Design Manual for Roads and Bridges

Sustainability & Environment
Design

LD 117
Landscape design

(formerly LA 117 revision 1 which superseded HA 13/81, HA 55/92, HA 56/92, HA 57/92, HA 58/92, HA 60/92, HA 63/92, HA 85/01, HA 87/01, HA 88/01, HA 89/01, HA 92/01, HA 108/04, HA 115/05)

Version 0.1.0

Summary
This document provides requirements for landscape design.

National Variation
This document has associated National Application Annexes providing alternative or supplementary content to that given in the core document, which is relevant to specific Overseeing Organisations. National Application Annexes are adjoined at the end of this document.

Feedback and Enquiries
Users of this document are encouraged to raise any enquiries and/or provide feedback on the content and usage of this document to the dedicated National Highways team. The online feedback form for all enquiries and feedback can be accessed at: www.standardsforhighways.co.uk/feedback.

This is a controlled document.

Latest release notes

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LD 117	0.1.0	December 2024	Core document, Scotland NAA	Incremental change to requirements

Version 0.1.0: Update to introduce new Transport Scotland National Application Annex. [Published: December 2024]

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LD 117	0	March 2020		
LA 117	1	February 2020		
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Foreword

Publishing information

This document is published by National Highways.

This document supersedes the following documents, which are withdrawn:

1) Volume 5, Section 2, HA 13/81, The Planting of Trees and Shrubs;
2) Volume 10, Section 0:
    a) Part 2, HA 87/01 Environmental Functions;
    b) Part 3, HA 88/01 Landscape Elements;
    c) Part 4, HA 89/01 Environmental Elements; and
    d) Part 7, HA 92/01 Scheme Development, Implementation and Management;
3) Volume 10: Section 1:
    a) Part 1, HA 55/92 The Good Roads Guide - New Roads Landform and Alignment;
    b) Part 2, HA 56/92 The Good Roads Guide - New Roads Planting, Vegetation and Soils;
    c) Part 3, HA 57/92 The Good Roads Guide - New Roads Integration with Rural Landscapes;
    d) Part 4, HA 58/92 The Good Roads Guide - The Road Corridor - (incorporating Amendment No. 1 Retaining Walls (Chapter 3) February 1997); and
    e) Part 5, HA 60/92 The Good Roads Guide - New Roads Heritage;
4) Volume 10, Section 2:
    a) Part 1, HA 85/01 Road Improvement within Limited Land Take;
    b) Part 2, HA 63/92 The Good Roads Guide - Improving Existing Roads Improvement Techniques;
5) Volume 10, Section 3:
    a) Part 2, HA 108/04 The Landscape Management Handbook; and
    b) Part 3, HA 115/05 The Establishment of An Herbaceous Plant Layer in Roadside Wood.

This document makes provision for requirements outlined under EU Directive 2011/92/EU as amended by 2014/52/EU (hereafter referred to as the 2014/52/EU [Ref 1.N]).

Contractual and legal considerations

This document forms part of the works specification. It does not purport to include all the necessary provisions of a contract. Users are responsible for applying all appropriate documents applicable to their contract.

Introduction

Background

Integration and minimising the impact of disturbance of new roads within the rural or urban landscapes and improving the landscape character of existing roads is the basis for good environmental landscape design.

Development of this document has been influenced by:

1) the UK Government's commitment in ratification of the European Landscape Convention ELC 2000 [Ref 5.N] (hereafter referred to as the Convention), to recognising landscape matters in law, and promoting landscape planning, protection, and management policies;
2) the Convention's ELC 2000 [Ref 5.N] widely adopted definition of landscape which recognises:
    a) landscape as a resource inclusive of townscape;
    b) the relationship between people and place; and
    c) all landscapes are important irrespective of their location (i.e. seascapes, rural, urban, and peri-urban areas) or condition (i.e. natural, outstanding or ordinary).

This document aligns with Directive 2011/92/EU as amended by 2014/52/EU [Ref 1.N] EIA Directive.

The environmental codes for masterplans are included within this document.

Assumptions made in the preparation of this document

The assumptions made in GG 101 [Ref 3.N] apply to this document.

Terms and definitions

Terms

Term	Definition
Character area	Distinct, recognisable and consistent patterns of elements and activity that make one landscape different from another. NOTE: A combination of landscape, biodiversity, geodiversity and economic activity that follow natural, rather than administrative, boundaries.
Design excellence	Elevates design quality and value in the work through greater creativity, challenges, and influences; inspiring people and communities, and building pride of place while acknowledging the importance of both cost and whole-life cost. NOTE: Design excellence is subjective, unique and can be unquantifiable until it is known it has been achieved.
Design quality	Quality design in roads is the art and science of locating and integrating public roads into the local as well as the total landscape environment that is both enhancing and appealing to the senses for people to use and enjoy while acknowledging the importance of both cost and whole-life cost.
Design strategy	Establish and implements specific actions, measures or requirements to manage and influence the project's design life-cycle and deliver value for money.
Environmental element	Features relevant to achieving non-landscape environmental objectives in respect of auditory amenity, biodiversity, and water quality.
Environmental function	Identifies and states the purpose of different features and their physical nature to design and manage a road network, i.e. why they are there and the intention for achieving them. NOTE: Used to attach environmental objectives to engineering, and other built elements, to influence their design and/or operational maintenance.
Good road design	Good road design is inclusive, resilient and sustainable that aims to put people at its heart; appreciated for its usefulness, and elegance in its design reflecting the beauty of the natural, built and historic environment through which it passes, enhancing it where reasonably possible. NOTE: Source of reference GG 103 [Ref 2.N]

Terms (continued)

Term	Definition
Landscape design	An integral part of road design involving collaboration in the composition and integration, within cost, of a wide range of elements as a part including: 1) landform including geology and soils; 2) built structures; 3) roads, paths, steps, ramps, railings, and so on (including accessibility considerations); 4) vegetation and planting; 5) ecology - habitats and species; 6) drainage, such as sustainable urban drainage systems (SUDS); 7) water features, art and other installations (such as educational installations); 8) furniture including roadside furniture and signage; and 9) lighting.
Landscape elements	Broad classification types of component parts of the landscape with specific requirements or management needs to achieve their longer-term objectives. NOTE: Can be subdivided according to their detailed design or management needs relating to their function.
Landscape objectives	Objectives developed in relation to key landscape aims - such as adaptability to change, enhancement, high quality design, and sustainable use of resources - to inform the planning, design, implementation and management of a project i.e. transport infrastructure project.
Landscape strategy	Proposal to implement specific actions, measures or requirements to protect and enhance the landscape with its many challenges arising from competing priorities by setting out measures to influence and integrate enhancement and improvement opportunities into the project's design life-cycle and delivery of value for money. NOTE: Also referred to as 'design vision'.
Masterplan	A plan illustrating an overall development concept - vision - of all aspects for the whole site or area establishing functional, interrelationship proposals between all parts of the site/area which then guides the detailed design.
Mitigation strategy	A strategy to prepare for and lessen the effects of an impact to reduce adverse, and potentially long-term, effects.
Special landscapes (special landscape areas)	A non-statutory local landscape designation used by Local Planning Authorities to define areas of high landscape importance. NOTE: Also referred to as 'local landscape areas'.

1. Scope

Aspects covered

1.1 The requirements in this document shall be applied to the construction, improvement, operation and maintenance of all UK motorway and all-purpose trunk road projects to include:

1) new roads; or
2) improvements to existing roads.

1.2 Construction, improvement, operation and maintenance of roads shall be in line with the design's landscape strategy and/or defined set of landscape objectives incorporating excellence and quality in good design, value for money, and whole-life cost throughout the design life-cycle as identified within GG 103 [Ref 2.N] Introduction and general requirements for sustainable development and design.

NOTE *Good design of roads is a matter of aesthetic quality and respecting the special character of each individual location.*

1.3 This document shall be used to identify the appropriate codes for masterplans to illustrate environmental mitigation and enhancement measures.

Implementation

1.4 This document shall be implemented forthwith on all schemes involving design on the Overseeing Organisations' motorway and all-purpose trunk roads according to the implementation requirements of GG 101 [Ref 3.N].

1.4.1 The requirements set out in this document should be applied in the preparation of all schemes for the construction and improvement of UK motorways and all-purpose trunk road projects.

Use of GG 101

1.5 The requirements contained in GG 101 [Ref 3.N] shall be followed in respect of activities covered by this document.

2. Principles and purpose

Approach to design

2.1 Projects shall apply the principles of good road design established within GG 103 [Ref 2.N] which complements the general principles of design excellence that:

1) is beyond just compliance;
2) has the necessary rigour in consideration of landscape; and
3) incorporates landscape design and whole-life cost.

NOTE General principles of design excellence encourages better team collaboration involving more innovative and creative solutions of aesthetically high quality focusing on communities or people's needs and sustainability.

2.2 Enhancing and improving the landscape quality shall form part of all good road design and be measured by how well the design serves those who use the roads, who live alongside the roads, and enhances the landscape environment through which it passes acknowledging the importance of cost and whole-life cost.

NOTE Landscape quality is fundamental to the design process throughout the design life-cycle and plays an important role in the overall cost and whole-life cost of a project.

2.3 Good road design shall create opportunities to conserve and enhance the landscape character and is measured by the project's response(s) to:

1) reflecting and respecting people's needs;
2) providing or incorporating a sense of place – place making;
3) being robust, buildable, functional, and operational;
4) manage / minimise the impact of landscape disturbances and destruction from temporary works;
5) climate change and its challenges;
6) enhancing environmental impact;
7) being flexible, sustainable (including and minimising waste) - whole-life cost; and
8) enhancing its environment by providing net environmental gain.

2.4 A project's design strategy shall establish a landscape strategy (design vision) and/or a set of defined landscape objectives for the project early on in the development of motorway and all purpose trunk road projects as an essential part of the design process.

2.5 A project's landscape strategy and/or defined set of landscape objectives shall inform the project's design, its whole-life cost and the development of the project's environmental / landscape master plan.

2.5.1 A project's landscape strategy (design vision) and/or a set of defined landscape objectives should encourage excellence and greater design quality that is sensitive to and integrates the road into the local context acknowledging cost and whole-life cost.

2.6 A project's landscape strategy and/or a set of defined landscape objectives shall reflect and respect the landscape and its character, including cultural and social sensitivities.

2.7 A project's design shall address the Overseeing Organisation's specific project requirements, demonstrate collaborative working in the design development, incorporate the defined set of landscape objectives, encourage landscape quality, and acknowledge the importance of cost and whole-life cost in accordance with Appendix A or Appendix B.

NOTE 1 Whether a project is a new road or improvements to an existing road would influence the development of design requirements and aesthetic quality.

NOTE 2 Appendix A provides information on the approach to landscape design for new roads.

NOTE 3 Appendix B provides information on the approach to landscape design for existing roads.

2.8 Good road design shall be at the right scale to manage and minimise the impact of temporary works and to respect and integrate with:

1) the landscape's natural beauty, its importance and sensitivity;
2) the landscape's views and visual amenity;
3) the built and historic landscape through which a road passes; and
4) existing features while providing driver interest and sense of place.

2.9 Good road design shall provide consistency and continuity in its approach through cost effective, site-specific designs that reflect and respect the landscape's character.

2.10 Good road design shall create opportunities to conserve and enhance special landscapes and character areas.

2.10.1 Excellence in landscape design should demonstrate greater creativity in challenging and influencing enhancement of landscape quality that is also:

1) adaptable (long lasting);
2) collaborative;
3) inclusive (respect places, people's needs, and views);
4) innovative (respond to opportunities for change);
5) simple; and
6) sustainable (provide net environmental gain) and minimise waste.

3. Design objectives

Design strategy

3.1 Good road design shall align with GG 103 [Ref 2.N] and encourage better landscape quality within the context of value for money by demonstrating its approach to:

1) protection and enhancement of the local environment;
2) sensitivity to the local context - its numerous, and sometimes complex combinations of landscape elements of fields, heathland, hedges, lanes, settlements and woodland;
3) interest by creating a sequence of attractive views, extending views along the road or maintaining existing views;
4) integration of footpaths, bridleways, and side roads into the landscape to minimise severance;
5) integration of roadside barriers, fences and walls with their surroundings;
6) structure designs to be slender and unobtrusive, respecting the local landscape character;
7) assessment of tranquility and its importance to the local context and/or wildness;
8) sensitivity to and respectful of 'dark skies' areas, minimising adverse environmental impacts and intrusion caused by lighting;
9) reflection and integration of the surrounding pattern and species grouping in any new planting;
10) reflection and integration of enhancement opportunities to biodiversity;
11) safeguarding individual trees/woodland as well as ecological interests; and
12) protection and enhancement of the surrounding historic environment.

NOTE *For the design of highways structures reference is made to CD 351 [Ref 1.I] The design and appearance of highway structures.*

3.2 Good road design shall blend a road into the surrounding landscape aligning it with the existing, natural landform to minimise earthwork requirements while acknowledging the importance of cost and whole-life cost.

3.2.1 Aligning a road with its surrounding landform should provide a balance between concealing the road, and highlighting important design features (i.e. landmark structures or bold geological / design features), while allowing for selective views in and attractive views out.

3.2.2 Interrelationship of landscape design with road-corridor elements form an important part of the landscape quality in road design that should create opportunities for providing or improving on a sense of place and interest for the road user and others beyond road users.

3.2.3 Coordination of road-corridor elements in road design and their alignment with the surrounding landscape characteristics and character area(s) should better integrate a road into its setting, minimising its impact on the countryside.

Design development

3.3 Landscape characteristics and character areas(s) including local character area(s) together with the composition of natural vegetation types shall influence the project's landscape design and masterplan.

3.3.1 The project's landscape strategy for planting should work with the composition of natural vegetation types, considering use of natural groupings.

3.4 Planting design shall allow for access to highway structures and features (i.e. bridges, barriers, gantries, signs, CCTV cameras) and not conflict with their operational functions.

3.4.1 Planting design should take account of longer term maintenance, management, nature of the road corridor that this is intended for, including operational as well as safety requirements with shrubs used in edge planting not to be planted within 4.5 m from the edge of the carriageway, medium size trees (tree girth less than 450mm) no closer than 7 m (i.e. Malus sp, Prunus sp) and larger, climax trees (tree girth greater than 600 mm) not within 9 m (i.e. Quercus sp, Fagus sp,) unless otherwise agreed by the Overseeing Organisation.

3.4.2 Planting outside the highway boundary, where agreed and permitted by adjacent landowners, may be implemented to allow for better integration with the surrounding landscape.

3.5 Existing natural slopes shall be reflected in design profiles to meet the landscape objectives of the project.

3.5.1 Retaining the least amount of highway land by the return of land to its former use should not conflict with the need to provide enhancement through reprofiling to create gentler slopes, planting or seeding.

3.6 Good road design shall account for road alignment opportunities that enhance integration with the surrounding landscape to avoid or minimise the following:

1) intrusion into undisturbed, high-quality landscapes;
2) intrusion into views from nearby property and public places;
3) intrusive embankments crossing valleys and low-lying land;
4) cuttings that create notches on the skyline or scars on hillsides and sidelong ground;
5) unsympathetic junctions within the landscapes;
6) landtake required for large earthworks affecting heritage and nature conservation sites;
7) changes to drainage regimes; and
8) unsympathetic and intrusive inclusion of side road crossings in a road scheme.

3.7 Integration of horizontal and vertical alignment with the natural landform shall be factored into the design to achieve optimum screening for settlements whilst helping to minimise earthworks and achieving a cut and fill balance.

3.7.1 Use of existing landform to minimise noise and visual intrusion should be designed in accordance with the requirements found in LD 119 [Ref 4.N] to form part of the design development.

3.7.2 Developing new landforms to screen the road from settlements should include mounds and false cuttings as part of a mitigation strategy and be in accordance with the requirements in LD 119 [Ref 4.N].

3.8 Where impacts of a proposed road cannot be avoided through alignment or design choices, a mitigation strategy shall be developed early in the design stage to reduce any potential significance of the effects of the proposed design.

4. Masterplans

4.1 Environmental functions and environmental/landscape elements within the environmental masterplans shall be submitted to the Overseeing Organisation in the relevant geographical information system (GIS) format unless otherwise agreed with the Overseeing Organisation.

4.2 Environmental and/or landscape masterplans shall use the codes within Tables 4.2a, 4.2b and 4.2c to illustrate environmental mitigation and enhancement measures.

Table 4.2a Environmental function codes

Code	Dataset
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

Table 4.2b Landscape element codes

Code	Dataset
LE1.1	Amenity grass areas
LE1.2	Grassland with bulbs
LE1.3	Species rich (or conservation) grassland
LE1.4	Rock and scree
LE1.5	Heath and moorland
LE1.6	Open grassland
LE2.1	Woodland
LE2.2	Woodland edge
LE2.3	High forest
LE2.4	Linear belts of shrubs and trees
LE2.5	Shrubs with intermittent trees
LE2.6	Shrubs
LE2.7	Scattered trees
LE2.8	Scrub

Table 4.2b Landscape element codes (continued)

Code	Dataset
LE3.1	Amenity tree and shrub planting
LE3.2	Ornamental shrubs
LE3.3	Groundcover
LE3.4	Climbers and trailers
LE4.1	Ornamental species hedges
LE4.2	Native species hedges (trimmed)
LE4.3	Native species hedgerows
LE4.4	Native hedgerows with trees
LE5.1	Individual trees
LE6.1	Water bodies and associated plants
LE6.2	Banks and ditches
LE6.3	Reed beds
LE6.4	Marsh and wet grassland
LE7	Hard landscape features
P3.1	Cultural heritage feature
P3.2	Conservation area

Table 4.2c Environmental element codes

Code	Dataset
E1.1	Noise-reducing surface
E1.2	Noise barrier-built elements
E1.3	Noise-reducing earthworks
E2.1	Water pollution control measures
E2.2	Surface-water outfalls
E2.3	Soakaways
E3.1	Protected species
E3.2	Ecological protection measures
E4.1	Injurious weeds
E4.2	Legislated pests

5. Normative references

The following documents, in whole or in part, are normative references for this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Ref.	Document
Ref 1.N	Europa.eu. 2014/52/EU, 'Assessment of the effects of certain public and private projects on the environment'
Ref 2.N	National Highways. GG 103, 'Introduction and general requirements for sustainable development and design'
Ref 3.N	National Highways. GG 101, 'Introduction to the Design Manual for Roads and Bridges'
Ref 4.N	National Highways. LD 119, 'Roadside environmental mitigation and enhancement'
Ref 5.N	Council of Europe, 2000. European Treaty Series No. 176. ELC 2000, 'The European Landscape Convention (2000)'

6. Informative references

The following documents are informative references for this document and provide supporting information.

Ref.	Document
Ref 1.I	National Highways. CD 351, 'The design and appearance of highway structures'

Appendix A. Approach to landscape design - new roads

A1 Scope

This appendix provides guidance on the approach to landscape design for new roads incorporating three key aspects - connecting people, connecting places and connecting processes. It also provides guidance on the approach to design relating to such aspects as landform and alignment, planting, the road corridor and rural landscapes that can affect aesthetic quality. Supplementary guidance may be available for specific landscape areas or aspects of landscape treatment but will require prior agreement of the Overseeing Organisation for use.

A2 Options development

Many factors influence road design with the landscape and its setting playing an important part in how the road is perceived and sits within the context of the local landscape character. This requires a clear assessment and understanding of aesthetic qualities, the landscape, its character and the surrounding environment/setting together with an appreciation of conflicting project requirements – functional and technical considerations. This in turn influences a landscape strategy and/or defined set of project specific landscape objectives which plays an important role in design development.

New road design involves development of alternatives/options which would require an assessment of the effects each would have on the broader landscape, its character and setting as the design evolves. Assessing and understanding these effects is fundamental to the design life-cycle in influencing the final design solution but does involve time. For this reason, early involvement by a suitably qualified Landscape Architect, as part of the project's design team, is important at the project's inception, in providing relevant information sufficiently early to minimise these effects.

Achieving a good design requires commitment from all parties (client, design team, contractor, Statutory Environmental Bodies, local community) during the design life-cycle along with a clear understanding of aesthetic principles (i.e. line, shape, sense of place, texture, etc.), sensitivity of the environment (susceptibility and value), as well as the functional and technical considerations. An appreciation of conflicting project requirements requires collaborative working in achieving a consensus to an aesthetic and sensitive solution; designing in a way that aligns with the broader aspirations of the local communities and stakeholders.

A landscape strategy and/or defined set of project specific landscape objectives forms the basis for an environmental/landscape masterplan identifying the functions and elements required to deliver the project's proposed environmental/landscape design. To ensure design quality throughout the design life-cycle, as part of the design process, the masterplan informs the development of detailed design which in turn informs the construction and operational aspect to the overall design.

A whole of the design is made up of parts that include:

1) alignment and landform;
2) planting, vegetation and soils;
3) integration with rural landscapes;
4) the road corridor; and
5) heritage.

A3 Alignment and landform

Alignment plays an important part in respecting and minimising the effects of road design on landform and the landscape. It is important the design chooses a route least damaging to the landscape. An alignment that uses existing landform and reflects natural slopes can minimise a road's impact on landform and on sensitive landscapes while providing an aesthetic setting within a local context.

A4 Planting, vegetation and soils

The landscape design objectives should be reflected in the development of a project's planting/seeding needs and their future management requirements. Reflecting the surrounding area's pattern and

species composition not only plays an important part in the quality of a landscape design but also in the biodiversity of the surrounding area. It is also important for the landscape design to reflect the soil conditions present or required for successful establishment of particular habitat requirements such as low soil fertility for species rich grassland.

Defining areas for landscape enhancement, vegetation retention and where necessary mitigation planting is crucial to developing the environmental/landscape masterplan and maintaining aesthetic quality. This may include planting outside the road boundary.

Creating, enhancing, and maintaining views as well as effective screening that reflects the local character and not an intrusion into the landscape is achieved through good design and sensitive road alignment. Use of natural characteristics in planting and landforms while building on distinctive place quality is key to integration of the road while maintaining views, or integration of the road into the countryside.

Signalling the change from rural landscapes to urban environments using a distinctive road-corridor landscape focuses the road user's attention and plays an important part to providing a sense of place and a distinctive character or style to a road corridor and the urban fringe. Bold or formal planting can provide structure to the urban fringe, while well-sited planting can highlight landmarks or other noteworthy features.

Key to good landscape design is not only the appropriate composition and pattern(s) of planting respecting existing site conditions together with retention of existing vegetation but also its understanding, respect and contribution to ecosystems and biodiversity net gain and no net loss. Successful planting establishment does require the appropriate level of management during and after the establishment period.

A5 Integration within rural landscapes

Reflecting the landscape character of the area the road passes through and providing consistency and continuity through site-specific designs is the essence of integration. Use of local materials and styles is to be encouraged as part of any design solution where this is deemed feasible. Retention of existing features and respect for the local context is important to integration as is alignment and scale (i.e. risks of fragmentation of holdings and landscape pattern from landtake due to inappropriate alignment). Therefore, a thorough understanding of the area, its landscape character and the various elements that make up its composition is required.

Integration within the rural landscape may offer or reflect opportunities for the enhancement to or creation of site-specific grass/wild flower areas as visual and wildlife corridors. Such opportunities should be encouraged in developing the landscape design.

A6 The road corridor

Redundant roads, overbridges, side road crossings, junctions, signs, footpaths, bridleways, side roads, lighting, fences and retaining structures that form part of a road design need to respect and reflect the local landscape character and its setting. Integration into the landscape is important with nature recovery and landscape enhancement possible through careful design, the right landform and planting as well as through choice of materials and avoidance of unsympathetic standard details. This is possible through collaboration within the design team and external statutory consultees and affected parties.

A7 Heritage

It is important for the design to respect the cultural and historic character of the landscape or historic settlements or urban environment. Maintaining and enhancing historic views and vistas should be a priority and may be possible by appropriate alignment, earthworks, planting and vegetation management. This requires collaboration with an archaeologist or relevant heritage professional to identify potential conflicts and opportunities in developing the design.

Appendix B. Approach to landscape design - improving existing roads

B1 Scope

This appendix provides guidance on the approach to landscape design for improving roads within existing highway land or within limited land take. Many of these projects are limited or small in nature which may result in a number of constraints, but can also provide opportunities for enhancement to the aesthetic quality of the existing road. The guidance provided relates to such aspects as landform, alignment, planting, and the road corridor that can improve aesthetic quality.

B2 Options development

As with new roads many factors can influence the design for improving existing roads with the landscape and its setting playing an important part in how the improvement is perceived and sits within the context of the local landscape character. While it may prove more difficult to promote improvements to aesthetic qualities of existing roads, opportunities to enhance the views and setting should still be sought, providing interest for the users and well as the receptors. An understanding of the landscape, its character and the surrounding environment/setting together with an appreciation of conflicting project requirements – functional and technical considerations - is required. This in turn influences a landscape strategy and/or project specific landscape objectives that plays an important role in design development and towards improving the aesthetic qualities.

The same process of developing alternatives/options is used but may be limited in scope due to the project's location and existing layout. As with designing for new roads, assessment of the effects each would have on the broader landscape, its character and setting as the design evolves is required. Understanding these effects is fundamental to the design life-cycle in influencing the final design solution but does involve time. Early involvement by a suitably qualified landscape architect, as part of the project's design team, is important at the initial stages of the project's design, in providing relevant information sufficiently early to minimise these effects.

Commitment from all parties (client, design team, contractor, statutory environmental bodies, local community) is required during the design life-cycle as is an understanding of aesthetic principles, context and sensitivity of the environment, along with the operational and technical considerations. Conflicting project and operational requirements makes collaborative working even more important here as does the broader aspirations of the local communities and stakeholders to achieving a consensus to an aesthetic and sensitive solution.

Smaller projects may not warrant an environmental/landscape master plan but a landscape strategy and/or set of project specific landscape objectives may suffice to inform and deliver on the intended project design and landscape works to reduce the impact of the road on people and the environment.

B3 Improvement techniques

An integrated approach should:

1) minimise conflict by respecting and integrating the road into the local context;
2) minimise significant effects to the natural and built environment;
3) provide enhancement opportunities for biodiversity, landscape and townscape; and
4) provide interest for both the road user as well as others beyond road users.

Design solutions may, therefore, need to consider new techniques. These can include appropriate planting designs, use of materials, contrasting forms, colour, texture and introducing variety and opening up views to create visual interest and reduce the impact caused by limited land take. A balance between the proportion of hard and soft landscape elements is important but this is often determined by location and local context. Road Improvement within limited land take offers examples of good and bad aspects to dealing with improvements within land take, and offers examples for opening up views or developing a sequence of views along an existing road or by providing better landscape structure with new planting.

Sustainability & Environment
Design

LD 117
England National Application Annex to LD 117 Landscape design

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Revision 0

Summary
There are no specific requirements for Highways England supplementary or alternative to those given in LD 117.

Feedback and Enquiries
Users of this document are encouraged to raise any enquiries and/or provide feedback on the content and usage of this document to the dedicated National Highways team. The online feedback form for all enquiries and feedback can be accessed at: www.standardsforhighways.co.uk/feedback.

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Latest release notes

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LD 117	0	March 2020	Not available	Not available
Highways England National Application Annex to LD 117. LD 117 was first published as LA 117 in October 2019. The document has changed codes from 'A' to 'D' due to a coding error. The letter 'D' denotes design requirements rather than 'A' for appraisal requirements.				

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LA 117	0	October 2019		

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Revision 0

Summary
There are no specific requirements for Department for Infrastructure Northern Ireland supplementary or alternative to those given in LD 117.

Feedback and Enquiries
Users of this document are encouraged to raise any enquiries and/or provide feedback on the content and usage of this document to the dedicated team in the Department for Infrastructure, Northern Ireland. The email address for all enquiries and feedback is: dcu@infrastructure-ni.gov.uk

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Department for Infrastructure Northern Ireland National Application Annex to LD 117.LD 117 was first published as LA 117 in October 2019. The document has changed codes from 'A' to 'D' due to a coding error. The letter 'D' denotes design requirements rather than 'A' for appraisal requirements.				

Previous versions

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LA 117	0	October 2019		

Sustainability & Environment
Design

LD 117 - SNAA
Scotland National Application Annex for Landscape design

(formerly HA 13/81, HA 55/92, HA 56/92, HA 57/92, HA 58/92, HA 60/92, HA 63/92, HA 85/01, HA 87/01, HA 88/01, HA 89/01, HA 92/01, HA 108/04 and HA 115/05)

Version 1.0.0

Summary
This National Application Annex contains the Transport Scotland-specific requirements related to landscape design.

Feedback and Enquiries
Users of this document are encouraged to raise any enquiries and/or provide feedback on the content and usage of this document to the dedicated Transport Scotland team. The email address for all enquiries and feedback is: TSStandardsBranch@transport.gov.scot

This is a controlled document.

Latest release notes

Document code	Version number	Date of publication of relevant change	Changes made to	Type of change
LD 117 - SNAA	1.0.0	December 2024	Scotland NAA	Change to policy, major revision, new document development

Revision notes - Version 1.0.0: This document supersedes HA 13/81, HA 55/92, HA 56/92, HA 57/92, HA 58/92, HA 60/92, HA 63/92, HA 85/01, HA 87/01, HA 88/01, HA 89/01, HA 92/01, HA 108/04 and HA 115/05 which are withdrawn. [Publication: December 2024]

Previous versions

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LD 117	0	March 2020		
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Foreword

Publishing information

This document is published by National Highways on behalf of Transport Scotland.

This document supersedes HA 13/81, HA 55/92, HA 56/92, HA 57/92, HA 58/92, HA 60/92, HA 63/92, HA 85/01, HA 87/01, HA 88/01, HA 89/01, HA 92/01, HA 108/04 and HA 115/05 which are withdrawn.

Contractual and legal considerations

This document forms part of the works specification. It does not purport to include all the necessary provisions of a contract. Users are responsible for applying all appropriate documents applicable to their contract.

Introduction

Background

This National Application Annex contains the Transport Scotland-specific requirements related to landscape design.

This document gives the requirements to be used for:

1) application of Scottish Government landscape policy;
2) landscape design and environmental mitigation drawings;
3) landscape and environmental element and function codes;
4) protection of ancient woodland, and ancient and veteran trees;
5) offset distances between the carriageway, hard shoulder or hard strip, and tree and shrub planting;
6) soft landscape treatment to verges, visibility splays and central reserves; and
7) soil requirements for species-rich grassland areas.

Assumptions made in the preparation of this document

The assumptions made in GG 101 [Ref 3.N] apply to this document.

Abbreviations and symbols

Abbreviation	Definition
EIA	Environmental Impact Assessment
GIS	Geographical information systems
RRRAP	Road restraint risk assessment process

Terms and definitions

Term	Definition
Carriageway	The area of the paved width which is trafficked by road users under normal operation. Refer to CD 127 [Ref 1.N].
Environmental Impact Assessment	Statutory process consisting of: 1) preparation of an Environmental Impact Assessment Report; 2) consultation; 3) examination by the competent authority of the information contained within the Environmental Impact Assessment Report; 4) the reasoned (justified or evidenced) conclusion by the competent authority on the significant effects of the project on the environment; and 5) the reasoned (justified or evidenced) decision by the competent authority to grant or refuse development consent.
Suitably qualified landscape architect	A chartered member of the Landscape Institute or equivalent, with experience relevant to the landscape design of road projects.
Suitably qualified engineer	A chartered infrastructure engineer and member of the Institution of Civil Engineers or equivalent, with experience relevant to the design of road projects.

S/1. Scope of National Application Annex [LD 117, 1]

S/1.1 This document shall apply with respect to:

1) application of Scottish Government landscape policy;
2) landscape and environmental design and mitigation drawings;
3) landscape and environmental element and function codes;
4) protection of ancient woodland, ancient and veteran trees;
5) offset distances between the carriageway, hard shoulder, or hard strip and tree and shrub planting;
6) soft landscape treatment to verges, visibility splays and central reserves; and
7) soil requirements for species-rich grassland areas.

NOTE *The term 'Masterplan' does not apply to landscape design for trunk roads in Scotland. This document provides advice on alternative requirements and advice for landscape design.*

S/2. Landscape policy

Landscape policy in Scotland

S/2.1 The Scottish Government's landscape policy 'Fitting Landscapes: Securing more sustainable landscapes' (Fitting Landscapes [Ref 2.N]) shall be applied on projects in Scotland.

S/2.1.1 Where any of the requirements of LD 117 [Ref 4.N] are identified to conflict with the Scottish Government's landscape policy, the latter should take precedence.

NOTE *With regard to landscape design and maintenance, the Scottish Government has developed and published their policy 'Fitting Landscapes: Securing more sustainable landscapes' (Fitting Landscapes [Ref 2.N]). Since 2014 it has been compulsory that this policy be applied to all trunk road landscape design and management in Scotland.*

S/3. Design development [LD 117, 3.4.1]

S/3.1 Clause 3.4.1 of LD 117 shall not apply.

S/3.2 Road and planting design shall take account of long-term maintenance, management, and the nature of the road corridor that it is intended for, including operational and safety requirements.

S/3.2.1 The design should avoid any loss of ancient woodlands, ancient and veteran trees, or adverse impact on their ecological condition.

NOTE 1 Existing woodlands, ancient and veteran trees, and tree and shrub planting alongside roads make an important contribution to biodiversity.

NOTE 2 The Scottish Government is committed to protecting biodiversity, reversing biodiversity loss and delivering positive effects from development (NPF4 [Ref 2.I]).

NOTE 3 Scottish Government's National Planning Framework 4 states that development proposals will not be supported where they will result in any loss of ancient woodlands, ancient and veteran trees, or adverse impact on their ecological condition (NPF4 [Ref 2.I]).

S/3.3 A suitably qualified landscape architect shall coordinate those elements of risk assessment relevant to determining the minimum offset distances from the trafficked edge of carriageway, hard shoulder, or hard strip where present, to tree and shrub planting for each planting location, with inputs from a suitably qualified engineer.

S/3.3.1 The risk assessment should consider the following:

1) the landscape and environmental importance and value of the tree and shrub planting;
2) visibility requirements;
3) whether the new planting would introduce obstructions that would endanger vehicle occupants;
4) safety of future maintenance operations;
5) potential for overhanging limbs and falling tree limbs;
6) need or otherwise for vertical restraint systems determined by the Road Restraint Risk Assessment Process (RRRAP [Ref 6.N]); and
7) accident history (on existing roads).

S/3.3.2 The risk assessment should be undertaken to inform the preparation of the landscape design and environmental mitigation drawings during the EIA stage to ensure that sufficient space is allocated, and land acquired for planting, at an early stage of the project.

S/3.3.3 Notwithstanding the outcome of the risk assessment, the minimum offset distances from the trafficked edge of carriageway, hard shoulder, or hard strip where present, to planting should be 3 metres for shrubs and 5 metres for trees.

S/4. Landscape and environmental design and mitigation drawings [LD 117, 4]

Environmental functions and objectives

S/4.1 Section 4. 'Masterplans' of LD 117 [Ref 4.N]shall not apply.

S/4.2 The environmental function codes within Table S/4.2 shall be used to label landscape and environmental design and mitigation drawings at all project stages from EIA to completion of construction.

Table S/4.2 Environmental function codes

Code	Dataset term	Environmental function
EFA	Visual screening	Mitigation against adverse visual impacts by screening views of the road, traffic and associated infrastructure from properties and outdoor locations.
EFB	Landscape integration	Integration of the road with the character of the surrounding landscape, for example by replicating local vegetation patterns, blending with the local landform or softening views of the road, its infrastructure and its traffic.
EFC	Enhancing the built environment	Enhancement of townscape or built elements of the project, which may include special design of structures, new/improved public realm landscape, special boundary treatments, traffic calming measures and active travel provision.
EFD	Nature conservation and biodiversity	Protection, management, and enhancement to the nature conservation value of the road estate and its surroundings, including measures to achieve positive effects for biodiversity.
EFE	Visual amenity	Improvement or maintenance of the visual experience of road users and people in the surrounding area by creating, maintaining or enhancing attractive views, for example framing views of the wider landscape, providing seasonal variation with planting, creating a 'sense of place' via landmark features or use of special materials and finishes.
EFF	Heritage	Conservation or enhancement of the physical nature, appearance, setting or understanding of features of cultural heritage value within and near to the road, where they are either afforded statutory protection, or contribute to the quality and character of the local area. May include elements such as drystone walls or hedgerows to reflect and integrate with traditional field boundaries.
EFG	Auditory amenity	Provision of measures to reduce the adverse noise impact of road traffic or construction at properties or publicly accessible areas.
EFH	Water quality	Provision of measures to mitigate the impact of the construction and operation of the road on areas sensitive to flooding or hydrological changes, local water courses, water bodies or groundwater.

S/4.3 In addition to the environmental function codes each design and mitigation measure shall be labelled with a written description of the design objective and environmental function including details of receptors expected to benefit.

S/4.4 Where an individual area or design element has multiple functions, these shall be included in the written description and labelled with all relevant function codes.

NOTE *Individual design elements often have multiple functions, for example an area of planting might screen views of traffic from a receptor (EFA), help to integrate the scheme into the surrounding landscape*

(EFB) and provide compensatory wildlife habitat (EFD).

Landscape element codes

S/4.5 Landscape design and environmental mitigation drawings at all project stages shall clearly differentiate all design elements with a key/legend supplemented with annotations where necessary.

S/4.5.1 Landscape design elements should be coded or described on landscape and environmental design and mitigation drawings such that they are aligned with the habitat types in the Overseeing Organisation's adopted biodiversity accounting tool current when the design is prepared.

NOTE *The Scottish Government's National Planning Framework 4 (NPF4 [Ref 2.I]) aims to deliver positive effects for biodiversity from development. The measurement of these effects will be undertaken using a biodiversity accounting tool suited to Scotland's habitats.*

S/4.5.2 The Overseeing Organisation should be consulted regarding the alignment of habitat types with biodiversity accounting.

Design drawings

S/4.6 Landscape and environmental design and mitigation drawings shall be prepared at all relevant project stages from EIA to completion of construction.

NOTE *Appendix S/A provides details of drawings that are typically prepared for each design stage.*

S/4.7 As-built drawings labelled with the relevant function and element codes and written descriptions of the design objective and environmental function shall be prepared.

S/4.8 The as-built drawings shall be submitted to the Overseeing Organisation in a GIS format to be agreed with the Overseeing Organisation, for inclusion in its landscape inventory.

S/5. Seeding of verges, visibility splays and central reserves

Seed mixes for verges, visibility splays and central reserves

S/5.1 Where verges, visibility splays and widened central reserves feature soft landscape, these shall be seeded with an appropriate seed mix.

S/5.1.1 Seed mixes used on verges, visibility splays and central reserves should be low-growing, low-maintenance, native, and species-rich, to promote biodiversity, reduce maintenance and create a visually attractive roadside environment.

Soil requirements for species-rich grasslands

S/5.2 The substrate for seeding of species-rich grassland shall be subsoil, bare-substrate, or shallow low-fertility topsoil as defined in BS 3882 [Ref 5.N].

S/5.3 Topsoil, subsoil and bare substrate shall be tested for nutrient levels and suitability for supporting the proposed seeding mix and if necessary modified to encourage wildflower growth and minimise competition from undesirable weed species and coarse grasses.

S/5.3.1 Not using topsoil in the specification of new species-rich grassland has the potential to result in a topsoil surplus, which should be addressed early in the design process, considering the different topsoil depths required for landscape and environmental design elements and the area of land required for the project.

NOTE *Topsoil is a vital reservoir for biodiversity containing a highly diverse range of organisms including bacteria, fungi, microflora and microfauna which interact and contribute to the carbon and nitrogen cycles. There is a need to preserve and maintain topsoil in good condition to safeguard biodiversity and store carbon to help combat climate change (Dobbie et al 2011 [Ref 3.I]).*

S/5.4 Topsoil shall not be buried or spread to excessive depths that lead to degradation of the soil biome or result in development of anaerobic conditions.

NOTE *Topsoil does not normally perform well below a depth of 400 mm from the surface, where there is an increase in self-compaction and where the biochemical oxygen demand often exceeds the rate of aeration. This often results in the development of anaerobic conditions that are detrimental to plant root functions (Soils CoP [Ref 1.I]).*

S/5.4.1 The removal of topsoil from site should only be considered as a last resort and be avoided unless it can be demonstrated that it would have a beneficial environmental effect.

S/6. Normative references

The following documents, in whole or in part, are normative references for this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Ref.	Document
Ref 1.N	National Highways. CD 127, 'Cross-sections and headrooms'
Ref 2.N	Transport Scotland. Fitting Landscapes, 'Fitting Landscapes: Securing More Sustainable Landscapes'
Ref 3.N	National Highways. GG 101, 'Introduction to the Design Manual for Roads and Bridges'
Ref 4.N	National Highways. LD 117, 'Landscape design'
Ref 5.N	BSI. BS 3882, 'Specification for Topsoil'
Ref 6.N	Highways England. RRRAP, 'The Road Restraint Risk Assessment Process'

S/7. Informative references

The following documents are informative references for this document and provide supporting information.

Ref.	Document
Ref 1.I	Department for Environment Food and Rural Affairs. Soils CoP, 'Construction Code of Practice for the Sustainable Use of Soils on Construction Sites'
Ref 2.I	Scottish Government - Riaghaltas na h-Alba. Local Government and Housing Directorate. NPF4, 'National Planning Framework 4'
Ref 3.I	Natural Scotland. Dobbie, K.E., Bruneau, P.M.C and Towers, W. (eds). Dobbie et al 2011, 'The State of Scotland's Soil'

Appendix S/A. Approach to landscape design and environmental mitigation measures [LD 117, Appendix A]

S/A1 Scope of Appendix

This appendix provides guidance on the approach to preparation of drawings at the various stages of design development from EIA to completion of construction.

S/A2 Design stage drawings

Landscape design and environmental mitigation drawings are typically prepared for each of the following design stages:

1) Landscape and Visual Impact Assessment

Landscape and environmental mitigation drawings to set out the proposals to mitigate landscape and environmental effects and provide environmental enhancements. Generic planting and seeding mix types including the habitat type they are intended to create are included as a minimum. The landscape and environmental mitigation drawings prepared at this stage are in place of the 'masterplan' referred to in Appendices A and B of LD 117 [Ref 4.N].

2) Contract

Indicative landscape and environmental design contract drawings to accommodate post EIA developments to the road design, typically including greater detail than the landscape and environmental mitigation drawings. Indicative planting and seeding species mixes are typically included.

3) Tender

Drawings submitted by tenderers containing a similar level of information and detail to the indicative landscape and environmental design contract drawings but modified to align with the conceptual engineering design proposals including any innovations or value engineering changes proposed by the tenderer.

4) Detail design

Drawings including full details required for construction.

5) Completion

As-built drawings to be submitted to the Overseeing Organisation in the relevant geographical information system.

Llywodraeth Cymru
Welsh Government

Sustainability & Environment
Design

LD 117
Wales National Application Annex to LD 117 Landscape design

(formerly HA 13/81, HA 55/92, HA 56/92, HA 57/92, HA 58/92, HA 60/92, HA 63/92, HA 85/01, HA 87/01, HA 88/01, HA 89/01, HA 92/01, HA 108/04 and HA 115/05)

Revision 0

Summary
There are no specific requirements for Welsh Government supplementary or alternative to those given in LD 117.

Feedback and Enquiries
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Latest release notes

Document code	Version number	Date of publication of relevant change	Changes made to	Type of change
LD 117	0	March 2020	Not available	Not available
Welsh Government National Application Annex to LD 117. LD 117 was first published as LA 117 in October 2019. The document has changed codes from 'A' to 'D' due to a coding error. The letter 'D' denotes design requirements rather than 'A' for appraisal requirements.				

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