

# Roads

## Master Specification

### RD-EW-C4 Controlled Low Strength Material

#### Document Information

K Net Number:	13623469
Document Version:	1
Document Date:	28/6/2019
Responsible Officer:	

DEPARTMENT OF  
PLANNING, TRANSPORT  
AND INFRASTRUCTURE



Government of South Australia  
Department of Planning,  
Transport and Infrastructure

## Document Amendment Record

Version	Change Description	Date	Endorsement record (KNet ref.)
1	Initial issue (formerly R09 Controlled Low Strength Material)	28/6/19	

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## RD-EW-C4 Controlled Low Strength Material

### 1 General

- 1.1 This Part specifies the requirements for the supply and placement of Controlled Low Strength Material (CLSM).
- 1.2 CLSM and its constituent materials shall comply with and / or be tested in accordance with the following:
  - a) AS 1012 Methods of testing concrete.
  - b) AS 1478 Chemical admixtures for concrete.
  - c) AS 2566.2 Buried flexible pipelines Part 2: Installation; Appendix K: Controlled Low Strength Materials.
  - d) AS 3582 Supplementary cementations materials for use with Portland and blended cement.
  - e) AS 3972 Portland and blended cements.

### 2 Quality Requirement

- 2.1 CLSM shall be supplied from a manufacturing plant which has third party certification to AS 9001 from a JAS-ANZ accredited assessment body.
- 2.2 The Contractor shall be able to provide the CLSM mix design, including:
  - a) the source, type and proportions of the constituent materials;
  - b) aggregate gradings and saturated surface-dry densities;
  - c) chemical admixtures details and manufacturer's recommended method of use;
  - d) the nominated slump and where a super-plasticizer is used, the final slump;
  - e) documentary evidence that the mix will comply with the specified requirements of the Contract under consideration, from either previous production of the mix (the test results shall not be more than 12 months old) or full details of a trial mix undertaken; and
  - f) evidence, either through trial mixes (in accordance with AS 1012.2) or production testing, that the CLSM will comply with the requirements of this Part.

### 3 Materials

- 3.1 Cement shall comply with AS 3972.
- 3.2 Admixtures shall comply with AS 1478.1.
- 3.3 Fly Ash shall comply with AS 3582
- 3.4 Aggregates shall be free of reactive or expansive materials and be compatible with the CLSM flow characteristics.
- 3.5 The maximum size of coarse aggregates used shall not exceed the values as specified in Table RD-EW-C4 4-1.

### 4 Properties

- 4.1 The CLSM shall comply with the properties in Table RD-EW-C4 4-1 for the application specified.

Table RD-EW-C4 4-1 Use Criteria &amp; Properties

Application	Description	28 day Strength (MPa)	Slump (mm)	Maximum Size of Coarse Aggregates (mm)
General Purpose Backfill	Early strength is not critical. High degree of flowability. Future excavation by hand.	< 0.5	> 180	19
Roadway Trench Backfill	High early bearing strength. Normal flowability, Future excavation by machine.	1.5 – 2.0	150 - 200	19
Pipe Embedment Backfill	Normal flowability. Future excavation by machine.	0.6 – 3	150 – 200	10
Structural Backfill	Normal flowability. Strength to be specified. Not to be used for pipe backfill or where future excavation is likely.	3.0 – 8.0	150 – 200	19

4.2 CLSM shall be homogeneous, free of lumps of unmixed material and without segregation.

## 5 Placement

- 5.1 The method of placement shall be such as to ensure no foreign materials enter the mix.
- 5.2 Where CLSM is used as conduit and culvert backfill, the Contractor shall establish a placement process to ensure conduits and culverts will not float, or otherwise become dislodged, during placement of CLSM. CLSM shall be installed in accordance with AS 2566.2 Part 2: Appendix K.
- 5.3 The Contractor shall retain a copy of the delivery information specified in AS 1379: Clause 1.8. 3 “Identification Certificate”.

## 6 Test Procedures

- 6.1 The Contractor shall use the following test procedures (refer [https://www.dpti.sa.gov.au/contractor\\_documents](https://www.dpti.sa.gov.au/contractor_documents)) to verify conformance with the Specification:

Table RD-EW-C4 6-1 Test Procedures

Test	Test Procedure
Compressive strength of CLSM specimens	AS 1012.9
Slump Test	AS 1012.3.1

## 7 Hold Points

There are no Hold Points referenced in this Part.

## 8 Verification Requirement and Records

- 8.1 The Contractor shall supply the following records:

Table RD-EW-C4 8-1 Verification Requirements

Document Ref.	Subject	Record To Be Provided
5.3	Delivery Information	Identification certificates in accordance with AS 1379: Clause 1.8. 3 “Identification Certificate”