No. 326. Read the following endorsement of the Secretary to Government, Public Works Department, dated 11th December 1871 :—

Read the following letter from the Superintending Engineer, 8th Division, to the Secretary to Government, Public Works Department, dated Madura, 5th December 1871, No. 3,415 :—

I HAVE the honour to submit herewith, with its enclosures, a report, prepared by Executive Engineer Mr. Rundall, on the past season's work in the reconstruction of the two bridges over the Tambrapoorney river at Palamcottah and Ambasamoodrum respectively.

1 Report.
1 Estimate.
1 Specification.
1 Plan sent by banghy.

2. As this report furnishes a detailed description not only of the work actually executed, but of the manner in which that work was carried out, it leaves little for me to say in this respect.

3. As regards the first-mentioned bridge, namely, Soolochenum's, the difficulties attendant on its reconstruction have been already explained by me in my report to Government under date 28th April 1871, No. 324.

4. In order to overcome these the plan I suggested was as follows :—As the treacherous wells on which the fallen piers had been constructed were of no avail, and required therefore to be removed, it appeared to me advisable, in lieu of forming a timber coffer-dam in the first instance round each pier, which would have been a costly operation, to sink two parallel lines of wells across this portion of the river, each line to be just clear, and no more, of the debris of the foundations of the cut-waters of each pier. Thus the wells would not only act as coffer-dams, but would protect hereafter the foundations of the pier-starlings, as also the retaining walls of the flooring under the arches.

5. Although this plan was substantially carried out, Mr. Rundall explains how impossible it was found to get down the wells either in a line with the old cut-waters, or even to get them in a straight line at all, but by feeling the way with iron rods the wells were pitched as close to the required line as possible.

6. Without entering into further details I may simply state my belief that the foundations have been got in most successfully; the wells have, in all cases, been taken down to the rock, the depth of which varied from 5 feet to 12 feet below the surface of the bed of the river, and have been filled with hydraulic concrete which has set, on the whole, most satisfactorily.

7. With regard to the foundations of No. 7 pier the rock was found to be about 12 feet below zero of the gauge, and the quantity of brick-work, flooring, stones, and ruined wells to be removed, was so enormous (see paragraph 6 of Mr. Rundall's report), that no wells could be sunk, and there was no help for it, but to put in the foundation solid; this was a laborious and costly operation; but by the ingenuity and energy of Assistant Engineer Mr. Grant, to whom I had entrusted the direct supervision of the work, these difficulties were successfully overcome. Owing to the great depth of the foundations it was not found possible to keep the water down to a depth of less than 2 feet over the rock, and the first 2 feet, therefore,

of the wells on the outside were laid in cubes of clay, the remainder being in hydraulic cement.

8. The above is the only weak point, so to speak, of the whole of the work executed by Mr. Grant. But when the great breadth of foundation is taken into consideration, and the impossibility of any water being able to get inside these cubes laid in clay, so as to create any scouring action of the clay-joints, the fact of the lower 2 feet of these cubes not being laid in hydraulic cement similarly to the others, though a subject for regret, is not, as I believe, a matter of really vital importance.

9. It will be seen from paragraph 6 of the report and by the accompanying sketch that the foundations of No. 7 pier now rest on gneiss, and not on kunkur, as is the case with those of No. 8 pier. The old wells of this pier were found to stop 3 feet short of the rock, and Mr. Grant is of opinion, which is not shared by Mr. Rundall, that the wells originally rested on kunkur, and were gradually undermined. I must say that I concur with Mr. Rundall, as far as the suggested gradual undermining is concerned; for it is difficult to believe that, had this been the case, the insecurity of the pier would not have been apparent before the final catastrophe. For such a mass of brick-work as was held supported by this pier could manifestly not have stood like the coffin of Mahomet suspended in mid air, nor can I believe that it was supported simply by lateral pressure and the cohesion of its own particles.

10. However difficult to decide, this question, it must be confessed is one of vital importance; for it may be said, if the kunkur, on which the new foundation of No. 8 pier now rest, is of so light and friable a kind as to be easily disintegrated, which it confessedly is, what security have we for the ultimate stability of the bridge? To this I reply the flood of 1869 is the greatest known for the last forty years, and the scour that then took place with the water-way then afforded by the bridge is not likely to be equalled, still less exceeded, by any flood through the bridge with the increased water-way with which it has now been supplied (*vide* paragraph 14 of the report); and that having gone, moreover, on the present occasion to the lowest depth of that scour on which to rest our foundations, the kunkur, even if disposed to disintegrate, has no loop-hole of escape.

11. While on this subject of scour I may mention that one of the iron lamp-posts, which formerly adorned the parapet of the bridge, was found imbedded in mud (in the river) at a depth of about 3 feet below the depth of the lowest foundation of the old piers. The granite slabs, which commemorated the names of those under whose auspices the structure originally came into being, have not been found, though search has been made for them. It is supposed that they have ominously disappeared in their primeval mud.

12. In regard to the completion of the bridge I have already reported in my letter No. 3,212, dated 23rd November 1871, that Assistant Engineer Mr. Grant has proceeded to Aleppey to purchase the timber required for the centerings, and should we be successful in getting all the centres in position in March as anticipated, it is hoped that the bridge may be re-opened for traffic in September 1872.

13. Although, of course, it is clearly premature to pronounce the successful execution of the work, while so much and such an important portion of it remains

Proceedings of the Madras Government, Revenue Department,
26th January 1872.

to be done, yet I think that it is only right to mention that what has been done could not have been carried out but for the unremitting attention and assistance on the part of Mr. Puckle. His foresight has been as remarkable as his action has been prompt, in obtaining all the necessary supplies of material, labour, etc. He has been most ably assisted by Executive Engineer Mr. Rundall, while, as I have already reported, Assistant Engineer Mr. Grant has had the immediate departmental control of the work which he has superintended most efficiently.

14. As regards the second subscription bridge over the same river, namely, that at Ambasamoodrum, the progress is not so satisfactory. This is owing to several causes, but principally to the fact of freshes coming down more frequently and with greater force at this part of the river than it does at Palamcottah; as the stream is in the interval intercepted by many irrigation works, which frequently prevent the effects of what may be a disastrous fresh at Ambasamoodrum being even noticed at Palamcottah.

15. The work executed in the restoration of the Ambasamoodrum bridge was carried out, as I have reported in my letter dated 6th May 1871, No. 415, under the superintendence of the then Acting Sub-Collector Mr. A. J. Stuart, and was exceedingly well done. He completed the foundations of four piers during April and May, but he was precluded, by the setting in of the monsoon, from attempting any thing further. Unfortunately Mr. Stuart was ordered away from the district, and those dispositions which, had he remained, he would undoubtedly have made for the early resumption of the work, were not taken. Consequently in the beginning of August, when this department took charge of the work, there were no well-bricks ready, nor any preparations made for starting the work to the remaining pier, namely, pier No. 7. Mr. Rundall recounts the difficulties that were incurred in starting this pier, and how, on the 26th September, a fresh came down the river and put an end to the season's work. Energetic measures will be taken for the resumption of the work early in February, and every effort will be made to get in satisfactorily the foundations of what has been called the Partington pier.

16. The expenditure incurred up to 30th October 1871 on the two bridges under notice has been as follows:—

		RS.	A.	P.
1.	Soolochenum bridge	30,448	6	4
2.	Ambasamoodrum do.	9,257	3	4

TRANSFERRED to the Revenue Department with reference to the orders in that department, dated 3rd June 1871, No. 982.

(Signed) J. CARPENDALE, Colonel, R.E.,
Secretary to Government, P.W.D.

No. 327. ORDER THEREON, 26th January 1872, No. 163.

Miscellaneous.

ORDERED to be communicated to the Board of Revenue.

2. The Government congratulate Messrs. Puckle, Stuart, and Rundall on the success which has so far attended

Proceedings of the Madras Government, Revenue Department,
26th January 1872.

their zealous efforts to give effect to the liberal intentions of the native residents to restore these valuable structures.

3. The Government note with satisfaction the testimony that is borne to Mr. Assistant Engineer Grant's intelligent and active supervision of the work.

(True Extract.)

(Signed) W. HUDLESTON,
Secretary to Government.

To the Board of Revenue.
,, the Collector of Tinnevelly.
,, the Superintending Engineer,
,, the Public Works Department

Read the following Correspondence
& 15th Dec 1871

3B

No 3415 Superintg Engineers Office S D
Madura 5 December 1871

From
Lieut. Colonel H A Roberts RE
Superintg Engineer S D

To
Colonel J Carpendale RE
Secretary to Government D W

Sir,

I have the honor to submit herewith with its enclosures a report prepared by Executive Engineer Mr Rundall on the past season's work in the reconstruction of the two bridges over the Tambraporney River, at Palamcottah and Ambasamoodrum respectively.

2 As this report furnishes a detailed description not only of the work actually executed, but of the manner in which that work was carried out, it leaves little for me to say in this respect.—

3 As regards the first mentioned bridge viz. Soolochemmis, the difficulties

attendant on its reconstruction have been already explained by me in my report to Government under date 28th April 1871 No 324.

4 In order to overcome these, the plan I suggested was as follows:- As the treacherous wells on which the fallen piers had been constructed were of no avail, and required therefore to be removed it appeared to me advisable, in lieu of forming a timber coffer dam in the first instance round each pier, which would have been a costly operation, to sink two parallel lines of wells across this portion of the river, each line to be just clear, and no more, of the débris of the foundations of the cutwaters of each pier. Thus the wells would not only act as coffer dams, but would protect hereafter the foundations of the pier-starlings, as also the retaining walls of the flooring under the arches -

5 Although this plan was substantially carried out, Mr. Sindall explains how impossible it was found to get down the wells either in a line with the old cut-waters or even to get them in a straight line at all, but by feeling the way with iron rods, the wells were pitched as close to the required line as possible.

6. Without entering into further details, I may simply state my belief that the foundations have been got in most successfully; the wells have, in all cases, been taken down to the rock, the depth of which varied from 5 feet to 12 feet below the surface of the bed of the river, and have been filled with hydraulic concrete which has set, on the whole, most satisfactorily -

7. With regard to the foundations of No 7 Pier, the rock was found to lie about 12 feet below zero of the

gauge, and the quantity of brick work flooring stones and rubbish wells to be removed was so enormous see Para 6 of Mr Rundalls Report that no wells could be sunk and there was no help for it but to put in the foundation solid - this was a laborious and costly operation, but by the ingenuity and energy of Assistant Engineer Mr Grant to whom I had intrusted the direct supervision of the work, these difficulties were successfully overcome. Owing to the great depths of the foundations, it was not found possible to keep the water down to a depths of less than 2 feet over the rock - And the first two feet therefore of the wells, on the outside were laid in cubes of clay, the remainder being in hydraulic cement -

8. The above is the only weak point, so to speak, of the whole of the work executed by Mr Grant -

But when the great breadth of foundation is taken into consideration and the impossibility of any water being able to get inside these cubes laid in clay, so as to create any scouring action of the clay-joints, the fact of the lower two feet of these cubes not being laid in hydraulic cement similarly to the others, though a subject for regret, is not, as I believe, a matter of really vital importance -

9. It will be seen from Para 6. of the report, and by the accompanying sketch that the foundations of No 7 pier now rest on gneiss, and not on Kunkur as is the case with those of No 8 pier - the old wells of this pier were found to stop 3 feet short of the rock, and Mr Grant is of opinion, which is not shared by Mr Rundall, that the wells originally rested on Kunkur and were gradually undermined

I must say that I concur with Mr Kindale as far as the suggested gradual undermining is concerned; for it is difficult to believe that had this been the case, the insecurity of the pier would not have been apparent before the final catastrophe. For such a mass of brick work as was held supported by this pier could, manifestly, not have stood like the coffin of mahomet suspended in mid air, nor can I believe that it was supported simply by lateral pressure and the cohesion of its own particles-

10 However difficult to decide, this question, it must be confessed, is one of vital importance; for it may be said, if the Bankur, on which the new foundation of No 8 pier now rest, is of so light and friable a kind as to be easily disintegrated, which it confessedly is, what

security have we for the ultimate stability of the bridge? To this I reply the flood of 1869 is the greatest known for the last 40 years, and the scour that then took place with the water-way then afforded by the bridge is not likely to be equalled, still less exceeded, by any flood through the bridge with the increased waterway with which it has now been supplied, vide para 14 of the Report. And that having gone moreover on the present occasion to the lowest depth of that scour on which to rest our foundations, the Bankur even if disposed to disintegrate has no loophole of escape-

11 While on this subject of scour I may mention that one of the iron lamp-posts which formerly adorned the parapet of the bridge was found imbedded in mud (in the river) at a

depth of about 3 feet below the depth of the lowest foundation of the old piers - the granite slabs, which commemorated the names of those under whose auspices the structure originally came into being, have not been found, though search has been made for them - It is supposed that they have ominously disappeared in their primeval mud.

12. In regard to the completion of the bridge, I have already reported in my letter No 3212 dated 23rd November 1871. that Assistant Engineer Mr Grant has proceeded to Aleppey to purchase the timber required for the centerings - And should we be successful in getting all the centres in position in March, as anticipated, it is hoped that the bridge may be re-opened for traffic in September 1872 -

13. Although of course it is clearly premature to pronounce the successful execution of the work

while so much, and such an important portion of it remains to be done, yet I think that it is only right to mention that what has been done could not have been carried out but for the unremitting attention and assistance on the part of Mr Stuckle - His forethought has been as remarkable as his action has been prompt, in obtaining all the necessary supplies of material, labor &c - He has been most ably assisted by Executive Engineer Mr Kindall, while, as I have already reported, Assistant Engineer Mr Grant has had the immediate departmental control of the work which he has superintended most efficiently -

14 As regards the second subscription Bridge over the same river viz: that at Ambasamoodrum the progress is not so satisfactory. This is owing to several causes,

but principally to the pack of freshes coming down more frequently and with greater force at this part of the river than it does at Palamcottah; as the stream is in the interval intercepted by many irrigation works, which frequently prevent the effects of what may be a disastrous fresh at Ambasamoodrum being even noticed at Palamcottah.-

15 The work executed in the restoration of the Ambasamoodrum Bridge was carried out, as I have reported in my letter dated 6th May 1871 No. 415 under the superintendence of the then Acting Sub Collector Mr A. J. Stuart, and was exceedingly well done.- He completed the foundations of 4 piers during April and May, but he was precluded, by the setting in of the monsoon, from attempting anything further.- Unfortunately Mr Stuart was ordered away from the District, and

those dispositions which had he remained, he would undoubtedly have made for the early resumption of the work were not taken.- Consequently in the beginning of August, when this Department took charge of the work, there were no well-bricks ready nor any preparations made for starting the work to the remaining pier, viz. Pier No 4.- Mr Rundall recounts the difficulties that were incurred in starting this pier, and how on the 26th September a fresh came down the river, and put an end to the season's work.- Energetic measures will be taken for the resumption of the work.- Early in February, and every effort will be made to get in satisfactorily the foundations of what has been called the Farrington pier

16. The expenditure incurred up to 30th October 1871

on the two bridges under notice has been as follows:-

1. Sooloochenum Bridge Rupees. 30448-6-4
2. Ambasamoodrum -Do- Rupees. 9257-3-4

I have the honor to be
Sir
your Most Obedient Servant

Richd. Roberts Lieut: Col: R.E.
Superintg Engineer 8th Dn

No 5859 9th June 1871

Transferred to the Revenue Department with reference to the orders in that Dept date 8th June 1871 No 982

[illegible] Coll R.E.
Secy to Govt
11th Dec/71 P.W. Dept

Plan will follow

Public Works 1871 Department No 3415

From No 5859
The Superintg Engineer
8th Dn

To
The Secretary to
Govt 8th Dn

Dated 5 December 1871
Received 9th

Enc: 1

Report regarding the progress made in the reconstruction of the Sooloochenum and Ambasamoodrum bridges in the Tinnevelly district during the past season.

Transferred

Rev: 1871 Dept
№ 3954.

From Supg Engr 8th Dn
Thro' P. W. Dept.

Dated 5th
Recd 12th } Dec. 1871

№ 5859.

Subject Reports regarding the progress made in the reconstruction of the Sooloochemmum and Ambasamoodrum bridges in the Tinnevelly Dist: during the past season.

S. O. No. 163 – 26 Jany/72

No 326
"
Encl 5 Jany/72 R 22.

Revenue Depart
26th Day. 1872.

№ 163.

Proceedings of the Madras Govt
Under date the 26 Jany/72

Read the following letter from the Supt Engr
8 Division.

Reporting on the progress made in the reconstruction of the Sooloochemmum and Ambasamoodrum bridges in the Tinnevelly District during the past season.

H. C. S Dos 5/1-71-72 5859.

Ordered to be communicated to the Board of Revenue.

The Govt congratulate Supt Pettle, Stuart, and Rundall on the success which has so far attended their zealous efforts to give effect to the liberal intentions of the native residents to restore these valuable structures.

The Govt note with satisfaction the testimony that is borne to Mr Asst Engineer Grant's intelligent and active supervision of the work.

14. Board of Revenue Desp 29 Jany/72
1. Collector of Tinnevelly
6. Supt Engr 8 Div
21. Public Works Dept

Acc. 926-33

No. 1.

Recorded
of certain
in Tunnel

Circ

Ge

Govt. of [1872] Madras.

REVENUE.

To

THE BOARD OF REVENUE,

&c., &c

Dated January 26th.

Recd. Encl.

G. O., 26th January 1872, No. 163.

JANUARY.

Nos. 326-327.

Soolochenum and Ambasamoodrum bridges in Tinnevelly District.—Letter from Superintending Engineer, 8th Division, reporting on the progress made in their re-construction, communicated to Board of Revenue.