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(1) Number of pages 76 sheets

(2) Date of repair 3. 11. 86

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AMIL NADU ARCHIVES

VERNMENT OF TAMIL NADU

Public works DEPARTMENT

G.O. No. 875 (W)
~~B.P. No.~~

Press.
Mis.

Dated 24. 3. 1879 ~~197 .~~

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GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

24th March 1879, No. 875 W.

Buildings and Roads.
Civil Works.

Read the following papers :—

No. 279. Proceedings of the Madras Government in the Revenue Department, dated 24th February 1879, No. 461.

No. 279-A. From Major S. C. CLARKE, R.E., Acting Superintending Engineer, Third Circle, to the Chief Engineer, Public Works Department, dated St. Thomas' Mount, 26th February 1879, No. 1,063.

WITH reference to your memorandum, No. 593, dated 10th February 1879, I have the honor to inform you that the Executive Engineer, Buckingham Canal, reports that the estimated amount to be paid for compensation for lands taken up for the canal in the Nellore District is about Rupees 55,000, and that he has submitted certain bills amounting to Rupees 20,000 to the Examiner for adjustment, but that as per advice received from the latter officer the sum of Rupees 4,671 would appear only to have been disbursed by his office.

No. 279-B From Major L. CONWAY-GORDON, R.E., Examiner of Public Works Accounts, to the Secretary to Government, Public Works Department, General Branch, dated Chepauk, 14th March 1879, No. 488 W.

IN continuation of my office note of the 11th instant, returning press proofs of the revised budgets for expenditure during the last three months of the current official year 1878-79, and adverting to the provision therein made of Rupees 50,000 to defray existing liabilities on account of the Buckingham Canal, I have the honor to state that from Government Orders lately received and sums audited on account of compensation for land in connection with that work, it is probable that a further sum of Rupees 78,000, as per margin, will have to be provided in the revised budgets from Provincial Funds, provided the compensation in question has been or will be disbursed by the Civil Department before the close of the current official year.

	RS.
(1) Bills passed for the Nellore District prior to 31st December 1878 not yet transferred by the Accountant-General, Madras.	34,297
(2) *Vide* G.O., No. 461 F.R., of 24th February 1879.	41,635
(3) *Vide* G.O., No. 415 W, of 10th February 1879.	2,294
Total ...	78,226

2. I would, therefore, respectfully suggest that it may first be ascertained from the Accountant-General, Madras, to what extent the compensation has already been paid, and provide funds to that extent in the revised Provincial Budget, the payment of the balance being deferred until next month (April) to throw the charge on the Budget for 1879-80.

No. 279-C. From A. C. TUPP, Esq., Officiating Accountant-General, Madras, to the Secretary to Government, Public Works Department, dated Fort St. George, 15th March 1879, No. 1,087.

IN reply to your memoranda, dated the 12th and 15th instant, I have the honor to state that the amount paid up to February last on account of compensation for lands taken up is Rupees 1,98,064-5-5 for the Junction Canal, and Rupees 31,735-4-11 for the Buckingham Canal. The latter sum is made up of Rupees 273-3-11 disbursed at the Presidency, and Rupees 31,462-1-0 by the Collector of Nellore.

2. I have telegraphed to the Collector of Nellore to report by telegraph at once the amount he has paid during the current month.

3. The enclosures received with the above are herewith returned.

✓ No. 279-D. From the same Officer, dated Fort St. George, 18th March 1879, No. 1,116.

IN continuation of my letter, No. 1,087, dated the 15th instant, I have the honor to state that the Collector of Nellore reports that no compensation for lands taken up for the Buckingham Canal was paid during this month.

✓ No. 279-E. Proceedings of the Madras Government, Revenue Department, dated 20th March 1879, No. 1,124.

From the Collector of Madras, dated 10th March 1879, No. 82.

WITH reference to G.O., No. 461, dated 24th February 1879, I have the honor to point out that the further sum likely to be expended hereafter on account of land compensation is Rupees 41,935,* and not Rupees 41,635 as quoted in the Government Order. This will make the total amount Rupees 2,39,999-5-5 instead of Rupees 2,39,699-5-5.

* *Vide* paragraphs 2 and 3 of this office letter, No. 380, of 20th December 1878.

THE figures 2,39,699-5-5 and 7,08,619-5-5 will be altered to 2,39,999-5-5 and 7,08,919-5-5 respectively in G.O., 24th February 1879, No. 461.

(Signed) G. STOKES,
Addl. Under Secy. to Govt.

To the Public Works Department.

✓ No. 280. ORDER THEREON, 24th March 1879, No. 875 W.

THE Government observe that of the sum of Rupees 41,935, due on account of compensation for land taken up for the Buckingham Canal, payments to the extent of Rupees 31,735, made by the Civil Department, and debited in its accounts to the Public Works Department, remain to be adjusted in the books of the Examiner for the official year 1878-79.

2. They resolve therefore to appropriate the entire available balances at the credit of the reserve towards meeting these charges. The amount so available being Rupees 17,200 only, the remainder, Rupees 14,535, must be held over for adjustment in the accounts of 1879-80.

(True Extract.)

Colonel, R.E.,
Ag. Secy. to Govt., P.W.D.

To the Superintending Engineer, Third Circle.
" Examiner of Public Works Accounts.
" Revenue Department.

Exd. C. Howarth.
Spare Copies.

BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of [1879] Madras.

PUBLIC WORKS.

To
THE SUPERINTENDING ENGINEER,
THIRD CIRCLE,
&c., &c., &c.

[illegible]

[illegible]

MARCH.

Nos. 279-280.

[illegible]

Public Works Department

PROCEEDINGS OF THE MADRAS GOVERNMENT.

Under date the 87 5/3

Read the following :—

Fm. Revenue Departt (Rc. No. 461 d/ 24 Feby/79)

The Government regret that there are no available funds from which ~~any~~ provision can be made in the 1878-79 revised Budget to meet the sum of Rs. 41,635, due on account of compensation for land taken up for the Junction Canal.

2. There is no alternative therefore but to defer payment until the next official year.

2. The Supg Engineer will

ill bring forward the
th in his statement
demands to the
ubmitted on the 1st
pril next.

8.3.79

8/3

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

14th February 1879, No. 461.

Famine Relief.

Read the following paper:—

No. 479. Endorsement of the Chief Engineer, Public Works Department, dated 20th December 1878, No. 5,794.

Read the following letter from Major ROSS THOMPSON, R.E., District Engineer, Presidency, to Colonel E. A. FOORD, R.E., Chief Engineer and Secretary to Government, Public Works Department, dated Fort St. George, 20th August 1878, No. 3,646;—

One Abstract Estimate for Rs. 7,48,220.
Eleven Detailed Estimates for above.
One List of Plans.
Ten Plans.
Two Statements A and B.
One Report.

I have the honor to submit herewith, as per margin, detailed plans and statements of cost of construction of the Buckingham (Junction) Canal prepared by Major Sydenham Clarke, R.E., Executive Engineer, in charge of the work.

ENCLOSURE No. 1.

From Major S. C. CLARKE, R.E., Executive Engineer, Buckingham (Junction) Canal Works, to Major ROSS THOMPSON, R.E., District Engineer, Presidency, dated Madras, 17th August 1878, No. 266.

I have the honor to submit the statement of expenditure incurred from first to last on the Buckingham Canal works, accompanied by the plans of the various masonry works, which have been erected and finally completed along the line of the canal. I very much regret that any delay has occurred in the submission of this final account; but, as I have before pointed out, it is entirely attributed to the inadequate complement of office clerks to undertake the task of compiling the voluminous heap of daily accounts and of writing up the various ledgers, journals, &c.; however I must hope that the result of one work will more than compensate for the unavoidable delay that has occurred.

2. Before touching on the various masonry works, I have thought it expedient to draw attention to the comparative statements (A and B) that are appended to this report since it might be asked why has this estimate, and to what degree, differed from that of my predecessor's (the late Mr. Fraser, C.E.,) estimate which was framed during the year 1870.

3. To the first instance I may call attention to the fact that several important items of work have been omitted from Mr. Fraser's summary or abstract, as detailed in his report of the first of July 1870, such as baling, store-houses, &c., tools and plant, clearing the line, &c., and again it will be observed that more work has been carried out than was evidently contemplated by that officer; but doubtless, had he lived to have been entrusted with the execution of the work, he would have found, as I have done, that the "extra work" to be carried out grew on one, as it might be fairly termed, as the work proceeded, and that it was impossible to stop short, as the extra work was forced on one by forcible circumstances.

4. *Excess Quantity of Earthwork, &c.*—To the item "earthwork" it will be observed that the actual number of cubic yards of excavation, removal, &c., exceeds that originally estimated for by 883,200 cubic yards.

The item "baling" entirely omitted in the old estimate alone amounts to a high figure, viz., Rs. 20,000, partly due to the exceptional rainfall during 1877 and partly due to the inefficiency of the picottah pump, and above all to the unsatisfactory condition of the steam pumps which were obtained from the Government yard. I do not wish to impute any blame for their defective condition to the officer in charge of the Public Works Workshop, but I think it but right on my part to point out in this final report that a very considerable saving could have been effected had more steam pumps been available for the canal works and had such as were supplied been in sound working condition.

5. Another cause to which I may fairly attribute the extra cost of the bridgeworks was the unavoidable coincidence of their having been taken in hand about the monsoon season instead of early in the year during the dry weather. I may be charged with the sin of causing this delay, but I would beg to shelter myself under the protection of the unfortunate delay that occurred in obtaining final sanction for the masonry works.

In any case the foundations were to be in wells, and when the several designs were sanctioned, wet bricks were not ready.—Ed. F.

6. Statement B shows that under the following sub-heads :—

1. Earthwork.
2. Syphons (Irrigation).
3. Temporary Roads.
4. Compensation.
5. Sundries.

there has been an excess of expenditure over that shown in the old estimate, but it is easy to account for the same on the 1st, 4th, and 5th items. As regards Nos. 2 and 3, it is difficult for me to show the cause of excess, for very unfortunately Mr. Fraser's plans and detailed estimates have been lost—at any rate they are not forthcoming now.

7. Under the sub-heads—

Bridges.
Basins.
Minor Works.

there has been a considerable saving effected, the result of which "saving and "extra cost" will be as follows when summarized :—

	RS.	RS.
Excess ...	2,36,685	
Saving ...	83,904	
Difference excess ...		1,52,781
Add extra work not originally provided for...		93,700
Total...		2,46,481

8. Having, I trust, shown a reasonable cause for the enhanced cost of the canal work, I will now give, as succinctly as practicable, a short description of the several works. I may here state that I purpose very shortly submitting to Government a short history of the Buckingham (Junction) Canal comprising a period of twenty-four years accompanied by photographs of the plans of the masonry works and of some of the structures as they now appear in their completed condition. Some little delay will occur in obtaining the requisite photographs, but when completed I shall hope to find it meet with general approval.

9. *Cooum River Embankment of Boulder Stones.*—To protect the northern end of the new canal and to reclaim to a certain extent the lowlying shore between the canal mouth and the Napier Bridge, a stone revetment has been built, the foundations of which have been set four feet below the river bed level, and the major portion of the stone work has been set in Soorkee mortar, so that it might prove a lasting river wall.

10. *Adyar River Embankment.*—A similar stone embankment has been also built at the southern end of the canal to protect it from the erosive action of the stream during the extraordinary high floods. During May 1877, when the severe cyclonic storm passed over Madras, the Adyar river rose unusually high and carried away the lower end of the canal banks for a length of 100 feet or more, thus pointing out the necessity for the setting up of a strong wall of protection on the west side of the canal. The revetment has been carried up-stream side for a short distance to prevent the washing away of the eastern spoil bank from the backwash of the stream.

11. *Marine Villa Over-bridge (Roadway four feet wide).*—This small over-bridge, for the accommodation of pedestrians only, was made up in the Government Workyard, and was set up in site by the General Superintendent and his executive staff of mechanics and lascars. The platform rests on longitudinal girders supported by light iron screw piles which, it is feared, will be liable to serious injury if any barge should happen to come in contact with the light iron supports.

12. *Chepauk Bridge.*—Since it was determined on to close the Government House Park roadway leading to the beach, it was considered very necessary to provide for a masonry bridge having a thirty-foot breadth of roadway, and as it was to form a prominent feature in Chepauk, and to harmonise with the æsthetic appearance of the ornamental piles of buildings around, a more finished design for the bridge was drawn up and finally executed.

875/6

The whole of the bricks used in this structure were supplied from the Government Brick Manufactory, and, had not the supply fallen very much short of the demand for the larger class of brick, the other bridges would have been built of the same better class of material than that procurable from the native manufacturers.

13. *Manufacture of Bricks, &c.*—The bricks used for the Greenaway Road Bridge were made alongside of the canal, about a mile from the bridge site, of the exceptionally good brick clay that can only be found at that particular locality; only tempering and moulding were required to produce an homogeneous mixture of clay, and such of the bricks as were burnt properly and turned out of the canal brickyard facilities were without exception of first-class quality. Owing to the unfortunate occurrence of the brickyard having been twice submerged, a great number of bricks in their green state were destroyed, which contingency obviously tended to raise the rate at which the bricks were being turned out. They were all moulded on tables or boarding and dried under sheds, so that a large percentage were actually fit for burning when sufficiently dried.

14. Several experiments had to be tried before it was determined as what would prove the most effectual method of filling in the wells (foundation) with both the Portland and Soorkee cement concretes, but it was finally shown that the simple plan of lowering the admixture of Portland cement concretes in baskets by means of a pulley or block and by so arranging that it should not tip over until the basket reached the bottom of the well. The concrete had to be put into the wells under a head of 9 to 10 feet of water, and considerable difficulty was at first experienced in insuring of its being tamped thoroughly all round.

Portland Cement Concrete.

	Parts.
Portland Cement ...	1
Stone (broken) ...	2
Sand ...	3

15. The Portland cement concrete was put in first of all to a depth of 2 feet, then the Soorkee cement concrete until the material had reached a height of 4 to 5 feet in the well, and then a second 12" layer of Portland cement concrete was lowered in, and, as soon as the cement had had sufficient time to indurate (about four to five days), the water (if any) in the well above the cement was bailed out and the space filled in with brick-work set in Portland cement. This portion of the work necessarily involved a heavy expenditure since the material Portland cement is of high value in this country, but to form unimpeachable foundations and to be on the safe side it was considered justifiable to put the Government to the extra cost, and I may be allowed to add that the satisfactory results of all the bridge foundation work has strengthened my opinion that no false economy should be allowed to militate against the dictates of experience in the matter of laying down "sound foundations." No saving in the first instance could ever compensate for an unsound foundation which can never be rectified without involving the dismantling of the whole or part of the structure.

16. Owing to the peculiarity of the subsoil at the site of this bridge being unusually tenacious, the sinking of the wells occupied some seven or eight days, which has caused the rate in this particular instance to exceed somewhat that found sufficient for most of the other bridge well work.

17. *Portland Cement Concrete used for keying the Brick Arches.*—For the first time (I believe) the experiment of making use of Portland cement concrete as a substitute for a keying brick or stone was tried on this structure, and, as it happily proved a great success, the same method was pursued in the case of all the other bridges.

A trough was formed on the apex of the centering by omitting the central courses of the arch-rings measuring 8" at foot, about 12" to 14" at crest, and the depth of the number of rings about 4 to 5 in Number. The lowermost arch-ring was completed over the extrados of the centering, the bricks being set in Portland cement, then the outer ends of the trough so formed were bricked up or a granite voussoir was inserted as in the case of the Chepauk Bridge, and when the mortar had set thoroughly the Portland cement concrete was put in in thicknesses or layers of 6 inches, which layers were rammed for upwards of one hour, and in this way the trough was filled up to the crest of the arch, and over the Portland cement concrete wet grass and matting was laid to protect it from the injurious effects of the solar heat and kept damp for four days. It was a matter of great satisfaction when, on removing the damp matting it was found that the Portland cement concrete had not shrunk in the slightest degree, and that it was possible to complete the roadway, parapet walls, &c., &c., push on the work to completion at once. Driving in bricks to act as keying bricks is not attended with success generally unless the bricks are of special manufacture, and to provide cut granite voussoirs is an expensive expedient in most localities, so that the experiment referred to above can be recommended for its efficiency, economy in time and in cost, and for its unrivalled durability (provided the Portland cement is of good quality). The same class of work was pursued in the case of the forming of foundations of all the other bridges, syphons, &c., where wells had to be sunk.

18. In the case of the Chepauk Bridge the coating of the exterior, which has been entirely formed of table-moulded brick with chunam or mortar plaster, has been omitted, and, as an experiment based on the experience of other Engineer Officers, a coating of silicate of lime has been substituted to act as a preservative of the brick crest.

19. *Major Communication Bridges.*—For the "major communications" as detailed in the margin, a more simple design of bridge has been carried out, having a roadway of 20 feet clear. These bridges were built of an inferior class of (native-made) brick, so that it was necessary to coat them with stucco to hide the defective coursing, but even already the sea air is beginning to peel off the outer crest of the plastering, showing conclusively that the ordinary plastering is not suitable for such localities as are within the destructive influence of the sea air.

At Pycroft's Road
,, Ice House Road.
,, Elliott's Road
,, Luz Church Road.
,, Brodie Road.

20. Owing to the peculiar quagmiry character of the subsoil of the Pycroft Road Bridge site, the wells had to be lowered 3 to 4 feet beyond what was originally calculated on, as 9 feet below canal bed had been laid down as the probable maximum depth of the clay or the argillaceous sand stratum. The Brodie and Luz Church Road Bridge foundation wells had to be for the same reason extended to a depth of 12 feet. The wells have been connected by segmental archwork, and on this archwork the abutments and wing walls have been set. The whole of the under-water portion of the superstructure has been built of brick set in Soorkee to insure stability throughout.

21. *Minor Communication Bridges.*—For the accommodation of the minor communication traffic a cheaper class of bridge has been designed and set up consisting of a wooden platform supported by under-girders and masonry piers, the abutment being formed only of boulder stone revetment work.

Soonkavara Street.
Nungumbaukum Road.
Yellapah Covil Road.

The piers are standing on wells, but the foundation of the abutments only consisted of a solid block of Soorkee cement concrete set four feet into the side bank at tow path level, the lower slope leading down to the canal bed, being revetted with stone, to keep the concrete bed in its position, this lower stone coursing abuts against the wells (crest), and thus there is no fear of its subsiding, in addition to which the toes of the revetment abut against a stone-footing wall sunk 3 feet below bed of the canal.

The alternate joists of the roadway are bolted down to the main longitudinal girders, and where corbels have been made use of, as in the case of the Soonkavara Street Bridge, the girders and corbels have been strapped together. The hand-railing standards have been fixed with flat iron struts abutting into the ends of the joists.

Sewage Syphons.—To aqueduct the sewage at these two localities, cast iron pipes (27 in diameter) have been laid down connecting two six-feet diameter masonry wells, which latter are connected with the old open sewage channels by newly-constructed masonry ones.

Triplicane Farm.
Kistnampett Farm.

The wells are set on Portland cement concrete, which was laid about 3 feet in thickness, and they have been built up of brick set in Soorkee. It was found necessary to run up counter-fort walls in front of the wells to prevent the side banks subsiding and burying the piping, which might at some time or another require being examined or repaired.

The cast iron pipe is laid on 2 feet depth of boulder Stone set in Soorkee mortar, and on each side of the pipe a block of Soorkee concrete has been spread and thoroughly rammed to prevent any possibility of its being shifted out of position by some cause or another. All around the heads of the piping at the point of "insertion" into the wells, Portland cement has been forced in with granite chips, and every care was taken to insure of that particular part of the syphon being watertight, to prevent all possibility of the sewage escaping by that probable point of exit.

As far as one can judge, after examining the syphons which have been now working six months, there would appear to be no reason for being dissatisfied with the result of the work; the sewage flows through steadily, and during the very recent rainfall the diluted sewage has flowed through the syphon into the sea without any apparent interruption.

23. *Stone Weirs.*—The stone weirs that have been built up in connection with these syphon channels will answer two purposes—(1) as wharves, (2) as weirs to break the force of the channel stream when suddenly swollen by a heavy downpour of rain.

Storm-water shoots.

24. The idea is that by shutting off the upper water of the sewer when reaching "extra" full, and by diverting it down the adjoining broader or storm-water channel by

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means of a movable plank or shutter arrangement, the greater bulk of the sewage, which, when 24 hours or so appears to become free of masses of organic matter, will find its way into the canal and thus relieve the syphon of an overpowering mass of water. The [illegible] at the head sluice might be made [illegible], but the extra cost of such an expensive [illegible] would not be considered warrantable.

25. The aprons at front slopes of stone-work [illegible] applied to stone walls and around the [illegible] feet on the canal [illegible] originally intended to [illegible] pleted in three [illegible] masonry [illegible] up.

26. *Harbour Bridge.*—The old bridge and low roadway [illegible] closer had to be entirely dismantled in the [illegible] portion where the canal [illegible] and had to be partly removed throughout the remaining portions.

It was necessary to keep down the roadway level as much as possible, as well as to insure of a free waterway, as well as a sufficient headway; therefore a platform bridge was suggested and designed. The main girders are trussed, and the clear span given is 20 feet. The abutments have been built up between two of the old piers, resting on Portland cement concrete foundation wells sunk six feet below the canal bed level.

The bridgeway was made up at the site of the bridge, and, when the trussed girders were set up in position, the fitting on of the posts, planking (3"), and other iron fittings occupied only from eight to ten days.

The iron tension rods have been set outside the tie-beams of the truss, being fitted to cast-iron plates at foot.

The old masonry proved very tough and most unyielding to the pick, but gunpowder (small charges) was eventually tried, which loosened the massive blocks sufficiently to allow of the levers (crowbars) being made more free use of.

The joists were made of sufficient length to project three feet beyond the girder on the one plank, so that the 12 [illegible] water pipe might be carried over the canal. The [illegible] are strutted up by iron brackets and are bolted down to the girders by sets of four bolts fitted with cast-iron plates (side plate).

	Feet
A plate	[illegible]
Plate (bracket)	[illegible]
Band	[illegible]

27. *Connection.*—Where the roadway planking & [illegible] flooring has been [illegible] down, which has answered very well.

28. *Aqueduct.*—The only peculiarity about this structure is the mode adopted of supporting the aqueduct trough formed of teak planking, rebated, and [illegible] together and well caulked, i.e., to the main longitudinal girders which further support the [illegible] roadway above.

The trough is square or nearly so in section, measuring about 4 feet, and rests on under-joists, set 4 feet apart, which are suspended, as shown in the section on the plan, by wrought-iron bolts that run through cast-iron [illegible] set at top and bottom. The side-planking is supported by standards tenoned into the under-joists and supported by the [illegible]. The full breadth of the canal has been divided into three bays of 20 feet, and for each bay there have been provided five under-joists with iron fittings [illegible]. The planked roadway over the trough has had to be extended some [illegible] feet or more on each side, so that the [illegible] along the canal banks should not be intercepted or cut off by the [illegible] connection with the aqueduct. On the [illegible] storm-water [illegible] has been formed to carry off the surplus flow of the irrigation channel.

29. *Irrigation Channel Syphons.*—The two cast-iron pipe syphons which have been built in the vicinity of [illegible] are identical in [illegible], excepting in one particular, viz., their finished appearance to those constructed for the disposal of the sewage referred to before. The diameter of the piping is [illegible] greater, amounting to 3 feet, and the wells [illegible] for this heavier class of piping had to be made proportionately stronger.

In the case of No. 1 syphon, where an [illegible] bridge has been added, the outlet and inlet channels had to be arched over to support the bridgeway approaches (vide section on plan).

30. *Silt Traps.*—Deep silt traps have been provided for all the syphons also [illegible] gratings have been fitted at the mouths of the inlet [illegible] wells to intercept all large floating bodies.

31. *Greenway Road Bridge.*—This bridge is built on a sharp skew, and has a clear span of 27 feet on a line parallel to the plane of the bridge, but only [illegible] feet as in the case of all the other bridges on the square. Some difficulty was first experienced in making the carpenters and masons understand how to lay out the archings on the skew, but after two or three attempts with the assistance of a model arch (half size) that was set up in the compound adjoining the

masons suceeded in completing their task very satisfactorily, and on the centering being removed not a single opening could be detected from one end of the arch to the other. The external work of the superstructure is built of Indian—made brick manufactured near the bridge site, and the joists between the brick courses have been carefully pointed with Soorkee mortar.

32. *Bridge Centerings.*— For the bridge centerings, as far as it was found possible, the various scantlings that were subsequently to form part of the over-bridge structures, and all available (mango) roadway-planking were made use of, so that it was not found necessary to purchase any extra material for such. All the centerings were set on masonry pillars, sand bags being inserted between the crests of the pillars and the centering pieces, and with only one exception was any difficulty experienced in the striking of the centerings; the sand bags answered on the whole admirably and allowed the ponderous weight of wood-work above to sink some two inches very gradually and evenly.

33. *Planting, Turfing, &c.*—Several lengths of the canal have been turfed two or three times on the lower slope; but, owing to the destructive effects of the heavy rains before the grass had taken root, a great extent of the turfing has been completely destroyed.

The planting of the Jatropha or Croton and the Convolvulus creeper has been much more successful, and on some portions of the banks both have grown most luxuriantly, thus sheltering most effectually the banks from erosion.

The casuarina and other hardy classes of trees have been planted on the banks, but from the want of some one to look after them and care for the young seedlings, a great number have died since the coolies have been withdrawn from the canal works.

34. *Tools and Plant.*—A sum of Rs. 6,800 has been debited to this estimate for tools, &c., but, as the very much larger proportion of these tools, &c., are available for other works and have already been transferred to other works, I presume that at least three fifths of their formal value may be fairly charged off from this work, but orders from the Government will be awaited before any further steps are taken in the matter.

A.

ESTIMATE of Expenditure.

No.	Sub-heads.		Quantity.	Amount.
				RS.
1	Earthwork	C. Yds.	1,000,000	2,10,856
2	Basins, Earthwork		18,548	5,183
3	Marine Villa Over-bridge	No.	1	2,200
4	Masonry Road Bridges	”	8	96,620
5	Over-bridges (wooden platform)	”	3	12,450
6	Irrigation Syphons and Aqueduct	”	3	34,160
7	Sewage Syphons	”	2	15,720
8	Minor works	...		11,020
9	Temporary Roads, &c.	C. Yds.	20,030	4,900
10	” Dams (charge inclusive of removal)		...	8,903
11	Baling Steam Pumps, &c.		...	20,000
12	Marine Villa improvements	C. Yds.	3,850	3,480
13	River Stone Embankment			9,728
14	Surveying and clearing Canal line	Sq. Yds.	47,150	2,720
15	Turfing, planting creeper, &c.		...	7,220
16	Relief-camps	...	...	3,560
17	Store huts, &c. ...	...	...	2,000
18	Tools and Plants			6,800
			...	4,46,564
19	Superintendence and Sundries at 5 per cent.			22,356
				4,68,920
20	Compensation for land			2,80,000
	Total Estimate ...		...	7,48,920

17th August 1878. (Signed) S. C. CLARKE, Major, R.E.,
Executive Engineer.

B.

Increase and Decrease.

Comparison of Sub-heads of Estimates.

No.	Sub-heads.		Amount.	Difference. More.	Difference. Less.
			RS.	RS.	RS.
1	Earthwork ...	Major Clarke's Mr. Fraser's	2,10,856 1,16,900	94,000	
2	Bridges ...	Major Clarke's Mr. Fraser's	1,11,330 1,22,440		11,110
3	Syphons, &c. ...	Major Clarke's Mr. Fraser's ...	40,155 19,423	20,732	
4	Minor Works ...	Major Clarke's Mr. Fraser's	11,020 21,014		9,994
5	Basins ...	Major Clarke's Mr. Fraser's ...	5,183 67,090		61,907
6	Extra Works ...	Major Clarke's Mr. Fraser's ...	63,706	63,706	
7	Temporary Roads ...	Major Clarke's Mr. Fraser's ...	4,900 3,426	1,474	
8	Contingencies ...	Major Clarke's Mr. Fraser's ...	22,356 17,501	4,855	
9	Compensation ...	Major Clarke's ... Mr. Fraser's ...	2,80,000 1,34,860	1,45,140	
		Total ...	...	3,30,382	83,011
		Difference of Rs. ...	...	2,47,371	

(Signed) S. C. CLARKE, Major, R.E.,
17th August 1878. Executive Engineer.

List of Plans submitted in connection with the Buckingham Canal.

1. Greenway Road Bridge.
2. No. I. Syphon—Irrigation Channel.
3. Barber's Bridge.
4. Standard Plan of Masonry Bridge (M. Com).
5. No. II. Syphon and Covil Road Bridge, I. C.
6. Aqueduct.
7. Kistnampett Sewage Syphon.
8. (Minor Com.) Standard plan of Over-bridge.
9. Triplicane Sewage Syphon.
10. Chepauk Bridge.

FORT ST. GEORGE, (Signed) S. C. CLARKE, Major, R.E.,
8th August 1878. Executive Engineer, B.C.W.

N.B.—The Survey Plan is with the Chief Engineer.

(Signed) ROSS THOMPSON, Major, R.E.,
District Engineer, Presidency.

From G. H. FAULKNER, Esq., Executive Engineer, in charge of Presidency Public Works Workshops, to Major ROSS THOMPSON, District Engineer, Presidency, Fort St. George, dated 8th November 1878, No. 3,114.

WITH reference to Memorandum from Chief Engineer, No. 4,807, dated 24th October 1878, I have the honor to forward copies of three estimates for iron girders prepared in accordance with instructions conveyed in Mr. Fraser's letter, No. 132, dated 30th September 1867. The plans for which the estimates were prepared were returned to Mr. Fraser in compliance with his request—vide letter No. 211, dated 20th December 1867. No copies of the bridges appear to have been kept in the office.

ENCLOSURE No. 1.

From W. FRASER, Esq., C.E., Executive Engineer, to T. L. MONCRIEFF, Esq., General Superintendent of Stores, dated Madras, 30th September 1867, No. 132.

I HAVE the honor to forward a plan and general specification of the lattice girder bridge, proposed for the Madras Junction Canal, alluded to in my letter to Government, No. 114, dated 13th instant.

2. I shall be much obliged if you will let me have the estimate by Friday next, on which day I shall be putting the plans, &c., together for submission to the Government.

3. I shall also be much obliged if, in examining the plan, you see anything that should be altered or improved, if you will be good enough to note the same, as I should be glad to have the advantage of your practical knowledge of such work.

ENCLOSURE No. 2.

From the same Officer, dated Madras, 20th December 1867, No. 211.

I HAVE the honor to request that you will be good enough to return the plan of the lattice girder bridge (proposed for the Madras Junction Canal) which was sent to you with my letter, No. 132, dated 30th September last.

No. 4,636.

SUBMITTED to the Chief Engineer, Public Works Department, with reference to his Memorandum, No. 4,807, dated 24th October 1878.

12th November 1878. (Signed) ROSS THOMPSON, Major, R. E.,
Executive Engineer, Presidency.

From Colonel P. O'CONNELL, R.E., Superintending Engineer, 3rd Circle, to Colonel E. A. FOORD, R.E., Chief Engineer, Public Works Department, dated Madras, 27th November 1878, No. 4,393.

IN reference to your Memorandum No. 4,933, dated 31st October 1878, to the District Engineer, Presidency, which that officer forwarded to me, as Major Clarke, R.E., who was in charge of the Junction Canal work, is now employed in the Chingleput Division, I have the honor to forward, in original, a report* submitted by the last-named officer on the subject.

* No. 155, dated 21st November 1878.

ENCLOSURE No. 1.

From Major S. C. CLARKE, R.E., Executive Engineer, Chingleput Division, to Colonel P. O'CONNELL, R.E., Superintending Engineer, 3rd Circle, dated Chingleput, 21st November 1878, No. 155.

WITH reference to your No. 4,641, of the 5th instant, forwarding for my report copies of letters from the Chief Engineer and District Engineer, Presidency, anent the subject of excess work shown under the sub-head "Earthwork" in the final abstract of the work executed in connection with the Buckingham (late Junction) Canal as compared with the similar item in the abstract of Mr. Fraser's estimate, I have the honor to point out, in the first place, that it is impossible for me or any one else to compare a statement of work carried out with an estimate for the same class of work only hypothetically arrived at. The line I have finally carried out did not strictly agree with any of Mr. Fraser's projected lines, some various modifications had to be adopted to overcome unavoidable obstacles, which only came to light after the [illegible] was cut down and the valuation of the different gardens had been arrived at.

2. In the second place, as none of Mr. Fraser's plans, surveys or survey books are extant, I cannot see my way to comparing the various items of the estimates and giving the reasons why?

3. From the records in my late office, I find that the total quantity of work (excavation) executed very nearly tallies with that entered in my first estimate submitted in July 1877, and I think (but I am speaking from memory) also with that shown in the abstract of Mr. Fraser's estimate.

Earthwork—Excavation.

	C. Yds.
Estimate of 1877	630,000
Quantity executed and paid for	620,000
Mr. Fraser's estimate about	600,000

4. In addition to this item, the register of works shows that the quantity of earthwork, viz., removal of spoil bank, &c., amounts to 230,000 cubic yards, which item does not appear in Mr. Fraser's estimate abstract, so that I gather that Mr. Fraser never contemplated the removal of any spoil bank.

IN reforwarding for sanction the estimate of Rs. 7,49,920 for the Adyar Junction Canal, the Chief Engineer has the honor to state (with reference to His Grace's note of 26th October) that he has been unable to obtain any satisfactory information on which to compare the cost of earthworks or of bridges as actually executed and the amounts in Mr. Fraser's estimates. The loss of all Mr. Fraser's plans and estimates renders any close comparison impossible in the case either of bridges or earthworks. The amount of spoil to be removed, intended by Mr. Fraser, cannot be ascertained. It is quite possible that there were errors in Mr. Fraser's estimate.

No plans or estimates for bridges can be obtained from the records of the Workshops. Mr. Fraser's estimates for bridges were based on information supplied by the Workshops as to the cost of a single girder of a given length. The plans and detailed estimates are not forthcoming.

The cost of the brick bridges is heavy compared with the cost of similar bridges inland, but the difficulties were greater.

The bridges that have been built meet all the requirements of the traffic, and the foundation of two other bridges have been laid. It may be desirable to complete them at some future time.

Since the opening of the Canal no complaint has reached the Chief Engineer either of the traffic or of the irrigation being in any way obstructed by the Canal.

The Collector has been called on for an explanation of the great increase in the amount of compensation paid for land.

(Signed) E. A. FOORD, Colonel, R.E.,
Chief Engineer, P.W.D.

No. 479. Endorsement of the Chief Engineer, Public Works Department, dated 21st December 1878, No. 5,780.

Read the following letter from R. J. MELVILLE, Esq., Collector of Madras, to Colonel E. A. FOORD, R.E., Secretary to Government, Public Works Department, dated 20th December 1878, No. 380.

I HAVE the honor to reply to your Official Memorandum No. 4,929, dated 31st October 1878.

2. The sum paid by the Accountant-General on account of compensation for land taken for the Junction Canal from the commencement of operations up to date amounts to Rs. 2,99,107-13-0, of which Rs. 1,01,043-7-7 were returned to the Bank

of Madras on the 28th March 1877 and the 29th March 1878, under instructions from the Accountant-General. The remaining sum of Rs. 1,98,064-5-5 has all been expended, and for this amount bills supported by vouchers have been forwarded to the Accountant-General. There still remain a few cases of compensation to be settled, and the amount required for payment in these cases is estimated by the Deputy Collector of Madras at Rs. 41,935. Thus the total payment is likely to be in round numbers Rs. 2,40,000. The sum estimated by the Tahsildar of Madras in 1870, on account of the same purpose, and which is adopted by Mr. Fraser in his report, printed in G.O., No. 1,585, dated 1st July 1870, Public Works Department, is Rs. 1,34,858 not Rs. 1,34,845 as stated in the memorandum under reply.

3. The details of both the amounts are subjoined :—

—	Value of land with Trees.	Value of Buildings.	Value of Wells.	Fifteen per cent. allowance.	Total
	RS.	RS.	RS.	RS.	RS.
Estimate of 1870	1,04,601	24,222	6,035		1,34,858
Present expenditure up to date ...	1,09,017	55,317	9,678	24,053	1,98,065
Future	34,865	1,000	700	5,370	41,935
Total ...	1,43,882	56,317	10,378	29,423	2,40,000

The increase of Rs. 1,05,142 is made up as follows :—

	RS.
Value of land	39,281
Do. of buildings	32,095
Do. of wells	4,343
Fifteen per cent. allowance	29,423
	1,05,142

Item 1.—In the estimate proposed in 1870, provision was made for the acquisition of 79·884 Cawnies, whereas the actual area acquired is 103·87 Cawnies. This increase in area is to be attributed to changes in the line of the Canal, and to a greater width required for the spoil banks in places owing to the nature of the soil. The sum of Rs. 39,281 represent the value of 24 Cawnies, which gives Rs. 1,637 to the acre, a rate which I do consider not high.

Item 2.—The increase of Rs. 32,095 in the value of buildings is easily explained. In six instances the line of the Canal passed through bungalow properties, and Government were compelled to purchase the entire compound with the buildings thereon for a sum of Rs. 75,571. Deducting the amount recovered in rents, and by the resale of the bungalows, and the portions of the compounds not required for the Canal, the remaining amount paid for these properties is Rs. 48,202. This has not apparently been provided for in the estimate framed in 1870, wherein only Rs. 24,222 is entered for all buildings.

Item 3.—As to the increase in the value of wells, there is no information to show how many wells were included in the estimate of 1870. I have no doubt but that some additional wells have been sunk since 1870 in the tract along which the Canal has been excavated, as the land in this locality is usually planted with sugar-cane and the betel vine, both of which require a constant supply of water.

Item 4 is an authorized payment prescribed by Section 42 of Act X of 1870. The provision is novel, and is not to be found in previous legislative enactments on the subject of acquisition of land for public purposes. Hence this expenditure was not provided for in the estimate adopted by Mr. Fraser.

---

4. I may here add that the estimated expenditure of Rs. 41,935 hereafter is fixed on the supposition that ordinary rates of compensation will have to be paid in the cases yet to be settled. Some of these are pending in Court as the owners demand, under Section 55, that the whole of their properties be taken by Government. If Government should be compelled to purchase the entire property, the amount that will be required for payment will be increased.

TRANSFERRED to the Revenue (Famine) Department in continuation of endorsement, No. 5,764, dated 20th December 1878.

(Signed) E. A. FOORD, Colonel, R.E.,
Chief Engineer, P.W.D.

No. 480. ORDER THEREON, 24th February 1879, No. 461.

Miscellaneous.

His Grace the Governor in Council observes that the final account of expenditure on the Junction Canal submitted by Major Clarke, shows Rs. 4,68,929 already expended on the work which is now completed. A further sum of Rs. 2,50,000 is provided for land compensation. It appears, however, from the Collector's letter, read above, that a sum of Rs. 2,39,999-5-5 will suffice for the latter purpose. Of this, a sum of Rs. 1,98,064-5-5 has been already disbursed and Rs. 41,935, it is estimated, is still to be so. The estimate, amounting to Rs. 7,08,929-5-5, is sanctioned accordingly.

2. Provision to meet the liability of Rs. 41,935, above referred to, will have to be made in the revised Public Works Department Budget, for 1878-79.

(True Extract.)

Addl. Under-Secy. to Govt.

To the Public Works Department, with fifteen enclosures returned.
,, the Financial Department.
,, the Board of Revenue.
,, the Accountant-General.
,, the Collector of Madras.
,, the Chief Engineer for Irrigation.
,, the Examiner of Public Works Accounts.

Exd. W. H. French.
25 Spare Copies

Govt. of 1879 Madras

REVENUE.

The Public Works Dept.

&c., &c., &c.

Dated February 24th.

Received March 4th.

Read Read.

G.O., 24th February 1879, No. 401.

FAMINE RELIEF

FEBRUARY.

Nos. [illegible]

Famine Canal.—Sanctioning the payment of Rs. 7,06,819-5-5 in connection with the [illegible] and clearing [illegible] the sum of [illegible] the above amount will have to be provided in the Public Works Budget for 1878-79.

GOVT. OF MADRAS } 1879. { P.W. DEPT.

SECRETARY.

Fort St. George, March 1879

OFFICE NOTE

407/10

To C.

Please report what amount, bills have been passed, audited and paid, on account of compensation for land taken up for the Buckingham Canal in the Nellore District.

W.H.
Dy. S.
5.3.79

5/3

187

To
M.

BILLS HAVE BEEN [illegible]

OF 187

6/13

ARE AUDITED FOR RS.34,307-5-0 FOR COMPENSATION FOR LAND TAKEN UP FOR THE BUCKINGHAM CANAL IN THE NELLORE DISTRICT.

OF THIS SUM TWO ITEMS ONLY, RS.519-8-0 AND RS.80 HAVE BEEN PAID AS INTIMATED BY THE CIVIL DEPARTMENT.

for C.

Estimate of probable cost of making a [illegible] for [illegible]
(for the Bridge)

P.S.

Particulars

84	Cft of [illegible]	[illegible]	[illegible]	[illegible]
15	Cft of [illegible] for Vertical plates	[illegible]	[illegible]	[illegible]
51	Cft of [illegible] for [illegible]	[illegible]	[illegible]	[illegible]
5	cwt of Coal [illegible]		[illegible]	[illegible]
20	Seers of [illegible]		[illegible]	[illegible]
12	lb of Red Lead		[illegible]	[illegible]
½	Gallon of Linseed oil		[illegible]	[illegible]
½	Bottle Turpentine		[illegible]	[illegible]
				[illegible]
	Add allowance for [illegible] per cent			[illegible]
	Labor			[illegible]
	[illegible] @ 50 per cent			[illegible]
	Total Estimate Rupees			[illegible]

or say in round numbers Rupees 317

(True Copy)

G. H. Faulkner, Ex. Engineer
Supdt. of [illegible] Works

Madras
1878

Estimate of the probable cost of an iron [illegible] 27 feet long and [illegible]
(there is only 8 sides of the Building)

P.S

Particulars

216	Rft of angle iron 3"x3"x3/8"	lb	[illegible]
30	—— do —— iron 2"x2"x3/8" for stiffening	lb	[illegible]
37½	Sq. feet of plate iron ⅜" for top covering	lb	750
37½	—— do —— ⅜" bottom		[illegible]
37½	—— do —— ⅜" Vertical plate at top		750
37½	—— do —— ⅜" at bottom		[illegible]
37½	—— do —— ⅜" at ends		[illegible]
18	—— do —— ⅜" joint [illegible]		[illegible]
292	Rft of iron flat 5"x⅝" for cross straps	lb	[illegible]
	—— do —— 5"x⅜" for [illegible] straps		[illegible]
331	—— Iron round ⅝" for rivets	lb	[illegible]
13	Cwt Coal Country		
70	Seers of Paddy Husk		
5	bottles of Lamp oil		
3	lb Chalk		
20	lb Red Lead		
1½	Gallon Linseed oil		
2	Bottles of Turpentine		
	Add allowance for wastage at 10 per cent		
	Total cost of Materials		
	Labor		
	Contingency on Labor @ 5 per cent		

Total Estimated Rupees [illegible]

or Say in round sum Rupees 1035

(True Copy)

G. W. Faulkner
[illegible]

Madras
178

Estimate of the probable cost of making a Wrought iron girder
58 feet long and 5' 2" deep
(for one side only of a Bridge) - 275/13

Particulars

225	Rft of Angle iron 5" × 5" × 5/8"	lb	2250	" 1 7 lb	228 15 [illegible]
61	" " T iron 4" × 3" × 1/2"	"	522	" " 10 "	25 12 [illegible]
39 1/2	Sq ft of plate iron 5/8 for top covering plates	lb	750		
29 1/2	" " " 5/8 for bottom covering plates		565		
101 1/2	" " " 3/8 vertical plate at top		835		
38 1/2	" " " 3/8 " " bottom		669		
6	" " " 3/8 " " end		120		
15	" " " 3/8 joint covers & butt straps		550		
			3296	1 1/2 lb	357 7 9
107	Rft of iron flat 5" × 3/8" for cross straps	lb	1712		
38 1/2	" " " 5" × 1/2" for vertical between straps		169		
			1885	" 1 1/2 lb	132 2 9
1109	Rft of iron round 3/4" for rivets	lb	601	" 1 lb	50 1 [illegible]
1/2	cwt of Coal [illegible]	@		1 " cwt	20 " "
80	Seers of Paddy husks	"		" 2 "	1 4 "
6	Bottles of Lamp oil	"		" 5 " bottle	1 14 "
3	lb of Cobalt	"		" 8 " lb	" 2 "
105	lb of Red lead for 2 coats	"		" 4 " lb	11 4 "
1 1/2	Gallon of Linseed oil	"		3 4 " gal	5 11 "
2	bottles of Turpentine	"		1 " " bottle	2 " "
	Add allowance for wastage at 10 per cent				81 4 4
	Total Cost of materials				900 " "
	Labour				167 10 9
	Centage on Labour @ 50 per cent				83 13 4
	Total Estimate Rupees				1152 7 1

or say in round numbers Rupees 1160

(True Copy)

G. H. Faulkner Ex. Engr

Madras

1845

G.O. No. 461 of 24/12/75

20 AUG 78

Abstract Estimate of the Buckingham Canal Work

Description of work		Rate	Pe	Item No I Skew Bridge		Item No II Chepauk Bridge		Item No III Barber's Bridge		Item IV Major Communication		Item No V Minor Communication		Item No VI Main [illegible] Bridge		Item VII Bridges Syphons &c Kistnampett [illegible]		Item No VIII Syphon weir &c Triplicane &c	
				Quantity	Amount	Do	Amount	Do	Amount	Do	Amount	Do	Amount	Do	Amount	Do	Amount	Do	Amount
Earth work Excavation &ca	cyft	4 -	cyft	5700	1425 -	2204	551 -	4020	1005 -	9250	2312 8	1200	300 -	68	17 -	1800	450 -	4260	1065 -
Concrete (Soorkee)	cft	4 -	cft	7904	1976 -	5216	1304 -	1680	420 -	16400	4100 -	3696	924 -			5353	1338 4	3665	916 6 6
Concrete (Portland Cement)	cft	8 -		2808½	1404 4	2075	1037 8												
Do Do	cft	7 6								10315	4835 2 6	1017	476 11 6			1065	499 3 6	1146	537 3
Brick in (Portland Cement)	cft	7 6		3267	1528 14 6	2204	1033 2												
Do Do	cft	7 -								9675	4232 13 -	1017	444 15			1139	498 5	430¼	188 5 6
Brick in (Soorkee)	cft	4 -		5637	1409 4	4418	1104 8			21246⅔	5311 10 8	5511	1377 12			3148	787	2245½	586
Sun moulded Brick in Chunam	cft	4 -		2740	685 -														
Do Do Do	cft	3 9				4340	1017 3	4270	1000 12 6										
Brick in Chunam	cft	3 -		9441	1770 12	17529	3286 11	9639	1807 5	59120	11085	5046	946 2	79	14 13	6805⅔	1276	6186⅔	1160
Arch work	cft	6 -		3412⅞	1279 13 3														
Do Do in (Soorkee)	cft	5 -				2849	890 5												
Do Do	cft	4 -						315	74 12	6900	1725								
Portland Cement Coping for Quoins	Rft	1 8	Rft	224	366	400	600												
Plastering	Sqre	2 8		21	11														
Metalling and Gravelling		5		95½	477 8	309	151	207	1035		2540 8	48							
Well work (Soorkee) 6 ft diameter	Rft	11 8	Rft			216	2484												
Do	"	8	Rft	294	2352					1140	9120	132	1056			44	352		
Broken Brick and Sand	cft	2 3																	
Pointing	Sq	3	Sq	57	171	55	165	55	165	115	345								
Cornice work including dental	Rft	1	Rft			280	280												
Do Do	Rft	2 6																	
Rough Boulder stone in (Soorkee)	cyft	4	cyft			80	320	44½	178			192	768			224½	898	305	1220 7
Do Do in Chunam	cyft	3 12	cyft									134	502 8	49	183 12				
Do Do	"	3																	
Granite Stone work (Slabs)	No	3						4	12										
Do Do	Sft	2	Sft			37	74												
Do Do	cft	12	cft			520	390					42	31 8	10	7 8			35 17/24	26 12 6
Do Do (Slabs)	cft	1	cft													29¼	29 4		
Teak wood work	cft	4	cft									178⅗	714 10 8						
Do Do	cft	3 8	cft					205⅙	718 2 4			609	2131 8			5	17 8		
Jungle wood Do	cft	2	cft																
Planking (Mango 3" thick)	Sft	7	Sft					540	236 4			2775	1214 1			120	52 8		
Cast Iron Pipe 27" diam 6 ft long	No	77 12																5 15/? cwt	447 1
Cast Iron Pipe 60 ft Do		130														24 6/40	1430		
Iron Fittings &ca									655				1140		250		230		
36" Iron Pipe 36 ft long																			
Wooden Shutters	No	50														2	100	2	100
Bar Iron Grating	No	60																1	60
Bar Iron Do	No	50																	
Bar Do	No	35																	
Do Do																1	294	1	141
[illegible]	Sq	3 4						10	32			57	185 4	11					
[illegible] wood work		12						40	30			22½	66 14						
Flooring [illegible] Asphalte	Sq	71 8						5⅔	386 1 7										
Relaying 12" Main Pipe									450										
Dismantling old Bridge									940										
Stone Approaches to Canal	cft								300										

[illegible] Canal Works

IV ior nication	Item No V Minor Communication		Item No VI [illegible] Passage		Item No VII Bridges Syphons &c Kistnampet [illegible]		Item No VIII Syphons weirs &c at [illegible]		Item No IX 1st Syphon		Item No X 2d Syphon		Item No XI Aqueduct		Other Works		Total	
Amount	Qy	Amount	Qy	Amount	Qy	Amount	Qy	Amount	Qy	Amount	Qy	Amount	Qy	Amount	Qy	Amount	Quantity	Amount
2312 8	1200	300	68	17	1800	460	4260	1065	2390	597 8	2200	530	500	125			33592	8398
4100	3696	924			5353	1338 4	3665 5/8	916 6 6	4016	1004	2111	527 12	3646	911 8			53687 5/8	13421 14 6
									2212	1106			339	169 8			7434 1/2	3717 4
4835 2 6	1017	447 11 6			1065	499 3 6	1146	537 3			684	320 10					27	6668 14 6
									427	202 12 6							6118	2867 13
4232 13	1017	444 16			1139	498 5	430 1/2	188 5 6									12261 1/2	5364 6 6
5311 10 8	5511	1377 12			3145	787	224 1/2	586	[illegible]								46760 1/2	[illegible]
																	2740	685
																	8610	2017 15 6
11985	3046	946 2	77	14 13	6805 3/4	1276	6186 3/4	1160 3	11949	2240 7	11934	2237 10	6307 1/2	1182			144039 5/8	27007 6 11
																	3412 5/8	1279 13 3
																	2849	890 5
1725									725	231 4	100	25					8240	2060
																	624	936
																	532 1/2	1331 4
3457 8	43				53	[illegible]	11	[illegible]		22	57	142 8	46	115			1359	6795
																	216	2484
9120	132	1056			44	352							36	28			1646	13168
									2892	406 11							2892	406 11
345																	282	846
																	280	280
													270	42			270	42 3
	192	768			224 1/2	898	305 5/9	1220 7 11			30	120	89	356			965 5/9	3860 7 1
	134	502 8	49	183 12					226 1/2	849 6	128	480	276	103			812 1/2	3046 14
													132	396			132	396
																	4	12
																	37	74
	42	31 8	10	7 8			35 17/24	26 12 6	113	84 12	33	24 12	60				81 13/24	610 4 6
					29 1/4	29 4											29 1/4	29 4
			178 2/3	714 10 8													178 2/3	714 10 8
	609	2131 8			5	17 8			73	255 8			628 1/2				1620 1/2	5324 12 4
																	65 1/6	180 5 4
	2775	1214 1			120	52 8			290	1261 4			2277	9			6002	2625 14
							5-15 cwt	447 1									5-15 cwt	447 1
					24640	1430											24640	1430
		1140		260		230				74 10 8				10				3349 [illegible] 8
										510		486						995
					2	100	2	100			2	100					6	300
							1	60									1	60
									1	50							1	50
											2	70					2	70
					1	294	1	[illegible]									2	447
	57	186 4	11														[illegible]	307 [illegible]
	22 1/2	66 14															131 1/2	98 10
									10	78			59	44			5 2/5	386 1 7
																		450
																		940
																		300
																	41	369
																		100

Relaying 12" Main Pipe
Dismantling old Bridge
Stone Approaches to Canal
Silicate washing
Ornamental Stone Vases
Iron Pipes 5" [illegible]
[illegible]
Fencing along Marine Villa [illegible]
Gun powder (Blasting)
Masonry
Lamp Posts

Earth work { Excavation & through roots / Removal of Spoil Bank / Sectioning

Turfing
Temporary Dams
Temporary Roads & Bridges
Boat Basins
Minor Masonry Works
Marine Villa Improvement
River stone Embankment
Baling
Relief Camps
Stone Houses
Surveying & Clearing the Canal Line
Tools and Plant
Salaries & Superintendence

Compensation for Lands &ca

40 30
57 386 1 7
460
940
200
41 369
4 100
300
100 25
250
1600

1522 . 31
16790
1849 9 1
9 7
2445 5 10
597 6 6
18330
10200
Sr 5 57300
Sr 3 12480
Sr 1 10260
Sr 4 4160

Fort St George
Buckingham Canal Office
19th August 1878

Flooring Asphalte	Sq 71 8					52 – 386 1 7		332 16 10
Relaying 12" Main Pipe						450		
Dismantling old Works &c						940		
Stone Approaches to Canal	Cy				300			
Silicate Washing	Sq 9		Sq		41 – 369			
Ornamental Stone Vases	No 25		No		4 – 100			
Iron Piles 4'2" & 24 ft long	No 16							
[illegible]								
Fencing along Marine Villa Road Compound								
Gunpowder (Blasting)	46		lb			100 – 28		
Centring				300	250		1600	
Lamp Posts	No 20		No	4 – 80				
Earth work { Excavation 1st through Rock	3½		Cy					
Removal of Spoil Bank	2		Cy					
Stationery	4½		Cy					
Turfing	2½		Sq					
Temporary Dams	4¼		Cy					
Temporary Roads & Bridges								
Boat Basins	4½		Cy					
Minor Masonry Works								
Marine Villa Improvement								
River Stone Embankment	7		Cy					
Baling								
Relief Camps								
Stone Ports								
Surveying & Clearing the Canal Line								
Tools and Plant								
Sundries & Superintendence	Rs 5		Rs	1532 . 3	1847 9 8	783 9 7	2445 5 10	597 4 6
				16790 . 8	18330 . 8	10200 . Rs 5	57300 . Rs 3	12480 . 8
Compensation for Lands &ca							Rs 1. 10260 . Rs	4160 . .

Fort St George
Buckingham Canal Office
17th August 1878

Buckingham Canal Works

Abstract Estimate

Amounting to Rs 74,892

From

The Executive Engineer

Buckingham Canal Works

Dated 17th / Recd August 1878

20 AUG 78

No. of 1878-79

Enclosures ||| Eleven

875/15

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do of 1878/79

Head of Service — Famine Relief
Fund — Ordinary
Class — Original works
Main Head — Communication
Sub head — Canal
Name of work — Constructing Chepauk Bridge

[illegible]

875/15

Detail of Work.	Number.	L.	B.	D.	Area or Contents.	Total quantity of each description of Work.
Concrete cooke						
Below Tow Paths	2	34	8	½	272	
Wing walls (terminal portion)	4	24	8	2	1536	
Filling in of wells with S. Concrete	20	area 28¼		4	2260	
	6	28¼		2	339	
Do. with P. C. Concrete	20	28¼		3	1695	
	6	28¼		2	339	
Key stone Course	1	33	1	1¼	41	
Filling around the wells with S. Concrete	22	5¼	5½	2	809	7291
					Total S. Concrete cft	5216
					Do. P.C. Do. cft	2075
Brick set in Portland Cement wells upper portion above Concrete Bed	26	28¼		3	2204	
					Total cft	2204
Brick in cooke						
Abutments	2	48½	7½	2½	1631	
Wing walls	4	28	7½	2½	2100	
Counterforts	2	8	7½	2½	200	
Retaining walls around [illegible]	1	166	1½	2	387	
					Total cft	4318
Brick in Chunam						
Abutments	2	35	5	17	5950	
Wing walls	4	62	3¾	15	11700	
Counterforts	2	5	4	15	600	
Face walls & returns	4	8	3	4¾	456	
Blocking Course	2	134⅔	2	¾	404	
Parapet walls	4	121½	1½	3	2187	
Buttresses	4	3½	1½	17	367	
Pilasters	4	3	1	4	48	
Pedestals	4	3	3	4	144	
Face walls of Parapets	4	34	1¾	5	1190	

Detail of Work.	Number.	Measurements in Feet L.	B.	D.	Area or Contents.	Total quantity of each description of Work.
		18	6		23036	
Deductions						
Ton Patte Openings	4	4	3		48	
Do. Arch do.		14½	8½		119	
					167	
					Total C.ft	22869
Arch work						
Central Arch do.	1	28	34	2	1904	
Ton Patte Arch Work	2	7	39	1	546	
Barrel Connecting Ton Patte	4	14½	7	1	399	
					Total C.ft	2849
Cornice						
Cornice including dentils	2	140			280	
					Total R.ft	280
Pointing with Chunam						
Interior face of Abutments	2	35	.	9½	665	
Exterior of faces	2	134	.	15	4020	
Do. lower portions	4	15		4	240	
Soffit of Arch	1	22½	34	.	765	
					5690	
Deduction						
Segmental openings	2	Area 67			134	
Ton Patte do.	4	4		5	80	
Do. circular do.	4	Area 6½			26	
					239	5451 □'
					Total Sqrs	55
Plastering						
Interior of Ton Pattes	2	40	15½		1240	
					Total Sqrs	12½
[illegible] of Brick work					Sqrs	41

875/16

Detail of Work.	Number.	Measurements in Feet L.	B.	D.	Area or Contents.	Total quantity of each description of Work.
P. Cement Concrete Mouldings						
Quoins of Ton Patte Abutments	4	10			40	
Coping to Parapet walls	2	135			270	
Quoins of Abutments	4	5			20	
String Course	2	35			70	
					Total R.ft	400
Metalling and Gravelling						
Roadway over Bridge	1	100	60		6000	
Approaches to do. (West)	1	300	40		12000	
Do. do. (East)	1	190	60		11400	
Do. do.	1	50	30		1500	30900 □'
					Total Sqrs	309
Rough Boulder stone work						
Revetments	4	54	10	1	2160 c'	
					Total C.yds	80
Rough Granite Slabs						
Steps leading to Ton Patte	4	13	10		520	
					Total R.ft	520
Granite stone work						
Plates on top of Pedestals	4	1½	1½		9	
Do. for Lamp posts	4	3½	2½		25½	
Do. Do.	4	5/6	3/4		2½	
					Total Sup. feet C.ft	37
Ornamental stone lions					No.	4
Earth work						
Excavating foundation & filling &c.					Cyds	2204
Brick walls 6ft drains &						
9ft deep	20			9		180
Do. Do. 6ft deep	6			6		36
					Total R.ft	216

Detail of Work.	Number.	Measurements in Feet.			Area or Contents.	Total quantity of each description of Work.
		L.	B.	D.		

No. of 1877-78.

Head of Service Famine Relief
Fund Ordinary
Class Original works
Main Head Communication
Sub-head Canal
Name of Work Constructing Chepauk Bridge

275/17

Amounting to Rupees 18330 – –
To be carried out by Public works Department

Quantity.	Description of Work.	Rate.			Per	Amount.			Total.		
		RS.	A.	P.		RS.	A.	P.	RS.	A.	P.
5216 cft	[illegible]	.	4	.	cft	1304	.	.			
2075 "	Portland Cement Concrete	.	8	.	"	1037	8	.			
2204 "	Brick in P. Cement	.	7	6	"	1033	2	.			
4418	Do in Arches	.	4	.		1104	8	.			
19574	Do in [illegible]	.	3	.	"	~~3670~~	2	.			
4340	Fairly moulded Brickwork Chamfer	.	3	9	"	1017	3	.			
2849	Arch work	.	5	.	"	890	5	.			
280 Rft	Cornice with dentils	1	.	.	Rft	280	.	.			
55 sft	Coping with [illegible]	3	.	.	sft	165	.	.			
12½ sft	Plastering Do [illegible]	2	8	.	sft	31	4	.			
41 sft	Sole plate [illegible]	9	.	.		369	.	.			
400 Rft	Coping to Railings	1	8	.	Rft	600	.	.			
309 sft	Metalling & Gravelling	5	.	.	sft	1546	.	.			
80 cft	Rough Dressed stone	4	.	.	cft	320	.	.			
520 Rft	Rough Granite Slabs	.	12	.	Rft	390	.	.			
2204	Earthwork	.	4	.	cft	551	.	.			
216 Rft	Parapet wall [illegible]	11	8	.	Rft	2484	.	.			
37 sft	Granite stone work	2	.	.	sft	74	.	.			
4 No.	Ornamental Do Stone	25	.	.	Each	100	.	.			
	Contg. stone approaches [illegible]					300	.	.			
	Contingencies					250	.	.			
	Supervision [illegible] per cent					[illegible]					

Total Rupees 18330

W. Thompson

C. Clarke Major R.E.

Quantity.	Description of Work.	Rate.			Per	Amount.			Total.		
		RS.	A.	P.		RS.	A.	P.	RS.	A.	P.

Quantity.	Description of Work.	Rate.			Per	Amount.		
		RS.	A.	P.		RS.	A.	P.

875/10

Quantity	Description of Work	Rate	Per	Amount	Total
		Rs. A. P.		Rs. A. P.	Rs. A. P.

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Item ~~to~~ 11 in
Abstract Estimate
No. 1328

Rs 430-11-8
5

5
Rs [illegible]

To be Carried out by P. Works Department

Detail of Work.	Number	Measurements in Feet L.	B.	D.	Area or Contents.	Total quantity of each description of Work.
Concrete (Counter)						87 5/12
Abutments	2	26	6	2½	780	
Wing walls & c.	2	90	2½	2	900	
					Total cft	1680
Brick in Chunam						
Abutments	2	23	6	16	3680	
Counterforts	2	23	6	5⅝	718⅔	
Wing walls	4	90	2	7½	5400	
Side walls of Tow Path Passage	4	16½	1½	4½	446	
Blocking Course	1	102	2	3	612	
Parapet walls to Bridge	4	90	1½	4	2160	
	4	2¼	2¼	5	101	
Pedestals of Parapet walls	4	4	3	5	240	
Basement of Counterforts to Abutments	2	21	3½	5	735	
Cornice throughout	1	180	¾	1	135	14227¾
Deductions						
Tow Path Passage Openings	4	4	2⅔	4½	192	
Do Do Arches	4	area 11⅞		2⅔	127	319
					Total cft	13908¾
Arch work						
Semicircular Arches	2	21	7½	1	315	
					Total cft	315
Plastering & Pointing						
Abutments	2	22	.	12	528	
Exterior face of the Bridge	2	60		20	2400	
From end of one wing wall to the other	2	180		7	2520	
Parapet walls	4	90	.	9	3240	
					8688	

Detail of Work.	Number.	Measurements in Feet. L.	B.	D.	Area or Contents.	Total quantity of each description of Work.
		B. F.			8688	
Granite parapet walls	2	15		21	630	9318
Deductions						
Openings	2	6		6	72	
Of wheel guards	4	8			20	97
						9221
		Total [illegible]				85
		Do Rubble				37
Granite Stone						
Templates	4	3	1½	½	4	
		[illegible]				
Metalling & Gravelling 6" thick						
Roadway	1	950	21		20706	
		Total Square				207
Wood work						
Girders	2	30	⅔	1	44⅔	
Straining piece	2	7½	⅔	1	12	
Principals	4	12	⅔	1	8	
Diagonal piece	4	10	⅓	⅓	4 1/9	
Do Do	4	4½	⅓	⅓	2	
Road Joists	15	19	5/12	⅔	79 1/6	
	4	2	5/12	⅓	1 1/9	
Hand Rail Standards	4	5¾	5/12	⅓	2	
Upper Rails	4	7½	5/12	⅓	5	
Wall plates	2	15	½	½	7½	
Wheel Guards	2	36	½	⅙	12	
			Total C. ft.			265½
Planking (3")	1	36	15		540	
					Total S. ft.	540

8 2/10

Detail of Work.	Number.	Measurements in Feet. L.	B.	D.	Area or Contents.	Total quantity of each description of Work.
Rough Boulder stone set in mortar						
Abutment walls	4	20	1½	10	1200	
				Total	Cyds	44½
Painting						
Girders	2	28	.	3⅓	187	
Straining piece	2	8½	.	3⅓	57	
Principals	4	8⅔	.	3⅓	116	
Diagonal bracing long	4	9	.	1⅓	48	
Do Do short	4	4	.	1⅓	21	
Joists	11	19	.	1⅔	379	
Hand Rail Standards	4	1½	.	1⅓	8	
Do	4	3½	.	1⅓	19	
Upper Rails	4	8	.	1⅓	45	
Wheel guards	2	28	.		56	
Add 58 sft for Iron works					58	994 sft
				Total	Sqs	10
Flooring Asphaltee						
Over the Bridge platform	1	36	15	.	540	
				Total	Sqs	5 2/5
Iron Fittings			Rs	as	pie	
C I Sockets	4	@ Rs	13	6	–	
Do Plates	8	@ Rs	2	"	"	
Bolts with nuts 6" long	12	@	4	8	"	
C I Plates	24	@	0	13	–	
Bolts with nuts 2" long	48	@	1	4	–	
Fish Plates washers clamps	912	@	0	5	–	
Bolt Iron	lb 668	@	0	4	–	
Refixing 12" main Pipe						1

Detail of Work.	Number.	Measurements in Feet. L.	B.	D.	Area or Contents
Dismantling old Iron work Relaying of old Pipes Raising of Main Pipe & wood work (and ...) Earth work Excavating abutment foundation & raising of approaches &c. Cft					

No. of 1877-78.

Head of Service Famine Relief
Fund Ordinary
Class Original Works
Main Head Communications
Sub-head Canal
Name of Work Re constructing Barbers Bridge

875/21

Amounting to Rupees 10200
To be carried out by P. Works Department

Quantity.	Description of Work.	Rate. Rs.	A.	P.	Per	Amount. Rs.	A.	P.	Total. Rs.	A.	P.
1680 cft	Concrete work		4		cft	420					
9639 „	Brick in Chunam		3		„	1807	5				
4270 „	Face moulded Brick in Chunam		3	9	„	1000	12	6			
315 „	Arch work		4		„	78	12				
55 Sq	Pointing	3			Sq	165					
37 „	Plastering	2	8		„	92	8				
4 No.	Granite Slabs	3			Each	12					
207 Sq	Metalling & Gravelling	5			Sq	1035					
205 Cft	Teakwood work	3	8		cft	718	1	4			
44½ Cys	Rough Boulder stones set in mortar	4			Cys	178					
6740 Sft	Bridge Planking		7		Sft	236	4				
10 Sq	Painting 3 coats of colour	3	4		Sq	32	8				
4020 Cys	Earth work		4		Cys	1005					
6 Sq	Flooring (asphalte) 3" thick	71	8		Sq	386	1	7			
	Raising of main Pipe & wood work					30					
	Refixing 12" main Pipe					450					
	Iron fittings					655					
	Dismantling old Bridge work					940					
10 cwt	Gunpowder (Blasting)		4	6	cwt	28	2				
	Contingencies					266	9	7			
	Total Rupees					10200					

Robt Thompson
Major R.E.

H. Clerk Major R.E.

[illegible]

Quantity.	Description of Work.	Rate.			Per	Amount.			Total.		
		RS.	A.	P.		RS.	A.	P.	RS.	A.	P.

Quantity.	Description of Work.	Rate.			Per	Amount.			Total.		
		RS.	A.	P.		RS.	A.	P.	RS.	A.	P.
						875					
						22					

Quantity	Description of Work	Rate		Amount	

III

Abstract of Estimate

Rs 920/7s

5

Rs 2/7/9

[illegible] P. Works Depth

Detail of Work.	Number.	Measurements in Feet. L.	D.	D.	Area or Contents.	Total quantity of each description of Work.
Concrete works						275/27
Filling of wells	12 8	28¼ 28¼		6 3	2034 678	
Do Ground walls	1	101	2 13/16	2	568	3280
Do in the Portland Cement	12 8	28¼ 28¼		4 3	1356 678	
Keystone Course	1	28¼	1	1½	29	2063
		Total Concrete works c.ft.				3280
		Do	Do	of Cement	c.ft.	2063
Brick in Portland Cement						
Upper portion of Filling	20	28¼		3	1695	
Foundation to wing walls at the terminal points	4	7½	4	2	240	
				Total c.ft.		1935
Brick in Soorkee						
Basement brick work on wells for abutments	2	34½	8	2½	1380	
Wing walls	4	27	8	2½	2160	
Retaining wall around [illegible]	1	15⅝	1½	2	467⅞	
Basement of terminals of wing walls	4	7½	4	2	240	
				Total c.ft.		4247⅞
Brick in Chunam						
Abutments	2	25	6	5	1500	
Wing walls	4	30	3½	16½	6930	
Upper portions of abutments	2	26	4 1/12	2	425	
Top of the sub arches	2	10	1½	8	240	
Buttresses	4	4	2¾	16	704	
Top of the Parapet walls	4	17	1 15/16	5	665	
Central portion of masonry	2	27	2½	11	1485	
		Carried over			11949	

Detail of Work.	Number.	Measurements in Feet. L.	B.	D.	Area or Contents.	Total quantity of each description of Work.
			13·9		11949	
Parapet walls	2	78	1½	2½	780	
Pedestals	3	3	2½	4½	270	
Cornice	2	105	1½	¾	196¼	
					13204	13204
Deductions						
Main Arch	1	24	1½	23	828	
Towpath arches	4	23	6	1	552	
					1380	1380
			Total	c ft		11824
Arch work						
Main Arch	1	24	1½	23	828	
Towpath arches	4	23	6	1	552	
			Total	c ft		1380
Plastering						
Intrados of arch		24		48	1152	
Arch & voussoirs	2	24		2	96	
Quoins & Buttresses	8	24		12	2400	
Coping	2	90		2½	450	
Spring Course	2	100		1½	375	
Voussoirs of Towpath arches	12	18		1½	108	
Pillars Copings	8	12		1½	144	
Parapet walls	2	86		5	860	
Intrados of Towpath arches	2	23		16	736	3621
			Total	Square		36
Pointing						
Faces throughout	2	86		16	2752	
Abutments to	2	30		5	300	3052
Face above						
Spring Decorative arch	2	33			306	
Towpath Arches	4	20		5	80	
Springs of the arches		2	12		48	
Spandrels & arch	2	30		7½	300	734
						23185
			Total	Squares		23

Detail of Work.	Number.	Measurements in Feet. L.	B.	D.	Area or Contents.	Total quantity of each description of Work.
Earth work						
Excavation & Filling in	Cyds					1850
Metalling & Gravelling 6" thick						
Roadway	1	655	21	.	13755	
					Total Sqrs	137½
	12				12 144	
Brick walls & returns walling	8				10½ 84	
					Total Rft	228

Detail of Work.	Number.	Measurements in Feet L.	B.	D.	Area or Contents.	Total

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No. of 1877-78.

Head of Service Famine Relief
Fund Ordinary
Class Original works
Main Head Communications
Sub-head Canal
Name of Work Constructing a Bridge of one arch of 20 ft Span, & 20 ft Roadway at sites 207, 215, 305 360, and 410
Amounting to Rupees 10260 - -
To be carried out by P. Works Department.

Quantity.	Description of Work.	Rate. RS.	A.	P.	Per	Amount. RS.	A.	P.	Total. RS.	A.	P.
3280 cft	Concrete (Soorkee)	.	4	.	cft	820	.	.			
2063 "	Do P. Cement	.	7	6	"	967	-	6			
1935 "	Brick in Do Do	.	7	.	"	846	9	.			
4249⅓ "	Do in Soorkee	.	4	-	"	1062	5	4			
11824 "	Do in Chunam	.	3	.	"	2217	-	.			
1380	Arch work	.	4	.	"	345	.	.			
36 %	Plastering	2	8	.	%	90	.	.			
23 "	Painting	3	.	.	"	69	.	.			
1850 %	Earthwork &c	.	4	-	%	462	8	.			
137½ %	Metalling & Gravelling	5	.	.	%	687	8	.			
228 rft	Brick well 8 ft diam.	8	.	.	Rft	1824	.	.			
4	Lamp posts &c	20	.	.	Each	80	.	.			
	Contingencies &c					300	.	.			
	Sundries @ 5 per Cent					489	1	2			
	Total Rupees								10260	.	.

Major R.E.
Dist. Eng. Presidency

Major R.E.
Executive Engineer

Quantity.	Description of Work.	Rate.			Per	Amount.			Total.		
		RS.	A.	P.		RS.	A.	P.	RS.	A.	P.
						875/25					

Quantity.	Description of Work.	Rate Rs. a. p.	Per	Amount Rs. a. p.	Total. Rs. a. p.

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Item to be in
abstract Estimate
[illegible]

P.W. 930/77

Rs 72/-

[illegible] carried out by P. Works Department

Detail of Work.	Number.	Measurements in Feet. L.	B.	D.	Area or Contents.	Total quantity of each description of Work.
Concrete (Soorkee)						227/6.
Towpaths	2	17½	4	4	560	
Approaches to roadway	2	5½	10	2	220	
Filling up wells with soorkee	4	area 28¼		4	452	
Do with Portland Cement	4	28¼		3	339	
					Total cft.	1571
Concrete with P. Cement cft						339
Do Do Soorkee cft						1232
Brick in Portland Cement						
Bed over curtain walls	4	28¼		3	339	
					Total cft.	339
Brick in Soorkee						
Piers up to height of 7 ft.	2	17½	7½	7	1837	
					Total cft.	1837
Brick in Chunam						
Piers	2	14½	4½	7	913½	
Pedestals to Parapet walls	4	2¼	2¼	7½	152	
Side walls	4	4½	1½	13	351	
Caps to pedestals of P. Wall	4	4⅓	2½	¾	33	
Crop Retaining Walls	2	10	1½	7¾	232½	
					Total cft.	1682
Plastering (Chunam)						
Piers up to Towpath level	2	40		8	640	
Do above Do	2	36		8	576	
Retaining walls	8	8		4	256	
Parapet wall piers	4	8		7	224	1696 or
					Total Squares	17

Detail of Work.	Number.	Measurements in Feet L.	B.	D.	Area or Contents	Total quantity of each description of Work.
Rough Boulder stone work						
Footing walls	2	15	2	3½	210	
[illegible] walls to stone flooring	8	10	2	6	960	
Two pitted flooring	2	15	6	2	360	
Abutment wing walls	4	14½	2½	3½	[illegible]	
backwards upper & lower [illegible]	2	14	2	17	952	
Between walls pillars	2	9	2	2	72	
wing walls	4	3	1	1½	18	2964
			Total Cyds			108½
			Total stone in [illegible]		64½	
			Do in [illegible]		64	
Granite stone work						
Templates for hand Beams	4	6	¾	½	7½	
	4	4	¾	½	6	
			Total c ft			14
Wood work						
Girders	2	75	[illegible]	[illegible]	62½	
Corbels	4	12	½	[illegible]	20	
Joists	31	12	½	[illegible]	62	
Hand Rail standards	32	4½	½	½	16 8/9	
Upper & Centre Railings	4	75	½	[illegible]	41 2/3	
			Total c ft			203
Measure of Planking 3" thick						
Planking	1	74	10	3"	740	
Wheel Guards	2	74	1¼	3	185	
			Total c ft			925
Iron fittings						
Cast Iron Plates [illegible] 31 [illegible] 12-6						
[illegible] 12 [illegible] 12-6						
[illegible]						

Detail of Work.	Number.	Measurements in Feet L.	B.	D.	Area or Contents	Total quantity of each description of Work.
Painting						
Girders	2	74		2⅔	395	
Corbels	4	12		2	96	
Joists	31	12		1¾	651	
Hand Rail Standard	32	4½		1⅙	168	
Hand railing	4	71		1¼	355	
Wheel Guards	2	69		1¼	172½	1837½
			Total Sq			18
Tarring						
Over the Planks	1	74	10	.	740	740
			Total Sq			7½
Earth work						
Excavation &c					Cyds.	400
Brick wells 6 ft diam & 11 ft in depth	4			11	44	
			Total R ft			44
Metalling & Gravelling		180	9	-	1620	1620
			Total Sq			16

Detail of Work.	Number.	Measurements in Feet. L.	B.	D.	Area or Contents.	Total quantity of each description of Work.

No. of 1877-78.

Head of Service Famine Relief 275/28
Fund Ordinary
Class Original Works
Main Head Communication
Sub-head Canal
Name of Work Constructing a Bridge [illegible] at [illegible] 139. 239. [illegible]

Amounting to Rupees 4160
To be carried out by P. Works Department

Quantity.	Description of Work.	Rate. RS. A. P.	Per.	Amount. RS. A. P.	Total. RS. A. P.
	"Foundation Work"				
1232 cft	Concrete (Soorkee)	4 -	cft	308 - -	
339 .	Do in P. Cement	7 6	-	158 14 6	
339 .	Brick Do Do	7 -	-	148 5 -	
1837 .	Do in Soorkee	4 -	-	459 4 -	
1682 .	Do in Chunam	3 -	-	315 6 -	
17 sq	Plastering in Do	2 8 -	Sq	42 8 -	
64 cy	Rough Boulder stone in soorkee	4 - -	Cys	256 - -	
44½ .	Do Do in Chunam	3 12 -	-	167 8 -	
14 cft	Granite slabs	12 -	cft	10 8 -	
203 .	Teakwood work	3 8 -	-	710 8 -	
925 sft	Planking Mango 3 inch	7 -	sft	404 11 -	
36 No	Cast Iron plates	12 4	Each	27 12 -	
162 lb	Bolts with nuts	12 6	lb	126 9 -	
1142 lb	Straps Washers &c	3 2	lb	[illegible]	
19 Sq	Painting	3 4 -	Sqs	61 12 -	
7½ .	Tarring (Wood work & coal)	12 -	-	5 10 -	
400 cy	Earthwork (Excavating foundation)	4 -	Cys	100 - -	
44 Rft	Well work (Brick)	8 - -	Rft	352 - -	
16 Sq	Metalling & Gravelling (Road way)	5 - -	Sq	80 - -	
	Contingencies @ 5 per cent			[illegible]	
				Total Rupees	4160 - -

W. H. Thompson
[illegible] March 1878

[illegible] March 1878

Quantity	Description of Work	Rate			Per	Amount			Total		
		RS.	A.	P.		RS.	A.	P.	RS.	A.	P.
	Letter No. 139 [illegible] Road					41	6	0			
	Do 239 [illegible] Do					41	6	0			
	Do 378 [illegible] Do Do					41	6	0			
	Total for [illegible]					124	8	0			

Quantity.	Description of Work.	Rate.			Per	Amount.			Total.		
		RS.	A.	P.		RS.	A.	P.	RS.	A.	P.
						275 129					

[illegible]

Do. Carried out by P. Works Department

Detail of Work.	Number.	L.	B.	D.	Contents.	Total quantity of each description of Work.
Rough Boulder stone set in Mortar					375/87	
Abutments	2	11	2	9½	418 ✓	
Wing walls	4	15½	2	7¼	899 ✓	
	4	2	1	1½	12 ✓	1329 c.f
					Total Cyd	49
Wood work						
Beams Teakwood	2	68	½	1	68 ✓	
Joists Do	33	5½	1/4	1/3	15 1/6 ✓	
Standards Do	8	5½	½	½	11 ✓	
Do Do	18	4½	1/3	1/3	9 ✓	
Lattice Bars Do	48	6	5/24	5/48	6¼ ✓	
Planking Do for Roadway	1	64	5½	1/6	58 2/3 ✓	
Hand Rails Do	2	64	1/4	1/3	10 2/3 ✓	
					Total cft	178 2/3
Brick in Chunam						
Coping to wing walls	4	17½	1½	3/4	79 ✓	
					Total cft	79
Plastering						
Coping to wing walls	4	16		2½	160 sf ✓	
					Total sqs	1¾
Granite Slabs						
Templates for Girders	2	5			10 ✓	
					Total Rft	10
Iron Piles	4	24	1" Diam		4032 lt	
Iron Fittings					Rs 250	
Painting Woodwork Sft					1169	
Cost of Erecting Bridge, Cartage &c					Rs 317	

Detail of Work.	Number.	Measurements in Feet. L.	B.	D.	Area or Contents.	Total quantity of each description of Work.
E [illegible] Dock fitting of & forming approaches [illegible]					68	

Detail of Work.	Number.	Measurements in Feet. L.	B.	D.	Area or Contents.	Total quantity of each description of Work.
					875 31	

Detail of Work.	Number.	Measurements in Feet.			Area or Contents.	Total quantity of each description of Work.
		L.	B.	D.		

No. of 1877-78.

Head of Service Provincial Rates
Fund Ordinary
Class Original Works 825/32
Main Head Communications
Sub-head Canal
Name of Work Constructing Marine Villa Canal Bridge

Amounting to Rupees 2200
To be carried out By P. Works Dept.

Quantity.	Description of Work.	Rate.			Per	Amount.			Total.		
		RS.	A.	P.		RS.	A.	P.	RS.	A.	P.
49 Cyp	Rough Boulder Stone set in Mortar	3	12	-	Cyps	183	12	-			
178⅔ cft	Wood work	4	-	-	cft	714	10	8			
79 "	Brick in Chunam	.	3	-	cft	14	13	-			
1¾ Syp	Plastering	2	8	-	Syp	4	6	-			
10 Sft	Granite Slabs	.	12	-	Sft	7	8	-			
4032 lb	Iron Piles 4" Diameter & 24' long	.	1	6	lb	378					
	Iron Fittings					260	.	.			
11 69/100 Syp	Painting	3	4	.		38	.	.			
	Cost of Erecting Bridge Coolies &c					217	.	.			
	Fencing along Marine Villa River Embankment cost					125	.	.			
68 Cyp	Earth work	.	4	.	Cyp	17					
	[illegible] @ about 7 per cent					149	14	4			
	Total Rupees								2200		

Major R.E.
Executive Engineer

Major
District Engineer

Quantity.	Description of Work.	Rate.			Per	Amount.			Total.		
		RS.	A.	P.		RS.	A.	P.	RS.	A.	P.

Quantity.	Description of Work.	Rate.			Per	Amount.			Total.		
		RS.	A.	P.		RS.	A.	P.	RS.	A.	P.
						875 383					

Per Correct Out by P. Works Department

375/34

Detail of Work.	Number.	Measurements in Feet. L.	B.	D.	Area or Contents.	Total quantity of each description of Work.
Concrete — Lookee						
Storm water Channel Drain	1	78	8	1	624	
Sewage Channel East Ward	1	240	8	1	1920	
Do Head &c.	1	51	5	1	255	
Silt Trap	1	15	9½	1	143	
[illegible] Walls						
around weir apron	1	88	3	1¾	462	
Projecting walls	2	6	4	3	144	
End walls	2	13	2½	2	130	
Towpath retaining walls	2	30	2½	2	300	
On either side of Concrete stone flooring	2	20	3	3	360	
Bridge						
Steining of wells 6ft deep	4	area 28¼		3	339	
Counterfort walls to B.P.	4	12	3	1½	216	
Retaining Do head walls	4	12	3	½	72	
Wing walls of Sluice	2	7	2	1	28	
On either side of Pipe	2	20	3	3	360	
					Total cft	5353
Portland Cement Concrete						
wells	2	11	11	3	726	
Steining of wells	4	28¼		3	339	
					Total cft	1065
Breaking Portland Cmt.						
wells	2	10	10	4	800	
Basement of B Piers	4	area 28¼		3	339	
					Total cft	1139

Detail of Work.	Number.	Measurements in Feet. L.	B.	D.	Area or Contents.	Total quantity of each description of Work.
Brickwork						
Bridge						
Piers	2	16	5	7½	1200	
Walls Syphon	2	10	10	12	2400	
					3600	
Deduction						
Walls (Syphon pipes for inlet)	2	28¾		8		
Brickwork in Chunam						
Stone work to Channel						
Side walls of channel	2	78	1½	3½	819	
Weir						
Side and end walls of	1	68	2½	4	768	
Projecting walls on sides	2	5	2¾	4	110	
Side walls beyond d.	2	9	1¾	2¼	70⅞	
Bridge						
Parapet walls to wells	2	30	1½	3½	315	
Counterforts to wells	4	12	2	6	576	
Piers	2	14	4	3	336	
Drain						
Side walls of drainage channel work	2	240	1½	4	2880	
Do Ends	2	57	1¾	3½	382½	
Cistern outlet trap	2	22	1½	4	264	
Walls of Sluice	1	8	2	4	64	
Wing walls to Do	2	6	1½	3	54	
Road Bridge P. Walls	4	10	1½	2½	150	
					6989⅝	
Deduction						
Walls Syphon (arch)	2	28¾		3¼	184	
				Total c.ft.	6805⅝	

Detail of Work.	Number.	Measurements in Feet. L.	B.	D.	Area or Contents.	Total quantity of each description of Work.
Rough Boulder stone						
Weir	1	38½	33½	1½	1482⅛	
Revetments front slopes	2	31½	18	1½	1701	
Bed of Canal	1	32	20	2½	1600	
Retaining walls at the foot of Revetments	2	32	3	4	768	
Bedding of pipe	1	56	5	2	560	6061⅞ c.ft
				Total	Cyds	224½
Earth work						
Excavation of channel	3	106	8	4	10176	
Weir Side walls	1	88	3	7	1848	12024 c.ft
				Total Cyds		445⅓
						1354
Granite stone work				Total Cyds		1800 Cyds
Grooved sill stones for sluice shutters	4	4	1½	¾	18	
For sluice sill	1	10	1½	¾	11¼	
				Total c.ft.		29¼
Wooden Shutters	2					2
Bars iron Gratings	1					1
Wooden Platform						
Bridge joists over channel	5	8	5"	6"	5	
				Total c.ft.		5
Planking	1	8	16	2½		
				Total c.ft.		120
Plastering						
Channel walls	2	78	6		936	
Do	2	133	6		1596	
Do	2	107	6		1284	
Cistern	2	18	6		216	
Wing walls	2	8	8		128	
Bridge (channel) P. Walls	4	16	4		256	
Inside of wells	2	18	18		648	
Piers	2	40	10½		840	5904 s.ft

No. of 1877-78.

Head of Service Famine Relief
Fund Ordinary
Class Original Works 8 73/36
Main Head Communication
Sub-head Canal
Name of Work Constructing Kistnampett Sewage farm Bridge, Weir and Syphon No III

Amounting to Rupees 8,880 — „ — „
To be carried out by P. Works Department

Quantity.	Description of Work.	Rate. RS.	A.	P.	Per	Amount. RS.	A.	P.	Total. RS.	A.	P.
5353 c.ft	Concrete soorkee	.	4	.	c.ft	1338	4	.			
1065 "	Do P. Cement	.	7	6	"	499	3	6			
1139 "	Brick in Do	.	7	.	"	498	5	.			
3148 "	Do in soorkee	.	4	.	"	787	.	.			
6805 3/8	Do in Chunam	.	3	.	"	1276	.	2			
224 1/2 c.yds	Rough Boulder stone	4	.	.	c.yds	898	.	.			
1800 "	Earth work	.	4	.	"	450	.	.			
29 1/4 c.ft	Granite slabs	1	.	.	c.ft	29	4	.			
2 No	Wooden Shutters	50	.	.	Each	100	.	.			
1 "	Bar Iron Grating					294	.	.			
24640 lb	Cast Iron Pipe 6 ft in lengths	130	.	.	Ton	1430	.	.			
	Fitting Charges, Bolts &c					230	.	.			
5 c.ft	Teakwood	3	8	.	c.ft	17	8	.			
120 s.ft	Planking	.	7	.	s.ft	52	8	.			
44 R.ft	Brick wells 6 ft diam	8	.	.	R.ft	352	.	.			
59 Sq.	Plastering	2	8	.	Sq.	147	8	.			
12 "	Metalling & Gravelling	5	.	.		60	.	.			
	Contingencies @ 5 per cent					420	7	4			
	Total Rupees								8,880	.	.

Paul Thompson
Major R.E.
Dist Engr Presidency

H. Clarke Major R.E.
Executive Engineer B.C.W.

Quantity.	Description of Work.	Rate.			Per	Amount.			Total.		
		RS.	A.	P.		RS.	A.	P.	RS.	A.	P.
						475 547					

Quantity	Description of Work	Rate	Per	Amount	Total

[illegible]						
Con portion of walls	2	10	10	3	600	
Deduction						
Interior area of walls	2	28¼		3	169½	
					Total c.ft.	430½
Service Channels						
Transition to main walls	1	90	3	1¾	472½	
Projecting walls (main)	2	6½	5½	½	178¾	
Inverts of do do	2	7½	4½	1¼	84⅜	
For Retaining walls	2	30	1½	4	360	
Bedding of Silt Trap	1	10	10	1	100	
Trap (Outlet Channel) ditto	1	10	7	1	70	
On either side of Piping	2	20	3	3½	420	
Sewage Drain						
Inlet Channel	1	190	8	1	1520	
Outlet Do Bedding	1	20	8	1	160	
Cross walls (main walls)	2	10	2	1	40	
Head Sluice	1	7	2	1	14	
Storm water Channel						
Head Sluice wing walls	2	20	2	1	80	
Under Sill stone	1	14	2	1	28	
Channel Revetment		69	2	1	138	
					Total c.ft.	3665⅝
Brick work in Soorkee						
Silt Trap walls	4	10	1½	3	180	
Transition Projecting wall (main)	2	5	2½	3	75	
Walls Syphon	2	10	10	13	2600	
		C. O.			2855	

[illegible]						
Less portion of walls —	2	10	10	3	600	
Deduction						
Interior area of wells	2	28¼		3	169½	
					Total c.ft	430½
Surkee Concrete						
Foundation to new walls	1	90	3	1¾	472½	
Projecting walls (drain)	2	6½	5½	½	17¾	
In rear of do do	2	7½	1½	1¼	84⅜	
For Retaining walls	2	30	1½	4	360	
Bedding of Silt Trap —	1	10	10	1	100	
Trall (Outlet Channel Dict walls)	1	10	7	1	70	
On either side of Syphon —	2	30	2	3½	420	
Sewage Drain						
Inlet Channel —	1	190	8	1	1520	
Outlet Do Bedding —	1	20	8	1	160	
Cross walls (main walls)	2	10	2	1	40	
Head Sluice —	1	7	2	1	14	
Storm water Channel						
Head Sluice Wing walls	2	20	2	1	80	
Under Silt Stone —	1	14	2	1	28	
Channel Revetment —		69	2	1	138	
					Total c.ft	2665⅝
Brick work in Surkee						
Silt Trap walls —	4	10	1½	3	180	
Foundation Projecting walls (main)	2	5	2½	3	75	
walls Syphon —	2	10	10	13	2600	
		C.ft.			2855	

Detail of Work.	Number.	Measurements in Feet L.	B.	D.	Area or Contents.	Total quantity of each description of Work.

No. of 1877-78.

Head of Service Famine Relief
Fund Ordinary
Class Original works
Main Head Communication
Sub-head Canal
Name of Work Constructing Triplicane Sewage Form, Weir, and Syphon.

Amounting to Rupees 6840 — . .
To be carried out

Quantity.	Description of Work.	Rate. RS.	A.	P.	Per	Amount. RS.	A.	P.	Total. RS.	A.	P.
1146 cft	Concrete P. Cement	.	7	6	cft	537	3	.			
430½	Brickin Portland Do	.	7	.	cft	188	6	6			
3665½	Concrete work	.	4	.	.	916	6	6			
2345½	Brickin Do	.	4	.	.	586	6	.			
6186¾	Do in Chunam	.	3	.	.	1160	.	3			
305 7/9 cyds	Rough Boulderstone set in mortar	4	.	.	cyds	1220	7	1			
35 7/12 cft	Granite slabs	.	12	.	cft	26	11	6			
16 sqs	Plastering	2	8	.	sqr	40	.	.			
1	Bar Iron grating					60	.	.			
1	Do over walls					147	.	.			
7 cwt 5 15	Cast Iron Pipes 27 [illegible]	77	12	.	Ton	447	1	.			
	Carriage &ca for Do					22	6				
4260 cyds	Earth work	.	4	.	cyds	1065	.	.			
2	Wooden Shutters	50	.	.	Each	100	.	.			
	Contingencies 25 per cent					1322	7	2			
	Total Rupees								6840	.	.

M. Clarke Major R.E.
Executive Engineer
M.C.W.

R. W. Thompson
Major R.E.
Dist. Engr. Presidency

Quantity.	Description of Work.	Rate.			Per	Amount.			Total.		
		RS.	A.	P.		RS.	A.	P.	RS.	A.	P.

Quantity.	Description of Work.	Rate.			Per	Amount.			Total.		
		RS.	A.	P.		RS.	A.	P.	RS.	A.	P.

875
421

Quantity	Description of Work	Rate	Per	Amount	Total

20 AUG 79

~~Item to Bill~~ in abstract Estimate

P.W. 938/4

To be Carried out by Public Works Dept.

Detail of Work	No.	L.	B.	D.	Area or Contents	Total quantity of each description of Work
Concrete (Soorkee)						
Below Towpath	2	23	7½	1	345	
Sinking wells with soorkee Concrete	26	Area 28¼		4	2938	
	10	28¼		2	565	
Do. around the wells					4056	7904
Concrete with P. Cement	26	28¼		3	2203½	
	10	28¼		2	565	
Keystone Course	1	32	1	1¼	40	2808½
	Total Concrete Soorkee cft.					7904
		Do.	Do.	P.C.	cft.	2808½
Brick set in Portland Cement						
Upper 13 ft. of wells	36	28¼		3	3061	
Foundation of wing walls at their terminal points	4	5	5	2	200	
			Total		cft.	3261
Brick in Soorkee Mortar						
Segmental arches between wells of Abutments	2	35	8	2½	1400	
Wing walls	4	39	8	2½	3120	
Counterforts	2	6	4	2½	120	
Training wall connecting wells	1	177	1½	3	797	
End of wing walls	4	5	5	2	200	
			Total		cft.	5637
Brick in Chunam						
Abutments	2	33	5	7	2310	
Wing walls	4	39	3	13½	6318	
Counterforts	2	5	4	9	360	
Buttresses	4	4	1½	17	408	
Face walls	4	7¼	3	4	348	
Blocking Course	2	115	2	¾	345	

No. of 1878/79
Head of Service Famine Relief
Grant Ordinary
Class Original works
Main Head Communication
Sub head Road
Name of work Constructing Greenway Road Bridge

Deductions						
Low Path Opening	4	4	8½	6	260	
Do Mean Arch	4	area 12½	3		148	408
					Total c ft	12184
Arch work (sectn)						
Arches	1	36	32	2¼	2520	
Low Path arches	2	½	33	1½	556¾	
Basement arches before Low path	4	8	7	1½	336	
					Total c ft	3412¾
Facing						
[illegible] Abutment	2	33		[illegible]	[illegible]	
Do face of Bridge	2	98		18	[illegible]	
[illegible] of Low path arches	1	33	32		1056	
Relief work					300	
[illegible] face of Bridge [illegible]	4	15		4	240	5655
					Total [illegible]	57
Plastering						
[illegible] of Low path	2	33	16½		1089	
Parapet walls	2	114	8		1824	
Arch soffit	2	33	7		462	3375
Deductions						
Low path Openings	4	4		5	80	
Do Arches areas	4	area 6¼			25	
Segmental arch	2	89⅝			179	1384
						3091
					Total Sq ft	31

Detail of Work.	Number.	L.	B.	D.	Area or Contents.	Total quantity of each description of Work.
					873/53	
Restoring and [illegible]						
Roadway of [illegible]	1	460	21		9660 sq	
					Total Sq ft	96⅗
Earth work						
Excavating foundation of [illegible] [illegible] &c, Cyds						5700
Portland Cement Concrete						
Quoin mouldings to						
Abutments	4	8	1		32	
Do Buttresses	4	32	1		128	
Abutment Copings	2	32	1		64	224 Rft
Breakwater c ft [illegible]	26			9	234	
Do do c ft [illegible]	10			6	60	
					Total c ft	294

Detail of Work.	Number.	Measurements in Feet. L.	B.	D.	Area or Contents.	Total quantity of each Description of Work.

No. of 1877-78.

875/

Head of Service Famine Relief
Fund Ordinary
Class Original
Main Head Communication
Sub-head Canal
Name of Work Constructing Greenway Road Bridge

Amounting to Rupees 16790 " "
To be carried out By Public Works Department

Quantity.	Description of Work.	Rate. RS.	A.	P.	Per	Amount. RS.	A.	P.	Total. RS.	A.	P.
7904 c.ft.	Concrete (soorkey)	.	4	.	c.ft.	1976	.	.			
2808½ "	Do P. Cement	.	8	.	"	1404	4	.			
3251 "	Brick in Do	.	7	6	"	1523	14	6			
5637 "	Do in soorkee	.	4	.	"	1409	4	.			
9444 "	Do in Chunam	.	3	.	"	1770	12	.			
2740 "	Table moulded Brick in Do	.	4	.	"	685	.	.			
3412½ "	Arch work (soorkee)	.	6	.	"	1279	13	3			
57 sq.yds	Pointing with Chunam	3	.	.	sq.yd	171	.	.			
31 "	Plastering Do	2	8	.	"	77	8	.			
224 c.ft	P. Cement Concrete Coping for quoins &c.	1	8	.	c.ft	336	.	.			
95½ sq.yds	Metalling & gravelling	5	.	.	sq.yds	477	8	.			
5700 c.ft	Earth work &c	.	4	.	c.ft	1425	.	.			
294 R.ft	Breast walls 6 ft Chunam	8	.	.	R.ft	2352	.	.			
4	Lamp posts	20	.	.	each	80	.	.			
	Centrings					300	.	.			
	Supervision at 10 p.c. Cent					1522	.	3			

Total Rupees 16790

R. Thompson
Major R.E.
District Engineer Presidency

H. Clarke Major R.E.
Executive Engineer P.W.

Quantity.	Description of Work.	Rate.			Per	Amount.		
		RS.	A.	P.		RS.	A.	P.

Quantity.	Description of Work.	Rate.			Per	Amount.			Total.		
		RS.	A.	P.		RS.	A.	P.	RS.	A.	P.

875
45

To be carried out by P. Works Departt.

Detail of Work.	Number.	Measurements in Feet. L.	B.	D.	Area or Contents.	Total quantity of each description of Work.
Concrete (Lookee).						875/4
Below wing walls & Abutment	2	24	20	2	1920	
Channel flooring	2	18½	9	½	167	
Do. Do.	1	22	14	2	616	
Cistern	1	14	15	1½	315	
Foundation to walls of Cistern	4	15	3	4	720	
Buttresses to Abutments	4	2	2½	4	80	
Bed to Irrigation Channel [illegible]	1	22	9	1	198	
					Total Cft	4016
Concrete Portland Cement						
Foundation Course Below Syphon walls	2	14	14	2½	980	
Below to wells	2	20	15	2	1200	
Above Rough stone work Below Pipe	1	25½	5	¼	31⅞	
					Total Cft	2211⅞
Brick in Portland Cement						
Syphon wells	2	14	14	1½	522	
Deduction Inner area of well	2	28¼		1½	85	
					Total Cft	437
Brick in Lookee						
Syphon Abutment (wells)	2	12	14½	7½	2610	
Buttresses to Do.	4	1½	2	7½	90	
					2700	
Deductions						
Inner area of walls	2	area 28¼		7½	423¾	
					Total Cft	2276
Brick in Chunam						
Syphon wells & abutments	2	12	14½	7½	2610	
Wing walls	4	2½	8¼	11	3039	
End Do.	2	8	2½	11	440	
		C. O.			6089	

[illegible] Cross Wall	2	23	1½	[illegible]	358	
Buttresses to Abutments	4	14	2	1½	168	
Parapet Walls	2	67¾	1½	3	633	
Pedestals & Pilasters		[illegible]			334	
Parapet Wall on south side of Weir	1	120	1½	5	900	
Cornice	1	107	¾	1	80	
Irrigation Channel (East)	2	64	1½	3¾	720	
Do Do (West)	2	22	1½	3	198	
Foundations to Tunnel Abutments on Irrigation Channel	2	18	2½	3	270	
Abutments above	2	17½	2	1	70	
Face walls including Parapets	2	10	1½	4	120	
					12483	
Deductions						
Opening for Pipe	2	area 7		4	56	
Do Over Cross Wall of Cistern	1	5½	1½	4	32	
Wells	2	28¼		1½	424	
Opening of Archway on face walls	1	2	1	4	8	
	1	2	2⅔	2⅔	14	
					534	
					Total cft	11949

Detail of Work.	Number.	Measurements in Feet. L.	B.	D.	Area or Contents.	Total quantity of each description of Work.
Arch work in Soorkee						
Over Channel	2	33	10	1¼	825	
Over Tunnel	1	8	10	1¼	100	
					Total cft	925
Plastering						
Face of Abutments	2	23		15	690	
Wing Walls	4	33		8	1056	
Parapet Do	2	69¼		8½	1177	
Side walls of Irrigation Chanl (East)	2	70		5½	770	
Do Do (West)	1	40		4	160	
Bed of Cistern	1	10		10	100	
Side walls of Irrigation Channel (West)	2	22		4	176	4129 sf
					Total sq	41¼
Rough Boulder stone set in Mortar						
Under Iron Pipe	1	26	10½	5	1365	
Weir Revetment	1	28½	62	1½	2651	
Bed of Canal	1	30	20	1½	900	
Retaining walls to Revetment	2	28½	1½	3½	299	
Do do to flooring	1	37	9	1½	500	
Bed of Irrigation Channel East	1	64¼	8	1½	582	
					6297	
Deductions						
Pipe (area of	1	26	area 7		182	6115 cft
					Total cys	226½
Broken Brick and Sand over Clayey Soil						
Bedding to Weir Wall	2	25	20	2	2000	
Around Pipe	1	26	12	1	312	
Do Wells	1	29	20	1	580	
					Total cft	2892

Detail of Work.	Number.	Measurements in Feet. L.	B.	D.	Area or Contents.	Total quantity of each description of Work.
Granite stone work						
Templates to Girders Roadway	4	3	1½	½	9	
At crest of well	2	5	2	½	10	
Sill stones	2	10	1½	½	15	
Do	2	4½	1½	½	[illegible]	
Covering Slabs	2	8	5	½	[illegible]	
Well Steps (mason)	2	12	1	½	[illegible]	
		Total	Cft			113
Wood Work						
Girders	2	26	[illegible]	1	[illegible]	
Joists	14	10	½	⅓	23⅓	
Tie Beams	4	10	[illegible]	1	8⅓	
King Posts	4	4½	[illegible]	1	[illegible]	
Principals	4	8	[illegible]	1	[illegible]	
Straining Beams	4	10	[illegible]	1	[illegible]	
Distance Pieces	8	1	½	½	[illegible]	
Uprights or Rail posts	4	10	½	½	[illegible]	
		Total	Cft			73
Mango Planking	1	29	10		290	
		Total	Sft			290
36" diam Iron Pipe 36 ft long with iron fittings					1	1
Tarring						
Over Mango Planking	2	29	10		580	
Trusses & under	2				400	980
		Total	Sqre			10
Iron Bar Grating	1				1	1
Earth Excavation foundation & Clearance &c					Cft	2390

No. of 1877-78.

Head of Service Famine Relief

Fund Ordinary

Class Original works 875/8

Main Head Communication

Sub-head Canal

Name of Work Constructing First Syphon and Over Bridge

Amounting to Rupees 8850

To be carried out by P. Works Department.

Quantity.	Description of Work.	Rate. RS.	A.	P.	Per	Amount. RS.	A.	P.	Total. RS.	A.	P.
4016 cft	Concrete Soorkee	-	4	-	cft	1004	-	-			
2212 "	Do Portland Cement	-	8	-	"	1106	-	-			
437 "	Brick in Do Do	-	7	6	"	204	13	6			
2276 "	Brick in Soorkee	-	4	-	"	569	-	-			
11949 "	Do in Chunam	-	3	-	"	2240	7	-			
925 "	Arch work	-	4	-	"	231	4	-			
41¼ Sqre	Plastering	2	8	-	Sqre	103	2	-			
226½ Cft	Rough Boulder Stone in mortar	3	12	-	Cft	849	6	-			
113 cft	Granite Stone work	-	12	-	cft	84	12	-			
73 "	Wood work	3	8	-	"	255	8	-			
290 sft	Planking (Mango)	-	7	-	sft	126	14	-			
2892 cft	Broken Brick & Sand	-	2	3	cft	406	11	-			
36"	Iron Pipe 36 ft in length with iron fittings					510	-	-			
10 Sqre	Tarring 2 coats	-	12	-	Sqre	7	8	-			
1	Iron Bar Grating					50	-	-			
2390	Cft Earth work	-	4	-	Cft	597	8	-			
32	Cast Iron Plates	-	12	4	Each	24	10	8			
64	Bolts with nuts	-	12	6	"	50	-	-			
	Sundries @ 5 per cent					428	7	10			
					Total Rupees	8850	-	-			

W. Thompson
Major R.E.
Dist. Supdt. Residency

A. Clarke Major R.E.
Executive Engineer R.E.
Works

Quantity.	Description of Work.	Rate.			Per	Amount.			Total.		
		RS.	A.	P.		RS.	A.	P.	RS.	A.	P.

Quantity.	Description of Work.	Rate.			Per	Amount.			Total.	
		RS.	A.	P.		RS.	A.	P.	RS.	A.
						875 859				

Quantity.	Description of Work.	Rate.	Per	Amount.	Total.
		Rs. A. P.		Rs. A. P.	Rs.

20 MAY 79

Allow [illegible] 1X in abstract [illegible]

To be Carried Out by P Works Deposits

Detail of Work.	Number.	Measurements in Feet L.	B.	D.	Area or Contents.	Total quantity of each description of Work.
						875/8
Concrete to wells						
Bedding for Pipe	1	29	5	4½	653	
Do Wing walls	2	20	12	2	960	
Weir Parapet wall	1	100	2	3	600	
					2213	
Deductions Area of C.I. Pipe 36" diam	1	29	3	area 53	102	
					Total Cft	2111
Concrete Portland Cement						
Foundation wells	2	12	12	2⅜	684	
					Total Cft	684
Brick in Chunam						
Wing walls	4	20	2⅛	12	2040	
Drop Do	2	7½	2⅛	12	383	
Wall of Cistern (till Drop)	1	9	1½	4	54	
Wells Superstructure	2	12	12	15	4320	
Parapet wall of wells	2	42	1½	4½	567	
Side walls of outlet & Inlet Channels	4	28	2½	4½	1260	
Weir Parapet wall	1	100	1½	5	750	
Irrigation Channel Do East	2	72	1½	3¼	702	
Foundation to Abutments & Tunnels	2	18	2½	3	270	
Abutments above	2	17½	2	1	70	
Face walls [illegible] parapet	2	11½	1½	5	172½	
Retaining wall at the end of Parapets	2	5¾	1½	1½	25	
Irrigation Channel wall on the west	2	30	1½	3¼	292½	
Retaining wall at the end of Bank	1	73	2	6	876	
Do Do at the end of East Channel	1	17	1½	6½	166	
				Total Cft	11948	11948

1878/79

to

Head of Service — Famine Relief

Fund — Ordinary

Class — Original

Major Head — Communication

Sub head — Canal

Name of Work — Construction Irrigation Channel Supply 25th

St in Mortar

Flooring of Weir	1	25½	9	2	459	
	1	26	12	2	624	
Retaining walls of Do	1	61	1½	2	183	
Canal flooring	1	28½	20	1½	855	
Revetment & Slopes	2	18	17	1½	918	
Do Do	2	12	5	1½	180	
Retaining Wall & Revetment	2	25	1½	3	225	3444½
				Total Cyds		128

Plastering

Exterior of Well Superstructure	2	12	•	12	288
Sides of Do Do	4	25	•	6	600
Parapet Wall above	2	42	•	11	924
Outlet Channel Walls	4	28	•	12	1344
Walls interior	2	28¼	•	15	848
Silt Trap	1	38	•	4	152
Irrigation Channel Walls East	2	72		4½	648
Do Do Do West	2	30		4½	270
Face Wall of Tunnels	2	12		8	192
Retaining Walls at end of Parapet	2	5¾		4½	52
Do at end of Branch West	1	66		4½	297
Do Do of Inlet Chan.	1	17		4½	76½
		Carried over			5691½

Detail of Work.	Number.	Measurements in Feet. L.	B.	D.	Area or Contents.	Total quantity of each description of Work.
						~~875~~
B-0		—			5691½	51
Deductions						
Pipes of area of	2	area 7			14	
Archway of Tunnel					22	
					36	5655½ = or
		Total Sqs				57.
Granite Slabs						
Well Steps (inside)	14	3	1	½	21	
Grooved Stones (sill)	2	8	1½	½	12	33
			Total Cft			33
Wooden Shutters	2				2	2
Cast Iron Pipe 36" dia 36ft long	1				1	1
Bar Iron Grating to Cistern	1				1	1
Earthwork						
Excavation of foundation trenches	Cyds					2201

Detail of Work.	Number.	Measurements in Feet. L.	B.	D.	Area or Contents.

No. of 1877-78.

Head of Service [illegible]
Fund [illegible]
Class Original Work
Main Head Communications 875/52
Sub-head Canal
Name of Work [illegible] irrigation channel syphon [illegible]

Amounting to Rupees 5390
To be carried out by Public Works Department

Quantity.	Description of Work.	Rate Rs.	A.	P.	Per	Amount. Rs.	A.	P.	Total. Rs.	A.	P.
2111 c.ft.	[illegible] in lime [illegible]		4		c.ft.	527	12				
684 c.ft.	P. Cement Do.		7	6		320	10				
1192	Bricks in Khoa		3			223	8				
30 c.yds.	Rough Boulder stone in [illegible]	4			c.yds.	120					
128 "	Do. also Mortar	3	12		Do.	480					
57 c.yds.	Re-fixing	2	8		c.yds.	142	8				
33 c.ft.	Granite Slabs		12		c.ft.	24	12				
2	Wooden Shutters	50			Each	100					
1	Cast Iron Pipe (36 diam)					485					
100 c.ft.	Arch work in Tunnel		4		c.ft.	25					
2200 c.yds.	Earth work (Excavation of foundation) &c.		4		c.yds.	550					
2	Bar Iron grating to Cistern	35			Each	70					
	Sundries @ 5 per cent					30[illegible]					
	Total Rupees					5390					

[illegible] Major R.E.
Executive Engineer B. & W. I.

R. W. Thompson
Major R.E.
Dist. Engr. Presidency

Quantity	Description of Work	Rate		Per	Amount	
		RS.	A. P.		RS.	A. P.

antity.	Description of Work.	Rate.		Per	Amount.		Total.	
		RS.	A. P.		RS.	A. P.	RS.	A. P.
					875/53			

No. of 1877-78.

375/54

Head of Service Famine Relief
Fund Ordinary
Class Original works
Main Head Communications
Sub-head Canals
Name of Work Constructing an Aqueduct and Over Bridge

Amounting to Rupees 10,220—
To be carried out by P. works Departt

Detail of Work.	Number.	Measurements in Feet. L.	B.	D.	Area or Contents.	Total quantity of each description of Work.
Concrete (Surkhee)						
Filling of wells (Rest)	4	28¼		4	462	
D° between wells	2	6½	5½	3	136½	
D° D° D° abutts	8	1½	1	3	36	
Bed to East Channel	1	66	8	2	1056	
D° D° at End	1	8	13	2	208	
Filling between Ceiling and Channel walls	2	8	1	2	32	
Bed to Wing Wall on the (west)	2	20½	2½	½	51	
D° to Retaining Walls at Lower slopes (East end)	4	21½	1½	½	64½	
Bed to Retaining Walls to Upper Slope west	2	21½	1½	½	32¼	
Bed to West Channel	1	90	8	2	1440	
D° to West Retaining Walls on the west	1	74	1½	½	55½	
	1	79	1½	½	60	
	1	16½	1½	½	12	
Cap of Retaining Walls at the End of west	1	13½	1½	½	10	
					Total cft	2646
Concrete Portland Cement						
Filling of wells	4	28¼		3	339	
					Total cft	339

Detail of Work	Number	L.	B.	D.	Area or Contents	Total quantity of each description of Work
Break in Portland Cement						
Pier walls	4	28½		2	226	
					Total C ft	226
Break in Surkee Mortar						
Returning walls in front of Piers	2	16½	1¼	3	74½	
Do Do at Ends	4	6	1¼	3	24	
Intercepting Arches in rear of walls	2	7½	7½	½	57½	
Piers up to Top Pitter level	2	15	5	7	1050	
Arch work	2	7½	8	1¼	150	
					1365¾	
Deduct Arch & Centring					187½	
					Total C ft	1178
Break in Chunam						
Piers above Top Pitter level	2	14	4	8	896	
Do Do up to Coping	4	4½	3	1½	81	
Coping above Piers	4	3¾	4	¾	45	
Returning walls on Lower slopes	4	21½	1½	2½	322½	
Do Do Upper Do walls	2	21½	1½	4¼	274⅛	
Do Do of Weir	1	74	1½	5	555	
Wing walls up to Trough	1	79	1½	5	592½	
Receiver on the West	2	20¼	2	7½	607½	
Wing walls above up to Cornice	4	10	2	4	320	
Abutment walls up to Trough	2	9½	2	¾	28½	
Do Do up to Girders	4	2¼	2	3¾	67½	
Drop walls Do Do	4	2	2	4	64	
Channel Do on the western side	2	90	1¼	[illegible]	728⅛	
Returning walls at the end	1	16½	1½	2½	61⅞	
of Weir	1	13½	1½	2½	50⅝	

Detail of Work	Number	L.	B.	D.	Area or Contents	Total quantity of each description of Work
Parapet Pillasters on Abutments	4	2	2	5¾	92	
Do Do at End of Wings	4	1½	1½	4¼	38¼	
Heads with Coping to Pillasters	4	2¾	2¾	¾	22 11/16	
	4	2	2	¾	12	
Pillasters over Weir	4	1½	1½	3¾	33¾	
Coping to Pillasters to Do	4	2	2	¾	12	
Parapets with Coping	4	16¼	1½	3½	341¼	
	1	80	1¼	4⅝	462½	
Channel walls on the East side	1	69	1¼	4⅝	398 29/32	
					Total C ft	6307½
Plastering						
Piers	2	38		16	1216	
Parapet walls	4	10		4	160	
Side walls of Channel	2	153		4⅓	1326	
Pedestals	8	8		6	384	
Weir Parapets	2	127		6	1524	4666
					Total Sq ft	46
Rough Granite stone Work						
Templates below Trough	2	6	4	½	24	
Do	2	6	5	½	30	
Do Below the Road Girders	4	2	1½	½	6	
					Total C ft	60
Rough Boulder stone in Surkee						
Weir Apron Face walls	2	97	2	3	1164	
Do first Revetment	4	15	1½	7	630	
Toeing wall to Revetment	4	34½	1½	3	621	2415
					Total C ft	89
Rough Boulder stone in Chunam Works						
Toe walls	1	67½	5	1½	356	
Wider Revetment	4	47½	2	7	665	
					1021	

Detail of Work.	Number.	L.	B.	D.	Area or Contents.	Total quantity of each description of Work.
Inlet Apron			[illegible]	[illegible]	[illegible]	
Cross Section	1	57	[illegible]	[illegible]	[illegible]	
Floor [illegible]	1	35	30	[illegible]	1050	
Do [illegible]	1	35	30	[illegible]	1050	
[illegible]	2	[illegible]	[illegible]	[illegible]	245	
Boulder stone [illegible]	1	[illegible]	[illegible]	[illegible]	3579	16431
						Cft
Stone [illegible] Cft						275
Do [illegible] Do						125
Wood work						
Girders						
Hand posts to Roadway	2	54	[illegible]	1	112	
Upper and centre Hand Rails	[illegible]	[illegible]	[illegible]	[illegible]	16	
Joists for Roadway	4	78	⅓	⅓	26	
Do Do	16	15	½	⅔	66⅔	
Standard for supporting Trough	17	10½	½	⅓	49½	
Joists Do	34	4	⅓	⅓	[illegible]	
Side planking Do	20	11	⅓	⅓	48⅔	
Bottom Do	2	80	6½	6	106⅔	
Rail posts Do	1	80	6¾	½	95	
Top and Centre Hand Rails	34	4	⅓	⅓	10⅔	
Girders for Do Inner	4	28	⅓	¼	9⅓	
Bridge Do over	4	28	½	⅓	37⅓	
			Total	Cft		164⅔
Single wood						
Joists for supporting approaches	38	6	¼	½	28½	
Do Do	22	10	⅓	½	36⅔	
			Total	Cft		65⅓
Planking [illegible] 3" thick						
Roadway over Canal	1	80	10½		840	
Channel	1	94	6		564	
Do Remainder of	1	40	7⅓		293	
Do Over weir	2	29	10		580	
			Total	Sft		2277

Detail of Work.	Number.	L.	B.	D.	Area or Contents.	Total quantity of each description of Work.
						275/56
Iron fitting &ca for Road Trough						Rs 1000
Painting						
Girders	2	78	.	3⅓	520	
Hand Rail posts	32	4	.	1⅓	171	
Upper and Centre Rails	4	76		1⅙	355	
Joists	16	15		1⅓	320	
Do	17	10½		1⅓	238	
Trough Standard	34	3¾		1⅓	170	
Joists supporting Trough	20	11		2	440	2214
					Total Sqr	22 Sqr
Tarring						
Roadway planking	2	80	10½		1680	
Do approaches	4	60	7		1680	
Do Remainder of	1	40	7⅓		293	
Over weir	4	29	10		1160	
Trough interior	1	80	13½		1080	5893
			Total		Sqr	59
Brick wells 6ft diam 9ft depth	4			9	36	36
Cornice work Rft					270	270
Earthwork Excavation 1/100 Cft					500	500

Detail of Work.	Number.	Measurements in Feet L.	B.	D.	Area or Contents.

No. of 1877-78.

Head of Service Famine Relief 875/57

Fund Ordinary

Class Original works

Main Head Communication

Sub-head Canal

Name of Work Constructing an Aqueduct and One Bridge

Amounting to Rupees 10220

To be carried out by P. Works Department

Quantity.	Description of Work.	Rate. RS.	A.	P.	Per	Amount. RS.	A.	P.
3646 cft	Concrete Soorkee	.	4	.	cft	911	8	.
339 ,,	Do Portland Cement	.	8	.	,,	169	8	.
226 ,,	Brick in Do Do	.	7	6	,,	105	15	.
1178 ,,	Do in Soorkee	.	4	.	,,	294	8	.
6307½ ,,	Do in Chunam	.	3	.	,,	1182	10	6
46 sft	Plastering	2	8	.	sft	115	.	.
60 cft	Granite stone	.	12	.	cft	45	.	.
89 Cyd	Rough Boulder stone in Soorkee	4	.	.	Cyd	356	.	.
275 Cyd	Do Do in Chunam	3	10	.	Do	1001	4	
132 Do	Do Do work	3	.	.	Do	396	.	
698¾ cft	Teakwood work	3	2	.	cft	2199	2	.
65½ cft	Junglewood work	2	.	.	Do	130	6	.
2277 sft	Planking (?)	.	7	.	sft	996	3	.
	Iron Fittings &c					1000	.	.
22 sft	Painting	3	4	.	sft	71	8	.
59	Tarring	.	12	.	Do	44	4	
36 sft	[illegible]	8	.	.	[illegible]	288		
27	Cornice work	2	[illegible]		Do	52	3	
500 Cyd	Earth work	.	4	.	1000	125		
	Sundries & Contingencies					246		6
	Total					10220		

Executive Engineer

Quantity.	Description of Work.	Rate.			Per
		RS.	A.	P.	

Quantity.	Description of Work.	Rate.			Per	Amount.		
		RS.	A.	P.		RS.	A.	P.
		875/58						

No. 1063.

3rd Circle
~~Chingleput~~ Superintending Engineer's Office,
Saint Thomas' Mount, 26 Feb 1879
Despd. 3rd March

875/59

From

THE SUPERINTENDING ENGINEER,
~~Chingleput~~ 3rd Circle.

To

The Chief Engineer
Public Works Department.

Sir,

With reference to your Memorandum No 593, dated 10th February 1879 I have the honor to inform you that the Executive Engineer Buckingham Canal, reports that the estimated amount to be paid for compensation for lands taken up for the Canal in the Nellore District is about Rs 55,000 and that he has submitted certain Bills amounting to Rs 20000 to the Examiner for adjustment but that as per advice received from the latter officer the sum of Rs 4671 would appear only to have been disbursed ing the Office

I have the honor to be
Sir
Your most obedient servant

Major R.E.
Asst Depy Engineer for Archer

From the Supt. Engr.

No 1063

Dated 26th Feby/79
Recd 3rd March

Compensation for land taken up for the Canal in the Nellore District

Reports that the Ex. Engr. Buckingham Canal has submitted bills amounting to Rs 20000 to the Exr of P.W. Accounts

2792

P3

875/61

FROM THE EXAMINER, P.W. ACCOUNTS,
MADRAS.

TO THE SECRETARY TO GOVERNMENT,
PUBLIC WORKS DEPARTMENT,
GENERAL BRANCH.

NO: 482.W. CHEPAK, 6 MARCH 1879.

SIR,

IN CONTINUATION OF MY OFFICE NOTE OF THE 11TH. INSTANT, RETURNING PRESS PROOFS OF THE REVISED BUDGETS FOR EXPENDITURE DURING THE LAST THREE MONTHS OF THE CURRENT OFFICIAL YEAR 1878-79, AND ADVERTING TO THE PROVISION THEREIN MADE OF RS.50,000 TO DEFRAY EXISTING LIABILITIES ON ACCOUNT OF THE BUCKINGHAM CANAL, I HAVE THE HONOR TO STATE THAT FROM G.OS. LATELY RECEIVED AND SUMS AUDITED ON ACCOUNT OF COMPENSATION FOR LAND IN CONNECTION WITH THAT WORK, IT IS PROBABLE THAT A FURTHER SUM OF RS.78,000 AS PER MARGIN WILL HAVE TO BE PROVIDED IN THE REVISED BUDGETS FROM PROVINCIAL FUNDS, PROVIDED THE COMPENSATION IN QUESTION HAS BEEN OR WILL BE DISBURSED BY THE CIVIL DEPARTMENT BEFORE THE CLOSE OF THE CURRENT OFFICIAL YEAR.

(1). BILLS PASSED FOR THE NELLORE DISTRICT PRIOR TO 31ST. DEC. 1878 NOT YET TRANSFERRED BY THE ACCOUNTANT GENERAL, MADRAS...RS.34,297.
(2). VIDE G.O. NO.461.F.R. OF 24TH. FEBRUARY 1879..........,, 41,635.
(3). DO NO.415.W. OF 10TH. FEBRUARY 1879..............,, 2,294.

RS.78,226.

5. I WOULD THEREFORE RESPECTFULLY SUGGEST THAT IT MAY FIRST BE ASCERTAINED FROM THE ACCOUNTANT GENERAL, MADRAS TO WHAT EXTENT THE COMPENSATION HAS ALREADY BEEN PAID, AND PROVIDE FUNDS TO THAT EXTENT IN THE REVISED PROVINCIAL BUDGET, THE PAYMENT OF THE BALANCE BEING DEFERRED UNTIL NEXT MONTH (APRIL) TO THROW THE CHARGE ON THE BUDGET FOR 1879-80.

I HAVE THE HONOR TO BE,

SIR

YOUR MOST OBEDIENT SERVANT,

L. Conway-Gordon

EXAMINER, P.W. ACCOUNTS & MAJOR R.E.

FROM THE EXAMINER, P.W. ACCOUNTS,
MADRAS.

TO THE SECY. TO GOVT. P.W.D.
GENERAL BRANCH.

No. 480, A.

DATED [illegible] MARCH 1879.

RECD.

INFORMS THAT A PROVISION OF PROVINCIAL FUNDS TO THE EXTENT OF RS.20,000 WILL PROBABLY BE REQUIRED FOR LAND COMPENSATION IN CONNECTION WITH THE BUCKINGHAM CANAL BEFORE THE CLOSE OF 1878-79.

277B

Famine Department

Fort Saint Georg
Accountt. Genl's Offic
15th March 187

3/27 No. 1087

From
A. Cotterell Tupp Esqre
Offg. Accountant General
Madras.

To
The Secretary to Government
Public Works Department
Fort Saint George

Sir,

In reply to your memo. dat the 12th & 15th Instant I have the hono to state that the amount paid up to February last on account of Compen-sation for lands taken up is Rs. 198,064-5- for the Junction Canal & Rs. 31,735-4-11 for the Buckingham Canal. The latter sum is made up of Rs. 273-3-11 dis-bursed at the Presidency & Rs. 31,462-1- by the Collector of Nellore.

2 I have telegraphed to the Collecto of Nellore to report by telegraph at onc the amount he has paid during the current month.

3 The Enclosures received with the above are herewith returned.

I have the honor to be
Sir
Your most obedt. Servt.

A. Cotterell Tupp

Offg. Accountt. General

nue Dept

Fort Saint George

No. 118

Acctt. General's Office

83/64

15th March 1879

From

The Offg. Accountant General

Madras

To

The Secretary to Government

Public Works Department

Sir,

In continuation of my letter of [illegible] dated the 1st instant, I have the honor to state that the Collector of Nellore reports that no compensation for lands taken up for the Buckingham Canal was paid during this month.

I have the honor to be

Sir,

Your obedient servant

Offg. Acctt. General.

1790

Revenue Department

Proceedings of the Madras Government

Read the following lette
from the Collector of Madras, dated
10 March 1879, No 82.

827/65

With reference to Government
Order, No 461, dated 24th February 1879.
I have the honor to point out that
the further sum likely to be expended
hereafter on account of land
compensation is Rs 41,935 and not
Rs 41,635 as quoted in the Government
Order. This will make the total
amount Rs 239,999-5-5 instead of
Rs 239,699-5-5

Vide paras 2 & 3 of this office letter No 380 of 20 Decr 1878.

Order thereon 20 March 1879. No 1124

The figures 239,699-5-5 and 708,619-5-5
will be altered to 239,999-5-5 and
708,919-5-5 respectively in G.O. 24th February
1879, No 461

(True Extract)

Actg Under Secy to

To The Public Works Department

2776

Urgent

875/66

GOVT. OF MADRAS } 1879. { P. W. DEPT.

SECRETARY.

Fort St. George, 15th March 1879.

OFFICE NOTE

To C.

Please see the enclosed letter from P.

It would appear that Rs 1,98,064-5-5 have been debited to the P. W. D. in the Civil Exchange Accounts up to February 1879, on account of payments made for land taken up for the Junction Canal, and Rs 31,735-4-11 for the Buckingham Canal, in the Nellore District, and at the Presidency.

2. Please state how much of these amounts has been already adjusted, and how

OF 187

have much remains to
be adjusted in the P.W.
accounts for 1878-79.
2. On receipt of this
information, the necessary
action will be taken in
regard to the adjustment
of [illegible]

S.B. W.

15/3

TO (B.

RS.1,0[illegible] REFERRED TO ABOVE ON ACCOUNT OF LANDS TAKEN UP FOR THE [illegible] CANAL HAS BEEN ADJUSTED IN THE P.W.EXCHANGE ACCOUNTS FOR JANUARY 1879.

2. WHILE TO THE EXTENT OF RS. 30,567-0-0 ON ACCOUNT OF LAND TAKEN UP FOR THE BUCKINGHAM CANAL

875/67

[illegible] ADVISED YESTERDAY FROM THE ACCOUNTANT GENERAL, MADRAS, WITH HIS EXCHANGE ACCOUNTS FOR JANUARY 1879. THIS AMOUNT WILL ACCORDINGLY BE ADJUSTED DURING PROGRESS OF MARCH 1879. THE DIFFERENCE RS.1,197-15-[illegible] HAS NOT BEEN DEBITED TO THIS DEPARTMENT BY THE CIVIL DEPT. UP TO THE PRESENT, BUT IT MAY BE ADJUSTED IN THE EXCHANGE ACCOUNTS FOR PROGRESS OF MARCH 1879.

23/3

19/3

[illegible]

No. 875 W Public Works Department

PROCEEDINGS OF THE MADRAS GOVERNMENT.

Under date the 22nd March 79

27/64

Read the following :—

Pro: of Govt. in the Rev. Dept. (No. [illegible] dt. 26th July 1879)

Letter from the Supdg. Engineer Third Circle } (" " 1063 " 5th March ")

" " the Ex. P. W. Acctt. (" " 488 W " 10th " ")

" " the Accountant Genl. Madras } (" " 1087 " 13th " ")

" " do do (" " 1116 " 18th " ")

Pro: of Govt. in the Rev. Dept. (" " 924 " 20th " ")

The Government observe that of the sum of Rs 41,935, due on account of compensation for land taken up for the Buckingham Canal, payments to the extent of Rs 31,735, made by the Civil Deptt. and

debited in the accounts
to the Public Works Dept
now to be adjusted
in the books of the Govern
for the official year
1878-79.

2 They resolve therefore
to appropriate the entire
available balance at
the credit of the Revenue
Fund to meeting these
charges. The amount so
available being Rs 17,208
only the remainder Rs
14,535 must be held over
for adjustment in the
accounts of 1879-80

Imperial	16,9[illegible]
Provincial	299
General	18
(Balance Revenue)	17,2[illegible]

To the Secy Govt N.W.P. & Oudh
[illegible] Revenue Dept

17

PUBLIC WORKS.

Inwards

No. 277

Buckingham Can
Appropriation from the
[illegible] on account of
[illegible] for land
[illegible] for the