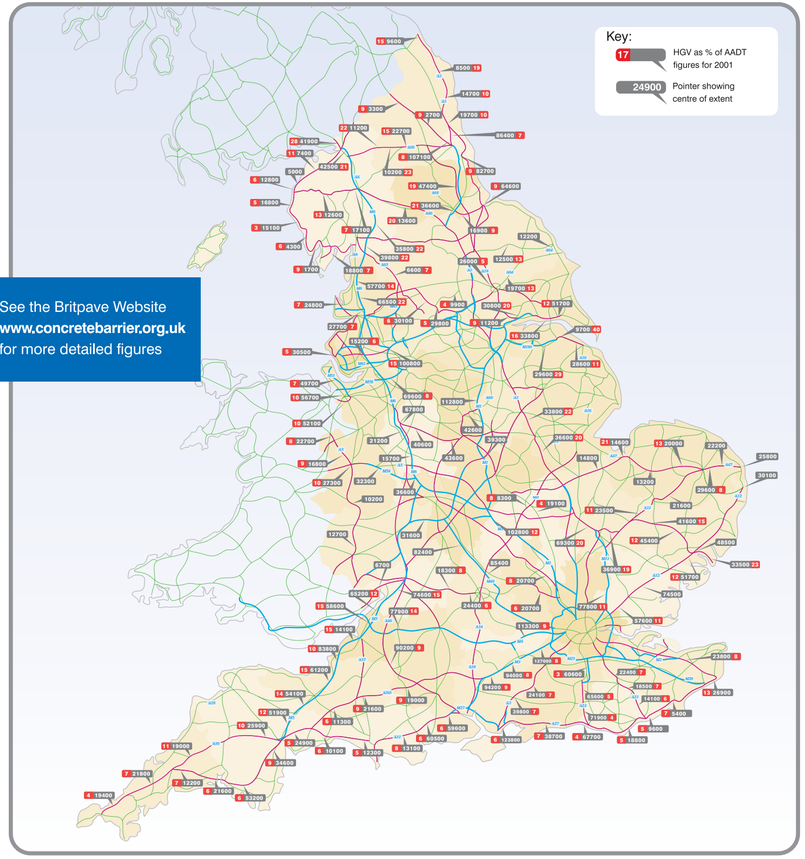
Roads Affected

IAN 60/05 is specific regarding the roads that must be served by concrete Step barrier and the Highways Agency has confirmed that it hopes to have replaced all existing steel barrier along the median of the 3,000 miles of motorway currently included in the instruction. The instruction further more includes clear guidelines indicating that the safety and cost benefits provided by concrete safety barrier on the motorway network can equally apply to busy all-purpose dual carriageways.
The Highways Agency is looking to industry and particularly design teams to bring about wider use of concrete barrier on the trunk road network initially by desire rather than direct instruction.

Feedback from Europe, where roads ministries of EU member countries have issued similar instructions regarding the use of concrete barrier, indicates strong public support for the policy. Indeed the European motorist's perception is that concrete barrier provides the safest vehicle restraint system available.
Use of concrete Step barrier will not be limited to Highways Agency roads. There is already great interest and support for the system from local authorities. Some of the first roads benefiting from concrete Step barrier are likely to fall outside the network directly affected by the IAN 60/05 instruction.



See the Britpave Website
www.concretebarrier.org.uk
for more detailed figures

Britpave, the British In-situ Concrete Paving Association, was formed in 1991. It is active in all areas of transport infrastructure including roads, airfields, light and heavy rail, guided bus, safety barriers and drainage channels, soil stabilisation and recycling. The Association has a broad corporate membership base that includes contractors, consulting engineers and designers, suppliers of plant, equipment and materials, academics and clients, both in the UK and internationally.
Britpave provides members and clients alike with networking opportunities and aims to develop technical excellence and best practice in key cement and concrete markets through its publications, seminars and website.

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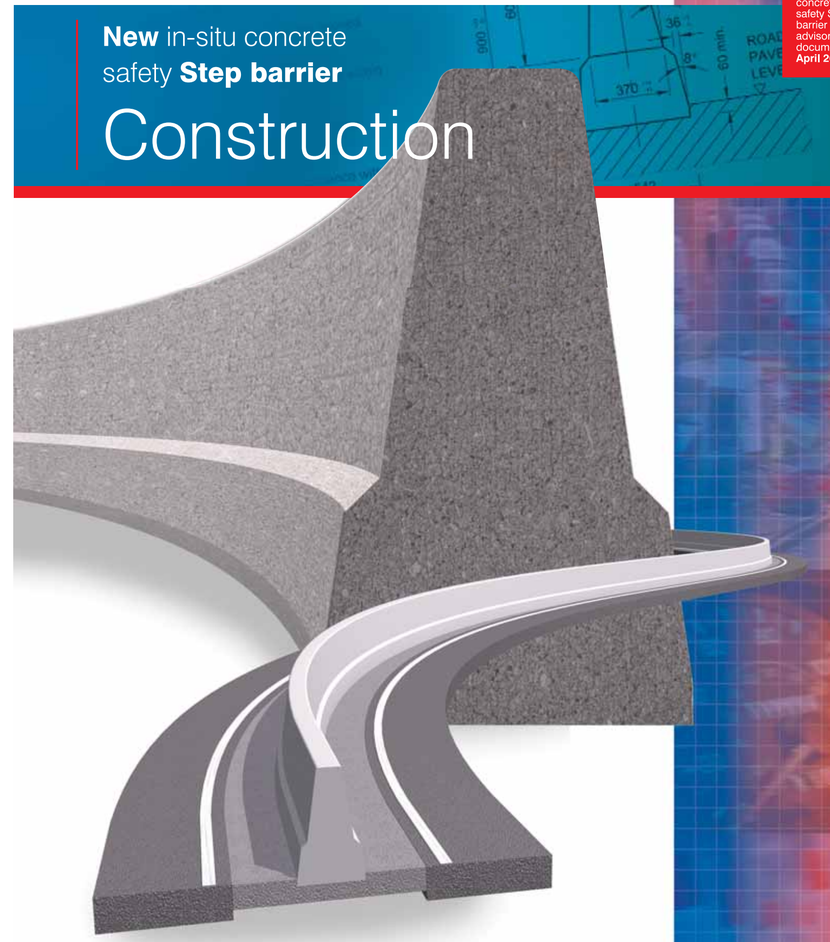
Ref: BP/19

Series 1
1 of 2
New in-situ concrete safety Step barrier advisory document
April 2005

New in-situ concrete safety **Step barrier**

Construction



Step this way

The Highways Agency Interim Advice Note 60/05

The introduction of a new Highways Agency policy for the performance requirements for central reserve safety barriers on motorways

1 Summary

This Interim Advice Note (IAN 60/05) introduces a new Highways Agency Policy for the provision of Safety Barriers in central reserves on motorways.

2 Background

A review has been carried out comparing the performance and maintenance of concrete barriers with steel barriers in the central reserve. The evidence indicates that where the AADT exceeds 25,000 veh/day there are significant benefits from a maintenance viewpoint in using rigid concrete rather than deformable steel barriers on busy motorways and dual carriageways. These benefits include significant health and safety benefits for road maintenance and traffic management operatives, as fewer safety barrier repair and maintenance operations are required. On the M25 no replacement or maintenance of the concrete barriers in the central reserve has been necessary in two years. Taking into account the Whole Life Cost and benefits of all safety barriers in the central reserve, the evidence supports a change in policy. Initially this is to be implemented as policy on motorways but the benefits obtained can equally apply to busy all-purpose dual carriageways.

3 What are the new Performance Requirements?

To implement the change in policy for motorways, new performance requirements for the specification of central reserve barriers shall be adopted. New installations of safety barriers in the central reserve shall be Rigid Concrete Safety Barrier with a Containment Performance Class H2 and a Working Width Class W2 and shall be designed to achieve an essentially maintenance free serviceable life of not less than 50 years. Where lamp columns are to be mounted on the safety barrier the Working Width shall be increased to a minimum of W3 to reflect the additional width of barrier required to accommodate the lamp column and its fixings.

4 Implementation

This Interim Advice Note shall be used forthwith on all future schemes for the construction, implementation, improvement and maintenance (Major Maintenance Renewal schemes only) of motorways provided the AADT exceeds 25,000 veh/day. It shall apply also to all those schemes that are in preparation provided that, in the opinion of the Overseeing Organisation, this will not result in significant additional expense or delay progress.

Design Organisations shall confirm its application to particular schemes with the Overseeing Organisation. Please note that the requirements of Clause 6 apply as the process for obtaining the Overseeing Organisation's agreement.

5 Costs

Whole Life Cost analysis has indicated that rigid concrete safety barrier, with a containment performance class of H2, has the greatest benefits in terms of cost and safety. Although concrete barriers can be up to 30% more expensive to install, on a sample of schemes, the average scheme costs of installing the concrete barrier are assessed as being 0.2% greater than steel safety barrier. In certain cases this will be greater where changes to the central reserve drainage may be required. The additional initial costs will be offset by the reduction in maintenance and associated traffic management costs. Further cost savings should be made by increasing safety and reducing the likelihood of crossover accidents. It should be noted that because of their site-specific nature, it has not been possible to include in the calculations for whole life costs the cost for any re-location of services in the central reserve. These costs and the work involved with any essential relocation of services will need to be investigated on a scheme by scheme basis during the design and procurement stages of the contract.
It is believed that any re-location of services will, in the main, only occur where concrete safety barrier is replacing steel safety barrier in the central reserve during major Maintenance Renewal Schemes.

6 Departure from Standard Requirement

If for any reason the requirements of this IAN will not be applied, then a Departure from Standard submission will be required. This shall include a full justification for the proposed departure.


HIGHWAYS AGENCY

INTERIM ADVICE NOTE 60/05

THE INTRODUCTION OF A NEW HIGHWAYS AGENCY POLICY FOR THE PERFORMANCE REQUIREMENTS FOR CENTRAL RESERVE SAFETY BARRIERS ON MOTORWAYS

1. Summary
This Interim Advice Note (IAN) introduces a new Highways Agency Policy for the provision of Safety Barriers in central reserves on motorways.

2. Background
A review has been carried out comparing the performance and maintenance of concrete barriers with steel barriers in the central reserve. The evidence indicates that where the AADT exceeds 25,000 veh/day there are significant benefits from a maintenance viewpoint in using rigid concrete rather than deformable steel barriers on busy motorways and dual carriageways. These benefits include significant health and safety benefits for road maintenance and traffic management operatives, as fewer safety barrier repair and maintenance operations are required. On the M25 no replacement or maintenance of the concrete barriers in the central reserve has been necessary in two years. Taking into account the Whole Life Cost and benefits of all safety barriers in the central reserve, the evidence supports a change in policy. Initially this is to be implemented as policy on motorways but the benefits obtained can equally apply to busy all-purpose dual carriageways.

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5. Costs

Basic Barrier & Foundation

The alignment and general median design for a road served by concrete barrier follows similar guidelines and principles as those followed for steel barrier systems. The perception that designers and contractors familiar with steel barrier have to learn a whole new set of principles and construction guidelines is incorrect. Concrete barrier design and construction is in many ways simpler than steel. There is principally one profile, one type of required foundation, standard details for bifurcation and few transitions to other safety restraint systems.

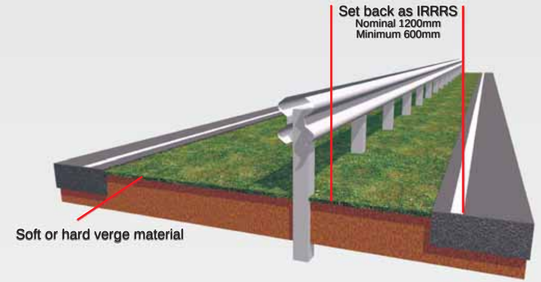
Concrete Step barrier, like steel barrier, is normally aligned to one carriageway traffic line. The traffic face of the barrier is where the base intersects with the pavement surface course. The working width and set back are measured from this point. Set back is as provided in IRRRS being nominally 1200mm but can be reduced to 600mm adjacent to structures or obstructions.

The actual alignment of the barrier within the median is, like steel barrier, dictated by a number of factors including:- location of services, location and type of drainage, lines of sight, street lighting, traffic information signs, level difference between adjacent pavements and width of median.

Concrete Step barrier must be sited upon a minimum 150mm deep, bound (either bituminous roadbase or low strength concrete) foundation. A minimum 210mm deep by 500mm wide, bound (either bituminous roadbase or low strength concrete) restraint must also be provided such that the barrier is afforded a minimum 60mm embedment. If the barrier can only be impacted from one side - say when located in the verge or when two lines of barrier are used in the median, the restraint needs only to be provided behind the barrier.

Additional hardening must be provided between pavement and restraint to the traffic face of the barrier, on the side where set back is measured from. Whilst it is recommended on both safety and maintenance grounds, and indeed the preferred design of the Highways Agency that the entire median be hardened, the use of concrete Step barrier does not necessitate it.

before



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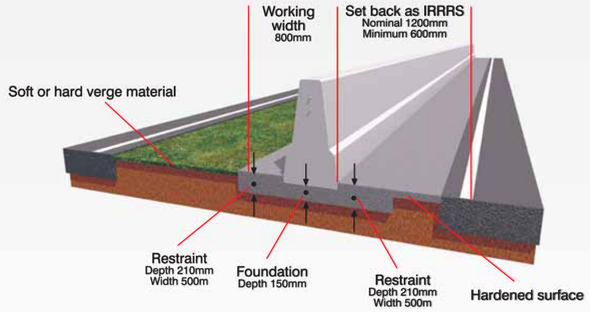
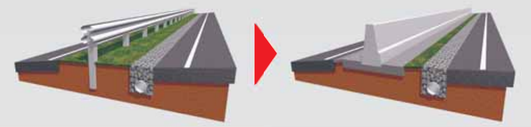


Step by step guide to installation

Accommodating Existing Drainage

As with steel barrier the location and type of existing drainage may influence the alignment of the concrete Step barrier. The animations provided on our website assist in understanding how different drainage systems can be accommodated with concrete Step barrier. In-situ slotted linear drainage channel, conventional gully pot systems or surface water channel as detailed in the Manual of Contract Documents for Highways Works, Highway Construction Details, may be constructed directly adjacent to concrete Step barrier. The use of granular drainage directly in front of concrete Step barrier is not permitted.

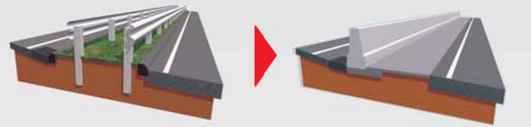
before | after



Kerbs and Gullies

A concrete Step barrier serves not only as a safety restraint system but also acts as a kerb line. Where a median is currently served by kerbs, gullies and steel barrier, the new concrete Step barrier alignment should be set back from the traffic line of the pavement featuring the gully line. The gullies will need relocating to the toe of the barrier.

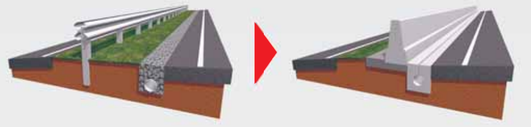
before | after



Accommodating New Drainage

The use of open water channels or filter drains is not permitted directly in front of concrete Step barrier as the barrier has only been tested with a level, hardened surface. Slot drain provides a drainage system that reflects the surface tested. Slot drain specification and design are included within the Specification for Highways Works although Britpave is currently working with Highways Agency to produce an improved specification and suite of drawings (April 2005).

before | after



Bifurcation

A similar principle is adopted by concrete Step barrier as with steel barrier when bifurcating to accommodate structures, traffic signs, road junctions, varying level or width medians and other obstructions. The basis of the recommended bifurcation detail is provided in the Britpave suite of drawings. Certain specific project requirements may demand a degree of engineering latitude on the basic principles provided.

before | after

Accommodating Lighting Columns

As with steel barrier, where median width permits, the simplest option is to provide two lines of concrete Step barrier one serving 'each carriageway, with the lighting columns planted in the space between. This option facilities future maintenance works in the safe haven between the concrete barriers with minimal disruption to adjacent traffic flow.

before | after

Wide Concrete Step Barrier

A widened version of concrete Step barrier is included in the Britpave suite of Drawings; this profile of barrier is accredited with H2 containment and a W3 working width. This profile allows lighting columns or traffic signs to be fixed directly to the barrier. It also lends itself to narrow medians with street lighting. The profile can be used in short lengths, within a section of standard Step barrier, to accommodate isolated traffic matrix signs with the transition from standard to wide profile following the guidelines for barrier bifurcation.