

SANDS, CRUSHED ROCK AND CRUSHED SCORIA

SPECIFICATION 21.A.038

1 GENERAL

This Specification is for the supply of sands, crushed rock and crushed scoria to Melbourne Water work sites.

2 SOURCES OF MATERIAL

The sands, crushed rock and crushed scoria shall be supplied from a source approved by the Superintendent.

3 REQUIREMENTS

3.1 SANDS

3.1.1 General

Sands shall be extracted from an approved, naturally occurring siliceous deposit and may be produced by screening and/or washing processes.

Sand shall consist of hard durable particles, principally quartz, and shall be free from mica, clay lumps and organic matter.

'A' Grade sand and 'B' Grade sand shall be in conformity with the test requirements set out in Table 1 and the particle size distribution shall be within the grading limits of that table.

Each sand submitted may be subjected to chemical tests and may be rejected if in the opinion of the Superintendent, its use may initiate corrosion problems in Melbourne Water installations.

3.1.2 Resistivity

Sands will be tested for resistivity and shall have a value not less than 20 ohm-m when saturated with water which has a resistivity of not less than 200 ohm-m. The resistivity tests will be carried out in accordance with Australian Standard AS 1289 D4.1-1980 *'Determination of the Electrical Resistivity of Sands and Granular Materials'*.

3.1.3 'A' Grade Sand

'A' Grade sand as supplied shall be suitable for satisfactory placing under and around pipes in trench by water jetting and/or sluicing methods as approved by the Superintendent.

3.2 CRUSHED ROCK

The crushed rock shall be derived from an igneous or metamorphic source rock by crushing clean spalls. The product shall consist of hard, durable particles free from clay and the particle density shall be in excess of 2.6 t/m^3 .

Crushed rock shall not contain any crushed scoria. (See clause 3.4 for definition)

When tested with standard laboratory sieves, the graded crushed rock shall be within the particle size distribution limits set out in Table 1. Other test property requirements of Table 1 shall also be met.

The 5 mm crushed rock supplied shall be suitable for satisfactory placing under and around pipes in trench by water jetting and/or sluicing methods, as approved by the Superintendent.

3.3 WET MIX CRUSHED ROCK

The graded crushed rock to be used in the production of the wet mix crushed rock shall conform to the requirements in all respects of 20 mm 'A' and 5 mm 'A' grade crushed rock as set out in Table 1 of this Specification.

The wet mix crushed rock shall be proportioned by mixing two or more crushed rock aggregates measured by mass or volume and the water shall be introduced into the mixer such as to produce a uniform distribution through the crushed rock.

The wet mix crushed rock shall be produced in a plant by continuous mixing using a pug-mill mixer or other approved type.

The wet mix crushed rock shall have a moisture content, measured at the point of delivery, within the range 1% dry to 1/2% wet of the Optimum Moisture Content of Standard Compaction as defined by Australian Standard AS 1289.5.1.1 *'Determination of the dry density/moisture content relation of a soil using standard compactive effort'*.

3.4 CRUSHED SCORIA

Crushed scoria is defined as being ejected pyroclastic rock in origin and vesicular (honey combed) in nature.

The crushed scoria shall be derived by crushing clean spalls and shall consist of hard, durable particles free from clay. The particle density shall be in excess of 2.4 t/m^3 .

When tested with standard laboratory sieves, the graded crushed scoria shall be within the particle size distribution limits set out in Table No. 2. Other test property requirements of Table No. 2 shall also be met.

3.5 MOISTURE CONTENT

3.5.1 Crushed Rock

The moisture content of crushed rock (except wet mix crushed rock) shall not be less than 4% and shall not exceed 10% by mass. Crushed rock whose moisture content exceeds 10% will be rejected.

3.5.2 Sands

The moisture content of sands shall not exceed 10% by mass. Sands whose moisture content exceeds 10% will be rejected.

3.5.3 Crushed Scoria

The moisture content of crushed scoria shall not be less than 6% and shall not exceed 15%. Crushed scoria whose moisture content exceeds 15% will be rejected.

TABLE 1 - GRADING LIMITS FOR SANDS AND CRUSHED ROCK

Sieve Metric A.S.	SANDS		GRADED CRUSHED ROCK					
			LIMITS OF PERCENTAGE PASSING SIEVE APERTURE BY MASS					
APERTURE	SAND 'B' GRADE	SAND 'A' GRADE	40 mm 'B' GRADE	40 mm 'A' GRADE	20 mm B' GRADE	20 mm 'A' GRADE	10 mm 'A' GRADE	5 mm 'A' GRADE
53 mm	See clause	See clause	100	100				
37.5 mm	3.3.2 of Spec	3.3.2 of Spec	80 - 100	90 - 100				
26.5 mm	regarding resistivity	regarding resistivity	60 - 100	-	100	100		
19.0 mm			50 - 90	65 - 85	80 - 100	85 - 100		
13.2 mm							100	
9.5 mm			34 - 65	44 - 64	58 - 80	60 - 80	90 - 100	
6.7 mm	100							100
4.75 mm	90 - 100	100	22 - 46	28 - 50	44 - 65	42 - 62	60 - 80	80 - 100
2.36 mm	60 - 100	80 - 100	16 - 36	20 - 36	32 - 54	30 - 48	40 - 65	60 - 80
1.18 mm	40 - 100	50 - 100	10 - 28	14 - 28	24 - 45	22 - 36	25 - 50	40 - 64
0.600 mm	20 - 90	30 - 90	8 - 24	10 - 22	18 - 36	16 - 28	16 - 38	22 - 48
0.3000 mm	8 - 50	8 - 50	6 - 20	6 - 16	12 - 30	10 - 20	9 - 30	8 - 34
0.150 mm	0 - 20	0 - 10	4 - 16	4 - 13	8 - 24	6 - 15	5 - 24	2 - 26
0.075 mm	0 - 10	0 - 5	2 - 12	2 - 10	5 - 20	4 - 12	2 - 20	0 - 20
Atterberg Liquid Limit			35	25	35	25	25	25
Plasticity Index (max)			15	6	16	4	6	6
Los Angeles Abrasion Loss (max)			35	30	35	30	30	-

TABLE 2 - GRADING LIMITS FOR CRUSHED SCORIA

Sieve Metric AS	GRADED CRUSHED SCORIA					
	LIMITS OF PERCENTAGE PASSING SIEVE APERTURE BY MASS					
APERTURE	40 mm 'B' Grade	40 mm 'A' Grade	20 mm 'B' Grade	20 mm 'A' Grade	10 mm 'A' Grade	5 mm 'A' Grade
53 mm	100	100				
37.5 mm	80 - 100	90 - 100				
26.5 mm	60 - 100	-	100	100		
19.0 mm	50 - 90	65 - 85	80 - 100	85 - 100		
13.2 mm					100	
9.5 mm	34 - 65	44 - 64	58 - 80	60 - 80	90 - 100	
6.7 mm						100
4.75 mm	22 - 46	28 - 50	44 - 65	42 - 62	60 - 80	80 - 100
2.36 mm	16 - 36	20 - 36	32 - 54	30 - 48	40 - 65	60 - 80
1.18 mm	10 - 28	14 - 28	24 - 45	22 - 36	25 - 50	40 - 64
0.600 mm	8 - 24	10 - 22	18 - 36	16 - 28	16 - 38	22 - 48
0.300 mm	6 - 20	6 - 16	12 - 30	10 - 20	9 - 30	8 - 34
0.150 mm	4 - 16	4 - 13	8 - 24	6 - 15	5 - 24	2 - 26
0.075 mm	2 - 12	2 - 10	5 - 20	4 - 12	2 - 20	0 - 20
Atterberg Liquid Limit (max)	35	30	35	30	30	30
Plasticity Index (max)	15	6	15	6	10	10
Los Angeles Abrasion Loss (max)	35	30	35	30	30	