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(3) Initials of the Referencer _____

MADRAS RECORD OFFICE

Government of Madras

Public works DEPARTMENT

G.O. No.	1765	Press
B.P. No.		Mis.
140-141		
Dated	9 7	18 73

Not to be folded or roughly handled

*Proceedings of the Madras Government, Public Works Department,
9th July 1873.*

No. 140. Read the following letter from Lieutenant-Colonel J. H. M. SHAW. STEWART, R.E., Consulting Engineer for Railways, to Colonel G. W. WALKER, R.E., Secretary to Government, Public Works Department, dated Madras, 23rd May 1873, No. 287 :—

THE Order of Government, dated the 2nd April 1873, No. 1,021, was communicated to the Agent of the Madras Railway Company, with a request that he would give effect to the views therein expressed by His Excellency in Council. With reference to that Order of Government, and to the Report of the Committee

* No. 361, 22nd May 1873.

upon which it was based, I have received a letter* from Mr. Barton Wright which, at his request, I do myself the honour to lay before Government for their consideration.

2. It will be seen that Mr. Going, the Acting Chief Engineer of the Company, urges certain objections against the measures advocated by the Committee, and approved by the Government, for retaining the waters of the Naggery river within its banks above the Railway bridge. He points out, first, that the "proposed works would be at such a distance from the railway (three miles) that it would be impossible for the Company's Engineers to exercise efficient control over them." And he adds that he "cannot participate in the apprehensions expressed by the Committee that in an extraordinary flood the river above Sathravada would be liable to a diversion of its waters from their present channel."

3. The first of these objections suggested itself forcibly to Mr. Beresford Anderson, a member of the Committee, and I may safely say that he would not have joined in recommending the proposal if the security of the railway could, in his opinion, have been otherwise insured.

4. With regard to Mr. Going's second and principal objection, it is of course a matter of opinion whether the Committee were justified in the apprehensions which they have recorded in their Report. I have on two occasions made careful examinations of the localities in company with Mr. Anderson, the Chief Engineer; and, after giving full weight to Mr. Going's representations, I can see no reason for modifying the decision which we both arrived at. And a reference to the

2nd April 1867, No. 1,017.
14th " 1869, " 1,226
3rd May 1869, " 1,446.

papers printed with the Proceedings of Government noted in the margin will show that on two occasions, in 1866 and 1869, competent professional authorities

were of opinion that the line of railway was exposed to imminent danger from the inadequate nature of the protective works at the very spot which it is now recommended to make thoroughly secure. To the opinions recorded in these papers, I may add that Mr. Smart, the previous Chief Engineer, wrote in December 1866, that "the threatening aspect of the weather, coupled with the neglect of the Zemindar to repair the breaches in the Naggery river at the head of the Sathravada channel, places our railway embankment in such imminent danger of being carried away, north of the Naggery bridge, that I have directed the Resident Engineer to commence the necessary repairs."

5. Mr. Going quotes from a letter written in July 1867 by the late Colonel J. G. Anderson, in order to show that in that officer's opinion there was no ground

*Proceedings of the Madras Government, Public Works Department,
9th July 1873.*

for apprehending danger from leaving the river bank unprotected; but I think the

* *Vide* Proceedings of Government, 23rd July 1867, No. 2,209.

inference is not correct. The last paragraph of the letter* quoted by Mr. Going runs as follows:—

"I may add that our recent examination of the locality shows, as I think you will allow, that the water-way allowed on the railway is far from sufficient. It is on a scale which could not be considered liberal, even if the river were embanked throughout, but as it appears that there is nothing to prevent a great flood passing over the country and bearing down on the railway, I apprehend that additional masonry works on a tolerably large scale will be required to render the line completely secure."

6. Instead of the protective works recommended by the Committee, Mr. Going proposes to "a strong stone pitching of the railway embankment from Govindrajecoopum tank to the Naggery river." He adds that "it will also be desirable that all the bridges and culverts in this bank should be provided with good floors and curtain walls;" and he mentions that this is now being carried out where not before provided. Mr. Going is of opinion that if these precautions be taken, all will have been done that is required for the safety of the railway.

7. I cannot agree in this view. If the proposal to protect the river bank above the village of Sathravada be abandoned, I am of opinion that it will be absolutely necessary not only to strengthen the railway bank, as suggested by Mr. Going, but to add largely to the water-way provided upon the line to the north of the Naggery bridge. Upon this point I beg to refer to the late Colonel Anderson's opinion as above quoted, and to the opinions recorded in the Proceedings of Government, dated the 22nd March 1869, No. 953. A reference to the plan which accompanies Mr. Going's letter will show that in the event of any of the flood waters of the Naggery being diverted into the low-lying ground to the north of Sathravada, and thence into the Naggery tank, the only provision for passing such water across the railway consists in two small openings of 9 feet each. I cannot entertain the smallest doubt that, in such an event, this amount of waterway would be utterly inadequate, and that the line of railway must sustain great injury.

8. The approximate estimates submitted by Mr. Going show that between the cost of the works recommended by the Committee, and of those proposed by him, there is a difference of only some Rupees 20,000. As I have already stated, it would, in my opinion, be necessary to supplement Mr. Going's proposals by making considerable and costly additions to the existing allowance of waterway; but even were it otherwise, I do not think that in dealing with a question of such importance a comparatively slight difference in cost should be allowed to carry much weight.

9. If the other members of the late Bridge Committee had been now in Madras, I should have consulted them before submitting Mr. Going's letter for the consideration of the Governor in Council; but His Excellency is aware that Mr. Beresford Anderson and Captain Smith are at present out of India.

10. I beg to be favoured with the views of Government upon this subject as soon as possible.

*Proceedings of the Madras Government, Public Works Department,
9th July 1873.*

From W. BARTON WRIGHT, Esq., Acting Agent and Manager of the Madras Railway Company, to Lieutenant-Colonel J. H. M. SHAW-STEWART, R.E., Consulting Engineer for Railways, dated Madras, 22nd May 1873, No. 361.

With reference to the correspondence and Order of Government noted in the margin, I have

From Consulting Engineer, No. 346, 8th April 1873.
G. O., No. 1,021, dated 2nd April 1873.
From Consulting Engineer, No. 425, 7th May 1873.
From Collector of North Arcot, No. 12, 2nd May 1873.

the honour to request that the enclosed copy of the Acting Chief Engineer's letter, No. 310, dated the 20th instant, on the subject of the proposed protective works to the Naggery

bridge, may be laid before Government, and that any orders passed thereon may be communicated to me as early as possible.

From T. H. GOING, Esq., Acting Chief Engineer, to W. BARTON WRIGHT, Esq., Acting Agent and Manager of the Madras Railway Company, dated Madras, 20th May 1873, No. 310.
CONSULTING ENGINEER's letter No. 316 of 8th April, paragraph 3, and letter No. 425 of the 7th instant.

Before taking action in this matter I thought it necessary to make an examination of the locality in question and ascertain in what condition the revetment is.

2. I find that a large portion of it has been destroyed and that the stones have disappeared.

3. This was to be expected as the work was laid dry and no sufficient foundation, as it appears, provided. The bed of the river is sand to a considerable depth. A work of this sort would, therefore, require well foundations, and it ought to be built of good stone in mortar masonry.

4. The works proposed by the Government Bridge Committee comprise—

- 1st.—The thorough repair of this revetment.
- 2nd.—The construction of an embankment about half a mile long and six feet high with three sluices.
- 3rd.—The construction of a groyne.

5. I estimate the approximate cost of these works as follows:—

	Rs.
1st.—River revetment 2,640 feet long, founded on a row of wells seven feet deep	52,629
2nd.—Pitched embankment half a mile in length	16,334
3rd.—Three sluices through embankment	702
4th.—Loose stone groyne 50 feet long	1,023
	70,688

6. It is with very great diffidence that I venture on any criticism of the measures recommended by the Bridge Committee as to the method of dealing with the question of protecting the railway works from the effects of an inundation from the Naggery river. My official position, however, may perhaps give me a right to regard the subject from a more exclusively railway point of view than a Government Committee would naturally do, and as this is the only aspect from which the question as now before us has any right to be considered, I beg to state certain objections which I have to urge against the measures advocated by the Committee, in so far as they are intended to provide for the security of the railway works, without attempting to question their efficacy as a means of protecting the lands from the injurious action of the river.

7. In the first place these proposed works would be at such a distance from the railway (three miles) that it would be impossible for the Company's Engineers to exercise efficient control over them. But I cannot participate in the apprehensions expressed by the Committee, that in an extraordinary flood the river above Sathravada would be liable to a diversion of its waters from their present channel. There is undoubted evidence of erosion at this point, and this action of floods would probably continue to eat away the bank for a certain distance down-stream till the local influences which caused it had ceased, either in consequence of this very change of form in the bank itself, or owing to the current being given a different set from changes in the bed or banks overflow in great floods. But the whole tract of land lying inside the north bank of the river above the railway crossing consists of stiff clay soil, and its surface shows no appearance of having been at any time scoured by a flood.

*Proceedings of the Madras Government, Public Works Department,
9th July 1873.*

8. At the village of Sathravada the section figures marked on the accompanying plan show the land on the north bank to be considerably higher than the river bed. Above this point, and as far as the point marked A on plan, the ground is lower, and I find that floods have been known to rise to a height of two feet above the bank. There is thus a strip of ground about 200 feet broad, included between the river bank and the bund of Sathravada tank, over which in very high floods water is liable to find its way; but in spreading over the broad tract of cultivated land lying between the railway and the north bank of river such a flow could have no destructive effects beyond flooding the paddy fields.

9. But there are strong reasons why the flood level on the north bank above Sathravada should not rise to dangerous limits, in the fact that the lands on the opposite (south) bank of the river are equally low and spread out into a greater expanse of flat plain. Such an outlet for the overflow in floods must naturally keep down the head of water, and in fact I find, as before stated, that the highest floods never rise more than two feet on the low ground above Sathravada.

10. If it be urged that the supply-channel to Naggery tank would carry forward a great body of water in the event of a heavy flood breaking into it, I cannot express my own opinion better than by quoting that of the late Colonel J. C. Anderson, R.E., who remarks as follows, with reference to this contingency, in his letter to the Agent and Manager, No. 134, of 10th July 1867, viz. :—

“ My own opinion is that the destruction of the bank above the channel would have thrown into it such a large proportion of the *débris* as very much to reduce its discharging powers.”

11. For the reasons I have thus stated I can, then, see nothing in the facts of the case to lead me to believe that the Naggery river above Sathravada has any tendency to leave its well defined sandy channel in the bottom of the valley and to seek for itself a new channel through three miles of stiff clay soil.

12. What may happen and does happen is an overflowing of the banks on both sides of the river in high floods, and on the north side the tanks become filled. This is the real cause of danger. The bursting of any one of these tanks might cause much damage to the railway.

13. The Govindrajcoopum tank did breach in 1864 on two occasions and carried away a portion of the embankment. I noticed a weak place in Naggery tank bund a few days ago, which will certainly breach if not attended to. I cannot, of course, expect that any steps will be taken to compel the Zemindar to render his tank safe, seeing what has been already recorded on this subject; I therefore propose a strong stone pitching of the railway embankment from Govindrajcoopum tank to the Naggery river.

14. It will be also desirable that all the bridges and culverts in this bank should be provided with good floors and curtain walls. This is being carried out in the case of all of them which have not already been thus protected.

15. If these precautions be taken I am of opinion that all will have been done that is required for the safety of the railway. The case of the Sathravada village will, however, be in no degree bettered, and there appear to be good grounds for apprehending the ultimate destruction of this village by the gradual encroachment of the river.

16. The whole question had its origin in a petition to the Deputy Magistrate of Naggery from the inhabitants of Sathravada in October 1866, pointing out their danger, and suggesting that moved to recognize a common danger and so take the case off their hands. The Deputy Magistrate accordingly appealed to the Resident Engineer, who to some extent fell in with his views, and recommended that the Railway Company should extend the dry revetment, which had some time previously been built by the Zemindar to protect the head of the irrigation channel, having its source above the village. This extension of the revetment was carried out by the Railway Company, but has been of very little value in preventing the encroachment of the river, owing to the reasons given in the first part of this letter. There can be no doubt, however, but that a properly executed revetment at this place, and extended further up-stream, would be most serviceable in saving valuable land from erosion, and in preserving the head-sluice of the irrigation channel in an effective condition for regulating the supply of water during floods: but I trust it may be under-

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9th July 1873.*

stood, from the reasons given throughout this letter, that the question is not one in which the Railway Company is concerned.

17. I should in any case be debarred from undertaking the execution of these works in view of the expressed opinion of the Board of Directors respecting the incidence of their cost. It will thus be seen how impossible it is for me to give effect to the Consulting Engineer's request. And I would now ask you to obtain his consent to my submitting an estimate for the sanction of Government to enable me to revet the railway embankment from the Naggery bridge to Govindrajcoopum tank as a protection against the damage to be dreaded from the bursting of the Zemindar's tanks to north of the Naggery river.

18. The estimate (approximate) of this work would be as follows :—

	RS.
Pitching with stone set in mortar between Naggery river and tank ...	28,314
Dry pitching between Naggery and Govindrajcoopum tanks ...	22,215
Total...	50,529

19. Even supposing such a contingency as that contemplated by the Bridge Committee to occur, I should consider the protective works which I propose to the embankment and minor bridges to be sufficient.

No. 141. ORDER THEREON, 9th July 1873, No. 1,765.

RAILWAY, No. 17.

The Government are unable to accept Mr. Going's alternative plan of strengthening the railway embankment by revetting it for about two miles north of the Naggery bridge at a probable cost of Rupees 50,000, in preference to the proposals of the Railway Bridge Committee to revet and embank at and near the river bank some three miles up-stream at a cost which he estimates at Rupees 70,000.

2. In Colonel Anderson's Report of July 1867, it is stated that he considered additional masonry works, affording increased way on a liberal scale, as essential for the security of the portion of the railway line in question if the river were not embanked; and in paragraph 12 of Mr. Going's letter he states that much damage to the line might be anticipated from high floods overflowing the river bank and filling the adjacent tanks till they burst. The Government must therefore agree with Lieutenant-Colonel Shaw-Stewart that his proposals to be effectual should be largely supplemented by provision of increased water-way, which would involve even a greater cost than the treatment of the river bank according to the design of the Bridge Committee.

3. The Governor in Council must decline to re-open the question, to which Mr. Going recurs, respecting the incidence of the charge, or to recognize the validity of Mr. Going's objection to his planning and executing works approved for the protection of the railway simply because they are not immediately on the line, and incidentally benefit the tenants of a certain Zemindar. The cost of new works required to correct the original imperfections of the railway at a particular point must be charged against the line, whether their object be attained in a more or less obviously direct manner.

(True Extract.)

Colonel, R.E.,

Secretary to Government.

To the Consulting Engineer for Railways.

Exd. S. T. Austin.

Spare Copies.

Railway Department.

Consulting Engineer's Office

N: 287

From, Lieut. Col. J. H. M. Shaw Stewart, A.E.,
Consulting Engineer for Railways

To, Colonel G. W. Walker, A.E.,
Secretary to Government
Public Works Department
Port Saint George.

Sir,

The Order of Government
dated the 2nd April 1873, N: 1021,
was communicated to the agent of the
Madras Railway Company, with a
request that he would give effect to
the views therein expressed by His
Excellency in Council. With reference
to that Order of Government, and to
the report of the Committee upon which
it was based, I have received a letter
from Mr. Barton Wright which, at

his

N: 361- 22nd May 1873.

his request, I do myself the honour to lay before Government for their consideration).

2. It will be seen that Mr. Goings, the Acting Chief Engineer of the Company, urges certain objections against the measures advocated by the Committee, and approved by the Government, for retaining the waters of the Taggery river within its banks above the railway bridge. He points out, first, that the "proposed works would be at such a distance from the railway (3 miles) that it would be impossible for the Company's Engineers to exercise efficient control over them." And he adds that he "cannot participate in the apprehensions expressed by the Committee that in an extraordinary flood the

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3. The first of these objections suggested itself forcibly to Mr. Beresford Anderson, a member of the Committee, and I may safely say that he would not have joined in recommending the proposal if the security of the railway could, in his opinion, have been otherwise insured.

4. With regard to Mr. Goings' second and principal objection, it is of course a matter of opinion whether the Committee were justified in the apprehensions which they have recorded in their report. I have on two occasions made careful examinations of the localities, in company with Mr. Anderson, the Chief Engineer, and, after

after giving full weight to Mr. Going's representations, I can see no reason for modifying the decision which we both arrived at. And a reference to the papers printed with the proceedings of Government noted in the margin, will show that on two occasions, in 1866 and 1869, competent professional authorities were of opinion

* 2 April 1867
N: 1017.

14 April 1869
N: 1226.

3 May 1869
N: 1446.

that the line of railway was exposed to imminent danger from the inadequate nature of the protective works at the very spot which it is now recommended to make thoroughly secure. To the opinions recorded in these papers I may add that Mr. Smart, the previous Chief Engineer, wrote in December 1866 that "the threatening aspect of the weather, coupled with the neglect of

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"the Zemindar to repair the breaches in the Naggery river at the head of the Sathravada Channel, placed over railway embankment in such imminent danger of being carried away, north of the Naggery bridge, that I have directed the Resident Engineer to commence the necessary repairs."

5. Mr. Going quotes from a letter written in July 1867 by the late Colonel J. G. Anderson in order to show that in that Officer's opinion there was no ground for apprehending danger from leaving the river bank unprotected: but I think the inference is not correct. The last paragraph of the letter quoted by Mr. Going runs as follows:-

Proceedings -
comment-
by 1867 N: 2209.
I may add that our recent examination

"examination"

examination of the locality shows,
as I think you will allow, that
the water-way allowed on the
Railway is far from sufficient.
It is on a scale which could
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Mr. Goings is of opinion that if these
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I cannot agree in this
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necessary not only to strengthen the railway bank as suggested by W. Goings, but to add largely to the waterway provided upon the line to the north of the Naggery bridge. Upon this point I beg to refer to the late Colonel Anderson's opinion as above quoted, and to the opinions recorded in the proceedings of Government dated the 22nd March 1869 N. 953. A reference to the plan which accompanies W. Goings's letter will shew that in the event of any of the flood waters of the Naggery being diverted into the low-lying grounds to the north of Puthravada, and thence into the Naggery tank, the only provision for passing such water across the railway

165
railway consists in two small openings of 9 feet each. I cannot entertain the smallest doubt that, in such an event, this amount of waterway would be utterly inadequate, and that the line of railway must sustain great injury.

X. The approximate estimates submitted by W. Goings shew that between the cost of the works recommended by the Committee, and of those proposed by him, there is a difference of only some rupees 2,000. As I have already stated it would in my opinion be necessary to supplement W. Goings's proposals by making considerable and costly additions to the existing

existing allowance of waterway; but, even were it otherwise, I do not think that in dealing with a question of such importance a comparatively slight difference in cost should be allowed to carry much weight.

9. If the other members of the late Bridge Committee had been now in Madras, I should have consulted them before submitting Mr. Goings's letter for the consideration of the Governor in Council; but His Excellency is aware that Mr. Beresford Anderson and Captain Smith are at present out of India.

I beg to be favoured with

with the views of Government upon this subject as soon as possible.

I have the honour to be

Sir

Your most obedient servant

Madras
23rd May 1873

Comp. S. B.

Montgomery L. C. Esq., &c.

Cons. Engineer for Railways

[Faint, illegible handwritten notes at the bottom of the page]

1873 Sept.
Genl. of Govt. for India
No 3088.

From

W. P. S. J. S.
Govt. Railway.

Dated 23rd May/73.
Recd. 26 May/73.

Inc. 3
18 want
No 287.

Submitting
with observations
a letter from the Agent
Madras Railway
on the subject of the
proposed protective
works to the Naggery
Bridge.

No 1765-9 dated 17/73.

P. W. D.

Proceedings of the Madras Government,
Under date the 187

Read the following:—

The following is for the Govt. (H.R. No 287 of 23rd May/73)

The Government
are unable to accept
Mr. Goings' alternative
plan of strengthening
the Railway embank-
ment by revetting it for
about 2 miles north
of the Naggery Bridge
at a probable cost of
Rs. 50,000, in preference
to

Recd. 26 May/73

to the proposals of the
Railway Bridge Com-
mittee torevet and em-
bank at and near
the River bank some
3 miles upstream at
a cost which he esti-
mates at Rs 70000-

In Colonel Ander-
son's ~~Report~~ Report of
July 1867, it is stated
that he considered ad-
ditional masonry
works affording increased
way on a liberal scale,
as essential for the security

14
of the portion of the
Railway Line in ques-
-tion if the River were
not embanked - and in
para 12 of Mr. Gough's
letter he states that
much damage to the
line might be antici-
-pated from high floods
overflowing the River
bank and filling the
adjacent tanks till
they burst - The Govern-
-ment must therefore
agree with Lieut. Col.
Shaw Stewart that
his proposals to be
Effectual

Effectual should be
largely supplemented
by provision ~~by~~ increased
waterway, which would
involve even a greater
cost than the treatment
of the River bank ac-
cording to the designs
of the Bridge Committee.

Mr. Goring would
apparently reopen the
question of the incidence
of the charge, but His
Excellency the Governor
in Council must de-
cide to discuss the
subject with him, and
is

I am
The Secretary must
decide to reopen the
question, which
Mr. Goring raises,
respecting the incidence
of the charge, or to
recognize the validity
of Mr. Goring's objection.

is unable to appreci-
ate his objection to his
Planning and execu-
ting the work that
have been approved
for the protection of the
Railway simply be-
cause they are not im-
mediately on the line,
and incidentally benefit
the tenants of a certain
Zemindar. The cost
of new works required
to correct the original
imperfections of the
Railway at a particu-
lar point must be
charged.

mauer: Quint

8-140-41.

Depd 18/7/73

Govt. of Madras.

PUBLIC WORKS.

To The Honorable Engineer
for Railways

Dated

Recd.

Encl 3

G. O. 9 July 1873. No 1765.

Nos. 1402 & 1411

Executive works to the
Nagerry Bridge on the
Madras Railway. Varying

orders in letter from the
Comptroller. Submitting, with
observations, letter from
the Agent of the Madras
Rly., on the subject of the
proposed protective works to
the Nagerry Bridge.