

Specification (Measurement)

**Transport and Main Roads Specifications
MRS41 Concrete Pavement Base (Ancillary Works)**

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1 Introduction

This Specification applies to the construction of concrete pavement base in ancillary works using fixed forms.

This Specification shall be read in conjunction with MRS01 *Introduction to Specifications* and other Specifications as appropriate.

This Specification forms part of the Transport and Main Roads Specifications Manual.

2 Measurement of work

2.1 Standard Work Items

In accordance with the provisions of Clause 2 of MRS01 *Introduction to Specifications*, the Standard Work Items covered by this Specification are listed in Table 2.1.

Table 2.1 – Standard Work Items

Standard Item No.	Description	Unit of Measurement
Concrete Pavement Base (Ancillary Works)		
43001	Supply and place concrete Class S [<i>compressive strength</i>] MPa/20 in Plain Concrete Pavement (PCP, PCP-R) base	m ³
43002	Supply and place concrete Class S [<i>compressive strength</i>] MPa/20 in Continuously Reinforced Concrete Pavement (CRCP) base	m ³
43003	Supply and place concrete Class S [<i>compressive strength</i>] MPa/20 in Jointed Reinforced Concrete Pavement (JRCP) base	m ³
43004	Supply and place steel fibre reinforced concrete Class SF5.5 MPa/20 in Steel Fibre Reinforced Concrete Pavement (SFCP, SFCP-R) base	m ³
43005	Terminal and slab anchors	m ³
43006	Finish, cure and texture base	m ²
43007	Longitudinal joints	m
43008	Expansion joints and isolation joints	m
43009	Transverse contraction joints	m
43010	Supply and place reinforcing mesh	m ²
43011	Supply and place steel bar reinforcement	tonne

2.2 Work Operations

Work Operations include the removal from the site and safe disposal of Work and materials which do not conform and are not accepted for a reduced level of service, and their replacement with Work and materials that conform to the requirements of the documents and drawings for the project.

Item 43001 **Supply and place concrete Class S [*compressive strength*] MPa/20 in Plain Concrete Pavement (PCP, PCP-R) base**

Item 43002 **Supply and place concrete Class S [*compressive strength*] MPa/20 in Continuously Reinforced Concrete Pavement (CRCP) base**

Item 43003 Supply and place concrete Class S [*compressive strength*] MPa/20 in Jointed Reinforced Concrete Pavement (JRCP) base

Work Operations incorporated in the above items include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*, and
- b) the costs of mix designs and trials, paving trials, construction joints, outer edges and all concrete required to produce paved concrete.

The width and length are as specified on the drawings or as directed by the Administrator. The thickness is the thickness specified or as directed by the Administrator across each section. Include in the measurement the additional base above terminal anchors, taken from the drawings.

Item 43004 Supply and place steel fibre reinforced concrete Class SF5.5 MPa/20 in Steel Fibre Reinforced Concrete Pavement (SFCP, SFCP-R) base

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*, and
- b) the costs of steel fibre reinforcement, mix designs and trials, paving trials, construction joints, outer edges and all concrete required to produce paved concrete.

The width and length are as specified on the drawings or as directed by the Administrator. The thickness is the thickness specified or as directed by the Administrator across each section. Include in the measurement the additional base above terminal anchors, taken from the drawings.

Item 43005 Terminal and slab anchors

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) excavation for the anchor, and
- c) the provision of concrete anchors.

The volume is taken from the drawings or as directed by the Administrator. The depth is measured from the top of the subbase.

Item 43006 Finish, cure and texture base

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*, and
- b) the achievement of conforming finish, cure and texture.

The width and length are as specified on the drawings or as directed by the Administrator. The sides of the slabs shall not be included in the measurement of surface area.

Item 43007 Longitudinal joints

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*, and
- b) the provision of tiebars (where specified) and the application of debonding treatment at formed joints.

The measurement is along the line of the joint.

Item 43008 Expansion joints and isolation joints

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*, and
- b) the provision of dowels (where specified).

The measurement is along the line of the joint.

Item 43009 Transverse contraction joints

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*, and
- b) the provision of dowels (where specified).

The measurement is along the line of the joint. A separate rate shall be provided for SFCP (where applicable).

Item 43010 Supply and place reinforcing mesh

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*, and
- b) the supply and placement of reinforcing mesh.

The width and length are as specified on the drawings or as directed by the Administrator. The areas that contain laps shall only be measured once.

Item 43011 Supply and place steel bar reinforcement

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*, and
- b) the supply and placement of bar reinforcement in base and anchors, but excluding dowels and tiebars.

The mass is determined from the unit masses given in Clause 7 of AS/NZS 4671 *Steel Reinforcing Materials* and the actual length of bar, excluding laps and splices, measured in place. Only one bar may be measured within a lap or splice.

3 Utilisation of a rejected lot for a reduced level of service

3.1 Acceptances of nonconformances

Unless specified elsewhere in the Contract, pre-determined acceptance criteria in the form of payment deduction(s), as provided in this Specification, will be applied to nonconformances for the following properties:

- a) Concrete mix properties:
 - i. Compressive strength (PCP, PCP-R, JRCP, CRCP), or
 - ii. Flexural strength (SFCP, SFCP-R)
- b) Ride quality.

Deductions apply to the scheduled rate for the relevant Standard Work Item (43001, 43002, 43003 or 43004) for supply and placement of concrete for the lot.

Where a nonconformance is accepted for more than one of these properties, the total payment reduction (%) to be applied to the scheduled rate shall be determined by adding together the individual payment reduction (%) calculated for each property in accordance with Clauses 3.2 to 3.4.

3.2 Compressive strength (PCP, PCP-R, JRCP, CRCP)

Concrete with 28 day compressive strength less than the specified 28 day characteristic compressive strength may be accepted by the Administrator at a reduced level of service if it is not rejected under the provisions of MRTS70 *Concrete*. Nonconforming concrete accepted by the Administrator at a reduced level of service will be subject to a deduction of 4% of the schedule rate for each 0.5 MPa or part thereof deficiency in 28 day compressive strength (based on the lowest sample strength for the lot).

3.3 Flexural Strength (SFCP, SFCP-R)

Concrete with 28 day flexural strength between 5.0 MPa and 5.5 MPa may be accepted by the Administrator at a reduced level of service. Nonconforming concrete accepted by the Administrator at a reduced level of service will be subject to a deduction of 8% of the schedule rate for each 0.1 MPa or part thereof deficiency in 28 day flexural strength.

3.4 Ride quality

Concrete base with ride quality up to 0.80 m/km greater than the specified limit may be accepted by the Administrator at a reduced level of service. Nonconforming concrete accepted by the Administrator at a reduced level of service will be subject to the deductions in Table 3.4.

Table 3.4 – Deductions for ride quality

Ride Quality in Excess of Specified Limit by (m/km)	Deduction (%)
< 0.20	2
0.20 – 0.39	4
0.40 – 0.59	8
0.60 – 0.80	16

4 Incentives

Unless specified elsewhere in the Contract, pre-determined incentives for base concrete ride quality shall be applied in accordance with Table 4. Incentives apply to the scheduled rate for the relevant Standard Work Item (43001, 43002, 43003 or 43004) for supply and placement of concrete for the lot. However, the ride quality incentive does not apply to base concrete which is nonconforming in terms of thickness, compaction or strength.

Table 4 – Incentives for ride quality

Ride Quality Below Specified Limit by (m/km)	Incentive (%)
< 0.40	0
0.40 – 0.59	1
0.60 – 0.80	2
> 0.80	3

