MATERIAL SPECIFICATION FOR AGGREGATES - MISCELLANEOUS

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1004.01 SCOPE

This specification covers material requirements for aggregates for use as clear stone, granular sheeting, mortar sand, gabion stone, rip-rap, rock protection, truck arrester bed aggregate, and winter sand.

1004.01.01 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 according to the Contract Documents.

1004.01.02 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.

1004.02 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 Specifications, Material

OPSS 1001 Aggregates - General
OPSS 1010 Aggregates - Base, Subbase, Select Subgrade, and Backfill Material

Ontario Ministry of Transportation Publications

MTO Laboratory Testing Manual:
LS-601 Materials Finer than 75 μm Sieve in Mineral Aggregates by Washing
LS-602 Sieve Analysis of Aggregates
LS-604 Relative Density and Absorption of Coarse Aggregate
LS-607 Percent Crushed Particles in Processed Coarse Aggregate
LS-608 Percent Flat and Elongated Particles in Coarse Aggregate
LS-610 Organic Impurities in Concrete Sands
LS-614 Freezing and Thawing of Coarse Aggregate
LS-616 Petrographic Analysis of Fine 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-625 Guidelines for Sampling of Aggregate Materials
LS-703/704 Liquid Limit, Plastic Limit, and Plasticity Index of Soils

ASTM International

C87/C87M-17 Standard Test Method for Effect of Organic Impurities in Fine Aggregate on Strength of Mortar
D6473-15 Standard Test Method for Specific Gravity and Absorption of Rock for Erosion Control

1004.03 DEFINITIONS

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

CCIL means the Canadian Council of Independent Laboratories.

Clear Stone means a graded aggregate intended for use in drainage, backfill, bedding, and other applications.

Control Chart means a graphical method used to monitor the central tendency and the variability of material characteristic in order to control production.

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 material.

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.

Gabion Stone means a graded fractured rock aggregate intended for use in gabion baskets, gabion mats and revet (gabion) mattresses.

Granular Sheeting means a graded granular aggregate material intended for use as a protective surface layer on erodible soil slopes.

Mortar Sand means a fine aggregate intended for application in hydraulic cement-based mortars.

Nominal Maximum Size means the largest sieve in the applicable specification upon which material is permitted to be retained.

Physical Property means an inherent attribute or feature of an aggregate material. Tests are carried out to determine an aggregate's resistance to weathering or degradation or both.

Pit-Run Material means material excavated directly from an existing bank in a pit and delivered to the job site without further processing, i.e., crushing, screening, washing, and classifying.

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

Rip-Rap means a well graded, fractured rock or crushed reclaimed concrete intended for use as slope protection in hydraulic channels.

Rock Protection means a well graded, fractured rock or crushed reclaimed concrete intended for use as general slope protection.

Spheroidal Particle means when the ratio of the greatest dimension in the longitudinal axis compared to the least dimension in a plane perpendicular to the longitudinal axis is less than 2:1.

Statistical Control means when all sources of assignable variation have been removed, the variability of the process is confined to probability variation alone,

Truck Arrester Bed Aggregate means a single-sized aggregate used in runaway truck lanes to slow and stop the progress of vehicles.

Winter Sand means a fine aggregate intended for application to roadways during winter conditions to improve frictional properties of the pavement surface.

1004.05 MATERIALS

1004.05.01 General

Aggregates shall be according to OPSS 1001, unless otherwise specified in this specification.

All aggregate source materials shall be clean, hard, durable particles free of earth, humus, clay or other coatings, clay lumps, shale or shaley partings, and other deleterious materials. Aggregates shall be produced from sands, gravels, cobbles, boulders, or quarried rock. Reclaimed asphalt pavement, reclaimed hydraulic cement concrete, glass, other reclaimed materials, and slag materials shall not be used. When reclaimed materials are permitted by this specification or as specified in the Contract Documents, they shall be homogeneously blended. When reclaimed hydraulic cement concrete is permitted, it shall not contain loose reinforcing material and shall be free of protruding metal.

When a change in the character of the aggregate occurs or when the performance of aggregate that meets the requirements of this specification is found to be unsatisfactory, use of the aggregate 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.

Irrespective of compliance or non-compliance with the gradation and physical property requirements of this specification, aggregates may be accepted or rejected on the basis of field performance as determined by the Owner.

1004.05.02 Clear Stone

Clear stone may be 53.0 mm, 19.0 mm Type I, 19.0 mm Type II, 16.0 mm, 13.2 mm, or 9.5 mm and shall meet the physical property requirements shown in Table 1 and the gradation requirements shown in Table 2.

1004.05.03 Granular Sheeting

Granular sheeting shall meet the physical property requirements shown in Table 3 and the gradation requirements shown in Table 4.

1004.05.04 Mortar Sand

Mortar sand shall consist of natural sand, or subject to the approval of the Contract Administrator other inert materials with similar characteristics, or combinations thereof, having hard, strong, durable particles. The sand shall be free from a coating of any deleterious material and free from other deleterious substances.

Mortar sand shall meet the physical property requirements shown in Table 5 and the gradation requirements shown in Table 6.

1004.05.05 Gabion Stone, Rip-Rap, and Rock Protection

1004.05.05.01 General

Rip-rap, rock protection, and gabion stone shall be produced from crushed or fractured bedrock fragments with 100% fractured faces or crushed from cobbles or boulders greater than 300 mm diameter and shall not deteriorate when exposed to air and water and shall be resistant to deterioration by cycles of wetting, drying, freezing, and thawing.

Reclaimed hydraulic cement concrete may be used in non-watercourse applications.

1004.05.05.02 Rip-Rap and Gabion Stone

Rip-rap R-10 and R-50 classifications and gabion stone G-3 and G-10 classifications shall meet the physical property requirements shown in Table 7 and gradation requirements shown in Table 8.

1004.05.05.03 Rock Protection

Rock protection shall meet the physical property requirements shown in Table 7 and the gradation requirements shown in Table 8.

1004.05.06 Truck Arrester Bed Aggregate

Truck arrester bed aggregate shall be pit-run material meeting the physical property requirements shown in Table 9 and the gradation requirements shown in Table 10. In addition, truck arrester bed aggregate shall meet the following shape requirements:

a) Rounded particles shall be a minimum of 30% by mass. Rounded particles shall be determined by the procedure given in LS-607, reporting the percentage of rounded particles instead of crushed particles. The test specimen size shall be a minimum of 3,000 g passing the 26.5 mm sieve and retained on the 19 mm sieve.

b) Spheroidal particles shall be a minimum of 50% by mass. Spheroidal particles shall be determined by the procedure given in LS-608, using a figure-eight calliper in which the ratio of the opening at one end to that at the other end is 2:1 instead of 4:1. The test specimen size shall be a minimum of 3,000 g passing the 26.5 mm sieve and retained on the 19 mm sieve.

1004.05.07 Winter Sand

Winter sand shall meet the physical property requirements shown in Table 11 and the gradation requirements shown in Table 12.

1004.07 PRODUCTION

1004.07.01 Aggregate Processing, Handling, and Stockpiling

Aggregates separated during processing shall be placed in individual stockpiles. Processed aggregates secured from different sources and aggregates from the same source but of different gradations shall be placed in individual stockpiles.

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

Once a stockpile has been produced, sampled, and tested, no further material may be added to the stockpile. Stockpiles produced, sampled, and tested under the procedure for control chart method may continue to have material added, provided that sampling and testing show that the material in the stockpile is in accordance to this specification and that the process remains in statistical control.

1004.08 QUALITY ASSURANCE

1004.08.01 General

QA 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 may 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 material, test data from each source and product shall be managed independently.

The laboratory designated by the Owner shall carry out testing for purposes of ensuring that aggregates used in the Work are according to the physical property and grading requirements of this specification. The Owner shall be responsible for all costs associated with testing for QA purposes, unless otherwise indicated in this specification. Individual test results shall be forwarded to the Contractor, as they become available.

1004.08.02 Laboratory Requirements

The Contract Administrator shall designate all QA 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 also participates in the annual MTO Proficiency Sample Testing Program for the specific tests, when applicable.

An acceptable laboratory conducting tests for gradation according to LS-602, materials finer than 75 µm by washing of the aggregates according to LS-601, and percent crushed particles according to LS-607 shall be one that holds a current Type C certificate from CCIL.

Testing shall be conducted by 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 that they are acceptable to the Contract Administrator.

1004.08.03 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 material contains blended or reclaimed aggregates or both, QA sampling shall be performed on the final blended product.

The mass of each sample shall meet the requirements of Table 13. When more than 30 kg is required, the total sample shall be recombined by the QA laboratory prior to testing.

In the event that the Contractor is unavailable to take the sample, no further materials shall be placed in the Work until the QA sample has 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. QA samples shall be identified both on the inside and outside of the sample container.

1004.08.04 Testing and Retention of Samples

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

1004.08.05 Winter Sand

Following delivery, winter sand shall be subject to a visual inspection of the stockpile to determine the presence of oversize material. Oversize particles may be confirmed with a 9.5 mm sieve.

1004.08.06 Acceptance

QA test results shall be used for acceptance purposes, except when referee testing or a visual examination of winter sand has been carried out.

When QA test results show that the material meets the requirements of this specification, the aggregates shall be accepted.

When QA test results show that the material does not meet the requirements of this specification, the Contract Administrator shall notify the Contractor that material 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 material from the work or invoking referee testing. The Contractor may request a reduced price in lieu of removal for 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.

1004.08.07 Referee Testing

When QA 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 testing 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 QA 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 testing 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 the Owner may send a maximum of two representatives each to observe the referee testing. The Contract Administrator shall notify the Owner and the 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 testing. Observers shall be permitted to validate sample identification and view sample condition. Subject to safety requirements, test method and equipment limitation, the 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. The Contractor may request a reduced price in lieu of removal of the 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 for Clear Stone

Laboratory Test	MTO Test Number	Nominal Maximum Size			
		53 mm	19 mm		16 mm, 13.2 mm, and 9.5 mm
			Type I	Type II	
Wash Pass 75 µm Sieve, Guideline B, % maximum	LS-601	2.0	2.0	2.0	2.0
Percent Crushed Particles, % minimum	LS-607	-	50	60	60
Micro-Deval Abrasion, Coarse Aggregate, % maximum loss	LS-618	25	25	25	25

TABLE 2
Gradation Requirements for Clear Stone

Sieve Size	Gradation (LS-602), Percent Passing					
	Nominal Maximum Size					
	53 mm	19 mm		16 mm	13.2 mm	9.5 mm
		Type I	Type II			
63 mm	100	-	-	-	-	-
53 mm	90 - 100	-	-	-	-	-
26.5 mm	-	100	100	-	-	-
19.0 mm	0 - 15	90 - 100	90 - 100	100	-	-
16.0 mm	-	-	65 - 90	96 - 100	100	-
13.2 mm	-	-	-	67 - 86	96 - 100	100
9.5 mm	-	0 - 55	20 - 55	29 - 52	50 - 73	95 - 100
6.7 mm	-	-	-	-	-	20 - 45
4.75 mm	-	0 - 10	0 - 10	0 - 10	0 - 10	0 - 10
75 µm	0 - 2.0	0 - 2.0	0 - 2.0	0 - 2.0	0 - 2.0	0 - 2.0

TABLE 3
Physical Property Requirements for Granular Sheeting

Laboratory Test	MTO Test Number	Granular Sheeting
Petrographic Requirement, Fine Aggregate Part A	LS-616	(Note 1)
Micro-Deval Abrasion, Coarse Aggregate, % maximum loss (Note 2)	LS-618	30
Micro-Deval Abrasion, Fine Aggregate, % maximum loss	LS-619	35
Plasticity Index, maximum	LS-703/704	0

Notes:

1. For materials north of the French/Mattawa Rivers only: For materials with > 4.0% passing the 75 µm sieve, passing the 150 µm sieve and retained on the 75 µm sieve shall not exceed 10% of the material on that sieve. Prior data demonstrating compliance with this requirement shall be acceptable provided such testing has been done within the past 5 years and the Contractor can show to the satisfaction of the Owner that field performance has continued to be acceptable.

2. The requirement for the coarse aggregate Micro-Deval abrasion loss test shall be waived if the material has more than 80% passing the 4.75 mm sieve.

TABLE 4
Gradation Requirements for Granular Sheeting

Sieve Size	Gradation (LS-602), Percent Passing
150 mm	100
26.5 mm	50 - 100
13.2 mm	35 - 100
9.5 mm	-
4.75 mm	20 - 80
1.18 mm	10 - 50
300 µm	5 - 25
150 µm	0 - 15
75 µm	0 - 8.0

TABLE 5
Physical Property Requirements for Mortar Sand

Laboratory Test	Test Number	Requirement
Organic Impurities, Organic Plate Number	LS-610	3 (Note 1)
Mortar Strength Test	ASTM C87/C87M	(Note 2)

Notes:

1. When the fine aggregate is subjected to this test, it shall not produce a colour darker than the standard solution or Organic Plate Number 3. A fine aggregate failing this test may be approved if it meets the requirements of the mortar strength test according to ASTM C87/C87M.

2. Mortar specimens comprised of fine aggregate for use as mortar sand and hydraulic cement shall develop a compressive strength at the age of 7 Days of not less than 90% of the strength developed by a mortar prepared in the same manner with the same cement and with graded Ottawa sand having a fineness modulus of 2.40 $\pm$ 0.10.

TABLE 6
Gradation Requirements for Mortar Sand

Sieve Size	Gradation (LS-602), Percent Passing
4.75 mm	100.0
2.36 mm	95 - 100
1.18 mm	60 - 100
600 µm	35 - 80
300 µm	15 - 50
150 µm	2 - 15
75 µm	0 - 5.0

TABLE 7
Physical Property Requirements for Gabion Stone, Rip-Rap and Rock Protection

Laboratory Test	Test Number	Rip-Rap	Gabion Stone	Rock Protection
Specific Gravity, minimum	ASTM D6473 (Note 1)	2.50	2.50	2.5
Absorption, % maximum		2.0	2.0	2.0
Flat and Elongated Particles, % maximum	LS-608 (Note 2)	15	15	15
Micro-Deval Abrasion, Coarse Aggregate, Grading A % maximum loss	LS-618 (Note 3)	25	25	25

Notes:

1. These requirements shall be based on the average test results for at least five pieces of rock when the source is macroscopically uniform or at least 8 pieces of rock when the source is macroscopically non-uniform. In addition, no individual piece of tested rock shall have a specific gravity less than 2.30 or absorption greater than 3.5%.
2. These requirements shall be based on measurements taken of at least 20 randomly-chosen pieces of rock either in stockpile at the source or after being delivered to the site.
3. Testing using LS-618 may be carried out on another aggregate product that is being simultaneously produced from the same crushing stage as rip-rap, gabion stone, or rock protection, as long as the other aggregate product being produced is sufficient for sampling and testing, according to the requirements of the procedure. As an example, if the Contractor can show that rip-rap and Granular A which meets the requirements of OPSS 1010 are being simultaneously produced from a primary crusher, a sample of the Granular A may be used for acceptance testing, in-lieu of testing a sample of rip-rap.

TABLE 8
Gradation Requirements for Gabion Stone, Rip-Rap, and Rock Protection

Mass kg	**Approximate Dimension mm** (Note 1)	**Gradation, percent less than mass specified** (Note 2)				
		Gabion Stone		**Rip-Rap**		**Rock Protection**
		G-3	**G-10**	**R-10**	**R-50**	
330	500	-	-	-	-	100
75	305	-	-	-	100	Well-graded
50	265	-	-	-	70 - 90	
25	210	-	-	-	40 - 55	
15	180	-	100	100	-	
10	155	-	90 - 100	70 - 90	-	
5	125	100	-	40 - 55	-	
3	105	90 - 100	-	-	-	0-10
2.5	100	-	0 - 5	-	0 - 15	-
0.5	60	0 - 5	-	0 - 15	-	-

Notes:

1. Masses are based on approximate size of an equivalent cube with a specific gravity of 2.65 and are provided for estimating purposes only.

2. The gradation shall be determined by individually weighing a minimum of 20 randomly-chosen stone particles from a sample taken from the stockpile representing a lot when comparing the total mass of the stone particles within each fraction with the total mass of all of the stone particles measured in the sample. For pieces of rock with masses that are larger than 25 kg, the approximate dimension of the piece determined using an average of three rectilinear measurements of the piece shall be allowed in lieu of weighing.

TABLE 9
Physical Property Requirements for Truck Arrester Bed Aggregate

Laboratory Test	MTO Test Number	Requirement
Wash Pass 75 µm Sieve, Guideline B, % maximum	LS-601	1.0
Absorption, % maximum	LS-604	2.0
Unconfined Freeze-Thaw, % maximum loss	LS-614	6
Micro-Deval Abrasion, Coarse Aggregate, % maximum loss	LS-618	21

TABLE 10
Gradation Requirements for Truck Arrester Bed Aggregate

Sieve Size mm	Gradation (LS-602), Percent Passing
37.5	100
26.5	90 - 100
19.0	0 - 10

TABLE 11
Physical Property Requirements for Winter Sand

MTO Laboratory Test	MTO Test Number	Requirement
Micro-Deval Abrasion, Fine Aggregate, % maximum loss	LS-619	25 (Note 1)

Notes:

1. When obtained from sources on St. Joseph Island, Manitoulin Island, or areas of Ontario south and west of a boundary delineated by the Severn River, Provincial Highway 12, and Provincial Highway 7 east of Highway 12.

TABLE 12
Gradation Requirements for Winter Sand

Sieve Size	Gradation (LS-602), Percent Passing
9.5 mm	100.0 (Note 1)
6.7 mm	97 - 100
4.75 mm	90 - 100
2.36 mm	50 - 95
1.18 mm	20 - 90
600 µm	0 - 70
300 µm	0 - 35
150 µm	0 - 15
75 µm	0 - 5.0

Notes:

1. In addition to LS-602, to be confirmed by visual inspection of the stockpile.

A. The minimum size of the test sample shall be 5 kg. Following oven drying, the sample shall be sieved on the 9.5 mm, 6.7 mm, and 4.75 mm sieves. Material passing the 4.75 mm sieve shall be split to an appropriate size according to LS-602 for subsequent washing and fine sieving. The final grading shall be calculated according to LS-602 as the percentage of material passing each sieve based on the total mass of the oven dried sample.

TABLE 13
Sample Size Requirements

Aggregate Type	Nominal Maximum Size mm	Minimum Sample Size kg
Clear Stone	53	80
	19.0	20
	16.0	15
	13.2	15
	9.5	10
Granular Sheeting		25
Mortar Sand		10
Rip-rap / Gabion Stone / Rock Protection (for physical properties only)		25 (consisting of stone particles from 2 to 5 kg each)
Truck Arrestor Bed Aggregate		75
Winter Sand		10

Appendix 1004-A, November 2021
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:

- Requirements for meeting QA. (1004.03)

- Reclaimed materials. (1004.05.01)

- Warranty provisions. (1004.08.06)

- Warranty provisions in referee testing. (1004.08.07)

The designer should be aware that OPSS 1004 includes the introduction of physical test methods:

The designer may consider the use of reclaimed materials as an alternate aggregate source material. If so, the designer should specify this requirement in the Contract Documents. (1004.05.01)

The designer should be aware that quality assurance (QA) testing for purposes of ensuring material used in the Work meets the requirements of OPSS 1004 is not mandatory, unless specifically included in the Contract Documents. The designer should determine the need for QA testing based on the size and complexity of the work and specify the required frequency of QA sampling and testing (1006.08.01). Appendix 1004-B provides recommended QA sampling and testing frequencies. The designer should determine if the sampling and testing frequencies provided in Appendix 1004-B are to be used for QA purposes. If so, they need to be invoked by reference in the Contract Documents.

The designer should ensure that the need for stability of 53 mm clear stone is considered. When required, the minimum percent crushed requirement should be added. (Table 1)

The designer should ensure that the General Conditions of Contract and the 100 Series General Specifications are included in the Contract Documents.

Related Ontario Provincial Standard Drawings

No information provided here.

Appendix 1004-B, November 2021
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 Frequencies

OPSS.MUNI 1004, Aggregates - Miscellaneous, is amended as follows:

1004.08 Quality Assurance

1004.08.01 General

The first paragraph of subsection 1004.08.01 is deleted in its entirety and replaced with the following:

QA 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. QA sampling and testing shall be carried out at the frequency specified in Table B-1. Individual test results may be forwarded to the Contractor as they become available.

Table B-1 is added.

TABLE B-1
Sampling and Testing Frequencies for Physical Property and Gradation Requirements

Aggregate Type	Tender Quantity	Minimum Frequency
Clear stone	< 200 tonnes	At the Contract Administrator's discretion.
	≥ 200 tonnes and < 1,000 tonnes	One sample.
	≥ 1,000 tonnes (Note 1)	One sample per 1,000 tonnes.
Gabion Stone, (m^3 of gabion baskets)	< 100 m^3	At the Contract Administrator's discretion.
	≥ 100 m^3 and < 1,000 m^3	One sample.
	≥ 1,000 m^3 (Note 1)	One sample per 1,000 m^3.
Granular Sheeting Rip-Rap	< 200 m^2	At the Contract Administrator's discretion.
	≥ 200 m^2 and < 5,000 m^2	One sample.
	≥ 5,000 m^2 (Note 1)	One sample per 5,000 m^2.
Rock Protection	< 200 m^3	At the Contract Administrator's discretion.
	≥ 200 m^3 and < 5,000 m^3	One sample.
	≥ 5,000 m^3 (Note 1)	One sample per 5,000 m^3.
Truck Arrestor Bed	< 5,000 tonnes	One sample.
	≥ 5,000 tonnes (Note 1)	One sample per 5,000 tonnes.
Winter Sand	< 500 tonnes	At the Contract Administrator's discretion.
	≥ 500 tonnes and ≤ 5,000 tonnes	One sample.
	> 5,000 tonnes (Note 1)	One sample per 5,000 tonnes.

Notes:

1. When the tender 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.