Public Works (1897) Department.

Print
Ever hereafter

G.O., No. 155-6.

DATED 13 February 1897

13/2/97

[Despatch Abstract.]

Shutters: Approving the estimate of Rs. 1,29,200 for fitting lift — to the Grand Anicut, Cancelling the Sanction accorded in G.O. No 514 I of 16 June 1896, and directing that a Copy of the Pros: be forwarded to the Govt. of India with request that sanction to the estimate may be communicated at an early date.

Shutters; Forwarding Pros: requesting the sanction of the Govt. of India (with remarks) to the estimate of Rs. 1,29,200 for fitting lift — to the Grand Anicut, Cauvery Delta System

100
4
40 copies

T.C. 13/2/97

P.W. 36.
1,600—60 11-96

Indexed. 13/2

38
2 copies with docket at the back

BACK PAPERS.

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

FURTHER PAPERS.

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

IRRIGATION.
ACCOUNT.

Government {1897} of Madras.

PUBLIC WORKS.

Recd.	1897.	*Enclosures*	
Regd.		*Spare copies*	

G.O., Nos. 155, 156 I., 13th February 1897.

FEBRUARY.

Shutters

Forwarding Proceedings requesting the sanction of the Government of India with remarks to the estimate of Rs. 1,29,200 for fitting lift — to the Grand anicut, Cauvery Delta System.

No. 155 I., 13th February 1897.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following papers :—

From Lieutenant-Colonel A. W. SMART, R.E., Superintending Engineer on Special Duty, Cauvery Completion Estimates, to the Chief Engineer for Irrigation, dated Tanjore, 15th August 1896, No. 541.

I am informed by the Superintending Engineer of this Circle that he is about to surrender Rs. 20,000 under Capital account, Cauvery system. I would request that this sum may go towards the construction of lift shutters for the Grand anicut, for which, with your approval, I will submit an estimate. In G.O., No. 514 I., dated 16th June 1896, two shutters have been already sanctioned; twenty-eight more will be required which, at Rs. 2,200 a shutter, will cost 2,200 × 28 = Rs. 61,600.

2. From tests made by Mr. Moss on rollers with roller bearings for the shutters of the Pelandorai anicut, he has obtained a coefficient of friction as small, if not smaller, than that of Mr. Stoney's patent shutters. These would, therefore, appear to be no question that the shutters now being made will be a success.

3. The loss of water at the Grand anicut is very great, not only over the anicut itself but down the Cauvery which gets a supply far in excess of its wants, as long, that is, as water is above 7·5 in front. The Vennár gets a full supply with about 7 feet on rear gauge of regulator, but is not in reality being well supplied till there is 9 feet on that gauge.

4. It is a question to be decided hereafter whether the old Vennár bridge should not be repaired and part of it converted into a regulator in order to supplement the supply of the Vennár during the time of freshes. In spite of the large quantity of water available this year there have been complaints that lands under some of the drainages of Vennár and Vettár have not been well supplied.

To Superintending Engineer on Special Duty, Cauvery Completion Estimates, dated 27th August 1896, No. 141.

From Lieutenant-Colonel A. W. SMART, R.E., Superintending Engineer on Special Duty, Cauvery Completion Estimates, to the Chief Engineer for Irrigation, dated Tanjore, 31st August 1896, No. 558.

In continuation of my No. 541, dated 15th August 1896, I have the honour to send you a copy of the latest water register of the Cauvery-Vennár regulators, the serious import of which I wish to bring prominently to your notice.

The areas of cultivation of first crops under the two rivers are very nearly equal; but the second crops are in the proportion of 2½ (Cauvery) to 1 (Vennár). The gauge reading in front of the regulators cannot be raised above 7·4 without surplus discharging into the Coleroon over the top of the iron shutters, so that we cannot increase the supply of the Vennár by decreasing that of the Cauvery. During the late freshes the Cauvery was obtaining a magnificent supply, whilst the Vennár was, in fact, very poorly supplied.

2. The discharge of the Vennár with 7·4 on rear gauge is given as 5,550 cubic feet per 1 inch, but it is reported that there is 1 foot more silt in the Vennár than last year, so I doubt if the discharge is as much as stated.

3. I would request that the fitting of the Grand anicut with lift shutters may be treated as of urgency, so that we may have them working by next season. I am confident that in a very short time with their judicious use the second crops cultivation will increase very considerably, and that there will be extension of irrigation towards the coast.

To Superintending Engineer on Special Duty, Cauvery Completion Estimates, dated 11th September 1896, No. 148 S.A.

From Lieutenant-Colonel A. W. SMART, R.E., Superintending Engineer on Special Duty, Cauvery Completion Estimates, to the Chief Engineer for Irrigation, dated Tanjore, 12th November 1896, No. 729.

no plans

With reference to your memorandum No. 148 S.A., dated 11th September 1896, I have the honour to submit plans and estimate (Rs. 90,000) for lift shutters for the Grand anicut.

In G.O., No. 514 I., dated 16th June 1896, two shutters were sanctioned; but as reported in my No. 678, dated 27th October 1896, it was found that the shutters, as designed, were not stiff enough and that they would have to be made of the bow-string girder type. In the present estimate the amount sanctioned for those two shutters may be deducted, or if you think necessary, however, the original estimate may be cancelled and the present one sanctioned instead without deduction.

2. The revised design is more costly than the original, because

(1) the bowstring girder takes the place of rolled beams.

(2) the weight of the shutters is transmitted to the floor instead of being carried by the piers, as originally proposed. As the part of the piers which is directly connected with the shutters will be almost wholly new masonry, the advantage of bringing the weight to bear as low as possible is very considerable.

3. By the use of roller bearings the coefficient of friction will be reduced to ·002 and perhaps even to ·001 as recent experiments in the shops would lead one to suppose.

ENCLOSURE.

REPORT to accompany plan and estimate for fitting lift shutters to the Cauvery Grand anicut.

The falling shutters now used on the Grand anicut are very troublesome to manage, and the cause of a great loss of water. They leak considerably when up, and after a flood they cannot be raised until the water is comparatively low, and the process of raising them is difficult and slow and somewhat dangerous to the lascars. It is now proposed to remove all these falling shutters, and substitute large iron shutters fitted with rollers. With these there will be practically no loss of water. The water way for floods will be very greatly increased, and there will be nothing whatever to obstruct the flow of water, when the vents are open or to catch rubbish and débris and so give trouble. The labour of working the new shutters will be immensely diminished as each of the large shutters will be well within the power of one man to raise or lower under all circumstances. It is calculated that two men will easily fully open or close all the (30) thirty shutters in two hours.

The shutters are each built of a pair of bowstring girders which each support approximately half of the pressure on the shutter. The face of the shutter is of ⅜ inch plate, which is backed by vertical channel irons which again are carried by the girders behind.

The shutter when down rests on a planed cast iron sill. As the bottom edge will be carefully made quite straight, the joint between it and the sill will be practically water-tight. Leakage at the sides will be prevented by special leakage plates bearing against the vertical channel irons at the sides as shown in the drawing.

Two alternative methods are shown on the drawing.

Each shutter will be provided with six cast iron rollers, 9 inches diameter and 6 inches wide. These will have pins of bronze, will be bushed with the bronze and have hard bronze rollers in the bearings.

The rollers travel on vertical cast iron roller paths which will be planed perfectly true. The backs of the upper portion of these cast iron roller paths also form guides for the counterweights which move in the space between them and the masonry of the bridge.

The shutters and counterweights will be connected by strong gear-chains which pass over chain wheels turning on disc-rolled bearings on the working platform above.

A shaft connects the two upper or driving chain wheels and is connected in the middle to a treble-geared winch with three speeds. Thus the shutter may be raised or lowered quickly or slowly as the occasion may demand.

The counterweights are built up of slabs of cast iron. When they reach the bottom of their travel they will rest on brackets cast on the backs of the roller path castings. Thus there will be no danger of the brick work of the piers being damaged by these heavy weights resting on it.

The whole weight of the shutter, counterweights, &c., is transmitted down through the roller path castings and vertical channels to the foundation plates independent of the masonry of the piers, which are only required to take the cross-strain due to the pressure of the water on the shutter. As this is distributed over a considerable surface, all danger due to concentrating heavy pressures on small surfaces of masonry, and especially of new masonry, is avoided.

The roller paths, vertical channels, sill and platform above for each vent, form an independent structure by themselves in which the shutter and counterweights work. This structure will be carefully fitted together at the shops before being sent out and all the parts marked. It will then be quickly put together again at the work spot and after being fitted up perfectly true, the masonry of the piers will be built in, care being taken to build that part behind the roller path very solidly and in perfect contact with the casting.

The framework for each vent will be tied to that of the adjacent vent on each side by flat bars as shown in the drawings.

The rollers or wheels behind the shutters will be 9 inches diameter, and will have disc-roller bearings. This will ensure the shutters being worked with great ease under all possible circumstances.

Two alternative arrangements of rollers are shown. The one shown by red lines is the best and is recommended though its cost is a little more than the other which is provided in the estimate. This latter requires very perfect fitting. Should there be any inaccuracy of fitting the rollers or irregularities or obstructions on the roller-path, an undue proportion of the pressure is thrown on to some of the rollers. By the latter arrangement this trouble is obviated, and each roller will carry its fair share of the pressure under all possible circumstances.

This should be adopted.
(Intld.) A.W.S.

7th November 1896.

(Signed) H. MOSS.

The lift shutters will enable us to give a better supply to the Vennár in low freshes than is now possible. Water cannot be held up in front to give more than 7·5 on rear gauge of Vennár at present and this may be taken to be about 2 yards an hour per acre for the average under the Vennár; at the same time the Cauvery will be taking twice the amount of water it really requires. Even with 7·5 the Vennár is not well supplied in the lower reaches and 9·5 may be taken as giving a really good supply to that river.

(Signed) A. W. SMART, Lt.-Col., R.E.,
Suptg. Engr. on Special Duty,
Cauvery Completion Estimates.

12th November 1896.

To the Superintendent, Public Works Workshops, dated 16th December 1896, No. 54 M.
From „ „ „ „ 21st „ „ No. 14 I.

No. 29 I.

Submitted to Government with a recommendation that the estimate as increased by the Superintendent of Public Works Workshops from Rs. 90,000 to Rs. 1,05,000 may be submitted for the sanction of the Government of India.

2. As Colonel Smart in his letter, No. 558, dated 31st August 1896, anticipates some extension of irrigation by the fitting of the shutters, the estimate may be classed as a remunerative work, the sanction thereto being current up to 31st March 1899.

3. The 2½ feet falling shutters now on the crest of the Grand anicut are not high enough to enable a proper division of the water being made between the Cauvery and Vennár. With water at the level of the top of the shutters less than 5,000 cubic feet per second can be passed into the Vennár, the depth in the rear sill of the

regulator being then 7 feet. In order to take advantage of freshes it is necessary to be able to send 9 feet into the river especially after a period of deficient supply. When freshes rise above 8½ feet (on regulator sills) the Grand anicut shutters fall and cannot be raised again until the river falls to about 6 feet, a great quantity of water meantime running waste over the anicut. The only way to get the required control of the river is to have lift shutters of sufficient height. The design now submitted was shown to the Inspector-General of Irrigation when he inspected the work in December last and the proposals approved by him.

8th February 1897.

(Signed) W. HUGHES,
Chief Engineer for Irrigation.

ORDER—No. 155 I., dated 13th February 1897.

	RS.
* Works	1,05,000
Establishment	24,150
Tools and plant	50
Total estimate ...	1,29,200

The estimate, amounting to Rupees 1,29,200, * for fitting lift shutters to the Grand anicut, is approved.

2. The sanction accorded in G.O., No. 514 I., dated 16th June 1896, is cancelled.

3. Ordered that a copy of these Proceedings, together with the plans and estimate for the lift shutters, be forwarded to the Government of India with a request that sanction thereto may be communicated, at an early date, under "49. Capital Expenditure not charged to Revenue," Cauvery Delta System, Open Capital Account.

[Here enter No. 156 I., dated 13th February 1897.]

(True Extract.)

(Signed) W. HUGHES,
Joint Secy. to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, V Circle.
„ Examiner, Public Works Accounts.
„ Superintending Engineer on Special Duty,
Cauvery Completion Estimates.

ENDORSEMENT—No. 156 I., dated 13th February 1897.

Forwarded.

(By order.)

(Signed) W. HUGHES,
Joint Secy. to Government,
Irrigation Branch.

Exd. C. M. Thumbuswamy.

Estimate for fitting lift shutters to Grand Anicut

H.E.
Hon'ble Mr. Ross
Hon'ble Mr. Jones

PUBLIC WORKS DEPARTMENT,
IRRIGATION BRANCH.

Public Works (1897) Department
PROCEEDINGS OF THE MADRAS GOVERNMENT.

Print emergently

Current No: 1570
Recd: 12.2.97
UNDER date the
Enclos: 7
READ the following

From	Supg Eng, on special duty, C. C. Estimates,	No. 541	d/ 15. 8. 96
To	do.	. 141	d/ 27. 8. 96
From	do.	. 558	d/ 3. 8. 96
To	do.	. 148 Sa.	d/ 11. 9. 96
From	do.	. 729	d/ 12. 11. 96
To	Supt P.W. Workshops	. 54 M	d/ 16. 12. 96
From	do	. 14 I	d/ 21. 12. 96

Print
Indexed (3)
Print
Indexed (11)
2 Print with Report

No 29 I d/ 8. 2. 97

× Vide original G.O. No. 869-70 I/96

Submitted to Govt with a recommendation that the estimate as increased by the Supt of P. W. Workshops from Rs 90,000 to Rs 105,000 may be submitted for the sanction of the Govt of India.

2. As Colonel Smart

Issue

12/2/97

D.S.

137
11-2-97

in his letter, No. 558, d/ 31 Augt/96, anticipates ~~an~~ some extension of irrigation by the fitting of the shutters, the estimate may be classed as a remunerative work, the sanction thereto being current upto 31st March /99. [illegible]

Order thereon No. 155 I, d/ 13-2-97

The estimate, amtg to Rs 129,200 +, for fitting lift shutters to the Grand Anicut, is approved.

2. The sanction accorded in G.O. No. 514 I, d/ 16 June/96, is cancelled.

3. Ordered that a copy of these Procs. together with the plans & estimate for the lift shutters be forwarded to the Govt of India with a request that sanction thereto may be communicated at an early date, under "49 Capital Expenditure not charged to Rev" Cauvery Delta System, Open Capital Account.

Endorsement No. 156 I, d/ 13-2-97

Forwarded.

3. The 2½ ft falling shutters now on the crest of the Grand Anicut are not high enough to enable a proper division of the water being made between the Cauvery & Vennar. With water at the level of the top of the shutters less than 5000 cub ft per second can be passed into the Vennar, the depth in the rear sill of the regulator being then 7 ft – In order to take advantage of freshes it is necessary to be able to send 9 ft into the river especially after a period of deficient supply – when freshes rise above 8½ ft (on regulator sills) the Grand Anicut shutters fall and cannot be raised again until the river falls to about 6 ft, a great quantity of water meantime running waste over the Anicut. The only ~~test~~ way J.G. to get the required control of the river is to have lift shutters of sufficient height – The design now submitted was shown to the Inspector General of Irrigation when he inspected the work in December last and ~~it is understood~~ the proposals approved by him.

	Rs
+ Works –	105000
Establishment	24150
Tools & Plant	50
Total Estimate	129200

A.S.H.
10.2.97

11/2/97

J.G.
11/2/97

J.G.
6/2/97

W.H.
8/2/97

To
The Chief Engr for I.
Supdg Engr V
& T.W.R.
Supdg Engr on Special Duty
Cauvery Completion Estes

Dr 25/2/97

5/2/97 B.R.

CHIEF ENGINEER
FOR IRRIGATION.
02 JAN 97
No. 2 I J

No. 14. J S.

Workshops &
PRESIDENCY P. W. STORES,

Madras, 21st December 1896.

From

H A Moss, Esqr

GENERAL SUPERINTENDENT,

PUBLIC WORKS STORES,

To

THE Chief Engineer for Irrigation, Madras
through the Supg Engineer on Special Duty
Cauvari Estimates
Tanjore

Sir

Enclosures 2
1 Detail Estimate
1 Abstract — do —

As requested in the Memorandum No 521, M, dated the 16th December 1896, I have the honour to return herewith the Estimate for fitting lift-shutters to the Grand Anicut, duly verified and corrected where it seemed necessary.

I have the honour to be
Sir
Your most obedt Servant

H Moss
Genl Superintendent, P.W. Workshops
21.12.96

21/12/96

E. I. Form No. 1—500—3-12-96.

H E 9.2

G. $\frac{1037}{23.12.96}$

Presidency P. W. Stores.

From

THE GENERAL SUPERINTENDENT,
PUBLIC WORKS STORES,
Madras,

To

No. ______ S.

Dated 21 December 1896.
Despatched 21 December 1896.
Received

No. of Enclosures. 2

Subject.

Grand Anicut —.
Returning Estimate for fitting lift Shutters to the —. duly verified and Corrected where it Seemed necessary —.

Orders

P.W.S. E.7 / 1570/97

No 23

Forwarded

A W Smart
Lt Col RE
Superintending Engineer
on special duty
6/1/97

Public Works (1896) Department.

CURRENT No.

[illegible] 27.11.96

R173 Sa

Order ~~E.I.~~

~~The [illegible] E.I.~~
~~[illegible] No. 174 calling for an [illegible] for dealing with the whole [illegible]~~

[illegible] estimate now submitted provision is made for fitting lift shutters 5 ft [illegible] to all the 30 vents of the anicut and the proposal [illegible] in our [illegible] No. 265 [illegible] dated 6/8/96 [illegible] [illegible] about [illegible] the [illegible] — The plan of the anicut shows clearly [illegible] were intended to put 3 of the lift shutters above the existing low scouring sluices — No provision is made for masonry or for removal of existing shutters &c the estimate is simply Rs. 3001/- for a shutter multiplied by 30 —

16/11

[illegible]

Reply is [illegible]

16/11

B.K.

17/3/11

B.K. 16.11.96

B.K. 13.11.96

papers

12/11

14/11

From Lt Col. A. W. Smart RE
Superintending Engineer
on special duty
Tanjore

No. 729.

Dated 12th November 1896.
Received 13-11-96
Enclosures 3. {1. Estimate
1. plan of Grand anicut
1. Tracing of shutters
Spare copies

SUBJECT.

Lift Shutters for the Grand anicut

Submits plans and estimate for the —. amounting to Rs 90,000.

BACK PAPERS.

~~G.O.~~ Issue	No.	Department.	Date.
I	148	Sa	11-9-96
R	360	I.	16.6.96
R	161	S. A –	27.10.96
I	174	SA –	10.11.96

FURTHER PAPERS.

~~G.O.~~ Issue	No.	~~Department.~~	Date.
I	521	M	16/12/96
R	2	I J	6-1-97
R	8	I J	26-1-97

Original G O	869. 70 I		24 10 96
Issue	521	M	16 12 96
Receipt	2	I J	6 1 97
G O	514	I J	16 6 96

Report to accompany Plan and Estimate for fitting lift Shutters to the Cauvery Grand Anicut

The falling shutters now used on the Grand Anicut are very troublesome to manage, and the cause of a great loss of water. They leak considerably when up, and after a flood they cannot be raised until the water is comparatively low, and the process of raising them is difficult and slow and somewhat dangerous to the Lascars. It is now proposed to remove all these falling shutters, and substitute large iron shutters fitted with rollers. With these there will be practically no loss of water. The water way for floods will be very greatly increased, & there will be nothing whatever to obstruct the flow of water when the Vents are open or to catch rubbish and débris and so give trouble. The labour of working the new Shutters will be immensely diminished as each of the large Shutters will be well within the power of one man to raise or lower under all circumstances. It is calculated that two men will easily fully open or close all the (30) thirty Shutters in two hours.

The Shutters are each built of a pair of bowstring Girders which each support approximately half of the pressure on the Shutter. The face of the Shutter is of 3/8" plate, which is backed by vertical Channel irons which again are carried by the girders behind

The Shutter when down rests on a planed cast iron sill. As the bottom edge will be carefully made quite straight, the joint between it and the cill will be practically water-tight. Leakage at the sides will be prevented by special leakage plates bearing against the vertical channel-irons at the sides as shown in the drawing

Two alternative methods are shown on the Drawing.

Each shutter will be provided with 6 cast iron rollers

rollers, 9" diameter and 6" wide. These will have pins of bronze, will be bushed with bronze and have hard bronze rollers in the bearings.

The rollers travel on vertical cast iron roller paths which will be planed perfectly true. The backs of the upper portion of these cast iron roller paths also form guides for the counterweights which move in the space between them and the masonry of the bridge

The shutters and counterweights will be connected by strong gear-chains which pass over chain wheels turning on disc rolled bearings on the working platform above.

A shaft connects the two upper or driving chain wheels and is connected in the middle to a treble-geared winch with three speeds. Thus the Shutter may be raised or lowered quickly or slowly as the occasion may demand.

The counterweights are built up of slabs of cast iron. When they reach the bottom of their travel they will rest on brackets cast on the backs of the roller path castings. Thus there will be no danger of the brickwork of the Piers being damaged by these heavy weights resting on it.

The whole weight of the Shutter counterweights &c. is transmitted down through the roller path castings and vertical channels to the foundation plates independent of the masonry of the piers, which are only required to take the cross-strain due to the pressure of the water on the shutter. As this is distributed over a considerable surface, all danger due to concentrating heavy pressures on small surfaces of masonry - & especially of new masonry is avoided.

The roller paths, vertical channels, sill and platform above for each vent, form an independent structure by themselves in which the shutter and counterweights work. This structure will be carefully fitted together at the shops before being sent out and all the parts marked. It will then be quickly put together again at the work spot & after being fitted up perfectly true, the masonry of the

the piers will be ~~put~~ built in, care being taken to build that part behind the roller path very solidly, and in perfect contact with the casting

The framework for each vent will be tied to that of the adjacent vent on each side by flat bars as shown in the drawings

The rollers or wheels behind the Shutters will be 9" diameter, and will have disc-roller bearings. This will ensure the shutters being worked with great ease under all possible circumstances

Two alternative arrangements of rollers are shown. The one shown by red lines is the best; and is recommended though its cost is a little more than the other which is provided in the estimate. This latter requires very perfect fitting. Should there be any inaccuracy of fitting the rollers or inequalities or obstructions on the roller-path, an undue proportion of the pressure is thrown on to some of the rollers. By the latter arrangement, this trouble is obviated, and each roller will carry its fair share of the pressure under all possible Circumstances.

This should be adopted.

H Moss

7.11.96

The lift shutters will enable us to give a better supply to the Vennar in low freshes than is now possible. Water cannot be held up in front to give more than 7.5 on gauge of Vennar at present and this may be taken to be about 2908 [illegible] per acre for the acreage under the Vennar; at the same time the Cauvery will be taking twice the amount of water it really requires. Even with 7.5 the Vennar is not well supplied in the lower reaches and 9.5 may be taken as giving a really good supply to that river.

12/11/96

CHIEF ENGINEER
FOR IRRIGATION.
15 Nov. 96
No.

P.W. E.2 / 1570/97

№ 729

Office of the Superintending Engin
Cauvery Completion Estimates
Tanjore dated 12th November 189

From

Lt. Col. A. W. Smart R.E.
Superintending Engineer
On special duty
Tanjore.

To

The Chief Engineer
for Irrigation.
Madras.

Sir,

Vide Disp of Lo No 869/1.90 / 26.10.96

Encls. 3.
1. Estimate
1. plan of Grand anicut
1. Tracing of Shutter
3

x. sent separately.

With reference to your memorandum No 148. S.A dated 11th September 1896, I have the honour to submit plans and estimate (Rs 90,000) for Lift Shutters for the Grand anicut.

Vide R 1615A/96.

In G. O. No 514. I. dated 16th June 1896, ~~two~~ Shutters were sanctioned; but as reported in my No† 678 dated 27th October 1896, it was found that the Shutters, as designed, were not stiff

enough

enough and that they would have to be made of the Bowstring girder type. In the present estimate the amount sanctioned for those two shutters may be deducted, or if you think necessary, however, the original estimate may be cancelled and the present one sanctioned instead without deduction.

2. The revised design is more costly than the original, because

(1) the Bowstring girder takes the place of Rolled Beams.

(2) The weight of the shutters is transmitted to the floor instead of being carried by the piers, as originally proposed; As the part of the piers which is directly connected with the shutters will be almost wholly new masonry, the advantage of bringing the weight to bear as low as possible, is very considerable.

3. By the use of roller bearings the coefficient of friction will be reduced to .002 and perhaps even to .001 as recent experiments in the shops would lead one to suppose.

I have the honour to be,
Sir,
Your most obedient Servt.

Lt Col R.E.
Superintending Engineer
On special duty

CHIEF ENGINEER
FOR IRRIGATION.
15 . . 96 R. 173 Sa
No.........................

P.W. E.3/1570/97

No 148 S.A. dy 11-9-96

Memo

With reference to letter No 558 dated 31st August/96 from the Supg Engr on Special duty, Cauvery delta completion Estimates the undersigned has the honor to say that he fully agrees with him in considering the work of fitting lift shutters to the Grand Anicut as one of urgency. The S. E is requested to expedite the submission of the Estimate called for in this Office memo No. 141 S A dated 27.8.96 On receipt of this Estimate necessary arrangements will be made for the provision of funds.

11/9
96

To The S. E on Special duty
Cauvery Delta Completion Estes

B.R. 10-9-96

R1438a

CHIEF ENGINEER
FOR IRRIGATION.
[illegible] 96
No. 1438a

From

Lt Col A.W. Smart RE
Superintending Engineer
on special duty

To

The Chief Engineer for Irrigation
Madras

Dated 31st August /96
Despd 1st September /96 } Enclos.

No. 558

Subject

Lift shutters to Grand anicut:- Requesting to treat the subject of fitting —— as one of urgency, in order to prevent loss of water into the Coleroon and thus increase the supply into the Vennar.

RwE. 6
5443/96

Water Register of Cauvery and Vennar Regulators from 29th to 30th August/96

Month and Date		Cauvery			Vennar			Grand Anicut						Remarks
								Sluice			Anicut			Regulator upper sill 184.25 Lower sill 183.25 Safety limit Cauvery 7.5 Do Vennar 9.4
		Front	Rear	Discharge	Front	Rear	Discharge	Front	Rear	No. opened	Crest Gauge		No. of Shutters down	
		184.75	184.75		184.75	184.75		179.60	179.60		189.00			
27	6 a.m.	7.4	5.6	16,810	7.5	7.4	5,550	12.3	1.4	"	2.9	-	-	
	6 p.m.	7.4	5.6	16,810	7.5	7.4	5,550	12.3	1.4	"	2.9	-	-	The depth of silt
28	6 a.m.	7.4	5.6	16,810	7.5	7.4	5,550	12.3	1.4	"	2.9	-	-	on Cauvery sill — Nil
	6 p.m.	7.4	5.8	17,730	7.5	7.4	5550	12.3	1.4	-	2.9	-	-	Do — Vennar 2.9
29	6 a.m.	7.4	5.6	16,810	7.5	7.4	5,550	12.3	1.4	-	2.9	-	-	
	6 p.m.	7.4	5.7	17,270	7.5	7.4	5,550	12.3	1.4	-	2.9	-	-	
30	6 a.m.	7.3	6.0	18,650	7.5	7.4	5,550	12.3	1.4	-	2.9	-	-	

F.S.L. 3 Cyds per hour per acre of Cauvery 4.5 on rear gauge

F.S.L 2 Cyds per hour per acre of Vennar about 7.0 do.

(True copy)

C W Smail Lt Col RE

Superintending Engineer
on Special Duty
1.9.96.

CHIEF ENGINEER
FOR IRRIGATION.
5 SEP 96
No. 143 Sa

Des.2
Sec43 / 58

No. 558

Office of the Superintending Engr
Cauvery Completion Estimate
Tanjore dated 31st August 1896

From:

Lt. Col. A. W. Smart R.E.
Superintending Engineer
on special duty
Tanjore

To.

The Chief Engineer for Irrigation
Madras.

Sir,

Encls. 1.
+ R 137 8A/96

In continuation of my no. 541 dated 15th August 1896, I have the honor to send you a copy of the latest water register of the Cauvery-Vennar Regulators the serious import of which I wish to bring prominently to your notice.

The areas of cultivation of 1st crops under the two rivers are very nearly equal, but the second crops are in the proportion of 2½ (Cauvery) to 1 (Vennar). The guage reading in front of the regulators

cannot

Cannot be raised above 7.4 without Surplus discharging into the Coleroon over the top of the iron shutters, so that we cannot increase the supply of the Vennar by decreasing that of the Cauvery. During the late freshes the Cauvery was obtaining a magnificent supply whilst the Vennar was, in fact, very poorly supplied.

2. The discharge of the Vennar with 7.4 on rear gauge is given as 5,550 cft per 1", but it is reported that there is 1 ft more silt in the Vennar than last year, so I doubt if the discharge is as much as stated.

3. I would request that the fitting of the Grand anicut with lift shutters may be treated as ~~one~~ of urgency, so that we may have them working by next season. I am confident that in a very short time

with

with their judicious use the second crops cultivation will increase very Considerab and that there will be extension of irrigation towards the coast.

I have the honor to be
Sir,
Your most Obedient Servant

Lt Col RE
Superintending Engineer
on Spl duty

CHIEF ENGINEER
FOR IRRIGATION.
3 SEP. 96
No. 1438a

CWE.I
9443/96

No 1415A d/ 27.8.96

Memo

With reference to letter No 541, d/ 15th inst, from the Supdg Engr on special duty, Cauvery completion estimates, the undersigned has the honour to inform him that the sum of Rs 20,117 including the charge for establishment surrendered by the Supdg Engr, V Circle, from the current year's grant for the Cauvery Delta system under "49 Capital Expenditure not charged to Revd." has been credited to the reserve. The S.E's proposal to utilize this amount on the construction of

+ Indn No 71 E.I. d/ 11 Augt/96

Go. No 730 I is still in Press.
27.8.96

the lift shutters for the Grand anicut is approved & he is requested to be so good as to submit the estimate for the work as soon as possible for submission to the Govt of India for sanction.

Rmedd
27/8/96

3/8

Ow E 9
Secy 3/8/96

To
The Supt Engr
On Special Duty
Cauvery Completion Estimates

RCW 25/8 BR

R137SA

Pla 341

No. 541 Office of the Superintending Engin
Cauvery Completion Estimates
Tanjore dated 15th August 96

From
Lt. Col. A. W. Smart RE
Superintending Engineer
on special duty

To
The Chief Engineer
for Irrigation
Madras

Sir,

I am informed by the Superintend Engineer of this Circle that he is about to surrender Rs 20,000 under Capital account Cauvery system. I would request that this sum may go towards the construction of lift shutters for the Gran anicut for which with your approval I will submit an estimate. In G.O. No. 514 I dated 16th June 1896, two shutters have been already sanctioned; twenty e more will be required which, at Rs 2200 a shutter, will cost 2,200 × 28 = Rs 61,600.

2. From tests made by Mr. Moss on

rollers with roller bearings for the shutters of the Pelandorai anicut, he has obtained a coefficient of friction as small, if not smaller, than that of Mr. Stoney's patent shutters. There would, therefore, appear to be no question that the shutters now being made will be a success.

3 The loss of water at the Grand anicut is very great, not only over the anicut itself but down the Cauvery which gets a supply far in excess of its wants, as long, that is as water is above 7.5 in front. The Vennar gets a full supply with about 7 ft on rear guage of regulator, but is not in reality being well supplied till there is 9 ft on that guage.

4. It is a question to be decided hereafter whether the old Vennar bridge should not be repaired and part of it converted into a regulator in order to supplement the supply of the Vennar during the time of freshes. In spite of the large quantity of water available this year there have been complaints

is similar

Ccs/25/8 BM

that lands under some of the drainages of Vennar and Vettar have not been well supplied.

I have the honor to be
Sir,
Your most obedient Servant
Lt. Col. RE
Superintending Engineer
on Special Duty

From

Lt Col. A.W. Smart R.E.

Superintending Engineer

on special duty

FOR IRRIGATION.
17 AUG.96
No. K/5/0a

To. The Chief Engineer for Irrigation

No. 541

Dated 15th } August 96.
Despd. 15th }

Subject

Lift shutters at the Grand anicut :- Requesting that the surrender of grant Rs 2,000 under Capital account, Cauvery System, proposed by the Supg. Engineer Vth Circle, may go towards the construction of the — for which Estimate will be submitted if approved.

O.W.E.C.
544 3/8/96

Public Works (1896) Department.

CURRENT No.

Order

From the Chief Engineer for Irrign.

To the Supt of Stores Workshops Madras

No. 521 M

Dated 16° December 896

Received

Enclosures 1 Estе

Spare copies

SUBJECT.

Left shutters for the Grand Anicut - Estimate for - Forwards with instructions for verification of the rates on -

BACK PAPERS.

No.	Date.

FURTHER PAPERS.

No.	Date.

CE I
18-1-97

Public Works (1897) Department.

~~CURRENT~~ Receipt No. 2 T.J.

Order

The estimate has been checked.

[illegible]

4-2-97

[illegible]

Enter
(8/1/97)

D.E.I.
(15-1-97)

From

Lt. Col. A. W. Smart R.E.
Superintending Engineer
on special duty
Tanjore

No. 23.

Dated 6th January 1897.
Received 8—1—97
Enclosures 2
Spare copies

SUBJECT.

Lift Shutters for the Grand anicut.

Submits an estimate duly revised for fitting—

8-1-97

Cd/1

18-1-97

BACK PAPERS.

G.O.	No.	Department.	Date.
S	521	MJ	16-12-96

FURTHER PAPERS.

G.O.	No.	Department.	Date.
R	87	J	26-1-97

R173 SA/96

No 521 MJ of 16-12-96

E.E. in charge Workshops

Encl 1

As personally arranged
with Lt Col Stuart the
estimate for lift shutters
further paid Account is
forwarded to the E.E. in
charge of the Workshops
for verification of the rates.
Care should be taken that
safe amounts are entered.
With regard to the lump
sum amounts it is observed
that the provision for
conveyance to work and
probably that for fitting are too small. The
Shutters will have to be carried
along 12 miles of bad road from Nedumangad

16/12/96