

# HumeDeck<sup>®</sup> bridge system

Issue 1







## HumeDeck® modular bridge system

The HumeDeck® bridge system is a modular precast solution for bridges spanning 6 m to 12 m. It is suitable for installation onto an existing or new substructure, or can be combined with precast concrete piles, abutments and headstocks to achieve a total precast solution.

Above:  
HumeDeck® bridge system used in a pedestrian overpass application.

Right:  
HumeDeck® modular bridge system utilised in a timber bridges renewal programme.

The HumeDeck® bridge system is a cost effective decking system with fast and simple installation and requires minimal maintenance:

- The deck and girders are combined into one unit to enable efficient design and fast and simple installation. The combined deck and girder unit provides a span from 6 m to 12 m.
- Headstocks and abutments are either fixed to piles or bolted to existing piers for faster installation.
- Minimal longitudinal joints reduce installation time and maintenance requirements.
- It is efficient to transport and handle.
- Site work is reduced as post tensioning of units is not necessary.
- The top surface of the HumeDeck® units have a coarse broom finish which can be used as the road surface without the need for additional concrete topping or asphalt surfacing.



The standard HumeDeck® bridge system has a design life of 100 years, in accordance with the Australian Standard – Bridge Design (AS 5100 – 2004).

Bridge units can be designed to meet site-specific parameters and tolerances and can also incorporate cast-in fittings for the connection of different types and classes of barriers. Kerbs can be precast integrally with the HumeDeck® units or manufactured as separate precast units and bolted to the deck units on site.

# Specifications

## HumeDeck® system components

Figure 1 – A complete HumeDeck® system assembly

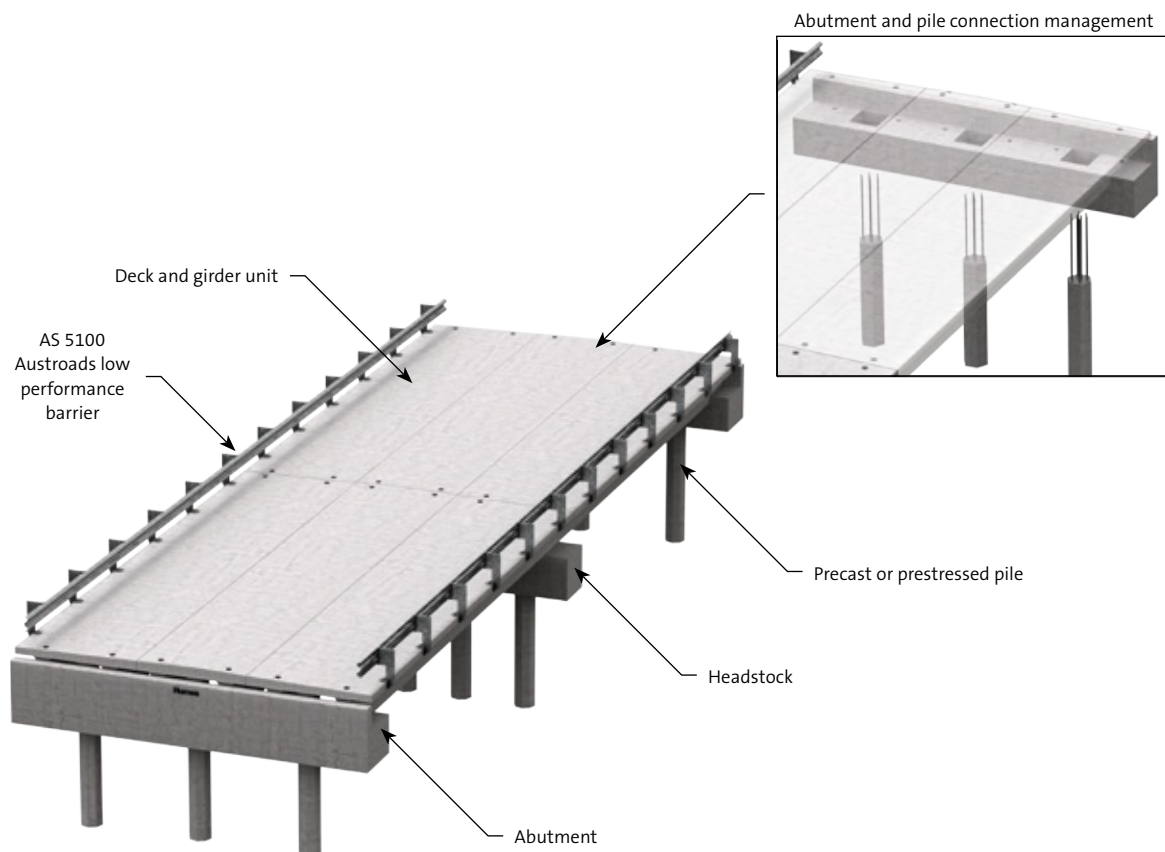


Table 1 – Superstructure components

<b>Deck and girder unit*</b>	<ul style="list-style-type: none"> <li>• Deck and girders are combined into one unit.</li> <li>• Can be produced in spans ranging from 6 m to 12 m.</li> <li>• Cross-sectional dimensions are dependent upon the span and applied design load.</li> <li>• Maximum unit width is 2,700 mm although additional width can be achieved by using an in-situ joint.</li> <li>• Available with and without kerbing.</li> </ul>
<b>Precast kerbs</b>	<ul style="list-style-type: none"> <li>• The deck and girder units can be manufactured with integral or bolt-on kerbs. While continuous kerbing is applicable to some bridges, standard Humes practice is to have non-continuous, slotted kerbing for ease of drainage.</li> <li>• Kerb segments are typically 1,800 mm in length with a 200 mm block-out between each segment.</li> </ul>
<b>Barriers†</b>	<ul style="list-style-type: none"> <li>• Designed to accommodate a variety of barriers that comply with Austroads and AS 5100 standards including AS 5100 low and regular performance barriers, and jersey kerbs.</li> </ul>

Notes:

\* Refer to Figures 2 and 3 on page 3.

† Refer to Figure 4 on page 3.

Figure 2 – Typical deck and girder unit cross-section

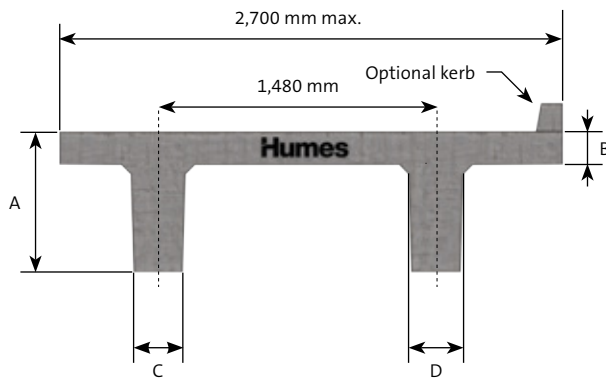


Figure 3 – Cross-section detail of a complete HumeDeck® bridge system

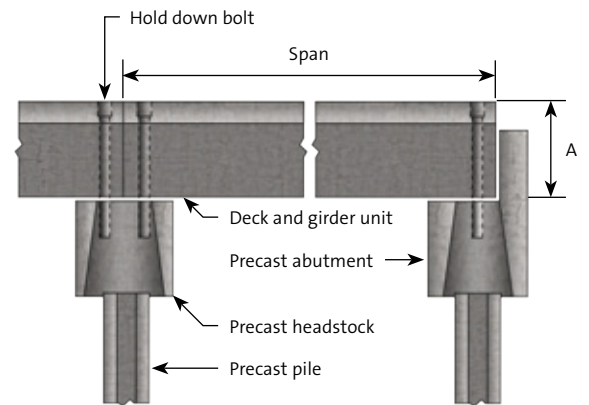


Table 2 – Deck and girder unit cross-sectional dimensions and masses

Span (m)	A (mm)	B† (mm)	C (mm)	D (mm)	Mass for 2.7 m wide deck* (t)
8	550	150 - 180	280	300	15.41
9	650	150 - 180	274	300	18.60
10	725	150 - 180	270	300	21.74
11	825	150 - 180	264	300	25.40
12	900	150 - 180	260	300	29.03

Notes:

1. Refer to Humes Technical Services for decks spanning more than 12 m.
2. \*Mass does not include kerb.
3. †Typical thickness between 150 mm - 180 mm.

Figure 4 – AS 5100 low performance barrier



**Table 3 – Substructure components**

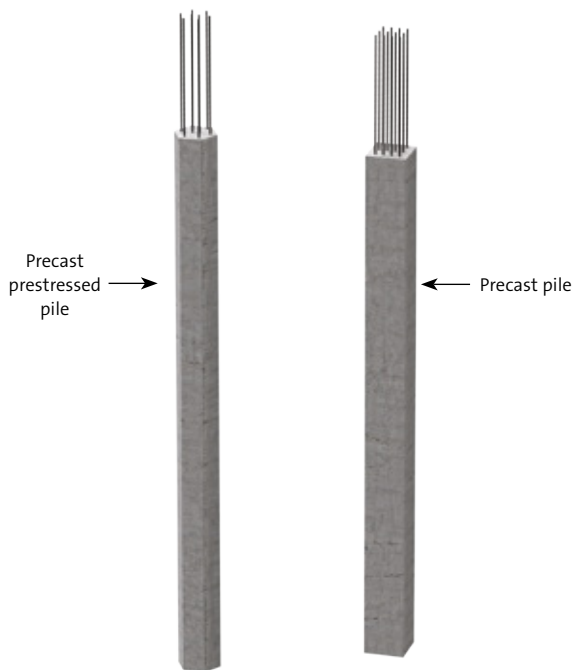
<p><b>Piles*</b></p>	<p>Two types:</p> <ul style="list-style-type: none"> <li>• Rectangular reinforced concrete piles - measure up to 550 mm x 550 mm wide. Piles can be potted or driven.</li> <li>• Prestressed octagonal piles - measure from 400 mm to 550 mm diameter. Both types are designed to be mechanically joined to meet designated length.</li> </ul>
<p><b>Headstock and abutments†</b></p>	<ul style="list-style-type: none"> <li>• Can be installed on newly erected piles or existing piers.</li> <li>• Custom made to fit a variety of traffic profiles and to suit a specific bridge width.</li> <li>• A crossfall can be maintained in one or two directions.</li> </ul>

Notes:

\* Refer to Figure 5.

† Refer to Figure 6.

**Figure 5 – Piles**



**Figure 6 – Abutment**



# Design information

## Footing, abutment and pier design

Humes can provide design services, including foundations, for the bridge substructure. Geotechnical survey and evaluation can also be provided if ordered by the customer.

## Connection to abutments and piers

HumeDeck® units are connected to abutments by Grade 8.8 hold down bolts. Galvanised pipe sections are cast into the units to allow for longitudinal movement at the free end, while restricting lateral movement. At the fixed end, the recess formed by the pipe section is grouted up. The hold down bolts are epoxy grouted into the abutments. Specific hold down bolt details are designed for individual site requirements.

## Longitudinal joints

Where multiple units are placed adjacent to each other to provide the required carriageway width, a longitudinal joint will be required. The longitudinal joint may be either of the following:

1) **Butt joint.** This joint type is detailed with a nominal 10mm gap between units. The joint may be either sealed with a flexible sealant, or left open. Humes can provide a suitable design and detail of a sealed joint upon request.

2) **In situ joint.** The in situ joint is a reinforced concrete joint poured on site, after the units have been placed. The in situ joint provides a continuous concrete running surface across the width of the bridge. The longitudinal joint is reinforced with starter bars protruding from the sides of the HumeDeck® units. With additional longitudinal reinforcement, supplied by Humes, the joint can be completed. All onsite formwork and in situ concrete remains the responsibility of the customer.

## Transverse joint

HumeDeck® units are manufactured with a galvanised channel cast into the ends of the units to prevent spalling of concrete along the transverse joint. Elastomeric sealant is placed between units in adjacent spans and also between end units and abutment walls to seal joints and limit individual units from longitudinal displacement due to braking loads.

## Skewed installations

Skewed bridge structures are assessed individually to establish the appropriate design of HumeDeck® units. Skews in excess of 20° will require additional considerations, and alternatives may be suggested.





# Contact information

National sales 1300 361 601

[humes.com.au](http://humes.com.au)

[info@humes.com.au](mailto:info@humes.com.au)

## Head Office

18 Little Cribb St  
Milton 4064 QLD  
Ph: (07) 3364 2800  
Fax: (07) 3364 2963

## Queensland

**Ipswich/Brisbane**  
Ph: (07) 3814 9000  
Fax: (07) 3814 9014

**Rockhampton**  
Ph: (07) 4924 7900  
Fax: (07) 4924 7901

**Sunshine Coast**  
Ph: (07) 5472 9700  
Fax: (07) 5472 9711

**Townsville**  
Ph: (07) 4758 6000  
Fax: (07) 4758 6001

## New South Wales

**Grafton**  
Ph: (02) 6644 7666  
Fax: (02) 6644 7313

**Newcastle**  
Ph: (02) 4032 6800  
Fax: (02) 4032 6822

**Sydney**  
Ph: (02) 9832 5555  
Fax: (02) 9625 5200

**Tamworth**  
Ph: (02) 6763 7300  
Fax: (02) 6763 7301

## Victoria

**Echuca**  
Ph: (03) 5480 2371  
Fax: (03) 5482 3090

**Melbourne**  
Ph: (03) 9360 3888  
Fax: (03) 9360 3887

## Tasmania

**Launceston**  
Ph: (03) 6335 6300  
Fax: (03) 6335 6330

## South Australia

**Adelaide**  
Ph: (08) 8168 4544  
Fax: (08) 8168 4549

## Western Australia

**Gnangara**  
Ph: (08) 9302 8000  
Fax: (08) 9309 1625

**Perth**  
Ph: (08) 9351 6999  
Fax: (08) 9351 6977

## Northern Territory

**Darwin**  
Ph: (08) 8984 1600  
Fax: (08) 8984 1614



National sales 1300 361 601

[humes.com.au](http://humes.com.au)

[info@humes.com.au](mailto:info@humes.com.au)

#### **A Division of Holcim Australia**

This publication supersedes all previous literature on this subject. As the specifications and details contained in this publication may change please check with Humes Customer Service for confirmation of current issue. This publication provides general information only and is no substitute for professional engineering advice. No representations or warranty is made regarding the accuracy, completeness or relevance of the information provided. Users must make their own determination as to the suitability of this information or any Humes' product for their specific circumstances. Humes accepts no liability for any loss or damage resulting from any reliance on the information provided in this publication. Humes is a registered business name and registered trademark of Holcim (Australia) Pty Ltd (Holcim). "Strength. Performance. Passion." is a trademark of Holcim. HumeDeck is a registered trademarks of Holcim (Australia) Pty Ltd. Swiftlift is a registered trademark of ITW Construction Products Australia Pty Ltd.

© April 2014 Holcim (Australia) Pty Ltd ABN 87 099 732 297. All rights reserved. This guide or any part of it may not be reproduced without prior written consent of Holcim.