

NRA ADDENDUM TO

BD 31/01

**THE DESIGN OF BURIED CONCRETE BOX
AND
PORTAL FRAME STRUCTURES**

April 2002

This Addendum supersedes the NRA Addendum dated December 2000 to Standard BD 31/87. The revisions have arisen due to the publication of Standard BD 31/01 dated November 2001, which supersedes BD 31/87.

Standard BD 31/01 – The Design of Buried Concrete Box and Portal Frame Structures – is applicable in Ireland with the following amendments:

GENERAL

1. The Standard provides specification requirements for use in public purchasing contracts. It does not lay down legislation requirements for products and materials used in road construction in Ireland.

2. At several locations:

For: “Overseeing Organisation”
Read: “National Roads Authority”;

For: “MCHW1”
Read: “NRA Specification for Road Works”;

For: “BD 37 (DMRB 1.3)”
Read: “BD 37 (DMRB 1.3.14)”.

SPECIFIC

1. Page 3, Definition of BS 5400 Part 4:
Delete definition and replace with:

“**BS5400 Part 4**” means BS5400 Part 4 as implemented by NRA BD 24 (NRA DMRB 1.3.1) and supplemented by NRA BD 57 (NRA DMRB 1.3.7).”

2. Page 1/1 Paragraph 1.2, line 3:
For: “the Specification for Highway Works (MCHW1).”
Read: “the NRA Specification for Road Works.”

3. Page 1/2, Paragraph 1.5:
Delete Paragraph 1.5 and replace with:

1.5 The Standard should be used forthwith for all schemes for the construction and/or improvement of national roads. The Standard should be applied to the design of schemes already being prepared unless, in the opinion of the National Roads Authority, application would result in significant additional expense or delay progress. In such cases, Design Organisations should confirm the application of this Standard to particular schemes with the National Roads Authority.

4. Page 2/1, Paragraph 2.2, line 3:
For: “as implemented by BD 24 (DMRB 1.3.1) and supplemented by BD 57 (DMRB 1.3.7)”
Read: “as implemented by NRA BD 24 (NRA DMRB 1.3.1) and supplemented by NRA BD 57 (NRA DMRB 1.3.7)”.
5. Page 3/3, Paragraph 3.2.1 (b)(i):
Delete Paragraph 3.2.1(b)(i) and replace with:

“(i) 45 Units of HB loading shall be applied on structures on national roads, including motorways. Unless a higher value is specified by the National Roads Authority or other relevant road authority, 37.5 Units shall be applied on structures on regional roads and 30 Units on structures on other public roads.

6. Page 4/3, Paragraph 4.2.2, line 10:
For: “BA 57 (DMRB 1.3.8).”
Read: “NRA BD 57 (NRA DMRB 1.3.7).”

7. Page 4/6, Paragraph 4.3.7 (a):
Delete Paragraph 4.3.7 (a) and replace with:

“(a) The nominal cover to reinforcement to be used for precast segments shall be in accordance with Table 13 in BS 5400 Part 4 plus 10mm as specified in NRA BD 57 (NRA DMRB 1.3.7).”

8. Page 4/6, Paragraph 4.3.7 (b), line 3:
For: “BD 57 (DMRB 1.3.7).”
Read: “NRA BD 57 (NRA DMRB 1.3.7).”
9. Page 4/6, Paragraph 4.3.8 (a), line 5:
For: “as amended by Interim Advice Note IA.5.”
Read: “as implemented by NRA BD 24 (NRA DMRB 1.3.1).”
10. Page 4/6, Paragraph 4.3.8 (c):
Delete Paragraph 4.3.8 (c) and replace with:

“(c) The fatigue strength tack welded reinforcing bars shall be checked. BA 40 (DMRB 1.3.4) contains advice on checking the fatigue strength.”

11. Page 5/2, Paragraph 5.3, line 3:
For: “Classes 7A and 7B”
Read: “Class 7B”.
12. Page 5/2 Paragraph 5.4, line 7:
For: “Notes for Guidance on the Specification for Highway Works MCHW2.”
Read: “Notes for Guidance on the NRA Specification for Road Works.”

13. Page 5/2, Paragraph 5.7:
Insert new Paragraph 5.7(aa) at the beginning of Paragraph 5.7:

“(aa) The proper sealing of joints between precast members can only be achieved when the gap between adjacent units is within the tolerances of the Specification. The joint sealant shall be compatible with the gaps, including tolerances, between precast units. Suitable measures for the supervision of the construction should be put in place to ensure that the units are placed as accurately as possible to achieve a tight waterproof seal in the joint between adjacent units. Tolerances in the geometry of the precast units must also be maintained to prevent cumulative development of gaps between units over the length of the structure.”

14. Page 5/3, Paragraph 5.8:
Insert new Paragraph 5.9 after Paragraph 5.8:

“5.9 FISH AND WILDLIFE

The advice of the local fisheries authority on culverts carrying streams or rivers under roads or urban areas should be sought. Their guidelines are based on maintaining access through the culvert for anglers, walkers, authority officials and wildlife; and minimising the gradient to reduce the velocity, thereby allowing fish to migrate upstream. A natural stream bed should be provided within the culvert to provide a natural habitat and create flow disturbance. Screening the entrance or exit of a culvert should not be undertaken, as the debris caught blocks the discharge and prevents clear passage for the fish: it is also illegal. Water-borne stones can be prevented from carrying through the culvert by the addition of a drop inlet or catchpit.”

15. Page 6/1, Sections 6.1 and 6.2:
Delete Sections 6.1 and 6.2 and replace with:

“6.1 DESIGN MANUAL FOR ROADS AND BRIDGES

Volume 1:

NRA BD 2: Technical Approval of Structures on Motorways and other National Roads (NRA DMRB 1.1.1A)

NRA BD 24: Design of Concrete Road Bridges and Structures: Use of BS 5400 Part 4: 1990 (NRA DMRB 1.3.1)

BD 28: Early Thermal Cracking of Concrete (DMRB 1.3)

BD 37: Loads for Highway Bridges (DMRB 1.3.14)

NRA BD 57: Design for Durability (NRA DMRB 1.3.7)

BA 40: Fatigue Strength of Tack Welded Reinforcing Bars (DMRB 1.3.4).

Volume 2:

BD 74; Foundations: Use of BS8004: 1986 (DMRB 2.1.8).

Volume 10: Environmental Design

6.2 NRA MANUAL OF CONTRACT DOCUMENTS FOR ROAD WORKS

Volume 1: Specification for Road Works

Volume 2: Notes for Guidance on the Specification for Road Works.”

16. Page 7/1, Chapter 7:
Delete text and replace with:

“7.1 All technical enquiries or comments on this Standard should be sent in writing to:

Head of Project Management and Engineering
National Roads Authority
St Martin’s House
Waterloo Road
Dublin 4”.

17. Page E/1, Paragraph E.2:
Delete Paragraph E.2 and replace with:

“E.2 Precast segmental buried concrete box type structures are normally proprietary products. The procedures to be followed when specifying a proprietary manufactured structure are described here.”
18. Page E/1, Paragraph E.3, line 2:
For: “an Outline Approval in Principle (O/AIP), as part of the Technical Approval/Technical Appraisal procedure, described in BD 2 (DMRB 1.1),”
Read: “a Preliminary Report in accordance with NRA BD 2 (NRA DMRB 1.1.1A),”.
18. Page E/1, Paragraph E.3, line 9:
Delete sentences in brackets “(Note: Currently BD 2 is not...Northern Ireland.)”.
19. Page E/1, Paragraph E.4, line 3:
For: “the AIP form”
Read: “a Preliminary Report”.
20. Page E/1, Paragraphs E.5 and E6:
Delete Paragraph E.5 and replace with:

“E.5 The further stages in the post award contract procedures, including the requirements for the submission of documents, are described in NRA BD 2 (NRA DMRB 1.1.1A).

E.6 (Not used)”



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E O'CONNOR
Head of Project Management and
Engineering