C.F. Old No. 74, New No. 24—2,35,793—22-5-61.

DEPARTMENT.

Paper taken out of the Records from the charge of the Referencer.

Press
Miscellaneous No. ____, dated ____ 196 .
Routine

Date taken out.	For what purpose.			Initials of clerk taking the paper or of attender.	Date returned.	Initials of attender.
	Department.	C. No.	Year.			

C No 95—6

Public Works (1899) Department.

G.O., No. 1027 } 9
1028 }

DATED 5th ~~Nov~~ December 99. 1899

80/4

30

35 copies

[Despatch Abstract.]

Cauvery Delta. The estimates, aggregating Rs 74,700, for altering the Cauvery-Veerasholam dam into regulators and improving the Arasalar & Nattar Regulators for the better distribution of water in the — approved, and a copy of the Pros ordered to be forwarded to the G of I

Cauvery Delta. Forwarding a copy of the Pros requesting sanction to the estimates, aggregating Rs 74,700, for altering the Cauvery-Veerasholam dam into regulators and improving the Arasalar & Nattar Regulators for the better distribution of water in the —

P. W. 25
187—26-9-20.

2

IRRIGATION.
ACCOUNT.

Government {1899} of Madras.
PUBLIC WORKS.

Recd. } 1899. *Enclosures*
Regd. *Spare copies*

G.O., Nos. 1027, 1028 I., 5th December 1899.

DECEMBER.

Cauvery Delta

Forwarding a copy of the Proceedings requesting sanction to the estimates, aggregating Rs. 74,700, for altering the Cauvery-Veerasholan dam into regulators and improving the Arasalar-Nattar regulators for the better distribution of water in the —.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following papers :—

From Colonel A. W. SMART, R.E., Superintending Engineer, on Special duty, Cauvery Completion Estimates, to the Chief Engineer for Irrigation, dated Tanjore, 15th April 1899, No. 325.

I have the honour to forward, herewith, for sanction the following estimates with plans :—

	RS.
1. Altering Cauvery-Veerasholan dams into regulators	37,000
2. Improving the Arasalar-Nattar regulators	18,000

Enclosures.

Report to accompany estimate for altering Cauvery-Veerasholan dams into regulators.

	RS.
Amount of estimate	39,580

1. The present works at the bifurcation of the Veerasholan from Cauvery are two stepped dams, with no facilities or possibility of any accurate regulation. The diagrams of discharges show that the division of water is at present most unequal; the Veerasholan gets a full supply with 5′ 3″ on the gauge, whilst the Cauvery does not receive its full supply till the gauge reads 7′ 3″, a difference of 2 feet. As long as this state of things continues, so long will it be impossible to get a better duty from the supply (in the Cauvery the duty is taken at 44 acres to the cubic foot) and so long will the complaints of short supply in the Vickramanar and other channels in the lower reaches of the Cauvery continue.

2. It is therefore proposed to convert these open dams into regulators by levelling the present steps to one uniform level of 75·50 and throwing out new piers in front, to accommodate shutters. Four piers will be built (across Cauvery) 4′ 5¾″ thick each, dividing the regulators into five bays of 24′ 5″ each; and in the one across Veerasholan, the piers will be 4′ 8″ thick each, and the number of bays will be four, each 28′ 6″ in span. The lift shutter will be 6 feet high.

3. The foundation to the new work including the two front wings to be added in each case, will be 7 feet deep of ground moulded bricks in surki mortar; under piers 5′ 5¾″ and 5′ 8″ thick, and under wings 5′ 6″ thick. The piers and wing walls will be 13′ 4″ high throughout. The flooring between retaining wall and existing dam will be 2 feet deep, of which 6 inches at top will be cement concrete on 1′ 6″ of ordinary concrete in surki mortar. The floor of the two regulators will be brought to one uniform level of 75·50.

The accompanying plans show the construction of the shutters proposed for the regulators. There will be grooves 18″ × 10″ in the proposed piers to receive the roller paths of the new shutters. The roller paths are steel channels 10″ × 3″, standing on foot plates attached by gussets below, and carrying the gearing above, for lifting the shutters. The two roller paths of each vent are connected together by a cross channel 12″ × 3″, spanning the vents, which also carry the shaft connecting the gearing at each side of the vent.

The shutter is suspended at each end by chains in the grooves. These are attached to adjusting screws which enable the shutter to be set quite parallel to the sill. The chains wind on grooved cast iron drums 12″ diameter above. The drums are carried by cheeks of wrought iron plate bolted to the roller paths and have 24″ diameter cog wheels cast with them; 6″ diameter pinions on the 2″ shaft gear with these cog wheels. At one end the shaft carries a worm wheel 30″ diameter gearing with a double thread worm 4″ diameter and 2″ pitch, which is turned by a crank key 10″ radius; this combination is powerful enough to enable the shutter to be raised by one man.

The worm gearing proposed gives a very compact and powerful combination and prevents all chance of the shutter running down by accident. One man can easily lift the shutter at the rate of about ½ a foot a minute, that is to say, it will take him about 15 minutes or so to fully open one vent, if the shutter is down; closing the shutter will, of course, be done much more quickly as the weight is then with the work.

The shutter is built of two rolled beams 16″ × 6″ and vertical planking 2¼″ thick. It runs on four cast iron rollers 12″ diameter and 4½″ wide, two at each end, provided with roller bearings, and so fitted as to accommodate themselves to all irregularities of the roller path and any deflection of the shutter. They are also capable of adjustment so as to be set truly vertical, when the shutter has been adjusted to fit the sill. The rollers are so placed that each will take approximately one-fourth of the total pressure of the shutter.

As the planking of the shutter is vertical and the rolled beams are laid on their sides, it might prove deficient in shearing strength and there might be a tendency for the shutter to sag when lifted. To guard against this, angle iron diagonals 2½″ × 2½″ × ⅜″ have been introduced between the rolled beams.

A batten at each end of the shutter fits against the masonry to stop side leakage to a certain extent and prevent side play.

The rates allow for the iron work being fitted complete at the workshops to ensure accuracy. On arrival at the workspot, all that is necessary is to bolt the iron work together in place and to carefully fill in the spaces behind roller paths with fine cement concrete.

Specification report to accompany the estimate for improvements to Arasalar-Nattar regulators.

	RS.
Amount of estimate	21,120

It has been found that the present shutters of these works, only 4½ feet high, do not permit of any accurate regulation, and is rendered still more difficult by the large deposits of sand in front. The Nattar at present gets no supply till the water has risen over 3 feet on the gauge. To remedy this, it is proposed to remove the small shutters and to demolish the intermediate jack piers and to fit the bays of the two bridges with shutters of their full width and 6 feet high. In G.O., No. 715 I., dated 17th September 1898, an estimate for Rs. 8,560 was sanctioned for constructing a regulator and surplus at 1½ miles below the Nattar head for the supply of the Keerthimanar from the Nattar instead of the Arasalar, from whence it now draws its supply. It is believed that with the new large shutters in the main heads of the Arasalar and Nattar, and the greater supply which it will be possible to force down the Nattar, that the silt deposits will be considerably diminished. It is expected that the bed will be lowered at least 1½ feet, which will be a very considerable improvement on the present state of things. There are four bays of 26 feet clear span on the Arasalar side and three bays on the Nattar.

2. *Shutters.*—The accompanying tracings show the construction of the new shutters proposed for the regulators. On the upstream side, grooves 18″ × 10″ will be newly formed in the existing piers to receive the roller paths of the new shutters. These roller paths are steel channels (10″ × 3″) standing on foot plates attached by gussets below, and carrying the gearing above, for lifting the shutters. The two roller paths of each vent are connected together by a cross channel 12″ × 3″ spanning the vent, which also carries the shaft connecting the gearing at each side of the vent.

The shutter is suspended at each end by chains in the grooves. These are attached to adjusting screws which enable the shutter to be set quite parallel to the sill. The chains wind on grooved cast iron drums 12″ diameter above. The drums are carried by cheeks of wrought iron plate bolted to the roller paths and have 18″ diameter cog wheels cast with them; 6″ diameter pinions on the 2″ shaft gear with these cog wheels. At one end the shaft carries a worm wheel 24″ diameter gearing with a double thread worm 4″ diameter and 2″ pitch, which is turned by a crank key of 10″ radius; this combination is powerful enough to enable the shutter to be raised by one man.

The worm gearing proposed gives a very compact and powerful combination and prevents all chance of the shutter running down by accident.

One man can easily lift the shutter at the rate of about half a foot a minute, that is to say, it will take him about 21 minutes or so to fully open one vent if the shutter is down. Closing the shutters will, of course, be done much more quickly as the weight is then with the work.

The shutter is built of two rolled beams 16″ × 6″ and 2¼″ vertical planking. It runs on four cast iron roller 12″ diameter and 4½ inch wide—two at each end provided with roller bearings, and so fitted as to accommodate themselves to all irregularities of the roller path, and any deflection of the shutter. They are also capable of adjustment so as to be set truly vertical when the shutter has been adjusted to fit the sill. The rollers are so placed as each to take approximately one-quarter of the total pressure of the shutter.

As the planking of the shutter is vertical and the rolled beams are laid on their sides it might prove deficient in shearing strength, and there might be a tendency for the shutter to sag when lifted. To guard against this angle iron diagonals $(2\frac{1}{2}'' \times 2\frac{1}{2}'' \times \frac{3}{8}'')$ have been introduced between the rolled beams.

A batten at each end of the shutter fits against the masonry to stop side leakage to a certain extent and prevent side play.

Recesses are provided in the existing piers to admit workmen to get at the rollers when necessary.

The new platform is proposed at the level of top of the existing pier and the recesses are covered with $1\frac{1}{4}''$ teak wood planks bolted to the two angle irons $(3'' \times 3'' \times \frac{1}{2}'')$ which are on one side let into the piers and on the other fastened to the sides of channel iron roller paths; and when the workmen want to get into the recesses these planks can be easily removed.

The rates allow for the iron work being fitted complete at the workshops to ensure accuracy. On arrival at the workspot all that is necessary is to bolt the iron work together in place and to carefully fill in the hollows of the roller paths with fine cement concrete and also the foot of the grooves to floor level.

To the Superintending Engineer, V Circle, dated 1st May 1899, No. 44 T.J.

From H. A. MOSS, Esq., General Superintendent, Public Works Workshops, to the Superintending Engineer, V Circle, dated 9th August 1899, No. 72 S.E./5.

With reference to your No. 140 P.W.W., dated 18th May 1899, I have the honour to return the estimates herewith. The estimates have been altered as follows:—

Nattar-Arasalar regulator ...	From Rs. 2,000 Rs. to 2,400	(each shutter)
Cauvery-Veerasholan regulator		
Cauvery section	From Rs. 2,100 Rs. to 2,350	"
Veerasholan section	From Rs. 2,160 Rs. to 2,450	"

It is believed that these estimates are correct, and that all possibility of excess has been allowed for.

The calculation for the strength of the gearing is attached to the plan. The formula for the safe pressure on the teeth, safe pressure in cwt. $= 3{\cdot}2$ breadth × pitch (inches) is obtained from the ordinary proportions of crane teeth. It assumes that all the pressure comes on one tooth and is distributed along its whole breadth at the pitch line. The factor of safety is $\frac{1}{7}$. The allowance of strength seems ample as the fact that the teeth thicken towards the roots is neglected, and also that more than one tooth takes the pressure. The pinions will be shrouded to allow for their weaker form of teeth.

No. 315 E.I.

To the Chief Engineer for Irrigation, with reference to his No. 44 T.J., dated 1st May 1899. The revised estimates now amount to Rs. 21,120 for Nattar-Arasalar and Rs. 39,650 for Cauvery-Veerasholan regulator.

29th August 1899.
(Signed) A. W. SMART, Colonel, R.E.,
Superintending Engineer, V Circle.

No. 215 I.

Note by the Chief Engineer for Irrigation.

The Superintending Engineer on special duty, Cauvery Completion Estimates, submitted estimates aggregating Rupees 55,000 for the marginally-noted works required for the better distribution of water in the Cauvery delta. These estimates were forwarded to the Superintending Engineer, V Circle, for verification by the General Superintendent, Public

1. Altering Cauvery-Veerasholan dam into regulators—Rs. 37,000.
2. Improving the Arasalar-Nattar regulators—Rs. 18,000.

Works Workshops, so far as the shutters were concerned. The Superintending Engineer, V Circle, now submits revised estimates aggregating Rs. 60,770, which have been reduced in this office to Rs. 60,700 owing to errors found in the calculations. The estimates as altered are recommended for sanction. The works may be classed as "unremunerative" as they are not directly remunerative in themselves, but being required for the system can justly be charged to "Capital". They will probably be completed by the 31st March 1902.

1st November 1899.
(Signed) W. HUGHES,
Chief Engineer for Irrigation.

ORDER—No. 1027 I., dated 5th December 1899.

The following estimates are approved:—

Cauvery Delta System.
Cauvery Section.
2. Main Canals and Branches.
3. Regulators.

Unremunerative works—.

		RS.
1. Altering Cauvery-Veerasholan dams into regulators	... ...	39,580
2. Improving Arasalar-Nattar regulators	... ...	21,120
Total, I. Works	...	60,700
II. Establishment	...	13,961
III. Tools and plant	...	39
Total	...	74,700

2. Ordered that a copy of these Proceedings together with the estimates and plans for the works, be forwarded to the Government of India with a request that sanction to the estimates may be accorded at an early date under "49. Capital expenditure not charged to Revenue", Cauvery delta system.

[Here enter No. 1028 I., dated 5th December 1899.]

(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.

ENDORSEMENT—No. 1028 I., dated 5th December 1899.

Forwarded.

(By order.)

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

Exd. T. K. Narayana Aiyangar.

5

Public Works (189) Department.

CURRENT No.

From
The Chief Engineer for Irrign:

Order

No. 415 I.

Dated 1--11--99.
Received
Registered
Enclosures 17 Maps 8
Papers 18
Spare copies.

SUBJECT.

Cauvery-Veerasholam & Arasalar-Nattar Regulators—Estimates of Rs 60,700 as reduced in this office for improvements to—Note recommending that the—may be sanctioned.

S.

may be classed as "unremunerative" as they are not directly remunerative in themselves, but being required for the system can justly be charged to "Capital". They will probably be completed by the 31st March 1902.

ORDER thereon No: 1027 I. 5-12-99 Irrign. Asst.

The following estimates are approved:-

Cauvery delta system.
Cauvery Section.
2 Main Canals and Branches.
3 Regulators.
Unremunerative Works—

	Rs
1. Altering Cauvery-Veerasholam damsluice Regulators	39580
2. Improving Arasalar-Nattar Regulators	21120
Total I Works	60700
II Establishment	13961
III Tools & plant	39
Total	74700

2. Ordered that a copy of these Proceedings together with the estimates and plans for the works be forwarded to the Government of India with a request that sanction to the estimates may be accorded at an early date under "49 Capital Expenditure not charged to Revenue" Cauvery delta system.

Endorsement No. 1028 I. 5-12-99

Forwarded.

31/10/98

WH
1-11-99

H.S.
18-11-99

Sealed to G of India with 21 enclosures (8) plans
9/12/99

To
The Chief Engineer for Irrign:
" Supg: Engineer, V Circle.
" Examiner P.W. Accounts.

E. I. Form No. 1—900—27-3-99.

27-10-99

H 2 210

Public Works (1899) Department.

1

CURRENT No. 72

100

Placement out the weights for shutter in each case—

From The Supg Engineer 5th Circle

Order

The particulars of the weight of each shutter are given in the statement sent—

No. 315 Est.

Dated 17/29 August 1899
Received
Registered
Enclosures 15
Spare copies

SUBJECT.

Cauvery, Veerasholam, Arasalar and Nattar Regulators Lift Shutters—

Returns the Estimate and Plans in connection with— with certain remarks.

30/8/99

31/8/99

S44 T.I	1-5-99
(3162)	4-7-99
(3879)	15-4-99

Copy of letter from H. A. Moss Squire, General Superintendent, P. W. Workshops, to the Supdg Engineer, 5 Circle, No 72 Sh. 5 dated 9 August 1899:

8 With reference to your No 140 P.W.H dated

10 8 18 May 1899 I have the honour to return the estimates herewith. The estimates have been altered as follows:—

Nattour-Arasalar Regulator From Rs 2000 to Rs 2400 (each shutter)

Cauvery-Veerasholam Regulator

Cauvery section - From Rs 2100 to Rs 2350 each shutter

Veerasholam section " " 2160 to " 2450 -do-

It is believed that these estimates are correct, and that all possibility of excess has been allowed for.

The calculation for the strength of the gearing is attached to the plan. The formula for the safe pressure on the teeth, safe pressure in cwt = 3.2 breadth × Pitch (inches) is obtained from the ordinary proportions of crane teeth. It assumes that all the pressure comes on one tooth and is distributed along its whole breadth at the pitch line. The factor of safety is $\frac{1}{7}$. The allowance of strength seems ample as the fact that the teeth thicken towards the roots is neglected, and also

that

that more than one tooth takes the pressure. The pinions will be shrouded to allow for their weaker form of teeth -

---

No 315 E.I.

To the Chief Engineer for Irrigation with reference to his No. 44 T.J. dated 1st May 1899. The revised estimates now amount to Rs 21,120 for Nattaur - Arasalaur
" 39,650 " Cauvery - Veerasholam Regulator -
60,770

Enclo 18 as per list enclosed. Flag X.

29 Aug/99 A W Smart
Colonel R.E.
Supg. Engineer, 5 Circle

Public Works (1899) Department.

IRRIGATION BRANCH.

ISSUE No. 44 T.J.

To

The S.E. V Circle

(~~Reply to~~ from letter No. 325, dated 15/4/99)
fm Col Smart

Dated 1- 5 - 99
Despatched 4 - 5 - 99 -
Enclosures * 16 (see within)

* Particulars of Enclosures.

SUBJECT.

Cauvery Veerasholam ~~dam~~ and Arsalar - Nattar Regulators - Forwarding plans + estimates for the - recd from Col. Smart with the request that the Workshop Supt. may be ordered to send a copy of the calculations for the design of the gearing and that the ests. for Shutters may be carefully verified.

Form No. 13—4,000—7-1-99

BACK PAPERS.

No.	Date.
R 38 T.I.	17-4-99.

Sent to Government with No. I., dated 189 .

Printed with G.O., No. I., dated 189 .

REMINDERS ISSUED.

No. 1, dated 15-8 1899.

,, 2 ,,

,, 3 ,,

,, 4 ,,

,, 5 ,,

KEEP-WITHS.

FURTHER PAPERS.

No.	Date.
R 72 I d/	17-8-99

Papers-

R 38 T. 99

G.O. 85 I d/ 12-1-99

G.O. 715 I d/ 17-9-98

G.O. 514 I d/ 6-7-98

10

244 T.I.

Encls:

Col. Smart's letter with plans & Ests.

x D. Send these back

Cauvery Veerasholan.

1 Repᵗ

1 Data list

1 Detail Ests

1 abstract Ests.

1 Discharge Diagram

1 Plan of Masonry works

1 Plan of Shutter.

7

arasalar. Nattar

1 Repᵗ

1 Data list

1 Detᵈ Ests

1 Abstᵗ Ests

1 Discharge Diagram

2 Plans of Masonry works.

1 Plan of Shutter.

1 Plan showing elevation of shutter.

9

Col. Smart's letter No 325 d/ 15 Sept ~~1897~~ 1899 is forwarded with the plans and estimates for the Cauvery Veerasholan and Arasalar-Nattar Regulators with a request that the Workshop Supdt may be asked to send a copy of the calculations on which the ~~strength~~ design of the gearing is based

2. It is requested that the estimates for the shutters may be carefully verified. There have been several instances lately of estimates made in the Workshop having to be ~~be~~ revised and it is hoped no further cases will occur unless they ~~are~~ necessary arise from unavoidable changes of design.

1.5.99 W.H

Specification Report to accompany the Estimate for Improvements to Arasalar - Nattar Regulators:

5 S/

Amount of Estimate Rs 18,000.
21120

1. It has been found that the present Shutters of these works, only 4½ ft high, do not permit of any accurate regulation, ~~which~~ and is rendered still more difficult by the large deposits of Sand in front. The Nattar at present gets no Supply till the water has risen over 3 feet on the guage. To remedy this, it is proposed to remove the Small Shutters and to demolish the intermediate jack piers and to fit the bays of the two bridges with Shutters of their full width and 6 ft high. In G. O. No. 715 I dated 17th September 1898 an estimate for Rs 8,500 was Sanctioned for constructing a regulator and Surplus at 1½ miles below the Nattar Head, for the Supply

SUPERINTENDING ENGINEER
No. 71/...
20 AUG 1899
E. P.W.D.

FOR INFORMATION
17 APR. 1899
5/...

SUPERINTENDING ENGINEER
No. 8/20/ E I
5 MAY 1899
V. CIRCLE, P.W.D.

of the Keerthimanar from the Nattar instead of the Arasalar, from whence it now draws its supply. It is believed that with the new large shutters in the main heads of the Arasalar and Nattar, and the greater supply which it will be possible to force down the Nattar, that the silt deposits will be considerably diminished. It is expected that the bed will be lowered at least 1½ ft, which will be a very considerable improvement on the present state of things. There are 4 bays of 26 ft clear span on the Arasalar side and 3 bays on the Nattar.

2 Shutters:- The accompanying tracings shew the construction of the new shutters proposed for the Regulators. On the upstream side, grooves 18"×10" will be newly formed in the existing piers to receive the roller paths of the new shutters.

These

6 Sp

These roller paths are steel channels (10"×3") standing on foot plates attached by gussets below, and carrying the gearing above, for lifting the shutters. The two roller paths of each vent are connected together by a cross channel 12"×3" spanning the vent, which also carries the shaft connecting the gearing at each side of the vent.

[illegible] pinions 12"×3"/2"×½

The shutter is suspended at each end by chains in the grooves. These are attached to adjusting screws which enable the shutter to be set quite parallel to the sill. The chains wind on grooved cast iron drums 12" diameter above. The drums are carried by cheeks of wrought iron plate bolted to the roller paths and have 18" diameter cogwheels cast with them; $\overset{6''}{5''}$ diameter pinions on the 2" shaft gear with these cogwheels. At

one

one end the Shaft carries a worm wheel 24" diameter gearing with a double thread worm 4" diameter and 2" pitch, which is turned by a crank Key of 10" radius; this combination is powerful enough to enable the Shutter to be raised by one man.

The worm gearing proposed gives a very compact and powerful combination and prevents all chance of the Shutter running down by accident.

One man can easily lift the Shutter at the rate of about half a foot a minute - that is, to say, it will take him about 21 minutes or so to fully open one vent if the Shutter is down. Closing the Shutters will of course be done much more quickly as the weight is then with the work.

The Shutter is built of two rolled beams 16" x 6" and 2¼" vertical planking. It runs

on

on 4 cast iron rollers 12" diameter and 4½ inch wide, two at each end provided with roller bearings, and so fitted as to accommodate themselves to all irregularities of the roller path, and any deflection of the Shutter. They are also capable of adjustment so as to be set truly vertical when the Shutter has been adjusted to fit the sill. The rollers are so placed as each to take approximately ¼ of the total pressure of the Shutter.

As the planking of the Shutter is vertical and the rolled beams are laid on their sides it might prove deficient in shearing strength and there might be a tendency for the Shutter to sag when lifted. To guard against this angle iron diagonals (2½" x 2½" x ⅜") have been introduced between the rolled beams.

A

A batten at each end of the Shutter fits against the masonry to stop side leakage to a certain extent and prevent side play.

Recesses are provided in the existing piers to admit workmen to get at the rollers when necessary.

The new platform is proposed at the level of top of the existing pier and the recesses are covered with 1¼" teakwood planks bolted to the two angle irons (3" × 3" × ½") which are on one side let into the piers and on the other fastened to the sides of channel iron roller paths, and when the workmen want to get into the recesses these planks can be easily removed.

The rates allow for the iron work being fitted complete at the Workshops to ensure accuracy. On arrival at

the

the workspot all that is necessary is to bolt the ironwork together in place and to carefully fill in the hollows of the roller paths with fine cement concrete and also the foot of the grooves to floor level.

Col. R. E

15

Report to accompanying estimate for altering Cauvery-Veerasholen dams into Regulators.

Amount of Estimate Rs ~~3[illegible]~~ 3[illegible]

1. The present works at the bifurcation of the Veerasholen from Cauvery are two stepped dams, with no facilities or possibility of any accurate regulation. The diagrams of discharge show that the division of water is at present most unequal; the Veerasholen gets a full supply with 5.3 on the guage, whilst the Cauvery does not receive its full supply till the guage reads 7.3, a difference of 2 ft. As long as this state of things continues, so long will it be impossible to get a better duty from the supply (in the Cauvery the duty is taken at 44 acres to the c.ft.) and so long will the complaints of short supply in the Vikramanar and other channels in the lower reaches of the Cauvery continue.

2. It is therefore proposed to convert these

AUG 1899
V. CIRCLE, P.W.D.

17 APR 1899

MAY 1899
V. CIRCLE, P.W.

these open dams into Regulators by levelling the present steps to one uniform level of 75.50 and throwing out new piers in front, to accommodate shutters. Four piers will be built — (across Cauvery) 4'–5¾" thick each, dividing the Regulators into 5 bays of 24'–5" each; and in the one across Veera-sholen, the piers will be 4'–8" thick each, and the number of bays will be 4, each 28'–6" in span. The 6ft shutter will be 6ft high.

3 The foundation to the new work including the two front wings, to be added in each case, will be 7 feet deep of ground moulded bricks in surki mortar, under piers 5'–5¾" & 5'–8" thick, and under wings 5'–6" thick. The piers and wing walls will be 13'–4" high throughout. The flooring between retaining wall and existing dam will be 2 feet deep, of which 6 inches at top will be Cement Concrete on 1'–6" of ordinary Concrete in Surki mortar.

The

The floor of the two Regulators will be brought to one uniform level of 75.50.

3 Sl

The accompanying plans show the Construction of the shutters proposed for the Regulators. There will be grooves 18"×10" in the proposed piers to receive the roller paths of the new shutters. The roller paths are steel channels 10"×3", standing on foot plates attached by gussets below, and carrying the gearing above, for lifting the shutters. The two roller paths of each vent are connected together by a cross channel 12"×3", spanning the vents, which also carry the shaft connecting the gearing at each side of the vent.

Estimate provides for channel iron 12"×3½"×½"

The shutter is suspended at each end by chains in the grooves. These are attached to adjusting screws which enable the shutter to be set quite parallel to the sill. The chains wind on grooved cast iron drums ~~18~~ 12" Dr. above. The drums are carried by cheeks of wrought iron plate bolted to the roller paths and have 24" Dr. Cog wheels cast with them.

Estimate provides for 12" Dr drum

4' 6"

~~8"~~ 6" Dr. pinions on the 2" shaft gear with these cog wheels. At one end the shaft carries a worm wheel 30" Dr. gearing with a double thread worm 4" Dr. and 2" pitch, which is turned by a crank key 10" radius; this combination is powerful enough to enable the shutter to be raised by one man.

The worm gearing proposed gives a very compact and powerful combination and prevents all chance of the shutter running down by accident. One man can easily lift the shutter at the rate of about ½ a foot a minute, that is to say, it will take him about 15 minutes or so to fully open one vent, if the shutter is down; closing the shutter will, of course be done much more quickly as the weight is then with the work.

The shutter is built of 2 rolled beams 16"×6" and vertical planking 2¼" thick. It runs on four

cast

Cast iron rollers 12" Dr. and 4½" wide, two at each end, provided with roller bearings, and so fitted as to accommodate themselves to all irregularities of the roller path and any deflection of the shutter. They are also capable of adjustment so as to be set truly vertical, when the shutter has been adjusted to fit the sill. The rollers are so placed that as each will to take approximately ¼ of the total pressure of the shutter.

As the planking of the shutter is vertical and the rolled beams are laid on their sides it might prove deficient in shearing strength and there might be a tendency for the shutter to sag when lifted. To guard against this, angle iron diagonals 2½"×2½"×⅜" have been introduced between the rolled beams.

A batten at each end of the shutter fits against the

masonry

masonry to stop side leakage to a certain extent and prevent sideplay.

The rates allow for the iron work being fitted complete at the work shops to ensure accuracy. On arrival at the workspot, all that is necessary is to bolt the iron work together in place and to carefully fill in the spaces behind roller paths with fine cement-concrete.

A W Smart Col R.E.

No. 325

Special Superintending Engineer's Office
Cauvery completion Estimate.
Tanjore dated 15th April 1899.

From

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Colonel. A. W. Smart R.E.,

No. 3/120 PWD
1899

18

To

17 APR. 1899
No. 377

The Chief Engineer,
for Irrigation,
Madras.

Sir,

No. 2/201 E I
5 MAY 1899

I have the honour to forward herewith for Sanction the following estimates with plans:-

1. altering Cauvery-Veerasholen dams into Regulators. Rs 37,000.
2. Improving the Arasalar-Nattar Regulators Rs 18,000.

I have the honour to be
Sir,
your most obedt Sert

A W Smart Col R.E.