

SUPERSEDED BY AS 2327.1-1996

*Corrigenda - May 1980.*

AS 2327, Part 1 — 1980

UDC 624.016 : 693.9

SIB Ab3

AVAILABLE SUPERSEDED 1 DEC 1996

# Australian Standard 2327, Part 1-1980

---

**SAA COMPOSITE CONSTRUCTION  
CODE**

**PART 1—SIMPLY SUPPORTED  
BEAMS**



**STANDARDS ASSOCIATION OF AUSTRALIA**  
*Incorporated by Royal Charter*



**THE FOLLOWING SCIENTIFIC, INDUSTRIAL AND GOVERNMENTAL organizations were officially represented on the committee entrusted with the preparation of this standard:**

Association of Consulting Engineers, Australia  
Confederation of Australian Industry  
Division of Building Research, CSIRO  
Experimental Building Station, Department of Housing and Construction  
National Association of Australian State Road Authorities  
Railways of Australia Committee  
University of Sydney

---

**This standard, prepared by Committee BD/32, Composite Construction, was approved on behalf of the Council of the Standards Association of Australia on 9 November 1979, and was published on 1 February 1980.**

---

**To keep abreast of progress in industry, Australian standards are subject to continuous review and are kept up-to-date by the issue of amendments or revised editions as necessary. It is important therefore that standards users ensure that their standards are up-to-date. Full details of all SAA publications will be found in the Annual List of Australian Standards; these details are supplemented by monthly listings in the SAA journal 'The Australian Standard'. Information on the Annual List and 'The Australian Standard' may be obtained from any sales office of the Association, where details are also available of the current status of individual standards. Suggestions for improvements to published standards, addressed to the head office of the Association, are welcome.**

*This standard was issued in draft form for public review as DR 78062.*

AUSTRALIAN STANDARD

**COMPOSITE CONSTRUCTION IN  
STRUCTURAL STEEL AND CONCRETE**

**(known as the SAA Composite Construction Code)**

**Part 1**

**SIMPLY SUPPORTED BEAMS**

**AS 2327, Part 1—1980**

First published ..... 1980

PUBLISHED BY THE STANDARDS ASSOCIATION OF AUSTRALIA  
STANDARDS HOUSE, 80 ARTHUR STREET, NORTH SYDNEY, N.S.W.

ISBN 0 7262 1821 9

## P R E F A C E

This standard was prepared by the Association's Committee on Composite Construction as one of a series of standards applying to composite construction in structural steel and concrete. It is a revision of and supersedes Supplement No 1 to AS 1480—1974.

This Part 1 details rules for the use of simply supported steel beam-concrete slab construction in structures; other Parts are as follows:

Part 2—Continuous Beams\*

Part 3—Slabs\*

Part 4—Columns\*

Topics covered include design of encased beams and composite beams with slabs incorporating profiled steel sheeting; flexural design by either the load factor method or working strength method; serviceability; shear connection design; longitudinal shear transfer; construction; and the testing of shear connectors.

This standard may require reference to the following standards:

- AS 1000 The International System of Units (SI) and its Application
- AS 1131 Dimensions of Hot-rolled Structural Steel Sections
- AS 1163 Welded and Seamless Hollow Steel Sections for General Structural Purposes
- AS 1170 SAA Loading Code
  - Part 1—Dead and Live Loads
  - Part 2—Wind Forces
- AS 1204 Structural Steels—Ordinary Weldable Grades
- AS 1250 SAA Steel Structures Code
- AS 1252 General Grade High-strength Steel Bolts with Associated Nuts and Washers for Structural Engineering (ISO Metric Series)
- AS 1443 Carbon Steels and Carbon-manganese Steels—Bright Bars
- AS 1480 SAA Concrete Structures Code
- AS 1481 SAA Prestressed Concrete Code
- AS 1530 Methods for the Tests on Building Materials and Structures
  - Part 4—Fire-resistance Test of Structures
- AS 1538 SAA Cold-formed Steel Structures Code
- AS 1554 SAA Code for Welding in Buildings
  - Part 1—Manual Welding
  - Part 2—Automatic and Semi-automatic Welding
  - Part 3—Welding of Reinforcing Steel

\* In course of preparation.

© Copyright — STANDARDS ASSOCIATION OF AUSTRALIA 1980  
 Users of standards are reminded that copyright subsists in all SAA publications. No part of this publication may be reproduced, stored in a retrieval system in any form or transmitted by any means without prior permission in writing of the Standards Association of Australia.

## CONTENTS

	<i>Page</i>		<i>Page</i>
<b>SECTION 1. SCOPE AND GENERAL</b>		<b>SECTION 7. SHEAR CONNECTION</b>	
1.1 Scope .....	4	7.1 Shear Connectors .....	16
1.2 New Materials or Methods .....	4	7.2 Composite Beams with Slabs Incorporating Profiled Steel Sheeting	20
1.3 Design and Supervision .....	4	7.3 Encased Beams .....	20
1.4 Definitions .....	4		
1.5 Notation .....	5	<b>SECTION 8. TRANSFER OF LONGITUDINAL SHEAR IN CONCRETE</b>	
<b>SECTION 2. MATERIALS</b>		8.1 General .....	21
2.1 Structural Steel .....	7	8.2 Composite Beams with Slabs Incorporating Profiled Steel Sheeting	22
2.2 Concrete and Reinforcement .....	7	8.3 Encased Beams .....	22
2.3 Shear Connectors .....	7		
<b>SECTION 3. GENERAL DESIGN PROVISIONS</b>		<b>SECTION 9. CONSTRUCTION</b>	
3.1 Loads and Forces .....	8	9.1 General .....	23
3.2 Design of Concrete Slab .....	8	9.2 Composite Beams with Slabs Incorporating Profiled Steel Sheeting	23
3.3 Design of Composite Beams .....	8		
<b>SECTION 4. FLEXURAL DESIGN BY THE LOAD FACTOR METHOD</b>		<b>SECTION 10. TESTS ON SHEAR CONNECTORS</b>	
4.1 General .....	11	10.1 General .....	24
4.2 Composite Beams with Reinforced Concrete Slabs .....	11	10.2 Test Piece .....	24
4.3 Composite Beams with Slabs Incorporating Profiled Steel Sheeting	12	10.3 Preparation of Test Piece .....	24
4.4 Encased Beams .....	12	10.4 Application of Force .....	25
		10.5 Derivation of Characteristic Strength of Connector from Test Results .....	25
<b>SECTION 5. FLEXURAL DESIGN BY THE WORKING STRESS METHOD</b>		<b>APPENDICES</b>	
5.1 General .....	13	A Ultimate Moment of Resistance for Compressive Stresses in Steel Beam	26
5.2 Composite Beams with Slabs Incorporating Profiled Steel Sheeting	13	B Effect of Transverse Compressive Forces on Transverse Reinforcement	28
<b>SECTION 6. SERVICEABILITY</b>		C Design for Fire .....	29
6.1 General .....	14		
6.2 Yield Under Serviceability Loads .....	14	<b>INDEX</b> .....	30
6.3 Deflection .....	14		
6.4 Vibration of Floors .....	14	<b>RECORD OF AMENDMENTS</b> .....	32
6.5 Ductility .....	15		
6.6 Encased Beams .....	15		

## STANDARDS ASSOCIATION OF AUSTRALIA

**Australian Standard**  
for  
**COMPOSITE CONSTRUCTION IN STRUCTURAL STEEL AND CONCRETE**

**PART 1 — SIMPLY SUPPORTED BEAMS**

**SECTION 1. SCOPE AND GENERAL**

**1.1 SCOPE.** This standard sets out rules for the use of simply supported composite steel beam/concrete slab construction in structures, including applications where the slab incorporates profiled steel sheeting and also where the steel beam is concrete encased. For the purposes of this standard, the concrete slab may be either normal-weight or lightweight concrete as defined in AS 1480.

This standard does not apply to the following structures and materials:

- (a) Dynamically loaded structures.
- (b) Road and railway bridges.
- (c) Material less than 3 mm thick used in the steel beam.
- (d) Steel used in the steel beam for which the value  $F_Y$  used in design exceeds 450 MPa.
- (e) Cold-formed members used as the steel beam other than those complying with AS 1163.

**NOTES:**

1. For the design and construction of composite concrete flexural members, see AS 1480; and of composite prestressed concrete flexural members, see AS 1481.
2. The design and construction of composite slabs using profiled steel sheeting is covered in Part 2 of this standard.\*

**1.2 NEW MATERIALS OR METHODS.** This standard shall not be interpreted to prevent the use of materials or methods of design or construction not specifically referred to herein. If it is desired to seek the opinion of the SAA Committee on Composite Construction as to whether materials other than those specified or methods of design or construction not covered herein, are deemed to comply with the intention of this standard, details of such materials or methods, including relevant test results, shall be submitted to the committee.

NOTE: It may be necessary to seek approval from the appropriate building authority for the use of new materials or methods.

**1.3 DESIGN AND SUPERVISION.**

**1.3.1 Design.** The design of a structure or part of a structure to which this standard is applied shall be the responsibility of an engineer experienced in the design of such structures.

**1.3.2 Supervision.** All stages of construction of a structure or the part of a structure to which this standard is applied shall be adequately supervised

to ensure that all the requirements of the design are satisfied in the completed structure. Supervision shall be the responsibility of either—

- (a) the design engineer,
- (b) the supervising engineer.

**NOTES:**

1. Although the execution or supervision may be delegated to persons who need not necessarily be qualified but nominated by the supervising engineer, Clause 1.3 requires that design and supervision be the responsibility of qualified and experienced persons.
2. Clause 1.3 does not require the design engineer to be also responsible for supervision unless he has been specifically assigned this responsibility. The design engineer and the supervising engineer need not be the same person.

**1.4 DEFINITIONS.**

**1.4.1 General.** For the purpose of this standard, the definitions in Clauses 1.4.2 and 1.4.3 shall apply.

NOTE: Other terms having special meanings are defined in the clause in which they occur.

**1.4.2 Administrative Definitions.**

*Approved* — except as may be otherwise stated approved either by the design engineer or the Building Authority.

*Building Authority* — the body having statutory powers to control the design and erection of the building or structure.

*Contract drawings* — the drawings forming part of the document in which is set out the work to be executed.

*Design engineer* — the engineer responsible for the design.

*Engineer* — a person qualified for Corporate Membership of the Institution of Engineers, Australia.

NOTE: The definition of 'engineer' does not require that an engineer be a Corporate Member of the Institution of Engineers, Australia.

*Supervising engineer* — the engineer responsible for supervision of construction, or his nominated representative.

*Specification* — the specification forming part of the documents in which is set out the work to be executed.

\* In course of preparation.