



STATUTORY INSTRUMENTS.

S.I. No. 354 of 1949.

Standard Specification (Coarse and
Fine Aggregates from Natural
Sources for Concrete) Order, 1949.

IRISH STANDARD 5 : 1949.

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S.I. No. 354 OF 1949.

STANDARD SPECIFICATION (COARSE AND FINE AGGREGATES FROM NATURAL SOURCES FOR CONCRETE) ORDER, 1949.

I, DANIEL MORRISSEY, Minister for Industry and Commerce, in exercise of the power conferred on me by subsection (3) of section 20 of the Industrial Research and Standards Act, 1946 (No. 25 of 1946), hereby order as follows :

1. This Order may be cited as the Standard Specification (Coarse and Fine Aggregates from Natural Sources for Concrete) Order, 1949.

2.—(1) The specification set forth in Part II of the Schedule to this Order is hereby declared to be the standard specification for the commodity described in Part I of the said Schedule.

(2) The said standard specification may be cited as Irish Standard 5 : 1949.

SCHEDULE.

PART I.

COARSE AND FINE AGGREGATES FROM NATURAL SOURCES FOR CONCRETE.

PART II.

SPECIFICATION.

SCOPE.

1. This specification applies to the naturally occurring materials, crushed or uncrushed, used in the production of concrete for normal structural purposes, including roads.

DEFINITIONS.

2. For the purpose of this specification the following definitions shall apply :

(a) *Test Sieve* of any particular size or number shall mean the British Standard test sieve of that size or number as prescribed by the British Standards Institution in its publication of serial number 410 of the year 1943.

(b) *Fine aggregate* shall mean aggregate mainly passing a $\frac{3}{16}$ in. test sieve and containing only so much coarser material as is permitted in this specification.

(c) *Coarse aggregate* shall mean aggregate mainly retained on a $\frac{3}{16}$ in. test sieve and containing only so much finer material

as is permitted for the various types described in this specification.

(d) *All-in aggregate* shall mean aggregate containing a proportion of material of all sizes as obtained from the pit, river bed, foreshore, quarry or crushing plant.

(e) *Percentages* except where otherwise stated shall mean percentages by weight.

QUALITY OF AGGREGATE.

3. Aggregates shall consist of naturally occurring sand, gravel or stone, crushed or uncrushed, or a combination thereof. They shall be hard, strong, durable, clean and free from adherent coatings and shall not contain excessive quantities of flat or elongated particles.

(a) *Harmful Impurities.*

Aggregates shall not contain harmful material in sufficient quantity to affect adversely the strength or durability of the concrete (or, in the case of reinforced concrete, to attack the reinforcement) Mica, shale or similar laminated materials or soft particles shall not be present in such a form or in such quantity as to affect adversely the concrete.

When tested in accordance with the method given in Appendix C the quantity of harmful impurities passing a No. 200 test sieve shall not exceed (1) in the case of fine aggregate 3 per cent. for natural sand and 5 per cent. for crushed stone and (2) in the case of coarse aggregate 1 per cent.

Fine aggregate when tested for organic impurities in accordance with the method given in Appendix D shall not show a depth of colour exceeding that of the reference solution given in Appendix D.

(b) *Crushing.*

The extent of crushing of aggregate, when determined according to the method given in Appendix E shall not exceed 30 per cent. for concrete wearing surfaces (roads, paving, etc.) and 45 per cent. for other concrete.

(c) *Frost Resistance.*

Coarse aggregate for concrete liable to be exposed to the action of frost shall not be of a type that is liable to suffer from the action of frost.

GRADING.

4. (a) *Coarse Aggregate.*

The grading of a coarse aggregate when analysed as described in Appendix B shall be within the limits given in Table 1 for each nominal size.

TABLE 1.—GRADED COARSE AGGREGATES.

Test Sieve	Nominal Size			
	2 in. to $\frac{3}{16}$ in.	$1\frac{1}{2}$ in. to $\frac{3}{8}$ in.	$\frac{3}{4}$ in. to $\frac{3}{16}$ in.	$\frac{1}{2}$ in. to $\frac{3}{16}$ in.
	Per cent. passing			
3 in.	100	—	—	—
$2\frac{1}{2}$ in.	—	100	—	—
2 in.	95-100	—	—	—
$1\frac{1}{2}$ in.	—	95-100	100	—
1 in.	35-70	—	—	—
$\frac{3}{4}$ in.	—	35-70	90-100	100
$\frac{1}{2}$ in.	10-30	—	—	90-100
$\frac{3}{8}$ in.	—	10-35	20-55	40-85
$\frac{3}{16}$ in.	0-5	0-5	0-10	0-10

(b) Single-sized Coarse Aggregates.

Where coarse aggregate graded in accordance with Table I is to be obtained by combining single-sized aggregates, the grading of the single-sized aggregates, when analysed as described in Appendix B, shall be within the limits given in Table 2 for each nominal size.

TABLE 2.—SINGLE-SIZED COARSE AGGREGATES.

Test Sieve	Nominal Size				
	2 in.	$1\frac{1}{2}$ in.	$\frac{3}{4}$ in.	$\frac{1}{2}$ in.	$\frac{3}{8}$ in.
	Per cent. passing				
3 in.	100	—	—	—	—
$2\frac{1}{2}$ in.	—	100	—	—	—
2 in.	85-100	—	—	—	—
$1\frac{1}{2}$ in.	—	85-100	100	—	—
1 in.	0-20	—	—	—	—
$\frac{3}{4}$ in.	—	0-20	85-100	100	—
$\frac{1}{2}$ in.	0-5	—	—	85-100	100
$\frac{3}{8}$ in.	—	0-5	0-20	0-45	85-100
$\frac{3}{16}$ in.	—	—	0-5	0-10	0-20
No. 7	—	—	—	—	0-5

(c) *Fine Aggregates.*

- (i) The grading of a fine aggregate, when analysed as described in Appendix B, shall be within the limits given in Table 3.

TABLE 3.—FINE AGGREGATES.

Test Sieve	Per cent. passing
$\frac{3}{8}$ in.	100
$\frac{1}{2}$ in.	
$\frac{3}{4}$ in.	95-100
No. 7	70-95
No. 14	45-85
No. 25	25-60
No. 52	10-30
X No. 100	0-10

- (ii) When the fine aggregate is to be used in concrete containing more than 480 lb. of cement per cubic yard of concrete, the limit passing the No. 52 test sieve may be lowered from 10 per cent. to 5 per cent.
- (iii) When the fine aggregate is to be used in concrete containing less than 350 lb. of cement per cubic yard of concrete, the limit passing the No. 52 test sieve may be raised from 30 per cent. to 33 per cent.
- (iv) Fine aggregate containing less than 10 per cent. of material passing the No. 52 test sieve may be used provided an approved satisfactory inorganic material is added to correct the deficiency in grading.
- (v) A fine aggregate intended for use in medium and lean concrete shall contain not less than 2 per cent. of material passing the No. 100 test sieve.
- (vi) In order to control the grading of fine aggregate from any one source a preliminary sample shall be submitted before actual deliveries are made. This sample shall be representative of the material which it is proposed to supply. The fineness modulus of this sample and of samples from subsequent consignments shall be determined in the manner described in Appendix B. If the sample from any consignment shows a variation in fineness modulus greater than plus or minus 0.2 from the fineness modulus of the preliminary sample, the consignment shall be rejected or at the option of the purchaser it may be accepted subject to such changes in the proportion of materials as he or his representative may deem necessary by changes in grading of the fine aggregate.

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