

TECHNICAL STANDARD

**FINE AND COARSE CALCAREOUS
AGGREGATES (MARBLE) FOR CONCRETE
SEWERAGE STRUCTURES
(Excluding Lightweight Aggregate)**



Issued by: Manager Engineering

Issue Date: January 2012

This is an intellectual property of the South Australian Water Corporation. This document is copyright and all rights are reserved by SA Water. No part may be reproduced, copied or transmitted in any form or by any means without the express written permission of SA Water.

The information contained in these Standards is strictly for the private use of the intended recipient in relation to works or projects of SA Water.

These Standards have been prepared for SA Water's own internal use and SA Water makes no representation as to the quality, accuracy or suitability of the information for any other purpose.

It is the responsibility of the users of these Standards to ensure that the application of information is appropriate and that any designs based on these Standards are fit for SA Water's purposes and comply with all relevant Australian Standards, Acts and regulations. Users of these Standards accept sole responsibility for interpretation and use of the information contained in these Standards.

SA Water and its officers accept no liability for any loss or damage caused by reliance on these Standards whether caused by error, omission, misdirection, misstatement, misinterpretation or negligence of SA Water.

Users should independently verify the accuracy, fitness for purpose and application of information contained in these Standards.

The currency of these Standards should be checked prior to use.

APPROVAL TO DEVIATE FROM THIS STANDARD

Approval may be granted by the Asset Owner to deviate from the requirements as stipulated in this Standard if the functional requirements (e.g. Asset Life) for the asset differs from those stated in the Standard, but is assessed as still being acceptable by the Asset Owner's nominated representative.

Any approval to deviate from the stated requirements of this Standard will not be seen as creating a precedent for future like project. Any request to deviate from this Standard must be carried out on a project by project basis where each alternate proposal will be individually assessed on its own merit.

NO CHANGES REQUIRED IN THE JANUARY 2012 EDITION

The following lists the major changes to the April 1996 edition and published in the October 2004 edition of TS 3c:

1. Reformatted from DS to TS (Departmental Standard to Technical Standard), and updated referenced Australian Standards.
2. Conversion to a technical standard by removal of contractual conditions (to be included in the contract that references this standard).

CONTENTS

© SA WATER 2012..... 2

APPROVAL TO DEVIATE FROM THIS STANDARD 2

NO CHANGES REQUIRED IN THE JANUARY 2012 EDITION..... 2

CONTENTS 3

TABLES & FIGURES..... 3

REFERENCED DOCUMENTS 3

SECTION 1: SCOPE..... 4

SECTION 2: SA WATER’S REPRESENTATIVE 4

SECTION 3: SIEVES 4

SECTION 4: AGGREGATE 4

4.1 Physical Characteristics 4

4.2 Chemical Characteristics 4

4.3 Fine Aggregate..... 4

4.4 Coarse Aggregate..... 5

SECTION 5: SAMPLES 6

SECTION 6: REJECTION..... 6

TABLES & FIGURES

Table 4.1 Fine Aggregate - Grading Requirements 5

Table 4.2 Limits of Physical Properties..... 5

Table 4.3 Coarse Aggregate - Grading Requirements 6

REFERENCED DOCUMENTS

- AS 1141: Methods for sampling and testing aggregates
- AS 1152: Specification for test sieves
- AWWA B100: Standard for Granular Filter Material

SECTION 1: SCOPE

This Technical Standard (TS) covers the supply and delivery of fine and coarse calcareous aggregates (marble) for concrete in sewerage structures.

Unless specified otherwise the sampling and testing of aggregates shall be in accordance with AS 1141.

SECTION 2: SA WATER'S REPRESENTATIVE

SA Water's Representative in this Technical Standard will be nominated by SA Water.

SECTION 3: SIEVES

Sieves used in particle size determinations shall be in accordance with AS 1152.

SECTION 4: AGGREGATE

4.1 Physical Characteristics

The fine and coarse aggregate shall be crushed Angaston marble, or an approved equivalent and shall have clean, strong, durable uncoated particles free from injurious amounts of thin, elongated or laminated pieces, alkaline salts, quarry dust, organic matter, loam or any other deleterious material.

Note: Limestones, dolomites or other calcareous rock shall be precluded from this standard.

Aggregates obtained from weathered rock will not be accepted.

4.2 Chemical Characteristics

The aggregate shall have a minimum acid solubility of 94 percent when tested in accordance with AWWA B100.

4.3 Fine Aggregate

The fine aggregate shall be graded as shown in Table 4.1.

Table 4.1 Fine Aggregate - Grading Requirements

Sieve Size (mm)	Percent Passing
4.75	90 -100
2.36	60 -100
1.18	40 - 80
0.600	20 - 60
0.300	10 - 40
0.150	0 -15
0.075	0 - 6
2 µm (see note)	0 - 0.8

Note: The need to extend testing to include this size is conditional. The condition being where significant clay or fine silt particles are present in the fine aggregate as determined by the settling method described in AS 1141.33 and as directed by SA Water's Representative.

Where appropriate the percentage of material finer than 2 µm shall be as determined by the method described in AS 1141.13.

4.4 Coarse Aggregate

The coarse aggregate shall have the physical properties in accordance with Table 4.2 and the grading in accordance with Table 4.3.

Table 4.2 Limits of Physical Properties

Physical Properties	40-14 mm	10 mm
Absorption Test (AS 1141, Section 6)	1.5%	2.0%
Los Angeles Abrasion Test (AS 1141, Section 23)	not greater than 55%	not greater than 55%
Aggregate Crushing Value (AS 1141, Section 21)	not greater than 40%	not greater than 40%
Grading	Table 4.3 of this Technical Standard	
Particle Shape (AS 1141, Section 14) of misshapen particles using: 3:1 ratio 2:1 ratio	not greater than 10% not greater than 25%	

Table 4.3 Coarse Aggregate - Grading Requirements

Sieve Size (mm)	Percent Passing						
	Nominal Size of graded aggregate (mm)			Nominal size of single sized aggregate (mm)			
	40	20	14	40	20	14	10
63	100			100			
37.5	90-100			90-100			
26.5		100			100		
19.0	30-70	90-100	100	0-20	90-100	100	
13.2			90-100			90-100	100
9.5	10-35	25-55	40-85	0-15	0-15	0-45	85-100
4.75	0-5	0-10	0-10	0-5	0-5	0-10	0-20
2.36	0-2	0-5	0-5	0-2	0-5	0-5	0-5
0.075	0-2	0-2	0-2	0-2	0-2	0-2	0-2
2 µm (see note)	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5

These gradings are washed gradings in accordance with AS 1141.11.

Note: The need to extend testing to include this size is conditional. The condition being where the percentage of material finer than 0.075 mm is equal to or greater than 1 percent the percentage of material finer than 2µm shall be determined by the method described in AS 1141.13.

SECTION 5: SAMPLES

The Supplier shall supply to SA Water's Representative NATA certified test certificates for the aggregates which have been tested in accordance with AS 1141.

The Supplier shall state the proposed source of supply for each material supplied in accordance with this standard. Reference samples shall be supplied if requested by SA Water's Representative.

SECTION 6: REJECTION

Materials that do not comply with this standard shall be liable to rejection by SA Water's Representative.

Fine aggregate having a moisture content greater than 8 percent on delivery will not be acceptable.

Tests made by SA Water's Representative to determine the acceptance or rejection of material will be carried out in accordance with AS 1141.