

CRUSHING.

Description.	Age.	Total Load.	Load per sq. inch.	Remarks.
6 in. cube—Compo. 4 : 7½ : 15	days. 112	lbs. 100,000	lbs. 2,778	6 blocks stood same press.
„ „ 4 : 12 : 20	101	84,216	2,339	
„ „ „	101	87,155	2,421	
„ „ „	101	70,174	1,949	
„ „ „	101	79,668	2,213	

TENSION.

Description.	Age.	Total Load.	Load per sq. inch.	Remarks.
100 sq. in. section—4 : 7½ : 15	days. 106	lbs. 21,246	lbs. 212	
„ „ „	106	20,286	203	
„ „ „	106	24,798	248	
„ „ 4 : 12 : 20	95	13,182	132	
„ „ „	95	14,272	143	
„ „ „	95	16,510	165	

SAND (HARD GRANITE, CRUSHED)—UNWASHED.

Description of Test.	Standard sand as used in Cement Tests.	Nepean Sand graded as Sample Sand.	Sample Sand.	Voids from Specific Gravity.
Relative strength of sample sand when mixed with Portland Cement in the proportion of 3 of sand to 1 of cement, and compared with standard sand when mixed in the same proportion with the same cement—				
Co-efficient for tensile strain	100	....	173.4	....
Co-efficient for crushing strain	100	....	142.2	....
Loss of weight by washing p.c.	0.0	....	9.5	....
Weight per cubic foot lb.	100.0	....	115.79	....
			36.08	44.72
Percentage of voids calculated from specific gravity p.c.	38.32	....	22.52	28.38
Residue on sieve of 144 meshes per sq. in. p.c.	0.00	....	19.7	....
„ „ 400 „ „	0.00	....	28.2	....
„ „ 900 „ „	100.00	....	15.7	....
„ „ 2,400 „ „	0.00	....	13.0	....
Passed through 2,400 „ „	0.00	....	23.4	....
Relative hardness	100.00	....	90.1	....

The standard sand used is Nepean River sand, washed, dried, and sifted through a sieve of 400 meshes per square inch, and caught on a sieve of 900 meshes per square inch.

Sand passed through $\frac{1}{8}$ inch sieve before testing. Ordinary figures, when measure was tightly filled; in black figures, when filled loosely.

Tensile-lb. per square inch. 28 day tests.			Compression-lb. per square inch. 28 day tests.		
Briquettes. Standard.	Briquettes Nepean.	Briquettes Sample.	Cubes. Standard.	Cubes. Nepean.	Cubes. Sample.
370	660			
370	630	3,480	....	5,010
380	630			
370	630	3,500	....	4,980
360	580			
360	670	3,550	....	4,990
360	610			
400	640	....	....	....
360	670			
350	620	....	....	....
380	660			
370	680			
Total .. 4,430	7,680	10,530	....	14,980 Total.
Average.. 369	640	3,510	....	4,993 Average.
Co-efficient 100	173·4	100	....	142·2 Coefficient.

SAND (HARD GRANITE, CRUSHED)—WASHED.

Description of Test.	Standard Sand as used in Cement Tests	Nepean Sand graded as Sample Sand.	Sample Sand.	Voids from Specific Gravity.
Relative strength of sample sand when mixed with Portland Cement in the proportion of 3 of sand to 1 of cement, and compared with standard sand when mixed in the same proportion with the same cement—				
Co-efficient for tensile strain	100	....	166·4	....
Coefficient for crushing strain	100	....	126·7	....
Loss of weight by washing p.c.	0·0	....	....	....
Weight per cubic foot lb.	100·0	....	106·42	....
			41·88	47·38
Percentage of voids calculated from specific gravity p.c.	38·32	....	30·20	34·18
Residue on sieve of 144 meshes per sq. in. p.c.	0·00	....	20·2	....
" " 400 " " " " "	0·00	....	29·8	....
" " 900 " " " " "	100·00	....	18·5	....
" " 2,400 " " " " "	0·00	....	14·5	....
Passed through 2,400	0·00	....	17·0	....
Relative hardness	100·00	....	90·1	....

The standard sand used is Nepean River sand, washed, dried, and sifted through a sieve of 400 meshes per square inch, and caught on a sieve of 900 meshes per square inch.

Sand passed through $\frac{1}{8}$ inch sieve before testing. Ordinary figures, when measure was tightly filled; in black figures, when filled loosely.

Tensile-lb. per square inch. 28 day tests.			Compression-lb. per square inch. 28 day tests.		
Briquettes. Standard.	Briquettes Nepean.	Briquettes Sample.	Cubes. Standard.	Cubes. Nepean.	Cubes. Sample.
370	650			
370	610	3,480	....	4,430
380	560			
370	630	3,500	....	4,560
360	670			
360	610	3,550	....	4,360
360	590			
400	620	....	....	....
360	610			
350	620	....	....	....
380	590			
370	610			
Total .. 4,430	7,370	10,530	....	13,350 Total.
Average 369	614	3,510	....	4,450 Average.
Co-efficient 100	166.4	100	....	126.7 Coefficient.

SAND (DECOMPOSED GRANITE, CRUSHED)—UNWASHED.

Description of Test.	Standard Sand as used in Cement Tests.	Nepean Sand graded as Sample Sand.	Sample Sand.	Voids from Specific Gravity.
Relative strength of sample sand when mixed with Portland Cement in the proportion of 3 of sand to 1 of cement, and compared with standard sand when mixed in the same proportion with the same cement—				
Co-efficient for tensile strain	100	....	144.2	
Co-efficient for crushing strain	100	....	138.9	
Loss of weight by washing p.c.	0.0	....	8.3	
Weight per cubic foot lb.	100.0	....	109.87	
			38.8	47.17
Percentage of voids calculated from specific gravity p.c.	38.32	....	25.12	32.30
Residue on sieve of 144 meshes per sq. in. p.c.	0.00	....	19.0	
" " 400 " " " "	0.00	....	35.7	
" " 900 " " " "	100.00	....	19.9	
" " 2,400 " " " "	0.00	....	10.8	
Passed through 2,400 " " " "	0.00	....	14.6	
Relative hardness	100.00	....	91.57	

The standard sand used is Nepean River sand, washed, dried, and sifted through a sieve of 400 meshes per square inch, and caught on a sieve of 900 meshes per square inch.

Sand passed through $\frac{1}{8}$ -inch sieve before testing. Ordinary figures show when measure was tightly filled; in black figures when filled loosely.

Tensile-lb. per square inch. 28 day tests.			Compression-lb. per square inch. 28 day tests.			
Briquettes. Standard.	Briquettes Nepean.	Briquettes Sample.	Cubes Standard.	Cubes Nepean.	Cubes. Sample.	
370	520				
370	530				
380	540	3,480	....	4,800	
370	520				
360	530	3,500	....	5,000	
360	520				
360	560	3,550	....	4,830	
400	560				
360	550	....	....	....
350	550				
380	540	....	....	....
370	470				
Total ..	4,430	6,390	10,530	14,630 Total.
Average	369	532	3,510	4,877 Average.
Co-efficient	100	144.2	100	138.9 Co-efficient.

SAND (DECOMPOSED GRANITE, CRUSHED)—WASHED.

Description of Test.	Standard Sand as used in Cement Tests.	Nepean Sand graded as Sample Sand.	Sample Sand.	Voids from specific gravity.
Relative strength of sample sand when mixed with Portland Cement in the proportion of 3 of sand to 1 of cement, and compared with standard sand when mixed in the same proportion with the same cement—				
Co-efficient for tensile strain	100	....	134.4	....
Co-efficient for crushing strain.. ..	100	....	121.7	....
Loss of weight by washing %	0.0	....	....	....
Weight per cubic foot lb.	100.0	....	103.6	....
			42.48	47.75
Percentage of voids calculated from specific gravity %	38.32	....	31.36	36.17
Residue on sieve of 144 meshes per square inch %	0.00	....	17.7	....
Residue on sieve of 400 meshes per square inch %	0.00	....	33.7	....
Residue on sieve of 900 meshes per square inch %	100.00	....	20.4	....
Residue on sieve of 2,400 meshes per square inch %	0.00	....	14.7	....
Passed through 2,400 meshes per sq. inch	0.00	....	13.5	....
Relative hardness	100.00	....	91.57	....

The standard sand used is Nepean River sand, washed, dried, and sifted through a sieve of 400 meshes per square inch, and caught on a sieve of 900 meshes per square inch.

Sand passed through $\frac{1}{8}$ inch sieve before testing. Ordinary figures when measure was tightly filled; in black figures when filled loosely.

Tensile-lb. per square inch. 28 day tests.			Compression-lb. per square inch. 28 day tests.		
Briquettes. Standard.	Briquettes Nepean.	Briquettes Sample.	Cubes. Standard.	Cubes Nepean.	Cubes. Sample.
370	490	3,480	....	4,320
370	500			
380	520	3,500	....	4,380
370	470			
360	480	3,550	....	4,120
360	490			
360	530	....	....	....
400	470			
360	520	....	....	....
350	490			
380	480	....	....	....
370	530			
Total .. 4,430	5,970	10,530	....	12,820 Total.
Average 369	497	3,510	....	4 273 Average.
Co-efficient 100	134.4	100	....	121.7 Co-efficient.

RIVER SAND—UNWASHED.

Description of Test.	Standard Sand as used in Cement Tests.	Nepean Sand graded as Sample Sand.	Sample Sand.
Relative strength of sample sand when mixed with Portland cement in the proportion of 3 of sand to 1 of cement, and compared with standard sand when mixed in the same proportion with the same cement	....	....	....
Co-efficient for tensile strain	100	116.4	114.8
Co-efficient for crushing strain	100	109.6	96.6
Loss of weight by washing	0.0	1.2	1.9
Weight per cubic foot	100.0	107.31	104.85
Percentage of voids calculated from sp. gravity	38.32	34.64	36.37
Residue on sieve of 144 meshes per square inch	0.00	0.8	0.8
" " 400 " " "	0.00	8.3	8.3
" " 900 " " "	100.00	25.6	25.6
" " 2,400 " " "	0.00	44.0	44.0
Passed through 2,400 " " "	0.00	21.3	21.3
Relative hardness	100.00	99.26	86.44

The standard sand used is Nepean River sand, washed, dried, and sifted through a sieve of 400 meshes per square inch, and caught on a sieve of 900 meshes per square inch.

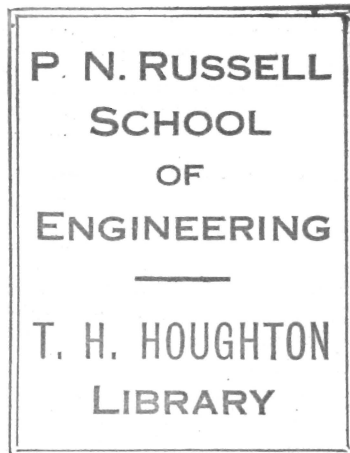
TENSILE.			COMPRESSION.		
Briquettes Standard.	Briquettes Nepean.	Briquettes Sample.	Cubes. Standard.	Cubes. Nepean.	Cubes. Sample.
430	530	530	3,950	4,220	3,800
460	440	500	3,900	4,310	3,650
420	510	480	3,670	4,090	3,680
450	510	500	...	...	...
420	530	470	...	...	...
420	...	500	...	...	...
2,600	2,520	2,980 Total	Total 11,520	12,620	11,130
433	504	497 Average	Average 3,840	4,207	3,710
100	116.4	114.8 Co-efficient.	Co-efficient 100	109.6	96.6

RIVER SAND—WASHED.

Description of Test.	Standard Sand as used in Cement Tests.	Sample Sand.
Relative strength of sample sand when mixed with Portland Cement in the proportion of 3 of sand to 1 of cement, and compared with standard sand when mixed in the same proportion with the same cement—		
Co-efficient for tensile strain lb.	100	106.3
Co-efficient for crushing strain	100	90.9
Loss of weight by washing p.c.	0.0	...
Weight per cubic foot lbs.	100.0	103.41
Percentage of voids calculated from sp. gravity ... p.c.	38.32	37.25
Residue on sieve of 144 meshes per square inch ... p.c.	0.00	1.7
" " 400 " " " " " " " " "	0.00	9.3
" " 900 " " " " " " " "	100.00	25.7
" " 2,400 " " " " " " " "	0.00	45.2
Passed through 2,400 " " " " " " " "	0.00	18.1
Relative hardness	100.00	86.44

The standard sand used is Nepean River sand, washed, dried, and sifted through a sieve of 400 meshes per square inch, and caught on a sieve of 900 meshes per square inch.

TENSILE.			COMPRESSION.			
Briquettes Standard.	Briquettes Nepean.	Briquettes. Sample.	Cubes. Standard.	Cubes. Nepean.	Cubes. Sample.	
440	...	440	4,320	...	3,650	
450	...	400	4,260	...	3,800	
420	...	450	4,020	...	4,000	
380	...	450	...	...	...
390	...	440	...	...	...
390	...	450	...	...	...
2,470	...	2,630	Total	12,600	...	11,450
412	...	438	Average	4,200	...	3,817
100	...	106.3	Co-efficient.	100	...	90.9



APPENDIX H.

ESTIMATED QUANTITY OF ELECTRIC PLANT REQUIRED TO CONSTRUCT A DAM OF 200,000 CUBIC YARDS CONTENTS.

Item.	No.	Size or capacity of each unit.	Cost per each unit.			Cost of Erection.			Gross Cost.			Approx. Weight. Tons.
			£	s.	d.	£	s.	d.	£	s.	d.	
Power-house building		Lump sum	200	0	0	100	0	0	300	0	0	10
Steam boilers (tubular) set in brick	3	90 h.p.	575	0	0	300	0	0	2,625	0	0	225
Steam piping, etc.		Lump sum	75	0	0	25	0	0	100	0	0	3
Electric generators, one large size, 200 k.w., and one 100 k.w.		1/400 amp. 500 volts										
		1/200 " 500 "										
		Lump sum "	4,000	0	0	100	0	0	4,100	0	0	43
Switch-board	1	Lump sum	300	0	0	25	0	0	325	0	0	1
Cableways, including travelling towers 49 and 33 ft. high, with 150 ft. track laid with 80 lb. rails and fastenings	2	8 tons.	3,670	19	8	417	12	0	8,177	3	4	270
Cranes, complete	4	10 "	897	1	10	50	0	0	3,788	7	4	104
" hand complete	1	5 "	85	0	0	10	0	0	95	0	0	5
" " " "	1	3 "	65	0	0	10	0	0	75	0	0	4
Stone crushers, complete, capacity 25 c. yds. per hour, electric motor 50 h.p. and timber for staging, etc. ...	2	25 c. yds. per hour.	710	0	0	75	0	0	1,570	0	0	40
Concrete mixers, each 1 c. yd. capacity, including motor and timber for staging, etc.	3	1 c. yd. each.	445	0	0	125	0	0	1,710	0	0	32
Sand crushing plant, including stone crusher, capacity 25 c. yds. per hour, electric motor, 50 h.p., water service, elevators, fluming, etc., complete ...	1	Lump sum	810	0	0	125	0	0	935	0	0	35
Buckle plate tank	2	20,000 gal.	100	0	0	20	0	0	240	0	0	13
12 in. pump and motor	1	Lump sum	250	0	0	20	0	0	270	0	0	3
8 " " " "	1	" "	200	0	0	20	0	0	220	0	0	2
6 " " " "	1	" "	175	0	0	15	0	0	190	0	0	1½
3 " " driven by compressed air	1	" "	55	0	0	5	0	0	60	0	0	} 2½
2 " " " " " " " "	1	" "	35	0	0	3	0	0	38	0	0	
1 " " " " " " " "	2	" "	20	0	0	2	0	0	44	0	0	
Electric light engine, 22 h.p., including transmission wires, lamps, etc.	1	" "	550	0	0	50	0	0	600	0	0	6
Transmission cables	1 mile.	37/12	550	0	0	35	0	0	585	0	0	} 5
" " " " " " " "	1 "	19/14	200	0	0	15	0	0	215	0	0	
Air compressor, capacity 444 cub. ft. per minute, and including motor	1	Lump sum	600	0	0	50	0	0	650	0	0	8½
Air leads, piping, fittings, etc.	2,000 ft.	3 in. to 1 in.	100	0	0	25	0	0	125	0	0	3
Rock drills, Ingersoll-Rand (F. 94)	4	3½ in. to 7 in.	90	0	0	—	—	—	360	0	0	21½
Drilling machine for fitters' shop	1	Lump sum	52	0	0	10	0	0	62	0	0	1½
Lathe for fitters' shop	1	12 ft.	86	0	0	10	0	0	96	0	0	
Screw-cutting machine for fitters shop	1	1 in. to 4 in. gas.	48	0	0	2	0	0	50	0	0	¼
									£1,644	12	0	
									£27,605	10	8	
												821½

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