



**MATERIAL SPECIFICATION FOR AGGREGATES - BASE, SUBBASE, SELECT  
SUBGRADE, GRANULAR SURFACE, SHOULDERING, BEDDING AND BACKFILL  
MATERIAL**

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This specification covers the material requirements for aggregates for use in base, subbase, select subgrade, granular surface, shouldering, and bedding and backfill material.

## **1010.01.02 Specification Significance and Use**

This specification is written as a municipal-oriented specification. Municipal-oriented specifications are developed to reflect the administration, testing, and payment policies, procedures, and practices of many municipalities in Ontario.

Use of this specification or any other specification shall be as specified to the Contract Documents.

## **1010.01.03 Appendices Significance and Use**

Appendices are not for use in provincial contracts as they are developed for municipal use, and then, only when invoked by the Owner.

Appendices are developed for the Owner's use only.

Inclusion of an appendix as part of the Contract Documents is solely at the discretion of the Owner. Appendices are not a mandatory part of this specification and only become part of the Contract Documents as the Owner invokes them.

Invoking a particular appendix does not obligate an Owner to use all available appendices. Only invoked appendices form part of the Contract Documents.

The decision to use any appendix is determined by an Owner after considering their contract requirements and their administrative, payment, and testing procedures, policies, and practices. Depending on these considerations, an Owner may not wish to invoke some or any of the available appendices.

## **1010.02 REFERENCES**

When the Contract Documents indicate that municipal-oriented specifications are to be used and there is a municipal-oriented specification of the same number as those listed below, references within this specification to an OPSS shall be deemed to mean OPSS.MUNI, unless use of a provincial-oriented specification is specified in the Contract Documents. When there is not a corresponding municipal-oriented specification, the references below shall be considered to be the OPSS listed, unless use of a Provincial-oriented specification is specified in the Contract Documents.

This specification refers to the following standards, specifications, or publications:

### **Ontario Provincial Standard Specification, Material**

OPSS 1001     Aggregates - General

### **Ontario Ministry of Transportation Publications**

MTO Laboratory Testing Manual:

LS-601	Material Finer than 75 µm Sieve in Mineral Aggregates by Washing
LS-602	Sieve Analysis of Aggregates
LS-607	Determination of Percent Crushed Particles in Processed Coarse Aggregate
LS-614	Freezing and Thawing of Coarse Aggregate
LS-616	Procedure for the Petrographic Analysis of Fine Aggregate
LS-617	Determination of Percent Particles with Two or More Crushed Faces and Uncrushed Particles in Processed Coarse Aggregate
LS-618	Resistance of Coarse Aggregate to Degradation by Abrasion in the Micro-Deval Apparatus
LS-619	Resistance of Fine Aggregate to Degradation by Abrasion in the Micro-Deval Apparatus
LS-621	Determination of Amount of Asphalt Coated Particles in Coarse Aggregate

LS-625	Guidelines for Sampling of Aggregate Materials
LS-630	Determination of Amount of Contamination of Coarse Aggregates
LS-702	Determination of Particle Size Analysis of Soils
LS-703/704	Liquid Limit, Plastic Limit, and Plasticity Index of Soils
LS-709	Determination of Permeability of Granular Soils

## 1010.03 DEFINITIONS

For the purpose of this specification, the following definitions apply:

**Air-Cooled Blast Furnace Slag** means the material resulting from solidification of molten blast furnace slag under atmospheric conditions. Subsequent cooling may be accelerated by application of water to the solidified surface.

**CCIL** means the Canadian Council of Independent Laboratories.

**Ceramic** means porcelain, china, and whiteware (e.g., sinks, toilets, and bidets made from clay and silica fired at a high temperature, excluding clay brick and tile) that is free of organic materials, metal, and plastic.

**Deleterious Material** means materials that include, but not limited to, the following: wood, clay brick, clay tile, plastic, gypsum, gypsum plaster, wallboard, roots, and all other organic matter.

**Duplicate Samples** means two samples taken at the same time and location; one to be used for quality assurance testing and the other for referee testing.

**Fines** means material passing the 75 µm sieve when tested according to LS-601 or LS-602.

**Free of Clay** means the amount of material with a particle diameter less than 2 µm shall not be greater than 1% of the total sample when tested according to LS-702.

**Glass** means processed glass obtained from the recycling stream that is free of organic materials, metal, and plastic.

**Granular A** means a set of requirements for dense graded aggregates intended for use as granular base within the pavement structure, granular shouldering, and backfill.

**Granular B** means a set of requirements for well-graded aggregates intended for use as granular subbase within the pavement structure and granular backfill. Granular B may be Type I, Type II, or Type III.

**Granular M** means a set of requirements for dense graded aggregates intended for use on unpaved road surfaces and for the maintenance of unpaved shoulders.

**Granular O** means a set of requirements for open graded aggregates intended only for use as a free draining granular base within the pavement structure.

**Granular S** means a set of requirements for dense graded aggregates intended only for use as surface dressing of low volume unpaved roads with an AADT less than 200.

**Nickel Slag** means the non-metallic product resulting from the production of nickel.

**Physical Property** means an inherent attribute or feature of an aggregate or soil material. Tests are carried out to determine a materials resistance to weathering or degradation or both.

**Reclaimed Asphalt Pavement (RAP)** means processed hot mix asphalt material that is recovered by partial or full depth removal.

**Reclaimed Concrete Material (RCM)** means removed or processed old hydraulic cement concrete.

**Referee Testing** means testing of a material property or attribute for the purpose of resolving acceptance.

**Select Subgrade Material (SSM)** means a set of requirements for well-graded non-plastic aggregates used to replace poor subgrade materials and as swamp backfill.

**Steel Slag** means the non-metallic product resulting from the production of steel in a basic oxygen furnace or electric arc furnace.

## **1010.05 MATERIALS**

### **1010.05.01 General**

When specified in the Contract Documents, aggregates shall be according to OPSS 1001.

Aggregates shall meet the physical property requirements specified in Table 1 and the gradation requirements specified in Table 2.

When aggregates are tested according to LS-630, the total amount of wood shall not exceed 0.1% by mass, and the total amount of deleterious material and other contaminants shall not exceed a combined total of 1.0% by mass.

Glass and ceramic material shall be processed to remove all deleterious organic materials. 100% of the processed glass and ceramic material shall pass the 13.2 mm sieve.

When RCM is permitted, RCM shall not contain loose reinforcing materials.

When air-cooled blast furnace slag, nickel slag, and RAP containing steel slag aggregates are used, they shall be as specified in the Contract Documents and site-specific notification shall be submitted to the Ontario Ministry of the Environment, Conservation and Parks (MECP).

When reclaimed materials are permitted, they shall be homogeneously blended in a manner acceptable to the Contract Administrator.

Steel slag shall not be used.

When a change in the character of the aggregate occurs or when the performance of the aggregate is found to be unsatisfactory, use of those aggregates shall be discontinued until it can be proven to the satisfaction of the Contract Administrator that the source remains acceptable or can be made acceptable.

Aggregates shall be clean, hard, durable particles and shall be produced from material free of earth, humus, clay coatings, and clay lumps or fragments of any size or shape that does not contain deleterious material.

### **1010.05.02 Granular A, Granular M, and Granular S**

Granular A, Granular M, and Granular S shall be produced by crushing one or more of the following:

- a) Quarried bedrock.

- b) Boulders, cobbles, gravel, sand, and fines from naturally formed deposits.
- c) RAP up to 30% by mass.
- d) RCM up to 100% by mass.
- e) Glass or ceramic materials up to a combined total of 15% by mass.

Granular A and Granular M containing RAP with steel slag aggregates shall be acceptable for unpaved gravel shoulders only.

### **1010.05.03                      Granular B**

#### **1010.05.03.01                  General**

Granular B may be Type I, Type II, or Type III.

#### **1010.05.03.02                  Granular B Type I and Type III**

Granular B Type I and Type III may be produced from naturally formed deposits of sand, gravel, and cobbles or by crushing one or more of the following:

- a) Quarried bedrock.
- b) RCM up to 100% by mass.
- c) RAP up to 30% by mass.
- d) Glass or ceramic materials up to 15% by mass combined.
- e) When glass, ceramic, and RAP blend is used, the total shall not exceed 15% by mass.

RAP containing steel slag aggregates shall not be allowed.

#### **1010.05.03.03                  Granular B Type II**

Granular B Type II shall only be produced by crushing:

- a) Quarried bedrock.
- b) RCM up to 100% by mass.

Recycled concrete material used in the production of Granular B Type II shall not contain more than 1% by mass of any combination of wood, clay brick, gypsum, gypsum wall board or plaster. It shall be free from asphalt, and it shall not be produced from concrete deteriorating due to material related distresses.

#### **1010.05.04                      Granular O**

Granular O shall only be produced by crushing:

- a) Quarried bedrock.
- b) Cobbles or boulders retained on the 50 mm sieve.

Steel slag and reclaimed materials shall not be used in the production of Granular O.

#### **1010.05.05                      Select Subgrade Material**

Select subgrade material shall only be produced from natural deposits of non-plastic silt, sand, and gravel material. Reclaimed materials of any type shall not be used.

#### **1010.07                              PRODUCTION**

##### **1010.07.01                      Aggregate Processing, Handling, and Stockpiling**

Aggregates that have become mixed with foreign matter of any description or aggregates that have become mixed with each other shall not be used and shall be immediately removed from the stockpile.

#### **1010.08                              QUALITY ASSURANCE**

##### **1010.08.01                      General**

Quality Assurance testing may be carried out by the Owner for the purposes of ensuring that the aggregates used in the work are according to the requirements of this specification. Individual test results shall be forwarded to the Contractor, as they become available.

Test data for each aggregate type shall be managed independently. When more than one source is used for supplying materials, test data from each source and product shall be managed independently.

When specified in the Contract Documents, the Owner shall be responsible for all costs associated with testing for Quality Assurance purposes. The Contractor shall be responsible for supplying all labour and materials to collect and deliver the Quality Assurance samples to the Quality Assurance laboratory, at no additional cost.

When more than one aggregate source is being used, sampling shall be required from each of the sources.

##### **1010.08.02                      Laboratory Requirements**

The Contract Administrator shall designate the Quality Assurance laboratories.

An acceptable laboratory conducting tests for physical properties shall be one that holds a current Type D certificate from CCIL for the applicable test methods and participates in the annual MTO Proficiency Sample Testing Program for the specific tests.

An acceptable laboratory conducting tests for gradation according to LS-602 and percent crushed particles according to LS-607 shall be one that holds a current Type C certificate from Canadian Council of Independent Laboratories (CCIL).

Testing shall be conducted by a qualified laboratory staff that holds a current certificate from CCIL in aggregate testing.

Equivalent alternate laboratory and technician certifications or laboratory proficiency testing programs may be used to demonstrate similar requirements, provided they are acceptable to the Contract Administrator.

### **1010.08.03                      Sampling**

Sampling shall be according to LS-625.

Duplicate samples shall be taken and sealed by the Contractor in the presence of the Contract Administrator at the time and location determined by the Contract Administrator. When materials contain blended or reclaimed aggregates or both, Quality Assurance sampling shall be performed on the final blended product.

The mass of each sample shall meet the requirements specified in Table 3. When more than 30 kg is required, the total samples shall be recombined by the Quality Assurance laboratory prior to testing.

If the Contractor is unavailable to take the sample, no further materials shall be placed in the work until the duplicate samples have been taken.

The Contractor shall provide new or clean sample bags or containers that are constructed to prevent the loss of any part of the material or contamination or damage to the contents during shipment. Metal or cardboard containers are unacceptable.

Quality Assurance samples shall be identified on both the inside and the outside of the sample container.

### **1010.08.04                      Testing and Retention of Samples**

When the Contract Administrator elects to carry out Quality Assurance testing, one of the duplicate samples shall be randomly selected for testing by the Quality Assurance laboratory and the remaining sealed sample shall be retained by the Quality Assurance laboratory for possible referee testing.

### **1010.08.05                      Acceptance**

Quality Assurance test results shall be used for acceptance purposes, except when referee testing has been carried out.

When Quality Assurance test results show that the aggregates meet the requirements of this specification, the aggregates shall be accepted.

When Quality Assurance test results show that the aggregates do not meet the requirements of this specification, the Contract Administrator shall notify the Contractor that those aggregates represented by the test results shall not be accepted. This notification shall take place in writing within 3 Business Days of receipt of the non-conforming data. The Contractor has the option of either removing the aggregates from the work or invoking referee testing. Subject to acceptance by the Contract Administrator, the Contractor may request a reduced price in lieu of removal of aggregates that fail to meet the requirements of this specification. Irrespective of the negotiation of a reduced-price payment, the warranty provisions specified in the Contract Documents shall apply.

At the discretion of the Contract Administrator, irrespective of non-compliance with the requirements of this specification, aggregates may be accepted based on satisfactory field performance.

### **1010.08.06                      Referee Testing**

When Quality Assurance test results do not meet the requirements of this specification, the Contractor has the option of invoking referee testing of the test result that fails to meet the requirements. The Contractor shall notify the Contract Administrator of the selected option in writing within 2 Business Days following written notification of unacceptable material.

The Contract Administrator shall select a referee laboratory acceptable to the Contractor within 3 Business Days following the Contractor's notification to invoke referee testing. Referee test samples shall be delivered to the referee testing laboratory from the Quality Assurance laboratory by the Contract Administrator. The sealed sample shall be opened in the presence of the Contractor and the Contract Administrator. If referee materials are not available, the Contractor shall be responsible for obtaining and submitting new samples to the referee laboratory from a location to be decided by the Contract Administrator. The Contract Administrator shall be present to witness the sampling.

Referee testing shall be carried out in the presence of the Contract Administrator. When applicable, the referee laboratory shall also test a control aggregate sample for each test method required. The Contractor may observe the testing at no cost to the Owner.

The Contractor and Owner may send a maximum of two representatives each to observe the referee testing. The Contract Administrator shall notify the Owner and Contractor a minimum of 3 Business Days in advance of the date of referee testing. Provided that such notice was given, referee testing shall be carried out regardless of the absence of one or more observers.

Observers shall follow the referee laboratory protocols for access to the premises and testing equipment and shall not unnecessarily impede the progress of the testing. Observers shall be permitted to validate sample identification and view sample condition. Subject to safety requirements, test method and equipment limitations, they shall also be permitted to observe test procedures, take notes, view equipment readings and review completed work sheets while in attendance.

Comments on the non-conformity of the test methods shall be made and corrected at the time of testing.

Referee test results shall be binding on both the Owner and the Contractor.

When a referee test result shows that the aggregates do not meet the requirements of this specification, the aggregates represented by the test result, including aggregates in existing stockpiles or in the Work, shall not be accepted. The Contractor shall remove the aggregates from the Work at no cost to the Owner. Subject to acceptance by the Contract Administrator, the Contractor may request a reduced price in lieu of the removal of aggregates that fail to meet the requirements of this specification. Irrespective of the negotiation of a reduced-price payment, the warranty provisions of the Contract Documents shall apply.

When a referee test result shows that the aggregates meet the requirements of this specification, the aggregates represented by the sample shall be accepted.

The Owner shall be responsible for the cost of referee testing provided that the referee test results show that the aggregates meet the applicable specifications. Otherwise, the Contractor shall be responsible for the cost.



**TABLE 1**  
**Physical Property Requirements**

MTO Laboratory Test and Number	Granular O	Granular A	Granular S	Granular B Type I and Type III	Granular B Type II	Granular M	Select Subgrade Material
Percent crushed particles, % Minimum, LS-607	100	60	50	--	--	60	--
Unconfined Freeze-Thaw, % Maximum loss, LS-614	15	--	--	--	--	--	--
2 or more crushed faces, % Minimum, LS-617	85 (Note 1)	--	--	--	--	--	--
Micro-Delval Abrasion Coarse Aggregate, % Maximum loss, LS-618	21	25	25	30 (Note 2)	30	25	30 (Note 2)
Micro-Deval Abrasion, Fine Aggregate, % Maximum loss, LS-619	25	30	30	35	35	30	N/A
Asphalt Coated Particles, % Maximum, LS-621	0	30	30	30	0 (Note 3)	30	0
Amount of Contamination, LS-630	(Note 4)						
Plasticity Index, Maximum LS-703/704	0						
Determination of Permeability, k, LS-709	(Note 5)						
Notes:							
1. When Granular O is produced from boulders, cobbles, or gravel retained on the 50 mm sieve.							
2. The coarse aggregate Micro-Deval abrasion loss test requirements shall be waived if the material has more than 80% passing the 4.75 mm sieve.							
3. When specified in the Contract Documents, a Granular B type II may allow up to 30% asphalt particles							
4. Granular A, B Type I, B Type III, or M may contain crushed glass or ceramic materials up to a combined total of 15% by mass. Granular A, B Type I, B Type III, M, O, and S shall not contain more than 1% by mass of wood, clay brick and/or gypsum and/or gypsum wall board or plaster. Granular B Type I and SSM shall not contain more than 0.1% by mass of wood.							
5. For materials north of the French and Mattawa Rivers only, the coefficient of permeability, k, shall be greater than 1.0 x 10 <sup>-4</sup> cm/s or alternatively, where past field experience has demonstrated satisfactory performance. Prior data demonstrating compliance with this requirement for k shall be acceptable provided such testing has been carried out within the 5 years of the material being used and field performance has continually been shown to be satisfactory.							

**TABLE 2**  
**Gradation Requirements - Percent Passing**

MTO Test	Sieve	Granular							Select Subgrade Material
		A	B (Note 1)			M	O	S	
			Type I (Note 2)	Type II	Type III (Note 2)				
Sieve Analysis, % Passing, LS-602	150 mm	N/A	100	N/A	100	N/A	N/A	N/A	100
	106 mm	N/A	N/A	100	N/A	N/A	N/A	N/A	N/A
	37.5 mm	N/A	N/A	N/A	N/A	N/A	100	N/A	N/A
	26.5 mm	100	50-100	50-100	50-100	N/A	95-100	100	50-100
	19.0 mm	85-100 (87-100, Note 3)	N/A	N/A	N/A	100	80-95	90-100	N/A
	13.2 mm	65-90 (75-95, Note 3)	N/A	N/A	N/A	75-95	60-80	75-100	N/A
	9.5 mm	50-73 (60-83, Note 3)	N/A	N/A	32-100	55-80	50-70	60-85	N/A
	4.75 mm	35-55 (40-60, Note 3)	20-100	20-55	20-90	35-55	20-45	40-60	20-100
	1.18 mm	15-40	10-100	10-40	10-60	15-40	0-15	20-40	10-100
	300 µm	5-22	2-65	5-22	2-35	5-22	N/A	11-25	5-95
	150 µm	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.0-65.0
	75 µm	2.0-8.0 (2.0-10.0, Note 4)	0-8.0 (0-10.0, Note 4)	0-10.0	0-8.0 (0-10.0, Note 4)	2.0-8.0 (2.0-10.0, Note 4)	0-5.0	9.0-15.0 (9.0-17.0, Note 4)	0-25.0

Notes:

1. When Granular B is used for granular backfill for pipe subdrains, 100% of the material shall pass the 37.5 mm sieve.
2. When RAP is blended with Granular B Type I or Type III, 100% of the RAP shall pass the 75 mm sieve. Conditions in Note 1 supersede this requirement.
3. When the aggregate is obtained from an air-cooled blast furnace slag source.
4. When the aggregate is obtained from a quarry or an air-cooled blast furnace slag or nickel slag source.

**TABLE 3**  
**Sample Size**

<b>Material</b>	<b>Minimum Mass of Individual Field Samples kg</b>
Granular A, S, M, and O	25
Granular B and SSM	50
Granular B and SSM (100% passing 26.5 mm sieve)	25
<p>Note:</p> <p>A. Each sample container shall hold no more than 30 kg of aggregate. When more than 30 kg is required, additional sample containers shall be used.</p>	

## **Appendix 1010-A, April 2025 FOR USE WHILE DESIGNING MUNICIPAL CONTRACTS**

**Note:** This is a non-mandatory Commentary Appendix intended to provide information to a designer, during the design stage of a contract, on the use of the OPS specification in a municipal contract. This appendix does not form part of the standard specification. Actions and considerations discussed in this appendix are for information purposes only and do not supersede an Owner's design decisions and methodology.

### **Designer Action/Considerations**

The designer should specify the following in the Contract Documents:

- Type of Granular B to be used. (1010.05.03)
- For Granular B Type II, the type of material to be used. (1010.05.03.03)
- When specified in the Contract Documents, a Granular B Type II may allow up to 30% RAP subject to design recommendations. (1010.05.03.03)

The designer should determine if the following is required and, if so, specify it in the Contract Documents:

- If the quality assurance sampling and testing frequencies provided in Appendix 1010-B are to be used, Appendix 1010-B needs to be invoked by reference in the Contract Documents.
- If the payment reduction in lieu of aggregate removal provided in Appendix 1010-C is to be used, Appendix 1010-C needs to be invoked by reference in the Contract Documents.
- If the test data forms in Appendices 1010-D and 1010-E are to be used for submission purposes, Appendices 1010-D and 1010-E need to be invoked by reference in the Contract Documents.

The use of steel slag aggregate is prohibited.

The designer should be aware that aggregates that are wholly or partially comprised of industrial by-products and/or recycled materials such as, but not limited to, air-cooled iron blast furnace slag, nickel slag, and RAP containing steel slag aggregates, may have specific placement and approval requirements or constraints to mitigate adverse effects on the environment based on local conditions and/or municipal and MECP policy. Prior to tendering, when such Owner supplied or specified materials are to be used, the designer should provide site notification to MECP and ensure any applicable environmental placement and approval requirements and constraints are included in the Contract Documents.

RAP content is determined by LS-621, percent Asphalt Coated Particles. However, this test is limited to identifying RAP content in the coarse aggregate portion only. When RAP in fine aggregate is a concern, a LS-616 Petrographic Examination of the material passing the 4.75 mm sieve is recommended. (1010.05.02)

The designer should be aware that Quality Assurance testing for the purpose of ensuring material used in the work meet the requirements of OPSS 1010 is not mandatory unless specifically included in the Contract Documents. The designer should determine the need for Quality Assurance testing based on the size and complexity of the work and specify the required frequencies of Quality Assurance sampling and testing. Appendix 1010-B provides recommended Quality Assurance sampling and testing frequencies.

The designer may specify a higher percent crushed requirement to improve performance in higher traffic areas. The designer should ensure that the General Conditions of Contract and the 100 Series General Specifications are included in the Contract Documents.

## **Appendix 1010-A**

### **Related Ontario Provincial Standard Drawings**

No information provided here.

**Appendix 1010-B, April 2025****FOR USE IN MUNICIPAL CONTRACTS, WHEN REFERENCED IN THE CONTRACT DOCUMENTS**

**Note:** This is a non-mandatory Additional Information Appendix intended to provide supplementary requirements for the OPS specification in a municipal contract when the appendix is invoked by the Owner. It is written in mandatory language to permit invoking it by reference in the Contract Documents. If the appendix has not been invoked by reference in the Contract Documents, it does not apply.

**Supplementary Requirements for Quality Assurance Sampling and Testing Frequency**

OPSS.MUNI 1010, Aggregates-Base, Subbase, Select Subgrade, and Backfill Material, is amended as follows:

**1010.08 QUALITY ASSURANCE****1010.08.01 General**

The first paragraph of subsection 1010.08.01 is deleted in its entirety and replaced with the following:

Quality Assurance sampling and testing shall be carried out by the Owner for the purposes of ensuring that the aggregates used in the work are according to the requirements of the Contract Documents. Quality Assurance sampling and testing shall be carried out at the frequency specified in Table B-1 and Table B-2. Individual test results may be forwarded to the Contractor as they become available.

Table B-1 is added.

**TABLE B-1**  
**Sampling and Testing Frequency for Physical Property Requirements**

<b>Quantity from Each Source or Process t</b>	<b>Granular A; Granular B - Type I, II, and III; Granular M; Granular O; Granular S; and Select Subgrade Material</b>
$\leq 5,000$	One sample.
$> 5,000$ (Note 1)	One sample per 5,000 tonnes.
<b>Note:</b> 1. When the quantity of material is:  a) Less than one-half the quantity required for a sample, then that quantity shall be added to the quantity representing the previous sample.  b) Greater than or equal to one-half the quantity required for a sample, then that quantity shall require its own sample.	

## Appendix 1010-B

Table B-2 is added.

**TABLE B-2**  
**Sampling and Testing Frequency for Gradation Requirements**

<b>Quantity from Each Source or Process t</b>	<b>Granular A, O, M, and S Granular B - Type I, II, and III, and Select Subgrade Material</b>
< 250	At the Contract Administrator's discretion.
≥ 250 and ≤ 1,000	One sample.
> 1,000 (Note 1)	One sample per 1,000 tonnes.
<p>Note:</p> <p>1. When the quantity of granular material is:</p> <p>a) Less than one-half the quantity required for a sample, then that quantity shall be added to the quantity representing the previous sample.</p> <p>b) Greater than or equal to one-half the quantity required for a sample, then that quantity shall require its own sample.</p>	

**Appendix 1010-C, April 2025**

**FOR USE IN MUNICIPAL CONTRACTS, WHEN REFERENCED IN THE CONTRACT DOCUMENTS**

**Note:** This is a non-mandatory Additional Information Appendix intended to provide supplementary requirements for the OPS specification in a municipal contract when the appendix is invoked by the Owner. It is written in mandatory language to permit invoking it by reference in the Contract Documents. If the appendix has not been invoked by reference in the Contract Documents, it does not apply.

**Supplementary Requirements for Reduced Price Payment In Lieu of Aggregate Removal**

When a tested sample of aggregates shows that the aggregates do not meet the requirements of this specification, the aggregates represented by the test result, including material in existing stockpiles or in the Work, shall not be accepted. The Contractor may request a reduced price in lieu of removal provided the applicable test results:

- a) Do not exceed the requirement for LS-614 by more than 25% of the specified value.
- b) Do not exceed the requirement for LS-618 by more than 10% of the specified value.
- c) Do not identify a plasticity index within the material when determined according to LS-703/704 and the requirement for LS-602 on the 75  $\mu$ m is met.
- d) Meet all other requirements of this specification.

Irrespective of a reduced-price payment, the warranty provisions of the Contract Documents shall apply.



# Appendix 1010-D, April 2025

## FOR USE IN MUNICIPAL CONTRACTS, WHEN REFERENCED IN THE CONTRACT DOCUMENTS

**Note:** This is a non-mandatory Additional Information Appendix intended to provide supplementary requirements for the OPS specification in a municipal contract when the appendix is invoked by the Owner. It is written in mandatory language to permit invoking it by reference in the Contract Documents. If the appendix has not been invoked by reference in the Contract Documents, it does not apply.

### OPSS 1010 - Aggregate Test Data - Granulars Physical Properties

Contract No.:	Contractor:	Contract Location:	
Name of Testing Laboratory:		Telephone No.:	Fax No.:
Sampled by (Print Name):		Date Sampled (YY/MM/DD):	Date Tested (YY/MM/DD):
Granular Type:		Quantity (tonnes) :	
Source Name/Location:		Aggregate Inventory Number (AIN) :	

Laboratory Test and Number	Requirements								Test Results		
	A	B Type I	B Type II	B Type III	M	O	S	SSM	Reference Material	Sample	Meets Requirements (Y/N)
Crushed Particles, % Minimum, LS-607	60	--	100	--	60	100	50	--			
Unconfined Freeze-Thaw, % Maximum loss, LS-614	--	--	--	--	--	15	--	--			
2 or more Crushed Faces, % Minimum, LS-617	--	--	--	--	--	85 (Note 1)	--	--			
Micro-Deval Abrasion, Coarse Aggregate % Maximum loss, LS-618	25	30 (Note 2)	30	30 (Note 2)	25	21	25	30 (Note 2)			
Micro-Deval Abrasion, Fine Aggregate % Maximum loss, LS-619	30	35	35	35	30	25	30	--			
Asphalt Coated Particles, % Maximum, LS-621	30	30	0	30	30	0	30	0			
Amount of Contamination, LS-630	(Note 3)										
Plasticity Index, maximum, LS-703/704	0										
Determination of Permeability, k, LS-709	(Note 4)										

#### Notes:

- When Granular O is produced from boulders, cobbles, or gravel retained on the 50 mm sieve.
- The coarse aggregate Micro-Deval abrasion loss test requirement shall be waived if the material has more than 80% passing the 4.75 mm sieve.
- Granular A, B Type I, B Type III, or M may contain up to 15% by mass crushed glass or ceramic materials. Granular A, B Type III, M, O, and S shall not contain more than 1.0% by mass of wood, clay brick and/or gypsum and/or gypsum wall board or plaster. Granular B Type II and SSM shall not contain more than 0.1% by mass of wood.
- For materials north of the French/Mattawa Rivers only, the coefficient of permeability,  $k$ , shall be greater than  $1.0 \times 10^{-4}$  cm/s or field experience has demonstrated satisfactory performance. Prior data demonstrating compliance with this requirement for  $k$ , shall be acceptable provided that such testing has been carried out within 5 years of the material being used and field performance has continually been shown to be satisfactory.

I hereby certify that testing has been carried out by a properly qualified/certified test technician:

Issued by: \_\_\_\_\_  
PRINT NAME TESTING LABORATORY REPRESENTATIVE SIGNATURE DATE

Received by: \_\_\_\_\_  
PRINT NAME CONTRACT ADMINISTRATOR REPRESENTATIVE SIGNATURE DATE

Copies to: ☐ Contract Administrator ☐ Contractor

# Appendix 1010-E, April 2025

## FOR USE IN MUNICIPAL CONTRACTS, WHEN REFERENCED IN THE CONTRACT DOCUMENTS

**Note:** This is a non-mandatory Additional Information Appendix intended to provide supplementary requirements for the OPS specification in a municipal contract when the appendix is invoked by the Owner. It is written in mandatory language to permit invoking it by reference in the Contract Documents. If the appendix has not been invoked by reference in the Contract Documents, it does not apply.

### OPSS 1010 - AGGREGATE TEST DATA - GRANULARS GRADATION REQUIREMENTS, LS-602

Contract No.:	Contractor:	Contract Location:	
Name of Testing Laboratory:		Telephone No.:	Fax No.:
Sampled by (Print Name):		Date Sampled (YY/MM/DD):	Date Tested (YY/MM/DD):
Granular Type:		Quantity (tonnes) :	
Source Name/Location:		Aggregate Inventory Number (AIN) :	

Sieve Size	Gradation Requirement, % Passing								Test Result	
	A	B (Note 1)			M	O	S	SSM	Sample	Meets Requirements (Y/N)
		Type I (Note 2)	Type II	Type III (Note 2)						
150 mm	--	100	--	100	--	--	--	100		
106 mm	--	--	100	--	--	--	--	--		
37.5 mm	--	--	--	--	--	100	--	--		
26.5 mm	100	50-100	50-100	50-100	--	95-100	100	50-100		
19.0 mm	85-100 (87-100, Note 3)	--	--	--	100	80-95	90-100	--		
13.2 mm	65-90 (75-95, Note 3)	--	--	--	75-95	60-80	75-100	--		
9.5 mm	50-73 (60-73, Note 3)	--	--	32-100	55-80	50-70	60-85	--		
4.75 mm	35-55 (40-60, Note 3)	20-100	20-55	20-90	35-55	20-45	40-60	20-100		
1.18 mm	15-40	10-100	10-40	10-60	15-40	0-15	20-40	10-100		
300 µm	2-55	2-65	5-22	2-35	5-22	--	11-25	5-95		
150 µm	--	--	--	--	--	--	--	2-65		
75 µm	2.0-8.0 (2.0-10.0, Note 4)	0-8.0 (0-10.0, Note 4)	0-10.0	0-8.0 (0-10.0, Note 4)	2.0-8.0 (2.0-10.0, Note 4)	0-5.0	9.0-15.0 (9.0-17.0, Note 4)	0-25.0		

#### Notes:

- When Granular B is used for granular backfill for pipe subdrains, 100% of the material shall pass the 37.5 mm sieve.
- When RAP is blended with Granular B Type I or Type III, 100% of the RAP shall pass the 75 mm sieve. Conditions in Note 1 supersede in this requirement.
- When the aggregate is obtained from an iron blast furnace slag source.
- When the aggregate is obtained from a quarry or blast furnace slag or nickel slag source.

I hereby certify that testing has been carried out by a properly qualified/certified test technician:

Issued by: \_\_\_\_\_  
PRINT NAME TESTING LABORATORY REPRESENTATIVE SIGNATURE DATE

Received by: \_\_\_\_\_  
PRINT NAME CONTRACT ADMINISTRATOR REPRESENTATIVE SIGNATURE DATE

Copies to: ☐ Contract Administrator ☐ Contractor