Australian/New Zealand Standard™

Prestressing anchorages

Standards Australia

STANDARDS NEW ZEALAND
Paerewa Aotearoa

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee BD-084, Steel Reinforcing and Prestressing Materials. It was approved on behalf of the Council of Standards Australia on 9 April 2003 and on behalf of the Council of Standards New Zealand on 22 April 2003. It was published on 5 June 2003.

The following are represented on Committee BD-084:

Association of Consulting Engineers Australia
Australian Chamber of Commerce and Industry
Australian Post Tensioning Association
Australian Steel Association
Australian Wire Association
AUSTROADS
Bureau of Steel Manufacturers of Australia
Business New Zealand
Cement and Concrete Association of New Zealand
Galvanizers Association of Australia
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Master Builders Australia
National Precast Concrete Association Australia
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Australian/New Zealand Standard™

Prestressing anchorages

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee BD-084, Steel Reinforcing and Prestressing Materials to supersede AS 1314—1972.

The objective of this Standard is to provide users and manufacturers with a test procedure to be used for establishing the performance of prestressing anchorages of various types for use in construction within Australia and New Zealand. It provides designers with test data from which they will be able to predict the ultimate capacity of the anchorage system when it is correctly installed in properly constructed concrete elements of the structure.

The Committee has reviewed several international standards in the preparation of the new Standard. These include BS 4447—*The performance of prestressing anchorages for post-tensioning construction*, FIP–*Recommendations for the acceptance of post-tensioning systems* and Post-tensioning Institute—*Acceptance Standards for Post-tensioning Systems.* The Committee recognized that it is important for joint Australian and New Zealand Standards to be compatible with other internationally recognized Standards so that no discrimination against Australia or New Zealand manufactured products can occur.

This revised Standard has removed various anomalies that existed in the 1972 edition of AS 1314, to bring it into line with current Standards in Europe and America.

The major changes are as follows:

(a) The Standard now references AS 3600 and NZS 3101.1, instead of AS 1481, for the design of bursting reinforcement. The amount of reinforcement required has been reduced from that previously required by AS 1481.

(b) The maximum crack widths for the anchorage efficiency test have been redefined. Previously this was defined as visible to the naked eye, which allowed many interpretations.

(c) Concrete strength for anchorage efficiency testing must be reported. Previously, the requirement was for concrete strength to be less than 50 MPa, but the strength did not need to be reported.

(d) An alternative test procedure using cyclic loading has been introduced for anchorage efficiency. The test is similar to the British Standard and FIP requirements.

(e) An efficiency test has been introduced for non-stressing anchorages.

The Standard applies to the manufactured hardware and not to the structural end use.

This Standard applies to monostrand and multistrand anchorage systems as well as bar systems. The Standard makes a distinction between the gripping efficiency of an anchorage and the ultimate strength of stressing and non-stressing anchorages.

The testing regimes prescribing the size of test prisms were developed so that consumers can make valid comparisons of systems for particular end uses.

The testing of restressable anchorages, such as may be used in permanent ground anchor applications, has not been directly addressed by the Committee.

Similarly, the Committee has not considered the requirements for cable-stayed bridge anchorage systems where very large tendons are subjected to two million load cycles before testing to failure. At present, no facilities exist in Australia and there are very limited facilities internationally for this type of testing.

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the appendix to which they apply. A ‘normative’ appendix is an integral part of a Standard, whereas an ‘informative’ appendix is only for information and guidance.

Statements expressed in mandatory terms in notes to figures are deemed to be requirements of this Standard.

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1 SCOPE

This Standard specifies minimum requirements for the—

(a) materials;

(b) manufacture; and

(c) methods of establishing the static or cyclic load performance, of prestressing anchorages and couplings intended for retaining the prestressing forces induced in wire, strand, or bar tendons and for transferring those forces to concrete members.

This Standard does not apply to the calculation of the stresses, or to the design of the concrete zones in which anchorages are embedded (see AS 3600 or NZS 3101.1).

Appendix B of the Standard is directly applicable to single tendon anchorages commonly employed by precast concrete manufacturers in pretensioning operations and multiple re-use of barrels and wedges.

Where multiple re-use of wedges occur, careful attention to the condition of the wedge teeth is essential. This is a management responsibility and beyond the scope of this Standard.

NOTE: Means for demonstrating compliance with this Standard are given in Appendix A.

2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS

1199	Sampling procedures and tables for inspection by attributes
1399	Guide to AS 1199—Sampling procedures and tables for inspection by attributes
1310	Steel wire for tendons in prestressed concrete
1311	Steel tendons for prestressed concrete—7-wire stress-relieved steel strand for tendons in prestressed concrete
1313	Steel tendons for prestressed concrete—Cold-worked high-tensile alloy steel bars for prestressed concrete
1379	Specification and supply of concrete
3600	Concrete structures

AS/NZS ISO

9000	Quality management and quality assurance standards
9000.1	Part 1: Guidelines for selection and use
9001	Quality management systems — Requirements

SAI

HB18	Guidelines for third-party certification and accreditation
HB18.28	Guide 28: General rules for a model third-party certification system for products