DELIVERING FOR QUEENSLAND

Technical Note 221

Stockpile Guidance – AS 1141.3.1

April 2026

Queensland Government

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1 Purpose

This technical note provides guidance on how to sample from stockpiles using AS 1141.3.1 *Methods for sampling and testing aggregates*.

2 Background

Sampling ensures that a small sample accurately represents the true nature of the larger stockpile. It shall be performed by staff competent in the procedure, who are able to recognise segregation and contamination, who are able to take appropriate action.

For Transport and Main Roads projects, the sampling goal is to obtain a representative sample from the stockpile using sampling method(s) nominated by the relevant technical specification. It is assumed the lot to be sampled will be homogeneous as detailed in MRTS50 *Specific Quality System Requirements* Clause 8.1.

3 Sampling

When sampling, follow these general guidelines:

a) Where 1 sample is required to provide a sample for determining the average value of a property:

   i. there shall be 1 sample taken that contains a minimum of 5 increments taken from essentially random locations throughout the lot.

b) Where more than 1 sample is required to provide samples for determining the average value and variation:

   i. there shall be for each sample, a random location from which 5 increments are taken.

The number of samples required is specified in the relevant departmental Technical Specifications (e.g. MRTS05 *Unbound Pavements* and MRTS22 *Supply of Cover Aggregate*). The mass of each increment, sample and minimum number of increments is detailed in AS 1141.3.1 Clause 6.3, Tables 1 and 2. Important requirements regarding sample increment location, size and reduction are detailed in AS 1141.3.1 Clause 6.1. These include:

- Samples should be taken more than 200 mm from the edge of the pad or stockpile.
- For homogeneous materials, remove enough depth to meet sample size requirements.
- For non-homogeneous materials, divide each lot into separate sub-lots and sample sub-lot for testing as detailed in MRTS50 *Specific Quality System Requirements* Clause 8.1.

- All increments must have similar mass / volume and be mixed before reducing or splitting.

The most common sampling technique for stockpiles is sampling aided by power equipment, as detailed in AS 1141.3.1 Clause 9. The clauses in the procedure describe the following:

- For **average properties only**, pull down sample pads from 5 locations, each representing an equal volume of the stockpile, and collect 1 increment from each.
- For **average properties and variation**, pull down sample pads from 5 locations and take 5 increments, each from a random spot within the pad.

4 Recommendation

With the increased use of AS 1141.3.1 in departmental projects it is imperative that testers need to be aware of the process for obtaining samples from stockpiles using AS 1141.3.1 as follows:

- Sampling for departmental projects will be for testing of samples for average properties where 1 sample is required and testing of samples for average properties and variation where more than 1 sample is required.
- Numbers of samples required will be nominated in the relevant departmental Technical Specification.
- Each sample will consist of at least 5 increments.
- Sample increments shall be taken essentially at random locations throughout each section or sub-lot.
- When sampling stockpiles using power aided equipment to determine only average properties, it is permissible to pull down sample pads from at least 5 locations around the stockpile. Choose each location to represent approximately equal volumes of the stockpile and collect a single increment from each pad and combine to create a sample. **Refer to Example 1**.
- When sampling stockpiles using power aided equipment to determine average properties and variation, the stockpile should be divided into a number of sub-lots equal to the number of samples required. A random location within each sub-lot should be determined and a pad created for that location, resulting in at least 5 pads in total for the stockpile. At least 5 sample increments should be taken from each pad within the sub-lot and combined to create a sample for each sub-lot. **Refer to Example 2**.

5 References

Standards Australia, AS 1141.3.1 *Methods for sampling and testing aggregates, Method 3.1: Sampling – Aggregates*

Standards Australia, AS 1141.22 *Methods for sampling and testing aggregates, Method 22: Wet/dry strength variation*

Standards Australia, AS 1289.1.4.2 *Methods of testing soils for engineering purposes, Method 1.4.2: Sampling and preparation of soils - Selection of sampling or test sites - Stratified random number method*

Transport and Main Roads, *Materials Testing Manual*, Q144A *Assignment of maximum dry density and optimum moisture content for soils and crushed rock*

Transport and Main Roads, Technical Specification, MRTS05 *Unbound Pavements*

Transport and Main Roads, Technical Specification, MRTS22 *Supply of Cover Aggregate*

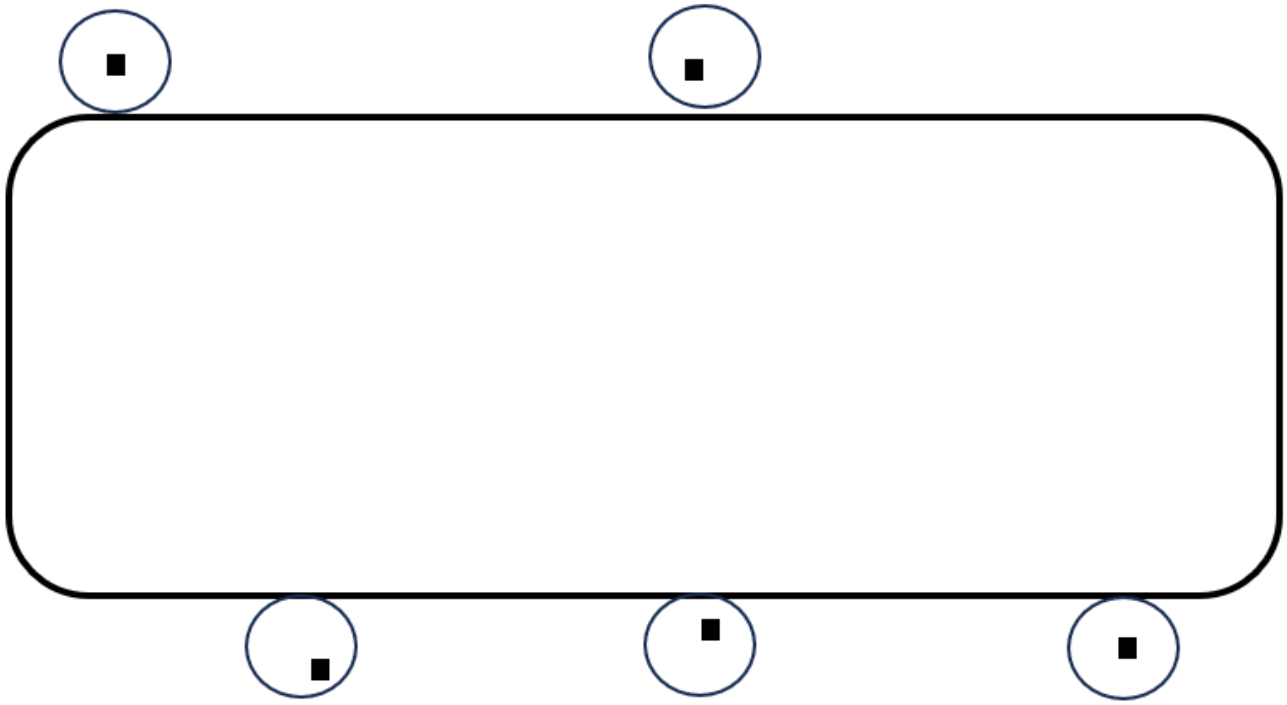
Transport and Main Roads, Technical Specification, MRTS50 *Specific Quality System Requirements*

Example 1: Single sample from a stockpile (AS 1141.22 or audit testing of a stockpile)

When sampling a stockpile with power aided equipment for only average properties variation the following technique shall be used:

- **1 sample** required for average properties.
- Determine sampling locations using Test Method AS 1289.1.4.2.
- Remove 5 pads and take 1 increment per pad to be combined to produce a single sample.

The below figure shows 5 locations with 1 pad per location each pad containing 1 increment.



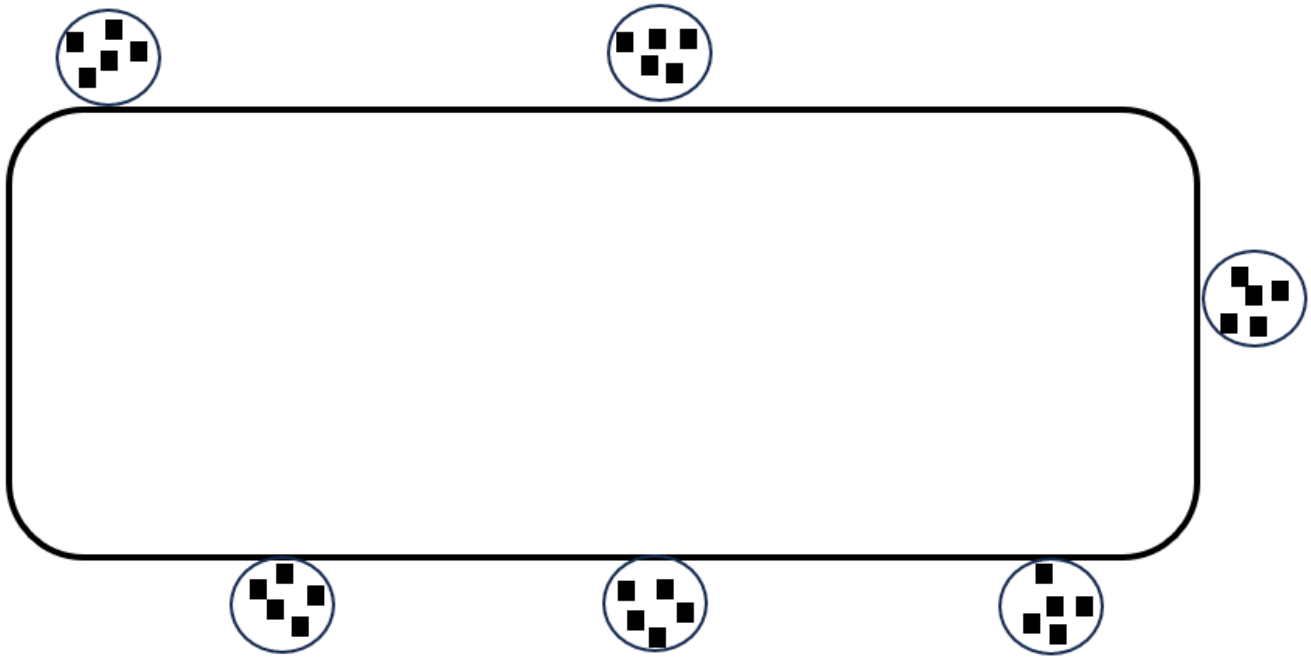
5000t Stockpile (maximum lot size)

Example 2: Multiple samples from a stockpile (Q144A)

When sampling a stockpile with power aided equipment for average properties and variation the following technique shall be used:

- **6 samples** are required for average properties and variation.
- Determine sampling locations using Test Method AS 1289.1.4.2.
- Remove 1 pad from each location and take 5 random increments from it to form a single sample.

The below figure shows 6 locations with 1 pad per location each pad containing 5 increments.



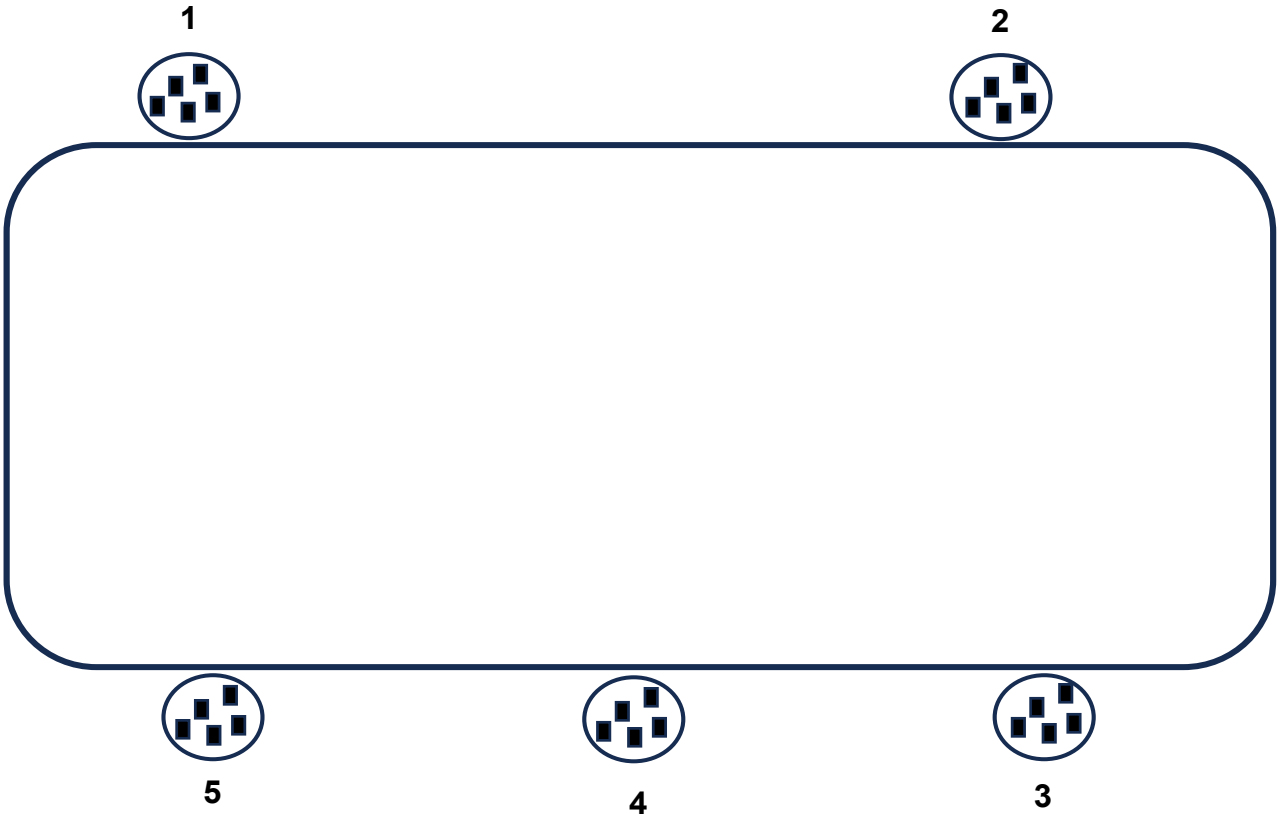
5000t Stockpile (maximum lot size)

Stockpile sampling for compliance testing (MRTS05)

When sampling for compliance testing purposes Example 2 shall be followed:

- from each of the 5 locations – Particle Size Distribution (PSD), Liquid Limit (LL) and Linear Shrinkage (LS).
- from 2 (randomly chosen) locations – California Bearing Ratio (CBR) and Flakiness Index (FI).
- from at least 1, if required – source testing.

The below figure shows 5 locations with 1 pad per location each pad containing 5 increments.



New 5000t Stockpile (maximum lot size)