SECTION 703 - AGGREGATES (Last Revision April, 2020)

703-01 FINE AGGREGATE

SCOPE. The specification covers the material details, quality requirements and methods policies for sampling and testing fine aggregate generally used in portland cement concrete and bituminous hot mix asphalt concrete.

SAMPLING. Samples of fine aggregates shall will be obtained by and submitted to the Materials Bureau by a representative of the Department under the following conditions:

A. Sampling Approved Operating Sources. All approved operating sources shall will be sampled when:

- The latest test for a source is two (2) or more years old.
- A change in the character of the raw or processed fine aggregate occurs.
- The location of the course of raw material is shifted, or a change in the character of raw material occurs.
- Considered necessary by the Department.

B. Sampling Non-approved or Rejected Operating Sources. Non-approved or rejected operating sources, equipped with adequate processing facilities, may be sampled upon favorable recommendation by a Regional Director and approved by the Director, Materials Bureau. Approval action on such sources may be conditioned on the results obtained by periodic sampling and testing as prescribed by the Materials Bureau and described in Material Method 29, "Aggregate Source Acceptance Procedures" (MM 29). MM 29 is available on the NYSDOT public website here: https://www.dot.ny.gov/divisions/engineering/technical-services/materials-bureau/forms-manuals.

C. Sampling Proposed Unopened Sources of Material. Proposed unopened sources of material may be sampled upon the favorable recommendation of a Regional Director and approved by the Director, Materials Bureau. The results of tests on such samples shall will be for information only and shall will be indicative of the potential quality of the source. Action regarding acceptance of a source is described in MM 29 or rejection of a source will be taken only after processing facilities have been installed and approved.

Stripping. All sources of fine aggregate shall be thoroughly stripped of all inferior and objectionable material before processing operations are started and shall be kept stripped far enough from the working face to insure against undesirable material becoming mixed with the output. If undesirable material is furnished from accepted sources through faulty operations or any other cause whatsoever, the source and any objectionable material therefrom may be rejected by the Regional Director.

Geologic Source Reports and Quality Control Plans. As part of the source approval requirements, the following information shall be submitted to the Department for each operating source, according to the requirements in MM 29:

- A. Geologic Source Report (Static Module). The Static Module contains basic geology and mining information. It includes all relevant information about an aggregate source that is not likely to change over the lifetime of a mine. It is required to be submitted for the initial approval of an aggregate source. The requirements are detailed in MM 29.
- B. Geologic Source Report (Cyclic Module). The Cyclic Module contains geologic information such as maps and cross-sections that may change as a mining operation advances laterally or vertically, and must be updated according to the schedule and requirements in MM 29.

C. Quality Control Plan (Annual Module). The Annual Module contains the Quality Control Plan (QCP) and procedures for mining and processing aggregates; the plan must be submitted at least annually, or whenever changes occur.

Annual Reports. As part of the acceptance requirements, the following information shall be submitted to the Department annually for each operating source:

A. Geologic Source Report. A geologic source report that describes the characteristics of the material to be processed during the coming year.

B. *Plant Flow Information.* Plant flow information describing the processing equipment and the products to be furnished for Departmental use.

The Details of these requirements may be obtained from the Materials Bureau MM 29. These annual reports shall will be received and approved reviewed by the Department before the start of the year's operations. according to the schedules contained in MM 29.

Approval of the reports by the Department The submittal and/or Department acceptance of a report does not relieve the supplier of its responsibility to provide a uniform and acceptable product meeting the additional requirements described herein.

MATERIAL REQUIREMENTS. Fine aggregate shall consist of natural sand or manufactured sand, or other engineered aggregate conforming to the requirements of these specifications. All fine aggregate shall consist of hard, strong, durable particles meeting the requirements of Table 703-1, Fine Aggregate Requirements (Testing). In addition, such particles must be which are free from a-coatings or any injurious materials and/or injurious amounts of clay, loam, or other deleterious substances. Engineered aggregate includes any other materials that are inert, non-reactive, and meet all relevant specifications described herein. In addition, the fine aggregate shall not contain substances, which, when mixed in portland cement concrete, produce an unacceptable level of chloride ions in the final product. Substances that produce chloride ions shall will be considered deleterious material. Any fine aggregate may be rejected if it is determined by the Department to contain sufficient amounts of unsound or deleterious material to an end-use product.

Fine aggregates from more than one approved aggregate source or of more than one type of material may be blended and stockpiled to meet gradation requirements or improve aggregate quality for any end-use. Blending procedures shall be approved by the Department. All blending procedures and proportions must be approved by the Department, and all resulting blends require a new source designation. Producers of blended fine aggregates are subject to all requirements of §703-01, including testing and Quality Control Plans.

Fine aggregates meeting the physical testing requirements of Table 703-1, "Fine Aggregate Requirements (Testing)" shall may be accepted for the indicated use, unless service records indicate that it is unsound, or that the material is otherwise determined to be unsatisfactory by the Director, Materials Bureau.

TABLE 703-1 FINE AGGREGATE REQUIREMENTS (TESTING)						
Test Method	For use in: Portland Cement Concrete (PCC)	For use in: Bituminous Hot Mix Asphalt Concrete (HMA)				
Magnesium Sulfates (NYSDOT 207 703-06 P,G) Max. percent loss by weight at 5 cycles	30	45				
Organic Impurities (NYSDOT 202 703-03P,G, AASHTO T-21) Organic Plate, Lighter Than	3	-				
Gardner Color (AASHTO T-21), Lighter Than	11	-				

Fine aggregate not meeting the requirement of Table 703-1 may be further evaluated by additional testing, petrographic examination, geologic studies, review of performance history and plant flow information, or investigation of performance history. If the results of the evaluation indicate that the aggregate should perform satisfactorily, the source may be accepted by the Director, Materials Bureau.

If fine aggregate is found unsatisfactory when examined for organic impurities, it shall will be rejected unless it passes the mortar strength test for compression (NYSDOT 703-04P). Fine aggregates so tested shall achieve a compressive strength of at least one hundred percent of the matching washed fine aggregate when tested according to methods prescribed by the Material Bureau (NYSDOT 204).

FRICTION. Fine aggregate for use in wearing surfaces of portland cement concrete pavement must meet the friction aggregate requirements of §501, Portland Cement Concrete.

TESTS. The details of all test methods for fine aggregates may be obtained from the Materials Bureau ASTM, AASHTO, or the NYSDOT public website here: https://www.dot.ny.gov/divisions/engineering/technical-services/materials-bureau/forms-manuals.

BASIS OF ACCEPTANCE APPROVAL. Acceptance Approval of the source is determined on the basis of based on tests performed by the Materials Bureau on samples representing the sources; review of Geologic Source Reports, Quality Control Plans, and Plant Flow Information; petrographic examination and other geologic studies; and performance histories where applicable.

BASIS OF ACCEPTANCE. The material is incorporated into the work on the basis that it is from an approved source conforming to procedural directives of the Department and the aggregate shall meet the gradation requirement at the point of use.

Aggregate for use in the manufacture of precast concrete units may be accepted based on stockpile approval at a location acceptable to the Department on a per job basis. Requests for stockpile approval shall be made in writing to the Materials Bureau. The manufacturer shall allow at least ninety (90) days for the testing and evaluation of the aggregate.

703-2 COARSE AGGREGATE

SCOPE. This specification covers the material details, requirements and methods for sampling and testing coarse aggregate generally used in portland cement concrete, bituminous hot mix asphalt concrete and surface treatments. This specification does not cover those aggregates used solely as part of certain proprietary non-structural overlays or surface treatment systems.

SAMPLING. Samples of coarse aggregates shall will be obtained by and submitted to the Materials Bureau by a representative of the Department under the following conditions:

A. Sampling Approved Operating Sources. All approved operating sources shall will be sampled when:

- The latest test for a source is two (2) or more years old.
- A change in the character of raw or processed coarse aggregate occurs.
- The location of the source of raw material is shifted or a change in the character of raw material occurs.
- Considered necessary by the Department.

B. Sampling Non-approved or Rejected Operating Sources. Non-approved or rejected operating sources, equipped with adequate processing facilities, may be sampled upon favorable recommendation by a Regional Director and approval by the Director, Materials Bureau. Approval action on such sources may be conditioned on the results obtained by periodic sampling and testing as prescribed by the Materials Bureau and described in MM 29.

C. Sampling Proposed Unopened Sources of Material. Proposed unopened sources of material may be sampled upon the favorable recommendation of a Regional Director and approval by the Director, Materials Bureau. The results of tests on such samples shall will be for information only and shall will be interpreted as indicative of the potential quality of the source. Action regarding acceptance of a source is described in MM 29 or rejection of a source will be taken only after processing facilities have been installed and approved. MM 29 is available on the NYSDOT public website here: https://www.dot.ny.gov/divisions/engineering/technical-services/materials-bureau/forms-manuals.

Stripping. All sources of coarse aggregate shall be thoroughly stripped of all inferior and objectionable material before processing operations are started and shall be kept stripped far enough from the working face to insure against undesirable material becoming mixed with the output. If undesirable material is furnished from accepted sources through faulty operation or any other cause whatsoever, the source and any objectionable material therefrom may be rejected by the Regional Director.

Geologic Source Reports and Quality Control Plans. As part of the acceptance requirements, the following information shall be submitted to the Department for each operating source, according to the requirements in MM 29:

- A. Geologic Source Report (Static Module). The Static Module contains basic geology and mining information. It includes all relevant information about an aggregate source that is not likely to change over the lifetime of a mine. It is required to be submitted for the initial approval of an aggregate source. The requirements are detailed in MM 29.
- B. Geologic Source Report (Cyclic Module). The Cyclic Module contains geologic information such as maps and cross-sections that may change as a mining operation advances laterally or vertically, and must be updated according to the schedule and requirements in MM 29.
- C. Quality Control Plan (Annual Module). The Annual Module contains the Quality Control Plan (QCP) and procedures for mining and processing aggregates; the plan must be submitted at least annually, or whenever changes occur.

Annual Reports. As part of the acceptance requirements, the following information shall be submitted to the Department annually for each operating source:

A. Gravel Operations

1. A Geologic Source Report that describes the characteristics of the material to be processed during the coming year.

2. Plant Flow Information describing the processing equipment and the products to be furnished for Departmental use.

B. Quarry Operations. A Quarry Report describing the characteristics and uniformity of rock to be quarried during the coming year.

All Details of these report requirements may be obtained from MM 29. the Materials Bureau. These annual reports shall will be received and approved reviewed by the Department according to the schedules contained in MM 29. before the start of the year's operations.

The approval submittal and/or Department acceptance of a report does not relieve the supplier of its responsibility to provide a uniform and acceptable product meeting the additional requirements described herein.

MATERIAL REQUIREMENTS. Coarse aggregates shall consist of crushed stone bedrock, crushed gravel, screened gravel or crushed air-cooled blast furnace slag, or other engineered aggregate conforming to the requirements of these specifications. All coarse aggregates shall meet the requirements for these materials as outlined in Tables 703-2, "Physical Requirements (Testing)," 703-3, "Physical Requirements (Deleterious Materials)," and 703-4, "Size of Stone Crushed Bedrock, Gravel and Slag." Engineered aggregate includes any other materials that are inert, non-reactive, and meet all relevant specifications described herein.

Coarse aggregates from more than one approved aggregate source or of more than one type of material may be blended and stockpiled to meet gradation requirements or improve aggregate quality for any end-use. All blending procedures and proportions must be approved by the Department, and all resulting blends require a new source designation. Producers of blended coarse aggregates are subject to all requirements of §703-02, including testing and Quality Control Plans.

Coarse aggregate meeting the physical requirements of Tables 703-2, and 703-3 shall may be accepted unless service records indicate that it is unsound or that the material is otherwise determined to be unsatisfactory by the Director, Materials Bureau. Coarse aggregate not meeting the requirements of these tables may be further evaluated by additional testing, petrographic examination, geologic studies, review of Plant Flow Information and performance history. If the results of the evaluation indicate that the aggregate should perform satisfactorily, the source may be accepted by the Director, Materials Bureau.

TABLE 703-2 PHYSICAL REOUIREMENTS (TESTING) ⁽¹⁾							
	Material Designation						
Material Test Designation	Gradation/ Particle Size	Crushed Stone Bedrock 703-0201	Crushed Gravel 703-0202	Screened Gravel 703-0203	Crushed Slag 703-0204		
Magnesium Sulfate Test (703-07 P,G)	No. 2	18	18	18	6		
Max. % loss by weight at 10 cycles ⁽¹⁾	No. 1	32	32	32	6		
Freezing and Thawing Test (703-08 P,G)	No. 2	20	20	20	-		
Max. % loss by weight at 25 cycles ⁽²⁾	No. 1	25	25	25	-		
Flat Particles, Elongated Particles, or Flat and E Particles (ASTM D4791) Max. % by weight Flat and Elongated to the De	Clongated gree of 5:1 $^{(3)}$	10	10	-	-		
Crushed particles in any primary size	+ ¹ / ₂ inch with 1 fractured face	-	75 ⁽⁴⁾				
(ASTM D5821) Min. % by weight	- ¹ /2 inch with 2 fractured faces		85 ⁽⁴⁾	-	-		
Minimum unit weight (703-10 P,G) lbs/cu. ft.		-	_	-	70		

1. To determine its conformance to specification limits, processed coarse aggregate may be tested at any point after completion of processing. The manufactured material shall be separated into the primary sizes indicated in Table 703-5, "Primary Size." Each size fraction shall conform to the requirements of \$703-02 Coarse Aggregate. The loss on either size fraction may be used for acceptance if they are of similar composition.

2. Loss applies to No. 2 size fraction. The freeze-thaw requirement applies only to aggregate used in Portland cement concrete. The loss on either size fraction may be used for acceptance if they are of similar composition.

3. The freeze thaw requirement applies only to aggregate used in Portland cement concrete. The loss applies to the No. 2 size fraction. Requirement applies to coarse aggregate for use in hot mix asphalt with design ESALs of 0.3 million or greater.

4. Loss applies to all materials excepting marble, granite, and other similar materials. Gravel which has not been processed through a crusher shall not be combined with crushed gravel.

5. Loss applies to marble, granite, and other similar materials.

6. Requirement applies to coarse aggregate for use in hot mix asphalt with design ESALs of 0.3 million or greater.

7. Gravel which has not been processed through a crusher shall not be combined with crushed gravel.

A. *Crushed Stone-Bedrock.* Crushed bedrock stone shall will be Material Designation 703-0201 and shall consist of clean, durable, sharp-angled fragments of rock of uniform quality. The crushed stone used as coarse aggregate for all items shall be obtained from sources conforming to the requirements of the Department as to sampling, testing methods, Quarry Reports and any other required procedures.

B. Crushed Gravel. Crushed Gravel shall will be Material Designation 703-0202 and shall consist of clean, durable, sharp-angled fragments of gravel free from coatings. A crushed particle shall be is defined as one in which the total area of face fracture exceeds 25% of the

maximum cross-sectional area of the particle. When two fractured faces are designated, the total area of each fractured face shall exceed 25% of the maximum cross-sectional area of the particle.

A naturally fractured face shall will be acceptable providing that the sharp angular portion of the particle consists of sound material and is free from unsound or injurious coatings.

The crushed gravel used as coarse aggregate for all items shall be obtained from sources conforming to the requirements of the Department as to sampling, testing methods, Geologic Source Reports, Plant Flow Information, and any other required procedures.

C. Screened Gravel. Screened gravel shall be Material Designation 703-0203 and shall consist of clean, durable gravel free from coatings.

Screened gravel may consist of all uncrushed particles and shall be obtained from sources conforming to the requirements for crushed gravel.

DC. Crushed Slag. Crushed slag particles shall will be Material Designation 703-0204 and shall consist of hard, durable, angular fragments which are reasonably uniform in density and quality; free from injurious amounts of sulphur; and reasonably free from thin, elongated pieces, dirt, or other objectional matter. All crushed slag shall be obtained from approved sources conforming to the requirements of the Department as to sampling, test methods and any other required procedures.

TABLE 703-3 PHYSICAL REQUIREMENTS - DELETERIOUS MATERIALS						
Maximum perce	ent by weight	t in any prim	ary size ⁽¹⁾			
Material Designation	Crushed Stone Bedrock 703-0201	Crushed Gravel 703-0202	Screened Gravel 703-0203	Crushed Slag 703-0204		
Shale and shale-like materials ⁽²⁾	3.0	3.0	3.0	-		
Coal/Lignite/Sulfides ⁽³⁾	1.0	1.0	1.0	-		
Clay lumps or Wood	0.2	0.2	0.2	-		
Metal Ore ⁽⁴⁾	3.0	3.0	3.0	3.0		
Other Deleterious Materials ⁽⁵⁾	3.0	3.0	3.0	3.0		
Total Deleterious Materials	5.0	5.0	5.0	5.0		

(1) Coarse aggregates containing more than the specified maximum amounts of deleterious materials may be washed or otherwise processed until such specifications are satisfied.

- (2) Shale, slate, phyllite, argillite, schist, and similar shale-like fissile rocks that have been identified by performance or by test to be unsound and deleterious. Such shale-like fissile rocks may be tested separately from the rest of the aggregate by freezing and thawing according to NYSDOT Test Method 703-08 P,G. If the loss is 20% or greater, that material will be designated as deleterious shale or shale-like material.
- (3) Pyrite, marcasite, pyrrhotite, bog iron, and similar material.
- (4) Magnetite, illmenite, etc. Percentages above 3.0% may be accepted by the Director, Materials Bureau, when appropriate adjustments to yield have been made.
- (5) Cemented clusters, weathered particles, and similar material.

	TABLE 703-4 ⁽⁴⁾ SIZES OF STONE, GRAVEL AND SLAG										
	Screen Sizes (% Passing by Weight)										
Size	4 in	3 in	2 ½ in	2 in	1 ½ in	1 in	1⁄2 in	1⁄4 in	1/8 in	# 80	#200 ⁽²⁾
Screenings ⁽¹⁾	-	-	-	-	-	-	100	90-100	-	-	0-1.0
1B	-	-	-	-	-	-	-	100	90-100	0-15	0-1.0
1A	-	-	-	-	-	-	100	90-100	0-15	-	0-1.0
1ST	-	-	-	-	-	-	100	0-15	-	-	0-1.0
1	-	-	-	-	-	100	90-100	0-15	-	-	0-1.0
2	-	-	-	-	100	90-100	0-15	-	-	-	0-1.0
3A	-	-	-	100	90-100	0-15	-	-	-	-	0-0.7
3	-	-	100	90-100	35-70	0-15	-	-	-	-	0-0.7
4A	-	100	90-100	-	0-20	-	-	-	-	-	0-0.7
4	100	90-100	-	0-15	-	-	-	-	-	-	0-0.7
5	90-100	0-15	-	-	-	-	-	-	-	-	0-0.7

(1) Percentage by weight passing the following square

openings.

(1) Screenings shall include all of the fine-material passing a

1/4 in. screen.

(2) The minus No. 200 material requirements apply only to aggregate for use in portland cement concrete, chip seal, cold mix bituminous pavements and underdrain filter material. The test (NYSDOT 201AASHTO T11) will be performed on the entire sample of the designated size aggregate. Primary size does not apply in the determination of the minus No. 200 material.

TABLE 703-5 ⁽⁺⁾⁻ SIZES OF CRUSHED GRAVEL, STONE, AND SLAG FOR SLURRY								
	Screen Sizes							
Size Designation	3/8 in	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200⁽¹⁾
2MS	100	90-100	65-90	4 5-70	30-50	18-30	10-21	5-20.0
3MS	100	70-90	45-70	28-50	19-34	12-25	7-20	5-20.0

(1) Percentage by weight passing the following square

openings.

(1) Determine percent passing No. 200 sieve according to AASHTO T 11, Materials Finer than No. 200 Sieve in Mineral Aggregates by Washing.

TABLE 703-5 Sizes of Crushed Gravel, Stone, and Slag for Microsurfacing and Slurry								
	Screen Sizes (% Passing by Weight)							
Size Designation	3/8 in	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200 ⁽¹⁾
2MS	100	90-100	65-90	45-70	30-50	18-30	<mark>10-22</mark>	<mark>5-15</mark>
3MS	100	70-90	45-70	28-50	19-34	12-25	7-20	<mark>5-15</mark>

(1) Determine percent passing No. 200 sieve according to AASHTO T 11, Materials Finer than No. 200 Sieve in Mineral Aggregates by Washing.

TABLE 703-6 PRIMARY SIZES							
Size	Primary So	reen Sizes	Size	Primary Screen Sizes			
Designation	Passing	Retained	Designation	Passing	Retained		
1B	1/8 in	No. 80	3A	1 1/2 in	1 in		
1A	1/4 in	1/8 in	3	2 in	1 in		
1ST	1/2 in	1/4 in	4A	2 1/2 in	1 1/2 in		
1	1/2 in	1/4 in	4	3 in	2 in		
2	1 in	1/2 in	5	4 in	3 in		

Gradation. The sizes of all stone crushed bedrock, gravel or slag used under these specifications shall conform to the gradation requirements for the various sizes tabulated in Table 703-4.

All crushing plants shall be fitted with tailing chutes so that no aggregate will reach the bins other than that which passes through the proper screens.

Primary Size. For the purposes of this specification, the term "Primary Size" shall be is defined for each size designation as all of the material passing and retained on the screens specified in Table 703-56 "Primary Sizes."

FRICTION. Coarse aggregate for use in wearing surfaces of portland cement concrete pavement must meet the friction aggregate requirements of §501, Portland Cement Concrete. Coarse aggregate for use in top courses of bituminous asphalt concrete pavements must meet the friction aggregate requirements of §401, Hot Mix Asphalt.

TESTS. The details of test methods for coarse aggregate may be obtained from the Materials Bureau ASTM, AASHTO, or the NYSDOT public website here: https://www.dot.ny.gov/divisions/engineering/technical-services/materials-bureau/forms-manuals.

BASIS OF ACCEPTANCE APPROVAL. Acceptance Approval of the source is determined on the basis of based on tests performed by the Materials Bureau on samples representing the source; review of Quarry Reports; Geologic Source Reports, Quality Control Plans, and Plant Flow Information; petrographic examination and other geologic studies; and performance history where applicable.

BASIS OF ACCEPTANCE. The material is incorporated into the work on the basis that it is from an approved source conforming to procedural requirements of Department and that the aggregate shall meet gradation at the point of use.

Aggregate for use in the manufacture of precast concrete units may be accepted on the basis of based on stockpile approval at a location acceptable to the Department on a per job basis. Requests for stockpile approval shall be made in writing to the Materials Bureau. The manufacturer shall allow at least ninety (90) days for the testing and evaluation of the aggregate.

703-03 MORTAR SAND

SCOPE. This specification contains the requirements for sand used in mortar.

GENERAL. §703-01, Fine Aggregate requirements for use in Portland cement concrete shall apply except as modified herein.

MATERIAL REQUIREMENTS. When dry, mortar sand shall meet the following gradation requirements:

Sieve Size Percent Passing by	y Weight	No. 4 100	No. 8 95-10	0 No. 50 0 10-40	No. 100 0-15
Mor	rtar Sand Gra	adation			
Sieve Size	Percent P	assing by W	eight		
No. 4		100			
No. 8		95-100			
No. 50		10-40			
No. 100		0-15			

Concrete sand, §703-07, will be permitted as an alternative to mortar sand.

TEST. Test methods may be obtained from the Materials Bureau ASTM, AASHTO, or the NYSDOT public website here: <u>https://www.dot.ny.gov/divisions/engineering/technical-services/materials-bureau/forms-manuals</u>.

BASIS OF ACCEPTANCE. The provisions of §703-01, Fine Aggregate, shall apply.

703-04 GROUT SAND

SCOPE. This specification contains the requirements for sand used in grout.

GENERAL. §703-01, Fine Aggregate requirements for use in Portland cement concrete, shall apply except as modified herein.

MATERIAL REQUIREMENTS. When dry, the grout sand shall meet the following gradation requirements:

Sieve Size Percent Passing by Weight

No. 16 100 No. 100 0-10

Grout Sand Gradation					
Sieve Size Percent Passing by Weight					
No. 16	100				
No. 100	0-100				

The sand may be determined to be unacceptable for grout sand if it contains more than 6 percent by volume of loam and silt.

TEST. Test methods may be obtained from the Materials Bureau ASTM, AASHTO, or the NYSDOT public website here: <u>https://www.dot.ny.gov/divisions/engineering/technical-services/materials-bureau/forms-manuals</u>.

BASIS OF ACCEPTANCE. The provisions of §703-01, Fine Aggregate, shall apply.

703-5 FINE AGGREGATE FOR WHITE PORTLAND CEMENT CONCRETE

SCOPE. This specification contains the requirements for white fine aggregate used in the white portland cement concrete.

MATERIALS REQUIREMENT. Material Specification §703-01, Fine Aggregate, shall apply except as modified herein. The aggregate shall be white, having a Munsell color with a value of 8 or greater and a chroma saturation of 2 or less, when compared to a set of standard color chips. Gradation shall conform to the specification requirement under §703-07, Concrete Sand.

TEST. The details of the test methods may be obtained from the Materials Bureau ASTM, AASHTO, or the NYSDOT public website here: <u>https://www.dot.ny.gov/divisions/engineering/technical-services/materials-bureau/forms-manuals</u>.

BASIS OF ACCEPTANCE. The provisions of §703-01 Fine Aggregate requirements for use in Portland cement concrete, shall apply except that the color will be accepted on a per stockpile basis by the Director, Materials Bureau.

703-6 CUSHION SAND

SCOPE. This specification contains the requirements for cushion sand used for concrete block slope paving.

GENERAL. Material for cushion sand shall meet the requirements specified herein.

MATERIAL REQUIREMENTS. Cushion sand shall consist of clean, hard, durable, uncoated particles, free from lumps of clay and all deleterious substances. When dry, the cushion sand shall meet the following gradation requirements:

When dry, the cushion sand shall me	et the following gradation requirements:
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Sieve Size Percent Passing by	1/4 in 100	No. 50 0-35	No. 100 0-10	
Cush]			
Sieve Size	Percent Passing by	1		
1⁄4 in	100		1	
No. 50	0-35		1	
No. 100	0-10]	

The sand may be determined to be unacceptable for cushion sand if it contains more than 10 percent by volume of loam or silt.

TEST. Test methods may be obtained from the Materials Bureau ASTM, AASHTO, or the NYSDOT public website here: <u>https://www.dot.ny.gov/divisions/engineering/technical-services/materials-bureau/forms-manuals</u>.

BASIS OF ACCEPTANCE. The cushion sand is accepted on the basis of based on gradation tests and visual inspection, unless otherwise specified, at the point of use.

703-07 CONCRETE SAND

SCOPE. This specification contains the requirements for sand used in portland cement concrete.

GENERAL. §703-01, Fine Aggregate requirements for use in Portland cement concrete, shall apply except as modified herein.

MATERIAL REQUIREMENTS. When dry, the fine aggregate for portland cement concrete shall conform to the following gradation requirements:

Sieve Size	Percent Passing By Weight Minimum Maximum			
3/8 in	100			
No. 4	90	100		
No. 8	75	100		
No. 16	50	85		
No. 30	25	60		
No. 50	10	30		
No. 100	+	10		
No. 200 (Wet)	θ	3		

Concrete Sand Gradation				
<u> </u>	Percent Passing by Weight			
Sieve Size	Minimum	Maximum		
3/8 in	100	-		
No. 4	90	100		
No. 8	75	100		
No. 16	50	85		
No. 30	25	60		
No. 50	10	30		
No. 100	1	10		
No. 200 (Wet)	0	3		

TEST. Test methods may be obtained from the Materials Bureau ASTM, AASHTO, or the NYSDOT public website here: <u>https://www.dot.ny.gov/divisions/engineering/technical-services/materials-bureau/forms-manuals</u>.

FRICTION. Sand for use in wearing surfaces of portland cement concrete pavement (including bridge deck and approach slab wearing surfaces) must meet the friction aggregate requirements of §501, Portland Cement Concrete.

BASIS OF ACCEPTANCE. The provisions of §703-01, Fine Aggregates, shall apply.

703-08 MINERAL FILLER

SCOPE. This specification contains the requirements for mineral filler used in bituminous hot mix asphalt concrete mixtures.

MATERIAL REQUIREMENTS. Mineral filler shall conform to the requirements of the standard specification for Mineral Filler for Bituminous Asphalt Paving Mixture, ASTM D242. When dry, the mineral filler shall meet the following gradation requirements:

Sieve Size	No. 30	No. 50	No. 200
Percent Passing by Weight	100	95-100	70-100

Mineral Filler Gradation			
Sieve Size	Percent Passing by Weight		
No. 30	100		
No. 50	95-100		
No. 200	70-100		

BASIS OF ACCEPTANCE. Acceptance of this material will be based on the producer's certification of compliance with these specification requirements.

703-9 (VACANT)

703-10 LIGHTWEIGHT AGGREGATES

SCOPE. This specification covers the material details and quality requirements for lightweight aggregates generally used in structural portland cement concrete.

GENERAL. The provisions of Sampling, <u>Stripping and Annual Reports</u> and <u>Geologic Source Reports</u> under §703-02 Coarse Aggregate shall apply., <u>except that in addition under 2</u>. <u>Quarry Operations, plant</u> flow information describing the processing equipment shall be provided.

MATERIAL REQUIREMENTS. The lightweight aggregates shall be prepared by thermally expanding, pelletizing, or sintering materials such as shale, slate, clay, fly ash or blast furnace slag, or by processing natural materials such as pumice. The requirements of ASTM C330 shall apply except as modified in these specifications. In addition to ASTM C330, the lightweight aggregates shall meet the requirements given in Table 703-10, Lightweight Aggregate Requirements (Testing). The Durability Factor of concrete made from lightweight aggregates, as determined in accordance with ASTM C666, shall not be less than 80 percent.

A lightweight aggregate meeting the requirements of this specification shall will be accepted unless service records indicate that the aggregate is unsound or that the material is otherwise determined to be

unsatisfactory by the Director, Materials Bureau. Lightweight aggregates not meeting these requirements may be further evaluated by additional testing, petrographic examination, geologic studies, a review of the lightweight aggregate processing and the performance history. If the results of the evaluation indicate that the lightweight aggregate should perform satisfactorily, the material may be accepted by the Director, Materials Bureau.

TEST. Sampling procedure instructions and test methods may be obtained from the Materials Bureau ASTM, AASHTO, or the NYSDOT public website here:

https://www.dot.ny.gov/divisions/engineering/technical-services/materials-bureau/forms-manuals.

TABLE 703-10 LIGHTWEIGHT AGGREGATE REQUIREMENTS (TESTING)					
Test Method	Fine Aggregate	Coarse Aggregate			
Magnesium Sulfate (NYSDOT 207703-06 P,G). Max. % Loss by Weight after 5 cycles.	30	-			
Magnesium Sulfate (NYSDOT 703-07 P,G). Max. % Loss by Weight after 10 cycles.	-	18/35 (1)			
Los Angeles Abrasion Test (ASTM C131). Max % Loss by Weight (Grading B or C) , % Max .	-	50			

(1) 18% Maximum applies to No. 2 size aggregate. 35% Maximum loss applies to No. 1 size aggregate.

BASIS OF APPROVAL. Approval of the source is determined on the basis of tests performed by the Materials Bureau on samples representing the sources; review of Geologic Source Reports and Plant Flow Information; petrographic examination and other geologic studies; and performance histories where applicable.

BASIS OF ACCEPTANCE. Acceptance of lightweight aggregates is determined by the Director, Materials Bureau on the basis of based on tests performed by the Materials Bureau on representative samples of the materials; review of Geologic Source Reports Quarry Reports and Plant Flow Information; petrographic examination and other geologic studies; and performance histories where applicable. The material is incorporated into the work on the basis that it is accepted and conforms to procedural directives of the Department and the aggregate shall meet the gradation requirement at the point of use.

SECTION 704 - MASONRY UNITS