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MADRAS RECORD OFFICE.

Government of Madras.

Public works. DEPARTMENT.

G.O. No. <u>1504.</u>	Press ~~Mis.~~
<u>437-438.</u>	
Dated <u>18-5-</u>	<u>1867.</u>

Not to be folded or roughly handled

*Proceedings of the Madras Government, Public Works Department,
13th May 1867.*

No. 437. Read the following letter from the Acting Superintending Engineer, 6th Division, to the Secretary to Government, Department Public Works, dated Lower Anicut, 4th May 1867, No. 117 :—

1. I have the honour to report, for the information of Government, the results of an inspection which I have just made of the work of re-construction and improvement under progress at the Lower Coleroon anicut and bridge, and of these structures generally.

2. The items in the Budget for 1867-68, which provide for these works, are as follows :—

Execu- tive.	PROJECTS.			Amount of Esti- mate.	Computed expendi- ture to 31st March 1867.	Estimate 1867-68.
	No.	Locality.	Description of Work.			
Tanjore.	170	Combaco- num.	Constructing a sluice and seven arches, and completing an additional laterite and rough stone apron at the north extremity of the south branch of the Lower Coleroon anicut.	RS. 74,000	RS. 58,351	RS. 31,169
			Constructing additional laterite and rough stone apron with retaining walls at the advanced portion of three sluices with south branch of the Lower Coleroon anicut.	16,000		
Do.	171	Do.	Completing a front and rear retaining wall and apron along the south branch of the Lower Coleroon anicut.	65,400		31,700
Do.	172	Do.	Collecting rough stone for the Lower Coleroon anicut.	7,500		7,500

3. The order in which the arches stand and their respective spans are as follows :—Commencing from the northern abutment of the bridge these are, first, six arches, each spanning 34 feet. These are separated by five piers, each 4 feet 4 inches in width. After the sixth 34-foot arch comes a pier, 4 feet 8 inches in width, common to itself and to the sluice arch spanning 17 feet, which immediately follows. The sluice arch is succeeded by another pier, 4 feet 8 inches in width, common to itself and to an arch spanning 34 feet, which closes the re-construction series so far as the bridge is concerned.

4. Of these arches the four northernmost are turned and uncentered ; the 5th and 6th are turned, but not yet uncentered. The sluice arch centering is finished. The centering of the seventh 34 feet-arch is under construction.

5. The floorings and their retaining walls under these arches are all finished.

6. The wording of project No. 170 does not directly indicate that portions of the body and apron of the anicut itself were also to be re-constructed, and that additional front and rear aprons were to be added in the estimate amounting to Rupees 74,000 ; but such, as Government are well aware, is the case. The body of the anicut, as originally built and as now re-constructed is, in two steps, the upper and front one being 4 feet in width and 7 feet 6 inches in height ; the lower and rear one being also 4 feet in width, and 4 feet in height. Commencing from the

north wing-wall of the anicut, the first portion, 27 feet 9 inches in length, belongs to the old work. Next come 202 feet 7 inches of new body up to the sluice arch; then the 17 feet span of the arch; and, lastly, 24 feet more new work, which terminates the reconstructed portion of the body of the anicut. Immediately in rear of the body of the anicut, a first apron similar, as far as width and depression below the summit of the body is concerned, to one which belonged to the original structure, is being built. It is to consist of a flooring of 1 foot in depth of brick-in-chunam, crowned and protected from the force of the water falling over the anicut by 1 foot of laterite-in-chunam one of a rear retaining wall 5 feet in depth and $2\frac{1}{2}$ feet in mean width. This commences from a salient angle of the wing-wall 24 feet further north than the northern extremity of the body. It has been entirely reconstructed for the first 113 feet 9 inches. For the next 110 feet 9 inches the retaining wall has been completed, but the flooring has not been very long commenced. For the next 30 feet the old retaining wall merely needs repair to render it as efficient as the new 5 feet in depth retaining wall, which it is to succeed. The flooring appertaining thereto is now being rebuilt, and considerable progress has been made therewith. A second rear apron, which is to be 12 feet in width and of the same depths of brick-in-chunam and laterite as the first apron, *i. e.*, 1 foot of each, is under construction. It is complete including its retaining wall for the first 80 feet, commencing the measurements from the extremity of the wing-wall, a point 66 feet further north than the northern extremity of the anicut. This retaining wall consists of a mass of brick work 7 feet in depth and $3\frac{1}{2}$ feet in mean width, resting upon wells $4\frac{1}{2}$ feet in external diameter, and 6 feet in depth. It extends southward for another 162 feet, but the flooring appertaining to this second section has not yet been commenced. Further to the south, still, there are twenty-one wells; of which six have been sunk; six are being sunk; six have just been built; and three are being built. A second or additional apron, for which the estimate provides in the up-stream or western side of the bridge, is finished in front of the first eight arches.

7. The whole of this work is enclosed and protected from the river by an embankment, which stood the highest freshes of last year, and which is still in good condition. I do not propose to remove it this year either; because when the river fills, much of the work of the rear aprons will still be new, and scarcely fit to receive either river current or overfall; and because, from all I can learn of the previous state of the bed of the river above the anicut, and from my own observation of its present state, I believe the effect of this embankment to have been very beneficial. I will return to this subject hereafter, and will now proceed to describe the work progressing to the south, and outside of the embankment.

8. The estimate for this is No. 171 of the Budget, extracted at the commencement of this letter. It provides for the continuation of the new front and rear retaining walls and aprons now being constructed within the embankment, in order that one continuous work of this description may protect the front and another the rear of the foundation of the anicut and bridge. I find that the upper one has not been commenced. Captain Oakes not thinking it possible, Mr. Sub-Engineer Bateman tells me, to execute it this year; and, at this advanced stage of the working season, it certainly would be quite useless, perhaps injurious to attempt it; I could not therefore advise its being commenced now.

9. Some progress has been made with the construction of the additional rear apron. Commencing from the southern wing-wall, it has been completed, inclusive of its retaining wall, for 200 feet in length. To the north of which, for 133 feet, the foundation, and 4 out of 7 feet of the height of the retaining wall, have been raised. Beyond the finished portion of this rear apron a good deal of rough stone and cubes have been thrown down.

10. The necessity for the completion of this additional rear apron as rapidly as possible is, unfortunately, urgent at a time when, with every effort, it is to be feared that much of the work must still be new, and unfit to resist a current when the river fills.

11. The water stood on Wednesday morning about three feet below the upper surface of the old rear apron; and the whole length of the exposed portion of the retaining wall presented a very dilapidated appearance. In some parts no masonry was visible immediately beneath the flooring itself. The water stands in deep pools behind this old apron. It was not carried away last year, but it looks as though it might easily be so this year. I have therefore urged Mr. Bateman to complete this portion of the work. He is embanking the rear water space in detachments in order to facilitate bailing, and is carrying on his work so far judiciously and energetically. But, in order to render this portion of the work less costly, he has committed an error in obtaining his clay from the front of the anicut, removing the deposit, and laying the sand below bare. Considering that this very work has already suffered from the hydraulic pressure above the anicut forcing water through the sand underneath it, and causing leaks, and that deposit is one of the best preventatives of such leaks, I have directed the sand where exposed to be levelled, and covered again with four inches of deposit. This can be done in two or three days; and if, at a future stage of the work, labour can again be spared, I will direct the stratum to be increased to six inches in depth.

12. The bed of the river above the anicut and bridge is free from islands and sand banks up to within 250 yards of the anicut. Its surface is then rendered irregular by the excavations lately made to obtain soil for embankment already alluded to, and by another made, I am told, last year to increase the flow towards the second sluice from the south. These irregularities are hardly sufficient to produce material effects upon the distribution of the flow of water over the anicut.

13. The state of the bed of the river to the eastward, or rear of the anicut, is not so good, by any means, as that of the bed 250 yards and upwards westward of the work. In the immediate vicinity of the rear apron is a pool, varying in depth from 10 to 15 feet, which runs right across the bed of the river from near the south bank to within 50 yards of the embankment which encloses the work now being re-constructed. This pool, which is from 50 to 100 yards in width, then turns eastward, and is terminated by a shallow which divides it from the deep bed of the river, which here runs under the left or north bank. A cross section of the river taken along a line parallel to, and 400 yards to the eastward of the anicut, would show the deep bed on the north, in which the water now stands for a width of

Suff. Engineers Office to Division
Lancaster 4th May 1867

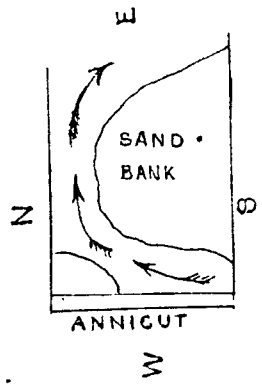
Lieut^{nt} Colonel P. A. Connell MS
Supt Engineer, Co^d 1st Regt

Colonel C. I. Orr. M. E.
Secretary to Government. D. R. M.

Sir

I have the honor to report for the information of Government the results of an inspection which I have just made of the work of Reconstruction and improvement under progress at the Lower Collieron Arm and Bridge and of these structures generally.

2 The items in the Budget for 1867/68 which provide for these works are as follows—



about 50 yards, succeeded on the south by a sand bank stretching up to the south bank of the river. The water falling over the anicut, and over its apron, evidently flows, first, from south to north along the rear of the retaining wall, scouring out the bed, and then turns to to the eastward just as the pool has been described to do in the last paragraph, into the deep bed under the north bank; after which it sweeps round the large sand bank already mentioned which faces the anicut.

14. This scour has no doubt been an active agent in injuring the retaining wall of the old rear apron, and would be anything but a desirable neighbour for the new work just after its cross section. I have therefore prepared estimates for the excavation of a channel from west to east, right through the sand bank, and for the construction of a bund, strengthened, where necessary, by a revetment of durba grass rollers, and further protected in the vicinity of the pool already described by a screen of palmyras and matting, such as is commonly employed in Tanjore. The use of this bund is to direct the stream into the excavation through the sand bank.

15. Estimates for these two works, and for running an embankment across the head of the south branch of the Coleroon to keep out small freshes, so as to allow of the rear apron work proceeding undisturbed, have been prepared, and will be submitted to Government after examination. The amount is large, viz., Rs. 6,500, but considering the works to be emergently required, I have directed their execution to be taken in hand as soon as possible.

• No. 438. ORDER THEREON, 18th May 1867, No. 1,504.

IRRIGATION, No. 26.

1. The Government are glad to observe from this report that good progress has been made with the re-construction of the country.

tion of the Lower Coleroon Anicut in the Tanjore District, but looking to the near approach of the season of freshes, they would urge upon the attention of the Superintending Engineer the necessity for pushing on the works with the utmost possible expedition.

2. The Government approve of Lieutenant-Colonel O'Connell's proceedings as reported in paragraphs 7, 8, 11, and 14, and will await the receipt of the estimates referred to in paragraph 15.

(True Extract.)

(Signed) CHARLES A. ORR, Colonel, R. E.,
Secretary to Government

To the Superintending Engineer, 6th Division.
 „ Controller of Public Works Accounts.
 „ Accountant General.

Lad. S. T. Augustin.

Expense Item		Locality	Description of Work	Amount of Estimate	Completed by purchase	Balance
Jan 190	Camboon		Constructing a Sluice, and Piers and Completing an additional terrace and Rough Stone Apron at the North extremity of the South Branch of the Lower Coleroon Amicech.	74,000		
			Constructing additional terrace and Rough Stone Apron with retaining walls at the advanced portion of these Sluices in the South Branch of the Lower Coleroon Amicech.	16,000	58,051	21,469
Do 191	Do		Completing a front and Rear retaining Wall and Apron along the South Branch of the Lower Coleroon Amicech	65,400		31,700
Do 192	Do		Collecting Rough Stone for the Lower Coleroon Amicech	7,500		7,500

189/1981
 1867/1687

3 The Order in which the Arches stand and their respective spans are as follows. Commencing from the Northern Abutment of the Bridge these are first 6 arches each spanning 34 feet. These are separated by 5 piers each 14'-14" in width. After the last 34 feet arch comes a pier, 14'-8" in width, common to itself and to the Sluice arch spanning 17 feet, which immediately follows - The Sluice arch is succeeded by another pier, 14'-8" in width, common to itself and to an arch spanning 34 feet, which closes the reconstruction series so far as the bridge is concerned -

4 Of these Arches the 4 Northern most have turned and uncentered; the 5th and 6th are turned but not yet uncentered. The Sluice Arch Centering is finished. The Centering of the 7th 34 feet Arch is under Construction.

5 The floorings and their retaining walls under these Arches are all finished.

6 The wording of Project No 170 does not directly indicate that portions of the body and apron of the Amnicut itself were also to be reconstructed, and that additional Spout and Near Spouts were to be added in the Retaining wall amounting to Rs 74000, but such, as Government are well aware, is the case. The body of the Amnicut, as Originally built and as now reconstructed is, in two steps the upper and front one being 4 feet in width and 7'-6" in height; the lower and rear one being also 4 feet in width and 4 feet in height. Commencing from the North wing wall of the Amnicut, the first portion, 27'-9" including piers, belongs to the old work. Next comes 202'-7" of new body

up to the Sluice Arch; then the 17 feet span of the Arch; and, lastly, 24' more new work which terminates the reconstructed portion of the body of the Amnicut. Immediately in rear of the body of the Amnicut, affixed apron similar as far as width and depression below the summit of the body is concerned, to one which belonged to the Original structure - is being built. It is to consist of a flooring of 1 foot in depth of brick in Chumam, crowned and protected from the force of the water falling over the Amnicut by 1 foot of laterite in Chumam, one of a rear retaining wall 5 feet in depth and 2 1/2 feet in mean width. This commences from a salient angle of the wing wall 24 feet further north than the northern extremity of the body. It has been entirely reconstructed for the first 113'-9". For the next 110'-9" the retaining wall has been completed but the flooring has ^{not} been very long commenced. For the next 30' the old retaining wall, ^{not} needs repair to render it as efficient as the new 5 feet in depth retaining wall which it is to succeed. The flooring pertaining thereto is now being rebuilt, and considerable progress has been made therein. A second rear apron which is to be 12 feet in width and of the same depth of brick in Chumam, and laterite as the first apron, i.e. one foot of each, is under construction. It is complete including its retaining wall for the first 80 feet, commencing the measurements from the extremity of the wing wall a point 66 feet further north than the northern extremity of the Amnicut. This retaining wall consists of a mass of brickwork 7 feet in depth & 3 1/2 feet in mean width resting upon wells

well. It is 4 feet in diameter, and 6 feet in depth. It is 19 feet Southward from another 16 feet but the flooring of pertaining to this second section has not yet been commenced. Further to the South still there are 2 tunnels; of which 6 have been sunk; 6 are being sunk; 6 have just been built; and 3 are being built - A second or additional Apron for which the Estimate provided in the report is on the west side of the bridge is finished in front of the first eight Arches. —

The whole of the mouth is malaccia & protected from the River by an Indian River, in which stand the highest fresh water grass and which is still in good condition. We not propose to remove it this year either, because when the River fills much of the mouth is the near Apron will still be new and scarcely fit to receive either the river current or gale; and because from all I can learn the previous state of the bed of the River above the Amicut, and from my own observation of its present state, I believe the effect of this Indian River to have been very beneficial. I will not touch this subject here, but will now proceed to describe the mouth, progressing to the South, and outside of the Amicut.

8 The Estimate for this is No. 171 of the Budget & is treated at the commencement of this letter. It provides for the continuation of the new front and rear retaining walls and aprons now being constructed in the Indian River in order that our continuous works of this description may protect the front and another the rear of the foundation.

13. The state of the bed of the River to the eastward or rear of the Amicut is not so good, by any means, as that of the bed 250 yards and upwards westward of the work. In the immediate vicinity of the rear Apron is a pool, varying in depth from 10 to 15 feet, which runs right across the bed of the River from near the South bank to within 50 yards of the Indian River which encloses the work now being reconstructed. This pool, which is from 50 to 100 yards in width, then turns Eastward and is terminated by a shallow which divides it from the deep bed of the River, which here runs under the left or North Bank. A cross section of the River taken along a line parallel to and 400 yards to the eastward of the Amicut would show the deep bed on the North, in which the water now stands for a width of about 50 yards succeeded on the South by a sand bank stretching up to the South bank of the River. The water falling over the Amicut, and over its apron, evidently flows first, from South to North along the rear of the retaining wall scouring out the bed, and then turns to the Eastward, just as the pool has been described to do in the last para, into the deep bed under the North bank; after which it sweeps round the large sand bank already mentioned which faces the Amicut —

14 This scour has no doubt been an active agent in injuring the retaining wall of the old rear Apron and would be any thing but a desirable neighbour for



for the new work just after the crop season. I have therefore prepared estimates for the excavation of a Channel from west to East right through the sand bank, and for the construction of a bund, strong enough, where necessary, by a revetment of durbar grass rollers, and further protected in the vicinity of the pool already described by a screen of Palmyras and matting such as is commonly employed in Siam. The use of this bund is to divert the stream into the excavation through the sand bank.

15 Estimates for these two works and for running an embankment across the head of the South branch of the Colleroon to keep out small freshes so as to allow of the Rear Apron work proceeding undisturbed have been prepared and will be submitted to Government after examination. The amount is large, viz. £6500 not considering the cost to be urgently required. I have decided their execution to be taken in hand as soon as possible.

I have the honor to be

Sir

Your most obedt Servant

Wm. M. Meland

W. M. Meland Esq.

of the Amoy and Bridge. I find that the upper one has not been commenced. Captain Capes not thinking it possible. Mr. Sub Engineer Mr. Watman tells me to execute it this year; and, at this advanced stage of the working season, it certainly would be quite useless, perhaps injurious to attempt it. I could not therefore advise its being commenced now.

Some progress has been made with the construction of the additional Rear Apron, commencing from the Southern Wing Wall, it has been completed, inclusive of its retaining wall, for 200 feet in length. To the north of which, for 133 feet the foundation and 4 out of 7 feet of the height of the retaining wall have been raised. Beyond the finished portion of this Rear Apron a good deal of rough stone and Cubes has been thrown down.

10 The necessity for the completion of this additional Rear Apron as rapidly as possible is, unfortunately, urgent at a time when, with every effort, it is to be feared that much of the work must still be new, and unfit to resist a current in the River.

The water stood on Wednesday morning about three feet below the upper surface of the old Rear Apron; and the whole length of the exposed portion of the retaining wall presented a very deplorable appearance. In some parts, no masonry was visible immediately beneath the flooring itself. The water stands in deep pools behind this old apron. It was not carried away last year, but

but it looks as though it might easily be so this year. I have therefore urged Mr. Waterman to complete this portion of the work. He is embanking the rear water space in detachments in order to facilitate bailing, and is carrying on his work so far judiciously and energetically. But, in order to render this portion of the work less costly, he has committed an error in obtaining his clay from the front of the Amicut; removing the deposit, and laying the sand below bare. Considering that this very work has already suffered from the hydraulic pressure above the amicut forcing water through the sand underneath it, and causing leaks, and that deposit is one of the best preventatives of such leaks, I have directed the sand in here exposed to be levelled and covered again with four inches of deposit. This can be done in two or three days; and if, at a future stage of the work, labour can again be spared, I will direct the stratum to be increased to six inches in depth.

¶ 2. The bed of the River above the Amicut and Bridge is free from islands and sand banks up to within 250 yards of the Amicut. Its surface is then rendered irregular by the excavations lately made to obtain soil for embankment already alluded to, and by another made, I am told, last year to increase the slope towards the second sluice from the South. These irregularities are hardly sufficient to produce material effects upon the distribution of the flow of water over the Amicut.

(SAR)

*Chief Secy. Genl.
16/4/67
From the ag. Supt. Engineer
to Division*

*J. Secretary
to General P.M.*

*Dated 4th May 1867
Recd. 16/5*

*117
- memo - close*

*Report to the Secy. Genl.
of the construction
of the dam at the Lower Coleroon
and the bridge
across the river at the
mouth of the Coleroon*

1504 - 18th May 1867

16/4/67

C. 13th May 1867 A. 13th

Public Works Department.

1504
C. 1504

PROCEEDINGS of the MADRAS GOVERNMENT.

Under the 18th May 1867
Read the following

From the ag. Supt. Engineer of the 1st Dist. (Here enter No. 117 dated 4th May 1867)

The Government are glad to observe from this report that good progress has been made with the reconstruction of the Lower Coleroon in the Tanjore District, but looking to the near approach of the season of freshes, they would urge upon the attention of the Supt. Engineer the necessity for pushing on the works with the utmost possible expedition.

The Government approve of Lieut. Col. Cornwell's proceedings

W.M.

as reported in paras
7, 8, 11 and 14, and
will await the receipt
of the estimates referred
to in para 15

[Signature]

To The Secy & Ld Secy
- Controller of Police
- Asst Genl

Recd 21/5/67

Pub: Works 1867 Depart^{ts}

Pro: of Govt for Navy

No 1504

Pro: of the Medical Corps

Of 18th Dec 1867

1000 CP 2191/67

Passing orders on a
report by Lieut. Col. C.
Cannell, on the works in
progress at Lower Colerone
Ancient in the Singapore
District.

No. 437-438