



Designation: D 2940 – 98

Standard Specification for Graded Aggregate Material For Bases or Subbases for Highways or Airports¹

This standard is issued under the fixed designation D 2940; 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.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This specification covers quality-controlled graded aggregates that, when hauled to and properly spread and compacted on a prepared grade to appropriate density standards, may be expected to provide adequate stability and load support for use as highway or airport bases or subbases.

NOTE 1—The engineer is cautioned to provide appropriate construction specifications to ensure compaction to an extent that further densification from traffic loadings on the completed pavement will be insignificant. The method suggested is to require compaction on a firm foundation of a short control strip of the material at a suitable moisture content, by means of vibratory or other proven effective rollers or tampers, until no further increase in density results. Compaction requirements should ensure that an average density of certain appropriate percentages of the control strip maximum density be achieved on the balance of the job; for base courses, 98% is suggested as the minimum average requirement.

1.2 The values stated in SI units are to be regarded as the standard. The inch-pound units, shown in parentheses, are for information only.

2. Referenced Documents

- 2.1 *ASTM Standards:*²
- C 136 Test Method for Sieve Analysis of Fine and Coarse Aggregates²
 - C 702 Practice for Reducing Field Samples of Aggregate to Testing Size²
 - D 75 Practice for Sampling Aggregates³
 - D 422 Test Method for Particle-Size Analysis of Soils⁴
 - D 2419 Test Method for Sand Equivalent Value of Soils and Fine Aggregate³
 - D 4318 Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils⁴
 - D 4792 Test Method for Potential Expansion of Aggregates from Hydration Reactions³

¹ This specification is under the jurisdiction of ASTM Committee D-4 on Road and Paving Materials and is the direct responsibility of Subcommittee D04.50 on Aggregate Specifications.

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² *Annual Book of ASTM Standards*, Vol 04.02.

³ *Annual Book of ASTM Standards*, Vol 04.03.

⁴ *Annual Book of ASTM Standards*, Vol 04.08.

E 11 Specification for Wire-Cloth Sieves for Testing Purposes⁵

E 105 Practice for Probability Sampling of Materials⁵

E 122 Practice for Choice of Sample Size to Estimate the Average Quality of a Lot or Process⁵

3. General Requirements

3.1 Coarse aggregate retained on the 4.75-mm (No. 4) sieve shall consist of durable particles of crushed stone, gravel, or slag capable of withstanding the effects of handling, spreading, and compacting without degradation productive of deleterious fines. Of the particles which are retained on a 9.5-mm ($\frac{3}{8}$ -in.) sieve, at least 75% shall have two or more fractured faces.

NOTE 2—No standard ASTM method is recognized to be capable of measuring the quality, or tendency of coarse aggregate to degrade to the extent that deleterious fines may be produced. Some local jurisdictions have developed tests believed to be of value in this respect. The purchaser of material under this specification is advised to investigate the availability and reliability of such tests in order to specify quality requirements appropriate to his local area.

3.1.1 The fractured particle requirement of 3.1 is modified when specified in the contract documents, providing for the use of another method for measuring interparticle friction which has been correlated with good field performance.

3.2 Fine aggregate passing the 4.75-mm (No. 4) sieve shall normally consist of fines from the operation of crushing the coarse aggregate. Where available and suitable, addition of natural sand or finer mineral matter, or both, is not prohibited. The fraction of the final mixture that passes the 75- μ m (No. 200) sieve shall not exceed 60 % of the fraction passing the 600- μ m (No. 30) sieve. The fraction passing the 425- μ m (No. 40) sieve shall have a liquid limit no greater than 25 and shall have a plasticity index no greater than 4. The sand equivalent value of the fine aggregate shall be no lower than 35.

3.2.1 For material to be used as a subbase at a greater depth than probable frost penetration, the plasticity index and sand equivalent requirements are modified to a maximum of 6 and a minimum of 30, respectively.

3.3 The gradation of the final composite mixture shall conform to an approved job mix formula, within the design

⁵ *Annual Book of ASTM Standards*, Vol 14.02.