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(3) Initials of the Referencer

MADRAS RECORD OFFICE

Government of Madras

Public Works DEPARTMENT

G.O. No. 1070 A — Press
~~B.P. No.~~ — ~~Mis.~~
440 A 440 B

Dated 16 4 1875.

Not to be folded or roughly handled

No. 440A.

Read the following :—

No. 355.

MEMORANDUM.

THE undersigned having visited the Palar anicut on the 8th instant for the purpose of seeing how the work of restoration was progressing, thinks it desirable that the Government should know what progress has been made.

2. The breach, which measures 1,050 feet across, has been ring-bunded. Only sand being available this bund, which is or will be 10 feet high, cannot be relied upon to hold in the event of much water coming down the river, but as the under-sluices on the one hand and the large irrigation channels on the two sides of the river will dispose of small freshes if the season be favorable, the works may be carried on without interruption. The up-stream or west face of the bank has been protected by bamboo tatties and a slight current will do no harm, but a nanel revetment with a few lines of nanel or durbah rollers would be a much better protection. It is intended to form the new crest wall across the gap on a curved alignment on the up-stream side of the position of the former wall, so as to avoid difficulty in getting down the foundations from the presence of debris of the old bridge piers, &c., and this arrangement is a good one.

3. The greater part of the fallen masonry which was near or above the surface has been cleared away, and excavations are in progress on the line of the intended crest wall. No constructive work has been as yet commenced, owing principally to delay in getting bricks, of which up to date only 58,000 had been delivered at the work, but some kilns are reported to be ready. The contractors have not fulfilled their engagements, but in a work of this kind where time is of so much importance, it is generally better not to rely upon contractors, but to establish brick-fields and arrange for turning out the required number of bricks. Three months of the working season have already gone by, and these months are perhaps the most reliable in the year for putting in foundations. A large number of well rings is ready, and bamboo rings will be used as well as wooden curbs.

4. The progress made in the collection of rough-stone for the aprons and of lime is very good, and as regards the stone there is now no risk of any delay arising from want of this material. In order that, should the ring bund be carried way, scour may be prevented, the outer rough-stone apron all across the breach should be laid down as soon as possible, from the lower edge to a line a few feet east of the retaining wall of the masonry apron. There will then be but little risk of any of the new masonry being destroyed by water passing over it.

5. The construction of the foundations of the crest wall will need to be pushed on as rapidly as possible. Until these shall have been completed all across to under-sluice sill level, there will be room for considerable anxiety. The District Engineer has been recommended not to rely upon well sinkers only ; to employ these men as far as practicable for sinking the wells the first 2 or 3 feet, but to have some dredgers for ensuring regular and rapid progress, as well as for rendering that progress not dependent upon well sinkers who are apt to give trouble if they think their services indispensable.

6. As designed the foundations of the crest wall are to be 7 feet of masonry on 6 feet wells, and the lower the level at which masonry can be commenced the better, so

that if found conveniently practicable these details may be adhered to, but should the water level be high, it may be as well to make the tops of the wells a foot or even 2 feet higher. For all the work a mixture of burnt clay and lime should be used to ensure thorough setting as well as strong masonry. The lime used on the original work was excellent, and it is said that that now prepared is of the same kind. Probably $1\frac{1}{2}$ clay to 1 lime and 2 sand will make a proper and efficient mortar, but the exact proportions should be determined experimentally. For the concrete filling of the wells, a larger proportion of burnt clay is likely to be needed.

7. The District Engineer is of opinion that labor will be abundant. Just at present there is not much present on the works.

8. The bricks ought, it is considered, to have been table made, but provided they are of good shape and quality it is immaterial how they may be prepared. The brick masonry of the old work is excellent, and that should be the standard to be conformed to. Even the cut-waters of the under-sluices show but little, if any, sign of wear and tear, and they are unplastered.

9. The District Engineer showed me the estimate, amounting to Rupees 1,46,700, which had been prepared, and which needed only to be examined by him before submission. The rates appeared to need careful investigation, several of them seeming to be very high.

The rates are—

	Rs.
Wells 6 feet deep and $4\frac{1}{2}$ feet external diameter, each	24
Concrete per 100 cubic feet	14
Rubble masonry do.	19
Brick do. do.	18
Rough-stone do.	$9\frac{1}{2}$
Cut-stone, a cubic foot	$\frac{3}{4}$

The estimate or estimates on which the anicut was built should be looked up, and the cost of the several descriptions of work ascertained. Probably data were then prepared, and if current rates of labor and cart-hire be substituted an approximation to the proper rates may readily be arrived at. The rough-stone rate is, it is thought, extremely high; the stone is of the boulder formation principally, and it is said to come from a distance of two miles, so that 9 or 10 Annas per carriage would be about proper, and 4 to 6 Annas for quarrying with 3 Annas at most for packing in the apron. As far as I can judge, therefore, the rate is more than double that at which similar work can be done elsewhere. As already mentioned a large quantity has been brought to the work and so the money has been spent. Rates ought to be determined according to the exact circumstances, and if contractors cannot be found to take up work at a moderate advance upon such rates they should not be employed, but the work should be done departmentally.

Again, supposing that rough-stone must cost Rupees 2-9-0 a cubic yard, the rate for rubble masonry is very high. Given the stone, the rest of the cost would be the value of

2 parahs of chunam.
3 do. of burnt clay.
4 do. of sand.
1 builder.
1 man cooly.
3 small coolies.
Sundries.

Proceedings of the Madras Government, Public Works Department,
16th April 1875.

and at any rate without explanation it is difficult to understand how these can amount to Rupees 2-9-0 a cubic yard.

10. A few stone-cutters were at work preparing apron and coping stones; a maistry capable of lining the stones so as to get plane faces for the joints with a minimum of labor and of waste is much needed. Fine work is unnecessary, but plane faces giving equal and moderately thick joints are essential. The stone-cutters themselves evidently knew not how to set to work, and they were wasting time and stone.

11. The District Engineer has been requested to ascertain and note in his report transmitting the estimate what the fall of the bed of the river is, as this has an important bearing on the width to be given to the outer apron to ensure stability. It seems to be more than probable that this anicut, which stood so well for twenty years failed at last, because with the higher fresh of 1874 and the great velocity due to the fall the water pitched on to the sandy bed of the river beyond the apron, and scoured out the bed to a depth which engulphed first the outer and then the masonry apron.

The highest water levels above and below the anicut before the breach took place, and the highest level below during the fresh with the corresponding level above at the same time, should be shown on the cross section of the weir as it was before the flood.

12. The establishment available for the restoration of this important anicut is by no means such as is desirable. Ensign Smither, the Assistant Engineer in charge, is an energetic officer, but he has his range work to look after, and he must be away a great deal. Such work requires the continued presence of a competent man, and he should be on the work almost from morning until night. It is to me evident already that had a good Executive Officer been posted to this work in the first instance, the 500 or 600 Rupees a-month which he would have been paid would have been money extremely well spent; the Range Officer would have been much more independent of contractors, and more than the officer's pay would have been saved in reduced rates and cost of work. The department is so weak in men of the kind wanted that instead of having half a dozen of them available to take up emergent work by temporary withdrawal from ordinary range duties, it is hard to find one who is not already so fully employed on equally important duties as to be incapable of being transferred. Only men who have been trained on large works, who are accustomed to the management of large bodies of laborers, skilled and unskilled, and who know how to set about the organization of the arrangements for the preparation or collection of materials, are fitted to deal effectively and economically with work which must be carried out rapidly and well. Probably under present circumstances the best plan would be to relieve Ensign Smither of his range work, so that he may devote his energies entirely to the Palar and Poiney anicuts.

13. I understand that Captain Pennycuick's health is such that it is desirable that he should avail himself of the privilege leave to which he has been gazetted, and if Mr. Smither can be relieved of range work, the former's services may perhaps be spared, but otherwise it would seem to be necessary, unless a Medical Officer thinks that Captain Pennycuick should be allowed to go away, for the latter to make the Palar

anicut temporarily his head-quarters, and to be there as much as possible in Mr. Smither's absence.

FORT ST. GEORGE,
9th April 1875.

(Signed) JOHN MULLINS, Lieut.-Colonel, R.E.,
Chief Engineer for Irrigation.

No. 440B. ORDER THEREON, 16th April 1875, No. 1,070-A.

IRRIGATION, No. 51A.
Establishment.

HIS EXCELLENCY the Governor in Council is of opinion that the foregoing remarks of the Chief Engineer for Irrigation on the circumstances of the Palar anicut, and on the progress hitherto made towards the commencement of its restoration, show that prompt measures are needed with a view to the more energetic prosecution of the work, lest serious loss should result from allowing it to continue to form a part of the charge of the Range Officer, who is necessarily obliged to devote the greater part of his time to the general duties of the range.

2. Ensign Smither will accordingly be relieved of his range work by Supervisor Appasawmy Pillay, now in charge of the Palar Bridge Works, which will devolve on Mr. C. Vincent, Assistant Engineer, 2nd grade, who is stationed at Vellore.

3. To enable Captain Pennycuick to avail himself of his privilege leave, Mr. W. B. Leggatt will relieve him of the district charge as soon as possible.

(True Extract.)

Colonel, R.E.,
Secretary to Government.

To the District Engineer, North Arcot.
" Superintending Engineer, Tanjore.
" Controller of Public Works Accounts.
" Chief Engineer for Irrigation.

Exd. W. J. Lewis.
Spare Copies

No 355

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Memorandum

The undersigned having visited the Palar Anicut on the 8th instant for the purpose of seeing how the work of restoration was progressing, thinks it desirable that the Government should know what progress has been made.

2. The breach, which measures 1050 feet across, has been partly bunded off and being available this hundred which is or will be 10 feet high cannot be relied upon to hold in the event of much water coming down the river, but as the under-sluices on the one hand and the large irrigation channels on the two sides of the river will dispose of small freshes, if the season be favorable the works may be carried on without interruption. The upstream or West face of the bank has been protected by bamboo tatties and a slight current will do no harm but a pavel pavement with a few lines of pavel

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the new creek wall across the gap on
a curved alignment on the upstream
side of the portion of the former wall
so as to avoid difficulty in getting down
the foundations from the presence of
debris of the old bridge piers &c and
this arrangement is a good one.

3. The greater part of the fallen
masonry which was near or above the
surface has been cleared away and
excavations are in progress in the line
of the intended creek wall: No construc-
tive work has been as yet commenced,
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6. As designed the foundations of the creek wall are to be 7 feet of masonry on 6 feet wells, and the lower the level at which masonry can be commenced the better, so that if found conveniently practicable these details may be adhered to, but should the

the water level be high, it may be as well to make the tops of the wells a foot or so 2 feet higher. For all the work a mixture of burnt clay and lime should be used to ensure thorough setting as well as strong masonry. The lime used on the original work was excellent, and it is said that that now prepared is of the same kind. Probably 1½ clay to 1 lime & 2 sand will make a proper and efficient mortar, but the exact proportions should be determined experimentally. For the concrete filling of the wells a larger proportion of burnt clay is likely to be needed.

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of March of 1874, and the great velocity due to the fall, the water fetched on the Sandy bed of the river beyond the Apron & scoured out the bed to a depth which engulphed first the outer & then the masonry Apron.

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Fort St. George
9th April 1875.

Lt. Col. R.E.
Chief Engr. for Irrigation

To, The Secretary to Government
P.W.D.

For 1875 Dept
W. 355
No 2415

From
The Chief Engr for
Irrigation
To the Secretary to Govt
P.W.D

Dated 9th April
Received 15th 1875

Reports progress in
the work of restoration
of the Palar Anicut
North Arcot Distt

G.O No 1070 A. 16.4.75

14-4-75 R-15-4-75

The arrangements that the Chief Engineer would propose with reference to the accompanying Diagram are

1st To replace Captain Pennycuick by Mr W. S. Degrate, now in Tangiers.

2d To place Brettingham, 1st Asst Engr 2d Grade in charge of the Patea Bridge Works, vice Superintendency Pilling.

3d To place Superintendent Pilling in charge of Mr Smithers' Range - (with which he is unconnected) -

4th To place Mr Smithers in charge of the Manuka

Lyttelton
16.6.75

P. R. D. Gladwin

Rec. of the Madras Govt.

Read the following

from the Chief Engr for Irrign &c. No 355 dd 9 April 1875

& Govt. Order No 670 A. dd 16th April 1875

His Excellency the
Governor in Council is
of opinion that the fore-
going remarks of the
Chief Engineer for Irriga-
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progress hitherto made
towards the commencement
of its restoration show that
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more energetic prosecution
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ing it to continue to form
a part of the charge of
the Range Officer, who is
necessarily

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devote the greater part
of his time to the general
duties of the Range—
The determination of the
way in which the Super-
intendence of this Ancient
and of that on the Penny,
the restoration of which
is likewise in progress,
can be most economically
strengthened will be left
to the Chief Engineer, D.W.C.,
who can either relieve
Mr. Smeaton of Range work,
select some competent
Executive Officer to take
charge of these Ancients
or require Captain Pennycuick
to postpone his leave
until these works shall
have made such progress
as to place them probably
beyond the risk of accident
from early freshes, and
ensure their advancement
by September next to such
an extent as may be
essential

which is not to be left
at once to report in
this case the Super-
intendent proposed
by the A.G. Engineer
Capt Pennycuick on
whose leave

for

essential to security

Lieut. 13/4/75

Lieut Smeaton will ac-
cordingly be relieved of his
Range work by Inspector
Appraiser Valley now in
charge of the Palar Bridge
Works, which will devolve on
Mr. C. Vincent Assistant
Engineer 2nd Grade who is
stationed at Vellore.

To enable Capt Penny-
cuick to avail himself of his
Privilege Leave Mr. R. B Leggatt
will relieve him of the District
Charge as soon as possible.

To
The Sup Engr North Arcot
" Supt Engr Tanjore
Ms. dispd to both - 16-4-75
P.C. Desp - 30-4-75
Conductor OW Accts
Chief Engr for Desp - Disp - 30-4-75

2h/5.

Govt. of Madras.

PUBLIC WORKS.

Chief Engineer
North Circle.

Revd.

Read.

Encl.

G. O. 16 April 1875, No. 1075

Nos. 440A-440B.

Palar Anicut, Kurnh Arch.

Certain Movement of Officers ordered with a view to the more energetic prosecution of work on the —

14-4-75 - R 15-4-75