M.R.O. 1—77,006—8-6-37.

(1) Number of pages 69

(2) Date of repair 12/11/40

(3) Initials of the Referencer

MADRAS RECORD OFFICE.

Government of Madras.

Financial DEPARTMENT.

G.O. No. 1429. Press Mis.

31-33.

Dated 7- 10 — 1873.

34/35

Not to be folded or roughly handled

Proceedings of the Madras Government, Financial Department,
7th October 1873.

Read the following papers :—

No. 31. Proceedings of the Board of Revenue, dated 21st August 1873, No. 1628.

Read the following letter from H. E. SULLIVAN, Esq., President of the Local Fund Boards, South Arcot District, to J. GROSE, Esq., Secretary to the Board of Revenue, dated Cuddalore, 8th August 1873, No. 274 :—

WITH the Supplemental Local Fund Budget for the Virdachellum Circle, forwarded with my letter, dated 16th June 1873, No. 189, I submitted plans and estimates for the construction of a Suspension Bridge over the Vellaur. M. DeClosets, the Manager of the Napier Foundry at Madras, tells me that in preparing the estimate he calculated on procuring a quantity of surplus wire belonging to the Irrigation Company at a moderate cost. The wire is now advertised to be sold on the 1st October next, and M. DeClosets represents that, if it is not secured for the bridge, the cost of the structure will be enhanced. Under these circumstances, I should like to be informed, if possible, whether the Government are likely to accord their sanction to the project, and, if so, whether I may authorize M. DeClosets to purchase the wire.

THE President should not have sent up M. DeClosets' report and estimate with the Supplemental Budget but in a separate letter. They are not even mentioned in the letter accompanying the Budget.

2. The report and estimates will now be submitted for the orders of Government with the resolutions of the two Local Fund Boards regarding the work. The report, plans, and estimates are framed by M. DeClosets and countersigned by the President and the District Engineer. They provide for a Wire Suspension Bridge over the Vellaur at Muttaloor, on the Cuddalore and Chellumbrum Road, and the cost is estimated at Rupees 76,360 *provided* that orders are passed in time to allow M. DeClosets to take wire now in the market priced at an exceptionally low rate.

3. The facts attending the collapse of the former bridge, the refusal of the Virdachellum Local Fund Board to re-build it, recorded at their meeting of the 25th January 1873 and animadverted on by the Collector in the letter submitted to Government with Board's Proceedings, dated 4th July 1873, No. 1,193, will be in the recollection of Government.

G. O., dated 15th October 1872, No. 2,427, Public Works Department.
G. O., dated 7th June 1873, No. 803, Financial Department.
Board's Proceedings, dated 4th July 1873, No. 1,193.
Board's Proceedings, dated 5th July 1873, No. 1,203.

4. The resolution in which the Virdachellum Local Fund Board agree to the re-building of the bridge was passed at a meeting held on the 30th May 1873 and attended by the President, the District Engineer, the Virdachellum Tahsildar, and two private members.

5. The Virdachellum Local Fund Board ask for a special grant in aid from Provincial Funds because of the loss entailed on the Local Fund by the collapse of the former bridge.

6. The Cuddalore Local Fund Board ask for sanction to contribute Rupees 25,000 towards the cost of the bridge, and the Board of Revenue think this should be allowed.

(A true Copy and Extract.)

(Signed) H. E. STOKES,
Acting Secretary.

Report on the proposed Wire Suspension Bridge for the Vellaur River, District of South Arcot.

Estimate of Rupees 66,539-11-0 sixty-six thousand five hundred and thirty-nine and Annas eleven for constructing a Wire Suspension Bridge of two spans, each of 300', across the Vellaur River, on the road from Cuddalore to Chellumbrum, according to the plans, details, and sections accompanying.

1*st.*—The river-bed is of sand, the thickness of which is not less than 20' in the middle, and it is presumable that at this depth blue hard clay would be met. The tidal waters reach the spot where the bridge is to be built, and the section of the stream during extraordinary floods cannot be less than 500' × 19'; the scouring in the middle of the stream has been said of 12' deep. Such are the reasons which have induced me to propose two spans of 300' with a central pier only, sunken 20' deep. Besides the cheapness of such a bridge, convenient for light traffic as is now passing, it is also worth consideration.

2*nd.*—The foundations of the abutments will consist of a thickness of concrete, upon which a masonry of brick-in-chunam will be erected. The depth of the foundation for the abutments will be 10', which I consider sufficient, as the scouring on the sides of the river is not perceptible. The concrete will be made of the best materials available on the spot, but, if thought convenient, a masonry of brick-in-chunam could be substituted at a slight increase of cost.

3*rd.*—The central pier will consist of a casing made of cast-iron plates bolted together by inward flanges. This casing will be sunken to a convenient depth of 20' and filled, when in place, with concrete (or masonry of brick-in-chunam) as far as the upper level of the upper plates. On this a layer of cut-stones will be placed and well-levelled; the two ends of the casing being cylindrical will conveniently act as cut-water.

4*th.*—Upon the layer of cut-stone two cast-iron sole plates, 8' diameter each and 2·50'', will be settled, at a distance of 20' from centre to centre, so as to receive the obelisks supporting the cables.

5*th.*—The obelisks will be constructed with a series of cylindrical plates (open work) bolted together by outside flanges, to the height of 40', above the top of the pier. Each of these obelisks will be filled up with a masonry of brick-in-chunam and will support at the top a cast-iron circular plate 2·50'' thick, on which will be arranged a cast-iron saddle moveable on seven cast-iron rollers. Each saddle will be provided with two grooves, into which the two wire cables of one side will rest. Each obelisk will be kept by four holding-down bolts 18' deep.

6*th.*—The superstructure of the abutments will be executed in brick-in-chunam. Each abutment will be in average 63' long by 32' broad, and will consist, above the foundations, of two side walls 10' thick with a connecting face wall constructed arch-like in the intrados, so as to report the straining effect of the cables upon the whole face of the abutments in the direction of the ground. Each of the side walls will be provided with a vertical well communicating to a cell 6' × 7' in which the cables will be moored by passing round a cast-iron beam (1' × 6'' section) bearing upon a cast-iron plate fastened to a layer of cut-stone bearing against the masonry. From each of these cells up to the coping of the abutment a small tunnel will be provided through which the cables will pass.

7*th.*—The cables, four in number, will be made of galvanized iron wire No. 8 (B. W. G.) as used in telegraphic communications. Each cable will have 4'' in diameter. These cables

3

will be made in place, that is, by passing wire after wire from an abutment to the other and above the obelisk on their respective saddles. At intervals the wires will be squeezed together and firmly secured by a certain number of turns of small wire round the cable.

8*th.*—On the two cables of one side round wrought-iron pillars will cross and be fastened, and each of these will support one vertical link of proper length and composed of a certain number of wires. Each of these links will have 2'' circular section. Two opposite links will be fastened round the ends of one joist for supporting the floor; the total number of joists being 100 6' apart, the total number of the links will be 200. The length of each link will be found by this formula :—

$$y = \frac{f}{d^2} x^2$$

in which

y = the length required.
f = depression of cable = 14 metres.
d = the span = 100 metres.
x = the distance of the link to the abutment.

9*th.*—The roadway, 18' broad between the railings, will be constructed by nailing teak-wood planks, 3'' thick, across the joists, at right angle. Over and across these a coating of teakwood boards 1'' thick will also be nailed parallel to the joists.

10*th.*—The parapets will be made of teakwood, and consist of a top rail, a lower rail, vertical struts, and diagonal braces. At each of the struts a bolt passing through the top rail, the lower one, the flooring, and the joists under, will be strongly screwed on so that each parapet will act as a braced girder.

11*th.*—I have every reason to think that all that is required is provided for in the estimate and that nothing more is required.

12*th.*—However, owing to cyclones, it would be well perhaps to secure the stability of the bridge by some side moorings (eight or ten), each consisting of a screw in the depth of the river-bed, and a piece of chain fastened to the side of the flooring.

13*th.*—The breadth of the roadway has been kept at 18' and the entrance at the abutments at 16', but this last could be altered and made 20' or 22' if deemed convenient; the only care would be then to recover the entrance of the tunnels near the crossing on abutments.

14*th.*—If it was judged advisable to add to the firmness of the cable moorings, piles with screws could be fastened upon the cables cross beams and screwed in rear of the abutment, as shown in Plan No. 2 by dotted lines.

15*th.*—In the abstract of estimate I have not entered the item for office and superintendence, as this could be arranged further and depends on the mode which will be adopted for the execution of the works. I think, however, that this item will be nearly ten per cent. on the amount of the bridge.

16*th.*—I do not consider difficult to sink the pier casing, as for what I know of the river-bed there is no rock or stone to be encountered. The only care would be to remove the sand as the casing go down, and some pumping will be necessary as well as for the construction of abutments foundations.

MADRAS, (Signed) A. DECLOSETS, C.E.
12*th May* 1873.

EXTRACT from the Proceedings of the Local Fund Board, Virdachellum Circle, dated 25th January 1873.

Read letter, No. 225, of the 13th December, from the President, covering a letter from Mr. DeClosets, C.E., making certain proposals in regard to the bridging of the Vellaur.

V.—The Board think it is not desirable for the present to build a new bridge over the Vellaur at Muttaloor.

EXTRACTS from the Proceedings of the Local Fund Board, Cuddalore Circle, dated Tindevanum, 22nd May 1873.

Read letter from Mr. DeClosets, C.E., submitting plans and estimate for the construction of a Suspension Bridge of two openings, each of 300', over the Vellaur River, on the main road from Cuddalore to Negapatam.

In bringing the subject before the meeting the President observed that, although the project was one which, strictly speaking, should be executed solely from the funds of the Virdachellum Circle, the advantage to be derived from bridging a stream like the Vellaur would be shared by the inhabitants of the whole district, and, this being the case, it was but fair, the magnitude of the undertaking and the expense involved being considered, that this Circle should contribute a portion of the funds required. The Board were competent to make such a contribution under the provisions of Section 27 of the Act. The estimate for delivering the bridge complete in situ was Rupees 76,000 in round numbers, and he proposed that the sanction of Government should be obtained for the contribution by this Board of Rupees 25,000 towards the costs of the bridge.

20. This proposal was seconded by the District Engineer and carried unanimously.

EXTRACT from the Proceedings of the Local Fund Board, Virdachellum Circle, dated Porto Novo, 11th June 1873.

Read letter from Mr. DeClosets, C.E., forwarding detailed plans and estimates for a Suspension Bridge over the Vellaur at Muttaloor.

3. The Board approve of the plans and estimates submitted, and, they having been scrutinized and countersigned by the District Engineer, the President is requested to forward the same for the sanction of Government through the usual channel. In making an allotment of Rupees 16,000 from the unappropriated balance of last year the Board trust that, in consideration of the heavy loss which accrued to Local Funds by the failure of the last bridge, the Government will be pleased to sanction a special grant in aid of the new undertaking.

No. 32. MEMORANDUM.

The submission of an important work like this in a Supplemental Budget some months after the commencement of the official year is a proceeding which the Chief Engineer must object to as inconsistent with the Standing Orders for preparation of Budgets, the infraction of which leads to ridiculously small allotments for carrying out large estimates on old sanctions and to short expenditure of allotments.

2. Speedy orders are now requested to admit of the purchase of a quantity of telegraph wire in the possession of the Madras Irrigation Company which is advertised for sale on the 1st October, and conditional on the cheap purchase of which the cost of the work is, to a certain extent, made to depend. That cost is stated at Rupees 76,358 including five per cent. for sundries, two per cent. for preparation of plans and estimates, and ten per cent. for superintendence.

3. The design and estimate are by Monsieur DeClosets, and it is presumed that the work is intended to be carried out by his agency. But there is no contract to that effect. The District Engineer has accepted the plans and estimate; but they are submitted by the Revenue Board without any word of recommendation.

4. The Chief Engineer objects to the present proposal on several grounds. In the first place, looking to the recent failure of a bridge at the same site, confessedly from faulty design, and bearing in mind paragraph 3 of the G. O.

thereon, No. 2427, of 15th October 1872, it is unsatisfactory to find that no borings have been taken at the sites of the single pier and two abutments to ascertain the nature of the soil below the sand. It is simply presumed that hard clay would be met with at a depth of twenty feet for the pier, and ten feet is considered sufficient for depth of abutment foundations.

5. Again, the material of the pier and its foundation is proposed to be a casing of cast-iron plates held together by inner flanges sunk twenty feet below the surface of the sand and rising twenty feet above it, within which concrete is to be filled. The want of detail as to the thickness of these plates, the manner in which they are to be held together within, the method of sinking them, &c., is unsatisfactory.

6. Still more so are the details of the proposed obelisks forty feet high to be erected on the pier, and over which the suspension cables are to pass. Their power of resisting the crushing and straining forces that will be brought upon them is more than doubtful and cannot be taken for granted, especially when their material, brickwork in a casing of cast-iron plates, is considered.

7. The proposal to use four-inch cables, two on each side, composed of a number of No. 8 Telegraph wires, not twisted together but simply bound round by small wires, and the other suspension details unaccompanied by any calculations of the power of the component parts to bear the weights and strains that will come upon them, are such as would never be accepted by professional men. The Chief Engineer is of opinion that the whole subject has been very crudely treated by Mr. DeClosets, and cannot recommend the Government to give it the slightest consideration in the form and manner that it has been laid before them.

(Signed) G. W. WALKER, Colonel, R.E.,
2nd September 1873. *Chief Engineer, P.W.D.*

No. 33. ORDER THEREON, 7th October 1873, No. 1429.

The Governor in Council, having regard to the objections of the Chief Engineer to the projected Suspension Bridge and to the fact that the Railway must eventually bridge the river, is not prepared to sanction so costly a work until the Government know how far the Railway will relieve the road and whether the work will be as urgently required when the railway is opened as it is perhaps at present.

2. If the President of the Local Fund Board thinks that under any circumstances the bridge is required, and if there is a prospect that the Railway Bridge will be built near the proposed site, the Government will be prepared to ask the Railway Company whether they will add a roadway to that structure at a moderate cost to the Local Fund.

(True Extract.)

W. HUDLESTON,
Chief Secretary.

To the Board of Revenue, with plans and estimates returned.
,, Public Works Department.

Exd. A. S. Rodgers.

Revenue Department

Proceedings of the Board of Revenue
dated 21st August 1873

No. 274 Read the following

From,

H. E. Sullivan Esquire
President Local Fund Boards
South Arcot District

To

The Secretary to the Board of Revenue
Madras

Sir,

With the Supplemental Local Fund Budget for the Vridachellam Circle forwarded with my letter dated 16th June 1873 No. 189 I submitted plans and estimates for the construction of a suspension bridge over the Vellaur. Mr. De Closets the Manager of the Napier Foundry at Madras, tells me that in preparing the estimate he calculated on procuring a quantity of surplus wire belonging to the Irrigation Company at a moderate cost. The wire is now advertized to be sold on the 1st October next and Mr. De Closets represents that if it is not secured for the Bridge the cost of the structure will be enhanced. Under these circumstances I

Bdgt. of {1873} Madras.

FINANCIAL.

THIS BOARD OF REVENUE, &c., &c.

ted October, 73.

ed. Bnd.

G. O., 7th October 1873, No. 1429.

OCTOBER.
Nos. 31—33.

Vridachellam Circle.—Owing to the Chief Engineer's objections the construction of a bridge over the Vellaur River refused sanction until it is known how far the Railway Company, which must eventually bridge the river, will relieve the road and whether the work will be as urgently required when the railway is opened as it is at present.

I should like to be informed, if possible, whether the Government are likely to accord their sanction to the project and if so whether I may authorize Mr. DeCloset to purchase the wires.

I have &c.

Local Fund Office
Cuddalore 8th August 1873.

(Signed) H. E. Sullivan
President L. F. Boards

The President should not have sent up Mr. DeCloset's Report and estimate with the supplemental budget, but in a separate letter. They are not even mentioned in the letter accompanying the budget.

The Report and Estimates will now be submitted for the orders of Government with the resolutions of the two Local Fund Boards regarding the work. The Report, Plans and Estimates are framed by Mr. DeClosets and countersigned by the President and the District Engineer.

They provide for a wire suspension bridge over the Vellaur at Muttaloor on the Cuddalore and Chellambram road, and the cost is estimated at Rupees 76,360 provided that orders are passed in time to allow Mr. DeClosets to take wire now in the market priced at an exceptionally low rate.

The

G.O. 16th October 1872 No. 2427 P. W. D.
G.O. 7th June 1873 No. 803 F. D.
Board's Proceedings 4th July 1873 No. 1193
5th July 1873 No. 1203.

The facts attending the collapse of the former bridge, the refusal of the Vridachellam Local Fund Board to rebuild it recorded at their meeting of the 25th January 1873 and animadverted on by the Collector in the letter submitted to Government with Board's Proceedings dated 4th July 1873 No. 1193 will be in the recollection of Government.

The resolution in which the Vridachellam Local Fund Board agree to the rebuilding of the bridge was passed at a meeting held on the 30th May 1873 and attended by the President, the District Engineer, the Vridachellam Tahsildar and two private members.

The Vridachellam Local Fund Board ask for a special grant-in-aid from Provincial Funds because of the loss entailed on the Local Fund by the collapse of the former bridge.

The Cuddalore Local Fund Board ask for sanction to contribute Rupees 25,000 towards the cost of the bridge, and the Board of Revenue think this should be allowed.

| True copy & Extract |

H. Ettoles
Acting Secretary

To, The Chief Secretary to Government
Financial Department

with a Report, 2 Estimates, 2 Plans and copy of 3 Resolutions of Local Fund Boards

W. D. Gr. Locker
Cd. M. Narasimacharry

Financial. 1873. 886 N°

Proceedings of the Board of Revenue

No 1014

Dated 21st August 1873

Recd 24 ——

Returned 3 Sept. 1873

Do

No. 1551

Copy of Letter from the Secretary to the Board of Revenue

Submitting for orders certain papers regarding the construction of a suspension bridge over the Vellaur river

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1/11

Extract from the Proceedings of the Local Fund Board, Viridachellum Circle dated 25th January 1873.-

Read letter No 225 of the 13th December from the President covering a letter from Mr. de Cloarts C. E. making certain proposal in regard to the bridging of the Vellaur.-

Resolved The Board think it is not desirable for the present to build a new bridge over the Vellaur at Mattalore.

Extracts from the Proceedings of the Local Fund Board, Cuddalore Circle, dated Tindivanum 22nd May 1873.-

Read letter from Mr. Deloche to C. E. submitting plans and estimate for the construction of a suspension bridge of two Springs each of 300' over the Vellaur river on the main road from Cuddalore to Negapatam.-

In bringing the subject before the meeting the President observed that, although the project was one which, strictly speaking, should be executed solely from the funds of the Viridachellum Circle, the advantage to be derived from bridging a stream like the Vellaur would be shared by the inhabitants of the whole District

District and this being the case it was but fair, the magnitude of the undertaking and the expense involved being considered that this Circle should contribute a portion of the funds required. The Board were competent to make such a contribution under the provisions of section 27 of the Act. The estimate for delivering the bridge complete in situ was Rs 70,000 in round numbers, and he proposed that the sanction of Government should be obtained for the contribution by this Board of Rs 25,000 towards the costs of the bridge.

20. This proposal was seconded by the District Engineer and carried unanimously.

Extract from the Proceedings of the Local Fund Board Vridachellum Circle, dated Porto Novo 11th June 1873.-

Read letter from Mr de Closets &c. forwarding detailed plans and Estimates for a suspension bridge over the Vellaur at Muttaloor.

3. The Board approve of the plans and Estimates submitted and they having been scrutinized and countersigned by the District Engineer the President is requested to forward the same for the sanction of Government through the usual channel.

In making an allotment of Rs 1,600 from the unappropriated balance of last year the Board trust that in consideration of the heavy loss which accrued to Local Funds by the failure of the last bridge that the Government will be pleased to sanction a special grant in aid of the new undertaking.

/True Extract

H Ettoles

Offg. Secretary

K D Swaboeker

Spd Brakappaijo

The anticipation of an important work like this in a Supplemental Budget some months after the commencement of the Official Year is a proceeding which the Chief Engineer must object to as inconsistent with the Standing Orders for preparation of Budgets; the inspection of which leads to ridiculously small allotments for carrying out long estimates on old sanctions, and to short expenditure of allotments.

Speedy orders are now requested by mail of the purchase of a quantity of Telegraph Wire in the possession of the Madras Irrigation Company which is advertised for sale on the 1st October; & conditional on the cheap purchase of which the cost of the work is to a certain extent made to depend. That cost is stated at Rs 76358, including 5 per cent for Standing, 2 per cent for preparation of Plans and Estimates, and 10 per cent

Enclosure in Proceedings of the Board of Revenue &c. &c. &c.

To the Chief Secretary to Government of Fort St. George, dated 21st August 1873.

Sir,

I have to forward for the consideration of Government a Report from the Executive Engineer, Kistna Canal Division, dated 15th instant, with its enclosures, soliciting the sanction of Government to the purchase of the Telegraph wire mentioned in the Report, for the purpose of erecting a telegraph line between Vellaur and Chittoor.

I have &c.

(Signed) [illegible]

Board's Proceedings No. 1571 of 1873.

for Superintendence -

The design and Estimate are by Monsieur de Closets, and it is presumed that the work is intended to be carried out by his Agency. But there is no Contract to that effect - The District Engineer has accepted the Plans and Estimate; but they are submitted by the Board without any kind of recommendation -

The Chief Engineer objects to the present proposal on several grounds - In the first place, looking to the recent failure of a Bridge at the same site, embodying precisely the same faulty design, and bearing in mind para 3. of the Govt order thereon, No. 2427 of 15th October 1872, it is unsatisfactory to find that no borings have been taken at the sites of the main Pier and two Abutments to ascertain the nature of the ~~foundations~~ soil below the same - It is simply presumed that hard Clay would be met with at a depth of 20 feet for the Pier; and 10 ft is considered sufficient for depths of Abutment foundations -

Again, the material of the Pier and its foundations is proposed to be a casing of Cast Iron Plates ~~of a thickness which is not to be mentioned in the Plans or Estimate~~ held together by inner flanges, such 20 ft below the surface of the sand moving 20 ft above it; within which concrete is to be filled - The want of detail as to the thickness of these plates, the manner in which they are to be held together within, the method of making them is unsatisfactory -

Still more so are the details of the proposed Obelisk 40 ft high to be erected on the Pier, and over which the Suspension Cables are to pass; their power of resisting the ~~Straining~~ ~~Forces~~ ~~Forces~~ that are to be brought upon them, are is more than doubtful, &

Bygrort.

Vellaur Bridge

cannot be taken proport:
:ed, especially when their
material, brickwork in a
casing of Iron Plates,
is considered -

The proposed truss & wichlu:
:bles, 2 on each side, compo:
:sed of a number of No. 8 Te:
:legraph Wires, not twisted
together but simply bound
round by small bars, and
the other suspension details
not accompanied by any
calculations of the power of
the different component parts
shews the weights & strains
that will come upon them
are defective such as would
never be accepted by pro:
:fessional men - The Chief
Engineer is of opinion that
the whole subject has been
very crudely treated by
Mr. Deflosets, and cannot
recommend the Govt. to
give it the slightest consi:
:deration in the form &
manner that it has been
laid before them -

Capt. Galton R.E.

2d Sept. 1873.

Report on the Proposed Wire Suspension Bridge for the Vellaur River.

District of South-Arcot.

Estimate of Rs. - - - 66539-11-0

Rupees-Sixty Six thousand five hundred and thirty nine annas eleven.

For Constructing a Wire Suspension Bridge of two Spans each of 300 feet across the Vellaur River, on the Road from Cuddalore to Chellumbrum, according to the plans, Details, & Sections accompanying

The River bed is of sand, the thickness of which is not less than 20' in the middle, and it is presumable that at this depth blue hard clay would be met. The tidal water near the spot where the bridge is to be built and the Section of the Stream during Extraordinary floods cannot be less than 500' × 15'. The Scouring in the middle of the Stream has been said of 12' deep. Such are the reasons which have induced me to propose two Spans of 300' with a Central Pier only, Sunken 20' deep. Besides the cheapness of such

a bridge. Convenient for light traffic as it is now passing, it is also worth consideration.

2°= The foundations of the Abutments, will consist of a thickney of concrete, upon which a masonry of brick in cumun will be erected. The depht of the foundation for the abutments will be 10' which I consider sufficient, as the scouring on the sides of the River is not perceptible. The Concrete will be made of the best materials available on the spot, but if thought convenient, a masonry of brick in cumun could be substituted at a slight increase of cost.

3°= The Central Pier will consist of a casing made of cast iron plates bolted together by inwards flanges, this casing will be sunken to a convenient depht of 20', and filled when in place with concrete (or masonry of brick in cumun) as far as the upper level of the upper plates, on this a layer of cut stones will be placed and well levelled. the two ends of the casing being cylindrical

will conveniently act as
cutwaters.

4° Upon the layer of cut stone two Cast Iron Sole plates, 8' diameter each and 2".50 will be settled, at a distance of 20' from centre to centre; so as to receive the Obelisks supporting the Cables.

5° The Obelisks will be constructed with a serie of cylindrical plates (open work) bolted together by outside flanges, to the height of 40' above the top of the Pier, each of these Obelisks will be filled up with a masonry of brick in chunam and will support at the top a Cast Iron circular plate, 2".50 thick, on which will be arranged a Cast Iron Saddle moveable on 4 C. Iron Rollers, each Saddle will be provided with two grooves into which the two wire Cables of one side will rest. Each obelisk will be kept by 4 holding down bolts 18' deep.

6° The Superstructure of the Abutments will be executed in Brick in chunam each abutment will be in

average 63' feet long by 32' broad and will consist above the foundations of 2 side walls 10' thick with a connecting face wall constructed arch like in the intrados, so as to report the straining effect of the cables upon the whole face of the abutments in the direction of the ground. Each of the side walls will be provided with a vertical well communicating to a cell 6'x7' in which the cables will be moored by passing round a cast iron beam (1'x6" section) bearing upon a cast iron plate fastened to a layer of cut stone bearing against the masonry; from each of these cells up to the coping of the abutment a small funnel will be provided through which the cables will pass.

7th. The cables 4 in number will be made of Galvanized iron wire, no 8 (B.W.G.) as used in telegraphic communications, each cable will have 4" inches in diameter. These cables will be made in place, that is

By passing wire after wire from an abutment to the other and above the obelisk on their respective saddles, at intervals the wires will be squeezed together and firmly secured by a certain number of turns of small wire round the Cable.

8 ⁰/₀ on the two Cables of one side round wrought Iron pieces will croff and be fastened, and each of these will support one vertical link of proper length and composed of a certain number of wire, each of these links will have 2" circular section.— two opposite links will be fastened round the ends of one joist for supporting the floor. The total number of joists being 100 six feet a part, the total number of the links will be 200. the length of each link will be found by this formula:

$$y = \frac{f}{d^2} x^2$$

in which

y = the length required

f = expedition of Cable = 14. mètres

d = the Span = ------ 100. mètres

x = the distance of the link to the abutment

9° The roadway 18' broad between the Railings, will be constructed by nailing teak wood planks 3" thick across the joists, at right angle, over and across these a coating of teak wood boards 1" thick will also be nailed parallel to the joists.

10° The Parapets will be made of teak wood and consist of a top rail, a lower rail vertical struts and Diagonal braces, at each of the struts, a bolt passing through the top rail, the lower one, the flooring, and the joists under, will be strongly screwed so that each parapet will act as a braced girder.

11° I have every reason to think that all that is required is provided for in the Estimate, and that nothing more is required.

12° However owing to Cyclones it would be well perhaps to secure the stability of the bridge by some side

moorings (8 or 10) each
consisting of a screw in
the depth of the river bed,
and a piece of chain fastened
to the side of the flooring.

13° The breadth of the roadway
has been kept at 18', and
the entrance at the abutments
at 16' but this last could
be altered and made 20 or
22' if deemed convenient
the only care would be
then to recover the entrance
of the tunnels near the
coping on abutments

14° If it was judged advisable
to add to the firmness of
the Cable moorings; piles with
screws could be fastened upon
the Cables cross beams and
screwed in rear of the
abutment, as shewn in plan
No 2 by dotted lines.

15° In the abstract of Estimate,
I have not entered the Item
for office and superintendance,
as this could be arranged
further, and depends on the
mode which will be adopted

for the execution of the
works. I think however that
this item will be nearly
10% on the amount of the
bridge.

6th I do not consider difficult
to sink the Pier Casing as for
what I know of the river bed
there is no rock or stone to be
encountered. the only care would
be to remove the sand as the
Casing go down, and some
pumping will be necessary
as well as for the construction
of abutments foundations.

De Cl

Madras the 12th May 1873.

39

Mr Sullivan writes home Officially in the following terms - dated 7th Instant

"As regards the Railway bridge
"over the Villaur - the information as
"to Site must be in the Government
"office. Three alternative lines
"have been Surveyed but no Sanctioned
"Surveys Sent up Cuddalore have
"been Sent home. The Railway bridge
"will take the through traffic to
"from Combaconum & Tanjore
"but the traffic from Negapatam
"Trangebar & Karical would still
"come by road and all the grain
"from the Chellambrum taluq finds
"its way to Porto Novo for shipment.
"However I think the money is
"more wanted for roads in the
"Sub Division than for bridges so the
"Government had better measure
the

the Kellaus and the Maymoktaundz
"bridges. Estimates for both of which
"have been sent up. The latter is
"only down in freak for a few days
"at a time & is not worth bridging".

I would therefore
merely refer this matter
back with an order
that the Government
are not prepared
to sanction so costly
a work until they
know how far the Railway
will relieve the road
and whether the work
will be as urgently
required when the
Railway is opened
as it is perhaps it is
then.

If the President of
the Local Fund Board
think that under any
circumstances the
Bridge is required
and

and there is a prospect
that the Railway Bridge
will be built near the
proposed site, the Government
will be prepared to ask
the Railway Company if
they will add
a roadway to that
structure at a moderate
cost to the Local Fund.

13/10 W.R.

Financial Department.

Cancelled

PROCEEDINGS of the MADRAS GOVERNMENT.

Read the following ~~letter~~

Proceedings of the Board of Revenue, 9/21st August 1873.

Memorandum by the Chief Engineer, and Secretary to Govt, Public Works Dept., on the above project, dated 2nd September 1873.

Order thereon

The Governor in Council having regard to the objections of the Chief Engineer is unable to sanction this particular proposal for bridging the Vellaur at Muttalur, but if his objections can be met, or if an approved scheme be submitted, the Govt will be prepared to give liberal

liberal apsistance for the
execution of the work.

2. They cannot but
express their surprise that
the District Engineer should
have countersigned a plan
and estimate so open to un-
favorable criticism.

L. K.

To

The Board of Revenue
—a- Public Works Dept.

Bridge over Vellaur
& Railway Station

Govt. of 187 } Madras.

To

Dated
Recd. } 187 , No.

Nos.

C 22-9 R1-10.

Attendance
in Council - Lt -
3. 10. 73.

Financial Department.

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Corrected

PROCEEDINGS of the MADRAS GOVERNMENT.

Read the following ~~letter~~

Proc: of the Board of Revenue, d/ 21st August 1873.

Memorandum by the Chief Engineer and Secretary to Govt., Public Works Dept., on the above project, d/ 2nd September 1873.

Order thereon. Countersigned 7 Oct. 1873. No 1429.

The Governor in Council having regard to the objections of the Chief Engineer, and to the circumstance of the Carnatic Railway Company, being about to build a bridge within 200 yards

yards of Muttaloo,
upon
resolves ~~to defer~~ sanc-
tioning the proposal
of the Local Fund Board
for bridging the Vellaur
at ~~Muttaloo~~ ~~until~~ 2 Direct ~~that~~ it be ascertained
~~that~~ ~~the~~ this the Cons[d] Rly Co[y] for
~~Railway has been~~ Railways. 2 ~~That~~ the
Rly Company with
~~opened sufficiently long~~ contract 2 adopt this
bridge 2 the passages
to admit of an opening ~~of~~ the
~~being formed as to the~~ add[l] cost being
~~necessity for a bridge~~ provided by the L. F.
Board 1st. - 2 ~~That~~ this add[l]
cost with probably be-
cost with probably be-
& ~~That~~ the engineer
arrangement is taken
of the C[o]

To,

The Board of
Public Works

dem[d] 7/10
Rec[d] 10/10

Rec[d] D.P.W.

~~That~~ 2 ~~that~~ the estimate

Vetbridge Bridge

Alterations
draft

Govt. of {187 } Estimate.

To _____

(1)

Dated
Read. } 187 , No.

Nos.

Despatch in
Mr L.

Before sanctioning this
Scheme Consult the
Lascelles Letters
Bk (c. into adopt this)
Estimate costing
Rs made cost being
to be incurred -

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The objections
raised by the Chief
Engineer were observed
and discussed by the
Board, but being
professional it was
decided to leave them
to the certain detection
of the professional
Department.

But, I fear, the
thing is worse than
that - There has been a
good deal of local
Squabbling about the
Bridge. The Vertachellum
Local Fund, with
Mr Lister, heartily
affirming the large
expenditure
very
inconvenient

expenditure - pending
inquiry into the causes
of the late disasters.
The District Engineer
with the Collector desiring
to put the work in hand
at once - So it would
appear that either as
soon as Dr Lister left
the district on leave,
or had temporarily
turned his back on
his Headquarters - the
Collector and district
Engineer posted out to
Virdachellum and in
their Capacity of Ex Offcio
members of all Local
Boards in the District
assembled a Board
consisting of themselves
and the Tahsildar and
two outside members
only, and there and then
passed

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passed these important
resolutions without reference
to the local Officers, and
submitted this ill-devised
and inefficiently examined
plan for carrying out the work.

Dr Short, I fancy,
never saw the place and
there is no appearance
of proper official Corres-
pondence &c. In short
the whole thing has been
an unseemly scramble
sure to end in Confusion
and grief.

I do not see how
one can notice the
Collectors action - however
improper and precipitate
that action has been - but
I think that the G. O.
should not go out without
severe animadversion on
the Conduct of the Dist: Engineer

10/9. WHL

very

I cannot agree
to this draft as it
appears to me that
the Chief Engineer's
objections — the only
ones prominently before
me when I wrote my
last note — are
professional only,
and, Even if they were
removed, I conceive
that other very
important objections
may lurk behind

I have consulted
Mr Lister — the Sub Master
of the Division — now on
leave on the Stilt. — a
very

very able officer and
one far more Conversant
with the requirements of
that part of the Country
than Mr Sullivan — on
the subject of the proposal
to build a Bridge at
Muttalore and I submit
the written reply with
which at my request
he favored me — for the
information of my
Honorable Colleagues

"I have opposed — not factiously but
"honestly and legitimately as I believe in
"my place at the Board — the proposal
"to build another bridge over the Vellar
"at Muttaloor"

"I must premise that in my humble
"opinion the Circle Board cannot afford
"to build two large bridges at once; it is
"true that the Cuddalore Circle Board
"at a thinly-attended meeting at Tindevanum
"agreed to contribute towards the Cost; but Even
"with this contribution I do not think the two

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"two works can be carried on simultaneously
"without leaving Every other work of
"improvement alone for the next three
"years".

"The receipts last year from Land
"Cess were 1,20,000 Rs. — but this was due
"entirely to the revenue being Collected
"punctually by means of paid process-servers;
"the old arrears were got in and the present
"Kist was Collected as it fell due; the
"Land Cess which falls due in a year
"is only 85000 Rs. and this is all that will
"be Collected this year; the Government
"Contribution is almost if not entirely
"absorbed by the Cost of D.P.W. Supervision
"visits, and petty Establishment; the
"other Sources of income nett only a few
"thousand rupees".

"The Maintenance grant for existing
"roads and tracks is about 45,000; 25000 Rs
"for Continuing the Vridachellum Bridge
"will absorb the whole of the road funds;
"funds for the second bridge would have
"to be provided by an additional grant
"from the General Funds".

"The Local Fund Board at a well-attended
"meeting decided by a majority of 7 to 3
"after a full discussion that the Vridachellum
"bridge should be built before the
"Vellar Bridge.

The

addresses

"The reasons in favor of this are:—
"The Vridachellum Bridge like the
"Villar Bridge is not properly speaking
"an entirely new work; a bridge over
"the same river at Shepakum was
"washed away three or four years ago;
"instead of rebuilding the Shepakum bridge
"the Board wish to build a Bridge at
"Vridachellum for:—

"α "There is a confluence of two rivers
"between Shepakum and Vridachellum,
"so two rivers get bridges instead of one."

"β The Vridachellum bridge will establish
"through bridged Communication
"between Salem & Huddalore and
"between Salem & Porto Novo"

"γ The Sub Collector's office and the Range
"office are on the Eastern side while the
"town, the Monsiff's Court and the
"Post office are on the western side
"of the river; when the river is freshed
"business is sometimes stopped
"and for many days carried on with
"great difficulty

"δ The Vridachellum Circle runs from
"East to West for about 70 miles. this
"river is just in the middle of it, so
"a bridge here must advantage
"the circle more than at any other
"point".

The

"The reasons against the Muttalore Bridge
"are:—

"α. There is very little traffic on the
"road; in submitting proposals for the
"Chellambrum Municipality the Taluk
"Estimated that only 50 bandies pass
"through the town every day.

"β. The Carnatic Railway Bridge
"will probably cross the river within
"200 yards of Muttalore; this will
"much reduce the present small
"traffic".

"γ. The Villar is only 9 miles from
"the Southern limit of the District,
"so very little country will be
"benefitted by the Bridge, for there
"is little or no through traffic".

"δ. There is one bridge over the Villar
"in Chellambrum Taluq about 15 miles
"higher up the Stream at Shatiatope

"ε. As the river hugs the Southern
"bank at Muttalore a ferry boat
"can go alongside which makes
"crossing in a boat pretty Easy".

"ζ. It will benefit the Taluq far
"more to improve the wretched roads
"than to build a bridge alongside
"of the Railway Bridge

Without Endorsing
Absolutely what Mr Dietz
addresses

addduces in favor
of the preference
entertained by the Local
Fund Board of Vridachellam - when fairly
Consulted - for the
Construction of a Bridge
at Vridachellam, I may
add that my own
acquaintance with that
part of the Country enables
me to assure my
Honorable Colleagues
that there is much
truth and weight in
what he says.

But I am satisfied
that his opinion as
respects the proposed
Muttalvor Bridge
should induce us
to defer its Construction
for the present entirely.

Fifty Cooly a day

- the ascertained traffic
will not justify the
proposed large Expenditure
at a spot within a Couple
of hundred yards of
the Railway Bridge
which will carry most
of the through traffic.
The Villagers already
bridged within the
same Taluq.

I would therefore
defer the Consideration
of this proposal until
the Railway has been
opened sufficiently
long to enable a sound
judgment as to the
need of the Structure

W. D. M.

Financial Department.

Canvassed

PROCEEDINGS of the MADRAS GOVERNMENT.

Read the following ~~letter~~ Proc.

Proceedings of the Board of Revenue d/ 21st August 78.

Memorandum by the Chief Engineer, and Secretary to Govt. Public Works Department, on the above project, dated 2nd September 1878.

Order thereon

The Governor in Council regrets that he is unable to sanction the proposed work in the face of the objections to the details of the plan raised by the Chief Engineer.

Approving the bridge &c

But he must have a bridge on this river - If the Del. will consent for it - or meet the Chief Engrs objections, we might consent. I fear the Delta will be taken on piles

To

The Board of Revenue.
Public Works Dept.
a Drake - I.O.L.

necessary (how far is this the case?) I would reply that nothing bearing upon the Medical profession in connexion with the present Bill can be foreseen, but if the Medical Gentlemen can be fully met, this Bill will be prepared to give considerable assistance.

How much we shall hear, with the question, "will the Bill meet the approval of the Medical Profession" I cannot tell, but I trust the Bill will at least receive a fair

Bridge over Vellaur River, S. Arcot District

Govt. of 187 } Madras.

To

(19)

Dated
Recd. } 187 , No.

Nos.

C3-9-a/10-9

Financial Department.

PROCEEDINGS of the MADRAS GOVERNMENT.

Read the following ~~letter~~

Proceeding of the Bd of Revenue D/21 Augt. /73, &
Memorandum by the Chief Engineer, and Secretary to Govt
Public Works Dept on the above project, D/2 Septr /73.

Order thereon - Ootacamund.
7 Octr. 1873. No 1429

The Governor in Council having regard to the objections of the Chief Engineer to the projected suspension bridge, and to the fact that the Railway must eventually cross the river, is not prepared to sanction so costly a work, until they know how far the Railway will relieve the road and whether the work will

&c.

be as urgently required when the Railway is opened as it is perhaps at present.

2. If the President of the Local Fund Board thinks that under any circumstances the bridge is required, and if there is a prospect that the Railway bridge will be built near the proposed site, the Govt will be prepared to ask the Railway Company whether they will add a roadway to that structure at a moderate cost to the Local Fund.

J.H.

To
The Board of Re
the P.W. Depart

Govt. of {187} Madras.

Fwd.

To

The Bd of Rev.
&c.

(1)

Dated 7 Oct
Recd. } 1873, No. 1129

Nos. 31 – 33

Vindachellum Circle. Irving &
the Chief Engr Objections, the Construc-
tion of a bridge over the Vellaur
river, refused sanction until its
known how far the Railway Co.
which must eventually bridge
the river, will relieve the road
& whether the work will be an
urgent one. when the Railway
is opened, as it is at present