



Designation: D 5121 – 90 (Reapproved 1995)

Standard Practice for Preparation of Rock Slabs for Durability Testing¹

This standard is issued under the fixed designation D 5121; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice covers the preparation of rock slabs for various tests used to evaluate any visual internal defects, or the durability of rock by means of laboratory tests. These tests include, but are not limited to, freeze-thaw, wet-dry, and soundness.

NOTE 1—Tests for evaluating the durability of rock for erosion control uses are presently under development by ASTM Committee D-18.

1.2 *This standard does not purport to address all of the safety concerns associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* For a specific hazards statement, see Section 7.

2. Referenced Documents

2.1 ASTM Standards:

- D 653 Terminology Relating to Soil, Rock, and Contained Fluids²
- D 4992 Practice for Evaluation of Rock to be Used for Erosion Control²

3. Terminology

3.1 *Definitions*—The definitions of terms used in this practice shall be in accordance with Terminology D 653.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *slab, n*—a section of rock having two smooth, approximately parallel faces, produced by two saw cuts. The thickness of the slab is generally less than the other dimensions of the rock. The slab will be the specimen of a rock which will subsequently undergo durability tests.

3.2.2 *slice, n—in rock testing*, the smooth surface of rock piece produced by the cutting of the rock by a saw.

3.2.3 *rocksaw, n*—a saw capable of cutting rock. The term “saw” shall include the blade, framework on which the blade is mounted, and the motor.

4. Significance and Use

4.1 This practice is used to prepare specimens to evaluate any internal defects, such as cracks, that may not be apparent

on the surfaces of broken blocks of rock. Such evaluation can also aid in the selection and location of slabs for testing as outlined in Practice D 4992. In some cases, the need for further testing or evaluation may be eliminated.

4.2 The sawing of rock samples will reduce them to a suitable size for testing and, in many cases, preserve the natural structure of the internal defects so the samples can be evaluated by the various durability tests.

NOTE 2—Many of the testing procedures used to evaluate the durability of rock for erosion control projects are based on tests used to evaluate concrete or road aggregate. These tests utilize specimens roughly equivalent to the size and mass of a 1-in. maximum particle size piece of concrete aggregate. These specimens are usually obtained by crushing, breaking with a hammer, or by other percussive means. This size reduction process may eliminate any internal defects or planes of weakness. Therefore, the small specimen finally tested may not truly represent the actual behavior of the larger rock mass containing these defects that will be used at the construction site.

4.3 Durability test slabs obtained using this practice will generally result in the largest specimens that can be tested effectively by most well-equipped laboratories. Ideally, a test specimen size equal to the proposed design size would provide the ultimate in correlation between laboratory tests and actual field performance. However, in most cases, this is neither practical nor economically feasible.

NOTE 3—As the various rock durability test methods are developed, a table listing the slab size required for each test will be included in a subsequent revision of this practice.

5. Apparatus

5.1 *Rocksaw*—For most tests, a minimum blade diameter of 36 cm (14 in.) will be needed to obtain the slab sizes required for most durability tests (a larger one is preferable). The blade shall be a circular diamond blade. The size of the slab that can be obtained by sawing is limited by the blade-stabilizing flanges. Table 1 gives the approximate blade diameter and slab height relationships for saws typically used.

5.1.1 The saw shall have a vise to hold the specimens, in addition to an automatic feed (either gravity operated, hydraulic, or screwfed). A table saw with a removable vise is also acceptable. The saw shall have a platform to prevent the cut slab from falling and shattering. Any laboratory diamond saw used to cut geological and concrete specimens, or any diamond saw used for lapidary purposes, shall be acceptable.

5.2 *Camera*—It is preferable to take pictures of the sawed rock before and after slabbing.

¹ This practice is under the jurisdiction of ASTM Committee D-18 on Soil and Rock and is the direct responsibility of Subcommittee D18.17 on Rock for Erosion Control.

Current edition approved Sept. 28, 1990. Published November 1990.

² *Annual Book of ASTM Standards*, Vol 04.08.

TABLE 1 Approximate Blade Diameter and Slab Height Relationship

Blade Diameter, Nominal, in.	Slab Height, Nominal, in.
14	5
18	7
24	9

6. Materials

6.1 *Coolant*—Water shall be used as a coolant. Lubricants other than water may interfere with subsequent testing or evaluation, or both.

7. Hazards

7.1 Circular diamond saw blades do not have sharp protruding teeth that wood-cutting blades have, and as such are not inherently as dangerous as blades with teeth. However, their use does require care, safe handling procedures, and proper safety equipment.

8. Procedure

8.1 Choose individual rock samples for testing that are representative of the total rock mass, as noted in Practice D 4992. The sample shall be of a size to fit within the vise of the saw without further mechanical reduction of size.

8.2 Clamp the rock sample in the vise, or hand-hold it on the saw table. Saw the rock sample perpendicular to the bedding or banded texture of the rock, unless another orientation is specified for the saw cut. Cut the sample in a single pass between the midpoint of the rock and one-third of the distance from its edge. Make the cut either by: (1) automatically feeding

the sample within the vise through the blade, or (2) hand-holding and hand-feeding soft rocks through the blade. The automatic feed is preferable. In either case, saw the rock to minimize breakage which can result from internal cracks, features of weakness, or the sawing operation. Care shall be taken to produce a cut as smooth as possible.

8.3 Remove the rock from the saw after each cut is made. Wash and examine the slice. If desired, make a second cut at some distance from the first one in the same manner. Visual examination may indicate some slabs are unsuitable for testing due to breakage during or after slabbing, or for some other reason; discard these slabs. The thickness of any slab produced from two cuts shall be determined by the type of durability test for which the slab is sawed.

9. Report

9.1 Report the following information:

9.1.1 Identification number,

9.1.2 Sample location,

9.1.3 Rock type (formational name is optional),

9.1.4 The number of trials needed to obtain the number of test slabs requested from each sample,

9.1.5 Textures, defects, or other information that may affect the durability testing of the rock,

9.1.6 Mass of the rock slab,

9.1.7 A photograph of the sample prior to the slabbing, with a dimensional scale, and

9.1.8 A photograph of the slice with a dimensional scale, preferably in color.

10. Keywords

10.1 defects; diamond saw blade; durability; rocksaw; slabs

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