

(1) Number of Pages.....12
(2) Date of repair.....4. 1. 1966
(3) Initials of the Referencer.....

MADRAS RECORD OFFICE

GOVERNMENT OF MADRAS

RE DEPARTMENT

G.O. No.	146.	Press
B.P. No.		Mis.
Dated	21. 3	1873 196 .

Not to be folded or roughly handled

Read the following papers:—

No. 287. From the Superintending Engineer, 8th Division, to the Secretary to Government, Public Works Department, dated Madura, 10th July 1872, No. 1,645.

In acknowledging receipt of G. O. of the 20th June 1872, No. 1,519, intimating that "the services of Lieutenant Greer, R.E., will be available for the trace and survey and estimate of the Goodaloor Ghaut" on his return from privilege leave, I have the honour to observe that, in paragraph 8 of my letter No. 263, dated 20th April 1872, printed in G. O. of the 14th May 1872, No. 1,326, I have pointed out that the trace of the new ghaut has already been made by Lieutenant Rawson, R.E., and that the estimate for the same has been submitted to Government by Mr. R. Smith.

2. Moreover, in paragraph 2 of G. O. of the 14th May 1872, No. 1,325, the Government remark that "it is desirable that the road from Cumbum to the top of the ghaut should be completed as early as possible, as rapid progress appears to have been made on the part of the Travancore Government on the road from Travancore to the Madura frontier."

3. Under the above circumstances, I propose to start the ghaut work on the return of Lieutenant Greer, R.E., from privilege leave, and I trust that the Government will approve of this proposal.

No. 211.

MEMORANDUM.

THE Chief Engineer has the honour to observe, with reference to Lieutenant-Colonel Roberts' letter No. 1,645 of 10th July, that in Mr. R. Smith's report on the Perryaur Project the expression is used "when the line has been regularly traced;" which taken in connection with the words "Lieutenant Rawson's section" in letter printed with G. O. No. 1,325 of 14th May, leads him, in the absence of any survey of the ghaut, to require further documentary assurance that the line chosen and estimated for is a satisfactory one; and of the necessity of such further assurance the Chief Engineer is convinced by the statement of the lengths of the ghaut and road as projected. These are—

	M.	F.	YDS.
Length of ghaut	4	0	135
Road below	5	5	19
Total...	9	5	154

From which he comes to the conclusion that Lieutenant Rawson's ghaut section consists of a series of zigzags whose beginning and end nearly coincide with those of the old Native Ghaut.

Now, a zigzag ghaut is the rudest and least satisfactory that can be made, and should not be adopted unless natural obstacles utterly preclude a clear run from the ghaut head (which must be a fixed point) in the direction aimed at, so that the foot of the ghaut may be thrown as far out into the low country as possible. And, as none of the officers employed upon the work are known to have had any experience in ghaut tracing, the Chief Engineer must request that no work shall be undertaken until he has been supplied with a survey of such ghaut trace (together with the existing ghaut road) as shall have been inspected and approved of by the Superintending Engineer himself.

The Chief Engineer has also to remark, with reference to the estimates, that an average of Rupees 16,000 a mile for a ghaut only 16 feet wide is heavier than that of any work of the kind hitherto carried out in the Madras Presidency, excepting the new Coonoor Ghaut, the side slopes of which are unusually steep and rocky. He must, therefore, decline to submit the estimates already sent in for sanction, and request that revised ones may be made after a trace has been cut one yard wide within the level pegs, for which an advance of Rupees 2,000 out of the allotment of Rupees 20,000 is approved.

(Signed) G. W. WALKER, Colonel, R.E.,
Chief Engineer, P.W.D.

No. 288. Endorsement of the Superintending Engineer, 8th Division, dated Courtallum, 4th September 1872, No. 2,544.

From Captain J. PENNYCUICK, R.E., Executive Engineer, Dindigul Range, to the Superintending Engineer, 8th Division, dated Camp at Cumbum, 18th August 1872, No. 291.

I HAVE the honour to forward a plan of the trace proposed for the Goodaloor Ghaut.

One Plan of the Trace.

2. The work has taken rather longer than I had expected, as the ground was very difficult for the last 500 feet, and Lieutenant Rawson's trace, although following the same general line as that now adopted, was not found so useful as I had hoped. At the beginning and end especially it seems to have been rather hastily and not very judiciously made.

3. The general direction of the ghaut is, of course, governed by the valley of the Moollya-Panjaur, the stream by which the water of the Perryaur will be carried to the Sooroolly. This stream has only a slight fall at first, and the ghaut runs along its right bank; it then crosses the stream (at C. on the plan) and follows the left bank for a short distance, the ground on the right bank being very difficult. A line was run for some distance with a view to ascertaining whether the road would be continued on this bank, but not only is the ground very difficult indeed, but it is evident that the foot of the ghaut would come out much further from Goodaloor than would be the case by crossing the stream. The stream is therefore crossed again at D, and the road continued along its right bank until stopped by the large ravine at E; a return is necessary here in order to get down to a convenient level for crossing this ravine. The latter, in point of fact, governs the position of the foot of the ghaut, as it would be impracticable, except at an enormous expense, to cross it above the level chosen. The length of the zigzag has been adjusted with a view to getting the best positions for the returns.

4. I have been over the whole of the ground with Lieutenant Greer and am convinced that the line taken is the best possible.

5. Owing to the fact that no proper ghaut tracer was procurable in either the division or the range office, all the surveying has had to be done with the level and compass. Over uneven ground it is very difficult to preserve the right proportions between fall and distance, and this will account for the fact that the line surveyed deviates in some places from the intended trace.

6. You will see that the end of this trace comes out nearly a mile nearer to Goodaloor than that of Lieutenant Rawson's, and the ground between it and the village is very much more favorable.

9. Formally this ghaut is only a portion of the general line between Madura and Travancore by the Cumbum valley, but it is quite impossible for me to consider it separately from the Perryaur project, and it is especially with regard to this project that delay in the execution of the ghaut seems so inexpedient. I fear it will, under any circumstances, be impossible to complete the road from the head of the ghaut to the Perryaur during this season, but if the ghaut itself be completed, the cutting or tunnel at the water-shed can be commenced next year. I believe there is every prospect of the estimates for the project being very soon laid before the Government of India, and it would be a great pity if these estimates were sanctioned and the work still postponed on account of the ghaut not being ready.

FORWARDED to the Chief Engineer with reference to his memoranda, Nos. 211 and 155, dated respectively, 25th July and 15th August 1872.

(Signed) R. A. ROBERTS, Lieut.-Colonel, R.E.,
Superintending Engineer, 8th Division.

No. 113.

MEMORANDUM.

In his memorandum No. 211 of 25th July, the Chief Engineer requested that he might be supplied with a survey of such trace of the proposed new Goodaloor Ghaut as should have been inspected and approved by the Superintending Engineer, 8th Division. The survey accompanying Captain Pennycuick's report No. 291 of 18th August, has been simply forwarded by Lieutenant-Colonel Roberts under date the 4th September, without note or comment.

From the papers submitted it appears that the Chief Engineer rightly conjectured Lieutenant Rawson's trace to have commenced and ended at the head and foot of the old ghaut. The new trace is a great improvement on the first no doubt, as regards throwing the foot of the ghaut nearly 1,300 yards nearer Goodaloor, while the ghaut itself is actually a few yards shorter than that first projected.

The Chief Engineer accepts, on Lieutenant-Colonel Robert's responsibility, the trace as now laid out by Captain Pennycuick and Lieutenant Greer, and directs that it be opened out as a bridle-path one yard in width to admit of the preparation of a detailed estimate for submission to Government; pending receipt of whose orders thereon it may be widened to about 12 feet, that width being about as much as can be opened in the current year with the money at present available.

Colonel Walker requests that Captain Pennycuick may be told, once for all, that the present operations on which Lieutenant Greer is employed have no connection whatever with the Perryaur project.

Orders have been sent to the Superintendent of Public Works Stores to supply Lieutenant Greer with a couple of ghaut tracing instruments of the latest pattern.

(Signed) G. W. WALKER, Colonel, R.E.,
19th September 1872. Chief Engineer, P.W.D.

including one bridge of 50' span, while the general abstract has the bridges entered differently, namely:—

On ghaut.

	RS.	A.	P.
1 Bridge of 25' span	1000	0	0
Do. of 25' do.	650	0	0
Do. of 15' do.	380	0	0

Total... 2,030 0 0

No mention is made of a bridge of 50' span, which I presume is not required, some confusion on the subject evidently exists which demands explanation, and the sites, span, and cost of each bridge, should be separately specified.

17. Though as designs for bridges those submitted are all that can be desired and have been carefully prepared, I think they are unnecessarily elaborate and it will be difficult to construct them at Goodaloor.

18. On the survey sketch of the ghaut prepared for me by Lieutenant Greer, R.E., the sites and spans of the bridges are given; Nos. 1, 3 and 4 being only of 25' span, these might be more easily and cheaply constructed by using simple balks resting on cantilevers projecting 5 feet from the abutments, strutted, or simply bolted to the upper balks by two $\frac{3}{4}$ " iron bolts, etc., etc. Bridges Nos. 2, 6, 7, and 8 being only 15' span require no cantilevers.

19. The roadway provided, namely, 15 and 16 feet, appears to me to be greater than required, 12' being quite sufficient for all practical purposes, the plans and estimates for the bridges should, therefore, be revised, provision being made for timber girders where necessary on cantilevers 12" x 10" with joists 6" x 4", 2 feet from centre to centre, covered with 2 inch planking, the whole being gravelled or metalled, fixed hand rails would be likely to be damaged by the wild elephants which frequent the ghaut. A mere bamboo railing which could be easily renewed if damaged is all that is wanted.

20. Lieutenant Greer informed me that it was proposed to construct a bridge of 25' span over the nullah marked as the site of bridge No. 5 in the sketch survey of the ghaut; the nullah is very broad though shallow, and I consider can be much cheaper and safer crossed by an ordinary road dam for which provision should be made in the revised estimate.

21. The road from the foot of the ghaut to the village of Goodaloor, a distance of 5 miles, has been laid out; the estimate for it enclosed, has not, I believe, yet been before Government. I have no remark to make regarding it, with the exception that I believe a solid teak-wood queen post truss bridge like that constructed on the Coonoor Ghaut, is a more suitable structure than that designed for the Vyravenar, the plan and estimate for which, I recommend, should be revised accordingly. My remarks in reference to the bridges of 25' span on the ghaut apply also to the bridge over the Oodiapatty tank channel.

22. The road from Goodaloor, via Cumbum to Pariacolum at the foot of the Pulney Hills, is now being re-constructed, and will probably be completed by the time the ghaut is ready for traffic.

23. Pariacolum is connected by a fine road with Madura, 15 miles on this road at Balagoonta a line to Dindigul is also being re-constructed.

24. CAMP AT GOODALOOR TAVALUM. The camp is well situated on high ground, well ventilated close to the head of the ghaut. About 150 feet above the ghaut

stream, the huts are roughly constructed of bamboo and thatch, the walls also being of grass; the cold damp night air blows freely through them, and thus the liability of their occupants to jungle fever is, I consider, much increased. Lieutenant Greer, while I was with him, was even at this early period of the year, threatened with an attack which was only stoned off by large doses of quinine; it appears to me to be very desirable that the Executive Officer should be provided with good quarters; a wooden hut with corrugated iron roof, with out-houses, enclosed in a timber kraal sufficiently strong to keep out elephants, would add much to his comfort and the chance of keeping his health, while it would subsequently be a useful building as a travellers' bungalow which is much required in this wild uninhabited country. At present, to keep off the troublesome elephants, it is found necessary to have a large fire kept alight during the whole night, attended by two watchmen; which costs 250 Rupees per working season; if a protected building of the description proposed were constructed, this amount would be saved, the cost of the bungalow, etc., might be met from the savings likely to be made on the estimate as already pointed out by me.

25. MEDICAL ATTENDANCE.—I noted what appeared to me to be a very great want to Lieutenant Greer, working as he is, with a large body of workmen, in so unhealthy a locality on a description of work on which, though every precaution be taken, occasionally accident must occur, namely, that he has no medical aid nearer than Madura or Dindigul, and I would strongly urge the necessity of either an Apothecary or a first-class Hospital Assistant of some ability being attached to his camp during the working season. Lieutenant Greer informed me that, with the exception of the lascars, he does not require the establishment sanctioned for his use; the pay of this establishment would, therefore, be made better use of in meeting the cost of a medical subordinate, which it will more than cover.

26. SUPERINTENDENT MR. JONES.—Lieutenant Greer brought to my notice the valuable Assistant he has in Mr. Jones, his Ghaut Overseer. Hitherto this man has drawn pay only during the working season, after which he remains without employment till it commences again. I now understand that, if some departmental employment is not found for him when the work stops, he will probably seek work in some other department, and his services, which are most useful on the ghaut, be lost. I therefore recommend that his case receives consideration and arrangements be made to retain his services.

ORDER THEREON, 13th March 1873, No. 799.

No. 290.

CIVIL WORKS, No. 18.

His Excellency the Governor in Council has received with satisfaction the report of the Inspecting Engineer for Ports and Communications, showing that a creditable trace has been made down the Goodaloor Ghaut, throwing its foot nearly a mile further down the Cumbum Valley than that of the old ghaut, and with a gradient nowhere exceeding 1 in 16.

2. He approves of the suggestions for altering the cross section of the ghaut contained in paragraphs 9, 10, and 11 of Lieutenant-Colonel Farewell's

*Proceedings of the Madras Government, Public Works Department,
13th March 1873.*

(True Extract.)

W. A. R. E. Colonel, R.E.,
Secretary to Government.

.. Revenue Department.

" Chiefly for the

Exd. E. C. Shunker.

Revenue Dept.
77-834

Govt. of 1873 Madras.

PUBLIC WORKS.

To

THE DISTRICT ENGINEER, MADURA.

&c., &c., &c.

dated March 13/73.

Recd. - 201

Encl.

G. O., 13th March 1873, No. 799.

MARCH

Nos. 287-290

W. H. B.
Copy to the Bd. of Rev. the
Resident T. & the Bd.
of Madras & Annamalai

13th March/73

New Goodaloor Ghaut.—Passing orders
on papers relating to the new Goodaloor
Ghaut.

4. To the Board of Rev. the
1. To the Resident T. & the Bd.
1. To the Bd. of Madras & Annamalai
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