AS 1085.14—1990

Australian Standard®

Railway permanent way material

Part 14: Prestressed concrete sleepers

STANDARDS AUSTRALIA

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Bureau of Steel Manufacturers of Australia

Railways of Australia Committee

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Cement and Concrete Association of Australia

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PREFACE

This Standard was prepared by the Standards Australia Committee on Railway Permanent Way Materials as requirements for Prestressed Concrete Railway Sleepers.

In the preparation of this Standard, valuable assistance was given by organizations and individuals experienced in various aspects of the design and production of prestressed concrete railway sleepers; and the assistance gained from these sources is acknowledged.

CONTENTS

FOREWORD

This Standard covers materials, physical dimensions and structural strength of prestressed concrete sleepers and their fastener components for use in main line railway systems.

The performance of concrete sleepers in track depends on the condition of the rail and the joints provided, and upon the rail fastening system which comprises elastic fastenings, rail pads and insulators. Accordingly, when considering their performance, the concrete sleeper and its fastening together with the rail must be regarded as interdependent components of a system.

Track constructed using concrete sleepers and fastener components meeting the requirements of this Standard is expected to give satisfactory performance under current Railways of Australia approved maximum axle loads and with acceptable standards of maintenance.

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SECTION 1 SCOPE AND GENERAL

1.1 SCOPE This Standard sets out requirements for the design, manufacture, and installation of prestressed concrete sleepers and their fastening components for use in main line railway systems. It also sets out requirements for electrical performance of rail fastener and sleeper combinations.

This Standard also gives recommendations for special sleepers such as turnout bearers, sleepers with additional rails and dual gauge sleepers and their fastenings for use in special sleepered track. Specific requirements and recommendations are included in Appendix C.

This Standard does not cover—

(a) the design of post-tensioned concrete sleepers;

(b) the design of duo block concrete sleepers; or

(c) the techniques and equipment for the manufacture of concrete sleepers or fastenings.

NOTE: Purchasing guidelines are given in Appendix B.

1.2 REFERENCED DOCUMENTS The documents referred to in this Standard are listed in Appendix A.

1.3 DEFINITIONS For the purpose of this Standard the definitions given below apply.

1.3.1 Administration definitions

1.3.1.1 *Authorized*—authorized by the Regulatory Authority or its nominated representative.

1.3.1.2 *Manufacturer*—the person(s) or organization responsible for the manufacture of prestressed concrete sleepers and their fastening components.

1.3.1.3 *Purchaser*—the person(s), organization or Regulatory Authority for whom the manufacturer has contracted to manufacture the prestressed concrete sleepers and their fastening components.

1.3.1.4 *Regulatory Authority*—the appropriate body having statutory powers to control the construction and maintenance of main line railway systems in the relevant location and region.

1.3.1.5 *Specified*—stated in writing in any document (including order, drawing or specification) which forms a part, or the whole of the contract between the purchaser and the manufacturer.

1.3.2 Technical definitions

1.3.2.1 *Bearer*—a transverse concrete unit supporting rails.

1.3.2.2 *Bed of sleepers*—all the sleepers that are stressed and cast together in the one concreting operation, and then cured in the same batch.

1.3.2.3 *Fastening*—a component or group of components of a track system which fixes the rail to the concrete sleepers.

1.3.2.4 *Insert*—one or more of the fastening components which is cast in the sleeper at the time of manufacture.

1.3.2.5 *Lateral load*—a load, or vector component of a load, at the gauge corner of the rail parallel to the longitudinal axis of the sleeper, and perpendicular to the rail.

1.3.2.6 *Line of sleepers*—all the sleepers in a bed which share the same prestressing tendons.

1.3.2.7 *Longitudinal load*—a load along the longitudinal axis of a rail.

1.3.2.8 *Negative bending*—bending of a concrete sleeper by application of a load that produces tension in the top surface of the sleeper.

1.3.2.9 *Positive bending*—bending of a concrete sleeper by application of a load that produces tension in the bottom surface of the sleeper.

1.3.2.10 *Prestressed concrete sleeper*—a sleeper utilizing compressed concrete and prestressing tendons to resist flexure.

1.3.2.11 *Prestressing tendon*—a strand or wire within the sleeper which, under tension, compresses the concrete.