

S2 **REINFORCING STEEL**

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1 GENERAL

1.1 CROSS REFERENCES

1.1.1 General

Refer also to:

- “General Conditions of Contract” which shall apply to this section of the works.
- “PG1 - Preliminary and General” worksection.

2 SCOPE OF WORK

2.1 GENERAL

2.1.1 Works

The works covered by this Section include the supply of all labour, materials, plant and equipment for the provision of reinforcing steel, its bending, the making up of cages and the placing of the reinforcement ready for concreting.

Refer also to “S1 – Concrete Works” of the Specification.

2.2 STANDARD SPECIFICATIONS

2.2.1 References

This Specification shall be read in conjunction with the following Standards, which are deemed to form a part of this Specification.

In the event of this Specification being at variance with any provision of these Standards, the requirements of this Specification have precedence over the provisions of the Standard.

2.3 STANDARDS TABLE

2.3.1 General

The following British standards shall also apply:

Standard	Standards Table
	Description
BS 4449	- Hot rolled steel bars for reinforcement of concrete
BS 4482:1985	- Specification for cold reduced steel wire for the reinforcement of concrete
BS 4483:1985	- Specification for steel fabric for the reinforcement of concrete
BS 7123:1989	- Specification for metal arc welding of steel for concrete reinforcement
BS 8666:2000	Specification for scheduling, dimensioning, bending and cutting of steel reinforcement

BS 4466 - Bending dimensions and scheduling of bars for the reinforcement of concrete.

And any relevant recent updates of these standards.

3 MATERIALS

3.1 REINFORCING STEEL

3.1.1 Grades

The reinforcing steel required for this project shall have the specified characteristic strength $f_y = 250 \text{ N/mm}^2$, unless expressly specified in the design drawings or in the specification.

4 EXECUTION

4.1 FABRICATION AND PLACING OF REINFORCEMENT

4.1.1 General

The Contractor shall allow in his price for all labour and materials for the support of the reinforcing steel to maintain its correct position during the placing and compaction of concrete.

All reinforcement on site shall be stored on racks, clear of the ground.

Reinforcement shall be protected at all times from injury.

Provision shall be made for workmen to reach any part of the work without standing on any reinforcement.

4.1.3 Fabrication

Welding of reinforcement is forbidden without the express consent of the Client.

The Client will not permit the welding of high tensile reinforcement.

- This requirement takes precedence over BS 7123:1989

All reinforcement shall be provided in the full lengths indicated in the Drawings.

Except where shown, no lapping of rods will be permitted without the express consent of the Client.

Lap lengths given in BS 8666:2000 - Specification for scheduling, dimensioning, bending and cutting of steel reinforcement - shall be used unless a lap is expressly specified or detailed otherwise in the Drawings.

4.1.4 Bending

All bends shall be made cold, over freely rotating rollers, and shall comply with BS 8666:2000.

4.1.5 Placing

No springing of rods into place will be permitted.

Rods with kinks or bends not shown on the Drawings will not be used.

All reinforcement must be quite straight between bends shown.

4.1.6 Cover

To be complied with BS 8110 - The Structural Use of Concrete. Unless expressly specified.

4.1.7 Wire Ties

Wire shall be used for tying reinforcement at intersections, being located at sufficiently close intervals to maintain bars in their correct positions during the placing and compaction of concrete.

4.1.8 Rigid Supports

The minimum number of rigid supports to be provided by the Contractor shall be:

- Slab and beam steel: - 2 approved supports per m2
Column and wall steel: - 1 approved support per m2.

Plastic spacers are preferred.

Concrete blocks may be used to fix the steel from the forms and shall be at least as strong as the adjacent poured concrete, so designed and placed that they do not cause blemishes on exposed surfaces, and firmly wired to the reinforcement using wires cast into the blocks.

Steel high chairs in slabs are preferred to concrete blocks.

Concrete blocks may be used only where the concrete surface will be hidden or plastered.

4.1.9 Slabs

Top steel in slabs shall not be supported from the bottom steel and shall have independent support from the formwork.

4.2 TESTING

4.2.1 Samples

At the beginning of the project, the Client will select at random three samples at the stock delivered.

The Contractor shall arrange for these samples to be tested by an approved independent material testing laboratory.

Testing shall include tensile test and bend test.

4.2.2 Procedures

The procedure for sampling and testing shall comply with BS 1881 - Methods of testing concrete for strength

The yield strength of each sample must exceed the grade stated above, otherwise the stock will be rejected.

Once the stock has been approved, all reinforcement for the project must come from this stock.

If the stock is not sufficient for the whole of the project further stock should be ordered from the same manufacturer.

The Client may at his discretion order more sampling and testing of each new order, or at random throughout the project.

Each test of testing shall consist of no fewer than samples.

4.3 ALTERNATIVES

4.3.1 General

The Contractor shall note that should the bars specified not be available then he shall present alternative sizing to the Client for his approval.

This approval will not entitle the Contractor to any further payments should additional reinforcing be approved.

4.4 HIGH TENSILE STEEL

4.4.1 General

The Contractor shall be wholly responsible for ensuring that all high tensile starter bars are physically prevented from swaying and/or vibrating, since such movements can lead to failure.

In the event that the Contractor fails to take adequate steps to eliminate swaying and/or vibration, the Client reserves the right to instruct the Contractor in the steps he is to take at no extra cost to eliminate this hazard.

4.5 COVER

4.5.1 General

Cover shall be as in the table below except where specifically noted otherwise in the drawings.

The table below is generally in accordance with the provisions of BS 8110

Cover table	
Cast in Place Concrete	Cover (mm)
Cast against and permanently exposed to earth:	75
Exposed to earth or weather:	
• Slabs, walls	40
• Principal reinforcement	50
• Ties, stirrups, spirals:	40
Not exposed to weather nor in contact with the ground:	
• Slabs, walls:	
40 mm and larger bars	40
24 mm through 32 mm	30
20 mm bars or wire, and smaller	20
• Beams and Columns:	
Principal longitudinal reinforcement	40
Ties, stirrups and spirals	25

The reinforcing steelwork Sub-Contractor shall supply and fix all necessary distance pieces and spacers to maintain cover.

Wall steel shall be spaced off the forms with proprietary plastic pieces or similar and maintained at the correct spacing.

4.6 OBSERVATION BEFORE CONCRETING

4.6.1 Notice

No concrete shall be placed until the Client has had the opportunity to observe that the above requirements have been complied with.

To this end, the Contractor shall give the Client two working days notice of when he will pour concrete.

Such notice and observation in no way relieves the Contractor of any of his responsibilities under the terms of the Contract.

Concrete poured in violation of the foregoing is liable to condemnation and removal at no extra cost.