

**INTERIM ADVICE NOTE 44/02 (IAN 44/02)
(REVISION 1)**

**INTERIM REQUIREMENTS FOR ROAD
RESTRAINT SYSTEMS
(VEHICLE & PEDESTRIAN)**

SUMMARY

This Interim Advice Note provides information and guidance on changes to the provision and procurement process in relation to Road Restraint Systems to ensure compliance with European Standard BS EN 1317.

INSTRUCTIONS FOR USE

This IAN which takes immediate effect supersedes IAN 44/02 issued in August 2002

INTERIM ADVICE NOTE 44/02 (IAN 44/02) (REVISION 1)

INTERIM REQUIREMENTS FOR ROAD RESTRAINT SYSTEMS (VEHICLE & PEDESTRIAN)

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INTERIM REQUIREMENTS FOR ROAD RESTRAINT SYSTEMS (VEHICLE & PEDESTRIAN)

1 Introduction

1.1 This Advice Note, which takes immediate effect (see Section 3 below), provides guidance on changes to the provision and procurement process in relation to Road Restraint Systems (RRS) (i.e. safety barriers [deformable or rigid], vehicle and pedestrian parapets, pedestrian guardrails, crash cushions, arrester beds and anti-glare screens) to ensure compliance with European Commission requirements for RRS as set out in BS EN 1317 (Parts 1 to 4 as published and Parts 5 and 6 currently available as Drafts). The introduction of the various parts of BS EN 1317 ensures a consistent performance based Standard is used in the testing, manufacture and supply of RRS throughout the European Economic Area and will thereby remove any 'barriers to trade'.

1.2 A review of the requirements for RRS is currently taking place and consequently it is not possible to formally issue a new Standard setting out HA's requirements at present. Until such time therefore as a new Standard is introduced, a document entitled 'Interim Requirements for Road Restraint Systems (Vehicle and Pedestrian)' (IRRRS) has been produced which gives 'Containment Performance Class' and 'Working Width' requirements and design and guidance criteria for the provision of RRS. It includes permanent and temporary safety barriers, vehicle parapets, terminals and transitions between different types of safety barriers and vehicle parapets, pedestrian parapets, pedestrian guardrails, crash cushions, arrester beds and anti-glare screens. The IRRRS replaces those Standards listed in Section 2 below, either wholly or in part and is to be implemented in accordance with Section 3.

1.3 BS EN 1317 is a performance based Standard which requires Design Organisations to specify the required Performance Class of a Safety Barrier, Vehicle Parapet and associated Transitions / Terminals and Crash Cushions for a particular location. Design Organisations must not now specify the use of any specific Safety Barrier or Vehicle Parapet etc. but instead requirements shall be expressed in terms of 'Containment Performance Class' and 'Working Width'. Contractors will be allowed to propose for review / acceptance any validated Safety Barrier, Vehicle Parapet or Crash Cushion that complies with relevant parts of BS EN1317 and for Transitions / Terminals DD ENV 1317-4 and the 'Containment Performance Class' 'Working Width' and 'Lateral Displacement Zone' criteria specified in the contract.

1.4 One option available to Contractors will be to choose from the existing safety barrier systems (deformable and rigid) that have been developed and used extensively in the UK for many years; details of which are contained in a document entitled 'Non-Proprietary Safety Barrier Systems' (NPSBS). Road Vehicle Restraint Systems proposed by Contractors (including the systems contained in NPSBS) shall be subject to acceptance prior to use on a scheme specific basis. The acceptance process is outlined in Section 5 below.

2 Withdrawal / Amendment of Standards

2.1 For those works defined in Section 3 of this IAN, existing vehicle and pedestrian restraint DMRB Standards, Advice Notes, various parts of the MCHW and IAN's etc. as listed in Appendix 1 attached, are either, subject to paragraph 2.2 below, amended or withdrawn from use immediately, either totally, or in part, as indicated. For withdrawn documents the corresponding replacement document is listed in Appendix 1.

2.2 For all road vehicle restraint system work outside the scope of Section 3 paragraph 3.1 below then those Standards and Advice Notes etc. referred to as being either amended or withdrawn in paragraph 2.1 above shall still apply.

3 Implementation

3.1 The IRRRS document is to be used with immediate effect on new contracts as follows: -

- On Targeted Programme of Improvement Schemes (TPI's);
- All other new highway work and
- All Maintenance Renewal Schemes (total value over £100,000) where there are significant lengths of Road Vehicle Restraint Systems
- All Maintenance Renewal Schemes where there are obsolete lengths of Road Vehicle Restraint Systems

3.2 The only exceptions are minor maintenance Safety Barrier and Vehicle Parapet replacement works (e.g. accident damage), schemes already under construction and those currently being prepared where this would result in significant additional cost or delay.

3.3 If in doubt Design Organisations / Agents should seek guidance from their Traffic Operations Directorate (TOD) or Major Projects Directorate (MPD) Project Sponsor, as applicable, on a scheme specific basis.

4 Bringing IRRRS into Effect - Formal Application to Use IRRRS

4.1 Until such time as new Standards etc. are introduced to replace those that have been withdrawn, formal application to use the IRRRS will be required from Design Organisations / Agents on a scheme specific basis. Such application shall be made by means of a Departure from Standard for 'aspects not covered by Standard' submitted directly to the appropriate TOD or MPD Project Sponsor as applicable.

4.2 This procedure is to be followed to ensure that all work involving IRRRS is accepted and recorded for audit and reporting purposes.

4.3 In addition any departure from the requirements of IRRRS shall require a Departure from Standard submission for 'aspects not covered by

Standard' submission from the Design Organisations / Agents to the TOD or MPD Project Sponsor as applicable.

5 Formal Application to Use Proprietary Road Vehicle Restraint Systems and NPSBS

5.1 Contractors will now be allowed to formally propose, in accordance with the contract, any Safety Barrier, Vehicle Parapet or Crash Cushion that complies with the relevant parts of BS EN 1317 and for Transitions / Terminals DD ENV 1317 and the 'Containment Performance Class', 'Working Width' and 'Lateral Displacement Zone' requirements specified in the contract. Once the proposals are received by Design Organisations / Agents they shall be submitted to TOD or MPD as applicable for review / acceptance. TOD or MPD shall process the submission as follows:

1) Road Vehicle Restraint Systems Listed in Appendix 2 attached.

These systems can be accepted, for the Containment Performance and Working Width Classes shown, without recourse to a Departure from Standard submission.

2) Road Vehicle Restraint Systems which require a Departure from Standard for 'aspects not covered by Standard' submission by means of DAS .

The following require a Departure from Standard for 'aspects not covered by Standard' submission to DAS:

i) Vehicle Parapet Systems contained in Appendix 3

These systems replace those listed in Appendix F of BS 6779 Part 1, which has been withdrawn by BSI.

ii) Safety Barrier Systems and associated Transitions and Terminals contained in Appendix 4

iii) Road Vehicle Restraint Systems that depart from the manufacturers specifications

Such proposals will need to be supported by a manufacturers declaration confirming that the changes are acceptable. The departure submission will need to be carefully considered and this may take time depending on the exact nature of the departure presented.

iv) Any other Road Vehicle Restraint System not included in Appendix 2, 3 and 4 of this Interim Advice Note 44/02.

These proposals will only be considered if they are accompanied by the information specified in Appendix 5, duly completed in support of the submission and confirming product

compliance with BS EN1317. The departure submission will need to be carefully considered and this may take time depending on the exact nature of the departure presented.

The Contractor shall be promptly notified of the decision taken in accordance with the timescales allowed under the contract:

5.2 A flowchart of the above procedure is provided for guidance in Appendix 6.

5.3 In order to keep the number of Departure from Standard submissions to a minimum a single submission will be permitted for use of the same type of Road Vehicle Restraint System, where this is proposed by a Contractor at a number of different locations on any one scheme. In so doing however the exact location of each Road Vehicle Restraint System will need to be defined on the submission to enable each to be entered into DAS on a location specific basis.

6 Incorporation into Contract Documents

6.1 A set of general guidance notes on incorporating IRRRS requirements into contract documents is attached for information purposes (see Appendix 7).

Should any further guidance or advice be required, this should be sought from either TOD or MPD's Project Sponsor as applicable.

7 Copies of IRRRS and NPSBS

7.1 Copies of IRRRS and NPSBS are available on CD only upon request (by email only) to HA.IRRRS@Highways.gsi.gov.uk

7.2 To ensure copies are despatched promptly please provide details of the scheme for which the IRRRS and or NPSBS are required together with full Company name and address.

7.3 IRRRS and NPSBS will be controlled documents so any future revisions will be made available to HA staff and known external recipients of the document.

8 Contact for Technical Queries

8.1 All technical queries on IRRRS should be directed by email to Daniel Ruth in the Risk Management and Vehicle Restraint (RMVR) Team of Safety Standards and Research (SSR) at the following address:

daniel.ruth@highways.gsi.gov.uk

List of Documents to be Withdrawn / Amended

Standard / Advice Note etc.	Title	Source	Aspect	Replace -ment Document
TD 19/85 (Plus Amendments 1 & 2)	Safety Fences and Barriers	DMRB 2.2.8	Totally withdrawn	IRRRS
TD 32	Wire Rope Safety Fence	DMRB 2.2.3	Totally withdrawn	IRRRS
TA 45	Treatment of Gaps in Central Reserve Safety Fences	DMRB 2.2.8	Totally withdrawn	IRRRS
TA 57	Roadside Features	DMRB 6.3	Chapter 4 - Totally withdrawn Chapter 5 - Totally withdrawn Chapter 6 - Totally withdrawn	IRRRS
BA 48	Pedestrian Protection at Headwalls, Wingwalls and Retaining Walls	DMRB 2.2.2	Totally withdrawn	IRRRS
BD 52	The Design of Highway Bridge Parapets	DMRB 2.3.3	Totally withdrawn	IRRRS
BD 51	Design Criteria for Portal and Cantilever Sign/Signal Gantries (Part only)	DMRB 2.2.4	<p>Replace para. 2.14 with: “Vehicle restraint systems in accordance with Overseeing Organisations’ requirements shall be provided at gantry supports.”</p> <p>Replace first sentence of para. 4.21 with: “The horizontal dimensional clearances of the structures and safety fences and barriers shall be in accordance with IRRRS & TD27 (DMRD 6.1). The clear headroom under the gantry shall be 5,700mm minimum.”</p> <p>Remove “BD 52 Design of highway bridge parapets (DMRB 2.3.3)” from Section 8.1</p> <p>Remove “BS6779: Parapets for vehicle containment on highways, Parts 1 and 2: 1992 and 1991” from Section 8.4</p>	This Appendix & IRRRS

List of Documents to be Withdrawn / Amended

Standard / Advice Note etc.	Title	Source	Aspect	Replace -ment Document
			Figure 2	See Appendix 1a attached to this IAN 44/02 (Rev 1)
SD 1/98	Implementation of Specification for Highway Works and Notes for Guidance	MCHW 0.2.1 (Volume 0 Binder 0b)	<p>Annex A – Table on page A/1. Amend as follows: Delete ‘Safety fences’ and corresponding entries in columns 1, 2, 4, and 7 of row 2.</p> <p>In row 9 column 1 delete ‘Metal bridge parapets’ and replace with ‘Bridge parapets’.</p> <p>In row 9 column 1 delete ‘Metal parapet anchorages’ and replace with ‘Parapet anchorages’.</p> <p>Delete 2200 (twice) in column 2 row 9 and replace with 400 (twice).</p> <p>Delete *a of column 4 of row 9 and replace with **a</p> <p>Key: ** delete ‘for alternatives to those listed in Clause 401 of the SHW’</p>	Amend as per this Appendix
SA1/01	Lists of Approved /Registered Products	MCHW 0.3.1 (Volume 0 Binder 0b)	Annex B – Those aspects concerning Safety Fences and Barriers on page B/1 and Wire Rope Safety Fence on page B/2	See Appendix 2 attached to this IAN 44/02 (Rev 1)
Specification for Highway Works	Safety Fences, Safety Barriers and Pedestrian Guardrails	MCHW Volume 1	Series 400 Totally withdrawn	New Series 400 contained in Annex A to IRRRS
Specification for Highway Works	Parapets	MCHW Volume 1	Series 2200 withdrawn	New Series 400 contained in Annex A to IRRRS
Notes for Guidance on the Specification for Highway Works	Miscellaneous	MCHW Volume 1 Page 6	Series 2600 - Table 26/1: Concrete for Ancillary Purposes.	Contained in Annex A to IRRRS
Notes for Guidance on the Specification	Appendix A	MCHW Volume 1 Page 1	Appendix A – Quality Management Schemes – Table A/1	Amend as per this Appendix

List of Documents to be Withdrawn / Amended

Standard / Advice Note etc.	Title	Source	Aspect	Replace -ment Document
Specification for Highway Works		Page 1	Amend as follows: In row 5 column 6 insert '√' In row 13 column 1 delete all entries for 2200	Amend as per this Appendix
		MCHW Volume 1 Page 4	In row 3 column 2 delete '2200'	Amend as per this Appendix
Notes for Guidance on the Specification for Highway Works	Appendix B	MCHW Volume 1 Page 2	Appendix B - Product Certification Schemes. Amend as follows: In row 20 column 3 delete '400'	Amend as per this Appendix
Notes for Guidance on the Specification for Highway Works	Appendix C	MCHW Volume 1 Page 2F	Appendix C - Certification for Proprietary Products Amend as follows: In row 15 column 2 delete '2203' and replace with '407,	Amend as per this Appendix
Notes for Guidance on the Specification for Highway Works	Appendix E	MCHW Volume 1 Page 1F	Appendix E - Type Approval/Registration Amend as follows: In row 6 column 1, 2 and 3 delete all entries for Safety fences and barriers	Amend as per this Appendix
Notes for Guidance on the Specification for Highway Works	Appendix F	MCHW Volume 1 Page 2	Appendix F - Publications Referred to in the Specification. Amend as follows: Entries for BS 4, in column 2 and 3 delete 'Part 1. Specification for hot-rolled sections and 402'	Amend as per this Appendix
		Page 8	In row 33 column 3 delete '403'	Amend as per this Appendix
Notes for Guidance on the Specification for Highway Works	Appendix F	MCHW Volume 1 Page 10	Appendix F - Publications Referred to in the Specification Amend as follows: In row 33 column 3 delete '402' In row 36 and 37 column 3 delete '402 and 403' and replace with '407' (see Annex A IRRRS)	Amend as per this Appendix

List of Documents to be Withdrawn / Amended

Standard / Advice Note etc.	Title	Source	Aspect	Replace -ment Document
		Page 12	Delete all entries for BS 2763	Amend as per this Appendix
		Page 13	Entries for BS 3019, in column 3 delete '2204'	Amend as per this Appendix
		Page 15	Entries for BS 4320, in column 3 delete '402 and 403' and replace with '407' (see Annex A IRRRS)	Amend as per this Appendix
		Page 16	Entries for BS 4449, in column 3 delete '402'	Amend as per this Appendix
		Page 17	Delete all entries for BS 4848	Amend as per this Appendix
		Page 18	Entries for BS 5080, in column 3 delete '2208' and replace with '404' (see Annex A IRRRS)	Amend as per this Appendix
		Page 21	Entries for BS 6105, in column 3 delete '402 and 403' and replace with '406' (see Annex A IRRRS) Delete all the entries for BS 6579	Amend as per this Appendix
Notes for Guidance on the Specification for Highway Works	Appendix F	MCHW Volume 1 Page 22	Appendix F - Publications Referred to in the Specification Amend as follows: Entries for BS 6779, in column 3 delete '2202, 2203, 2204, 2207 and 2208' and replace with '401, 406, 407, 410 and 411' (See Annex A of IRRRS)	Amend as per this Appendix
		Page 23	Delete all the entries for BS 7475	Amend as per this Appendix
		Page 24	Entries for BS 7669, in column 3 delete '403	Amend as per this Appendix

List of Documents to be Withdrawn / Amended

Standard / Advice Note etc.	Title	Source	Aspect	Replace -ment Document
		Page 25	column 3 delete '403, 405, 406, 407, 408, 409, and 410' Entries for BS 7818, in column 3 delete '2202' Delete all the entries for BS 8118 Entries for BS EN 288-3, in column 3 delete '2204' Entries for BS EN 288-4, in column 3 delete '2204'	Amend as per this Appendix
		Page 26	Entries for BS EN 1461, in column 3 delete '402' and '403'	Amend as per this Appendix
		Page 27	Entries for BS EN 10 025, in column 3 delete '402 ' Delete all the entries for BS EN 10 029	Amend as per this Appendix
Notes for Guidance on the Specification for Highway Works	Appendix F	MCHW Volume 1 Page 32	Delete all the entries for ISO 898-1 (BS EN ISO 898-1) Entries for ISO 4016, in column 3 delete '402 ' and replace with '407'(See Annex A of IRRRS) Entries for ISO 4018, in column 3 delete '402 ' and replace with '407' (See Annex A of IRRRS) Entries for ISO 4034, in column 3 delete '402 ' and replace with '407' (See Annex A of IRRRS)	Amend as per this Appendix
		Page 34	Appendix F - Publications Referred to in the Specification Amend as follows: Entries for item (vi), in column 4 delete '2202'	Amend as per this Appendix

List of Documents to be Withdrawn / Amended

Standard / Advice Note etc.	Title	Source	Aspect	Replace -ment Document
		Page A7	In row 50 column 4 delete ‘Safety Fences and Barriers’ and replace with ‘Annex A of IRRRS’ In row 51 column 2, 3 and 4 delete ‘(, 4/2, Pedestrian Guardrails’ In row 12 column 4 delete title ‘PARAPETS’ In row 13 column 2,3 and 4 delete ‘(Co) (, 22/1 and Parapet Schedule’	Amend as per this Appendix
Notes for Guidance on the Specification for Highway Works	Preliminaries	MCHW Volume 2 Page 15	Series NG100 – Table NG1/1 Typical Testing Details	See Annex A IRRRS
Notes for Guidance on the Specification for Highway Works	Preliminaries	MCHW Volume 2 Page 43 Page A13	Series NG100 – Table NG1/1 Typical Testing Details Series NG000 – NG Sample Appendix 13: Programme of Works Amend as follows: Add new item under Schedule of Constraints ‘ (xi) Submission by the Contractor of Road Restraints System for acceptance, including awaiting acceptance, and resubmissions.	See Annex A of IRRRS Amend as per this Appendix
Notes for Guidance on the Specification for Highway Works	Safety Fences, Safety Barriers and Pedestrian Guardrails	MCHW Volume 2	Series NG400 withdrawn	New Series NG400 Notes for Guidance contained in Annex A to IRRRS

List of Documents to be Withdrawn / Amended

Standard / Advice Note etc.	Title	Source	Aspect	Replace-ment Document
Notes for Guidance on the Specification for Highway Works	Parapets	MCHW Volume 2	Series NG2200 withdrawn	New Series NG400 Notes for Guidance contained in Annex A to IRRRS
Notes for Guidance on the Specification for Highway Works	Annex 1	MCHW Volume 2 Page 3	Annex 1 - Publications Referred to in the Notes for Guidance Amend as follows: In row 12 column 3 delete '2204' and replace with '408' In row 26 column 3 delete '2204' and replace with '408'	Amend as per this Appendix
Notes for Guidance on the Specification for Highway Works	Annex 1	MCHW Volume 2 Page 7	Annex 1 - Publications Referred to in the Notes for Guidance Amend as follows: In row 42 column 2 delete '1992' and replace with '1998' In row 44 to 47 column 3 delete '2201,2202, 2204 and NG Sample Appx 22/1' and replace with '408'	Amend as per this Appendix
		Page 8	In row 1 to 4 column 2 and 3 delete all entries	Amend as per this Appendix
		Page 9	In row 12 column 3 delete '2204' and replace with '408' In row 15 column 3 delete '2204'	Annex A of IRRRS)
		Page 15	Row 17 and 18 column 1,2 and 3 delete all the entries for BD 52	Amend as per this Appendix
Highway Construction Details	Safety Fences and Barriers	MCHW Volume 3	Section 2 withdrawn	NPSBS

List of Documents to be Withdrawn / Amended

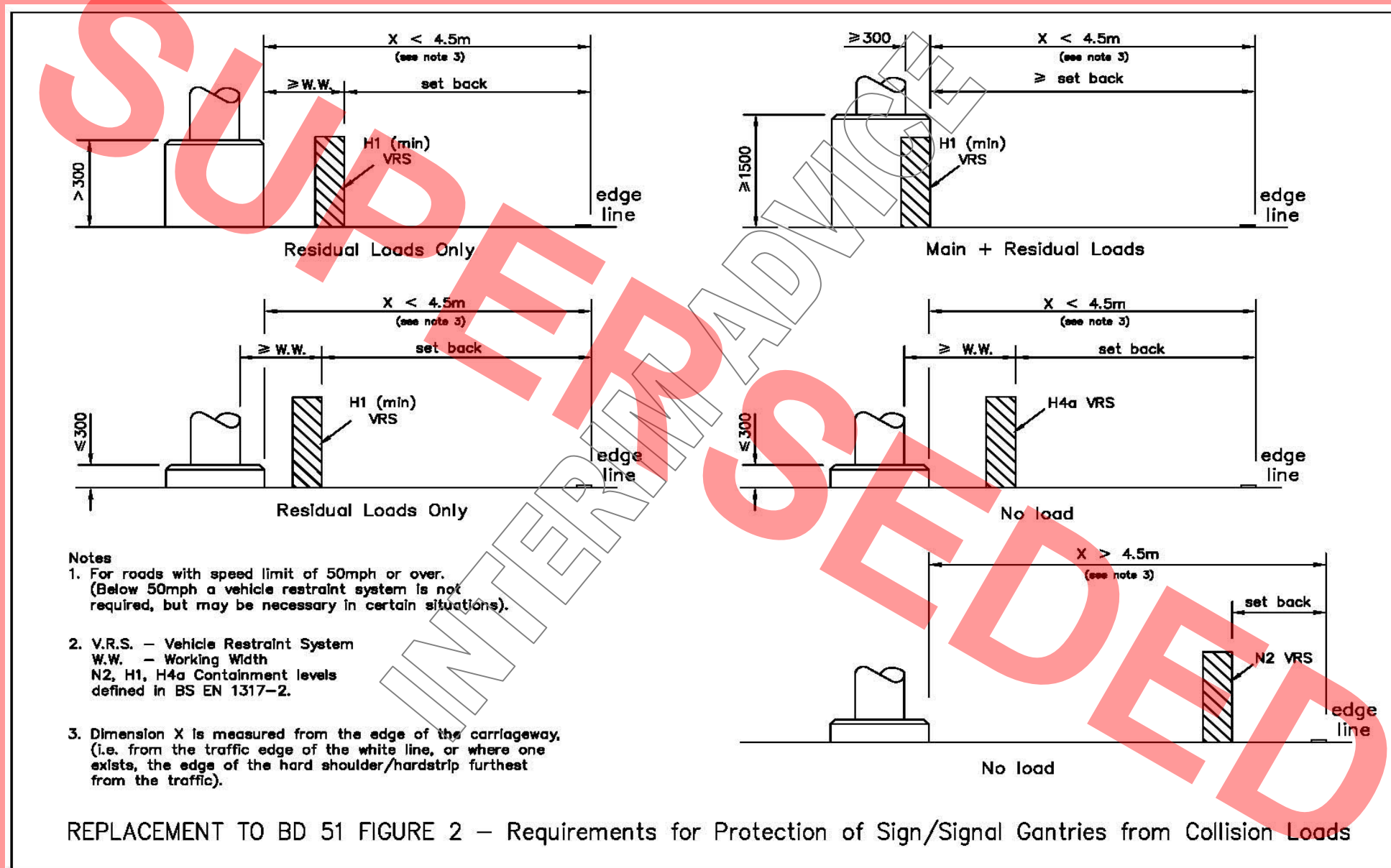
Standard / Advice Note etc.	Title	Source	Aspect	Replace-ment Document
Bills of Quantities for Highway Works	Method of Measurement (part only) Notes for Guidance (part only) Library of Standard Item Descriptions for Highway Works (part only)	MCHW Volume 4	Method of Measurement (MOM) Series 200 (part only) Series 400 and Series 2200 Notes for Guidance (NG) Series 400 and Series 2200 Library of Standard Item Descriptions (LSID) for Highway Works Series 400 and Series 2200	MoM, NG and LSID contained in Annex A to IRRRS.
IAN 14/98	Use of Crash Cushions	CHE Memo 48/98	Totally withdrawn	IRRRS
Interim Amendment 1/99	Various amendments to Volume 1 & 2 MCHW	CHE Memo 81/99	Totally withdrawn	New Series 400 and Series 400 Notes for Guidance contained in Annex A to IRRRS
IAN 24	Use of Temporary Barriers at Roadworks	CHE Memo 63/98	Totally withdrawn	IRRRS
IAN 26	TD19/85 Safety Fences and Barriers	CHE Memo 68/99	Totally withdrawn	IRRRS
IAN 34	Use of "Varioguard" Temporary Safety Barriers at Roadworks	CHE Memo 68/99	* Document totally withdrawn in IAN 44/02 – reinstated in this IAN 44/02 (Rev 1)*	N/A
CHE Memo 24/95	Motorway Widening Cross-Section and Layout	CHE Memo 24/95	The following aspects are affected by IRRRS: - Paragraph 2.5, 2.22, Table 1, and Figures 1,2 and 3.	Amend as per this Appendix
CHE 113/02	Introducing Interim Advice Note 44/02 - Interim Requirements for Road Restraint Systems (Vehicle and Pedestrian)	CHE 113/02	Totally withdrawn	CHE 127/03

Key: IRRRS = Interim Requirements for Road Restraint Systems
NPSBS = Non-Proprietary Safety Barrier Systems

List of Documents to be Withdrawn / Amended

Note:

- 1) All references made within DMRB and MCHW to the withdrawn documents listed above shall refer instead to the appropriate replacement document shown.
- 2) The documents listed above are only withdrawn / amended for the works defined in Section 3 of IAN 44/02.
- 3) Whilst every care has been taken in compiling the above list it should not be considered exhaustive. If it is thought that a particular document, or part thereof, has inadvertently been omitted then please bring to the attention of Daniel Ruth at the following email address:
daniel.ruth@highways.gsi.gov.uk



SAFETY BARRIERS

REPLACEMENT FOR SA1/01 ANNEX B **LISTS OF APPROVED / REGISTERED PRODUCTS** **PAGES B1 and B2 - SAFETY FENCES AND BARRIERS**

SUMMARY

This document lists products which have obtained Highways Agency approval for meeting the requirements of EN 1317 in order that they can be used in the construction of trunk roads.

SAFETY BARRIERS

Approved Designs:	Page:
Brifen 4 Rope Wire Rope Safety Fence	A2.3 - A2.4
Brifen 3 Rope Wire Rope Safety Fence	A2.5
Asset International Varioguard Safety Barrier	A2.6 - A2.7
Highway Care Barrierguard 800	A2.8
Marshalls Delta Bloc 80	A2.9
Sistema Steelgard Barrier	A2.10

SAFETY BARRIERS

Brifen 4 Rope Wire Rope Safety Fence

Approved design:

Brifen 4 Rope Wire Rope Safety FenceContainment Class EN1317: **N2**Working Width Class: **W6**

Brifen 4 Rope Wire Rope Safety Fence shall be in accordance with the following drawings:

BL03/11 & 12	Concreted Line Post
BL03/13 & 14	Concreted End Post
BL03/17 & 18	Short Driven Post
BL03/15 & 16	Long Driven Post
BL10/34 & 35	Surface Mounted Line Post
BL10/56 & 57	Surface Mounted Deflection Post
BL02/03 & 04	Tail Rope
BL02/03A & 04A	Alternative Tail Rope
BL02/01 & 02	Component Rope
BL/02	Safety Check Rope
BL03/47	Anchorage Shackle
BL02/54	Left Handed Swaged End Terminal
BL02/55	Right Handed Swaged End Terminal
WR1016	2 Slot Breakaway Anchor
WR1007	Cast-in Twin Rope Anchorage
BL02/10	Wire Rope Rigging Screw
WR1017	Breakaway Anchor - Type NYA06
BL04/25	Standard Post Socket
WR1029	Swaged Terminal Connecting Stud
WR1010	Transition Beam
WR1009	Connector Piece
WR1012	Load Spreader
WR1030	Strap
M24-10	M24 x 50 HT Cap Screw
M12	M12 Button Head Screws
M12	M12 Nut
M12	M12 Form C Galv' Washer
BL04/26	Rings
D233	Post Socket Cover (Central Reserve)
D234	Post Socket Cover (Verge)
BL04/27	Excluder
BL03/43	Peg
BL04/19	Post Cap
BL02/05	M24 Washer
BL02/06	M24 Nut
WR1500	Plan View Showing Anchorage Layout
WR1517	'Bri-Tran' Wire Rope Transition Layout

Drawing list continued on page A2.4

SAFETY BARRIERS

Brifen 4 Rope Wire Rope Safety Fence

Brifen 4 Rope Wire Rope Safety Fence - *Drawing List continued:*

WR1520	Central Reserve Crossing Point Layout
WR1528	Wire Rope Interface & Double Sided T.C.B. Layout
WR1529	OBB/WRSF Protecting Structure (4m)
WR1530	OBB/WRSF Protecting Structure (4.5m)
BL/01	General Layout WRSF (Central Reserve)
BL/07	General Layout WRSF (Verge)
BL/27	Layout at Fence Crossover.

Please check with the Promoter for the latest issue of the above drawings

In addition, the safety fence shall comply with the manufacturers Specification and component descriptions for the Brifen 4 rope Wire Rope Safety Fence and with the Installation Standard. Copies of these documents can be obtained from the Promoter at the following address:

Brifen (A Division of Hill and Smith)
Springvale Avenue
Bilston
Wolverhampton
WV14 OQL

Tel. 01302 714 747
E-mail: eng@brifen.co.uk

SAFETY BARRIERS

Brifen 3 Rope Wire Rope Safety Fence

Approved design:

Brifen 3 Rope Wire Rope Safety Fence

Containment Class EN1317: **N2**

Working Width Class: **W6**

Brifen 3 Rope Wire Rope Safety Fence shall be in accordance with the following drawings:

BL03/11 & 12	Concreted Line Post
BL03/13 & 14	Concreted End Post
BL03/17 & 18	Short Driven Post
BL03/15 & 16	Long Driven Post
BL10/34 & 35	Surface Mounted Line Post
BL10/56 & 57	Surface Mounted Deflection Post
BL02/03 & 04	Tail Rope
BL02/03A & 04A	Alternative Tail Rope
BL02/01 & 02	Component Rope
BL/02	Safety Check Rope
BL03/47	Anchorage Shackle
BL02/54	Left Handed Swaged End Terminal
BL02/55	Right Handed Swaged End Terminal
WR1016	2 Slot Breakaway Anchor
WR1007	Cast-in Twin Rope Anchorage
BL02/10	Wire Rope Rigging Screw
WR1017	Breakaway Anchor - Type NYA06
BL04/25	Standard Post Socket
BL04/26	Rings
D233	Post Socket Cover (Central Reserve)
D234	Post Socket Cover (Verge)
BL04/27	Excluder
BL03/43	Peg
BL04/19	Post Cap
BL02/05	M24 Washer
BL02/06	M24 Nut
BL/30	3 Rope Layout (Central Reserve)
BL/31	3 Rope Layout (Verge)

Please check with the Promoter for the latest issue of the above drawings.

In addition, the safety fence shall comply with the manufacturers Specification and component descriptions for the Brifen 3 rope Wire Rope Safety Fence and with the Installation Standard. Copies of these documents can be obtained from the Promoter at the address listed on page A2.4.

SAFETY BARRIERS

Asset International Varioguard Safety Barrier

Approved Design:

Asset International Varioguard Safety BarrierContainment Class: **N2**Working Width Class: **W6**

Asset International Varioguard Safety Barrier shall be in accordance with the following drawings:

VG2000	Terminal End Element (Without Pins) (Revision 'A')
VG2001(1)	Standard 4m Element
VG2001(2)	4m Element for Bridge Deck Fixing
VG2002(1)	Terminal End Element (With Pins)
VG2002(2)	Terminal End Element (Core Hole Fixing)
VG2003(3)	Terminal End Element (Driven Post)
VG2002(4)	Terminal End Element (Bridge Deck Fixing)
VG2003	Expansion Joint Element (Revision 'B')
VG2005	Sologuard Element (Type *B*) (Revision 'B')
VG2006	Sologuard Element (Type *A*) (Revision 'B')
VG2007	Sologuard Element (Type *C*) (Revision 'B')
VG2008	Transition (Verge Approach) (Revision 'C')
VG2009	Transition (Verge Depart) (Revision 'C')
VG2010	Transition (Central Reserve) (Revision 'C')
VG2011	Transition (Central Reserve with Lighting Columns) (Revision 'C')
VG2012	Sigma Post (Central Reserve) (Revision 'C')
VG2013	Rubbing Rail Assembly (Single Sided) (Revision 'A')
VG2014	Rubbing Rail (Double Sided) (Revision 'A')
VG2015	Rubbing Rail Clamp Plate (Revision 'A')
VG2016	Rubbing Rail Hanger Plate (Revision 'A')
VG2017	Rubbing Rail Hanger Clamp Plates (Revision 'A')
VG2018	Flared Rubbing Rail (2100mm LG) (Revision 'A')
VG2019	Rubbing Rail (6000mm LG) (Revision 'A')
VG2020	Rubbing Rail Spigot (Revision 'A')
VG2021	Rubbing Rail Support Strap (D.S.O.B.B. – Varioguard) (Revision A)
VG2022	Rubbing Rail Clamp Strap (D.S.O.B.B. – Varioguard) (Revision A)
VG2023	Flared Rubbing Rail (D.S.O.B.B. – Varioguard) (Revision 'A')
VG2024	Parapet Connection Bracket Type *A* (Revision 'A')
VG2025	Parapet Connection Bracket Type *B* (Revision 'A')
VG2026	Baseplate Details (Revision 'B')
VG2027	BridgeFixing Detail (Revision 'A')

Drawing list continued on page A2.7.

SAFETY BARRIERS**Asset International Varioguard Safety Barrier**

Asset International Varioguard Safety Barrier - *Drawing List continued:*

VG2028	Top Rail Fishplate (Revision 'B')
VG2029	Single Sided Standard 4m Element
VG2030	Single Sided Terminal End Element
VG2031	Hinged Varioguard Terminal for Sologuard
VG2032	Core Hole Fixing Socket and Post
VG2033	Driven Post Top and Bottom Sections
VG2034	30 Dia' Pin Details
VG2036	Side Connection Plate Details
VG2037	Base Connection Plate Details
VG2038	Standard 1.3m Element
VG2500/...	
VG2500	Layout for O.B.B – Varioguard (Verge Departure) (Revision 'B')
VG2501	Layout for O.B.B – Varioguard (Verge Approach) (Revision 'B')
VG2502	Layout for D.S.O.B.B – Varioguard (Central Reserve) (Revision 'B')
VG2503	Layout for Varioguard Protecting Work Zone (70mph) (Revision 'A')
VG2504	Varioguard Protecting Work Zone Details (Revision 'B')
VG2505	O.B.B.-Varioguard (Central Reserve) with Lighting Columns
VG2506	Temp' Varioguard for Work Zone Protection
VG2507	Varioguard/Sologuard Crossover Point Arrangement
VG2508	Varioguard/Sologuard Contraflow Arrangement
VG2509	Typical Connection Detail

Please check with the Promoter for the latest issue of the above drawings.

In addition, the safety barrier shall comply with the manufacturers Specification and component descriptions for the Asset International Varioguard Safety Barrier and with the Installation Standard. Copies of these documents can be obtained from the Promoter at the following address:

Asset International (A Division of Hill and Smith Ltd.)
 Springvale Business & Industrial Park
 Bilston
 West Midlands
 WV14 0QL
 WV14 0QL

Tel: 01902 499402
 Fax: 01902 402104
 E-mail: peter@hill-smith.co.uk
 Web site: www.varioguard.co.uk

SAFETY BARRIERS

Highway Care Barrierguard 800

Approved design:

Highway Care Barrierguard 800

Containment Class EN1317: **N2**

Working Width Class: **W6**

Highway Care Barrierguard 800 shall be in accordance with the following drawings:

BG800-001	GA DRAWING
BG800-002	TERMINAL SECTION
BG800-003	INNER ANCHOR ASSEMBLY
BG800-004	INTERMEDIATE ANCHOR ASSEMBLY
BG800-005	RADIUS SECTIONS

Please check with the Promoter for the latest issue of the above drawings.

In addition, the safety barrier shall comply with the manufacturers Specification and component descriptions for the Highway Care Barrierguard 800 and with the Installation Standard. Copies of these documents can be obtained from the Promoter at the following address:

Highway Care Ltd
The Highlands
Detling Hill
Detling
Maidstone
Kent
ME14 3HT

Tel: 01622 734215

Fax: 01622 735106

E-mail: info@highwaycare.co.uk

Web site: www.highwaycare.co.uk

SAFETY BARRIERS

Marshalls Delta Bloc 80

Approved Design:

Marshalls Deltabloc 80

Containment Class: **N1**

Working Width: **W4**

Marshalls Deltabloc 80 shall be in accordance with the following drawings:

DeltaBloc80/dwgschedule
DeltaBloc80/intermediatecomponent
DeltaBloc80/terminationcomponent
DeltaBloc80/couplingcomponent
Deltabloc80/generalinstallationlayout

Please check with the Promoter for the latest issue of the above drawings.

In addition, the safety barrier shall comply with the manufacturers Specification and component descriptions for Marshalls Deltabloc 80 and with the Installation Standard. Copies of these documents can be obtained from the Promoter at the following address:

Marshalls
Traffic Management
Southowram
Halifax
HX3 9SY

Tel: 0845 3040708
Fax: 0845 3040709
E-mail: Traffic.Management@marshalls.co.uk

SAFETY BARRIERS

Sistema Steelgard Barrier

Approved Design:

Sistema Steelgard Barrier

Containment Class: **H4a**

Working Width Class: **Contact Highways Agency for advice**

Sistema Steelgard Barrier shall be in accordance with the following drawings:

Sistema Drawing 18-05-A
Sistema Drawing 18-05-H
Sistema Transition Drawing 02B
Sistema Drawing L61-M1
Sistema Drawing L61-M2

Please check with the Promoter for the latest issue of the above drawings.

In addition, the safety barrier shall comply with the manufacturers Specification and component descriptions for Sistema Steelgard Barrier and with the Installation Standard. Copies of these documents can be obtained from the Promoter at the following address:

Sistema Construction (UK) Limited
The Chantry
Rougham
Bury St Edmunds
Suffolk
IP30 9JW

Tel: 01359 271 830
Fax: 01359 271 831
Email: enquiries@sistema-construction.com
Contact: Jason Ferro
Direct E-mail: jferro@sistema-construction.com

Vehicle Parapets

3.1 General

Following the withdrawal of BS 6779 Part 1 Annex F, the designs listed in Sections 3.2 and 3.3 of this Appendix are acceptable to the Highways Agency for use on the trunk road network for the containment classes shown.

Systems listed in 3.2 have been successfully tested to meet all the current requirements of EN1317 Parts 1 and 2.

Systems listed in 3.3 are acceptable for use for a limited period, on the basis of a Declaration of Performance Compliance from the respective manufacturers that states that a system was tested and met the test criteria for containment in EN1317 and that the system contained and redirected the relevant test vehicle in a controlled and stable manner. Declarations have been received for all systems listed in 3.3.

The acceptance of Section 3.3 systems is an interim solution expected to remain in place until publication of the new Highways Agency standard for Road Restraint Systems that will supersede the IRRRS. Publication of the new standard is expected in 2004.

It is expected that systems currently listed in Section 3.3 will achieve EN1317 compliance as a result of testing and development, and further clarification of the acceptance criteria for EN1317. Enquiries regarding the latest status of any systems listed in Section 3.3 should be made to the Promoter.

Acceptance of systems listed in this Appendix shall not exclude the use of a product offered by other manufacturer's, provided that the manufacturer can demonstrate that the product complies with the published parts of BS EN 1317 and meets the requirements of particular contract specifications.

NOTES:

1. Systems satisfying the containment requirements for N2 are also expected to meet the containment requirements for N1
2. Enquiries regarding Working Width and other performance criteria for the systems listed in this Appendix should be made to the individual Promoters
3. Enquiries regarding reference copies of drawings listed in this appendix should be made to the individual Promoters.

Vehicle Parapets

3.2 EN 1317 Compliant Systems

3.2.1 Normal Containment Aluminium Parapets

Promoter

Bridge Parapets Ltd.
 Tomich Industrial Estate
 Muir of Ord
 Ross-shire
 Scotland
 IV6 7UA
 Tel. (01463) 870194
 E-mail: sales@bridge-parapets.com

Product	Containment Class EN1317	(See Note 1)*	Drawing References
BPL Parapet Systems	N2	N/1.00/O	BPL/100/1 E
		N/1.00/M	BPL/100/1 E
		N/1.25/b	BPL/100/2 E
		N/1.25/B	BPL/100/2 E
		N/1.25/M	BPL/100/2 E
		N/1.50/M	BPL/100/3 E
		N/1.50/B+W	BPL/100/3 E
		N/1.80/M	BPL/100/4 E

***Notes:**

1. BPL Parapet Systems were not listed in BS 6779 Part 1 Annex F; BS 6779 Part 1 Annex F Designations are given here for reference purposes only.
2. Tests carried out to demonstrate compliance of the BPL Parapet System to EN1317 requirements demonstrated that the system met the test criteria for containment in BS 6779 Part 1.

Vehicle Parapets

3.3 Other Systems Acceptable For Use until Publication of the New Road Restraint System Standard (Expected in 2004)

3.3.1 Normal Containment Aluminium Parapets

Promoter

Balmer Lindley Group Ltd.

Dragonby Vale

Enterprise Park

Manaberg Way

Scunthorpe

North Lincolnshire

DN15 8XF

Tel. (01724) 289119

E-mail: barrier@balmer-group.co.uk

Product	Containment Class EN1317	BS 6779 Part 1 Annex F Designation*	Drawing References
Lindley Parapet	N2	N/1.00/O	LG2001 Rev 3
			LG2060
		N/1.00/M	LG2002 sht 1&2
			LG2060
		N/1.00/W	LG2002
			LG2060
			LG2070
		N/1.25/M	LG2003
			LG2060
			LG2004
	LG2060		
	N/1.5/B	LG5002	
		LG2060	
		LG5050	
	N/1.8/mw	ABH13950C	
	N/1.5/X	ABH13672A Rev 2	
Phoenix Parapet	N2	N/1.00/O	PHO/A/010 Rev B
			PHO/A/016 Rev A
			PHO/A/019 Rev B
		N/1.00/M	PHO/A/011 Rev B
			PHO/A/016 Rev A
			PHO/A/017 Rev A
	PHO/A/019 Rev B		
	N/1.25/B	PHO/A/014 Rev B	
		PHO/A/015 Rev B	
	N/1.50/B	PHO/A/015 Rev B	
		PHO/A/016 Rev A	
		PHO/A/018 Rev B	

* BS 6779 Part 1 Annex F Designations are given for reference purposes only

Vehicle Parapets

Product	Containment Class EN1317	BS 6779 Part 1 Annex F Designation*	Drawing References
Phoenix Parapet	N1	L/1.00/O	PHO/A/025
		L/1.00/M	PHO/A/012
		L/1.50/O	PHO/A/013
		L/1.5/M	PHO/A/013
		L/1.5/mw	PHO/A/013

* BS 6779 Part 1 Annex F Designations are given for reference purposes only

Promoter

Lionweld Kennedy Ltd
 Marsh Road
 Middlesbrough
 TS1 5JS
 Tel. (01642) 233 298
 E-mail: d.hill@lk-uk.com

Product	Containment Class EN1317	BS 6779 Part 1 Annex F Designation*	Drawing References
Lionweld Kennedy Aluminium Parapets	N2	N/1.00/O or N/1.00/M	LWK/ALU/01 Rev 03
			LWK/ALU/02 Rev 02
		N/1.00/M	LWK/ALU/03 Rev 01
			LWK/ALU/04 Rev 01
			LWK/ALU/05 Rev 01
			LWK/ALU/06 Rev 02
		N/1.5/M	LWK/ALU/08 Rev 00
		N/1.50/W or N/1.50/B	LWK/ALU/09 Rev 00
			LWK/ALU/10 Rev 00
		N/1.80/mw	LWK/ALU/11 Rev 00
		N/1.25/O or N/1.25/M	LWK/ALU/12 Rev 00
		N/1.40/O or N/1.40/M	LWK/ALU/13 Rev 00

* BS 6779 Part 1 Annex F Designations are given for reference purposes only

Vehicle Parapets

Promoter

Varley and Gulliver Ltd
 Alfred Street
 Sparkbrook
 Birmingham
 B12 8JR
 Tel.(0121) 773 2441
 E-mail: darren@v-and-g.co.uk

Product	Containment Class EN1317	BS 6779 Part 1 Annex F Designation*	Drawing References
BACO 3000 Series	N2	N/1.00/O	RF 160/001 Rev D
			RF 160/003 Rev B
			RF 160/004 Rev C
		N/1.00/M	RF 160/001 Rev D
			RF 160/003 Rev B
			RF 160/004 Rev C
		N/1.25/b	RF 160/005 Rev B
			RF 160/001 Rev D
			RF 160/003 Rev B
		N/1.25/B	RF 160/004 Rev C
			RF 160/005 Rev B
		N/1.50/B	RF 160/004 Rev C
RF 160/006 Rev B			

* BS 6779 Part 1 Annex F Designations are given for reference purposes only

Vehicle Parapets

3.3.2 Normal Containment Steel Parapets

Promoter

Corus Tubes
 PO Box 101
 Weldon Road
 Corby
 Northants
 NN17 5UA
 United Kingdom
 Tel.(01536) 402121
 E-mail: trevor.mustard@corusgroup.com

Product	Containment Class EN1317	BS 6779 Part 1 Annex F Designation*	Drawing References
Celsius HBP N1 Parapet	N1	L/1.00/O & L/1.00/M L/1.50/M	HBP/200/2 HBP/200/4 HBP/200/6 HBP/200/7 HBP/200/8 HBP/200/12
Celsius HBP N2 Parapet	N2	N/1.00/O & N/1.00/M N/1.50/B & N/1.50/W	HBP/200/1 HBP/200/5 HBP/200/6 HBP/200/7 HBP/200/8 HBP/200/12 HBP/200/13
Corus L/1.00/V Vertical infill Parapet	N1	L/1.00/V	HBP/100/3 HBP/100/11 HBP/100/12 HBP/100/13

* BS 6779 Part 1 Annex F Designations are given for reference purposes only

Vehicle Parapets

3.3.3 High Containment Combined Concrete/Aluminium Parapets

Promoter

Varley and Gulliver
 Alfred Street
 Sparkbrook
 Birmingham
 B12 8JR
 Tel. (0121) 773 2441
 E-mail: darren@v-and-g.co.uk

Product	Containment Class EN1317	BS 6779 Part 1 Annex F Designation*	Drawing References
Combined Concrete/Aluminium Parapet	H4a	H/1.50/O, B	P6P 69/3 P6P 69/1/9 P6P 71/1 P6P 71/1/1 P6P 71/1/2 P6P 71/1/3 P6P 71/1/10 P6P 71/1/11 P6P 71/1/12 P6P 71/1/13 P6P 71/1/14 P6P 71/1/15 P6P 71/1/22

* BS 6779 Part 1 Annex F Designations are given for reference purposes only

Vehicle Parapets

3.3.4 High Containment Steel Parapets

Promoter

Highways Agency

SSR

Vehicle Restraints

C3

5 Broadway

Birmingham

B15 1BL

E-mail: Daniel.Ruth@highways.gsi.gov.uk

Product	Containment Class EN1317	BS 6779 Part 1 Annex F Designation*	Drawing References
P6 Parapet	H4a	H/1.50/O H/1.50/W	HC/01B : HC/02B HC/01B : HC/02B
P6 Parapet Transitions	H2		HCT/A/01 HCT/A/02 HCT/B/01 HCT/B/02 HCT/B/03 HCT/C/01 HCT/C/02c HCT/D/01 HCT/D/02

* BS 6779 Part 1 Annex F Designations are given for reference purposes only

Safety Barriers

4.1 General

All those designs referred to in 4.2 in this Appendix are acceptable to the Highways Agency for use on the trunk road network for the containment classes shown. This acceptance shall not exclude a product offered by a manufacturer that complies with the published parts of BS EN 1317 and meets the requirements of particular contract specifications.

4.2 Non-Proprietary Safety Barrier Systems (NPSBS)

All the safety barrier systems in this category are contained in the document entitled Non-Proprietary Safety Barrier Systems (NPSBS). To receive a copy of the NPSBS email: ha.irrs@highways.gsi.gov.uk.

PROPOSED ROAD VEHICLE RESTRAINT SYSTEMS

Information Required to Demonstrate Compliance with BS EN 1317

CEN COMPLIANCE ¹

Initial submission documents to be supplied for consideration of initial type test.

1. Test report in accordance with EN1317 Part1 Section 9.
2. Video/high speed film of test annotated showing date, test number and performance class.
3. Still photographs of complete installation including anchorage points.
4. Still photographs of vehicle before and after impact.
5. Full drawings of tested item.
6. Certification from the manufacturer that the item tested complies with drawings supplied.
7. Certificate from test house.

Additional information, which will be required on acceptance of initial type test prior to installation.

8. Installation drawings.
9. Manufacturer's specification.
10. Manufacturer's installation instructions including foundation requirements and test methods to verify their performance.
11. Manufacturer's repair and maintenance manual.
12. Certificate of compliance with the quality management scheme for Manufacture of fencing components.²
13. Compliance with the Sector Scheme for the Supply, Erection and Repair of Vehicle Restraint Systems.²
14. Certificate of compliance for the Fabrication and installation of Bridge Parapets and Cradle Anchorages.³
15. Nominal loads (direct forces, moments and co-existent shears) to be transferred from the parapet to the structure or foundation.^{2 & 3}

Notes

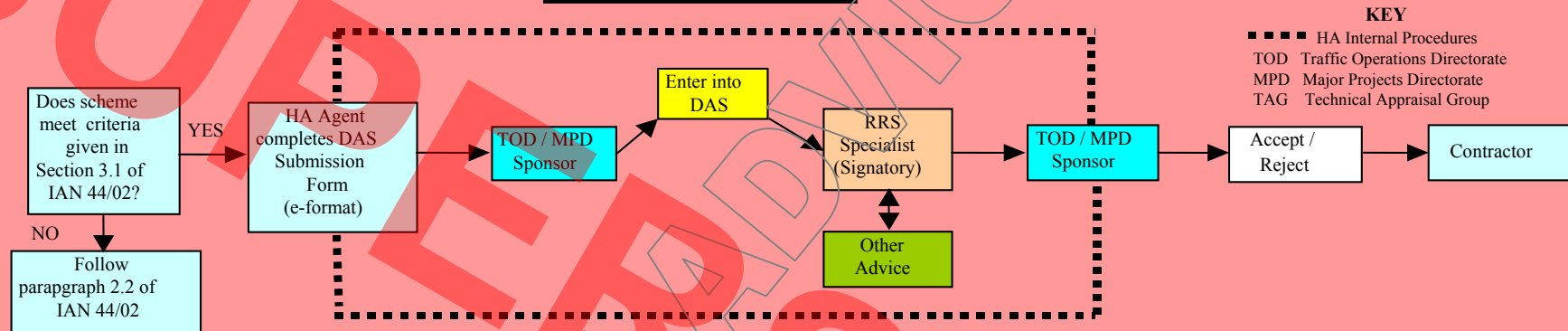
1. All documents, which are not in English, will have to be translated. If they are in a language other than French or German the promoter will be required to supply a full translation.
2. *Items 12, 13 and 14 are required for safety fences and barriers.*
3. **Items 14 & 15 are required for parapets.**

SUBMISSION FOR COMPLIANCE WITH EN 1317: PARTS 1 and 2			
CONTAINMENT LEVEL: (test of 2), Test Type TB (Primary/Complementary Test)			
TEST REPORT NUMBER:			
TEST NUMBER:		TEST DATE:	
COMPANY NAME:			
CONTACT:			
ADDRESS:			
Tel: / Fax:/ E-mail:			
PRODUCT NAME:			
Initial submission documents to be supplied for consideration of Initial Type Test (ITT).			
Item	Comment	Item Received (Y or N)	Date requested
1	Test report	In accordance with EN1317-1:1998 Section 9.	
2	Video/high speed film	Of test coverage as specified in relevant Part of EN 1317. Annotated showing date, test number and performance class.	
3	Still photographs	Of complete installation including anchorage points.	
4	Still photographs	Of vehicle before and after impact.	
5	Drawings	Fully detailed drawings of tested item	
6	Certification from the manufacturer	Confirming that the item tested complies with drawings supplied	
7	Confirmation from test house	That the test complies with the relevant requirements of EN 1317	
Additional information, which will be required on acceptance of initial type test prior to installation.			
8	System specification	Manufacturer's specification.	
9	Installation details	Manufacturer's drawings	
10	Installation procedures	Manufacturer's installation instructions.	
11	Maintenance Manual	Manufacturer's inspection, repair and maintenance instructions	
12	Certificate of compliance	With the quality management scheme for Manufacture of fencing components. ²	
13	Certificate of compliance	With the Sector Scheme for the Supply, Erection and Repair of Vehicle Restraint Systems. ²	
14	Certificate of compliance	For the Fabrication and installation of Bridge Parapets and Cradle Anchorages. ³	
15	Support loads	Nominal loads (direct loads, bending moments and shear forces) that have to be transferred from the vehicle restraint system to the supporting structure or foundation. ^{2 & 3}	
<u>Notes</u>			
1. All documents, which are not in English, will have to be translated. If they are in a language other than French or German the promoter will be required to supply a full translation			
2. Items 12, 13 and 15 are required for safety fences and barriers			
3. Item 14 & 15 are required for parapets			
Signature:		Name:	
		Date:	

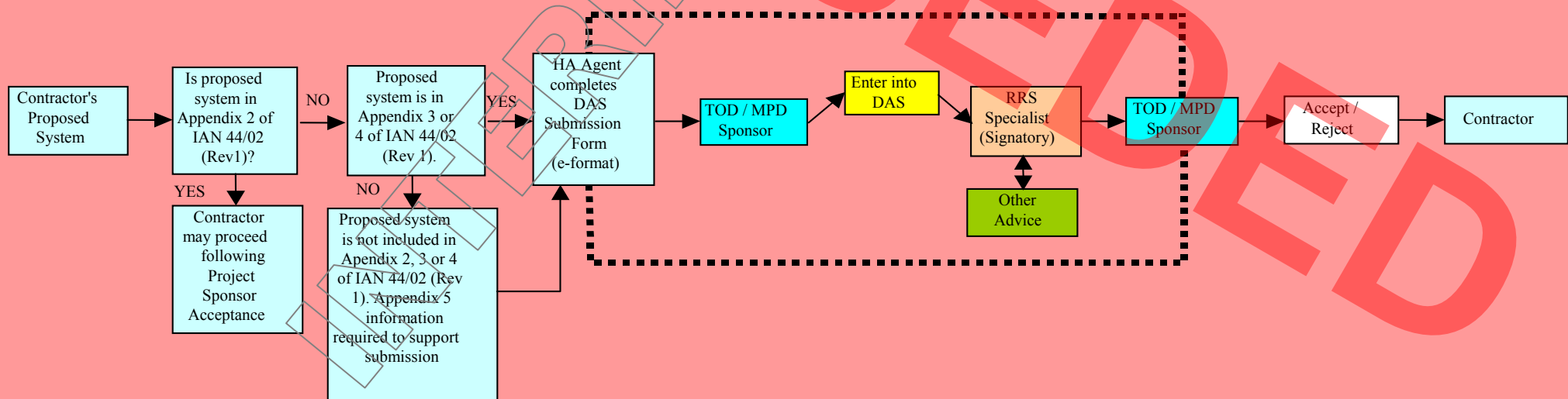
SUBMISSION FOR COMPLIANCE WITH EN 1317: PARTS 1 and 2						
CONTAINMENT LEVEL: (test of 2), Test Type TB (Primary/Complementary Test)						
TEST REPORT NUMBER:						
TEST NUMBER:			TEST DATE			
COMPANY NAME:						
CONTACT:						
ADDRESS:						
Tel: / Fax:/ E-mail:						
PRODUCT NAME:						
			Specified	Actual	Satisfactory (Yes or No)	Compliance
Pt1	Vehicle Details	Impact Conditions Mass of veh (kg) Speed (kmh ⁻¹) Angle (deg)	**** (±) *** (0; +7%) ** (-1; + 1.5)			
		Centre of Gravity Vertical (m) Longitudinal (m) Lateral (m)	*** (± 10%) *** (± 10%) ± ****			
		Model				N/A
4.2	Vehicle Restraint System (VRS) Behaviour	<ol style="list-style-type: none"> 1) The VRS shall contain and redirect the vehicle without breakage of principal longitudinal elements 2) No major part of the VRS shall become totally detached or present an undue hazard to other traffic, pedestrians or personnel in the work zone. 3) Elements of the VRS shall not penetrate the passenger compartment of the vehicle. Deformations of, or intrusions into, the passenger compartment that could cause serious injuries are not permitted. 4) Ground anchorages and fixings shall perform to meet the requirements of the design of the VRS. 				
4.3	Vehicle Behaviour	<ol style="list-style-type: none"> 1) The Centre of Gravity (CG) of the vehicle shall not cross the centre line of the deformed system. 2) The vehicle shall remain upright during and after the impact although moderate rolling, pitching and yawing are acceptable. 3) The vehicle shall leave the VRS after impact, so that the wheel track does not cross a line parallel to the initial traffic face of the parapet at a distance A (2.2 m) plus Vehicle width + 16% vehicle length within 10 m from break of wheel track with initial traffic face of parapet 				
5.3.2	Installation	The length of the VRS shall be sufficient to demonstrate the full performance characteristics of the system				
	Severity Indices	SPECIFIED		ACTUAL		
		THIV Limit 33 kmh ⁻¹				
		PHD Limit 20 g				
		ASI Limit 1.4				
	Photography	<ul style="list-style-type: none"> • High Speed Photography • Stills 				
	Drawings	Drawings included				
FULLY COMPLIES WITH STANDARD						
N/A = Not Applicable						
Signature:				Name:		
Date:						

Road Restraint System Acceptance Procedure - Flowchart

Implementation of Interim Requirements for Road Restraint Systems (IRRRS) - (ROADS & STRUCTURES)
 [IAN 44/02 Paragraph 4.1]

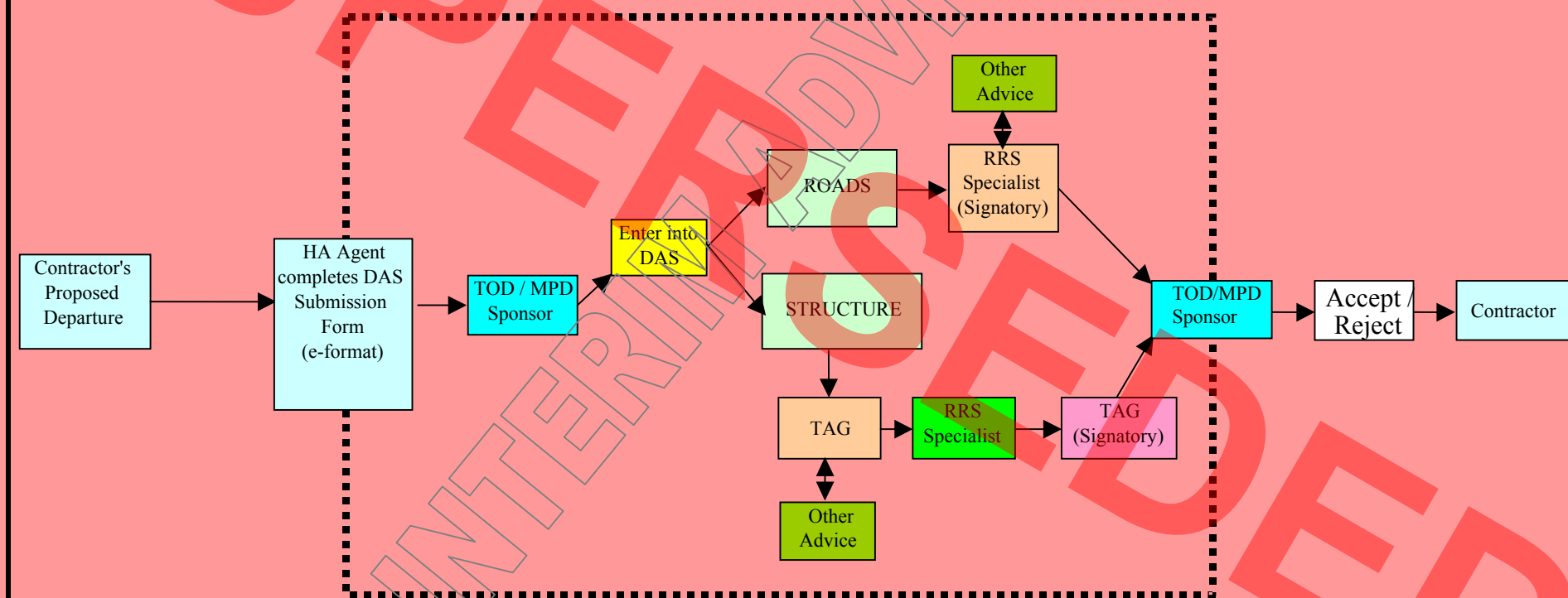


Acceptance of a Particular Road Restraint System (RRS) - (ROADS & STRUCTURES)
 [IAN 44/02 Paragraphs 5.1.1 & 5.1.2 (i), (ii) & (iv)]

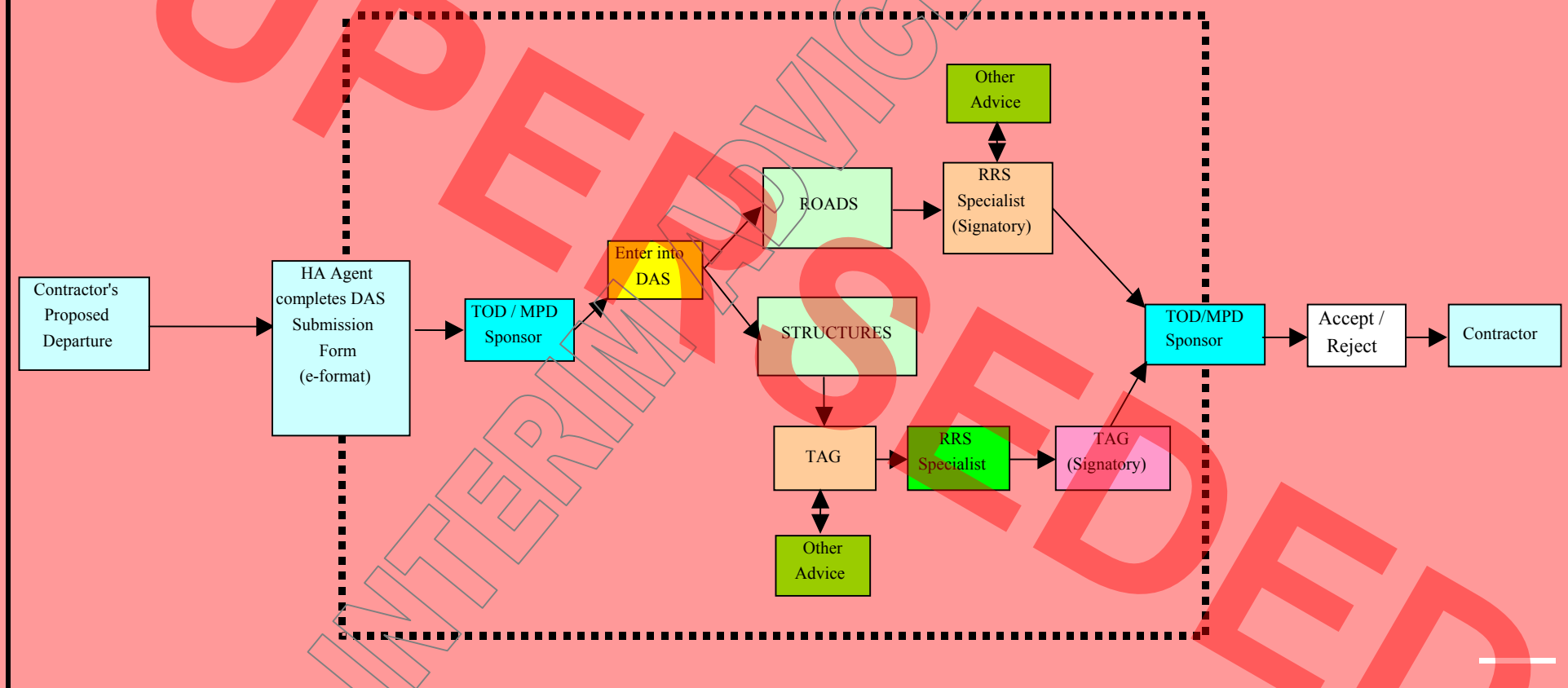


Departure from a Particular Road Restraint System (RRS) - (ROADS & STRUCTURES)

[IAN 44/02 Paragraph 5.1.2 (iii)]



Departure from requirements of Interim Requirements for Road Restraint Systems (IRRRS) - (ROADS & STRUCTURES)
(IAN 44/02 Paragraph 4.3)



General Guidance on Incorporating Interim Requirements for Road Restraint Systems (IRRRS) into Contracts

1 Introduction

To comply with European Requirements, as set out in BS EN 1317, an interim document entitled – ‘Interim Requirements for Road Restraint Systems (Vehicle and Pedestrian)’ (IRRRS) has been produced to replace those safety fence, parapet and pedestrian guardrail Standards, Advice Notes and associated documents listed in IAN 44/02.

HA Design Organisations / Agents shall comply with IRRRS where appropriate. In so doing they shall ensure, when preparing contract documentation to procure work in accordance with IAN 44/02, that relevant information from the IRRRS document is specified accordingly dependent on the form of procurement used.

These notes offer general guidance on incorporating IRRRS requirements into the various model contracts contained in the Manual of Contract Documents for Highway Works (MCHW) together with the Works Framework, Design Build Finance and Operate (DBFO), Managing Agent (MA), Term Maintenance Contractor (TMC) and Managing Agent Contractor (MAC) contract types. They apply to the preparation of new contracts and for the work referred to in Section 3.1 of IAN 44/02

2 General Information – Contents of IRRRS

The IRRRS document contains the following information:

- Containment Performance Class Requirements for Deformable Safety Barriers, Rigid Safety Barriers and Vehicle Parapets.
- Criteria for the provision of permanent Safety Barriers and Vehicle Parapets.
- Design Guidance for the provision and layout of Permanent Safety Barriers.
- Criteria for the Provision of Vehicle Parapets on new and improved trunk Roads.
- Design Guidance for the provision and layout of Vehicle Parapets
- Criteria and Guidance for the provision of Temporary Safety Barriers at Roadworks.
- Containment Performance Class Requirements and Guidance on Terminals and Transitions between different types of Safety Barriers and Vehicle Parapets.
- Crash Cushions, Pedestrian Restraint Systems, Vehicle Arrester Beds and Anti-Glare Screens

Annex A to IRRRS

- MCHW Volume 1 - Specification for Highway Works [SHW] replacement Series 400 clauses
- MCHW Volume 2 - Notes for Guidance on the SHW relating to Series 400 and 2200.

- MCHW Volume 4 – Bills of Quantities for Highway Works including Method of Measurement and Notes for Guidance relating to Series 400 and 2200.

This information shall where appropriate be used in new contracts and in most cases will replace existing criteria specified. General guidance on how this is to be achieved is offered as follows:

3 Incorporating IRRRS into Model Contract Documents

3.1 Model Contract Document for Engineering and Construction Contract

The contract shall be compiled in accordance with the requirements of the MCHW Volume 0 Section 1 Part 7 - Model Contract Document for Engineering and Construction Contract and the comments made in Table 1 below.

3.2 Model Contract Document for Design and Build

This model contract is no longer a preferred means of procurement and written approval should be sought from Traffic Operations Directorate(TOD) or Major Projects Directorate(MPD) as appropriate prior to using MCHW Volume 0 Section 1 Part 6.

3.3 Model Works Framework Contract

New contracts shall be compiled in accordance with the model Works Framework contract document and the comments made in Table 1 below.

For existing contracts the vehicle restraint system work shall be procured in accordance with IAN 44/02. The Framework Contractor shall be instructed to comply with BS EN 1317. Containment Performance Class, Working Width and the new Series 400 of the SHW, as contained in Annex A of IRRRS, shall also be specified together with any scheme specific constraints. This may give rise to a compensation event under which the Contractor may wish to negotiate new rates for the work.

3.4 Design Build Finance and Operate (DBFO) Contract

New contracts shall be compiled in accordance with the model DBFO contract document and the comments made in Table 1 below.

For existing contracts a copy of IAN 44/02 shall be submitted to DBFO Co's for their information requesting them to consider the IAN and to confirm whether or not they wish to introduce such arrangements into the contract.

3.5 Maintenance Contracts

3.5.1 Managing Agent (MA) Contract

New contracts shall be compiled in accordance with the model MA contract document and the comments made in Table 1 below. For existing contracts the MA will be instructed to comply with IAN 44/02

3.5.2 Term Maintenance Contract (TMC)

New contracts shall be compiled in accordance with the model TMC contract document and the comments made in Table 1 below.

For existing contracts the MA shall procure the vehicle restraint system work through the TMC in accordance with IAN 44/02 by means of 'Works Orders'. These shall instruct the TMC to comply with BS EN 1317. Containment Performance Class, Working Width and the new Series 400 of the SHW, as contained in Annex A of IRRRS, shall also be specified on the Works Order together with any scheme specific constraints. The TMC may wish to negotiate new rates for the work depending on the system proposed by the TMC.

3.5.3 Managing Agent Contractor (MAC) Contract

New contracts shall be compiled in accordance with the model MAC contract document and the comments made in Table 1 below.

For existing contracts the MAC Provider will need to be instructed to comply with IAN 44/02. Under the contract this instruction will be a compensation event if as a result of the change in the Employer's Standards the Provider's cost is either increased or decreased by more than 5%.

3.6 Design only Contracts

The contract between the Employer and the Design Organisation / Agent should state the Design Standards and Specification the Designer is to use. Future contracts shall be prepared to incorporate, as appropriate, the requirements of IAN 44/02. For existing contracts the Design Agent shall be instructed to comply with IAN 44/02 and the contract amended accordingly.

4 Aesthetics

Section 6 paragraph 6.2 of the IRRRS confirms that aesthetic effects of parapet construction is to be considered at the initial design stage of the structure. It is most important that this is undertaken to ensure any aesthetic requirements considered necessary are included in the contract. (Appendix 4/3 of SHW can be used for this purpose). The Technical Approval Authority (TAA) shall be consulted at this stage and their approval gained on the proposed parapet aesthetic requirements to be included. Care must be taken to ensure that such specifications do not impose any 'barriers to trade'.

For aesthetic reasons, doubling up of any combination on parapets across structures is to be avoided. Where it is considered necessary however then approval will need to be sought from the TAA. In seeking approval full justification on technical and whole life costing grounds will need to be given.

5 Use of IRRRS and Procedure for Acceptance of Road Vehicle Restraint Systems

5.1 In accordance with IAN 44/02 Design Organisation / Agents shall ensure that a formal request is made to use IRRRS on a scheme specific basis.

5.2 Any departure from the requirements of IRRRS itself shall also be treated as a Departure from Standard for 'aspects not covered by Standards' and shall be entered into the Departure Approval System (DAS) by either TOD or MPD as appropriate.

5.3 Design Organisations / Agents shall also ensure that those road restraint systems submitted for acceptance / review by the Contractor are forwarded to TOD or MPD as appropriate for consideration. TOD or MPD shall treat the submission as a Departure from Standard for 'aspects not covered by Standards' and shall enter the Departure onto the Departure Approval System (DAS). For proposals adjacent to, on or under a structure TOD or MPD as appropriate shall submit to TAA via DAS for approval. Once a decision has been made the Contractor shall be advised in accordance with the timescales allowed under the Contract.

5.4 Any proposed change to the road restraint system manufacturer's standards shall be treated as a Departure from Standard and forwarded to TOD or MPD as appropriate for consideration. TOD or MPD shall enter the proposed Departure onto the Departure Approval System (DAS) and seek TAA approval as necessary for proposals adjacent to, on or under a structure. Once a decision has been made the Contractor shall be informed accordingly in accordance with the timescales allowed under the Contract.

6 Road Restraint Systems Procurement Methodology

Contract documents must not now specify the use of any specific type of Safety Barrier or Vehicle Parapet. Instead requirements shall be expressed in terms of 'Containment Performance Class' and maximum 'Working Width'.

Contractors will be allowed to put forward for acceptance any Road Vehicle Restraint System (Safety Barrier, Vehicle Parapet or Crash Cushions) that complies with the various parts of BS EN 1317 and for Transitions / Terminals DD ENV 1317-4, that meet the requirements of the contract in terms of "Containment Performance Class," "Working Width" Lateral Displacement Zone criteria, aesthetics (see Section 4 above) and TAA requirements.

One option available to Contractors will be to choose from the existing safety barrier systems (deformable and rigid) that have been developed and used extensively in the UK for many years; details of which are contained in the document entitled 'Non-Proprietary Safety Barrier Systems' (NPSBS).

The systems put forward by Contractors post contract award shall be subject to acceptance by the TOD or MPD Project Sponsor as appropriate in accordance with section 5 above and the TAA.

7 Design Manual for Road and Bridges (DMRB)

The DMRB contains HA's Design Standards and is either used:

- directly by Design Organisations / Agents in designing work to incorporate details into contracts or

- by calling up in the contract the defined Standards and Advice Notes to be used in work that is to be designed by the Contractor.

Design Organisations / Agents or Contractors are therefore directed to follow the Standards referred to in the DMRB. To ensure that for all relevant contracts those safety fence, safety barrier and parapet Standards and Advice Notes etc. listed in Appendix 1 to IAN 44/02 are withdrawn and the requirements of the IRRRS is followed, an amendment to the contract documentation shall be made as follows: -

- Modify the list of Design Standards and Advice Notes that have been withdrawn to include those Standards and Advice Notes listed in Appendix 1 to IAN 44/02. *(If such a list is not included within the contract documentation then incorporate one as appropriate).*
- Add IRRRS to the list of design documents to be used in the contract.
NB: The NPSBS document or any aspect of it should not be incorporated or indeed referred to in any contract without obtaining prior written consent from HA. Its purpose is to provide Contractors with other options to choose from [e.g. those systems used extensively in the UK for many years] in addition to the other systems available. Once chosen the Contractor must present the system for review / acceptance and inclusion in the Works.
- In addition, provide suitable cross-referencing to the IRRRS document as appropriate.

8 Manual of Contract Documents for Highway Works

8.1 Specification for Highway Works (SHW)

The specification annexed to the IRRRS document replaces Series 400 - 'Safety Fences, Safety Barriers and Pedestrian Guardrails' and Series 2200 - 'Parapets' of the Specification for Highway Works. To ensure that all new contracts follow the new IRRRS requirements the following amendment shall be made: -

- Replace in its entirety the existing **Series 400** of the Specification for Highway Works entitled: "**Safety Fences, Safety Barriers and Pedestrian Guardrails**" with the new Series 400 as appended to IRRRS entitled: "**Road Restraint Systems (Vehicle and Pedestrian)**". This shall be achieved by providing in Appendix 0/1 to the SHW lists of "Cancelled...." and "Substitute Clauses, Tables and Figures" in accordance with the Notes for Guidance on the Specification for Highway Works. (NGSHW)
- Cancel existing **Series 2200** of the SHW entitled "**Parapets**" in its entirety by providing in Appendix 0/1 to the SHW a list of "Cancelled Clauses, Tables and Figures" in accordance with the Notes for Guidance on the Specification for Highway Works. (NGSHW) *NB: The revised specification requirements for Parapets are now contained in the new*

Series 400 requirements entitled “Road Restraint Systems (Vehicle and Pedestrian)”.

- Provide as required the following Appendix to the SHW in accordance with the Notes for Guidance provided in Annex A to IRRRS:
 - Appendix 4/1: Road Restraint Systems (Vehicle and Pedestrian)
- Include “Containment Performance Class” and “Maximum Working Widths” as required in Appendix 4/1 for Road Restraint Systems (Vehicle and Pedestrian) (see Annex A to IRRRS for sample Appendix 4/1).
- Complete Appendix 1 / 4 ‘Working and Fabrication Drawings’ to include **Series 400 Vehicle and Pedestrian Restraint Systems** and references to Safety Barriers, Vehicle Parapets, terminals and transition drawings to be supplied by the Contractor as required.
- Appendix 1/5: ‘Testing to be Carried Out by the Contractor’: - Series 400 testing requirements for anchorages, attachment systems, posts and foundations for the proposed and accepted road restraint systems shall be completed as appropriate in accordance with the Notes for Guidance on the Specification for Highway Works. Testing in accordance with the recommendations of the safety barrier / vehicle parapet manufacturer can be added to Table 1/1 of Appendix 1/5 as appropriate by the Contractor following acceptance of the proposed safety barrier / vehicle parapet system by the Overseeing Organisation. Suitable notes to this effect can be added to Appendix 1/5 and cross-referenced with Appendix 4/1.
[NB: Contractor to confirm any further testing requirements at time of submission of drawings in accordance with clause 104.17 of SHW and Appendix 4/1]
- Include in Appendix 1/11: ‘Structural Elements and Other Features to be Designed by the Contractor’ references to Safety Barriers and Vehicle Parapets and their locations and confirm IRRRS as the Design Specification.

8.2 Highway Construction Details (HCD)

The safety fence and safety barrier drawings contained in MCHW Volume 3 Section 2 of the HCD are withdrawn from use for works defined in paragraph 3 of IAN 44/02.

Instead Contractors shall put forward for review / acceptance proposals for safety barrier and vehicle parapet systems in accordance with the contract requirements. They shall provide all necessary supporting information including general arrangement and component part drawings and shall advise on the recommended testing requirements of the manufacturer. In so doing, one option available to Contractors is to propose the systems contained within the document entitled ‘Non-Proprietary Safety Barrier Systems’ (NPSBS). *This document contains information on*

Deformable and Rigid Safety Barriers and reproduces layout and component detail drawings previously contained in MCHW Volume 3 Section 2 of the HCD.

Once the system put forward has been accepted the associated general arrangement, component part drawings and testing requirements shall become part of the contract.

8.3 Bills of Quantities (BOQ)

For those contracts that require a BOQ then the Series 400 details contained in Annex A to the IRRRS document shall be included as appropriate in accordance with the Notes for Guidance on the Method of Measurement for Highway Works.

Please note that at present there are no BOQ items available for Crash Cushions, Vehicle Arrester Beds or Anti-Glare Screens. It is intended that these items will be developed in the near future and made available in the Highways Agency's library of Specification / Method of Measurement database system, entitled SPECLIB / MEMLIB. In the meantime if such systems are proposed then draft BOQ items shall be submitted to TOD or MPD as appropriate for approval as a Departure from Standard for Aspects not covered by Standards.

9 Schedule of Amendments to MCHW

In addition to the above, Table 1 below provides general guidance on incorporating IRRRS requirements into the Highways Agency's Model Contract Documents.

10 Contacts for Queries

If you have any queries regarding the above then please seek guidance either from your TOD or MPD contact as appropriate or Robert Gibson in the Contracts and Specification Team - Safety Standards and Research (SSR) - Telephone 01234 79 6597.

Technical queries on IRRRS should be directed by email to Daniel Ruth in Risk Management and Vehicle Restraint (RMVR) Section of Safety, Standards and Research (SSR) at the following address:

daniel.ruth@highways.gsi.gov.uk

Non-technical queries regarding Departures from Standard submissions onto DAS can be made to the following email address:

james.iles1@highways.gsi.gov.uk

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APPENDIX 7

TABLE 1

NB: This Table is not a definitive list of amendments but offers general guidance to compilers on incorporating IRRRS requirements into the Highways Agency's model contract documents.

Contract Model	Clause Reference	General Guidance / Comments
ECC		
Model Contract Document		<ul style="list-style-type: none"> i) Refer to Section 7 above where Road Restraint Systems are to be designed by the Contractor. Include in the Works Information in accord with ECC Guidance Notes. ii) Refer to Section 8.1 and 8.2 above and include as appropriate in the Works Information. iii) Refer to Section 8.3 above where BOQ's are used.
D&B		
Instructions for Tendering	Annex U	Annex U Mini Bill of Quantities. Ensure the heading and item descriptions in the mini bill are in accord with the revised MoM requirements in Annex A to IRRRS.
Model Contract Document		<ul style="list-style-type: none"> i) Refer to Section 7 above. Road Restraint Systems are to be designed by the Contractor. Include in the Works Information in accord with ECC Guidance Notes. ii) Include in Annex 0/1 of the Employers Requirements Amendments to Notes for Guidance to the Specification as attached to Annex A of IRRRS. iii) Include in Annex 0/2 of the Employers Requirements the list of Design Standards that have been withdrawn in accordance with those listed in Appendix 1 to IAN 44/02. Include IRRRS in Annex 0/2 as a 'Stand Alone Publication' which the Contractor will need to comply with. iv) Include IAN 44/02 in Annex 0/3 of the Employers Requirements. v) Include in Annex 0/5 of the Employers Requirements a statement to confirm that the safety fence and safety barrier drawings contained in Section 2 of the HCD are withdrawn from use. vi) Refer to Section 8.1 above - first and second bullet point include in Annex 06 of the Employers Requirements. vii) Ensure the Title of Series 400 and Appendix 4/1 in Annex 0/6 and Annex 0/7 of the Employers

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Contract Model	Clause Reference	General Guidance / Comments
		<p>Requirements are amended in accordance with the revised titles and Appendices contained in Annex A of IRRRS.</p> <p>viii) Delete Series 400 and Series 2200 of the SHW and include replacement Series 400 contained in Annex A to IRRRS in Annex 0/6 in accord with the first and second bullet points of Section 8.1 above.</p> <p>ix) The Contractor is to prepare a BOQ. Include the amendments to the MoM and Notes for Guidance in Annex A of IRRRS in the Employers Requirements.</p>
Works Framework Contract		
Model Contract Document		<p>i) Refer to Section 8.1 and 8.2 above and include in the Works Information as appropriate.</p> <p>ii) Refer to Section 8.3 above where BOQ's are used.</p>
DBFO		
Model Contract Document		<p>i) Include those Standards and Advice Notes that have been withdrawn in Schedule 4 Part 2 Annex 1 paragraph 1.2.</p> <p>ii) Include details of those Standards that have been amended / partially withdrawn etc in Schedule 4 Part 2 Annex 2.</p> <p>iii) Insert IAN 44/02 into Schedule 4 Part 2 Annex 1 under paragraph 2.</p> <p>iv) Insert the IRRRS document into Schedule 4 Part 2 Annex 3 under Stand-alone Publications.</p> <p>v) Amend Table 1.22 of Schedule 4 Part 2 to include revised header title and Appendix 4/1 title in accord with Annex A of IRRRS and delete Appendix 4/2 and title accordingly.</p> <p>vi) Include Specification and Notes for Guidance amendments, as outlined in Annex A of IRRRS, to Schedule 4 Part 2 Annex 5–Amendments to the Specification for Highway Works.</p> <p>vii) Include IAN in Schedule 6 Part 4 Paragraph 7.</p> <p>viii) Include IRRRS in Schedule 6 Part 4 Paragraph 26 Stand-alone Publications.</p> <p>ix) Amend the list of Standards and Advice Notes in Schedule 6 Part 4 O&M Standards to exclude those Standards that have been withdrawn as contained in IAN 44/02.</p>

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Contract Model	Clause Reference	General Guidance / Comments
		x) Include Specification and Notes for Guidance amendments, as outlined in Annex A of IRRRS, to Schedule 6 Part 4.
MA		
Model Contract Document		<ul style="list-style-type: none"> i) Include the IAN and IRRRS document into Table 6.1 of Annex 6. ii) Include details of those Standards and Advice Notes that have been amended / partially withdrawn etc. in Table 6.3 of Annex 6. iii) Also, include the amendments to SHW and Notes for Guidance to SHW and Bill of Quantities for Highway Works as contained in Annex A to IRRRS in Table 6.3 of Annex 6.
TMC		
Model Contract Document		<ul style="list-style-type: none"> i) Amend the Schedule of Rates 400 Series in accord with IAN 44/02 as considered appropriate. Include additional items in the Schedule for alternative options of Road Restraint Systems as appropriate. ii) Incorporate those amendments to SHW included in Annex A of IRRRS within Works Information 2 as appropriate in line with the terminology and requirements of IRRRS. iii) Amend the Notes for Guidance Series NG 400 within Works Information 3 in line with Annex A of IRRRS and the terminology and requirements of IRRRS. iv) Amend the Method of Measurement for Highway Works – Term Maintenance in line with the terminology and requirements of IRRRS and Annex A of IRRRS as considered appropriate.
MAC		
Model Contract Document		<ul style="list-style-type: none"> i) Include the IAN and IRRRS document into Table 15.1 of Annex 15. ii) Include details of those Standards and Advice Notes that have been amended / partially withdrawn etc in Table 15.3 of Annex 15. iii) Also, include the amendments to SHW and Notes for Guidance to SHW and Bill of Quantities for Highway Works as contained in Annex A to IRRRS in Table 15.3 of Annex 15.