Public Works (1896) Department.

G.O., No. 535

Dated 25-6-96

[Despatch Abstract.]

Shutters: The estimates amounting to Rs 9700 for fitting screwed casing and iron — to the Lower Coleroon Anicut, Sanctioned

[P.W. 25.
1,000—23-10-96.]

## BACK PAPERS.

| G.O. | No. | Department. | Date. | G.O. | No. | Department. | Date. |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

## FURTHER PAPERS.

| G.O. | No. | Department. | Date. | G.O. | No. | Department. | Date. |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

No. 535 I., 25TH JUNE 1896.

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, 13th April 1896, No. 208.

With reference to your No. V./62 S.A., dated 30th March 1896, I have the honour to forward plans of iron counterweighted shutters for the Lower anicut, with estimates amounting to Rs. 3,500 and Rs. 4,340, respectively. The first design is for a counterweighted shutter of 4½ feet to slide down in front of the new proposed anicut 4½ feet high. In this case it is necessary to have screws, as there may be small deposits of silt in front, through which it may be necessary to force the shutter. If this shutter works successfully it may be adopted for the rest of the anicut, save for one vent in each bay, and for the under-sluices where we must have lift shutters to deal with the deposits of silt (sand and mud) in front.

I would recommend that a model should be made of this shutter at once, as we can then best ascertain how to stop the leakage in the roller recesses from below. There will be no difficulty in stopping side leakage by the leakage post working slightly eccentric; but I have not been able to solve satisfactorily to my mind the problem of stopping leakage at the recesses. This shutter will take the place of the experimental shutter put in last year.

2. The second design is for 6-feet lift shutter (with 3 feet height of dam) of the same kind as that submitted recently for the Mudicondanar; in this case no screws are necessary, and the counterweighted shutter is lifted and raised by a ¾″ chain, which must be of the very best quality, tested beforehand with a weight double the weight of the shutter.

3. The shutters may be now put up in front, but the rear old dam should not be removed, nor should the shutters, in my opinion, be worked in floods, till the protective work recently sanctioned has been completed; the cross walls of which will prevent lateral scour.

4. For the sliding shutter I have made the diameter of the leakage post 9 inches, because it is longer than that of the lift shutter, and also because when jammed tight, it will materially help to lessen deflection which is of considerable importance in the case of the sliding shutter.

5. The lift shutter has been so designed as to utilize to some extent the surplus stock in the shops. If any great number should be required, they should be made of steel to reduce the weight and cost.

ENCLOSURES.

| | RS. |
|---|---|
| Estimate ... ... ... ... ... ... ... ... ... | 4,380 |

It is proposed to place in the 4″ vent from the north in the north branch of the Lower Anicut an iron counterweighted shutter of the full span, running on cast iron rollers and raised by chains with suitable gearing. The body wall of anicut in rear will be eventually removed to one foot above floor level. The floor of bridge will be raised by one foot, and the cutstone from dam and rear floor to be utilized as shown in plan.

The weight of each shutter with its balance weight is taken by two cast iron columns at each side, and being formed in the shape of boxes will take the counterweight. They are made in lengths of 6 feet for facility of transport, bolted together, and will be built into the masonry.

They are formed of $\frac{3}{4}''$ metal, except in the sides next to the shutter where they will be 1″ thick, as they directly support the weight. The bottom of each column is expanded with a wide foot to distribute the pressure on the foundation. The top length is cast so as to be fitted with a worm wheel and screw by which the sprocket wheel which carries the chain connecting the shutter and balance weight is driven.

The two screws or worms for each shutter are on one shaft and are right and left handed. They are driven by a small crab in the centre of the shaft. Two light rolled beams support the crab and working platform.

The shutter is formed of three bowstring girders connected by channel bars and plated with $\frac{3}{16}''$ iron plate except the bottom, which for a foot of depth, has $\frac{1}{2}''$ plate to strengthen it.

A half-inch thick plate is bolted to each end of the shutter through which the pressure is transmitted to the rollers. The rollers are carried in cast iron pedestals which are bolted through the spring plate to a $\frac{3}{4}''$ plate. The ends of the latter are turned back over the ends of the end plate of the shutter, so that the rollers may be carried along with the shutter in raising and lowering. It is also loosely connected with the end plate by a couple of $\frac{1}{4}''$ wire loops to keep it in position.

The spring plate is a $\frac{3}{8}''$ plate rivetted to an angle iron which is bolted to the backs of the girders. Being a little flexible, it will allow the rollers to always take a fair bearing, should the shutter bend slightly.

The rollers will be of cast iron and bushed with $\frac{1}{2}''$ *lignam vitæ* and will run on $1\frac{1}{2}''$ gun metal pins.

Suspender plates of $\frac{3}{4}''$ iron are bolted by two $\frac{3}{4}''$ bolts to the tops of the end plates of the shutters, and to these the chain by which the shutter is worked, are attached by shackles. The other ends of the chains are attached to balance weights of cast iron which are hung in the casings. These balance weights will be made in slabs for facility of transport and adjustment. The roller paths will be of cast iron and will be built into the masonry. They will be each in two lengths bolted together in the middle and will be planed.

The bottom of the shutter will rest on a planed sill of wrought or cast iron. The bottom plates of the shutter will be planed quite true to form a tight joint with the sill.

The sides of the shutter will be made, water-leakage posts working slightly eccentric as shown in the plan.

Pressure in shutter $= 35 \times 6\frac{7}{2} \times 62{\cdot}5$

With 7 feet head of water = 45,192 lb.

Take $\frac{1}{4}$ of this for friction as an extreme case—

The friction will probably never exceed $\frac{1}{10}$ pressure.

Crab { small wheel ... ... ... ... ... ... 8″ diameter.
large „ ... ... ... ... ... ... 24″ „

Worm wheels, 25″ diameter with 82 teeth.

Sprocket wheel, 16″ diameter, $3 \times 82 = 246$ times of the crab handles (1 foot radius) turn the sprocket wheels once and raise shutter $16 \times \frac{22}{7} = 50$ inches.

$\therefore \frac{246 \times 12}{50} = 59$ times raise the shutter 1 foot.

Distance travelled by power $= 2 \times \frac{22}{7} \times 59 = 371$ feet.

Since radius of handles is 1 foot, wheels and shutter is raised one foot. Weight to be lifted is 11,298 lb.

Therefore power required to raise the shutter one foot $= \frac{11{,}298^*}{371} = 30$ lb. nearly. (This power will only be required at the moment of first lifting.)

* Friction or weight which has to be lifted by power, the shutter being counterweighted = 11,298.

---

| | Rs. |
|---|---|
| Estimate ... ... ... ... ... ... ... ... ... | 3,500 |

It is proposed to place in the north branch Lower Anicut in the vent now occupied by the experimental shutters, an iron shutter of full span $4\frac{1}{2}$ feet in height, actuated by screws and counterweighted, and to slide down in front of new proposed body wall of anicut.

The shutter is made up of three 5″ × 3″ rolled beams with a skin of $\frac{3}{8}''$ plate. It is provided with rollers to reduce friction. The counterweight is carried by a chain over a sprocket wheel and clipped to the screw shafts. The pins of the rollers are to be gun metal and the bushes will be of $\frac{1}{2}''$ *lignam vitæ*. A crab winch with main shaft and bevel gearing will work the screws.

To stop bottom leakage a small plate project below the shutter and will catch when the shutter is raised, against a similar projecting plate fastened down to the anicut as shown in plan. The projecting plate will be carried right along anicut and into the recesses for the rollers. The side leakage will be stopped by the leakage post working slightly eccentric.



No. V./89 S.A.

Forwarded, in original, to the Superintending Engineer, V Circle, for any alteration he may consider necessary with reference to the foundations.

(By order.)

MADRAS, 2nd May 1895. (Signed) F. J. WILSON, Asst. Chief Engr. for Irrigation.

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*Note by the Chief Engineer for Irrigation.*

No. 124 I.

In G.O. No. 150 I., dated 10th February 1896, approval was given to the proposals of Lieutenant-Colonel Smart with regard to the Lower Coleroon anicut.

These proposals involve the adoption of two types of shutter—one to slide down in front of the body wall of dam, and the other to lift.

Orders have been given for the preparation of an estimate dealing with the whole anicut, but in the meantime it is proposed to construct and erect one shutter of each type which have been designed by Lieutenant-Colonel Smart, and which are provided for in the accompanying estimates submitted for the sanction of Government.

15th June 1896. (Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E., Chief Engineer for Irrigation.

---

ORDER—No. 535 I., dated 25th June 1896.

The following estimates are sanctioned:—

Irrigation.
43. Minor Works and Navigation.
Minor works for which Capital and Revenue Accounts are kept.
Lower Coleroon Anicut.
Capital Account.
I. Head Works.
3. Works.
Lower Coleroon Anicut.

| | Rs. |
|---|---|
| Fitting screw-gearing shutters ... ... ... ... ... ... | 3,500 |
| „ iron shutter ... ... ... ... ... ... ... | 4,380 |
| Total, I. Works ... | 7,880 |
| II. Establishment ... | 1,812 |
| III. Tools and plant ... | 8 |
| Total ... | 9,700 |

2. This sanction is registered as No. 74 I. of 1896–97.

(True Extract.)

Under Secy. to Govt., P.W.D., Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, V Circle.
„ „ „ on Special Duty, with six enclosures.
„ Examiner, Public Works Accounts.

Exd. T. K. Narayana Aiyangar.
Spare Copies

IRRIGATION.
ACCOUNT.

# Govt. of {1896} Madras.

## PUBLIC WORKS.

*Dated June, 25th.*

*Read.* *Encl.*

**G.O. No. 535 I., 25th June 1896.**

**JUNE.**

**Shutters**

The estimates amounting to Rs. 9,700 for fitting screw-gearing and iron — to the Lower Coleroon anicut, sanctioned.

Original not seen

110 copies
5 copies please reserve for the Press
8 July 1896
Proof

No. 535 I., 25TH JUNE 1896.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

**Irrigation.**
**Account.**

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I would recommend that a model should be made of this shutter at once, as we can then best ascertain how to stop the leakage in the roller recesses from below. There will be no difficulty in stopping side leakage by the leakage post working slightly eccentric; but I have not been able to solve satisfactorily to my mind the problem of stopping leakage at the recesses. This shutter will take the place of the experimental shutter put in last year.

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---

No. V./89 S.A.

Forwarded, in original, to the Superintending Engineer, V Circle, for any alteration he may consider necessary with reference to the foundations.

(By order.)

(Signed) F. J. WILSON,
Asst. Chief Engr. for Irrigation.

MADRAS,
2nd May 1895.

---

*Note by the Chief Engineer for Irrigation.*

No. 124 I.

In G.O. No. 150 I., dated 10th February 1896, approval was given to the proposals of Lieutenant-Colonel Smart with regard to the Lower Coleroon anicut.

These proposals involve the adoption of two types of shutter—one to slide down in front of the body wall of dam, and the other to lift.

Orders have been given for the preparation of an estimate dealing with the whole anicut, but in the mean time it is proposed to construct and erect one shutter of each type which have been designed by Lieutenant-Colonel Smart, and which are provided for in the accompanying estimates submitted for the sanction of Government.

(Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
Chief Engineer for Irrigation.

15th June 1896.

No. 535 I., 25TH JUNE 1896.

ORDER—No. 535 I., dated 25th June 1896.

The following estimates are sanctioned:—

Irrigation.
43. Minor Works and Navigation.
Minor works for which Capital and Revenue Accounts are kept.
Lower Coleroon Anicut.
Capital Account.
I. Head Works.
3. Works
Lower Coleroon Anicut.

| | Rs. |
|---|---|
| Fitting screw-gearing shutters ... ... ... ... ... ... ... | 3,500 |
| „ iron shutter ... ... ... ... ... ... ... | 4,380 |
| Total, I. Works ... | 7,880 |
| II. Establishment ... | 1,812 |
| III. Tools and plant ... | 8 |
| Total ... | 9,700 |

2. This sanction is registered as No. 74 I. of 1896–97.

(True Extract.)

Under Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, V Circle.
„ „ „ on Special Duty, with six enclosures.
„ Examiner, Public Works Accounts.

Exd. T. K. Narayana Aiyangar.
Spare Copies

WORKS DEPARTMENT,

BRANCH.

…N.
…T.

…96} Madras.

…WORKS.

Dated June, 25th.

Recd. Encl.

G.O. No. 535 I., 25th June 1896.

JUNE.

**Shutters**

The estimates amounting to Rs. 9,700 for fitting screw-gearing and iron — to the Lower Coleroon anicut, sanctioned.

PUBLIC WORKS DEPARTMENT,
IRRIGATION BRANCH.

No. 535 I., dy 25-June 1896

PROCEEDINGS OF THE MADRAS GOVERNMENT.

UNDER date the

READ the following

From Supdg Engr. Special Duty. Canvery Completion Estimate, No 208 dy 13 April 96.
No 1243 I dated 15th June 1896.
Note by the Chief Engr for Inspection.
In G.O. No. 150. I. dy 10th Feb/96, approval was given to the proposals of Lt. Colonel Stuart with regard to the Lower Coleroon Anicut.

These proposals involve the adoption of two types of shutter, one to slide down in front of the body wall of dam & the other to lift.

Orders have been given for the preparation of an estimate dealing with the whole anicut

but in the mean time it is proposed to construct & erect one shutter of each type which has been designed by Lt. Colonel Smart & which are is provided for in the accompanying estimates submitted for the sanction of Govt.

Order thereon

The following estimates are sanctioned:-

Irrigation.

3. Minor Works. Major Minor Works for which Capital & Rev. Accts are kept.

Lower Coleroon Anicut

Capital Account.

I. Head Works.

3 Works.

Lower coleroon anicut - Lifting screw gearing shutters - 3500

Do. vice shutters - 4380

Total I Works - 7880

II Establishment 1872

III Work Charges. 8

Total 9700

2. This sanction is registered as No. 743 of 1896-97.

Recd 15/6/96

DESPATCH 13

To The Chief Engineer & Secretary Madras Public Works Department & Special Duty with Branches.

P. W. CURRENT No. 5725

Estimates for fitting shutters to the lower Cole regulator

Encls 9 (2 plans)

Q.— : 24.6.96

25.2.95. 181 J
10.2.96. 150 J
21.3.96. 273 J

7.E.J. 25/6

Rec'd 18/6

Rec'd 25/6

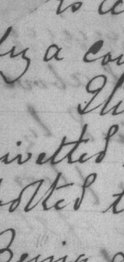
Registered 25/6

E. I. Form No. 1—500—14-5-95

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water = 45192 lbs
for friction as an extreme case -
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Wheel 8" Dr.
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" 5 Dr. with 82 teeth -
16" Dr. 3×82 = 246 times of the
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required to raise the shutter
= 30 lbs nearly. (This power
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ight. Which has to be lifted
utter being counterweighted

Lieut. C.M.R.E.

Leap 4 required
on special duty.
13/4/96

CHIEF ENGINEER
FOR IRRIGATION.
19 MAY. 96
No. 988

CHIEF ENGINEER
FOR IRRIGATION.
20 APR. 96
No. 1276 SA

No 200

Office of Superintending Engineer
Cauvery Completion Estimates
Tanjore dated 10th April 96

From.

A. W. Swan Lt Col RE
Superintending Engineer
on Spl duty

To,

The Chief Engineer for Irrigation
Madras.

Sir,

With reference to your no 4/62.S.A dated 31st March/96, I have the honor to forward plans of iron counterweighted shutters for the Lower Anicut with estimates amounting to Rs 3500 and Rs 4340/- perpectively. The first design is for a counterweighted shutter of 4½ ft to slide down in front of the new proposed anicut 4½ ft high. In this case it is necessary to have screws as there may be small deposits of silt in front through which it may be necessary to force the shutter. If this shutter works successfully it may be adopted for the rest of the anicut, save for one vent in each bay and for the undersluices where we must have lift shutters to deal with the

Encls 4.
1. Estt Rs 4340 with 1 (tracing)
1. Estt Rs 3500 with 1 (tracing)

PWS. 4
5725/96

the deposits of silt (sand and mud) in front.

I would recommend that a model should be made of this shutter at once as we can then best ascertain how to stop the leakage in the roller recesses from below. There will be no difficulty in stopping side leakage by the leakage pool working slightly eccentric; but I have not been able to solve satisfactorily to my mind the problem of stopping leakage at the recesses. This ~~extension~~ shutter will take the place of the experimental shutter put in last year.

2. The second design is for 6ft lift shutter (with 3ft height of dam) of the same kind as that submitted recently for the Madrid Canal; in this case no screws are necessary and the counter-weighted shutter is lifted and raised by a 3/4" chain, which must be of the very best quality tested beforehand with a weight double the weight of the shutter.

3. The shutter may be now put up in front but the rear old dam should not be removed nor should the shutter, in my opinion, be worked in floods, till the protective work

work recently sanctioned has been completed the cross walls of which will prevent lateral scour.

4. For the sliding shutter I have made the diameter of the leakage pool 9" because it is longer than that of the lifting shutter and also because when jammed tight it will materially help to lessen deflection which is of considerable importance in the case of the sliding shutter.

I have the honor to be
Sir,
Your most obed.t Servant
A. Cunard Lt. Col. R.E.
Superintending Engineer
on Spl. duty

5. The lift shutter has been designed so as to utilise to some extent the surplus stock in the shops. If any great number should be required they should be made of steel to reduce the weight and cost.

A. Cunard

CHIEF ENGINEER FOR IRRIGATION. 20 APR. 96 178 SA

CHIEF ENGINEER FOR IRRIGATION. 15 MAY 96 No. 9884

CHIEF ENGINEER FOR IRRIGATION. 20 APR. 96 No. 178 SA

SUPERINTENDING ENGINEER'S OFFICE CHERAUK. 6- 96 No. 178 E.I. P. W. D. 5TH CIRCLE.

From

A. H. Stuart Lt Col RE
Superintending Engineer
on Special Duty

To

The Chief Engineer for
Irrigation

No. 206

Dated 12th
Despd 13th } April 1896
Recd Encls 4

(W.S.)
5755/6

Subject - Forwarding plans and estimates for the iron counterweighted shutter for the Lower Anicut - for approval.

No 8954 Encl 4

I forwarded, in original to the Supt Engineer, 5th Circle, for any alteration he may consider necessary with reference to the foundations.

By order
J Hudson
Actg Chief Engineer
for Irrigation

Madras
2nd May 1895.
Recd 5/5/96

Enclosures 2
1. Estimate with report &c.
1. Plan (Tracing) 2

Estimate Rupees 3550

It is proposed to place in the middle branch Lower anicut in the vent now occupied by the experimental shutters, an iron shutter of full span 4½ ft in height, actuated by screws and counterweighted and to slide down in front of the proposed body wall of anicut.

The shutter is made up of three 5"×3" rolled beams with a skin of ⅜" plate. It is provided with rollers to reduce friction. The counterweight is carried by a chain over a sprocket wheel and clipped to the screw shafts. The pins of the rollers are to be gun metal and the bushes will be of ½" Lignum Vitæ. A crab winch with main shaft and bevel gearing will work the screws.

To stop bottom leakage a small plate project below the shutter and will catch when the shutter is raised, against a similar projecting plate fastened down to the anicut as shown in plan. The projecting plate will be carried right along anicut and into the recesses for the rollers. The side leakage will be stopped by the leakage past working slightly eccentric.

A. H. Stuart
Lt Col RE

Actg Chief Engineer
on Special Duty
13/4/96

CHIEF ENGINEER
FOR IRRIGATION.
15 MAY.96
No.....

CHIEF ENGINEER
FOR IRRIGATION.
20 APR.96
No. R.7[illegible]SA

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