Proceedings of the Madras Government, Public Works Department,
14th December 1874.

No. 266. 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, 27th November 1874, No. 727 :—

In continuation of my letter, No. 664, dated 29th ultimo, I have the honor to enclose a copy of the statement which accompanied the letter from the Government of India, No. 939 R, of the 4th May 1874, with the details filled in for the remainder of the large bridges on the Railways in this Presidency.

Statement of Cost of some of the dimensions of the largest Bridges on Guaranteed and State Railways in India.

Name of Bridge.	No. of Spans.	Length of Bridge.	Depth of foundation below low-water.	Height from low-water level to under-side girders.	Total Cost.	Cost per Lineal Foot.	Remarks.
	1	2	3	4	5	6	
		FEET.	FEET.	FEET.	RS.	RS.	
Gorai Bridge ...	7	1,295	77 to 95	.....	16,95,009	970	Actual cost for a single railway. Each pier consists of two iron cylinders. The approaches cost 3 lakhs. Deducting approaches, the cost per foot is Rupees 1,077.
Approaches to ditto.	13	452	25	.....			
Jumna (Allahabad)	14	3,080	40	.....	40,75,800	1,323	Ten wells in foundation of piers, which are of stone masonry, for a double way, but girders for a single way only yet laid. Common roadway between the girders and Railway on top.
Soane	28	4,730	32	.....	26,10,167	551	Double sub-structure with girders for single way with second girder ; the total cost is Rupees 37,67,473, or Rupees 800 per foot nearly.
Ganges (Cawnpore).	25	2,750	50 to 65	.....	19,40,000	685	Estimated cost. One well of 18 feet and one of 10 feet in pier. Railway over, roadway between the girders.
Land-spans ...	2	80					
Jumna (Agra) ...	16	2,272	70	.....	16,54,203	728	Ditto. Three wells in foundation of piers, which are of stone masonry, and carry girders for a single Railway both broad and narrow between, and a common roadway on top.
Ganges (Rajghat) ...	33	3,040	55	.....	9,63,580	317	Ditto. One well of 16 feet diameter in pier foundation. Railway on the top of the girders.
Jumna (Delhi) ...	12	2,610	7 to 39	.....	16,60,354	629	Actual cost. Ten wells in foundation of piers, which are not dressed with stone masonry. Sub-structure and girders for a single way on top with a common roadway between the girders.
„ (Saharunpoor).	24	2,640	42	.....	...	...	The contract rate was Rupees 428 per foot, but extensive additions have since become necessary, and actual cost is not known—piers are on single wells 12 feet 6 inches diameter.
Sutlej (Loodianah).	58	6,424	40 to 50	.....	...	...	
Beas	29	3,220	43	.....	...	...	
Ravee (Lahore) ...	33	3,217	75	.....	18,52,176	575	Estimated cost without training works for a narrow gauge railway. Three wells in foundation of piers, which are of brick masonry.
Chenab ...	64	9,088	75	.....	41,75,973	459	
Jhelum ...	50	4,875	30	.....	14,78,077	303	
Sutlej (Bhawulpoor)	16	4,224	100	.....	38,85,780	920	
Goomtee (Jounpoor)	16	1,472	45 to 50	.....	9,00,000	611	Estimated cost for broad gauge. Two wells of 16 feet in pier foundation. Railway between the girders.
Ramgunga (Bareilly)	34	2,260	85	.....	10,74,000	475	Ditto. Wells of 16 feet and of 14 feet in pier foundation single cylinders. Railway on top of the girders.

Proceedings of the Madras Government, Public Works Department,
14th December 1874.

Statement of Cost of some of the dimensions of the largest Bridges, etc.—(Concld.)

Name of Bridge.	No. of Spans.	Length of Bridge.	Depth of foundation below low-water.	Height from low-water level to under-side girders.	Total Cost.	Cost per Lineal Foot.	Remarks.
	1	2	3	4	5	6	
		FEET.	FEET.	FEET.	RS.	RS.	
Taptee	30	1,875	Average 14	.....	8,95,260	497	Actual cost for a double-way. Three iron-piles in each pier.
Nerbudda ...	67	4,187	,, 37	.....	46,93,490	1,167	Ditto. ditto. Five ditto, with a cluster of 10 in every 6th pier.
Saburmuttee ...	18	1,125	,, 31	.....	3,89,852	360	Ditto single line.
Kistna	36	3,865	,, 15 69	.....	12,80,001	331	Ditto ditto.
Taptee	33	2,556	,, 17·30	.....	13,64,900	534	Ditto double line.
Cauvery	22	1,536	Shallow on rock.	36	408,752	266	Ditto single line over masonry piers built for a double line.
Toongabudra ...	58	4,060	,, ,,	37	7,55,756	186	
Papugnee ...	20	1,400	Average 15	19½	1,62,253	116	Actual cost. Masonry abutments for double line and screw pile tressle piers for a single line. Permanent way laid for a single line.
Chittravutty ...	40	2,800	12 to 30	20	3,54,705	127	Actual cost. Abutments and ten piers at each end of masonry on wells for double line, remaining nineteen piers on screw pile tressles. Permanent way for single line.
Pennair... ...	24	1,680	11 to 12	21	1,72,525	103	Actual cost. Masonry abutments and piers for double line. Permanent way for single line.
Ambravutty ...	21	1,260	10 to 20	20	2,63,664	209	Two piers on brick wells resting on rock; the rest of stone masonry with rock foundation.
Palar	18	2,376	44	22	3,89,294	164	Estimated cost. Masonry abutments and piers on brick wells 12 feet in diameter filled with concrete. Rails carried on open girders.
Coleroon... ...	18	2,376	25 to 59	25	5,05,000	213	
Pooniar	17	1,908	30	10	2,89,174	152	
Guddelum ...	10	1,152	30	25	1,73,324	150	
Vigay	15	1,197	12	12	1,53,148	128	Estimated cost. Quarry faced ashlar in regular course. Rails carried on plate girders.

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

No. 267. ORDER THEREON, 14th December 1874, No. 3,505.

RAILWAY, No. 42.

ORDERED that these papers be forwarded to the Government of India in continuation of G. O., No. 3,186-A, dated 10th November 1874.

(True Extract.)
(Signed) G. W. WALKER, Colonel, R.E.,
Secretary to Government.

No. 268. (DOCKET No. 3,506, dated 14th December 1874.)

COPY of the above forwarded to the Government of India.

(True Extract.)

Colonel, R.E.,
Secretary to Government.

Exl. E. C. Shunker.
Spare Copies

Statement of Cost of some of the dimensions of the largest Bridges on Guaranteed and State Railways in India.

Name of Bridge.	1 No. of Spans.	2 Length of Bridge.	3 Depth of foundation below low-water.	4 Height from low-water level to underside girders.	5 Total Cost.	6 Cost per Lineal Foot	Remarks.
		Feet.	Feet.	Feet.	RS.	RS.	
Gorai Bridge ...	7	1,295	77 to 95	.....	16,95,009	970	Actual cost for a single railway. Each pier consists of two iron cylinders. The approaches cost 3 lakhs. Deducting approaches the cost per foot is Rupees 1,077.
Approaches to ditto	12	452	25	.....			
Jumna (Allahabad).	14	3,080	40	.....	40,75,800	1,323	Ten wells in foundation of piers, which are of stone masonry, for a double way, but girders for a single way only yet laid. Common roadway between the girders and railway on top.
Soane	28	1,4,730	32	.....	26,10,167	551	Double sub-structure with girders for single way with second girder; the total cost is Rupees 37,67,473, or Rupees 800 per foot nearly.
Ganges (Cawnpore).	25	2,750	50 to 65	.....	19,10,000	695	Estimated cost. One well of 13 feet and one of 11 feet in pier. Railway over, roadway between the girders.
Land-spans ...	2	80					
Jumna (Agra) ...	16	2,272	70	.....	16,51,203	728	Ditto. Three wells in foundation of piers, which are of stone masonry, and carry girders for a single railway* both broad and narrow between, and a common roadway on top.
Ganges (Rajghat)...	33	3,040	55	.....	9,63,580	317	Ditto. One well of 16 feet diameter in pier foundation. Railway on the top of the girders.
Jumna (Delhi) ...	12	2,640	77 to 89	.....	16,60,354	629	Actual cost. Ten wells in foundation of piers, which are not dressed with stone masonry. Sub-structure and girders for a single way on top with a common roadway between the girders.
,, (Saharunpoor).	24	2,640	43	.....	...	...	The contract rate was Rupees 428 per foot, but extensive additions have since become necessary, and actual cost is not known—piers are on single wells 12 feet 6 inches diameter.
Sutlej (Loodianah).	58	6,494	40 to 50	.....	...	...	
Beas ...	29	3,226	43	.....	...	...	
Ravee (Lahore) ...	33	3,217	75	.....	18,52,176	575	Estimated cost without training works for a narrow gauge railway.
Chenab ...	64	9,089	75	.....	41,75,973	459	
Jhelum	50	4,875	30	.....	14,78,077	303	Three wells in foundation of piers, which are of brick masonry.
Sutlej (Bhawulpoor).	16	4,224	100	.....	38,85,780	920	
Goomtee (Jounpoor)	16	1,472	45 to 50	.....	9,00,000	611	Estimated cost for broad gauge. Two wells of 16 feet in pier foundation. Railway between the girders.
Ramgunga(Bareilly)	34	2,260	85	.....	10,74,000	475	Ditto. Wells of 16 feet and of 14 feet in pier foundation single cylinders. Railway on top of the girders.
Taptee ...	30	1,875	Average 14	.....	8,95,260	497	Actual cost for a double-way. Three iron-piles in each pier.
Nerbudda ...	67	4,187	,, 37	.....	46,93,490	1,167	Ditto ditto. Five ditto, with a cluster of 10 in every 6th pier.
Saburmuttee ...	18	1,125	,, 31	.....	3,89,852	360	Ditto single line.
Kistna	36	3,865	,, 15·69	.....	12,80,001	331	Ditto ditto.
Taptee	33	2,556	,, 17·30	.....	13,64,900	534	Ditto double line.
Cauvery	22	1,536	Shallow on rock.	36	4,08,752	266	Ditto single line over masonry piers built for a double line.
Toongabudra ...	58	4,060	,, ,,	37	7,55,756	186	
Papugnee		1,400	Average 15	19½	1,62,253	116	Actual cost. Abutments for double line and screw pile tressels piers for a single line. Permanent way laid for a single line.
Chittravutty	40	2,800	12 to 30	20	3,54,705	127	Actual cost. Abutments and ten piers at each end of masonry on wells for double line; remaining nineteen piers on screw pile tressles. Permanent way for single line.

Continued.

Name of Bridge	1 No. of spans	2 Length of bridge	3 Depth of foundation below low water	4 Height from low water level to underside girders	5 Total Cost	6 Cost per Lineal foot	Remarks.
		Feet	Feet	Feet	Rs.	Rs.	
Pennair	24	1680	4 to 12	21	1,73,525	103	Actual Cost. Masonry abutments and piers for double line. Permanent way for single line.
Ambravelly	21	1260	10 to 20	20	2,63,664	209	Iron piers on brick wells resting on rock: the rest of stone masonry with rock foundation.
Palar	18	2376	44	22	3,89,294	164	Estimated Cost. Masonry abutments and piers on brick wells 12 feet in diameter filled with Concrete. Rails carried on open girders.
Coleroon	18	2376	25 to 59	25	5,05,000	213	
Pennair	17	1908	30	10	2,89,174	152	
Guddelam	10	1152	30	25	1,73,324	150	
Vygay.	15	1197	12	12	1,53,148	128	Estimated Cost. Quarry faced ashlar in regular course. Rails carried on plate girders.

Mauntsworth

Lieut.-Col., R.E.,

Consulting Engineer for Railways

P.W.D. Dft. No. 4

Ex. No. 266.

8 & 14 / 3 / 74

Railway Department.

CONSULTING ENGINEER'S OFFICE.

No. 727

From

LIEUT.-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.

Fort Saint George.

SIR,

In continuation of my letter No. 664 dated the 29th ultimo, I have the honour to enclose a copy of the statement which accompanied the letter from the Government of India No. 939 R, of the 4th May 1874, with the details filled in for the remainder of the large Bridges on the Railways in this Presidency.

I have the honour to be

Sir

your most obedient servant

Mauntsworth Lt. Col., R.E.,

Cons. Engineer for Railways

Madras

27th November

1874

3

ordered to be forwarded to the Govt of India -

Forwarding a Statement containing particulars in regard to the dimensions of large bridges on the Railways in the Madras Presy.

7473

Govt. of {1874 Madras.

PUBLIC WORKS.

To The Chief Secy to Govt of India

Dated Secy. to Govt of India

Rec'd. Encl. 1

G. O., 14 Dec. 1874, No 3505

Nos. 266-268.

Bridges - (Rys)

Paper The Statement furnished by the Cons Engr for Rys containing the details required by the Govt of India in regard to the dimensions of the large Bridges on the Railways in this Presidency

No 4 dated 14 Sept 79-80
" 19 Oct 437-438
" 10 Nov 164 & 165

Endorsement from Secy to Govt of India, Public Works Department, No. 3505, dated 2nd November 1874, forwarding to the Government of Madras, Public Works Department, a copy of the above letter from the Consulting Engineer for Railways, No. 3186 of 1874, and requesting that the information required may be furnished.

Copy of the above forwarded to the Consulting Engineer for Railways.

266-268.

P. W. 1874 Department
Rec'd 28 Oct 74-73

RAILWAY DEPARTMENT.

From
The Consulting Engineer
for Railways,

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

Dated 27 November 1874.
Rec'd 28
Endorsed
No. 727

Forwarding statements showing the details of large bridges on the lines now under construction in this Presidency.

No. 664.