

(1) Number of pages _____

(2) Date of repair _____

(3) Initials of the Referencer _____

MADRAS RECORD OFFICE.**Government of Madras.***Public Works* **DEPARTMENT.**

G.O. No. 544	Press ~~Mis.~~
477-72	
Dated 24-8-	1871.

Not to be folded or roughly handled

I

*Proceedings of the Madras Government, Public Works Department,
24th February 1871.*

No 497. Read the following letter from the Superintending Engineer, 2nd Division, to the Chief Engineer for Irrigation, dated Camp at Ongole, 23rd January 1871, No. 147 —

I HAVE the honour to forward the estimates for the repair of the anicut across the Pennair at Nellore modified as desired by you, also a letter from Major Clay on the subject of the rates

- 2 Plans
1 Detailed and Abstract Estimate, with two accompaniments, Rupees 57,500.
1 Major Clay's letter, No 282, dated 7th January 1871

2. I am now on my way to Nellore, and propose, during the next two months, to pay frequent visits to the work in progress, and shall pay attention to the matter of cost

3. The amount of labour being much limited and the necessity for getting this work done quickly great, we shall be obliged to stop many other repairs and consequently may perhaps have sufficient means for the current year, but of this I shall be better able to judge in a few days more.

From Major A D CLAY, Executive Engineer, 1st or Nellore Range, to the Superintending Engineer, 2nd Division, dated Nellore, 7th January 1871, No 282

I HAVE the honour to reply to your memorandum, No 569, dated 21st December 1870.

2 The stone in stock (paragraph 2 of above) amounts to cubic yards 4,999 and costs Rupees 1-0-5 per cubic yard, total Rupees 5,129-2-11, this being already paid for has not been included in my estimate, but, as it must be re-placed for future contingencies, I have entered a lump sum of Rupees 5,000 as representing 5,000 cubic yards, at 1 Rupee per cubic yard

3 I am reducing the estimate, as pointed out by Major Mullins, but I may be permitted to remark that his data is founded on his knowledge of rates and prices ruling in Nellore upwards of six years ago for instance, he rates* a man-cooly at 2 Annas, whereas he commands 0-2-6 and sometimes as much as 3 Annas in all parts of the Nellore Talook and at Survapully and other places where labour is scarce and the demand considerable

* Not for the apron work or for quarrying, as 2½ Annas were paid in former years for the coolies at the apron packing, and, I think, more to some of the quarrymen (Signed) J M

4 Major Mullins remarks that the packing was before done at 4 Annas per cubic yard, but the work of re-packing, as actually now in progress, costs 6 Annas, and this is not excessive when it is remembered that these stones are of large size and weight, and have been washed down a considerable distance† and cast in confusion in heaps, from which they have to be disengaged and worked up to site by crowbars, etc, at great labour.

† I admit the force of this reason (Signed) J M

5 The data for "rubble stone from quarry to site of work" has been corrected, as (per errorem) loading and unloading was twice charged for

6 The item for quarry rubbish has been reduced as pointed out.

7 I do not think much of the old iron work will be brought into use in the new shutters, as we shall use‡ thicker iron in the new ones and also stouter timber.

‡ Not necessary I think (Signed) J M

8 The amounts entered by Major Mullins for "excavation and baling" will, I am confident, be found altogether inadequate The excavation of old ruined work to lay new foundations of present

*Proceedings of the Madras Government, Public Works Department,
24th February 1871*

retaining wall is now costing Annas 2 and 9 Pice per cubic yard, while to build the new retaining walls we shall have to remove strongly packed rubble stone and go 6 feet below water-mark,* the additional 3 Pice will not, therefore, be found excessive. In regard to baling I am of opinion that my estimate of Rupees 3,000 will be found nearer the actual cost than Rupees 2,000.

(Signed) J M

Height of Water in front and in rear of Anicut during floods in October 1870

Month and date	Time	ANICUT			
		Front		Rear	
		Feet	Inches	Feet	Inches
20th October	6 A M	9	9	1	2
21st "	6 P M	11	0	3	0
22nd "	6 A M	14	6	7	6
22nd "	6 P M	21	6	14	0
23rd "	6 A M	20	6	13	0
23rd "	6 P M	19	3	11	9
24th "	6 A M	18	4	10	9
24th "	6 P M	16	4	9	3
25th "	6 A M	15	4	8	9
25th "	6 P M	14	8	8	0
26th "	6 A M	14	1	7	6
26th "	6 P M	14	0	7	5
27th "	6 A M	13	6	6	9
27th "	6 P M	13	0	6	0
28th "	6 A M	13	10	6	9
28th "	6 P M	12	11	5	9
29th "	6 A M	12	4	5	3
29th "	6 P M	12	0	5	0
30th "	6 A M	11	6	4	0
30th "	6 P M	11	4	3	6
31st "	6 A M	11	2	3	4
31st "	6 P M	10	9	2	9
	6 A M	10	7	2	6
	6 P M	10	5	2	6

NELLORE,
9th December 1870.

(Signed) A D CLAY, Major,
Executive Engineer, 1st or Nellore Range

No. 497 A.

No 35.

NOTE by the Chief Engineer for Irrigation

At the beginning of December I visited Nellore and inspected the damage sustained by the anicut across the Pennair. Except at the two ends the greater part of the rough-stone apron has been more or less disturbed at some point between the front wall and the tail; but the location of the damage varies greatly, and I was unable to deduce from an examination of the work any clear idea as to the cause of the damage, beyond the evident fact that in all directions the surface stone had been unable to resist the action of the water. The general section of the work is shown in the tracing marked A, and this exhibits also the two additional longitudinal retaining walls, which I propose to insert to bind the rough-stone work, and prevent the spread of damage, should any portion of the surface be in

*Proceedings of the Madras Government, Public Works Department,
24th February 1871.*

the future disturbed. I do not see anything faulty in the section it is far stronger than most anicuts of this class, and for ten years not a stone hardly was displaced. The tail of the apron has nowhere been materially disturbed, and, therefore, the damage was not occasioned by any gradual displacement from the tail upwards. I noticed, however, that the bed of the river below the anicut has been much lowered* since the anicut

* About 5 feet

was first built, some fifteen or sixteen

- years ago, and this may, in some measure, account for the great difference of level of the water above and below the anicut, which is exhibited in the appended statement. The figures therein entered are not, I think, absolutely correct, for the differences should be smaller for a falling than for a rising fresh, and, to take an instance, the observations on the 26th at 6 A.M and 6 P.M show a difference of 6 feet 9 inches in the morning and of 7 feet in the evening, when at the latter time the water was 6 inches lower above the anicut than at the former hour, and on the 25th, moreover, when the river was still higher, the difference was only 6 feet 7 inches. If the measurements below the anicut are from under-sluice sill as the datum, and this is that used for the upper water, it is clear to me that the conditions of the river have greatly altered, and that where, in former years, there would have been but a small difference of level, and hardly any action consequently on the work, both are now very considerable.

2 I am nevertheless much surprised that any damage should have occurred above the second retaining wall, for there the stone was of very large size and, as far as I could judge, very well packed. I can only suppose that, in places, a few stones were not properly secured, and that the removal of these enabled the water to overturn the larger stones also, some of those moved are between 1½ and 2 tons in weight. Some of the destroyed retaining wall was knocked away bit by bit by the stones striking against it as they were rolled down, other parts were undermined and fell over. The tracing marked B. gives sections where the damage was most considerable, and it indicates sufficiently clearly its nature and extent, but the general section is incorrect; that marked A, which was taken from the original section on which the anicut was built, is the proper one.

3. Below the second retaining wall the stone was intentionally smaller than above this line, and here it will be proper to use much larger stone in carrying out the repairs.

4 The following arrangements are those which appear to me to be likely to render the anicut more secure for the future —

1st.—The damaged parts of the first and second retaining walls to be rebuilt, where before of rubble masonry, the upper yard, if more has been destroyed, to be of laterite masonry.

2nd—Two additional retaining walls, at distances of 30 and 63 feet from the second retaining wall, to be built 6 feet in depth from the surface, the lower half to be in rubble masonry and the upper half in laterite.

3rd—All the apron above the second retaining wall to be carefully re-packed where necessary; the surface stones to be placed with their greatest length at right angles to the slope, and this length to be nowhere less than 3 feet. After these stones have been packed, commencing from each retaining wall and working

upwards, the interstices to be filled in with small stone, well jammed in with crow-bars, and then the smaller spaces, which will still remain, to be grouted with concrete up to 3 inches below the general surface of the apron.

4th.—The aprons between the second and fourth retaining walls to be similarly treated in every respect

5th.—The apron below the fourth retaining wall, for a distance of 40 feet, or to the foot of the slope, to be carefully packed with surface stones $2\frac{1}{2}$ feet deep, and the interstices to be filled, as in the upper aprons, except that the concrete will not be required.

6th.—For the outer apron, 60 feet wide, smaller stone will suffice, and it also should be carefully packed

5 The flooring of the northern under sluices sustained some damage, the repair of which is provided for in the estimate; the stones of the laterite masonry should be carefully fitted, and the stone itself should be the hardest procurable. It is difficult to account for the damage here, for laterite work at Nellore is generally indestructible except by undermining, and there was no evidence of any such action at the time of my visit.

6 The shutters of several of the vents of the auxiliary head-sluice were forced in owing to a mistake in the way in which they were put together, the planks being vertical instead of transverse. Such a mistake should not have been made, and it is fortunate that the accident did not result in extensive damage to the delta canals and to the lands commanded by them. The drawing of the shutters, as given in Irrigation Series No 2, is somewhat misleading, but a moment's reflection would have demonstrated the weakness of shutters, the resisting power of which depended upon the joints and the iron-lifting straps. The wonder is that the whole were not forced in directly the river rose. The screw gearing of these shutters is efficient, and it is kept clean and in good order

7 The estimate for repairs amounts to Rupees 59,500, inclusive of 11,000 Rupees for re-laying the tramway and of Rupees 10,000 for stone for future contingencies, against 4,999 cubic yards of old stock stone taken for the repairs, the value of which was Rupees 5,129-3-0. As the tramway will be taken up after the repairs have been executed and the new stock deposited on the north bank of the river, and as a stock of about 10,000 cubic yards will obviate the necessity for re-laying the tramway for many years, this expenditure may be allowed; but it should be treated separately from the repair estimate, as it will be used for repairs in future years, and, in the meantime, should be considered as a stock advance. The repair estimate will then be

Deduct for new stock

Add for stone from old stock used

Rupees	59,500
"	10,000
"	49,500
"	5,130
	54,630

8. The estimate, as originally submitted to the Superintending Engineer, was based upon much higher rates than those now entered. I had an opportunity of discussing them with the Superintending Engineer, and they have been assimilated generally to those in force when the re-construction of the anicut was carried out and when the rates of labour, etc., were the same as at present. The rate for packing stone is still, however, about 50 per cent higher than it was formerly. The quantity of concrete used should be carefully ascertained, I think that allowed in the estimate is excessive, as I roughly calculate that 4 cubic yards would be required for every 144 square yards of apron, whereas 24 cubic yards are entered for that area

9. It may be convenient to add here a few observations on the works connected with the anicut which I inspected.

Survapully Channel—This canal is generally in fair order, but in places the slopes are much cut up, this being due, in a great measure, to want of care when the channel was first cut many years ago. The new bridge on the Nabobpetta road is an excellent piece of work. The iron aqueducts have been well built and are effective, and in one place a combination of a high and low-level channel has been well carried out these works require a little attention to stop leakage at the junctions of the iron and masonry. Nothing has been done as yet towards increasing the capacity of this canal, but it is intended to commence work as soon as possible. The estimate allows for pitching the first mile of the channel on both sides, the rate being Rupees 1-2 0 a cubic yard. It is not possible to execute the work even with rough stone (quartz) at this rate, and I think such stone would be of comparatively little use, and the work would be costly to maintain, laterite must, therefore, be used, and, as the estimate will not admit of the mile on both sides being carried out, the best plan will be to begin on the left bank, which is that which, near the head, is exposed to the force of the current. the cost will be—

	RS	A.	P.
Cutting or quarrying stone	1	2	0
Cartage, 6 to 9 Annas, say	0	8	0
Building ..	0	8	0
Rate per cubic yard ..	2	2	0

Encroachments—I observed that some Yenadies' huts have been built upon the spoil banks near the storeyard, the banks having been cut down to form a platform. Such practices must not be allowed. The Yenadies should be directed to remove at once from within the boundaries of the land belonging to the channel, and similar encroachments elsewhere should be prevented. No interference or trespass of any kind should be permitted, and all the establishments employed in the delta should understand that it is their duty to report every such trespass, and that, if they fail to do so, they will be liable for any expenses incurred in making good damage, or in ejecting squatters.

Jaffer Saib Head-sluice—This is a well-constructed laterite sluice of five vents of 6 feet each. It is at the bifurcation of the Jaffer Saib and Survapully channels, and it is a pity that gate instead of baulk shutters were not allowed, as the registration of the supply admitted to the channel is not now ascertainable with accuracy from gauges at the sluice.

*Proceedings of the Madras Government, Public Works Department,
24th February 1871.*

Head-sluiice and Surplus Sluice near Kanupurtipad—These are of brick masonry, and the bricks are indifferent. The laterite masonry of the works built of that material is excellent.

The *Survapully Channel* from the above head-sluiice seems to be on rather too high a level, but it was doubtless so arranged with reference to the great depth of water, 10 feet, which this channel is to carry. Parts of it are to be single banked to admit the drainage of the country above. The levels of the irrigation sluices to be built in the left bank have not been indicated in the papers connected with the project—they are being built with their sills some feet above the bed of the channel, and this, though inconvenient, is hardly avoidable, as the cutting of the branch channels would otherwise be very heavy, and would cost far more than the provision in the estimate. It appears to me that a better arrangement would be to take off a channel near the head (Kanupurtipad), which might be run at a fall of 1 foot a mile, and in say $2\frac{1}{2}$ feet cutting, with a depth of water of 3 feet, to irrigate all the land between the head and Amakapilly. Apparently there are 4,000 acres to be irrigated, and the allowance is Rupees 9,000, which would probably suffice. The fall of the channel is 9 feet 11 inches in $7\frac{1}{2}$ miles, and it is for the most part in heavy cutting. Near the lower end, a dam or bar should be built across the channel, at some point where the soil is rocky, with the crest at such a level that with a full supply the water-surface may be maintained at its normal level, otherwise, when the *Survapilly Channel* is low, the velocity in the channel would be excessive and the water-surface will be unduly depressed, so that the distribution sluices already built will not get a proper supply. The following are the principal levels—

New head-sluiice near anicut	..	+ 29 49 M. S. L.
Jaffer Saib Head-sluiice	..	29 05
Surplus Sluice, Kanupurtipad	..	19 32
Survapully Head-sluiice, do.	..	24 32
Do Tank surplus weir crest	..	21 59
Full tank level	..	23 59

The full supply at the head-sluiice will be at $24\ 32 + 10\ 00 = 34\ 32$. The bed of the channel, $7\frac{1}{2}$ miles below, is 14 40, and the surface fall, with a free outfall into the basin of the tank, would be much too great, hence the necessity for a regulating weir, which should have a sluice in it for unwatering the channel when necessary.

Survapully Tank—The head-sluiice at the south-west end of the bund for the supply of the Idagully and other tanks is finished, and the channel below it is completed, except a little rock cutting. The masonry of the sluice is good, and the shutters are fitted with screw gearing, which works fairly. There are eight vents 3 feet $\times$ 4 feet, with 1 foot additional for rise of arch.

The tank has five sluices—they are of the native pattern, with platforms and plug holes. Only one hole has been given in each platform, but there is room for two holes, and for enlarging the existing holes if requisite. All these sluices are old sluices which have been lengthened. At the north end some additional sluices will be required. Hitherto a good deal of cultivation has been carried on by *vamús* or cuts, which will have to be closed this year

*Proceedings of the Madras Government, Public Works Department,
24th February 1871.*

and I have mentioned to the Superintending Engineer that the new sluices required had better be constructed as minor new works, as they appear to have been omitted from the estimate by an oversight.

The *water-supply* in the tank this year at one time rose to 20 59, or to 3 feet below full tank-level. It was, at the time of my visit, at 17 09, the greater part of the difference having been lost by the breaching of the temporary bunds at the north end, by which water has hitherto been retained. It is a pity that this supply should have been lost, but the works were hardly sufficiently advanced for any precautionary measures to have been successful, and, until the new bund is closed across the old supply channel and the new supply channel opened throughout, a full supply cannot well be thrown in without risk of breaches. This, however, ought to be arranged for in time for the early freshes of 1871.

Revetment—Some of the revetment corresponds with that provided for in the estimate, namely, roughly dressed laterite pitching, built at right angles to the slope, on a backing of gravel and clay elsewhere boulder revetment has been constructed. I think the better description is none too good for the deeper and more exposed parts of the tank. Pits have been cut at the toe of the old revetment, where it would have been better to have left the ground undisturbed.

Earthworks—A great deal has been done, but much remains to be executed: it is difficult to get earth for the bund, there being a wide and rather deep madagu or pool in its rear. At the north end considerable widening and raising have been carried out, but the revetment is as yet uncommenced. The new bund, which is to run westward across the old supply channel, has been about one-fourth done, but here, as elsewhere, the bank has not been thrown up of the full width from the bottom as it ought to have been.

The *Drain* which is to carry off the water falling into the *Survapully Channel*, which latter is in the future to be a main drain, has been cut for about half a mile, or for half the distance to the *Potempád swamp*.

An effort should be made to get on faster with the tank revetment during the current season, as also to complete the whole of the work above the tank. The officer in charge should exert himself to collect labour, which may not be so abundant as to come in from a distance for work, but which, if looked up in the outlying talooks, would probably exceed the requirements of a very much larger expenditure than has been made during the last year; for the outlay was in former years two or three times as much, and there was then no particular difficulty in getting labour, though it had to be collected.

10 *Office Buildings and Workshop at Nellore*—These are much in want of repair, and the necessary repairs should be carried out as soon as possible. A dirty exterior, broken floors, plaster off in places, etc., is not a creditable condition for departmental buildings to be in, and they have a claim to a fair share of the assignments for Civil Buildings. I pointed out that the machinery in the yard should be cleaned from time to time and so preserved. Boilers and heavy machinery do not deteriorate from exposure in the climate of Nellore if properly painted. Many of the small fittings of cranes, etc., were lying about in the yard, and such things should be placed in boxes and labelled, or it will be found that cranes,

*Proceedings of the Madras Government, Public Works Department,
24th February 1871.*

etc, will be useless when they are wanted. The machinery in the shops was very clean and in good order. Major Clay wants a good Foreman to look after the shops. Such a man would be very useful, but I am doubtful whether there would be, constantly, enough work to warrant his employment on this duty alone, and it is difficult to find a man who would be qualified for general, as well as workshop, duties. If, however, the Sungum project be carried out, there will be an abundance of work, and a Foreman will then be indispensable.

11. I rode with the Collector and Major Clay through a part of the delta, and saw portions of the Labúr, Gungapatam, Indakurpett, Idúr Kodúr, and Jaffer Saib channels, all were in good working order. I noticed in some places, and especially on the Idúr Kodúr and Jaffer Saib channels, a great deal of *prichly-pear*, which should be exterminated wherever found on channel banks, and the embankments should then, whenever practicable, be brought into section.

Delta Superintendent — Major Clay thinks that this man, who receives Rupees 70 a month, should get horse allowance in addition. It appears that he has the immediate charge of all the Southern Delta irrigation works and of all the Local Fund roads in the delta, and the length of the latter is about fifty miles. I think the irrigation works alone are a very sufficient occupation for this man, and he should not have anything to do with the roads unless they are on the channel banks. So long, however, as it may be absolutely necessary to keep him in charge of the roads, I would give him horse allowance; but the Superintending Engineer should arrange as soon as possible to relieve him of work which is foreign to his proper duties.

9th February 1871.

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

No 498.

ORDER THEREON, 24th February 1871, No 544.

IRRIGATION, No 30.

THE estimate amounting to Rupees 54,630 for the repair of the damage sustained by the Nellore anicut during the freshes of October last is sanctioned, as also an advance of Rupees 4,870 for providing, with the stone used on emergent repairs and to be replaced, a stock of about 10,000 cubic yards of stone for future repairs

2 The Note by the Chief Engineer for Irrigation will be communicated to the Superintending Engineer, 2nd Division, who will give attention to the instructions therein contained as to the way in which the repairs should be carried out

3 Horse allowance may be passed to the Delta Superintendent so long as he may continue in charge of the Local Fund Roads in the delta, but the Government concur with the Chief Engineer in thinking that his whole attention should be given to his proper duty on the irrigation works of the delta

4. His Excellency the Governor in Council hopes that the progress of the Southern Delta works will be more satisfactory in the current than in the past year. The Executive Engineer should exert himself to procure a sufficiency of

*Proceedings of the Madras Government, Public Works Department,
24th February 1871.*

labour, and a special report should be submitted through the Chief Engineer in September next, showing the exact state of the works, and noticing particularly the quantity of water which the Survapully tank may be capable of retaining, and the condition of the drainage works.

(True Extract.)

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

To the Superintending Engineer, 2nd Division.
„ Controller of Public Works Accounts.
„ Chief Engineer for Irrigation.

Revenue Dept.

Exd. S. T. Augustin.

Govt. of Madras.

PUBLIC WORKS.

To

THE SUPERINTENDING ENGINEER,

2ND DIVISION.

cc. cc. cc.

Dated February, 21st.

Recd.

L. 1.

G O, 21st February 1871, No 54

FEBRUARY

Nos. 437-493

Pennair Anicut at Nellore.—The estimates, amounting to Rupees 59,500, for the repair of the damage sustained by the Pennair anicut during the freshes of October last, sanctioned with remarks

No 147

Superintending Engineer
2nd Div. Camp. Enzole
Valmukhi
23rd January 1871.

From Colonel F. J. Moberly RE
Super Engineer 2nd Div.
To The Chief Engineer for
Irrigations
Madras.

Enclosures

2 Plans -
1 Detailed &
Abstract Estimate
into account.

Rs. 57,500

1. Major Clark's
letter No 202
of 7 January 1871.

4.

Sir. I have the honor to forward
the estimates for the repair of the anicut
across the Pennair at Nellore, modified
as desired by you - also a letter from
Major Clark on the subject of the rates.
2 I am now on my way to Nellore
and propose during the next 2 months
to pay frequent visits to the work in
progress and shall pay attention to
the matter of cost.
3 The amount of labour being much
limited and the necessity for getting this
work done quickly great, we shall be
obliged to stop many other repairs and

Col. R. L.
Supt. Engineer. D. W.

191

31147 J.
 From the rights reserved
 to the Chief Engineer
 for Singapore
 dated 2nd January
 1871
 Recd. 3rd July-71
 No. 147. 3-6 Aug 71
 Enclosures 4.
 J. H. B. 85/71
 Forwarding plan
 & to the Chief Engineer
 for the
 repairs of the
 various ancient
 at Malacca surrounding
 at 31147 59500-

No 282

810

From
The Executive Engineer
1st or Stationary
To
The Superintending Engineer
2^d Division

Sir

I have the honor to reply to your
Memo No 569 of 21st December 70.
2. The Store in Stock (para 2 of above)
Accounts to Rs 4999 and Cost
Rs 1-0-5 per Cys, total Rs 5129-2-11,
this being already paid for has not been
included in my Estimate, but as it
must be provided for future contingencies
I have entered a lump sum of Rs
5000 representing 5000 Cys at
1 Rupee per Cys.

3. I am reducing the Estimate
as pointed out by Major Mullins,
but I may be permitted to remark
that his data is founded on his
Knowledge

Knowledge of rates and prices ruling
in Malacca upwards of 6 years ago;
for instance, he rates a man Cooly
at 2 Annas, whereas he commands
0-2-6 and sometimes as much as 3 Annas
in all parts of the Malacca Salug,
And at Surapalle, and other places
where labour is scarce and the
Demand Considerable.

* not for the above
work or for quarrying
as 2 Annas were
paid in former
years for the above
Coolies at the above
packing and I
think more to come
of the quarrymen
Mr.

4. Major Mullins remarks
that the packing was before done at
4: as per Cyp; but the work of
repacking as actually now in
progress, costs 6: as; and this is
not excessive, when it is remembered
that these stones ^{are} of large size, and
weight, and have been washed
down a considerable distance
and cast in Confusion in heaps,
from which they have to be dis-engaged
and worked up to site by crow bars &c.
at great labour.

I admit the
force of this reason
Mr.

5. The data for "Puddle Stone
from quarry to site of work"
has been corrected (as per error)
loading and unloading was twice
charged -

Charged for.

6. The item for quarry rubbish
has been reduced as pointed out.

I do not think much of the ^{old} iron
work will be brought into use
in the new shutters, as we shall use
thicker iron in the new ones, and also
stouter timber.

necessary
into
Mr.

8 The Amounts entered by Major
Mullins for "Excavation and Baling"
will I am confident be found altogether
inadequate, the Excavation of old
ruined work, to lay new foundations
of present retaining wall is now costing
0-2-9 per Cyp; while to build the new
retaining walls we shall have to

0 - water
will be considered
below under
the floor
Mr.

remove strongly packed rubble stone
and go 6 feet below water mark, then
Additional 3 Pae will not therefore
be found excessive. In regard to
Baling, I am of opinion that
my Estimate of Rs. 3000 will be
found nearer the actual cost, than
Rs. 2000 -

L

(2)
From
The Executive Dept
No 574
1st School Bus
to The Superintendent City
20 Dec
Paid Jan 2 1911
Rand
Dec 202
Due: \$
Returning the
Estimates & Plans for
the Repair of Highways
After Consulting, in
accordance to Mayor
Frederick's Minutes.
W H 6857/1

~~_____~~

1 Detailed & Abstract Estimates with
two accompanying Rs 57500-
as recorded in Sl. No. 544 of 247 & 6 p. 1.

~~Head Clerk.~~

FOR IRRIGATION,
12--10-- 1876.)

The Registrar of the *PA Ltd.*

(13)
 From Off. of Engineer
 501 Bridge St. S. Ga.
 The Chief Engineer
 forwarding them
 perfect.
 Oct 9th December 1871
 Recd — done

Exd. E. C. Shunter.

From the Chief Engr for Irrigation No 35 of 9 February 1871

Public Works Department
No 544
Proceedings of the Madras Government
Under date the 24 February 1871
Read the following

The estimate amounting
to Rs 54,600 for the repair of
the damage sustained by
the Melioration during
the freshets of October last
is sanctioned, as also an
advance of Rs 4,870 for
providing with the stone
used on emergent repairs
and to be replaced a stock
of about 10,000 cubic yards
of stone for future repairs.
The note by the Chief
Engineer for Irrigation
will be communicated
to

157

Parker No 1183 D 28-4-71
1179-23-5-71

6/17/71 2125

2/10/85

Govt. of 1871 Madras.

PUBLIC WORKS.

1st The Superintending Engrs.

2nd Division

W. J. P.

Det. 1

Recd

29

G. O. 24 Feb 71. No. 544.

Nos. 497-498

Repair Account at Bellary. The
estimates amounting to
Rs. 59,550 for the repair of
the damage sustained by
the Murair Account during
the month of Oct. last, have
been sent with remarks.

617 Feb 21 25