



Track Subballast Specification

34 11 26.16

Revision 00
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Amendment Record

Amendment in Clause No.	Date of Amendment	Description of Changes
Rev 00	September 2026	Initial release for publication.

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Acronyms and Abbreviations

Table 1: Acronyms and Abbreviations

Abbreviation	Full Name
ESD	Engineering and Safety Division
ASTM	American Society for Testing and Materials
ISO	International Organization for Standardization
LS	Ministry of Transportation Laboratory Standard
MTO	Ministry of Transportation Ontario
OPSS	Ontario Provincial Standard Specifications

Definitions

Table 2: Definitions

Term	Definition
Ballast	A layer of coarse material, such as gravel or crushed stone, placed beneath railway tracks to provide stability, distribute loads, and aid in drainage
Subballast	A layer of finer material, typically sand or crushed stone, placed under the ballast to improve drainage, provide additional support, and enhance track stability

1. General Requirements

1.1. Description of Specification

- 1.1.1. This Specification outlines the requirements for production, and quality testing of track Subballast material, as well as all labour and equipment required to transport, stockpile, and store Subballast material.
- 1.1.2. Construction and placement of Subballast including compaction requirements must follow Track Construction Specification 34 72 00.
- 1.1.3. All Metrolinx approvals required as part of this technical specification must be provided by Metrolinx ESD – Track department.

1.2. Reference Standards

- 1.2.1. This Specification includes references to other publications. These references are noted in the text as appropriate. All tests must be carried out in accordance with the latest revision of the standard test methods referred to in this Specification. In the event of conflict, the most stringent requirement must apply.
 - a) Metrolinx Track Standards (Heavy Rail) RC-0506-02TRK;
 - b) Portfolio of GO Track Standard (GTS) Plans;
 - c) American Railway Engineering and Maintenance-of-Way Association (AREMA);
 - d) OPSS 1010, Ontario Provincial Standard Specification for Granular A, Granular B Granular M and Selected Subgrade Material (SSM);
 - e) ASTM C88, Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate;
 - f) ASTM C117, Standard Test Method for Materials Finer than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing;
 - g) ASTM C127, Standard Test Method for Relative Density (Specific Gravity) and Absorption of Coarse Aggregate;
 - h) ASTM C136/C136M, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates;
 - i) ASTM C702, Standard Practice for Reducing Samples of Aggregate to Testing Size;
 - j) ASTM D75, Standard Practice for Sampling Aggregates;
 - k) LS-601, Materials Finer Than 75 mm Sieve in Mineral Aggregates by Washing;
 - l) LS-602, Sieve Analysis of Aggregates;

- m) LS-604, Relative Density and Absorption of Coarse Aggregate;
- n) LS-606, Soundness of Aggregates by Use of Magnesium Sulphate;
- o) LS-614 Method of Test for Freezing and Thawing of Coarse Aggregate;
- p) LS-618, Resistance of Coarse Aggregate to Degradation by Abrasion in the Micro-Deval Apparatus;
- q) LS-619, Resistance of Fine Aggregate to Degradation by Abrasion in the Micro-Deval Apparatus; and
- r) LS-625, Guidelines for Sampling of Aggregate Materials.

2. Detailed Requirements

2.1. Materials

- 2.1.1. The Subballast material must form a stable layer beneath the ballast to prevent pumping of subgrade materials into the ballast material and provide structural support to the track structure.
- 2.1.2. Subballast material must be well-graded crushed granular material substantially free of clay lumps, organic matter, friable particles, and other deleterious materials.
- 2.1.3. Subballast material must be modified Granular B Type II, based on OPSS 1010 and must only be produced from a quarry or from talus, iron blast furnace slag or nickel slag.
- 2.1.4. Recycled materials are not permitted.
- 2.1.5. Subballast layer design including but not limited to thickness, dimensions and cross-slope must follow Standard Plan GTS-2204.
- 2.1.6. Subballast material gradation must follow LS-602 and LS-601 with the following additional requirements shown in Table 3.

Table 3: Subballast Gradation

Sieve Size	% Passing
106 mm	100
26.5 mm	50 - 100
4.75 mm	20 - 55
1.18 mm	10 - 40
300 µm	5 - 22
75 µm	0 - 5

2.1.7. Subballast material physical properties and test methods must follow Table 4.

Table 4: Subballast Material Physical Properties and Test Methods

Test Specification	Test Method	Limiting Values
Micro-Deval Abrasion (Coarse Aggregate), % Maximum Loss	LS-618,	30%
Micro-Deval Abrasion (Fine Aggregate), % Maximum Loss	LS-619	35%
Soundness (tested with sodium sulfate or magnesium sulfate)	LS-606, LS-614 /ASTM C88	<10%
Absorption, Specific Gravity	LS-604/ASTM C127	<2.0%

2.2. Qualification Testing Requirements

- 2.2.1. The Contractor responsible for procurement of the Subballast material must conduct the qualification testing performed by a Canadian Council certified independent testing laboratory. Certified qualification test reports must be submitted to Metrolinx not less than 30 calendar days prior to the anticipated delivery of Subballast material to the Site.
- 2.2.2. Metrolinx must be consulted and must agree on the qualification testing during the planning stage of the project.
- 2.2.3. Qualification testing should be in accordance with AREMA Manual, Chapter 1, Part 2, Section 2.11.3, and applicable standards listed in Section 1.2.
- 2.2.4. No Subballast material must be delivered or placed until source acceptance (qualification) testing results have been reviewed and approved by Metrolinx.
- 2.2.5. Additional quality tests must be undertaken by Contractor as requested by Metrolinx if there is any indication of a change in quality.

2.3. Sampling Method

- 2.3.1. Sampling must comply with LS-625 for sampling aggregates.
- 2.3.2. A representative sample (minimum 200 lb (90 kg)) must be taken for each 10,000 tonnes of Subballast or as otherwise directed by Metrolinx.
- 2.3.3. The sample size must be reduced for laboratory testing per ASTM C702.

2.4. Handling and Loading

- 2.4.1. Subballast must be handled, transported, stockpiled, and loaded in a manner to avoid segregation, contamination and degradation.

- 2.4.2. Stockpiles must be placed on a clean, and well-drained surface, such as asphalt or concrete, to prevent the intrusion of fine, and deleterious materials.
- 2.4.3. Stockpiling sites are to be level, well-drained and of adequate bearing capacity and stability to support stockpiled materials and handling equipment.
- 2.4.4. The Contractor must separate different aggregates by strong, full depth bulkheads or stockpile far enough apart to prevent intermixing.
- 2.4.5. Equipment and vehicles used for transport must be clean and free of foreign substances that could impair material quality.
- 2.4.6. Should contamination occur, the contaminated material must be removed and replaced.

3. Quality Assurance

3.1. General

- 3.1.1. Material ordered in line with this Specification must be subject to inspection for compliance with all requirements herein.
- 3.1.2. Source acceptance does not preclude the possibility of later rejection by Metrolinx if materials are found noncompliant during production or placement.

3.2. Plant Access

- 3.2.1. Metrolinx must have free entry during working hours to all parts of the producer's plant for the purpose of:
 - a) Observing sampling and testing procedures;
 - b) Reviewing Subballast production facilities; and
 - c) Performing additional sampling and testing, as deemed necessary.

3.3. Quality Assurance Provisions

- 3.3.1. The Contractor is responsible for ensuring the Subballast material conforms to this Specification, either through direct testing or a controlled production process that assures continuous compliance.
- 3.3.2. Metrolinx reserves the right to conduct independent tests to verify compliance. If a discrepancy arises, Metrolinx's tests must take precedence unless otherwise agreed in writing.

3.4. Test Samples

- 3.4.1. The frequency and location of sampling for quality assurance by Metrolinx will be at their discretion.
- 3.4.2. Samples must be taken in accordance with LS-625.
- 3.4.3. Materials that fail to meet specification requirements will be rejected; the Contractor must halt further deliveries until corrective measures have been taken.

3.5. Defective Material

- 3.5.1. Subballast material failing to meet any part of this Specification must be removed and replaced with acceptable material at no cost to Metrolinx.
- 3.5.2. If Subballast is discovered to be non-compliant after placement, Metrolinx may require its removal or remediation.

End of Section