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**VOLUME 10 ENVIRONMENTAL  
DESIGN AND  
MANAGEMENT  
SECTION 0 ENVIRONMENTAL  
OBJECTIVES**

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**PART 2**

**HA 87/01**

**ENVIRONMENTAL FUNCTIONS**

**SUMMARY**

This Advice Note describes how function codes are to be used in the design and management of Highways.

**INSTRUCTIONS FOR USE**

This is a new document to be incorporated into the manual.

1. Insert HA 87/01 into Volume 10, Section 0.
2. Archive this sheet as appropriate.

Note: A quarterly index with a full set of Volume Contents Pages is available separately from The Stationery Office Ltd.



**THE HIGHWAYS AGENCY**



**THE SCOTTISH EXECUTIVE DEVELOPMENT  
DEPARTMENT**



**THE NATIONAL ASSEMBLY FOR WALES  
CYNULLIAD CENEDLAETHOL CYMRU**



**THE DEPARTMENT FOR REGIONAL DEVELOPMENT\***

# Environmental Functions

\* A Government Department in Northern Ireland

**Summary:** This Advice Note describes how function codes are to be used in the design and management of Highways.

**REGISTRATION OF AMENDMENTS**

Amend No	Page No	Signature & Date of incorporation of amendments	Amend No	Page No	Signature & Date of incorporation of amendments

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## 1.0 INTRODUCTION

- The principal reason for the Function codes is that, in order to design and manage the highway network towards achieving the government's environmental objectives, we need to state the purpose of the various features, as well as their physical nature, ie. why they are there and what they are intended to achieve in environmental terms.
- Features may have multiple Functions, and in this case it is necessary to decide on the Primary and Secondary code to prioritise the design or maintenance of the feature (see Section 1 Part 6).
- The Function codes are also used to attach environmental objectives to engineering, and other built elements, that will influence their design and/or operational maintenance. This is explained in more detail in Parts 3 and 4.
- The core Functions are listed below, however, there may, on occasions be the need to add additional text for scheme-specific functions that are not adequately described in the 'core' text. The designer/manager will need to insert this supplementary information in the tender documentation or database.

Ref	Dataset	Core Data	As-and-When
EFA	Visual Screening	●	
EFB	Landscape Integration	●	
EFC	Enhancing the Built Environment	●	
EFD	Nature Conservation and Biodiversity	●	
EFE	Visual Amenity	●	
EFF	Heritage	●	
EFG	Auditory Amenity	●	
EFH	Water Quality	●	

## 1.1 DEFINITION

- “Mitigation against adverse visual impacts by screening views of the Highway and associated infrastructure from properties and public viewpoints, including rights of way and public open space.”



**Planted Screen** *Planting to provide Screening for residential property. It has also been extended down to the cutting to better integrate the earthworks into the landscape, and provide interest to road users; Secondary Function EFB*



**Earthwork Screen** *Earthworks used as a screen where linear planting would unnecessarily cut off views of the surrounding landscape*

## 1.2 KEY NOTES

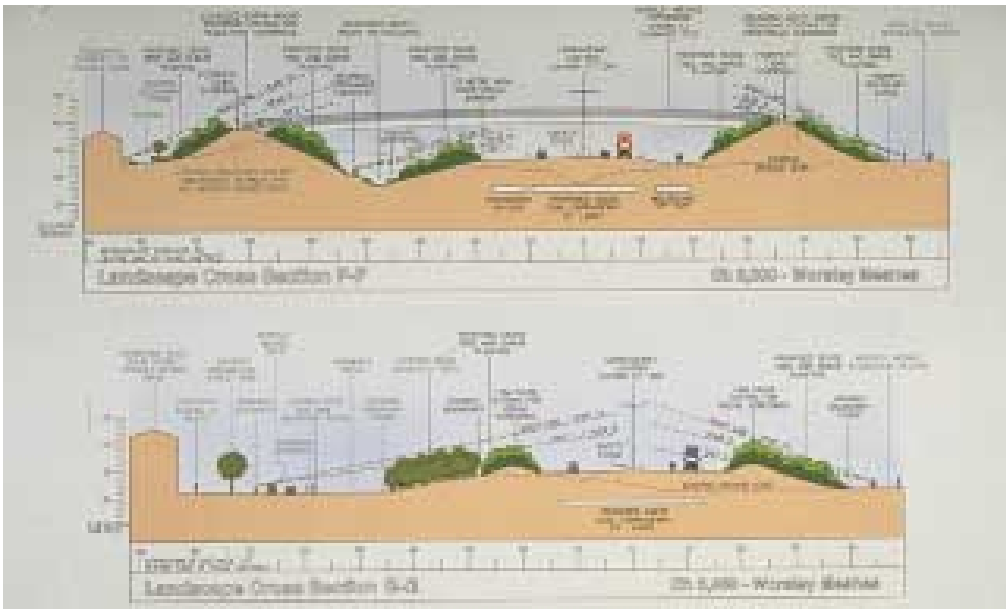
- May be achieved by planting, earthworks or structures.
- The screening element itself needs to be visually acceptable, and may require mitigation via EFE, EFC or EFB.
- Detailed scheme requirements to state planting or barrier height, density, evergreen content and where necessary, appropriate species or material/finishes, for the chosen Element.
- This Function will often be combined with requirements for Auditory Amenity, Visual Amenity and Enhancing the Built Environment.
- Highway structures may be adapted to achieve screening.



**Colwyn Bay Concrete Wall** *This retaining wall has been raised to provide screening and separation for the adjacent public areas, where space does not permit other measures; and a separate barrier on top of the wall would degrade the design concept and cause maintenance problems*



**Tyne and Wear Metro Tree Screen** *Woody vegetation used as a screen needs to be carefully chosen to provide the correct ultimate height and density. Trees alone will ultimately allow open views beneath the crowns*



**Wigan Cross Section** *A combination of mounding and planting in areas of significant impact provides the optimum combination and enhances visual amenity*



### 2.1 DEFINITION

- “Integrate the Highway with the character of the surrounding landscape by maintaining the matrix of local vegetation patterns, blending with local landform and softening views of the highway, its infrastructure and its traffic.”



**Landscape Integration** *Sympathetic re-grading of adjacent land during construction helps to disguise the structural earthworks outline*



**Landscape Integration** *Less intrusive fencing and restoring appropriate edaphic conditions help to retain the upland grazing appearance of the extended verge*

### 2.2 KEY NOTES

- Off-site or accommodation measures may provide appropriate and effective solutions.
- Applicable to structures such as fences, walls, lighting, kerbs etc.
- Applicable to maintenance operations eg grass-cutting, hedge trimming.
- This Function will often be achieved in conjunction with Visual Amenity.



**A1 (M) Gantries** *Network control projects: The structures, sometimes combined with their flashing message signs, can be extremely obtrusive. Cable-routes also need assessment to avoid damage to established vegetation and grassland habitats*



**A11 Tube Forest** *This linear planting is not required for Screening, and also prevents Landscape Integration by imposing an artificial barrier and highlighting the highway boundary*



**A55 Dunes** *Specialist soil and vegetation restoration techniques may be specified to achieve a seamless interface with adjacent land and mask the highway boundary. Such areas will need ongoing management to achieve their objectives*



**Green Bridge, Huddersfield**



**A17 Flat Landscape** *The absence of boundary fences retains the road's relationship with the traditional landscape*



### 3.1 DEFINITION

- “Enhance the landscape and built elements of the highway with surrounding features, to reflect the scale, character and materials of the local townscape or community through which the highway passes.
- The needs and amenity of the public living/working in or utilising areas within or adjacent to the highway, including pedestrians, cyclists and those using public transport and local facilities.”



**Great West Road** *The design and materials used for footways, boundaries and other infrastructure will play a key role in enhancing the amenity for residents and road users on the town approaches*

### 3.2 KEY NOTES

- Design and finishes of structures.
- Choice of furniture/paint colour.
- Hard landscape materials and design.
- Accessibility and public safety.
- Standards of maintenance.
- Interaction with EFE ‘Visual Amenity’.
- ‘Townscape’ Appraisal Summary Table (AST) subheading for Multi-modal Studies recognises the impact of transport infrastructure on built-up areas.



**Burghley House Gates** *Maintenance standards need to reflect and integrate those used on adjacent properties*



**Penmaenmawr Prom** *Renewal of seaside promenade with modern amenities*



**Gargrave Village** Sensitive design of parking provision and traffic calming will also upgrade the urban landscape



**Gargrave Traffic Calming** Safety schemes in villages need careful design to avoid intrusive features near residents' properties



**A12 Pebble Surfacing** Local character enhanced by treatment of public spaces and surfacing solutions for surplus pockets of highway land



**Doncaster** Ornamental plantings require increased maintenance resources but play an important role in diffusing the highway infrastructure's dominance



**Victoria Quays** Hard landscape and urban design skills blend the historic and modern features



### 4.1 DEFINITION

- “Protect, manage and enhance the nature conservation value of the highway estate and integrate with and protect adjacent habitats and locations containing protected species, or other locally-important species or habitats.”



**River Crossing** *River corridors affected by bridge crossings may require specific design measures to protect habitats, and also constraints on construction methods and/or maintenance techniques*



**Wildlife Corridor** *Wildlife Corridor*

### 4.2 KEY NOTES

- May apply to full range of soft landscape elements.
- This Function applies to survey work.
- Requires a positive Management Plan by Managing Agents.
- Relates to specific objectives eg impeded drainage, badger safety.
- Needs to be included in database and scheme requirements.
- Needs to take the relevant biodiversity action plan into account.
- Wildlife measures (see E3.2) need inspection to identify any repairs required.



**Gorse** *Intervention management may be needed to prevent encroachment of gorse and ruderal species in sensitive habitats*



**Wildflowers** *In addition to being both attractive and of nature conservation value, the encouragement of floristic diversity is also increasingly important to the public's perception of the roadside landscape*



**Birdbox** *Birdboxes located in appropriate locations may help to provide nesting sites*



**Bridge Underside** *Bats may roost under bridge decks and these should be inspected prior to maintenance operations*



## 5.1 DEFINITION

- “Maintain interest, variety and an acceptable visual appearance for both road users and adjacent public viewers by creating/maintaining views to the wider landscape, providing seasonal variation and creating a ‘sense of place’ via landmark features, either plant species, landform/geology, the design and materials used for structures and furniture, and the spatial arrangements.”



**Parkland Trees** *The setting of mature trees near the highway is important for their health and providing interest for both the road user, and adjacent residents. Maintaining their long-term health and vigour, and avoiding root damage during nearby service excavations and construction requires close liaison with all relevant parties*



**A451 Retaining Wall Relief** *Structural finishes can provide a dramatic feature and are set off by amenity grass within the public open space nearby*

## 5.2 KEY NOTES

- Considering the interests and amenity for the surrounding public and road users may be important.
- Applies equally to maintenance methods/standards. A good design concept can be negated by inappropriate maintenance.



**A11 Footbridge** *Detailing the shape and finishes on the majority of structures, emphasises their dramatic effect, and can enhance the sense of arrival*



**Tunnel Portal** *Detailing the shape and finishes on the majority of structures, emphasises their dramatic effect, and can enhance the sense of arrival*



**Rock Cutting** *Exposed geology adds interest, acts as a landmark, and over time may develop biodiversity interest*



**Colwyn Bay** *Approach roads to urban centres are enhanced by bold planting, with pedestrian routes integrated*



**Lighting** *Lighting in rural areas can have adverse impacts on the landscape*



**Newhall** *Visual Amenity function achieved by the use of decorative finishes and surfaces*





**Okehampton** *Earthworks design is of primary importance for achieving a visually-acceptable corridor, particularly where planting to mask it would be inappropriate*



**Noise Barrier** *The primary function of barriers is normally Noise or Visual Screening, but they should also be designed to provide Visual Amenity*

6.1 DEFINITION

- “Conserve and enhance the physical nature and appearance and setting of existing features within and adjacent to the highway, where they are either afforded statutory protection, or make a material contribution to the quality and character of the local area.”



**Market Square** *Traditional market squares and town centres are an essential part of the character of routes and their setting should not be dominated by highway furniture or inappropriate function design*

6.2 KEY NOTES

- May involve cultural heritage features and traditional built elements.
- Significant landscape character/features or vegetation.
- Maintaining adjacent soils/drainage type to protect historic habitats.
- Adjacent landform/geological features.
- Interaction with ‘The Built Environment’.



**Milestone** *Milestones*



**Traditional Metal Sign** *Traditional Metal Sign*



**Stone Wall** *Traditional regional character to be retained or restored where practicable*



**Ely Cathedral** *Planting and verge maintenance enhance viewpoint*



**Stamford** *Conservation Areas merit careful consideration of pavement finishes, location of signage and paint colour*



**Kew Trees** *Traditional street trees such as these London Planes are a key element of urban heritage*



**Steam Hammer** *Britain's Industrial Heritage can be demonstrated by accentuating specific structures as landmarks*



**Pevensey Archaeology**



**A1(M)**



**Conwy Bridges**

*Respect the changes in design through the centuries and improve the setting of unusual or historical features*



7.1 DEFINITION

- “Reduce the adverse noise impact of highway traffic or construction on adjacent properties or publicly accessible areas by providing and maintaining measures to reduce noise pollution.”



**Noise Barrier** *Textural finishes and transparent materials may reduce the visual impact*



**Resurfacing** *The use of quieter pavement surfacing is an example of an Environmental Function being achieved by an engineering element. However, other consequential environmental effects such as spray reduction, higher winter salting requirements, also need to be considered*



**Noise Mound** *Noise mounds can be overbearing near housing and may need their form softening with planting. Species density choice and ultimate heights should be designed to reduce, rather than emphasise, the perceived height and mass of the mound*

7.2 KEY NOTES

- Can be achieved by surfaces, earthworks or road alignment, fences.
- Contract may state maximum noise levels or minimum attenuation to be achieved.

### 8.1 DEFINITION

- “To provide and maintain appropriate measures to mitigate the impact on areas sensitive to flooding or hydrological changes, local water courses and groundwaters from construction works, run-off from the road and spillages.”



**Water Quality Control** *Earthworks design can enhance Landscape Integration of the water quality control features*



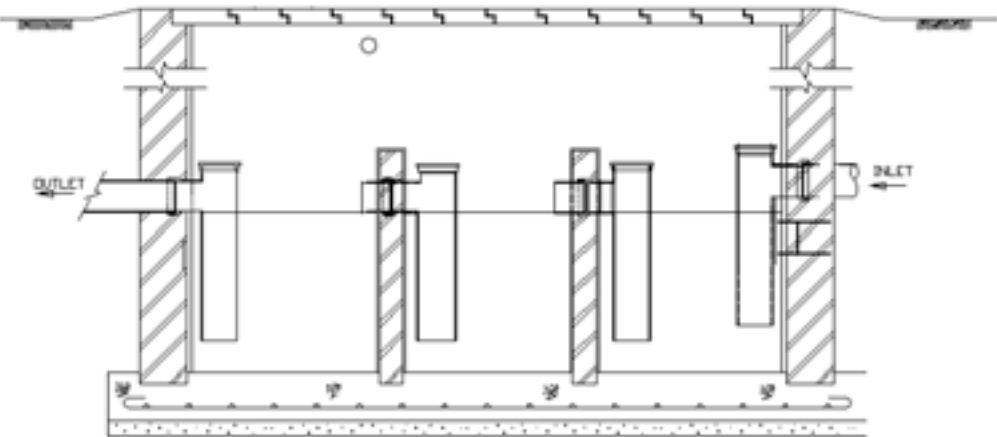
**Water Quality Feature** *Engineering feature designed to include an area of nature conservation interest*

### 8.2 KEY NOTES

- Groundwater protection zones and watercourse water quality data and objectives are needed.
- Early consultation with the relevant Regulatory Authorities should be undertaken.
- Pollution and flood control measures may have biodiversity and landscape mitigation functions provided that these are subservient to their primary protection role.
- Contract requirements should include indicative requirements for water mitigation measures and any alternatives offered should be demonstrated to be equivalent of these.
- Contract requirements should include conditions to be met during construction to prevent damage from flooding, disturbance to land drainage and pollution of watercourses from silt and erosion.



**Conwy Tunnel** *Temporary works design and construction constrained by the need to protect the marine environment*



**Petrol Interceptor** *Petrol interceptors can provide protection against surface oil and small scale oil and fuel spillages. They should only be considered for specific known high risk locations*

## 9. ENQUIRIES

All technical enquiries or comments on this Advice Note should be sent in writing as appropriate to:

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