Section 4112. Intermediate Aggregate for Portland Cement Concrete

4112.01 DESCRIPTION.

A. Crushed carbonate stone chips or pea gravel from approved sources as described in Materials I.M. 409. Coarse natural sand resulting from disintegration of rock through erosional processes, without addition of crushed over-sized material may be used in place of the intermediate and fine aggregate.

B. For crushed limestone or dolomite chips, meet the durability class required for the coarse aggregate. Acquire uncrushed pea gravel or coarse sand from any PCC approved durability class gravel. When the gravel durability is lower than the coarse aggregate durability requirements, the pea gravel is not to exceed 15% of total aggregate in the mix. Aggregate meeting the requirements of Section 4117 will be considered coarse sand.

4112.02 GRADATION.

A. Intermediate Aggregate.
For gradations, intermediate aggregate is considered coarse aggregate. Meet the following gradation limits:

Sieve Size	% Passing
1/2 inch (12.5 mm)	95-100
No. 4 (4.75 mm)	0-10

B. Coarse Sand.
Meet the following gradation limits:

Sieve Size	% Passing
1/2 inch (12.5 mm)	100
3/8 inch (9.5 mm)	90-100
No. 4 (4.75 mm)	75-95
No. 8 (2.36 mm)	60-90
No. 30 (600 µm)	10-60
No. 200 (75 µm)	0-1.5

4112.03 QUALITY.

A. Intermediate Crushed Stone.
Meet the requirements of Table 4112.03-1:

Table 4112.03-1: Aggregate Quality

Aggregate Quality	Maximum Percent Allowed	Test Method
Alumina[(a)]	0.5	Office of Materials Test Method No. Iowa 222
A Freeze	6	Office of Materials Test Method No. Iowa 211, Method A
Clay Lumps and Friable Particles	0.5	Materials I.M. 368
[(a)] If the Alumina value fails, determine the A Freeze value for specification compliance.		

B. Pea Gravel and Coarse Sand.

1. For the portion of coarse sand passing the No. 4 (4.75 mm) sieve, meet the quality requirements of Section 4110.

2. For pea gravel and the portion of coarse sand retained on the No. 4 (4.75 mm) sieve, meet the quality requirements of Table 4112.03-2:

Table 4112.03-2: Maximum Permissible Amounts of Objectionable Materials

Objectionable Materials.	Maximum Percent Allowed	Test Method
Coal and carbonaceous shale	0.5	AASHTO T 113
Total of all shale, similar objectionable materials, coal and iron combined	1.0	AASHTO T 113
Organic Materials, except coal	0.01	Office of Materials Test Method No. Iowa 215
Unsound chert particles retained on 3/8 inch (9.5 mm) sieve (Nonstructural concrete)	3.0	Materials I.M. 372
Unsound chert particles retained on 3/8 inch (9.5 mm) sieve (Structural concrete)	2.0	Materials I.M. 372
Note: Chert particle which break into three or more pieces when subjected to the freezing and thawing test will be considered unsound. Chert in aggregate produced from limestone sources is defined as unsound when any of the fractions of the crushed or uncrushed chert do not meet the soundness requirements.		