



Advisory Note

Summary of Recommendations for the Use of Galvanized Reinforcement

GEN/21/1

July 2002

- Use galvanizing to provide increased protection rather than as a substitute for proper concrete quality and low cover
- Specify galvanizing to be in accordance with the Galvanizers Association of Australia's Standard Specification and AS/NZS 4680
- Use AS/NZS 4671 Grade 500N low-carbon reinforcement (eg 'Steelforce500' or '500PLUS' to avoid embrittlement problems)
- Use galvanizing in critical or high-risk areas or in prestige construction for long service life
- Avoid mixing galvanized and ungalvanized reinforcement
- Check for damage to the coating after bending. Increase bend diameters if possible. Repair coating if necessary
- Take extra precautions when welding galvanized reinforcement. Make good the regions of damage to the coating.

Discussions

It has been established by researchers here and overseas that the galvanizing of reinforcement can greatly improve its resistance to corrosion in concrete.

It is not realistic to make generalised quantitative assessments of expected increases in the lives of structures, which would result from galvanizing, because there are too many factors involved. However, there are numerous case histories documented in the literature, which provide interesting and reliable information.

Because of the complexities involved, the question whether or not to use galvanized reinforcement in a particular structure has no simple or general answer. The breakdown of concrete as an effective barrier against corrosion of reinforcement is generally due to a combination of unfavourable factors.

There are certain situations in which the long-term durability of the structure is clearly likely to be questioned and where galvanized reinforcement should therefore receive special consideration.

The fact is that a good cover of impermeable concrete provides the best protection for reinforcing steel. Wherever there are serious doubts that this will be achieved and maintained for the design life of the structure, and then galvanizing should be given serious consideration.

This is particularly so in aggressive exposure situations and high-risk structures, and in prestige construction where a long maintenance-free service life is required.

References

1. AS 3600 – 2001 *Concrete structures*
2. AS/NZS 4680 – 1999 *Hot-dipped galvanized coatings on fabricated ferrous articles*
3. Galvanizers Association of Australia *Standard Specification for Hot-Dip Galvanized Coatings*
4. Yeomans SR. 'Performance of Black, Galvanized and Epoxy Coated Reinforced Concrete' *Corrosion*. 50(1), 1994, pp 72-81
5. Yeomans SR. 'Corrosion of the Zinc Alloy Coating in Galvanized Reinforced Concrete' *Corrosion/98 Paper No. 653, NACE, Houston, Texas 1998*
6. AS/NZS 4671 – 2001 *Steel reinforcing materials*
7. Yeomans SR and Ellis DR. 'Further Studies of the Bond Strengths and Slope Characteristics of Galvanized and Epoxy Coated Steel Reinforcement in Concrete'. ILZRO Project ZE-341. University of New South Wales. Canberra ACT. Progress Report No 5., December 1992
8. Concrete Institute of Australia, Current Practice Note 17 - *The Use of Galvanized Reinforcement in Concrete*, Second Edition March 2002.

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