on masonry walls, foundations, and roof supports, all other parts being removed from time to time by operating maintenance account:

Masonry			 	•	• •	•		•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•				30-60
Wood	•	• •		-	• •	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•			•	•	•	•	•	•		•	•	•		20-40

Stacks .- Are limited in life to conditions of power production directly; somewhat affected by style and general appearance:

Masonry	7		•	•	•	• •	• •	• •	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•			25-5	0	
Steel .	•••	•	•	•	•	• •	•	• •	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	• •			•	•	•	•	•	•	10-2	5	

PROPOSED TOUGHNESS TEST FOR ROAD-BUILDING WORK

BEFORE the recent annual meeting of the American Society for Testing Materials the following modified test for the toughness of rock for road construction was submitted. It is the intention to publish these tentative proposals for a year before being referred to letter ballot of the society for adoption :-

r. Toughness, as applied to rock, is the resistance offered to fracture under impact, expressed as the final height of blow required of a standard hammer to cause fracture of a cylindrical test-specimen of given dimensions.

2. Quarry-samples of rock from which test-specimens are to be prepared shall measure at least 150 mm. on a side and at least 100 mm. thick, and when possible shall have the plane and structural weakness* of the rock plainly marked thereon. Samples should be taken from freshly quarried material, and only from pieces which show no evidences of incipient fracture resulting from blasting or other causes. The samples should preferably be split from large pieces by the use of plugs and feathers and not by sledging.

3. Specimens for test shall be cylinders prepared as described in Section 4, 25 mm. in height and 24 to 25 mm. in diameter. Three test-specimens shall constitute a test-set. The ends of the specimen shall be plane surfaces at right angles to the axis of the cylinder.

4. One set of specimens shall be drilled perpendicular and another parallel to the plane of structural weakness of the rock, if such plane is apparent. If a plane of structural weakness is not apparent, one set of specimens shall be drilled at random. Specimens shall be drilled in a manner which will not subject the material to undue stresses and which will insure the specified. dimensions.† The ends of the cylinders may be sawed by means of a band or diamond saw, ‡ or in any other way which will not induce incipient fracture, but shall not be chipped or broken off with a hammer. After sawing, the ends of the specimens shall be ground to a plane surface with carborundum or emery on a cast-iron lap until the cylinders are 24 mm. in length.

5. Any form of impact-machine which will comply with the following essentials may be used in making the test :---

(a) A cast-iron anvil weighing not less than 50 kg., firmly fixed upon a solid foundation.

(b) A hammer weighing 2 kg., arranged so as to fal! freely between suitable guides.

(c) A plunger made of hardened steel and weighing I kg., arranged to slide freely in vertical direction in a sleeve, the lower end of the plunger being spherical in shape with a radius of 1 cm.

(d) Means for raising the hammer and for dropping it upon the plunger from any specified height from I to not less than 75 cm., and means for determining the height of fall to approximately I mm.

(e) Means for holding the cylindrical test-specimen securely on the anvil without rigid lateral support, and under the plunger in such a way that the centre of its upper surface shall, throughout the test, be tangent to the spherical end of the plunger at its lowest point.

6. The test shall consist of a 1-cm. fall of the hammer for the first blow, a 2-cm. fall for the second blow, and an increase of 1-cm. fall for each succeeding blow until failure of the test-specimen occurs.

7. The height of the blow in centimetres at failure shall be the toughness of the test-specimen. The individual and the average toughness of three test-specimens shall be reported when no plane of structural weakness is apparent. In cases where a plane of structural weakness is apparent the individual and average toughness of the three specimens in each set shall be reported and identified. Any peculiar condition of a test-specimen which might affect the result, such as the presence of seams, fissures, etc., shall be noted and recorded with the test-result.

BIG NEW ELECTRICAL CATALOGUE

The new general supply catalogue, just issued by the Northern Electric Co., Ltd., is a compliment to the electrical business of Canada. The book, which is one of the largest electrical catalogues issued on the continent, contains no less than 1,485 pages and weighs 61/2 pounds ready for mailing. It contains the most complete listing of up-to-date electrical specialties of every description, classified in twenty-two sections, each section commencing with a four-page colored insert printed on heavy coated paper. Some idea of the material covered by this book may be had from the titles which have been assigned to the various sections as follows: Telephone section, wires and cables, pole line hardware, insulators, tools and construction appliances, insulating materials, conduit and conduit fittings, small electric light wiring devices, fuses and knife switches, lighting fixtures and accessories, socket devices and electric ranges and fans, light courses and complications have a sublight sources and applications, house goods and novelties and flashlights, batteries and accessories, switchboards and pan-elboards, protective and power control devices, meters (indicating, recording, integrating and testing), generators (in-cluding motors, transformers and motor applications), low voltage outfits, railway electrical supplies, automobile electrical devices and accessories, and miscellaneous.

This catalogue contains many improvements and innovations over previous issues but the big improvement in this issue is the method provided wherever practicable whereby prices f.o.b. Halifax, Montreal, Toronto, Winnipeg, Calgary and Vancouver can quickly and easily be obtained.

Electrical supply catalogues as heretofore issued have given only the manufacturer's list prices and discounts, usually making it necessary for the purchaser to estimate his own freight (or freight and duty), where costs were required f.o.b. various destinations. In this catalogue, the Northern Electric Co. have taken care of these two very important elements entering into the cost of electrical supplies delivered to Canadian points. To accomplish this, they have used Montreal and Toronto as basing points and the list prices found in the catalogue apply to goods sold f.o.b. Montreal or Toronto, except in cases otherwise noted. For other points at which the company has warehouses, the approximate delivered prices can be obtained by adding, to the list prices shown, the necessary percentage as explained in a footnote on each page.

^{*}The plane of structural weakness may in certain cases

be the rift, cleavage, or bedding plane. ⁺The form of diamond-drill described in Bulletin No. 347, U.S. Department of Agriculture, pp. 6-7, is recommended, and should prove satisfactory if the instructions are strictly

[‡]A satisfactory form of diamond saw is described in Bulletin No. 347, U.S. Department of Agriculture, pp. 7-9.