

**5 METHODS of ANALYSIS**

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## 5.5 Requirements for Specific Bridge Types

### 5.5.4 Rigid Frame Types and Integral Abutment Types

#### 5.5.4.2 Integral Structures

Design of these structures must take account of the zone of soil/structure interaction behind the abutments, specifically the lateral soil pressure build-up and settlements that will occur in this zone as a result of thermal cycling.

The maximum skew angle for integral abutment designs shall be 30°. Skew angles greater than this shall preclude the use of integral abutment bridge construction.

Design shall follow published design criteria from a recognized source applicable to the type of jointless bridge under consideration.

**Commentary:** *Some suitable design guides are:*

- *BA 42/96 including Amendment No. 1 dated May 2003, [Design Manual for Roads and Bridges](#), ISBN 115524606 [www.tso.co.uk].*
- *Integral Bridges: A Fundamental Approach to the Time-Temperature Loading Problem, George England, David Bush & Neil Tsang, ISBN 0-7277-2845-8.*
- *NJDOT Design Manual for Bridges and Structures, Section 15 – Integral Abutment Bridges.*
- *Ontario Ministry of Transportation, Structural Office Report #SO-96-01, Integral Abutment Bridges*
- *Ontario Ministry of Transportation, Bridge Office Report #BO-99-03, Semi-Integral Abutment Bridges*

*Experience in North America with jointless superstructures of limited backwall height using integral pile-supported end-diaphragms, or semi-integral abutment designs has demonstrated that superstructures of this type may be designed longer than the 60 m limit in BA 42/96, provided that the effects described therein are properly accounted for.*

## 5.7 LIVE LOAD

### 5.7.1 Simplified Methods of Analysis

#### 5.7.1.1 Conditions for Use of Simplified Analysis

Add to Item (i):

Bridges comprised of twin cell Ministry standard concrete box stringers are categorized as multispine bridges that sufficiently meet the conditions for use of the simplified analysis approach.

Add to Table 5.7.1.1 Group (2) Multispine Bridges:

Twin cell Ministry standard concrete box stringers are defined as shear-connected beam bridges with clauses 5.7.1.3, 5.7.1.5 and 5.7.1.8 therefore being applicable.