

5.5.7 Rigid frame and integral abutment types 2

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Add the following paragraphs:

Analysis 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.

Movement calculations shall consider temperature, creep, and long-term pre-stress shortening in determining potential movements at the abutment.

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

The designer shall provide details regarding construction constraints, sequencing of work etc. on the Plans.

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.*
- *England, G.L., Tsang, N.C.M., Towards the Design of Soil Loading for Integral Bridges-Experimental Solution, Imperial College London, 2001*
- *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*
- *Ontario Ministry of Transportation, Structural Office Report #SO-99-04, Performance of Integral Abutment Bridges*
- *The 2005 – FHWA Conference: Integral Abutment and Jointless Bridges (IAJB 2005). 2005. U.S. Department of Transportation, Federal Highway Administration, Washington, DC.*

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.