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MADRAS RECORD OFFICE

Government of Madras

Public Works DEPARTMENT

G.O. No.	1276-77	Press
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Not to be folded or roughly handled

*Proceedings of the Madras Government, Public Works Department,
7th May 1873.*

No. 73. Read the following endorsement of the Consulting Engineer for Railways, dated Madras, 5th April 1873, No. 206:—

Note on the Great Southern of India Railway Extension between Trichinopoly, Palamcottah and Tuticorin, inspected in the months of February and March 1873.

I HAVE the honour to submit the following report upon the progress of the works under construction along the extension of the Great Southern of India Railway from Trichinopoly to Palamcottah and Tuticorin, which I had the pleasure and advantage of inspecting during this and last month with Mr. Logan, the Chief Engineer of the Great Southern of India Railway Company.

DISTRICT I.—LENGTH 15 MILES 57 CHAINS.

2. The first two miles of line in this district have not yet been touched in consequence of the arrangements for junction with the open line at Trichinopoly being still under the consideration of Government. It is to be hoped that the question will be settled at an early date.

If it is not, delay and extra cost will probably be incurred in passing permanent-way materials, girders, etc., down the line from Trichinopoly.

The construction of the station buildings, etc., at Trichinopoly is also necessarily delayed.

3. *Earthwork*.—The earthwork of seven miles, viz., the 3rd, 4th, 5th, 6th, 7th, 8th, and 10th has been completed. In the remaining miles it is well advanced.

4. About 166,000 cubic yards, or rather more than two-fifths of the total estimated amount of earthwork, had been completed.

5. When describing the earthwork of certain miles along the line as *completed*, I wish it to be understood that the banks have been thrown up to their full height and width, and the cuttings excavated to their full width and depth, but in many of these miles the trimming of slopes, the throwing up of banks for aloe fencing, turfing, and other work properly called earthwork, has not yet been carried out, or is only in various stages of progress.

6. *Masonry*.—There are only two masonry works of considerable size to be constructed in this district, viz., a girder bridge of five 30 feet spans over the Coryaur river near Trichinopoly, and one of four 20 feet girder openings at the 4th mile 20th chain. Excavations for the foundations of the latter work were commenced a few days ago.

7. When I last inspected the Coryaur bridge in July 1872, the foundations of the north abutment had just been put in, and excavations for the pier next it were in progress.

Since then the north abutment and Piers Nos. I. and II. next it have been completed.

The stream has been diverted through the two north openings and sheet piling put in on one side of the excavation for Pier No. III.

8. The slow progress on this work is more apparent than real. The Engineers have had considerable difficulty to contend with in getting the foundations down, the excavations constantly filling in with fine sand and water, necessitating a large amount of baling and excavating.

The monsoon and the heavy and unexpected rains in the beginning of last

8
11

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7th May 1873.*

month of course put a complete stop to all work on this bridge as well as on most others along the line.

9. When describing the present condition of some of the masonry works as "completed," I wish it to be understood that in the case of culverts and arched bridges, the culverts are covered in, and the arches of the bridges have been turned; that they are in fact so far completed as to admit of an engine and train passing over them.

Similarly with girder bridges, I have described as completed all in which the piers and abutments have been raised to girder bed level, and which, supposing girders and rails to be laid down, would admit of a train passing over. Parapets, copings, etc., will have to be constructed afterwards, but their absence is no bar to material trains being passed over the bridges.

10. A large amount of stone has been carted to, and chunam is being prepared at, the sites of many bridges along the line, but in this report I have not mentioned any masonry work as commenced in which the actual work of construction had not been started, viz., the excavating for and laying down of the foundations.

11. The number of cubic yards of masonry and earthwork completed has been given up to the end of February 1873.

DISTRICT II.—LENGTH 15 MILES 21 CHAINS.

12. *Earthwork.*—In this district the earthwork of seven miles has been completed, viz., the 9th, 10th, 11th, 12th, 13th, 14th, and 15th.

In four other miles, viz., the 3rd, 4th, 6th, and 8th, it is well advanced, and in the remaining miles it has been commenced. About 139,000 cubic yards, or rather more than half the total estimated amount of earthwork, had been completed.

13. *Masonry.*—The only bridges of any importance in this district are one of three and another of four 20 feet girder openings. Neither of which had been commenced. Nineteen smaller works were, however, under construction.

About 660 cubic yards, or a little more than one-fourth the total estimated amount of masonry, had been executed.

DISTRICT III.—LENGTH 15 MILES 59 CHAINS.

14. *Earthwork.*—The earthwork of two miles has been completed, viz., the 5th and 6th. In ten other miles the work is well advanced, viz., the 1st, 2nd, 3rd, 7th, 10th, 11th, 12th, 13th, 14th and 15th. In the remaining miles work has been commenced. About 95,000 cubic yards, or about one-third of the total estimated amount, had been completed.

15. *Masonry.*—The bridges of most importance in this district are one of four 20 feet spans, one of five do. do., and a third of three 30 feet girder spans, none of which had been commenced. Nine bridges of minor importance were in progress. About 340 cubic yards or one-twelfth of the masonry of the district was completed.

DISTRICT IV.—LENGTH 15 MILES 13 CHAINS.

16. *Earthwork.*—A very large amount of earthwork has been carried out in this district, eleven miles being completed, viz., the 1st, 2nd, 4th, 5th, 8th, 10th, 11th, 12th, 13th, 14th, and 15th, and all the others well advanced. About 274,000 cubic yards, or seven-tenths of the total estimated amount, had been completed.

*Proceedings of the Madras Government, Public Works Department,
7th May 1873.*

17. *Masonry.*—The most important bridges are one of two 30 feet and another of six 30 feet girder openings, the latter work is to be a skew bridge, and is situated at the 8th mile and 40th chain of the district. It has just been commenced.

18. A number of pointed rails have been driven in to retain the sheeting which is to be put in round the excavations for the foundations. Some of the rails stop after being driven in only 9 feet, whilst others again close by do not stop until they have been driven down 17 feet. The depths to which the rails go down being so unequal, a bottom of boulders would appear to be indicated.

19. Twenty-two bridges of minor importance have been commenced; of these eleven have been completed, so in masonry as well as earthwork the progress in this district may be regarded as very satisfactory. 1,544 cubic yards of masonry, or rather more than one-third the total estimated amount, had been completed.

DISTRICT V.—LENGTH 15 MILES 22 CHAINS.

20. *Earthwork.*—Twelve miles of earthwork have been completed, viz., the 1st, 3rd, 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th, 13th, and 14th. The remaining miles were progressing very fairly. About 139,000 cubic yards, or more than two-fifths of the total estimated amount, had been completed.

21. *Masonry.*—The largest bridges to be constructed are one of three 20 feet arch spans, and another of two 20 feet girder openings. Neither of which had been commenced. Eleven bridges of minor importance were in progress. About 800 cubic yards, or one-fifth of the masonry of the district, was finished.

DISTRICT VI.—LENGTH 15 MILES.

22. *Earthwork.*—The earthwork of twelve miles has been completed, viz., in the 3rd, 5th, 6th, 7th, 8th, 9th, 10th, 11th, 12th, 13th, 14th, and 15th. The remaining miles are well advanced. About 155,000 cubic yards have been completed, or rather more than seven-tenths of the estimated total amount.

23. *Masonry.*—The bridges in this district are all small, a double girder opening of 15 feet span, and a single girder opening of 20 feet span, being the largest.

Fourteen of the smaller bridges have been commenced and about 350 cubic yards, or one-seventh of the total estimated amount of masonry, had been executed.

DISTRICT VII.—LENGTH 12 MILES.

24. *Earthwork.*—Six miles of the earthwork are completed, viz., the 1st, 3rd, 4th, 7th, 8th, and 9th, and the remaining six miles are well advanced.

25. *Masonry.*—The most important bridge to be constructed in the district, or on the whole line, is that over the river Vigay at Madura. It is to consist of fifteen 70 feet girder openings. All the other bridges of the 7th district are small, the next in importance to that over the Vigay being one of two 20 feet girder openings.

26. The excavations for the foundations of the Vigay bridge had just been commenced when I passed through Madura on the 20th of last month.

Piles were being driven in to support the sheeting round the excavations for Pier No. XIV., viz., the pier next to the south abutment. I have since learnt that a firm bed of kunker and gravel has been arrived at for the foundations of the above mentioned pier, 15 feet below the surface at the point of excavation or 11 feet below the bed of the river at its lowest point.

27. Little or no water was met with; one picottah sufficing to keep the excavation dry. The first course of masonry was commenced on the 12th of this month.

28. The stone for the Vigay bridge comes from the Skandamallay quarries, about five miles south of Madura. It is of excellent quality and is being worked up in fine large blocks, each course is dressed and arranged on the ground before being built in. Twenty-eight smaller bridges and culverts have been undertaken, and of these twenty-five have been completed.

DISTRICT VIII.—LENGTH 14 MILES 77 CHAINS.

29. *Earthwork*.—The earthwork of the 3rd, 7th, 8th, 9th, 12th, 13th, 14th, and 15th miles has been completed, and the remaining miles well advanced; in the 7th and 8th districts, an aggregate amount of about 154,000 cubic yards of earthwork has been completed, or about three-tenths of the total estimated amount.

30. *Masonry*.—The largest masonry works in the 8th district are a girder bridge of seven and another of six 30 feet openings.

The former is to be constructed over the Goondaur river, which is broad and shallow at the point of crossing. The bridge has been laid out on a $1\frac{1}{2}$ mile curve.

The excavations for the north abutment were being dug at the time of my visit.

The soil promises a good bed for foundations at a moderate depth, being a mixture of kunker, morum, and rock. A good deal of stone has been collected and dressed at the site of this bridge.

31. The bridge of six 30 feet girder openings above referred to is to be constructed over the Sheverycotta river, which is a tributary of the Goondaur.

Excavations for the abutments at each side of the river were in progress, and a large amount of stone had been collected at the site.

32. Besides these two bridges, nine others of minor importance were in progress. An aggregate of about 1,200 cubic yards of masonry had been completed in the 7th and 8th districts, or about one-fifth of the total estimated amount for the two.

DISTRICT IX.—LENGTH 14 MILES 69 CHAINS.

33. *Earthwork*.—The earthwork of the 1st, 2nd, and 7th miles is completed. In the 3rd, 9th, 11th, 13th, and 14th miles it is in progress, and the remaining miles had not been commenced. About 72,000 cubic yards, or three-tenths of the total estimated amount of earthwork had been completed.

34. *Masonry*.—There are few large bridges in this district, one of nine 30 feet and another of three 20 feet girder openings, being the two of most importance. The larger of the two is to be constructed about a mile to the south of Virdupatty over a tributary of the Vypar river. About 40 cubic feet of masonry had been completed, or about one-eightieth of the total estimated amount.

DISTRICT X.—LENGTH 14 MILES 67 CHAINS.

35. *Earthwork*.—Earthwork has been commenced in the 1st, 3rd, 5th, 7th, 8th, 9th, and 13th miles. About 28,000 cubic yards, or rather more than one-tenth of the total estimated amount had been completed.

36. *Masonry*.—This is about the most important district on the whole line as regards bridge-work. The river Vypar will be crossed at Satoor on a bridge of twelve 70 feet girder openings.

The Gunnecherry river, one of the chief tributaries of the Vypar, on a bridge of five 70 feet girder openings, and two other minor tributaries of the Vypar on bridges of five 50 feet and one 70 feet girder openings.

37. Beyond the collection and preparation of material for the large bridges little had been done. One or two small works were in progress, but only about 30 cubic yards of masonry had been executed, or about one two-hundredeths of the total estimated amount.

DISTRICT XI.—LENGTH 16 MILES 29 CHAINS.

38. *Earthwork*.—In this district the 11th, 12th, 13th, and 14th miles have been completed and the 10th and 17th commenced.

About 62,000 cubic yards or one-fourth of the total estimated amount of earthwork has been completed.

39. *Masonry*.—One bridge of three and another of one 30 feet girder openings are the largest to be constructed in this district. About 200 cubic yards of masonry or one-tenth of the total estimated amount has been completed.

DISTRICT XII.—LENGTH 17 MILES 60 CHAINS.

40. *Earthwork*.—About seventeen miles of the earthwork in this district may be considered as completed. 136,000 cubic yards of earthwork, or more than nine-tenths of the total estimated amount, had been completed.

41. *Masonry*.—The amount of masonry in this district is small, but it has progressed well. 800 cubic yards or about half of the total estimated amount was completed.

Bridges of three 20 feet girder openings are the largest works to be constructed in District XII.

DISTRICT XIII.—LENGTH 16 MILES 30 CHAINS.

42. *Earthwork*.—The earthwork of fourteen miles has been completed. The 8th and 9th were still in progress at the time of my visit. About 167,000 cubic yards, or four-fifths of the total estimated amount, had been completed.

43. *Masonry*.—The masonry works in this district are small, with the exception of a bridge of four and another of three 50 feet openings.

Eight of the minor works were in progress. About 330 cubic yards of masonry had been executed, or one-eighth of the total estimated amount.

44. The line in this district passes for several miles before entering Tuticorin over a fine, light, sandy soil, which drifts greatly in the strong winds, which at certain seasons of the year prevail in the Tinnevely District.

45. A considerable amount of the railway embankment close to Tuticorin has been almost blown away. This will have to be made up again. The Chief Engineer informs me that when it is being done, a coating of earth will be put over the renewed bank of sand, and plants with binding roots, such as are usually seen in sandy districts, encouraged as much as possible to grow on the slopes.

46. *Masonry*.—I observed that very indifferent stone had been collected at the sites of several bridges in this district.

None of the stones being much larger than a man's head, many of them much smaller, of all shapes but those best adapted to building purposes, and all of bad quality.

47. I was informed that this stone had been passed and paid for by the Engineer in charge of the district at the time of its collection. There is difficulty in getting good stone within easy reach of the line in the 13th District, and contractors were not readily found to supply it.

The Chief Engineer being aware of this difficulty had requested the District Engineer to encourage contractors as much as possible to undertake the supply of stone, but when the quality of the stone supplied was found to be so utterly bad, the District Engineer should neither have passed nor paid for it. The Chief Engineer informs me that it will not be used except for concrete or for protecting portions of embankments near waterways.

48. The difficulty in procuring good stone in this district will make the masonry dear; it is fortunate, therefore, that the amount of masonry to be executed is less than in most of the other districts.

49. It is important that the bridge work should be pushed on as permanent-way material will probably be landed at Tuticorin and platelaying commenced by the middle of this year.

50. With the exception of the stone above referred to, I did not notice indifferent building material collected anywhere along the whole length of the line, viz., 215 miles.

DISTRICT XIV.—LENGTH 15 MILES 57 CHAINS.

51. *Earthwork.*—In this district, which terminates the branch to Tinnevely, there are nine miles of earthwork completed, viz., the 1st, 8th, 9th, 10th, 11th, 12th, 13th, 14th, and 15th; the 3rd, 4th, 5th, and 7th are in progress. The other miles had not been commenced. About 160,000 cubic yards, or rather more than three-fifths of the total estimated amount, had been completed.

52. *Masonry.*—With the exception of the bridge over the Chittaur of ten 70 feet girder openings and another over one of its tributaries of three 30 feet girders openings, the bridges in this district are small. As there are many culverts and 6 feet girder openings however to be constructed the number of cubic yards of masonry is larger in this than in the other districts with the exception of Nos. X. and VII.

53. Beyond the collection of material for the large bridges there had not been much done. About 140 cubic yards of masonry, or one-fortieth part of the total estimated amount had been completed.

54. Although Districts IX. to XIV. are not so far advanced as Districts I. to VIII., it must be remembered that the Engineers were not in possession of a good deal of the land through the Tinnevely District until the close of last year (1872). The progress, especially in earthwork, in the last six districts may therefore be regarded as very satisfactory.

55. A considerable amount of turfing had been carried out at intervals along the line, and the grass appeared to be thriving well as a rule on the slopes of embankments. The heavy rains which fell in the beginning of February were

very beneficial. Towards the end of February, however, turfing was put a stop to as the soil was becoming too dry and hard to carry out this description of work with advantage.

56. A good deal of vegetable fencing has been planted, and is on the whole thriving well.

57. Telegraphic communication has for some weeks past been established between the Chief Engineer's Office at Trichinopoly and those of the District Engineers all the way down the line as far as Pandaurapoliem, about six miles from Tinnevely and Mootanillaun, about 3½ miles from Tuticorin.

58. It appears a pity that since the line of telegraph is so far finished, and could so easily be pushed on to Tuticorin and Tinnevely, it is not thrown open to the public. It would in all probability pay at least its own expenses.

59. To the south of Tiroomungalum there are a good many heavy banks of black cotton soil, which it is to be feared will have the same insatiable capacity for swallowing up ballast as portions of the North-West Line of the Madras Railway have. Nothing can be done but to feed such places with ballast so long as they remain unsatisfied. Fortunately there is a plentiful supply of very fair ballast to be had at short distances apart all along the line.

Even under the black cotton soil it can be obtained generally at a depth of from 3 to 5 feet.

60. In some places, where the line is almost on the surface, it is a question whether it would not be better and cheaper in the end to run it in cutting through the black cotton soil so as to get down near the hard substratum instead of feeding the roadway with ballast until it has been satisfied.

61. When at Palamcottah I had the pleasure of meeting the Collector of Tinnevely, who told me that he felt sure the manufacture and sale of salt at Tuticorin would be largely increased on the opening of the line, and that arrangements were being made to meet the increased demand for salt which would be certain to spring up. It appears probable that a wide extent of the Madura as well as the Tinnevely District will be served with salt from Tuticorin.

62. There is a considerable traffic in piece goods between Tuticorin and Madura. I observed many bandy loads going northward between Covilputty and Madura. The bandy traffic generally on the road between Tinnevely and Madura appeared to me to be heavier than on any road I know in Southern India.

63. Less ground has been taken up for the station yard at Tuticorin than appears to be sufficient. The Chief Engineer, therefore, proposes taking up additional ground on the north-west and on the south of the portion already taken over.

The additional ground on the south will be required for a siding to the salt depôt, and that on the north for increased station yard accommodation.

64. The masonry on the line throughout is all that could be desired. Every care appears to be taken to bond the work thoroughly and to use only large, flat-bedded stones. No expenditure is permitted on useless finish or ornamentation, but the work is perfectly neat, and looks what it is, sound and strong.

65. Up to the end of February 1872 about 7,733 cubic yards of masonry had been completed, or rather more than one-seventh of the total estimated amount for the whole line. None of the station buildings had been commenced.

*Proceedings of the Madras Government, Public Works Department,
7th May 1873.*

In earthwork 1,744,221 cubic yards had been finished, or about half of the total estimated amount for the whole line.

MADRAS, (Signed) ROSS THOMPSON, Captain R. E.,
31st March 1873. *Officiating Deputy Consulting Engineer for Railways.*

SUBMITTED for the information of Government.

(Signed) J. H. M. SHAW-STEWART, Lieut.-Colonel, R.E.,
Consulting Engineer for Railways.

No. 74. ORDER THEREON, 7th May 1873, No. 1,276.

RAILWAY, No. 14.

ORDERED that paragraphs 2, 57 and 58 of the Acting Deputy Consulting Engineer's report be extracted for the

information of the Government of India with reference to previous correspondence.

2. Adverting to paragraph 2 it is observed that the question of the junction arrangements at Trichinopoly was remitted for the consideration of the Chief Engineer of the Company in G. O., No. 244, dated 24th January 1873, and that his proposals are now awaited.

(Here enter No. 1,277, dated 7th May 1873.)

(True Extract.)

Colonel, R.E.,
Secretary to Government.

To the Consulting Engineer for Railways.

Exd. S. T. Austin.

Extract from a report by the Acting Deputy Consulting Engineer for Railways, dated 31st March 1873.

PARAGRAPH 2.—The first two miles of line in this district have not yet been touched in consequence of the arrangements for junction with the open line at Trichinopoly being still under the consideration of Government. It is to be hoped that the question will be settled at an early date.

If it is not, delay and extra cost will probably be incurred in passing permanent-way materials, girders, etc., down the line from Trichinopoly.

The construction of the station buildings, etc., at Trichinopoly is also necessarily delayed.

PARAGRAPH 57.—Telegraphic communication has for some weeks past been established between the Chief Engineer's Office at Trichinopoly and those of the District Engineers all the way down the line as far as Pandaurapoliem, about six miles from Tinnevely and Mootanillaun, about 3½ miles from Tuticorin.

PARAGRAPH 58.—It appears a pity that since the line of telegraph is so far finished, and could so easily be pushed on to Tuticorin and Tinnevely, it is not thrown open to the public. It would in all probability pay at least its own expenses.

PUBLIC WORKS DEPARTMENT,
FORT ST. GEORGE, 7th May 1873.

No. 75.

No. 1,277.

FROM

COLONEL G. W. WALKER, R. E.,
Secretary to the Government of Madras,
Public Works Department.

TO

THE SECRETARY TO THE GOVERNMENT OF INDIA,
Public Works Department.

RAILWAY, No. 15.

SIR,—I am directed to forward, for the information of the Government of India, the accompanying extracts from a report by the Acting Deputy Consulting Engineer for Railways submitted after personal inspection, during February and March, of the works in progress on the Southern Extension of the Great Southern of India Railway between Trichinopoly, Palamcottah, and Tuticorin, and, with reference to paragraphs 57 and 58, to request an early decision on the question of the temporary line of telegraph being used by the public for the transmission of messages, sanction to which was solicited in my letter No. 349, dated 3rd February 1873.

2. The question of the junction arrangements at Trichinopoly has, I am to add, been remitted for the consideration of the Chief Engineer of the Company, with reference to the remarks of the Government of India, communicated in letter No. 1,809 G. R., dated 22nd November 1872.

I have the honour to be,

Sir,

Your most obedient servant,

Colonel, R.E.,

Secretary to Government.

Exd. S. T. Austin.

Note on the G.S.L.R. Extension
between Trichinopoly, Palamcottah
and Tuticorin — Inspected
in the months of February and
March 1873

(1) Have the honor to
submit the following
report upon the
progress of the works
under construction
along the extension of
the G.S.L.R. Railway
from Trichinopoly to
Palamcottah and
Tuticorin. Which I had
the pleasure and
advantage of inspecting
during this and last
month with Mr. Logan
the Chief Engineer of
the G.S.L.R. Company

District-I (2) The first two miles of
Length 15 miles 57 chains — the line in this district
have not yet been
touched, in consequence
of the arrangements for
junction with the Malabar
line at Trichinopoly
being still under the
consideration of Govt.

It is to be hoped that
the question will be
settled at an early date.

If it is not delayed
and extra cost will
probably be incurred
in passing permanent-
way materials, girders
&c. down the line
from Frickinopolis.

The construction of
the station buildings
&c. at Frickinopolis is
also necessarily delayed.

The earth work of seven (3) earth work.
miles, viz the 3rd, 4th, 5th, 6th,
7th, 8th and 10th has been
completed. In the
remaining miles it
is well advanced.

About 166,000 Cubic (4)
yards, or rather more
than $\frac{2}{5}$ th of the
total estimated amount
of earth work has
been completed.

When describing (5)
the earth work of certain
miles along the line
as Completed I wish
it to be understood
that the banks have

been thrown up to their
full height and width
and the cuttings 4-
excavated to their full
width and depth.
But in many of these
miles, the trimming of
slopes, the throwing
up of banks for abut-
fencing, trestling, and
other work properly
called earth work, has
not yet been carried
out, or is only in various
stages of progress.

Masonry (6)

There are only two
masonry works of im-
portable size yet
constructed in this
district. viz. a
girder bridge of 5
thirty feet spans over
the Conaway River near
Frickinopolis, and one
of 4 twenty feet spans
girder openings at
the 4th mile. 20th Chain
Excavations for the foun-
dation of the latter
work were commenced
a few days ago -

(7) When last-

Inspected the Corydon
Bridge in July 1872. The
foundations of the North
Abutment had just
been put in, and
excavations for the pier
Sept. 1. - were in progress.
Since then, the North
Abutment and piers
Nos I and II Sept.
1. - have been completed.

The stream has been
diverted through the
two North openings,
and sheet-piling put
in on one side of the
excavation for pier
No III.

(8)
The slow progress on
this work is more
apparent than real.
The Engineers have had
considerable difficulty
to contend with, in
settling the foundations
down, the excavations
constantly filling up
with fine sand and
water, necessitating
a large amount of
balancing and excavating.

The masonry and
the heavy and unexpected
raids at the beginning

of East Smith, of course,
put a complete stop
to all work on this bridge
as tall as on most others
along the line.

(9)
When describing
the present condition of
some of the masonry work
as "Completed", I
wish it to be understood
that in the case of
Culverts and Arch
bridges, the Culverts are
covered in, and the
Arches of the bridges
have been turned,
that they are in fact
so far completed as
to admit of an engine
and train passing
over them.

Similarly with
Girder bridges, I have
described as Completed,
all in which the piers
and abutments have
been raised to girder
bed level, and which,
supposing girders and
rails to be laid down,
would admit of a
train passing over.
Parapets, Copings
&c will have to be

District-III

Length-15 miles 69 Chains

(13) Earthwork.

The Earthwork of ten miles has been completed viz the 5th and 6th.

In ten other miles the work is well advanced viz the 1st 2. 3. 4. 10. 11 12. 13. 14 and 15th.

In the remaining miles work has been commenced.

About-95,000 Cubic Yards or about $\frac{1}{3}$ of the total estimated amount had been completed.

(14) Masonry.

The bridges of most importance in this District are one of 4. Twenty feet-spans one of 5. do. do and a third of 3.

Thirty feet-girder spans some of which had been commenced.

Five bridges of minor importance are in progress. About-

340 Cubic Yards

District-IV

Length-15 miles 13 Chs

(15) Earthwork.

A very large amount of Earthwork has been carried out in this District. Eleven miles being completed viz the 1st 2. 4. 5. 8. 10. 11 12. 13. 14 and 15th and all the others well advanced.

About-274,000 Cubic Yards or $\frac{7}{10}$ of the total estimated amount had been completed.

(16) Masonry

The most important bridges are one of 2. Thirty feet and another of 6. Thirty feet-spans girder openings. The latter work is also a skew bridge and is situated at the

or $\frac{1}{2}$ of the masonry of the District was completed.

8th mile and 40th Chain
of the District. It has
just been commenced

A number of pointed (17)
rails have been driven
in to retain the sheeting
which is to be put
in round the excavations
for the foundations

Some of the rails stop
after being driven in
only some feet, whilst
others again, close by,
do not stop until
they have been driven
down seven feet.

The depth to which
the rails go down, being
so unequal, a
bottom of boulders
would appear to be
indicated.

Twenty two bridges (18)
of minor importance
have been commenced,
of these, eleven have
been completed, so
in masonry as well
as earth-work the
progress in this District
may be regarded as

Very satisfactory -
15,444 Cubic Yards of
Masonry, or rather more
than $\frac{1}{3}$ rd the total
estimated amount -
has been completed.

District V
Length 15 miles 22 Chs.

Earth-work. (19) Twelve miles of earth-
work have been com-
pleted. In the 1st - 3
4. 5. 6. 7. 8. 9. 10. 11
13 and 14th the
remaining miles are
progressing very fairly,
about 139,000 Cubic
Yards or more than
 $\frac{2}{5}$ th of the total
estimated amount -
has been completed.

Masonry (20) The largest bridges to be
constructed are one
of 3. twenty feet Arch
spans and another
of 2. twenty feet
grid openings.
Neither of which had
yet been commenced.

Eleven bridges of some importance have been in progress — About 800 Cubic Yards or $\frac{1}{5}$ of the masonry of the District was finished

District VI
Length. 15 Miles

(21) Earthwork
The Earthwork of twelve miles has been completed, viz viz the 3rd. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. and 15th.

The remaining miles are well advanced — About 155,000 Cubic Yards have been completed or rather more than $\frac{7}{10}$ of the estimated total amount.

(22) Masonry
The bridges in this District are all small, a double girder opening of 15 feet span, and a single girder opening

of 20 feet span, being the largest. — Fourteen of the smaller bridges have been commenced and about 350 Cubic Yards or $\frac{1}{4}$ of the total estimated amount of masonry had been executed.

District VII
Length. 12 Miles.

(23) Earthwork. Six miles of the Earthwork are completed viz the 1st. 3. 4. 7. 8 and 9th and the remaining six miles are well advanced.

(24) Masonry The most important bridge here constructed within the District or on the whole line, is that over the River Tigay at Madura. It is to consist of 15 seventy feet girder openings, all the other bridges of the VIIth District are small

The next in importance
to that over the Vijay
being one of 2. twenty
feet - girder openings

The Excavations for (25)
the foundations of the
Vijay bridge had
just been commenced
when I passed through
Madura on the 20th
of last month.

Piles were being
driven in to support
the Shulung round the
excavations for piers.
No. XIV. viz. the pier
next to the South
abutment - I have
since learnt that
a firm bed of kunka
& gravel has been
arrived at for the
foundations of the
above mentioned pier,
15 feet below the surface
at the point of excavation
or 11 feet below the
bed of the river at its
lowest point.

Little or no water (26)
was met with, one
picotah sufficing to

keep the excavation dry.
The first course of
masonry was commenced
on the 12th of this month.

(27) The stone for the
Vijay bridge comes from
the B. S. Sandamulay
Quarries about 5 miles
South of Madura.
This of excellent quality
and is being worked
up in fine large blocks.
Each course is dressed
and arranged on the
ground before being
built in. Twenty
eight smaller bridges
and culverts have
been undertaken and
of these twenty five have
been completed.

District - VIII
Length 14 miles 77 chains

(28) Earthwork The earthwork of the
3rd, 7, 8, 9, 12, 13, 14
and 15 miles has been
completed, and the
remaining miles
well advanced. In

In the VIIth and VIIIth Districts. An aggregate amount of about 154,000 Cubic Yards of Earth-work has been completed or about 3/10th of the total Estimated Amount.

(29) The largest masonry works in the VIIth District are a Jordan bridge of 7 and another of 6 thirty feet openings.

The former is to be constructed over the Goudaur River, which is broad and shallow at the point of crossing. The bridge has been laid out on a 1 1/2 mile curve.

The excavations for the masonry abutments were being dug at the time of my visit.

The soil promises a good bed for foundations at a moderate depth being a mixture of sand, morum and rock. A good deal

of stone has been collected and dressed at the site of the bridge.

(30) The bridge of 6 thirty feet openings above referred to is to be constructed over the Sherry Colla River which is a tributary of the Goudaur. Excavations for the abutments at each side of the river are in progress, and a large amount of stone had been collected at the site.

(31) Besides these two bridges, some others of minor importance were in progress. An aggregate of about 1200 Cubic Yards of masonry had been completed in the VIIth and VIIIth districts or about 1/5th of the total Estimated Amount for the two.

District IX

Length - 14 miles 69 chs.

Completed or, about - $\frac{1}{80}$
of the total estimated
amount. —————

The Earthwork of Dist (32)

1st. 2 and 7th miles Earthwork
is completed. In the

3rd. 9. 11. 13 and 14th
miles it is in progress
and the remaining
miles had not yet
been commenced.

About 72,000 Cubic
Yards or $\frac{3}{10}$ of the
total estimated amount
of Earthwork had
been completed.

There are few large (33) Masonry
bridges in this District.

One of nine twenty feet
and another of 3 twenty
feet girder openings
being the two of most
importance. The

larger of the two is the
constructed about a
mile to the South of
Tordupally on a
tributary of the Tygar
River. About 40 Cubic
feet of masonry had been

2 yards

District X

Length - 14 miles 67 chs.

(34) Earthwork

Earthwork has been
commenced for the 1st.
3. 5. 7. 8. 9 and 13 miles.
About 28,000 Cubic
Yards or rather more
than $\frac{1}{10}$ of the total
estimated amount
had been completed.

V

(35) Masonry

This is the most important
District on the whole
line as regards bridge
work. The River
Tygar will be crossed
at Saton on a bridge
of 12. Seventy feet
girder openings.

The Sumcherry
River, one of the chief
tributaries of the Tygar
on a bridge of 5. Seventy
feet girder openings
and also other minor
tributaries of the Tygar
on bridges of 5. fifty
feet girder openings.

and 1. Seventy feet
Girder Openings.

Beyond the Collection (36)
and preparation of
material for the large
bridges, little had been
done. One or two
small works were in
progress but only
about 30 Cubic feet
yards of masonry had
been executed or
about $\frac{1}{200}$ th of the
total estimated amount.

District XI
Length 16 miles 29 chains

(37) Earthwork

In this district the total
11 and 14 miles have
been completed and
the 13 and 12 miles
commenced.

About 62,000
Cubic yards or $\frac{1}{4}$ th
of the total estimated
amount of earthwork
has been completed.

(38) Masonry

One bridge of 3 and
another of 1 thirty
feet girder openings
are the largest. One

District XII
Length 14 miles 60 chains
Earthwork

Constructed in this
district. About
200 Cubic yards of
masonry or $\frac{1}{10}$ th
of the total estimated
amount has been
completed.

(39) About Seventeen miles
of the earthwork in
this district may
be considered as
completed: 136,000
Cubic yards of masonry
or more than $\frac{9}{10}$ th
of the total estimated
amount has been
completed.

Masonry (40) The amount of masonry
in this district is
small, but it has
progressed well.
800 Cubic yards
or about $\frac{1}{2}$ of the
total estimated amount
was completed.

Bridges of 3. twenty
feet girder openings
are the largest works
now commenced in
district XII.

(41) District - XIII
The Earthwork of 14th Length - 16 miles. 30 chains.
Miles has been completed

The 8th and 9th were Earthwork
still in progress at the
time of my visit.

About 167,000 Cubic
Yards or $4\frac{1}{3}$ - $\frac{1}{2}$ of
the total estimated
Amount - has been
completed.

(42) Masonry
The Masonry works
in this district are
small, with the exception
of a bridge of 4 arches
and one of 3 fifty
feet openings.
Eight of the minor
works were in progress
About 330 Cubic Yards
of masonry had been
executed, or $1\frac{1}{8}$ of
the total estimated
Amount.

The line in this district (43)
passes for several miles
before entering Tulecine

over a fine, light, sandy
soil, which drifts
greatly in the strong winds
which at certain seasons
of the year prevail in
the Lemmelly district

(44) A considerable
amount of the railway
embankment close to
Tulecine has been
almost blown away.
This will have to be
made up again.
The Chief Engineer informs
me that when it is
being done, a coating
of earth will be put over
the renewed bank
of sand, and plants
with binding roots,
such as are usually
seen in sandy districts,
encouraged as much
as possible to grow on
the slopes.

Masonry (45)
I observed that very
indifferent stone had
been collected at the
sites of several bridges
in this district.

None of the stones
being much larger than
a man's head, many
of them much smaller
of all shapes but

More best-adapted to
building purposes
and all of best quality

Was informed that (46)
this stone had been
passed and paid
for by the Engineer
in Charge of the District
at the time of its
collection. There is
difficulty in getting
good stone, within easy
reach of the line, in
the XIII District.
And Contractors were
not readily found to
supply it.

The Chief Engineer being
aware of this difficulty
had requested the
District Engineer to
encourage Contractors
as much as possible
to undertake the supply
of stone, but when the
quality of the stone
supplied was found
to be so utterly bad
the District Engineer
should rather have
passed nor paid
for it. The Chief

13
Engineer informs me
that it will not be
used except for concrete
or for protecting portions
of Embankments near
waterways.

(47) The difficulty in procuring
good stone in this
District will make
the masonry dear. It
is fortunate therefore
that the kind of
masonry to be executed
is less than a part
of the XIII District.

(48) It is important that
the bridge work should
be putted on as
permanent local material
will probably be landed
at Tuticorin and
stone laying commenced
by the middle of this year.

(49) With the exception
of the stone above referred
to, it did not produce
satisfactory building
material collected
anywhere along the
whole length of the line
viz 215 miles.

District IX
Length 15 miles. 57 chains

(50)

In this district, which is rather work.

terminalis the Grande

to Limerick, there are

some miles of earthwork

completed. viz the

1st 8 9 10 11 12 13 14

and 15th miles of the

3rd 4 5 6 7 8 9 10 11 12 13 14

are in progress. The

other miles have not

yet commenced.

About 160,000

Cubic Yards of earth

more than 3/5th of

the total estimated

amount had been

completed.

(51)

With the exception of masonry

of the bridge over the

Chitaur of 10. Seventy

feet and opening

and another over one

of its tributaries of

3. Thirty feet and

openings, the bridges

in this district are

small, as there

are many Culverts

and 6 feet for an opening
former one constructed
the number of Cubic
Yards of masonry is
larger in this than
in the other districts
with the exception
of Nos I and II

(52) Beyond the collection
of material for the
large bridge there had
not been much done
about 140 Cubic
Yards of masonry
or 140th part of
the total estimated
amount had been
completed.

(53) Although districts
IX to XII are not
so far advanced as
districts I to VIII it
must be remembered
that the Engineers were
not in possession of
a good deal of the land
through the Limerick
district until the close
of last year (1872).

The progress, especially
in earth work in the
last six districts
may therefore be
regarded as very

Satisfactory

(54)

A considerable amount of turpentine had been carried out at intervals along the line, and the grass appeared to be thriving well as a rule on the slopes of embankments.

The heavy rains which fell in the beginning of February were very beneficial.

Inwards the end of February however turpentine was sent a stop as the soil was becoming too dry and hard to carry out. This description of work with advantage.

(55)

A good deal of vegetable fencing has been planted and is on the whole thriving well.

(56)

Telegraphic communication has for some weeks past been established

between the Chief Engineer's office at Fitchburg and those of the District Engineers all the way down the line, as far as Pandaurahine about 6 miles from Jimerelly and Mootanillaun about $3\frac{1}{2}$ miles from Anticoria.

(57)

It appears a pity that since the line of telegraph is so far finished, and could so easily be pushed on to Anticoria and Jimerelly, it is not thrown open to the public. It would in all probability pay at least its own expenses.

(58)

To the South of Mootanillaun there are a good many heavy banks of black cotton soil, which it is to be feared will have the same insatiable capacity for swallowing up ballast as portions of the North-West line of the Madras Railway have - nothing can be done, but to

5 full such plans
with ballast so long
as they remain un-
satisfied. Fortunately
9 there is a plentiful
supply of very fair
ballast - which had at
8 short distances apart
all along the line.
a Under the
black Cotton Soil it
can be obtained generally
at a depth of from
3 to 5 feet.
a In some places (59)
where the line is almost
on the surface it is
a question whether it
8 would not be better
and cheaper as the
a and when it is cutting
9 through the black Cotton
8 soil, so as to get down
to the hard substratum
instead of bedding the
roadway with ballast -
until it has been
satisfied.

6 When at Palamettah (60)
I had the pleasure
of meeting the Collector
of Trimmerelly, who told
me that he felt
some the manufacture

And Sale of Salt at 16
Tuticorin would be
largely increased on
the opening of the line
and that arrangements
were being made to
meet the increased
demand for Salt which
would be certain to
spring up. It appears
probable that a wide
extent of the Madras
as well as the Trimmerelly
District will be served
with Salt from Tuticorin.

(61) There is a considerable
traffic in piece goods
between Tuticorin and
Madras, I observed
many bandy loads
going northward between
Coilputty and Madras
the bandy traffic
generally on the
road between Trimmerelly
and Madras appears
to be the heavier
drawn on any road
I met in Southern
India.

(62) Less ground has been
taken up for the Station
yard at Tuticorin
than appears to be
sufficient. The Chief
Engineer there proposes

taking up additional
ground on the North
West and on the South
of the portion already
taken over.

The additional ground
on the South will be
required for a siding
to the Salt-Deposit
and that on the North
for increased station
yard accommodation.

The masonry on (63)
the line throughout
is all that could
be desired. Every
care appears to be
taken to bond the
work thoroughly and
to use only large
flat bedded stones.
No expenditure is
permitted on useless
finish or ornamentation,
but the work is perfectly
neat, and looks what
it is. Sound and
strong.

Up to the end of (64)
February 1872
about 7733 cubic
yards of masonry

* None of the station
buildings had been
commenced

Had been completed
or rather more than
 $\frac{1}{4}$ of the total
estimated amount
for the whole line.
In earthwork 17,44,221
cubic yds had been finished or
about $\frac{1}{2}$ of the total
estimated amount
for the whole line.


Captain P.E.

Offg. Dy. Consulting Engineer for
Railways.

Madras.

March 31st 1873

P. W. 2219/73
No. 1276-1277

3. April. 73.
A.

P. W. 2219/73

No. 10 19
Submitted for the *information* of Government.

Mentmore L. C. C. E.

CONSULTING ENGINEER'S OFFICE,
Madras, 5th April 1873.

Cong. Engr. for Railways,

To

The Secretary to Government,

Public Works Department,

Fort Saint George.

January 10th 1873
that.

Public Works 1873 Report
Mr. J. G. G. G. G. G.
RAILWAY DEPARTMENT.

1873.

2219

From The Consulting Engineer
for Railways,

To The Secretary to Government,
P. W. Department,
Fort St. George.

Dated 5th April 1873.
Received 7th April 1873.
No. 206

In forwarding
Captain Thompson's
report on the G. S. of
I. Ry. extension
between Trichinopoly
Trichinopoly & ...
Borein.

No 1276-1277-7

16th April 73 No 73

P W Dept
No 1276
Proceedings of the Madras Government
Under date the April 1873
Read the following

From the Comr for Railway / H. G. No 206 of 5th April 1873

Ordered that
paragraphs 2. 56 & 57 of the
Ag. Engr. Consulting
Engineer's report be
extracted for the infor-
mation of the Govt of
India with reference to previous
correspondence.

Adverting to paragraph
2 it is observed that
the question of the
junction arrangements
at Trichinopoly was
submitted for the con-
sideration of the Chief
Engineer of the Company
in G. O. No: 244 dated 24th
January 1873, and
that.

that his proposals are
now awaited.

H.C. No. 1277
d.

To, The C. E. for Rys.

12
Dated 15th May 1878

To, The Secy. to the
Govt. of India.

Sir.
I am directed to forward
for the information of the
Govt. of India the accom-
panying extracts from
a report by the Acting
Dy. Consulting Engineer
for Railways submitted
after personal inspection,
during February and March,
of the works in progress
on the Southern Extension
of the G. S. of I. Railway
between Trichinopoly, Pal-
ametta and Interior;
and, with reference
to paragraphs 36 & 37, to
request an early decision
on

on the question of the
temporary line of telegraph
being used by the
public for the trans-
mission of messages,
sanction to which was
solicited in my letter
No 349 dated 3rd February
1873.

The question of the
Junction arrangements
at Trichinopoly has, I
am to add, been remitted
for the consideration
of the Chief Engineer of
the Company with
reference to the remarks
of the Govt. of India
communicated in
letter No. 1809 G. R. of
22nd Nov. 1872.

G.M.C.

26
Dated 15th May 1873, with
copy of ~~the~~ 12th of 1873

Wagon for the
Hudson, 1825 & 1826.

To J. H. B.

8:73-75

Cp. 2219

Govt. of 1873 Madras

PUBLIC WORKS.

To the Consulting Engs
for Railways
&
To the Secretary to the
Govt of India

Dated

Recd.

Encl.

G. O. 7 May 1873, No. 1276-12

Nos. 73-74 & 75

Southern Extension.

Forward, with re-
marks, extracts from the
report by the Dy. Supt. Engs.
on the Southern Extension
of the G. & S. Railway
between Trichinopoly
Palamcottah and
Tuticorin.

Passing orders on report,
submitted by the Dy. Supt. Engs.,
by the Dy. Supt. Engs. on
the Southern Extension
of the G. & S. Railway
between Trichinopoly,
Palamcottah and Tutic-
corin.