14th
August 1893 No. A/3517.

I am directed to acknowledge the
receipt of your letter No. 2638 dt/the 6th
July 1893 forwarding a copy of
correspondence regarding the construction
of a canal from the Manguinapudi
salt factory to Masulipatam in the
Kistna District in view to affording
facilities for the transport of salt,
and requesting that a special
allotment of Rs 5,000/ may be made
during the current year for its
construction.

2. It is stated that no provision
was made in the current year's
estimates on this account, owing
to a mistaken impression on the
part of the Board of Revenue that
the canal would be excavated
from Provincial funds and that
the necessary provision would be
made in the Public Works Budget but
that as the Canal is required almost
entirely in the interest of the Salt
Department His Excellency the
Governor-in-Council considers that
the cost of its construction should

(40—2,000—13-5-93.)

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

Read—the following papers :—

Read—the following Proceedings of the Board of Revenue (Separate Revenue), dated 3rd October 1887, No. 535 :—

C. A. Galton, Esq.

Read—G.O., dated 1st September 1887, Mis. No. 5241, Revenue.

Resolution—dated 3rd October 1887, No. 535.

The Board venture respectfully to protest against the introduction of wharfage fees for the use of the Salt Cotaur.

2. The avowed objects of the new tax, as would appear from the Note by the Chief Engineer for Irrigation, printed with the Government Order read above, are to put all boats using the canal on the same footing, and to prevent boats loading and unloading goods except at authorized places which can be kept clean and under inspection. The probable collection of a sum of Rs. 54,000 is mentioned incidentally, and it is supposed that one object of the new fees is to increase the income of the canal.

3. The Board beg to submit that neither of the avowed objects of the tax will be attained in the case of the Salt Cotaur. It cannot be contended that this is not an authorized place for loading and unloading goods, and it has never yet been suggested that it is dirty or not under proper supervision. The new fees appear calculated to place the salt boats on a much worse footing than the boats used by the Forest Department and those carrying wood, which are especially referred to by the Chief Engineer for Irrigation. Before the new fees were imposed the firewood boats paid the old tax for the use of Trevelyan's Basin, while the new order imposes a fee upon salt boats which are unable to use the basin. In fact the salt boats are called upon to pay a new fee for which they obtain no convenience, while the forest boats are in exactly the same position as before. The Board venture to suggest that the avowed objects of the new fees, as well as an increase to the canal funds, could be attained by enhancement of the canal tolls, all boats would be placed upon the same footing, the same wharves might be notified without fees, and a portion of the increased funds spent in keeping the wharves clean and under inspection. Such boats as now find it convenient to use the basin would continue to do so and pay the fees, while no extra tax would be levied from those boats which find it inconvenient, or, as in the case of the salt boats, impossible to use the basin.

e debited to the Salt Budget.

3. In reply I am directed to say that the cost of the Canal is properly chargeable to the head "43 - Minor Works & Navigation" which is a provincial head of account under the current Provincial Contract and not to the head 5, Salt, and that in the opinion of the Governor General in Council, the fact of the work being required in the interests of the Salt department is not a sufficient reason for charging its cost to the latter head.

Order thereon 14th September 1893 No 3381.

Communicated to the Board of Revenue.

(True Extract,
(Sd). D. A. Ashfield.
Under Secretary to Govt
for Secretary to Govt

Order thereon No 2475-W. dt 26 September 1893.

Recorded.

(True Extract,

W. Ashfield
Under Secretary to Govt
P. W. D.

To
The Supt Engineer Circle.
" Chief Engineer for Irrigation
" Accounts

4. The effect of the new fees is to place a tax upon salt alone. The boats which carry all other commodities can use the basin and other conveniences provided by the canal, while the salt boats alone are compelled to use the Cotaurs upon which nothing is spent from canal funds, and the banks of which are entirely under the control of the Salt Department. The licensees of the factories already pay rent for the use of the Cotaurs, part of which is expended on its conservancy, and the new fees are a new tax for which the licensees get absolutely nothing in return.

5. Many of the boats at present bringing salt to the Cotaur do not use the banks of the canal for loading and unloading. About one-third of the Cotaur can be reached more conveniently from side channels, which are in no way looked after by the Public Works Department, but are kept clear by the Salt Department. It can scarcely be intended to make boats unloading in these channels liable for the fees which have however to be paid as they are collected before the boats enter Madras.

6. There will be no difficulty, should it be decided that boats using the canal banks within the Salt Cotaur are to pay wharfage fees, in arranging that the whole of the salt landed at the Cotaur should be landed in side channels. The old channel at the east of the Cotaur running along Wall Tax road can easily be cleared out and four or five side channels cut so that the banks of the canal need not be used at all. The whole of the necessary work could be done for about Rs. 5,000 and all future charges on account of wharfage avoided.

7. The sum of money involved in the imposition of the new fees upon salt boats is a large one; hence presumably the eagerness of the canal authorities to have the Salt Cotaur declared a wharf. The annexed statement shows the quantity of salt transported to the Cotaur, the tonnage of the boats required for the transport, and the fees payable under the new wharfage rules for the last four years :—

—	Salt transported.	Tonnage of boats used.	Amount of fees.	Maunds per ton.
	Mds.		Rs. A. P.	
1884	1,677,270	81,254	5,078 6 0	13·2
1885	1,492,750	81,412	5,088 4 0	18·3
1886	1,139,582	65,912	4,119 8 0	17·3
1887	2,588,734	139,882	8,742 10 0	*18·5
Total ..	6,898,336	368,460	23,028 12 0	..
Average {	Mds. 1,724,584 / Tons. 63,866	92,115	5,757 3 0	...

The figures for 1887 have been calculated from the actuals up to 24th September, assuming that the boats will continue to carry the same average loads for the rest of the year. It will be seen from these figures that the accommodation afforded by the canal is distinctly unsatisfactory; on the average boats cannot carry anything like their proper tonnage, and things are getting worse year by year.

8. The transport from the Covelong circle has been carried out this year without great difficulty owing to the bar having been opened by the canal authorities on behalf of the Salt Department, but the Ennore bar having closed transport has been exceedingly slow from the Northern factories. Roughly speaking 113,000 tons have been required to carry 20 lakhs of maunds from Ennore, while only 26,500 tons have been required to carry 6 lakhs of maunds from Covelong. The results of this season's manufacture and transport strongly confirm Mr. Bliss' contention in the correspondence upon the question whether the Salt Department or the Buckingham canal should bear the cost of opening the Ennore and Covelong bars—*vide* G.O., No. 2942 W., dated 8th November 1882. The Ennore bar closed in May and was not opened. The result has been the largest manufacture on record in that circle, while the canal has been worse than ever, while the southern portion of the canal has been in fair order owing to the opening of the Covelong bar.

9. A further objection may justly be made to the suddenness with which the new fees have been imposed. Practically no notice was given of the intention to levy

wharfage, and the levy began during the currency of the usual contract for the transport of this year's manufacture. Consequently much of the salt has escaped the fee and the incidence of the impost will be unequal. It is distinctly unfair that those licensees whose salt happens to be transported last should have to pay a tax which others escape. The question, however, arises how is the amount to be apportioned among the licensees who will eventually have to pay the tax. If it is decided that the tax is to be paid there will be great difficulty in dividing among the different licensees of those platforms which escape the tax owing to boats unloading at them not using the banks of the canal, but discharging in the side channels.

10. For these reasons, the Board beg to submit that the Salt Cotaur should be excluded from the limits of the Salt Cotaur wharf, and that in future years the Ennore and Covelong bars should be opened by the canal authorities at the expense of canal funds, if they close before the end of June, in order to render the canal navigable.

(True Extract.)

(Signed) HERBERT BRADLEY,
Acting Secretary.

Endorsement No. 6811, Revenue.

Transferred to the Public Works Department.

(Signed) R. S. BENSON,
Ag. Under Secy. to Govt.

Fort St. George,
9th November 1887.

Order—dated 21st December 1887, No. 798 I., Public Works.

In the above proceedings, the Board of Revenue protest against the introduction of wharfage fees under the notification published in *Fort St. George Gazette*, dated 16th August 1887, page 652, being made applicable to salt boats loaded or unloaded at the Salt Cotaurs on the ground that they only make use of the Salt Cotaurs' wharf which is maintained by the Salt Department.

On further consideration, the Governor in Council is pleased to order that all licensed boats entering or leaving Madras laden with salt shall be exempt from wharfage fees.

2. The question of the cost of opening the Ennore and Covelong bars being paid by the Salt Department was settled in G.O., No. 2942 W., dated 8th November 1882, and Government see no reason to alter that decision.

(True Extract.)

Under Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, II Circle.
" Examiner, Public Works Accounts.
" Revenue Department.

Exd. A. D. Xavier.
Spare Copies

IRRIGATION.

Govt. of {1887} Madras.

PUBLIC WORKS.

Dated December, 21st.

Read. *Encl.*

G.O., 21st Dec. 1887, No. 798 I.

DECEMBER.

Wharfage Fees

Orders on Proceedings of the Board of Revenue protesting against the introduction of — for use of the Madras Salt Cotaurs.

PROCEEDINGS OF THE BOARD OF REVENUE (SEPARATE REVENUE).

C. A. GALTON, ESQ.

READ—G.O., dated 1st September 1887, Mis. No. 5241, Revenue.

RESOLUTION—dated 3rd October 1887, No. 535.

The Board venture respectfully to protest against the introduction of wharfage fees for the use of the Salt Cotaur.

2. The avowed objects of the new tax, as would appear from the Note by the Chief Engineer for Irrigation, printed with the Government Order read above, are to put all boats using the canal on the same footing, and to prevent boats loading and unloading goods except at authorized places which can be kept clean and under inspection. The probable collection of a sum of Rs. 54,000 is mentioned incidentally, and it is supposed that one object of the new fees is to increase the income of the canal.

3. The Board beg to submit that neither of the avowed objects of the tax will be attained in the case of the Salt Cotaur. It cannot be contended that this is not an authorized place for loading and unloading goods, and it has never yet been suggested that it is dirty or not under proper supervision. The new fees appear calculated to place the salt boats on a much worse footing than the boats used by the Forest Department and those carrying wood, which are especially referred to by the Chief Engineer for Irrigation. Before the new fees were imposed the firewood boats paid the old tax for the use of Trevelyan's Basin, while the new order imposes a fee upon salt boats which are unable to use the basin. In fact the salt boats are called upon to pay a new fee for which they obtain no convenience, while the forest boats are in exactly the same position as before. The Board venture to suggest that the avowed objects of the new fees, as well as an increase to the canal funds, could be attained by enhancement of the canal tolls, all boats would be placed upon the same footing, the same wharves might be notified without fees, and a portion of the increased funds spent in keeping the wharves clean and under inspection. Such boats as now find it convenient to use the basin would continue to do so and pay the fees, while no extra tax would be levied from those boats which find it inconvenient, or, as in the case of the salt boats, impossible to use the basin.

4. The effect of the new fees is to place a tax upon salt alone. The boats which carry all other commodities can use the basin and other conveniences provided by the canal, while the salt boats alone are compelled to use the Cotaurs upon which nothing is spent from canal funds, and the banks of which are entirely under the control of the Salt Department. The licensees of the factories already pay rent for the use of the Cotaurs, part of which is expended on its conservancy, and the new fees are a new tax for which the licensees get absolutely nothing in return.

5. Many of the boats at present bringing salt to the Cotaur do not use the banks of the canal for loading and unloading. About one-third of the Cotaur can be reached more conveniently from side channels, which are in no way looked after by the Public

Works Department, but are kept clear by the Salt Department. It can scarcely be intended to make boats unloading in these channels liable for the fees which have however to be paid as they are collected before the boats enter Madras.

6. There will be no difficulty, should it be decided that boats using the canal banks within the Salt Cotaur are to pay wharfage fees, in arranging that the whole of the salt landed at the Cotaur should be landed in side channels. The old channel at the east of the Cotaur running along Wall Tax road can easily be cleared out and four or five side channels cut so that the banks of the canal need not be used at all. The whole of the necessary work could be done for about Rs. 5,000 and all future charges on account of wharfage avoided.

7. The sum of money involved in the imposition of the new fees upon salt boats is a large one; hence presumably the eagerness of the canal authorities to have the Salt Cotaur declared a wharf. The annexed statement shows the quantity of salt transported to the Cotaur, the tonnage of the boats required for the transport, and the fees payable under the new wharfage rules for the last four years :—

——	Salt transported.	Tonnage of boats used.	Amount of fees.
	Mds.		Rs. A. P.
1884	16,77,270	81,254	5,078 6 0
1885	14,92,750	81,412	5,088 4 0
1886	11,39,582	65,912	4,119 8 0
1887	25,88,734	139,882	8,742 10 0
Total ..	68,98,336	368,460	23,028 12 0
Average {	Mds. 17,24,584 Tons. 63,866	} 92,115	5,757 3 0

The figures for 1887 have been calculated from the actuals up to 24th September, assuming that the boats will continue to carry the same average loads for the rest of the year. It will be seen from these figures that the accommodation afforded by the canal is distinctly unsatisfactory; on the average boats cannot carry anything like their proper tonnage, and things are getting worse year by year.

8. The transport from the Covelong Circle has been carried out this year without great difficulty owing to the bar having been opened by the canal authorities on behalf of the Salt Department, but the Ennore bar having closed transport has been exceedingly slow from the Northern factories. Roughly speaking 113,000 tons have been required to carry 20 lakhs of maunds from Ennore, while only 26,500 tons have been required to carry 6 lakhs of maunds from Coveloug. The results of this season's manufacture and transport strongly confirm Mr. Bliss' contention in the correspondence upon the question whether the Salt Department or the Buckingham Canal should bear the cost of opening the Ennore and Covelong bars—*vide* G.O., No. 2942 W., dated 8th November 1882. The Ennore bar closed in May and was not opened. The result has been the largest manufacture on record in that circle, while the canal has been worse than ever, while the southern portion of the canal has been in fair order owing to the opening of the Covelong bar.

9. A further objection may justly be made to the suddenness with which the new fees have been imposed. Practically no notice was given of the intention to levy wharfage, and the levy began during the currency of the usual contract for the transport of this year's manufacture. Consequently much of the salt has escaped the fee and the incidence of the impost will be unequal. It is distinctly unfair that those licensees whose salt happens to be transported last should have to pay a tax which others escape. The question, however, arises how is the amount to be apportioned among the licensees who will eventually have to pay the tax. If it is decided that the tax is to be paid there will be great difficulty in dividing among the different licensees of those platforms which escape the tax owing to boats unloading at them not using the banks of the canal, but discharging in the side channels.

10. For these reasons, the Board beg to submit that the Salt Cotaur should be excluded from the limits of the Salt Cotaur wharf, and that in future years the Ennore and Covelong bars should be opened by the canal authorities at the expense of canal funds, if they close before the end of June, in order to render the canal navigable.

(True Extract.)

(Signed) HERBERT BRADLEY,
Acting Secretary.

(True Copy.)

(Signed) EDMUND MILLETT,
Assistant Secretary.

To the Secretary to Government, Revenue Department.
Copy to the Deputy Commissioner of Salt and Abkári Revenue, Central Division.
" " Assistant Commissioner of Salt and Abkári Revenue, Chingleput Division.

Exd. W. J. Lewis

DEPART TO GOVERNMENT
17 NOV 87
DEPARTMENT

P. W. Corr 9-380

Endorsement No. 6811

Transferred to the Public Works department.

R. W. Benson
Officiating Secretary to Govt.

Fort St. George
9th November 1887

P. of Gazette 16-8-87
G.O. 5069 d/16-8-87
" 2619 " 21-3-83
" 5624 " 20-2-83
" 6129 " 5-8-82

1887.

Board of Revenue

(Separate Revenue).

MADRAS.

No. 8822

Rec'd 17-11-87

Printed November 3rd.

Rd 31st October

Proceedings, 3rd *October* 1887, *No.* 535.

Protesting against the introduction of *wharfage fees* for the use of the Madras Salt Cotaurs, and requesting, with remarks, that the Salt Cotaurs may be excluded from the limits of Salt Cotaur wharf and that the *opening* of the *Ennore and Covelong bars* may, in future, be undertaken by the canal authorities at the expense of the canal funds, if they close before the end of June, in order to render the Buckingham Canal navigable.

Endorsement.

P. W. Department.

Read the following :—

Proceedings of the Board of Revenue (Separate Revenue) No 535 dy 3d Oct 1887

FOR ORDERS.

Approved by me J. F. Lee
D. Sect. Pub. Dept.

Before considering if the charge for wharfage is legal I'd like to know how Col. Hastie, wg. seems to have been authorized, justifies it.

But the point made by Mr Salton is that the charge is for the use of a wharf made & maintained by the PWD, while the Salt Cotaur wharf, & the bank of the canal there, are maintained by them.

PPH
8 Dec

In their Proceedings of 3d October 1887 No 535 the Board of Revenue (Separate Revenue) take exception to the levying of wharfage fees on Salt Boats as notified in the Gazette of 16th August 1887.

2. In this Gazette certain portions of the Buckingham Canal lying within the limits of the Town of Madras were declared to be wharves within the meaning of para 17 of the Navigation Rules.

3. The Salt Cotaur wharf

wharf thus one of the portions so declared a wharf. By para 17 of the Navigation Rules a wharfage fee of one anna per ton on the registered tonnage is leviable on all boats loading or unloading at any place on the canal which shall be declared a wharf within the meaning of the Navigation Rules and which shall be duly notified as such in the Gazette.

4. The Salt Cotaur wharf having been declared a wharf within the meaning of the Navigation Rules and this fact having been duly notified in the Gazette, it is not clear on what grounds the Salt Boats alone should be exempted from the payment of the wharfage fee levied from all other boats plying on the Canal and there appears to be no good reason why Salt Revenue should be protected at the expense of the Buckingham Canal.

5. Wharfage fees are, it is to be noted, levied under the authority given in para 17 of the Navigation Rules as revised in 1883 but the Godavari Kistna & Buckingham Canals are worked under the Canal and Ferry Act No. I of 1890 and a study of the various sections of this Act especially Section 44 throws much doubt on the legality of para 17 of the Navigation Rules under which as already stated

the

the wharfage fees are levied. It is considered advisable now that the question has been raised to settle once for all the legality or otherwise of this para 17 - the origin of the Revised Navigation Rules is therefore given.

6. A Committee to revise the Navigation Rules of the three systems of Canals was convened in October 1882 in accordance with the Proceedings of Madras Government No. 612. I. of August 1882. At this time the Buckingham Canal alone of the three Canal systems was under the Canal and Ferry Act I of 1870. The Committee recommended that the Godavari and Kistna Canals should also be brought under the Act, so that the three systems might be worked on one basis; they further recommended the introduction of a system of through licenses, the taking out of which would enable boats to navigate all three systems of Canals without other charges in the shape of tolls; tolls however were to be retained to meet the case of boats which did not take out licenses, the amount of the tolls was to be considerably reduced and everything was to be done to facilitate boat traffic.

7. It is to be noticed however that the Committee while dealing with the question

question of tolls & license fees make no mention of wharfage fees. The Chief Engineer for Irrigation when forwarding the Committee's recommendations submitted a note No 117. I. dated 6th November 1882 in which while generally agreeing with the Committee, he proposed to still further lower the amount of tolls & license fees, and (para 11) drew up a statement in which the rates as proposed by the Committee and those proposed by himself were compared. A separate statement shewing the estimated receipts from Navigation Rules then in force compared with those proposed

by the Committee and by the Chief Engineer for Irrigation was also attached to the Note.

9. From the statement it will be seen that the adoption of either new scale of rates while slightly increasing the receipts in the Godavari & Kistna Canals would lower those in the Buckingham Canal from Rs 1,20,055 (actual receipts in 1881) to Rs 54,343 (Committee's scale of rates) or Rs 32,279 (Chief Engineer's scale of rates)

10. In para 2 of his note clause 4 the Chief Engineer for Irrigation points out that "the rule has been laid down that Navigation should be made to pay, that is, not only should receipts cover the working Expenses but

but also interest on the original cost of works constructed solely in the interests of navigation."

11. The estimated collection, whether the rates proposed by the Chief Engineer or the Committee be adopted would in the case of the Godavari and Kistna Canals approximate very closely to the amount estimated to be the total of maintenance and interest charges; as the Canals mature in completion, the maintenance charges would diminish, and the receipts would probably meet interest and maintenance charges in full.

12. With regard to the Buckingham Canal the case is different, the adoption of the Chief Engineer's rates would bring the receipts to Rs 32,000 while from para 1 of Major Dr. A.R.D. Brockman's memorandum printed with G.O. No 562. W. of 20th February 1883, it will be seen that the maintenance charges of the Canal, even when fully completed, are estimated at Rs 40,000, and to this, vide para 20 of Chief Engineer's (Col. Sankey) Note of 26th January 1883 forwarding Chief Engineer for Irrigations' Note and Committees' recommendation to Govt, must be added Rs 5000 on account of Establishment, Contingencies &c.

13. The receipts as calculated would therefore fall short of the maintenance charges when these latter were at their lowest and there would be nothing to meet interest charges.

14. The Chief Engineer P.W.D. in his above already quoted recommended the adoption of

of Colonel Hastie's proposals but with a view to establishing equilibrium between receipts and Expenditure, he in para 21 of his note suggested the levying at Madras of a wharfage charge of one anna per ton.

15. This is the first and only suggestion of a wharfage fee throughout the Correspondence, and there can be little doubt that para 17 of the Navigation Rules is the outcome of this suggestion.

16 Government accepted the recommendations of the Committee as modified by the Chief Engineer for Irrigation and Chief Engineer P. W. D. and ordered the Chief Engineer for Irrigation to submit a revised draft of the Navigation Rules in time

Col. Saulkey said the charge was made at Col. Hastie's suggestion - §23.

to admit of their being introduced by the 1st April 1883.

17. Revised rules were submitted in accordance with the above order and passed in G.O. № 261. J. of 21st March 1883 and under para 17 of these rules wharfage fees have been levied. It is for Government to decide if this is legal or not. It appears to the undersigned that under the act para 4 Tolls or License fees Can be levied but Tolls cannot be levied on licensed boats.

18. It also appears that Government have the right to order that the Canal banks are not to be used for loading or unloading boats and it follows therefore, if this is the case, that Govt may legally take a

of Colonel Hasted's

a fee for allowing
boats to load or
unload at certain
places specified
by them. If this
view is accepted
the Notification
in the Gazette of
16th August 1887 may
stand but if not
it is feared that
the wharfage fees
now collected
are illegal and
will have to be
given up unless
the act is altered
on the Buckingham principle.
19. The sums collected during
the three years 1884-85
to 1886-87 inclusive
under the three heads
License fees, wharfage
fees and Tolls are
given below:-

	License fees	wharfage fees	Tolls	Total
1884-85	32,172	6,938	4,818	44,028
1885-86	32,962	13,547	4,977	51,486
1886-87	38,013	12,764	6,118	56,895

6/12/87
R Davidson
Under Secy to Govt. P.W.D.
Irrigation Branch

1 Co o Wastes

The Hon'ble P.P. Hutchins

For orders

F. E. 1989.
Kindly say
if ~~this~~ it is
intended to
print the Board's
proceedings.
It contains a
protest against
the Dept'l reply

Yes. Please print also
the Bd's Proceedings
BR
22-10-87.

73

To P

For favor of Return

100
9.11.87

circ. 7-12-87 R 9-12-87

E. I. Form No. 22.

PUBLIC WORKS DEPARTMENT.

No. 7989

PROCEEDINGS OF THE MADRAS GOVERNMENT.

Under date the 21st December 87

READ the following :—

Endorsement Revenue No. 6811 on

Proceedings of the Board of Revenue (Separate Revenue) } (Rt No. 535 dated 3rd October 1887)

6

PPT 20 Dec

In the above proceedings the Board of Revenue protest against the introduction of wharfage fees under the notification published in Fort Saint George Gazette dated 16th August 1887 page 652 being made applicable to salt boats loaded or unloaded at the Salt Cotaurs on the ground that the only make use of the Salt Cotaurs maintained by the Salt Department.

On further consideration The Governor in Council is pleased to order that all ~~salt~~ ~~entering~~ ~~clearing~~ ~~laden~~ ~~with salt~~ licensed boats shall be exempt from wharfage fees ~~and no~~ ~~such~~ fees from salt boats shall be levied except they load or unload at one of the Buckingham wharves.

2 The question of the cost

cost of opening the Cmore and
Loneloog hard being paid by
the Salt department was settled
in G.O.No. 2942 W. dated 8th Nov. 1882
and Government see no reason to
alter that decision

20.12.87

D
8/1/188

C.E. for Insp.
Supt Engr III Circle
Exn S.W. Accts
Rev Dept.

9330

Govt. of {1887} Madras.

PUBLIC WORKS.

Dated 23/12

Read. Encl.

G.O., 21 Dec 1887, No. 7981

Wharfage fees

Orders on Rep. of the Bd of Rev. protesting against the introduction of – for use of the Madras Salt Cotaurs

100/-6

48 23/12

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following papers:—

From G. D. WYBROW, Esq., Superintending Engineer, II Circle, to the Chief Engineer for Irrigation, dated 23rd July 1887, No. 119 B.C.

I have the honor to forward a draft notification for your approval and sanction of Government, framed by the Executive Engineer, Buckingham canal, for declaring the portion of the Buckingham canal between Shadayankuppam and the Adyar as wharfs under the Navigation Rules.

2. The object of the notification is to put all boats loading or unloading at Madras on the same footing. The Executive Engineer points out that at present boats landing goods at declared wharfs pay wharfage, whereas those that land their goods elsewhere are exempted. In the portion now proposed to be declared a wharf the Salt Cotaurs have been included, as there would appear to be no reason why the salt boats should be exempted when the boats belonging to the Forest department and other boats carrying wood have to pay.

3. Copies of the Executive Engineer's letters, Nos. 171 C. and 482 C. of 30th April and 23rd June 1887, respectively, on the subject, are enclosed for your information.

No. 94 I.

Note by the Chief Engineer for Irrigation.

Under paragraph 17 of the Navigation Rules a wharfage fee of one anna per ton on the registered tonnage is charged on each boat loading or unloading at any place on the Canal bank that shall be declared a wharf, and, when a wharf has been declared, boats are prohibited from loading or discharging except at the wharf.

2. On the Buckingham canal it is proposed that, between the limits of the Shadayankuppam lock on the north and the Adyar north lock on the south, no boats shall be allowed to load or unload cargo or embark or disembark passengers except at six specified wharves, and that the wharfage fees leviable under the Navigation Rules shall be collected at the Madras basin and the Adyar south lock for boats coming from or going to the north and south respectively.

3. Should it be found necessary hereafter, additional loading and unloading places can be declared, but for the present it is believed the six named will suffice. A draft notification is forwarded with a recommendation that it be sanctioned.

4. It is considered that all boats loading and unloading in Madras should be put on the same footing, and there is no reason why in Madras boats should be allowed to load and unload anywhere and so escape the payments of wharfage fees.

5. Again at present the salt boats load at the Salt Cotaurs and so escape wharfage fees. The Forest department pay fees as other boats carrying wood pay, and it is considered right that the salt boats should pay wharfage fees; therefore the Salt Cotaur wharf has been in the notification declared a wharf within the meaning of the Navigation Rules.

6. The effect of this notification, if approved, will be a slight increase in the revenue of the Buckingham canal (estimated at Rs. 54,000 for 1887-88), and also will prevent boats loading and unloading goods and passengers except at authorised places which can be kept clean and under inspection. It will also place all boats using the canal on the same footing as regards payment of wharfage fees.

7. As it is proposed to collect all wharfage fees at the north and south ends of the canal in Madras limits, there will be no difficulty in adding to the declared authorised loading and unloading places if required.

OOTACAMUND,
3rd August 1887.

(Signed) H. R. MEAD, Colonel, R.E.,
Chief Engineer for Irrigation.

To the Joint Secretary to Government,
Public Works Department, Irrigation Branch.

ORDER—dated 16th August 1887, No. 506 I., Public Works.

The notification declaring certain places on the Buckingham canal between the Shadayankuppam lock and the Adyar to be wharves under the Navigation Rules is approved as amended by Government and will be published in the *Fort St. George Gazette*.

2. The Superintending Engineer, II Circle, will report in three months, time if any additional wharves are required within these limits.

(True Extract.)

(Signed) H. R. MEAD, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Superintending Engineer, II Circle.
" Chief Engineer for Irrigation.
" Revenue Department.

Exd. J. Moses.

Spare Copies

CHIEF ENGINEER
No. 59/W
20 AUG 87
FOR IRRIGATION.

IRRIGATION.

Govt. of {1887} Madras.

PUBLIC WORKS.

Dated August, 16th.

Read. *Encl.*

G.O., 16th Aug. 1887, No. 506 I.

AUGUST.

Buckingham Canal

Ordering the publication of the notification declaring certain places on the — between the Shadayankuppam lock and the Adyar to be wharves.

REPORT ON THE BUCKINGHAM CANAL.

CONTENTS.

	PARAS.
Position of the canal	1
Length of main navigable canals	2
Distance from the sea	3
General nature of the country in which the canal is made	4
How these natural features have been taken advantage of for navigation	5
Cochrane's canal, 6 miles	*ib.*
Katupalli do. 8 ,,	*ib.*
Condition of the canal in 1852	6
Shadayankuppam lock, 7 miles 3 furlongs	7
Pulicat lake to Dugarázpatnam, 44 miles	8
Dugarázpatnam to Kistnapatam, 21 miles	9
Estimate and expenditure on the above section	10
Kistnapatam to Pennér river, 24 miles	11
Pennér river to Pedda Ganjam, 82 miles	12
Famine work	13
Pennér river to Chippalairu river, 18 miles	*ib.*
Chippalairu northwards for 22 miles	14
Northern 42 miles to Pedda Ganjam	*ib.*
Surveys and estimates delayed owing to supervision of actual work in progress	15
Comparison between the line proposed by Captain Chambers and adopted	16
Bed level	17
Errors in the levels of canal between Kistnapatam and Pennér	18
Bed width	*ib.*
Canal slopes	*ib.*
Total excavation	19
Estimated rate	*ib.*
Actual quantity and rate	*ib.*
Amount of work done	20
Total length of canal cut in thirteen months	*ib.*
Number of people employed on the work	*ib.*
Named after His Grace the Duke of Buckingham at Mr. O'Shaughnessy's request	*ib.*
Portion previously named after Lord Clive	*ib.*
East Coast Canal, a more suitable name	*ib.*
Southern canal	21
Canal beyond Merkanam for a distance of 23½ miles	22
Junction canal	23
Cyclone of 1879	24
Results of the cyclone	25
Discussion thereon and estimates framed	26
Sole aim of the several projections of making the canal a safe line of internal navigation.	28
Principle acted on did not admit of regulating works	29
If natural conditions were permanent, above principle correct	30
Recurrence of cyclones	31
General condition of canal after cyclone	32
Hence the principle of non-regulation cannot be maintained	33
Measures necessary to be adopted for regulation	34
Principles upon which the completion estimates are based	35
Reasons for and against the construction of locks as regulating works	36
Flood-gates	37
Their description	*ib.*
Their utility	38
General provisions under which the present estimate has been framed—	
(1) Isolation of reaches	39
(2) Treatment of minor cross drainages	
(3) Unnecessary river bars to be closed	
(4) Result of experience of cyclones	
(5) Detail of construction of canal	

	PARAS.
(6) Shallow rivers to be embanked	39
(7) Diversion lines to be formed	
(8) Canal removed where necessary out of backwaters	
(9) Boat basins and lay-byes to be provided	
(10) New bridges constructed and existing ones altered	
(11) Inspection bungalows and accommodations for toll establishments	
(12) Terminal basin at Madras to be improved	
Method of dealing with different reaches of the canal	40
Junction cut from Buckingham canal to Commamur canal	41
Pedda Ganjam to Gundlakamma river, 8 miles	42
Gundlakamma river to Mudigondi river, 3 miles	43
Mudigondi river to Moosee river, 14 miles	44
Moosee river to Palairu river, 1 mile	45
Palairu river to Mannairu river, 8 miles	46
Mannairu river to Elikaru river, 10 miles	47
Elikaru river to Chippalairu river, 18 miles	48
Chippalairu river to Pydaru river drainage, 9 miles	49
Pydaru river to the Pennér river, 7 miles	50
Pennér river reach, 2½ miles	51
Pennér river to Gungapatam river, 3½ miles	52
Gungapatam river to Kódúr river, 9½ miles	53
Kódúr river to Nalatúr river, 6 miles	54
Nalatúr river to Kundalairu river, 5½ miles	55
Kundalairu river to Swarnamukhi river, 14 miles	56
Swarnamukhi river to Dugarázpatnam river, 8½ miles	57
Dugarázpatnam river to Coromandel, 41 miles	58
Coromandel to Arni river, 3 miles	59
Arni river to Ennore backwater, 13 miles	60
Ennore backwater to Cooum river, 11 miles	61
Cooum river, 1 mile	62
The Junction and Southern canal	63
Adyar to Covelong, 15 miles	64
Covelong to Kokkelamodu, 16 miles	65
Kokkelamodu to Pálár river, 8 miles	66
General summary of estimates	67
Substitution in certain items of estimate proposed	*ib.*
Total outlay on the work	68
Soil in foundations of masonry works	69
Data for rates allowed in estimates	70
Particulars of traffic	71
Description of boats plying on the canal	72
Registration of tides	73
Limiting levels for determining improvements to canal	*ib.*
Peculiar circumstances of certain reaches in the canal	74
Necessitating reclamation of the backwaters with which they are connected	75
Instances of the Pulicat lake	*ib.*
Proposed method of reclamation	76
Resultant benefits derived from the canal	77

NOTE.—The figures entered in the margin of the report thus, $\frac{134}{III}$ to $\frac{132}{VI}$, denote miles and furlongs.

REPORT ON THE BUCKINGHAM CANAL.

Fund.—Provincial.

Financial Head.—33, Irrigation and Navigation.

Budget Head.—Works for which Capital and Revenue Accounts are kept: Capital Account.

Departmental Head.—Works.

Name of Work.—Buckingham Canal.

REFERENCES.

G.O.,	No. 2153-A,	dated	17th August	1876.
Do.	,, 920,	,,	17th March	1877.
Do.	,, 1238,	,,	10th April	,,
Do.	,, 266 W.,	,,	18th June	,,
Do.	,, 845 W.,	,,	19th February	1878.
Do.	,, 283 W.,	,,	6th ,,	1880.
Do.	,, 284 W.,	,,	6th ,,	,,
Do.	,, 2080 W.,	,,	3rd September	,,
Do.	,, 2081 W.,	,,	3rd ,,	,,

REPORT.

Position of the canal.

THE Buckingham canal is a salt-water Canal (tidal to a great extent whenever the river bars are open) extending along the east coast of the Madras Presidency, southwards 66 miles, from Madras to Merkanam, and northwards 195 miles, from Madras to Pedda Ganjam, at which place communication is made (at the end of the high level Commamur channel) with the fresh-water canal system of the delta of the Kistna, which again communicates with the canal system of the delta of the Godávari.

Length of main navigable canals.

2. The total length of main navigable canal to Cocanada and northwards thus made available is as below, viz. :—

		MILES.
Buckingham canal		261
High level canals (Commamur channel)	of the Kistna delta systems.	112
Do. do.	of the Godávari do.	89
	Total ...	462

this length being exclusive of any but the direct line of fresh-water canal from Pedda Ganjam to Sámalkót, viz., Bezváda, Ellore, Dowlaishweram, and Cocanada ; though the branch canals of the Kistna and Godávari will, no doubt, acting as feeders, bring much traffic to the main line.

Distance from the sea.

3. The canal runs within 3 miles of the sea-coast throughout its entire length and in many parts is within half-a-mile of it.

General nature of the country in which the canal is made.

4. The general features of many parts of the east coast of the southern portion of India are briefly as follows :—

Close to the sea there is generally a line of sand dunes, between which and, frequently, a second line of dunes there is a hollow which may be taken as the result of the action of waves, currents and winds on the extension of the coast line eastward, due to the silt, &c., brought down by each river into the sea. These hollows, frequently forming backwaters, are filled with water, and are of sufficient depth in many places for navigation, being supplied with sea-water through the bars of the rivers with which they are in connection.

How these natural features have been taken advantage of for navigation.

5. Early in this century (1801) the narrow strips of backwater found at the mouth of the river Kortalayár suggested to Mr. Heefke to obtain from Government permission to cut a canal, about 11 miles in length, from Madras to the southern end of the Ennore backwater ; this permission was granted, and Mr. Basil Cochrane was the surety to Government for the terms being complied with.

Cochrane's canal, 6 miles.

Katupalli canal, 8 miles.

The contractor, Mr. Heefke, and Mr. Cochrane ultimately obtained the whole control of the canal—completed the section of the canal from Madras to Ennore backwater in 1806. Some cuts were also made near Katupalli between the backwaters so as to complete the communication with the Pulicat lake, 27 miles distant from Madras. Mr. Cochrane became sole proprietor of the canal for a period of 45 years, dating from 1st November 1802, with permission to levy tolls on it. In 1837,

he having left India, the canal got into bad order, and Government took it over, paying to him Rs. 14,061 a-year, which was the average amount he had been realising from the traffic, until 1847, when his lease expired.

Condition of the canal in 1852.

6. Such was the commencement of the East Coast canal, and from the condition of the waterway, as shown in appendix II of the first report of the Madras Public Works Commissioners, there had, by 1852, been great silting up of the bed. The system followed in construction was merely that of joining the backwaters in the cheapest manner possible.

Shadayankuppam lock at 7 miles 3 furlongs.

7. The Shadayankuppam lock, 7 miles from Madras, was commenced in 1854, with the object of keeping the level of the water in Cochrane's canal high during periods when the Kortalayár bar at Ennore is open. It was originally sanctioned at 16 feet wide and 105 feet long, but Captain Chambers, R.E., the then Superintendent, obtained permission during its construction to alter it to 20 feet wide and 150 feet long.

Pulicat Lake to Dugarazpatnam, 44 miles (77 miles in Commissioners' Report).

8. In the first report of the Public Works Commissioners, compiled in 1852, appendix II, paragraphs 27, 28, notice is taken of improvements to the canal by extending it to Dugarázpatnam, 69 miles from Madras, from the northern end of the Pulicat lake; along this line strips of backwater more or less were found, so that the cutting was not heavy and the work was in progress in 1854, and is shown by the progress report for 1856-57 to have been "recently extended" to Dugarázpatnam. In the same year improvements were also made to Cochrane's canal to the extent of Rs. 72,800, inclusive of the Shadayankuppam lock, estimated to cost Rs. 25,000.

Dugarazpatnam to Kistnapatam, 21 miles.

9. In the same progress report mention is made of a proposed extension of the East Coast canal from Dugarázpatnam to Kistnapatam backwater (the estimated cost being Rs. 1,13,665) as having been included in the budget of 1855-56, and the project was recommended to the Honorable Court of Directors in 1855; this estimate was framed by Captain Chambers, R.E., but was not carried out. As shown by G.O., No. 189, of the 20th January 1865, Mr. W. Fraser, C.E., was engaged about that time in a comparison between the merits of Captain Chambers' design of December 1854 and one proposed by Mr. Kennedy in November 1863, and estimated to cost Rs. 2,35,000. Government, however, were unable to provide funds for either.

Estimate and expenditure on the above section.

10. Captain Hasted, R.E., in June 1870, submitted a revised estimate of Rs. 2,87,000 for this section of the canal, which was at the time being cut, following Captain Chambers' line in preference to Mr. Kennedy's; the estimate of Rs. 2,35,000 for the latter was, however, the one on which the work was executed—

		Rs.
The expenditure in	1867-68 was	6,248
Do.	1868-69	64,796
Do.	1869-70	35,154
Do.	1870-71	29,827

when work was suspended under G.O., No. 274, of 28th January 1873. Funds were provided for the remainder of the work on Colonel Hasted's estimate, and orders were given to push on the work in 1873-74 from Provincial funds, and work to the extent of Rs. 67,000 was carried out in that year; Rs. 59,845 were expended in the year 1874-75, the section being completed in 1876-77 at a total cost of Rs. 2,85,532, thereby placing Nellore in easy communication (with a short length of road from Kistnapatam) by water with Madras. This section was reported open for traffic in May 1875, the portion up to Siddaveram having been made by Mr. Fraser, and from Siddaveram to the Kundalairu by Lieutenant C. B. Henderson, R.E.

Kistnapatam to Penner river, 24 miles.

11. The next section of the East Coast canal undertaken was that from the Kundalairu river, close to Kistnapatam, to the Pennér river. The work was sanctioned under G.O., No. 814, of the 23rd March 1875, and the line followed is for

the most part identical with that proposed by Captain Chambers nineteen years before; the estimate amounted to Rs. 2,74,000. In G.O., No. 266 W., of the 18th June 1877, certain modifications, including the Kistnapatam basin, were sanctioned, estimated by Mr. O'Shaughnessy to cause an addition of Rs. 14,100. This section was commenced by contract in 1875-76, in which year 25,000 rupees were spent on it, Rs. 1,71,658 being spent in 1876-77. Six miles were completed by November 1876. In the year 1877-78 this section was employed as a famine work for the distressed of the Nellore district, Rs. 1,06,755 being expended, and the work completed in 1878-79 at a total cost of Rs. 3,63,536. This section was open for traffic in May 1877; having been under Lieutenant C. B. Henderson, R.E., from 1873—75, under Lieutenant Cotter, R.E., in 1876, and, lastly, under Sub-Engineer Ottmann and Supervisor Stephens.

Penner to Pedda Ganjam, 82 miles.

12. G.O., No. 1302, of 24th May 1876, shows the state of the work up to that date, and points to the anxiety of Government to complete at an early date the communication with the Godávári and Kistna systems of navigation. Lieutenant Cotter, R.E., in June 1875, had reported on the section from the Pennér to the Chippalairu, and had pointed out that the high floods of October 1874 in the Pennér had altered the features of that river since Captain Chambers had selected his line as being the most suitable one for the canal.

Famine work.

13. The pressure of famine being very severe in the districts to the west of Nellore, it was decided in G.O., No. 3060, of 15th November 1876, that this section of canal should be immediately proceeded with by famine labor imported from the Bellary, Kurnool, and Cuddapah districts. Under the orders of Mr. O'Shaughnessy, the District Engineer of Nellore, Lieutenant C. B. Henderson, R.E., was directed to lay out the section of canal between the Pennér and Chippalairu, and he did so, following,

Penner to Chipplairu river, 18 miles.

where practicable, Captain Chambers' line and giving a bed width of 30 feet with side slopes of $2\frac{1}{2}$ to 1. The bed of the canal was fixed at $3\frac{1}{2}$ feet below a mean of all low-tides recorded for six months, and 3 feet below the lowest recorded spring-tides. This section was ordered to be carried out by 10,000 coolies from Bellary and Kurnool. After laying out the portion to the Chippalairu, Lieutenant C. B. Henderson, R.E., was directed to survey and lay out the section to the north of the Chippalairu for the employment of a second batch of 10,000 coolies.

Chippalairu northwards for 22 miles.

Northern 42 miles to Pedda Ganjam.

14. At the same time Lieutenant C. C. Rawson, R.E., was directed to commence at Pedda Ganjam and survey and set out work for the employment of 20,000 more coolies on 42 miles.

Surveys and estimates delayed owing to supervision of actual work in progress.

15. The surveys and estimates were pushed on as quickly as practicable, but in this case, as in all the famine works, it was primarily necessary to employ and pay or feed the coolies, and so the work of projection and estimation had necessarily to take a secondary place; however, Lieutenant Henderson, R.E., in the Pennér to Mannairu section, and Mr. deGrousillers, an Executive Engineer of the Bengal Public Works Department, in the Mannairu to Pedda Ganjam, nevertheless, pushed on the plans and estimates quickly, at the same time that they supervised the execution of the works.

Comparison between the line proposed by Captain Chambers and adopted.

16. In his original report on the Pennér-to-Pedda-Ganjam section of the canal, Mr. O'Shaughnessy states that the line is generally the same as that selected by Captain Chambers in 1855, but that certain deviations had to be made; in the first four miles a deviation to the westward was made, as Captain Chambers' line was too near the sea; in the 7th and 8th miles a deviation was made to avoid cutting through a high ridge; in the 10th to the 14th miles a deviation was made to obtain a sufficient cutting for towpaths and embankments; in the 15th mile a deviation to avoid a deep cutting was made. Between the Chippalairu (about the 20th mile) and the 52nd mile north of the Pennér no deviation was made from Captain Chambers' line; from the 52nd to the 56th miles a trifling deviation was also made to carry the line further from the sea. A considerable deviation was made from the Moosee river, near Ethamukala, to the Ongole road, between the

56th and 63rd miles, to avoid a very heavy cutting through sand, and also to keep clear of some valuable land.

Bed level.

17. In regard to the level of the bed, Mr. O'Shaughnessy writes:—"Hitherto $4\frac{1}{2}$ feet below mean tide level has been the specified depth of the canal. It was supposed that the range of tides was about 3 feet, and that a depth of $4\frac{1}{2}$ feet below M.S.L. would give a minimum depth of 3 feet for navigation at low-tide. * * * It has been found, however, that the range of the tides is more than 3 feet at Kistnapatam; a gauge has registered a range of 3 feet 10 inches, and at the Mannairu, 71 miles further north of the gauge, has shown a difference of level between high and low water of spring-tides of over 4 feet; if the canal was cut to $4\frac{1}{2}$ feet below mean tide in those reaches, there would be only 2 feet 6 inches or 2 feet 7 inches of water at low-tide, or about 6 inches less than the depth required."

Errors in the levels of canal between Kistnapatam and Penner river.

18. Mr. O'Shaughnessy points out that this error has been carried through the section between Kistnapatam and the Pennér, but to the north of the latter river it has been avoided by fixing gauges at the open bars and cutting the canal out to a depth of 3 feet below the lowest readings on the gauges.

Bed width.

The width at the bed was made 30 feet, with side slopes

Canal slopes.

of 2, $2\frac{1}{2}$ and 3 to 1, according to the nature of the soil.

Total excavation.

Estimated rate.

19. Mr. O'Shaughnessy estimated that the whole excavation required for the canal from the Pennér to Pedda Ganjam would be 8,652,146 cubic yards at 1 anna 10 pies per yard, and his subsequent report shows that, in actual working, 7,959,708 cubic yards completed by the end of May 1878 had cost, on an average, 2 annas $2\frac{3}{4}$ pies per yard, an excess which he had attributed to the employment of famine labor.

Amount of work done.

Total length of canal cut in thirteen months.

Number of people employed on the work.

20. The same officer reports that including $16\frac{1}{4}$ miles of the Kistnapatam-to-Pennér section and $16\frac{3}{4}$ miles of new canal along the margin of the Pulicat lake, a total length of $11\frac{5}{8}$ miles of canal were open to traffic between December 1876 and January 1878, and gave employment to an average of 32,000 work-people daily, while the greatest number of people on the work at one time was 61,200 (or, including women and children, 100,000 persons were at one time on the work during the famine); and he concludes his report by an allusion to the fact that he had asked for and obtained permission from His Grace the Duke of Buckingham to name the canal after him. It may here be observed that the portion of the canal from Madras to Ennore appears to have been originally (*vide* atlas sheet No. 78) named after the great Lord Clive. The designation subsequently applied to the work, "East Coast Canal," so distinctly pointed to the position of the work on the map of India that it seems doubtful whether, looking also to the fact that Government did not take the initiative in the matter, His Grace did not permit it to be called after himself rather than wound the feelings of an energetic District Engineer, during whose charge of the Nellore division the junction with Kistna system of canals had been completed. That the work was no new design, but had been steadily prosecuted, at intervals, ever since the beginning of the century, especially in the years 1867 to 1870, and with even more vigor again in the years 1872 to 1875, will have been observed from the history as above narrated. The designation of the work as the Buckingham canal is, however, so far the accepted one, that there is now no sufficient reason for again altering it.

Named after His Grace the Duke of Buckingham at Mr. O'Shaughnessy's request.

Portion previously named after Lord Clive.

East Coast Canal a more suitable name.

Southern canal.

21. Turning to the Southern canal, Colonel Foord's memorandum, dated the 29th November 1878, printed with G.O., No. 1102, of the 20th May 1879, puts on

record, in paragraphs 26 to 47, the whole history of the work, which is quoted below for ready reference:—

"26. The project of excavating a canal along the eastern coast between the Adyar and the Pálár, with the view of perfecting the long line of inland water communication north and south of Madras, was brought forward for consideration in the year 1854. Two points in connection with this project particularly claimed attention—

"(1) The possibility of keeping the canal navigable throughout the year; and

"(2) The substitution of masonry bridges in lieu of ferries, recommended by the Chief Engineer, at each of the places where the road crossed the proposed water communication.

"27. The Chief Engineer, who made a personal examination of the canal, reported that it was quite possible to keep up an unfailing supply of water, averaging 4 feet 6 inches, in seasons of the greatest drought, by artificial cuttings of the bars at Covelong and at the mouth of the Pálár. This result, however, could only be attained by a proper system of locks with a sluice or calingulah at Covelong for the admission of tidal water. Bridges were also recommended at three places. The whole cost of the work was estimated at Rs. 2,21,800.

"28. The length of the canal was to be 40 miles. The first section extended from the river Adyar to the town of Sadras, a distance of 35 miles. This section was commenced in May 1855 and completed in the early part of March 1857, with a surface width of 45 feet and a depth varying from 3 feet 6 inches to 4 feet 6 inches. Boats drawing 1 foot 6 inches were, in March 1857, enabled to use this section throughout, and it was calculated that there would be sufficient water for passenger traffic and the transport of light goods even when the Adyar, Covelong, and Yeroor bars were closed.

"29. The expenditure on the canal amounted to Rs. 1,75,500, against the sanctioned estimate of Rs. 2,21,800.

"30. The extension to the river Pálár, 5 miles south of Sadras, was estimated to cost Rs. 54,750. The average cost of the 40 miles of canal between the rivers Pálár and Adyar, including five large bridges, each 60 feet span, was thus Rs. 7,000 per mile.

"31. In March 1857 an estimate, amounting to Rs. 7,800, was sanctioned for completion of a cut through pure sand, close to the sea, between

G.O., No. 414, of 4th March 1857.

Sadras and the Pálár, $1\frac{1}{2}$ miles in length.

The object of the work was to improve the alignment.

In the same year a committee was appointed to consider the question of the existing navigation, and the measures necessary for its improvement and extension. As regards the Southern canal, the committee recommended the establishment of landing places in different parts of Madras, with the view of bringing the Cooum into use for purposes of traffic, the connection of the canal with the Cooum at its northern and with the Pálár at its southern end, and the construction of feeder roads. The

G.O., No. 166, dated 29th January 1858.

Government recognised the importance of the proposed measures, and called for plans and estimates.

"33. The estimate of Rs. 7,800, sanctioned in March 1857, for the extension of the canal,

G.O., No. 2844, dated 7th December 1859.

from Sadras to the Pálár river, was, in December 1859, superseded in favor of an estimate of Rs. 21,000. This estimate provided for the alignment being taken further inland.

"34. In July 1861 the Government, on a representation of the Chief Engineer, urging the

G.O., No. 1273, dated 10th July 1861.

commencement of the work, remarked that they did not see sufficient prospect of its proving so remunerative as to then justify the proposed large outlay. It was intimated, however, that as it was intended ultimately to connect the canal terminus at the Adyar with the Northern canal, the scheme would be considered as a whole.

"35. The estimate of Rs. 2,21,800 for the Sadras canal was subsequently reduced to

G.O., No. 814, dated 23rd April 1862.

Rs. 2,18,873, and of this sum Rs. 1,91,000 were spent, when further outlay was suspended for financial reasons, leaving the canal incomplete. In April 1862 the Government sanctioned a further expenditure of Rs. 29,000 for deepening and widening the canal between the Sadras river and Salangoopum. This estimate provided for deepening the southern portion of the canal to $4\frac{3}{4}$ feet below mean tide, and was designed to comlpete the canal as allowed for by the estimate of Rs. 2,18,873.

"36. One of the main considerations in sanctioning the Sadras canal was its capability of being prolonged to Cuddalore, to join there the canal from Porto Novo, which again is connected with the line of water communication between Coimbatore and the sea-coast through the district of Tanjore. This section of canal was sanctioned by the Government of India in July 1853 at an estimated cost of Rs. 40,000, and provided for connecting the ports of Porto Novo and Cuddalore by a cutting from the river Vellár, near Porto Novo, to the Paravanár or Cuddalore river. The canal was designed to give sea-outlet to the traffic carried by the navigation of the Coleroon and Vellár rivers, the former of which runs inland a distance of 150 miles through Tanjore and Trichinopoly into Coimbatore.

"37. There being through water communication along the coast from the Adyar to Sadras, and from Cuddalore to Porto Novo, it was proposed, in March 1856, to excavate a canal

through the intervening country. The project was originally framed as a prolongation of the Sadras canal all the way to Cuddalore, a distance of 59 miles, but the southern part of the canal appearing to need more careful investigation, and arrangements having to be made with the French authorities for the passage of the canal through French territory, the Madras Government laid before the Government of India only a portion of the project, which included 34 miles of canal, estimated to cost Rs. 3,75,000.

"38. The canal was to be cut to a depth of 4½ feet below mean tide, and it was believed that even at the worst season there would be sufficient water in it for passenger and light cargo boats. The framer of the project provided for no locks, preferring to add them afterwards if found necessary; the bed of the canal being left to be acted upon by the flux and reflux of the tide, and to be scoured by the passage of the land drainage to the sea. The Chief Engineer, however, included two locks and falls, being of opinion that in a tract so destitute of large streams sufficient scour would not be obtained. Instead of admitting the intercepted minor drainage into the canal, the Chief Engineer proposed to lead it, wherever practicable, along the outside of the western bank by small channels until it reached a backwater or other main drainage, into which it would be made to enter at some distance from the navigation. Three bridges of masonry and three of timber were provided. The section allowed for the cutting gave a bottom width of 20 yards. This width was considered necessary in consequence of the sandy nature of the soil. Some difficulty was anticipated in keeping the canal free from sand-drifts, and it was intended to plant the top of the banks with palmyra as a protection, and the slopes with shrubs and marine creepers. In some places the banks were considered to require puddling.

"39. The Government of India took exception to the project, on the ground that it did not appear clear how its level could be steadily maintained unless there were a lock at each point where it enters and emerges from the tidal lagoons, through which it passes. To this it was replied that though locks formed no part of the original project, yet two were included in the revised estimate drawn up in the Chief Engineer's office, that such works would not have been thought so indispensable to maintain a sufficient depth for navigation had the fact been known that the extreme difference of level between spring and neap tides in the backwaters is under 2 feet, while the actual rise and fall is only from 6 to 9 inches; and that the depth of the bed of the canal being assumed at 4 feet 6 inches below mean tide, and the fall of tide in neaps being, as above stated, only 1 foot below this level, the minimum depth of water, lasting perhaps not more than a few hours once a fortnight, would still be 3 feet 6 inches. It was added that the locks introduced into the project in the central office were doubtless intended for increasing the depth of water in the canal by the retention of land floods, and, though not quite sufficient in number to effect that object entirely, would still add greatly to the efficiency of the communication. The framer of the project, Lieutenant Chambers, was, however, of opinion that tidal locks in estuaries with such little rise and fall as those on the east coast are not of unmixed good to the canals on which they are constructed. He held that in connection with weirs, their adjuncts, they offer obstruction to the free flux and reflux of the tidal wave, and diminish greatly its scouring power; and he was of opinion, therefore, that their construction need not be simultaneous with the establishment of any one section of the coast line; in fact, that the locks should not be built until experience shall have pointed out their necessity or utility, or at least not until after a few years' scour, to allow the banks, berms, and sides of the main channel, and of the drainage cuts of a tidal canal, to assume their normal shapes and slopes. These views were concurred in generally by the Superintending and Chief Engineers, the latter of whom remarked that the two locks added to the estimate were intended for the junction of the canal with the estuary of the Pálár on the north, and that of the Merkanam river on the south, between which points there exist no drainage outfalls which may not be regulated by simple weirs, which, being provided with ample sluices, will always admit as much tidal water as will keep the canal full when the bars are open. The Chief Engineer added that the locks would, in his opinion, be necessary to prevent or retard the subsidence of the canal surface with the evaporation of the backwaters during the hot season. When fully completed the canal would, the Chief Engineer stated, form one long backwater or lagoon, receiving all the drainage of the country it traverses, and discharging the surplus by the waste weirs, both intermediate and terminal, and that on the proper construction of these works would greatly depened the freedom of the channel from deposits.

Letter, No. 462, dated 12th March 1857.

"40. The project was brought forward to the Government of India, for an appropriation of funds, in the budget of 1858-59, but no funds were granted, and the Court of Directors seemed to think that the time* had not then arrived for expending the large amount of money required for the completion of the line of water communication along the east coast of the Presidency.

* Despatch No. 5 of 1858.

"41. The coast canal in the South Arcot and Chingleput districts was again brought forward in connection with the recent famine as suitable work on which to employ the distressed population.

"42. This section, from the south bank of the Pálár to Merkanam at the southern boundary of the Chingleput district, was ordered to be lock-spitted in G.O., No. 412 W., dated 25th January 1878. In August of the same year an estimate of Rs. 1,79,600 was submitted for the execution of work. The total length of this portion of the canal is 20 miles 3 furlongs, which, added to the portion already open, will give a length of 60 miles 6 furlongs from the Adyar.

"43. On leaving the Pálár, the canal, as now aligned, skirts for a short distance a sandy ridge, and is then taken through 3 miles of wet cultivation. It afterwards follows the course of

backwaters almost the whole way to the boundary of the Chingleput district. There is, however, a bit of very high ground, about 2 miles in length, between the Cheyúr and Merkanam backwaters. The cutting required here is 7 yards. The estimate, amounting to Rs. 1,79,600, for this portion of the canal received the final sanction of Government in G.O., No. 2102, dated 9th October 1878, F.R.

"44. From Merkanam to French territory estimates for the canal have been prepared. The cost of the earthwork is estimated at Rs. 3,28,000, and that of the masonry at Rs. 1,19,700. To this a sum of Rs. 45,800 has to be added for compensation for land, making a total of Rs. 4,93,500 for the portion of the canal which is in English territory. For a distance of 2¾ miles the canal runs through French territory. This length is estimated to cost Rs. 1,70,880. The total cost of the portion of the canal between Merkanam and French territory will therefore amount to Rs. 6,64,380.

"45. The section of the canal from the Vellár river, near Porto Novo, to the Paravanár was estimated for in 1878. This section was originally cut in 1856, and was commenced as a famine relief work, but not completed. The excavation was not taken as far as it should have been. A depth of 4½ feet below M.S.L. and 20 feet bottom width has now been allowed, and an estimate, amounting to Rs. 85,855, sanctioned by Government in the Famine Department in G.O., No. 1518, dated 11th July 1878.

"46. In September 1878 an estimate, amounting to Rs. 31,290, was submitted for completing the canal from Vellár, at Porto Novo, southward to the Killiar, which communicates with the Coleroon. The canal was cut more than twenty years ago, but not apparently to the full depth of 4½ feet below M.S.L., and as it has not been repaired since the work was stopped in 1857, there is now a large quantity of silt to be removed. The length to be cleared is 3⅞ miles. The rest of the communication between the Vellár and Coleroon is by a natural backwater.

"47. The following statement shows the estimates sanctioned for the coast canal within Chingleput and South Arcot limits, and the budget provision made in successive years":—

Number.	Work.	Amount of estimate.	Government order sanctioning the work.	Amount appropriated in 1856-57.	1857-58.	1858-59.	1877-78.	1878-79.
		Rs.		Rs.	Rs.	Rs.	Rs.	Rs.
1	Adyar Junction Canal.	*5,02,378	G.O., No. 2874 W., dated 13th July 1878.	..	..	..	†6,12,156	‡ 46,867
2	From Adyar to Pálár.	2,21,873	Government of India, 1st June 1855. G.O., No. 321, of 10th July 1855. G.O., No. 1243, dated 25th June 1857.	1,21,873	40,931	27,396	..	..
3	From Pálár to Merkanam.	1,79,600	G.O., No. 2102, of 9th October 1878, F.R.	..	..	..	..	§ 12,582
4	From Merkanam to the French territory.	4,93,500	Estimates under consideration.	..	..	..	..	..
5	From the French territory to Cuddalore.	1,70,880	Do. do. ..	..	..	..	..	..
6	From Cuddalore to Porto Novo.	40,000	G.O., No. 230, of 17th August 1853.	..	..	..	..	‖ 85,855
		85,855	G.O., No. 1518, of 11th July 1878, F.R.					

* This is the amount at which Mr. Fraser estimated the canal; a revised estimate is under consideration; completed as a famine relief work.

	Actual Outlay.	*Probable Normal Cost.*
	Rs.	Rs.
1876-77	28,305	16,982
1877-78	5,83,851	5,15,556
	†6,12,156	5,32,538
1878-79	‡46,867	44,097

Sanctioned as a famine relief work.

	Actual Outlay.	*Probable Normal Cost.*
	Rs.	Rs.
1878-79, 1st April to 30th September ..	§ 12,582	10,656

Ordered to be carried out as a famine relief work in G.O., No. 1720, of 9th August 1878, F.R.

	‖ *Actual Outlay.*	*Probable Normal Cost.*
	Rs.	Rs.
1877-78	5,555	..
1878-79, 1st April to 30th September ..	5,587	..
	11,142	8,913

21 A. The portion between the Pálár and Mudaliyarkuppam (58 miles south of Madras) was opened for traffic in the latter months of 1880, and from this point down to Merkanam (66 miles south of Madras) was opened for traffic since April of the current year. Boats, prior to 1880, were able only to ply between Madras and the Pálár river (46 miles south of Madras).

Canal beyond Merkanam for a distance of 23½ miles.

22. The portion beyond Merkanam, not included in the present estimate, for a distance of 23½ miles, as far as the northern boundary of French territory (Pondicherry), the line has been surveyed, and for the work an estimate for Rs. 6,64,380 has been prepared, though probably requiring to be again checked and put into shape. This line of canal, though not at present proposed for execution, would form an excellent famine work, and would, it is considered, bring a good deal of traffic to Madras.

Junction canal.

23. For many years it had been in contemplation to cut a canal between the Cooum and Adyar rivers, in order to complete the water communication between the northern and southern canals. This work was carried out under instructions in G.O., No. 3225, of 29th November 1876, the bed of the canal being 20 feet wide and the depth 3 feet below low-water spring-tides with side slopes of 2 to 1. A headway of 9½ feet clear above M.S.L. was ordered to be allowed for all bridges, which gives 6 feet above highest water level of the canal. The bridges are without towpaths, and the span of several of them being only 20 feet is inconvenient. The provision of towpaths, which must subsequently be made, will further contract the already over-restricted space, while the narrowness of the span has added sensibly to the cost of the bridges, owing to the long and heavy wing-walls thereby entailed. While the head of the canal was open to the river Adyar and Cooum, this construction of the waterway was a source of weakness to the bridges owing to the scour set up in the channel; but with the construction of the double lock sanctioned for 1881-82 at the south end of the Junction canal, and which is intended to shut off the Adyar or Cooum floods, whichever may be the highest, all danger of this kind will be at an end.

Cyclone of 1879.

24. As a conclusion to this brief history of the Buckingham canal it may here be noted that before the estimates were submitted in detail for the work done during the famine, and before the banks were protected by well-grown vegetation, that portion of the coast through which it runs to the north of Madras was, in the months of May and November 1879, visited by cyclones, which, though perhaps not of maximum violence, were of sufficient force to damage the works considerably, and to prove clearly the necessity for modifications of the design in many particulars.

Results of cyclone.

25. The several G.Os. quoted at the head of this report under "*References*" show in detail the results of the cyclones alluded to, and Colonel Sankey's memoranda of the 10th April and 29th May 1880, printed therewith, give the conclusions which, up to that time, had been arrived at.

Discussion thereon and estimates framed.

26. Since then certain points of detail have been discussed, and estimates for several portions of the work framed, and had orders passed on them.

27. With a large work of this character carried across the whole drainage of the country, and exposed in an exceptional manner to cyclones of the greatest severity, it would be impossible, without expanding this report to an undesirable length, to note fully in detail the effects that have been produced by these occurrences, or to set forth all the reasons for the modifications and improvements now considered essential, in order to give the desired stability to the work, and make it a safe line of internal navigation throughout the year.

Sole aim of the several projections of making the canal a safe line of internal navigation.

28. As will have been gathered from the history of the work above narrated, the sole aim of the several projects has been to cut a navigable canal close to the sea-coast, taking advantage of all back-waters and depressions lying to the west of the outer line of sand dunes, so as to minimise the amount of excavation, and, necessarily, therefore, the expense.

Principle acted on did not admit of regulating works.

29. With the one exception of the lock at Shadayankuppam (specially constructed in the interests of Madras sanitation), there were practically no regulating works of any kind. The principle acted on of simply improving a line indicated as it were by nature, allowing rivers and drainages to spill across the canal uninterruptedly on their way to the sea, did not admit of any regulating works which would cause obstruction. As explained by Sir Arthur Cotton, the object to be aimed at was the construction of an "effective" work at the least possible outlay.

If natural conditions were permanent, above principle correct.

30. If the conditions which exist in all ordinary years were only permanent, none would be disposed to question the thorough soundness of this principle.

Recurrence of cyclones.

31. Unfortunately, however, experience has shown that the disturbing elements, chiefly cyclone floods, &c., which occur every eight or ten years, and with especial violence to the north of Madras, must be taken into account.

General condition of canal after cyclone.

32. In only two or three portions of the line of channel is a beneficial scour set up by the retiring land floods, and elsewhere the tendency, at such times, is to deposit silt, and in some places (particularly in the neighbourhood of the several river mouths and across their deltas) to very nearly, if not entirely, fill up the whole of the bed.

Hence the principle of non-regulation cannot be maintained.

33. It has thus been incontestibly proved that the principle of non-regulation cannot be maintained if the very serious recurring charges, due to re-opening periodically the channel, are to be avoided, and if the requisite permanence and stability is to be given to the trade, which has not only sprung into vigorous existence throughout the whole line, but which is rapidly increasing as shown by the returns.

Measures necessary to be adopted for regulation.

34. The recognition of the necessity for regulation throughout the work involves the (1) adoption of means for isolating the several reaches of the canal which intervene between the respective drainages, so as to exclude, whenever desired, all extraordinary floods, and (2) the training of all rivers and drainages as they cross the line of canal, so as to give clear and sufficiently deep crossings at such points for the passage of boats.

Principles upon which the completion estimates are based.

35. The provisions to which the adoption of these principles have necessarily led are specified below, as being those upon which the estimate now framed has been based; and as it is to be hoped that the reasons for the provisions detailed in each case may be sufficiently obvious, it is only necessary here to advert briefly to the preference which has been given to flood-gates at the ends of the several reaches instead of regular locks.

Reasons for and against the construction of locks as regulating works.

36. Locks, no doubt, would have a specific value in retaining throughout a great portion of the year a higher water level in the several isolated reaches than is possible without them. But, in the *first* place, they are expensive works, and, considering the number necessary, would add very materially to the capital outlay.

Secondly, it is not as yet clearly proved that the actual gain in depth of water as due to their construction would exceed, on the average, 6 inches.

Thirdly, there is the expense of housing and maintaining a large number of lock establishments.

Lastly, and mainly, is the fact that locks would not only delay traffic, but might very seriously impede and drive it away by the illegal exactions which are almost certain to be made by the establishments entertained.

37. To flood-gates opening outwards at the end of each reach of canal these objections do not, as a rule, apply. They will, in fact, consist of a simple pair of gates to be closed only on the occasion of any extraordinary flood by the ordinary establishment entertained generally for the canal.

Flood-gates.

Their description.

38. Their use is simply to isolate each reach on such occasions, and as it has been shown by calculation that if they only prevent the deposit of 6 inches of silt in the channel, it would be economical to place them even in such short reaches as ones of only 2 miles in length. They can also at any future time be turned into locks, if such be considered desirable, by the simple expedient of adding a pair of similar gates at the required distance (120 or 150 feet) from the first set.

Their utility.

39. The general provisions under which the present estimates have been framed are as follows :—

General provisions under which the present estimate has been framed.

(1) Isolation of reaches.

That the canal shall be isolated into reaches between rivers or such other large drainages as require free vent across the line of canal to the sea, each end of such reach being provided with flood-gates, and the channel embanked on both sides, where necessary, so as to keep out the highest known floods, above which level the banks will be constructed 3 feet generally, and in certain places 4 feet; that

(2) Treatment of minor cross drainages.

the ordinary minor land drainage shall be taken into the canal by pipes in places, or by open inlets, where such expedient is feasible, and that all excess drainage water be discharged either at ends of the "reach," or at other convenient places, by means of masonry sluiced outlets; that all river bars which it is unnecessary to keep open

(3) Unnecessary river bars to be closed.

shall be closed, and the floods concentrated into the rivers and other major natural outlets, thereby increasing the depth of the channels, and correspondingly improving the crossing of the canal. From the experience gained in two successive

(4) Results of experience of cyclones.

cyclone years, it has been distinctly demonstrated that many of the bars referred to are superfluous, and that land and river floods, if left unregulated, have a tendency to spill in all directions, thus clearly showing the necessity for minimising the number of bars to those absolutely essential for the discharge of the drainage which must find its way to the sea; that by regulating river floods and preventing spill, the canal can be secured, as a rule, from nearly all injury by floods, and the number of drainage outlets reduced to a minimum; that as the nature of the country along the coast does not permit of the discharge of surplus water at all the existing crossings by means of masonry outlets, such works are, as a rule, avoided, and, as already stated, the floods are concentrated on certain selected major openings, and regulated in the manner above noticed; that the canal be given generally a bottom

(5) Detail of construction of canal.

width of 20 feet, side slopes 4 to 1 or less and a depth of 3 feet below lowest recorded tide in each "reach;" that the embankments be made up to 3 and 4 feet above the highest known flood according to circumstances; that all diversions found necessary have a similar cross section to that above specified up to the tow-path, which will be 6 feet wide, the slope of the embankment being 2 to 1; that beyond the tow-path shall be berms of 15 feet, excepting in cases where the ground is at or below tow-path level, when the berm shall be 21 feet, the tow-path being always made up to the standard 4·5 feet above M.S.L.; that all embankments much exposed to the action of floods shall be 10 feet wide at top, slopes 2 to 1 on the canal side, 3 to 1 outside, other banks being given a width of 6 feet at top, but with the same slopes; that the cutting and bank slopes shall be turfed or planted with rabbit wort

(6) Shallow rivers to be embanked.

or other suitable vegetation; that rivers which, owing to the shallowness of their beds as they approach the sea, throw out spill water over the country, shall have their waters confined by flood-banks, the operations, however, of this character being

restricted to such rivers only as have been proved in cyclone years to require this mode of treatment; that the crossings of certain rivers shall be improved by excavating diversion lines and by training works, and, as in the case of Pálár and Pennér rivers, by concentrating the several defluents into one main channel; that where experience has proved it to be necessary, the canal shall be removed out of the backwaters, and a new independent channel excavated, leaving the backwaters for drainage, it having been proved that the maintenance of canal in such positions is both difficult and expensive, and navigation toilsome and risky; that boat basins shall be provided at the places where experience has shown such to be necessary; that bridges shall be constructed only at such places (and these very few in number) where their necessity has been indisputably established; that certain existing bridges shall be altered so as to give the requisite headway; that necessary inspection bungalows, rest-houses, overseers' quarters, toll offices, and lines shall be provided for meeting the requirements of the canal employés and of the travelling public; that the basin at Madras shall be improved and extended to meet ascertained demands of traffic.

(7) Diversion lines to be formed.

(8) Canal removed, where necessary, out of backwaters.

(9) Boat basins and lay-byes to be provided.

(10) New bridges constructed and existing ones altered.

(11) Inspection bungalows and accommodations for toll establishments.

(12) Terminal basin at Madras to be improved.

40. The following notes on the mode of dealing with each of the reaches of the canal, so as to render them complete in every way, show how the provisions above laid down are to be now applied.

Method of dealing with different reaches of the canal.

41. As experience has shown that this section* has not, as a rule, suffered from the effects of cyclone floods, it is not proposed to isolate the reaches, and the work is therefore of an ordinary character calling for no special remarks.

Junction cut from Buckingham canal to Commamur canal.

* Section VI of estimate of Northern canal.

42. It is proposed to isolate this reach by "flood-gates" at the ends, with outlet at selected places, to embank out the Raperla and Oopoogoondur swamp drainages, which spill over the Kanuparti ridge, and to construct a flood-bank for cutting off the Gundlakamma river spill, these measures being necessary to obviate necessity for keeping an opening in the canal near the Kanuparti bar. At this latter place a *diversion*† of canal is proposed in order to take the channel further from sea than it is at present. From the Gundlakamma river to Pedda Ganjam there is a rising ground, on which the village of Kanuparti stands; if the low places at certain points of this ridge are banked off, and spill of river floods diverted by judiciously placed banks, the reach (closed as it will be at each end by flood-gates) should be sufficiently secure, especially as, otherwise, there is but little land drainage to be taken into the canal. On the east or sea side, however, of this reach, the ground being low and exposed, the canal bank will have to be strengthened, and further rendered secure by cross and training banks at all the old bars which are to be closed as being unnecessary.

Index survey sheet No. $\frac{8}{8}$.

Pedda Ganjam to Gundlakamma river, 8 miles.

Section V as per general abstract.

† $\frac{191}{IV}$ to $\frac{190}{111\frac{1}{2}}$.

It may be necessary hereafter in this reach to provide for other embankments at the south end of the Kanuparti ‡ ridge, but at present it is considered needless to provide specifically for these. The land drainage on west side of Kanuparti ridge finds an outlet northwards, through swamp already referred to, to the large masonry outlet at Pedda Ganjam, § which is now being built by the officers of the Western Kistna division.

‡ $\frac{190}{IV}$.

§ 195 M.

43. This reach is necessarily short, as the Mudigondi opening must be maintained. It will be isolated by flood-gates, embankments; also by a flood-bank for directing the spill of the Gundlakamma river. The eastern, or sea-side, bank of the canal in this reach has to be very strong, as the ground up to the sea-shore is very low and exposed. The western bank also requires to be strong, as being much exposed to the Mudigondi floods.

Gundlakamma river to Mudigondi river, 3 miles.

It will be well to mention here that, although the Mudigondi stream itself is insignificant, when the floods are supplemented by the spill of the Gundlakamma river on one side, and those of the Moosee-Enegelaru spill on the other, a large quantity of water is banked up and becomes dangerous to the canal. When once the proposed flood-banks, however, have been carried out, it is considered that no further danger here need be apprehended.

44. This reach is a large one, but exposed only at the north end for some five miles to Mudigondi floods, and also for about three miles to the effects of storm waves from the sea side. This reach will be isolated by flood-gates, outlet sluices, embankments; also by a flood-bank for the Moosee river. With the elevated line of coast from Kotapatam * to near the Moosee river there is no need for a high canal bank on that side, as also from Thondaroo to Moosee. On certain occasions the flood-waters of the Moosee and Enegaleru have been known to extend from near the trunk road on one side up to the sand ridges of the coast line, thus forming a vast sea of water. This was, in fact, twice experienced during construction of canal in this reach, and the Thondaroo drainage is believed to have been formed by these floods. To deal effectually with this reach it is proposed to *abandon* † that portion of the line which runs through the Thondaroo drainage, which is a deep pool of fluid mud, and in which the channel as now formed cannot (as shown by experience) be maintained at the proper depth without undue expenditure.

Mudigondi river to the Moosee river, 14 miles.

* 179 M.

† $\frac{177}{VII}$ to 177.

45. The Moosee and Palairu river reach is short and difficult, if not impossible, to maintain as now existing. This reach will be isolated by flood-gates and strong banks, but even with these this short piece of canal is so much exposed to rapid silting that it is considered highly desirable, in order to provide against all inconvenience being experienced by traffic, to have an alternative portion of canal close alongside, which can be used while the main line is being cleared.

Moosee river to Palairu river, 1 mile.

The Moosee ‡ river makes an awkward bend at the crossing which it is proposed to cut through, in order to rectify this objectionable feature. The banks of the Moosee river on the left side for about 4 furlongs (up to village) are also to be levelled down, so as to give the river a perfectly free spill. Experience has shown that where perfect isolation cannot be secured by means of sufficiently high banks, &c., the less the obstruction opposed to the flood the better, even at cost of having to maintain yearly the open reach of canal up to the flood-gates. In this case the latter will be placed near the village of Anantapuram.§

‡ 169 M.

§ 170 M.

46. This reach suffers severely every year, and has been much injured by the cyclones of 1879 and 1880. It will be isolated by flood-gates and by strong embankments and by flood-banks to both rivers to train the spill water. Outlets are also needed. The east or sea side bank must be strongly constructed, as the coast line is low and exposed, and the sea very close to canal. In 1879 the storm wave from the sea reached nearly to top of banks. The west bank, when once the land floods are regulated in the manner proposed, need not be very strong, as the only drainage of any importance derived from surplus is that from the Pakala ‖ tank series. As this terminal reservoir rarely, however, gets a full supply, no apprehension need exist respecting it. This part of canal reach is also exposed to the spill of the Palairu ¶ river,

The Palairu river to Mannairu river, 8 miles.

‖ 166 M.

¶ 168 M.

which the proposed flood-bank will dispose of. At the other end, the rising ground at Singaroyeekonda acts as a sufficient protection, and there is thus only Binginipally * and Somarazapally † tank drainages to dispose of. None of these tanks are well supplied, and the special arrangements for disposal of their surplus water, such as it is, will be readily made. In order to improve the crossing of the Mannairu river, a *diversion* ‡ of the canal, on the north side for a mile, has shown itself to be necessary. The head of old course of Mannairu must also be closed, in order to afford proper protection to the diversion line from injury by floods.

* 162 M.

† 163 M.

Index survey sheet No. $\frac{5}{6}$.

‡ $\frac{160}{VI}$ to $\frac{159}{VII\frac{1}{2}}$ or Mannairu northern diversion.

All the old river openings and bars in this reach are to be securely closed, it being neither desirable nor necessary that they should be kept open.

47. This reach is protected nearly throughout on both sides by high sand dunes, and will not need much banking for isolation, which will be sufficiently secured by the proposed flood-gates with outlets. At the end next to Mannairu river a short diversion § of canal will be made, to ensure a better crossing than heretofore, as in the storm of November 1880, the river became sensibly widened at the old crossing, 2 furlongs of canal being carried away. The river course will also be trained at the crossing, to ensure a permanent deep channel. At the Elikaru ‖ crossing, training banks on both sides of canal are required to keep flood-water from taking the canal bank in reverse along the swamps, as also to close the second or north Elikaru bar, which it is not at all necessary to keep open.

Mannairu river to Elikaru river, 10 miles.

§ $\frac{159}{VII}$ to $\frac{159}{VI}$ or Mannairu southern diversion.

‖ 151 M.

48. The isolation of this reach is to be ensured by flood-gates and outlets, by training banks to shut off flood, and prevent water through the bar getting behind the banks along the swamps; also by embankments (though of this latter much will not be necessary), and again at the Chippalairu river end by a *diversion* ¶ in the line of canal, in order to avoid the river-bed, along which the navigation is now conducted at serious inconvenience and expense.

Elikaru river to Chippalairu river, 18 miles.

¶ $\frac{134}{III}$ to $\frac{132}{VI}$.

At Chenneyapallem,** the canal cuts through rising ground which extends seaward nearly up to Ramapatam †† bar, and thus obviates the necessity for high banks on that side. Similarly on west side, from Chenneyapallem southward up to the Chippalairu river, the high ground extends, so that here also the canal is naturally protected and requires no high banks. The canal from Chenneyapallem to Chippalairu runs through a depression forming a salt swamp, protected on both sides by high sand dunes. This swamp is under the influence of the Chippalairu tides, so that by training banks from canal running east and west into the high ground this reach can be protected from all floods without the necessity for much banking.

** 145 M.

†† 149 M.

From Chenneyapallem to Ramapatam, on the west side of canal, is all paddy land with tanks. Heretofore this section had but one small opening in bank for outlet of drainage.

Owing to very heavy rainfall of November 1880, this drainage opening became gorged, and a large breach was the result. In the interest of the cultivators and of the canal, it seems best to make several openings for venting the surplus water in similar cases, converting these eventually into masonry works, should experience prove this to be essentially necessary. It is proposed to close permanently the Ramapatam bar, as it is not wanted. All drainage of this reach will discharge itself in both directions to the terminal outlets.

From the proposed diversion of the canal here, a short flood-bank will be carried to Chippalairu river across the low saddle in ridge up to the rising ground, so as to prevent flood-water getting behind the bank.

49. The isolation of this reach will be effected in precisely the same way as that of the preceding reach. Old bars will be closed and training banks run across so as to divert any excess of flood or tide water to the swamps; this will obviate the necessity for any high banking for some miles. Owing to the high ground on both sides, at both Chippalairu and Pydaru ends, short *diversions* * of canal will suffice for ensuring good and safe crossings.

Chippalairu river to Pydaru drainage, 9 miles.

* $\frac{132}{V}$ to $\frac{131}{VII}$, Chippalairu.

$\frac{126}{VII}$ to $\frac{123}{VI}$, Pydaru.

It is proposed to close entirely the opening at Eskapally † and force all drainage by the Pydaru.

† 127 M.

From the Pydaru to Eskapally, being a very exposed and rather difficult reach for navigation, it is intended to isolate the channel for the entire distance from Pydaru to the Chippalairu river.

From Eskapally northwards to the Chippalairu there is very little land drainage to contend with, and no special work is proposed.

50. This reach will be isolated on the same principles as the others. At the Pydaru end there will be a *diversion* ‡ which will place the canal beyond influence of the swamps. At Ramatheertham,§ where there is an old bar very close to canal, a *diversion* ‖ of the channel will be made so as to retire the line sufficiently. A strong bank on the sea side will also be added to give the desired security. Except at Ramatheertham there is no land drainage of importance to contend with, while that of Ramatheertham is so insignificant that it may be taken safely into the canal.

Pyderoo river to the Penner river, 7 miles.

‡ $\frac{123}{V}$ to $\frac{122}{VII}$.

§ 120 M.

‖ $\frac{120}{I}$ to $\frac{119}{III}$.

The reach is generally through deep cutting; being thus protected from floods, very little embanking will suffice.

The flood-gate for south end of this reach will not be constructed at present, in view to the following observations on the subject of dealing with the delta of the Pennér river.

51. Extensive works are proposed for this section, experience having shown it to be essential to train the river to one channel, viz., the southern defluent which is widest, deepest, and otherwise best suited for the object in view.

Penner River reach, 2¼ miles.

Owing to the effects of the two storms of 1879 in silting up the canal channel across the delta, operations with this view have already been undertaken in anticipation by carrying a substantial training embankment from Ootoocuru ¶ along north bank of the river crossing north branch with a strong bund, and proceeding eastward, skirting the island between the central and southern branches. After this the embankment crosses the central branch and will run on to the island between the central and southern branches where a village was washed away some years ago. The river will also be trained by groynes, &c., to prevent erosion along its new left border and with a view to clear away the shoals and islands in southern channel. A new *diversion* ** cut is, moreover, proposed in a direct line from end to end of present channel on all this portion which will be strongly banked on the east side where it will cross northern arm as a protection here against any unusual sea wave during storms. The diversion line will be taken to the west of the island cut, and the flood-gate will be at its northern end. The top of the embankments will be at a level of 4 feet above highest known floods, and 6 feet wide at top with slopes 2 to 1, except at crossing of rivers, where the top will be made 10 feet wide, with side slopes either 4 or 6 to 1 as may be required by the soil; also, where necessary, protected by piling, planting, &c.

¶ 115 M.

** $\frac{116}{VII}$, left bank.

$\frac{114}{II}$, right bank.

52. This short reach is unavoidable, though experience may possibly show that the Gungapatam * opening will admit of being closed up, and this reach made continuous with the next up to Kódúr.† This is, however, a detail of no particular significance. The present crossing looks formidable now, as no less than three bars are open, but as it is only an old estuary hitherto kept up by Pennér spill water during flood, the operations now in hand for training this through one channel should effectually dispose of any difficulty here. Just now the Pennér discharges much of its flood-water through the Gungapatam bar, but the training banks proposed for this portion will effectually prevent this in future. Should further experience prove the necessity for maintaining any opening between the Pennér river and Kódúr, it is not improbable that the position of Korattur ‡ about midway, where there is a bar channel, now used for carrying away the land flood from Pennér delta cultivation, may be found best, but this, like a few other minor details, may with advantage be left open for the present. In the estimate, however, provision is made for making the Gungapatam river discharge opening on the information previously obtained, and this may stand as a provisional arrangement.

Section IV as per general abstract.

Penner river to Gungapatam river, 3½ miles.

* 111 M.

† $\frac{102}{VI}$.

‡ $\frac{107}{IV}$.

Any alteration of the design here will not in any material way affect the estimate. The reach will have flood-gates at both ends, and an outlet which may conveniently be placed in the bed of the so-called "Old Pennér." The embankments will be strengthened, particularly the eastern one, as the coast line is here low, and the channel rather exposed from that side. South bar will be closed.

53. This reach will have flood-gates at both ends with "outlets;" except for 2 miles at north end, the coast line is very high, consequently no banks are wanted on that side. None are, moreover, required on the west side, so far as rising ground in the neighbourhood of Kódúr extends; but beyond it northward to the Gungapatam river the country is low and all under wet cultivation, and here protection is essential. A number of old river bars must be closed in this reach, which are not wanted, in addition to the Gungapatam drainage bar. Training banks in the neighbourhood of the bars are to be provided with a view to keep flood-water from getting behind the banks along the swampy hollows. A *diversion* § of canal will also be made at south end of this reach, so as to secure a good crossing for the Kódúr river, and confine this drainage in a distinct channel capable of carrying off a maximum flood.

Gungapatam river to Kodur river, 9½ miles.

§ $\frac{101}{VI}$ to $\frac{101}{IV}$.

Further experience of the full effects of the works undertaken with the object of training the Pennér river into one channel may as above show the desirability of amalgamating the two reaches mentioned in this and preceding paragraph with, in addition to the end outlets, two others at intermediate points to discharge surplus drainage.

54. The isolation of this short reach is unavoidable, as the Nalatúr ‖ drainage brings in a large volume of water, which must be provided for. At the north end there will be a *diversion* ¶ in continuation of that of preceding reach to avoid the drainage which comes from south and enters on the west of the channel. Similarly at the south end a *diversion* ** is proposed to provide separately for the drainage which now crosses the canal in several places and runs through the canal doing mischief. At the south end a strong bank will be required on the east side to prevent the flood and tide water from entering swamp and getting behind the bank. On the east side but slight banking will be required, as the ground along the coast line is here high. The west side bank, on the contrary, requires to be strong in order to effectually keep out land floods.

Kodur river to Nalatur river, 6 miles.

‖ $\frac{95}{V}$.

¶ $\frac{101}{IV}$ to $\frac{101}{I}$.

** $\frac{97}{VII}$ to $\frac{97}{II}$.

55. This reach, which is unavoidably short, is to be isolated by flood-gates and outlets at both ends. For three miles from north end the cutting is deep through sufficiently high ground, and will not require much banking. After this up to the Kundalairu * river, the line is through swamp and backwater, where, to a great extent, heavy banking is required on both sides. A *diversion* † along Kistnapatam backwater is also to be made, as this will be cheaper than to embank both sides through the portion of exposed backwater.

Nalatur river to Kundalairu river, 5¼ miles.

* $\frac{90}{IV}$.

† $\frac{93}{IV}$ to 92.

The left border of Kundalairu river will likewise be embanked at all the low places up to the Mootoocoor ‡ high ground, so as to keep that river spill from getting behind canal along the Kistnapatam swamp on the west side of canal.

‡ 93 M.

This part of reach from the Kundalairu river to the Kistnapatam § high grounds is exposed to floods and the swamps on both sides and will need strong banking.

§ 93 M.

56. This is a well-protected reach, situated in a hollow between high sand ridges. Flood-gates will isolate it, and an outlet will be constructed for the discharge of the small field drainage. Banks not wanted, but it will be essential to fill in certain gaps in saddle of the ridges, as during the floods of November 1880 these low portions were overtopped by the flood-water, seriously damaging the canal. The side field drains can be disposed of by pottery-pipes across the berms, simple cuts in bank being sufficient to pass the drainage. Originally it was intended to sluice all these openings, but after isolating the reach it is thought that no such measures will be necessary.

Index survey sheet No. $\frac{4}{6}$.
Kundalairu to Swarnamukhi river, 14 miles.

A short *diversion* ‖ cut, 6½ furlongs long, at the Kundalairu river end, will be made to give the canal a conveniently placed mouth in deep water.

Section III as per general abstract.

‖ $\frac{89}{VII}$ to $\frac{89}{\frac{1}{2}}$.

At some places in this reach the cuttings are very deep and sandy, and in such places the canal slopes will be altered to 4 to 1, and the banks thrown back.

57. This reach requires extensive works for its isolation. *First*, a *diversion* ¶ of canal will be made at Swarnamkuhi end, which will have the effect of keeping the canal away from the river, and of training the river to its old bar. *Second*, a *diversion* ** will be formed from above the Tupuli drainage along Kódúrpalliem †† and Dugarázpatnam, so as to remove the line from the backwater. The only land drainage that has to be disposed of in this portion is that of Tupuli, and this can be readily received into the canal by proper inlet arrangements. The reach will have flood-gates and outlets as usual with all isolated portions. The Swarnamukhi diversion works are explained in the annexed estimate, which is among those already sanctioned by Madras Government.

Swarnamukhi river to Dugarazpatnam river, 8¼ miles.

¶ 77 to 75.

** $\frac{72}{II}$ to $\frac{67}{II}$.

†† $\frac{70}{VI}$.

As regards the other diversion, it will suffice to observe, that it is essential in order to avoid the backwater. This line will run at the back of Kódúrpalliem, which, being purely a fishing village, would otherwise be inconvenienced by having the canal between it and the sea. The cutting will here be deep, but this is unavoidable.

58. Dugarázpatnam to Coromandel is the longest isolated reach which it has been found posssible to make in the entire canal. It starts with a *diversion* ‡‡ at the north end to avoid the backwaters of Dugarázpatnam §§ At south end there will also be a long *diversion* ‖‖ of 17 miles to avoid the Pulicat lake along and indeed almost through which the existing line is carried, and which, experience has shown, is dangerously exposed. There will

Section II as per general abstract.
Dugarazpatnam river to Coromandel, 41 miles.

‡‡ $\frac{67}{I}$ to $\frac{65}{V}$.

§§ 69 M.

‖‖ $\frac{43}{V}$ to 27.

be flood-gates to isolate it, with four outlets, one at each end, and two placed intermediately on the east side; the coast line is high, but there is a great width of land here between the canal and the sea; large provisions for drainage have to be made. On the west side the bank will be made up to full height for 22 miles to keep out the lake floods. With the two diversions and the lake-side bank this reach is necessarily a costly one, but under all the circumstances the improvements here proposed will be found well to repay the outlay. On east side a low bank will suffice.

It may here be mentioned that in the lake diversions the present so-called "Tettupet"* cut will be included and utilised.

* 38 M.

59. Virtually this reach will be but 1½ miles in the land, the rest being along open lake and across the Pulicat river. A short reach here is unavoidable, in order to avoid the backwater along Pulicat, which is much exposed during high wind, and proves troublesome to the boatmen, and in which also, as in all backwaters, it has been found both difficult and costly to maintain a channel efficiently to the needful minimum depth. The *diversion*† here proposed will run from Pulicat river, along west border, along Pulicat ‡ and Edamany. The northern arm of Arani river, by which spill water now enters the channel, will be embanked across on both sides of canal line, and there will be a subsidiary bund higher up the arm so as to render the crossing safe. This arm is virtually the spill of the lake at the back of Pulicat and forms a swamp. By shutting up this opening, the flood-water will concentrate in the main arm of the Arani river and keep the crossing deep, which is the point to be aimed at. The Pulicat backwater is shallowing up very fast, and it is therefore very desirable to have a distinct channel for navigation. The reach will have boat basins, formed by simply widening the channel, will be formed at Pulicat. The basin for the fishing village will be small and sufficient for immediate wants, the other is needed for traffic and boat building, a large number of boat owners and builders being residents at Pulicat.

Index survey sheet No. $\frac{3}{6}$.
Section I as per general abstract.
Coromandel to Arani river, 3 miles.

† $\frac{25}{VI}$ to 24.

‡ 25 M.

60. Arani river to Ennore will be a comparatively costly reach, as it will consist of a *new* § canal throughout for nearly the whole distance, placed beyond reach of backwater along the east border. The expense here is chiefly enhanced by the compensation which will have to be paid for land and plantations. Parts of the existing canal along Chintamony ‖ and Kálánji ¶ will be utilised, their western side being strongly embanked. As the ground along the coast is here high, there will be no need for a high bank along the new line; the reach will be isolated by flood-gates, and have outlets for land drainage. Across Chintamony backwater on 21st mile the crossing on west side will be embanked so as to keep out the land floods. The old bar being closed no bank will be required on the east side for the present, though possibly hereafter some special work with this object may be needed.

Arani river to Ennore backwater, 13 miles.

§ $\frac{23}{VII}$ to $\frac{11}{IV}$

‖ $\frac{20}{II}$

¶ $\frac{18}{IV}$

61. The work proposed in this reach with a view to the proper isolation of the channel from the backwater is a *diversion* ** extending from Ennore to the lock at Shadayankuppam, †† and embankments from the latter place to Madras, with a drainage channel along the low swampy ground on the east side. This will provide for the Madras drainage being led to a point north of lock, where it will join diversion line, and be furnished

Index survey sheet No. $\frac{2}{6}$

Ennore backwater to Cooum river, 11 miles.

** 11 to $\frac{7}{IV}$

†† $\frac{7}{II}$

with a surplus self-acting sluice on west side. The existing Trivettore surplus sluice will be altered, so as to make the shutters more effective. The Ennore * end of the diversion channel will have a flood-gate. It is not practicable to carry this head of diversion more to the north, and a stretch of about a mile of open lake will therefore have to be crossed. In order, moreover, to obtain a direct crossing, the shoal now forming across lake, from west border and extending towards bar, will be cut through.

* 10 M.

With a flood-gate at Ennore end, and strong high banks from that place to Madras, there will be no need to make any alterations to the existing Shadayankuppam lock.

A flood-gate is not requisite at the point where the canal enters the Cooum river at Madras, as the bar of this river is invariably cut through so soon as the water level rises to 3·5 feet above mean sea level.

At the Madras (better known as "Cochrane's") basin an extensive wharf will be constructed to supersede the present basin, the walls of which have sunk, and the form found inconvenient. The improvement of basin here provided for will be limited to the east side for the present. The form of wharf will consist of a widening of canal by 60 feet for 1,800 feet in length, 50 feet being allowed for canal. The wharf will be formed by a concrete wall to M.S.L., above which there will be steps of laterite. The basin grounds will be enclosed in with palisading, and the ground adjoining entirely cleared of native huts, provision being made for compensating the owners. The existing lime-kilns, with the exception of one or two, will not be touched. To afford the requisite facilities for traffic, roads will be run from the wharf wall directly across to existing line of road.

The only improvement to be made on the west side is the construction of a short branch channel to join the basin at the Government lime-kilns. This will allow of the shell boats unloading there instead of at the former shell platforms which have been now surrendered.

The Government grounds on which the lime-kilns are placed will also be fenced off from the canal. The Trivettore and Washermanpet bridges, as they obstruct navigation, will be altered by removing the arches and substituting iron girders to give the requisite headway.

These bridges, as also all the others up to the Cooum, save the railway and salt bridges, will have tow-paths constructed under the arches. The South Indian Railway bridge, which is now a temporary structure for running trains to the Harbour Works will, if eventually made permanent (a point still open for consideration), need to be much enlarged, but no provision for the work is necessary in this estimate. The Timber Salt Depôt bridge will be altered, as the centre span is quite obstructed.

At the Shadayankupam lock an embankment will be made eastwards to Trivettore, so as to afford means of access across the swamp and fields to the toll and lock establishments.

62. The only work required in this reach will be deepening and forming the channel, which along all this portion is carried through the river bed without any special arrangements as far as the north end of the next reach known as the Junction Canal.

Cooum river, 1 mile.

63. This reach, better known as the Junction Canal, will be closed at the Adyar † end by a lock which is so arranged with double sets of gates facing in opposite directions as to afford means for keeping out floods whether coming from the Cooum or the Adyar river ends.

Index survey sheet No. $\frac{2}{6}$.

The Junction and Southern Canal.

† Zero of mileage as per map.

As it is essential for the health and comfort of Madras so to work its two rivers (the Cooum and Adyar) that there shall always, if possible, be water in their beds from 2 to 3·5 feet above M.S.L., so as to keep all offensive mud banks covered with water, it would be useless to attempt to do what is necessary by flood-gates alone. The lock at Shadayankupam and the other to be constructed permanently at south end of the Junction Canal are both indispensable with this object. The inconveniently low headway and small waterway of the bridges may at some future time (should a

large traffic spring up) necessitate the alteration of all the bridges, by raising them and substituting iron girders for the existing arches. The cost of altering the fourteen bridges involved will not be serious, but under existing circumstances no such change is urgently required, and no provision for the work has therefore been made in this estimate. Some other improvements may also in future be desirable, but tow-paths only are immediately necessary at present, and an item for this is inserted. The Adyar river, the bed of which above and below the point of crossing of the line of canal has been very much encroached upon by the silting up of the river margins and the formation of numerous large islands therein, requires to be considerably improved. It is proposed to effect this by a system of groyning and the construction of flood-banks to confine the floods within fixed limits, and thereby increasing the scour, establish a deep and permanent waterway for the river for some distance upwards from its mouth. The amount required for carrying out these improvements has been provided for in item No. 68 A of the general abstract of the estimate for Southern Canal.

64. This reach will be isolated by a lock at the north with gates facing towards the river and flood-gates at south end. The lock is essential for keeping up the requisite water level in the Adyar, Junction Canal, and Cooum river (see previous remarks). In this reach there will be a *diversion* * from Solanganallur along east border to take the channel out of the backwater, and obtain a good crossing at the Covelong opening. The west bank will be made strong. The coast line on the east being well raised no high bank will be wanted on that side. One outlet will suffice for this reach, as there is little land drainage taken in and disposed of.

Section II as per General Abstract.

Adyar to Covelong, 15 miles.

* $\frac{8}{IV}$ to $\frac{15}{I.}$

65. This reach is at present in every way unsatisfactory, running as it does through swamp and backwater, and becoming quite a sea during high floods, rendering the navigation very troublesome.

Covelong to Kokkelamoodoo, 16 miles.

A *diversion* † will be made for its entire length along the east border. Flood-gates will also be employed for closing both ends. Outlets at both ends will, moreover, be constructed for relieving the land drainage which, however, will not be much. The west bank will be made strong, but as the ground along the coast is high, the east bank of the canal need not be high.

† $\frac{15}{II}$ to $\frac{31}{II.}$

The Kokkelamoodoo bar does not generally open, but as there will be no other relief to drainage in this portion of the canal, it is considered essential that this opening shall be maintained.

66. A short *diversion* ‡ line in continuation of the preceding one is required at the north end of this reach to join on to the existing canal. There will be flood-gates and outlets at both ends of this reach. Training banks running from canal eastward will also be constructed with a view to keep the flood from getting behind banks throughout the swampy and low grounds.

Index survey sheet No. $\frac{1}{6}$.

Kokkelamoodoo to Palar river, 8 miles.

‡ $\frac{31}{IV}$ to 39.

A drainage near the Sadras bar will be strongly banked on the seaside and the drainage taken into the channel; so also with the next drainage at Sembadakupam,§ which will be banked across on east side and drainage similarly disposed of. An old outlet to the south will now be restored, and will no doubt be kept open by the above two drainages, discharging through the flood-gate and outlet. The direction of this old cut will be altered with reference to the Pálár river crossing. Here, contrary to the case of the Pennér river, the southern channel of the Pálár will be closed, and northern one only maintained, as the present choked-up condition of the bed of the former and the more free and open passage down the latter favor this arrangement, which in other respects accords with the local features.

§ $\frac{37}{III.}$

A diversion * cut will also be made through the islands to the south, near the end of which the flood-gate will be placed. The estimate, it will be observed, provides for the flood-gates for right bank of Pálár at the end of extension canal. No large drainages cross the extension canal.

* 39 to $\frac{41}{111}$.

67. Having thus, as far as possible, detailed the method of treatment proposed for the improvement of each reach of the canal from its most northern limit † from Madras to the Pálár river at 47 miles south of Madras, and to a point whence the extension canal into the Merkanam back-water is continued, a summary of the headings of the estimate for each section of the proposed work, and the amounts of estimates, will now be given. From the statement A it will be seen that the total outlay on the canal contemplated, as well as that already incurred, amounts to Rs. 63,87,100. It is believed that this sum will be found sufficient for all requirements, and that it is even quite possible savings may be effected by the substitution of artificial stone composed of Portland cement concrete in the quoins and floors of the flood-gates for cut granite, and either of indigenous teak, or by employing Jarrah wood from Australia in the flood-gates, instead of the more expensive Burma teak.

† 196 miles.

General summary of estimates. Appendix A.

Substitution in certain items of estimate proposed.

68. The distribution of the whole outlay, past, present and future, will be seen from Appendix B, and divides itself naturally into three distinct periods, viz.:—

Total outlay on the work. Appendix B.

		Rs.
(1)	Outlay from the commencement of the work to the last famine	5,49,078
(2)	Outlay during the famine, *i.e.*, from October 1876 to 31st March 1879	21,93,854
(3)	Subsequent outlay, viz.:—	
	(*a*) From April 1879 to 31st March 1882	3,44,253
	(*b*) Probable in current year	1,54,300
	(*c*) From end of the current official year ...	31,45,615
		36,44,168
	Total ...	63,87,100

The figures given under (1), (2), and (3) (*a*) have been supplied by the Examiner, Public Works Accounts, and have been finally accepted as correct by the Accountant-General.

69. The soil all along the canal is pretty constant in its character, a surface layer of sand and light loam with denser clayey strata underlying it. No borings were found necessary, and in the construction of the foundations of the flood-gates grilles of timber with sheeting piles have been provided for with a view to distribute the superincumbent pressure over the subsoil.

Soil in foundations of masonry works.

70. The data upon which the rates have been based are those obtained from the actual construction of works along the canal and in the neighbourhood, and sufficient margin has been allowed to accommodate them to such moderate increment of charge as unforeseen circumstances may entail.

Data for rates allowed in estimates.

71. The traffic on the canal has shown a tendency to increase in the successive years, during which registers have been systematically maintained. Appendix C gives the abstract of the traffic inwards to and outwards from the terminal station at Madras for the successive half-years from 1st July 1878 to 30th June 1882. In the year 1879 the tonnage arriving at the Madras basin amounted to 185,491 tons, and the departures amounted to 49,133 tons during that period. For 1881 the figures were 241,207 and 208,630 tons respectively.

Particulars of traffic. Appendix C.

The first half of the current year shows a considerable falling off owing to the long-continued drought during that period having so far reduced the depth of water in the backwaters through which the canal passes as to close them for over two months against any but the smallest description of boats.

Of the commodities carried over the canal, the largest and most important is salt; after which come firewood, food-grains, and shells (for burning lime) in order of their importance. The import of these articles into Madras amounted in 1881 to 85,301, 54,654, 22,020, and 21,971 tons respectively. Numbers of boats with passengers and goods now find their way from Cocanada and Dowlaishweram, as also other intermediate places to Madras; and it can scarcely be doubted that on the execution of the completion works of the Godávari and Kistna Delta schemes lately sanctioned by the Government of India, adding greatly to the existing irrigated area, the traffic in grain, &c., must greatly increase; and in the event of famine occurring, the value of such through communication with the Northern Delta works would be of incalculable benefit. Further impetus may also be ere long looked forward to owing to proposed reductions of tolls and simplification of license fees. The mode of travelling by boats is decidedly popular with the natives, and efforts of this character cannot fail to produce beneficial results.

With the opening, moreover, of the Singareni coal fields in the Nizam's Dominions, about 80 miles north-west of Bezváda, a traffic in carrying coal down for the use of the Madras and South Indian Railways may not improbably spring up. The fact of the canal as a highway will be thus still further established, as through no other route could these coal fields be tapped so economically as by means of the canal.

In the Proceedings, Madras Government, No. 450, dated 21st November 1868, reports on the traffic on the Godávari, Kistna and East Coast canals gave full details regarding the working of the boats plying on those canals. The conditions then obtaining have not in any great degree altered, and the rates charged for goods have not materially decreased. These Proceedings were communicated to the Government of India in G.O., No. 3652, of 21st November 1868. The suggestions then made by Colonel Anderson, the Chief Engineer for Irrigation, that a scheme of a coast canal be taken up in earnest, met with the approval of the Madras Government, and is now an accomplished fact.

72. In Appendix D is shown the number, tonnage, and description of boats which ply on the canal. Amongst the class that are built specially for cargo, the largest number are of 20 tons burden, whilst the tonnage of the class which carries 28 and 29 tons respectively gives the largest aggregate results. The whole of the cargo boats work out to an average of $16\frac{3}{4}$ tons, which is a convenient size both for being handled with ease and of a draught better suited to the varying depths of water in the several reaches of the present canal. The largest boats are used for conveying firewood from the plantations within 45 miles north of Madras, as they afford stowage to compensate for the light nature of the freight carried by them. Of covered cargo and passenger boats, the most numerous are those of 4 and 5 tons respectively, commonly called "top" boats, and the total number of these works out to an average capacity of 6 tons for each. The deck and dinghy boats are the description used most generally in the Northern Circars, and which, plying on the Godávari and Kistna canals, have taken out licenses for the Buckingham canal as well.

Description of boats plying on the canal. Appendix D.

Appendix E contains the text of the rules for navigation now in force on the canal, which were approved and sanctioned by the Madras Government in their Proceedings, No. 1801 A W., of 8th July 1879. These rules differ in several respects from those obtaining on the Kistna and Godávari canals. There is no apparent reason why this difference should exist; the Madras Government have therefore ordered a Committee to convene and take into consideration the advisability of establishing an uniform set of rules for the whole of the coast canal license system, and abolishing most of the tolls. This, however, will not do away altogether with the toll establishments now maintained, as particulars of traffic will have still to be recorded for each section of the canal as is done at present. As there will be no money collections, this

Appendix E.

work can in future be carried out by a clerk and one peon on Rs. 15 and Rs. 6 per mensem.

Registration of tides.

73. The fluctuations of the tides were registered at thirty-eight stations along the canal during the years 1879, 1880, 1881, and 1882, but these were necessarily only of value during the period when the several bars were open along the coast. The recorded readings during the times when the rivers were in flood, and again when some of the bars were open, whilst others were closed, gave very conflicting results, and have proved of doubtful value in determining the nature of the works to be carried out for the improvement of the canal. The M.S.L. was the datum to which it was at first proposed to refer all bed levels of different sections of the canal, and the cills of the masonry works along them. The M.S.L. in use in this Presidency was, till recently, that established by the late Colonel De Havilland, of the Madras Engineers, and referred to a bench-mark stone placed by him some forty years ago on a marble slab in the Fort wall near the north gate at Madras. The tidal observations carried out in the Great Trigonometrical Survey of India have, however, proved De Havilland's bench-mark to be very nearly 1 foot below its true value.

Limiting levels for determining improvements to canal.

In a canal running along the coast line, however, and only here and there connected with the sea, as is the case with the Buckingham canal, it has appeared necessary to work between two limiting levels, viz., that of the highest storm wave level as yet recorded for the determination of the heights to which the bank of the canal should be raised, and the lowest recorded tide level for the depth to which the bed of each reach should be excavated. The former level was deduced from the cyclone of November 1880, when the canal suffered severe damages from the irruption of the sea; and the latter levels, owing to the peculiar circumstances of each reach of the canal, were taken from the tide-gauge readings. To simplify the calculations of quantities in the estimates, average lowest recorded tide levels were struck for each reach, and the longitudinal and cross sections drawn out accordingly, a slightly give-and-take arrangement being thus followed. Below this average L.R. tide level the canal bed has been calculated to 3 feet, and it is at this depth that it should always be maintained.

Peculiar circumstances of certain reaches in the canal.

74. Of those sections of the canal where connection with the sea is liable to be temporarily suspended by the closure of the bars, the most notable are the reaches between Madras and Kundelairu (90th mile N.). In this length exist large bars at Ennore (11th mile), Pulicat (26th mile), Dugarázpatnam (69th mile), and Kottapatam (80th mile). The opening of these bars, however, is due chiefly to the fact that large backwaters within the coast line receive upland drainage until they accumulate to a level at which they overtop and clear away the bars formed by the surf. As there are no defined channels out to sea through these bars, it has been found impossible to keep them open when, with the setting in of the south-west monsoon, the wind and littoral current turn northwards up the Bay of Bengal. With the closure of the river bars, and the setting in of the hot weather, evaporation over the areas of backwater goes on apace without any compensating indraught from the ocean, or supplies from local drainage; and the water level in long sections of the canal gradually diminishes as was evidenced more particularly in the present than in probably any other year.

Necessitating reclamation of the backwaters with which they are connected.

75. These backwaters may, therefore, be looked upon as huge evaporating basins during a time of the year when the canal is cut off from all its sources of supply, and as such should be avoided.

The reclamation of the backwaters in the interests of the canal then is a subject of vital importance, but in doing so the fact must not be overlooked that a certain storage area is necessary to receive water at high tides from the sea in order to maintain the scouring action on the bars during the ebb. But on the other hand, as in the case of the Pulicat lake, where the area to be covered amounts to 178 square miles, and of which one-half at least is covered by high tides during the time the Pulicat

Instance of the Pulicat lake.

bar is open to a depth of something under 2½ feet of water, the width of the bars during this period being under 100 yards, it may be taken for granted that from the month of March, when the bars begin to show signs of closing, down to September, when the lowest tidal variation is reached, the indraught through the bars is not commensurate with loss by evaporation from the surface of the backwaters, and that, owing to their great area, the accession of tidal water does not influence the remoter parts before the ebb sets in. There are thus large areas of these backwaters which after a certain time of the year draw upon the canal for their supply to keep pace with the evaporation from their surfaces, and the water level must necessarily diminish until the bars open again by the influence of the sea, or by the receipt of upland drainage waters.

Proposed method of reclamation.

76. The reclamation by embankments of all backwaters is therefore necessary within certain limits, say, to lands not covered at high tides to a greater depth than 2 feet. Were this done, the drainage falling into the backwaters could be pounded up within those embankments, and, as it is presumed that the water will be charged with much silt from the uplands, they may be allowed to deposit the little held in suspension, and then be allowed to flow off through regulating weirs at ebb-tides to increase the action on the bars. By shutters opening towards the backwaters, no salt water need be allowed on to the lands thus reclaimed, which would increase enormously in value owing to their proximity to the canal, and eventually, by their sale, recompense all expenditure incurred on them.

Resultant benefits derived from the canal.

77. As it is on all accounts desirable, therefore, in the interests of the canal to permanently establish a series of open bars along the coast, and as the only way this *desideratum* can be attained is by the concentrated outflow through a defined channel at frequent periods, both as regards all upland waters and of all the tidal outflow during an ebbtide, and as this can only be effected by extensive reclamation of tracts of backwater which have up to the present served no other purpose than to dissipate rather than conserve the energy of tidal action, the regulation of the canal in the manner now proposed must lead to the conversion of hitherto useless, if not unhealthy, swamps into valuable cultivated areas.

These areas thus reclaimed may, if desired, be taken over by the Forest Conservancy Department for the growth of timber and fuel trees. The practicability of this has already been sufficiently demonstrated at various points along the course of the canal, and testimony is borne to the utility of the scheme in Proceedings of the Board of Revenue, No. 859, dated 25th June 1880, where the inward traffic in firewood in the Nellore District (through which the canal runs for 150 miles of its course) is ascribed to the "facilities afforded by the improvement of the Buckingham Canal" during the year 1878-79. From the information furnished by the Collector of South Arcot District again, it would appear that large tracts of waste land remain to be planted up with casuarina and other fuel trees, which he is confident will be taken up by private enterprise as the benefits afforded by the canal as a cheap means of carriage come to be realized. The effect of opening up the canal to Merkanam and southwards, as contemplated, will be to raise the local price of fuel by at least 25 or 30 per cent., and thus improve the condition of the villagers along the coast. It would be desirable if the whole of the works now estimated for could be completed within the next six years, which would necessitate an average allotment of 5 lakhs of rupees per annum distributed as follows:—

3 lakhs in 1883-84.
5 do. in 1884-85.
5 do. in 1885-86.
6 do. in 1886-87.
6 do. in 1887-88.
6 do. in 1888-89.

The average amount allotted for new works on the canal during the last two official years has been Rs. 1,35,000 only.

(Signed) R. R. E. DRAKE-BROCKMAN, Major, R.E.,
Executive Engineer, Buckingham Canal Division.

APPENDIX A.

Summary of Estimates for improving the several reaches of the Buckingham Canal as sanctioned in detail from time to time by the Madras Government.

Number on Index Map and General Abstract Estimate.	Sheet Number of Index Map.	Description of Work.	Position.	Reference to Report.	Amount of Estimate as sanctioned in detail by the Madras Government.	Total for each Section.
		NORTHERN CANAL.			RS.	RS.
		Section I.—From St. Mary's Bridge at Madras to Pulicat.				
1	2	Improvements and alterations to Salt Kotar Bridge.	1st mile ..	Paragraph 61 ..	13,000	
2	..	Improvements to the basin at Madras ..	2nd ,, ..	Do. 61 ..	95,685	
3	..	Improvements to canal from basin to Shadayankupam Lock.	2nd to 7th mile ..	Do. 61 ..	19,775	
4	..	Improvements and alterations to Washermanpet Bridge.	3rd mile ..	Do. 61 ..	7,090	
5	..	Do. do. to Trivettore Bridge ..	5th ,, ..	Do. 61 ..	7,090	
6	..	Toll Office and Establishment sheds at Shadayankupam Lock.	7th mile 3rd furlong.	Do. 39 (11).	759	
7	..	Diversion to canal from Shadayankupam Lock to Ennore.	7th mile 3rd furlong to 11th mile.	Do. 61 ..	42,250	
8	..	Flood-gate south bank of Ennore Backwater.	11th mile ..	Do. 61 ..	19,380	
9	..	Do. north bank of do. ..	12th ,, ..	Do. 60 ..	19,380	
10	..	Second-class Rest-house at Ennore ..	13th ,, ..	Do. 39 (11).	5,715	
11	..	Diversion and improvements to canal from Ennore to Pulicat.	12th to 25th mile 6th furlong.	Paragraphs 59 and 60.	1,43,360	
12	2	Siding basins at Pulidivakkam, Kattupally, Kalanjee, and Karangalee.	15th, 17th, 19th and 22nd miles.	Paragraph 39 (9).	4,540	
13	..	Flood-gates south bank of Arni River ..	23rd mile 6th furlong.	Paragraph 60 ..	16,650	
14	..	Do. north bank of do. ..	24th mile ..	Do. 59 ..	16,650	
15	..	Two siding basins at Pulicat	25th ,, ..	Paragraphs 59 and 39 (9).	2,685	
16	..	Flood-gate at the Pulicat Lake end ..	25th mile 6th furlong.	Paragraph 59 ..	16,650	
		Add items of General Abstract Estimate, Nos. 65, 68 and 73.	..	..	4,30,759 3,653	
						4,34,412
		Section II.—From Pulicat to Dugarázpatnam.				
1	..	First-class Rest-house at Coromandel ..	27th mile ..	Paragraph 39 (11).	3,160	
2	..	Diversion to canal from Coromandel to Tettupett.	26th to 28th mile.	Do. 58 ..	99,000	
3	..	Flood-gate at Coromandel end	26th mile ..	Do. 58 ..	16,650	
4	..	Siding basin at Coromandel	27th ,, ..	Do. 39 (9).	510	
5	..	Outlet at do.	27th ,, ..	Do. 58 ..	3,950	
6	2	Improvements to canal, 36 miles 2 furlongs to 38 miles.	36th to 38th mile.	Do. 58 ..	7,350	
7	..	Siding basin at Tettupett	38th mile ..	Do. 39 (9).	635	
8	..	Diversion to canal from Tettupett to Jonaghipolliem, 38 miles to 43 miles 5 furlongs.	38th to 43rd mile.	Do. 58 ..	70,000	
9	..	Two siding basins at Chemigaripolliem and Jonaghipolliem.	42nd and 44th miles	Do. 39 (9).	1,055	
10	..	Second-class Rest-house at Jonaghipolliem	44th mile ..	Do. 39 (11).	5,715	
11	..	Improvements to canal, 44 miles to 65 miles 5 furlongs.	44th to 65th mile.	Do. 58 ..	1,35,765	
12	..	One siding basin at Cusbah	46th mile ..	Do. 39 (9).	395	
13	..	Toll Office and Establishment sheds at Royadoruvu.	59th ,, ..	Do. 39 (11).	868	
14	..	Second-class Rest-house at Royadoruvu ..	59th ,, ..	Do. 39 (11).	5,715	
15	..	Two siding basins at Royadoruvu and Pambali.	58th and 64th miles	Do. 39 (9).	1,320	
16	..	Diversion to canal, 65 miles 5 furlongs to 67 miles 2 furlongs.	65th to 67th mile.	Do. 58 ..	20,430	
17	..	Outlet at 67 miles 2 furlongs	67th mile 2nd furlong.	Do. 58 ..	3,660	
18	..	Flood-gate south bank of Dugarázpatnam river.	Do. do. ..	Do. 58 ..	19,030	
		Add items of General Abstract Estimate, Nos. 65, 68, 69 and 73.	..	..	3,95,208 2,63,590	
						6,58,798

Summary of Estimates for improving reaches of Buckingham Canal, &c.—*cont.*

Number on Index Map and General Abstract Estimate.	Sheet Number of Index Map.	Description of Work.	Position.	Reference to Report.	Amount of Estimate as sanctioned in detail by the Madras Government.	Total for each Section.
		NORTHERN CANAL—*cont.*			RS.	RS.
		Section III.—From Dugarázpatnam to Kistnapatam.				
1	..	Diversion to canal 67 miles, 2 furlongs to 72 miles 2 furlongs.	67th to 72nd mile.	Paragraph 57 ..	55,570	
2	..	Flood-gate north bank of Dugarázpatnam river.	67th mile 3rd furlong.	Do. 57 ..	19,030	
3	..	Outlet at 67 miles 3 furlongs	Do. do. ..	Do. 57 ..	3,660	
4	..	Second-class Rest-house at Dugarázpatnam.	69th mile ..	Do. 39 (11).	5,715	
5	..	Stores and office at Dugarázpatnam ..	69th ,, ..	Do. ..	2,340	
6	..	Siding basin at do. ..	69th ,, ..	Do. 39 (9).	1,090	
7	..	Do. at Thupili	72nd mile ..	Do. ..	590	
8	..	Outlet at 71 miles 6 furlongs	71st mile 6th furlong.	Do. 57 ..	3,660	
9	..	Improvements to canal, 72 miles 2 furlongs to 75 miles 3 furlongs.	72nd to 75th mile.	Do. 57 ..	17,200	
10	..	Swarnamukhi diversion and flood-banks ..	76th to 77th ,, ..	Do. 57 ..	36,700	
11	..	Outlet at 76 miles 5 furlongs	76th mile 5th furlong.	Do. 57 ..	3,450	
12	..	Flood-gate south bank of Swarnamukhi river.	77th mile ..	Do. 57 ..	20,880	
13	..	Do. north bank of do. ..	77th mile 1st furlong.	Do. 56 ..	20,880	
14	..	Improvements to canal, 77 miles 1 furlong to 89 miles ½ furlong.	77th to 89th mile.	Do. 56 ..	24,200	
15	..	Second-class Rest-house at Siddavaram ..	79th mile ..	Do. 39 (11).	5,715	
16	..	Two siding basins at Siddavaram and Kanoopur.	79th and 81st miles	Do. 39 (9).	1,270	
17	..	Diversion to canal, 89 miles ½ furlong to 89 miles 7 furlongs.	89th mile ..	Do. 56 ..	8,400	
18	..	Outlet at 89 miles 6 furlongs	89th mile 6th furlong.	Do. 56 ..	3,450	
19	..	Flood-gate south bank of Kundaleru river..	90th mile ..	Do. 56 ..	18,040	
		Add items of General Abstract Estimate, Nos. 65, 68, and 73.	..	..	2,51,840 2,88,409	
						5,40,249
		Section IV.—From Kistnapatam to Pennér River.				
1	2	Flood-gate north bank of Kundaleru river..	91st mile ..	Paragraph 55 ..	18,380	
2	..	Improvements to canal, 90 miles 6 furlongs to 92 miles.	90th to 92nd mile.	Do. 55 ..	6,100	
3	..	Outlet at 90 miles 6 furlongs	90th mile 6th furlong.	Do. 55 ..	3,450	
4	..	Siding basin at 91 miles	91st mile ..	Do. 39 (9).	1,480	
5	..	Bridge at Kistnapatam road crossing ..	91st ,, ..	Do. 39 (10).	10,250	
6	..	First-class Rest-house at Kristnapatam ..	93rd mile ..	Do. 39 (11).	6,630	
7	..	Diversion to canal, 92 miles to 93 miles 4 furlongs.	92nd to 93rd mile.	Do. 55 ..	13,680	
8	..	Siding basin at Kristnapatam	93rd mile ..	Do. 39 (9).	655	
9	..	Improvements to canal, 93 miles 4 furlongs to 95 miles 6 furlongs.	93rd to 95th mile	Do. 55 ..	7,030	
10	..	Outlet at 95 miles 4 furlongs	95th mile 4th furlong.	Do. 55 ..	3,485	
11	..	Flood-gate south bank of Nalatur river ..	Do. do. ..	Do. 55 ..	18,550	
12	..	Improvements to canal, 95 miles 6 furlongs to 97 miles 2 furlongs.	95th to 97th mile.	Do. 54 ..	11,930	
13	..	Flood-gate north bank of Nalatur river ..	95th mile 6th furlong.	Do. 54 ..	18,550	
14	..	Outlet at 95 miles 6 furlongs	Do. do. ..	Do. 54 ..	3,485	
15	..	Diversion to canal, 97 miles 2 furlongs to 97 miles 7 furlongs, and new cut to drainage channel.	97th mile ..	Do. 54 ..	6,340	
16	..	Improvements to canal, 97 miles 7 furlongs to 101 miles 1 furlong.	97th to 101st mile.	Do. 54 ..	4,350	
17	..	Diversion to canal, 101 miles 1 furlong to 101 miles 6 furlongs and cutting drainage channel.	101st mile to 6th furlong.	Do. 54 ..	7,300	
18	..	Outlet at 101 miles 3 furlongs	101st mile 3rd furlong.	Do. 54 ..	3,590	
19	..	Flood-gate south bank of Kódúr river ..	Do. do. ..	Do. 54 ..	15,540	

Summary of Estimates for improving reaches of Buckingham Canal, &c.—*cont.*

Number on Index Map and General Abstract Estimate.	Sheet Number of Index Map.	Description of Work.	Position.	Reference to Report.	Amount of Estimate as sanctioned in detail by the Madras Government.	Total for each Section.
		NORTHERN CANAL—*cont.*			RS.	RS.
		Section IV.—From Kistnapatam to Pennér River—cont.				
20	..	Flood-gate north bank of Kódúr river ..	101st mile 4th furlong.	Paragraph 53 ..	15,540	
21	..	Outlet at 101 miles 4 furlongs	Do. do. ..	Do. 53 ..	3,590	
22	..	Improvements to canal, 101 miles 6 furlongs to 111 miles 3 furlongs and 5 furlongs.	101st to 111th mile.	Do. 53 ..	29,950	
23	..	Toll Office and Establishment sheds at Kódúr.	103rd mile ..	Do. 39 (11).	1,400	
24	..	Outlet at 107 miles 3 furlongs	107th mile 3rd furlong.	Do. 53 ..	3,590	
25	..	Do. at 108 miles 5 furlongs	108th mile 5th furlong.	Do. 53 ..	3,510	
26	..	Siding basin at Mypaud	110th mile ..	Do. 39 (9).	1,075	
27	..	Store and office at do.	110th ,, ..	Do. 39 (11).	2,340	
28	..	Outlet at 111 miles 3 furlongs	111th mile 3rd furlong.	Do. 53 ..	3,510	
29	..	Flood-gate south bank of Gungapatam river.	111th mile 4th furlong.	Do. 53 ..	20,500	
30	..	Improvements to canal, 111 miles 5 furlongs to 114 miles 2 furlongs.	111th to 114th mile.	Do. 52 ..	12,980	
31	..	Flood-gate north bank of Gungapatam river.	111th mile 5th furlong.	Do. 52 ..	20,500	
32	..	Outlet at 113 miles 2 furlongs	113th mile 2nd furlong.	Do. 52 ..	3,510	
33	..	Flood-gate south bank of Pennér river ..	114th mile ..	Do. 52 ..	20,500	
		Add items of General Abstract Estimate, Nos. 65, 68 and 73.	..	..	3,03,270 3,09,498	
		Section V.—From Pennér River to tail of Commamur Canal in Kistna District.				6,12,768
1	..	Pennér diversion	114th to 117th mile.	Paragraph 51 ..	69,300	
2	..	Flood-gate north bank of Pennér river ..	114th mile 4th furlong.	Do. 51 ..	20,500	
3	..	Training and cross bank of Pennér river ..	Do. do. ..	Do. 51 ..	68,690	
4	..	Second-class Rest-house at Pennér island ..	115th mile ..	Do. 39 (11).	5,715	
5	..	Outlet at 116 miles 7 furlongs	116th mile 7th furlong.	Do. 51 ..	3,510	
6	..	Improvements to canal, 116 miles 7 furlongs to 119 miles 3 furlongs.	116th to 119th mile.	Do. 50 ..	11,145	
7	..	Ramatheertham diversion, 119 miles 3 furlongs to 120 miles 1 furlong.	119th to 120th mile.	Do. 50 ..	8,230	
8	..	Siding basin at Ramatheertham	120th mile ..	Do. 39 (9).	1,310	
9	..	Outlet at 120 miles	120th ,, ..	Do. 50 ..	3,250	
10	..	Improvements to canal, 120 miles 1 furlong to 122 miles 6½ furlongs.	120th to 122nd mile	Do. 50 ..	20,000	
11	..	Diversion to canal, 122 miles 6½ furlongs to 123 miles 5 furlongs.	122nd to 123rd mile.	Do. 50 ..	14,630	
12	..	Two outlets at 123 miles 5 furlongs and 123 miles 6 furlongs.	123rd mile 5th and 6th furlongs.	Do. 50 ..	6,500	
13	..	Flood-gate south bank of Pyderu river ..	123rd mile 5th furlong.	Do. 50 ..	19,060	
14	..	Diversion to canal, 123 miles 6 furlongs to 126 miles 7 furlongs.	123rd mile to 126th mile.	Do. 49 ..	45,900	
15	..	Flood-gate north bank of Pyderu river ..	123rd mile 6th furlong.	Do. 49 ..	19,060	
16	..	Improvements to canal, 126 miles 7 furlongs to 131 miles 7 furlongs.	126th to 131st mile.	Do. 49 ..	25,900	
17	..	Siding basin at Iskapalle	128th mile ..	Do. 39 (9).	1,160	
18	..	Flood-gate south bank of Iskapalle river ..	128th ,, ..	Do. 49 ..	19,080	
19	..	Do. north bank of do.	128th ,, ..	Do. 49 ..	19,080	
20	..	Diversion to canal, 131 miles 7 furlongs to 132 miles 5 furlongs.	131st to 132nd mile.	Do. 49 ..	9,364	
21	..	Outlet at 132 miles 5 furlongs	132nd mile 5th furlong.	Do. 49 ..	3,045	
22	..	Flood-gate south bank of Chippaleru river..	Do. do. ..	Do. 49 ..	18,100	
23	..	Diversion to canal, 132 miles 5 furlongs to 134 miles 3 furlongs.	132nd to 134th mile	Do. 48 ..	18,690	
24	..	Flood-gate north bank of Chippaleru river..	132nd mile 6th furlong.	Do. 48 ..	18,100	

Summary of Estimates for improving reaches of Buckingham Canal, &c.—*cont.*

Number on Index Map and General Abstract Estimate.	Sheet Number of Index Map.	Description of Work.	Position.	Reference to Report.	Amount of Estimate as sanctioned in detail by the Madras Government.	Total for each Section.
		NORTHERN CANAL—*cont.*			RS.	RS.
		Section V.—From Pennér River to tail of Commamur Canal in Kistna District—cont.				
25	..	Two outlets at 132 miles 6 furlongs ..	132nd mile 6th furlong.	Paragraph 48 ..	6,090	
26	..	Improvements to canal, 134 miles 3 furlongs to 150 miles 5 furlongs.	134th to 150th mile.	Do. 48 ..	33,100	
27	..	Siding basin at Tumalapenta	139th mile 2nd furlong.	Do. 39 (9).	900	
28	..	Second-class Rest-house at Tumalapenta ..	Do. do. ..	Do. 39 (11).	5,715	
29	..	Siding basin at Chenugaripolliem	145th mile ..	Do. 39 (9).	3,180	
30	..	First-class inspection bungalow at Ramapatam.	149th mile 2nd furlong.	Do. 39 (11).	8,004	
31	..	Office and store at Ramapatam	Do. do. ..	Do. 39 ..	2,340	
32	..	Toll Office, &c., at do.	Do. do. ..	Do. 39 ..	1,300	
33	..	Siding basin at do.	Do. do. ..	Do. 39 (9).	2,590	
34	..	Two outlets at 150 miles 5 furlongs ..	150th mile 5th furlong.	Do. 48 ..	5,640	
35	..	Flood-gate south bank of Elekeru river ..	Do. do. ..	Do. 48 ..	13,720	
36	..	Improvements to canal, 151 miles to 159 miles 7 furlongs.	151st to 159th mile.	Do. 47 ..	21,530	
37	..	Flood-gate north bank of Elekeru river ..	151st mile ..	Do. 47 ..	13,720	
38	..	Outlet at 151 miles	151st ,, ..	Do. 47 ..	2,820	
39	..	Two siding basins at Chackicherla and Karodu.	154th and 159th miles.	Do. 39 (9).	1,310	
40	..	Manneru southern diversion	159th to 160th mile.	Do. 47 ..	2,937	
41	..	Outlet at 159 miles 7 furlongs	159th mile 7th furlong.	Do. 47 ..	2,990	
42	..	Flood-gate south bank of Manneru river ..	160th mile ..	Do. 47 ..	20,240	
43	..	Manneru right flood bank ..	160th ,, ..	Do. 46 ..	2,118	
44	..	Do. left do. ..		Do. 46 ..	6,525	
45	..	Do. north diversion	160th mile to 160th mile 6th furlong.	Do. 46 ..	6,250	
46	..	Flood-gate north bank of Manneru river ..	160th mile ..	Do. 46 ..	20,240	
47	..	Outlet at 160 miles	160th ,, ..	Do. 46 ..	2,990	
48	..	Improvements to canal, 160 miles 6 furlongs to 168 miles 2 furlongs.	160th to 168th mile.	Do. 45 ..	31,660	
49	..	Second-class Rest-house at Oollapolliem ..	163rd mile ..	Do. 39 (11).	5,715	
50	..	Siding basin at Oollapolliem	163rd ,, ..	Do. 39 (9).	1,115	
51	..	Outlet at 164 miles 5 furlongs	164th mile 5th furlong.	Do. 45 ..	3,055	
52	..	Siding basin at Pakala	166th mile ..	Do. 39 (9).	615	
53	..	Outlet at 168 miles	168th ,, ..	Do. 45 ..	3,055	
54	..	Flood-gate south bank at Paleru river ..	168th ,, ..	Do. 45 ..	18,440	
55	..	Paleru right flood bank	167th to 168th mile.	Do. 46 ..	6,130	
56	..	Duplicate cut and improvements to canal, 168 miles 2 furlongs to 169 miles 3 furlongs.	168th to 169th mile.	Do. 45 ..	14,100	
57	..	Flood-gate north bank of Paleru river ..	168th mile 2nd furlong.	Do. 45 ..	18,440	
58	..	Flood-gate south bank of Moosee river ..	169th mile 3rd furlong.	Do. 45 ..	18,440	
59	..	Do. north bank of do. ..	Do. do. ..	Do. 45 ..	18,440	
60	..	Outlet at 169 miles 3 furlongs	Do. do. ..	Do. 45 ..	3,055	
61	..	Moosee left flood bank and Enagalur diversion to Moosee.	172nd mile ..	Do. 45 ..	14,960	
62	..	Improvements to canal, 169 miles 3 furlongs to 177 miles.	169th to 177th mile.	Do. 44 ..	15,800	
63	..	Siding basin at Manneru	172nd mile ..	Do. 39 (9).	2,135	
64	..	Bridge at Ethamukkala	173rd ,, ..	Do. 39 (10).	10,250	
65	..	Siding basin at do.	173rd ,, ..	Do. 39 (9).	2,410	
66	..	Thonderu diversion, 177 miles to 177 miles 7 furlongs.	177th ,, ..	Do. 44 ..	11,150	
67	..	Improvements to canal, 177 miles 7 furlongs to 183 miles 1 furlong.	178th to 183rd mile.	Paragraphs 43 and 44.	23,900	
68	..	First-class inspection bungalow at Kothapatam.	179th mile ..	Paragraph 39 (11).	6,630	
69	..	Stores and office at Kothapatam	179th ,, ..	Do. 39 (11).	2,340	
70	..	Bridge at Kothapatam	179th ,, ..	Do. 39 (10).	10,250	
71	..	Basin at do. both sides	179th ,, ..	Do. 39 (9).	8,180	
72	..	Road dam at do.	179th ,, ..	Do. 39 (10).	3,600	
73	..	Siding basin at Mottumala	183rd ,, ..	Do. 39 (9).	505	
74	..	Outlet at 183 miles 2 furlongs	183rd mile 2nd furlong.	Do. 44 ..	3,170	

Summary of Estimates for improving reaches of Buckingham Canal, &c.—*cont.*

Number on Index Map and General Abstract Estimate.	Sheet Number of Index Map.	Description of Work.	Position.	Reference to Report.	Amount of Estimate as sanctioned in detail by the Madras Government.	Total for each Section.
					Rs.	Rs.
		NORTHERN CANAL—*cont.*				
		Section V.—From Pennèr River to tail of Commamur Canal in Kistna District—cont.				
75	..	Flood-gate south bank of Mudigoudi river ..	183rd mile 2nd furlong.	Paragraph 44 ..	21,460	
76	..	Improvements to canal, 183 miles 3 furlongs to 186 miles 6 furlongs.	183rd to 186th mile.	Do. 43 ..	41,220	
77	..	Flood-gate north bank of Mudigoudi river ..	183rd mile 3rd furlong.	Do. 43 ..	21,460	
78	..	Siding basin at Patapadu	185th mile ..	Do. 39 (9).	515	
79	..	Gundlacamma right flood-bank	186th mile 6th furlong.	Do. 43 ..	3,400	
80	..	Flood-gate south bank of Gundlacamma river.	Do. do. ..	Do. 43 ..	21,720	
81	..	Improvements to canal, 187 miles to 190 miles 3½ furlongs.	187th to 190th mile.	Do. 43 ..	13,380	
82	..	Gundlacamma left flood-bank	187th mile ..	Do. 43 ..	11,850	
83	..	Flood-gate north of bank of do.	187th ,, ..	Do. 42 ..	21,720	
84	..	Siding basin at Devarampadu	188th ,, ..	Do. 39 (9).	590	
85	..	Diversion at Kanooparthi, 190 miles 3½ furlongs to 191 miles 4 furlongs.	190th to 191st mile.	Do. 42 ..	11,630	
86	..	Second-class Rest-house at Kanooparthi ..	191st mile ..	Do. 39 (11).	5,715	
87	..	Siding basin at Kanooparthi	191st ,, ..	Do. 39 (9).	1,115	
88	..	Two outlets at 191 miles	191st ,, ..	Do. 42 ..	6,780	
89	..	Flood-bank at Kanooparthi	191st to 192nd mile.	Do. 42 ..	1,970	
90	..	Improvements to canal, 191 miles 4 furlongs to 194 miles 7¾ furlongs.	191st to 194th mile.	Do. 42 ..	24,800	
91	..	Toll Office and Establishment sheds at Pedda Ganjam.	195th mile ..	Do. 39 (11).	2,004	
92	..	Siding basin at Pedda Ganjam	195th ,, ..	Do. 39 (9).	430	
93	..	Flood-gate at do.	196th ,, ..	Do. 42 ..	18,300	
94	..	Improvements to canal, 194 miles 7¾ furlongs to 196 miles 3 furlongs.	194th to 196th mile.	Do. 42 ..	3,100	
					11,25,667	
		Add items of General Abstract Estimate, Nos. 65, 68, 69 and 73.	..	..	13,25,229	24,50,896
		Section VI.—Junction Canal from Buckingham Canal to Commamur Canal, Kistna District.				
1	..	Drainage cut	195th mile ..	Paragraph 41 ..	3,830	
2	..	Under-tunnel	195th ,, ..	Do. 41 ..	14,000	
3	..	Inlet and outlet at the crossing of the Pedda Ganjam creek.	195th ,, ..	Do. 41 ..	2,770	
					20,600	
		Add item of General Abstract Estimate, No. 73.	..	..	20,674	41,274
						47,38,397
		Tools and Plant and Machinery (General Abstract Estimate, Item No. 71).	..	..	..	56,103
		Total, Northern Canal ..	..	..	..	47,94,500
		SOUTHERN CANAL.				
		Section I.—From St. Mary's Bridge at Madras to Sadras Canal Lock.				
1	⅛	Lock at Adyar river left bank	..	Paragraph 63 ..	51,280	
		Add items of General Abstract Estimate, Nos. 65, 68 A, 69 A, and 73.	..	..	6,51,957	7,03,237
		Section II.—From Sadras Canal Lock to Pálár River.				
1	..	Improvements to canal from Adyar river to 8 miles 4 furlongs.	0 to 8th mile ..	Paragraph 64 ..	50,700	
2	..	Lock at Adyar river right bank	1st mile ..	Do. 64 ..	42,750	
3	..	Two siding basins at Guindy Bridge and at lattice girder bridge, &c.	1st and 3rd miles.	Do. 39 (9).	4,045	
4	..	Toll Office and Establishment sheds at Palavakkam.	5th mile ..	Do. 39 (11).	925	

Summary of Estimates for improving reaches of Buckingham Canal, &c.—*cont.*

Number on Index Map and General Abstract Estimate.	Sheet Number of Index Map.	Description of Work.	Position.	Reference to Report.	Amount of Estimate as sanctioned in detail by the Madras Government.	Total for each Section.
					Rs.	Rs.
		SOUTHERN CANAL—*cont.*				
		Section II.—From Sadras Canal Lock to Pálár River—cont.				
			5th mile	Paragraph 39 (9).	1,250	
5	..	Siding basin at Neelankarai	8th to 15th mile.	Do. 64 ..	55,200	
6	..	Diversion to canal, 8 miles 4 furlongs to 15 miles 1 furlong.	12th to 13th mile.	Do. 39 (9).	1,800	
7	..	Two siding basins at Vanienchavady, 12 miles and 13 miles.	15th mile 1st furlong.	Do. 64 ..	14,800	
8	..	Flood-gate north bank of Covelong backwater.	15th to 31st mile.	Do. 65 ..	1,69,300	
9	..	Diversion to canal, 15 miles 2 furlongs to 31 miles 2 furlongs.	15th mile to 2nd furlong.	Do. 65 ..	14,800	
10	..	Flood-gate south of Covelong backwater ..	16th mile 3rd furlong.	Do. 39 (11).	5,715	
11	..	Second-class Rest-house at Covelong ..	16th mile 3rd furlong, 18th mile, 20th mile 4th furlong, 23rd mile 4th furlong, 28th mile 4th furlong, and 30th mile 1st furlong.	Do. 39 (9).	9,625	
12	½	Six siding basins at 16 miles 3 furlongs, 18 miles, 20 miles 4 furlongs, 23 miles 4 furlongs, 28 miles 4 furlongs, and 30 miles 1 furlong.	31st mile 2nd furlong.	Do. 65 ..	14,800	
13	..	Flood-gate north of Edayur backwater ..	31st to 32nd miles	Do. 66 ..	7,430	
14	..	Diversion to canal, 31 miles 4 furlongs to 32 miles 3 furlongs.	31st mile 4th furlong.	Do. 66 ..	14,800	
15	..	Flood-gate south bank of Edayur backwater.	32nd mile 2nd furlong.	Do. 39 (9).	1,695	
16	..	Siding basin at Konatur, 32 miles 2 furlongs.	32nd to 36th mile.	Do. 66 ..	14,875	
17	..	Improvements to canal, 32 miles 3 furlongs to 36 miles 3 furlongs.	35th mile ..	Do. 39 (9).	2,670	
18	..	Siding basin at Sadras	36th mile 3rd furlong.	Do. 66 ..	15,130	
19	..	Flood-gate north of Pudupatnam drain near Sadras.	36th to 41st mile.	Do. 66 ..	92,280	
20	..	Improvements to canal, diversion and flood bank to Pálár river.	36th mile 5th furlong.	Do. 66 ..	15,130	
21	..	Flood-gate south bank of Pudupatnam drain	37th mile ..	Do. 39 (9).	3,375	
22	..	Siding basin at Pudupatnam	39th ,, ..	Do. 66 ..	18,950	
23	..	Flood-gate left bank, Pálár river	13th, 18th, 30th, 33rd and 38th miles.	Do. 66 ..	14,700	
23 A.	..	Five outlet sluices			5,86,745	
					78,608	
		Add items of General Abstract Estimate, Nos. 65, 68, 68 A, and 73.	..	..		6,65,353
		Section III.—From Pálár River to Merkanam.				
		Flood-gate, Pálár river, right bank ..	40th mile ..	Paragraph 66 ..	18,620	
1	..	Second-class Rest-house at Panayur ..	54th ,, ..	Do. 39 (11).	5,715	
2	..	Toll Office and Establishment sheds at Alambarai.	58th ,, ..	Do. 39 (11).	640	
3	..	Store and Office at Alambarai	58th ,, ..	Do. 39 (11).	2,340	
4	..				27,315	
		Add items of General Abstract Estimate, Nos. 65, 68, and 73.	..	..	1,86,450	
						2,13,765
		Tools and Plant and Machinery, Item No. 71.	..	..	..	10,245
		Total, Southern Canal ..	..	..	..	15,92,600
		Grand Total, Northern and Southern Canals.	..	..	..	63,87,100

CHEPÂK,
December 1882.

(Signed) R. R. E. DRAKE-BROCKMAN, Major, R.E.,
Executive Engineer, Buckingham Canal.

APPENDIX B.

Statement showing the Expenditure incurred up to 31st March 1882 and to be incurred on different Sections of the Buckingham Canal.

No.	Sections of Canal.	Expenditure up to the commencement of Famine.	Expenditure during Famine.			Expenditure subsequent to Famine up to 31st March 1882.	Total of Columns 3, 6, and 7.	Further Expenditure to be incurred including the probable Outlay in 1882-83.	Total of Columns 8 and 9.
			Total Famine Expenditure.	Deduct Excess over Normal Rates debited to Famine.	Net Ordinary Expenditure.				
1	2	3	4	5	6	7	8	9	10
	Southern Canal.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1	From St. Mary's Bridge at Madras to Junction Canal Lock	16,002	7,12,497	1,29,395	5,83,102	48,053	6,47,157	56,080	7,03,237
2	From Sadras Canal Lock to Pálár River	48,836	39,719	15,591	24,128	361	73,325	5,92,028	6,65,353
3	From Pálár River to Merkanam	...	32,633	15,016	17,617	1,65,793	1,83,410	30,355	2,13,765
		64,838	7,84,849	1,60,002	6,24,847	2,14,207	9,03,892	6,78,463	15,82,355
	Northern Canal.								
1	From St. Mary's Bridge at Madras to Pulicat ...	...	...	...	...	1,452	1,452	4,32,960	4,34,412
2	From Pulicat to Dugarázpatnam	1,800	3,10,685	69,185	2,41,500	7,673	2,50,973	4,07,825	6,58,798
3	From Dugarázpatnam to Kistnapatam	2,85,782	...	...	...	..	2,85,782	2,54,467	5,40,249
4	From Kistnapatam to Pennér River ...	1,96,658	85,239	6,341	78,898	32,434	3,07,990	3,04,778	6,12,768
5	From Pennér River to tail of Commamur Canal ...	...	17,39,875	4,94,500	12,45,375	71,047	13,16,422	11,34,474	24,50,896
6	Junction Canal from Buckingham Canal to Commamur Canal	...	4,281	1,047	3,234	17,440	20,674	20,600	41,274
		4,84,240	21,40,080	5,71,073	15,69,007	1,30,046	21,83,293	25,55,104	47,38,397
	Total ...	5,49,078	29,24,929	7,31,075	21,93,854	3,44,253	30,87,185	32,33,567	63,20,752
	Tools and Plant and Machinery provided for in the General Abstract Estimate	...	...	...	...	...	..	...	66,348
	Grand Total ..	...	...	...	...	...	...	...	63,87,100

(Signed) R. R. E. DRAKE-BROCKMAN, Major, R.E.,
Executive Engineer, Buckingham Canal.

APPENDIX C.

Statement showing the Arrivals at, and Departures from, the Madras Basin of Boats, with their Tonnage, for the period 1st July 1878 to 30th June 1882.

Directions.	Half-year ending 31st December 1878.		Half-year ending 30th June 1879.		Half-year ending 31st December 1879.		Half-year ending 30th June 1880.		Half-year ending 31st December 1880.		Half-year ending 30th June 1881.		Half-year ending 31st December 1881.		Half-year ending 30th June 1882.	
	Number of Boats.	Tons.	Number of Boats.	Tons.	Number of Boats.	Tons.	Number of Boats.	Tons.	Number of Boats.	Tons.	Number of Boats.	Tons.	Number of Boats.	Tons.	Number of Boats.	Tons.
Inwards from A Section ..	3,199	19,880	2,681	14,946	4,019	25,494	1,467	9,330	3,762	26,440	3,890	26,638	3,842	21,841	3,100	15,968
Do. from C do. ..	6,561	81,836	7,125	78,645	5,396	66,406	5,653	70,208	7,657	116,755	5,333	95,975	6,856	96,753	5,070	59,341
Total ..	9,760	101,716	9,806	93,591	9,415	91,900	7,120	79,538	11,419	143,195	9,223	122,613	10,698	118,594	8,170	75,309
Outwards into A Section ..	1,438	7,863	1,629	9,059	730	3,954	277	2,405	2,208	17,037	3,975	26,247	3,828	21,561	3,153	16,639
Do. into C do. ..	959	6,754	1,121	11,463	2,036	24,657	5,591	67,679	7,701	117,591	5,763	62,357	6,918	98,474	5,072	58,018
Total ..	2,397	14,617	2,750	20,522	2,766	28,611	5,868	70,084	9,909	134,628	9,738	88,604	10,746	120,035	8,225	74,657
Grand Total ..	12,157	116,333	12,556	114,113	12,181	120,511	12,988	149,622	21,328	277,823	18,961	211,217	21,444	238,629	16,395	149,966

Chepâk,
15th September 1882.

(Signed) R. R. E. DRAKE-BROCKMAN, Major, R.E.,
Executive Engineer, Buckingham Canal.

APPENDIX E.

THE BUCKINGHAM CANAL.

Ootacamund, September 22, 1879.

The following revised rules for the regulation of the navigation of the Buckingham Canal, passed by the Madras Government with such alterations as appeared necessary, are, under the provisions of Section 23 of Act I of 1870, hereby published for general information :—

I.—The Buckingham Canal includes the following lines of navigation, extending from south of the Pálár river in the district of Chingleput to the junction of the tidal and fresh-water canals in the Kistna District near Pedda Ganjam, together passing over a continuous distance of about 256 miles, viz. :—

1*st.*—The Sadras Canal extending from 12 miles south of the right bank of the Pálár river to Palavakkam, distance about 50 miles.

2*nd.*—The Madras Canal extending from Palavakkam to the Shadayankuppam Lock, distance about 16 miles.

3*rd.*—The Pulicat Canal extending from the Shadayankuppam Lock to near Raidurravoo, distance about 48 miles.

4*th.*—The Kistnapatam Canal extending from near Raidurravoo to near Kódúr, distance about 48 miles.

5*th.*—The Ramapatam Canal extending from near Kódúr to Ramapatam, distance about 48 miles.

6*th.*—The Kottapatam Canal extending from Ramapatam to the junction with the Commamur fresh-water canal in the Kistna District, distance about 46 miles.

II.—These lines of navigation include also such portions of all navigable estuaries, backwaters, rivers, and channels, whether salt or fresh, connected with each such lines as have been artificially formed, deepened, or protected; except all those minor channels which have been excavated as feeders to the main line of canal for purposes connected with the Salt and Wood Departments; they shall be each and severally distinct lines of navigation as defined in Section 1 of Act I of 1870 (The Canals and Ferries Act), the provisions of which shall apply to each of these distinct lines of navigation separately, and they shall be denominated sections of the Buckingham Canal as follows :—

1*st.*—A or the Sadras Section.
2*nd.*—B or the Madras Section.
3*rd.*—C or the Pulicat Section.
4*th.*—D or the Kistnapatam Section.
5*th.*—E or the Ramapatam Section.
6*th.*—F or the Kottapatam Section.

III.—From and after the 8th day of October 1879 no vessel, but those hereinafter excepted, shall be allowed on, or to use any of the abovementioned distinct lines of navigation without—

(1*st.*) The payment of an annual license fee at the rates specified in the Schedule A annexed for the use of any one of the abovementioned distinct lines of navigation.

Exception (1).—Vessels possessing licenses for the navigation of the canals of the Godávari or Kistna District will not be required to pay a license fee for the use of any section of the Buckingham Canal.

Exception (2).—The Pulicat fishermen (with boats under 2 tons each) should be free to fish in the backwater without the obligation to take out a license.

(2*nd.*) The payment of a toll at the rates specified in the Schedule B annexed for passing from any one to any other of the abovementioned distinct lines of navigation for which the owner does not hold a license.

Exception (1).—Boats leaving their section will not be liable to toll when returning empty within two months.

Exception (2).—Boats licensed for the Kistna and Godávari plying through the length of the canal to Madras will pay 4 annas per ton on the outward journey, but on returning full or empty, they will pass free at any toll-bar at which they had paid toll within one month.

Exception (3).—Boat-owners have the option of compounding for a year's tolls at Rs. 10 per ton.

Exception (4).—Boats licensed for the whole canal will not pay tolls.

Exception (5).—Boats returning into their own sections with a cargo after an absence from it of ten clear days, or if returning empty after an absence from it of two months, must pay tolls.

IV.—The Executive Engineer of the canal will issue licenses (in the Form C annexed) personally or by agents authorised by him in writing for the purpose, at such times and places as he may notify in the *Fort St. George Gazette* and in the Official Gazette of the district in which the line of navigation, for which licenses are to be issued, is situated. The vessels to be licensed must be brought at the time specified in the notification to the places where licenses are to be issued to be measured and registered and to have the necessary distinguishing marks put on them.

V.—These marks will show by letter the section of the canal to which the vessel belongs and which it is licensed to navigate. They will show the registered number of the vessel, and the tonnage, or the number of passengers the vessel is licensed to carry. They shall be put on under the direction of the Executive Engineer at the cost of the owner of the vessel, who will be held responsible that they are not defaced or obliterated, and that they are renewed from time to time as required. Yachts, pleasure boats, and other vessels not intended to ply for hire, may be marked as the owner desires, provided the figures are clearly legible.

VI.—Applications for licenses shall be made in the Form D annexed, at any time before the 8th October for the current calendar year, and in the months of October, November or December for the ensuing calendar year. Printed forms of applications for licenses will be issued by the Executive Engineer of the Canal at his office in Madras and by the Toll Superintendents of the Canal at the Toll offices at Palavakkam, Shadayankuppam Lock, Raidurravoo, Kódúr, Ramapatam, and Pedda Ganjam.

VII.—The maximum dimensions of vessels brought on the canal hereafter will be limited to 90 feet in length, 13 feet beam, and 2½ feet draught; vessels of greater length and beam that may be now on the canal will be allowed to remain upon it at the owner's risk until they are worn out or renewed, but the draught of water will be limited in all cases to 2½ feet, which draught will be marked by a painted band or water-line round the outside of the hull, provided that the painted band or water-line thus arrived at shall not allow less free-board than 12 inches; or, in other words, be less than 12 inches below the lowest point in the gunwale; and no vessel shall be laden so as entirely to submerge this painted band. The height of fixed fittings, such as the roofs of boats, mast partners, funnel sockets, &c., shall be limited to 6½ feet above the deep load-line.

The height of piled cargo, such as firewood, cotton, leaves, &c., will be limited to the same dimensions and in a similar manner.

VIII.—The gross tonnage of all vessels will be obtained by the following rule :—

$$\frac{L \times B \times D}{50}$$

L being equal to the length of the vessel, measured at half the midship depth, from the afterpart of the stem to the forepart of the stern post.

B is equal to the sum of five widths taken from the inner side of the planking to one side of the rib on the other side, at equal distances of one-sixth of the above length, divided by 6.

D is the midship depth taken from the upper surface of the limber strake (the bottom plank next the keelson, or the centre bottom plank when there is no keelson) to the under-surface of the deck planking in decked vessels, or to the top of the upper strake or gunwale in open vessels.

The net or registered tonnage will be for—

Steamers, the gross tonnage less one-third; and for

Other vessels, the gross tonnage less 15 per cent.;

but the carrying capacity of *any* vessel to the load-line painted round the hull as laid down in Rule VII will be actually tested by weight on the owner of the vessel or his agent bringing it to the Basin at Madras and making written application to the Executive Engineer to have it so tested, and the result arrived at by such testing shall be the registered tonnage of the vessel and be painted on it and adopted as the registered tonnage of the vessel, with effect retrospective to the commencement of the license under which the vessel is plying, *i.e*, all excess license fees and tolls collected from the commencement of the calendar year for which the vessel is licensed will be refunded, and *vice versâ*. In the case of a vessel being tested which is found to have had its tonnage correctly or underestimated by the method of measurement in this rule, the boat-owner or his agent who applies for the testing will pay a fee for testing of eight annas per ton of the tonnage arrived at by the testing. The cost of testing shall be borne by the Government when it is carried out on the order of the officer in charge of the canal, and in such case its effect shall not be retrospective.

APPENDIX D.

Statement showing the Number, Tonnage, and Description of Boats licensed for each Section of the Buckingham Canal for the year 1881.

Particulars.	Uncovered Cargo Boats.																															
	1 Ton.	2 Tons.	3 Tons.	4 Tons.	5 Tons.	6 Tons.	7 Tons.	8 Tons.	9 Tons.	10 Tons.	11 Tons.	12 Tons.	13 Tons.	14 Tons.	15 Tons.	16 Tons.	17 Tons.	18 Tons.	19 Tons.	20 Tons.	21 Tons.	22 Tons.	23 Tons.	24 Tons.	25 Tons.	26 Tons.	27 Tons.	28 Tons.	29 Tons.	30 Tons.	31 Tons.	32 Tons.	35 Tons.	Total.
Government Boats	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Private Boats	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Boats compounded for the whole canal	..	..	..	1	2	..	3	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8
A or Sadras Section ..	..	..	7	12	5	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	25
B or Madras do. ..	..	..	..	1	..	..	..	..	..	..	1	..	1	1	2	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8
C or Pulicat do. ..	4	6	1	13	9	6	7	11	4	6	5	7	7	8	1	14	13	12	7	19	14	13	12	12	17	9	13	16	16	11	8	4	1	306
D or Kistnapatam Section ..	..	..	..	1	..	3	1	..	1	..	..	..	..	..	1	2	1	2	2	2	..	..	1	..	..	..	..	..	..	..	..	..	..	17
E or Ramapatam do. ..	..	..	..	..	..	1	1	2	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5
F or Kottapatam do. ..	..	..	..	1	2	1	..	1	1	2	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10
Total Number of Boats ..	4	6	8	29	18	11	13	15	6	9	7	7	8	10	4	17	14	15	10	21	14	13	13	12	17	9	13	16	16	11	8	4	1	379
Total Tonnage ..	4	12	24	116	90	66	91	120	54	90	77	84	104	140	60	272	238	270	190	420	294	286	299	288	425	234	351	448	464	330	248	128	35	6,352
																																		161 Tons

Statement showing the Number, Tonnage, and Description of Boats licensed for each Section, &c.—*cont.*

Particulars.	Covered Cargo, Passengers and Radari Boats.																			Total.	Deck and Dinghy Boats.											
	1 Ton.	2 Tons.	3 Tons.	4 Tons.	5 Tons.	6 Tons.	7 Tons.	8 Tons.	9 Tons.	10 Tons.	11 Tons.	12 Tons.	13 Tons.	14 Tons.	15 Tons.	16 Tons.	17 Tons.	18 Tons.	19 Tons.		1 Ton.	2 Tons.	3 Tons.	4 Tons.	5 Tons.	6 Tons.	7 Tons.	8 Tons.	9 Tons.	10 Tons.	11 Tons.	12 Tons.
Government Boats	..	..	1	3	1	4	2	2	3	..	..	..	1	..	..	..	..	..	..	17	..	..	..	..	..	..	..	..	..	..	..
Private Boats	..	..	..	1	1	2	1	..	..	..	..	1	..	1	2	..	..	..	..	9	..	..	..	..	..	..	..	..	..	..	..	..
Boats compounded for the whole year	..	1	1	2	1	9	3	5	3	2	3	1	1	1	1	1	..	..	..	35	..	..	..	..	..	..	..	1	..	..	..	..
A or Sadras Section	..	7	27	43	19	4	..	..	..	..	..	..	..	..	..	..	..	..	..	100	..	..	..	..	..	..	..	..	..	..	..	..
B or Madras do.	3	1	4	2	2	..	1	1	..	..	..	..	1	..	1	1	..	..	1	18	..	..	..	..	..	..	..	1	..	..	1	..
C or Pulicat do.	4	24	18	52	55	35	19	18	16	15	8	10	9	5	2	1	..	..	..	291	..	..	..	..	..	..	..	1	1	..	..	..
D or Kistnapatam Section	..	..	..	1	5	..	4	..	2	..	1	1	..	..	..	..	1	..	..	15	..	..	..	..	..	..	..	..	..	3	..	..
E or Ramapatam do.	..	..	1	1	5	6	6	5	3	1	..	1	..	..	..	..	..	..	..	29	..	..	..	..	..	..	..	2	..	2	..	2
F or Kottapatam do.	..	..	..	1	5	1	5	4	..	2	..	..	1	..	..	..	..	..	..	19	..	..	..	..	..	..	..	..	..	..	..	..
Total Number of Boats ..	7	33	52	106	94	61	41	35	27	20	12	14	13	7	6	3	1	..	1	533	..	..	..	..	..	..	..	4	1	6	..	3
Total Tonnage ..	7	66	156	424	470	366	287	280	243	200	132	168	169	98	90	48	17	..	19	3,240	..	..	..	..	..	..	..	32	9	60	..	36
																				6 Tons												

Statement showing the Number, Tonnage, and Description of Boats licensed for each Section, &c.—*cont.*

Particulars.	Deck and Dinghy Boats—*cont.*						Total.	Fishing Boats.						Total.	Various other Boats.				Total.	Total Number of all kinds of Boats.	Total Tonnage of Boats.
	13 Tons.	14 Tons.	15 Tons.	16 Tons.	17 Tons.	18 Tons.		1 Ton.	2 Tons.	3 Tons.	4 Tons.	5 Tons.	6 Tons.		1 Ton.	2 Tons.	3 Tons.	4 Tons.			
Government Boats	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	17	114
Private Boats	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	84
Boats compounded for the whole year	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	44	348
A or Sadras Section ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	125	487
B or Madras do. ..	1	..	1	..	..	..	2	..	..	..	..	..	..	..	18	..	..	..	18	44	237
C or Pulicat do. ..	..	..	..	..	..	..	4	108	42	3	1	..	..	154	3	8	..	..	11	767	7,816
D or Kistnapatam Section ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	35	380
E or Ramapatam do. ..	..	..	..	..	1	..	2	..	..	..	..	..	1	1	..	..	..	..	..	39	291
F or Kottapatam do. ..	2	2	2	1	2	2	17	..	..	..	..	..	..	..	..	1	..	1	2	48	458
Total Number of Boats ..	3	2	4	1	3	2	29	108	42	3	1	..	1	155	21	10	..	1	32	1,128	..
Total Tonnage ..	39	28	60	16	51	36	367	108	84	9	4	..	6	211	21	20	..	4	45	..	10,215

(Signed) R. R. E. DRAKE-BROCKMAN, Major, R.E.,
Executive Engineer, Buckingham Canal.

CHEPÂK,
15th September 1882.

IX.—Vessels adapted to carry passengers, *i.e.*, having a covered space for their protection, may be registered as passenger vessels and will then be licensed to carry one passenger for every 5 square feet of deck surface under cover to be measured as follows:—Length, from stem to stern at the deck level; breadth, the sum of five widths taken at equal distances of one-sixth the length and divided by 6; then length and breadth divided by 5 will give the number of passengers a vessel will be licensed to carry, including 40 lb. of luggage for each passenger. When passenger vessels carry cargo as well as passengers, the quantity of cargo allowable will be the registered tonnage less 400 lb. for each passenger on board.

First-class passenger vessels (such as budgerows) plying for hire and not carrying cargo will be licensed at the commencement of the year at the option of the owners, either like other vessels by a license fee of Rs. 2 per ton for one section and tools at 4 annas per ton, or by a license fee at Rs. 4 per ton for the *whole* Buckingham Canal for the year. In the calculation of the tonnage of such boats the free-board will be taken as at 18 inches and the load-line marked accordingly, the tonnage being determined by testing. The minimum fee for licensing a budgerow for the whole canal shall be Rs. 15.

Vessels, the private property of individuals, making use of the canals, but not carrying passengers or goods or plying for hire, will be licensed for a calendar year for the *whole* Buckingham Canal on payment of a fee of Rs. 15.

X.—Rafts will be permitted to navigate the several sections of the Buckingham Canal on payment when entering each such section of the toll prescribed in Schedule B annexed; no raft exceeding 90′ × 13′ × 2″ will be allowed on the canal.

XI.—If a vessel after the issue of a license be enlarged, it shall not again use the canal until it has been remeasured and relicensed. The new license will be granted on surrender of the old license and on payment of the prescribed fee per ton on the difference between the old and new tonnage.

XII.—No person who has taken out a license for the navigation of any section of the canal shall have claim to compensation on account of any impediment to navigation that may occur from any cause whatever.

XIII.—Sea-going vessels brought into rivers and backwaters for shelter, for repair, or for any other purpose except to ply for hire must anchor or lay up outside the fair way of canal traffic which will be defined by the Canal officers; such vessels will not be allowed to enter on the main line of the canal for the purpose of proceeding from one river or backwater to another river or backwater for any other purpose except in accordance with the rules prescribed for the use of the canal.

XIV.—The Executive Engineer in charge of the canal for the time being is authorised to enforce these rules, to collect tolls and license fees, to remove obstructions to navigation, and to direct prosecutions under the provisions of Sections 7, 8, 9, 10, 12, and 25 of Act No. I of 1870.

BYE-LAWS.

I.—No vessel shall moor on the towing-path side of the canal when there is only one towing-path, nor on the windward side when there are two towing-paths, except when actually loading or unloading, or with the special permission of the Canal officers.

II.—No cargo shall be loaded or unloaded, and no passengers shall be shipped or landed at any lock or masonry work other than the quays or wharfs specially provided for the purpose.

III.—No vessel shall be repaired or fitted on the main line of the canal without the written permission of the Executive Engineer or other officer authorised to give such permission on the Executive Engineer's behalf.

IV.—No vessels shall be moored in a lock channel defined as such by notice-boards erected for the purpose by the Canal officers.

V.—Vessels when moored in main line of the canal shall be made fast stem and stern to the banks in single tier, and there must be a person always in charge of each vessel; vessels when thus moored must, between sunset and sunrise, show a clear bright light not less than 4 feet above the water level and visible all round the vessel.

VI.—When vessels, other than steamers, going under sail in opposite directions, meet, the vessel going with the wind shall give way, while the vessel going against the wind shall hold on its course.

VII.—Vessels not under sail shall give way to vessels under sail, and steamers shall in all cases give way to other vessels.

VIII.—When vessels not under sail, including steamers, meet, those going north should keep to the east, and those going south should keep to the west.

IX.—When a vessel passes another vessel going in the same direction, it should keep to the leeward of vessels under sail, and on the opposite side of the towing line of vessels not under sail.

X.—Vessels when not moored must, between sunset and sunrise, carry lights as follows:—

Steamers, three lights—

1*st.*—A clear white light not less than 9 feet above water and in the centre line of the vessel.

2*nd.*—A bull's-eye bright red light on the port (left) side.

3*rd.*—A bull's-eye bright green light on the starboard (right) side.

The bull's-eye lights to be not less than 8 inches in diameter and not less than 4 feet above water.

Vessels other than steamers must carry a clear white light at the fore end not less than 4 feet above water.

Passenger boats must, in addition to the above lights, carry a light in each cabin or compartment for passengers.

XI.—The maximum speed of steamers will be limited to 10 miles an hour by day and to 5 miles an hour by night, reduced to 4 miles an hour when within half a mile of a lock, or vessels ahead coming in an opposite direction. The steam whistle shall be blown when speed is reduced on the abovementioned occasions and when nearing a vessel going ahead in the same direction, or when approaching any sharp bend in the canal. Steamers passing through portions of the canal under repair or through portions of the canal that cannot stand a high speed shall reduce speed at those places to the limit fixed by the Canal officers on notice-boards erected for this purpose.

XII.—Every vessel shall have its license always on board, and it shall be produced for examination by the Executive Engineer or by any officer authorised by the Executive Engineer to demand an inspection of it.

XIII.—Every vessel plying for hire is liable to be inspected at any time or place by the Executive Engineer or by officers authorised by him to inspect vessels, and the Executive Engineer may withdraw the license of any vessel found to be from any cause unfit for use, and to withhold the license until the vessel is made serviceable.

XIV.—The Executive Engineer may suspend the license of any vessel for any period not exceeding three months, or levy a fine not exceeding 5 rupees in each case, for any infringement of these rules or bye-laws.

THE BUCKINGHAM CANAL, MADRAS.

SCHEDULE A.

License Fees.

Description of Vessel.	Rate per Ton of Registered Tonnage per Annum. RS. A. P.
For every ship, steamer, boat, barge, or vessel of any description, except those specified in the latter part of Rule IX (for the licenses for the whole canal), propelled in any manner and used for any purpose except fishing or pleasure	2 0 0
For every fishing or pleasure boat	0 4 0

Fractions of tons will be counted as one ton, and the minimum charge for any vessel will be one rupee.

Licenses will be issued on payment of the above fees for the use of any distinct line of navigation included in the Buckingham Canal.

A license will not be granted to the same vessel for the use of more than one line of navigation on the canal, except in the instances of the two classes of vessels specified in the latter part of Rule IX.

Vessels licensed in any month of one year must pay the annual fee for the whole of that year.

Licensed vessels will have to pay no other dues of any sort for the use throughout the year of the section of the canal for which the license is granted.

The fee for a duplicate license will be 2 rupees.

THE BUCKINGHAM CANAL, MADRAS.

SCHEDULE B.

SCHEDULE OF TOLLS.

Tolls.

Description of Vessel.	Rate per Ton of Registered Tonnage. RS A. P.
For every ship, steamer, barge, boat, or vessel of any description and propelled in any manner entering any of the distinct lines of navigation or sections of the canal other than the section in which it is licensed, and which it can use free of tolls	0 4 0
	Rate per Square Yard. RS. A. P.
For every raft of floating timber, bamboos, or other floating substance	0 1 0

THE BUCKINGHAM CANAL, MADRAS.

FORM C.

License No. of 1879.

This vessel is licensed to use the section of the Buckingham Canal during the calendar year 1879 free of further charge.

Registered No.
Name of owner.
Residence of owner.
Class of vessel. (*a*)
Extreme length.
Do. breadth.
Do. depth.
Draught of water.
Licensed to carry tons cargo.
Do. do. passengers.
Fee paid.
License issued by

on the day of 1879.
Executive Engineer.

(*a*) Here enter steamer, budgerow, cargo-boat, passenger-boat, fishing-boat, or pleasure-boat as the case may be.

THE BUCKINGHAM CANAL, MADRAS.

FORM D.

APPLICATION FOR LICENSE.

I (or we) the undersigned (1) residing at (2)
in the district of (3) hereby apply for license to
place (4) on the (5) section of the Buckingham Canal during
the year 1879.
Date Signature.

(1) Here enter name or names of owners.
(2) Place of residence.
(3) Name of district in which residing
(4) Description of boat and purpose for which it is to be used, such as passenger-boat, cargo-boat, budgerow, &c.
(5) Section of the canal for which a license is required, *i.e.*, the
A or Sadras Section.
B or Madras Section.
C or Pulicat Section.
D or Kistnapatam Section.
E or Ramapatam Section.
F or Kottapatam Section.

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

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Buildings and Roads.
Civil Works.

No. 106.

READ—the following papers :—

Report by the Executive Engineer, Buckingham Canal Division.

No. 106-A.

Note by the Chief Engineer, Public Works Department.

The history, constructive details, financial position, &c., of this work have been dealt with at such length in the accompanying report that little more than a brief *résumé* of the points will suffice in submitting the project for the consideration of Government.

2. The work now known as the Buckingham Canal, extending along the coast 66 miles south and 195 miles north of Madras (where it unites with the Kistna and Godávari canal systems), had its commencement as early as 1801.

3. Mr. Heefke, with Mr. Basil Cochrane as security, obtained the first concession for excavating 11 miles of channel (which was then known as Lord Clive's canal) between Madras and Ennore, but Mr. Cochrane, obtaining subsequently entire control, finished this portion in 1806, and afterwards extended the communication to Pulicat, 25 miles. This gentleman remained sole proprietor of the work for 45 years, when his rights were bought out by Government. Throughout this period the work was generally known as "Cochrane's Canal," a term which, in spite of the lapse of time and two subsequent changes of title, first, to "East Coast Canal," and, then, later on, to the "Buckingham Canal," still adheres to the first portion.

To maintain a sufficient height of water in the canal, which, otherwise, when the Ennore bar was open, would have reduced the height of water in the Cooum river at Madras, the Shadayankuppam lock was built in 1854 at 7½ miles north of Madras; and, subsequently, the channel was extended as far as Dugarázpatnam, 69 miles north. About the same time the canal was pushed south from Madras 40 miles to the Pálár river.

The ultimate objects in view at this period were to reach Kistnapatam backwater, 21 miles north of Dugarázpatnam, thus affording a terminus for Nellore; and as regards the southern branch of the canal, to make for Merkanam, and ultimately the French territory (Pondicherry).

That much wider views of the ultimate extension of the work obtained is clear from all the reports of the time, but want of funds and difficulties connected with the disposal of the cross drainage (every river along the coast passing the channel on its way to the sea) interfered with the actual progress of the work.

Captain Chambers, Mr. Kennedy, Mr. Fraser and other able officers designed extensions of the work north and south, and it was probably as much due to the fact

that these designs were in readiness as to anything else that on the occurrence of the late severe famine the further prosecution of the work was resolved on.

Under the orders of His Grace the Duke of Buckingham large gangs of work-people from the famine-stricken districts of Bellary, Kurnool, and Cuddapah were marched down to the coast, and worked along the whole line, partly in improving the then existing channel, partly in excavating the new canal extending from Dugaráz-patnam to Pedda Ganjam, the junction of the Kistna system (a length of 126 miles in all) was put in hand to the north, and a further length from the Pálár river south. At one time it is reported that no less than 100,000 men, women, and children were so employed.

The whole line, in its present length, may thus be said to have reached a certain stage of completion with the termination of the famine.

The circumstances which have directly led to the necessity for the present large completion estimate may now be briefly noticed.

From the shallowness of the several backwaters along the coast, out of the connection of which no doubt arose the original conception of the canal, flat-bottomed boats, with only trifling draft, were at first used; owing to this the several connection cuts or channels were given very little depth, say 12, or at most 15 inches.

In many places the backwaters were necessarily much deeper than this, and so also the canals in places, but these were at least the ruling depths.

This view of the requirements and capacity of the work is clearly shown by the trifling outlay which, down to 1856, had taken place in its construction, which did not exceed Rs. 1,400 per mile.

Some of the highest engineering authorities of the time considered that, for the development of an inland coast trade it would not only suffice thus, as it were, to "scratch" out a shallow channel, but that it would be quite a mistake to attempt anything more.

This view in itself was by no means illogical, as, in addition to providing for the small class of boats there in use, it certainly met in a way the difficulties arising out of silt-bearing floods which, in crossing the line of canal all along the coast, would always tend to fill up the channel.

To re-excavate, even along a considerable length, a channel to only 12 or 15 inches might be periodically faced, and few or no works of flood protection would be essential.

This view, like all others dependent on arguments derived from small beginnings had of necessity to yield as traffic increased, and a larger class of boats began, to be built and used on the canal.

It thus came to be recognised that if the work was to meet in any adequate way the strain thrown upon it, a depth of not less than 3 feet everywhere at low water must be secured; and although, as will be observed from an examination of the present report, this has led to greatly enhanced outlay, the conclusions on which it is based appear to be irresistible.

Whereas merely clearing a shallow trough through backwaters might have well suited the requirements of the small flat-bottomed skiffs at first used, it has year by year become more clear that, if a canal with sole 3 feet below low water were to be maintained, the first necessity would be to exclude the land floods which usually accompany cyclones on the coast, and which in many places have been shown to rise to no less than 10 or 11 feet above mean sea level.

Such floods, owing to the flatness of the littoral tract, take some time to vent themselves, and after two or three days they have, in many places, been shown not only to bring in silt sufficient to fill up the canal, but even to raise the bed above mean sea level. The enormous recurring outlay required by the re-excavation of the silt thus poured into the unprotected channel has proved that it would in the end be far cheaper to isolate and protect from flood invasion all the several reaches of the canal between the different drainages as they cross the line.

The necessity of constructing high isolating side-embankments, flood-gates, and the training of the several rivers near the coast have thus, one and all, followed as a matter of necessity.

The trifling outlay which, as before shown, was found to suffice with shallow boats and a small trade, has thus gradually progressed from a capital outlay of Rs. 1,400 per mile in 1856 to nearly—

Rs. 3,500 per mile at end of 1875-76,
" 8,500 " " of 1877-78,
" 12,000 " " of 1881-82.

[This omits the excess over normal rates due to famine, which amounted in the aggregate to Rs. 7,31,075.]

As shown by the completion estimates herewith sent up, amounting with all past outlay to Rs. 63,87,100, the ultimate cost for a fully completed first-class canal, 261 miles in length, will be a little under Rs. 24,500 per mile.

The returns show that all classes of boats employed on the canal have increased in a very marked manner, notwithstanding what is now admitted to have been a vexatious and deterrent method of levying license-fees and tolls.

In 1879 there were in all 723 boats with a gross burden of 6,287 tons. By 1882 these had increased to 1,055 boats, aggregating 10,551 tons.

In 1875 the receipts from tolls, &c., were Rs. 51,113, and the total collections had increased to—

Rs. 1,09,808 in 1880,
" 1,16,527 in 1881,
" 1,00,037 in 1882.

The falling off in the last year was due to certain changes in regard to the tolls not necessary to particularize.

As further illustrating the vitality of the trade which, in the present imperfect condition of the work, exists, it may be mentioned that no less than 241,207 tons passed through the locks north and south of Madras during 1881.

It is now fully recognised that the system on which the tolls have been levied acts as a direct impediment to trade, and on the report of a committee which has lately taken the whole subject into consideration, Government has decided on modifications which, though reducing the actual receipts for the present, will, it is certain, have a very beneficial effect in stimulating traffic.

Sufficient, it is hoped, has been adduced to show the growing commercial value of a work which, while being admirably adapted to all the physical conditions of the coast, suits in every way the native habits as a mode of conveyance for passengers and goods, opens a field of new and diverse employment to the inhabitants of the littoral tract, and affords a highway of limitless capacity at a cost of certainly not over one quarter of that of a railway.

Among other benefits indirectly touched on in the report is the value which may yet attach to the large tracts of land which hitherto from having been open to invasion of tidal water will eventually be reclaimed by the works, and may, like others of a similar character, be turned to the best account as casuarina plantations, the success of which as an industry is now so well established along the older portions of the canal.

As a means of bringing the coal from the Singareni field in Hyderabad at a price which will admit of successful competition with patent fuel and English coal at Madras, the railway authorities have lately expressed themselves to be very sanguine.

But the main advantage and importance of the work is its probable use during the prevalence of famine. As linking the great delta systems of the Godávari and Kistna with Madras and the country to the south, and thus affording a means, whether the sea-board be closed or not, of depositing grain at any point along the whole line ready for transport into the interior, its value must be held to be incalculable. It is on these grounds that the claims of this work to be classed as "Protective" have been urged on the attention of the Government of India, and, it is hoped, that this view may be fully maintained and recognised.

As shown in appendix B to the report, the actual capital amount expended on the work from its commencement down to 31st March 1882 has been Rs. 30,87,185.

As the outlay in the current year will be nearly Rs. 1,36,000, the capital outlay for the completion of the work during 1883-84 and subsequent years will amount to Rs. 31,63,915.

From experience of past working, it is thought that, with temporary increase to the present permanent staff, the expenditure in subsequent years might fairly be raised to three lakhs per annum on original works over and above the amounts needed for repairs and maintenance.

The annual outlay under the latter head, which has for the period, April 1879 to March 1883, on an average amounted to Rs. 99,000, will necessarily, as the works now estimated for advance towards completion, diminish sensibly till, as anticipated by the present Executive Engineer, the whole maintenance of the 261 miles of canal will not exceed Rs. 40,000 per annum (exclusive of establishment), a charge which will be fully covered by the revenue derived from tolls and license-fees.

To provide, then, the requisite ways and means for completion of the work, yearly contributions of one lakh from Provincial (which also bears the full maintenance charges) and two lakhs from Imperial under Protective would, it is thought, best meet the requirements of the case, and would, under all the circumstances of the case, appear to provide in a fair and equitable manner for the incidence of the charges.

8th March 1883. (Signed) R. H. SANKEY, Colonel, R.E.,
Chief Engineer, P.W.D.

ORDER—dated 14th March 1883, No. 841 W., Public Works.

Ordered that the plans and estimates for the Buckingham Canal Project be forwarded to the Government of India.

(True Extract.)

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

To the Superintending Engineer, V Circle.
" Chief Engineer for Irrigation.
" Examiner, Public Works Accounts.
" Board of Revenue.

Exd. E. Fernandez.
Spare Copies

BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of {1883} Madras.

PUBLIC WORKS.

Dated March, 14*th*.

Recd.

Encl.

G.O., 14th March 1883, No. 841 W.

MARCH.

Buckingham Canal Project

The plans, estimates, &c., for the —, ordered to be forwarded to the Government of India.

From the Committee convened in accordance with Proceedings of Madras Government, No. 612 I., of the 5th August 1882, to the Chief Engineer for Irrigation, dated Camp, Ellore, 12th October 1882.

We have the honor to report that having met at Pedda Ganjam we have discussed the matters referred for our consideration regarding the modifications of the Navigation Rules for the canal system of the East Coast.

2. As regards the first point to which our attention was directed, we have agreed that tolls cannot be entirely abolished, but that tolls should be charged on the basis of time rather than on that of distance or direction of journey. This would admit of the number of toll stations at present existing being considerably reduced.

3. We consider it necessary to maintain a system of tolls in the interests of the public, for although annual licenses are simpler and less harassing to frequent users of the canals, yet the occasional use of the canals of a system should not necessitate the taking out of a whole year's license.

4. We think that if tolls are kept within reasonable limits as to rate and frequency of collection, boats which otherwise would confine themselves to the one system for which they were licensed would make occasional use of the canals of other systems to the general advantage of the public.

5. We therefore recommend the retention of tolls, but on a modified system.

6. Our proposals are that tolls shall be paid at the rate of one-fourth the annual license fee for each separate system, and that a toll once paid at any station of a system shall clear the vessel through all the canals of that system and in any direction for a period of six weeks.

7. We have fixed upon this period as that which would suffice for a through return trip for the greatest distance on the main line, and we have fixed the amount so that it shall be to the advantage of users of the canals for more than six months to take out a license.

8. It will be seen that tolls under this system are practically short licenses.

9. In considering the positions for toll stations, we have thought it advisable to place them as far as possible where there is a natural stop, not at places where artificial bars have to be placed across clear reaches of the canals at which all traffic is stopped, whether toll has to be taken or not.

10. We propose therefore that the only toll stations shall be the head locks of each section of the deltas, all tidal locks, the Ellore Lock, the Western Tammileru Aqueduct on the Kistna Ellore Canal, where the Godávari and Kistna Systems join, and the following places on the Buckingham Canal :—

(1.) Pedda Ganjam, where the Kistna and Buckingham Canal Systems join.

(2.) *Kandleru River*.—We propose this place, because a toll station intermediate between Pedda Ganjam and Shadayankupam Lock is required, so that boats working on the canal between these places can obtain toll tickets without being compelled to proceed for that purpose to either extremity of this long reach of 188 miles.

(3.) Shadayankupam Lock (north of Madras).

(4.) Adyar Southern Lock (south of Madras).

11. The toll stations on the three systems will be reduced from a present number of 47 to 20.

12. We propose that the period for which a toll ticket remains current shall in the case of *rafts* be only one month, as it is very necessary that they should not be allowed to linger in the canal to the inconvenience of the general traffic.

13. Under the rules for rafts sanctioned in G.O., No. 384, of the 8th May 1882, a fresh toll was charged at the end of three weeks, or when the raft changed its direction. We propose that as in the case of boats a toll once paid shall clear a raft throughout the system and in any direction, but that the toll should in consideration of the much greater length of canal which will be thus opened out by one payment be double the present Godávari and Kistna rates. This however will be a very considerable reduction on the present Buckingham Canal rates. The proposed rates form but a small proportion of the value of rafts, and hence will not be oppressive.

14. Points 2 and 3 mentioned in paragraph 5 of the Government Order as specially referred to us are so intimately connected that it is necessary to consider them together.

15. For through traffic it is essential that there shall be only one unit of measurement, and we consider the unit should be that formerly in use in the deltas, and still in use on the Buckingham Canal, viz., 50 cubic feet, which may for convenience be called a ton.

16. We consider that having fixed a measure of capacity and provided for uniformity in the system of measurement, it is unnecessary that any attempt should be made to reconcile this with the *weight* carrying capacity of various builds of boats.

17. As regards the rates of license fees having reverted to the previous unit we propose for the Godávari system to revert also to the previous rate of Rs. 2 per 50 cubic feet in the case of cargo boats.

18. In the case of the Kistna we consider it equitable to fix a rate somewhat higher than that in use with the old unit (Re. 1), because the main line of the system has recently been much improved and connected with the Buckingham Canal. We therefore propose a fee of Rs. $1\frac{1}{2}$ per 50 cubic feet.

19. Hitherto the rate for licenses for the whole of the Buckingham Canal has been nearly five times the Godávari rate, and nearly seven times the Kistna rate, the mileage on the Buckingham Canal being not so much as that of the Kistna system and about $\frac{1}{3}$ths of that of the Godávari. The result has been that boats working on the Buckingham Canal have found it to their advantage to work under the present very complicated system of tolls rather than to take out licenses.

20. Considering that the Buckingham Canal serves a great extent of country, and has a more important terminus than any in either the Godávari or Kistna systems, we consider it advisable to recommend a rate of Rs. 3 per 50 cubic feet for the amount of annual license fee.

21. In order to encourage through traffic we propose a considerable reduction on the total license fees of the three systems separately when boats take out through licenses. The rate for these through licenses for cargo boats we would fix at Rs. 5 per 50 cubic feet.

22. As regards passenger vessels we find that the type of boats in use in the deltas differs so much from those in use on the Buckingham Canal that it is necessary to classify them.

23. For the Godávari and Kistna systems, having reverted to the former unit of measurement, we propose, as in the case of cargo boats, to revert to the former rate.

24. For the Buckingham Canal the proposed rates for the corresponding classes of boats have been made the same as in the deltas.

25. In the case of passenger boats we have however proposed one important modification of present rules, viz., that the space to be allowed for a passenger be increased from 5 to $7\frac{1}{2}$ square feet. This we believe to be advisable in the interests of the public, as with five square feet boats carrying their full number are known to be

inconveniently crowded for long journeys. With through communication made cheaper and simpler it is hoped that the numbers undertaking long journeys may be increased.

26. We also propose that passenger boats should be allowed to take out through licenses at reduced rates.

27. Special provision has been made for a modification of the rule regarding the number of passengers, on the occasion of festivals near Madras, to suit the circumstances of the local traffic at those times.

28. We propose that the revenue derived from through licenses should be credited to each system on the following proportions:—

Cargo Boats.

		Rs.
Amount of through license		5
Godávari System	1 8 0	
Kistna do.	1 4 0	
Buckingham Canal System	2 4 0	5

Passenger Boats.

(*a*) and (*c*) classes, through license		10
Godávari System	3 0 0	
Kistna do.	2 8 0	
Buckingham Canal System	4 8 0	10
(*b*) and (*d*) classes, through license		7
Godávári System	2 4 0	
Kistna do.	1 8 0	
Buckingham Canal System	3 4 0	7

As the proposed through license for steamers is Rs. 10 per 50 cubic feet, the amount to be credited to each system will be the same as in the case of (*a*) and (*c*) passenger boats.

29. In the case of steamers we propose that they shall, as heretofore, pay double the rates for cargo boats, both for licenses and for tolls.

30. Instead of keeping the existing division of rules and bye-laws, which as at present arranged is inconvenient and occasionally misleading, we propose that all the regulations shall be embodied into one set of rules, and that these should be applicable to all the three systems.

31. We have accordingly prepared the draft of a set of rules embodying our present proposals and such of the old rules and bye-laws as it is advisable still to maintain, and submit them herewith for approval. We believe that these rules will be found more concise than the old ones, and more easily intelligible by those whom they affect.

32. We have drawn out and appended to these rules license and toll ticket forms adapted to the new rules.

33. As the Buckingham Canal has been placed under Madras Act I of 1870 ("The Canals and Ferry Act"), whereas the canals of the delta systems have not been brought under that Act, there may probably be differences in their management which would be unadvisable and likely to lead to complications when attempting to work the three systems as one combined whole. We think all should be under the same rules. We are strongly of opinion, however, that the Delta Canal Officers should not be made Magistrates, as their work is important and always heavy. In the deltas there has been no practical difficulty in enforcing the navigation rules, because the numerous locks in both systems have enabled boats transgressing to be at once punished by stoppage.

34. We also desire to bring to notice that the Buckingham Canal is at present worked under the direct orders of the Chief Engineer, Public Works Department,

and the Delta Canals under the orders of the Chief Engineer for Irrigation. We would invite attention, if the navigation of the three systems is to be worked as a whole, to the advisability of ensuring uniformity of orders.

35. If the new rules are to be brought into force for the next calendar year, which seems very advisable, we are of opinion that the orders of Government should be received by the 30th November *at the latest*.

We have the honor to be,
Sir,
Your most obedient servants,

(Signed) J. W. RUNDALL,
Superintending Engineer.
(„) G. T. WALCH,
Offg. Superintending Engineer.
(„) W. S. OTTMANN,
Honorary Assist. Engr., P.W.D.

Draft of Revised Navigation Rules for the Godávari, Kistna, and Buckingham Canals.

Reference to present Rules.

SYSTEMS.

I. GENERAL.

Delta Rules I.
Buckingham Canal Rules III.

1. No vessel or raft will be allowed to enter or make use of any canal unless the owner shall have previously taken out a license, or unless toll shall have been paid as hereinafter provided.

II. LICENSES.

Delta Rules II.
Buckingham Canal Rules III.

2. Licenses will be issued for vessels for a calendar year only, and will entitle the vessel to navigate the canals of the system for which the license is issued from date of issue to 31st December following. The owner of a vessel desiring to obtain a license shall apply in person or by letter to an officer empowered to issue licenses, viz., the Executive Engineer of the division or officer authorized in writing by him. The owner shall give to the licensing officer the information required to fill up the license as shown in the license form.

Delta Rules III.
Buckingham Canal Rules III.

3. Every vessel licensed for the conveyance of cargo shall pay a license fee as follows :—

For the Godávari System Rs. 2 per ton of 50 cubic feet.
For the Kistna System „ 1½ do.
For the Buckingham Canal „ 3 do.

N.B.—Godávari System Licenses and Toll Tickets hold good as far as the Western Tammileru Aqueduct on the Kistna Ellore Canal.

New Rule.

4. The annual license fees payable on cargo vessels for the three systems separately can be compounded for one through license available over all the three systems at the rate of Rs. 5 per ton. A boat which has already taken out a license for either of the three systems will not be permitted to compound for that calendar year.

Delta Rules V.
Buckingham Canal Rules VIII.

5. The gross tonnage of all vessels will be obtained by the following rule :—

$$\frac{L \times B \times D}{50}$$

L being the length between the stern and fore post at half the midship depth.

B being one-sixth of the sum of five widths taken at equal distances along the above length. The width to be measured from the rib on one side to the planking (skin) on the other side.

D being the depth measured amidship from the top of the keelson, or of the centre plank, to the underside of the deck planking, or to the top of the gunwale in open or passenger vessels.

The net or registered tonnage on which the fee will be charged will be—

For steamers, the gross tonnage less one-third.

For other vessels, the gross tonnage less 15 per cent.

Fractions of a ton above the half will be charged as one ton.

Delta Rule V.
Buckingham Canal Rules, none.

6. On payment of the license fee according to the rates fixed, a license will be issued which will entitle the vessel to the use of all the canals of the system named in the license without any other payment whatever. If a vessel after the issue of a license be enlarged, it shall not ply again until it has been remeasured, and a new license taken out. This will be granted on surrender of the previous license and on payment of the prescribed rate per ton for the difference between the old and new tonnage. The penalty for using on the canals an enlarged vessel without a new license being taken out will be the forfeiture of the license fee previously paid.

Delta Rules VI.
Buckingham Canal Rules IV and V.

7. The license number with the distinguishing letter * of the system must be painted conspicuously in English figures, not less than four inches in height, on each bow of the vessel.

* G. Godávari.
K. Kistna.
B. Buckingham Canal.

The tonnage of the vessel must be similarly marked in English figures on each side of the sternpost.

These marks must be put on the vessel before it commences to use the canals at the expense of the owner, who will be responsible that they are not defaced or obliterated.

Delta Rules VII.
Buckingham Canal Rules IX.

8. License will be issued to vessels adapted for the conveyance of passengers under the following conditions and at the following rates.

Such vessels will be measured for tonnage under Rule V, and they will be permitted to carry one passenger for every 7½ square feet of covered space. The covered space will be calculated from the following measurements :—

Length, over all of covered space.

Breadth, the mean of three widths taken at equal distances.

Passenger boats will be divided into the following classes :—

(*a*) Boats of the "*Ráhádári*" or transit boat type, taking a license which leaves optional to the owner the fares to be charged and the caste of the passengers to be carried.

(*b*) Boats of the "*Ráhádári*" or transit boat type, taking a license by the acceptance of which the owner

undertakes to convey all passengers for whom there is room according to the rules, irrespective of caste, and at rates not exceeding the following maxima, viz., in the general cabin 2 pies per mile per passenger including one cooly head load of luggage; in the separate fore or aft cabins, for every 7½ square feet of cabin, 3 pies per mile per passenger, including one cooly head load of luggage. Any passenger wishing to reserve a separate cabin for his exclusive use will be entitled to do so on paying the full hire for the whole cabin.

A whole boat of this class shall not be hired out to one individual, except by permission of the Executive Engineer or officer authorised by him to issue licenses.

(*c*) Boats of the budgerow type, plying for hire, but not carrying cargo, the rate of fare and the passengers to be carried being optional with the owner.

(*d*) Boats of the "top boat" type, having a covered space for the protection of passengers, taking a license by the acceptance of which the owner undertakes to convey all passengers for whom there is room according to the rules, irrespective of caste, and at rates not exceeding 2 pies per mile per passenger, including one cooly head load of luggage.

During festivals in the neighbourhood of Madras, the rule limiting the number of passengers to be carried by this class of boat may, on application, be temporarily suspended by the Executive Engineer in charge of the division, or officer duly authorized by him to issue licenses.

The license fees for passenger boats will be as follows for each system:—

(*a*)	Class,	Rs.	4	per ton.
(*b*)	,,	,,	3	,,
(*c*)	,,	,,	4	,,
(*d*)	,,	,,	3	,,

New Rule.

9. The annual license fees payable on passenger boats can be compounded for one through license available over all the three systems at the following rates:—

(*a*)	Class,	Rs.	10	per ton.
(*b*)	,,	,,	7	,,
(*c*)	,,	,,	10	,,
(*d*)	,,	,,	7	,,

Delta Rules VIII.
Buckingham Canal Rules IV and V.

10. The number of the license issued for a passenger vessel must be painted on the bows in the manner prescribed for cargo vessels.

The tonnage of the vessel and the number of passengers which she is licensed to carry must be painted conspicuously on the stern of the vessel or on the afterpart of the cabin. The number of passengers will be preceded by the letter P.

Delta Rules IX.
Buckingham Canal Rules IX.

11. Passenger vessels may carry cargo as well as passengers, subject to the following conditions:—

(1) That vessels of the types (*b*) and (*d*) must convey passengers, when required to do so, in preference to cargo.

(2) That the quantity of cargo be not greater than the registered tonnage less 400 lb. for each passenger on board.

Delta Rules X.
Buckingham Canal Rules, part of IX.

12. Vessels, the private property of individuals, making use of the canals, but not carrying goods or passengers, or plying for hire, will be licensed to use the canals of a system on payment of a fee of Rs. 12 for the calendar year.

Delta Rules XI.
Buckingham Canal Rules, none.

13. Pleasure boats used for rowing on the canals, but not carrying goods or passengers, will be licensed to use the canals of a system on payment of a fee of Re. 1 for the calendar year.

Delta Rules XV (8).
Buckingham Canal Rules, Schedule A.

14. All fees payable by steamers will be double those of ordinary cargo boats.

The number of the license and tonnage must be painted on steamers in the manner prescribed for cargo boats.

Delta Rules XII.
Buckingham Canal Rules XII.

15. No person who has taken out a license for the navigation of the canals shall have any claim to compensation, in consequence of the closure of all or of any of the canals for repairs, or because of insufficiency of water, or on account of any other impediment to navigation.

III. Tolls.

Delta Rules XIV.
Buckingham Canal Rules III (2nd).

16. Vessels not holding a license will be allowed to navigate the canals on payment of the hereinafter stated tolls and on the following conditions.

The rates of toll per ton will be—

Cargo and Passenger Boats.	As.
Godávari System	8
Kistna ,, ...	6
Buckingham Canal	12

Steamers.	Rs.
Godávari System	1
Kistna ,, ...	0¾
Buckingham Canal	1½

Delta Rules XIV (4).
Buckingham Canal, Schedule B.

Private Boats referred to in Rule XII.

For each boat, for each system, Rs. 3.

A toll once paid at any toll station of a system will clear the vessel over all the canals of that system and in any direction for a period of six weeks, except in the case of rafts, which must either be removed from the canals *within one month* from the date of the toll ticket, or again pay toll.

Delta Rules XV (9).
Buckingham Canal Rules, Schedule B.

The toll stations in the Godávari and Kistna Systems will be—

New Rule.

The head lock of each section* of delta.

Delta Rules XIV.

All tidal locks.

The Ellore Lock.

The Western Tammileru Aqueduct on the Kistna Ellore Canal.

* *Godávari Sections.*
Eastern.
Central.
Western.
Kistna Sections.
Eastern.
Western.

The toll stations on the Buckingham Canal will be as follows:—

1. Pedda Ganjam.
2. Kandleru River.
3. Shadayankupam Lock.
4. Adyar Southern Lock.

To determine the tonnage for tolls vessels will be measured under Rule V.

A list of the toll stations for each system will be affixed to a notice board at each toll station in that system.

Delta Rules XIII.
Buckingham Canal Rules, Schedule B.

17. Rafts shall pay tolls at the following rates :—

Logs of timber, rough or squared, for each unit of 100 square feet.	As. 8
Bamboos for each unit of 100 square feet	4

New Rule.

Rafts of timber and bamboos mixed will be charged at the rate for timber.

Delta Rules XIII (1).

All fractions of the unit will be charged for as a full unit.

IV. Regulations.

Delta Bye-law 18.
Buckingham Canal Rule VII.

18. The extreme dimensions of any vessel allowed to navigate the canals will be 90 feet in length and 13 feet in breadth over all.

Boats built before the 31st December 1880, which exceed the above dimensions, may receive a special license at the discretion of the Executive Engineer of the division.

Buckingham Canal Rule VII.

No boat drawing more than 3½ feet will be admitted into any lock.

To suit the conditions of masonry works on the southern sections of the Buckingham Canal, the height of fixed fittings such as the roofs of boats, steps of masts, funnel sockets, &c., shall be there limited to 6½ feet above water level. A similar limit shall be applied to piled cargo.

Delta Bye-law No. 9.
Buckingham Canal Rule X.

19. No raft of larger dimensions than 90 feet in length, by 12 feet in breadth, or of more than 2′ draught will be allowed on the canals. Rafts exceeding these dimensions will be stopped until they are reduced and a fresh toll paid on the then measurement under Rule XVI.

Buckingham Canal Rules VII.

20. Boats carrying cargo must have a free board of not less than 9 inches ; boats carrying passengers must have a free board of not less than 1 foot.

Delta Bye-law 1.
Buckingham Canal Bye-law 1.

21. No vessel or raft shall moor on the towing-path side if there be only one tow-path, or on the windward side of a canal if there be two tow-paths, except when actually loading or unloading.

Delta Bye-law 2.
Buckingham Canal Bye-law 2.

22. No cargo shall be loaded or unloaded and no passengers be shipped or landed at any lock, or on any masonry work other than the quays or wharfs specially provided for the purpose.

New Rule.

23. No goods shall be stacked on any tow-path or on the canal side of any tow-path under any circumstances, nor shall they be stacked on canal lands without special permission of the canal officers.

Delta Bye-law 3.
Buckingham Canal Bye-law III.

24. No vessel shall be repaired in any canal at any time, without the written permission on the Divisional Executive Engineer, and then only at the place and during the time named in the written permission. Materials used in the repair of vessels will, unless removed from the canal before, or at the time of, the vessels departure, be confiscated, and any expense incurred in their removal must be paid by the owner of the vessel under penalty of suspension of license until it be paid.

Delta Bye-law 4.
Buckingham Canal Bye-law IV.

25. At any lock, or other masonry work, no vessel or raft shall moor within the limits fixed by notice boards.

Delta Bye-law 5.
Buckingham Canal Bye-law V.

26. Every vessel when moored in any canal shall have its masts down, shall be made fast stem and stern to the bank and in a single line.

Delta Rules, part of Bye-law 12.
Buckingham Canal Rules, part of Bye-law X.

Every vessel when thus moored shall be in charge of at least one man, and must between sunset and sunrise exhibit a clear bright light, at not less than 4′ above the water level, visible all round.

Canal Rules XIII (5).
Do. Bye-law 12.

Rafts when moored must be securely fastened to the canal bank at both ends, and between sunset and sunrise must exhibit a clear light at each outer corner.

Delta Bye-law 12.
Buckingham Canal Bye-law X.

27. Vessels when moving must between sunset and sunrise exhibit the following lights :—

Canal Rule XV (3).

All boats one clear bright light at the fore-end, fixed not less that 4 feet above the water.

Steamers, three lights as follows :—One clear white light on the upper deck abaft the funnel, a bull's-eye bright red light on the post (left) side, a bull's-eye bright green light on the star-board (right) side.

The bull's-eye to be not less than 8 inches in diameter. The lights to be so placed and fitted that both may be visible only from a point ahead of the vessel, and so as not to be obscured by any of the fittings, cargo, or passengers. Subject to these provisions the lights may be placed on the front or on top of the cabin, at the sides of the vessel near the bow, or on supports specially provided for the purpose.

Delta Bye-law 13.
Buckingham Canal Bye-law X.

Passenger boats must, in addition to the outside light, keep at least one bright light in the general cabin.

Delta Bye-law 6.
Buckingham Canal Bye-laws VI, VII, and VIII.

28. When vessels meet on the Godávari and Kistna Canals, those going with the current shall give way. In the Buckingham Canal vessels going north shall give way. Vessels under sail shall give way to vessels being towed, and steamers shall give way to all boats.

New Rule.

29. The licenses of cargo boats in an unsafe condition may be suspended by any officer authorized to issue licenses until the vessels be put into a proper state of repair.

Delta Bye-law 14.
Buckingham Canal Bye-law XIII.

30. All passenger vessels shall, whenever it may appear to him to be advisable, be inspected by the Executive Engineer in charge of the Division, or other officer duly authorized by him. The licenses of such as are not maintained in a proper state of repair and cleanliness shall be withdrawn until the vessels are fit for use by the public.

Delta Bye-law 8.

31. No person unless duly authorized shall interfere with the locks or any part of their machinery.

Delta Bye-law 11.

32. Any passenger vessel apparently overloaded must, when required by the Executive Engineer, or by an officer duly authorized by him, by the Superintendent or Assistant Superintendent of Police, or by a Magistrate, stop at

Delta Bye-law 10.
Buckingham Canal Bye-law XII.

any place to have the number of its passengers counted and its cargo examined.

Delta Bye-law 10.
Buckingham Canal, Schedule A.

33. Every vessel and raft must have its license or toll ticket always on board. These shall be produced when called for by any Lock or Toll Superintendent or other duly authorized officer.

Delta Rule XV (1).

34. In the case of a license or toll ticket being lost, and a duplicate copy being required, the fee for its issue will be Rs. 2.

Delta Rules XV (4).
Buckingham Canal Bye-law XI.

35. All steamers using the canals shall be inspected by the Executive Engineer or officer authorized by him, who will see that the machinery is in fair working order, that the boilers are provided with proper gauges, and are apparently in safe working order. The Executive Engineer or other officer will issue an inspection certificate in the form appended, which will hold good for six months.

No steamer shall travel at a greater speed than 8 miles per hour by day-light and 5 miles per hour at night.

Steamers shall reduce their speed to three miles an hour when they come within half a mile of a lock, and shall then whistle to give notice of their approach to the lock establishment. Steamers must be warped into and out of locks, and will not be allowed to use their propellers until quite clear of the locks.

Delta Rules XV (7).
Buckingham Canal Bye-law XI.
Delta Rules XV (11).
Do. XVI.

Steamers shall whistle when within a 100 yards of any boat, and reduce speed to 5 miles an hour.

36. Any vessel or raft damaging the works of the canal or any Government property on them shall have its license or toll ticket taken away and shall not be allowed to use the canals until the cost of repairing the damage has been estimated and the amount has been paid. A pass shall be given by the officer suspending the license to enable the vessel to proceed to its destination.

Buckingham Canal Rule XIII.

37. Sea-going vessels brought into rivers and backwards for shelter, for repair, or for any other purpose except to ply for hire, shall anchor or lay up outside the fair way of canal traffic, which will be defined by the canal officers; such vessels will not be allowed to enter the main line of the canals for the purpose of proceeding from one river or backwater to another river or backwater, or for any other purpose, except in accordance with the rules prescribed for the use of the canals.

Buckingham Canal Rules III.

38. All boats used solely for fishing purposes which have to pass through any portion of the Buckingham Canal must be registered, but will not be charged any fee.

Delta Bye-law 19.

39. Officers in charge of canals are empowered summarily to remove vessels which may have sunk in a canal waterway of any system, or rafts which have been in the canals for more than one month, and shall have failed to pay on demand the fresh toll leviable under Rule XVI, and to recover cost of removal afterwards.

Vessels sunk, abandoned, or left for more than three days without a man in charge will be dealt with as follows:—

(*a.*) If the vessel be licensed a notice will be sent by post, by the officer in charge of the canal, to the registered owner requiring him to remove the vessel within 15 days. Failing such removal the vessel will be sold by auction after giving not less than 15 days' notice of intended sale in the District Gazette.

(*b.*) In the case of unlicensed vessels a notice will be published in the District Gazette requiring the removal of the vessel within 15 days, and stating that if not so removed the vessel will be sold by auction. Such sale may be fixed to take place on any date not prior to 30 days from the date of the publication of the notice to remove. Vessels removed under this rule lie at the owner's risk.

Owners applying to recover possession of vessels or rafts referred to in this bye-law must, before their removal will be permitted, pay all expenses which may have been incurred.

The sale-proceeds of a vessel sold under this bye-law will be available to meet all expenses incurred in the removal and sale of such vessel, and to repair all damage which may have resulted to the canal from its being sunk or abandoned therein. Any balance remaining will be paid to the owner if claimed within three months from the date of the sale; otherwise such balance will be carried to the credit of Government.

Delta Bye-law 15.
Buckingham Canal Bye-law XIV.

40. Executive Engineers in charge of sections of the deltas and of the Buckingham Canal and other officers duly authorized by them will have power to suspend the license of any vessel on account of the infringement of any of the rules and regulations for periods not exceeding—

15 days for a first offence,
30 days for a second offence in the same calendar year,
60 days for a third offence in the same calendar year,

and for a fourth offence in the same calendar year the license may be cancelled.

Vessels plying under a toll ticket may be punished by the suspension of the toll ticket for 15 days for a first offence, and by the withdrawal of the toll ticket for a second offence.

Delta Bye-law 16.

41. Superintending Engineers will exercise the same powers as Executive Engineers in respect of any of these rules.

12th October 1882.

(Signed) J. W. RUNDALL,
President for Committee.

Memorandum regarding the different Forms of Licenses.

It is proposed that the license and toll tickets shall be on different colored paper for each system—

Godávari ... ... White.
Kistna ... ... Red.
Buckingham Canal ... ... Blue.

Through licenses will be printed on green paper.

When a license is taken out, a copy of the navigation rules in the vernacular is to be given to every boat-owner who has not already got one.

When printed for issue, the license forms and tickets will have a counterfoil separated from the original by perforations.

All license forms and toll ticket should be printed on good stout paper.

12th October 1882.

(Signed) J. W. RUNDALL.

.....System

.....

TOLL TICKET FOR RAFT.
తెప్ప పన్ను చీటి.

No.....
నెం.....

Dimensions..... Length } ..... feet.
కొలతలు..... పొడుగు } ..... అడుగులు.
Breadth } ..... feet.
వెడల్పు } ..... అడుగులు.

Superficial Area } ..... square feet.
చతురం కొలత..... } ..... చతురం అడుగులు.

Description of Raft } .....
తెప్పవివరం..... } .....

Amount of Toll paid. Rupees..... Annas.....
చెల్లించిన పన్ను మొత్తం. రూపాయిలు..... అణాలు.....

Issued at .....
చీటీయిచ్చినస్థలం .....

Date of issue .....
చీటీయిచ్చినతారీఖు .....

This ticket will hold good for *one month only*.

Toll Superintendent.

This ticket is issued subject to the Navigation Rules sanctioned in S. O. No.....dated.....

.....System

.....

TOLL TICKET FOR RAFT.
తెప్ప పన్ను చీటి.

No.....
నెం.....

Dimensions..... Length } ..... feet.
కొలతలు..... పొడుగు } ..... అడుగులు.
Breadth } ..... feet.
వెడల్పు } ..... అడుగులు.

Superficial Area } ..... square feet.
చతురం కొలత..... } ..... చతురం అడుగులు.

Description of Raft } .....
తెప్పవివరం..... } .....

Amount of Toll paid. Rupees..... Annas.....
చెల్లించిన పన్ను మొత్తం. రూపాయిలు..... అణాలు.....

Issued at .....
చీటీయిచ్చినస్థలం .....

Date of issue .....
చీటీయిచ్చినతారీఖు .....

This ticket will hold good for *one month only*.

Toll Superintendent.

This ticket is issued subject to the Navigation Rules sanctioned in S. O. No.....dated.....

Rafts not to exceed 90 feet in length, 12 in breadth, 2 feet in draught.

RATES OF TOLL.

	annas.
Logs of timber, rough or squared, per unit of 100 square feet	8
Bamboos per unit of 100 square feet	4

Fractions of the unit will be charged for as a full unit.

Rafts of timber and bamboos mixed will be charged for at the rate for timber.

తెప్పలపొడుగు 90 అడుగులు, వెడల్పు 12 అడుగులు, 2 అడుగుల నీటిలోతుకంటె
మించకూడకుండవలెను.

వసూలు రేట్లు.

ఆణాలు.

License for Passenger Vessel, Class (A) or (C), for 18 .

System — No. of License
Owner's name — Residence
Vessel built at — in the year

Maximum number of passengers ; less one for every 400 lb. of cargo carried.
Fares to be charged and caste of passengers to be carried, *optional.*

Extreme Dimensions over all.		Dimensions for Tonnage.				Gross Tonnage.	Deduction of 15 per Cent.	Net Tonnage for License.	License Fee paid.	Date of Issue.	Place of Issue.
Length.	Breadth.	L.	B.	D.	Cubic Feet.						
FEET.	FEET.	FT. IN.	FT. IN.	FT. IN.					RS. A.		

Signature of Licensing Officer.

This License is issued subject to the Navigation Rules sanctioned in G.O., No. dated

---

License for Passenger Vessel, Class (B) or (D), for 18 .

System — No. of License
Owner's name — Residence
Vessel built at — in the year

Maximum number of passengers ... ... { In the general cabin / In the fore cabin / In the aft cabin

Total No.

less one for every 400 lb. of cargo carried.

The holder of this license is required to convey all passengers, for whom there may be room, irrespective of caste, at rates for each passenger (including one cooly headload of luggage) not exceeding 2 pies in the general cabin, and 3 pies in the separate fore and aft cabins, per mile.

Extreme Dimensions over all.		Dimensions for Tonnage.				Gross Tonnage.	Deduction of 15 per Cent.	Net Tonnage for License.	License Fee paid.	Date of Issue.	Place of Issue.
Length.	Breadth.	L.	B.	D.	Cubic Feet.						
FEET.	FEET.	FT. IN.	FT. IN.	FT. IN.					RS. A.		

Signature of Licensing Officer.

This License is issued subject to the Navigation Rules sanctioned in G.O., No. dated

Cargo Boat License for 18 .

System
Name of owner
Residence of owner
Boat built at

No. of License

in the year

Extreme Dimensions over all.		Dimensions for Tonnage.				Gross Tonnage.	Deduction of 15 per Cent.	Net Tonnage for License.	License Fee paid.	Date of Issue.	Place of Issue.
Length.	Breadth.	L.	B.	D.	Cubic Feet.						
FEET.	FEET.	FT. IN.	FT. IN.	FT. IN.					RS. A.		

NOTE.—This License is issued subject to the Navigation Rules sanctioned in G.O., No. dated

Signature of Licensing Officer.

Private Boat License for 18 .

System
Name of owner
Residence of owner
Boat built at
Description of boat
Amount of license fee paid Rs.
Date of issue
Place of issue

No. of License

in the year

Signature of Licensing Officer.

N.B.—The License fee for private boats not carrying goods or passengers is Rs. 12 per cent. The fee on pleasure boats used for rowing is Re. 1.

This License is issued subject to the Navigation Rules sanctioned in G.O., No. dated

---

License for Steam Vessel for 18 .

No. of license
Owner's name
Vessel built at
Description of propeller
Do. of engines
Do. of boiler
Maximum pressure of steam

Residence
in the year

Extreme Dimensions over all.		Measurements for Tonnage.				Gross Tonnage.	Deduction of one-third.	Net Tonnage.	License Fee paid.	Date of Issue.	Place of Issue.
Length.	Breadth.	L.	B.	D.	Cubic Feet.						
FEET.	FEET.	FT. IN.	FT. IN.	FT. IN.					RS. A.		

This License is issued subject to the Navigation Rules sanctioned in G.O., No. dated

Signature of Licensing Officer.

Inspection Certificate.

This vessel has been inspected under Navigation Rule No. 35, and is passeed for navigation of the canals for a period of six months from this date _____

Signature of Inspecting Officer.

Station
Date
Certificate *renewed* on

Signature of Inspecting Officer.

Toll Ticket.

System
Name of owner

No.

Extreme Dimensions over all.		Measurements for Tonnage.				Gross Tonnage.	Deduction.	Net Tonnage.	Toll paid.	Date of Issue.	Place of Issue.
Length.	Breadth.	L.	B.	D.	Cubic Feet.						
FEET.	FEET.	FT. IN.	FT. IN.	FT. IN.					RS. A.		

Signature of Issuing Officer.

This ticket is issued subject to the Navigation Rules sanctioned in G.O., No. dated , and will hold good for *six weeks only.*

This ticket is to be surrendered on renewal.

No. 117 I.

Memorandum by the Chief Engineer for Irrigation.

Submitted to Government.

2. The first line of navigable canal opened on the Eastern Coast of the Madras Presidency was the Cochrane's Canal from Madras to the Ennore backwater, and from the Ennore backwater to Pulicat Lake. The work was completed in 1806 on contract, the terms being the exclusive possession of the canal by the contractor for forty-five years, with right to levy toll on all goods carried upon it at certain rates laid down. In 1837 the canal came into the possession of Government, who fixed a rather elaborate system of tolls. The annual receipts from tolls at this time were about Rs. 32,000. In the year 1855 the East Coast Canal to the south of Madras from the Adyar to the Pálár was commenced; this portion of the line was opened to traffic in 1857, and a separate system of tolls was adopted on it.

The extension of the Northern Canal was commenced in the year 1854, and was pushed on from time to time until, in the year 1875, it reached the Kistnapatam backwater, 90 miles to the north of Madras. This was the limit in the year 1876 immediately before the famine. The annual receipts were then—

	RS.
In the Northern Section	39,869
„ Southern „	5,720

In 1877, when it was necessary to find work for thousands of starving people, the connection of the northern and southern sections of the canal through Madras, which had been planned many years before, was undertaken, and the northern extension from Kistnapatam to Pedda Ganjam to join the Kistna Delta Canals being also pushed on vigorously under the government of the Duke of Buckingham, the canal was opened throughout, in 1878, from the Pálár, 47 miles south of Madras, to Pedda Ganjam, 196 miles north, under the name of the Buckingham Canal.

In 1879 the navigation rules for this canal now in force were introduced, under which the canal was divided into six sections. Copy of these rules is attached. Generally speaking they imposed a license fee of Rs. 2 per ton for all boats, except fishing and pleasure boats, the license clearing the boat for one section only. On entering any other section, the boat had to pay a toll of four annas a ton, or boat-owners were allowed to compound for a year's tolls throughout the canal for Rs. 10 a ton.

The navigation receipts have been as follows:—

	Rs.
1880	1,09,805
1881	1,20,056

2. The Godávari Delta Canals navigation commenced in the year 1853, the anicut having been completed in 1852. The navigation was started under the auspices of Government officers, but before long the natives were out of leading strings and look up the navigation with a will, so that in 1863-64, ten years after the navigation commenced, the number of boats on the Delta Canal was 1,200, and the annual receipts amounted to Rs. 24,493. On first opening the navigation no tolls were charged, as was noticed in 1859 by the then Governor, Sir Charles Trevelyan, in a minute on the Godávari irrigation and navigation. He says: "The canals are all toll-free, for it has been wisely determined that it is better to take the Government dues in a consolidated form on the crops than to harass and mulct the people by exactions which cannot be confined to those demanded on behalf of the public." In November 1863, however, a license fee of one rupee per ton was charged.

As the canals have been extended, the navigation rules have been, from time to time, revised, and the license fees raised, and toll stations have been instituted generally at the head and tail locks of each canal, so that boats are not compelled to take out licenses for the year, but may, if it suits their convenience, pay by the trip. Up to 1882 the rates for license fees were generally speaking (taking 50 cubic feet to represent a ton)—

Cargo boats ...	... 2 rupees per ton.
Passenger boats—	
First class ...	... 4 „ „
Second class ...	... 3 „ „
Rafts, timber ..	... 4 annas per 100 square feet.
„ bamboos, &c. ..	2 „ „ „

The measurement of boats was, up to that time, much the same in the Godávari and Buckingham Canals, and the unit of measurement, 50 cubic feet to a ton, was the same, but in 1882 revised rules for the Godávari and Kistna Canals were sanctioned by Government, in which the unit of measurement was altered to a ton of 75 cubic feet, and, as in the Buckingham Canal 50 cubic feet were still continued the unit, there arose difficulties in the case of through traffic, which have brought to notice the necessity for introducing rules of general applicability.

In introducing new rules for navigation in the Delta Canals, the rule has been laid down that navigation should be made to pay, that is, not only should the receipts cover the working expenses, but also interest on the original cost of works constructed solely in the interests of navigation. In a system of canals which combine irrigation and navigation there is, of course, great difficulty in apportioning the share of cost, but under instructions that have been issued from this office, this has been settled, and the yearly accounts show the maintenance charges and interest compared with the receipts. The accounts of last year, ending 31st December 1881, show the following results:—

	Rs.
Maintenance charges	55,106
Interest	24,504
Total ...	79,610
Receipts	55,670

that is, the receipts more than covered the working expenses, but were insufficient to meet the charge for interest. It was contemplated that, as the canals approached completion, the maintenance charges would become lighter, and the receipts would increase until they were sufficient to cover all charges. It is, however, to be noticed that, when the Godávari completion estimates were submitted to the Government of India, all that was claimed for navigation receipts was that they should cover maintenance charges.

3. The Kistna Delta Canal navigation, which was opened a few years later than the Godávari, was started in the same way, and has been generally under the same rules, but as in the Kistna Delta the canals are less advanced than in the Godávari, the license fees charged are less per ton than in the Godávari. In the last revised rules, 1882, cargo boats were charged $2\frac{1}{2}$ rupees against $3\frac{1}{2}$ rupees a ton in the Godávari.

The accounts of last year ending 31st December 1881 show the following results:—

	Rs.
Maintenance charge	60,330
Interest	8,054
Total ...	68,384
Receipts	21,788

but the maintenance charges were much higher than they should have been, in consequence of damage caused by floods.

4. The length of navigable canal now open is—

	Miles.
In the Godávari Delta	458
„ Kistna „	278
„ Buckingham Canal	243
Total ...	979

The through line from Pálár south of Madras to the port of Cocanada in the mouth of Godávari is—

	Miles.
In Godávari	78
„ Kistna	110
„ Buckingham Canal	243
Total ...	431

When the Delta Canals are completed there will be the following lengths of canals navigable :—

	MILES.
In Godávari	502½
„ Kistna	349

while the Buckingham Canal may possibly be extended southwards to near Point Calimere, a distance of 156 miles from the Pálár.

5. Under the rules as they at present stand, it will be seen that there are considerable obstacles in the way of through navigation. The rates of license fee for each system of canals are now certainly not oppressive in the deltas, but 10 rupees a ton per annum for the use of 243 miles of the Buckingham Canal seems very heavy. Supposing a boat to ply between Madras and Cocanada continually, and to take out licenses for all canals, it would pay—

Buckingham Canal	10	rupees per ton of 50 cubic feet.
Kistna Canals	2½	„ „ of 75 „
Godávari Canals	3½	„ „ of 75 „

or a license might be taken out for one section, and tolls paid at entering each other section, which would clear the boat for one trip. In any case, at each toll station on the through journey, 5 on the Buckingham Canal, 3 on the Kistna, and 2 on the Godávari, the boat would be stopped to exhibit its license, and a door would be opened for "exactions which cannot be confined to those demanded on behalf of the public." Taking into account the very incomplete state of the Buckingham Canal, and the difficulty which is at times experienced in navigating it, the high rate of license fees, and the interruptions to traffic caused by the frequent toll stations, it is surprising that navigation has extended as it has. It must also be noticed that the Kistna Canals are closed for repairs for three months yearly, and the through traffic is necessarily interrupted for that time.

6. The Committee appointed by Government in G.O., No. 612 I., dated 5th August 1882, was instructed to take the following points specially into consideration :—

(1) The abolition, as far as possible, of tolls;
(2) The license fees to be charged for the canals throughout;
(3) The measurement of boats with reference to the adoption of one unit of measurement;

and in their report now submitted they have embodied their proposals attaching a revised set of rules to be applicable to all the canals on the East Coast if their proposals are approved.

7. The Committee originally appointed consisted of Mr. Rundall, Superintending Engineer, Second Circle; Mr. Walch, Officiating Superintending Engineer, First Circle, and Major Drake-Brockman; but in consequence of the latter officer having taken leave before the Committee could meet, Mr. Ottmann, Honorary Assistant Engineer, who was acting for him, was appointed in his place. Mr. Ottmann has submitted a separate memorandum calling attention to some additions, which on further consideration he suggests should be made to the rules proposed by the Committee, and these will be considered further on. The whole of the papers were on the return of Major Drake-Brockman from leave sent for his consideration, and he has stated his concurrence generally with the Committee's views.

8. Regarding the first point referred to them, the Committee consider that tolls cannot be entirely abolished, but that to allow of the occasional use of the canals without taking out a license, toll stations must be maintained at the head locks of each section of the deltas, all tidal locks, at Ellore near the junction of the Godávari and Kistna Canals, and four places on the Buckingham Canal, for the public convenience, thus reducing the number of toll stations from 47 to 20. To these proposals I agree on the understanding that the toll stations are maintained for the public convenience only, that no obstructions such as now exist in the shape of a chain drawn across the canal shall be allowed, and that the toll-taker has no authority to stop any boat or call for the production of its license unless there is some apparent infringement of

the rules. A subordinate in the position of a Lock Superintendent or toll-keeper should never be allowed the powers of an Inspecting Officer. It apparently was contemplated by Mr. Ottmann that, at the proposed toll stations on the Buckingham Canal, all licenses would be produced for examination as at present, and in his memorandum he specially notices that some examination of the boats will be necessary, while the canal remains as at present one open reach from Shadayankupam Lock to Pedda Ganjam. There is of course an opening for boats to ply in this reach without licenses to get in by paying a toll and remain at work for an indefinite period, but this will be impossible when flood-gates are constructed at several places, and meanwhile I consider that the Division and Sub-division officers should, as Inspecting Officers, pay special attention to the subject, and endeavor to prevent evasions of fees. Under no circumstances would I allow the toll-keepers to have any thing to do with this duty; they should be restricted to issuing toll tickets when called upon to do so. It is better to risk some loss than to harass the traffic. As to the amount of toll I shall have to make some remarks further on.

9. The Committee recommend that one unit of measurement should be adopted for all canals, and that the ton should consist of 50 cubic feet. It is only lately, in August 1881, that, on the recommendation of Colonel Mullins, a ton of 75 cubic feet was introduced into the Godávari and Kistna Canals. The reasons for this change are given in the note printed with G.O., No. 484 I., dated 3rd August 1881, and I am unwilling to propose any radical alterations, but I quite agree with the Committee that to avoid confusion there must be only one unit of measurement, and I consider it quite unnecessary to make any attempt to reconcile the weight of cargo with the cubic space it occupies. For some years a ton has been considered to be 50 cubic feet, and I would retain this measurement, charging license fees by this unit, and only providing in the rules for a certain safe free board in all cases.

10. The Committee next proceed to give the rates at which they propose to fix license fees and tolls, and here they follow the system at present in force to some extent. They propose a separate license fee for each system, and a compound rate for all these systems, but they do not propose to retain the present plan of charging a separate fee for each section of the Buckingham Canal. Passenger boats of both classes are dealt with in the same way as cargo boats, also steamers. I am prepared here to go a great deal further than the Committee. What I desire to see is one demand to clear all the canals. I would remove all obstacles in the way of navigation that I possibly could, believing that the interests of Government will be best served by improving the communications, stimulating consumption, and consequently extending production.

The argument that, if 2 rupees is charged for carriage of 100 miles, more should be charged for carriage of 300 miles is not here I think applicable. In the case of the Godávari and Kistna Delta Canals, the irrigation gives a splendid return on the expenditure without any receipts from navigation, and the Buckingham Canal has been carried out as a Protective Public Work, and a return is to be looked for, from free and extended use of it. I consider that all that should be looked for is that the navigation receipts should cover the working expenses, by which I mean the cost of the navigation establishments and of maintenance of navigation works, and this I believe will soon be the case on all three of the existing systems. It must be remembered that the canals of two of these systems are still in a very incomplete state, and it should not be expected that as soon as a canal is opened it will pay its way.

11. The following statement shows at a glance the present rates of license fees, those proposed by the Committee, and those which I propose, and I have endeavored to make a comparison in statements appended between the actual receipts of last year, those to be expected if the Committee's rates are introduced, and if the rates I propose are adopted. The receipts should, I think, be credited to the system to which the boat belongs; that is, a Kistna boat might be licensed in the Buckingham Canal, but the license fees would be credited to the Kistna system. I do not look for an immediate return, but I do expect that the opening of the canal to traffic in this way will eventually prove remunerative to Government, and I allow that it will be practicable to raise these rates at some future time :—

Cargo Boats.	Present Rates per Ton of 50 Cubic Feet.	Rates proposed by Committee.	Rates proposed by Chief Engineer for Irrigation.
	Rs.	Rs. per Ton of 50 C. Feet.	Rs. per Ton of 50 C. Feet.
Godávari	2½	2	
Kistna	1½	1½ } 5	
Buckingham Canal ...	2 per section, 10 for whole canal.	3	2½
Passenger Boats, 1st Class.			
Godávari	4½	4	
Kistna	4½	4 } 10	
Buckingham Canal ...	2 per section, 4 for whole canal.	4	5
Passenger Boats, 2nd Class.			
Godávari	3½	3	
Kistna	3½	3 } 7	
Buckingham Canal ...	2 per section, 4 for whole canal.	3	3
Steamers.			
Godávari	5	4	
Kistna	5	3 } 10	
Buckingham Canal ...	As cargo on passenger boats.	6	5
Rafts, Timber.			
Godávari	4 annas per 100 square feet each canal.	8 annas per 100 sq. feet.	8 annas per 100 sq. feet.
Kistna	Do. ...	Do. ...	Do. do.
Buckingham Canal ...	1 anna per sq. yard...	Do. ...	Do. do.
Rafts, Bamboo.			
Godávari	2 annas per 100 sq. feet.	4 annas per 100 sq. feet.	4 annas per 100 sq. feet.
Kistna	Do. ...	Do. ...	Do. do.
Buckingham Canal ...	1 anna per sq. yard...	Do. ...	Do. do.
Tolls for Vessels.			
Godávari	4 annas per ton each canal.	8 annas per ton per system.	8 annas per ton per system.
Kistna	Do. ...	6 do. ...	Do. do.
Buckingham Canal ...	4 annas per ton each section of canal.	12 do. ...	Do. do.
Tolls for Steamers.			
Godávari	Same as vessels ...	1 rupee per ton per system.	1 rupee per ton per system.
Kistna	...	12 annas do. ...	Do. do.
Buckingham Canal ...	...	1½ rupees do. ...	Do. do.

If my recommendations are approved, revised rules and bye-laws, which shall be applicable to all canals, will be drawn up. I agree with the Committee in considering that the navigation must be worked in the same way on all three systems, but I see the difficulty that there will be in enforcing the rules by stoppage of license on the Buckingham Canal where the open reach is so long, and I think it will be necessary, until the proposed improvements to the canal are carried out, to continue to the Buckingham Canal Divisional Officer the powers of a First-class Magistrate.

12. As regards the difficulty referred to by the Committee in consequence of the Delta Canals being under the orders of the Chief Engineer for Irrigation, and the

Buckingham Canal under those of the Chief Engineer, Department Public Works, I may state my opinion that the Buckingham Canal should be under the Chief Engineer for Irrigation. It would tend to uniformity, and I am disposed to think that all water works should be in charge of the Irrigation Branch. I say this without expressing any personal feelings in the matter.

13. The Committee ask for early orders, so that the new rules may be introduced on the 1st January 1882. This opens another question, viz., whether it is necessary that the navigation rates should continue to relate to the calendar year. The arrangement necessitates the figures in the accounts being shown for receipts in the calendar year, and for charges in the official year, and as I have lately recommended that the revenue year should be made to correspond with the official year, so I now recommend that the navigation year should be made to correspond with the official year. The change may occasion trifling inconvenience at first, but there are, I believe, no insuperable difficulties in the way.

14. In preparing revised rules I propose to take into consideration the addition proposed by Mr. Ottmann to be made to Section I.

CHEPAUK, (Signed) J. O. HASTED, Col. R.E.,
6th November 1882. Chief Engineer for Irrigation.

To the Joint Secrotary to Government, Public Works Department, Irrigation Branch.

STATEMENT showing the Navigation Receipts and Charges of the Godávari, Kistna, and Buckingham Canals.

Year.	Receipts.	Year.	Maintenance Charges.	Balance.	Interest.
Godávari Canal.					
	Rs.		Rs.	Rs.	Rs.
1876	39,952	1875-76	37,713	2,239	23,372
1877	44,742	1876-77	37,959	6,783	25,154
1878	53,386	1877-78	43,855	9,531	27,125
1879	63,348	1878-79	40,582	22,766	28,128
1880	51,315	1879-80	47,307	3,908	28,994
1881	55,670	1880-81	55,106	564	24,504
Kistna Canals.					
1876	18,377	1875-76	31,963	— 13,586	300
1877	14,876	1876-77	29,584	— 14,708	308
1878	16,396	1877-78	25,262	— 8,866	373
1879	23,294	1878-79	34,653	— 11,359	2,916
1880	23,834	1879-80	35,980	— 12,146	5,807
1881	21,788	1880-81	60,330	— 38,542	8,054
Buckingham Canal.					
1880	1,09,805	1879-80	82,519	27,286	...
1881	1,20,056	1880-81	1,56,734	— 36,678	...

The maintenance charges on the Kistna and Buckingham Canals during 1880-81 were unusually high, owing to the damages caused by extraordinary floods and cyclone. The increase in the interest charges to the Kistna Canals is owing to the cost of the locks recently constructed on the Commamur Canal having been included in the amount on which interest was calculated.

STATEMENT showing the Estimated Receipts from Navigation at the Rates now in force compared with those proposed by the Committee and the Chief Engineer for Irrigation.

—	Actual Collection for 1881.			Estimated Collection at the Rates now in force.			Estimated Collection at the Rates proposed by the Committee.			Estimated Collection at the Rates proposed by the Chief Engineer for Irrigation.		
	Tons.	Rate.	Amount.	Tons.	Rate.	Amount.	Tons.	Rate.	Amount.	Tons.	Rate.	Amount.
							Godávari Canals.					
		Rs.	Rs.		Rs.	Rs.		Rs.	Rs.		Rs.	Rs.
Cargo boats	21,530	2	41,935½	14,354	3½	50,239	16,148	2	32,296	21,530	2½	53,825
Do. by compounding ..	..	..	..	..	..	..	10,710	1½	16,065	..	..	..
Passenger boat, 2nd class.	1,913	3	5,702¼	1,275	5	6,375	1,435	3	4,305	1,913	3	5,739
Do. by compounding ..	..	..	..	..	..	..	1,486	2½	3,470	..	..	..
Steamers	21	5	105	14	7½	105	21	4	84	21	5	105
Tolls	10,319	¼	2,579¾	6,880	¼	1,720	10,319	½	5,160	..	..	1,000
Rafts	..	..	4,999	..	..	4,985	..	..	9,970	..	..	9,970
Miscellaneous Revenue ..	..	..	358	..	..	358	..	..	358	..	..	358
Total ..	..	..	55,670	..	..	63,782	..	..	71,708	..	..	70,997
							Kistna Canals.					
Cargo boats	14,957	1	14,972	9,971	2½	24,927	11,218	1½	16,827	14,957	2½	37,392
Do. by compounding ..	..	..	..	..	..	..	10,710	1¼	13,387	..	..	..
Passenger boat, 2nd class.	793	3	2,379	529	5	2,645	595	3	1,785	793	3	2,379
Do. by compounding ..	..	..	..	..	..	..	1,486	2½	3,470	..	..	..
Tolls	10,996	¼	2,749	7,331	¼	1,833	10,996	⅜	4,123	..	..	1,000
Rafts	..	..	1,484	..	..	1,484	..	..	2,968	..	..	2,968
Miscellaneous	..	..	204	..	..	204	..	..	204	..	..	204
Total ..	..	..	21,788	..	..	31,093	..	..	42,764	..	..	43,943
							Buckingham Canals.					
Cargo boats	6,352	2	12,704	..	..	..	4,764	3	14,292	6,352	2½	15,880
Do. by compounding ..	..	..	..	..	..	..	10,710	2¼	24,097	..	..	..
Passenger boats, 2nd class.	3,240	2	6,480	..	..	..	2,435	3	7,305	3,240	3	9,720
Do. by compounding ..	..	..	..	..	..	..	1,486	2½	3,470	..	..	..
Tolls	..	..	95,667	..	..	..	..	..	..	..	..	1,500
Rafts	..	..	100	..	..	..	..	..	750	..	..	75
Miscellaneous	..	..	5,104	..	..	..	..	..	5,104	..	..	5,104
Total ..	..	..	1,20,055	..	..	..	..	..	54,343	..	..	32,279

Memorandum by the Executive Engineer, Buckingham Canal, replying to questions put by the Chief Engineer, Public Works Department.

(1.) What the annual maintenance charges may, on completion of the work, amount to?

The allotment for maintenance during the current year is —

	Rs.
For Southern Canal, 61 miles, at Rs. 110	6,710
,, Northern ,, 207 ,, at ,, 275	56,925
	63,635
Minor repairs to masonry works	5,000
	68,635

The allotment hitherto made for the Southern Canal has been found sufficient, and I think when the canal reaches have been remodelled throughout, the whole canal will be put into a condition that as regards the cost of maintenance, will compare favorably with the present condition of the Southern Canal. The immunity the Southern Canal enjoys from inordinate silting, results from the drainage flowing into its backwater in numerous small drainages, and not in a concentrated form through large streams or rivers which carry down large quantities of silt, and backing into the several still-water reaches of the Northern Canal, form large shoals at their entrances and for considerable distances upwards from their mouths. I consider therefore that when the improvements to the canal have been effected that no greater expenditure per mile will

be necessary for its maintenance than has been found requisite for the Southern Canal even in its present unimproved condition. For the 266 miles therefrom an allotment of Rs. 30,000 should prove sufficient, but taking into account the number of river crossings on the Northern Canal that are liable to obstruction, a sum of Rs. 10,000 may be added, bringing the sum total to Rs. 40,000.

(2.) What at the end of the remaining eight or nine years required for completion of the works under the lately revised Estimate the sums levied for licenses and tolls under the revised scale should, making due allowance for all reasonable increase, amount to?

With regard to this subject it may not be out of place, to give here a few particulars regarding the progress of navigation on the Buckingham Canal, and show the effect that the raising of tolls thereon of late years has had upon its development.

Prior to the assumption in October 1879, of the duty of levying tolls upon or issuing licenses for boats that were plying on the canal, the Collector of the Chingleput District was accustomed to levy, under the orders of the Board of Revenue, a toll of four annas per ton upon every cargo boat, and four annas per trip on every passenger boat passed through the Shadayankupam Lock towards Madras. No tolls were levied on boats entering Madras from the southward. The receipts from these aggregated respectively in 1875, 1876, 1877 and 1878 Rs. 51,113, 39,869, 23,110, and 47,130. The falling off in 1876, 1877 may be attributed to the famine. The receipts from the licenses issued to boats on the Southern Canal amounted to an average collection of Rs. 1,400. In October 1879 this system was abolished, and licenses and tolls began to be levied under the new Navigation Rules which still continue in force.

The collections in 1880, 1881 and up to November 1882 amounted to Rs. 1,09,808, 1,16,527, and 1,00,037, respectively, or to more than twice the amount previously collected. Instead, however, of the number of boats decreasing, consequent upon the multiplying of toll stations and the introduction of a more complicated system of tolls under the rules, the number has actually progressively increased as is shown from the table hereto appended:—

Years.	Uncovered Cargo Boats.		Covered Cargo, Passenger and Radari Boats.		Deck and Dinghee Boats.		Fishing Boats.		Miscellaneous Boats.		Total.	
	Number.	Tonnage.	Number.	Tonnage.	Number.	Tonnage.	Number.	Tonnage.	Number.	Tonnage.	Number.	Tonnage.
1879	252	3,974	282	1,919	4	70	144	232	41	92	723	6,287
1880	369	6,206	468	3,567	19	315	90	110	46	80	992	10,278
1881	379	6,352	533	3,240	29	367	155	* 211	32	45	1,128	10,215
1882	377	6,394	554	3,522	22	283	62	* 152	40	200	1,055	10,551

The establishment of tolling stations does not appear therefore to have had a prejudicial effect upon the number of boats that use the canal. The brunt of paying the tolls comes upon the well-to-do merchants who hire the boats for carrying their goods to market, and this they can always afford to do without difficulty, and the boat-owner who builds his boat to earn a livelihood is in no way affected. The principle, however, of abolishing toll stations, and removing the powers from petty subordinates of extorting more than they are authorized to collect is a correct one, and should if possible be carried out. But the retention of two tolling stations on the canal, say, at Shadayankupam and another at Adyar Lock, would not be objectionable, as these stations would from their proximity to the headquarters of the division be open to frequent check and scrutiny. I would recommend, therefore, as a direct means of simplifying the method of collection of revenue that a modification of the original system of collections, viz., 4 annas per ton on all boats, be established. The number of boats that passed through the locks at Shadayankupam and the Adyar during 1881 amounted to 241,207 tons, which at 4 annas per ton would give 60,000 and odd rupees. This added to the expected revenue from Licenses as per statement

* These do not pay tolls nor fees.

given by the Chief Engineer for Irrigation would bring up the receipts of the Buckingham Canal to about 93,000 rupees.

The charge under the establishment proposed under this scheme in the accompanying table would be 11,500 rupees, which added to the amount required for maintenance would bring the sum total of charges to Rs. 51,500.

BUCKINGHAM CANAL.

TABLE showing the Establishment proposed for Toll Offices, Locks and Flood-gates.

Locality.	Establishment. No.	Nature of Appointment.	Average Salary per Month.	Amount per Annum.	Total.
			Rs.	Rs.	
Toll Office at Shadayankupam.	1	Clerk, IV Class, 2nd Grade ...	35		
	1	Do. 3rd „ ...	25		
	1	Clerk, V Class, 1st Grade	17½		
	1	Do. 2nd „	12½		
	2	Peons at Rs. 7 each	14		
			104	1,248	
Lock at Shadayankupam.	1	Head Lascar	8		
	4	Lascars at Rs. 7 each	28		
			36	432	
Junction Canal Lock at Adyar.	1	Head Lascar	7		
	4	Lascars at Rs. 6 each	24		
			31	372	
Sadras Canal Lock at Adyar.	1	Head Lascar	7		
	4	Lascars at Rs. 6 each	24		
			31	372	
Toll Office at Adyar Lock.	1	Clerk, IV Class, 3rd Grade ...	25		
	1	Clerk, V Class, 1st Grade	17½		
	2	Peons at Rs. 7 each	14		
	2	Lascars at Rs. 6 each	12		
			68½	822	
47 Flood-gates, 2 Lascars at each.	94	Lascars at Rs. 6 each	564	6,768	
Basin at Madras ...	1	Clerk, IV Class, 2nd Grade ...	35		
	3	Peons at Rs. 6 each	18		
			53	636	
Division Office at Madras.	1	Clerk, IV Class, 3rd Grade ...	25		
	1	Clerk, V Class, 1st Grade	17½		
	2	Peons at Rs. 6 each	12		
			54½	654	
		Contingencies	...	196	
		Total ...	...	...	11,500

CHEPAUK,
16th December 1882.

(Signed) R. R. E. DRAKE-BROCKMAN, Major, R.E.,
Executive Engineer, Buckingham Canal.

Note by the Chief Engineer, Public Works Department.

It having been brought under the notice of Government that hindrance to the traffic between Madras and the northern deltas was caused by the navigation rules of the Buckingham Canal differing from those applicable to the Godávari and Kistna deltas, and to the possible abuses from the through traffic being called upon to pay frequent tolls, the following Committee was, under G.O., of 5th August 1882, No. 612 I., appointed to consider and report on the matter, viz. :—

J. W. Rundall, Esq., Superintending Engineer, Second Circle, President.
G. T. Walch, Esq., Officiating Superintending Engineer, First Circle, } Members.
Major Drake-Brockman, Executive Engineer, Buckingham Canal, }

2. The points to which the attention of the Committee was specially drawn were—

(1) The abolition, as far as possible, of tolls.
(2) The license fees to be charged for the canals throughout.
(3) The measurement of the boats with reference to the adoption of one unit of measurement.

3. Major Drake-Brockman being absent on leave, his place was taken on the Committee by his *locum tenens*, Mr. Ottmann, Honorary Assistant Engineer ; but as will be observed from the printed collection now submitted, the Executive Engineer has had every opportunity for expressing his opinion.

4. The accompanying papers are in themselves so full and complete that, it will be needless to do more than summarize the conclusions arrived at by the Committee, and those of the Chief Engineer for Irrigation, who has noted at length on the case.

5. On the first point referred to them the Committee consider that although tolls cannot be entirely abolished, the number of existing stations may with advantage be reduced from 47 to 20. To allow of the occasional use of the canals without taking out a license, toll stations must, they consider, be maintained at the head locks of each section of the deltas, at all tidal locks, at Ellore near the junction of the Godávari and Kistna Canals, and at four places (viz., Pedda Ganjam, Kundaleru, Shadayankupam, and Adyar) on the Buckingham Canal.

6. In regard to the second point the Committee propose a very considerable reduction on the license fees, especially on the Buckingham Canal, which are nearly five times those for the corresponding lengths of the Godávari Canals.

7. By paragraph 28 the proposed through rates, and the proportions in which the revenue should be credited to each system should, they consider, be as follows :—

Cargo Boats.

	Rs.	A.	P.
Amount of through licenses	5	0	0
Godávari system 1 8 0			
Kistna „ 1 4 0			
Buckingham Canal 2 4 0			
	5	0	0

Passenger Boats.

(*a*) and (*c*) classes, through license	10	0	0
Godávari system 3 0 0			
Kistna „ 2 8 0			
Buckingham Canal 4 8 0			
	10	0	0
(*b*) and (*d*) classes, through license	7	0	0
Godávari system 2 4 0			
Kistna „ 1 8 0			
Buckingham Canal 3 4 0			
	7	0	0

8. On the third point the Committee definitely recommend that the unit hitherto adopted for the Buckingham Canal, viz., that 50 cubic feet should represent

a registered ton, instead of 75 cubic feet, as not long since introduced on the Godávari and Kistna Deltas.

9. The Chief Engineer for Irrigation accepts the Committee's recommendation on the first head, with the proviso that no obstruction such as a chain drawn across the canal (as at present) shall be allowed at the tolling stations; also that the toll-taker shall have no authority to stop any boat for the production of its license unless there is some evident infringement of the rules. He would confine all such action to the Inspecting Officers alone, considering it better to risk some loss than harass traffic.

10. Under the second head Colonel Hasted, while agreeing to the general principles, is prepared to go much further than the Committee by making one demand for license to clear all the canals, and by otherwise removing all possible obstacles to navigation, believing that the interests of Government would best be served by improving the communications, stimulating consumption, and extending production. All he considers that should be looked for is that, the navigation receipts should cover the working expenses when the canals have been completed and brought into normal condition, excluding interest charge on capital outlay.

11. The scales of license fees as suggested by Colonel Hasted (see paragraph 11 of his Note) for cargo boats, passenger boats, and steamers, are just one-half those recommended by the Committee, while for rafts the scale is the same.

12. In the matter of tolls, he would substitute the uniform rate of 8 annas per ton for boats, and one rupee per ton for steamers for each system, in lieu of the Committee's rather heavier rates, and the existing ones on the Buckingham Canal, which are acknowledged to be both heavy and vexatious.

13. Major Drake-Brockman, to whom the question of licenses and tolls was referred, chiefly in view to show what would be the probable financial effect of the suggestions made by the Committee, and by the Chief Engineer for Irrigation, has recorded his opinion in a memorandum of the 16th December.

14. The main point brought prominently into view by this officer, is the large outlay now required for the maintenance of the Buckingham Canal in its present incomplete condition, and the sensible reduction which must occur when the improvement works, which have been estimated for and are being carried out, shall have been completed. The total future annual charge for the 266 miles open, he considers, should not exceed Rs. 40,000.

15. While showing what the collection from tolls has been during the past four years, he has taken no credit for future increase, which, when the trade has been freed from the present harassing system of tolls, may reasonably be expected to show itself. The growth of the revenue in the last few years does not, it is thought, prove that tolls are acceptable to boat-owners or others engaged in trade, so much as that the vitality of the traffic is so great that, the revenue has increased in a very marked manner in spite of all obstacles.

16. In addition to the license fees proposed by the Chief Engineer for Irrigation, Major Drake-Brockman would establish only two toll stations, viz., at the Adyar lock, the head of the southern branch, and at Shadayankupam, the southern extremity of the north branch of the Buckingham Canal.

17. With a toll of 4 annas per ton on the whole outward and inward traffic passing the locks (aggregating 241,207 tons) he calculates on a revenue from this source only of Rs. 60,000 per annum.

18. The plan, though apparently simple, would have the objection that the rate charged on boats plying near the extremities of the canals would be unduly heavy, while others might escape all tolls, *e.g.*, a boat making three outward trips would pass the toll station six times, and pay $1\frac{1}{2}$ rupees per ton, which is certainly very heavy, while any boat plying within the full length of the canal beyond the toll station, would pay nothing.

19. Colonel Hasted, on a further reference made to him regarding the cost of establishment, gives the following for his scheme:—

Toll Stations.	Establishment.	Pay.	Total.
		Rs.	Rs.
Shadayankupam Lock	1 Superintendent	15	41
	2 Lascars at Rs. 7	14	
	2 Do. at „ 6	12	
Adyar Lock	1 Superintendent	15	41
	2 Lascars at Rs. 7	14	
	2 Do. at „ 6	12	
Pedda Ganjam Lock	1 Superintendent	15	21
	1 Lascar	6	
Kundaleru	1 Superintendent	15	21
	1 Lascar	6	
Wharf at Madras	1 Superintendent	50	$79\frac{1}{2}$
	1 Clerk	$17\frac{1}{2}$	
	2 Lascars at Rs. 6	12	
Total per Mensem ...	.....	...	258
Total per Annum ...	.....	...	3,096

20. Assuming the maintenance charges at Rs. 40,000, the amount estimated by Major Drake-Brockman, allowing for contingencies, establishment and maintenance, would not exceed Rs. 45,000 per annum when the canal shall have been completed.

21. As even with the present imperfectly developed traffic the license fees and tolls would on Colonel Hasted's scale amount as shown to over Rs. 32,000 per annum, it would only need a wharfage charge of about 1 anna a ton levied at Madras, to bring receipts and disbursements into equilibrium.

22. A wharf is now being constructed near the basin at Madras, and it may be desirable to build another to south of the Adyar lock. A charge such as that indicated at both places would be in every way reasonable, and it certainly would be necessary to prevent all discharge of cargo excepting at the selected places.

23. On the whole, therefore, the proposals put forward by the Chief Engineer for Irrigation, supplemented by the small wharfage charge which he himself has suggested, would, it is thought, prove most suitable.

24. It is of the utmost moment that a work which holds out such promise of success in ordinary years, and of proving itself of inestimable value during famine, should be freed in its infancy from all needless trammels.

25. Among other points which have incidentally entered into the questions raised, is one regarding the branch of this department, by which in future the work should be controlled.

26. Reasons have hitherto existed, needless here to state, which have made it advisable to retain the control in the general branch of the department. These, however, do not now exist in the same force as formerly, and certainly if in future complete uniformity of management is to be introduced for all the canals as forming part of a general system, it would be desirable to transfer the management of the Buckingham Canal to the Irrigation Branch.

27. Another point has reference to the period covered by the annual returns, which hitherto has been the calendar and not the official year. There seems no reason why the latter should not now be reverted to as being in every way the most convenient. Should the above approve themselves to Government, orders might issue at a sufficiently early date to admit of the introduction of the new system in its entirety from the 1st April next.

(Signed) R. H. SANKEY, Colonel, R.E.,
Chief Engineer, P.W.D.

Madras,
26th January 1883.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Buildings and Roads.
Civil Works.

No. 139.

Read—the following paper :—

From the Committee convened in Proceedings, Madras Government, No. 612 I., of 5th August 1882, dated 12th October 1882.
Memorandum by the Chief Engineer for Irrigation, dated 6th November 1882, No. 117 I.
" " Executive Engineer, Buckingham Canal Division, dated 16th December 1882.
" " Chief Engineer, Public Works Department, dated 26th January 1883.

No. 140.

Order—dated 20th February 1883, No. 562 W., Public Works.

The Government accept the recommendations of the Committee, with the modifications suggested by the Chief Engineer for Irrigation, and the Chief Engineer, Public Works Department.

2. The Chief Engineer for Irrigation will submit, in time to admit of their introduction by the 1st April 1883, a revised draft of the rules for publication in the *Fort St. George Gazette* and communication to officers concerned.

3. The official, instead of the calendar, year will in future be adopted in regard to the preparation of navigation returns, &c., and from 1st April next all matters relating to the Buckingham Canal will be dealt with in the Irrigation Branch.

(True Extract.)

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

To the Chief Engineer for Irrigation.
" Superintending Engineer, First Circle.
" " " Second "
" " " Third "
" Board of Revenue.
" Revenue Department.
" Supg. Engineer Fifth Circle.

Exd. A. F. Goodall.
Spare Copies

BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of {1883} Madras.
PUBLIC WORKS.

Dated February, 20th.

Recd.

Encl.

G.O., 20th Feb. 1883, No. 562 W.

FEBRUARY.
Nos. 139-140.

Navigation Rules

Revised — for the Canal System of the East Coast.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

8th July 1879, No. 1,801 A-W.

Buildings and Roads
~~General.~~
~~Establishment.~~
Civil works

Read the following papers :—

No. 38. Proceedings of the Board of Revenue, dated 14th March 1878, No. 695.

Proceedings of the Madras Government in the Revenue Department, dated 21st February 1878, No. 284.

ABSTRACT.—*Sadras and Buckingham Canal.*—Considering that the time has arrived for a complete change in the system of tolling hitherto in force and for the introduction of a plan similar to that sanctioned in 1872 provisionally, and requesting the Board of Revenue to report on the subject.

—

From R. W. BARLOW, Esq., Collector of the Chingleput District, to the Acting Secretary, Board of Revenue, dated Saidapet, 5th March 1878, No. 98.

WITH reference to paragraph 15 of the Board's Proceedings, dated 24th January 1878, No. 216, I have the honor to report that at the time the budget of the Cochrane's and Sadras Canal Fund for 1878-79 was prepared, I had no information before me either as to what portions of the East Coast Canal in the district of Nellore, recently completed from Famine Funds, would be opened for traffic during next year, or as to what number of boats might arrive from those parts at Madras and pay tolls. I therefore restricted the estimate to the average collections of ordinary years; if, however, the Board are in a position to estimate the additional revenue that might be derived from the extension of the canal northwards, I would suggest that the necessary alteration may be made in the budget.

—

From the same Officer, dated Saidapet, 7th March 1878, No. 100.

ADVERTING to the Board's Proceedings, No. 400, dated 14th ultimo, and in reply to a demi-official from the Secretary, dated 5th instant, I have the honor to forward a set of draft rules for the whole system of the East Coast Canals.

2. As I have been directed in the demi-official to prepare the draft to suit the introduction of Act I of 1870 and the license system throughout, I have adopted the rules approved of by Government in G.O., No. 1,400, dated 10th October 1872, the only addition being one to regulate the speed at which steam launches are to run. I should have preferred to add a rule regarding the overcrowding of boats necessary, in my opinion, for the comfort, though perhaps not for the safety, of the passengers; but have omitted it as Government in the order above quoted laid down that such interference is not necessary.

3. In conclusion, I have to inform the Board that the Salt Boat Contractor cannot claim any compensation for change of system, as there is an express condition in his contract barring such claim, though the Board will doubtless award what they may consider equitable.

ENCLOSURE No. 1.—Draft Rules.

From Colonel E. A. FOORD, R.E., Chief Engineer, Public Works Department, to the Acting Secretary to the Board of Revenue, dated Fort St. George, 9th March 1878, No. 1,226.

I HAVE the honor to forward herewith as requested by you personally a statement of the establishment proposed to be entertained for the supervision and maintenance of the Buckingham Canal, which will be divided into the following executive charges :—

	Head-quarters.
Buckingham Canal Division	Madras.
No. 1 Sub-division for Sub-divisional Officer ...	Pulicat or Coromandel.
Do. for Overseers	Madras and Dugurazpatam.
No. 2 Sub-division for Sub-divisional Officer ...	Ramapatam.
Do. for Overseers	Eskapilly and Pakala.

The Divisional charge will include 250 miles of canal, each sub-divisional charge 125 miles, and each Overseer's charge 62½ miles.

This establishment does not include the subordinate agency which may be required for the collection of revenue.

Maintenance such as clearing, &c., 230 rupees per mile for 250 miles.

ENCLOSURE No. 1.

ESTABLISHMENT proposed for the Buckingham Canal.

Establishment—							Cost.
							RS.
1 Executive Engineer, 1st Grade, at Rupees 950							
1 Supervisor,	do.	at	„	200	...	... ...	950
1 Do.	2nd do.	at	„	150	...	... ...	200
2 Overseers,	1st do.	at	„	100	...	... ...	150
2 Do.	2nd do.	at	„	80	...	... ...	200
1 Do.	3rd do.	at	„	60	...	... ...	160
						.. ...	60
						Total per mensem ...	1,720
						Total per annum Rupees 1,720 × 12 =	20,640

Establishment for one Executive Engineer—

1 Accountant, at Rupees 60	60
1 Draftsman and Estimator, at Rupees 40	40
1 Assistant Accountant and Writer, at Rupees 30	30
1 Do. do. do. at „ 20	20
3 Lascars, at Rupees 7 each	21
Total per mensem ...	171
Total per annum Rupees 171×12 =	2,052

Establishment for two Supervisors—

1 Writer and Accountant, at Rupees 25	25
2 Lascars, at Rupees 7 each	14
	392
Total per mensem ...	78
Total per annum Rupees 78 × 12 =	936

Establishment for five Overseers—	RS.
1 Gumastah, at Rupees 15	15
2 Lascars, at Rupees 6 each	12
	27
	5
Total per mensem ...	135
Total per annum Rupees 135 × 12 =	1,620
Grand Total per annum ...	25,248

MEMORANDUM.

THE license fee on the Southern Canal is Rupees 2 per ton per annum.

2. Boats on the Northern Canal are only charged for passing the Shadayancooppam Lock as they *come into* Madras. No charge is made for boats leaving. The charge is 4 annas per ton for *all* cargo boats. Passenger boats pay 4 annas per trip per boat and only as they come *in*.

Exceptions.—Budgerows pay 8 annas for inward trip. The boats of the officers of the Public Works Department on inspection and of the Police Inspector of the northern salt-pans pay nothing.

3. Lattice bridge will do for the new toll on the Southern Canal, as I think it is a sufficient distance from Madras without being too far.

4. A table is enclosed showing financial results. The change will not be great on the Northern Canal. Assuming the aggregate tonnage of the serviceable boats to be 10,000* tons, these figures show the increase in Rupees 10,000. The change on the Southern Canal, where no tolls have been hitherto levied, will be considerable, amounting roughly to Rupees 5,190 of increase against the aggregate previous collections Rupees 1,400 per year; but it is a question whether the change may not cause a falling off in the traffic, and therefore in the estimated receipts.

* The exact tonnage will follow. Since reported as 13,460 tons on the *Northern* Canal.

5. Government do pay tolls on salt boats on the Northern Canal, but nothing towards licenses on the Southern.

6. The Boat Contractor on the Northern Canal can claim no compensation, as there is an express provision in his contract to the contrary; but if the Board should award any, the amount will be trifling, say, if the salt boats are employed for three months in the year, the amount of compensation to be paid would be one-fourth of the fees for their aggregate tonnage.

(Signed) R. W. BARLOW,
Collector.

11th March 1878.

ENCLOSURE No. 1.

Year.	Passenger Boats. Number.	Rate per Boat.	Amount.	Cargo Boats. Tonnage.	Rate per Ton.	Amount.	Total of Columns 4 and 8.
1	2	3	4	6	7	8	9
		Rs. A. P.	Rs. A. P.		Rs. A. P.	Rs. A. P.	Rs. A. P.
Northern Canal.							
1875	2,417	0 4 0	604 4 0	202,038¼	0 4 0	50,509 9 0	1875 ... 51,113 13 0
1876	2,161	0 4 0	540 4 0	157,315	0 4 0	39,328 12 0	1876 ... 39,869 0 0
1877	1,825	0 4 0	456 4 0	90,615¼	0 4 0	22,653 13 0	1877 ... 23,110 1 0
Total for three years ...	6,403	0 4 0	1,600 12 0	449,968¾	0 4 0	1,12,492 2 0	*Total for three years ...* 1,14,092 14 0
Average for one year ...	2,134⅓	0 4 0	533 9 4	149,989¼	0 4 0	37,497 6 0	*Average for one year ...* 38,030 15 4
Add license fee at 1 rupee per ton per annum	...	...	...	...	...	...	13,460 0 0
Total Estimated Revenue ...	...	...	...	...	...	...	48,030 15 4
							51,490 0 0
Southern Canal.							
1875	2,155	0 4 0	538 12 0	26,398	0 4 0	6,599 8 0	1875 ... 7,138 4 0
1876	2,074	0 4 0	518 8 0	20,805	0 4 0	5,201 4 0	1876 ... 5,719 12 0
1877	1,708	0 4 0	427 0 0	17,558	0 4 0	4,389 8 0	1877 ... 4,816 8 0
Total for three years ...	5,937	0 4 0	1,484 4 0	64,761	0 4 0	16,190 4 0	*Total for three years ...* 17,674 8 0
Average for one year ...	1,979	0 4 0	494 12 0	21,587	0 4 0	5,396 12 0	*Average for one year ...* 5,891 8 0
Add license fee at 1 rupee per ton per annum	...	...	...	...	...	...	700 0 0
Total Estimated Revenue ...	...	...	...	...	...	...	6,591 8 0

IN the foregoing order the Board are called upon to report on the question of applying Act I of 1870 to the whole line of the East Coast Canal from the Kistna to the South Arcot Districts, and of introducing a uniform system for the collection of dues thereon, the plan of tolls and licenses combined being suggested. It being desired that the new system should be brought into force from the commencement of the next official year, the Board were directed to lose no time in settling, in communication with the Public Works Department, what the establishment and rates should be. The Board have accordingly conferred with the Chief Engineer on the subject and have obtained some information from the Collector of Chingleput, but the time allowed for report does not admit of their consulting the Collector of Nellore as they would have done had time permitted, or of procuring such full information as is essential to a proper consideration of the subject. It is apparently in contemplation to appoint an officer of standing in the Public Works Department to the charge of the whole line, and the Board would prefer to see the system at present in force continued for a short time longer where traffic exists, whilst a little delay in introducing taxation where traffic has to be commenced may not be impolitic. Meantime the special officer would be able to investigate the conditions and prospects of traffic thoroughly, and to submit matured proposals after consulting the local authorities. Constant changes are undesirable, and as the information at the Board's disposal is very limited, it is highly probable that any arrangements which they may now propose will require modification at no distant date. They will endeavour, however, to comply with the wishes of Government.

2. As regards the application of Act I of 1870, the Board opposed the proposal in their Proceedings of the 20th November 1875 on the ground that the sole object of the suggestion was to provide for the extension of the East Coast Canal northwards from the surplus funds of other districts. The bulk of the balance of the Canal and Ferry Fund belongs to the Godavari and will shortly be locally utilized. If therefore immediate action is considered necessary, the Board see no objection now to steps being taken to introduce the Act. They think that the rules embodied in G.O., dated 10th October 1872, will suffice, at any rate till some experience of their working is gained. The draft forwarded by the Collector of Chingleput is a transcript of these rules, with an additional clause to regulate the speed of steam launches. The Board must, however, point out that under the provisions of Section 23 of the Act the rules cannot be brought into operation until the expiration of at least two months from the date of first publication in the official gazettes.

3. As regards the introduction of a uniform system, the Board are in favor of a combination of tolls and licenses. At present there are no tolls on the Sadras Canal, a license fee of Rupees 2 per ton per annum being the only charge. On Cochrane's Canal there are no license fees, but tolls are leviable on boats passing the Shadayancooppam lock at the rate of 4 annas per ton on all cargo boats and 4 annas per trip on passenger boats. These tolls are collected at the basin by the Superintendent; the traffic is registered at the lock and passes are issued which are given up to the Superintendent at the basin. Accounts are rendered both by the Superintendent at the basin and by the Conicopillay at the lock to the Salt Deputy Collector. No tolls are levied on traffic outwards. Budgerows pay 8 annas per inward trip; boats of public officers are exempt. The Board think that a uniform annual license fee entitling boats to ply on any part of the canal throughout its whole length during the year should be fixed with reference to tonnage; as traffic on the portion of the canal recently completed will not be developed for some time it is obvious that boats plying on that section will not be able to pay so high a fee as those engaged on the portion which has long been in working order; a very moderate rate must therefore be fixed at first, and the Board would suggest 1 rupee per ton for all boats which appears from G.O., dated 4th March 1873, No. 691, to be the rate in force on the Godavari and Kistna Canals. The Board think that a differential rate for boats exceeding a certain limit of size, as proposed when the subject was under discussion before, is highly desirable. The rate might be Rupees 2 per ton on all boats registered as over 30 tons. On the Northern Canal the license fees will be so much clear gain, as no reduction of the number of boats is likely to result from

5. For example, an ordinary cargo boat to carry 30 tons can be purchased for 500 rupees; it is worked by two men and a boy at a cost of 15 rupees a month or 180 rupees a year, and, taking the Godavari scales of fees as the standard, it pays 2 rupees per ton or 60 rupees per annum for the use of the canals. It travels easily 200 miles a month or 2,400 miles a year, and its hire, according to the rates now prevailing, is about 3 pie per ton per mile.

The annual outlay for such a boat is:—

	RS.
Interest on original cost of 500 rupees at 5 per cent.	25
Depreciation and repairs at 15 per cent.	75
Working expenses	180
Canal dues	60
Total annual outlay ...	340

and calculating the earning at the rate of 3 pie per ton per mile—

the income is 2,400 × 30 × 3 pie	1,125
Which gives a clear gain of	785

or one and a half times the original cost of the vessel to the owner.

6. On the other hand the return to Government is extremely small. There are 750 miles of navigable canals in the Godavari and Kistna Districts, and the navigation fees collected amount to about 50,000 rupees per annum or between 60 and 70 rupees per mile, an amount which must be quite insufficient for the up-keep of the establishment and the works much less to yield any return for the original cost of making the canals navigable.

7. The third defect, that is to say, the various classification of vessels and fees, seems likely to create unnecessary trouble and confusion, to the navigation establishment as well as to the owners of vessels; it is, moreover, inequitable in its application, and gives rise to a practice of circumvention on the part of boat-owners which it seems desirable to avoid; for instance, a passenger boat is supposed to pay a fee of 6 annas for every square foot of deck surface, the average depth of such boats is about 3 feet and $16\frac{2}{3}$ square feet is equal to a ton or 50 cubic feet of cargo measurement. The fee of 6 annas a square foot for passenger vessels is therefore equal to $6\frac{1}{4}$ rupees a ton, and if the same vessel was classed as a cargo boat it would have to pay only 2 rupees a ton in the Godavari and 1 rupee a ton in the Kistna District. As a matter of fact the rule is to a great extent inoperative by having passenger boats registered as cargo boats, and there is nothing in the rules to prevent cargo boats carrying passengers which they really do.

8. The alternative fee provided for in Rule XIV seems to be even more objectionable than the high rate charged for passengers' boats. It demands a fixed toll without reference to the size or circumstances of the vessel or the length of the canal to be used. For instance, an unlicensed 5-ton boat has to pay 6 rupees for using the canal from Dowlaishvaram to Cocanada a distance of about twenty-eight miles or at the rate of about 8 pie per ton per mile, a 60-ton boat can perform the same journey for 6 rupees also or at the rate of $\frac{1}{2}$rds of a pie per ton per mile. The Commamur Canal over fifty miles long can be used by the same boats at about half the cost per ton per mile they would have to pay respectively on the Cocanada Canal.

9. An attempt has been made in drafting rules for the Buckingham Canal to avoid the above-mentioned apparent defects in the rules for the Godavari and the Kistna Canals.

The Buckingham Canal rules are based entirely on Act I of 1870, and the repetition of what is fully provided for in the Act is avoided in the rules. The fees proposed to be levied are comparatively extremely low, but they are sufficient to provide for the upkeep of the work and to yield some return on its first cost which is all that is required. The fees provided for are the same on all vessels using the canal except fishing and pleasure boats, from which for obvious reasons and for registration purposes only but a very small fee is demanded. The fees are proportional to the size of the vessel and to the extent to which in the case of each vessel the canal is used.

10. Owing to the limitation and exemption provided for in Section 4 of the Act it has been necessary to treat each of the old and new sections of the canal as separate lines of navigation. If Section 4 of the Act was amended by providing for tolls AND licenses instead of tolls OR licenses, and if the last paragraph was expunged, the drawing up of navigation rules for canals generally would be much simplified, and the division of the Buckingham Canal into distinct lines of navigation would be in the present case unnecessary.

11. In fixing the scale of fees and tolls provided for in these rules, three things have been considered.—

1*st*,—the cost of the works and the amount required to maintain them in efficient order;

2*nd*,—the extent of the traffic and its capability to produce the amount required;

3*rd*,—the earnings and the ability of boat-owners to pay the fees and tolls proposed to be levied.

12. The Buckingham Canal has (or will) cost one mile with another 15,000 rupees per mile, and its upkeep including establishment will cost 300 rupees per mile per annum. The annual revenue for each mile of the canal should therefore be—

	RS.
The interest on first cost of Rs. 15,000 per mile, at 5 per cent. ...	750
And the cost per mile per annum for repairs and establishment ...	300
or a total of ...	1,050

13. The present system of registering traffic on the Buckingham Canal is thoroughly unreliable and unsatisfactory, passenger boats of from 5 to 10 tons burden are, according to the Madras rules, registered as 1 ton burden, while in one instance at least the registered tonnage of the Cocanada boats now plying on the canal is by a mistake in the measurement double what it should be; there is no apparent check on the returns of traffic or revenue, and their accuracy is wholly dependent on the disposition of the subordinate establishment. There may be nothing wrong in the collection and disposal of the revenue, but there is much room for irregularity in this respect, while from competent observation there is no doubt the reported traffic is much less than what the traffic really is.

14. It is useless however to speculate on what the actual traffic is at present, and for the purpose in hand the official returns must be accepted.

These returns give the following results for the year ending the 31st December last :—

Floating tonnage on the canal in round numbers	Tons	15,000
Inward and outward traffic from Madras	,,	268,902
Ton mileage	Miles	9,162,295
Passengers carried	No.	140,011
Fees and tolls collected to	Rs.	52,282-1-0

15. On the Sadras section where boats are licensed and no tolls collected :—

The traffic amounted to	Tons	71,286
The ton mileage	Miles	1,223,923
The average distance each ton of the traffic was carried ...	,,	$17\frac{1}{8}$
The fees collected were	Rs.	878

which is equal to Rupees 21-6-8 for each mile of the 41 miles of canal open, or $\frac{1}{7}$th of a pie per ton per mile carried.

16. On the northern section 196 miles in length where one toll is collected at 4 annas a ton and where boats are not licensed—

The traffic amounted to	Tons	205,616
The ton mileage to	Miles	7,938,432
The average distance each ton of cargo travelled ...	,,	$38\frac{1}{2}$
Tolls collected	Rs.	51,404-1-0
Which is equal to	,,	262-4-3
Per mile of canal open, or	,,	0-0-$1\frac{1}{4}$

nearly per ton per mile of traffic.

17. The quantity of salt carried on the Sadras section was 31,880 tons, and on the Pulicat section 95,709 tons, equal in each case to nearly half the entire traffic.

The average distance salt was carried on the Pulicat section is 12 miles, the ton mileage is therefore equal to 95,709 × 12 = 1,148,508. The fees collected from this traffic amounted to Rupees 23,927-4-0 or 4 pie per ton per mile, while the remainder of the traffic on this section of the canal amounting to 109,907 tons was carried 67,89,924 miles or an average distance of $61\frac{3}{4}$ miles per ton, the fees charged being 27,476-13-0 or about $\frac{3}{4}$ths of a pie per ton per mile. This shows that the canal revenue has been greatly dependent on the salt traffic, and that the fees paid by Government per ton per mile on this account is five times greater than what is paid by the public for the similar use of the canal.

18. It would be inconvenient to divide the canal into section of 12 or 15 miles to suit the salt traffic and to equalise the incidence of the fees on this and other traffic on such a short distance. The most convenient limit for the length of a section of the canal is considered to be 48 miles, and salt like other traffic must pay more or less in proportion to the actual distance it travels within and beyond these limits. The division of the canal into sections of this limit will equalise the charges on all traffic as nearly as such equalisation can practically be carried out, this limit of about 48 miles has therefore been adopted in the rules and it is proposed to erect toll bars as near to these limits as local circumstances will admit.

5. For example, an ordinary cargo boat to carry 30 tons can be purchased for 500 rupees; it is worked by two men and a boy at a cost of 15 rupees a month or 180 rupees a year, and, taking the Godavari scales of fees as the standard, it pays 2 rupees per ton or 60 rupees per annum for the use of the canals. It travels easily 200 miles a month or 2,400 miles a year, and its hire, according to the rates now prevailing, is about 3 pie per ton per mile.

The annual outlay for such a boat is:—

	RS.
Interest on original cost of 500 rupees at 5 per cent.	25
Depreciation and repairs at 15 per cent.	75
Working expenses	180
Canal dues	60
Total annual outlay ...	340

and calculating the earning at the rate of 3 pie per ton per mile—

the income is 2,400 × 30 × 3 pie	1,125
Which gives a clear gain of	785

or one and a half times the original cost of the vessel to the owner.

6. On the other hand the return to Government is extremely small. There are 750 miles of navigable canals in the Godavari and Kistna Districts, and the navigation fees collected amount to about 50,000 rupees per annum or between 60 and 70 rupees per mile, an amount which must be quite insufficient for the up-keep of the establishment and the works much less to yield any return for the original cost of making the canals navigable.

7. The third defect, that is to say, the various classification of vessels and fees, seems likely to create unnecessary trouble and confusion, to the navigation establishment as well as to the owners of vessels; it is, moreover, inequitable in its application, and gives rise to a practice of circumvention on the part of boat-owners which it seems desirable to avoid; for instance, a passenger boat is supposed to pay a fee of 6 annas for every square foot of deck surface, the average depth of such boats is about 3 feet and $16\frac{2}{3}$ square feet is equal to a ton or 50 cubic feet of cargo measurement. The fee of 6 annas a square foot for passenger vessels is therefore equal to $6\frac{1}{4}$ rupees a ton, and if the same vessel was classed as a cargo boat it would have to pay only 2 rupees a ton in the Godavari and 1 rupee a ton in the Kistna District. As a matter of fact the rule is to a great extent inoperative by having passenger boats registered as cargo boats, and there is nothing in the rules to prevent cargo boats carrying passengers which they really do.

8. The alternative fee provided for in Rule XIV seems to be even more objectionable than the high rate charged for passengers' boats. It demands a fixed toll without reference to the size or circumstances of the vessel or the length of the canal to be used. For instance, an unlicensed 5-ton boat has to pay 6 rupees for using the canal from Dowlaishvaram to Cocanada a distance of about twenty-eight miles or at the rate of about 8 pie per ton per mile, a 60-ton boat can perform the same journey for 6 rupees also or at the rate of $\frac{1}{20}$rds of a pie per ton per mile. The Commamur Canal over fifty miles long can be used by the same boats at about half the cost per ton per mile they would have to pay respectively on the Cocanada Canal.

9. An attempt has been made in drafting rules for the Buckingham Canal to avoid the above-mentioned apparent defects in the rules for the Godavari and the Kistna Canals.

The Buckingham Canal rules are based entirely on Act I of 1870, and the repetition of what is fully provided for in the Act is avoided in the rules. The fees proposed to be levied are comparatively extremely low, but they are sufficient to provide for the upkeep of the work and to yield some return on its first cost which is all that is required. The fees provided for are the same on all vessels using the canal except fishing and pleasure boats, from which for obvious reasons and for registration purposes only but a very small fee is demanded. The fees are proportional to the size of the vessel and to the extent to which in the case of each vessel the canal is used.

10. Owing to the limitation and exemption provided for in Section 4 of the Act it has been necessary to treat each of the old and new sections of the canal as separate lines of navigation. If Section 4 of the Act was amended by providing for tolls AND licenses instead of tolls OR licenses, and if the last paragraph was expunged, the drawing up of navigation rules for canals generally would be much simplified, and the division of the Buckingham Canal into distinct lines of navigation would be in the present case unnecessary.

11. In fixing the scale of fees and tolls provided for in these rules, three things have been considered.—

1*st*,—the cost of the works and the amount required to maintain them in efficient order;

2*nd*,—the extent of the traffic and its capability to produce the amount required;

3*rd*,—the earnings and the ability of boat-owners to pay the fees and tolls proposed to be levied.

12. The Buckingham Canal has (or will) cost one mile with another 15,000 rupees per mile, and its upkeep including establishment will cost 300 rupees per mile per annum. The annual revenue for each mile of the canal should therefore be—

	RS.
The interest on first cost of Rs. 15,000 per mile, at 5 per cent. ...	750
And the cost per mile per annum for repairs and establishment ...	300
or a total of ...	1,050

13. The present system of registering traffic on the Buckingham Canal is thoroughly unreliable and unsatisfactory, passenger boats of from 5 to 10 tons burden are, according to the Madras rules, registered as 1 ton burden, while in one instance at least the registered tonnage of the Cocanada boats now plying on the canal is by a mistake in the measurement double what it should be; there is no apparent check on the returns of traffic or revenue, and their accuracy is wholly dependent on the disposition of the subordinate establishment. There may be nothing wrong in the collection and disposal of the revenue, but there is much room for irregularity in this respect, while from competent observation there is no doubt the reported traffic is much less than what the traffic really is.

14. It is useless however to speculate on what the actual traffic is at present, and for the purpose in hand the official returns must be accepted.

These returns give the following results for the year ending the 31st December last :—

Floating tonnage on the canal in round numbers	Tons	15,000
Inward and outward traffic from Madras	,,	268,902
Ton mileage	Miles	9,162,295
Passengers carried	No.	140,011
Fees and tolls collected to	Rs.	52,282-1-0

15. On the Sadras section where boats are licensed and no tolls collected :—

The traffic amounted to	Tons	71,286
The ton mileage	Miles	1,223,923
The average distance each ton of the traffic was carried ...	,,	$17\frac{1}{8}$
The fees collected were	Rs.	878

which is equal to Rupees 21-6-8 for each mile of the 41 miles of canal open, or $\frac{1}{7}$th of a pie per ton per mile carried.

16. On the northern section 196 miles in length where one toll is collected at 4 annas a ton and where boats are not licensed—

The traffic amounted to	Tons	205,616
The ton mileage to	Miles	7,938,432
The average distance each ton of cargo travelled ...	,,	$38\frac{1}{8}$
Tolls collected	Rs.	51,404-1-0
Which is equal to	,,	262-4-3
Per mile of canal open, or	,,	0-0-$1\frac{1}{4}$

nearly per ton per mile of traffic.

17. The quantity of salt carried on the Sadras section was 31,880 tons, and on the Pulicat section 95,709 tons, equal in each case to nearly half the entire traffic.

The average distance salt was carried on the Pulicat section is 12 miles, the ton mileage is therefore equal to 95,709 × 12 = 1,148,508. The fees collected from this traffic amounted to Rupees 23,927-4-0 or 4 pie per ton per mile, while the remainder of the traffic on this section of the canal amounting to 109,907 tons was carried 67,89,924 miles or an average distance of $61\frac{3}{4}$ miles per ton, the fees charged being 27,476-13-0 or about $\frac{3}{4}$ths of a pie per ton per mile. This shows that the canal revenue has been greatly dependent on the salt traffic, and that the fees paid by Government per ton per mile on this account is five times greater than what is paid by the public for the similar use of the canal.

18. It would be inconvenient to divide the canal into section of 12 or 15 miles to suit the salt traffic and to equalise the incidence of the fees on this and other traffic on such a short distance. The most convenient limit for the length of a section of the canal is considered to be 48 miles, and salt like other traffic must pay more or less in proportion to the actual distance it travels within and beyond these limits. The division of the canal into sections of this limit will equalise the charges on all traffic as nearly as such equalisation can practically be carried out, this limit of about 48 miles has therefore been adopted in the rules and it is proposed to erect toll bars as near to these limits as local circumstances will admit.

19. The rules provide for a license or registration fee of 2 rupees per ton all round, on all vessels of all descriptions using a distinct section of the canal, except fishing and pleasure boats which will be registered for a fee of 4 annas a ton. The rules provide also for the collection of tolls at the rate of 4 annas a ton or 1 pie per ton per mile for the use of any section of the canal other than the section in which the vessel is registered, which it is allowed to use free of tolls.

20. The length of canal now open is in round number 245 miles, and calculating on the present returns of traffic, the registration fees and tolls will yield a revenue of Rupees 516-10-8 per mile as follows:—

	RS.	A.	P.
Registration fees on 15,000 tons at 2 rupees	30,000	0	0
Do. on fishing and pleasure boats say 1,000 tons at 4 annas...	250	0	0
Tolls on traffic carried 48 miles and less 200,000 tons at 4 annas.	50,000	0	0
Do. do. carried more than 48 miles and less than 96 miles, 50,000 tons at 8 annas	25,000	0	0
Do. do. from 96 to 144 miles 10,000 tons at 12 annas ...	7,500	0	0
Do. do. from 144 to 192 miles 5,000 tons at 1 rupee ...	5,000	0	0
Do. above 192 miles that is to say entering the canal at its north end 3,902 at 1¼ rupees...	4,877	8	0
Rafts, say	500	0	0
Rest-house fees, canal produce, &c.	872	8	0
Total ...	1,24,000	0	0
per mile of canal open. or ...	516	10	8

21. This is only about half what is required to pay interest on first cost and to maintain the canal in working order, but it is more than sufficient for the latter purpose, which is one great point that will be gained by the introduction of the new rules. The calculation does not moreover include intermediate traffic, that is to say traffic that does not leave or enter Madras which is not now included in the returns and upon which an additional revenue of 25,000 rupees per annum at least may be expected. It does not include traffic entering Madras that is probably omitted from the present return, and it takes no account of the daily increase in the traffic from the north end of the canal; when all these are accounted for there can be no doubt the traffic on the canal is quite able to pay its way in a liberal manner.

22. In regard to the ability of boat-owners to pay the fees and tolls provided for in the rules, it has been shown that the owner of a 30-ton vessel clears the large sum of Rupees 785 per annum after paying all current demands, and the payment of tolls at the rate of 1 pie a ton a mile or 375 rupees per annum when the vessel is in tolerably full work will still leave the owner a very large margin of profit; but even if this was not the case, and considering that the present cost of carriage by the canal is only from $\frac{1}{12}$th to $\frac{1}{20}$th of the cost of carriage by road the present charges for carrying traffic might be reasonably increased, if necessary, to meet the additional fees for which the rules provide.

23. The rules provide for boats licensed to use the canals of the Godavari and Kistna Districts being allowed to use the Buckingham Canal without undergoing the expense and trouble of taking out a fresh license, and the payment of the tolls is all that will be demanded of them. The boats of the Buckingham Canal should be allowed to use the canals of the Godavari and Kistna in a similar manner without taking out a license or licenses in those districts, but anything that can be done in this direction will be of no avail so long as Rule XIV of the Godavari and Kistna rules is allowed to stand as it is. This rule is apparently intended to force the owners of vessels to take out licenses, and this could be done by simply ruling that all vessels *should* take out licenses. Rule XIV would not then be necessary for the purpose for which it is apparently intended.

24. It has been already shown (paragraph 8 above) how inequitably this rule bears on the boats of the Godavari and Kistna Districts. It acts with still greater hardship on the small boats of the Southern Districts, and it is causing much obstruction to traffic at the junction of the Commamur and Buckingham Canals; for instance, a 6-ton boat with goods or passengers say for Santaravur only 8 miles from the junction of the two canals has to pay 6 rupees or about 12 annas per ton per mile for the use of this short length of the Commamur Canal or take out a license for navigating the Kistna Canals, or not use the canal at all. The latter alternative is generally adopted and the goods or passengers have to be landed and kept on the bank until a boat belonging to the upper canals can be brought to take them to their destination. The result is that owners of goods or passengers to or from the Northern Districts will not, if they can at all help it, employ the Madras boats; the boats of the Northern Districts are not always available and goods and passengers are often kept waiting for days and weeks for them while there are hundreds of Madras boats idle and ready for the work. The obstruction to traffic and

the hardships caused by this rule should be removed by having it cancelled as soon as possible, and a ratable and reasonable system of tolls established instead.

25. It is some times argued that canal revenue should be collected in the shape of license fees alone, but a license fee that would yield anything approaching adequate revenue would appear at first sight a formidable amount, as for instance in the example given in paragraph 5 above, the proportional fee would amount for a 30-ton boat to Rupees 435 per annum, enough to frighten the most ardent speculator away from boat building or from investing money in any way connected with canal navigation; and it might happen from some cause or other that while one vessel was lying idle the greater part of the year, another would be at constant work; in the first case the fee would be a heavy burden for which no return was received; in the latter case it would be no burden at all on the constant earnings of the vessel, a license fee should therefore be as small as possible in order to bear lightly on those who had no work, and in this view it might be advisable to reduce the fees provided in the Buckingham Canal rules from 2 to 1 rupee per ton. The amount thus given up would be comparatively small and the canal can afford to lose it.

26. The objection to tolls is the difficulty and expense of collecting them; these are evils that cannot be avoided, and experience shows that with ordinary caution and check they are not so great as might be supposed or as some people think. Tolls must be the back-bone of canal revenue; this is clearly shown by the experience of the northern and southern sections of the Buckingham Canal, where in the one case with a very imperfect system of tolls the revenue amounts to the comparatively decent sum of Rupees 262-4-3 per mile, while in the other case where the license system is in force and the traffic nearly as great, the revenue amounts to only 26-6-8 per mile, and the revenue in the Godavari and the Kistna though better than on the Sadras Canal amounts under the license system to only between 60 and 70 rupees per mile. There is the further advantage in regard to tolls, and that is, that they bear only on those who are really using the canals and whose earnings can well afford to pay them. With these remarks the rules are recommended for adoption and early sanction.

(Signed) J. O'SHAUGHNESSY,
Executive Engineer.

OOTACAMUND,
20th June 1879.

I.—The Buckingham Canal includes the following lines of navigation, extending from the Palar river in the district of Chingleput to the junction of the tidal and fresh water canals in the Kistna District near Peddaganjam, together passing over a continuous distance of about 245 miles, namely,—

1*st.*—The Sadras Canal extending from the right bank of the Palar river to the right bank of the Adyar river, distance about 43 miles.

2*nd.*—The Madras Canal extending from the right bank of the Adyar river to the Shadayancooppam Lock, distance about 12 miles.

3*rd.*—The Pulicat Canal extending from the Shadayancooppam Lock to near Raidurravoo, distance about 48 miles.

4*th.*—The Kistnapatam Canal extending from near Raidurravoo to near Kodoor, distance about 48 miles.

5*th.*—The Ramapatam Canal extending from near Kodoor to Ramapatam, distance about 48 miles.

6*th.*—The Kottapatam Canal extending from Ramapatam to the junction with the Commamur fresh water canal in the Kistna District, distance about 46 miles.

II.—These lines of navigation include also all navigable estuaries, backwaters, rivers and channels, whether salt or fresh, connected with each such line; they shall be each and severally distinct lines of navigation as defined in Section 1 of Act I of 1870 (The Canals and Ferries Act) the provisions of which shall apply to each of these distinct lines of navigation separately, and they shall be denominated sections of the Buckingham Canal as follows:—

1*st.*—A or the Sadras Section.

2*nd.*—B or the Madras Section.

3*rd.*—C or the Pulicat Section.

4*th.*—D or the Kistnapatam Section.

5*th.*—E or the Ramapatam Section.

6*th.*—F or the Kottapatam Section.

III.—From and after the 15th day of September 1879, no vessel shall be allowed on, or to use any of the above mentioned distinct lines of navigation without—

1*st*.—The payment of an annual license fee at the rates specified in the Schedule A annexed for the use of any one of the above mentioned distinct lines of navigation.

Exception.—Vessels possessing licenses for the navigation of the canals of the Godavari or Kistna Districts will not be required to pay a license fee for the use of any section of the Buckingham Canal.

2*nd*.—The payment of a toll at the rates specified in the Schedule B annexed for passing from any one to any other of the above mentioned distinct lines of navigation for which the owner does not hold a license.

IV.—The Executive Engineer of the canal will issue licenses (in the Form C annexed) personally or by agents authorised by him in writing for the purpose, at such times and places as he may notify in the *Fort St. George Gazette* and in the official gazette of the district in which the line of navigation, for which licenses are to be issued, is situated. The vessels to be licensed must be brought at the time specified in the notifications to the places where licenses are to be issued, to be measured and registered and to have the necessary distinguishing marks put on them.

V.—These marks will show by letter the section of the canal to which the vessel belongs and which it is licensed to navigate. They will show the registered number of the vessel, and the tonnage, or the number of passengers the vessel is licensed to carry. They shall be put on under the direction of the Executive Engineer at the cost of the owner of the vessel who will be held responsible that they are not defaced or obliterated, and that they are renewed from time to time as required.

VI.—Applications for licenses shall be made in the Form D annexed, at any time before the 15th September for the current calendar year, and in the months of October, November, or December for the ensuing calendar year. Printed forms of applications for licenses will be issued by the Executive Engineer of the canal at his office in Madras and by the Superintendents of Sections of the canal at their offices at Covelong, Madras, Pulicat, Dugarajapatam, Eskapilly, and Kottapatam.

VII.—The maximum dimensions of vessels brought on the canal hereafter will be limited to 90 feet in length, 13 feet beam and 2½ feet draft; vessels of greater length and beam that may be now on the canal will be allowed to remain upon it at the owner's risk until they are worn out or renewed, but the draft of water will be limited in all cases to 2½ feet, and no vessel shall hereafter be laden beyond this depth, which will be marked by a painted band or water line round the outside of the hull. The height of fixed fittings, such as the roofs of boats, mast partners, funnel sockets, &c., shall be limited to 6½ feet above the deep load line. The height of piled cargo, such as firewood, cotton, leaves, &c., will be limited to the same dimensions and in a similar manner.

VIII.—The gross tonnage of all vessels will be obtained by the following Rule $\frac{L \times B \times D}{50}$:—

L being equal to the length of the vessel, measured at half the midship depth, from the afterpart of the stem to the forepart of the stern post.

B is equal to the sum of five widths taken from the inner side of the planking on one side to the rib on the other side, at equal distances of one-sixth of the above length, divided by 6.

D is the midship depth taken from the upper surface of the limber strake (the bottom plank next the keelson or the centre bottom plank when there is no keelson) to the undersurface of the deck planking in decked vessels or to the top of the upper strake or gunwale in open vessels.

The net or registered tonnage will be for—

Steamers the gross tonnage less one-third, and for
Other vessels the gross tonnage less 15 per cent.

IX.—Vessels adapted to carry passengers, *i.e.*, having a covered space for their protection, may be registered as passenger vessels, and will then be licensed to carry one passenger for every five square feet of deck surface to be measured as follows:—Length from stem to stern at the deck level; breadth, the sum of five widths taken at equal distances of one-sixth the length and divided by 6, then length × breadth divided by 5 will give the number of passengers a vessel will be licensed to carry, including 40 lbs. of luggage for each passenger. When passenger vessels carry cargo as well as passengers, the quantity of cargo allowable will be the registered tonnage less 400 lbs. for each passenger on board.

X.—Rafts will be permitted to navigate the several sections of the Buckingham Canal on payment when entering each such section of the toll prescribed in Schedule B annexed; no raft exceeding 90′ × 13′ × 2′ will be allowed on the canal.

XI.—If a vessel after the issue of a license be enlarged, it shall not again use the canal until it has been remeasured and relicensed. The new license will be granted on surrender of the old license and on payment of the prescribed fee per ton on the difference between the old and new tonnage.

XII.—No person who has taken out a license for the navigation of any section of the canal shall have claim to compensation on account of any impediment to navigation that may occur from any cause whatever.

XIII.—The Executive Engineer in charge of the canal for the time being is authorised to enforce these rules, to collect tolls and license fees, to remove obstructions to navigation, and to direct prosecutions under the provisions of Sections 7, 8, 9, 10, 12, and 25 of Act No. 1 of 1870.

BYE-LAWS.

I.—No vessel shall moor on the towing path side of the canal when there is only one towing path, nor on the windward side when there are two towing paths, except when actually loading or unloading, or with the special permission of the Canal Officers.

II.—No cargo shall be loaded or unloaded, and no passengers shall be shipped or landed at any lock or masonry work other than the quays or wharfs specially provided for the purpose.

III.—No vessel shall be repaired or fitted on the canal without the written permission of the Executive Engineer or other officer authorised to give such permission on the Executive Engineer's behalf.

IV.—No vessel shall be moored in a lock channel defined as such by notice boards erected for the purpose by the Canal Officers.

V.—Vessels when moored shall have their masts down; they shall be made fast stem and stern to the banks in single tier and there must be a person always in charge of each vessel; vessels when moored must, between sunset and sunrise, show a clear bright light, not less than 4 feet above the water level and visible all round the vessel.

VI.—When vessels, other than steamers, going under sail, in opposite directions, meet the vessel going with the wind shall give way, while the vessel going against the wind shall hold on its course.

VII.—Vessels not under sail shall give way to vessels under sail, and steamers shall in all cases give way to other vessels.

VIII.—When vessels not under sail including steamers meet, those going north should keep to the east, and those going south should keep to the west.

IX.—When a vessel passes another vessel going in the same direction, it should keep to the leeward of vessels under sail and on the opposite side of the towing line of vessels not under sail.

X.—Vessels when not moored must between sunset and sunrise carry lights as follows:—

Steamers, three lights—

1*st*.—A clear white light not less than 9 feet above water and in the centre line of the vessel.

2*nd*.—A bull's eye bright red light on the port (left) side.

3*rd*.—A bull's eye bright green light on the starboard (right) side.

The bull's eye lights to be not less than 8 inches diameter and not less than 4 feet above water.

Vessels other than steamers must carry a clear white light at the fore end not less than 4 feet above water.

Passenger boats must in addition to the above lights carry a light in each cabin or compartment for passengers.

XI.—The maximum speed of steamers will be limited to 10 miles an hour by day and to 5 miles an hour by night, reduced to 4 miles an hour when within half a mile of a lock, or vessel ahead coming in an opposite direction. The steam whistle shall be blown when speed is reduced on the above mentioned occasions and when nearing a vessel going ahead in the same direction, or when approaching any sharp bend in the canal. Steamers passing through portions of the canal under repair or through portions of the canal that cannot stand a high speed shall reduce speed at those places to the limit fixed by the Canal Officers on notice boards erected for this purpose.

XII.—Every vessel shall have its license always on board, and it shall be produced for examination by the Executive Engineer or by any officer authorised by the Executive Engineer to demand an inspection of it.

XIII.—Every vessel plying for hire is liable to be inspected at any time or place by the Executive Engineer or by officers authorised by him to inspect vessels, and the Executive Engineer may withdraw the license of any vessel found to be from any cause unfit for use, and to withhold the license until the vessel is made serviceable.

XIV.—The Executive Engineer may suspend the license of any vessel for any period not exceeding three months for any infringement of these rules or bye-laws.

XV.—The penalty for infringement of the latter part of Rule V will be a double charge for the new license, in addition to any suspension of license which may be ordered.

THE BUCKINGHAM CANAL, MADRAS.

SCHEDULE A.

LICENSE FEES.

Description of Vessel.	Rate.	
For every ship, steamer, boat, barge or vessel of any description propelled in any manner and used for any purpose except fishing or pleasure ...	Rs. 2-0-0	Per ton of registered tonnage per annum.
For every fishing or pleasure boat	„ 0-4-0	Do. Fractions of tons will be counted as one ton, and the minimum charge for any vessel will be one rupee.

Licenses will be issued on payment of the above fees, for the use of any distinct line of navigation included in the Buckingham Canal.

A license will not be granted to the same vessel for the use of more than one line of navigation on the canal.

Vessels licensed in any month of one year must pay the annual fee for the whole of that year.

Licensed vessels will have to pay no other dues of any sort for the use throughout the year of the section of the canal for which the license is granted.

THE BUCKINGHAM CANAL, MADRAS.

SCHEDULE B.

SCHEDULE OF TOLLS.

Tolls.

Description of Vessel.	Rate.	
For every ship, steamer, barge boat, or vessel of any description and propelled in any manner entering any of the distinct lines of navigation or sections of the canal other than the section in which it is licensed and which it can use free of tolls	Rs. 0-4-0	Per ton of registered tonnage.
For every raft of floating timber, bamboos, or other floating substance	„ 0-1-0	Per square yard.

THE BUCKINGHAM CANAL, MADRAS.

FORM C.

License No. of 1879.

This vessel is licensed to use the Section of the Buckingham Canal during the calendar year 1879 free of further charge.

Registered No.
Name of owner.
Residence of owner.
Class of vessel (*a*).
Extreme length.
Do. breadth.
Do. depth.
Draught of water.
Licensed to carry tons cargo.
Do. do. passengers.
Fee paid.
License issued by
on the day of 1879.

Executive Engineer.

(*a*) Here enter steamer, budgerow, cargo boat, passenger boat, fishing boat or pleasure boat as the case may be.

THE BUCKINGHAM CANAL, MADRAS.

FORM D.

APPLICATION FOR LICENSE.

I or we the undersigned (1) in the
residing at (2)
district of (3)
hereby apply for license to place (4)
on the (5)
section of the Buckingham Canal during the year 1879.

Date Signature.

(1) Here enter name or names of owners.
(2) Place of residence.
(3) Name of district in which residing.
(4) Description of boat and purpose for which it is to be used such as passenger boat, cargo boat, budgerow, &c.
(5) Section of the canal for which a license is required, *i.e.*, the
A or Sadras section,
B or Madras section,
C or Pulicat section,
D or Kistnapatam section,
E or Ramapatam section,
F or Kottapatam section.

No. 38-A. Proceedings, Revenue Department, dated 5th July 1879, No. 2,411.

No. 39. ORDER THEREON, 8th July 1879, No. 1,801 A-W.

HIS GRACE the Governor in Council is pleased to approve of the above rules and bye-laws for the regulation of the navigation on the Buckingham Canal, and directs that under the provisions of Section 23 of Act I of 1870 (The Canals and Ferries

Act) they be published in the *Fort St. George Gazette* and in the Gazettes of the Chingleput, Nellore, Kistna, and Godavari Districts for a period of six weeks from this date.

2. The attention of the Revenue Board and of the Collectors of Nellore and Chingleput Districts will be drawn to the rules in view to their suggesting any points for consideration during the six weeks of preliminary publication.

3. The Collector of Chingleput will transfer from this date the Toll and License Establishment now employed under his orders on the canal to the establishment of the Executive Engineer of the canal, who will submit at once a statement of the further establishment required for carrying out these rules, and who will arrange to have the necessary number of schedules and forms printed and ready for use when required.

The Chief Engineer for Irrigation will report how the inconvenience caused by the operation of Rule XIV of the Godavari and Kistna rules can be best removed, and he will submit as soon as possible proposals for such other alterations in those rules as are necessary for giving to the boats on the Buckingham Canal the same facilities to navigate the canals of the Godavari and Kistna as are given in these rules to the vessels of the Godavari and Kistna Canals to navigate the Buckingham Canal.

(True Extract.)

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

To the Superintendent of the Government Press.
" Chief Engineer for Irrigation.
" Superintending Engineers, First, Second, and Third Circles.
" Revenue Department.
" Collector of Chingleput.
" do. of Madras.
" do. of Nellore.
" do. of Kistna.
" do. of Godavari.
" Commissioner of Salt Revenue.

Exd. E. C. Shunker and C. Howarth.
Spare Copies

Public works Secretary

709

Buildings & Roads
Canals

~~GENERAL~~
~~ESTABLISHMENT.~~

Govt. of 1879 Madras.

PUBLIC WORKS.

To

THE SUPERINTENDENT,
GOVERNMENT PRESS,
&c., &c., &c.

Dated July 8th.

Issued

Recd.

Encl.

G. O., 8th July 1879, *No.* 1,801 A.-W.

JULY.

Nos. 38-39.

Buckingham Canal.—Approves of the proposed rules and bye-laws for the regulation of the navigation on the —.