PART R03

SUPPLY OF PIPES, CULVERTS AND DRAINAGE STRUCTURES

CONTENTS

1. GENERAL

.1 This Part specifies the requirements for the supply of concrete pipes, box culverts (not exceeding 4200 mm span and 4200 mm height) and other precast drainage structures such as junction boxes, side entry pits and headwalls.

.2 Documents referenced in this Part are listed below:

AS 1597.1	Precast reinforced concrete box culverts - Small Culverts (not exceeding 1200 mm span and 1200 mm height)
AS 1597.2	Precast reinforced concrete box culverts - Large culverts (from 1500 mm span and up to and including 4200 mm span and 4200 mm height)
AS 1646	Rubber Joint Rings for Water Supply, Sewerage and Drainage Purposes
AS 3610	Formwork for concrete
AS 4058	Precast Concrete Pipes
AS 4139	Fibre Reinforced Concrete Pipes and Fittings
AS 9001	Quality management systems - Requirements

.3 The Contractor is responsible for ensuring that the pipes, culverts and drainage structures are designed for construction loading.

2. QUALITY REQUIREMENTS

.1 Concrete pipes, box culverts and precast drainage structures must be manufactured in accordance with a Quality System certified to AS 9001. The Contractor must give at least 7 days prior notice of the commencement of manufacture of the pipes.

3. SUPPLY OF CONCRETE PIPES

.1 Unless otherwise shown on the drawings, all concrete pipes must have interlocking (flush) joints and supplied with external rubber bands for jointing (i.e. Humes "EB", Rocla "Sandband" or approved equivalent). If rubber rings are specified, the rings must comply with AS 1646.

.2 Reinforced Concrete Pipes must comply with AS 4058. The information pursuant to Appendix B of AS 4058 is as specified on the drawings.

.3 Fibre Reinforced Concrete Pipes must comply with AS 4139. The information pursuant to Appendix A of AS 4139 is as specified on the drawings.

Damage to Reinforced Concrete Pipes

.4 Any damage to reinforced concrete pipes must be classified in accordance with AS 4058 Clause 3.4 “Workmanship and Finish” and subject to assessment in accordance with Table 3.4.

TABLE 3.4 ACCEPTABILITY OF DEFECTS		
Defect Type	**Pipe Wall**	**Joint Surface**
1	Acceptable	Not Applicable
2	Acceptable after completion of approved repair	Not Applicable
3	Reject	Not Applicable
4	Acceptable after completion of approved repair	Acceptable after completion of approved repair
5	Acceptable after completion of approved repair	Acceptable after completion of approved repair
6	Reject	Reject
7	Reject	Reject

Damage to Fibre Reinforced Pipes

.5 Fibre reinforced pipes must be rejected if fractures and cracks wider than 0.1 mm and deeper than 0.3 mm are present.

4. SUPPLY OF SMALL BOX CULVERTS

.1 Small box culverts (ie. not exceeding 1200 mm span and 1200 mm height) must:

(a) comply with AS 1597.1;

(b) be inverted "U" shape (crown and base type) vide AS 1597.1, Table 1.1; and

(c) have plain butt joints.

.2 Culverts must be provided with a means of attaching lifting gear. The clear distance between reinforcement and the nearest surface of the culvert must be not less than 25 mm.

5. SUPPLY OF LARGE BOX CULVERTS

.1 Large box culverts (ie from 1500 mm span and up to and including 4200 mm span and 4200 mm height) must:

(a) comply with AS 1597.2;

(b) be inverted "U" shape (crown and base type) vide AS 1597.2, Table 1.1; and

(c) have plain butt joints.

.2 Concrete, reinforcing and formwork used for the manufacture of large box culverts must comply with the following Parts of the DPTI Master Specification for Transport Infrastructure:

Part CC05 “Steel Reinforcement”;

Part CC10 “Formworks”;

Part CC20 “Supply of Concrete”;

Part CC30 “Precast Concrete Units”;

Part CC35 “Low Pressure Steam Curing of Precast Units” (where applicable); and

Part CC36 “Hot Water Curing of Precast Units” (where applicable).

.3 The DPTI Master Specification is available from:
http://www.dpti.sa.gov.au/contractor_documents/specifications_-_division_CC_concrete

.4 Surface defects and deviations must not exceed those specified in AS 3610, Table 3.4.2. Tolerances not covered by Table 3.4.2 must comply with the following:

(a) The external corners of the end sections must not depart by more than 5 mm in any direction from the corner point location defined by the drawings;

(b) The tolerance on the thickness of concrete must be + 8, - 0 mm at any section; and

(c) The end faces of the units must be square to the roof, walls and floor, when measured with a set square across the thickness of the section with a maximum deviation of 2 mm.

6. SUPPLY OF PRECAST DRAINAGE STRUCTURES

General

.1 If the Principal has provided drawings for drainage structures, the drawings will be based on insitu construction and the use of precast drainage structures must be at the Contractor's risk. The Contractor is responsible for ensuring that the dimensions, design and manufacture of any precast drainage structure are suitable for use in the Works.

Steel Reinforced Drainages Structures

.2 Concrete, reinforcing and formwork used for the manufacture of precast drainage structures must comply with the following Parts of the DPTI Master Specification for Transport Infrastructure:

Part CC05 “Steel Reinforcement”;

Part CC10 “Formworks”;

Part CC20 “Supply of Concrete”;

Part CC30 “Precast Concrete Units”;

Part CC35 “Low Pressure Steam Curing of Precast Units” (where applicable); and

Part CC36 “Hot Water Curing of Precast Units” (where applicable).

.3 Precast headwalls may be manufactured from geopolymer concrete complying with Part CC27 “Geopolymer Concrete” in lieu of concrete complying with Part CC20.

.4 The DPTI Master Specification is available from:
http://www.dpti.sa.gov.au/contractor_documents/specifications_-_division_CC_concrete

Fibre Reinforced Drainages Structures

.5 Subject to obtaining prior approval, the Contractor may use fibre reinforced precast concrete drainage structures. Any such request for approval must be accompanied by comprehensive details of:

(a) the concrete mix design;

(b) the reinforcing fibres (including fibre material type and dosage rate);

(c) structural calculations; and

(d) evidence of satisfactory performance of the product, including any previous approval to use the product.

.6 A proposal to use fibre reinforced precast concrete shall constitute a **HOLD POINT.**

7. HOLD POINTS

.1 The following is a summary of Hold Points referenced in this Part:

CLAUSE REF.	HOLD POINT	RESPONSE TIME
6.3	Proposal to use fibre reinforced precast concrete	3 working days

8. VERIFICATION REQUIREMENTS AND RECORDS

.1 The Contractor must supply written verification that the following requirements have been complied with and supply the verification with the lot package.

CLAUSE REF.	SUBJECT	PROPERTY	TEST PROCEDURE	TEST FREQUENCY	ACCEPTANCE LIMITS
3.	Reinforced Concrete Pipes: Manufacturing Requirements	As specified in AS 4058, Table 4.1	Appendices to AS 4058	As specified in AS 4058, Section 4	As specified in AS 4058, Section 4
3	Fibre Reinforced Pipes: Manufacturing Requirements	Product certification by a JAS-ANZ accredited certification body that the requirements of AS 4139 Appendix N are complied with.			
4.	Small Box Culvert Manufacturing Requirements	Ultimate Load	AS 1597.1, Section 3	Required in the first instance for each size of box culvert or in the first instance after any design change	As specified in AS 1597, Part 1 Section 3
		Water Absorption Test:	-	Not required (vide AS 1597.1, Clause 1.4)	-
5.	Large Box Culverts Manufacturing Requirements	Concrete Requirements, vide Parts CC05 to CC36	As specified in Parts CC05 to CC36	As specified in Parts CC05 to CC36	As specified in Parts CC05 to CC36
6.	Precast Drainage Structures: Manufacturing Requirements	Concrete Requirements, vide Parts CC05 to CC36	As specified in Parts CC05 to CC36	As specified in Parts CC05 to CC36	As specified in Parts CC05 to CC36

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