

**2.3.1 HIGHWAY BRIDGES**

**2.3.1.4 I-GIRDERS**

**GENERAL DESCRIPTION**

Standard prestressed I-beam sections complying with Austroads Bridge Design Code are supplied to highway authorities and local government authorities around Australia.

They are used in conjunction with an insitu deck slab which acts compositely with the girders. The I-section profile produces a pleasing appearance and are suitable for long-span highway bridges, ranging from 13 to 35 m.

They are also versatile in that they may be used in applications like industrial floor supports, or easily increased in width to cater for railway loadings, mining applications and the like, where high shear capacity is required.

**SECTION PROPERTIES**

Property	Type 2	Type 3	Type 4
Span range (m)	13-21	17-27	25-35
Depth, D (mm)	900	1150	1400
Area, A (mm <sup>2</sup> )	218 x 10 <sup>3</sup>	317 x 10 <sup>3</sup>	443 x 10 <sup>3</sup>
I <sub>x</sub> (mm <sup>4</sup> )	19.95 x 10 <sup>9</sup>	49.90 x 10 <sup>9</sup>	105.33 x 10 <sup>9</sup>
y <sub>b</sub> (mm)	415	548	625
Z <sub>t</sub> (mm <sup>3</sup> )	41.1 x 10 <sup>6</sup>	82.9 x 10 <sup>6</sup>	135.9 x 10 <sup>6</sup>
Z <sub>b</sub> (mm <sup>3</sup> )	48.1 x 10 <sup>6</sup>	91.1 x 10 <sup>6</sup>	168.6 x 10 <sup>6</sup>
Mass (t/m)	0.555	0.810	1.130

**COMPONENT DETAILS**

**I-Girders**

Three standard depths are used for bridge work and are designated Type 2, Type 3 and Type 4. General dimensional details are given in *Standard Sections* and properties in *Section Properties*.

Horizontal load transfer at the precast/deck interface is achieved through projecting reinforcement which, together with a roughened top flange, provides the composite action with the deck.

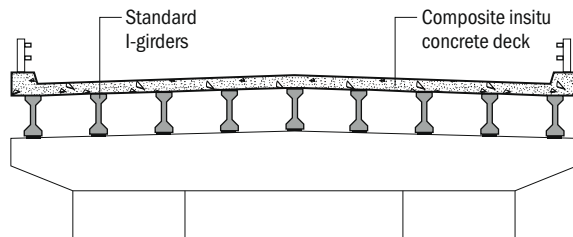
They are usually produced using a Special Class concrete, strength grade S50. Strength at transfer of prestress is usually in the range 32 MPa with a maximum of 37 MPa.

**Deck Concrete**

It is important to use a high-quality concrete in the deck in conjunction with best placing and curing practices. A typical deck concrete is Special Class concrete, strength grade S40.

Typical deck thicknesses range from 160 to 250 mm.

**TYPICAL ARRANGEMENT**



**STANDARD SECTIONS**

NOTE: Type 1 not generally used for bridge work

