

**SECTION M.02
GRANULAR FILL
SUBBASE
GRANULAR BASE AND SURFACES
STONE BASE
PERVIOUS STRUCTURE BACKFILL
FREE-DRAINING MATERIAL
CRUSHER-RUN STONE**

M.02.01--Granular Fill: For this purpose, the material shall consist of broken or crushed stone, gravel, reclaimed miscellaneous aggregate or a mixture thereof.

1 Broken or crushed stone shall be the product resulting from the artificial crushing of rocks, boulders or large cobblestones, substantially all faces of which have resulted from the crushing operation. Broken or crushed stone shall consist of sound, tough, durable stone, reasonably free from soft, thin, elongated, laminated, friable, micaceous or disintegrated pieces, mud, dirt or other deleterious material and shall be sized to meet the requirements of grading "A," Article M.02.06.

2 Bank or crushed gravel shall consist of sound, tough, durable particles of crushed or uncrushed gravel, free from soft, thin, elongated or laminated pieces and vegetable or other deleterious substances. It shall meet Grading "A" and the requirements for plasticity and resistance to abrasion indicated in Article M.02.06. Crushed gravel shall be the manufactured product resulting from the deliberate mechanical crushing of gravel with at least 50 percent of the gravel retained on the 4.75 mm sieve having at least one fractured face.

3 Reclaimed Miscellaneous Aggregate material shall consist of sound, tough, durable particles of crushed reclaimed waste. It shall be free of soft disintegrated pieces, mud, dirt, glass or other injurious materials and contain no more than 2 percent by mass of asphalt cement.

This reclaimed miscellaneous material shall meet Grading "A" and the requirements for plasticity and resistance to abrasion, which are set forth in M.02.06. It shall be tested for soundness in accordance with M.02.06 when directed by the Director of Research and Materials.

M.02.02--Subbase: Materials for this work shall conform to the following requirements:

1 Bank or crushed gravel shall consist of sound, tough, durable particles of crushed or uncrushed gravel, free from soft, thin, elongated or laminated pieces and vegetable or other deleterious substances. It shall be hard and durable enough to resist weathering, traffic abrasion and crushing. It shall be subject to testing for soundness in accordance with Article M.02.06 when directed by the Director of Research and Materials. It shall meet Grading "B" and the requirements for plasticity and resistance to abrasion indicated in Article M.02.06.

2 Crusher-Run Stone shall consist of sound, tough, durable broken stone. It shall be reasonably free from soft, thin, elongated, laminated, friable, micaceous or disintegrated pieces, mud, dirt or other deleterious material.

(a) Loss on Abrasion: The crusher-run stone shall show a loss on abrasion of not more than fifty percent using AASHTO Method T-96.

(b) Grading: The crusher-run stone shall meet Grading "A" and the requirements for plasticity indicated in Article M.02.06.

3 Reclaimed Miscellaneous Aggregate shall consist of sound, tough, durable particles of crushed reclaimed waste. It shall be free from soft, disintegrated pieces, mud, dirt, glass or other injurious material, and contain no more than 2 percent by mass of asphalt cement.

This reclaimed miscellaneous material shall meet Grading "B" and the requirements for plasticity and resistance to abrasion, which are set forth in M.02.06. It shall be tested for soundness in accordance with M.02.06 when directed by the Director of Research and Materials.

M.02.03--Granular Base, Rolled Bank Gravel Surface and Traffic Bound Gravel Surface: The materials for the "Rolled Granular Base" shall consist of sound, tough, durable particles of bank or crushed gravel, or reclaimed miscellaneous aggregate, or mixtures thereof with the resultant uniform blend containing no more than 2 percent by mass of asphalt cement. The materials for the Rolled Bank Gravel Surface and Traffic-Bound Gravel Surface shall consist of sound, tough, durable particles of bank or crushed gravel. All materials shall be free from thin or elongated pieces, lumps of clay, loam, or vegetable matter. Binder may be added and incorporated by approved methods as specified elsewhere. It shall meet Grading "A" except that the top course of the rolled bank gravel surface shall conform to Grading "C." It shall be subject to testing for soundness in accordance with Article M.02.06 when directed by the Director of Research and Materials. It shall also meet the requirements for plasticity and resistance to abrasion which, with grading, are indicated in Article M.02.06.

M.02.04--Gravel Shoulders: The materials for this work shall consist of sound, tough, durable particles of crushed or uncrushed gravel free from soft, thin, elongated or laminated pieces, vegetable or other deleterious substances. Gravel shall meet Grading "A" except that the upper 75 mm shall conform to Grading "C." It shall be subject to testing for soundness in accordance with Article M.02.06 when directed by the Director of Research and Materials. It shall also meet the requirements for plasticity and resistance to abrasion which, with grading, are indicated in Article M.02.06.

M.02.05--Pervious Structure Backfill: Pervious structure backfill shall consist of broken or crushed stone, broken or crushed gravel, or reclaimed miscellaneous aggregate containing no more than 2 percent by mass of asphalt cement or mixtures thereof.

Materials for this work shall conform to the following requirements:

1 Broken or crushed stone shall consist of sound, tough, durable stone, reasonably free from soft, thin, elongated, friable, laminated, micaceous or disintegrated pieces, mud, dirt or other deleterious material and shall be sized to meet the requirements of Grading "B," Article M.02.06. It shall meet the requirements of loss on abrasion indicated in Subarticle M.02.02-2(a).

2 Bank or crushed gravel shall consist of sound, tough, durable particles of crushed or uncrushed gravel free from soft, thin, elongated or laminated pieces and vegetable or other deleterious substances. It shall be subject to testing for soundness in accordance with Article M.02.06 when directed by the Director of Research and Materials. It shall meet Grading "B" and the requirements for plasticity and resistance to abrasion indicated in Article M.02.06.

3 Reclaimed Miscellaneous Aggregate shall consist of sound, tough, durable particles of crushed reclaimed waste. It shall be free of soft disintegrated pieces, mud, dirt, glass or other injurious material, and contain no more than 2 percent by mass of asphalt cement. It shall meet Grading "B" and the requirements for plasticity, resistance to abrasion and soundness indicated in M.02.06.

M.02.06--Gradation, Plasticity, Resistance to Abrasion and Soundness Requirements:

1--Gradation:

	Grading		
	<u>A</u>	<u>B</u>	<u>C</u>
Square Mesh Sieves	Percent passing by mass		
Pass 125 mm		100	
Pass 90 mm	100	90-100	
Pass 37.5 mm	55-100	55-95	100
Pass 19 mm			45-80
Pass 6.3 mm	25-60	25-60	25-60
Pass 2.0 mm	15-45	15-45	15-45
Pass 425 µm	5-25	5-25	5-25
Pass 150 µm	0-10	0-10	0-10
Pass 75 µm	0-5	0-5	0-5

The grading percentages specified in the above table shall apply to the material after it has been delivered to the construction site as well as when tested at the pit or other source of supply.

When the fraction of the dry sample passing the 150 µm mesh sieve is greater than eight percent by mass, the sample will be washed as indicated. The amount obtained from washing shall be added to that obtained by dry sieving; and the total amount passing each sieve shall meet the above gradation.

2--Plasticity:

(a) When the fraction of the dry sample passing the 150 µm mesh sieve is four percent or less by mass, no plastic limit test will be made.

(b) When the fraction of the dry sample passing the 150 µm mesh sieve is greater than four percent and not greater than eight percent by mass, that fraction shall not have sufficient plasticity to permit the performing of the plastic limit test using AASHTO Method T90.

(c) When the fraction of the dry sample passing the 150 µm mesh sieve is greater than eight percent by mass, the sample will be washed; and the additional material passing the 150 µm mesh sieve shall be determined by AASHTO Method T-146, except that the 150 µm mesh sieve will be substituted for the 425 µm mesh sieve where the latter is specified in AASHTO Method T-146. The combined materials that passed the 150 µm mesh sieve shall not have sufficient plasticity to permit the performing of the plastic limit test using AASHTO Method T90.

3--Test for Resistance to Abrasion. Gravel materials shall show a loss on abrasion of not more than fifty percent using AASHTO Method T96.

4--Soundness: When tested with magnesium sulfate solution for soundness using AASHTO Method T 104, coarse aggregate shall not have a loss of more than 15 percent at the end of five cycles.

M.02.07--Free-Draining Materials: Free-draining material shall consist of sand, gravel, rock fragments, quarry run stone, broken stone, reclaimed miscellaneous aggregate containing no more than 2 percent by mass of asphalt cement or mixtures thereof. This material, or the material from any one source of a mixture, shall not have more than 70 percent, by mass, passing the 425 µm mesh sieve and not more than 10 percent, by mass, passing the 75 µm mesh sieve.

