

Master Specification

Part ST-SC-S6

Steel Reinforcement

September 2024



Government of South Australia
Department for Infrastructure
and Transport

Build.
Move.
Connect.

Document Information

Document Information	
K Net Number:	13434800
Document Version:	1
Document Date:	30/09/2024

Document Amendment Record

Version	Change Description	Date
0	Initial issue	31/08/2023
1	Updated cover page	30/09/2024

Document Management

This document is the property of the Department and contains information that is confidential to the Department. It must not be copied or reproduced in any way without the written consent of the Department. This is a controlled document and it will be updated and reissued as approved changes are made.

Contents

Contents	3
ST-SC-S6 Steel Reinforcement	4
1 General	4
2 Documentation	4
3 Supply and placement of reinforcing	5
4 Electrical continuity	6
5 Measurement	6
6 Hold Points and Witness Points	6
7 Verification requirements and records	6

ST-SC-S6 Steel Reinforcement

1 General

- a) This Master Specification Part specifies the requirements for the supply and placement of reinforcing steel used for the reinforcement of concrete structures, including:
 - i) the documentation requirements, as set out in section 2;
 - ii) the requirements for the supply and placement of reinforcement, as set out in section 3;
 - iii) the requirements for electrical continuity, as set out in section 4;
 - iv) the measurement requirements, as set out in section 5;
 - v) the Hold Point and Witness Point requirements, as set out in section 6; and
 - vi) the verification requirements and records, as set out in section 7.
- b) In addition to the requirements of this Master Specification Part, steel prestressing materials must comply with ST-SC-C1 “Pre-Tensioned Concrete” and ST-SC-C2 “Post Tensioned Concrete”.
- c) The supply and placement of reinforcing steel used for the reinforcement of concrete structures must comply with the with the Reference Documents, including:
 - i) AS 1554.3 Structural steel welding, Part 3: Welding of reinforcing steel;
 - ii) AS 2832.5 Cathodic protection of metals, Part 5: Steel in concrete structures;
 - iii) AS 3600 Concrete structures;
 - iv) AS 5100 Bridge design;
 - v) AS/NZS 4671 Steel for the reinforcement of concrete; and
 - vi) Welding Australia TGN-BC-01 Tack Welding of Reinforcement Bar.

2 Documentation

2.1 Construction Documentation

In addition to the requirements of PC-CN3 “Construction Management”, the Construction Documentation must include:

- a) detailed procedures for verifying that the reinforcing has been fabricated and placed within the specified tolerances and providing documentary evidence of conformance; and
- b) a valid certificate of approval issued by the Australasian Certification Authority for Reinforcing and Structural Steels (ACRS) for manufacturers and processors of steel reinforcement, in accordance with section 3.1c).

2.2 Quality Management Records

In addition to the requirements of PC-QA1 “Quality Management Requirements” or PC-QA2 “Quality Management Requirements for Major Projects” (as applicable), the Quality Management Records must include the verification records required by Table ST-SC-S6 7-1.

3 Supply and placement of reinforcing

3.1 General

- a) Steel reinforcement must comply with AS/NZS 4671 Steel for the reinforcement of concrete, and must be fabricated and installed in accordance with AS 5100 Bridge design, or AS 3600 Concrete structures (all other structures) as appropriate.
- b) The Contractor must provide certification that the reinforcing complies with AS/NZS 4671 Steel for the reinforcement of concrete, and the ACRS, as part of the Quality Management Records.
- c) Manufacturers and processors of steel reinforcement must hold a valid certificate of approval issued by the ACRS, which must be provided as part of the Construction Documentation.
- d) If bar bending schedules are not supplied by the Principal, the Contractor must supply copies of the bar bending schedules as part of the Quality Management Records.

3.2 Fabrication and bending

- a) Steel reinforcement which requires fabrication or bending to shape must be supplied in the full length shown on the Design Drawings. Reinforcement must be cold bent to the specified shape. Bars must not be bent after fabrication unless shown on the Design Drawings.
- b) Straight bars must be supplied to the full lengths shown on the Design Drawings. Where lapping of straight bars is unavoidable and approved by the Designers, such laps must be staggered and a minimum of 2 wire ties placed at each lap.

3.3 Welding of steel reinforcement

- a) Welding of steel reinforcement must not be used unless the Hold Point in section 3.3d) has been released by the Principal, in which case the welding must be in accordance with AS1554.3 Structural steel welding, Part 3: Welding of reinforcing steel.
- b) Any tack welding must be:
 - i) in accordance with Welding Australia TGN-BC-01 Tack Welding of Reinforcement Bar; and
 - ii) performed such that no loss of section of bars occurs.
- c) High strength bolts or rods cast into concrete must not be welded.
- d) Submission of a proposal for any welding of steel reinforcement will constitute a **Hold Point**. Where appropriate, the proposal must be supported by evidence that the welding will not be detrimental to the performance of the structure.

3.4 Placing and fastening

- a) Steel spacers (including plastic coated or tipped) must not be used to maintain cover. Parallel layers of reinforcement must be held in their correct relative positions by steel spacers only. If mortar block spacers are used to maintain cover, the blocks must have properties at least equal to that of the surrounding concrete as specified and their colour and cement type must be the same as that of the surrounding concrete.
- b) Provision of evidence that mortar block spacers comply with section 3.4a) will constitute a **Hold Point**. Mortar blocks must not be used until the Hold Point has been released.

3.5 Cover and tolerances

- a) The cover (or clear cover), as stated on the Design Drawings, must be the clear distance from the face of any reinforcement, wire ties for fixing reinforcement, formwork fixings or similar metal work to the nearest concrete surface.

- b) Tolerances on the position of reinforcement controlled by cover in bridge deck slabs must be in accordance with ST-SC-C7 "Placement of Concrete"
- c) The Contractor must provide documented evidence that the reinforcement has been placed within the specified cover in section 3.5a), and tolerances specified in 3.5b), as part of the Quality Management Records.

4 Electrical continuity

Evidence of the electrical continuity of reinforcement and fitments in accordance with AS 2832.5 Cathodic protection of metals, Part 5: Steel in concrete structures, must be submitted as part of the Quality Management Records, prior to placement of concrete, which will constitute a **Witness Point**.

5 Measurement

Where the Contract Documents includes a schedule of rates or bill of quantities (or similar) where the reinforcement mass has been provided by the Principal, the Contractor must assume that it has been calculated from the net lengths shown on the Design Drawings excluding laps, hooks, bends, cogs, and wastage and from the nominal bar diameters.

6 Hold Points and Witness Points

- a) Table ST-SC-S6 6-1 details the review period or notification period, and type (documentation or construction quality) for each Hold Point referred to in this Master Specification Part.
- b) Table ST-SC-S6 6-2 details the review period or notification period, and type (documentation or construction quality) for each Witness Point referred to in this Master Specification Part.

Table ST-SC-S6 6-1 Hold Points

Section reference	Hold Point	Documentation or construction quality	Review period or notification period
3.3d)	Proposal to weld reinforcing bars	Documentation	3 Business Days review
3.4b)	Evidence of compliance of mortar block spacers	Documentation	24 hours review

Table ST-SC-S6 6-2 Witness Points

Section reference	Witness Point	Documentation or construction quality	Review period or notification period
4	Provision of evidence of electrical continuity of reinforcement	Documentation	5 Business Day review

7 Verification requirements and records

The Contractor must supply written verification as part of the Quality Management Records that the requirements listed in Table ST-SC-S6 7-1 been complied with.

Table ST-SC-S6 7-1 Verification records

Section reference	Subject	Record to be provided
3.1a)	Compliance with AS/NZS 4671 Steel for the reinforcement of concrete, and the ACRS	Certificate of conformance to AS 4671 Steel for the reinforcement of concrete, and the ACRS
3.1d)	Bar bending schedules	Copies of the Contractor's bar bending schedules
3.5	Cover and tolerances	Evidence of conformance
4	Electrical continuity of reinforcement	Evidence of conformance