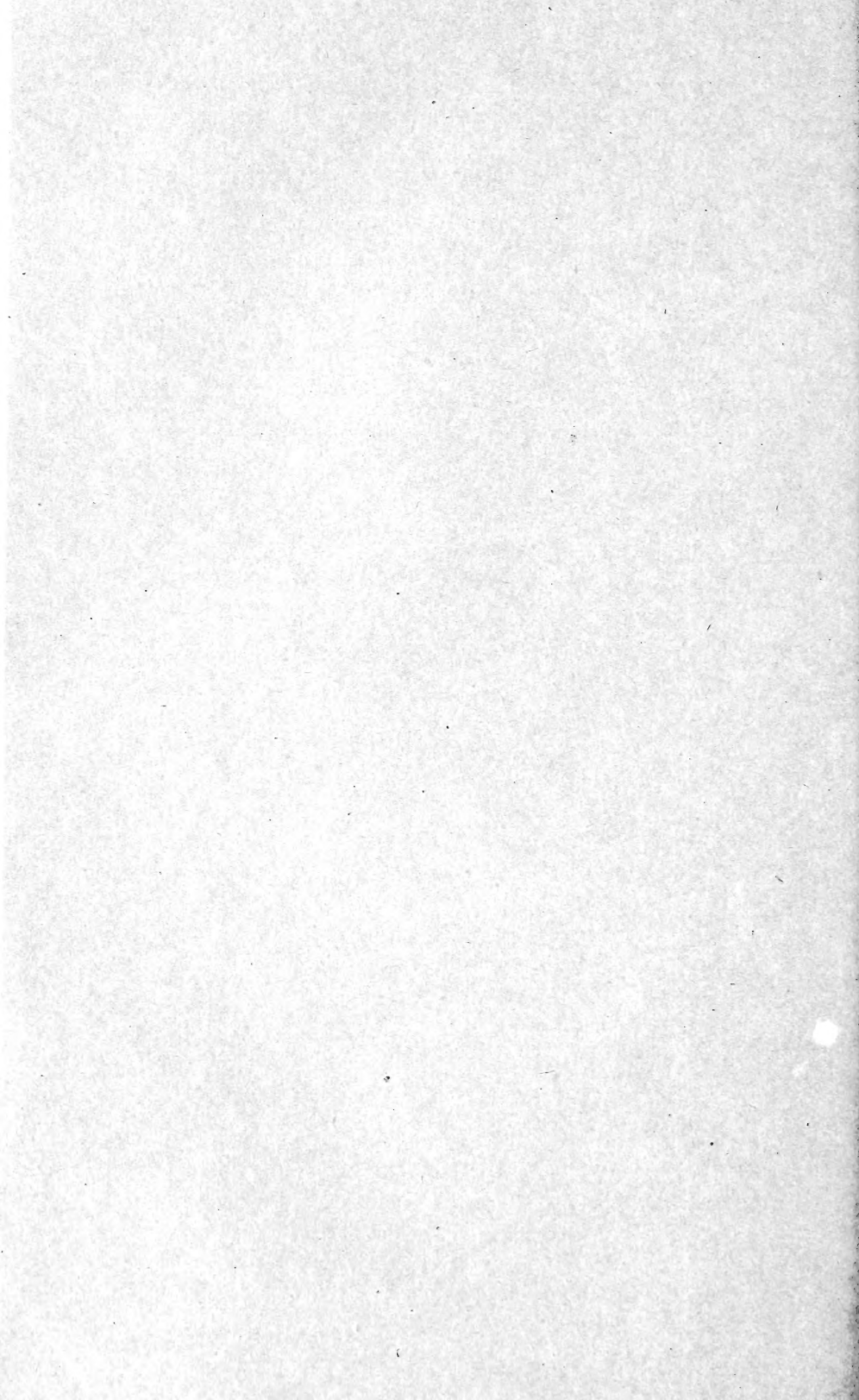


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**BULLETIN No. 537**



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LOGAN WALLER PAGE, Director.

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PROFESSIONAL PAPER

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**THE RESULTS OF PHYSICAL TESTS OF ROAD-BUILDING ROCK IN 1916, INCLUDING ALL COMPRESSION TESTS.**

By PRÉVOST HUBBARD, *Chemical Engineer*, and FRANK H. JACKSON, JR., *Assistant Testing Engineer*.

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**INTRODUCTION.**

This bulletin should be considered as a supplement to United States Department of Agriculture Bulletin 370, which gives the results of the more common physical tests of some 3,650 road-building rock examined by the Office of Public Roads and Rural Engineering to January 1, 1916. The office tested 396 samples of rock in 1916, the results of which tests are given in Table I, the rocks being classified according to their location. It should be noted that in a number of cases, in addition to other tests, the crushing strength of the rock also is given. This test is not made ordinarily when examining rock to determine its suitability for use in various types of broken-stone roads. The test is employed often, however, when considering a rock for use in the manufacture of paving block, and as many requests for records of the crushing strength of various rocks have been received in the past year, it has been thought advisable to give in Table II a complete record of all of the crushing-strength tests made by the office up to January 1, 1917. Following is a brief description of this test, as made by the office.

**CRUSHING STRENGTH OR COMPRESSION TEST.**

The compression test is made upon a cylindrical test specimen 2 inches in diameter and 2 inches high. Both ends of the specimen, which have been sawed at right angles to the axis of the cylinder,

and properly faced, are bedded in plaster of Paris. The cylinder then is crushed in a 200,000-pound universal testing machine. A small 2-inch spherical bearing block is placed between the moving head of the machine and the upper surface of the specimen. The average of at least two determinations is reported as the crushing strength, calculated in pounds per square inch. Crushing strength tests are made upon samples of road-building rock only when especially requested. Of a total of 282 compression tests made up to January 1, 1917, Table II shows that 97 were made on granites, 13 on gneisses, 78 on limestones, 42 on dolomites, 28 on sandstones, and 24 on various other types of material.

The percentage variation in the strength of the 110 granites and gneisses and the 120 limestones and dolomites is shown graphically

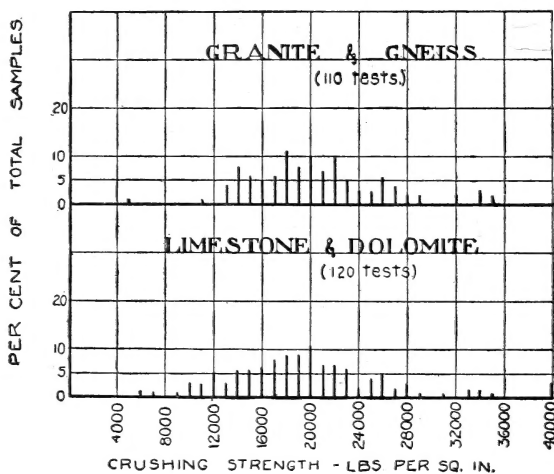


FIG. 1.—Variations in the crushing strength of rock.

in figure 1. In this chart the per cent of total samples tested having various values for crushing strength are plotted as indicated. For instance, the chart shows that 10 per cent of all granites and gneisses tested show a crushing strength of 20,000 pounds per square inch. Likewise, by summing up all the per cents to the left of the 20,000-pound line we find that 48 per cent of all samples of granite and gneiss tested have a crushing strength of less than 20,000 pounds per square inch, which shows that the average crushing strength of this type of material lies between 19,000 and 20,000 pounds per square inch. Likewise, the average crushing strength of the limestones and dolomites lies between 18,000 and 19,000 pounds per square inch.

#### INTERPRETATION OF RESULTS OF PHYSICAL TESTS.

A discussion of the interpretation of the results of physical tests was given in Bulletin 370, to which reference has been made. Since the publication of that bulletin, however, a table of general limiting test values for broken stone for various types of road construction has been adopted by the office and printed on the back of its form for reporting tests. For general reference these limiting values, together with comments upon limits shown, are given in Table IV.

TABLE I.—Results of physical tests of road-building rock from the United States, Canada, Porto Rico, and Cuba, from Jan. 1, 1916, to Jan. 1, 1917.

ALABAMA.

Serial No.	Town or city.	County.	Name of material.	Crushing strength, per pounds per square inch.	Weight per cubic foot.	Absorption per cubic foot.	Per cent of wear.	French coefficient of wear.	Hardness.	Toughness.	Cementing value.
10138	Bridgeport.	Jackson.	Oolitic limestone.	(1)	Pounds. 108	Pounds. 0.21	4.4	9.1	15.7	5	41
9985	Birmingham.	Jefferson.	Limestone.	(1)	108	.55	5.0	8.0	15.3	6	40

ARKANSAS.

9828	Lamar.	Johnson.	Feldspathic sandstone.	21,980	159	1.98	(1)	(1)	18.7	13	17
9838	Fort Smith.	Sebastian.	Sandstone.	(1)	150	5.00	6.5	6.2	15.3	6	25
10486	Gillham.	Sevier.	Feldspathic quartzite.	(1)	104	.42	2.3	17.4	19.0	32	(1)

COLORADO.

9821	Lyons (near)	Boulder.	Argillaceous limestone.	(1)	162	2.98	4.9	8.2	15.3	7	162
9822	Lyons.	do.	Sandstone.	(1)	156	1.73	3.4	11.8	18.3	11	36
9823	Lyons (near)	do.	do.	(1)	156	1.37	2.9	13.8	16.0	14	13
11168	Denver.	Jefferson.	Augite andesite.	(1)	109	1.27	2.7	14.8	15.3	17	98
11169	do.	Denver.	Smelter slag.	(1)	216	.65	7.6	5.3	(1)	(1)	6
11170	do.	do.	do.	(1)	217	.50	5.1	7.8	(1)	(1)	7
11171	do.	do.	do.	(1)	217	.86	4.6	8.7	17.3	15	4

CONNECTICUT.

9944	Plainville.	Hartford.	Diaabase.	(1)	184	1.14	2.0	20.0	19.0	23	102
11151	East Haven.	New Haven.	Altered basalt.	(1)	169	.63	3.7	10.8	17.3	10	72
11067	Waterford.	New London.	Granite.	21,840	102	1.74	(1)	(1)	18.7	13	(1)
11068	do.	do.	Biotite granite.	23,850	102	.78	(1)	(1)	18.7	8	(1)
11069	do.	do.	do.	22,170	104	.71	(1)	(1)	18.7	14	(1)
9791	Omeco.	Windham.	do.	16,035	(1)	(1)	(1)	(1)	18.3	8	(1)
11098	do.	do.	do.	23,290	104	.55	(1)	(1)	18.7	6	(1)
11099	do.	do.	Gneissoid granite.	20,200	103	.67	(1)	(1)	18.7	6	(1)
11148	do.	do.	do.	20,825	103	.44	4.6	8.7	18.7	7	(1)

<sup>1</sup> Test not made.

<sup>2</sup> Exact locality not known.

TABLE I.—Results of physical tests of road-building rock from the United States, Canada, Porto Rico, and Cuba, from Jan. 1, 1916, to Jan. 1, 1917—Con.

FLORIDA.											
Serial No.	Town or city.	County.	Name of material.	Crushing strength, pounds per square inch.	Weight per cubic foot.	Absorption per cubic foot.	Per cent of wear.	French coefficient of wear.	Hardness.	Toughness.	Cementing value.
10776	(2)	Broward	Siliceous limestone	(1)	Pounds.	Pounds.	(1)	(1)	17.3	6	61
10411	Delray (3 miles west)	Palm Beach	Shell limestone	(1)	(1)	(1)	50.9	0.8	(1)	(1)	52
10430	Boynton (near)	do.	do.	(1)	(1)	(1)	37.2	1.1	(1)	(1)	40
10431	Jupiter (15 miles west)	do.	Siliceous limestone	(1)	(1)	(1)	12.5	3.2	14.7	5	43
GEORGIA.											
10398	Cartersville (3 miles east)	Bartow	Quartz schist	(1)	159	0.71	5.0	8.0	19.3	11	(1)
10399	Cartersville	do.	Ferruginous sandstone	(1)	145	8.74	22.0	1.8	(1)	(1)	(1)
10400	Cass Station (2 miles north)	do.	Sandstone	(1)	152	2.86	7.5	3.3	18.7	(1)	(1)
10192	Titusville	Brevard	Shell limestone	(1)	155	4.03	4.7	5.3	14.9	2	42
10645	Carrollton (4 miles north)	Carroll	Biotite gneiss	(1)	172	.35	4.3	8.5	17.7	7	(1)
10646	Carrollton	do.	Granite gneiss	(1)	165	.02	4.5	8.9	18.7	5	(1)
10647	Carrollton (2 miles south west)	do.	do.	(1)	169	.51	4.6	8.7	18.5	6	(1)
10648	Carrollton	do.	do.	(1)	168	.33	4.8	8.3	18.7	4	(1)
10654	Carrollton (7 miles northeast)	do.	Biotite gneiss	(1)	166	.67	(1)	(1)	18.0	10	(1)
10655	Temple (4 miles east)	do.	do.	(1)	169	.96	7.7	5.2	17.0	5	(1)
10649	Carrollton (4 miles southeast)	do.	Biotite schist	(1)	168	.51	5.7	7.0	18.9	8	(1)
10651	Mabry	do.	Epidoite hornblende schist	(1)	192	1.12	5.5	7.3	17.7	9	(1)
10653	Roopville	do.	Mica schist	(1)	168	.75	(1)	(1)	16.7	5	(1)
10657	Bowdon (1 mile north)	do.	Amphibolite	(1)	187	1.20	19.0	2.1	10.5	4	(1)
10417	Athens	Clarke	Biotite granite	(1)	165	.68	6.4	6.3	18.7	6	(1)
10422	Athens (4 miles west)	do.	do.	(1)	163	1.56	4.4	9.1	15.4	4	(1)
10423	Athens (4 miles from)	do.	do.	(1)	163	.58	4.4	6.8	17.8	9	(1)
10420	Athens	do.	do.	(1)	167	.47	5.9	6.8	18.7	4	(1)
10418	do.	do.	Granite gneiss	(1)	169	.76	7.5	5.3	17.7	6	(1)
10421	Athens (south of)	do.	Biotite gneiss	(1)	167	.65	(1)	(1)	18.7	6	(1)
10377	Marietta (1½ miles south)	Cobb	do.	(1)	170	.67	6.5	6.2	17.3	6	(1)
10378	Chattahoochee River	do.	do.	(1)	165	.26	5.1	7.8	18.6	8	(1)
10380	Lost Mountain Store	do.	Hornblende gneiss	(1)	188	.93	(1)	(1)	13.3	4	(1)
10381	Southeast Kennesaw Mountain	do.	Feldspathic gneiss	(1)	167	.73	5.6	(1)	18.7	6	(1)
10382	Marietta (4 miles north west)	do.	Biotite gneiss	(1)	169	.50	(1)	(1)	17.3	6	(1)
10387	Aneworth (½ mile south)	do.	do.	(1)	175	.68	8.6	7.1	16.7	5	(1)
10388	Aneworth (4 miles south)	do.	do.	(1)	174	.59	10.1	3.9	16.7	5	(1)
10389	Aunsted (¼ mile west)	do.	Granite gneiss	(1)	163	.56	7.4	5.4	18.7	5	(1)

TESTS OF ROAD-BUILDING ROCK IN 1916.

10393	Blackwell Station (1 mile north)	do	17,350	184	4.9	8.2	17.3	(1)	7
10394	Kennesaw Mountain (north of Smyrna (3 1/4 miles west).	do	(1)	180	(1)	(1)	18.0	(1)	7
10397	do	do	(1)	172	(1)	(1)	18.0	(1)	7
10395	Kennesaw Station (4 miles southwest).	do	(1)	191	5.3	7.5	15.3	(1)	5
9869	Lela	Decatur	(1)	125	22.2	1.8	19.3	(1)	5
10197	Beach Creek Bridge	Floyd	(1)	163	(1)	(1)	10.7	(1)	8
10199	Javender Mountain	do	(1)	163	(1)	(1)	17.7	(1)	29
10198	Huffaker Station	do	(1)	170	3.6	11.1	16.0	(1)	6
10200	Rome (3 miles north)	do	(1)	168	5.1	7.8	15.7	(1)	42
10202	Dozier Creek	do	(1)	170	5.1	7.8	15.7	(1)	4
10203	Pinson	do	(1)	169	4.9	7.1	15.3	(1)	5
10211	Rome	do	(1)	167	22	9.5	14.7	(1)	13
10212	Armuchee (1 mile southeast)	do	(1)	168	35	7.3	15.0	(1)	6
10222	do	do	(1)	168	4.2	9.5	16.0	(1)	35
10223	do	do	(1)	168	3.8	10.5	16.7	(1)	8
10224	Armuchee (southeast of)	do	(1)	167	4.0	10.0	17.3	(1)	16
9751	Atlanta (near)	Fulton	(1)	168	3.7	10.8	18.3	(1)	8
9761	do	do	(1)	165	4.7	8.5	18.0	(1)	17
9764	Atlanta	do	(1)	162	(1)	(1)	19.3	(1)	7
9753	Atlanta (near)	do	(1)	168	3.8	10.5	19.3	(1)	24
9752	do	do	(1)	165	(1)	(1)	18.7	(1)	15
9754	do	do	(1)	165	8.4	4.8	17.3	(1)	9
9755	Atlanta	do	(1)	165	3.0	13.3	18.7	(1)	21
9756	Atlanta (near)	do	(1)	165	3.8	9.3	18.7	(1)	19
9757	do	do	(1)	165	4.3	9.3	18.7	(1)	15
9758	do	do	(1)	165	(1)	(1)	17.2	(1)	24
9759	Atlanta	do	(1)	165	4.1	9.8	19.3	(1)	20
9760	Atlanta (near)	do	(1)	168	3.8	10.5	18.3	(1)	13
9762	do	do	(1)	165	4.0	11.4	18.3	(1)	25
9763	do	do	(1)	172	1.03	(1)	14.7	(1)	35
9765	do	do	(1)	184	(1)	(1)	19.0	(1)	4
9766	Atlanta	do	(1)	165	5.0	8.0	18.7	(1)	6
9767	Fairmount (1/2 mile south)	Gordon	(1)	175	3.4	11.8	18.0	(1)	29
10397	do	do	(1)	169	4.4	9.1	16.7	(1)	22
10397	Lawrenceville	do	(1)	170	5.3	7.5	14.7	(1)	31
10547	Lawrenceville (1 1/2 miles south-east).	Gwinnett	(1)	183	4.1	9.8	15.3	(1)	5
10556	Lawrenceville (12 miles north-east).	do	(1)	196	(1)	(1)	15.7	(1)	6
10553	Lawrenceville	do	(1)	159	6.6	6.1	(1)	(1)	5
10564	Rosebud	do	(1)	162	6.2	9.0	17.0	(1)	6
10565	Snellville	do	(1)	162	5.6	7.1	18.9	(1)	5
10564	Lawrenceville	do	(1)	162	7.3	6.8	17.7	(1)	3
10555	Lawrenceville (1 1/2 miles east)	do	(1)	165	5.9	6.8	19.2	(1)	6
10557	Lawrenceville (6 miles south-east).	do	(1)	162	8.6	(1)	17.7	(1)	4
10558	do	do	(1)	162	4.9	8.2	18.4	(1)	6
10559	Grayson (2 miles east).	do	(1)	162	4.6	8.7	18.0	(1)	5
10560	McVaneys Shoals	do	(1)	158	7.0	7.0	18.0	(1)	5
10561	Grayson (southwest of)	do	(1)	162	5.2	7.7	18.2	(1)	4
10562	Langley Quarry	do	(1)	162	5.2	7.7	17.5	(1)	4
		do	(1)	162	6.7	6.0	17.5	(1)	4

2 Exact locality not known.

1 Test not made.

TABLE I.—Results of physical tests of road-building rock from the United States, Canada, Porto Rico, and Cuba, from Jan. 1, 1916, to Jan. 1, 1917—Con.

GEORGIA—Continued.

Serial No.	Town or city.	County.	Name of material.	Crushing strength, per square inch.	Weight per cubic foot.	Absorption per cubic foot.	Per cent of wear.	French coefficient of wear.	Hardness.	Toughness.	Cementing value.
10503	Grayson (3 miles southwest)	Gwinnett	Granite	(1)	Pounds. 102	Pounds. 0.78	5.5	7.3	18.3	6	(1)
10536	Snellville (2 miles southeast)	do.	do.	(1)	102	.73	4.0	10.0	18.3	6	(1)
10530	Lawrenceville (4 miles west)	do.	Amphibolite	(1)	190	.32	3.4	11.8	18.0	13	12
10543	Pendergrass	Jackson	Olivine diabase	(1)	184	.09	3.6	11.1	19.0	16	22
10534	Talmo	do.	Granite gneiss	(1)	161	1.13	7.6	5.2	(1)	5	(1)
10545	Holder Sliding (near)	do.	Hornblende gneiss	(1)	165	.48	4.0	10.0	18.3	7	(1)
10546	Jefferson (4 miles north)	do.	Granite	(1)	163	.65	5.6	7.1	18.3	5	(1)
10536	Jefferson (3 miles east)	do.	Hornblende schist	(1)	190	.04	(1)	(1)	17.0	4	(1)
10857	Robertsville (1½ miles north-east)	Jones	Argillaceous sandstone	(1)	105	19.80	12.2	3.2	(1)	(1)	(1)
9739	Montbrook	Levy	Chert	(1)	156	2.02	3.2	12.5	(1)	(1)	8
9740	do.	do.	do.	(1)	156	2.74	3.5	11.4	(1)	(1)	78
10354	Upper Marietta	Milton	Granite gneiss	(1)	167	.56	6.6	6.1	18.0	8	(1)
10355	do.	do.	do.	(1)	163	.59	6.9	5.8	18.7	6	(1)
10858	Columbus (4 miles north)	Muscogee	Hornblende gneiss	(1)	179	.25	4.5	8.9	16.7	5	(1)
10859	do.	do.	do.	(1)	179	.45	5.0	8.0	16.7	5	(1)
10861	Fortson (4 miles south)	do.	Biotite gneiss	(1)	167	.48	3.7	10.8	18.7	10	(1)
10862	Fortson (1 mile southwest)	do.	do.	(1)	164	.89	5.3	7.6	18.7	9	(1)
10863	Gentian (¾ miles north-east)	do.	Granite gneiss	(1)	163	.50	3.6	11.1	18.7	9	(1)
10864	Columbus (8 miles north)	do.	Hornblende gneiss	(1)	163	.83	4.3	9.3	18.7	7	(1)
10865	Gentian (¾ miles north-east)	do.	Granite gneiss	(1)	163	.58	3.7	10.8	18.7	10	(1)
10881	Gentian (east of)	do.	Hornblende gneiss	(1)	165	.36	3.9	10.2	18.7	7	(1)
10860	Fortson (2 miles south-east)	do.	Biotite granite	(1)	168	.40	4.2	9.5	19.3	8	(1)
10776	(?)	(?)	Siliceous limestone	(1)	(1)	(1)	(1)	(1)	17.3	6	(1)

IDAHO.

10462	St. Anthony	Fremont	Basalt	(1)	159	4.17	7.2	5.6	16.7	4	(1)
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ILLINOIS.

9750	Aurora.....	Kane.....	Smelter slag.....	221	0.17	2.2	18.2	(1)	5	(1)
10367	Kankakee.....	Kankakee.....	Dolomite.....	158	2.12	8.4	4.8	(1)	8	(1)
10298	Fox Township.....	Kendall.....	do.....	169	1.77	4.9	8.2	(1)	8	(1)
11133	Pontiac.....	Livingston.....	Argillaceous limestone.....	166	2.73	12.9	3.1	(1)	8	(1)
9827	Joliet.....	Will.....	Dolomite.....	193	1.18	4.9	8.2	(1)	7	(1)
10772	Aurora.....	do.....	Smelter slag.....	212	0.00	7.3	5.5	(1)	7	(1)

INDIANA.

9688	(2).....	Clark.....	Argillaceous dolomite.....	150	5.23	10.3	3.9	(1)	3	(1)
11082	Brazil.....	Clay.....	Limestone.....	174	.66	4.3	9.3	(1)	11	(1)
11018	Milftown.....	Crawford.....	do.....	167	.56	3.3	12.1	(1)	11	(1)
11019	do.....	do.....	do.....	168	.66	3.6	11.1	(1)	7	(1)
11020	do.....	do.....	do.....	167	.60	3.5	11.4	(1)	11	(1)
11021	do.....	do.....	Argillaceous limestone.....	168	1.17	3.0	13.3	(1)	11	(1)
11022	do.....	do.....	Limestone.....	168	.37	4.5	8.9	(1)	6	(1)
11023	do.....	do.....	do.....	168	.61	4.4	9.1	(1)	7	(1)
11024	do.....	do.....	Pisolithic limestone.....	158	5.2	7.7	8.7	(1)	4	(1)
11025	do.....	do.....	Limestone.....	161	2.59	4.5	8.9	(1)	8	(1)
9859	St. Paul.....	Decatur.....	Argillaceous limestone.....	168	2.01	4.4	9.1	(1)	5	(1)
10114	do.....	do.....	do.....	168	1.01	4.0	10.0	(1)	5	(1)
11066	Schmellville.....	Dubois.....	Siliceous limestone.....	169	2.58	3.8	10.5	(1)	12	(1)
11183	Huntington.....	Huntington.....	Dolomite.....	163	2.10	4.1	9.7	(1)	7	(1)
9811	Vernon.....	Jennings.....	do.....	159	4.30	5.0	8.0	(1)	9	(1)
10834	do.....	do.....	Limestone.....	167	2.08	3.9	10.2	(1)	9	(1)
10847	do.....	do.....	Polornite.....	149	8.1	(1)	4.9	(1)	4	(1)
10256	Bloomington (east of).....	Monroe.....	Argillaceous limestone.....	(1)	(1)	(1)	(1)	(1)	5	(1)
10257	Bloomington.....	do.....	Limestone.....	(1)	(1)	(1)	(1)	(1)	5	(1)
10493	do.....	Putnam.....	Limestone.....	(1)	(1)	(1)	(1)	(1)	5	(1)
9860	Greencastle.....	do.....	do.....	185	1.03	4.8	8.3	(1)	7	(1)
10519	Fillmore.....	do.....	Argillaceous limestone.....	168	.66	(1)	16.7	(1)	5	(1)
10520	do.....	do.....	do.....	159	2.22	(1)	11.2	(1)	6	(1)
10727	Greencastle.....	do.....	Limestone.....	162	2.00	(1)	12.0	(1)	6	(1)
10020	Elberfeld.....	Warrick.....	do.....	160	1.07	7.3	5.5	(1)	3	(1)
9935	Bluffton.....	Wells.....	Dolomite.....	159	3.81	4.5	8.9	(1)	9	(1)
10693	(2).....	(2).....	Limestone.....	165	2.89	6.2	6.5	(1)	8	(1)
10694	(2).....	(2).....	Argillaceous limestone.....	166	1.24	5.4	7.5	(1)	5	(1)
				148	8.75	8.9	4.5	(1)	3	(1)

KANSAS.

9599	Fort Scott (7 miles west of).....	Bourbon.....	Limestone breccia.....	7,380	(1)	(1)	(1)	(1)	(1)	(1)
9780	Beloit.....	Mitchell.....	Argillaceous limestone.....	(1)	18.2	(1)	2.2	(1)	4	(1)

2 Exact locality not known.

1 Test not made.

TABLE I.—Results of physical tests of road-building rock from the United States, Canada, Porto Rico, and Cuba, from Jan. 1, 1916, to Jan. 1, 1917—Con.

## KENTUCKY.

Serial No.	Town or city.	County.	Name of material.	Crushing strength, per square inch.	Weight per cubic foot.	Absorption per cubic foot.	Per cent of wear.	French coefficient of wear.	Hardness.	Toughness.	Cementing value.
10134	Lexington.....	Fayette.....	Argillaceous limestone.....	( )	Pounds. 168	0.19	6.1	6.6	16.0	4	41
10136	do.....	do.....	do.....	( )	168	.17	5.5	7.3	12.7	6	34
10451	Cerulean Springs (near).....	Trigg.....	do.....	( )	167	.45	4.7	8.5	14.2	4	37
9829	(?).....	(?).....	Limestone.....	( )	165	1.31	( )	( )	13.7	6	40
9830	(?).....	(?).....	Argillaceous limestone.....	( )	165	.82	( )	( )	15.5	10	44

## MAINE.

10219	North Jay.....	Franklin.....	Granite.....	21,260	104	0.84	2.7	14.8	19.3	7	13
9997	Mount Desert.....	Hancock.....	do.....	19,780	165	.21	3.4	11.8	19.7	9	11
10233	do.....	do.....	do.....	19,220	162	.90	4.1	9.8	18.7	8	9
10234	do.....	do.....	do.....	24,700	160	.67	3.2	12.5	18.7	12	14
10388	Ship Harbor.....	do.....	do.....	28,650	165	.21	( )	( )	19.3	18	( )
10689	do.....	do.....	do.....	26,900	163	.31	( )	( )	18.7	13	( )
10690	do.....	do.....	do.....	32,450	164	.42	( )	( )	19.3	16	( )
9781	St. George.....	Knox.....	do.....	18,780	( )	( )	( )	( )	( )	12	( )
9865	do.....	do.....	do.....	17,150	( )	( )	( )	( )	18.8	9	( )
10019	Vinal Haven.....	do.....	Biotite-granite.....	21,650	165	.25	3.1	12.9	19.3	14	28
9996	Long Cove.....	do.....	Granite.....	17,510	168	.23	3.3	12.1	19.2	10	30
10249	do.....	do.....	Biotite granite.....	22,500	165	.86	3.0	13.3	19.3	13	( )
10250	do.....	do.....	Granite.....	22,330	166	.82	3.5	11.4	19.3	8	( )
9706	Rockland.....	do.....	Marble.....	( )	175	.40	4.3	9.3	17.0	4	47

## MARYLAND.

10105	Frederick.....	Frederick.....	Limestone.....	( )	( )	0.46	3.0	13.3	16.0	5	( )
10021	North Laurel.....	Howard.....	Amphibolite.....	( )	200	( )	3.5	11.4	17.7	8	32
10101	Dickerson.....	Montgomery.....	Dialase (trap).....	( )	( )	( )	1.4	28.6	18.5	21	( )
11133	Harpine.....	do.....	Biotite granite.....	( )	171	.42	3.1	12.9	18.7	13	( )
11132	do.....	do.....	Epidote hornblende gneiss.....	( )	198	.65	3.1	12.9	16.0	11	( )

MASSACHUSETTS.

10016	Great Barrington.....	Marble.....	(1)	175	0.37	5.6	7.1	15.3	4	43
10288	Otis.....	Granite.....	18,280	166	.71	2.6	15.4	18.0	9	(1)
9770	Fall River.....	Biotite gneiss.....	(1)	178	.27	2.7	14.8	18.2	17	24
11017	Acushnet.....	Chlorite gneiss.....	(1)	167	.44	2.4	16.6	19.0	17	(1)
10247	Seekonk.....	Feldspathic sandstone.....	(1)	165	.76	4.0	10.0	18.7	12	17
9649	Essex.....	Granite.....	19,580	165	.32	3.7	10.8	19.7	10	9
9650	do.....	do.....	18,125	165	.35	4.4	9.1	19.7	10	17
9651	do.....	do.....	22,285	165	.33	4.9	8.2	19.3	7	13
9652	do.....	do.....	18,780	165	.21	3.6	11.1	19.3	11	13
10089	West Rutland.....	do.....	(1)	164	.16	2.9	13.8	18.6	12	19
10090	do.....	Biotite gneiss.....	(1)	161	.79	6.7	6.0	18.0	7	18
10091	do.....	Granite gneiss.....	(1)	168	.89	6.5	6.2	16.3	9	35
10935	Payville.....	do.....	(1)	162	.75	3.0	13.3	18.7	11	(1)

MICHIGAN.

9855	Marquette.....	Hornblende gneiss.....	(1)	184	0.62	(1)	(1)	19.3	22	30
9857	do.....	Amphibolite.....	(1)	181	.57	(1)	(1)	18.0	17	49
9856	do.....	Altered diabase.....	(1)	184	.66	(1)	(1)	18.7	25	32
9975	do.....	do.....	(1)	181	.52	2.1	19.1	19.3	12	27
9976	do.....	do.....	(1)	175	.42	3.8	10.5	16.0	13	55
9977	do.....	do.....	(1)	184	.60	3.1	12.9	18.3	11	97
9977	do.....	do.....	(1)	175	.64	3.6	11.1	17.0	16	30
9889	Monroe.....	Dolomite.....	(1)	165	3.03	4.2	9.5	(1)	5	22
9888	do.....	Argillaceous dolomite.....	11,750	175	1.47	4.7	8.5	13.5	5	27
9989	do.....	do.....	(1)	172	1.80	3.6	11.1	17.0	17	18
10041	do.....	Dolomite.....	(1)	159	2.82	12.4	3.2	15.3	6	44
9888	Sibley.....	Limestone.....	(1)	159	2.82	12.4	3.2	15.3	6	44

MINNESOTA.

10485	Jasper.....	Quartzite.....	(1)	164	0.18	2.0	20.0	19.7	17	(1)
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MISSISSIPPI.

10287	Holmes.....	Sandstone.....	(1)	144	4.70	7.8	5.1	18.0	8	(1)
10098	New Albany.....	do.....	(1)	156	2.58	7.1	3.6	18.7	7	5

<sup>1</sup> Test not made.

<sup>2</sup> Exact locality not known.

TABLE I.—Results of physical tests of road-building rock from the United States, Canada, Porto Rico, and Cuba, from Jan. 1, 1916, to Jan. 1, 1917.—(Con.)

Serial No.	Town or city.	County.	Name of material.	Crushing strength, pounds per square inch.	Weight per cubic foot.	Absorption per cubic foot.	Per cent of wear.	French coefficient of wear.	Hardness.	Toughness.	Cementing value.
MISSOURI											
10169	West Line	Cass	Limestone	(1)	Pounds. 156	Pounds. 1.09	11.5	3.5	13.5	5	24
10410	(2)	do	do	(1)	167	.53	5.6	7.2	14.7	6	31
10251	Hamburg	St. Charles	do	(1)	167	.63	5.2	7.7	12.3	4	37
10252	do	do	do	(1)	164	.90	7.3	5.5	10.7	3	34
10237	Sinclair	do	do	(1)	167	.73	4.0	10.0	16.0	7	25
10238	do	do	do	(1)	167	.75	5.1	7.9	15.3	5	22
NEBRASKA.											
9905	Nehawka	Cass	Argillaceous limestone	(1)	168	0.75	4.7	8.5	16.0	6	42
NEW HAMPSHIRE.											
9946	Fitzwilliam	Cheshire	Granite	26,100	165	0.32	3.7	10.8	17.7	9	15
9893	Marlboro	do	do	15,615	165	.36	6.7	6.0	17.3	8	18
9894	do	do	do	15,255	165	.52	5.7	7.0	19.3	6	23
9895	Fitzwilliam	do	do	10,825	165	.33	3.8	10.5	18.7	9	17
9994	Allenstown	Merrimack	do	18,110	165	.61	2.5	16.0	19.0	11	23
NEW JERSEY.											
10795	Lambertville	Hunterdon	Diabase	(1)	183	0.46	2.8	14.3	18.7	19	49
9921	Mount Hope	Morris	Pyroxene granite	(1)	178	.44	2.4	16.7	18.3	9	18
10472	Boundbrook	Somerset	Altered diabase	(1)	184	.06	2.2	18.2	18.7	30	54

NEW MEXICO.

9768	Silver City.....	Grant.....	Altered granite porphyry.....	(1)	156	1.73	3.4	11.8	18.6	18	(1)
10697	Dolgeville.....	Herkimer.....	Dolomite.....	(1)	173	0.66	3.1	12.9	15.3	10	29
10236	Alexandria Bay.....	Jefferson.....	Biotite granite.....	(1)	(1)	(1)	(1)	(1)	18.7	12	(1)
10319	do.....	do.....	Granite.....	28,000	163	.49	2.8	14.3	18.0	10	(1)
10042	Albion.....	Orleans.....	Sandstone.....	20,000	(1)	(1)	3.4	11.8	17.3	9	(1)
10693	Rockland Lake.....	Rockland.....	Gabbroitic diabase.....	(1)	187	.19	3.0	13.3	13.0	13	29
10694	do.....	do.....	do.....	(1)	183	.27	3.6	11.1	13.0	12	27
10771	do.....	do.....	do.....	(1)	189	.25	3.0	13.3	18.7	19	37
10191	Hopkinton.....	St. Lawrence.....	Sandstone.....	(1)	177	2.02	2.8	14.3	18.0	12	(1)
11181	Pustan.....	Sullivan.....	Feldspathic sandstone.....	26,300	171	.64	3.3	12.1	15.3	14	(1)
11182	Collicoon.....	do.....	do.....	22,620	166	1.04	3.0	13.3	14.7	13	(1)
10969	Peekskill (south of).....	Westchester.....	Hypersthene syenite.....	(1)	179	.62	3.5	11.4	17.0	9	(1)
11199	Yorktown.....	do.....	Granite.....	16,200	168	.77	5.8	6.9	18.0	5	(1)

NEW YORK.

NORTH CAROLINA.

10193	Cranberry.....	Avery.....	Hornblende gneiss.....	(1)	208	0.70	4.3	9.3	(1)	18	(1)
10194	do.....	do.....	do.....	(1)	192	.48	5.5	7.3	(1)	16	(1)
9858	Asheville.....	Buncombe.....	Biotite gneiss.....	(1)	168	.26	4.4	9.1	19.3	7	33
10972	do.....	do.....	do.....	(1)	168	1.35	2.7	14.8	18.0	10	(1)
10973	(2)	do.....	do.....	(1)	172	.67	3.7	11.4	18.0	13	(1)
9892	Granite Quarry.....	Rowan.....	Granite.....	21,125	(1)	(1)	4.6	8.7	(1)	(1)	(1)
10306	Granite Quarry (near).....	do.....	do.....	34,860	164	.22	2.0	20.0	18.7	11	(1)
10405	do.....	do.....	do.....	(1)	(1)	(1)	(1)	(1)	(1)	10	(1)
10412	do.....	do.....	do.....	20,930	164	.51	2.8	14.3	19.3	9	(1)
10413	(2)	do.....	do.....	162	162	.43	3.3	12.1	19.0	7	(1)
10770	(2)	do.....	do.....	23,580	164	.43	5.2	7.7	19.3	10	(1)
9897	(2)	do.....	do.....	(1)	162	.55	13.8	2.9	(1)	(1)	14

OHIO.

9864	Lima.....	Allen.....	Dolomite.....	(1)	165	2.67	3.2	12.5	14.7	7	(1)
10925	do.....	do.....	Argillaceous limestone.....	(1)	168	2.77	3.7	11.3	14.7	12	31
10926	do.....	do.....	do.....	(1)	168	1.06	3.0	10.8	16.0	11	33
10927	do.....	do.....	do.....	(1)	168	2.26	3.6	11.1	15.0	11	34
10905	do.....	do.....	Limestone.....	(1)	169	1.83	4.2	9.5	16.0	6	27
9953	Middletown.....	Bulter.....	Basic open-hearth slag.....	(1)	209	2.33	20.4	9.5	(1)	(1)	471
9954	do.....	do.....	do.....	(1)	190	2.74	20.4	1.7	(1)	(1)	191

<sup>2</sup> Exact locality not known.

<sup>1</sup> Test not made.

TABLE I.—Results of physical tests of road-building rock from the United States, Canada, and Cuba, from Jan. 1, 1916, to Jan. 1, 1917—Con.

Serial No.	Town or city.	County.	Name of material.	Crushing strength, pounds per square inch.	Weight per cubic foot.	Absorption per cubic foot.	Per cent of wear.	French coefficient of wear.	Hardness.	Toughness.	Cementing value.
10516	Farmer.....	Clinton.....	Limestone.....	(1)	Pounds, 171	1.66	5.2	7.6	13.2	4	36
10517	do.....	do.....	Siliceous limestone.....	(1)	167	1.49	6.6	6.1	13.7	5	45
10536	Marble Cliff.....	Franklin.....	Argillaceous limestone.....	(1)	(1)	(1)	(1)	(1)	15.2	6	27
9883	North Baltimore (Wood County, near).....	Henry.....	Argillaceous dolomite.....	(1)	168	2.61	5.0	8.0	16.0	10	44
11198	Bellevue.....	Huron.....	Dolomite.....	(1)	156	4.89	4.9	8.2	6.0	5	52
9854	London.....	Lawrence.....	Blast-furnace slag.....	(1)	181	7.73	5.8	6.9	16.0	6	21
9900	Waterville.....	Lucas.....	Argillaceous dolomite.....	(1)	168	2.36	3.3	12.1	16.3	11	47
9983	do.....	do.....	Dolomite.....	(1)	168	2.04	2.8	14.3	16.3	14	38
11097	White House.....	do.....	Siliceous limestone.....	(1)	191	2.90	6.2	3.9	9.3	6	41
10537	Piqua.....	Miami.....	Dolomite.....	(1)	156	2.53	10.3	3.9	11.0	4	35
10538	do.....	do.....	do.....	(1)	178	.97	4.8	8.3	15.0	13	30
10532	Centerville.....	Montgomery.....	Argillaceous limestone.....	(1)	(1)	(1)	(1)	(1)	(1)	3	50
10533	do.....	do.....	do.....	(1)	(1)	(1)	(1)	(1)	(1)	5	24
10535	do.....	do.....	do.....	(1)	(1)	(1)	(1)	(1)	(1)	3	37
9945	Rocky Ridge.....	Otawa.....	Dolomite.....	13,360	175	.41	5.4	7.4	12.0	9	37
9973	Limestone.....	do.....	do.....	(1)	162	(1)	5.5	7.3	12.0	7	38
10539	New Paris.....	Preble.....	do.....	(1)	167	1.12	3.4	11.8	16.2	6	37
10346	Luckey.....	Wood.....	do.....	(1)	162	3.68	7.3	5.5	12.0	6	38
9947	Bowling Green.....	do.....	do.....	(1)	165	1.38	7.5	5.3	12.2	6	33
9957	North Baltimore.....	do.....	do.....	(1)	168	2.08	4.0	10.0	14.3	14	50

PENNSYLVANIA.											
Serial No.	Town or city.	County.	Name of material.	Crushing strength, pounds per square inch.	Weight per cubic foot.	Absorption per cubic foot.	Per cent of wear.	French coefficient of wear.	Hardness.	Toughness.	Cementing value.
9786	Granite.....	Adams.....	Gabbroitic diabase.....	23,435	(1)	(1)	(1)	(1)	15.2	14	(1)
10104	Birdsboro (near).....	Berks.....	Diabase.....	(1)	(1)	(1)	1.7	23.5	18.7	13	(1)
10357	do.....	Delaware.....	Biotite gneiss.....	(1)	(1)	(1)	(1)	(1)	18.0	9	(1)
9773	Connelville.....	Fayette.....	Siliceous limestone.....	23,460	168	0.46	2.8	14.3	17.7	13	85
10518	Monroeville.....	Lycoming.....	Argillaceous limestone.....	(1)	166	.10	6.6	6.1	16.2	9	27
10672	Jersey Shore.....	do.....	Siliceous limestone.....	(1)	166	.44	2.6	15.4	16.2	9	53
10137	South Bethlehem.....	Northampton.....	Blast-furnace slag.....	(1)	145	4.42	9.3	4.3	13.7	9	103
10429	Mount Carmel.....	Northumberland.....	Quartzite.....	(1)	163	.53	3.3	12.1	19.0	13	(1)
9812	Holmesburg.....	Philadelphia.....	Biotite gneiss.....	(1)	165	.58	(1)	(1)	19.0	7	(1)
11190	Shohola.....	Pike.....	Feldspathic sandstone.....	25,250	170	.63	3.2	12.5	16.7	12	(1)
10345	Confluence.....	Somerset.....	Calcareous sandstone.....	24,790	168	.34	3.6	11.1	16.7	7	(1)

RHODE ISLAND.

10171	Lincoln.....	Providence.....	Granite gneiss.....	(1)	170	0.17	3.9	10.3	18.7	12	20
10248	East Providence.....	do.....	Feldspathic sandstone.....	(1)	168	.59	3.6	11.1	18.0	12	16
10467	Westerly.....	Washington.....	Granite.....	(1)	161	.37	3.9	10.3	18.7	9	(1)

SOUTH CAROLINA.

10531	Rion.....	Fairfield.....	Biotite granite.....	(1)	165	0.59	4.4	9.1	18.3	8	(1)
10131	Greenville (17 miles from).....	Greenville.....	Granite.....	(1)	165	.82	4.4	9.1	18.7	8	18
10129	do.....	do.....	Hornblende gneiss.....	(1)	172	.68	8.0	5.0	17.0	6	40
10130	Beverly.....	Pickens.....	Biotite gneiss.....	(1)	166	.75	4.1	9.8	17.7	4	20

SOUTH DAKOTA.

10108	Dell Rapids.....	Minnehaha.....	Quartzite.....	(1)	165	0.41	2.8	14.3	19.3	17	5
10894	Sioux Falls.....	do.....	do.....	(1)	163	.27	1.4	28.6	19.3	17	(1)
10895	do.....	do.....	Olivine diabase.....	(1)	190	.37	2.7	14.8	18.7	18	16
10896	Rowena.....	do.....	Quartzite.....	(1)	164	.28	2.7	14.8	19.3	17	(1)

TENNESSEE.

9992	Maryville.....	Blount.....	Argillaceous limestone.....	(1)	168	0.40	3.8	10.5	16.7	6	49
9993	do.....	do.....	Limestone.....	(1)	168	.30	4.3	9.3	15.7	5	39
10292	New Tazewell.....	Claiborne.....	Siliceous limestone.....	(1)	171	1.84	4.2	9.5	13.3	8	31
10326	Harrigate (near).....	do.....	Dolomite.....	(1)	174	.92	3.2	12.5	16.0	14	21
10327	do.....	do.....	do.....	(1)	171	1.85	3.6	11.1	13.3	7	19
10446	New Tazewell (near).....	do.....	do.....	(1)	172	1.20	4.1	9.8	15.3	9	42
10581	New Tazewell.....	do.....	Siliceous dolomite.....	(1)	170	1.93	4.1	9.8	15.2	9	18
10483	Jamestown.....	Pentress.....	Sandstone.....	(1)	145	3.97	10.8	3.7	15.0	4	(1)
9887	Mascot.....	Knox.....	Dolomite.....	(1)	178	.20	4.1	9.8	16.0	11	49
10315	Madisonville.....	Monroe.....	Ferruginous sandstone.....	(1)	178	.41	6.3	10.0	17.3	8	(1)
10316	do.....	do.....	Siliceous limestone.....	(1)	169	.46	6.0	6.4	16.7	9	29
10317	do.....	do.....	Limestone.....	(1)	167	.77	8.3	4.8	16.7	9	33
10318	do.....	do.....	do.....	(1)	171	.33	4.2	9.5	17.3	8	26
10323	do.....	do.....	Crystalline limestone.....	(1)	168	.33	6.0	6.6	13.3	5	49
10414	do.....	do.....	Siliceous dolomite.....	(1)	174	1.36	3.3	12.1	15.7	18	29
9734	Pickett.....	do.....	Argillaceous dolomite.....	(1)	168	2.65	4.3	9.3	13.2	12	55

<sup>2</sup> Exact locality not known.

<sup>1</sup> Test not made.

TABLE I.—Results of physical tests of road-building rock from the United States, Canada, Porto Rico, and Cuba, from Jan. 1, 1916, to Jan. 1, 1917—(con.)

## TEXAS.

Serial No.	Town or city.	County.	Name of material.	Crushing strength, per pounds per square inch.	Weight per cubic foot.	Absorption per cubic foot.	Per cent of wear.	French coefficient of wear.	Hardness.	Toughness.	Cementing value.
10044 (2)		Grayson	Clay limestone	(1)	Pounds. 134	Pounds. 12.80	(1)	(1)	0.0	2	(1)

## VERMONT.

10848	Burlington	Chittenden	Siliceous dolomite	(1)	163	0.26	3.7	11.1	16.7	13	38
11191	Derby	Orleans	Siliceous limestone	(1)	171	.46	3.0	13.3	17.3	9	96
9673	Barre	Washington	Biotite granite	(1)	165	.37	2.8	14.3	19.0	9	19

## VIRGINIA.

9028		Albemarle	Biotite gneiss	(1)	175	1.62	5.3	7.5	17.6	7	36
9027 (2)		do.	Horriblende gneiss	(1)	193	.98	3.5	11.4	16.3	9	47
9026 (2)		do.	Biotite gneiss	(1)	181	.57	5.1	7.8	18.7	7	63
10253	Charlottesville	do.	Granite gneiss	(1)	171	.75	5.4	7.4	17.3	5	24
10172	Clifton Forge	Alleghany	Siliceous limestone	(1)	166	.48	2.5	16.0	17.6	10	48
9891	Lone Jack Station	Campbell	Quartzite schist	(1)	159	1.34	12.0	3.3	(1)	(1)	(1)
9004	do.	do.	Alpique granite	(1)	165	.53	5.4	7.4	18.7	7	8
10344	Lynchburg	do.	Quartzite	25,885	160	1.20	4.3	9.3	18.6	14	(1)
9819	Cliff View	Carroll	Horriblende schist	(1)	184	.71	4.4	9.1	18.3	14	31
9820	do.	do.	Altered horriblende gneiss	(1)	181	1.60	15.8	2.5	14.3	5	109
10115	Boston	Culpeper	Altered horriblende gneiss	(1)	168	.84	4.7	8.5	19.0	5	44
9919	Warrenton	Fauquier	Amphibolite	(1)	187	.76	4.0	6.7	(1)	(1)	120
9920	do.	do.	do.	(1)	181	2.44	5.9	8.7	(1)	(1)	43
9870	do.	do.	do.	(1)	187	1.46	3.6	11.1	(1)	(1)	(1)
10304	do.	do.	Epidote chlorite schist	(1)	185	.63	3.5	11.4	14.7	11	(1)
10095	Hamilton (¾ mile east of)	Loudoun	Amphibolite	(1)	178	.49	3.9	10.3	17.3	5	17
10099	Luray	Page	Argillaceous limestone	(1)	167	.75	5.4	7.4	14.3	10	27
10258	Buckland	Prince William	Dibase	(1)	178	1.75	(1)	(1)	17.3	(1)	35
10930	Gate	Scott	Argillaceous limestone	(1)	168	.38	4.1	9.7	16.0	13	35
10780	Wise	Wise	Sandstone	(1)	158	2.10	4.5	8.8	18.7	10	(1)



WASHINGTON.

10239	Cook (3 miles north of)	Skamania	Basalt	(1)	177	0.92	2.6	15.4	18.3	24	14
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WEST VIRGINIA.

10064	Martinsburg (south of)	Berkeley	Dolomite	(1)	178	0.31	3.6	11.1	16.2	10	29
10069	Battis Store	do	Feldspathic sandstone	(1)	140	3.45	7.2	5.6	18.7	(1)	8
10073	Hedgesville (west of)	do	do	(1)	156	1.02	2.8	14.3	16.7	(1)	61
10087	Tonahawk (north of)	do	Sandstone	(1)	144	3.19	7.9	5.1	(1)	(1)	23
10089	Tonahawk (near)	do	do	(1)	144	1.01	16.6	2.4	19.3	(1)	17
10093	Torrel Ridge	do	Limestone	(1)	168	1.19	5.1	7.8	14.0	4	56
10095	Berkeley (near)	do	Argillaceous limestone	(1)	168	.27	6.3	6.4	16.7	4	28
10096	Berkeley Station	do	Limestone	(1)	168	.31	4.4	9.1	17.3	9	34
10097	Jones Spring	do	Siliceous limestone	(1)	168	.19	4.9	8.2	16.0	10	44
10098	Bedington (east of)	do	Argillaceous limestone	(1)	172	.24	5.1	7.8	16.0	4	34
10070	Punker Hill	do	Limestone	(1)	168	.43	4.9	8.2	16.0	3	32
10071	Niptown	do	do	(1)	168	.27	4.2	9.5	15.0	4	45
10072	Spring Mills	do	Argillaceous limestone	(1)	168	.46	6.5	6.2	15.7	(1)	4
10074	Gerrardstown	do	do	(1)	172	.82	5.6	7.1	(1)	(1)	22
10075	Bedington (east of)	do	do	(1)	168	.36	5.0	8.0	17.0	9	29
10076	Van Clevesville (south of)	do	Limestone	(1)	168	.31	5.0	8.0	15.0	4	33
10077	Darkesville	do	Siliceous limestone	(1)	168	.27	4.5	8.9	18.3	15	47
10078	Tonahawk	do	Limestone	(1)	168	1.27	4.7	8.5	16.7	8	20
10079	Falling Water	do	Argillaceous limestone	(1)	168	.37	6.5	6.2	18.7	10	24
10080	Little Georgetown	do	Crystalline limestone	(1)	175	.37	5.7	7.0	14.0	4	47
10081	Jones Spring	do	Limestone	(1)	168	.59	5.6	7.1	(1)	(1)	25
10082	Falling Water (near)	do	Chert and limestone (mixed)	(1)	168	(1)	4.7	8.5	16.3	5	20
10083	Falling Water	do	Limestone	(1)	168	.23	5.9	6.8	16.7	4	23
10084	Blarnton	do	do	(1)	172	.52	4.6	8.7	18.0	4	32
10085	Cumbo	do	do	(1)	168	.56	5.8	6.9	18.0	5	39
10086	Martinsburg (south of)	do	do	(1)	166	(1)	5.2	7.7	16.7	6	(1)
10102	Martinsburg	do	Argillaceous limestone	(1)	166	.60	5.4	7.4	(1)	(1)	31
9925	Renic	Grant	do	(1)	166	.66	3.8	10.5	16.3	8	41
9972	Fort Spring	Greenbrier	do	(1)	168	.24	4.1	9.8	15.7	9	57
16703	Kearneyville	Jefferson	Limestone	(1)	168	(1)	2.7	14.8	14.0	6	(1)
9966	Greer	Monongalia	Argillaceous limestone	(1)	168	.73	4.7	8.5	15.7	8	40
9967	do	do	do	(1)	168	.59	4.7	8.5	15.7	9	63
9968	do	do	do	(1)	168	.73	4.8	8.3	14.0	7	37
9969	do	do	Siliceous limestone	(1)	168	.56	3.0	13.3	16.7	10	47
10348	Abright (near)	Preston	Sandstone	(1)	154	1.88	8.1	4.9	17.3	5	(1)
10349	Abright	do	Ferruginous sandstone	(1)	160	2.40	4.0	10.0	15.3	9	(1)
11130	Trap Hill District	Raleigh	Sandstone	(1)	154	3.09	3.9	10.3	16.6	9	(1)
10056	Spencer (near)	Roane	Feldspathic sandstone	(1)	156	3.52	12.3	3.3	8.7	4	(1)
10509	Davis	Tucker	Siliceous limestone	(1)	167	.05	2.7	10.8	14.3	10	30
10510	do	do	Argillaceous limestone	(1)	168	.12	5.0	8.0	16.3	6	37

2 Exact locality not known.

1 Test not made.

TABLE I.—*Results of physical tests of road-building rock from the United States, Canada, Porto Rico, and Cuba, from Jan. 1, 1916, to Jan. 1, 1917—Con.*  
WISCONSIN.

Serial No.	Town or city.	County.	Name of material.	Crushing strength, pounds per square inch.	Weight per cubic foot.	Absorption per cubic foot.	Per cent of wear.	French coefficient of wear.	Hardness.	Toughness.	Commenting value.
9999	Berlin.....	Green Lake.....	Rhyolite.....	( <sup>1</sup> )	<i>Pounds.</i> 165	0.16	1.9	21.3	19.0	25	15
10168	Bullalo.....	Marquette.....	Altered syenite.....	( <sup>1</sup> )	167	.13	2.2	18.2	19.3	30	13
10014	Wauwatosa.....	Milwaukee.....	Argillaceous dolomite.....	( <sup>1</sup> )	168	2.11	3.7	2.8	14.7	8	( <sup>1</sup> )
11129	do.....	do.....	do.....	16,700	168	2.01	3.8	10.5	15.3	11	( <sup>1</sup> )
10986	Wells.....	Monroe.....	Calcareous sandstone.....	( <sup>1</sup> )	162	2.79	4.8	8.3	18.0	5	( <sup>1</sup> )
9970	Black Creek.....	Outagamie.....	Dolomite.....	( <sup>1</sup> )	178	.58	4.6	8.7	14.7	9	31
9971	do.....	do.....	do.....	( <sup>1</sup> )	178	.53	4.1	9.8	15.3	8	31
10022	Belgium.....	Ozaukee.....	Argillaceous dolomite.....	( <sup>1</sup> )	175	1.15	7.4	5.5	14.3	8	30
10159	Grand Rapids.....	Wood.....	Sandstone.....	( <sup>1</sup> )	153	1.91	3.3	12.1	18.3	5	3
10028	( <sup>2</sup> ).....	( <sup>2</sup> ).....	Dolomite.....	( <sup>1</sup> )	168	1.05	7.1	5.6	13.3	6	41
CANADA.											
10017	Montreal.....	Province of Quebec.....	Nephelite syenite.....	( <sup>1</sup> )	156	0.00	2.2	18.2	18.7	18	22
10332	Wellesley Island.....	do.....	Biotite granite.....	( <sup>1</sup> )	165	.28	2.9	13.8	18.0	10	( <sup>1</sup> )
9746	Welland.....	Province of Ontario.....	Cherty limestone.....	( <sup>1</sup> )	165	.41	3.9	10.3	18.3	13	82

<sup>1</sup> Test not made.

<sup>2</sup> Exact locality not known.

TABLE II.—Results of compression tests of rock complete to January 1, 1917.

## ARKANSAS.

Serial No.	Locality.	County.	Name.	Crushing strength, pounds per square inch.
9828	Lamar .....	Johnson .....	Feldspathic sandstone .....	21,980
6331	Bald Knob .....	White .....	Sandstone .....	19,860

## CONNECTICUT.

9791	Oneco .....	Windham .....	Biotite granite .....	16,635
11098	do .....	do .....	do .....	23,290
11099	do .....	do .....	Gneissoid granite .....	20,200

## GEORGIA.

10381	Southeast side Kennesaw Mountain .....	Cobb .....	Feldspathic gneiss .....	18,500
10382	Marietta, 4 miles southwest of .....	do .....	Biotite gneiss .....	14,000
10389	Austell, $\frac{3}{4}$ mile west .....	do .....	Granite gneiss .....	12,890
10393	Blackwell Station, 1 mile north of .....	do .....	Hornblende gneiss .....	17,350

## ILLINOIS.

4422	Embarras .....	Coles .....	Limestone .....	17,300
5509	Thornton .....	Cook .....	Dolomite .....	23,060
6053	do .....	do .....	do .....	16,880
8711	Hillside .....	do .....	Argillaceous dolomite .....	15,730
4660	Tunnell Hill .....	Johnson .....	Sandstone .....	19,150
7509	Reevesville .....	do .....	Argillaceous limestone .....	25,780
7510	do .....	do .....	do .....	28,400
4764	Kankakee .....	Kankakee .....	Dolomite .....	20,610
5550	do .....	do .....	do .....	17,710
6088	do .....	do .....	Argillaceous dolomite .....	20,830
6165	do .....	do .....	Dolomite .....	11,660
6865	do .....	do .....	do .....	13,500
7298	do .....	do .....	Argillaceous dolomite .....	25,850
7299	do .....	do .....	do .....	20,000
7300	do .....	do .....	do .....	19,800
7301	do .....	do .....	do .....	19,700
7302	do .....	do .....	Dolomite .....	17,050
7871	Lehigh .....	do .....	Argillaceous dolomite .....	16,700
10367	Kankakee .....	do .....	Dolomite .....	11,180
4421	Alton .....	Madison .....	Limestone .....	15,100
7422	Brookville .....	Ogle .....	Argillaceous dolomite .....	18,640
7423	do .....	do .....	do .....	18,180
5549	Anna .....	Union .....	Limestone .....	19,510
9827	Joliet .....	Will .....	Dolomite .....	8,130

## INDIANA.

5534	Logansport .....	Cass .....	Limestone .....	20,350
4655	Greensburg .....	Decatur .....	Dolomite .....	17,960
4658	St. Paul .....	do .....	Limestone .....	18,400
4659	do .....	do .....	Dolomitic limestone .....	20,510
4690	Westport .....	do .....	do .....	20,000
5088	St. Paul .....	do .....	Limestone .....	19,800
11183	Huntington .....	Huntington .....	Dolomite .....	25,420
4197	Mitchell .....	Lawrence .....	Argillaceous dolomite .....	12,250
5027	Bedford .....	do .....	Limestone .....	6,900
5029	do .....	do .....	do .....	6,450
3368	Greencastle .....	Putnam .....	do .....	16,000
5737	Osgood .....	Ripley .....	do .....	14,470
4657	Wabash .....	Wabash .....	Dolomitic limestone .....	18,790

TABLE II.—Results of compression tests of rock complete to Jan. 1, 1917—Continued.

IOWA.				
Serial No.	Locality.	County.	Name.	Crushing strength, pounds per square inch.
5525	Cedar Rapids.....	Linn.....	Dolomitic limestone.....	19,950
5526	La Grande.....	Marshall.....	do.....	14,850
KANSAS.				
9599	Fort Scott (7 miles west).....	Bourbon.....	Limestone breccia.....	7,380
KENTUCKY.				
5552	Princeton.....	Caldwell.....	Dolomitic limestone.....	23,860
7688	Cedar Bluff.....	do.....	Argillaceous limestone.....	25,720
5921	Limestone.....	Carter.....	Limestone.....	14,900
5922	Carter.....	do.....	Siliceous limestone.....	13,400
MAINE.				
10219	North Jay.....	Franklin.....	Granite.....	21,260
7438	Swan's Island.....	Hancock.....	Biotite granite.....	18,400
9997	Somes Sound, Mount Desert Islands.....	do.....	Granite.....	19,780
10233	do.....	do.....	do.....	19,220
10234	do.....	do.....	do.....	24,700
10988	Ship Harbor.....	do.....	do.....	28,650
10989	do.....	do.....	do.....	26,500
10990	do.....	do.....	do.....	32,450
8745	Vinal Haven.....	Knob.....	do.....	20,020
8768	St. George.....	do.....	do.....	22,800
8769	Vinal Haven.....	do.....	do.....	20,920
9781	St. George.....	do.....	do.....	18,780
9865	do.....	do.....	do.....	17,150
9996	Long Cove.....	do.....	do.....	17,540
9445	Vinal Haven.....	do.....	Biotite granite.....	21,220
10249	Long Cove.....	do.....	do.....	22,500
10250	do.....	do.....	Granite.....	22,330
10366	St. George.....	do.....	do.....	27,050
10019	Vinal Haven.....	do.....	Biotite granite.....	21,650
7439	Frankford.....	Waldo.....	do.....	20,600
MARYLAND.				
5611	Mount Savage Junction.....	Allegany.....	Siliceous limestone.....	34,920
4884	Frederick.....	Frederick.....	Limestone.....	17,580
5694	Havre de Grace.....	Harford.....	Gneissoid granite.....	34,410
5695	do.....	do.....	Sericite gneiss.....	20,090
5696	do.....	do.....	Gneissoid granite.....	21,670
5697	do.....	do.....	Amphibolite.....	34,380
5698	do.....	do.....	Gneissoid granite.....	35,210
5699	do.....	do.....	do.....	22,190
MASSACHUSETTS.				
10288	Otis.....	Berkshire.....	Granite.....	18,260
6891	Rockport.....	Essex.....	Biotite granite.....	22,370
6892	do.....	do.....	do.....	23,610
6893	do.....	do.....	do.....	22,670
6894	do.....	do.....	do.....	21,600
8796	do.....	do.....	do.....	23,820
9649	Gloucester.....	do.....	Granite.....	19,580
9650	do.....	do.....	do.....	18,130
9651	Rockport.....	do.....	do.....	22,390
9652	do.....	do.....	do.....	18,780
5671	Westfield.....	Hampden.....	Altered diabase.....	32,850

TABLE II.—Results of compression tests of rock complete to Jan. 1, 1917—Continued.

## MASSACHUSETTS—Continued.

Serial No.	Locality.	County.	Name.	Crushing strength, pounds per square inch.
8862	Westford.....	Middlesex.....	Granite.....	13,980
8874	do.....	do.....	do.....	17,000
8875	do.....	do.....	do.....	16,250
5988	West Auburn.....	Worcester.....	Mica gneiss.....	21,950

## MICHIGAN.

9988	Monroe.....	Monroe.....	Argillaceous dolomite.....	11,750
9593	Calcite.....	Presque Isle.....	Limestone.....	10,300

## MINNESOTA.

5524	Stockton.....	Winona.....	Argillaceous dolomite.....	16,000
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## MISSOURI.

6375	Rochefort.....	Boone.....	Limestone.....	13,900
10169	West Line.....	Cass.....	do.....	16,690
6377	Sweeney.....	Cooper.....	Argillaceous limestone.....	14,900

## NEW YORK.

6457	(1).....	Clinton.....	Plagioclase gneiss.....	18,500
6458	(1).....	do.....	Pyroxene gneiss.....	20,500
8011	(1).....	Dutchess.....	Dolomite.....	34,450
5544	Camelo.....	do.....	do.....	29,050
5872	Akron Junction.....	Erie.....	Cherty limestone.....	16,700
8577	Gloversville.....	Fulton.....	Biotite gneiss.....	14,585
4157	Alexandria Bay.....	Jefferson.....	Granite.....	21,600
8833	do.....	do.....	do.....	26,180
8902	do.....	do.....	do.....	14,150
9129	do.....	do.....	do.....	14,390
9130	do.....	do.....	Gneissoid granite.....	17,600
7437	do.....	do.....	Granite.....	27,200
10236	do.....	do.....	Biotite granite.....	28,130
10042	Albion.....	Orleans.....	Sandstone.....	29,000
8012	(1).....	Rockland.....	Gabbroitic diabase.....	31,300
8013	(1).....	do.....	Siliceous dolomite.....	22,200
10191	Hopkinton.....	St. Lawrence.....	Sandstone.....	35,240
11182	Callicoon.....	Sullivan.....	Feldspathic sandstone.....	22,620
11181	Tusten.....	do.....	do.....	26,300
11199	Yorktown.....	Westchester.....	Granite.....	16,200

## NEW HAMPSHIRE.

9893	Marlboro.....	Cheshire.....	Granite.....	15,615
9894	do.....	do.....	do.....	15,250
9895	Fitzwilliam.....	do.....	do.....	10,830
9946	(1).....	do.....	do.....	26,100
8872	Melford.....	Hillsboro.....	do.....	15,050
9010	do.....	do.....	Biotite granite.....	16,640
9011	do.....	do.....	do.....	14,870
9012	do.....	do.....	do.....	18,230
9031	Concord.....	Merrimack.....	Granite.....	16,600
9036	do.....	do.....	do.....	13,420
9037	do.....	do.....	do.....	13,900
8870	do.....	do.....	do.....	15,100
9994	Allentown.....	do.....	do.....	18,110

1 Exact locality not known.

TABLE II.—Results of compression tests of rock complete to Jan. 1, 1917—Continued.

## NORTH CAROLINA.

Serial No.	Locality.	County.	Name.	Crushing strength, pounds per square inch.
8396	(1).....	Forsythe.....	Granite.....	13,140
8397	(1).....	do.....	Hypersthene gabbro.....	11,880
8682	Spencer Mountain.....	Gaston.....	Feldspathic quartzite.....	31,520
8881	Gastonia.....	do.....	Quartzite.....	17,100
8576	Mooreville.....	Iredell.....	Biotite granite.....	26,000
5373	(1).....	McDowell.....	Sandstone.....	22,600
9038,	Wilson.....	Wilson.....	Granite.....	16,070
5956	Stacey.....	Rockingham.....	Granite gneiss.....	23,220
5496	Sansbury.....	Rowan.....	Granite.....	33,750
9892	Granite Quarry.....	do.....	do.....	21,130
10306	Granite Quarry (near).....	do.....	do.....	34,860
10412	(1).....	do.....	do.....	20,930
10413	(1).....	do.....	do.....	23,580
10770	(1).....	do.....	do.....	17,800
11200	(1).....	do.....	do.....	26,400
6071	Bostic.....	Rutherford.....	Biotite gneiss.....	16,100
5497	Mount Airy.....	Surry.....	Granite.....	15,400
7433	do.....	do.....	do.....	15,200
8901	do.....	do.....	do.....	5,100
9048	do.....	do.....	do.....	16,440
8419	Granita (near).....	Wake.....	Biotite granite.....	14,160
3807	Wise.....	Warren.....	Granite.....	18,240
3808	do.....	do.....	do.....	18,560
5374	(1).....	Yancey.....	Quartzite.....	12,900

## OHIO.

4694	Osborne.....	Clarke.....	Dolomitic limestone.....	8,690
4695	Springfield.....	do.....	Dolomite.....	18,960
9282	Cleveland.....	Cuyahoga.....	Granite.....	31,790
9283	do.....	do.....	do.....	27,900
9284	do.....	do.....	do.....	24,790
9285	do.....	do.....	do.....	26,990
9459	do.....	do.....	do.....	24,900
4378	Sandusky.....	Erie.....	Limestone.....	19,400
5554	do.....	do.....	do.....	21,850
5753	Castalia.....	do.....	Dolomitic limestone.....	18,530
6055	do.....	do.....	Limestone.....	20,810
6056	Akron Junction.....	do.....	Cherty limestone.....	31,180
5505	Marble Cliff.....	Fran'lin.....	Limestone.....	16,750
5506	do.....	do.....	do.....	12,350
5630	Columbus.....	do.....	Ferruginous sandstone.....	21,800
4693	Patterson.....	Hardin.....	Dolomite.....	11,360
5553	Dunkirk.....	do.....	do.....	23,200
4707	Hillsboro.....	Highland.....	Cherty limestone.....	15,590
8347	Clarksfield.....	Huron.....	Calcareous sandstone.....	9,490
4656	Big Springs.....	Logan.....	Argillaceous limestone.....	16,380
6054	Vulcan.....	Lucas.....	Siliceous limestone.....	25,480
6057	Holland.....	do.....	Argillaceous limestone.....	19,430
8402	Toledo, 10 miles west of.....	do.....	Dolomite.....	11,600
10537	Piqua.....	Miami.....	do.....	9,810
10538	do.....	do.....	do.....	15,150
6052	White Rock.....	Ottawa.....	do.....	16,420
9945	Rocky Ridge.....	do.....	do.....	13,300
10539	New Paris.....	Preble.....	do.....	16,480
5556	Bloomville.....	Seneca.....	Limestone.....	20,250
5555	Middleport.....	Van Wert.....	Dolomite.....	25,200

## OKLAHOMA.

3388	Granite.....	Greer.....	Granite.....	18,000
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## PENNSYLVANIA.

9786	Granite.....	Adams.....	Gabbroitic diabase.....	23,440
5602	Hyndman.....	Bedford.....	Impure limestone.....	24,150
5603	do.....	do.....	Siliceous limestone.....	21,860
5632	Birdsboro.....	Berks.....	Altered diabase.....	39,215

<sup>1</sup> Exact locality not known.

TABLE II.—Results of compression tests of rock complete to Jan. 1, 1917—Continued.

## PENNSYLVANIA—Continued.

Serial No.	Locality.	County.	Name.	Crushing strength, pounds per square inch.
8724	Juniata.....	Blair.....	Argillaceous limestone.....	15, 480
8725	(1).....	do.....	do.....	20, 880
8625	Hazard.....	Carbon.....	Blast-furnace slag.....	9, 000
7973	(1).....	Chester.....	Pyroxene quartzite.....	31, 800
7978	(1).....	do.....	Mica schist.....	23, 500
7979	(1).....	do.....	do.....	23, 900
5578	Salona.....	Clinton.....	Argillaceous limestone.....	18, 710
7844	(1).....	Dauphin.....	Siliceous limestone.....	26, 500
8306	(1).....	do.....	Limestone.....	8, 510
8427	(1).....	do.....	do.....	19, 250
8465	(1).....	do.....	Siliceous dolomite.....	9, 640
8049	(1).....	Elk.....	Ferruginous sandstone.....	14, 150
5771	Indian Creek Station.....	Fayette.....	Calcareous sandstone.....	37, 740
6097	Bidwell.....	do.....	Limestone.....	13, 450
9347	Connellsville.....	do.....	do.....	26, 050
5604	Water Street.....	Huntingdon.....	Feldspathic sandstone.....	22, 330
5557	Walford.....	Lawrence.....	Limestone.....	27, 500
10518	Montoursville.....	Lycoming.....	Argillaceous limestone.....	23, 460
10672	Jersey Shore.....	do.....	Siliceous limestone.....	20, 360
6153	Porter Township.....	do.....	Argillaceous limestone.....	28, 580
6154	do.....	do.....	do.....	26, 860
6155	do.....	do.....	do.....	18, 610
6156	do.....	do.....	do.....	22, 930
6157	do.....	do.....	Limestone.....	21, 900
6158	do.....	do.....	do.....	14, 160
7980	Port Allegheny.....	McKean.....	Feldspathic sandstone.....	9, 680
8022	(1).....	(1).....	Ferruginous sandstone.....	12, 130
8023	(1).....	do.....	do.....	14, 000
8024	(1).....	do.....	do.....	12, 480
11190	Shohola.....	Pike.....	Feldspathic sandstone.....	25, 250
9812	Holmesburg.....	Philadelphia.....	Biotite gneiss.....	21, 530
3243	McSpadden.....	Somerset.....	Sandstone.....	26, 900
10345	Confluence.....	do.....	Calcareous sandstone.....	24, 790
5830	Prompton.....	Wayne.....	Feldspathic sandstone.....	26, 340
5605	Blairsville Intersection.....	Westmoreland.....	Siliceous limestone.....	32, 560
7428	York.....	York.....	Dolomitic marble.....	27, 400

## RHODE ISLAND.

8867	Westerly.....	Washington.....	Granite.....	11, 740
8868	do.....	do.....	do.....	20, 300
8869	do.....	do.....	do.....	20, 750

## SOUTH CAROLINA.

8389	Williamstown.....	Anderson.....	Granite.....	12, 990
5568	Rion.....	Fairfield.....	do.....	29, 180
5586a	do.....	do.....	do.....	25, 790
5586b	do.....	do.....	do.....	19, 240
5586c	do.....	do.....	do.....	33, 880
10531	do.....	do.....	Biotite granite.....	25, 540

## TENNESSEE.

5597	Quarry.....	Carter.....	Limestone.....	22, 750
5502	Straw Plains.....	Jefferson.....	do.....	21, 730
5504	do.....	do.....	do.....	28, 340
5503	do.....	do.....	Dolomite.....	38, 070
6533	Knoxville.....	Knox.....	Marble.....	17, 970

## VERMONT.

5543	East Wallingford.....	Rutland.....	Altered diabase.....	16, 800
8853	Barre.....	Washington.....	Granite.....	19, 560

1 Exact locality not known.

TABLE II.—Results of compression tests of rock complete to Jan. 1, 1917—Continued.

## VIRGINIA.

Serial No.	Locality.	County.	Name.	Crushing strength, pounds per square inch.
8804	Albert.....	Bedford.....	Granite gneiss.....	13, 820
10344	Lynchburg.....	Campbell.....	Quartzite.....	25, 885
6796	(1).....	Dinwiddie.....	Granite.....	13, 150
4900 A	Broad Run.....	Fauquier.....	Quartz.....	28, 400
4900 B	.....do.....	.....do.....	Epidosite.....	28, 000
5923	Strathmore.....	Fluvanna.....	Chlorite epidote schist.....	13, 210
5678	Eggleston (near).....	Giles.....	Dolomite.....	45, 690
5924	Boscobel.....	Goochland.....	Granite gneiss.....	13, 550
6615	Korah Station.....	Henrico.....	Biotite granite.....	20, 300
5925	Greenway.....	Nelson.....	Feldspathic quartzite.....	16, 500
5492	Nokesville.....	Prince William.....	Ferruginous sandstone.....	17, 780
5920	Greenlee.....	Rockbridge.....	Dolomitic marble.....	36, 900
5922	Bluff Water Station.....	Rockingham.....	Limestone.....	21, 450
5385	.....do.....	.....do.....	.....do.....	40, 850
5375	St. Paul.....	Russell.....	.....do.....	17, 600
7217	Burkes Garden.....	Tazewell.....	Dolomitic sandstone.....	21, 500

## WEST VIRGINIA.

5365	Berkeley.....	Berkeley.....	Limestone.....	23, 350
5917	Renick.....	Greenbrier.....	Crystalline limestone.....	21, 300
5918	Frazier.....	.....do.....	Limestone.....	17, 450
5919	Snow Place.....	.....do.....	.....do.....	13, 550
7475	Green Spring, east of.....	Hampshire.....	Siliceous limestone.....	34, 400
7476	.....do.....	.....do.....	Quartzite.....	15, 050
6109	Spring Hill.....	Kanawha.....	Sandstone.....	12, 400
9132	Fairmont.....	Marion.....	.....do.....	5, 420
9133	.....do.....	.....do.....	.....do.....	5, 720
9134	.....do.....	.....do.....	.....do.....	6, 080
5610	Sturgisison.....	Monongalia.....	Siliceous limestone.....	22, 440
5612	.....do.....	.....do.....	Limestone.....	17, 910
5613	.....do.....	.....do.....	Argillaceous limestone.....	14, 300
5614	.....do.....	.....do.....	Calcareous sandstone.....	29, 840
5615	.....do.....	.....do.....	Impure limestone.....	19, 650
5616	.....do.....	.....do.....	Argillaceous limestone.....	24, 850
8447	Parkersburg.....	Wood.....	Feldspathic sandstone.....	11, 910

## WISCONSIN.

5523	Peebles.....	Fond du Lac.....	Dolomite.....	32, 600
3448	Amberg.....	Marinette.....	Biotite granite.....	20, 000
11129	Wauwatosa.....	Milwaukee.....	Argillaceous dolomite.....	45, 310
8656	Lannon.....	Waukesha.....	Dolomite.....	23, 020

<sup>1</sup> Exact locality not known.

TABLE III.—Geographical distribution of rock samples tested to Jan. 1, 1917.

Alabama.....	31	Kansas.....	13	New Jersey.....	75	Utah.....	13
Arizona.....	3	Kentucky.....	46	New Mexico.....	1	Vermont.....	35
Arkansas.....	17	Louisiana.....	7	New York.....	148	Virginia.....	424
California.....	101	Maine.....	86	North Carolina.....	149	Washington.....	213
Colorado.....	28	Maryland.....	121	Ohio.....	165	West Virginia.....	180
Connecticut.....	52	Massachusetts.....	192	Oklahoma.....	50	Wisconsin.....	149
Delaware.....	30	Michigan.....	95	Oregon.....	14	Wyoming.....	3
Florida.....	13	Minnesota.....	17	Pennsylvania.....	610	Canada.....	52
Georgia.....	256	Mississippi.....	13	Rhode Island.....	41	Porto Rico.....	12
Idaho.....	10	Missouri.....	39	South Carolina.....	30	Cuba.....	4
Illinois.....	128	Montana.....	4	South Dakota.....	15		
Indiana.....	179	Nebraska.....	12	Tennessee.....	77	Total.....	4, 066
Iowa.....	23	New Hampshire.....	27	Texas.....	63		

By comparing the results of tests on a sample of rock with the limits as shown in the following table, a general idea of the types of road construction for which it is best suited may be obtained.



TABLE IV.—General limiting test values for broken stone.

Type of construction.	Traffic. <sup>1</sup>	Limiting values.		
		French coefficient of wear.	Toughness.	Hardness.
Water-bound macadam, plain or with dust palliative treatment.	Light.....	5 to 8	5 to 9	10 to 17
	Moderate.....	9 to 15	10 to 18	14 or over.
	Heavy.....	16 or over.	19 or over.	17 or over.
Macadam with bituminous carpet.....	Light to moderate...	5 or over.	5 or over.	( <sup>2</sup> )
Bituminous macadam with seal coat.....	Moderate to heavy..	7 or over.	10 or over.	.....
Bituminous concrete.....	Light to moderate...	7 or over.	7 or over.	( <sup>2</sup> )
	Moderate to heavy..	10 or over.	13 or over.	.....
Binder course for sheet asphalt or Topeka type.	Any.....	7 or over.	6 or over.	( <sup>2</sup> )
	Portland cement concrete.....	Moderate to heavy..	( <sup>3</sup> )	8 or over.
Stone paving block <sup>4</sup> .....	Any.....	( <sup>3</sup> )	9 or over.	16 or over.
Broken stone foundations.....	do.....	3 or over.	3 or over.	8 or over.
Cement concrete foundations.....	.....	.....	.....	.....

<sup>1</sup> Light traffic is assumed as less than 100 vehicles per day, moderate traffic between 100 and 250 vehicles, and heavy traffic over 250 vehicles per day.

<sup>2</sup> Numerous tests have shown that limits for hardness are unnecessary if the material possesses the required French coefficient of wear and toughness.

<sup>3</sup> Limits for French coefficient of wear are not at present considered necessary for this type of construction.

<sup>4</sup> Crushing strength, 20,000 pounds or over per square inch is sometimes required.

Cementing values should show over 25 in all cases if material is to be used in water-bound macadam construction.

In general, granites, gneisses, schists, sandstones, and quartzites should not be used in the wearing course of water-bound macadam roads. Shales and slates never should be used in this connection; therefore cementing value tests have been discontinued on these materials.

For further details and explanation of results in this table and also for tests on all materials to January 1, 1916, see U. S. Department of Agriculture Bulletin No. 370.

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