

2.3.1 HIGHWAY BRIDGES

2.3.1.5 BROAD-FLANGE GIRDERS

GENERAL DESCRIPTION

Broad-flange girders are precast, prestressed I-beams with wide, extended flanges and nominal 30-mm joints between girders.

They are used in conjunction with a deck slab which acts compositely with the girders. The wide top flanges reduce the amount of formwork required for the insitu deck slab. The bottom flanges, when abutted, produce a flush soffit presenting minimum resistance to flood waters. In cut-and-cover tunnels, they easily achieve high fire-resistance ratings.

When used with bottom flanges abutting they provide simple and speedy erection with minimum formwork and site labour.

Broad-flange girders are suitable for high-shear capacity and long-span applications, ranging from 15 to 30 m.

SECTION PROPERTIES

Property	Type B1	Type B2	Type B3
Span range (m)	15-20	20-25	25-30
Overall depth, D (mm)	865	1000	1220
Area, A (mm ²)	287.40 x 10 ³	384.50 x 10 ³	478.17 x 10 ³
I _x (mm ⁴)	30.47 x 10 ⁹	53.95 x 10 ⁹	103.63 x 10 ⁹
y _b (mm)	438.6	513.9	578.5
Z _t (mm ³)	71.45 x 10 ⁶	110.00 x 10 ⁶	161.54 x 10 ⁶
Z _b (mm ³)	69.46 x 10 ⁶	104.98 x 10 ⁶	179.13 x 10 ⁶
Mass (t/m)	0.735	0.980	1.220

COMPONENT DETAILS

Broad-flange girders

Three standard depths are available and are designated B1, B2 and B3. The three types have slightly different profiles, as shown in *Standard Sections*.

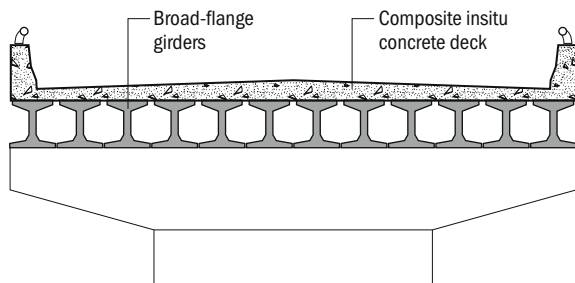
Design flexibility allows for varying road widths and different types of footpaths, for example.

They are usually produced using a Special Class concrete, strength grade S50. Strength at transfer of prestress should be in the range of 32 MPa to 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 ARRANGEMENT



STANDARD SECTIONS

