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WALGA SPECIFICATIONS

WALGA Appendix 5 Sealing Aggregate

Submitted to:

Mr Andrew Blitz
Western Australian Local Government Association
PO Box 1544
WEST PERTH WA 6872

SPECIFICATION

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**WALGA SPECIFICATION
SEALING AGGREGATE
REVISION REGISTER**

Date	Clause Number	Description of Revision	Authorised By



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1.0 SCOPE

This standard specifies the requirements of sealing aggregates, including the source rock and the crushed screened product, for a range of nominal size aggregates used in sprayed sealing.

Quotations are to be supplied as set out in a Schedule of Rates included in Annexure A1 and in a Lump Sum Bill of Quantities included in Annexure A2.

Acknowledgment: The use of Main Roads WA specifications and guidelines and the Institute of Public Works Engineering Australia (WA Division) Local Government Guidelines for Subdivisional Development are gratefully acknowledged as the basis of these specifications.

2.0 REFERENCES

Australian Standards, MAIN ROADS Western Australia documents and Test Methods and ASTM test methods are referred to in abbreviated form (e.g. AS 1234, Main Roads 67-08-43 or WA 123). For convenience, the full titles are given below:

Equivalent Australian Standard test methods may be substituted for the Main Roads test methods quoted in the specifications.

Australian Standards

AS 1141 Methods for Sampling and Testing Aggregates

MAIN ROADS Test Methods

WA 200.1	Sampling Procedures for Aggregates
WA 201.1	Sampling and Preparation of Granulated Rubber
WA 210.1	Particle Size Distribution of Aggregate
WA 212.1	Aggregate Moisture Content: Convection Oven Method
WA 212.2	Aggregate Moisture Content: Microwave Oven Method
WA 215.1	Average Least Dimension
WA 216.1	Flakiness Index
WA 220.1	Los Angeles Abrasion Value
WA 223.1	Crushing Test Value

Acts and Regulations

Environmental Protection Act 1986
Environmental Protection Regulations 1987
Aboriginal Heritage Act 1972
Wildlife Conservation Act 1950
Environmental Protection (Clearing of Native Vegetation) Regs 2004
Health Pesticide Regulations 1956
Dangerous Goods Safety (Road and Rail Transport of Non-explosives) Regulations 2007
Occupational Safety and Health Act 1984
Occupational Safety and Health Regulations 1996
Rail Safety Act
Road Traffic Code 2000
Main Roads Act 1930



3.0 ONE SIZED SEALING AGGREGATES

3.1 General

Crushed aggregate, including its source rock, shall meet the requirements of this specification.

3.2 Source Rock

Source rock shall be selected from an approved quarry site such that the feed to the primary crusher is fresh, hard and durable rock, free from clay, organic matter, weathered (except as allowed below) or friable material, and is consistent in appearance. A classification system for rock material weathering is defined in Table A9 of AS 1726. The proportions of weathered rock material in the source rock shall not exceed the following limits by mass:

Table 1: Proportions of Weathered Rock

Slightly Weathered Rock	10% Maximum
Distinctly weathered rock	0.1% maximum
Extremely weathered rock	0.1% maximum
Residual soil	0% maximum

Selection of source rock shall be such that the requirements shown in Table 2 are satisfied and sealing aggregate conforming to the following specifications is able to be produced.

Table 2: Source Rock Properties

Property	Limit	Method of Test
Pendulum Friction Test (PAFV)	45 min	AS 1141.42

3.3 Crushed Aggregate for Sprayed Sealing Works

Source rock shall be processed to produce crushed and/or screened aggregate suitable for sprayed sealing works which shall conform to the requirements shown in Table 3 and Table 4. The aggregate shall be of uniform quality, clean, hard and durable and shall be free from clay, organic matter and elongated particles. The aggregate shall be of a uniform colour and appearance for the whole of the application.

Table 3: Crushed Aggregate Properties

Property	Requirement	Test Method
Los Angeles Abrasion Value (Note 2)		
Granite and other rock types	35% maximum	WA 220.1
Basalt	25% maximum	WA 220.1
Flakiness Index (Note 2)	35% maximum	WA 216.1
Average Least Dimension (Note 2)	Report	AS 1141.20.1 or WA 215.1
Water Absorption of Fine and Coarse Aggregate	2% maximum	AS 1141 6.1 AS 1141.5
Wet Strength	100kN minimum	AS 1141.22
Wet/Dry Strength Variation	35% maximum	AS 1141.22
Stripping Test Value (Note 1)	10% maximum	AS 1141.50
Degradation Factor	50 minimum	AS 1141.25.2
Secondary Mineral Content	25% maximum	AS 1141.26
Petrographic Examination	Statement of suitability for use as a sealing aggregate	



- Notes: 1. The aggregate shall be tested with 0.5% of adhesion agent in the binder using one of the following approved adhesion agents: Bitumite Concentrate, Redicote BE, Diamin TO-L, Fentamine BA422 and Bitumite Concentrate.
 2. Not applicable for crusher dust, sand, 7 mm and 5 mm aggregate.

Table 4: Sprayed Sealing Aggregate Particle Size Distribution Limits

AS Sieve Size (mm)	Percentage by Mass Passing Each Sieve for Each Nominal Size of Aggregate						
	20 mm	16 mm	14 mm	10 mm	7 mm	5 mm	3 mm
26.50	100						
19.00	80-100	100					
16.00	0-20	80-100	100				
13.20	0-2	0-20	80-100	100			
9.50		0-2	0-20	80-100	100		
6.70			0-2	0-20	80-100	100	
4.75				0-2	0-25	80-100	100
2.36					0-2	0-30	80-100
1.18	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-1.0	0-30
0.60							0-5

4.0 FINE AGGREGATES - CRUSHER DUST/SAND

Crusher dust/sand shall be suitable for use for primer-sealing and shall be clean coarse material that should not contain more than 4% by mass of material passing the 0.075 mm sieve and should be relatively free of clay and silt. The particles should be tough, durable, sound and free of deleterious material.

Unless otherwise approved by the WALGA Member Representative, the material shall have the following properties:

Material shall be coarse, with a $D_{80} > 0.60\text{mm}$ and C_u (Coefficient of Uniformity) > 4 , where D_{80} is the particle size in millimetres at which 80%, by mass of the sample, is smaller in size and

$$C_u = \frac{D_{60}}{D_{10}},$$

where D_{60} and D_{10} are respectively equal to the particle size in millimetres at which 60% and 10%, by mass of the sample, is smaller in size.

The maximum particle size shall be 4.75 mm. Oversize material shall be removed by screening.



5.0 MATERIAL QUALITY

The Contractor shall implement a quality control system to ensure material supplied under this contract complies in all respects to the specified requirements for the type of material purchased.

The quality control system shall include the minimum testing requirements detailed in Table 5.

Table 5: Minimum Quality Control Testing Requirements

Property	Minimum Number of Tests
PSD (WA 210.1)	3 tests per quarry production lot
Flakiness Index (WA 216.1)	3 tests per quarry production lot
LA Abrasion (WA 220.1)	1 test per 12 months
Water Absorption (AS 1141.5/6)	1 test per 12 months
Degradation Factor (AS 1141.25.2)	1 test per 12 months (excluding acid igneous rock)
Wet Strength and Wet/Dry Strength Variation (AS 1141.22)	1 test per 12 months
Petrographic Examination (AS 1141.22)	1 test per 12 months per material type
Secondary Mineral Content (AS 1141.26)	1 test per 12 months (excluding acid igneous rock)
Resistance to Stripping (AS 1141.50)	1 test per 12 months
ALD (AS 1141.20.1)	Minimum 3 tests per lot per aggregate size.
Flakiness Index	Minimum 3 tests per lot per aggregate size.
Particle Size Distribution	Minimum 3 tests per lot per aggregate size.

Notes:

- 1) A lot shall be no more than one (1) days production or 1000 m³ whichever is the lesser and shall be homogeneous in terms of quality.
- 2) The quality control system shall include separate stockpiling of each aggregate type and size on well prepared stockpile sites at the quarry or pit.
- 3) Prior to the supply of any material the Contractor shall certify that material supplied by the Contractor complies in all respects with the specified requirements and shall provide test certificates that demonstrate compliance.
- 4) The Contractor shall provide ready access of WALGA Member Representative to inspect the quarry, pit or production and or manufacturing site and to take samples.
- 5) The Contractor shall provide ready access of WALGA Member Representative to inspect the quarry, pit or production and or manufacturing site and to take samples.
- 6) Conformance of the aggregate at its source shall be construed only as authorising the Contractor to deliver the material. Contamination of the aggregate during cartage, or failure to cart and stockpile the aggregate as specified shall render the material non-conforming. The Contractor shall not be paid for non-conforming material or its cartage.

6.0 SUPPLY OF SEALING AGGREGATE

The source of aggregate supplied by the Contractor shall be nominated with the quotation.

Where specified, the Contractor shall supply the aggregate into nominated stockpile sites at the time specified by the WALGA Member and shall make all necessary arrangements with the WALGA Member Representative concerning load size, rate for supply, timing of the delivery and documentation. Different aggregate sizes and types shall be placed in clearly identified and separate stockpiles.

Any contamination of aggregate during delivery or stockpiling that is due in any way to the Contractor's activities shall be corrected at no cost to the WALGA Member.

Where specified, the Contractor shall provide for the WALGA Member to have ready access to the quarry or pit and shall load the WALGA Member trucks with the specified aggregate size and type.



7.0 REGULATORY REQUIREMENTS

The Contractor shall conform to all statutory and regulatory requirements concerning the environment, aboriginal heritage, wildlife conservation, dangerous goods, occupational safety and health, rail safety, and road safety.



8.0 ANNEXURE A1

Schedule of Rates

The quantities in this Schedule of Rates are the estimated quantities of the Works and are not to be taken as the actual or correct quantities. The Contractor shall be paid for the measured quantity of each section or item of work described below and executed under the contract at the rates and amounts entered applicable thereto.

Item	Description	Unit	Qty	Rate (i)	Amount	
					\$	¢
1	14 mm sealing aggregate	m ³				
2	10 mm sealing aggregate	m ³				
3	7 mm sealing aggregate	m ³				
4	5 mm sealing aggregate	m ³				
5	Sand/crusher dust	m ³				
6	Cartage	m ³ /km				
GST Exclusive Total						
GST Amount						
Total Amount of Quote						

Note (i): Rate to include all overheads, incidentals, mobilisation and demobilisations, testing and aggregate loading.



9.0 ANNEXURE A2

Price Schedule (Lump Sum Bill of Quantities)

All items in this Bill of Quantities shall be priced and extended by the WALGA Member and the lump sum accepted by the WALGA Member shall equal the TOTAL AMOUNT GST INCLUSIVE. Any errors in the rates or prices entered in this Schedule shall be corrected by agreement between the WALGA Member and the WALGA Member. Where no agreement can be reached, any errors shall be corrected as determined by the WALGA Member so that the total amount of quotation for all items in this Schedule continues to equal the lump sum accepted by the WALGA Member.

Item	Description	Unit	Qty	Rate (i)	Amount	
					\$	¢
1	Supply and delivery of 14 mm sealing aggregate	m ³				
2	Supply and delivery of 10 mm sealing aggregate	m ³				
3	Supply and delivery of 7 mm sealing aggregate	m ³				
4	Supply and delivery of 5 mm sealing aggregate	m ³				
5	Supply and delivery of Sand/crusher dust	m ³				
6	Cartage	m ³ /km				
GST Exclusive Total						
GST Amount						
Total Amount of Quote						

Note (i): Rate to include all overheads, incidentals, mobilisation and demobilisations, testing and aggregate loading.



Report Signature Page

GOLDER ASSOCIATES PTY LTD

A handwritten signature in blue ink, appearing to read 'R. Leach'.

Reg Leach
Senior Consultant - Pavements and Surfacing

RDL/DK/shp

A.B.N. 64 006 107 857

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Africa	+ 27 11 254 4800
Asia	+ 86 21 6258 5522
Australasia	+ 61 3 8862 3500
Europe	+ 356 21 42 30 20
North America	+ 1 800 275 3281
South America	+ 55 21 3095 9500

solutions@golder.com
www.golder.com

Golder Associates Pty Ltd
Level 3, 1 Havelock Street
West Perth, Western Australia 6005
Australia
T: +61 8 9213 7600

