Guideline: Quarry assessment of natural uncrushed fine aggregate sources

1 Introduction
Transport and Main Roads (TMR) Concrete Technical Standards MRTS39, MRTS40 and MRTS70 require quarry assessment and registration in accordance with EP108 for all fine and coarse aggregate sources used in concrete supplied to TMR projects. This guideline clarifies the required content of a natural uncrushed fine aggregate source assessment report.

Natural uncrushed fine aggregate consists of natural sand and/or gravel particles passing the 4.75 mm sieve but larger than 0.075 mm.

2 Site details (Section 5.2)
Include locality plan (of extraction site and screening plant), and a copy of Department of Environment and Resource Management permit/access agreement and local government approvals.

3 Geology (Section 5.3)
Define source material origin (e.g. alluvial/fluvial, dune/marine, aeolian, colluvial, residual) and extent (area and depth). Include any investigative reports on the source material.

A petrographic report is required to determine sand composition, grain coatings, alkalisilica reactivity potential etc in accordance with ASTM C295 and TMR Test Method Q188.

4 Development/production (Section 5.4)
Describe extraction methods (end loader, excavator, dragline, suction dredge etc), processing methods (screens, cyclones etc) and available reserves.

5 Source material and product quality (Section 5.5)
The sand particles shall be clean, hard, durable and free from clay and other aggregations of fine material, soil, organic matter and any other deleterious material.

MRTS39, MRTS40, MRTS70 and AS 2758.1-1998 ("Aggregates and rock for engineering purposes - Part 1: Concrete aggregates") specify the following test methods (with recommended test limits):

- AS 1141.5 Particle density and water absorption
- AS 1141.11 Grading
- AS 1141.13 Material finer than 2 microns
- AS 1141.24 Sodium sulphate soundness
- AS 1141.31 Percent light particles
- AS 1141.34 Organic impurities
- AS 1141.35 Sugar
- AS 1012.20 Chlorides and sulphate
AS 1141.5 and AS 1141.11 are mandatory for certification; others may also be required as circumstances dictate (e.g. AS 1012.20 required if material is being won from tidal waters, AS 1141.34 and AS 1141.35 if material is being won from sugar cane areas, AS 1141.3 for residual natural sand deposits).

Note: MRTS39, MRTS40 and MRTS70 also specify that concrete mixes containing less than 20% approved flyash must be tested for alkali-silica reactivity in accordance with TMR Test Method Q458 or AS 1141.60.1 when published. All mixes for pre-stressed precast concrete must contain a minimum of 20% flyash.

6 Quality system status

Attach a copy of QA Certificate, if applicable.