 <p>Manitoba Transportation and Infrastructure</p> <p>Highway Design</p>	Standard No.: MEB-P055
	<p><u>Effective Date</u> Current: August 2024 Previous: March 2023</p>
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Standard Test Method: Specific Gravity and Absorption of Aggregates	

1.0 SCOPE

This test method covers the determination of bulk specific gravity and absorption of aggregates.

2.0 REFERENCE STANDARDS

ASTM Standards

- C127 Density, Relative Density (Specific Gravity) and Absorption of Coarse Aggregate
- C128 Density, Relative Density (Specific Gravity) and Absorption of Fine Aggregate
- C117 Materials Finer than 75- μm (No. 200) Sieve in Mineral Aggregates by Washing

AASHTO Standards

- T85 Specific Gravity and Absorption of Coarse Aggregate
- T84 Specific Gravity and Absorption of Fine Aggregate

MEB Standards

- P054 Preparation of Bituminous Aggregates for the Determination of Physical Properties

3.0 DEFINITION

Blended Aggregates: As-received aggregate samples combined as per the bituminous mix design

Coarse Aggregate: Coarse aggregate is all material retained on the 4.75 mm sieve. This includes material retained on the 4.75 mm sieve contained in the fine aggregates.

Fine Aggregate: Fine aggregate is all material passing the 4.75 mm sieve. This includes material passing the 4.75 mm sieve contained in the coarse aggregates.


4.0 PROCEDURE

Follow ASTM C127 and C128 procedure except as noted in 4.1, 4.2 and 4.3.

4.1 For bituminous aggregates, combine as-received aggregates in accordance with *MEB-P054 Preparation of Bituminous Aggregates for the Determination of Physical Properties*.

4.2 Split Blended Aggregates on the 4.75 mm sieve and separate portion retained on the 4.75 mm sieve (coarse aggregate) and the portion passing the 4.75 mm sieve (fine aggregate) for testing.

4.3 Wash fine aggregate portion over a 0.075 mm sieve in accordance with *ASTM C117 Materials Finer than 75- μm (No. 200) Sieve in Mineral Aggregates by Washing*.

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5.0 CALCULATION

5.1 Calculate the bulk specific gravity and absorption for Coarse Aggregates as follows:

$$SG_{Coarse} = \frac{A}{B - C}$$

$$ABS_{Coarse} = \frac{B - A}{A} * 100$$

Where,

A = Mass of oven-dry test sample in air, g

B = Mass of saturated surface dry test sample in air, g

C = Mass of saturated test sample in water, g

5.2 Calculate the bulk specific gravity and absorption of Fine Aggregates as follows:

$$SG_{Fine} = \frac{A}{B + S - C}$$

$$ABS_{Fine} = \frac{S - A}{A} * 100$$

Where,

A = Mass of oven dry specimen in air, g

B = Mass of pycnometer filled with water, g

S = Mass of SSD specimen, g

C = Mass of pycnometer with specimen and water to calibration mark, g

5.3 Calculate combined bulk specific gravity of Blended Aggregates as follows:

$$\text{Combined Specific Gravity} = \frac{[(P_{Coarse} * SG_{Coarse}) + (P_{Fine} * SG_{Fine})]}{100}$$

Where,

P_{Coarse} = Portion of Blended Aggregate retained on the 4.75 mm sieve, %


P_{Fine} = Portion of Blended Aggregate passing the 4.75 mm sieve, %

SG_{Coarse} = Specific Gravity of the Coarse Aggregate

SG_{Fine} = Specific Gravity of the Fine Aggregate

5.4 Calculate combined absorption of Blended Aggregates as follows:

$$\text{Combined Absorption} = \frac{[(P_{Coarse} * ABS_{Coarse}) + (P_{Fine} * ABS_{Fine})]}{100}$$

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Where,

ABS_{coarse} = Absorption of the Coarse Aggregate

ABS_{fine} = Absorption of the Fine Aggregate

6.0 REPORT

Report specific gravity to the nearest 0.001 and absorption to the nearest 0.01%.