M.R.O. 1—77,006—8-6-37.

(1) Number of pages

(2) Date of repair

(3) Initials of the Referencer

MADRAS RECORD OFFICE.

Government of Madras.

Public Works DEPARTMENT.

G.O. No. 179 (Ir) Press / Mis.

Dated 1-6- 1877.

Not to be folded or roughly handled

Cir 29-5-77

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

1st June 1877, No. 179 W.

Buildings and Roads.

Civil Works.

Read the following paper :—

No. 5. From Captain G. T. SKIPWITH, R.E., Assistant Secretary to the Government of India, Public Works Department, (Civil Works—Miscellaneous,) to the Secretary to the Government of Madras, Public Works Department, (General Branch,) dated Simla, 21st May 1877, No. 128 M.

WITH reference to Punjab Government Circular Memorandum, No. 1,660 of the 25th ultimo, forwarding statements of areas and cost of buildings and memorandum of construction and cost of bridges in the Punjab, I am directed to request that similar statements connected with buildings and bridges in Madras may be prepared and submitted to this office.

Circular Memorandum from the Government of Punjab, Public Works Department, (Civil Works—Buildings) to the Governments of India, Madras, Bombay, Bengal and North-Western Provinces; the Chief Commissioners of Oudh, Central Provinces, British Burmah, Mysore and Coorg, and Assam; the Resident of Hyderabad; the Agent of Governor-General for Central India and Rajaputana; the Superintendent, Port Blair, and Chief Commissioner, Andaman and Nicobar Islands; the Inspector-General of Military Works; the Director of State Railways; the Joint-Secretary to Government Punjab, Public Works Department, Irrigation Branch, dated Lahore, 25th April 1877, No. 1,660.

No. 3, dated 4th February 1876.
„ 28, „ 30th June 1876.

FORWARDS, for information, the Circulars of this Government marginally noted, together with their accompaniments as below :—

I. Statement of Comparative Areas and Cost of Buildings in the Punjab.

II. Memorandum of Construction and Comparative Cost of Bridges in the Punjab.

(Signed) R. MACLAGAN, Major-General,
Secy. to Govt., Punjab P.W.D.

Circular from Major-General R. MACLAGAN, Secretary to Government, Punjab Public Works Department, to all Officers concerned, dated 4th February 1876, No. 3.

IN this Office Circular No. 19, dated 27th July 1874, it was directed that proposals for new buildings submitted to Government in the Civil Department should be accompanied by a rough approximate estimate of cost based on the area. In order to facilitate the preparation of such rough estimates, a statement of the comparative areas and cost of certain selected buildings in each division has been compiled in this office, and a copy is forwarded herewith for record.

Circular from Major-General A. TAYLOR, Officiating Secretary to Government, Punjab Public Works Department, to the Superintending and Executive Engineers and Examiner of Public Works Account, dated Punjab, 30th June 1876, No. 28.

FORWARDS, for information and record, a Memorandum of Construction and Cost of Bridges exceeding 50 feet in length in the Punjab.

2. The present memorandum is in supersession of that circulated with this office No. 2,551, dated 11th May 1871.

Memorandum of Construction and Cost of Bridges

Executive Divisions.	Name of Bridge, or of River or Nallah and Situation.	Date of Completion.	Description of Bridge.	Kind and Depth of Foundation.
			2ND CIRCLE.	
Delhi.	Salimgarh bridge ...	March 1870 ...	Rubble foundations; coursed rubble superstructure, with brick arches and cut sandstone cornice, string courses, caps to piers and dressings.	Rubble masonry on rock 7′ to 8′ deep.
Hill Roads.	Harripur bridge, over Gambar river, on Simla and Subathu road.	Completed in 1846.	Iron suspension bridge on stone masonry piers	Stone masonry; probable depth 20′
	Kalka bridge ...	...	Stone masonry... ...	Stone masonry, averaging 3′ in depth.
	Jabli bridge ...	...	*Do.*	Do. ...
	Wangti bridge, over the Sutlej, 120th mile, Hindustan and Tibet road.	May 1864 ...	Wooden bridge, deodar throughout. Cantilevers protecting 40′ from either abutment, opening in the centre, spanned by a 40 diagonally braced girder. Abutments, dry stone.	Dry stone masonry on rock foundations.
1st Division Umballa and Lahore Road.	Nagri bridge ...	Nov. 1869 ...	Timber distant: first bay American trussed girder.	Rock ... ...
	Kashang bridge ...	May 1868 ..	Timber on spot; cantilever bridge.	Rock, granite ...
	Choya nallah bridge, Jagadhri road.	...	Wooden bridge, strut and straining beam.	Piles driven 12′ below bed.
	Baitam nallah bridge, do.	...	Do. do. ...	Do. ... ...
	Chittang nallah bridge, do.	...	Do. do. ...	Foundations 9′; piles driven 17′ below bed.
	Western Jumna canal bridge on Jagadhri road.	1873	Brick piers and abutments, timber superstructure on trussed beams.	4′ wells 17′ deep ...
	Mutasuti nallah ...	Completed in 1865.	Masonry bridge; segmental arches.	Masses of concrete, with inverts under large arches.
	Markanda bridge, 109th mile, Grand Trunk Road.	Completed in 1868.	Masonry bridge; elliptical arches; all 9′ rise.	Piers and abutments on wells 7′ diameter, sunk from 15′ to 17′ below bed, and filled in with concrete; curtain walls 5′, and concrete tail piece 50′ long 2′ thick, ending in curtain wall of wells 22′ deep.
	Gaggar bridge, 123rd mile, Grand Trunk Road.	Built in 1867.	Brick masonry; elliptical arches.	Wells 20′ deep ...
	Rajpura nallah bridge, 137th mile.	Do. in 1856.	Do. segmental arches...	Solid masonry, 4′ deep.
	Bridge No. 389, in 146th mile.	Do. in 1857.	Do. do. do. ...	4 concrete, 5 masonry

exceeding 50 feet in length in the Punjab.

Number and Size of Spans.	Width of Roadway between Parapets or Railings.	Height of Roadway above Foundations or River bed.	Total length of Bridge.	Total Cost.	Cost per 100 feet of Length.	Remarks.
				RS.	RS.	
Three arches, each 44′ 2″ span.	18′	36′	178′	39,003	21,912	
One span 114′	6′	10′	114′, and with back chains 202	21,718	11,933	
Spans 50′ each	16′	19′	128′	19,935	15,574	
Do. ...	Do.	Do.	About 112′	18,413	16,440	
120′ ...	10′	33′ above foundation; 90′ above bed of river	210′	9,786	4,660	
2 spans— 1 span 44′ 1 „ 26′	8′	23′	80′	2,000	2,500	
1 span 37′ 1 „ 42′	8′	20′	94′	790	840	
Three spans 30′	18′ 1″	13′	114′	5,136	4,500	
Do. ...	18′	13′	114′	5,130	4,500	
Five spans 30′ each.	18′	14′	177′	8,500	4,802	
Six arches 40′ span each.	16′	27′	315′	15,898	5,047	
Three spans 30′, ten spans 15′ each.	26′	18′ 6″	332′ 8″	45,413	13,651	
Seventeen spans 40′ each. Ten spans 36½′, two spans 10′ each.	23′ curbs, 25′ parapets.	24′ 9″ above concrete floors.	1,398′	4,94,261	35,355	
Ten arches 42′ spans each.	22′	36′	613′	2,70,437	44,117	
Twenty-five arches 16′ span.	27′	13½′	621′	21,440	3,452	
Five arches 20′ span each.	27′	17′	198¼′	17,718	8,948	

Memorandum of Construction and Cost of Bridges, &c.—(Continued).

Executive Division.	Name of Bridge, or of River or Nallah, and Situations.	Date of Completion.	Description of Bridge.	Kind and Depth of Foundation.	Number and Size of Spans.	Width of Roadway between Parapets or Railings.	Height of Roadway above Foundations or River bed.	Total length of Bridge.	Total Cost.	Cost per 100 feet of Length.	Remarks.
			2ND CIRCLE—(*Contd.*)						RS.	RS.	
1st Dn. Umballa and Lahore Road—(*Contd.*)	Bridge No. 415, in 155th mile.	Built in 1855.	Brick masonry segmental arches.	5′ concrete, 7′ masonry.	Four arches 25′ span each.	27′	19½′	209½′	20,961	10,029	
	Budha Sutlej bridge, 193rd mile.	Do. in 1854.	Brick masonry, with flooring and drop walls above and below bridge.	Wells 30′ deep ...	Seven arches 30′ span each.	27′	17¼′	312′	57,141	18,314	
2nd Dn. Umballa and Lahore Road.	Akvi nallah causeway, 242nd mile, Grand Trunk Road	1873 ...	Brick masonry, with flooring.	Wells 25′ deep ...	Five spans 10′ each.	18′	7′	850′	14,130	832	Submerged during floods.
	West Beyn bridge, 243rd mile, Grand Trunk Road.	1870 ...	Brick masonry	„ 36′ „ ...	3 spans 40′ each	18′	22′	130′	75,000	28,844	
	Ramidi Dhab nullah causeway, 244th mile, Grand Trunk road.	1873 ...	Brick masonry, with flooring.	„ 10′ „ ..	3 „ 10′ „	18′	7′	920′	13,853	753	Do. do.
	Hambowal nallah causeway, 245th mile, Grand Trunk road.	1873 ...	Do. do. ...	„ 15′ „ ...	5 „ 10′ „	18′	7′	725′	13,511	931	Do. do.
			3RD CIRCLE.								
Kangra.	Nigul bridge ...	1869 ...	Stone masonry abutments, with brick segmental arch; rise 28 feet. Depth of keystone 5′ 6″; thickness of arch at springing 7 feet; parapets brick, with stone copings.	Right abutments founded on solid sand rock. Left abutment on boulders well rammed with concrete 15½′ below bed of river.	One span 126′	12′	60′	280′	64,739	23,121	
	Bonair bridge ...	1871 ...	Do. do do.; parapets ashlar open work.	Right abutment on boulders and concrete, 18′ below bed of river. Left abutment on conglomerate rock, 12′ above river bed.	„ 140′	13′ 6′	58′	280′	68,422	24,436	
	Ban Ganga bridge..	1875 ...	Warren girder bridge...	Both abutments founded on conglomerate rock.	„ 85′	12′	80′	156′	22,683	15,181	
	Chaitru bridge ...	1875 ...	Stone masonry; rock-faced abutments, with cut stone and segmental arch; granite string courses and keys; parapets dressed ashlar open work.	Right abutment on conglomerate rock 10′ above river bed. Left abutment 16′ below bed, on large boulders and concrete.	„ 90′	13′	45′	170′	29,165	17,156	
	Kauli bridge ...	1874 ...	Temporary wire-rope suspension bridge.	Right abutment dry masonry. Left abutment huge boulders.	„ 102′	8′	14′	130′	530	408	
	Seon bridge ...	1875 ...	Three semi-circular arches, stone masonry; abutments of rubble faced with ashlar; two piers of ashlar faces and rubble hearting, with through bonds every 4 feet.	Abutment and piers all founded on conglomerate rock, averaging from 8 to 20 feet above river bed.	Three spans 25′ each.	13′	58′	150′	17,538	11,692	

Memorandum of Construction and Cost of Bridges, &c.—(Continued).

Executive Divisions.	Name of Bridge, or of River or Nallah, and Situation.	Date of Completion.	Description of Bridge.	Kind and Depth of Foundation.	Number and Size of Spans.	Width of Road-way between Parapets or Railings.	Height of Road-way above Foundations or River bed.	Total length of Bridge.	Total Cost.	Cost per 100 feet of Length.	Remarks.
									RS.	RS.	
(Kangra—*Continued*).			3RD CIRCLE—(*Contd.*)								
	Bhali bridge ...	1872 ...	Rubble masonry abutments and ashlar segmental arches, 12 feet rise, with dressed stone parapets, and ashlar copings.	Right abutment on sandstone rock level with river bed. Left abutment 8 below bed, on rock.	One span 60′	12′	33′	122′	12,050	9,877	
	Bral bridge ...	1873 ...	Rubble masonry abutments, with cut stone facings; ashlar arch, rise 16′ 6. Wheel guards ashlar blocks; and parapets with iron bars running through cast standards.	Both abutments on sand-stone rock level with river bed.	One span 84′	12′	47′	168	14,786	8,801	
	Dehri bridge ...	1875 ...	Deodar timber arches, with roadway suspended by vertical posts and wrought-iron rods, a lattice stiffening girder being added. The bows are of timber, and lattices of wrought-iron bars; roadway carried on deodar beams 10″ × 8″ spaced, 3′ centre roadway of 3′ planks covered with water-proof composition.	Left abutment on conglomerate and sandstone rock 10′ above river bed. Right abutment founded on concrete, laid 18 feet below bed.	„ 214′	12′	24′	264′	83,218	31,518	
	Bathu bridge ...	1851 ...	Stone throughout ...	Sandstone rock ...	„ 80′ Two spans 37′ each.	12½′	58′	288′	16,516	10,724	An old bridge, constructed by the late Sir Donald McLeod.
Gurdaspur.	Bhed nallah bridge, south of Sadr Bazaar, Sialkot.	...	Brick masonry	Brickwork 4′ 3″ deep.	Three spans 20′ each. Two spans 6′ each.	20′	14′ 9″	128′ 6″	4,236	3,309	
Lahore.	Deg nullah bridge...	Completed in 1868-69.	Timber bridge, strut and straining beam trusses; brick masonry abutments and timber piers.	Wells 24′ deep for the abutments; and piles 20′ deep for the piers.	Three openings 40′ each.	14′	28′	142′	11,500	8,099	
	Bhaid nullah bridge.	Do. do. ...	Do. do. ...	Wells 20′ deep for abutments; and piles 18′ deep for piers.	Do.	14′	20′	142′	10,320	7,268	
	Six bridges of five arches over minor nallahs on Lahore and Pindi Bhatian road.	Do. do. ...	Brick masonry, with brick-on-edge floor.	Brick masonry 4′ deep	Five spans 12′ each.	14′	7′	106′ each bridge.	2,912	2,747	
	Drain bridge on Grand Trunk road, outside the Taxali gate of city of Lahore.	Do. 1864 ...	Do. do. but without floor.	Do. do. ...	Fifteen spans 12′ each.	20	7½′	238′	7,500	3,277	

Memorandum of Construction and Cost of Bridges, &c.—(Continued).

Executive Divisions.	Name of Bridge, or of River or Nallah, and Situation.	Date of Completion.	Description of Bridge.	Kind and Depth of Foundation.	Number and Size of Spans.	Width of Road-way between Parapets or Railings.	Height of Road-way above Foundations or River bed.	Total length of Bridge.	Total Cost.	Cost per 100 feet of Length.	Remarks.
			3RD CIRCLE—(*Contd.*)						RS.	RS.	
Lahore—(*Continued*).	Bridge over nallah to the north of Fort Lahore.	Completed in 1864.	Brick masonry	Wells 20′ deep ...	Three spans 40′ each.	20′	22′	188′	35,023	18,630	
	Bridge of three arches on road from Central Jail to new Female Penitentiary at Lahore.	1874 ...	Brick masonry with brick-on-edge floor.	Wells 22′ deep ...	Three spans 20′ each.	12′	21′	140′	10,432	7,452	
			1ST CIRCLE.								
1st Division Lahore and Peshawar Road.	17th mile bridge... 18th „ ... 20th „ ... Pid nallah ...	Built in 1862.	Timber superstructure, strut and straining beam; masonry piers and abutments, with inverts and drop walls.	Inverts 1½′ thick level with nallah bed; drop wall 3′ and 4′ below inverts.	Six spans 30′ Five „ ... Four „ ... Seven „ ...	18′ 18′ 18′ 18′	17·9′ 18·0′ 17·6′ 21·0′	180′ 150′ 120′ 210′	6,591 7,241 7,141 13,468	3,662 4,827 5,951 6,413	
	Nangal Duna Singh bridge	Do. in 1869 ...	Timber strut and staining beam; piers of deodar timber; abutments brick.	Piers on piles driven 20′; abutments on wells 15′ deep.	Three spans 40′	14′	30′	122′	16,701	13,689	
	Bag Bacha bridge...	Do. do. ...	Timber strut and straining beam; timber piers.	...	Five „ 35′	18′	39·4′	175′	22,419	12,811	
	86th mile bridge ...	Built in 1862.	Timber strut and straining beam; masonry piers.	...	Four „ 30′	18′	24′	120′	8,232	6,680	
1st Dn. L. & P. Road.	Bhimbar bridge ...	Built in 1868.	Masonry abutments and wings; piers and abutments of deodar timber.	Piers on piles 20′ deep; abutments on wells 19′ deep.	Twenty-two spans 40′ each.	20	14′	901′	1,15,629	12,847	Expenditure includes tree-spur, which cost Rs. 4,831, and excavating a new channel 200′ broad, filling in old channel; also an earthen spur 2,000′ long, and a masonry water-wing 300′ long on wells.
Rawalpindi.	Leh nallah, near Sadr Bazaar, Rawalpindi.	August 1870.	Brick masonry; three elliptical arches.	Pacca rubble masonry on good clay, at 16′ deep.	Three spans 63′ each.	20′	40′ above bed of river.	315′	58,790	18,663	
2nd Division Lahore and Peshawar Road.	Dina bridge, mile 112.	Do. do.	Brick masonry ...	Wells and hollow blocks 24′ deep.	Ten spans 40′ each.	20′	42′ above foundations.	727′	1,11,618	15,353	
	Bakrala bridge, mile 120.	Sept. 1866 ...	Masonry abutments, pile piers; deodar superstructure of strut, straining beam and tie beams.	Piles 28′ deep ...	Twelve „ 40′ each.	20′	47′ do. ...	570′	39,501	6,930	
	Bishandaur bridge.	October 1863.	Masonry abutments and piers; deodar superstructure of strut and straining beam.	Solid masonry 12′ deep.	Three „ 60′ each.	20	52′ do. ...	285′	18,389	6,452	
	Bhag Khan bridge.	Not traceable.	Do. do. ...	Do. 8′ feet ...	Eight „ 40′ each.	20′	32′ do. ...	353′	19,638	5,563	
	Sohan bridge, mile 163.	February 1871.	Masonry abutments and piers, arches of brick-work.	Solid masonry, varying from 17′ to 30′ deep.	Fifteen spans 63′ each.	26′	Varies from 62¼ to 75′ above foundations.	1,199′	5,51,879	46,028	
	Leh bridge ...	October 1870.	Masonry abutments and piers; deodar superstructure, strut and straining beam.	Solid masonry 16′ deep.	Six spans 40′ each.	26′	70′ above foundations.	332′	48,681	14,663	
	Purdon's bridge at Khawra, near Pind Dadan Khan.	1858 ...	Stone masonry abutments and piers, arches of brick-work.	Stone masonry 2½′ deep.	Three spans 50′ each.	20′	20′ do. ...	350′	19,844	5,670	

Memorandum of Construction an

Executive Divisions.	Name of Bridge, or of River or Nallah, and Situation.	Date of Completion.	Description of Bridge.	Kind and Depth of Foundation
			1ST CIRCLE—(*Continued*).	
	Garhi bridge, over the Nainsukh, at Garhi Habibulla Khan.	August 1862.	Iron suspension in the centre; lattice on the two shore bays. Pacca masonry piers, abutments and standards. Vertical drop-bars V. Sin. 9′ 2″.	Masonry 2′ deep, on rock.
Hazara.	Kot Kay bridge, in 64th mile, Hazara Trunk Road.	...	Wooden strut and strain.	On rock, average depth 2′.
	Bridge over the Jhelum river at Kohala, on Murree and Kashmir Road.	1873 ...	Iron suspension bridge, masonry piers.	On west side 10′, on east side 6′ in rock.
	Kanair Kass bridge, on Murree and Kashmir Road.	...	Suspension bridge, with masonry piers; width of roadway 7′, suspension chains 1¼″ diameter, with vertical drop-bars.	Rubble masonry 4′ on rock.
3rd Division Lahore and Peshawar Road.	Chablat bridge, mile 200.	Constructed in 1861.	Wooden pile bridge; timber girders trussed by timber straining piers and struts; pile piers diagonally braced; timber deodar; masonry abutments and wing-walls.	Piles driven 22′ below the bed of river.
	Haro bridge, mile 204.	Constructed in Nov. 1863.	Piers and superstructure deodar timber; abutments rubble masonry.	Hard clay; piles driven 15′ under the level of river bed.
	No. 20½ do. do. 208.	Do. Mar. 1863.	Skew bridge, angle 55°; arches of brick masonry; the remainder stone.	14′ below nallah bed, on clay.
	,, 19 do. do. 209.	Do. Nov. 1861.	Abutments and piers of stone masonry; superstructure deodar timber; strut and straining beam.	14′ do. ... ...
	,, 18 do. do. 211.	Do. do. ...	Do. do. do. ...	10¾′ do. ... ...
	,, 17 do. do. 212.	Do. June 1859.	Segmental arches, rise 2¾′.	12 do. ... ...
	,, 18½ do. do. 212.	Not known.	Wing-walls and abutments of rubble masonry; superstructure wood-work.	.....

Cost of Bridges &c.—(Continued).

Number and Size of Spans.	Width of Roadway between Parapets or Railings.	Height of Roadway above Foundations or River Bed.	Total length of Bridge.	Total Cost.	Cost per 100 feet of Length.	Remarks.
				RS.	RS.	
Three—middle 104′, shore spans 49′.	6′ between railings or chains. Roadway is only 3′ 3″; arch in standard is 5′ 2″ span; lattice bays have 12″.	21′ from foundation.	228′	Rs. 3,407, putting up suspension bay, lattice bays and piers old, total cost uncertain.	Uncertain.	
1 span 61′ ...	16½′	Above foundation 30′, do. nallah bed 64′.	112′	5,186	4,630	
Clear span 231′; between suspension points 240′.	9′	West side 29′, east do. 9′ above foundation, and 22′ above highest flood level.	281′	81,036	28,833	
Clear span 72′; between suspension points 80′.	Width of roadway 7′, between chains 8′.	Above foundation 24′, do. river bed 38′.	116′	6,988	6,024	
Seven spans 40′ each.	20′	25′ over river bed.	286′	18,874	6,595	
Ten spans 40′ each.	20′	44′	465′	28,390	6,105	
Three spans 20′, on skew 16′ each.	20′	8½′	115′	3,886	3,379	
Two spans 30′ each.	20′	19′	130′	5,376	4,135	
Eight spans 20′ each	20′	12′	204′	9,516	4,664	
Five do. ...	26′	8¼′	171′	9,500	5,555	
One span 28′ ...	20′	11½′	70′	3,422	4,889	

Memorandum of Construction and Cost of Bridges, &c.—(Continued).

Executive Divisions.	Name of Bridge, or of River or Nallah, and Situation.	Date of Completion.	Description of Bridge.	Kind and Depth of Foundation.	Number and Size of Spans.	Width of Roadway between Parapets or Railings.	Height of Roadway above Foundations or River bed.	Total Length of Bridge.	Total Cost.	Cost per 100 feet of Length.	Remarks.
			1ST CIRCLE—(*Continued*).						RS.	RS.	
3rd Division Lahore and Peshawar Road—(Continued).	No. 16 C bridge, mile 213.	Constructed in June 1859.	Segmental arches, 2¾′ rise; arches, spandrills and parapets of brick-work; remainder stone.	12′ below nallah bed, on clay.	Three spans 20′ each.	26′	10′	127′	9,035	7,114	
	„ 17½ do. do. 214.	Not known ...	Arch and parapet walls of brick masonry; wing-walls of rubble masonry.	.....	One span 17′...	26′	9¼′	63′	3,386	5,360	
	„ 16 E do. do. 214.	Do. ...	Wing-walls and pillars of rubble masonry; superstructure wood-work.	.....	Three spans 10′.	24′	9′	66′	2,139	3,241	
	„ 16 do. do. 215.	Constructed in April 1863.	Skew bridge, angle 50°; segmental arches, rise 2·25′; inverts between piers; piers 3′ wide at spring.	Below nallah bed 3′ on clay.	Five spans; skew 15′, direct 10′.	20′	10′	133′	5,414	4,070	
	„ 16 A do. do. 216.	Do. July 1863.	Arch and parapet walls of brick masonry; remainder rubble masonry.	.....	One span 15′...	24′	10½′	62′	3,515	5,669	
	„ 16 B do. do. 216.	Not known ...	Do. do. do. ...	.....	One „ 20′...	24′	9½′	81′	3,394	5,901	
	„ 16 D do. do. 216.	Do. ...	Do. do. do. ...	.....	One „ 20′...	24′	9¼′	81′	7,791	9,619	
	„ 15 do. do. 217.	Constructed in July 1863.	Skew bridge, angle 67°; segmental arches, rise 6·5′; arches, spandrills and parapets of brick masonry; remainder stone.	Below nallah bed 15·5′ on clay.	Five spans; skew 43′, direct 40′.	21·78′	20′	278′	15,400	5,539	
	„ 14 do. do. 218.	Do. June 1859.	Skew bridge, angle 60°; segmental arches, rise 4·75′, of brick masonry; remainder stone; inverts between piers.	Below nallah bed 12′	Three spans; skew 34·64, direct 30′.	26′	Above nallah 15′.	198′	16,870	8,520	
	„ 15½ do. do. 218.	July 1863 ...	Arch and parapet walls of brick masonry; remainder rubble masonry.	.....	One span 15′...	24′	8½′	60′	1,581	2,643	
	„ 13 do. do. 220.	Constructed in Sept. 1855.	Segmental arches of brick masonry, rise 3·35′; remainder stone.	Depth of foundation 13′.	Two spans 25′ each.	26′	Above nallah bed 7·85′.	108′	8,273	7,660	
	„ 13½ do. do. 222.	July 1863 ...	Arch brick masonry; remainder rubble masonry.	.....	One span 15′...	24′	10½′.	64′	3,562	5,564	
	„ 101 do. do. 233.	Constructed in March 1860.	Segmental arches, rise 4½′; width of pier at spring 5′; arches brick masonry; remainder stone masonry.	12′ below nallah bed, on clay.	Five spans 30′ each.	26′	11·75 above nallah bed.	216′	16,024	7,418	
	„ 102 bridge, Khatik nallah, mile 234.	Do. do. ...	Segmental arches, rise 4′; width of piers at spring 4½′; arches brick masonry; the remainder stone masonry.	9′ below nallah on clay.	Three spans 20′ each.	26′	13′ do. ...	125′	3,415	2,732	

Memorandum of Construction and Cost of Bridges, &c.—(Continued).

3rd Division Lahore and Peshawar Road—(*Continued*).

Executive Divisions.	Name of Bridge, or of River or Nallah, and Situation.	Date of Completion.	Description of Bridge.	Kind and Depth of Foundation.	Number and Size of Spans.	Width of Roadway between Parapets or Railings.	Height of Roadway above Foundations or River bed.	Total Length of Bridge.	Total Cost.	Cost per 100 feet of Length.	Remarks.
			1ST CIRCLE—(*Contd.*)						RS.	RS.	
	No. 104 bridge, mile 235.	Constructed in March 1860.	Segmental arches, rise 4½′; width of piers at spring 4′; arches of brick masonry; the remainder stone masonry.	9′ below nallah on clay.	Four spans 25′ each.	26′	14′ above nallah.	180′	11,209	6,227	
	„ 105 do. do. 235.	Do. Feb. 1862.	Strut and straining beam; abutments of stone masonry; piers of deodar timber.	10′ below nallah ...	Two spans 30′ each.	20′	23′ do. ...	136′	7,545	5,547	
	„ 112 do., Badrashi nallah, mile 240.	Do. Mar. 1861.	Trussed deodar beams resting on masonry piers; inverts between piers below nallah bed.	12′ do. ...	Six spans 20′ each.	20′	13′ do. ...	196′	18,330	9,352	
	„ 113 bridge, mile 242.	Do. do. ...	Segmental arches, rise 5′; width of piers 5½′ at spring; arches of brick masonry; remainder of stone masonry.	12′ do. on clay...	Nine spans 30′ each.	20′	16′	364′	12,761	3,530	
	„ 114½ bridge, mile 243.	Do. Sept. 1862.	Segmental arches of brick, rise 1⅔′; thickness of piers at spring 2½′, with stone inverts 1′ thick.	4½′ below nallah ...	Six spans 10′ each.	20′	12′ above nallah.	118′	2,851	2,416	
	„ 117 bridge, Chugian nallah, mile 244.	Do. July 1855.	Segmental arches of stone, rise 2′; thickness of piers 4′ at spring.	53½′	Three spans 20′ each.	26′	12′ do. ...	121′	7,500	6,199	
	„ 118 bridge, mile 244.	Do. Jan. 1860.	Segmental arches, rise 2¾′; arches of brick masonry; width of piers at spring 4′.	7½′ on clay	Four spans 20′ each.	26′	17¾′	146′	8,106	5,552	
	„ 120 do., Mangarh nallah, mile 246.	Do. Nov. 1859.	Segmental arches, rise 4½′; stone masonry; width of piers 5′ at spring.	11′ do.	Three spans 30′ each.	26′	14′	169′	12,436	7,950	
	„ 120½ do., do. ...	Do. Aug. 1863.	Segmental arches, rise 5′; arches of brick masonry; thickness of piers at spring 6′; inverts in each span 1½′ thick; drop walls above and below.	5′ below nallah on clay.	Two spans 30′ each.	20′	12·75′ above nallah bed.	110′	3,655	3,322	
	„ 122 do., Pir Paice nallah, mile 247.	Do. do. ...	Segmental arches, rise 3½′, of brick masonry; the remainder stone; masonry inverts.	9½′ below nallah bed on clay.	Eight spans 20′ each.	20′	12¾′	236′	7,843	3,326	
	„ 123 bridge, Faoli nallah, mile 248.	Do. June 1863.	Segmental arches, rise 5′, of brick masonry; foundations and parapet wall of brick masonry; the remainder stone.	Wells sunk 24 below nallah.	Four spans 30′ each.	20′	12′	184′	12,490	6,728	
	„ 124 bridge, Dalhi Banda nallah, mile 249.	Do. Aug. 1863.	Do. do. ...	Do. 24 below nallah bed.	Seven spans 30′ each.	20′	12′	281′	17,621	6,271	

Memorandum of Construction and Cost of Bridges, &c.—(Continued).

Executive Divisions.	Name of Bridge, or of River or Nallah, and Situation.	Date of Completion.	Description of Bridge.	Kind and Depth of Foundation.	Number and Size of Spans.	Width of Roadway between Parapets or Railings.	Height of Roadway above Foundations or River Bed.	Total length of Bridge.	Total Cost.	Cost per 100 feet of Length.	Remarks.
			1ST CIRCLE—(*Contd.*)						RS.	RS.	
3rd Division Lahore and Peshawar Road—(*Contd.*)	No. 126 bridge, Chamkanda nallah, mile 249.	Constructed in August 1864.	Segmental arches, rise 5', of brick masonry; foundations and parapet wall of brick masonry; the remainder stone.	Wells sunk 24' below nallah bed.	Twelve spans 30' each.	20'	14'	460'	34,432	7,485	
	No. 133 bridge, Bara nallah, mile 260.	Do. July 1863.	Bow-string girders of deodar timber, on brick piers and abutments.	...	Centre span 75' 2 side spans 33' each.	24'	16'	201'	21,108	10,501	
Kohat.	Plinan Alquada bridge, 20th mile, Kohat and Khushalgarh Road.	1866 ...	Pacca, rubble stone in lime; segmental arches and copings brick in lime.	12' deep sandstone ...	Three spans 30' each.	14'	17'	156'	7,840	5,026	
	Tut-ki-Garhi bridge, on Bannu and Dera Ismail Khan Road.	1868 ...	Brick throughout ...	Wells 8' and 6' deep; flooring and curtain blocks 8' and 6' deep.	Five spans 20' each.	15'	13'	170'	12,191	7,171	The flooring and curtain added after bridge was completed, at estimated cost of Rupees 5,030 over the bridge Rupees 7,161, or Rs. 12,191 altogether.

PUBLIC WORKS DEPARTMENT, PUNJAB.

COMPARATIVE COST OF CERTAIN SELECTED BUILDINGS.

[*Compiled August* 1875.]

ABBREVIATIONS.—*P. denotes Pacca; K. P. Kacha Pacca; K Kacha; F. M. Flat Mud; T. Terraced; Pl. Planked; P. T. Pent Tiled; P. S. Pent Slated; P. Sh. Pent Shingled; P. Sp. Sh. Pent Split Shingled; R. Rubble; D. S. Dry Stone; C. Concrete; B. F. Brick Flat; Fl. Flagged; Dhj. Dhajji, i.e., timber frame-work filled in with mud and stone masonry; C. I. 22°. Corrugated Iron 22 B. W. G.; In Inner; O. Outer; Up. Upper; Gr. Ground.*

Division	Locality	Name of Building.	Description and Height of Walls, &c.									Cost.	Area.	Rate per Superficial Foot.
			Single or Double-storeyed.	Foundation.		Plinth.		Walls (to top of wall-plate).		Roof.	Floor.			
					FT.		FT.		FEET.			RS.	SPL. FT.	RS.
Delhi and Umballa Road Div.	Nangloi ...	*Thanah*	Single	...	3½	...	¼	...	12	P. terraced	Kacha.	4,481	3,336	1·338
	Do. ...	*Police rest-house*	"	...	1½	P. R.	2	R.	15	Do.	Do.	3,043	2,603	1·167
	Mahrauli ...	*Police Station*	"	...	2	Do.	1	Pacca.	10¼	Do.	Do.	6,778	4,610	1·469
	Sonepat ...	*Thanah*	"	...	2	...	1	Kacha.	10½	Terraced.	Earthen, rammed.	4,015	4,445	0·901
1st Division U. and L. Road.	Barara ...	Post Office	Single	K. P.	2	None		K.	12	F. M.	Kunkur mud	460	1,390	0·317
	Umballa ...	Solitary cells, Jail	"	K. P.	2½	Do.		K. P.	15	F. M.	M.	12,045	14,917	0·807
	Bilaspur ...	Police Station	"	K. P.	2½	Do.		K.	10	F. M.	M.	2,500	4,282	0·583
	Mirzapur ..	Do.	"	K. P.	2½	Do.		K. P.	10	F. M.	M.	4,205	4,204	1·000
	Sirhind ...	Post Office	"	K. P.	2	Do.		K. P.	12	F. M.	M.	813	1,390	0·583
Hill Roads Division.	Simla ...	Police quarters	Double	D. S.	3	D. S.	2	Dhj.	23	C. I. 22°	Gr. M. Up. Pl. 1".	3,028	805	3·760
	Dagshai ...	Post Office	Single	P.	2½	P.	1	O. P. In. K. P.	9	C. I. 22°	Fl.	3,562	1,069	3·333
	Subathu ...	Do.	"	P.	2½	P.	1	O. P. In. K. P.	9	C. I. 22°	Fl.	3,676	1,069	3·442
	Sanawar ...	Girls' School	"	P.	4	P.	1½	P.	20	P. Sh.	Ver. Fl. In. Pl. 2".	32,375	7,815	4·140
	Dharmpur ...	Inspection Bungalow ...	"	D. S.	2	D. S.	1	D. S.	13	P. Sp. Sh.	T.	1,568	1,401	1·125

Division	Locality	Name of Building.	Single or Double-storeyed.	Foundation.		Plinth.		Walls (to top of wall-plate).		Roof.	Floor.	Cost.	Area.	Rate per Superficial Foot.
Kangra Division.	Sultanpur ...	Tahsil	Single	C.	1½	K. P.	2	K. P.	16	Slated	B. F.	8,083	4,615	1·751
	Nurpur ...	Do.	"	C.	1	K. P.	...	K. P.	15	F. M.	B. F.	4,400	...	...
	Palampur ...	Do.	"	C.	1	P.	2⅓	P.	11	Slated	B. F.	7,717	1,228	6·284
	Dharmsala ...	Thanah	"	C.	1	K. P.	...	K. P.	14	Do.	B. F.	1,500	...	...
	Sujanpur ...	Do.	"	C.	...	K.	2	K.	14	Do.	F. M.	500	1,474	0·339
	Dharmsala ...	Kacheri, Deputy Commissioner's.	"	C.	2⅓	P.	2	P.	14	Do.	B. F.	18,000	10,434	1·725
2nd Divn. U. and L. Road.	Jullandar ...	Small Cause Court	Single	P.	3¼	P.	2¼	P.	14¾ 21½	Flat	B. F.	13,073	4,207½	3·099
	Hoshiarpur ...	Do.	"	...	3	...	2	...	...	Flat	B. F.	7,647	2,679	2·854
	Amritsar ...	Road Bungalow	"	P.	...	P.	1	...	...	F. terraced	B. F.	4,141	55×38¼ =2,103¾	1·969
Gurdaspur Division.	Sialkot ...	Quarter-guard	Single	K. P.	1	K. P.	1	K. P.	12¼	Terraced	Brick flat	870	1,825	0·476
	Do. ...	Magazine	"	P.	2	P.	1¾	P.	9	Do.	Do.	500	594	0·842
	Do. ...	Deputy Inspector's quarters, Police.	"	C.	1½	K. P.	1	K. P.	11½	Mud.	Kacha.	2,278	1,909	1·193
	Do. ...	Twenty solitary cells, Jail...	"	K. P.	2	K. P.	3¾	K. P.	14¾	Terraced.	Do.	8,175	4,071	2·008
	Do. ...	Police Barracks	"	K. P.	1	K. P.	1½	K. P.	12	Mud	Brick flat.	4,164	2,502	1·664
	Gurdaspur ...	Post Office	"	K. P.	2	K. P.	1	K.	11½	B. F. in lime	Terraced	1,195	1,471	0·812
	Pathankot ...	Dāk Bungalow	"	K. P.	3	K. P.	2½	K. P.	15	Do.	Do.	5,005	3,337	1·500
Lahore Division.	Anarkali, Lahore.	Mayo Hospital	Double	C. 3 P. 5	P.	2	Gr. floor Up. floor	17 16		Pent slated	Tiled.	1,40,205	23,224	6·031
	Do. ...	Deputy Commissioner's Kacheri.	Central block double	C. 3 P. 3	P.	2	Gr. floor Up. floor	18 17		Pent tiled.	Do.	1,03,421	32,026	3·234
	Do. ...	Small Cause Court	Single	K. P.	2	K. P.	1½	M. rooms S. rooms	23 17	F. terraced	Brick.	6,000	4,148	1·453
	Do. ...	Financial Commissioner's Office.	"	P.	3	P.	6	M. rooms S. rooms	20 14	Do.	Terraced.	15,000	7,410	2·031
	Do. ...	House for Inspector of Police.	"	C. K.P. 1		K. P.	2	M. rooms S. rooms	18 12	Do.	Do.	4,260	3,435	1·234
	Central Jail, Lahore.	Cells for 100 prisoners ...	"	K.	1	K.	2	Kacha	16	F. M.	Kacha.	9,300	36,480	0·250
	Shekhupura, Gujranwala District.	First-class Police Station ...	"	K. P.	1½	K. P.	1	K. P. Court-room. Others	14 10	F. M.	Do.	3,611	4,252	0·843

COMPARATIVE COST OF CERTAIN SELECTED BUILDINGS—(*Continued*).

ABBREVIATIONS.—*P.* denotes Pacca; K. P. Kacha Pacca; K. Kacha; F. M. Flat Mud; T. Terraced; P. T. Pent Tiled; P. Sh. Pent Shingle; R. Rubble; C. Concrete; F. B. Flat Brick; Unc. Uncoursed.

Division.	Locality.	Name of Building.	Description and Height of Walls, &c.									Cost.	Area.	Rate per Superficial foot.
			Single or double-storied.	Foundation.		Plinth.		Walls (to top of wall-plate).		Roof.	Floor.			
					FT.		FT.		FT.			RS.	SPL. FT.	RS.
Mooltan Division.	Mooltan ...	Debtors' ward	Single	K.	1½	K.	1	K.	16	F. M.	Kacha	1,367	638	2·140
	Do. ...	Sessions' ward	"	K.	1½	K.	1	K.	16	Do.	Do.	1,820	726	2·505
	Do. ...	Christ's Church	"	P.	2	P	2	K. P.	23¾	F. terraced	F. terraced	9,005	2,274	3·950
	Do. ...	Police Court-house	"	K. P.	¾	K. P.	1½	K.	10 & 18	F. M.	Do.	2,985	2,793	1·067
Peraiat Division.	Dera Ismail Khan.	Half-company Barracks for British Infantry, Fort Akalgarh.	Double	P.	4	P.	8	P.	34	Pacca	Pacca	51,000	10,872	4·692
	Do. ...	Commissariat Conductor's quarters, Fort Akalgarh.	Single	P.	2	K. P.	2	K. P.	16¼	Mud	Do.	3,500	2,795	1·250
	Do. ...	Right Native Infantry Lines at Dera Ismail Khan.	"	K.	1½	K.	1½	K.	12	Do.	Kacha	21,711	57,062	0·380
Lahore and Peshawar Road.	Shahpur ...	Police Office	Single	P.	2	P.	2	K. P.	18¼	2nd class	2nd class T.	2,332	3,136	0·661
	Mitha Tiwana.	Do. Station	"	K. P.	1½	K. P.	1	K. P.	14	1st class	Mud	2,935	7,035	0·505
	Kund ...	Sarai	"	P. R.	1	Nil	...	P. R.	10¼	F. M.	Do.	3,291	10,100	0·326
	Mitha Tiwana.	Do.	"	K. P.	1½	Nil	...	K. P.	18¼	1st cl. F.M.	Do.	3,875	48,900	0·064
	Jhelum ...	Sessions' house	"	P. / C.	½ / 1½	K.P.	1	K. P.	17	F. M. & T.	2nd cl. F.B.	6,000	4,169	1·437
	Do. ...	Servants' houses	"	K.	2	Nil	...	K.	12	F. M.	Mud	606	No data	...
	Do. ...	Shed for Witnesses... ...	"	K. P.	2	Nil	...	K. P.	10	F. M.	Do.	608	899	0·675
	Do. ...	Bells-of-Arms	"	... / C.	3 / 1½	Steps	½	...	10	1st class T.	1st class T.	3,653	845	4·322
	Talagang ...	Do.	"	... / C.	3 / 1	Steps	½	...	10	Do. M.	1st class T.	3,176	868	3·656
	Nila	Police Rest-house	"	P. R.	2	P. R.	2	K. R.	16	F. M.	...	1,547	1,403	1·102
	Chailu Jhangi.	Do. Station	"	P. R.	1½	Nil	...	P. R.	9¾	2nd cl. F.M.	Mud	581	1,383	0·419
	Dewal ...	Sarai	"	P. R.	1½	P. R.	1	P. R.	14	F. M.	2nd class T.	2,806	10,696	0·260
	Bagham ...	Police Rest-house	"	K. R.	2	K. R.	1	K. R.	17	F. M.	...	769	2,327	0·329
	Kotli... ...	Do.	"	C.	2	C.	1	K. R.	17	F. M.	2nd class T.	1,547	2,327	0·666
2nd Division.	Rawalpindi ...	Carpet-shed...	"	Unc. / R.	1 / 6	Unc. / R.	1 / ...	R.	12	1st class T.	Earthen	5,366	4,591	1·166
	Do. ...	Quarantine ward	"	Unc. / R.	1 / 6	Unc. / R.	... / 6	K.	16	1st cl. F. M.	Do.	13,706	16,704	0·812
	Do. ...	New Solitary cells	"	C.	2	...	...	K.	13	Do.	Do.	8,641	6,382	1·349
Hazara Division.	Abbott-abad...	Barracks for Drivers, Mountain Battery.	Single	K. P.	2½	P. & K. P.	2	K.	9½	P. Sh.	Kacha	3,085	4,941	0·624
	Do. ...	Married Quarters, Mountain Battery.	"	K. P.	2	K. P. & P.	2½	K.	12½	P. Sh.	Do.	2,974	5,121¼	0·580
	Do. ...	Combined Post and Telegraph Office.	"	P.	2½	P.	3	P.	12	P. Sh.	...	6,371	3,081¼	2·068
	Do. ...	Cook-house, Telegraph Office.	"	K. P.	2½	K. P.	1	K.	10	P. Sh.	Kacha	220	442¼	0·498
	Do. ...	Servants' houses	"	K. P.	2½	K. P.	1¼	K.	12	P. Sh.	Do.	747	1,511½	0·494
	Do. ...	Latrine	"	K. P.	2½	K. P.	2	K.	8	P. Sh.	Do.	107	416	0·257
	Do. ...	Executive Engineer's Godown.	"	P.	2	P.	1	K. P. & P.	12¼	...	Do.	2,922	14,520	0·201
	Do. ...	Mule-sheds, Mountain Battery.	"	K. P.	2	K. P.	¾	K. & P.	10	P. Sh.	Do.	1,173	2,186¼	0·537
	Bagnotar ...	Staging Bungalow	"	P.	2	Nil		Planked and P.	10¾	P. Sh.	Planked and P.	996	651	1·530
	Dungagali ...	Do.	"	P.	4½	Nil		P.	10½	P. Sh.	Do.	...	1,775½	...
	Do. ...	Do.	"	P.	3	Nil		Planked and P.	10½	P. Sh.	Do.	1,136	1,040	1·092
	Do. ...	Servants' houses	"	P.	1½	P.	½	P.	9¼	P. Sh.	Kacha	...	465¾	...
	Mansahra ...	Staging Bungalow... ...	"	P.	2	P.	1	P.	12	P. Sh.	T. and P.	3,300	2,252¼	1·465
	Do. ...	Servants' houses	"	K. P.	1½	Nil		K. P.	9¾	F. M. over dudgie.	Kacha	377	796½	0·474
	Khanpur ...	Thanah	"	P.	3	P.	1¾	P.	10½	F. M. over brick.	T. and P.	7,111	9,054½	0·784
	Haripur ...	Staging Bungalow... ...	"	P.	2	P.	2	P.	16	Do.	Do.	5,007	3,045	1 644
	Do. ...	Cook-house	"	P.	2	P.	2	P.	10	Do.	Do.	322	240¼	1·341
	Do. ...	Servants' houses and Stables.	"	K.	2	K.	½	K.	9	F. M. over dudgie.	Kacha	487	607½	0·802
	Do. ...	Thanah and Tahsil... ...	"	P.	2½ / 4	P.	...	P.	12	F. M. over brick.	P. and K.	23,926	35,516⅛	0 674

COMPARATIVE COST OF CERTAIN SELECTED BUILDINGS—(*Continued*).

ABBREVIATIONS—*P.* denotes Pacca; K. P. Kacha Pacca; K. Kacha; T. Terraced; R. Rubble; C. Concrete; B. F. Brick Flat.

Division.	Locality.	Name of Building.	Description and Height of Walls, &c.									Cost.	Area.	Rate per Superficial foot.
			Single or double-storied.	Foundation.		Plinth.		Walls (to top of wall-plate).		Roof.	Floor.			
					FT.		FT.		FT.			RS.	SPL. FT.	RS.
3rd Division, Lahore and Peshawar Road.	Road Buildings	Peshawar Bungalow ..	Single	K.	2	P.	1¼	K.	20	F. M.	B F.	2,100	1,124	1·868
	Do. ...	Bara "	"	K. P.	6	...	...	K.	19	Do.	C.	1,633	820	1·991
	Do. ...	Dehri "	"	Do	6	...	...	K.	19	Do.	K.	1,484	903	1·643
	Do. ...	Naushahra "	"	Do.	3	...	...	K.	17¼	Do.	C.	1,280	857	1·493
	Do. ...	Akora "	"	Do.	2¼	...	...	K.	16	Do.	C.	820	523	1·568
	Do. ...	Kund "	"	Do.	2½	...	...	K. P.	15½	Do.	K.	850	660	1·288
	Do. ...	Khairabad "	"	Do.	2	K. P.	1	K.	16	Do.	C.	1,500	1,494	1·004
	Do. ...	Gondal "	"	K. B.	...	K. B.	...	...	16½	Matting	K.	750	1,440	0·520
	Do. ...	Hatti "	"	P. R.	...	P. B.	...	...	17	K.	C.	3,500	1,970	1·776
	Do. ...	Haro "	"	K. B.	...	K. B.	...	...	14	K.	K.	1,000	2,040	0·490
	Do. ...	Hasan Abdal "	"	Do.	...	Do.	...	..	14	K. ..	C.	1,000	1,508	0·653
	Do. ...	Jani-ka-Sang "	"	K. R.	...	...	...	K.	16	T. R.	P. P.	1,500	3,192	0·469
	Do. ...	Chelojhangi "	"	P. R.	2	P. R.	...	P. R.	16	P. R.	P. P.	1,500	1,440	1·046
	Campbellpur...	Public Works "	"	K. R.	...	K. R.	...	K. R.	16	M. M.	B. M.	1,500	2,164	0·691
	Attock ...	Post Office	"	K. R.	...	K. R.	12	K. R.	...	M. M.	P. P.	800	957	0·833
	Campbellpur...	Do.	"	K. B.	...	K. B.	10	K. B.	...	M. M.	K.	...	660	...
	Peshawar ...	Do.	"	K. P.	1	K. P.	1	K.	16½	M. M.	P. F.	13,000	5,880	2·211
	Do. ...	Telegraph Office	"	K.	1	...	...	K.	20, 17 & 11	M. M.	P. T.	5,000	5,328	0·938
	Mardan ...	Post Office	"	P.	...	P.	...	K. P.	...	Kacha	396 P. 460 K.	973	8,536	0·113
	Peshawar ...	Dy. Commissioner's Court...	"	P.	2	P.	5	P.	22 & 16	T.	P. T.	22,300	6,768	3·295
	Do. ...	Commissioner's Court ...	"	P.	2	P.	5	P.	22 & 16	T.	P. T.	9,997	3,936	2·539
	Do. ...	Small Cause Court	Double	P.S.M.	1	P.	3	K.&K.P.	17, 15 & 12	M. M.	P. T.	3,900	11,765	0·331
	Do. ...	Old Residency	"	P.	1	...	...	P.	31	T.	T.	28,021	8,549	3·277
	Do. ...	Kacheri Havalat	Single	K. P.	1	..	...	K.	13	M. M.	...	1,743	2,916	...
	Do. ...	Jail	"	K.	1	K.	1	K.	15, 13, 10, 25 & 27	M. M.	K.	19,543	379,925	0·051
	Do. ...	Jail Havalat	"	K.	1	K.	1	K.	13 & 17	M. M.	K.	12,887	63,002	0·204
Kohat Division.	Bannu ...	Outpost Barganattu ...	Towers Double	R.	2 to 5	R.	2 to 4	R.	12 to 30	F. M.	B. F.	12,727	Not measurable; open area.	0·666
	Kohat ...	Quarter-guard, Store-room and Cells.	Single	R.	...	R.	...	R.	14	F. M.	B. F.	2,752	2,805	0·981
	Do. ...	Reserve Police Barracks ...	"	R.	2	R.	...	K.	12	F. M.	Mud	3,946	7,688	0·513
	Do. ...	Hangu Thanah	"	R.	2	R.	1	K.	12	F. M.	Mud	3,394	4,236	0·801
	Do. ...	Magazines for Infantry ...	"	C.	2	P. B.	3	P. B.	14 to crown.	Domed	B. F.	1,264	352	3·591

No. 6. ORDER THEREON, 1st June 1877, No. 179 W.

COMMUNICATED to all District Engineers who will compile and submit the return of selected bridges and buildings called for as early as practicable.

(True Extract.)

Colonel, R.E.,
Secretary to Government, P.W.D.

To District Engineers.

Exd. T. D. Ryan, pp. 1—19.
" T. O'Connor, pp. 20—24.
Spare Copies.

MEMORANDUM

OF

CONSTRUCTION AND COST

OF

BRIDGES EXCEEDING 50 FEET IN LENGTH

IN THE

PUNJAB.

LAHORE,
PUBLIC WORKS DEPARTMENT PRESS,
APRIL 1877.

200—1-4-77.

MEMORANDUM OF CONSTRUCTION AND COST OF BRIDGES EXCEEDING 50 FEET IN LENGTH IN THE PUNJAB.

Executive Divisions.	Name of bridge, or of river or nallah, and situation.	Date of completion.	Description of Bridge.	Kind and depth of foundation.	No. and size of spans.	Width of roadway between parapets or railings.	Height of roadway above foundations or river bed.	Total length of bridge.	Total cost.	Cost per 100 feet of length.	Remarks.
			2nd CIRCLE.						Rs	Rs.	
Delhi.	Salimgarh bridge ..	March 1870 ..	Rubble foundations; coursed rubble superstructure, with brick arches and cut sandstone cornice, string courses, caps to piers and dressings.	Rubble masonry on rock 7′ to 8′ deep.	Three arches, each 44′ 2″ span.	18′	36′	178′	39,003	21,912	
Hill Roads.	Harripur bridge, over Gambar River, on Simla and Subáthu Road.	Completed in 1846	Iron suspension bridge on stone masonry piers.	Stone masonry; probable depth 20′	One span 114′	6′	10′	114′, and with back chains 202′.	21,718	11,933	
	Kalka bridge ..	..	Stone masonry ..	Stone masonry, averaging 3′ in depth.	Spans 50′ each	16′	19′	128′	19,935	15,574	
	Jabli bridge ..	..	Ditto ..	Ditto ..	Ditto	Ditto	Ditto	About 112′	18,413	16,440	
	Wángti bridge, over the Sutlej, 120th mile, Hindustán and Tibet Road.	May 1864 ..	Wooden bridge, deodár throughout. Cantilevers projecting 40′ from either abutment, opening in the centre spanned by a 40′ diagonally braced girder. Abutments, dry stone.	Dry stone masonry on rock foundations.	120′	10′	33′ above foundation; 90′ above bed of river.	210′	9,786	4,660	
	Nágri bridge ..	November 1869..	Timber distant; first bay American trussed girder.	Rock ..	2 spans— 1 span 44′ 1 „ 26′	8′	23′	80′	2,000	2,500	
	Kashang bridge ..	May 1868 ..	Timber on spot; cantilever bridge ..	Rock, granite ..	{1 span 37′ 1 „ 42′}	8′	20′	94′	790	840	
	Choya nallah bridge, Jagádhri Road.	..	Wooden bridge, strut and straining beam.	Piles driven 12′ below bed.	Three spans 30′	18′ 1″	13′	114′	5,136	4,500	
	Baitam nallah bridge, ditto	..	Ditto ditto ..	Ditto ..	Ditto ..	18′	13′	114′	5,130	4,500	
	Chittang nallah bridge, ditto	..	Ditto ditto ..	Foundations 9′; piles driven 17′ below bed.	Five spans 30′ each.	18′	14′	177′	8,500	4,802	
	Western Jumna Canal bridge on Jagádhri Road.	1873	Brick piers and abutments, timber superstructure on trussed beams.	4′ wells 17′ deep ..	Six arches 40′ span each.	16′	27′	315′	15,898	5,047	
1st Division Umballa and Lahore Road.	Mútásúti nallah ..	Completed in 1865.	Masonry bridge; segmental arches ..	Masses of concrete, with inverts under large arches.	Three spans 30′, ten spans 15′ each.	26′	18′ 6″	332′ 8″	45,413	13,651	
	Márkanda bridge, 109th mile, Grand Trunk Road.	Completed in 1868	Masonry bridge; elliptical arches; all 9′ rise.	Piers and abutments on wells 7′ diameter, sunk from 15′ to 17′ below bed, and filled in with concrete; curtain walls 5′, and concrete tail piece 50′ long 2′ thick, ending in curtain wall of wells 22′ deep.	Seventeen spans 40′ each. Ten spans 36½′, two spans 10′ each.	23′ curbs 25′ parapets	24′ 9″ above concrete floors.	1398′	4,94,261	35,355	
	Gaggar bridge, 123rd mile, Grand Trunk Road.	Built in 1867 ..	Brick masonry; elliptical arches ..	Wells 20′ deep ..	Ten arches 42′ span each.	22′	36′	613′	2,70,437	44,117	
	Rájpura nallah bridge, 137th mile.	Do. 1856 ..	Ditto segmental arches ..	Solid masonry, 4′ deep.	Twenty-five arches 16′ span.	27′	13¼′	621′	21,440	3,452	
	Bridge No. 389, in 146th mile	Do. 1857 ..	Ditto ditto ditto ..	4′ concrete 5′ masonry.	Five arches 20′ span each.	27′	17′	198¼′	17,718	8,948	
	„ „ 415, in 155th „	Do. 1855 ..	Ditto ditto ditto ..	5′ concrete, 7′ masonry.	Four arches 25′ span each.	27′	19½′	209½′	20,961	10,029	
	Budha Sutlej bridge, 193rd mile.	Do. 1854 ..	Brick masonry, with flooring and drop walls above and below bridge.	Wells 30′ deep	Seven arches 30′ span each.	27′	17¼′	312′	57,141	18,314	

MEMORANDUM OF CONSTRUCTION AND COST OF BRIDGES—*continued.*

Executive Divisions.	Name of bridge, or of river or nallah, and situation.	Date of completion.	Description of Bridge.	Kind and depth of foundation.	No. and size of spans.	Width of roadway between parapets or railings.	Height of roadway above foundations or river bed.	Total length of bridge.	Total cost.	Cost per 100 feet of length.	REMARKS.
			2nd CIRCLE—*concluded.*						Rs.	Rs.	
2nd Dn. Umballa and Lahore Road.	Akvi nallah causeway, 242nd mile, Grand Trunk Road.	1873 ..	Brick masonry, with flooring ..	Wells 25′ deep ..	Five spans 10′ each.	18′	7′	850′	14,130	832	Submerged during floods.
	West Beyn bridge, 243rd mile, Grand Trunk Road.	1870 ..	Brick masonry ..	„ 36′ „ ..	3 spans 40′ each	18′	22′	130′	75,000	28,844	
	Ramidi Dhâb nallah causeway, 244th mile, Grand Trunk Road.	1873 ..	Brick masonry, with flooring ..	„ 10′ „ ..	3 „ 10′ „	18′	7′	920′	13,853	753	Ditto ditto.
	Hambowál nallah causeway, 245th mile, Grand Trunk Road.	1873 ..	Ditto, ditto ..	„ 15′ „ ..	5 „ 10′ „	18′	7′	725′	13,511	931	Ditto ditto.
			3rd CIRCLE.								
	Nigúl bridge ..	1869 ..	Stone masonry abutments, with brick segmental arch; rise 28 feet. Depth of key-stone 5′ 6″; thickness of arch at springing 7 feet; parapets brick, with stone copings.	Right abutment founded on solid sand rock. Left abutment on boulders well rammed with concrete 15½′ below bed of river.	One span 126′	12′	60′	280′	64,739	23,121	
	Bonair bridge ..	1871 ..	Ditto ditto ditto; parapets ashlar open work.	Right abutment on boulders and concrete, 18′ below bed of river. Left abutment on conglomerate rock, 12′ above river bed.	„ 140′	13′ 6″	58′	280′	68,422	24,436	
	Ban Ganga bridge ..	1875 ..	Warren girder bridge ..	Both abutments founded on conglomerate rock.	„ 85′	12′	80′	156′	22,683	15,181	
Kángra.	Chaitru bridge ..	1875 ..	Stone masonry; rock-faced abutments, with cut stone and segmental arch; granite string courses and keys; parapets dressed ashlar open work.	Right abutment on conglomerate rock 10′ above river bed. Left abutment 16′ below bed, on large boulders and concrete.	„ 90′	13′	45′	170′	29,165	17,156	
	Kauli bridge ..	1874 ..	Temporary wire-rope suspension bridge	Right abutment dry masonry. Left abutment huge boulders.	„ 102′	8′	14′	130′	530	408	
	Seon bridge ..	1875 ..	Three semi-circular arches, stone masonry; abutments of rubble faced with ashlar; two piers of ashlar faces and rubble hearting, with through bonds every 4 feet.	Abutment and piers all founded on conglomerate rock, averaging from 8 to 20 feet above river bed.	Three spans 25′ each.	13′	58′	150′	17,538	11,692	
	Bháli bridge ..	1872 ..	Rubble masonry abutments and ashlar segmental arches, 12 feet rise, with dressed stone parapets and ashlar copings.	Right abutment on sandstone rock level with river bed. Left abutment 8′ below bed, on rock.	One span 60′	12′	33′	122′	12,050	9,877	

MEMORANDUM OF CONSTRUCTION AND COST OF BRIDGES—*continued.*

Executive Divisions.	Name of bridge, or of river or nallah, and situation.	Date of completion.	Description of Bridge.	Kind and depth of foundation.	No. and size of spans.	Width of roadway between parapets or railings.	Height of roadway above foundations or river bed.	Total length of bridge.	Total cost.	Cost per 100 feet of length.	REMARKS.
			3rd CIRCLE—*concluded.*						Rs	Rs	
Kángra—concluded.	Brál bridge ..	1873 ..	Rubble masonry abutments, with cut stone facings; ashlar arch, rise 16′ 6″. Wheel guards ashlar blocks; and parapets with iron bars running through cast standards.	Both abutments on sandstone rock level with river bed.	One span 84′	12′	47′	168′	14,786	8,801	
	Dehri bridge ..	1875 ..	Deodár timber arches, with roadway suspended by vertical posts and wrought-iron rods, a lattice stiffening girder being added. The bows are of timber, and lattices of wrought-iron bars; roadway carried on deodár beams 10″ × 8″ spaced, 3′ centre roadway of 5″ planks covered with water-proof composition.	Left abutment on conglomerate and sandstone rock 10′ above river bed. Right abutment founded on concrete, laid 18 feet below bed.	„ 214′	12′	24′	264′	83,218	31,518	
Gurdáspur.	Bathu bridge ..	1851 ..	Stone throughout ..	Sandstone rock ..	Two „ 80′ Two spans 37′ each.	12½′	58′	288′	16,516	10,724	An old bridge, constructed by the late Sir Donald McLeod.
	Bhed nallah bridge, south of Sadr Bazár, Siálkot.	..	Brick masonry ..	Brick-work 4′ 3″ deep	Three spans 20′ each. Two spans 6′ each.	20′	14′ 9″	128′ 6″	4,236	3,309	
Lahore.	Deg nallah bridge ..	Completed in 1868-69.	Timber bridge, strut and straining beam trusses; brick masonry abutments and timber piers.	Wells 21′ deep for the abutments; and piles 20′ deep for the piers.	Three openings 40′ each.	14′	28′	142′	11,500	8,099	
	Bhaid nallah bridge ..	Do. do. ..	Ditto ditto ditto ditto	Wells 20′ deep for abutments; and piles 18′ deep for piers.	Ditto	14′	20′	142′	10,320	7,268	
	Six bridges of 5 arches over minor nallahs on Lahore and Pindi Bhatián Road.	Do. do. ..	Brick masonry, with brick-on-edge floor	Brick masonry 4′ deep	Five spans 12′ each.	14′	7′	106′ each bridge.	2,912	2,747	
	Drain bridge on Grand Trunk Road, outside the Taxáli gate of city of Lahore.	Do. 1864 ..	Ditto ditto, but without floor	Ditto ditto ..	Fifteen spans 12′ each.	20′	7½′	238′	7,500	3,277	
	Bridge over nallah to the north of Fort Lahore.	Do. do. ..	Brick masonry ..	Wells 20′ deep ..	Three spans 40′ each.	20′	22′	188′	35,023	18,630	
	Bridge of three arches on road from Central Jail to new Female Penitentiary at Lahore.	1874 ..	Brick masonry with brick-on-edge floor	Wells 22′ deep ..	Three spans 20′ each.	12′	21′	140′	10,432	7,452	
			1st CIRCLE.								
1st Div. Lahore and Peshawar Road.	17th mile bridge .. .. 18th „ .. .. 20th „ .. .. Pid nallah	Built in 1862..	Timber superstructure, strut and straining beam; masonry piers and abutments, with inverts and drop walls.	Inverts 1½′ thick level with nallah bed; drop wall 3′ and 4′ below inverts.	Six spans 30′ .. Five ditto .. Four ditto .. Seven ditto ..	18′ 18′ 18′ 18′	17·9′ 18·0′ 17·6′ 21·0′	180′ 150′ 120′ 210′	6,591 7,241 7,141 13,468	3,662 4,827 5,951 6,413	
	Nangal Duna Singh bridge ..	Do. in 1869 ..	Timber strut and straining beam; piers of deodár timber; abutments brick.	Piers on piles driven 20′; abutments on wells 15′ deep.	Three spans 40′	14′	30′	122′	16,701	13,689	
	Bág Bacha bridge	Ditto ..	Timber strut and straining beam; timber piers.	..	Five „ 35′	18′	39·4′	175′	22,419	12,814	
	86th mile bridge	Built in 1862 ..	Timber strut and straining beam; masonry piers.	..	Four „ 30′	18′	24′	120′	8,232	6,680	

MEMORANDUM OF CONSTRUCTION AND COST OF BRIDGES—*continued.*

Executive Divisions.	Name of bridge, or of river or nallah, and situation.	Date of completion.	Description of Bridge.	Kind and depth of foundation.	No. and size of spans.	Width of roadway between parapets or railings.	Height of roadway above foundations or river bed.	Total length of bridge.	Total cost.	Cost per 100 feet of length.	REMARKS.
			3rd CIRCLE—*concluded.*						Rs	Rs	
Kángra—concluded.	Brál bridge ..	1873 ..	Rubble masonry abutments, with cut stone facings; ashlar arch, rise 16′ 6″. Wheel guards ashlar blocks; and parapets with iron bars running through cast standards.	Both abutments on sandstone rock level with river bed.	One span 84′	12′	47′	168′	14,786	8,801	
	Dehri bridge ..	1875 ..	Deodár timber arches, with roadway suspended by vertical posts and wrought-iron rods, a lattice stiffening girder being added. The bows are of timber, and lattices of wrought-iron bars; roadway carried on deodár beams 10″ × 8″ spaced, 3′ centre roadway of 3″ planks covered with water-proof composition.	Left abutment on conglomerate and sandstone rock 10′ above river bed. Right abutment founded on concrete, laid 18 feet below bed.	,, 214′	12′	24′	264′	83,218	31,518	
Gurdáspur.	Bathu bridge ..	1851 ..	Stone throughout ..	Sandstone rock ..	Two ,, 80′ Two spans 37′ each.	12½′	58′	288′	16,516	10,724	An old bridge, constructed by the late Sir Donald McLeod.
	Bhed nallah bridge, south of Sadr Bazár, Siálkot.	..	Brick masonry ..	Brick-work 4′ 3″ deep	Three spans 20′ each. Two spans 6′ each.	20′	14′ 9″	128′ 6″	4,236	3,309	
Lahore.	Deg nallah bridge ..	Completed in 1868-69.	Timber bridge, strut and straining beam trusses; brick masonry abutments and timber piers.	Wells 21′ deep for the abutments; and piles 20′ deep for the piers.	Three openings 40′ each.	14′	28′	142′	11,500	8,099	
	Bhaid nallah bridge ..	Do. do. ..	Ditto ditto ditto ditto	Wells 20′ deep for abutments; and piles 18′ deep for piers.	Ditto	14′	20′	142′	10,320	7,268	
	Six bridges of 5 arches over minor nallahs on Lahore and Pindi Bhatián Road.	Do. do. ..	Brick masonry, with brick-on-edge floor	Brick masonry 4′ deep	Five spans 12′ each.	14′	7′	106′ each bridge.	2,912	2,747	
	Drain bridge on Grand Trunk Road, outside the Taxáli gate of city of Lahore.	Do. 1864 ..	Ditto ditto, but without floor	Ditto ditto ..	Fifteen spans 12′ each.	20′	7½′	238′	7,500	3,277	
	Bridge over nallah to the north of Fort Lahore.	Do. do. ..	Brick masonry ..	Wells 20′ deep ..	Three spans 40′ each.	20′	22′	188′	35,023	18,630	
	Bridge of three arches on road from Central Jail to new Female Penitentiary at Lahore.	1874 ..	Brick masonry with brick-on-edge floor	Wells 22′ deep ..	Three spans 20′ each.	12′	21′	140′	10,432	7,452	
			1st CIRCLE.								
1st Div. Lahore and Peshawar Road.	17th mile bridge .. .. 18th ,, ... 20th ,, ... Pid nallah	Built in 1862..	Timber superstructure, strut and straining beam; masonry piers and abutments, with inverts and drop walls.	Inverts 1½′ thick level with nallah bed; drop wall 3′ and 4′ below inverts.	Six spans 30′ .. Five ditto .. Four ditto .. Seven ditto ..	18′ 18′ 18′ 18′	17·9′ 18·0′ 17·6′ 21·0′	180′ 150′ 120′ 210′	6,591 7,241 7,141 13,468	3,662 4,827 5,951 6,413	
	Nangal Duna Singh bridge ..	Do. in 1869 ..	Timber strut and straining beam; piers of deodár timber; abutments brick.	Piers on piles driven 20′; abutments on wells 15′ deep.	Three spans 40′	14′	30′	122′	16,701	13,689	
	Bág Bacha bridge	Ditto ..	Timber strut and straining beam; timber piers.	..	Five ,, 35′	18′	39·4′	175′	22,419	12,811	
	86th mile bridge	Built in 1862 ..	Timber strut and straining beam; masonry piers.	..	Four ,, 30′	18′	24′	120′	8,232	6,680	

MEMORANDUM OF CONSTRUCTION AND COST OF BRIDGES—*continued.*

Executive Divisions.	Name of bridge, or of river or nallah, and situation.	Date of completion.	Description of Bridge.	Kind and depth of foundation.	No. and size of spans.	Width of roadway between parapets or railings.	Height of roadway above foundations or river bed.	Total length of bridge.	Total cost.	Cost per 100 feet of length.	REMARKS.
			1st CIRCLE—*continued.*						Rs	Rs	
1st Dn. L. & P. Road.	Bhimbar bridge	Built in 1868 ..	Masonry abutments and wings; piers and abutments of deodár timber.	Piers on piles, 20′ deep; abutments on wells 19′ deep.	Twenty-two spans 40′ each.	20′	14′	901′	1,15,629	12,847	Expenditure includes tree-spur, which cost Rs. 4,831, and excavating a new channel 200′ broad, filling in old channel; also an earthen spur 2000′ long, and a masonry water-wing 300′ long on wells.
Rawalpindi.	Leh nallah, near Sadr Bazár, Ráwalpindi.	August 1870 ..	Brick masonry; three elliptical arches	Pacca rubble masonry on good clay, at 16′ deep.	Three spans 63′ each.	20′	40′ above bed of river.	315′	58,790	18,663	
2nd Division Lahore and Peshawar Road.	Dína bridge, mile 112 ..	Ditto ..	Brick masonry	Wells and hollow blocks 24′ deep.	Ten spans 40′ each.	20′	42′ above foundations.	727′	1,11,618	15,353	
	Bakrála bridge, mile 120 ..	September 1866..	Masonry abutments, pile piers; deodár superstructure of strut, straining beam and tie beams.	Piles 28′ deep ..	Twelve „ 40′ each.	20′	47′ ditto ..	570′	39,501	6,930	
	Bishandaur bridge	October 1863 ..	Masonry abutments and piers; deodár superstructure of strut and straining beam.	Solid masonry 12′ deep	Three „ 60′ each.	20′	52′ ditto ..	285′	18,389	6,452	
	Bhag Khan bridge	Not traceable ..	Ditto ditto ditto ..	Ditto 8′ feet ..	Eight „ 40′ each.	20′	32′ ditto ..	353′	19,638	5,563	
	Sohan bridge, mile 163 ..	February 1871 ..	Masonry abutments and piers, arches of brick-work.	Solid masonry, varying from 17′ to 30′ deep.	Fifteen spans 63′ each.	26′	Varies from 62¼ to 75′ above foundations.	1199′	5,51,879	46,028	
	Leh bridge	October 1870 ..	Masonry abutments and piers; deodár superstructure, strut & straining beam.	Solid masonry 16′ deep	Six spans 40′ each.	26′	70′ above foundations.	332′	48,681	14,663	
	Purdon's bridge at Khewra, near Pind Dádan Khan.	1858 ..	Stone masonry abutments and piers, arches of brick-work.	Stone masonry 2½′ deep.	Three spans 50′ each.	20′	20′ ditto ..	350′	19,844	5,670	
Hazára.	Garhi bridge, over the Nainsukh, at Garhi Habíbulla Khan.	August 1862 ..	Iron suspension in the centre; lattice on the two shore bays. Pacca masonry piers, abutments and standards. Vertical drop-bars V. Sin. 9′ 2″.	Masonry 2′ deep, on rock.	Three—middle 104′, shore spans 49′.	6′ between railings or chains. Roadway is only 3′ 3″; arch in standard is 5′ 2″ span; lattice bays have 12″.	21′ from foundation.	228′	Rs. 3,407, putting up suspension bay, lattice bays and piers old, total cost uncertain.	Uncertain.	
	Kot Kay bridge, in 64th mile, Hazára Trunk Road.	..	Wooden strut and strain	On rock, average depth 2′.	1 span 61′ ..	16½′	Above foundation 30′, ditto nallah bed 64′.	112′	5,186	4,630	
	Bridge over the Jhelum river at Kohála, on Murree and Kashmir Road.	1873 ..	Iron suspension bridge, masonry piers	On west side 10′, on east side 6′ in rock.	Clear span 231′; between suspension points 240′.	9′	West side 29′, east ditto 9′ above foundation, and 22′ above highest flood level.	281′	81,036	28,833	
	Kanair Kass bridge, on Murree and Kashmir Road.	..	Suspension bridge, with masonry piers; width of roadway 7′, suspension chains 1½″ diameter, with vertical drop-bars.	Rubble masonry 4′ on rock.	Clear span 72′; between suspension points 80′.	Width of roadway 7′, between chains 8′.	Above foundation 24′, ditto river bed 38′.	116′	6,988	6,024	
3rd Dn. L. and P. Road.	Chablát bridge, mile 206 ..	Constructed in 1861.	Wooden pile bridge; timber girders trussed by timber straining piers and struts; pile piers diagonally braced; timber deodár; masonry abutments and wing-walls.	Piles driven 22′ below the bed of river.	Seven spans 40′ each.	20′	25′ over river bed.	286	18,874	6,595	

MEMORANDUM OF CONSTRUCTION AND COST OF BRIDGES—*continued.*

Executive Divisions.	Name of bridge, or of river or nallah, and situation.	Date of completion.	Description of Bridge.	Kind and depth of foundation.	No. and size of spans.	Width of road-way between parapets or railings.	Height of road-way above foundations or river bed.	Total length of bridge.	Total cost.	Cost per 100 feet of length.	REMARKS.
									Rs	Rs	
			1st CIRCLE—*continued.*								
3rd Division Lahore and Peshawar Road—continued.	Haro bridge, mile 204 ..	Constructed in November 1863.	Piers and superstructure deodár timber; abutments rubble masonry.	Hard clay; piles driven 15′ under the level of river bed.	Ten spans 40′ each.	20′	44′	465′	28,390	6,105	
	No. 20½ do., do. 208 ..	Do. March 1863	Skew bridge, angle 55°; arches of brick masonry; the remainder stone.	14′ below nallah bed, on clay.	Three spans 20′, on skew 16′ each.	20′	8½′	115′	3,886	3,379	
	„ 19 do., do. 209 ..	Do. Nov. 1861 ..	Abutments and piers of stone masonry; superstructure deodár timber; strut and straining beam.	14′ ditto ..	Two spans 30′ each.	20′	19′	130′	5,376	4,135	
	„ 18 do., do. 211	Do. do. ..	Ditto ditto ditto ..	10¾′ ditto ..	Eight spans 20′ each.	20′	12′	204′	9,516	4,664	
	„ 17 do., do. 212 ..	Do. June 1859 ..	Segmental arches, rise 2¾′	12′ ditto ..	Five ditto ..	26′	8¼′	171′	9,500	5,555	
	„ 18½ do., do. 212 ..	Not known ..	Wing-walls and abutments of rubble masonry; superstructure wood-work.	..	One span 28′ ..	20′	11½′	70′	3,422	4,889	
	„ 16C do., do. 213 ..	Constructed in June 1859.	Segmental arches, 2¾′ rise; arches, spandrills and parapets of brick-work; remainder stone.	12′ below nallah bed, on clay.	Three spans 20′ each.	26′	10′	127′	9,035	7,114	
	„ 17½ do., do. 214 ..	Not known ..	Arch and parapet walls of brick masonry; wing-walls of rubble masonry.	..	One span 17′ ..	26′	9¼′	63′	3,386	5,360	
	„ 16E do., do. 214 ..	Ditto ..	Wing-walls and pillars of rubble masonry; superstructure wood-work.	..	Three spans 10′	24′	9′	66′	2,139	3,241	
	„ 16 do., do. 215 ..	Constructed in April 1863.	Skew bridge, angle 50°; segmental arches, rise 2·25′; inverts between piers; piers 3′ wide at spring.	Below nallah bed 3′ on clay.	Five spans; skew 15′, direct 10′.	20′	10′	133′	5,414	4,070	
	„ 16A do., do. 216 ..	Do. July 1863 ..	Arch and parapet walls of brick masonry; remainder rubble masonry.	..	One span 15′ ..	24′	10½′	62′	3,515	5,669	
	„ 16B do., do. 216 ..	Not known ..	Ditto ditto ditto ..	..	One „ 20′ ..	24′	9½′	81′	3,394	5,901	
	„ 16D do., do. 216 ..	Ditto ..	Ditto ditto ditto ..	..	One „ 20′ ..	24′	9¼′	81′	7,791	9,619	
	„ 15 do., do. 217 ..	Constructed in July 1863.	Skew bridge, angle 67°; segmental arches, rise 6·5′; arches, spandrills and parapets of brick masonry; remainder stone.	Below nallah bed 15·5′ on clay.	Five spans; skew 43′, direct 40′.	21·78′	20′	278′	15,400	5,539	
	„ 14 do., do. 218 ..	Do. June 1859 ..	Skew bridge, angle 60°; segmental arches, rise 4·75′, of brick masonry; remainder stone; inverts between piers.	Below nallah bed 12′	Three spans; skew 34·64, direct 30′.	26′	Above nallah 15′.	198′	16,870	8,520	
	„ 15½ do., do. 218 ..	July 1863 ..	Arch and parapet walls of brick masonry; remainder rubble masonry.	..	One span 15′ ..	24′	8½′	60	1,581	2,643	
	„ 13 do., do. 220 ..	Constructed in Sept. 1855.	Segmental arches of brick masonry, rise 3·35′; remainder stone.	Depth of foundation 13′.	Two spans 25′ each.	26′	Above nallah bed 7·85′.	108′	8,273	7,660	
	„ 13½ do., do. 222 ..	July 1863 ..	Arch brick masonry; remainder rubble masonry.	..	One „ 15′ ..	24′	10½′	64′	3,562	5,564	
	„ 101 do., do. 233 ..	Constructed in March 1860.	Segmental arches, rise 4½′; width of pier at spring 5′; arches brick masonry; remainder stone masonry.	12′ below nallah bed, on clay.	Five spans 30′ each.	26′	11·75′ above nallah bed.	216′	16,024	7,418	
	„ 102 bridge, Khatík nallah, mile 234.	Do. do. ..	Segmental arches, rise 4′; width of piers at spring 4½′; arches brick masonry; the remainder stone masonry.	9′ below nallah on clay	Three spans 20′ each.	26′	13′ ditto ..	125′	3,415	2,732	

MEMORANDUM OF CONSTRUCTION AND COST OF BRIDGES—*concluded*.

Executive Divisions.	Name of bridge, or of river or nallah, and situation.	Date of completion.	Description of Bridge.	Kind and depth of foundation.	No. and size of spans.	Width of roadway between parapets or railings.	Height of roadway above foundations or river bed.	Total length of bridge.	Total cost.	Cost per 100 feet of length.	REMARKS.
			1st CIRCLE—*concluded.*						Rs.	Rs.	
3rd Division Lahore and Peshawar Road—concluded.	No. 104 bridge, mile 235 ..	Constructed in March 1860.	Segmental arches, rise 4½′; width of piers at spring 4′; arches of brick masonry; the remainder stone masonry.	9′ below nallah on clay	Four spans 25′ each.	26′	14′ above nallah.	180′	11,209	6,227	
	No. 105 do., do. 235 ..	Do. Feby. 1862..	Strut and straining beam; abutments of stone masonry; piers of deodár timber.	10′ below nallah ..	Two spans 30′ each.	20′	23′ ditto ..	136′	7,545	5,547	
	No. 112 do., Badráshi nallah, mile 240.	Do. March 1861..	Trussed deodár beams resting on masonry piers; inverts between piers below nallah bed.	12′ ditto ..	Six spans 20′ each.	20′	13′ ditto ..	196′	18,330	9,352	
	No. 113 bridge, mile 242 ..	Do. do. ..	Segmental arches, rise 5′; width of piers 5½′ at spring; arches of brick masonry; remainder of stone masonry.	12′ ditto on clay.	Nine spans 30′ each.	20′	16′	364′	12,761	3,530	
	No. 114½ bridge, mile 243 ..	Do. Sept. 1862 ..	Segmental arches of brick, rise 1⅞′; thickness of piers at spring 2½′, with stone inverts 1′ thick.	4½′ below nallah ..	Six spans 10′ each.	20′	12′ above nallah.	118′	2,851	2,416	
	No. 117 bridge, Chúgián nallah, mile 244.	Do. July 1855 ..	Segmental arches of stone, rise 2′; thickness of piers 4′ at spring.	53¼′ ..	Three spans 20′ each.	26′	12′ ditto ..	121′	7,500	6,199	
	No. 118 bridge, mile 244 ..	Do. Jany. 1860..	Segmental arches, rise 2⅞′; arches of brick masonry; width of piers at spring 4′.	7¼′ on clay ..	Four spans 20′ each.	26′	17¾′	146′	8,106	5,552	
	No. 120 do., Mangarh nallah, mile 246.	Do. Nov. 1859 ..	Segmental arches, rise 4½′; stone masonry; width of piers 5′ at spring.	11′ do. ..	Three spans 30′ each.	26′	14′	169′	12,436	7,950	
	No. 120½ do., do. ..	Do. Augt. 1863..	Segmental arches, rise 5′; arches of brick masonry; thickness of piers at spring 6′; inverts in each span 1½′ thick; drop walls above and below.	5′ below nallah on clay	Two spans 30′ each.	20′	12·75′ above nallah bed.	110′	3,655	3,322	
	No. 122 do., Pír Paice nallah, mile 247.	Do. do. ..	Segmental arches, rise 3½′, of brick masonry; the remainder stone; masonry inverts.	9¼′ below nallah bed on clay.	Eight spans 20′ each.	20′	12⅝′	236′	7,843	3,326	
	No. 123 bridge, Faoli nallah, mile 248.	Do. June 1863 ..	Segmental arches, rise 5′, of brick masonry; foundations and parapet wall of brick masonry; the remainder stone.	Wells sunk 24′ below nallah.	Four spans 30′ each.	20′	12′	184′	12,490	6,728	
	No. 124 bridge, Dalhi Banda nallah, mile 249.	Do. Augt. 1863..	Ditto ditto ditto ..	Do. 24′ below nallah bed.	Seven spans 30′ each.	20′	12′	281′	17,621	6,271	
	No. 126 bridge, Chamkanda nallah, mile 249.	Do. Augt. 1864..	Ditto ditto ditto ..	Do. 24′ do.	Twelve spans 30′ each.	20′	14′	460′	34,432	7,485	
	No. 133 bridge, Bara nallah, mile 260.	Do. July 1863 ..	Bow-string girders of deodár timber, on brick piers and abutments.	..	Centre span 75′, 2 side spans 33′ each.	24′	16′	201′	21,108	10,501	
Kohát.	Plinan Alquada bridge, 20th mile, Kohát and Khushálgarh Road.	1866	Pacca, rubble stone in lime; segmental arches and copings brick in lime.	12′ deep sandstone ..	Three spans 30′ each.	14′	17′	156′	7,840	5,026	
	Tút-ki-Garhi bridge, on Bannu and Dera Ismail Khan Road.	1868	Brick throughout	Wells 8′ and 6′ deep; flooring and curtain blocks 8′ and 6′ deep.	Five spans 20′ each.	15′	13′	170′	12,191	7,171	The flooring & curtain added after bridge was completed, at estimated cost of Rs 5,030 over the bridge Rs. 7,161, or Rs. 12,191 altogether.

PUBLIC WORKS DEPARTMENT, PUNJAB.

COMPARATIVE COST OF CERTAIN SELECTED BUILDINGS.

[*Compiled August 1875.*]

ABBREVIATIONS.—P. denotes Pacca; K. P. Kacha Pacca; K. Kacha; F. M. Flat Mud; T. Terraced; Pl. Planked; P. T. Pent Tiled; P. S. Pent Slated; P. Sh. Pent Shingled; P. Sp. Sh. Pent Split Shingled; R. Rubble; D. S. Dry Stone; C. Concrete; B. F. Brick Flat; Fl. Flagged; Dhj. Dhajji, *i.e.*, timber frame-work filled in with mud and stone masonry; C. I. 22°. Corrugated Iron 22 B. W. G.; In. Inner; O. Outer; Up. Upper; Gr. Ground.

Division.	Locality.	Name of Building.	Description and Height of Walls, &c. — Single or double-storeyed.	Foundation.		Plinth.		Walls (to top of wall-plate).		Roof.	Floor.	Cost.	Area.	Rate per superficial foot.
					Feet.		Feet.		Feet.			Rs	Supl. feet.	Rs
Delhi and Umballa Road Divn.	Nangloi	Thánah	Single	...	3½	...	½	...	12	P. terraced	Kacha ..	4,481	3,336	1·338
	Ditto	Police Rest-house	”	...	1½	P. R.	2	R.	15	Ditto	Do. ..	3,043	2,603	1·167
	Mahrauli	Police Station	”	...	2	Do.	1	Pacca	10¼	Ditto	Do. ..	6,778	4,610	1·469
	Sonepat	Thánah	”	...	2	...	1	Kacha	10½	Terraced	Earthen, rammed.	4,015	4,445	0·901
1st Divn. U. and L. Road.	Barára	Post Office	Single	K. P.	2	None		K.	12	F. M.	Kunkur mud	460	1,390	0·317
	Umballa	Solitary cells, Jail	”	K. P.	2½	Do.		K. P.	15	F. M.	M.	12,045	14,917	0·807
	Biláspur	Police Station	”	K. P.	2½	Do.		K.	10	F. M.	M.	2,500	4,282	0·583
	Morinda	Ditto	”	K. P.	2½	Do.		K. P.	10	F. M.	M.	4,205	4,204	1·000
	Sirhind	Post Office	”	K. P.	2	Do.		K. P.	12	F. M.	M.	813	1,390	0·583
Hill Roads Division.	Simla	Police quarters	Double	D. S.	3	D. S.	2	Dhj.	23	C. I. 22°	Gr. M. Up. Pl. 1″	3,028	805	3·760
	Dagshai	Post Office	Single	P.	2½	P.	1	O. P. In. K. P.	9	C. I. 22°	Fl.	3,562	1,069	3·333
	Subáthu	Ditto	”	P.	2½	P.	1	O. P. In. K. P.	9	C. I. 22°	Fl.	3,676	1,069	3·442
	Sanáwar	Girls' School	”	P.	4	P.	1½	P.	20	P. Sh.	Ver. Fl. In. Pl. 2″	32,375	7,815	4·140
	Dharmpur	Inspection Bungalow	”	D. S.	2	D. S.	1	D. S.	13	P. Sp. Sh.	T.	1,568	1,401	1·125

COMPARATIVE COST OF CERTAIN SELECTED BUILDINGS—*continued.*

ABBREVIATIONS.—P. denotes Pacca; K. P. Kacha Pacca; K. Kacha; F. M. Flat Mud; T. Terraced; C. Concrete; B. F. Brick Flat; Up. Upper; Gr. Ground.

Division.	Locality.	Name of Building.	Description and Height of Walls, &c.									Cost.	Area.	Rate per superficial foot.
			Single or double-storeyed.	Foundation.		Plinth.		Walls (to top of wall-plate).		Roof.	Floor.			
					Feet.		*Feet.*		*Feet.*			Rs	*Supl. feet.*	Rs
Kangra Division.	Sultánpur	Tahsíl	Single	C.	1½	K. P.	2	K. P.	16	Slated	B. F.	8,083	4,615	1·751
	Núrpur	Do.	"	C.	1	K. P.	...	K. P.	15	F. M.	B. F.	4,400	...	...
	Pálampur	Do.	"	C.	1	P.	2½	P.	11	Slated	B. F.	7,717	1,228	6·284
	Dharmsála.. ..	Thánah	"	C.	1	K. P.	...	K. P.	14	Do.	B. F.	1,500	...	...
	Sujánpur	Do.	"	C.	...	K.	2	K.	14	Do.	F. M.	500	1,474	0·339
	Dharmsála.. ..	Kacheri, Deputy Commissioner's	"	C.	2½	P.	2	P.	14	Do.	B. F.	18,000	10,434	1·725
2nd Divn. U. and L. Road.	Jullundur	Small Cause Court	Single	P.	3¼	P.	2¼	P.	14¾ 21½	Flat	B. F.	13,073	4,207½	3·099
	Hoshiárpur ..	Ditto	"	...	3	...	2	...	...	Flat	B. F.	7,647	2,679	2·854
	Amritsar	Road Bungalow	"	P.	...	P.	1	...	...	F. terraced	B. F.	4,141	55 × 38¼ = 2103¾	1·969
Gurdaspur Division.	Siálkot	Guarter-guard	Single	K. P.	1	K. P.	1	K. P.	12¼	Terraced	Brick flat	870	1,825	0·476
	Do.	Magazine	"	P.	2	P.	1¾	P.	9	Do.	Do.	500	594	0·842
	Do.	Deputy Inspector's quarters, Police	"	C.	1½	K. P.	1	K. P.	11½	Mud	Kacha	2,278	1,909	1·193
	Do.	Twenty solitary cells, Jail	"	K. P.	2	K. P.	3¾	K. P.	14¾	Terraced	Do.	8,175	4,071	2·008
	Do.	Police Barracks	"	K. P.	1	K. P.	1½	K. P.	12	Mud	Brick flat	4,164	2,502	1·664
	Gurdáspur	Post Office	"	K. P.	2	K. P.	1	K.	11½	B. F. in lime	Terraced	1,195	1,471	0·812
	Pathánkot	Dâk Bungalow	"	K. P.	3	K. P.	2½	K. P.	15	Ditto	Do.	5,005	3,337	1·500

Division.	Locality.	Name of Building.	Single or double-storeyed.	Foundation.	*Feet.*	Plinth.	*Feet.*	Walls (to top of wall-plate).	*Feet.*	Roof.	Floor.	Cost.	Area.	Rate per superficial foot.
Lahore Division.	*Anárkali, Lahore* ..	*Mayo Hospital*	Double	C. P.	3 5	P.	2	Gr. floor Up. floor	17 16	Pent slated	Tiled	1,40,205	23,224	6·031
	Ditto ..	*Deputy Commissioner's Kacheri* ..	Central block double	C. P.	3 3	P.	2	Gr. floor Up. floor	18 17	Pent tiled	Do.	1,03,421	32,026	3·234
	Ditto ..	Small Cause Court	Single	K. P.	2	K. P.	1½	M. rooms S. rooms	23 17	F. terraced	Brick	6,000	4,148	1·453
	Ditto ..	Financial Commissioner's Office	"	P.	3	P.	6	M. rooms S. rooms	20 14	Ditto	Terraced	15,000	7,410	2·031
	Ditto ..	House for Inspector of Police	"	C. K. P.	1	K. P.	2	M. rooms S. rooms	18 12	Ditto	Do.	4,260	3,435	1·234
	Central Jail, Lahore	Cells for 100 prisoners	"	K.	1	K.	2	Kacha	16	F. M.	Kacha	9,300	36,480	0·250
	Shekhupura, Gujránwála District.	First Class Police Station	"	K. P.	1½	K. P.	1	K. P. Court-room. Others	14 10	F. M.	Do.	3,611	4,252	0·843
Mooltan Division.	Mooltan	Debtors' ward	Single	K.	1½	K.	1	K.	16	F. M.	Kacha	1,367	638	2·140
	Do.	Sessions' ward	"	K.	1½	K.	1	K.	16	Do.	Do.	1,820	726	2·505
	Do.	Christ's Church	"	P.	2	P.	2	K. P.	23¾	F. terraced	F. terraced	9,005	2,274	3·950
	Do.	Police Court-house	"	K. P.	¾	K. P.	1½	K.	10 & 18	F. M.	Do.	2,985	2,793	1·067
Derajat Division.	Dera Ismail Khan..	Half-company barracks for British Infantry, Fort Akálgarh.	Double	P.	4	P.	8	P.	34	Pacca	Pacca	51,000	10,872	4·692
	Ditto ..	Commissariat Conductor's quarters, Fort Akálgarh.	Single	P.	2	K. P.	2	K. P.	16¼	Mud	Do.	3,500	2,795	1·250
	Ditto ..	Right Native Infantry Lines at Dera Ismail Khan.	"	K.	1½	K.	1½	K.	12	Do.	Kacha	21,711	57,062	0·380

COMPARATIVE COST OF CERTAIN SELECTED BUILDINGS—*continued.*

ABBREVIATIONS.—P. denotes Pacca; K. P. Kacha Pacca; K. Kacha; F. M. Flat Mud; T. Terraced; P. T. Pent Tiled; P. Sh. Pent Shingle; R. Rubble; C. Concrete; F. B. Flat Brick; Unc. Uncoursed.

Division.	Locality.	Name of Building.	Description and Height of Walls, &c. — Single or double-storeyed.	Foundation.		Plinth.		Walls (to top of wall-plate).		Roof.	Floor.	Cost.	Area.	Rate per superficial foot.
					Feet.		Feet.		Feet.			Rs.	Supl. feet.	Rs.
2nd Division Lahore and Peshawar Road.	Shahpur	Police Office	Single	P.	2	P.	2	K. P.	18¼	2nd class	2nd class T.	2,332	3,136	0·661
	Mitha Tiwána	Do. Station	"	K. P.	1½	K. P.	1	K. P.	14	1st class	Mud	2,935	7,035	0·505
	Kund	Sarai	"	P. R.	1	*Nil*		P. R.	10¼	F. M.	"	3,291	10,100	0·326
	Mitha Tiwána	Do.	"	K. P.	1½	*Nil*		K. P.	18¼	1st cl. F. M.	"	3,875	48,900	0·064
	Jhelum	Sessions' house	"	{ P. / C. }	½ / 1½	K. P.	1	K. P.	17	{ F. M. & T. }	2nd cl. F. B.	6,000	4,169	1·437
	Do.	Servants' houses	"	K.	2	*Nil*		K.	12	F. M.	Mud	606	No data	...
	Do.	Shed for Witnesses	"	K. P.	2	*Nil*		K. P.	10	F. M.	"	608	899	0·675
	Do.	Bells-of-arms	"	{ ... / C. }	3 / 1½	Steps	½	...	10	1st class T.	1st class T.	3,653	845	4·322
	Talagang	Ditto	"	{ ... / C. }	3 / 1	Steps	½	...	10	1st class M.	1st class T.	3,176	868	3·656
	Níla	Police Rest-house	"	P. R.	2	P. R.	2	K. R.	16	F. M.	...	1,547	1,403	1·102
	Chailu Jhangi	Do. Station	"	P. R.	1½	*Nil.*		P. R.	9¾	2nd cl. F. M.	Mud	581	1,383	0·419
	Dewal	Sarai	"	P. R.	1½	P. R.	1	P. R.	14	F. M.	2nd class T.	2,806	10,696	0·260
	Baghám	Police Rest-house	"	K. R.	2	K. R.	1	K. R.	17	F. M.	...	769	2,327	0·329
	Kotli	Ditto	"	C.	2	C.	1	K. R.	17	F. M.	2nd class T.	1,547	2,327	0·666
	Ráwalpindi	Carpet-shed	"	{ Unc. / R. }	1 / 6	Unc. / R.	1 / ...	} R.	12	1st class T.	Earthen	5,366	4,591	1·166
	Do.	Quarantine ward	"	{ Unc. / R. }	1 / 6	Unc. / R.	... / 6	} K.	16	1st cl. F. M.	Do.	13,706	16,704	0·812
	Do.	New solitary cells	"	C.	2	...	...	K.	13	Ditto	Do.	8,641	6,382	1·349

Division.	Locality.	Name of Building.	Single or double-storeyed.	Foundation.	Feet.	Plinth.	Feet.	Walls.	Feet.	Roof.	Floor.	Cost.	Area.	Rate per superficial foot.
Hazara Division.	Abbottabad	Barracks for drivers, Mountain Battery	Single	K. P.	2½	P. & K. P.	[illegible]	K.	[illegible]	P. Sh.	Kacha	[illegible]	4,[illegible]	0·62[illegible]
	Ditto	Married Quarters, Mountain Battery	"	K. P.	2	K. P. & P.	2½	K.	12½	P. Sh.	Do.	2,974	5,121¼	0·580
	Ditto	Combined Post and Telegraph Office	"	P.	2½	P.	3	P.	12	P. Sh.	...	6,371	3,081¼	2·068
	Ditto	Cook-house, Telegraph Office	"	K. P.	2½	K. P.	1	K.	10	P. Sh.	Kacha	220	442¼	0·498
	Ditto	Servants' houses	"	K. P.	2½	K. P.	1¼	K.	12	P. Sh.	Do.	717	1,511½	0·494
	Ditto	Latrines	"	K. P.	2½	K. P.	2	K.	8	P. Sh.	Do.	107	416	0·257
	Ditto	Executive Engineer's Godown	"	P.	2	P.	1	K. P. & P.	12¼	...	Do.	2,922	14,520	0·201
	Ditto	Mule-sheds, Mountain Battery	"	K. P.	2	K. P.	¾	K. & P.	10	P. Sh.	Do.	1,173	2,186¼	0·537
	Bagnotar	Staging Bungalow	"	P.	2	*Nil*		Planked and P.	10¾	P. Sh.	Planked and P.	996	651	1·530
	Dungagali	Ditto	"	P.	4	*Nil*		P.	10½	P. Sh.	Do.	...	1,775½	...
	Ditto	Ditto	"	P.	3	*Nil*		Planked and P.	10½	P. Sh.	Do.	1,136	1,010	1·092
	Ditto	Servants' houses	"	P.	1¼	P.	½	P.	9¾	P. Sh.	Kacha	...	465¾	...
	Mansahra	Staging Bungalow	"	P.	2	P.	1	P.	12	P. Sh.	T. and P.	3,300	2,252¼	1·465
	Ditto	Servants' houses	"	K. P.	1½	*Nil*		K. P.	9¾	F. M. over dudgie.	Kacha	377	796½	0·474
	Khánpur	Thánah	"	P.	3	P.	1¾	P.	10½	F. M. over brick.	T. and P.	7,111	9,054½	0·784
	Haripur	Staging Bungalow	"	P.	2	P.	2	P.	16	Ditto	Do.	5,007	3,045	1·644
	Ditto	Cook-house	"	P.	2	P.	2	P.	10	Ditto	Do.	322	240¼	1·341
	Ditto	Servants' houses and stables	"	K.	2	K.	½	K.	9	F. M. over dudgie.	Kacha	487	607½	0·802
	Ditto	Thánah and Tahsil	"	P.	{ 2½ / 4 }	P.	...	P.	12	{ F. M. over brick. }	P. and K.	23,926	35,516½	0·674
3rd Division Lahore and Peshawar Road.	Road Buildings	Peshávar Bungalow	Single	K.	2	P.	1¼	K.	20	F. M.	B. F.	2,100	1,124	1·868
	Ditto	Pára "	"	K. P.	6	...	...	K.	19	"	C.	1,633	820	1·991
	Ditto	Dehri "	"	"	6	...	...	K.	19	"	K.	1,484	903	1·643
	Ditto	Naushahra "	"	"	3	...	...	K.	17¼	"	C.	1,280	857	1·493
	Ditto	Akora "	"	"	2¼	...	...	K.	16	"	C.	820	523	1·568
	Ditto	Kund "	"	"	2½	...	...	K. P.	15½	"	K.	850	660	1·288
	Ditto	Khairabad "	"	"	2	K. P.	1	K.	16	"	C.	1,500	1,494	1·004
	Ditto	Gondal "	"	K. B.	...	K. B.	...	...	16½	Matting	K.	750	1,440	0·520
	Ditto	Hatti "	"	P. R.	...	P. B.	...	...	17	K.	C.	3,500	1,970	1·776
	Ditto	Haro "	"	K. B.	...	K. B.	...	...	14	K.	K.	1,000	2,040	0·490
	Ditto	Hasan Abdál "	"	"	...	"	...	...	14	K.	C.	1,000	1,508	0·663
	Ditto	Jáni-ka-Sang "	"	K. R.	...	...	...	K.	16	T. R.	P. P.	1,500	3,192	0·469
	Ditto	Chelojhangi "	"	P. R.	2	P. R.	...	P. R.	16	P. R.	P. P.	1,500	1,440	1·041
	Campbellpur	Public Works "	"	K. R.	...	K. R.	...	K. R.	16	M. M.	B. M.	1,500	2,164	0·693
	Attock	Post Office	"	K. R.	...	K. R.	12	K. R.	...	M. M.	P. P.	800	957	0·835

COMPARATIVE COST OF CERTAIN SELECTED BUILDINGS—*concluded.*

ABBREVIATIONS.—P. denotes Pacca; K. P. Kacha Pacca; K. Kacha; T. Terraced; R. Rubble; C. Concrete; B. F. Brick Flat.

Division.	Locality.	Name of Building.	Single or double-storeyed.	Foundation.	Foundation. Feet.	Plinth.	Plinth. Feet.	Walls (to top of wall-plate).	Walls. Feet.	Roof.	Floor.	Cost. Rs	Area. Supl. feet.	Rate per superficial foot. Rs
3rd Division Lahore and Peshawar Road—*concluded.*	Campbellpur	Post Office	Single	K. B.	...	K. B.	10	K. B.	...	M. M.	K.	...	660	...
	Peshawar	Ditto	„	K. P.	1	K. P.	1	K.	16½	M. M.	P. F.	13,000	5,880	2·211
	Do.	Telegraph Office	„	K.	1	...	...	K.	20, 17 & 11	M. M.	P. T.	5,000	5,328	0·938
	Mardán	Post Office	„	P.	...	P.	...	K. P.	...	Kacha	696 P. 460 K.	973	8,536	0·113
	Peshawar	Dy. Commr.'s Court	„	P.	2	P.	5	P.	22 & 16	T.	P. T.	22,300	6,768	3·295
	Do.	Commr.'s Court	„	P.	2	P.	5	P.	22 & 16	T.	P. T.	9,997	3,936	2·539
	Do.	Small Cause Court	Double	P. S. M.	1	P.	3	K. & K. P.	17, 15 & 12	M. M.	P. T.	3,900	11,765	0·331
	Do.	Old Residency	„	P.	1	...	...	P.	31	T.	T.	28,021	8,549	3·277
	Do.	Kacheri Havalát	Single	K. P.	1	...	...	K.	13	M. M.	...	1,743	2,916	...
	Do.	Jail	„	K.	1	K.	1	K.	15, 13, 10, 25 & 27	M. M.	K.	19,543	3,79,925	0·051
	Do.	Jail Havalát	„	K.	1	K.	1	K.	13 & 17	M. M.	K.	12,887	63,002	0·204
Kohat Division.	Bannu	Outpost Barganattu	Towers Double.	R.	2 to 5	R.	2 to 4	R.	12 to 30	F. M.	B. F.	12,727	Not measurable; open area.	0·666
	Kohát	Quarter-guard, Store-room and Cells	Single	R.	...	R.	...	R.	14	F. M.	B. F.	2,752	2,805	0·981
	Do.	Reserve Police Barracks	„	R.	2	R.	...	K.	12	F. M.	Mud	3,946	7,688	0·513
	Do.	Hangu Thánah	„	R.	2	R.	1	K.	12	F. M.	Mud	3,394	4,236	0·801
	Do.	Magazines for Infantry	„	C.	2	P. B.	3	P. B.	14 to crown.	Domed	B. F.	1,264	352	3·59

No. 128 M.

All communications should be addressed to the Secretary.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

Civil Works

Miscellaneous.

To

The Secretary to the Government of Madras
Public Works Department
General Branch

Simla 21st May 1877.

Sir,

With reference to Punjab Government circular memo No. 1660 of the 25th Ultimo forwarding statements of areas and cost of Buildings and memo of construction and cost of Bridges in the Punjab, I am directed to request that similar statements connected with Buildings and Bridges in Madras may be prepared and submitted to this Office.

I have the honor to be
Sir,
Your most Obedt. Servant

[signature] Captn. R.E.
Asstt. Secy. to the Govt. of India

P.C. 16.5.77 No 148 to bis

P.W.D.
30 MAY 77
No 5365

From
The Government of India

Dated 21st May 1877

No 128 Mo.

G.A. 1. June /77 J.B.L. 5

The original of these has not yet been received

12/5/77

Rec. 16.5.77 No. 148 w. encs

P.W.D.
30 MAY 77
No. 5365

From
The Government of India

Dated 21st May 1877

No. 128 M.

The original of these has not yet been received

12/6/77

G.O. 1st June /77 No. 5

P. W. D.

CIRCULAR MEMO. No. 1660.

GOVERNMENT OF PUNJAB,

PUBLIC WORKS DEPARTMENT.

CIVIL WORKS.

Buildings.

To

THE GOVERNMENTS OF INDIA, MADRAS, BOMBAY, BENGAL AND NORTH-WESTERN PROVINCES.

THE CHIEF COMMISSIONERS OF OUDH, CENTRAL PROVINCES, BRITISH BURMAH, MYSORE AND COORG, AND ASSAM.

THE RESIDENT OF HYDERABAD.

THE AGENT OF GOVERNOR-GENERAL FOR CENTRAL INDIA AND RAJPOOTANA.

THE SUPERINTENDENT PORT BLAIR, AND CHIEF COMMISSIONER ANDAMAN AND NICOBAR ISLANDS.

THE INSPECTOR-GENERAL OF MILITARY WORKS.

THE DIRECTOR OF STATE RAILWAYS.

THE JOINT-SECRETARY TO GOVERNMENT PUNJAB, PUBLIC WORKS DEPARTMENT, IRRIGATION BRANCH.

Dated Lahore, 25th April 1877.

Forwards, for information, the Circulars of this Government marginally noted, together with their accompaniments as below :—

No. 3 dated 4th February 1876.
" 28 " 30th June 1876.

I. Statement of Comparative Areas and Cost of Buildings in the Punjab.

II. Memorandum of Construction and Comparative Cost of Bridges in the Punjab.

R. MACLAGAN, MAJOR-GENERAL,
Secretary to Government Punjab,
Public Works Department.

Circular No. 3 dated 4th February 1876

From—Major-General R. Maclagan, Secretary to Government Punjab, P. W. D.
To—All Officers concerned.

In this Office Circular No. 19 dated 27th July 1874, it was directed that proposals for new buildings submitted to Government in the Civil Department should be accompanied by a rough approximate estimate of cost based on the area. In order to facilitate the preparation of such rough estimates, a statement of the comparative areas and cost of certain selected buildings in each Division has been compiled in this Office, and a copy is forwarded herewith for record.

Circular No. 28 dated 30th June 1876

From—Major-General Alex. Taylor, Offg. Secretary to Government Punjab, P. W. D.
To—Superintending and Executive Engineers and Examiner P. W. A. Punjab.

Forwards, for information and record, a Memorandum of Construction and Cost of Bridges exceeding 50 feet in length in the Punjab.

2. The present Memorandum is in supersession of that circulated with this Office No. 2551 dated 11th May 1871.

GOVERNMENT OF PUNJAB,

PUBLIC WORKS DEPARTMENT.

CIVIL WORKS. 12/77

Buildings. No. 1578

To

Proceedings May

THE GOVTS. OF INDIA, MADRAS, BOMBAY, BENGAL AND N. W. PROVINCES.

THE CHIEF COMMISSIONERS OF OUDH, CENTRAL PROVINCES, BRITISH BURMAH, MYSORE & COORG, & ASSAM.

THE RESIDENT OF HYDERABAD.

THE AGENT OF GOVERNOR-GENERAL FOR CENTRAL INDIA & RAJPOOTANA.

THE SUPERINTENDENT PORT BLAIR, AND CHIEF COMMISSIONER ANDAMAN AND NICOBAR ISLANDS.

THE INSPTR.-GENL. OF MILY. WORKS.

THE DIRECTOR OF STATE RAILWAYS.

THE JOINT-SECY. TO GOVT. PUNJAB, P. W. D., IRRIGATION BRANCH.

CIRCULAR MEMO. No. 1660.

Dated Lahore, 25th April 1877.

Received

No. 148 W d/16th May/77

Received

W.H.
10.5.77

G.O. 1st June/77 No. 5

Circulates Statement of areas and cost of Buildings, and Memo. of construction and cost of Bridges, in the Punjab.

P.W.D. Buildings & Roads

No. 179 W d/1 June/77

Proceedings of the Madras Govt

Under date the

Read the following:-

From the Govt of India (H.E. No 128 of 21st May/77)

Do. Do (" 130 do)

Communicated ~~to the Consulting Engineer for Railways and~~ all District Engineers who will compile and submit the return of selected Bridges and Buildings called for as early as practicable. ~~also to the Consulting Engr for Railways~~

W.H.
30.5.77

J.E.S. Dispd: 27-6-77

(603651)
4878

Govt. of India. Bengal
PUBLIC WORKS.

To District Engineers

5

Dated 1st June 1798

Nos. 5-6

Statements of areas and cost of Building and memo of construction and cost of Bridges. Letter from the Govt. of India requesting the preparation and submission of ——, Copies to the Chief Engrs for Bgs and to Dt Engrs with instructions.

Entd in Regr.

G.C.