



# National Highways Sector Schemes for Quality Management in Highway Works

5A

FOR THE MANUFACTURE OF PARAPETS FOR ROAD RESTRAINT SYSTEMS

PUBLISHED BY THE SECTOR SCHEME ADVISORY COMMITTEE  
FOR PARAPETS©

# DOCUMENT CONTROL

## Issue Statement

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## Revisions

It is the committee's policy that the issue of any revision to this document shall be an issue of the full document rather than individual pages, the following data gives information where changes have been made to the original document.

### August 2004

Implementation of UKAS issue 2 added  
Section 4 – Introductory foreword modified  
Clause 6.2.2(ii) Welder Qualifications para 1 clarified to align with BS EN 287  
Clause 6.2.2(ii) Inspection Personnel para 1 Insert "body" after "equivalent" in line 4  
Clause 7.5.1 (vii) Parapet Installation Criteria paragraph 2 extended  
Appendix F - updated

### April 2005

Implementation of UKAS issue 3 added  
Introduction amended to reflect changes made to document  
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Section 3 – definitions added for application design and product design  
Clause 4.1 expanded to include requirements for registration  
Clause 5.6 clarified  
Clause 6.2.2 (ii) updated including reference to requirement for BS EN 473  
Clause 7.1 expanded to integrate management plans  
Clause 7.2.2. Note added regarding verification of technical requirements  
Clause 7.3 divided into two: part A for product design and part B for application design  
Clause 7.4 clarification  
Annex 1 updated  
Appendices B, C, F and J1 amended  
Appendix G Clauses 1.1, 2.6 and 2.7 modified  
Appendix K added

### **June 2008**

Amendments to:

Composition of SSAC  
Selection of Certification Body  
Introduction  
Scope  
Normative Reference  
Appendices B, C, F, G, J1, J2 & K

Added:

Appendices G1, L & M

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# **COMPOSITION OF SECTOR SCHEME ADVISORY COMMITTEE, EXCLUSION OF LIABILITY AND SELECTION OF CERTIFICATION BODY**

## **COMPOSITION OF SECTOR SCHEME ADVISORY COMMITTEE**

BM TRADA Certification Limited

BSI Management Systems

Construction Industry Training Board

CSS

Highways Agency

FCA

Lantra Awards

Lloyd's Register Quality Assurance Limited

National Quality Assurance Limited

SGS Ltd

Society of Chief Officers of Transportation in Scotland

UK Steel Association

Vehicle Restraint Manufacturers Association

## **EXCLUSION OF LIABILITY**

The SSACP:

- 1 have and accept no liability whatsoever for any failure of any system assessed under the SSACP document or for the quality, fitness for purpose, or safety of any product or service which is subject of such assessment,
- 2 do not provide any representation or warranty as to any aspect of any such system, product or service, and
- 3 hereby expressly exclude all and any liability or responsibility (however alleged to arise) for or in connection with the provision of any service or product or any use of any product, all and any such, liability or responsibility attaching exclusively to the producer (or user as the case may be) thereof.

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## **SELECTION OF CERTIFICATION BODY**

It is important to note that due to the specific requirements for assessor competence required by this Sector Scheme a technical expert may be appointed by the Sector Scheme Advisory Committee to assist UKAS in the assessment of Certification Bodies as described in Appendix G.

Prospective companies seeking registration under this scheme should ensure that they engage a certification body specifically accredited to assess against the requirements of this SSD. Specifiers, consultants, engineers etc. that require confirmation of compliance with the contract specification in respect of the supply of products/materials should confirm the current status of the quality assurance certificate issuer and that specific reference is made to this Sector Scheme.

It should also be noted that CE Marking is a requirement of BS EN 1317; this can only be applied following successful evaluation of the product factory production control and initial type testing by a Notified Body. (Notified Bodies are appointed by the relevant authority in a Member State of the European Union and notified to the European Commission, in the United Kingdom the relevant authority for notification under the Construction Products Directive is the Department of Communities and Local Government.)

## **Implementation of Issue UKAS 1**

This sector scheme document replaces the previous requirement for bridge parapets through accepted certification body schemes to BS EN 9002:1994.

To enable companies and certification bodies to amend their procedures in accordance with this sector scheme document, a transition period of 12 months from the issue date of this document will apply (i.e. the document will be implemented by Dec 2004).

## **Implementation of Issue UKAS 2**

This edition of the sector scheme document is to be implemented from the date of publication on the UKAS web site, but remain subject to the implementation date requirements of issue 1.

## **Implementation of Issue UKAS 3**

This edition of the sector scheme document is to be implemented from the date of publication on the UKAS web site, but remain subject to the implementation date requirements of issue 1.

## **Implementation of Issue UKAS 4**

This edition of the sector scheme document is to be implemented from the date of publication on the UKAS web site.

## INTRODUCTION

In the late 1980's considerable concern was generated because of poor standards in the supply and installation of road restraint systems on highways. One consequence of this was that the supply and installation of these was included in the list of Quality Management Schemes (Appendix A) of the Department of Transport's Specification for Highway Works published in 1986 (the sixth edition). Initially BSI Quality Assurance was the only organisation authorised by the Department of Transport to provide quality assurance certification for this sector of industry. As time passed, the Highways Agency acknowledged that other organisations, subject to technical scrutiny, could also provide quality assurance certification. Accepted certification body schemes included BSI (QAS 3204/194), LRQA (QSS 32043) and BMTRADA (SFSS5).

However, providing scrutiny for new schemes was resource intensive, but also highlighted the need for re-scrutiny and up dating of earlier schemes. Following the publication of BS EN ISO 9002:1994 the certification industry wished to withdraw their published schemes and as a result, the bridge parapet industry with the agreement of UKAS created a Sector Scheme Technical Advisory Committee to establish a national guidance document to provide an interpretation of BS EN ISO 9002: 1994 which could be used by all parties involved in this type of work and maintained at least annually.

This Sector Scheme Document (SSD) relates to the quality management system requirements for the manufacture and supply of parapets for bridges, retaining walls and other structures to provide road restraint systems. The companion Sector Scheme Document for the installation of parapets (Scheme 5B) should be read in conjunction with this document.

The scheme needs to be read in conjunction with BS EN ISO 9001: 2000 and BS EN 1317 for Road Restraint Systems. The scheme does not supersede or amplify either of these standards but provides guidance on their application. A separate sector scheme for the supply, installation and repair of vehicle restraint systems for safety fences, Scheme 2B, provides guidance in respect of permanent and temporary vehicle safety barriers.

In using this Sector Scheme users shall use best practice of specifying any other relevant highway sector scheme as appropriate to the nature of the work being undertaken. Furthermore where there is a Sector Scheme in place it must be used.

The Document is a live document with the Advisory Committee meeting at least once each year to develop it as appropriate. Those using the document should always ensure that they have the current version of the document by checking on UKAS website ([www.ukas.com](http://www.ukas.com)) or by contacting any of the certification bodies accredited by UKAS for this scheme.

Lantra Awards maintain a list of registered Organizations but only those organizations that have applied for public listing can be viewed on the Schedule of Suppliers website [www.scheduleofsuppliers.co.uk](http://www.scheduleofsuppliers.co.uk). The website will also give you contact details for enquiries regarding the full listing.

Any observations or complaints relating to this document should be addressed to the Committee Secretary using the Feedback and complaints sheets provided as Appendices J1 and J2.

# INTERPRETATION OF BS EN ISO 9001: 2000

## 1. Scope

This schedule contains requirements for the quality management system to BS EN ISO 9001: 2000 for Organizations undertaking the product design, manufacture and supply of vehicle and pedestrian parapets on bridges, retaining walls and other highway structures. Separately, it also applies to Organizations that fabricate under licence or other legal or contractual means to product designs meeting the requirements of the relevant parts of BS EN 1317, application design and the supply of vehicle and pedestrian parapets on bridges, retaining walls and other highway structures. The parapets will form a road restraint system (or part of a road restraint system), which may include additional protection and restraint for pedestrians and other road users. This document is intended to provide good practice by benchmarking to meet the factory production control requirements of BS EN 1317, Part 5 and interprets, as appropriate, the requirements of BS EN ISO 9001: 2000; it should be read in conjunction with these two standards.

The scope of the scheme does not extend to cast in place parapet structures.

### Note

*BS EN 1317-5 : 2007 is the subject of transitional arrangements agreed under the European Commission mandate. The Member States have agreed a nominal transition period for the co existence of EN 1317-5 : 2007 and their corresponding National Standard(s). It is intended that this period will comprise a nominal nine month period during which any required changes to National Regulations are to be made, followed by a further nominal thirty six month period for the implementation of CE Marking. At the end of the co existence period, the National Standards will be withdrawn.*

## 2. Normative reference

The following normative documents contain provisions which constitute provisions of BS EN ISO 9001 : 2000:

BS EN ISO 9000 : 2005 Quality Management Systems – Fundamentals and Vocabulary

BS EN ISO 9004 : 2000 Quality Management Systems – Guidelines for Performance Improvements

BS EN 1317-5 : 2007 Road Restraint Systems product requirements, durability and evaluation of conformity for vehicle restraint systems

prEN 1317-6 : Pedestrian Restraint Systems, Part 6: Pedestrian Parapets

## 3. Terms and definitions

For the purpose this Sector Scheme Document the following definitions shall apply.

Anchorage	The method by which the parapet is securely attached to a structure. Anchorages must be capable of resisting without damage all loads which the vehicle parapet will transmit to the structure up to and including failure.
Certification of Registration	A certificate issued by a UKAS accredited Certification Body certifying that the holder operates a Quality Management System complying with BS EN ISO 9001: 2000 and this document.

Client	The body for which the work is being carried out, e.g. the Highway Authority and its nominated representative.
Contract Specification	<ul style="list-style-type: none"> <li>i) For example, Manual of Contract Documents for Highway Works: Volume 1 Specification for Highway Works.</li> <li>ii) Contract Specific Appendices</li> <li>iii) The Contract Drawings.</li> </ul>
Customer	The body and its nominated representative engaging the Organization for the purpose of the work described in this Document. (The main contractor where the Organization is a sub-contractor.)
Design	Application design is the layout of products/systems to meet project requirements within the limits available for the products/systems defined by the products/systems designer
a) Application Design	
Design	Product design is the development of products/systems to meet the requirements of recognised standards for performance and safety. Guidance on the limits of such products/systems must be provided by the product designer
b) Product Design	
Organization	The body responsible for the manufacture and supply of parapets or components there of.
Organization's Manager	The person named in the Organization's Quality Plan as having managerial responsibility for manufacturing operations.
Pedestrian Parapet	Pedestrian or other road users' restraint system along a bridge or on a retaining wall or similar structure which is not intended to be used as a vehicle restraint system.
Quality Plan	The document setting out the specific quality practices, resources and sequence of activities relevant to the contract.
'Shall'	Used to indicate a requirement strictly to be followed in order to conform to the standard and from which no deviation is permitted. (See ISO Directives Part 3: 1997, Annex E) (Reference "Guidance on the terminology used in ISO 9001: 2000 and ISO 9004: 2000.).
SSACP	Sector Scheme Advisory Committee for Parapets
Vehicle Parapet	Safety barrier installed on the edge of a bridge or on a retaining wall or similar structure where there is a vertical drop, and which may include additional protection and restraint for pedestrians and other road users.
Vehicle Restraint System	System installed on the road to provide a level of containment for an errant vehicle.

## Note

Paragraph numbers in sections 4 to 8 inclusive refer to paragraphs of BS EN ISO 9001: 2000. Where “no specific interpretation” is recorded under a heading this means that the committee did not consider it necessary to provide supplementary interpretation for that clause.

## **4 Quality management system**

### **4.1 General requirements**

The Organization shall operate a quality management system to BS EN ISO 9001: 2000 and this schedule.

The organization shall notify and provide evidence of conformity to this scheme to the Schedule of Suppliers via Lantra Awards (Lantra House, Stoneleigh Park, Coventry, CV8 2LG) and the Secretary of the Sector Scheme of their registration to this scheme immediately following confirmation from the certification body and thereafter annually. In addition the organization shall provide details of a focal point for the organization.

### **4.2 Documentation requirements**

#### **4.2.1 General**

No specific interpretation.

#### **4.2.2 Quality manual**

No specific interpretation.

#### **4.2.3 Control of documents**

Unless otherwise included in the Organization's processes, project specific procedures are required for the following documentation:

- Correspondence.
- Delivery notes and certificates of conformity for parapet components, and method statements from component supplier.
- Contract Specification.
- Customer order.
- Instructions to parapet erector (see paragraph 7.5.1 (vii) below).
- Methods to ensure the Organization obtain and use amendments to the documents listed in Appendix B.
- Customer variations and instructions.
- Training records and certificates.

#### **4.2.4 Control of records**

Unless otherwise included in the Organization's processes, project specific records are required for the following:

- Organization's drawings and design development records.
- Testing and inspection records, including inspection records for production welds and those covering the production periods relating to the components supplied.
- Compliance certification.
- Records of rejected materials.
- Calibration and maintenance records.
- Production records.

Contract specific records and all inspection and testing records shall be maintained for a minimum of six years.

## **5 Management responsibility**

### **5.1 Management commitment**

No specific interpretation.

### **5.2 Customer focus**

No specific interpretation.

### **5.3 Quality policy**

No specific interpretation.

### **5.4 Planning**

No specific interpretation.

### **5.5 Responsibility, authority and communication**

The Organization shall notify Lantra Awards in writing within 14 days of receipt of its confirmation of registration to the scheme by an accredited UKAS (or equivalent) Certification Body specifically accredited against this scheme.

### **5.6 Management review**

The Organization shall review the Quality Management System to ensure its continuing suitability and effectiveness to meet the requirements of this Sector Scheme at least once every 6 months, or on occasions when a significant change in the Contract Specification takes place.

## **6 Resource management**

### **6.1 Provision of resources**

No specific interpretation.

### **6.2 Human resources**

#### **6.2.1 General**

No specific interpretation.

#### **6.2.2 Competence, awareness and training**

- (i) The Organization shall maintain training records and records of practical experience for its employees with specific reference to the requirements of this Sector Scheme. (See BS EN 1317-5 Clause 6.3.3.1)
- (ii) The parapet manufacturer's workshop shall be supervised at all times by suitably experienced/qualified personnel.

Training /qualification requirements for various personnel involved with the manufacture of parapets are as follows. Details of the training programmes available are given in Appendix C.

#### Welder Qualifications

All welders shall hold certificates of approval to the relevant BS EN as specified in Clause 402.6 of the Specification for Highway Works for steel and for aluminum alloys as appropriate, These certificates shall have been endorsed within the previous 2 year period, for all weld types which they produce.

Certificates of approval shall be from an independent inspection authority using personnel who are either registered or appropriately certified in accordance with the Certification Scheme for Welding and Inspection Personnel (CSWIP) or equivalent. Tests shall be carried out by a laboratory accredited by the United Kingdom Accreditation Service (UKAS) for weld testing. (See also clause 402.6 of the Specification for Highway Works.)

#### Inspection Personnel

The manufacturer shall provide suitable personnel to carry out inspection of production welds as required by paragraph 4 of Annex 1 of this SSD. Personnel conducting visual inspection shall be certified by the Certification Scheme for Welding and Inspection Personnel (CSWIP) or equivalent at a competency level appropriate to the type of weld being inspected. Personnel conducting non-destructive testing (NDT) shall be certified by the CSWIP or equivalent body appropriate to the equipment used and weld groups inspected all in accordance with BS EN 473. Evidence of training and qualification shall be retained and made available for examination when required.

### **6.3 Infrastructure**

No specific interpretation.

### **6.4 Work environment**

No specific interpretation.

## **7 Product realization**

### **7.1 Planning of product realization**

The Quality Plan shall as a minimum address the topics listed in Appendix A of this schedule supplemented by contract specific information.

The Quality Plan should not be considered in isolation. An integrated approach should be taken which links the Quality Plan, Environmental Plan, Sustainability Plan and the Health and Safety Plan together. Management of the service as a whole is reliant on quality and hence the contract and the quality element cannot be separated, as one cannot function without the other.

The Quality Plan describes the management strategy that sets clear and sustainable performance objectives, delegate's responsibility and establishes lines of communication.

The topics are in BS EN ISO 10005 for the content of a Quality Plan and this document, in particular reference should be made to Appendix A of this document and Appendix H of the SHW.

The Quality Plan may be a largely standard document as indicated in Appendix A of this document and amended to include contract specific information and specification.

## **7.2 Customer-related processes**

### **7.2.1 Determination of requirements related to the product**

No specific interpretation.

### **7.2.2 Review of requirements relating to the product**

The review processed shall require the Organization to verify with the Customer that the order placed meets the technical requirements included in the Client's Contract Specification.

Note: Where there is no objective feedback from the Customer, the organization should be proactive and include a standard statement on their order acknowledgement clearly stating that by placing the order the main contractor has checked its suitability against the Client's technical specification

### **7.2.3 Customer communication**

No specific interpretation

## **7.3 Design and development**

### **Part A - Product design**

#### **A7.3.1 Product design and development planning**

The Quality Plan shall identify personnel involved with product design and/or development along with their appropriate qualifications/experience.

#### **A7.3.2 Product design and development inputs**

The manufacturer shall specify the type, working width and containment of his system. The manufacturer shall provide live loading data to the bridge designer and/or application designer as appropriate.

#### **A7.3.3 Product design and development outputs**

No specific interpretation.

#### **A7.3.4 Product design and development review**

The requirements for product design and development reviews including their frequency and programming shall be identified in the Quality Plan.

#### **A7.3.5 Product design and development verification**

No specific interpretation

#### **A7.3.6 Product design and development validation**

No specific interpretation

#### **A7.3.7 Control of product design and development changes**

No specific interpretation

## **Part B – Application design**

### **B7.3.1 Application design and development planning**

The Quality Plan shall identify personnel involved with application design along with their appropriate qualifications/experience.

### **B7.3.2 Application design and development inputs**

The fabricator shall liaise with the product designer to ensure that the application design and development is appropriate for the application it is intended to meet.

### **B7.3.3 Application design and development outputs**

No specific interpretation

### **B7.3.4 Application design and development review**

The requirements for application design and development reviews including their frequency and programming shall be identified in the Quality Plan.

### **B7.3.5 Application design and development verification**

No specific interpretation

### **B7.3.6 Application design and development validation**

No specific interpretation

### **B7.3.7 Control of application design and development changes**

No specific interpretation

## **7.4 Purchasing**

The Organization shall obtain evidence of conformity for all components purchased, such as identification marks and their traceability to certificates of conformity, specific details shall be described in the Quality Plan.

In using this Sector Scheme Organizations shall use best practice of specifying the use of relevant National Highway Sector Scheme and other schemes listed in Appendix A of the Specification for Highway Works, and in particular Scheme 3 for the stockist/distributor of Industrial Fasteners and Associated Items as appropriate to the nature of the work being undertaken.

See BS EN 1317-5 sub clause 6.3.3.3.

## **7.5 Production and service provision**

### **7.5.1 Control of production and service provision**

#### **(i) Workmanship, cutting and forming of holes**

Workmanship in aluminum alloy shall be carried out in accordance with BS 8118: Part 2. Workmanship in steel shall be carried out in accordance with BS 5400: Part 6.

Cutting of aluminum alloy components shall be carried out in accordance with BS 8118: Part 2.

Holes in steel components shall be drilled except that: a) holes may be punched full size in cleats and brackets where the thickness of the material does not exceed 12.5 mm and where the fabrication is not subject to repeated stresses; and b) oversize holes may be flame cut.

Holes in aluminum alloy components shall conform to BS 8118: Part 2.

(ii) Welding procedures

The manufacturer shall produce and work in accordance with written and approved procedures, confirmed by testing, in accordance with BS EN ISO 15607, BS EN ISO 15609-1 and BS EN ISO 15614-1 for steel and BS EN ISO 15607, BS EN ISO 15609-1 and BS EN ISO 15614-2 for aluminum alloys for all production and repair welds. (See also current edition of Specification for Highway Works)

(iii) Remedial work

Weld repairs, if allowed, shall conform to an approved procedure, as described in paragraphs 7.5.1 (ii) above and 8.2.4 below. Welds in aluminum alloys shall not be repaired more than once.

(iv) Fabricated components in either aluminum alloy or steel shall be assembled so that they are not twisted or otherwise damaged and shall be so prepared that the specified inclinations, if any, are provided. Shims and packings shall not be used except under the post base plate.

(v) The fit of mating components shall be such as to allow practical site assembly without inducing stress or distortion in the components whilst meeting the design strength requirements

(vi) Structural fastenings shall conform to the British, European or ISO Standard.

(vii) Installation details

The manufacturer of the parapet shall produce a statement of installation and site work to completion, including layout drawings detailing anchorage positions.

Particular attention shall be given to bolt tightening, weld gaps, the gap setting at expansion or bridge movement joints, protection of the underside of aluminum post base plates, anchorages and holding-down bolt engagement.

Parapet installation criteria

The installation of complete systems, or individual components of any system, must only be undertaken by companies or individuals that have been granted a license to do so for that particular system.

It is a condition precedent to the granting of such license that sufficient installation staff have attended and passed a training course devised and administered by the Promoter/Manufacturer of the system and Lantra Awards. Proof of such training will be by issue of a FISS/CSCS joint scheme card denoting the status of the individual. (See Appendix C and clause 6.6.2 of National Highway Sector Scheme 5B (for the installation of parapets for road restraint systems) for information)

Organizations shall use best practice by specifying the use of National Highway Sector Scheme 5B Installation of Parapets for Road Restraint Systems and any other relevant highway sector scheme as appropriate to the nature of the work being undertaken.

(viii) See BS EN 1317-5 sub clause 6.3.3.3

#### **7.5.2 Validation of processes for production and service provision**

Testing of procedures described in paragraph 7.5.1 (ii) above shall be subject to reassessment after a period not exceeding 7 years.

See BS EN 1317-5 sub clause 6.3.3.3

#### **7.5.3 Identification and traceability**

See Specification for Highway Works (current edition) – Series 400 for traceability requirements

See BS EN 1317-5 sub clause 6.3.3.4

#### **7.5.4 Customer property**

No specific interpretation

#### **7.5.5 Preservation of product**

(i) Handling and stacking

Parapets shall be handled and stacked in such a manner that permanent damage to components and to any temporary or permanent protective treatment is avoided.

(ii) Packing and transportation

Parapets shall be protected from damage during transportation. Means shall be provided to prevent distortion of the fabrications.

All bolts, screws, nuts and washers and any small loose components shall be suitably packed, protected and identified.

(iii) Contract specific storage/transportation requirements shall be identified in the Quality Plan.

#### **7.6 Control of monitoring and measuring devices**

Requirements for measuring and monitoring devices are given in Appendix E.

### **8 Measurement, analysis and improvement**

#### **8.1 General**

No specific interpretation.

#### **8.2 Monitoring and measurement**

##### **8.2.1 Customer satisfaction**

No specific interpretation.

##### **8.2.2 Internal audit**

No specific interpretation.

### 8.2.3 **Monitoring and measurement of processes**

No specific interpretation

### 8.2.4 **Monitoring and measurement of product**

In addition to other testing required in the Contract Specification the following testing is required for Aluminium and is detailed in Annex 1.

- Aluminium Alloy Structural Members  
Mechanical testing of rail sections.  
Drift testing of hollow sections.
- Effective Longitudinal Members  
Drift testing.
- Welding  
Aluminium alloy posts (weld procedures).
- Production inspection and testing  
Non-destructive testing: visual inspection, liquid penetrant inspection (LPI), and ultrasonic testing.

### 8.3 **Control of non-conforming product**

(i) Non-conforming products shall be precluded, re-worked or offered for acceptance to the Client.

(ii) Laminar defects

Steel base plates shall not have laminar defects exceeding the limits of BS 5996 for quality grade B2. If laminar defects are revealed during fabrication or ultrasonic testing, the base plate shall be rejected or tested for conformity.

(iii) See BS EN 1317-5 sub clause 6.3.3.5

### 8.4 **Analysis of data**

No specific interpretation.

### 8.5 **Improvement**

No specific interpretation.

#### 8.5.1 **Continual improvement**

No specific interpretation.

#### 8.5.2 **Corrective action**

See BS EN 1317-5 sub clause 6.3.3.6

#### 8.5.3 **Preventive action**

No specific interpretation.

# ANNEX 1: TESTING REQUIREMENTS

Testing shall be carried out to the following requirements.

## 1. Additional tests for aluminium alloy structural members

### 1.1 Manual testing for rail sections

#### *Test piece selection*

For batches of material consisting of five or more extruded lengths, cut a piece of material approximately 300 mm long from each of four extruded lengths within the batch, for tensile testing.

For batches of material consisting of up to four extruded lengths, cut a piece of material approximately 300 mm long from each extruded length, for tensile testing.

NOTE. An extruded length is the product of one extrusion billet.

A batch shall consist of a maximum of 2t of extruded product. All material in a batch shall be extruded from billet produced in the same cast and homogenized in the same furnace charge. All material in a batch, and its associated tensile test pieces, shall be precipitation heat treated in the same furnace charge. Where material is solution treated rather than press quenched, all material in a batch shall be solution treated in the same furnace charge. If tensile test pieces are cut prior to solution treatment they shall be included in the same furnace charge as the lengths from which they were taken.

#### *Procedure*

Carry out tests for either conductivity or, hardness after precipitation heat treatment, using the following procedure. Test each test piece obtained as described above for conductivity or hardness at its mid-point, on the traffic face of the section. Mark the reading obtained on the test piece. Test the front and back ends of all lengths of rail for conductivity or hardness on their traffic face and mark the readings on the rail.

Find the highest conductivity reading or the lowest hardness reading for a batch of material, including its associated test-piece lengths.

If a test piece length has the highest conductivity reading or the lowest hardness reading then machine a tensile test piece from it, in accordance with BS EN 10002-1.

If a length of rail has the highest conductivity reading or the lowest hardness reading, cut a length of approximately 300 mm from the end of the rail at which the reading is found. Machine a tensile test piece from this length, in accordance with BS EN 10002-1.

Test the tensile strength of the machined test piece in accordance with BS EN 10002-1 on a tensile test machine calibrated by the United Kingdom Accreditation Service (UKAS), or similar approved body.

### 1.2 Drift testing of hollow sections -rails

#### *Test piece selection*

For hollow sections, take a drift test piece of length approximately 150 mm from the front of every extruded length, adjacent to the front length of the hollow section. Mark the position of every cut length and test piece on the material. NOTE. An extruded length is the product of one extrusion billet. The front of the length is that which has been extruded first.

#### *Procedure*

Flare each drift test piece obtained as above using a conical or tapered steel mandrel with an angle of 30° to 60°. Force the mandrel into each test piece without shock. Apply a

load to the test piece to cause a tear of sufficient length that the fracture surface may be visually examined.

#### *Acceptance criteria*

If the fracture surface of the test piece shows tearing or plastic type fracture across 100 % of its surface it shall be deemed to have passed and all material in the extruded length from which it was taken shall be deemed acceptable.

If the test piece splits down an extrusion weld and does not show tearing or plastic type fracture across 100 % of its fracture surface then it shall be deemed to have failed. If there is only one member in the extruded length from which the test piece was taken, discard this.

If there is more than one member in the extruded length from which the test piece was taken, take a further drift test piece from the back end of the first member. Discard the remainder of the first member. If the new test piece passes then the remainder of the extruded length shall be deemed acceptable. If it fails then discard the remainder of the extruded length. NOTE. The front member is that which has been extruded first and the front of the member is the end that has been extruded first.

## **2. Aluminum Alloy Effective Longitudinal Members**

### **2.1 Drift Testing**

The following requirements for effective longitudinal members shall be observed.

The metallurgical integrity of aluminum alloy sections shall be proven by drift testing in accordance with paragraph 1.2 above.

## **3. Welding**

Weld procedures for aluminum alloy posts shall be verified by means of a static load test conducted not less than 3 days after welding. The test shall be deemed to be invalid if the weld size is less than the nominal size or more than 15 % above it. Testing verified by an independent competent witness.

Approval shall be by an independent inspecting authority using registered welding engineers, registered welding quality engineers or equivalent to the satisfaction of the purchaser.

## **4. Production inspection and Testing – Non-destructive Testing**

### **4.1 Inspection personnel**

The manufacturer shall provide suitable personnel to carry out inspection of production welds as described in section 4 paragraph 6.2.2 of this SSD.

### **4.2 Visual inspection**

All welded joints shall be subject to visual inspection after cleaning prior to NDT and protective treatment. The relevant techniques in BS EN 970 shall be applied as appropriate. Weld surfaces shall be free of slag residues, sharp edges, cracks and lack of fusion, including overlap. All surfaces shall be free of weld spatter, arc strikes and contaminants. The throat dimensions of butt welds and the leg length and apparent throat dimensions of fillet welds, as measured by a welding gauge and taking into account lack of fit, shall be not less than those specified, except that local shortfalls up to 1 mm are acceptable, provided the average dimension over any 50 mm length is not less than the specified dimension. The toe angle shall be not less than 90°. Undercut shall not result in a section loss of more than 5 % over any 50 mm length of joint, nor shall its depth exceed 0.5 mm or 10 % of the thickness, whichever is less. Where on visual inspection the presence of cracking or lack of fusion is suspected, testing by magnetic particle inspection or liquid penetrant inspection shall be carried out in accordance with BS EN

9934-1 (or BS 6072) or BS 6443 as appropriate. (See also requirements of the Specification of Highway Works – Series 400 May 2004 amendment or later)

#### **4.3 Magnetic Particle Inspection (MPI) and Liquid Penetrant Inspection (LPI)**

MPI shall be applied in accordance with BS EN ISO 9934-1 (or BS 6072) to joints in steel parapets, selected in accordance with paragraph 4.5 below, where any of the material thickness exceeds 20 mm.

Liquid penetrant inspection in accordance with BS EN 571-1 shall be applied to welds in aluminum alloy posts between the post and the base plate and any gusseting to the connection as selected in paragraph 4.5. (See also requirements of the Specification of Highway Works – Series 400)

#### **4.4 Ultrasonic Testing**

Post to base plate joints selected in accordance with paragraph 4.5 shall be ultrasonically tested where the post is butt welded and is 8 mm thick or greater in the traffic face half of the post section or, if fillet welded, the leg length is greater than 12 mm nominal. The ultrasonic testing of steel and aluminum shall be in accordance with BS EN 1714. The weld shall be free of cracks. The height of buried slag and lack of fusion shall not exceed 3 mm and, within 6 mm of the outer surface, their individual lengths shall not exceed 10 mm. The resulting net throat area loss over any 50 mm length shall not exceed 5 % of the specified throat area.

#### **4.5 Frequency of non-destructive testing (NDT)**

Joints for MPI, LPI or ultrasonic testing shall be selected as follows.

All joints of each type up to a batch size of 10 components and 10 % of the manufacturer's production thereafter for each type of component (see 4.3 and 4.4) shall be tested. If non-conformances are found, the scope of testing shall be doubled. If further non-conformity is found, the whole batch shall be tested.

NOTE. Differences in either member cross-sectional shape, joint configuration or weld type constitute a change in component type. Variations in cross-section size or member length need not constitute a change in component type. Variations in parent metal thickness or weld throat dimension from the specified sizes on the sample selected for the destructive test may be included within the same type up to a limit of + 40 %.

## APPENDIX A: REQUIREMENTS FOR QUALITY PLANS

The Quality Plan shall include the following:

1. Customer details, name and address, contact details.
2. Definition of the product or service being provided.
3. The structure of the Organization relevant to the contract, including the name of the senior manager responsible, and personnel managing the work. This shall include contact details.
4. Personnel carrying out the work and reference to their relevant qualifications and experience. This shall include, as appropriate, designers and design developers, welders, flame cutter users, inspectors of welds, material and end product testers.
5. Programme of work.
6. Contract Specification requirements.
7. Processes for receipt and examination of compliance certificates for purchased products.
8. Product identification and traceability.
9. Contract specific requirements for storage or transportation.
10. Testing programme.
11. Records deposition.

## APPENDIX B: REFERENCE DOCUMENTS

This listing is not exhaustive; other documents may be required to fulfil the requirements of the Contract. Organizations shall ensure that they have a working knowledge and access to all of the following documents including amendments.

1. Manual of Contract Documents for Highway Works (The Stationary Office):
  - Volume 1 Specification for Highway Works
  - Volume 2 Notes for Guidance on the Specification for Highway Works
  - Volume 3 Highway Construction Details
2. Design Manual for Roads and Bridges (DMRB) (The Stationary Office):
  - IAN 44 Interim Requirements for Road Restraint Systems
3. Standards:

BS EN 1317	Road Restraint Systems
BS EN 1317-1	Part 1: Terminology and general criteria for test methods
BS EN 1317-2	Part 2: Performance classes, impact test acceptance criteria and test methods for safety barriers
ENV 1317-4	Part 4: Barrier Systems: Terminals and Transitions - Performance classes, impact test acceptance criteria and test methods
BS EN 1317-5	Part 5: Product requirements, and evaluation of conformity for vehicle restraint systems
prEN 1317-6	Part 6: Pedestrian restraint systems, BS EN ISO 15607 pedestrian parapet
BS 8118 Part 2	Structural use of aluminium – Specification for materials, workmanship and protection
BS 5400 Part 6	Steel, concrete and composite bridges – Specification for materials and workmanship
BS EN 10160	Ultrasonic testing of steel flat product of thickness equal or greater than 6mm (reflection method). (Replacement for BS 5996)
BS EN ISO 15607	Specification and qualification of welding procedures for metallic materials. General Rules
BS EN ISO 15609-1	Specification and qualification of welding procedures for metallic materials- Welding procedure specification - Part 1: Arc welding
BS EN ISO 15614-1	Specification and qualification of welding procedures for metallic materials - Welding procedure specification - Part 1: Arc and gas welding of steels and arc welding of nickel and nickel alloys
BS EN 288 Part 4	Specification and approval of welding procedures for metallic materials – Welding procedure tests for the arc welding of aluminium and its alloys
BS EN 287 Part 1	Approval testing of welders for fusion welding – Steel
BS EN 287 Part 2	Approval testing of welders for fusion welding – Aluminium and aluminium alloys

BS EN 970	Non-destructive examination of fusion welds – Visual examination
BS EN 1714	Non destructive examination of welded joint Ultra examination of welded joints
BS EN ISO 9934-1	Non-destructive testing. Magnetic particle testing Part 1. General principles.
BS 6072	Methods for magnetic particle flaw detection
BS EN ISO 9000: 2005	Quality Management Systems – Fundamentals and Vocabulary
BS EN ISO 9001: 2000	Quality Management Systems – Requirements
BS EN ISO 9004: 2000	Quality Management Systems – Guidelines for Performance Improvements

## APPENDIX C: TRAINING AND HEALTH AND SAFETY

Details of training for personnel involved with parapets.

### **Welder, Steel, Aluminium**

*Details:*

Certification to BS EN 287-1 and BS EN 1418

Certification to BS EN 287-2

### **NDT Technicians**

Technicians should be approved to EN 473 for NDT testing by hand and to EN 10256 for volume production.

### **Inspection Personnel**

*Details*

#### Visual Welding Inspection

CSWIP – W1-6-92 6<sup>th</sup> Edition June 2000

#### Liquid Penetration Testing of Welding

ASNT (SNT-TC-1A (2001)) Level II or equivalent PCN/GEN Appendix E2 qualification (level 2)

#### MPI Testing

ASNT (SNT-TC-1A (2001)) Level II or equivalent PCN/GEN Appendix E1 qualification (level 2)

#### Ultrasonic Testing

PCN/GEN Appendix C1 (level 2)

#### Electromagnetic Testing

PCN/GEN Appendix C3A (level 2)

Inspection personnel should hold the relevant qualification and as appropriate supplementary qualifications for the materials being inspected.

## APPENDIX E: REQUIREMENTS FOR THE CONTROL OF MONITORING AND MEASURING DEVICES

### Plant Calibration Requirements

Equipment Title	Purchase	Calibration Control	Calibration Frequency
Steel Rule	BS 4372	Issue control and damage check by user	In use check
Steel Tape	EC Class 11		In use check
Fibre Tape	EC Class 111		In use check
Bevel Protractor			In use check
Engineers Square			In use check
<b>Thermometers:</b> Mercury/Alcohol		Traceable calibration <i>(upon purchase only)</i>	In use check
Other		Traceable calibration	Annually
Torque Wrench		Traceable calibration	Annually
Slip Gauges		Issue control and damage check by user	In use check
Gas Gauges		Traceable calibration <i>(upon purchase only)</i>	In use check
Vernier Calipers		Issue control and damage check by user	In use check
Film Thickness Gauges		Issue control and damage check by user	In use check
Combination Sets			In use check

## APPENDIX F: LIST OF CERTIFICATION BODIES

Information on certification bodies accredited against this scheme can be found on the UKAS website [www.ukas.com](http://www.ukas.com). To identify the certification bodies on the website:

- place the cursor onto 'about accreditation' in top grey menu bar
- move down to 'accredited bodies'
- move across to 'certification body schedules' and left click on this to take you to the list of schedules
- move down past 'key abbreviations' to 'search within the schedules' - click on 'advanced search'
- type 'Highway Sector Scheme No 5A' in the box and tick the square by 'search UKAS documents'
- left click 'search'
- This then lists the certification bodies that are accredited and their details can be found by clicking on the appropriate links.

### NOTE 1

Where access to the UKAS website is restricted for one reason or another, advice on the accreditation status of certification bodies to assess bridge parapet installation companies against this sector scheme may be sought from UKAS (Tel 0208 917 8400).

### NOTE 2

The following list provides details of Certification Bodies that currently have accreditation from UKAS for the fabrication and installation of bridge parapets to HA accepted Certification Body schemes, these schemes will be superseded by National Highway Sector Schemes 5A and 5B and the Certification Bodies will need to apply for an extension to their scope to meet the requirements of this scheme. Bodies carrying out factory production control for the purposes of EN 1317-5 will need to be notified to the Europe Commission by the Department of Communities and Local Government.

BMTRADA	<a href="http://www.bmtrada.com">www.bmtrada.com</a>
BSI	<a href="http://www.bsi-global.com">www.bsi-global.com</a>
Lloyd's Register Quality Assurance	<a href="http://www.lrqa.com">www.lrqa.com</a>
National Quality Assurance Ltd	<a href="http://www.nqa.com">www.nqa.com</a>
SGS UK Ltd	<a href="http://www.sgs.co.uk">www.sgs.co.uk</a>

# APPENDIX G: THE ROLE OF THE CERTIFICATION BODIES AND ASSESSOR COMPETENCE

## 1. Role of Certification Bodies

- 1.1. The independent assessment of conformity of Organizations to the requirements of ISO 9001:2000 and the additional requirements required by this SSD relies upon the assessment expertise, competence and capability of accredited certification bodies.
- 1.2. The Certification Body role is to ensure, through assessment that Organizations have management systems in place which address the enhanced ISO 9001:2000 requirements detailed in this SSD.

## 2. Certification Body Accreditation

- 2.1. To ensure consistency and to demonstrate independent capability Certification Bodies are required to be accredited against the requirements of BS EN ISO 17021 (formerly EN450012/ISO Guide 62) by the United Kingdom Accreditation Service (UKAS) or an equivalent International Accreditation Forum (IAF) member for assessment and registration of ISO9001:2000 quality management systems interpreted in accordance with this NHSS.

**NB** 15 September 2008 Certification Bodies will be assessed against the requirements of BS EN ISO 17021-1:2006

## 3. Assessor and Assessment Team Competence.

- 3.1. The Certification Body must be able to demonstrate to UKAS that it possesses and can maintain the necessary assessor experience and technical understanding in the products covered in the scope of this Sector Scheme. These assessment areas include, but not be limited to the following:
  - i) knowledge, understanding and application of this SSD
  - ii) knowledge of the manufacture and supply in the parapet restraint systems industry, including the methods and techniques sufficient to understand the processes employed and the controls necessary to ensure delivery of conforming product. Typically this would include knowledge of vehicle restraint systems and processes including connections to different systems. (Conveyance of this knowledge to auditing teams will be determined by the Certification Body and will be audited by UKAS).
  - iii) maintaining demonstrable technical highway engineering background, capable of reading and understanding specifications and drawings, including knowledge of the Specification for Highway Works and design standards requirements for road restraint systems.
  - iv) ability to demonstrate they have ongoing suitable health and safety training which shall include appreciation of the risks involved in the manufacture, supply and installation in the parapet restraint systems.
  - v) Preferably have knowledge of metallurgy
- 3.2. The Certification Body/Notified Body must also ensure that assessors have sufficient knowledge of health & safety requirements related to manufacturing.
- 3.3. Guidance to Certification Bodies/Notified Bodies on assessor competence related to this Sector Scheme is given in the Certification Body guidance document – National Highway

Sector Scheme Accreditation, Registration and Assessment Guidance for Certification Bodies (when available).

- 3.4 The Certification Body/Notified Body is responsible for ensuring that the assessment teams possess demonstrable expertise in the assessment areas detailed above as they relate to the scope of client activities under assessment.
- 3.5 Minimum assessor qualifications and competence for assessment of this NHSS, which may reside in a single or in an assessment team, are as follows:
- i) International Register of Certificated Auditors (IRCA) Registered ISO9001:2000 Lead Auditor qualification or Certification Body equivalent and demonstrable expertise in leading assessment teams.
  - ii) knowledge of the manufacture, supply and installation of parapet and road restraint systems industry, including the methods and techniques sufficient to understand the processes employed and the controls necessary to ensure delivery of conforming product. Typically this would include knowledge of road restraint systems and processes including connections to different systems, terminations of road restraint systems, anchorages and methods of tensioning relevant systems. (Conveyance of this knowledge to auditing teams will be determined by the Certification Body and will be audited by UKAS.)
  - iii) Is able to demonstrate that they have received suitable health and safety training which shall include appreciation of the risks involved in the manufacture, supply and installation in the parapet restraint systems.
  - iv) Preferably have knowledge of metallurgy

#### **4. Conduct of Assessments.**

- 4.1. Certification Bodies shall ensure that during a three year certification cycle there is evidence of assessment of all parapet manufacturing activities covered by the Organization's scope of registration.

#### **5. Format and Content of Registration Certificates.**

- 5.1. Certificates of registration issued by Certification Bodies, which include within the scope of registration reference to compliance with this Sector Scheme, shall be in a format and contain the content detailed in Appendix K of this SSD.
- 5.2. The National Highway Sector Scheme Logo shall be included in any Certificate of Registration which has this Sector Scheme detailed in the Scope of Registration. The logo shall only be used and applied in the manner detailed in any conditions of use which may be published from time to time.

#### **6. National Highway Sector Schemes Schedule of Suppliers.**

- 6.1. Certification Bodies shall monitor the National Highway Sector Schemes Schedule of Suppliers posted at [www.scheduleofsuppliers.com](http://www.scheduleofsuppliers.com) to ensure equivalence between their clients registered to this Sector Scheme and the listed Organizations and reports any discrepancies by email to [scheduleofsuppliers@lantra-awards.co.uk](mailto:scheduleofsuppliers@lantra-awards.co.uk).
- 6.2. Certification Bodies shall provide to National Highway Sector Schemes Schedule of Suppliers administrator at Lantra Awards details of registered Organizations whose scope of registration against this Sector Scheme has ceased to be applicable within 10 working days of that situation occurring. The process shall be controlled and documented.

## **7. Responsibilities and Reporting on Sector Scheme Performance.**

- 7.1. Each Certification Body accredited for this Sector Scheme shall provide to the Chairman of the SSACP a summary report which includes as a minimum:
- a) observations and comments on the implementation and assessment findings related to the Sector Scheme including any omissions or deficiencies in its scope.
  - b) recommendations for improving/clarifying the SSD
  - c) feedback on deficiencies against contract documentation
  - d) a list of Organizations whose scope of registration includes this Sector Scheme for comparison against the Schedule of Suppliers
- 7.2. The report shall be provided at or in the month before each National Highway Sector Scheme Liaison Committee meeting, so that it may be considered during the Group Sessions of the Liaison meeting. It is mandatory that all Certification Bodies are represented at these meetings.
- 7.3 Certification Bodies shall ensure they are all represented by at least one nominated individual (who will represent all Certification Bodies) at Sector Scheme Advisory Committee. This does not preclude other Certification Bodies from attending, as appropriate.

## **8. Role of Notified Bodies**

**NB** As BS EN 1317-5 has only recently been published, the following clauses are in the process of being implemented.

- 8.1. Approved test houses are required to oversee the initial type testing (ITT) of road restraint systems including bridge parapets. Notified Bodies must confirm that the test results meet the requirements of the relevant parts of BS EN 1317.
- 8.2. Additionally BS EN 1317-5 requires Notified Bodies to inspect the factory production control (fpc) systems to ensure that the product being produced will conform to the requirements of the relevant part of BS EN 1317.
- 8.3 These assessor activities may be combined as a single process. Alternatively where one or other assessment body does not have the necessary expertise, it is possible that a fpc Notified Body will be commercially linked to the Notified Body that assessed the ITT those permitting authorisation to affix the CE mark to the product.
- 8.4. It is possible that a Notified Body will also be able to provide appropriate assessment against BS EN ISO 9001 and NHSS 5A, providing that the Notified Body is appropriately accredited by UKAS or European Equivalent Body in this respect.

# APPENDIX G1: GUIDANCE TO ASSESSORS' AND OTHER AUDITORS' COMPETENCIES REQUIREMENTS FOR NATIONAL HIGHWAY SECTOR SCHEME 5A - Manufacture of Parapets for Road Restraint Systems

## General Information

The certification body group (reporting to the Highways Liaison Committee) has proposed that an e-learning programme for assessors based on the information provided by the individual National Highway Sector Scheme Committees should be made available to third party assessors to enable them to have a fuller appreciation of the particular activities involved in highway construction and maintenance. The information contained in this appendix has been collated by the NHSS committee to provide CB assessors with the background information that is considered appropriate for carrying out an assessment against BS EN ISO 9001 and these NHSS documents. During the development of the Appendices it was realised that this information would also provide useful guidance for first and second party auditors of the system. It is hoped that it will be possible in the near future for access to the e-learning programme to be available to all assessors and auditors; information on this development will be made available through revision issues of the relevant NHSS document posted on the UKAS web-site.

## Requirements

In addition to an assessor/auditor having a general appreciation of the requirements and processes required by BS EN ISO 9001:2000, a CB assessor or other auditor should be aware of the following when completing an audit:

### A General background to the scheme.

- i) The reasons for development of the National Highway Sector Schemes (NHSS) and this scheme in particular, and for CB assessor's examples of where its absence has caused concern/problems

This is normally contained in the introduction to the scheme, in this instance the scheme (NHSS 5A) was initially developed from existing certification body schedules and the participation of Vehicle Safety Barrier Association (now part of the Fencing Contractors Association)

- ii) To whom the scheme applies/field of application

See Scope (section 1) in NHSS 5A document

- iii) Contact details of those that can offer scheme specific assistance

Secretary of the Advisory Committee to the Sector Scheme see Introduction to the scheme and Appendix J1. Information should also be contained in the Organization's quality manual/NHSS documents

- iv) An overview of the highway infrastructure that the scheme applies to

- v) The range of contracts that the scheme can apply to

See Scope in relevant NHSS document i.e. NHSS 5A (section 1)

- vi) Specific types of works that the scheme applies to

See Scope (section 1) in NHSS 5A document; in this instance applies to Vehicle restraint systems manufactured to BS EN 1317, but excludes a) in-situ concrete restraint systems (see NHSS 21) and b) vehicle safety barrier systems (see NHSS 2B).

vii) Definitions and terminology that are particular to the scheme

See section 3 of the NHSS 5A

viii) Routes to competency of management, supervisors and operatives etc delivering the scheme services

Information/guidance is contained in Appendix C of the document, however the organization's training administrator should have this information available (assessors should also be aware of training and competency assessment requirements available from bodies such as Lantra Awards, who should be able to assist).

ix) Overview of important reference documentation applicable to the scheme

Section 2 and Appendix B of the document provides some information.

Knowledge of relevant European and British Standards for vehicle restraint system (BS EN 1317), and in particular those requirements relating to product conformity, type testing and their requirements.

Familiarity with SHW especially Series 400, TD19 and associated notes for guidance, including when these are updated.

Relationship with other NHSS and their applicability to this scheme, notably NHSS 19A for corrosion protection.

Knowledge of processes and their applicability involved in the manufacture, sampling, testing and installation of the service or product .

**B Summary of where the scheme introduces the interpretation of ISO 9001:2000**

4. Quality Management System	Interpretation Y/N	Comment
4.1	Y	
4.2		
4.2.1	N	
4.2.2	N	
4.2.3	Y	
4.2.4	Y	
5. Management Responsibility		
5.1	N	
5.2	N	
5.3	N	
5.4	N	

5.4.1	N	
5.4.2	N	
5.5	Y	
5.5.1	N	
5.5.2	N	
5.5.3	N	
5.6	Y	
5.6.1	N	
5.6.2	N	
5.6.3	N	
6. Resource Management		
6.1	N	
6.2	-	
6.2.1	N	
6.2.2	Y	See Appendices C, and D
6.3	N	
6.4	N	
7. Planning and Product Realization		
7.1	Y	See Appendix A
7.2	-	
7.2.1	N	
7.2.2	Y	
7.2.3	N	
7.3	Y	In 2 parts product design and application design
7.3.1	Y	
7.3.2	Y	
7.3.3	N	
7.3.4	Y	
7.3.5	N	
7.3.6	N	
7.3.7	N	
7.4	Y	<u>See BS EN 1317-5 sub clause 6.3.3.3</u>
7.4.1	N	
7.4.2	N	
7.4.3	N	
7.5	-	
7.5.1	Y	<u>See BS EN 1317-5 sub clause 6.3.3.3</u>
7.5.2	Y	<u>See BS EN 1317-5 sub clause 6.3.3.3</u>
7.5.3	Y	<u>See BS EN 1317-5 sub clause 6.3.3.4</u>
7.5.4	N	
7.5.5	Y	

7.6	Y	See Appendix E
8. Measurement, Analysis and Improvement		
8.1	N	
8.2	-	
8.2.1	N	
8.2.2	N	
8.2.3	N	
8.2.4	Y	
8.3	Y	<u>See BS EN 1317-5 sub clause 6.3.3.5</u>
8.4	N	
8.5	-	
8.5.1	N	
8.5.2	N	<u>See BS EN 1317-5 sub clause 6.3.3.6</u>
8.5.3	N	

## C Overview of vehicle restraint systems

- 1 safe working practices
- 2 operative/supervisor training and qualifications
- 3 maintain equipment
- 4 public protection
- 5 environment
- 6 testing/inspection/workmanship
- 7 Health and Safety
- 8 other

### C1 – Safe Working Practices

Auditors should be sufficiently competent to make general observations on the effectiveness of the organisation's safety provisions. This may include

Correct Personal Protective Equipment Worn

Equipment approved and suitable for use

Technicians/operatives to be fully aware of their H&S obligations

- must be able to read and understand their job sheet, risk assessment etc; and have appropriate communication skills.
- Method Statements/work procedures
- Risk Assessment
- Induction card/skills card

Vehicles/loads are inspected and drivers are qualified (where appropriate)

Awareness of relevant H&S legislation as applicable to manufacturing processes and supply.

Aware of current best practice

## C2 Training and Qualifications

Auditors should be aware that the people in the organisation will need to

- Have achieved appropriate training and competency modules
- Be aware of and understand the system processes and documentation in which they are involved
- Have been inducted on specific equipment (by employer) or if appropriate (i.e. under training) is supervised by a qualified person
- Be aware of and understand the relevant requirements of this NHSS
- Be aware of and understand the provisions for implementation of training in NHSS 5A.

Have relevant skills and authorisations where appropriate.

## C3 Maintain Equipment

Auditors should be aware of the importance of keeping plant and equipment properly maintained

- Operative/supervisor is aware of appropriate legislation requirements
- Maintenance checklists are available and have been completed on a regular (daily, weekly etc) basis

## C4 Public Protection

Auditors should be sufficiently competent to make general observations on the effectiveness of the organization's provisions for the protection of the public.

*(Note Public in this instance includes personnel employed by the customer/client)*

## C5 Environment

Auditors should be sufficiently competent to make general observations on the effectiveness of the Organization's provisions in respect of the environment and in particular management of waste and its reduction.

## C6 Testing/Inspection/Workmanship

Auditors should be aware of the importance of testing and inspection of the product.

## C7 Health and Safety

Auditors should be aware of the current Health and Safety Legislation and related legislation, such as CDM regulations, as it applies to the manufacture of metal bridge parapets (vehicle restraint systems).

## **APPENDIX H: ORGANIZATION ACCEPTANCE**

- 1.1 For work carried out for roads managed by the Highways Agency, the National Assembly for Wales, the Scottish Executive and DRD (Northern Ireland), Organizations holding a valid Certificate of Registration for work within the scope of the SSD will be accepted as complying with Clause 104 and Appendix A of the Specification for Highway Works.
- 1.2 For work carried out on roads managed by other highway authorities' acceptance of the Organization will depend on the requirements of the Contract.

## APPENDIX J1: FEEDBACK

Any observations or complaints relating to this document or the process described herein may either be

- a) reported electronically through the Highways Agency's Standards Improvement System (SIS) or
- b) addressed to the Committee Secretary using the form below

### a) Standards Improvement System (SIS)

SIS is implemented through Highways Agency Standard GD/03/08 (formerly HD34/03) - The Implementation and Use of Standards Improvement System (DMRB Volume 0 section 2 Part 2 (DMRB 0.2.2) - formerly DMRB Volume 5 Section 3.1 (DMRB 5.3.1)). HD34 was published in November 2003 followed in December 2003 by the launch of SIS, it was republished in May 2008 as GD 03/08.

SIS is the successor to the Quality Control Reporting System (QCRS) - a paper based system, which relied on designers to complete reports and Highways Agency staff to enter them on an old mainframe computer. The difficulty in entering reports and the fact that QCRS was perceived as a means of only recording defects with an emphasis on redress meant that QCRS had fallen into disuse.

The revised system overcomes both of these shortfalls. SIS is simple to use being available to anyone with Internet Access and is aimed at improving standards rather than reporting defects. It also provides a feedback system to the original author to advise him of the actions being taken. (GD03/08 formerly HD 34/03 can be accessed through the Highways Agency web site ([http://www.highways.gov.uk/business/tech\\_info.htm](http://www.highways.gov.uk/business/tech_info.htm)) or directly <http://www.standardsforhighways.co.uk/dmrb/vol0/section2.htm> and select part 2)

NOTE: It will be necessary to be authorised to use the system, and in the first instance you are requested to contact the Specifications and Policy Team by email to [standards\\_enquiries@highways.gsi.gov.uk](mailto:standards_enquiries@highways.gsi.gov.uk)).

## FEEDBACK FORM

Sector Scheme Advisory Committee for Parapets  
c/o UKAS  
21 – 43 High Street  
Feltham  
Middlesex  
TW13 4UN  
Tel: 0208 917 8400  
Fax: 0208 917 8500

Issue Identified:

Suggested Action:

Name:

Organization:

Address:

Contact details:

Date:

## APPENDIX J2: FEEDBACK TO CERTIFICATION BODIES

Any comments concerning the product provided under this scheme should in the first instance be taken up with the Organization. In the event that the matter cannot be satisfactorily resolved, written feedback should be made to the Organization's certification body detailing the issue identified. Contact addresses may be obtained by following the procedure given in Appendix F.

Any other comments should be fed back to the Certification Body.

Item Identified:

Organization's Details:

Name:

Address:

Feedback

Name:

Organization:

Address:

Date:

Signed:

## APPENDIX K: THE INTERPRETATION OF CERTIFICATES ISSUED BY CERTIFICATION BODIES

Certification Bodies (CB) issue Certificates of Registration (CoR) in a variety of styles as suits their particular house style. They may consist of a single CoR containing all the requisite information or the CoR may be a standard certificate with appendices or addendum attached providing the full scope of certification (services) and the location(s) where these services are offered by an Organization. In the latter case, the CoR refers to the relevant appendices or addenda, which form an integral part of the certificate.

A valid National Highway Sector Scheme (NHSS) CoR is only issued by a CB accredited by UKAS against the relevant NHSS (See Appendix F of this document) or by a recognised equivalent accreditation body.

As a minimum a valid CoR will contain the following information:

- The scope of registration including specific registration to BS EN ISO 9001:2000 and this NHSS including the scheme title e.g. National Highway Sector Scheme 5A for Manufacture of Parapets for Road Restraint Systems.
- The identification of each and every location (depot/area/office) to which the CoR is applicable.
- The services/product offered by the Organization at each location identified on the CoR e.g. NHSS 5A for Manufacture of Parapets for Road Restraint Systems.
- Logos for the NHSS, UKAS (or equivalent) and the CB.
- The name and address(es) of the Organization
- The validity of the certificate
- A unique reference number/code
- The signature of a relevant CB official with his name and title

Categories of Work are:

- (a) Product design, manufacture and supply of vehicle parapets for bridges.
- (b) Application design, fabrication and supply of vehicle parapets for bridges.
- (c) Product design, manufacture and supply of pedestrian parapets for bridges.
- (d) Application design, fabrication and supply of pedestrian parapets for bridges.

Or a combination of these.

Certification Bodies shall issue these certificates in this format no later than May 2009.

The following are example models for the certification.

**Figure 1** shows the scope of registration on the certificate and

**Figure 2** shows an example of an Appendix for scope of registration. The italic text in square brackets indicates where specific text would need to be included. Where appropriate the information on location and their respective scopes may be included on the Appendix for scope of registration.

**Figure 3** shows the scope of a typical NHSS 5A certificate of registration for Manufacture of Parapets for Road Restraint Systems

**Figure 4** shows an Appendix to the certificate of registration for the Manufacture of Parapets for Road Restraint Systems

The italic text in square brackets indicates where specific text would need to be included.

Figure 1 Example Model Certificate of Registration.

*[Certification Body Name / Logo/NHSS Logo]*

CERTIFICATE OF REGISTRATION

*[ORGANIZATION NAME]*

*[Organization Address]*  
*[Town]*  
*[County]*  
*[Post Code]*

*[Certification Body Name]* issues this certificate to the above named company after assessing the company's quality management system and finding it in compliance with

**BS EN ISO 9001:*[2000]* AND THE FOLLOWING NATIONAL HIGHWAY SECTOR SCHEMES**

For the following scope of registration  
*[List of appropriate highways related works].*  
National Highways Sector Schemes  
*[Sector Scheme number and Title]*  
*[Sector Scheme number and Title]*  
*[Sector Scheme number and Title]*

[(Appendix... details the full scope of registration and Appendix ... details the locations covered by this registration)]

Certificate Number:                   *[Certificate Number]*  
Issue Date                               *[date]*  
Renewal Date                           *[date]*

Signature

*[Name & Title of Certification Body Official]*

***[Certification Body standard footer: Name / Logo / UKAS Logo/NHSS Logo etc.]***

Figure 2 Example Model Appendix

***[Certification Body Name / Logo/NHSS Logo]***

**APPENDIX**

To Certificate Number *[Certificate Number]* Appendix No. *[1]* Page 1 of *[1]*

This Appendix declares the scope of registration of the certificate granted to:

***[ORGANIZATION NAME]***

*[Organization Address]*  
*[Town]*  
*[County]*  
*[Post Code]*

**Scope of Registration**

*[List of appropriate highways related activities]*  
 National Highway Sector Schemes  
*[Sector Scheme Number and Title]*  
*[Sector Scheme Number and Title]*  
*[Sector Scheme Number and Title]*

<b><i>Depot, Regional Office etc</i></b>	<b><i>Applicable Sector Scheme(s)</i></b>	<b><i>Scope of Registration</i></b>
<i>[Depot 1 New road, Newtown]</i>	<i>[Sector Scheme Number and title]</i>	<i>[Detailed scope]</i>
	<i>[Sector Scheme Number and title]</i>	<i>[Detailed scope]</i>
<i>[Depot 2 Old Road, Oldtown]</i>	<i>[Sector Scheme Number and title]</i>	<i>[Detailed scope]</i>

***[Certification Body standard footer: Name/ Logo/ UKAS Logo/NHSS Logo etc.]***

Figure 3 Example Model Certificate of Registration for parapet manufacture and/or fabrication

*[Certification Body Name / Logo/NHSS Logo]*

**C E R T I F I C A T E   O F   R E G I S T R A T I O N**

*[ORGANIZATION NAME]*

*[Organization Address]*  
*[Town]*  
*[County]*  
*[Post Code]*

*[Certification Body Name]* issues this certificate to the above named company after assessing the company's quality management system and finding it in compliance with **BS EN ISO 9001:2000 AND NATIONAL HIGHWAY SECTOR SCHEME 5A**

For the following scope of registration  
The manufacture of Parapets for Road Restraint Systems:

*[1 Product design, manufacture and supply of]*

*[a) Vehicle parapets for bridges and other highway structures]*  
*[b) Pedestrian parapets for bridges and other highway structures]*

*[2. Application design, fabrication and supply of]*

*[a) Vehicle parapets for bridges and other highway structures]*  
*[b) Pedestrian parapets for bridges and other highway structures]*

National Highways Sector Schemes

**5A– Sector Scheme for the Manufacture of Parapets for Road Restraint Systems**

Certificate Number:                   *[Certificate Number]*  
Issue Date                               *[date]*  
Renewal Date                           *[date]*

Signature

*[Name & Title of Certification Body Official]*

*[Certification Body standard footer: Name / Logo / UKAS Logo / NHSS Logo etc.]*

Figure 4 Example Model Appendix to Certificate of Registration for parapet manufacture and/or fabrication and supply

***[Certification Body Name / Logo/NHSS Logo]***

**APPENDIX 01**

To Certicate Number      *[Certificate Number]*      Appendix No. *[1]* Page 1 of *[1]*

This Appendix declares the scope of registration of the certificate granted to:

***[ORGANIZATION NAME]***

*[Organization Address]*  
*[Town]*  
*[County]*  
*[Post Code]*

Scope of Registration: The manufacture of Parapets for Road Restraint Systems:

*[1 Product design, manufacture and supply of]*

*[a) Vehicle parapets for bridges and other highway structures]*  
*[b) Pedestrian parapets for bridges and other highway structures]*

*[2. Application design, fabrication and supply of]*

*[a) Vehicle parapets for bridges and other highway structures]*  
*[b) Pedestrian parapets for bridges and other highway structures]*

**National Highway Sector Schemes 5A – Sector Scheme for the Manufacture of Parapets for Road Restraint Systems**

<b><i>Depot, Regional Office etc</i></b>	<b><i>Applicable Sector Scheme(s)</i></b>	<b><i>Scope of Registration</i></b>
<i>[Depot 1 New road, Newtown]</i>	<i>[Sector Scheme 5A for manufacture of parapets for road restraint systems]</i>	<i>[Product design, manufacture and supply of vehicle parapets for bridges]</i>
<i>[Depot 2 Old Road, Oldtown]</i>	<i>[Sector Scheme 5A for manufacture of parapets for road restraint systems]</i>	<i>[Application design, fabrication and supply of pedestrian parapets for bridges]</i>

***Certification Body standard footer: Name/ Logo/ UKAS Logo/NHSS Logo etc.]***

## APPENDIX L: GUIDANCE FOR CLIENTS

### 1 General

It is recommended that Clients acknowledge the requirements of this sector scheme as a contract requirement. It is intended as guidance on interpretation for factory production control on appropriate products in accordance with BS EN 1317-5.

This guidance is primarily of relevance to Clients and their supervisory staff.

The NHSS for the manufacture/fabrication of metal bridge parapets was originally conceived as a document for use by Clients to specify the minimum standards for quality, training and competence of Organizations used by them to carry out the manufacture and fabrication of metal bridge parapets.

The implementation of the Sector Scheme and development of training and competency requirements is intended to provide:

- a) A qualified workforce competent at carrying out manufacture/fabrication of metal bridge parapets.
- b) Requirements to evaluate risks and develop processes associated with manufacture/fabrication of metal bridge parapets and the production of an associated comprehensive quality plan for each contract.

It is necessary for the Client to ensure that all those involved in carrying out the manufacture/fabrication of metal bridge parapets are appropriately trained and skilled, whether or not they are directly employed. The training and assessment of competency schemes described in this SSD are designed to cater for the range of skills within the overall process of the manufacture/fabrication of metal bridge parapets.

Clients and Customers that require confirmation of compliance with the Contract Specification in respect of the supply of services, products or materials should confirm that the quality management system certificate issuer is accredited by UKAS or equivalent and that specific reference is made to relevant Sector Schemes on certificates.

For the Sector Scheme to achieve its objectives it is essential that Clients, either directly or via the agents and individuals they employ, ensure that the requirements of this document are complied with. This includes ensuring that sub-contractors employed directly or indirectly, are registered to the Sector Scheme.

Lantra Awards have established and manage a schedule of registered companies that have been registered to National Highways Sector Schemes; free access to the schedule is obtained by logging on to the Lantra Awards website [www.scheduleofsuppliers.com](http://www.scheduleofsuppliers.com). However, it should be noted that only those companies that confirm entry onto the schedule to Lantra Awards are listed. The list of all registered suppliers is held by Lantra Awards (if notified); Clients should contact Lantra Awards by email at [NHSSscheduleofsuppliers@lantra.co.uk](mailto:NHSSscheduleofsuppliers@lantra.co.uk) to ascertain/check the status of company if it is not listed on the schedule.

### 2 CE Marking

BS EN 1317-5:2007 is the subject of transitional arrangements agreed under the European Commission mandate. The Member States have agreed a nominal transition period for the co existence of EN 1317-5:2007 and their corresponding National Standard(s). It is intended that this period will comprise a nominal nine month period during which any required changes to National Regulations are to be made, followed by a further nominal thirty six month period for the implementation of CE Marking (August 2011). At the end of the co existence period, the National Standards will be withdrawn and CE Marking of metal bridge parapets will apply.

### **3. Corrosion Protection**

Reference should be made to Appendix M (NHSS 5A) before deciding whether to specify that Organizations should be registered to NHSS 19A, to include relevant requirements for corrosion protection of ferrous materials by industrial coatings.

The NHSS for Corrosion Protection of Ferrous Materials by Industrial Coatings was originally conceived as a document for use by Clients to specify the minimum standards for quality, training and competence of Organizations used by them to carry out corrosion protection of ferrous materials by industrial coatings.

The implementation of Sector Scheme 19A and development of associated corrosion protection training and assessment is intended to provide:

- a) A qualified workforce competent at carrying out corrosion protection of ferrous materials by industrial coatings.
- b) Requirements to evaluate risks and develop processes associated with the application of coatings and the production of an associated comprehensive quality plan for each contract.

## **APPENDIX M: GUIDANCE FOR WORK WHICH INCLUDES CORROSION PROTECTION OF FERROUS MATERIALS BY INDUSTRIAL COATINGS**

### **General Guidance**

1. This guidance is primarily of relevance to those Organizations that are required to apply corrosion protection to ferrous materials as a contractual requirement. The guidance is designed to enable them to decide how works covered under the scope of Sector Scheme 19A, which they might be undertaking, should be dealt with. This Appendix should be read in conjunction with Appendix L "GUIDANCE TO CLIENTS" and Sector Scheme 19A.
2. NHSS Committee 5A will need to develop bespoke training and competency assessment relevant to this sector and specific corrosion protection activities and may liaise with the relevant, recognized training and competency assessment body for corrosion protection identified in SSD19A. The training and competency assessment requirements will be described in this SSD and supporting documents following development of the criteria.
3. Where and when, as applicable, the arrangements described above will be in place within this NHSS, it is not intended that Organizations registered to NHSS 5A and undertaking works covered by it, which includes works covered by the scope of NHSS 19A, should also be registered to NHSS 19A.
4. The NHSS Committees will consider the available options and provide appropriate advice to Organizations on what they need to do to meet their individual specific requirements and work commitments in respect of corrosion protection of ferrous materials by industrial coatings for their field of operations.