

DURA[®] I650 – Prestressed Beam

Description

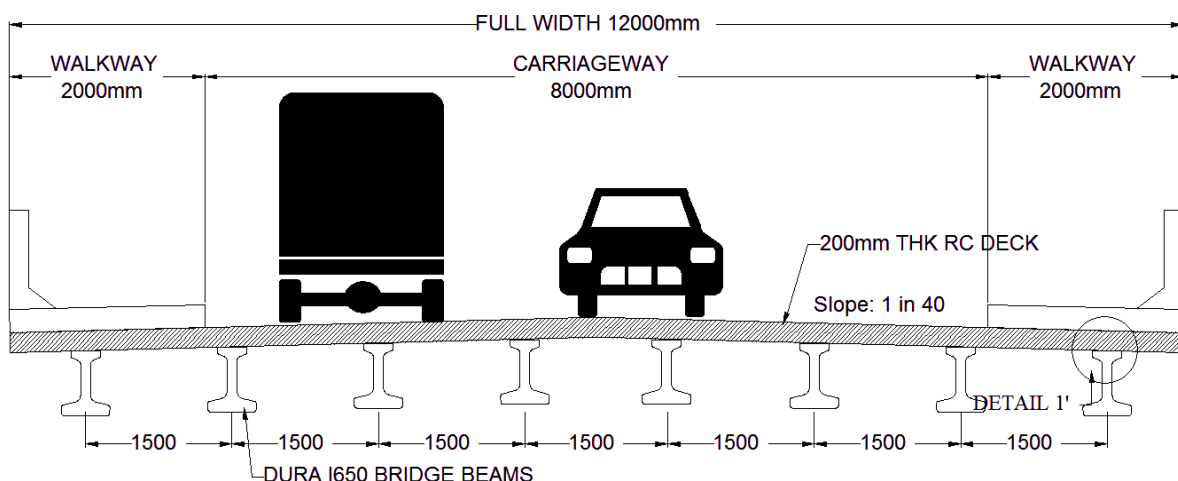
DURA[®] I650 beams are prefabricated using the revolutionary composite material of ultra-high performance concrete and high-carbon-high-tensile steel fibres (UHPdC). It is an excellent solution for bridge engineers looking for a swallow beam solution and high-durability option for beams with a span range of 15 to 20m.

Features

- The UHPdC used for **DURA[®] I650** beam has characteristic compressive strength range between 120 to 140 MPa; characteristic flexural strength of 20 MPa, and characteristic cracking strength of 7.5 MPa.
- **DURA[®] I650** beam is typically prestress to 70~80% of the 'guaranteed' tensile strength of the strands. Strands used are 15.2 mm diameter 7-wire super strands (low relaxation) complying with AS 1311; with a guaranteed tensile load of 250 kN and ultimate breaking load of 270 kN.
- **DURA[®] I650** beam eliminates the used of conventional steel reinforcing bars and stirrups, except at regions where jointing detail are needed during construction. All steel fibres used are made from high carbon steel wires with tensile strength of minimum 2300 MPa.

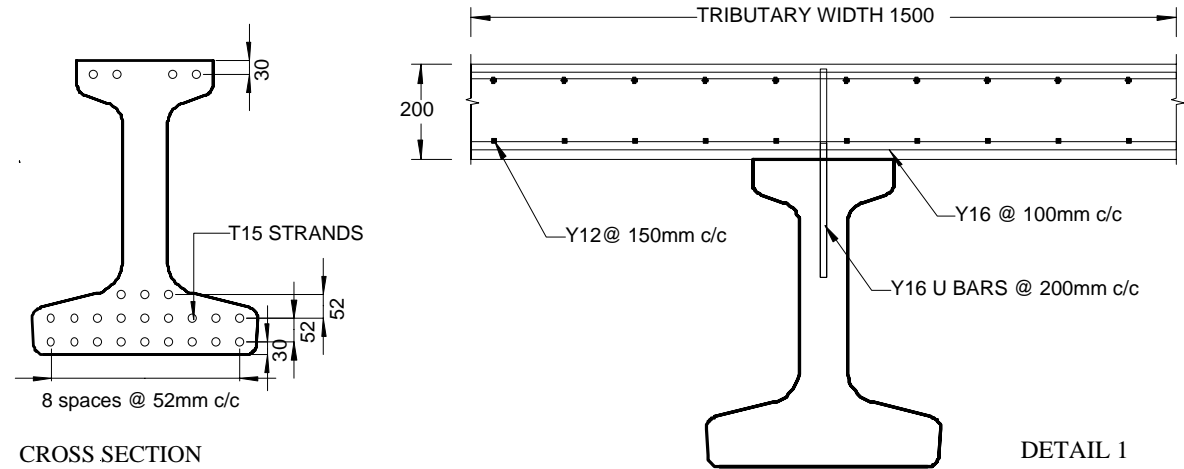
Advantages of DURA[®] I650 Beams

- **DURA[®] I650** beams are highly durable and impermeable. It is therefore suitable for use even in harsh environments.
- Ease of handling/transportation and installation - **DURA[®] I650** beams are significantly thinner in section and at least 50% lighter than conventional beams. This weight efficiency also leads to further optimization of the foundations and support structures; at the same time contributing to a sustainable development regime.
- **DURA[®] I650** can be produced to desired lengths with increments of 0.5 m. Spans outside the indicated range can be considered on request.
- Due to its high durability, high ductility and high fatigue strength, it provides excellent resistance against impact and abrasion loads.



Example of a 12m wide and 20 m single span highway bridge using DURA[®] I650 Beams

DURA[®] I650 Prestress Beam



CROSS SECTION

DETAIL 1

Refer to table 1 for technical data

Table 1: Technical Data for Pre-tension DURA[®] I650 Beam.

		Unit	I650	I650-Bridge
Remark			Non-composited	Composited (Detail 1)
Length	L	m	15 ~ 20	15 ~ 20
Weight	W	kN/m	3.4	10.6
Sectional Area	A _g	x 10 ³ mm ²	147	376.4
Neutral Axis	y _{top}	mm	397	294
	y _{bot}	mm	253	556
Moment of Inertia	I _{xx}	x 10 ⁹ mm ⁴	7.238	30.134
Section Modulus	Z _{top}	x 10 ⁶ mm ³	18.225	102.432
	Z _{bot}	x 10 ⁶ mm ³	28.626	54.215
Web Thickness	B _w	mm	100	100
Depth	D	mm	650	850
Recommended Moment Capacity	φM _u	kN	N/A	2950
Recommended Shear Capacity	φV _u	kN	455	455

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