

2.3.1 HIGHWAY BRIDGES

2.3.1.6 DECK UNITS

1 With Shear Key

GENERAL DESCRIPTION

Rectangular precast, prestressed deck units (also known as *bridge planks*) come in a large variety of sections and arrangements. Each state road authority has a particular unit and reference should be made to the appropriate authority for their details. However, a widely-used system which is standard in both New South Wales, Queensland and Victoria is illustrated here.

These units are used in conjunction with a topping slab which acts compositely with them. The smaller units are solid, but as the depth increases they are voided to reduce dead load and increase structural efficiency. Voids are terminated 450 mm in from each end to produce a solid section for end bearing and support.

They are simple and speedy to erect with minimum formwork and labour requirements. The bottom edges are virtually abutted, producing a flush soffit and presenting minimum resistance to flood waters. In cut-and-cover tunnels, they easily achieve high fire-resistance ratings.

Bridge planks are suitable for short- to medium-span applications, ranging from 7 to 19 m.

COMPONENT DETAILS

Solid and Voided Planks

Seven standard depths are available, each 600 mm wide and with standard shear keys to the upper edges. These and other dimensions are shown in *Standard Sections*.

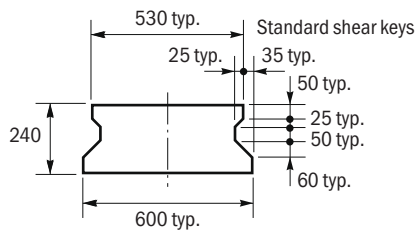
They are produced in standard lengths but other lengths as well as skewed ends can be supplied as required.

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

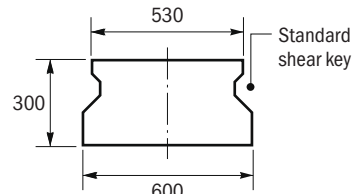
Deck Concrete

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.

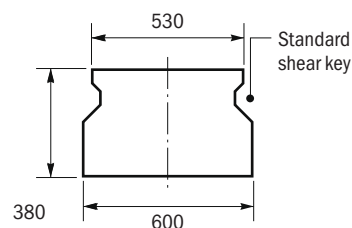
STANDARD SECTIONS



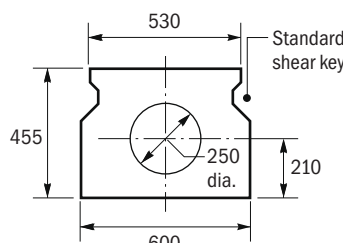
240 DEEP - Solid



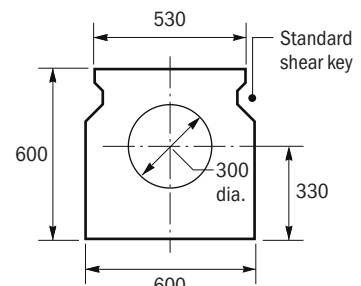
300 DEEP - Solid



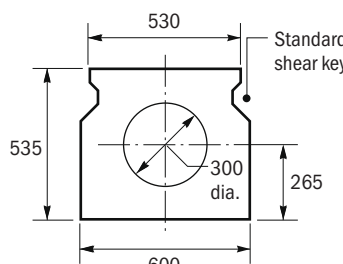
380 DEEP - Solid



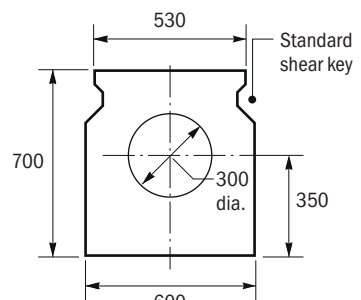
455 DEEP - Voided



600 DEEP - Voided

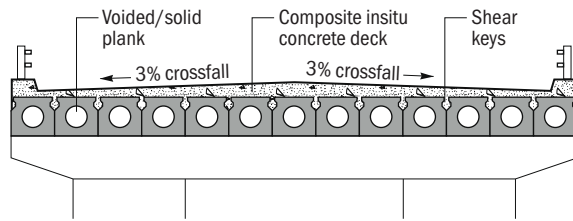


535 DEEP - Voided



700 DEEP - Voided

TYPICAL ARRANGEMENT



SECTION PROPERTIES

Depth (mm)	A (mm ²)	I _x (mm ⁴)	Y _b (mm)	Z _t (mm ³)	Z _b (mm ³)
240	128 525	6.427 x 10 ⁸	116	5.189 x 10 ⁶	5.534 x 10 ⁶
300	164 525	1.254 x 10 ⁹	144	8.047 x 10 ⁶	8.699 x 10 ⁶
380	212 525	2.540 x 10 ⁹	183	1.286 x 10 ⁷	1.391 x 10 ⁷
455	208 437	4.163 x 10 ⁹	221	1.781 x 10 ⁷	1.881 x 10 ⁷
535	234 839	6.700 x 10 ⁹	256	2.405 x 10 ⁷	2.613 x 10 ⁷
600	273 839	9.505 x 10 ⁹	280	2.973 x 10 ⁷	3.392 x 10 ⁷
700	335 640	15.630 x 10 ⁹	338	4.318 x 10 ⁷	4.624 x 10 ⁷

SPAN RANGE AND MASS

Depth (mm)	Standard spans (m)	Mass (kg/m)
240	7 to 8	330
300	9 to 10	420
380	11 to 12	540
455	13	510
535	14 to 16	600
600	17 to 18	700
700	17 to 20	1040

2.3.1 HIGHWAY BRIDGES

2.3.1.6 DECK UNITS

2 Transversely Stressed

GENERAL DESCRIPTION

Hollow rectangular, precast, prestressed deck units that are transversely stressed. These units, generally, do not require an insitu deck except for high skew situations where an insitu concrete deck is used.

The advantage of this system is it is simple and quick to erect. There are also advantages associated with the non-availability of skilled labour or supply of high-quality insitu deck concrete in remote locations.

For most applications, insitu kerbs are used. In short-span applications up to 13 m, standard 350-mm-wide kerb units are used. Insitu kerbs allow for hiding of hog in the units when forming the kerb.

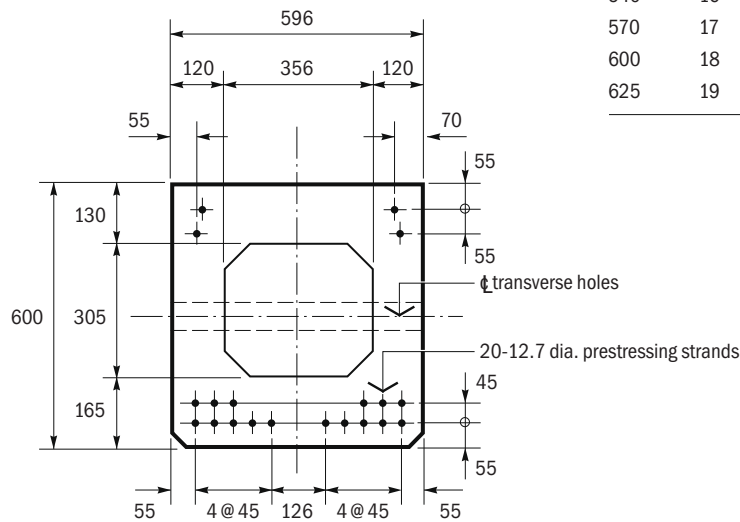
Transversely-stressed deck units are suitable for short- to medium-span applications of 10 to 25 m. Units up to 30 m have been used. This form of construction has advantages of a shallow structure depth in overpass applications.

COMPONENT DETAILS

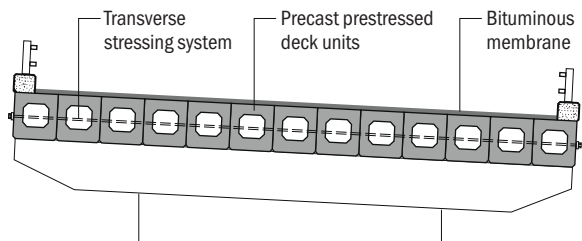
The deck units are typically standardised in one-metre length increments, but length variations and skew can be accommodated at cost.

They are manufactured from S50 concrete with a transfer strength of 40 MPa.

TYPICAL SECTION (600-mm-Deep Unit)



TYPICAL ARRANGEMENT



STANDARD LENGTHS

Depth (mm)	Standard length (m)	Depth (mm)	Standard length (m)
360	10	650	20
390	11	675	21
420	12	700	22
450	13	750	23
480	14	800	24
510	15	850	25
540	16	950	26
570	17	1000	27
600	18	1050	28
625	19		