NZS 3109:1997

CONCRETE CONSTRUCTION

AMENDMENT No. 2

March 2004

REVISED TEXT

EXPLANATORY NOTE
NZS 3109:1997 is amended as follows to provide for reinforcing steel manufactured to AS/NZS 4671:2001. A corrected table 9.1, as modified by amendment No.1, is included.

APPROVAL
Amendment No. 2 was approved on 26 March 2004 by the Standards Council to be an amendment to NZS 3109:1997.

RELATED DOCUMENTS (Page 4)
Delete "NZS 3402" and **substitute** "AS/NZS 4671:2001 Steel reinforcing materials"

Delete "NZS 4702" and **substitute** "AS/NZS 1554.3:2002 Welding of reinforcing steel".

(Amendment No.2, March 2004)

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2 DEFINITIONS (Page 11)
In the definition of "LOWER CHARACTERISTIC YIELD STRENGTH" **delete** "NZS 3402" and **substitute** "AS/NZS 4671".

(Amendment No.2, March 2004)

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2 DEFINITIONS (Page 11)
Add definition:

MICROALLOYED BARS. Grade 500 reinforcing bars that are cooled in air from rolling temperature and derive their high strength properties substantially from the alloy content of the steel.

(Amendment No.2, March 2004)

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2 DEFINITIONS (Page 12)
Add definition:

QUENCHED AND SELF-TEMPERED BARS. Grade 500 reinforcing bars that are partially water quenched from rolling temperature and derive their high strength properties substantially from modified microstructures resulting from heat treatment.

(Amendment No.2, March 2004)

3.2.1 (Page 13)
Delete "Reinforcing bars shall conform to NZS 3402." and **substitute**:

"Reinforcing bars shall conform to AS/NZS 4671, Grade 300E or Grade 500E except that the use of Grade 250N or Grade 500N is permitted where specifically indicated in the drawings and specifications. The use of Grade 500L bars is not permitted."

(Amendment No.2, March 2004)

C3.2.1 (Page 13)
Delete "*NZS 3402*" and **substitute:**

"*AS/NZS 4671*".

(Amendment No.2, March 2004)

3.3.1 (Page 13)
Table 3.1 **delete** "430" and substitute "500".

Add note to bottom of table:

"NOTE –
Where deformed bars are galvanized before or after bending, the minimum bend diameter shall be:
(i) $5d_b$ for bar diameters of 16 mm or less
(ii) $8d_b$ for bar diameters of 20 mm or greater."

(Amendment No.2, March 2004)

3.3.4 *Bending* (Page 13)
Insert at beginning of clause "Except as provided in 3.3.8,"

(Amendment No.2, March 2004)

3.3.8 (Page 14)
Insert new clause:

"**3.3.8**
Grade 300E and Grade 250N quenched and self-tempered bars that have been bent and which are required to be straightened or re-bent may be re-bent once only in accordance with 3.3.1, 3.3.2 and 3.3.4. Grade 500 quenched and self-tempered bars shall not be straightened or re-bent.

Where microalloyed Grade 500E or Grade 500N bars that have been bent are required to be straightened or re-bent, the bar shall be heated to 750 ± 75°C (cherry red heat) over the length of the bend and are to be bent at that temperature in accordance with 3.3.1 and 3.3.2. Such heated bars shall be permitted to air cool to ambient temperature with protection from accelerated cooling by wind, rain or similar influences.

Any re-bending, may only take place in the plane of the original bend, and shall not bend the bar past the original straight position. Re-bending shall be carried out using smoothly applied force in a continuous action, not using impact loads and using a bending tool that avoids causing surface damage.

The surface of all re-bent areas is to be inspected after completion of re-bending and if cracking of bars is found, those bars shall be rejected."

(Amendment No.2, March 2004)

3.5.2 (Page 15)
Delete "NZS 4702" and **substitute** "AS/NZS 1554.3."

(Amendment No.2, March 2004)

3.7.2.2 (Page 16)
Delete clause 3.7.2.2 and **substitute**:

"Welding, including tack welding shall meet the requirements of AS/NZS 1554.3, and shall not be closer than $3d_b$ from the commencement of bends or that part of bar which has been bent or bent and re-bent."

(Amendment No.2, March 2004)

C3.7.2.2 (Page 16)
Add a new commentary clause:

*"**C3.7.2.2***

Designers should avoid the need to weld reinforcing steel if possible as:

(a) Where butt jointing is required there is a good range of coupling devices available. Lapping, particularly of smaller bars, may also be an option;

(b) Tack welding of stirrups or ties to main bars may result in a reduction in capacity of the main bar, either through metallurgic changes, or the generation of notches due to undercut if the required procedures are not followed;

(c) Where welds are required to provide lightning protection, care should be taken to choose a route through non-critical members.

The designer's written approval should be obtained for any welding as what seems to be an unimportant weld to a site operative could affect a critical member.

The above cautions apply to all grades of steel."

(Amendment No.2, March 2004)

Table 9.1 (Page 60)
Delete table 9.1 (as amended by amendment no 1) and **substitute**:

Table 9.1 - Tolerances for nominated slump

Nominated slump (mm)	**Tolerance for snatch sample** (mm)
60 or less	±20
70 – 110	±30
Greater than 110	±40

(Amendment No.2, March 2004)