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TAMIL NADU ARCHIVES

GOVERNMENT OF TAMIL NADU

J.W.D. DEPARTMENT

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14TH MARCH 1884, No. 689 W., PUBLIC WORKS.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

General.
Account.

READ—the following letter from R. B. BUCKLEY, Esq., Officiating Under Secretary to the Government of India, Public Works Department (Civil Works—Miscellaneous), to the Secretary to the Government of Madras, Public Works Department, dated Fort William, 4th March 1884, No. 114 M. :—

With reference to correspondence ending with your letter, No. 1732 W., dated 20th June last, I am directed to forward a précis of the reports which have been received from certain Local Governments, &c., on the working of the mortar mills supplied by Messrs. Richardson and Cruddas of Bombay. It is clear that the firm make very good mills at reasonable prices, and the Government of India considers that every encouragement should be given them.

ENCLOSURE.

Extracts from reports on mortar mills supplied by Messrs. Richardson, Cruddas and Co. of Bombay.

From whom.	Nature of report.
Engineer-in-Chief, Southern Mahratta Railway.	A 7-feet mortar pan with two rollers worked constantly and most satisfactorily in every respect since it was first erected a few months ago.
Superintendent of Works, Simla Imperial Circle.	Mills of both patterns well made, strong and durable; the fixed pan and revolving rollers turn out more material than the revolving pans; are also more economical to work. But for wet grinding the revolving pans would be better.
Executive Engineer, Imperial Circle, 1st Division.	Three revolving pans and fixed rollers and two revolving rollers and fixed pans. Had to introduce two improvements accepted by the makers (<i>Vide</i> report). Mills occupy little room; worked with 3 to 5 H.P. excellently; easily set up or taken down. The false bottom should be very carefully bolted down. Mills with revolving rollers are the best. They outturn in work 40 to 60 per cent. more than the revolving pans; require only one man to look after. Has designed a new pan for dry grinding. Mills cannot be driven with less than 7 H.P. (<i>Vide</i> report). The mills are grinding over 10,000 c. ft. of material a month regularly since February 1882.
Executive Engineer, Central Provinces.	Has 3 mills at work; 2 mills have been in use for two years and have worked day and night continuously; found efficient, and given great satisfaction. Gives details of working and quantity turned out. Mills as a rule worked 10 hours daily; also day and night occasionally driven by a 10 H. P. engine worked at a pressure of 60 lbs. The fuel used is a poor description of coal. Mortar composed of equal parts by measurement of lime, soorki, and sand; weight, lime 40 lbs., soorki 60 lbs., and sand 99 lbs. The quantities of dry ingredients worked up by 2 mills during a day of 10 hours, are lime 245 c. ft., soorki 245 c. ft., and sand 245 c. ft.; after incorporation the dry mixture measures 679 c. ft. The quantity obtained is 443 c. ft. or about $\frac{2}{3}$ of the bulk of the dry mixture. The loss in converting the dry mixture into mortar is approximately 33 per cent. The quantity of water used in the preparation of 443 c. ft., of mortar is 126 c. ft. The time in filling, grinding, and emptying a mill 25 minutes, and the quantity of mortar turned out in that time = 10 c. ft. The cost per 100 c. ft. of mortar = Re. 1 as against Rs. 3-12-0 for mortar prepared in chuckie mills. The rate, Re. 1 does not include allowance for belting, &c. (<i>Vide</i> tables for cost of labour, materials, &c.).

Extracts from reports on mortar mills supplied by Messrs. Richardson, Cruddas and Co., &c.
—(continued).

From whom.	Nature of report.
Executive Engineer, Central India.	7 feet pan 13 inches deep (<i>Vide</i> description). The construction of the pan is favorable to good grinding and the mortar can be quickly removed from the pan whilst the machine is at work. The power actually required, when other machines are worked from shafting, is found to be about $3\frac{1}{2}$ H.P. This is taken as the basis of calculation of cost of working (<i>Vide</i> cost of machine) (<i>Vide</i> also instruction to the makers). Cost of renewals, &c. = Rs. 60 (<i>Vide</i> report). Rs. 100 may be assumed to be the annual cost of repairs or say 10 per cent. on the original cost; 18 pans of mortar are obtained in 10 hours working, and each filling consists of 5 c. ft. lime, 5 c. ft. sand, 3 c. ft. soorki, and $2\frac{1}{4}$ c. ft. water. This when thoroughly mixed up makes 10 c. ft. of mortar as nearly as possible. The pan could hold 20 per cent. more material, but experience proves the above to be the most economical way of working (<i>Vide</i> report for "expenditure," labor at machine, &c.).
Executive Engineer, Rewah State.	8 feet pan; weight of each roller = 20 cwt.; worked by 10 H.P. steam engine, but the same engine could easily work two mills. There can be no doubt as to the grinding power of the mill. The mortar turned out is first rate (<i>Vide</i> report for cost of grinding). Cost per 100 c. ft. is Rs. 2-11-0. By working 2 mills from same engine cost per 100 c. ft. would be considerably reduced (<i>Vide</i> report, comparison, with chuekie mill).
Executive Engineer, Punjab.	Mills proved very satisfactory; worked well; did not get out of order except from actual wearing away of parts, and when so worn, were easy of repairs.
Executive Engineer, Swat River Canal Division.	(<i>Vide</i> description of the mills, portability, &c.). Mills have been in continuous use since arrival; eminently adapted for grinding mortar or even pounding soorki (<i>Vide</i> cost of the mills, &c.). Mills have been in constant use for a year; required no repairs of any sort.
Executive Engineer, North-Western Pro- vinces and Oudh.	6 feet pans; 2 mills were put up in place to be driven together by a 12 H.P. engine on 15th January 1883; worked from then till middle of June very satisfactorily. The outturn for each mill was 400 c. ft. per diem of 24 hours (<i>Vide</i> cost of mills, defects found, &c.; particularly one serious defect, and the repairs made). Mills very satisfactory and are well worth the price paid for them.
North-Western Provin- ces (Revised report.)	The mills were very cheap but unsatisfactory. They were continually out of repair; are very light and consequently can be turned out cheap, but are not so well calculated to stand wear and tear as those of English manufacture. One of the objections to this kind of mill is the noise resulting from the shaking and rattling of the parts.
Executive Engineer, British Burma.	(The report also notices certain points of inferiority in design). Two mortar mills with two pans each 6 feet diameter, and one vertical engine of 6 H.P. connected to the mills with vulcanized rubber belting from 150 to 180 c. ft. per day in the dry season, and during the rains the turn out was 60 to 80 c. ft. daily. In both seasons the mills were worked 8 hours daily (<i>Vide</i> report for fuel used). The cost of soorki, including expenditure on erecting machinery shed, &c., was about Rs. 14-8-0 per 100 c. ft. This cost does not include the cost of bricks in the first instance.
	<i>Chakrata reports.</i> The mortar mills of which 'are now in use in the division, have been found to be economical in saving the erection of many fixed mills. They are portable and especially useful on a long stretch of road where masonry repairs are scattered. They can also be used as soorki mills. On a hill cart road with a gradient of 5 in 100 four bullocks are required to drag a mill, but in the plains this can be done with one strong pair. In position the mill can be worked with an ordinary pair.
	<i>Following improvements suggested.</i> I. The mill to be fitted with a water-tight plug at A (<i>Vide</i> drawing attached) in order to allow of the rollers being filled with water instead of sand, as the latter is difficult to remove.

Extracts from reports on mortar mills supplied by Messrs. Richardson, Cruddas and Co., &c.
—(Continued).

From whom.	Nature of report.
	II. The bottom of the mortar pan to be more securely bolted on. In the mills supplied the bolts are irregularly placed, and some being too far apart, the bottom of the pan, if used on rough ground, is apt to become strained and to become separated from the uprights or sides. Bolts should not be more than 1 foot 6 inches apart. Scraper might also be improved.
	<i>Kasauli reports.</i> Mills seven in number; have been (some of them) in use for many years and have given entire satisfaction. They mix the materials more thoroughly and effectually and produce a finer and better mortar than other mills turning out $1\frac{1}{2}$ times the quantity in the same time. The mills also have the advantage of being portable and the cost of carriage and setting up is trifling. They take up less room than ordinary mills, and can be used to grind small quantities which admits of fresh mortar being always used on small works. The machinery is not liable to get out of order. As regards economy in working, the mortar in the portable mills is turned by the scraper, while in ordinary stone mills this requires an extra man.
	<i>Rawal Pindi reports.</i> Only one mill received and that not yet brought into use.
	<i>Peshawur reports.</i> Four mills received in May last and have been used continually since. They are worked by two bullocks and on the average two operations are made in one day, the outturn of mortar at each being 20 c. ft. and the cost per diem Rs. 2. On the whole the mills do not work satisfactorily because— I. The casting of flanges of the rollers is very imperfect, many blow-holes exist and these have been roughly filled with metal which protrudes in places and prevents the rollers moving evenly in the bottoms of the pans. II. The metal of which the bed of the pan is composed is too thin, and unless the mill is set upon a perfectly even hard floor, the bed gives under the weight of the wheels. For these reasons the mills do not grind mortar as well as they should.

ORDER—dated 14th March 1884, No. 689 W., Public Works.

Communicated to the officers of the Public Works Department for information.

(True Extract.)

(Signed) J. SHAW-STEWART, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Chief Engineer for Irrigation.
" Consulting Engineer for Railways.
To the Superintending Engineers.
To the Consulting Architect to Government.
" Superintendent, Madras Harbour Works.
" General Superintendent, Public Works Stores.
" Engineers-in-Chief, State Railways.

Exd. A. Aubert.
Spare Copies

GENERAL.
ACCOUNT.

Govt. of Madras.
PUBLIC WORKS.

Dated March, 14th.

Recd.

Encl.

G.O., 14th March 1884, No. 689 W.

MARCH.

Mortar Mills

Letter from the Government of India forwarding a précis of reports from certain Local Governments, &c., on the working of the — supplied by Messrs. Richardson and Cruddas of Bombay, communicated to the officers of the Public Works Department.

No. 114 M.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

Civil Works.

Miscellaneous.

To
The Secy. to the Govt. of Madras
Public Works Deptt.

Fort William, 4th March 1884.

Sir,

With reference to correspondence ending with your letter No. 1732 W. dated 20th June last, I am directed to forward a précis of the reports which have been received from certain Local Govts. re. on the working of the Mortar Mills supplied by Messrs Richardson and Cruddas of Bombay. It is clear that the firm make very good Mills at reasonable prices

prices and the Govt. of India con- siderers that every encouragement should be given them.

Leave the honor to be.

Yours most Heat. Servt.

T. B. Muckley.

Offg. Under Secy. to the Govt. of India

Communicated to the officers of the Public Works Deptt. for information

13-3-84

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to E. Ford

to E. Ford

to E. Ford

to E. Ford

Supdt. M. H. Works

Genl. Supdt. P. W. D.

Engy in the State P. W. D.

Extracts from Reports on Mortar Mills supplied by Messrs Richardson Braddas & Co. of Bombay.

1889

From Whom.

Nature of Report.

Eng. in Chief S. M. Railway

A 7 ft mortar pan with 2 rollers worked constantly + most satisfactorily in every respect since it first erected a few months ago

Supdt. of Works Imperial Circle

Mills of both patterns well made, strong and durable: the fixed pan + revolving rollers turn out more material than the revolving pans. are also more economical to work. But for wet grinding the revolving pans will be better

Eng. Imperial Circle Division

3 revolving pans + fixed rollers + 2 revolving rollers + fixed pans. Had to introduce 2 improvements accepted by the smokers (vide report) Mills occupy little room. Worked with 3 to 5 H.P. excellently. easily set up or taken down. The false bottom should be very carefully bolted down. Mills with revolving rollers are the best they out turn in work 40 to 60 p.c. more than the revolving pans. requires only 1 man to look after. Has designed a new pan for dry grinding. Mills can not be driven with less than 7 H.P. (vide report). The Mills are grinding over 10,000 C ft of material a month regularly since February 1882.

Agent Engineer Central Provinces

Has 3 Mills at work. 2 Mills have been in

From Whom

Nature of Report.

in use for 2 years & have worked day & night continuously, found efficient, and given great satisfaction. Gives details of working & quantity turned out. Mills as a rule worked 10 hours daily. also day & night occasionally driven by a 10 H.P. engine worked at a pressure of 60 lbs. the fuel used is a poor description of Coal. Mortar composed of equal parts by measurement of Lime, Soorki, & Sand, weight Lime 40 lbs, Soorki 60 lbs, and Sand 90 lbs. The quantities of dry ingredients worked up by 2 Mills during a day of 10 hours, are Lime 2450 ft, Soorki 2450 ft, & Sand 2450 ft. after incorporation the dry mixture measures 679 C ft. The quantity obtained is 443 C ft. or about $\frac{2}{3}$ of the bulk of the dry mixture. The loss in converting the dry mixture into Mortar is approximately 33 p.c. The quantity of water ^{used} in the preparation of 443 C ft. of Mortar is 126 C ft. The time in filling, grinding & emptying a Mill 25 minutes, and the quantity of Mortar turned out in that time is 10 C ft. The cost per 100 C ft. of Mortar. Rs 1/2 as against 3/12 for Mortar prepared in Chukkie Mills. The rate 1/2 does not include allowance for belting &c. (Vide Tables for cost of labour, materials &c.)

7 ft. pan 13 in deep (Vide description). - The construction of the pan is favorable to good grinding - & the Mortar can be quickly removed

Executive Engineer
Central India

From Whom

Nature of Report.

removed from the pan whilst the machine is at work. The power actually required, when other machines are worked from shafting is found to be about $3\frac{1}{2}$ H.P. This is taken as the basis of calculation of cost of working (Vide cost of Machine) (Vide also instruction to the makers) Cost of renewals $\frac{1}{2}$ = 60 p. Rs. (Vide report) Rs 100 may be assumed to be the annual cost of repairs or say 10% on the original cost, 18 pans of Mortar are obtained in 10 hours working & each filling consists of 5 C ft. Lime, 5 C ft. Sand, 3 C ft. Soorki, & $2\frac{1}{2}$ C ft. water. This when thoroughly mixed up, makes 10 C ft. of Mortar as nearly as possible. The pan could hold 20% more material. but experience proves the above to be the most economical way of working (Vide report for "Expenditure" Labor at machine &c. &c.)

Executive Engineer
Rewals State

8 ft. pan, ^{weight} of each roller = 20 Cwt, worked by 10 H.P. Steam Engine. But the same engine could easily work two Mills. There can be no doubt as to the grinding power of the mill. The Mortar turned out is first rate. (Vide report for cost of grinding) Cost per 100 C ft. is 2/4. By working 2 Mills from same engine cost per 100 C ft. would be considerably reduced (Vide report, Comparison, with Chukkie mill).

1/23
From Whom

Nature of Report.

Executive Engineer
Punjab.

Mills proved very satisfactory. Worked well didn't get out of order except from actual wearing away of parts and when so were easy of repairs.

Executive Engineer
Swat River Canal
Division.

(Vide description of the Mills, portability & arrival, eminently adapted for grinding or even pounding Soorkie (Vide cost of Mills &c) Mills have been in constant use a year - required no repairs of any sort.

Executive Engineer

(6' pans) 2 Mills were put up in place to be driven together by a 12 H. P. Engine on 15th January 1888. Worked from then till middle of June very satisfactorily. The out turn for each Mill was 400 cft per diem of 24 hours (Vide cost of Mills, defects found &c. particularly one serious defect, and the repairs made) Mills very satisfactory and are well worth the price paid for them.

N.R.P. (Revised
Report) -

The Mills were very cheap but unsatisfactory. They were continually out of repair, are very light & consequently can be turned out cheap but are not so well calculated to stand wear and tear as those of English manufacture. One of the objections to this kind

From Whom

Nature of Report.

Executive Engineer
B. Burma.

of Mill is the ^{noise} resulting from the shaking and rattling of the parts. (The Report also notices certain points of inferiority in design).

2 Mortar Mills with 2 pans each 6' diam. + 1 Vertical Engine of 6 H. P. Connected to the Mills with vulcanized rubber belting (Vide cost of labour) The amount of Soorkie turned out varied from 150 to 180 cft per day in the dry season & during the rains the turn out was 60 to 80 cft daily. In both seasons the Mills were worked 8 hours daily. (Vide report for fuel used). The cost of Soorkie including expenditure on erecting machinery shed &c, was about Rs 14/8 per 100 cft. This cost does not include the cost of bricks in the first instance.

Chakrata reports.

The mortar Mills 3 of which are now in use in the division, have been found to be economical in saving the erection of many fixed Mills. They are portable and especially useful on a long stretch of road where masonry repairs are

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From Whom	Nature of Report.
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