

GOVERNMENT OF MADRAS.

MILITARY DEPARTMENT.

9th May 1881, No. 2544.

Promotions—Warrant Officers.

Read the following papers:—

No. 140. From H. B. GRIGG, Esq., Director of Public Instruction, to the Chief Secretary to Government, Fort St. George; dated Madras, 19th February 1881, No. 744.

With reference to G.O., dated 1st February 1881, No. 594, Military Department, I have the honor to submit, for the consideration of Government, the enclosed paper from the Principal of the Civil Engineering College.

From Lieutenant H. D. LOVE, R.E., Principal, Civil Engineering College, to the Director of Public Instruction; dated Chepauk, 17th January 1881, No. 398-C.

Adverting to G.O., Educational, No. 448, dated 6th December 1860, I have the honor to observe that the difficulty in connection with the promotion of Serjeant Hamilton to the warrant grade for which he is eligible appears to arise from doubt as to the department in which the rank should be conferred.

2. G.O., No. 1398, Military Department, dated 20th April 1886, states that promotions to the warrant grade among the staff of the Civil Engineering College must be within the warrant establishment of the Public Works Department. At the date of this order the Civil Engineering College was controlled by the Public Works Department, and a member of the former was necessarily on the establishment of the latter. It was thus possible for Serjeant Hyde, who resigned the Public Works Department in 1871, and who was admitted to the Civil Engineering College in the following year, to be promoted to Sub-Conductor in 1878 (*vide* G.O., No. 4502-W., dated 25th November 1878).

3. Now that the College is controlled by the Educational Department, it appears desirable that G.O., No. 1398, Military Department, referred to above, should undergo some revision, so that the promotion of a deserving non-commissioned officer, like Serjeant Hamilton, who is unconnected with the Public Works Department, may become possible.

4. The views of the Government on this subject will be found in G.O., Military Department, No. 142, dated 12th January 1866, where it is stated that "in the Public Works Department military promotion depends on vacancies occurring in a fixed numerical establishment of the warrant grades, the primary condition being that a Serjeant shall be of not less than five years' standing and not less than fifteen years' service in the army (including departmental service) to be eligible for promotion to Sub-Conductor. No such conditions attach to promotion in an educational establishment like the Civil Engineering College, where the appointment of military persons is isolated and contingent. To apply those conditions, therefore, to men so employed, they must be regarded as forming a part of the Public Works Establishment, an arrangement involving a change of system which His Excellency in Council is not prepared to entertain."

No. 398.

Referred to the Military Department for consideration:

28th February 1881. (Signed) C. D. MACLEAN,
Under Secretary.

No. 1327.

Referred to the Provincial Commander-in-Chief with advertence to Proceedings of Government, No. 1212, dated 28th February 1881, and previous correspondence.

FORT ST. GEORGE,
5th March 1881.

(By Order.)

(Signed) E. L. HANKIN, Colonel,
Ag. Secretary to Government.

No. 141. *From Brigadier-General GODFREY CLERK, Adjutant-General, to Colonel E. L. HANKIN, Acting Secretary to Government, Military Department; dated Ootacamund, 16th April 1881, No. 50.*

With reference to your memorandum, No. 1327, of the 5th March 1881

No. 744, from the Director of Public Instruction, to the Chief Secretary to Government, dated 19th February 1881.

No. 398-C., from the Principal, Civil Engineering College, to the Director of Public Instruction, dated 17th January 1881.

(herewith returned), forwarding correspondence as per margin, and in continuation of my letter, No. 1-42, of the 12th instant, and previous correspondence, I am directed by the Provincial Commander-in-Chief to submit the following remarks:—

2. According to regulations which are, so far as is known in this office, still in force, "any promotion to the warrant rank for service on the educational staff of the Civil Engineering College, must be within the warrant establishment of the Public Works Department."

3. Circumstances as regards the control of the Civil Engineering College having apparently changed, it may be desirable, as pointed out by the Principal of the College in paragraphs 2 and 3 of his letter,* that the order of Government quoted above should undergo some modification in view to a non-commissioned officer employed under the Educational Department obtaining promotion to the warrant rank, for it would not, Major-General Payn considers, be desirable that a deserving non-commissioned officer employed under the Educational Department should be debarred from promotion obtainable by non-commissioned officers serving in other departments which, equally with the Civil Engineering College, have no direct connection with the Military Department. The Provincial Commander-in-Chief would therefore suggest that the question as to Serjeant Hamilton's promotion be referred for the decision of the Government of India, with reference to their letter, No. 440-E., dated 14th March 1866, published in the Proceedings of Government already quoted.

No. 1398, dated 20th April 1866.

4. I am, however, to submit that, as already pointed out, the argument used by the Secretary to Government, Public Works Department, against Serjeant Hamilton being promoted in the Public Works Department, applies with equal, if not greater, force to this non-commissioned officer's promotion in the Military Department; and the Provincial Commander-in-Chief must protest against the present pay and future pension of a warrant officer who has done no military duty, nor had any connection with the Military Department for several years, being borne as a charge against the Military Department.

No. 142. ORDER THEREON, 9th May 1881, No. 2544.

The Right Honorable the Governor in Council having referred to the Proceedings of Government, Public Works Department, dated 22nd February 1872, relating to Serjeant Hamilton, is unable to recommend him for promotion to the warrant grade.

(True Extract.)

(Signed) E. L. HANKIN, Colonel,
Ag. Secretary to Government.

To the Adjutant-General.
,, Educational Department.
,, Public Works Department.

Exd. A. F. Goodall.

Gobt. of (1881) Madras.
MILITARY.

To
THE ADJUTANT-GENERAL,
&c., &c., &c.

Dated May, 9th.

Issued

Recd.

Encl.

G.O., 9th May 1881, No. 2544.

MAY.
Nos. 140-142.

Declining to recommend Serjeant Hamilton
for promotion to the warrant grade.

B. 1221 W. 16 May 1881

Recorded

4/6/81

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MILITARY DEPARTMENT.

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Under Secretary.

28th February 1881.

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(By Order.)
(Signed)

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5th March 1881.

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" Public Works Department.

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MILITARY.

To
THE ADJUTANT-GENERAL,
&c., &c., &c.

Dated May, 9th.

Issued

Recd.

Encl.

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Nos. 140-142.

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B M 1221 W d/1h 5-81
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C. L. Hankin Captain, R.E.,

For Ag. Secretary to Government,
Mily. Dept.

To the Adjutant-General.

„ Educational Department.

„ Public Works Department.

Exd. A. F. Goodall.

with 10 L/10/100.

17-2-81 No 352 m

P.H.C No 2994

Govt. of (1881) Madras.

MILITARY.

Prof May

To
THE ADJUTANT-GENERAL,
&c., &c., &c.

10.1.18

Dated May, 9th.

Issued

Recd. 18 May

Encl.

G.O., 9th May 1881, No. 2544.

MAY.
Nos. 140-142.

Declining to recommend Serjeant Hamilton
for promotion to the warrant grade.

B
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Recorded
16/5/81

Enclosure to Circular No. VI Public Works.

PUBLIC WORKS DEPARTMENT, BENGAL.
IRRIGATION BRANCH.

Comparative cost of selected buildings in the Northern Drainage and Embankment Division.

Division.	Locality.	Name of buildings.	DESCRIPTION OF HEIGHT OF WALLS, &c.						Cost.	Area.	Rate per superficial foot.	REMARKS.
			Single or double storied.	Foundation.	Plinth.	Walls (to top of wall plates.)	Roof.	Floor.				
NORTHERN DRAINAGE AND EMBANKMENT DIVISION.	Dabipore in Pergunnah Mooragatcha.	Almedpore Inspection Bungalow.	Single ...	Pucca ...	Ft. In. 3 0	Ft. In. 2 0	Pucca ...	Ft. In. 15 9	Terraced.	Terraced.	Rs. A. P. 2 10 9	Single-story, and terraced roof well buildings.
	Diamond Harbour in Pergunnah Mooragatcha.	Hooghly Point Inspection Bungalow.	" "	" "	" "	" "	" "	" "	" "	" "	2 10 9	Ditto ditto
	Diamond Harbour in Pergunnah Mooragatcha.	Diamond Harbour Inspection Bungalow.	Dem: upper roomed.	" "	" "	" "	" "	" "	" "	" "	4 0 0	Built on arches 12 feet above the ground level.
	Barroipore in Pergunnah Madonnull.	Scorjeepore Inspection Bungalow.	Single ...	" "	" "	" "	" "	" "	Tiled and terraced.	Single-story, terraced roof.	2 13 0	
	Burdwan in Pergunnah Burdwan.	Edilpore Inspection Bungalow.	" "	Cutchapucca.	" "	" "	Cutchapucca.	14 6	Terraced.	" "	0 5 3	Purchased. Value put down does not represent the cost.
	Oolcoberriah in Pergunnah Mundlegat.	Mohisrakha Inspection Bungalow.	" "	" "	" "	" "	" "	15 0	Tiled	Thatched	1 7 0	Single-story, thatched roof, inferior construction.
	Shampore in Pergunnah Mundlegat.	Shibgunge Inspection Bungalow.	" "	Pucca ...	" "	" "	Pucca ...	15 0	Terraced.	Terraced.	5 4 8	This is abnormally high, there is nothing in the work or building to justify this high rate.
	Daspoore in Pergunnah Kharia Mundlegat.	Gonegunge Inspection Bungalow.	" "	" "	" "	" "	" "	10 0	" "	" "	1 2 3	Single-story, terraced roof, inferior construction.
	Kaisa in Pergunnah Senpabaree.	Satcoonah Inspection Bungalow.	" "	Cutchapucca.	" "	" "	Cutchapucca.	15 9	Tiled	Thatched	0 14 2	Ditto ditto
	Raneegunge in Pergunnah Burdwan.	Rangoonatheluck Inspection Bungalow.	" "	Rubble masonry.	" "	" "	Rubble masonry.	17 5	Terraced.	Rough slate stone.	1 13 6	Not completed.

P. B. ROBERTS,
Executive Engineer,
Northern Drainage and Embankment Division.

PUBLIC WORKS DEPARTMENT, BENGAL.

IRRIGATION BRANCH.

Comparative cost of selected sluices in the Northern Drainage and Embankment Division.

Name of sluice.	Date of completion.	Description of sluice.	Kind and depth of foundation.	Number and size of space.	Width of roadway between parapets or railings.	Height of roadway above foundation or river bed.	Total length of bridge.	Total cost.	Cost per 100 feet length.	REMARKS.
Maherpore sluice	1854	Brick masonry sluice with iron gate and groove, and raised by screw gear.	6½ feet on concrete bed ...	One of 4 feet span	5 0	12 0	97 0	Rs. A. P. 3,532 0 0	Rs. 3,641	For drainage and irrigation of the cultivated lands.
Custom House embankment sluice at Diamond Harbour.	1874	Brick masonry sluice with self-acting gates	One foot without concrete	One of 1½ feet	61 0	13 0	65 0	2,000 0 0	3,077	For drainage of Custom House compound only.
Soorjeepore sluice	August 1871	Brick masonry sluice of 6' openings of 4' 6" span, each opening has two sets of iron gates. The upper gates move in grooves and are hoisted by differential pulleys and chains. The lower gates are self-acting, and are intended to prevent the entrance of tidal water. The sluice has 20 feet of rough stone apron and revetments on the upper side, and 100 feet stone apron and revetments on the lower side. The lower apron has been extended by 100 more of tiles set in mortar.	Foundations of abutments and piers 5' 6" between the floor of the sluice resting on a layer of concrete 1' in thickness.	Six openings of 4' 6" span each. Dimension of each opening 7' 9" x 4' 6".	18 0	15 6	65 0	20,330 0 0	45,123	For drainage and irrigation of the cultivated lands.
Kharee sluice	October 1873	Brick masonry sluice of 3 openings of 4' 6" span, each opening has one iron gate on the upper face, moving in iron grooves. The gates are hoisted by small cast iron winches, fixed on timber beams, supported by twelve posts. The sluice has a loose brick apron 10' in length on the upper side with brick revetments, and on the lower side a brick apron 25 feet in length with brick revetments.	Abutments, piers, &c., rest on a bed of concrete 2 feet in thickness, and the total depth of foundation down to bottom of concrete is 3' 3" below the floor of sluice or bed of the khall.	Three of 4' 6" span each. Dimensions of each opening 6' x 4' 6".	19 0	12 9	52 6	7,355 7 1	14,008	For drainage and irrigation of cultivated lands.
Patueeghatta sluice	...	Brick masonry sluice of 3 openings of 4' 6" span, each opening has one iron gate on the upper face, moving in iron grooves. The gates are hoisted by small cast iron winches, fixed on timber beams, supported by timber posts. The sluice has 10 feet of concrete block pitching and revetments on the up stream side and 30 feet of concrete block pitching and brick revetments on the down stream side.	Ditto ditto	Ditto ditto	19 0	12 9	52 6	Up to July 1880. 8,043 0 0		
Anapanch sluice	...	Brick masonry sluice of 3 openings of 5' span, each opening has two sets of wooden gates. The upper gates move in stone grooves and are hoisted by screw gear. The lower gates are self-acting and are intended to prevent entrance of salt water. The sluice has 20 feet of brick-on-edge apron and revetment on the up stream side, and 30 feet of brick-on-edge apron and revetments on the down stream side.	Abutments, piers, &c., rest on a bed of concrete, 1' 6" in thickness, and the total depth of foundation down to bottom of concrete is 3' below the floor of sluice or the bed of khall.	Three openings of 5' span each. Dimension of each opening 7' 6" x 5'.	16 0	13 6	60 0	Up to July 1880. 14,247 0 0		
Biddabutti sluice	July 1873	Brick masonry sluice with laterite stone quoins has 3 openings 9 feet span, each opening has a set of iron lock gates inside, and wooden self-acting gate outside; all these gates move on iron anchors. The sluice has 50' of rough stone apron and revetment outside and 20 feet inside.	The sluice rests on a bed of concrete 2' 6" in thickness and the total depth of foundation down to bottom of concrete is 5 feet below the floor or the bed of khall.	Three spans 9' x 13'	20 0	23 0	74 0	46,322 0 0	62,597	
Bonderbill sluice	July 1873	Ditto ditto openings 9' 6"	Ditto ditto	Three spans 9' 6" x 13'	20 0	21 0	78 0	46,776 0 0	59,969	
Kana Nuddee sluice	...	Brick masonry sluice of 4 openings, 5' span, each opening has a wooden lifting gate outside, moving in stone grooves and lifted by screw gear. The sluice has 50 feet rough apron and revetments both inside and outside.	The sluice rests on a bed of concrete 1 foot in thickness, and the total depth of foundation down to bottom of concrete is 2' 9" below the floor or the bed of khall.	Four spans 5' x 12'	12 0	25 0	64 0	29,263 0 0	45,723	
Joogooty sluice	...	Brick masonry sluice of 2 openings, 4' span, each opening has an iron lifting gate outside, moving in iron grooves and lifted by screw gear. The sluice has 20 feet jhama apron and brick-on-edge revetments both inside and outside.	The sluice rests on a bed of concrete 2' 6" in thickness, and total depth of foundation down to bottom of concrete is 4 feet below the floor or the bed of khall.	Two spans 4' x 6'	10 0	25 6	96 0	6,953 0 0	7,274	

P. B. ROBERTS, C.E.,

Executive Engineer,

Northern Drainage and Embankment Division.

Enclosure to Circular No. VI Public Works.

PUBLIC WORKS DEPARTMENT, BENGAL.
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Comparative cost of selected buildings in the Northern Drainage and Embankment Division.

Division.	Locality.	Name of buildings.	Single or double storied.	DESCRIPTION OF HEIGHT OF WALLS, &c.							Cost.	Area.	Rate per superficial foot.	REMARKS.
				Foundation.	Plinth.		Walls (to top of wall plates.)		Roof.	Floor.				
				Ft. In.	Pucca	Ft. In.	Pucca	Ft. In.	Terraced.	Terraced.	Rs.		Rs. A. P.	
NORTHERN DRAINAGE AND EMBANKMENT DIVISION.	Dabipore in Pergunnah Moorgatcha.	Almedpore Bungalow.	Single ...	Pucca ...	3 0	Pucca ...	2 0	Pucca ...	15 9	Terraced.	2,600	972 0	2 10 9	Single-story, and terraced roof well buildings.
	Diamond Harbour in Pergunnah Moorgatcha.	Hogghly Point Inspection Bungalow.	" ...	" ...	3 0	" ...	1 6	" ...	15 9	" ...	2,600	972 0	2 10 9	Ditto ditto
	Diamond Harbour in Pergunnah Moorgatcha.	Diamond Harbour Inspection Bungalow.	Demisupper roomed.	" ...	4 8	" ...	1 0	" ...	22 8	" ...	8,783	2,194½ 0	4 0 0	Built on arches 12 feet above the ground level.
	Barroipore in Pergunnah Madomull.	Soorjeepore Inspection Bungalow.	Single ...	" ...	2 0	" ...	2 0	" ...	12 0	Tiled and terraced.	2,886	1,022 0	2 13 0	Single-story, terraced roof.
	Burdwan in Pergunnah Burdwan.	Edilpore Inspection Bungalow.	" ...	Cutchapucca.	2 0	Cutchapucca.	2 0	Cutchapucca.	14 6	" ...	680	2,102 7	0 5 3	Purchased. Value put down does not represent the cost.
	Oolcoberriah in Pergunnah Mundlegat.	Mohierakha Inspection Bungalow.	" ...	" ...	5 6	" ...	4 6	" ...	15 0	Thatched	5,000	3,477 0	1 7 0	Single-story, thatched roof, inferior construction.
	Shampore in Pergunnah Mundlegat	Shibgunge. Inspection Bungalow.	" ...	Pucca ...	2 6	Pucca ...	5 6	Pucca ...	15 0	Terraced.	5,046	934½ 125	5 4 8	This is abnormally high, there is nothing in the work or building to justify this high rate.
	Dassore in Pergunnah Kharis Mundlegat.	Gopegunge Inspection Bungalow.	" ...	" ...	7 5	" ...	4 0	" ...	10 0	" ...	1,366	1,049 11	1 2 3	Single-story, terraced roof, inferior construction.
	Kaisa in Pergunnah Senpaharee.	Satcooniiah Inspection Bungalow.	" ...	Cutchapucca.	2 2	Cutchapucca.	4 0	Cutchapucca.	15 9	Tiled ...	2,600	2,820 1	0 14 2	Ditto ditto
	Raneegunge in Pergunnah Burdwan.	Rughoonathchuck Inspection Bungalow.	" ...	Rubble masonry.	2 0	Masonry...	2 5	Rubble masonry.	17 5	Terraced.	11,500	6,231 0	1 13 6	Not completed.

P. B. ROBERTS,
Executive Engineer,
Northern Drainage and Embankment Division.

PUBLIC WORKS DEPARTMENT, BENGAL.
IRRIGATION BRANCH.

Comparative cost of selected sluices in the Northern Drainage and Embankment Division.

Name of sluice.	Date of completion.	Description of sluice.	Kind and depth of foundation.	Number and size of space.	Width of roadway between parapets or railings.	Height of roadway above foundation or river bed.	Total length of bridge.	Total cost.	Cost per 100 feet length.	REMARKS.
Meherpore sluice	1854	Brick masonry sluice with iron gate and groove, and raised by screw gear.	6½ feet on concrete bed ...	One of 4 feet span	5 0	12 0	97 0	Rs. A. P. 3,532 0 0	3,641	For drainage and irrigation of the cultivated lands.
Custom House embankment sluice at Diamond Harbour.	1874	Brick masonry sluice with self-acting gates	One foot without concrete	One of 1½ feet	61 0	13 0	65 0	2,000 0 0	3,077	For drainage of Custom House compound only.
Soorjeepore sluice	August 1871	Brick masonry sluice of 6' openings of 4' span, each opening has two sets of iron gates. The upper gates move in grooves and are hoisted by differential pulleys and chains. The lower gates are self-acting, and are intended to prevent the entrance of tidal water. The sluice has 20 feet of rough stone apron and revetments on the upper side, and 100 feet stone apron and revetments on the lower side. The lower apron has been extended by 100 more of tiles set in mortar.	Foundations of abutments and piers 5' 6" between the floor of the sluice resting on a layer of concrete 1' in thickness.	Six openings of 4' 6" span each. Dimension of each opening 7' 9" x 4' 6".	18 0	15 6	65 0	29,330 0 0	45,123	For drainage and irrigation of the cultivated lands.
Kharee sluice	October 1873	Brick masonry sluice of 3 openings of 4' 6" span, each opening has one iron gate on the upper face, moving in iron grooves. The gates are hoisted by small cast iron winches, fixed on timber beams, supported by twelve posts. The sluice has a loose brick apron 10' in length on the upper side with brick revetments, and on the lower side a brick apron 25 feet in length with brick revetments.	Abutments, piers, &c., rest on a bed of concrete 2 feet in thickness, and the total depth of foundation down to bottom of concrete is 3' 3" below the floor of sluice or bed of the khall.	Three of 4' 6" span each. Dimensions of each opening 6' x 4' 6".	19 0	12 9	52 6	7,355 7 1	14,008	For drainage and irrigation of cultivated lands.
Patneeghatta sluice	...	Brick masonry sluice of 3 openings of 4' 6" span, each opening has one iron gate on the upper face, moving in iron grooves. The gates are hoisted by small cast iron winches, fixed on timber beams, supported by timber posts. The sluice has 10 feet of concrete block pitching and revetments on the up stream side and 30 feet of concrete block pitching and brick revetments on the down stream side.	Ditto ditto ...	Ditto ditto ...	19 0	12 9	52 6	Up to July 1880. 8,043 0 0		

Anapanch sluice	...	Brick masonry sluice of 3 openings of 5' span, each opening has two sets of wooden gates. The upper gates move in stone grooves and are hoisted by screw gear. The lower gates are self-acting and are intended to prevent entrance of salt water. The sluice has 20 feet of brick-on-edge apron and revetment on the up stream side, and 50 feet of brick-on-edge apron and revetments on the down stream side.	Abutments, piers, &c., rest on a bed of concrete, 1' 6" in thickness, and the total depth of foundation down to bottom of concrete is 3' below the floor of sluice or the bed of khall.	Three openings of 5' span each. Dimension of each opening 7' 6" x 5'.	16 0	13 6	60 0	Up to July 1880. 14,247 0 0		
Biddabuttu sluice	July 1873	Brick masonry sluice with laterite stone quoins has 3 openings 9 feet span, each opening has a set of iron lock gates inside, and wooden self-acting gate outside; all these gates move on iron anchors. The sluice has 50' of rough stone apron and revetment outside and 20 feet inside.	The sluice rests on a bed of concrete 2' 6" in thickness and the total depth of foundation down to bottom of concrete is 5 feet below the floor or the bed of khall.	Three spans 9' x 13' ...	20 0	23 0	74 0	46,322 0 0	62,597	
Bouderbill sluice	July 1873	Ditto ditto openings 9' 6"	Ditto ditto ...	Three spans 9' 6" x 13' ...	20 0	21 0	78 0	46,776 0 0	59,969	
Kana Nuddee sluice	...	Brick masonry sluice of 4 openings, 5' span, each opening has a wooden lifting gate outside, moving in stone grooves and lifted by screw gear. The sluice has 50' feet rough apron and revetments both inside and outside.	The sluice rests on a bed of concrete 1 foot in thickness, and the total depth of foundation down to bottom of concrete is 2' 9" below the floor or the bed of khall.	Four spans 5' x 12' ..	12 0	25 0	64 0	29,263 0 0	45,723	
Joogooty sluice	...	Brick masonry sluice of 2 openings, 4' span, each opening has an iron lifting gate outside, moving in iron grooves and lifted by screw gear. The sluice has 20 feet jhama apron and brick-on-edge revetments both inside and outside.	The sluice rests on a bed of concrete 2' 6" in thickness, and total depth of foundation down to bottom of concrete is 4 feet below the floor or the bed of khall.	Two spans 4' x 6' ...	10 0	25 6	96 0	6,983 0 0	7,274	

P. B. ROBERTS, C.E.,
Executive Engineer,
Northern Drainage and Embankment Division.

Enclosure to Circular No. VI Public Works.

Cost of weirs on Midnapore Canal.

Division.	Name of weirs.	Date of completion.	Description of weir.	Total length between abutments.	UNDER SLUICES.		Height above general level of river bed.	Height of abutments above tops of weir posts.	Cost.	Rate per foot run.
					No. of Bays.	Width of each.				
Cossye ...	Midnapore weir across Cossye River.	March 1876 ...	Rubble masonry weir and curtain walls on kutcha wells 6 feet deep. The curtain wall 32 feet from weir wall; this space packed with rubble, and a talus 55 feet below curtain wall; posts and planks tops of weir. Scouring sluices on flank.	Feet. 1,705	3	Feet. 50	For 1215 feet the weir 8 feet high with 2 feet posts and planks, and for 300 feet the weir 6 feet high with 4 feet posts and planks.	Feet. 12½	Ra. 3,68,767	Ra. 216
Ditto ...	Panchikoorah weir across Cossye River.	March 1872 ...	Brick masonry weir with vertical drop into block stone flooring, 20 feet wide, with packed concrete block apron 20 feet width. The foundations on kutcha wells 3 feet in depth. Posts and planks on top of weir and scouring sluices on either flank.	333	2	50	Masonry 4 feet above bed, posts and planks 4 feet above masonry.	20	1,06,503	319

Cost of Specimen Locks on Midnapore Canal.

Division.	Name of lock.	Date of completion.	Description of lock.	Description of foundations.	Length of chamber in the clear.	Width of chamber.	Height of lift.	Height from invert to coping.	Cost.	Rate per foot of height from invert to coping.	Rate per 100 c. ft. of chamber capacity.
	Midnapore Head Lock	July 1871	Head lock from non-tidal river, rubble masonry, wooden gates.	Foundations in sand on Madras wells	Feet. 150	Feet. 20	Varies with height of river, maximum rise of which is about 21	Feet. 22	Rs. 71,615	Rs. 3,252	Rs. 108
	Goulaguriah	September 1873	Lift lock of rubble stone masonry with road bridge over tail bay, wooden gates.	On stiff clay without wells or piling.	150	20	15 feet	22½	65,934	4,390	97
	Terapokenh	March 1873	Tidal lock, iron gates, brick masonry	Silty tidal clay foundations on piles.	150	20	Varies with the tide	24	1,06,566	...	147
	Gowkhally	March 1874	Ditto	Rather stiff clay	150	20	Varies with state of tide.	23	1,72,413	...	203
	Kaulapooka	Under construction.	Ditto	Tidal silty clay rather sloppy equipping on each square foot of foundation.	150	20	Varies with the tide.	20½	about 1,00,000	...	162

J. H. APJOHN, C. E.,
Executive Engineer, Cossye Division.

Specimen Tidal Sluices.

Division.	Name of sluice.	Date of completion.	Description of sluice.	Nature of foundation.	PARTICULARS OF VENTS.			Total sectional area.	Number of square miles drained.	Sectional area per square mile.	Height from floor to crest of embankment.	Slopes of embankment.	Total cost.	Rate per square foot of sectional area.	Rate per square mile of area drained.
					Number.	Width of each.	Height of each.								
	Peechabunee	March 1872	Tidal sluice in sea dyke, brick masonry, iron flap shutters on sea side, wooden draw shutters in masonry grooves with windlass lifting gear.	Very soft alluvial clay mixed with very fine sand foundations on grillage.	22	5	8.5	S. ft. 935	125	7.5	27.5	2 to 1 3 to 1	Rs. 1,84,962	Rs. 198	Rs. 1,480
	Rashigachetolla	July 1877	Sluice in Cossye River Embankment just within tidal influence, brick masonry with wooden draw shutters in iron grooves worked by screw gear.	Very soft alluvial clay foundations on block work sunk to 5.5 feet below bottom of platform.	4	5	7	140	12	12	21.5	2 to 1 1½ to 1	about 20,545	146	1,712

J. H. APJOHN, C. E.,
Executive Engineer, Cossye Division.

Aqueducts.

Division.	Name of aqueduct.	Date of completion.	Description of aqueduct.	Nature of foundations.	DIMENSIONS OF CANAL WATERWAY.			PARTICULARS OF VENTS.				Total sectional area.	Cost.	Rate per foot of length.	Rate per square foot of water-way.	
					Length.	Width.	Depth.	No.	Width.	Versed sine arch.	Versed sine invert.					Height of weir.
Cossye ...	Keræ ...	March 1875 ...	Brick masonry across nullah ...	Good clay ...	260	40	8	10	20	4	2	7	2,200	1,09,646	421	50
													Sq. ft.	Rs.	Rs.	Rs.

(4)

J. H. APJOHN, C. E.,
Executive Engineer, Cossye Division.

Comparative cost of certain selected buildings.

Division.	Locality.	Description.	DESCRIPTION AND HEIGHT OF WALLS, &c.							Cost.	Area.	Rate per square foot.
			Single or double storied.	Foundation.	Plinth.	Walls to top of wall plates.	Roof.	Floor.				
Cossye.	Anthra, Midnapore District.	1st Class Inspection Bungalow ...	Single	3'	3'	13 1/2'			Rs.	4,717	1,700	2.77
	Allunkarpore ditto ...	2nd ditto ditto ...	Ditto	For clay.	Pucca masonry earth filling.	3'	13 1/2'	Terraced.	3,176	1,156	2.74	
		Out-houses of the above Bungalows	Ditto	2'	2'	10			1,208	576	2.09	

(5)

[For Heads of Departments.]

Circular No. VI Public Works.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

CIVIL WORKS.

MILITARY WORKS.

To

THE GOVERNMENTS OF MADRAS, BOMBAY, BENGAL, THE NORTH WESTERN PROVINCES
AND OUDH, AND THE PUNJAB, IN THE PUBLIC WORKS DEPARTMENT.

THE CHIEF COMMISSIONERS OF THE CENTRAL PROVINCES, BRITISH BURMA AND ASSAM,
THE RESIDENT AT HYDERABAD.

THE AGENTS TO THE GOVERNOR GENERAL FOR CENTRAL INDIA, RAJPUTANA AND
BILUCHISTAN.

THE ACCOUNTANT GENERAL, PUBLIC WORKS DEPARTMENT.

THE INSPECTOR GENERAL OF MILITARY WORKS.

THE DIRECTOR GENERAL OF RAILWAYS.

THE FOREIGN DEPARTMENT FOR COMMUNICATION TO RESIDENT OF MYSORE AND
CHIEF COMMISSIONER OF COORG.

Simla, April 19, 1881.

In continuation of Circular No. III P W, dated the 27th January 1881,
the undersigned is directed to forward herewith, for information, statements
of areas and cost of buildings, and memorandum of construction and cost of
bridges exceeding 50 feet in length, in the Cossye and Northern Drainage
and Embankment Divisions of the South-Western Circle in the Bengal
Presidency.

(Signed) W. P. TOMKINS, Captain, R. E.,
Asst. Secretary to the Govt. of India.

W. M. LEES, Colonel,
Offg. Secy. to the Govt. of India, Mily. Dept.,
In charge P. W. Dept.

P. W. D. 2811
GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

CIVIL WORKS.

Miscellaneous.

To

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with 2-
enclosures*

Circular No. VI Public Works.

Dated Simla, April 19, 1881.

Received

B. No. 1217 u.s. of 14-5-81

Forwards, for information, statements of areas and cost of buildings, and memorandum of construction and cost of bridges exceeding 50 feet in length, in the Cossye and Northern Drainage and Embankment Divisions of the South-Western Circle in the Bengal Presidency.

No. 365, P. W. D. Press—25-4-81—755.