C No. 5280

Govt. of 18 } Madras.

PUBLIC WORKS.

Dated

Rcd. Encl.

G.O., 12 June 1896, No. 504-59.

Stern wheel Steamers.

≡

H.E. estimate amounting to Rs. 59,500 for constructing two — to ply above and below the Kistna Anicut, Kistna Eastern Delta, Sanctioned and the Govt of India ordered to be addressed to arrange for their construction at the Govt dockyard, Bombay.

Do

Requesting to order the construction at the Govt. dockyard, Bombay, of the two — required for the Kistna Delta System and to inform this Govt how long it will take to complete and deliver them.

P. W. 19.
1,000-4-5-96.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following papers:—

From Major W. L. C. BADDELEY, R.E., Superintending Engineer, II Circle, to the Chief Engineer for Irrigation, dated Bezwada, 13th October 1894, No. 1588 K.S.

I have the honour to bring to your notice the risk of the Kistna works being dependent on a single steam launch.

2. The *Alexandra* was obtained in 1886 from the Government Dockyard, Kidderpore, and her dimensions are—

Length	61′	Draught loaded	3′ 9″
Breadth (maximum) ...	9′ 2″	H.P.	10
Depth	5′ 9″	Speed (maximum) ...	7 miles per hour.

The cost ... Rs. 14,139, including Rs. 1,727 for fitting her with cabins at Bezwada.

At the present rate of exchange, I suppose a similar launch would cost Rs. 18,000.

3. The launch has done her work well, but of late years she has broken down occasionally in the canals, and if this happened when she was crossing the river with any considerable current running, the consequences would be serious, as even if her anchors held, there would be no means of bringing her back into the canals until the river subsided.

4. As matters stand, it is impossible to make rapid inspections as there is no steam launch available. I hope, therefore, you will approve of the Kidderpore Dockyard being asked for plans and estimates for a steam launch, similar to the *Alexandra* but with slightly more beam and more powerful engines.

5. I cannot find in my office any drawings of the *Alexandra* and I conclude that they must be in your office.

To the Superintending Engineer, II Circle, dated 13th November 1894, No. 174 K.S.
From the „ II „ „ 24th November 1894, No. 1992 K.S.
To the „ II „ „ 5th December 1894, No. 189 K.S.
From the „ II „ „ 27th February 1895, No. 2681 K.S.

Memorandum to the Superintending Engineer, II Circle, dated 27th May 1895, No. II/87 K.S.

The question of the kind of steamer suitable for the Kistna has been under consideration of the Secretary to Government, Public Works Department, and Honourable Mr. Bliss, as well as the undersigned, and the following conclusions may be said to have been arrived at:—

(1) That it is impossible to design a steamer with a draught of only 2 feet that will be satisfactory in towing heavy boats across the Kistna.

(2) That as this is the service for which the steamer is mostly required, her adaptation for inspection work on the canals must be a secondary consideration.

(3) That to enable her to grip the water the steamer must draw at least 3 feet and would be better drawing 3½ feet, and that there is no advantage to be gained by using stern wheels.

(4) No experience has yet been had of oil-engines, and it is considered that the best type of engine will be a simple non-condensing engine driving twin screws.

(5) With a beam of 14 feet and draught 3′ 6″, a powerful tug capable of drawing four heavy punts across the river against any flood should be possible, or eight punts when the river is low.

(6) The disadvantages of a flat-bottomed boat are a want of stability and of navigability, and these are considered to be of more importance than the power of getting easily off a shoal, besides which it is doubtful if a small keel would have much effect in the latter event.

2. The Superintending Engineer is requested to report the depth of water available in the Kistna and whether a channel 4 feet deep could not be easily maintained at slight cost across the shallow part.

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

From the Executive Engineer, Kistna Northern Division, to the Superintending Engineer, II Circle, dated 21st June 1895, No. 183 S.E.

With reference to your endorsement No. 563 K.S., dated 5th June 1895, on the Chief Engineer's memo. No. II/87 K.S., I have the honour to report that I consider that an artificially-maintained channel in the Kistna river for navigation during low freshes would be very costly, but that for towing in the river the draft of the steamer could, without detriment, be increased to 3 feet as the boats she will have to tow will draw this.

2. I am, however, still strongly of opinion that the type of boat described in my letter No. 537 S.E., dated 12th February 1895, would be the most suitable for the work required of a steamer for the Kistna, as regards both her river or canal work.

In support of this view I would respectfully urge that the river steamers of all great companies, where not liable to be subjected to rough seas, are of the flat-bottomed paddle or stern wheel type, and that all river tugs are paddle boats. The shallow draft stern wheel steamers which are used in the Chindwin are, I believe, extensively used for towing. I would suggest a reference to the Director of Indian Marine, who could give reliable information on this head.

A stern wheel steamer is at present in daily use by the East Coast Railway for towing on the Gódávari between Rajahmundry and Gódávari South.

The engines of a stern wheeler are of the simplest possible type and every part of the propelling machinery is easily accessible.

No. 757 K.S.

Forwarded to the Chief Engineer for Irrigation, with reference to his memo. No. II/87 K.S., dated 27th May 1895.

2. The Superintending Engineer entirely agrees with Captain Ellis, R.E., in considering a flat-bottomed stern wheel steamer the most suitable type for the Kistna work. One great advantage of a stern wheel is that the machinery and wheel can be repaired without docking.

3. A channel, 4 feet deep, could certainly not be maintained at slight cost across the river when it is low, and the steamer should be quite independent of any artificial channel. It would, in the opinion of the Superintending Engineer, be most advisable to obtain the advice of the Director of Indian Marine before proceeding further in the matter.

(Signed) W. L. C. BADDELEY, Major, R.E.,
29th June 1895. Superintending Engineer, II Circle.

To the Superintending Engineer, II Circle, dated 10th July 1895, No. 167 K.S.

From Major W. L. C. BADDELEY, R.E., Superintending Engineer, II Circle, to the Chief Engineer for Irrigation, dated 21st March 1896, No. 2701 K.S.

With reference to memo. No. II/107 K.S., dated 10th July 1895, I have the honour to forward herewith drawings, specification and letter from the Director of the Royal Indian Marine on the subject of the steamers required for the Kistna, and to request that the sanction of Government may be obtained to the provision of the steamers at the estimated cost.

2. The Superintending Engineer approves of the modifications suggested by the Director, but considers the provision of one of Sir William Thompson's patent sounding machines unnecessary.

ENCLOSURES.

From the Officiating Director of the Royal Indian Marine, Bombay, to the Superintending Engineer, II Circle, Bezwada, dated 12th March 1896, No. 1035 (Ships—Construction).

With reference to your letter No. 2012, dated 16th December 1895, I beg to forward herewith two sketches of the stern wheelers required—one to ply above the anicut, and the other below. The sketches have been prepared in accordance with the previous correspondence on this question, and embody the latest ideas as conveyed in your letter under reference.

2. No. I stern wheeler to ply below the anicut. The estimated cost including freight to and re-erection at destination is, if built as per sketch, Rs. 29,500. It is however considered a very unsatisfactory arrangement to have the awning as therein shown; it is absolutely necessary, in my opinion, that the awning should extend fore and aft to protect the engines and boilers, as well as the men working at them. If this be done, the cost will be increased to Rs. 30,000.

3. No. II stern wheeler to ply above the anicut. The cost of this steamer, if built as per sketch, is Rs. 29,000; the previous remarks about the awning also apply to this case, in which the cost would be increased to Rs. 29,500.

4. The whole of the awnings will be made portable, so that they can be taken off if the necessity arises.

5. With respect to the use of delta metal, I would observe that this metal is really only in its experimental stage so far as plates for the construction of vessels are concerned, although it has given most satisfactory results as a material for propellers, but by reason of its being allied to the aluminium alloys, the recent experience of the British Admiralty in the use of the latter metal for torpedo tubes, and that of the French Admiralty in a torpedo boat recently built for them by Messrs. Yarrow and Co. has not been satisfactory; the adoption therefore of delta metal is not recommended in the construction of the two steamers under consideration, but as the British Admiralty build all torpedo boats of galvanized steel, and Messrs. Yarrow and Co. recommend the same procedure with light shallow draught steamers, the defects complained of in the *Alexandra* would in all probability be avoided in the new steamers were their floor plates and bottom plates of galvanized steel.

6. As regards a removable gear for taking soundings, it would probably be better to obtain that of Sir William Thompson's patent sounding machines, but of a size smaller than usually fitted in a seagoing vessel. The cost of this machine is not included in the estimate.

7. An outline specification is also attached.

Outline specification of two stern wheel launches to work on Kistna above and below anicut.

	FT.
Length between perpendicular	75
Beam, extreme	14
Depth	4

Hull—to be subdivided by five transverse W.I. bulkheads forming six water-tight compartments.

Plating—to be $\frac{1}{8}''$ galvanized (if so ordered) steel plates, with butts properly shifted, lap jointed and butted.

Frames—to be of steel angles $1\frac{3}{4}'' \times \frac{1}{2}'' \times \frac{3}{16}''$ spaced 2 feet apart.

Floors—to be of $\frac{3}{32}''$ galvanized (if so ordered) steel plating.

Reverse bars—to be of steel angles $1\frac{1}{4}'' \times 1\frac{1}{4}'' \times \frac{3}{16}''$ turned up at the bilges sufficiently to make a strong connection with frames.

Deck beams—to be of steel angles $2'' \times 1\frac{1}{2}'' \times \frac{3}{16}''$ connected to frames by steel gusset plates $9'' \times 9'' \times \frac{3}{16}''$.

Bulkheads transverse—to be of steel plate $\frac{3}{32}''$ thick stiffened by angle bars $1\frac{1}{2}'' \times 1\frac{1}{2}'' \times \frac{3}{16}''$. Boundary angles to be $1\frac{3}{4}'' \times 1\frac{3}{4}'' \times \frac{1}{4}''$.

Bulkheads longitudinal—to be of steel plates $\frac{1}{8}$" thick, one on each side, to extend right fore and aft where broken, to make cool bunker bulkheads; continuity of strength to be maintained by overlapping. Bulkhead to be stiffened by angles $1\frac{1}{2}" \times 1\frac{1}{2}" \times \frac{3}{16}"$ as shown in sketch. Top and bottom boundary angles to be of steel $1\frac{3}{4}" \times 1\frac{3}{4}" \times \frac{1}{4}"$.

Stringer—to be a steel plate $\frac{1}{8}$" thick 12" wide with gunwale angle $1\frac{1}{2}" \times 1\frac{1}{2}" \times \frac{1}{4}"$.

Engine and boiler bearers—to be as per sketch.

Screen bulkhead—to be of $\frac{1}{8}$" plating, properly stiffened and shaped as per sketch.

Deck—to be of teak $1\frac{1}{2}$" thick, properly fastened.

Cabin—As per sketches, which is arranged so as to allow for minimum height specified and in accordance with letters from Public Works Department, Madras, Nos. 1972 and 2012 K.S., dated 10th and 16th December 1895, respectively.

Deck fittings—to be as usual for launches of this description and as shown on sketches.

Equipment—to be fitted out complete with necessary anchors, cables, awnings, curtains, &c., as usual and necessary for launches of this size.

Boilers—to be of Loco. type suitable to a working pressure of 150 lb. per square incl..

Engines—Cylinders 2 in number, $11\frac{1}{2}$" diameter, 42" stroke to develop, about 160 Horse-power.

General—Launches to be as per sketches generally, stiffened as shown thereon.

2nd March 1896. (Signed) T. AVERY, Constructor.

To the Superintending Engineer, II Circle, dated 1st April 1896, No. 49 K.S.

From Major W. L. C. BADDELEY, R.E., Superintending Engineer, II Circle, to the Chief Engineer for Irrigation, dated Bezwada, 13th April 1896, No. 120 K.N.

In reference to your No. II/49 K.S., dated 1st April 1896, I have the honour to inform you that the Director, Royal Indian Marine, has not expressed any positive opinion as to the relative advantages of twin screws and stern wheelers, but in one of his letters to me he remarks—

I am of opinion the steamer to ply on the river below the anicut should be a turn-screw launch, provided the minimum depth of water is not less than three feet.

2. As however, for work below the anicut, we require a steamer with draught not exceeding 2 feet, the proposal to provide a turn-screw launch was not accepted.

3. When Mr. Taylor, an Engineer of the Royal Indian Marine and one of the staff of the Kidderpore Dockyard, was at Bezwada, he was consulted by Captain Ellis, R.E., and expressed an opinion that both for river and canal work a stern wheeler was the most suitable. Mr. Taylor, I understand, has had much experience of these boats in Burma.

4. I will make a further reference to the Director of the Royal Indian Marine, and let you know the result.

From the Director of the Royal Indian Marine, Bombay, to the Superintending Engineer, II Circle, Bezwada, dated 17th April 1896, No. 1613 (Ships—Construction).

With reference to your letter No. 121 K.N. of 13th instant, I beg to say the general question as to whether twin screw or stern wheel steamers are the most suitable type for use on the Kistna river above and below the anicut, depends entirely on the depth of water that exists. If there is sufficient water at all times, say about 6 feet for a steamer drawing not less than 3 feet, then I would recommend a twin screw steamer as being handier and having more speed; but if a draught of not more than 2 feet is allowable, then the stern wheel type is the kind that must be used.

2. Another point which militates against screw-propulsion for shallow rivers is the risk of the propeller striking the bottom and getting damaged, or bending the shaft, which involves the vessel being placed in dock for repair, while in the case of a stern wheeler everything is above the water and accessible; but of course, if draught is no object, much better results, as regards speed, would be obtained with the screw steamer.

No. 201 K.S.

Forwarded to the Chief Engineer for Irrigation in continuation of No. 120 K.N., dated 13th April 1896.

25th April 1896. (Signed) W. L. C. BADDELEY, Major, R.E., Supg. Engineer, II Circle.

No. 112 I.

Submitted to Government with a recommendation that, as a depth of 6 feet cannot be depended on at all times, sanction may be accorded to the provision of two stern wheel steamers at an estimated cost of Rs. 59,500.

27th May 1896. (Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E., Chief Engineer for Irrigation.

ORDER—No. 504 I., dated 12th June 1896.

The Government of India in the Marine Department will be requested to order the construction at the Government Dockyard at Bombay of the two stern wheel steamers required for the Kistna delta.

2. The following estimates are sanctioned from the balance of the amount reserved for tools and plant required for the Kistna delta system, which will then be reduced to Rs. 45,034 :—

Capital expenditure not charged to Revenue.
49. Irrigation.
Kistna Delta System.
Eastern Section.
III. Tools and Plant.
4. Navigation Plant.

	Rs.
(1) Constructing No. I stern wheel steamer to ply below the Kistna anicut	30,000
(2) Constructing No. II stern wheel steamer to ply above the Kistna anicut	29,500
Total ...	59,500

3. This sanction is registered as No. 60 I. of 1896–97.

4. Ordered that the following letter be sent.

[Here enter No. 505 I., dated 12th June 1896.]

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E., Secretary to Govt., P.W.D., Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, II Circle.
" Examiner, Public Works Accounts.
" Revenue Department.
" Marine Department.

Exd. T. K. Narayana Aiyangar.
Spare Copies

CHIEF ENGINEER
FOR IRRIGATION.
15 JUL 96
No. 364

IRRIGATION.

Govt. of {1896} Madras.

PUBLIC WORKS.

Dated June, 12th.

Read. *Encl.*

G.O. No. 504 I., 12th June 1896.

JUNE.

Stern Wheel Steamers

The estimates amounting to Rs. 59,500 for constructing two — to ply above and below the Kistna anicut, Kistna Eastern delta, sanctioned, and the Government of India ordered to be addressed to arrange for their construction at the Government Dockyard, Bombay.

No. 505 I., 12TH JUNE 1896.

PUBLIC WORKS DEPARTMENT.

Irrigation.

LETTER—from

COLONEL R. R. E. DRAKE-BROCKMAN, R.E.,
Secretary to the Government of Madras,
Public Works Department,
Irrigation Branch,

To

THE SECRETARY TO THE GOVERNMENT OF INDIA,
MARINE DEPARTMENT.

SIR,

In forwarding herewith a copy of Proceedings of Madras Government, No. 504 I., dated 12th June 1896, I am directed to request that you will be so good as to order the construction at the Government Dockyard, Bombay, of the two stern wheel steamers required for the Kistna delta system in accordance with the designs forwarded with letter No. 1035, dated 12th March 1896, from the Director of the Royal Indian Marine and herein enclosed for reference, during the construction of the steamers.

2. It is necessary that the steamers should be obtained as soon as possible, and I am therefore also to request that you will be so good as to inform me how long it will take to complete and deliver them.

I have the honour to be,
Sir,
Your most obedient servant,

Colonel, R.E.,
Secretary to Govt., P.W.D.,
Irrigation Branch.

OOTACAMUND,
12th June 1896.

Exd. T. K. Narayana Aiyangar.
Spare Copies

IRRIGATION.

Govt. of {1896} Madras.

PUBLIC WORKS.

Dated June, 12th.

Recd. *Encl.*

No. 505 I., 12th June 1896.

JUNE.

Stern Wheel Steamers

Requesting to order the construction at the Government Dockyard, Bombay, of the two — required for the Kistna delta system, and to inform this Government how long it will take to complete and deliver them.

Letter from the Chairman Harbours Trust Board Madras No 2675 dated 6th November 189

No 174 KS dy 13 Nov 1896

Forwarded to the Superintending Engineer, Second Circle, with reference to letter No 1568 KS dated 13th October 1894. The Supg Engineer is requested to write to the Chairman Harbours Trust Board for any information he may require as it is possible that this launch may be suited to the needs of the Kistna Delta.

(Sd) F Washpitch

B

Ow 26
2400/1/35
3176

Superintending Engineer's Office,
Bezwada

No. 1992 KS

II CIRCLE,

Dated 24 November 1894.

From,

Major W. L. C. Baddeley Esquire, R. E.
Superintending Engineer,
II Circle.

To,

The Chief Engineer,
for Irrigation,
Madras.

Sir,

In reference to your
No. II/174 KS of 13th November/94,
I have the honour to inform
you that the Steam launch
referred to is not suitable
for work on the Kistna river.
I have however written to
the Harbour Board, to ask
for the draught of the launch,
which I know will be in excess
of what is permissible, if we
are to have a really useful
launch.

The "Indra" draws

and that is too much, as every time she touches ground, there is risk of damage to her screws, and the beaches get worn away by the sand that is forced up under the stern. The boat also has a keel which is a serious defect for our work as it makes it difficult to get her off if she goes aground.

3 If the Kidderpore Dock yard can build a steamer with rather more beam, not exceeding 15 feet, with powerful engines, and draught of about 1' 6", I would strongly recommend that plans & estimates be obtained.

4 Messrs Yarrow & Co Poplar London have built stern wheel steamers 75' long exclusive of wheel, 15' beam 4' 6" deep, and a draught of only 10 inches, and I have no doubt that they could supply a boat most suitable for work in this delta. If you think there is any hope of sanction

obtained, I will draw up a specification of what we want

I have the honour to be
Sir,
Your most obt Servt

W. Baddeley
Major RE
Sapty Engineer
II Circle

23-11-94

Draw in pencil

It must be remembered that for effecting towing purposes a sufficient draught in the steamer & required engines the extra

CHIEF ENGINEER FOR IRRIGATION No. 253 KS Received 1 DEC 1894

From

The Supdg Engineer
II Circle

To

The Chief Engineer.
For Irrigation.
Madras.

From,

The Superintending Engineer,
II Circle.

To,

The

Dated
Received } 18 .

Enclosures.

NO. .

SUBJECT.

No 1992 KS

Dated 24th November 1894.

Steam launch- | 3176 |
Reporting that the
referred to in Mr. II
174 Ks -
is not suitable for
work on the Kistna
River, with certain
remarks & Suggestions

II

No- 189 K.S. 4/12/94

Memo.

With reference to para 4 of letter No. 1992-KS dated 24th Nov. 1894 from the Supdg. Engineer, Second Circle, the undersigned has the honour to request that the Specification alluded to may be forwarded to this Office. It must be remembered that, for effective towing purposes, a sufficient draught in the Steamer is required to grip the water.

2. The result of the Supdg. Engr's correspondence with the Harbour Trust-Board should be repeated

7/12/94 Recd 6/12

To

The Supdg. Engineer,
Second Circle.

R252/1754

Superintending Engineer's Office,
Bezwada
II Circle,
Dated 27.2.1895.
28

No. 2681 KS

From,

Major W. L. C. Baddeley ~~Esquire~~, R.E.
Superintending Engineer,
II Circle.

To,

The Chief Engineer,
For Irrigation
Madras.

Enclosure 2

1 P.E. letter
1 General Specification
2

Sir,

I have the honour to forward a letter from the Executive Engineer Kistna Northern Dn. and a general specification of the type of steamers required for use on the Kistna Rivers.

2. I am of opinion that it is impossible to design a steamer that shall be suitable for work both on the Kistna river and on the Canals. For the former a powerful boat is necessary to make head way against moderate floods or rapid currents, but at the same time the boat must not be too large to pass through the head locks, as it is not possible to keep a steamer in safety throughout

throughout the year on the rivers.
For the Canals, a moderate speed is necessary but the boats should be designed to tow punts astern. Both types should be flat bottomed. The canal boats should preferably be screw steamers.

3. It would effect a great economy in the transport of materials if each division of the delta was provided with a steamer drawing about 2 feet of water and capable of easily steaming about 4 miles an hour with two or three punts in tow. The Canal banks would not allow a greater rate of steaming.

4. I would strongly recommend the purchase of three steamers, one for work on the rivers and two for work on the Canals. In any case the steamer for the river is an absolute necessity.

5. As regards the launch "Lady Westock" I saw her lying in the harbour, but I did not go on board. I have also received detailed information about her and in my opinion she is altogether unsuitable for work either on the River or in the Canals. The mere fact of her having a keel is sufficient to render her useless for work here, as everytime she struck ground, she would stick fast and in the river it would probably be exceedingly difficult to get her afloat again. Her draught is also far too great.

I have the honour to be,
Sir,
Your most Obt Servant,

Lt Col Baddeley Major R.E.
Supt Engr. 1st Circle.

Copied 27/12

From

The Supg Engineer

Second Circle

To The Chief Engineer

for Irrigation

Madras

Dated 28th February 1895

Encls 2

No 2681 KS

Steamers required on

Kistna rivers —

Forwards a letter from

Ex Engr. Kistna & a general

specification of — &

explains the necessity

for the same.

From,

The Superintending Engineer,

II Circle.

To,

The

43 Ks

Dated

Received } 18

Enclosures.

NO.

SUBJECT.

Mems

PUBLIC WORKS DEPARTMENT,

IRRIGATION BRANCH.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

UNDER date the

READ the following

Letter from the Supp. Engr., Second Circle, (H.Q. No 1588-KS dated 13 Oct 1894)
Endorsement to ——— do ——— do ——— (H.Q. No II 174 KS dated 13 Nov 1894)
Letter from ——— do ——— do ——— (H.Q. — 1992-KS — " — 24 — " —)
Mems to ——— do ——— do ——— (H.Q. — II 189 KS — " — 5 Dec 1894)
Letter from ——— do. ——— do. ——— (H.Q. — 2681-KS — " — 27 Feby 1895)

No 682 dy 26 & 28

Submitted to Government.

2. The general specification for a steam launch of the type required for use on the Kistna river to be constructed in lieu of "Alexandra" is approved. The Govt of India in the Marine Dept. may be requested to have a design according to the specification given, obtained from the Govt dockyard, Kidderpore, Calcutta, together with an estimate of the cost of the launch including charges for her conveyance and delivery at Coconada

I should like the hon. Mr. Ellis to see these papers, as he understands more about the construction of vessels than I do.
I am very doubtful after our past experience whether we ought to give Calcutta any more work. If Bombay can construct such a vessel as we require, I wd much rather go there.
W
29 Mar

To The Supery. Engineer, Second Circle.
" Chief Engineer for Irrigation.

I have seen very good launches turned out by the Kidderpore dockyard - I dont suppose the Govt of India will allow us to order from home in the open market here, so we shall have to get what is wanted built either at Kidderpore or at Bombay. I dont know that they build launches at the Bombay dockyard. I suppose they must - The Director of the

Order thereon.

Ordered that the following letter be sent:

To The Secretary to the Govt of India.
Marine Dept.

of the Madras Government, No. I
dated 1895, together with
a general specification for a steam
launch required for the Kistna river,
I am directed to request that this
Government may be furnished
with a design and an estimate
prepared at the Kidderpore Dockyard
of the cost of the launch delivered
at Cocanada.

2. As it is necessary that the
launch should be obtained as soon
as possible, I am to request that you
will be so good as to inform me
how long it will take to complete
and deliver the vessel.

23.3

25/3

E 3460 - 16-12-76
3459 - 16-12-76
1019 - 25-6-77
5729 - 30-7-79
1299 - 8-3-80
1309 - 8-3-80
6469 - 4-10-80.
5809 - 20-6-84
1123 - 12-11-84
1519 - 1-3-87
3130 - 7-12-94

E. I. Form No. 1—1,000-16-8-94.

~~His Excellency the Governor~~
3176
P. W. CURRENT No. 2407.
~~The Hon'ble~~ Mr Oless.

Encls 7
Recd: ~~26.3.95~~
23.4.95

Steam launch for
the Kistna

a launch built at Bby would have
to be sent to Bezwada by rail - but
I don't know if this wd be possible
even with a launch only 9'2" in
beam - I should suggest - of course
such a launch could be put on to a
Railway truck at Bombay easily enough,
but could she easily be got off and into
the water at Bezwada? I doubt it -
I expect we had better go to the Kid-
derpore yard.

As to the kind of launch required,
it is difficult to advise in the absence
of full info. - The Supt Engr does not
state what is the depth of water
& the dimensions in the canals - Nor
does he say what sort of engines
he wants, simple, compound, triple
expansion, condensing or non-con-
densing or what - I don't see how
the dockyard people can estimate without
this info. Coal is cheap at Bezwada
& perhaps it will be cheaper to ex-
pend it & have non-con-
densing engines than to engage an
Engr who is qualified to look
after condensing engines & who would probably
cost Rs 75 to 100 a month (and cheap
at that, if the engines are to be taken
proper care of) - The point should
have been ascertained

Have steam launch machinery, as
it has considerable disadvantages
& I never heard of it being recom-
mended should it could be dispensed
with. Its disadvantages are (1) it
is usually noisy; (2) the boilers must
be put forward in order to counter-
balance the weight of the engines
at the extreme stern of the boat;
hence (3) there is also of boat's
consequently of power, between
the boilers & the engines, & expense
of working is increased; (4) the
boiler being necessarily rather
forward, the space available
for cabins forward of the boiler
is contracted; (5) the engines being
of the slow-moving type, something
like paddle-wheel engines, are heavy
& therefore much more expensive & constant
than screw launch engines - I
went carefully into all these matters
some years ago with the people in
the Store Dept at the India Office
in regard to the supply of a steam-
wheel boat for the Salt Dept on
the Suez Canal, & I remember
the estimated increase of cost was
very marked. These disadvantages
must of course be faced, if need
be; but we don't know anything
about the essential question of
the depth of water in the canals.
I suppose I cannot get a twin screw
launch of the size required that
will not draw more than 3'. I rather,
I imagine that wd do much better
than a stern-wheel. The Supt
Engr does not say, so far as I
can see, whether the "Alexandra"
is a twin screw & a high screw.
A stern-wheel wd be better than
a screw boat to live on, both
because there wd be more
deck space & because there

I dont believe any small boat can be made comfortable for officers & men on + do their work on for days together. A twin screw would do as well as any other for a ship of your home waters, + would be very much more convenient in other ways; + that is what I should consequently recommend if the canals are deep enough - They ought to be at least 4 feet 6 inches for a launch drawing 3 feet - The draught of the launch could probably be kept down very considerably by the use of oil engines, which are daily increasing in favour. There are several, I think in use at the Navy Yard, + Col: Rennyquick could no doubt advise about them + could say how they compare, as regards Economy of working, with ordinary engines on the basis of coal at Rs 8 (20/) a ton, which must be about the price at Bezwada.

HO
4/4/95

To H.Ms.

A depth of 3 feet may be depended upon, the locks are designed to give 4 feet on the lowest sills

The Alexandra is a twin screw non condensing engine her great fault is want of

A depth of 3' in the canals I'd be confining it rather close. I should ask Col Rennyquick about oil engines, + then I'd state the facts to the Marine people + ask advice - They may be able to build a twin screw of a lower draught of water than 3 feet to send no doubt give more power than the

No 2052 w dy 29.3.55 No 6461 dy 4.10.80
" 2002 w dy 13.6.94 " 130 dy 8.3.80
" 3130 w dy 7.12.54 " 129 dy 8.3.80
" 151 dy 1-3.87 " 101 dy 25.6.77
" 1123 dy 12.12.84 " 3457 dy 16.12.76
" 880 dy 20.6.84 " 3460 dy 16.12.76

P. W. CURRENT No. 3176

To The Hon'ble the Public Works Member

Encl 9

Accd: 23.4.95

No 100. dy 15.4.95

Referred to Dr. for favor of remarks with reference to the Hon'ble note dated 9th April 1895.

13/4

Ryedt
S. 19/4

for
1894
1895

To

W with this Office memo No 4 P R dy 23.3.95 and Encl No 1462 E dated 7th April 1895.

W
23.4.95

pls. 33

I should take Col. Peacocke's advice & stick to the screws — whether from Bombay or from Kidderpore the India Marine Dept will advise, if the case is stated to them.

BS
14/5/95

No 74 D. dated 29th April 18

Note.

We have not yet really tried the oil engines at the Periyar in boats.

2. A boat was made locally in which one was tried, but it worked so unsatisfactorily that we determined to order a boat from Bombay, and this has not yet arrived. I shall be able to say more about the matter in another six months, but at present I am by no means favorably impressed with the oil engines, and doubt whether they will under the most favorable circumstances be as good as steam engines

for our canal and river work.

3. I would not advocate the use of a stern wheel steamer for the Kistna canals; such boats are only advisable where the depth of water available is very small, less than two feet; with a minimum of three feet screws are far preferable.

4. You could not do better than order a twin screw non-condensing engine; the less complication you have about a boat of this kind the better, as she probably does not run for an average of 1200 hours in the year, and saving of fuel is of much less consequence than simplicity and

5. There would be no difficulty in getting the boat sent by rail from Bombay. It need not be sent in one piece, but in as many as may be desirable; I presume there would be no difficulty in putting it together at Berwada. We have sent two good sized launches from Ipticatra to the Pericjast.

[illegible]

26.4.95

To, I with reference to his endorsement No. 100 dated 19.4.95

CWRR 26/4/95

~~The Hon'ble Mr H.W. Bliss. C.I.E~~

—

Oil enquiries for River boats

Forwarded to Sr. M. with reference to his Note dated 9th April 1895

Rueds

11/5

N. 747 D. 29-4-95

Re Marine Board

Rivers Steamers

Mr Meakin

Rueds

16/5

To Re

31/3

for fitting her [illegible]

I

10107-K.S. dy 10-7-95

Memo.

With reference to his endorsement N. 757-K.S. dated 29 June 1895, the Superg. Engineer, Second Circle, is requested to communicate direct with the Director of Indian Marine regarding the new steamer required for the Kistna, and thereafter to submit proposals for it.

Rueds
10/7

Memo.

Before passing orders on letter No.-2701-K.S. dated 21st March 1896 received from the Superg. Engineer, Second Circle, the undersigned has the honor to say that information is required as to the merits, or otherwise, of light draught stern wheelers as against twin screw steamers, it being understood that the chief service required of the steamers would be towing punts across the river. If the Superg. Engineer did not refer this point to the Director of Indian Marine for opinion, he is requested to do so now and report result.

31/3 Rivers 7/4

To The Superg. Engineer
Second Circle.

31/3

for fitting her [illegible]

Ben

Oct 7
5200/96

Particulars of three Steam launches working in Perijas No 1 Division

No	Description	Dimensions			Draught	Speed	Power	Remarks
		Length	Breadth	Height				
1	Steam Launch. "Edith"	40'	7'	4.0"	3'	-	About 20 H	Speed never tested. probably 9 miles per hour light.
2.	—— Do —— "Grace"	45'	9'	4.6"	3'	9 miles per hour light.	25 H	
3	Do "Daisy"	45'	9'	4.6"	3'	10 miles per hour light	60 H	

No 14 C.E.

Forwarded to the Chief Engineer for Irrigation, Madras with reference to his memorandum No 4 P. R. dated 23rd March 1895. There is also an oil launch 38'×7½'×4' (8 H.) which has yet been tried.

(Id) S D Grass.
Supt of Tels
No 1 Perijas

Perijas. 7. April 1895

The Coast ... for fitting her with cabins at Bo...

55/9618
5-350

574-5

certain tracings
auto 20.

Superintending Engineer's Office,
Bezwada

No. 1588 K1

II Circle,
Dated 13th October 1894.

From,

Major W. L. C. Baddeley R.E. Esquire,
Superintending Engineer,
II Circle.

To,

The Chief Engineer,
For Irrigation,
Madras.

1 Pre

Sir,

I have the honor to bring to your notice the risk of the Kistna works being dependent on a single steam launch.

2. The "Alexandra" was obtained in 1886 from the Government Dockyard Kidderpore, her dimensions are

Length 61'
Breadth (Maximum) 9'-2"
Depth - 5'-9"
Draught loaded 3'-9"
H.P — 10

Speed (maximum) 7 miles per hour

The cost Rs 14,139 including Rs 5,[illegible] for fitting her with cabins at Bezwada

At the present rate of exchange, I suppose a similar launch would cost Rs 18,000.

3. The launch has done her work well, but of late years she has broken down occasionally in the Canals, and if this happened when she was crossing the river with any considerable current running, the consequences would be serious as even if her anchors held, there would be no means of bringing her back into the Canals until the river subsided.

4. As matters stand it is impossible to make rapid inspections as there is no steam launch available. I hope therefore, you will approve of the Kidderpore Dockyard being asked for plans and estimates for a steam launch similar to the Alexandra, but with slightly more beam and more powerful engines.

5. I cannot find in my office any drawings of the "Alexandra" and I conclude that they must be in your office. I have the honor to be

Sir

Your most obt. Servt

W. Baddeley

Major R.E.

D.S. & I.W. Superintendent Civil

From

CHIEF ENGINEER
212 KS
15 OCT 1894
FOR IRRIGATION

The Supg Engineer
Lgo Circle.

To

The Chief Engineer
For Irrigation
Madras.

No 1588 KS
Dated 13 October 1894

Steam Launch for
Kistna Works ——.
Requesting permission
to get a —— as the one
~~now~~ in use now is not
in good order & insufficient
for the requirements

From,

The Superintending Engineer,
II Circle.

To,

The

Dated
Received } 18

Enclosures.

NO.

SUBJECT.

Memo. 20 D 87 KS d/27/2

Letter from Supg: Engr: II
No 2681 K.S. d/27-2-95.

The question of the kind of
Steamer suitable for the
Kistna has been under
consideration of the W,
I and Honorable Mr:
Bliss as well as the under-
signed and the following
conclusions may be said
to have been arrived at

(1) That it is impossible
to design a steamer with
a draught of only 2 feet that
will be satisfactory in
towing heavy boats acros
the Kistna.

(2) That as this is the service
for which the steamer is
mostly required her adoptat
for inspection work on the
Canals must be a secon
consideration.

(3) That to enable her to ge

fine water the steamer must draw at least 3 ft. and would be better drawing 3½ ft and that there is no advantage to be gained by using stern wheels.

4) No experience has yet been had of oil engines and it is considered that the best type of engine will be a simple non condensing engine driving twin screws

5) With a beam of 14 ft and draught 3-6" a powerful tug capable of drawing 4 heavy punts across the river against any flood should be possible or 8 punts when the river is low

6) The disadvantages of a flat bottomed boat are want of stability and navigability and these are considered to be of more importance that the power of getting easily off a shoal besides which it is doubtful if a small keel would have much effect in the latter event.

2. The Supdg. Engineer is requested to report the depth of water available in the Kistna and whether a channel 4 ft. deep could not be easily maintained at slight cost across the shallow part.

1st A R Ls. S.B.
E.I.
24/5

To

The Supdg Engineer
III Circle

Letter from the Executive Engineer Kistna Northern Div. to the Supdg: Engineer, 2nd Circle, dy 21.6.1895, No. 183 S.E.

With reference to your endorsement No. 563 K.S. dy 5.6.1895, on the Chief Engineer's Memo. No. II/87, I have the honour to report that I considered that an artificially maintained channel in the Kistna River for navigation during low freshes would be very costly, but that for towing in the river the draft of the steamer could, without detriment, be increased to 3 feet as the boats she will have to tow will draw this.

2. I am, however, still strongly of opinion that the type of boat described in my letter No. 537 S.E. dy 12.2.95 would be the most suitable for the work required of a steamer for the Kistna, as regards both River or Canal work.

In support of this view I would respectfully urge that the River Steamers of all great Companies where not liable to be subjected to rough seas, are of the flat bottomed paddle or stern wheel type, and that all river tugs are

...ree paddle boats. The shallow draft stern wheel steamers which are used in the Chindwin are, I believe, extensively used for towing. I would suggest a reference to the Director of Indian Marine who could give reliable information on this head.

A stern wheel steamer is at present in daily use by the East Coast Railway for towing on the Godavari between Rajahmandry and Godavari South.

The Engines of a Stern wheeler are of the simplest possible type and every part of the propelling machinery is easily accessible.

No 757 KS
29. 6. 95

Forwarded to the Chief Engineer for Irrigation with reference to his Memo No 11/87 K.S. dy 29th May 1895.

2. The Supg Engineer entirely agrees with Captain Ellis R.E. in considering a flat bottomed stern wheel steamer, the most suitable type for the Krishna Work. One great advantage of a Stern wheel is that the machinery

machinery & wheel can be repaired without docking.

3. A Channel 4' deep could certainly not be maintained at slight cost across the river when it is low, and the steamer should be quite independent of any artificial channel. It would, in the opinion of the Supg Engineer, be most advisable to obtain the advice of the Director of Indian Marine before proceeding further in the matter.

H.C. Baddeley
Major R.E.
Supg Engineer II Circle

CHIEF ENGINEER
FOR IRRIGATION.
1 JUL 95
No. 123 Ka

From

The Supg Engineer
Second Circle

To The Chief Engineer
For Irrigation

Dated 29th June 1895

No. 757 KS

New steamer required
for the Kistna —
Forwards with remarks
copy of Exc. Engr's (KS) 2
letter reporting on the
type of the —

Superintending Engineer's Office

No. 2701 KS

II CIRCLE,
Dated 21 March 1896.

From,

Major W. L. C. Baddeley Esquire, R.E.
Superintending Engineer,
II Circle.

To,

The Chief Engineer,
For Irrigation,
Madras.

Sir

Encl. 4

1. No. 1035 / 12.3.96 from Director of R.I.M.
1 outline Specification
2. Drawings sent separately

4

With reference to Memo No. 27/1096 dy 10.7.1895, I have the honour to forward herewith drawings, specification and letter from the Director of the Royal Indian Marine on the subject of the steamers required for the Kistna and to request that the sanction of Government may be obtained to the provision of the steamers at the estimated cost.

2. The Supg. Engineer approves of the modifications suggested by the Director but considers the provision of one of Sir William Thompson's patent sounding machines unnecessary.

I have the honour to be
Sir,
Your most obedient Servant
A. Trowbridge Rickards
Supg. Engr.
Wks for Supt. Engr. II Circle.

EM.

CHIEF ENGINEER
FOR IRRIGATION.
23 MAR 96
No. 896

From

The Supg Engineer

Second Circle

To

The Chief Engineer
For Irrigation

Dated 21 March 1896

Encl 4

Passed
5-2 Apl/96

No. 2701 KS

Steam wheel steamers to ply above & below Kistna Anicut —

Forwards for obtaining sanction of Govt to drawing & an outline specification &c of —

From,

The Superintending Engineer,

II Circle.

To,

The

Dated

Received } 18 .

Enclosures.

NO.

SUBJECT.

Outline Specification of two Steam wheel Launches to work on Kistna above and below Anicut

Length between perpendiculars — 75 ft-
Beam Extreme - - - - - 14 "
Depth - - - - - - - 4 "

Hull to be Subdivided by 5 Transverse W.T. bulkheads forming 6 water-tight Compartments

Plating = to be 1/8" galvanized (if so ordered) steel plates with butts properly shifted, lap jointed & butted.

Frames = to be of steel angles 1 3/4" × 1/2" × 3/8" spaced 2 ft apart.

Floors = to be of 3/32 galvanized (if so ordered) steel plating -

Reverse bars = to be of steel angles 1 1/4" × 1 1/4" × 3/16 turned up at the bilges sufficiently to make a strong connection with Frames

Deck Beams = to be of Steel angles
2" × 1½ × 3/16" Connected to Frames
by steel gusset-plates 9" × 9" × 3/16"

Bulkheads Transverse = to be of steel
plates 3/32" thick stiffened by
angle bars 1½" × 1½ × 3/16" Boundary
angles to be 1¾" × 1¾" × ¼".

Bulkheads Longitudinal = to be of
steel plates ⅛" thick one on each
side, to extend right fore & aft
where broken, to make coal
bunker bulkheads. Continuity of
strength to be maintained by
overlapping. Bulkhead to be
stiffened by angles 1½" × 1½" × 3/16"
as shewn in sketch. Top & bottom
boundary angles to be of steel
1¾" × 1¾" × ¼".

Stringer = to be a steel plate ⅛" thick
12" wide with gunwale angle
1½" × 1½" × ¼"

Engine & Boiler Bearers = to be as per
sketch.

Screen Bulkhead = to be of ⅛" plating
properly stiffened & shaped as per
sketch

Deck = to be of teak 1½ thick properly
fastened.

Cabin = As per sketches which is
arranged so as to allow for
minimum height specified and
in accordance with letters from
P.W.D. Madras No. 1972 & 2012 dtd 10th
& 16th Dec. 1895 respectively.

Deck fittings = to be as usual for Launch
of this description and as shewn on
sketches.

Equipment = to be fitted out complete
with necessary anchors, cables, awnings
curtains &c as usual and necessary
for launches of this size

Boiler = to be of Loco type suitable
to a working pressure of 150 lbs
per square inch.

Engines = Cylinders 2 in no. 11½" Diameter

42" stroke to develop about
160 H.P.

General = Launches to be as per
Sketches generally stiffened as
shewn thereon

SUPG. ENGINEER'S OFFICE
No. 2124
16 MAR. 95
P. W. D.
SECOND CIRCLE.

CHIEF ENGINEER
FOR IRRIGATION.
21 MAR. 95
No. 1665

CHIEF ENGINEER
FOR IRRIGATION.
23 MAR 95
No. 894

SUPG. ENGINEER'S OFFICE
No. 753
9 - APR. 95
P. W. D.
SECOND CIRCLE.

C. Avery.
Constructor
2/3/96

Rust
5386/96

Heading Ships Construction.

980

(Form No.5)

No 1035

It is requested that the above heading, with number and date of this communication, may be quoted in any subsequent correspondence on this subject.

R. I. M. Dockyard,
Bombay, 12th March, 1896.

From

The Director of the Royal Indian Marine,

To

The Superintending Engineer,

II Circle, B E Z W A D A.

Sir,

With reference to your letter No.2012 dated 16th December 1895, I beg to forward herewith two sketches of the stern wheelers required, one to ply above the -- Anicut and the other below. The sketches have been prepared in accordance with the previous correspondence on this question, and embody the latest ideas as conveyed in your letter under reference.

2. No.I Stern Wheeler to ply below the Anicut. The estimated cost including freight to and re-erection at destination is, if built as per sketch, Rs.29,500/- It is however considered a very unsatisfactory arragement to have the awning as therein shown, it is absolutely necessary in my opinion that the awning should extend fore and aft to protect the engines and boilers as well as

the

(S.389)

CHIEF ENGINEER
FOR IRRIGATION.
25 MAR 98
No.....

Rowse

10 SP

the men working at them. If this be done the cost will be increased to Rs.30,000/-.

3. No.II Stern Wheeler to ply above the Anicut.The cost of this steamer if built as per sketch is Rs.29,000/, the previous remarks about the awning also apply to this case,in which the cost would be increased to Rs.29,500/-.

4. The whole of the awnings will be made portable so that they can be taken off if the necessity arises.

5. With respect to the use of Delta Metal, I would observe that this metal is really only in its experimental stage so far as plates for the construction of vessels are concerned, although it has given most satisfactory results as a material for propellers, but by reason of its being allied to the Aluminium Alloys,the recent experience of the British Admiralty in the use of the latter metal for torpedo tubes, and that of the French Admiralty in a torpedo boat recently built for them by Messrs Yarrow - & Co. has not been satisfactory,the adoption therefore of Delta Metal is not recommended in the construction of the two steamers under consideration, but as the British -- Admiralty build all torpedo boats of galvanised steel and Messrs. Yarrow & Co. recommend the same procedure with light shallow draught steamers, the defects complained of in the "Alexandra" would in all probability be avoided in the new steamers were their floor plates and bottom plates of galvanised steel.

6. As regards a removable gear for taking soundings it would probably be better to obtain that of Sir William Thompson's patent sounding machines, but of a size smaller than usually fitted in a seagoing vessel. The cost of --- this machine is not included in the estimate.

7. An outline specification is also attached.

I am, Sir,

Your Obedient Servant,

Offg. Director of the Royal Indian Marine.

SUPG. ENGINEERS OFFICE
No. 2794
16 MAR. 95
P. W. D.
SECOND CIR. L.

From

The Director of the
Royal Indian Marine

SUPG. ENGINEERS OFFICE
No. 73
9 APR. 96
P. W. D.
SECOND CIRCLE

CHIEF ENGINEER
FOR IRRIGATION.
25 MAR. 96
No. 894

To

The Supg Engr. III Circle

CHIEF ENGINEER
FOR IRRIGATION.
21 MAY. 96
No. 1664

No. 1035 dated 12.3.96.

Encls: 3.

Dues. 5
5-20-96

Stern Wheelers

Forwards two sketches of ——— required to ply one above & the other below the Anicut & one outline specification.

Office of the Supg Engineer,
2nd Circle, Berwada.
13 April 1896.

No. 120 K.N.

13 P

From

Major W. L. C. Baddeley R.E.
Supg. Engineer
2nd Circle.

To

The Chief Engineer
For Irrigation
Madras.

Sir.

In reference to your No. II/49 R.S. dt. 1.4.96. I have the honor to inform you that the Director, R. I. Marine, has not expressed any positive opinion as to the relative advantages of twin screws and Stern Wheelers but in one of his letters to me he remarks:-

"I am of opinion the Steamer to ply on the rivers below the Anicut should be a twin screw launch provided the minimum depth of water is not less than three feet."

2.

2. As however for work below the Anicut we require a steamer with draught not exceeding 2' the proposal to provide a twin Screw launch was not accepted.

3. When Mr Taylor an Engineer of the R. I. M. and one of the Staff of the Kidderpore dock yard was at Bezwada, he was consulted by Captain Ellis R.E. and expressed an opinion that both for river and Canal work a stern wheeler was the most suitable. Mr Taylor I understand has had much experience of these boats in Burmah.

4. I will make a further reference to the D.R.I.M. and let you know the result.

I have the honor to be
Sir
Your most obt Servant
Bartley
Major R.E.
Supg Engr: II Circle.

CHIEF ENGINEER
FOR IRRIGATION.
20 APR. 96
No. R 118 K.S.

From

The Supg Engineer
Second Circle

To The Chief Engineer
For Irrigation

Dated 13th April 1896.

No. 120 Ket

Steamers to ply on Krishna river above & below Ament - Relative advantages of Screw wheels & twin screws for — communicating opinion of the Director of the R I M. regarding —

Letter from the Director of the Royal Indian Marine, to the Supg: Engineer 2nd Circle Bezwada, dated Bombay 17th April 1896, No. 1613. (Ships Construction).

With reference to your letter No. 121 K.N. of 13th instant, I beg to say the general question as to whether twin Screw or Stern wheel steamers are the most suitable type for use on the Krishna River above and below the Amcut, depends entirely on the depth of water that exists. If there is sufficient water at all times, say about 6 ft. for a steamer drawing not less than 3 feet, then I would recommend a twin Screw steamer as being handier and having more speed, but if a draught of not more than 2 feet is allowable then the Stern Wheel type is the kind that must be used.

2. Another point which militates against Screw propulsion for shallow rivers is the risk of the propeller striking the bottom and getting damaged, or bending the shaft, which involves the removal

vessels being placed in dock for repairs, while in the case of a stern wheeler everything is above the water and accessible, but of course if draught is no object much better results, as regards speed, would be obtained, with the screw steamer.

—

No 201 K
25.4-96

Forwarded to the Chief Engineer for Irrigation in Continuation of No 120 K. N. D. + Vide R 118 K.S/96
13-4-1896.

Lud Bartholomey
Major R.E.
Supt Engr. II Circle.

D.
21/4/96.

15

CHIEF ENGINEER
FOR IRRIGATION.
27 APR. 96
No. 125 KS.

From

The Supg Engineer

Second Circle

To The Chief Engineer
For Irrigation

Dated 25 April 1896

No. 201 K

Q&L
5-5-96

Steamers suitable for
use on Kistna river —

Forwards copy of remarks
made by the Director of
the Royal Indian Marine
Bombay, regarding —

27-4-95 — Dr 74 D —

No 5042, dy 12 June 1896.

PUBLIC WORKS DEPARTMENT,
IRRIGATION BRANCH.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

9 & 4

UNDER date the 16

READ the following

Print from Supg Engr, II Circle, ✓ No 1588 KS. dy 13.10.94
Do 2 do. ✓ 174 KS. dy 13.11.94
Print from 3 to 4 do. ✓ 1992 KS. dy 24.11.94
Do 4 to 5 do. ✓ 184 KS. dy 5.12.94
Print from 5 do. ✓ 2681 KS. dy 27.2.95
Print to do. ✓ 87 KS. dy 27.5.95
Print from do. ✓ 757 KS. dy 29.6.95
Print to 6 do. ✓ 167 KS. dy 10.7.95
Print from do. ✓ 270 KS. dy 21.3.96
Print to 12 do. ✓ 49 KS. dy 1.4.96
Print from do ✓ 120 KN. dy 13.4.96
Print from do. ✓ 201 KS. dy 24.4.96

No 112 J dy 27th may 1896.

I don't like these stern-wheelers, but suppose they are answering in this case — The drafts are approved

27/5/96

A.IH
4.6.96

Submitted to Govt with a recommendation that as a depth of 6 feet cannot be depended on at all times, sanction may be accorded to the provision of two stern wheel steamers at an estimated

cost of Rs 59,500.

Order thereon.

The Govt of India in the Marine Dept will be requested to order the construction at the Govt dockyard at Bombay of the two stern wheel steamers required for the Kistna Delta System which will then be reduced to Rs 45,034 to be entered before issue.

2. The following estimates are sanctioned from the balance of the amount reserved for tools & plant required for the Kistna Delta System,

+ Rs 104-34

Capital Expenditure not charged to Revs.

49: Irrigation

Kistna Delta System

Eastern Section

II Tools & Plant.

4. Navigation Plant.

1. Constructing No 1 stern wheel steamer to ply below the Kistna Amount - Rs 30,000

2. Constructing No II stern wheel steamer to ply above the Kistna amount - 29,500

Total 59,500

3. This sanction is registered as No 60 I of 1896-97.

4. Ordered that the following letter be sent.

No 505 I, dy 12 June 1896.

To The Secretary to the Govt of India Marine Dept

Sir,

In forwarding herewith a copy of P.W.D. No. 504 I dy 12-6-96, I am directed to request that you will be so good as to order the construction at the Govt dockyard, Bombay, of the two stern wheel steamers required for the Kistna Delta System in accordance with the designs forwarded with letter, No. 1035, dy 12 March 1896, from the Director of the Royal Indian Marine + herein enclosed for reference during

E. I. Form No. 1—500—14-5-95

+ Copies of designs to be kept in Office

PUBLIC WORKS DEPARTMENT,
IRRIGATION BRANCH.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

UNDER date the 18

READ the following

the construction of the steamers.

2. As it is necessary that the steamers should be obtained as soon as possible, I am also to request that you will be so good as to inform me how long it will take to complete & deliver them.

DESP ED
1st JUL. 96

To the Chief Engr for I.
Supdg Engr II
Ex. I.W.S.
Rev Dept.
Marine Dept

P. W. CORR. No. 5280

~~Haulfi Mul Bridge~~

Stern wheel steamers
required for the
Krishna Delta.

Recd. 11.6.96

Encls 11 (Encls 11. wrongly
into file, D 74
D/29.4.96

Secy
Railways
4/6/96.

7.E.9
11/6

LCS
1/6

Drawings will follow

Rly Bd
1/6.

12/6

E. I. Form No. 1—500—14-5-95

P.S. 128.