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Revision of Green Public Procurement Criteria for design, construction and maintenance of roads

*(Draft) criteria proposal
Working document for the 2nd Ad-
Hoc Working Group meeting*

Elena Garbarino, Rocío Rodríguez Quintero,
Shane Donatello and Oliver Wolf (JRC IPTS)

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Institute for Prospective Technological Studies

Contact information

Elena Garbarino, Rocío Rodríguez Quintero, Shane Donatello

Address: Edificio Expo, c/ Inca Garcilaso, 3. E-41092 Seville (Spain)

E-mail: JRC-IPTS-ROADS@ec.europa.eu

Tel.: +34 954488318

Fax: +34 954488300

<https://ec.europa.eu/jrc>

<https://ec.europa.eu/jrc/en/institutes/ipts>

<http://susproc.jrc.ec.europa.eu/road/>

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1 INTRODUCTION

Green Public Procurement (GPP) is a voluntary instrument. This document provides the EU GPP criteria developed for the product group "road construction". It is supported by a draft Guidance document that provides orientation on how to effectively integrate these GPP criteria into the procurement process. An accompanying Technical Background Report provides further details on the reasons for selecting these criteria and references for further information.

The criteria are divided into Selection Criteria, Technical Specifications, Award Criteria and Contract Performance Clauses. For each set of criteria there is a choice between two ambition levels:

- The *Core criteria* are those suitable for use by any contracting authority across the Member States and address the key environmental impacts. They are designed to be used with minimum additional verification effort or cost increases.
- The *Comprehensive criteria* are for those who wish to purchase the best products available on the market. These may require additional verification effort or a slight increase in cost compared to other products with the same functionality.

1.1 Definition and Scope

This GPP criteria set addresses the procurement process for road construction, including their design, construction and maintenance.

An **road** is defined as being:

"Line of communication (travelled way) open to public traffic, primarily for the use of road motor vehicles, using a stabilized base other than rails or air strips" (Eurostat, 2009)

An **road construction** is defined as being:

"The preparation and building of a road using materials, including aggregate, bituminous and hydraulic binders and additives that are used for the sub-base, road-base and surfacing layers of the road"

A definition of **road maintenance** is proposed, based on the definitions provided by Weninger-Vycudil (2009) in the ERA-NET PO3 project:

"Routine Maintenance: small measures to repair local deterioration (cracks, potholes...) and operational activities (e.g. winter maintenance/winter operation). The objective of these measures is to keep the road (pavement and the other sub-assets) in a defined (minimum) condition level and to avoid progressive deterioration. They have a limited lifetime and are normally performed on demand based on routinely periodic observations. These works are either conducted by the road administrations themselves or are contracted out.

Periodic maintenance: maintenance measures with a long lasting improving effect to the condition of the sub-asset or component. The objective is to provide a better condition to the present and future road users. These measures are conducted on components or sections close to or below an unacceptable condition level. They are planned as soon as the condition of the component falls below a given warning level and they have to be conducted according to a priority rating (e.g. LCC-analysis) using the relevant management system taking into account the given budget availability...

Upgrade and extension: measures which upgrade the existing sub-asset or component or extend the infrastructure to a higher level than the original new condition (e.g. additional lane, strengthening, higher requirements for retention systems etc.)... Normally only the part of the works which is attributed to the basic improvement (rehabilitation) of the existing part of the road is paid from the maintenance budget."

A definition of **rehabilitation** is proposed, based on Caltrans (2013):

"Rehabilitation: works undertaken to extend the service life of an existing facility. This includes placement of an overlay and/or other work necessary to return an existing roadway, including shoulders, to a condition of structural or functional adequacy, for the specified service life. This might include the partial or complete removal and replacement of portions of the pavement structure."

Roads are built in layers and three main types of road construction could be identified: flexible pavements, rigid pavements and semi-rigid pavements (Sherwood, 2001).

This criteria set contains recommendations that apply to both the construction of new roads and maintenance and rehabilitation of existing ones. The criteria are structured in order to broadly reflect the distinct sequence of procurement activities that tend to form part of a project:

- Preliminary scoping and feasibility;
- Detailed design and performance requirements;
- Construction;
- Use;
- Maintenance (and operation);
- End of life (EoL), i.e. road decommissioning

For each of these activities, environmental criteria are proposed. The criteria address the main hot-spots along the whole life cycle of a road, from materials production (including raw materials extraction and transportation), to construction, use (fuel consumption during the road service life due to the pavement-vehicle interaction), maintenance (and operation) and EoL. The most significant environmental impacts are related to greenhouse gas emissions from fuel consumption during the use of the road and resource use to manufacture construction materials. Other environmental areas of interest, such as water and habitat preservation and noise emissions reductions are also addressed.

In general, the criteria focus on a road construction as a system rather than individual components. It should be noted that separate GPP criteria for street lighting and traffic signals¹ are available that can be used for the procurement of roads.

1.2 Applicability of the Green Public Procurement criteria for road construction

Designing and procuring road construction and maintenance with a reduced environmental impact is a complex process. In light of this complexity, a draft guidance document has been developed to provide procurers with orientation on how to effectively integrate the GPP criteria for road construction into the procurement process (see section 3 of the technical report).

The process of constructing a new road or carrying out a maintenance activity consists of a distinct sequence of procurement activities with related contracts. This sequence of procurement can have a significant influence on the outcome. This is because each type of contract brings with it distinct interactions between the procurer, the road design team and the contractors.

Depending on the procurement route adopted, these contracts may be awarded to the same contractor or are let separately. Some contracts may be integrated in a design and build (DB) or a design, build and operate (DBO) arrangement, with the detailed design process, the main construction contract, the maintenance and operation contract all potentially co-ordinated by one contractor. It is therefore important to identify the main points in the sequence of procurement activities where GPP criteria should be integrated.

Depending on the ambition level of the project and the experience of the contracting authority, not all of the GPP criteria included in this criteria set will be relevant. Moreover, depending on the preferred procurement sequence criteria may be best addressed at specific stages. The strategic objectives and targets of the project should be determined at the outset of the project with reference to the GPP criteria set. The optimum stages for integration of GPP criteria should be evaluated during discussions to determine the procurement route. In all cases it is recommended that GPP criteria are integrated into both internal planning and the procurement sequence at as early a stage as possible in order to secure the desired outcomes and achieve the best value for money.

1.3 Key environmental impacts

The main environmental impacts arise from daily traffic (fuel consumption by cars and heavy trucks) during the use phase of a road.

Rolling resistance associated to the pavement texture generally has the highest-impact potential, because it is directly related to the vehicle fuel consumption. According to Wang et al. (2012a), a 10% reduction in rolling resistance could lead to 1-2% of improvement in fuel economy.

Congestion can be due to factors outside of the scope of public works (like rush hour traffic, accidents, breakdowns and adverse weather conditions) or due to factors directly related to them, such as lane/road closures necessary for road construction and/or maintenance. It can greatly influence vehicle fuel consumption due to queues and associated slowdown, both in the construction and in the maintenance phase.

The road life cycle stage with the second largest environmental impacts is indicated to be the construction phase, in which the hot-spots are related to **materials production** and **transportation**. The main environmental impacts are

¹ http://ec.europa.eu/environment/gpp/pdf/criteria/street_lighting.pdf

consumption of non-renewable resources, global warming, acidification, photochemical ozone formation and eutrophication in the majority of the investigated studies. In particular:

In complex orography condition, the impacts related to **earthworks** and **ground works**, including soil stabilization, can accounted for the main part of the total emissions and up to 30% of the project cost.

Nowadays **maintenance and rehabilitation** is gaining an increased relevance due to decreases in new road construction. Maintenance has to be evaluated not as a simple repetition of restoration and repairing activities, but on the contrary as a complex network of design strategies including evaluation on rolling resistance, congestion and durability of road surface materials. This phase is dominated by material production and congestion, similar to the construction phase. Several studies indicate that there is a clear connection between durability and sustainability aspects. Thus when durable materials are used, the need for maintenance is reduced.

An important factor is the influence of **traffic flow** on the relative importance of the identified hot-spots:

- In high traffic roads (i.e. example motorways, highways, and main national roads), rolling resistance and congestion have the highest impacts on energy consumption and emissions. Materials production and transportation is the third most important aspect to be taken into consideration.
- In low traffic roads² (i.e. secondary and other roads): higher impacts on energy consumption and emissions come from materials production and transportation rather than from rolling resistance and congestion. The relative importance of materials production and transportation increases with the decrease of the traffic flow.

Some other impacts that are not generally included in LCA studies of roads but which are of particular importance are: **environmental noise emissions** and **storm-water drainage**. With regards to environmental noise, road traffic is perhaps the single most dominant source across most of the EU. Within the scope of GPP, there are two possible approaches to reduce noise from road traffic: to specify low-noise road surfaces *or* to install noise barriers. Concerning storm-water drainage, a number of pollutants are transferred from roads to watercourses. The key to treating stormwater and removing pollutants from roads is to remove floating material (litter and oils) and solid particles (sediment). There is a huge opportunity for road drainage systems to provide much needed **flood capacity** in flood risk areas. Today two broad types of engineered drainage systems exist which can be distinguished as "**hard engineering**" (more concrete based) or "**soft engineering**" (less concrete based). In terms of flood management, both can be tailored to significantly reduce the risk of flooding downstream.

² Internationally, roads with traffic flows of less than 2000 vehicles per day are denoted as low volume roads (AASHTO, 1993).

Key Environmental Areas in Road construction life cycle and Key Environmental Impacts	Proposed EU GPP Road construction approach
<p>Key environmental areas</p> <ul style="list-style-type: none"> • Rolling resistance due to the pavement-vehicle interaction, and related fuel consumption, and associated greenhouse gas emissions, during the use phase of a road • Depletion of natural resources, embodied energy and emissions associated with the manufacturing of road construction materials • Excavated materials and soil, including topsoil, generated during site preparation, earthworks and groundwork. Construction and demolition of the road • Noise emissions from road construction, use and maintenance • Durability of the pavement surface courses. Optimisation of maintenance strategy to guarantee desirable performance for rolling resistance, durability and noise reduction. • Congestion due to construction and maintenance works • Water pollution during road construction and use phase. Contribution of road surfaces to flooding. Habitat fragmentation and risks to flora and fauna during the road use phase. <p>Key life cycle environmental impacts:</p> <ul style="list-style-type: none"> • The following key environmental impact categories along the product life cycle are: global warming potential, photochemical ozone formation, abiotic resource depletion, acidification, eutrophication, human toxicity, eco-toxicity and land use. 	<ul style="list-style-type: none"> • Design and construction to achieve low rolling resistance (within technically acceptable safety parameters) and low associated fuel consumption and emissions in motorways and highways by means of optimizing the macrotexture (measured as Mean Profile Depth MPD) and monitoring it during the road use phase • Design and specification to reduce the embodied impacts and resource use associated with construction materials • Design, specification and site management to maximize the on-site reuse of excavated materials and soils (including topsoil), maximize the reuse/recycling of construction and demolition waste (C&DW) and to use construction materials with a high recycled or re-used content • Lowering noise emissions during construction, use and maintenance phase. Noise reduction by means of low noise pavements and noise barriers. • Increasing material durability • Maintenance and rehabilitation strategies including a monitoring plan and a maintenance plan • A traffic congestion mitigation plan including solutions such as alternative routes, tidal flow lanes and hard shoulders evaluated by means of an LCC analysis • Introducing water pollution control components and storm water retention capacity components, including soft engineered solutions in the drainage system, including potential to introduce wildlife corridors across road

2 GPP CRITERIA FOR ROAD CONSTRUCTION

A. Selection of the design team and contractors	
Core criteria	Comprehensive criteria
SUBJECT MATTER The construction of new resource efficient roads whose design considers wider environmental impacts including noise, drainage and vehicle fuel consumption during use. Or The maintenance works or major rehabilitation of existing roads in a resource efficient manner which considers wider environmental impacts including noise, drainage and vehicle fuel consumption during use.	
SELECTION CRITERIA	
A1. Competencies of the project manager and design team <i>These criteria may form part of a pre-selection procedure for the main contractor or where the services of a design team are procured by the contracting authority.</i> The project manager, planners, engineers, architects, consultant and/or design team consortium shall have relevant competencies and experience in each of the following areas for which they would be responsible under the contract (<i>select as relevant to the specific contract</i>): <ul style="list-style-type: none"> - The project management of road construction and maintenance contracts that have delivered improved environmental performance. - Evaluation of unevenness and macro-texture effects on rolling resistance and, consequently, on fuel consumption and relationship with skid resistance. Evaluation of macrotexture (measured as MPD) and durability related to construction materials. - Assessment of road environmental performance using multi-criteria certification schemes and carbon footprint tools. - The specification, procurement and use of low environmental impact construction materials. - Traffic congestion mitigation plans and LCC analysis to identify the cost-optimal solution. - Real life road traffic noise mitigation solutions by means of low noise pavements and noise barriers. 	A1. Competencies of the project manager and design team <i>These criteria may form part of a pre-selection procedure for the main contractor or where the services of a design team are procured by the contracting authority.</i> The project manager, engineers, architects, consultant and/or design team consortium shall have relevant competencies and experience in each of the following areas for which they would be responsible under the contract (<i>select as relevant to the specific contract</i>): <ul style="list-style-type: none"> - The project management of road construction and maintenance contracts with improved environmental performance. - Evaluation of unevenness and macro-texture effects on rolling resistance and, consequently, on fuel consumption and relationship with skid resistance. Evaluation of macrotexture (measured as MPD) and durability related to construction materials. Use of MIRAVEC tool or, where existing, other assessment tools to evaluate fuel consumption. - The use of holistic assessment tools in the design and specification of environmentally improved roads including LCC and LCA. Comparative studies in compliance with ISO 14040 and ISO 14044 or equivalent. - The specification, procurement and use of low environmental impact construction materials. - Traffic congestion mitigation plans and LCC analysis to identify the cost-optimal solution. - Real life road traffic noise mitigation solutions by means of low noise pavements and noise barriers.

<ul style="list-style-type: none"> - Increasing the durability of pavement courses, bearing capacity and fatigue resistance. - Development and execution of monitoring and maintenance plans in real life cases. - Design and installation of storm-water pollution control components and storm water retention capacity, ideally including soft engineered components, in the drainage systems. <p>Verification: Evidence in the form of information and references related to previous contracts in which the above elements have been carried out. This shall be supported by CVs for personnel who will work on the project.</p>	<p>barriers.</p> <ul style="list-style-type: none"> - Increasing the durability of pavement courses, bearing capacity and fatigue resistance. Experience in long lasting pavements and perpetual pavements. - Development and execution of monitoring and maintenance plans in real life cases. - Design and installation of storm-water pollution control components and storm water retention capacity, ideally including soft engineered components, in the drainage systems. <p>Verification: Evidence in the form of information and references related to previous contracts in which the above elements have been carried out. This shall be supported by CVs for personnel who will work on the project.</p>
<p>A2. Competencies of the main construction contractor</p> <p><i>These criteria may form part of a pre-selection procedure for the main contractor.</i></p> <p>The construction contractor shall have relevant competencies and experience in the completion of road construction and maintenance contracts that have been shown to have delivered improved environmental performance.</p> <p>In the case of design and build or DBO contracts, criterion A1 will also be relevant to the design team employed.</p> <p>Relevant areas of experience shall include (as appropriate to the project and the selected GPP criteria):</p> <ul style="list-style-type: none"> - The commissioning of monitoring and routine maintenance activities on macro-texture (MPD). - Evaluation of durability related to construction materials. - The commissioning of a road congestion mitigation plan and management of congestion during construction and maintenance, including solutions such as alternative routes, tidal flow lane, hard shoulder, ITS devices and their evaluation by means of LCCA. - The purchasing and use of low environmental impact construction materials and verification of their performance. Supply chain management to ensure compliance with any relevant road assessment and certification systems, for example CEEQUAL or Greenroads. - The successful implementation of demolition waste and excavation materials and soil management plans in order to minimise waste production. Selection and knowledge of on-site and off-site treatment options. - Experience with low temperature asphalt with particular regards to best techniques related 	<p>A2. Competencies of the main construction contractor</p> <p><i>These criteria may form part of a pre-selection procedure for the main contractor.</i></p> <p>The construction contractor shall have relevant competencies and experience in the completion of road construction and maintenance contracts that have been shown to have delivered improved environmental performance.</p> <p>In the case of design and build or DBO contracts, criterion A1 will also be relevant to the design team employed.</p> <p>Relevant areas of experience shall include (as appropriate to the project and the selected GPP criteria):</p> <ul style="list-style-type: none"> - The commissioning of monitoring and routine maintenance activities on macro-texture (MPD) and evaluation of the fuel consumption due to changes in MPD, unevenness and surface defects. - Evaluation of durability related to construction materials. Use of MIRAVEC tool or, where existing, other assessment tools to evaluate fuel consumption. - The commissioning of a road congestion mitigation plan and management of congestion during construction and maintenance, including solutions such as alternative routes, tidal flow lane, hard shoulder, ITS devices and their evaluation by means of LCCA. - The purchasing and use of low environmental impact construction materials and verification of their performance. Supply chain management to ensure compliance with any relevant road assessment and certification systems, for example CEEQUAL or Greenroads. Experience with LCA and LCC tools. - The successful implementation of demolition waste and excavation materials and soil management plans in order to minimise waste production. Selection and knowledge of on-

<p>to health and safety of workers</p> <ul style="list-style-type: none"> - Construction of low noise pavements. - Long lasting pavements and increase of durability of the surface layers of the pavement. - Construction and commissioning of water pollution control components and storm water retention capacity, including soft engineered components. <p>Verification:</p> <p>Evidence in the form of information and references related to relevant contracts in the last 3 years in which the above elements have been carried out. This shall also be supported by CVs for personnel who will work on the project and their relevant project experience.</p>	<p>site and off-site treatment options.</p> <ul style="list-style-type: none"> - Experience with low temperature asphalt with particular regards to best techniques related to health and safety of workers. - Construction and monitoring of low noise pavements, analysis of the durability of noise reduction performance. - Long lasting pavements and increase of durability of the surface layers of the pavement. - Construction and commissioning of water pollution control components and storm water retention capacity, including soft engineered components. <p>Verification:</p> <p>Evidence in the form of information and references related to previous contracts in the last 3 years in which the above elements have been carried out. This shall be supported by evidence and data from:</p> <ul style="list-style-type: none"> - Third party auditing (for example from the demolition waste audit) - LCA/LCC analysis of the main road element and/or - Data collection from monitoring of, for example, the production and management of C&DW and excavated materials and soil, the performance parameters for road routine and periodic maintenance and rehabilitation, etc. <p>This shall also be supported by CVs for personnel who will work on the project and their relevant project experience</p>
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Supporting notes:

- The evaluation of consultants, design teams and contractors requires an experienced evaluation panel. It may be appropriate to bring in external expertise, which may include appointment of a project manager, and the setting up of a panel with the knowledge and experience to judge the experience of competing contractors. The lists included in selection criterion 1 and 2 are indicative and should be adapted to the project and the procurement stage.
- In the reform of the Public Procurement Directives^{3 4} (published in the Official Journal 28th March 2014 and requiring transposition by Member States within 24 months), it is explicitly stated (Art. 66 of Directive 2014/24/EU) that the organisation, qualification and experience of staff assigned to performing the contract (where the quality of the staff assigned can have a significant impact on the level of performance of the contract) can be a criterion for awarding a contract. They can therefore be cited in addition to selection criteria. For complex contracts such as road contracts it can usually be expected that the quality of the project managers, design team, specialist consultants and contractors can have a significant impact on the performance of the project.

³ Directive 2014/24/EU of the European Parliament and of the Council of 26 February 2014 on public procurement and repealing Directive 2004/18/EC

⁴ Directive 2014/25/EU of the European Parliament and of the Council of 26 February 2014 on procurement by entities operating in the water, energy, transport and postal services sectors and repealing Directive 2004/17/

B. Detailed design and performance requirements

Core criteria	Comprehensive criteria								
TECHNICAL SPECIFICATIONS									
<p>B1. Minimum recycled content</p> <p>A minimum recycled content, reused content and/or by-products⁵ of 10% by weight for the sum of the main road elements in Table (a).</p> <p><i>Table (a) Scope of the road elements to be evaluated</i></p> <table> <tr> <th>New construction or major extension</th><th>Maintenance and rehabilitation</th></tr> <tr> <td> <ul style="list-style-type: none"> Sub-grade, including earthworks and ground works Sub-base Base, binder and surface or concrete slabs </td><td> <ul style="list-style-type: none"> Base, binder and surface or concrete slabs </td></tr> </table> <p>The recycled content shall be calculated on the basis of an average mass balance of reused, recycled materials and/or by-products according to how they are produced (<i>as applicable</i>):</p> <ul style="list-style-type: none"> The total number of ready mixed batches delivered to site in accordance with standards on <ul style="list-style-type: none"> aggregates EN 13242, EN 13285 or equivalent; asphalt pavement EN 13043, EN 13108-1, EN 13108-2, EN 13108-3, EN 13108-4, EN 13108-5, EN 13108-6, EN 13108-7, EN 13108-8 or equivalent; concrete pavement EN 206, EN 12620, EN13877 or equivalent; hydraulically bound granular mixtures EN 14227 part 1 to 5 Stabilised soil EN 14227 part 10 to 15 On an annual basis for factory-made slabs and elements with claimed content levels in accordance with EN 12620 and EN 206, EN 13877 and national legislation or equivalent. <p>Verification: The Design team or the DB tenderer or the DBO tenderer shall quantify the proportional contribution of the recycled content and/or re-used content to the overall weight of the specified road elements, based on the information provided by the potential</p>	New construction or major extension	Maintenance and rehabilitation	<ul style="list-style-type: none"> Sub-grade, including earthworks and ground works Sub-base Base, binder and surface or concrete slabs 	<ul style="list-style-type: none"> Base, binder and surface or concrete slabs 	<p>B1. Minimum recycled content</p> <p>A minimum recycled content, reused content and/or by-products⁶ of 10% by weight for the sum of the main road elements in Table (b).</p> <p><i>Table (b) Scope of the road elements to be evaluated</i></p> <table> <tr> <th>New construction or major extension</th><th>Maintenance and rehabilitation</th></tr> <tr> <td> <ul style="list-style-type: none"> Sub-grade, including earthworks and ground works Sub-base Base, binder and surface or concrete slabs </td><td> <ul style="list-style-type: none"> Base, binder and surface or concrete slabs </td></tr> </table> <p>The recycled content shall be calculated on the basis of an average mass balance of reused, recycled materials and/or by-products according to how they are produced (<i>as applicable</i>):</p> <ul style="list-style-type: none"> The total number of ready mixed batches delivered to site in accordance with standards on <ul style="list-style-type: none"> aggregates EN 13242, EN 13285 or equivalent; asphalt pavement EN 13043, EN 13108-1, EN 13108-2, EN 13108-3, EN 13108-4, EN 13108-5, EN 13108-6, EN 13108-7, EN 13108-8 or equivalent; concrete pavement EN 206, EN 12620, EN13877 or equivalent; hydraulically bound granular mixtures EN 14227 part 1 to 5 Stabilised soil EN 14227 part 10 to 15 On an annual basis for factory-made slabs and elements with claimed content levels in accordance with EN 12620 and EN 206, EN 13877 and national legislation or equivalent. <p>Verification: The Design team or the DB tenderer or the DBO tenderer shall quantify the proportional contribution of the recycled content and/or re-used content to the overall weight of the specified road elements, based on the information provided by the potential</p>	New construction or major extension	Maintenance and rehabilitation	<ul style="list-style-type: none"> Sub-grade, including earthworks and ground works Sub-base Base, binder and surface or concrete slabs 	<ul style="list-style-type: none"> Base, binder and surface or concrete slabs
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New construction or major extension	Maintenance and rehabilitation								
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⁵ A by-product is defined in art. 5 of the Waste Framework Directive as 'A substance or object, resulting from a production process, the primary aim of which is not the production of that item.....'

⁶ A by-product is defined in art. 5 of the Waste Framework Directive as 'A substance or object, resulting from a production process, the primary aim of which is not the production of that item.....'

<p>supplier(s) of the construction material.</p> <p>This information must include the average mass balance calculations as described above, supported by batch documentation and/or factory production control documentation. In each case this shall be verified by a third party audit.</p>	<p>supplier(s) of the construction material.</p> <p>This information must include the average mass balance calculations as described above, supported by batch documentation and/or factory production control documentation. In each case this shall be verified by a third party audit.</p>
<p>B2. Performance requirements for low temperature asphalt</p> <p>The design team, DB tenderer and DBO tenderer shall propose best practice and techniques for laying bituminous mixtures in order to decrease the health and safety exposure risk of workers.</p> <p>The maximum temperature for laying the bituminous mixtures of surface and binder courses shall not exceed 140°C. Only in cases of higher viscosity special bituminous mixtures, laying temperatures up to greater than 140°C, but lower than 155°C, shall be allowed.</p> <p>Verification: The design team <i>or</i> DB tenderer <i>or</i> the DBO tenderer shall provide a technical report and a workplan of the design activities, indicating the mixing and laying techniques and the maximum temperatures required by these techniques.</p>	<p>B2. Performance requirements for low temperature asphalt</p> <p>The design team, DB tenderer and DBO tenderer shall propose best practice and techniques for laying bituminous mixtures in order to decrease the health and safety exposure risk of workers.</p> <p>The maximum temperature for laying the bituminous mixtures of surface and binder courses shall not exceed 120°C. Only in cases of higher viscosity special bituminous mixtures, laying temperatures up to greater than 120°C, but lower than 155°C, shall be allowed.</p> <p>Verification: The design team <i>or</i> DB tenderer <i>or</i> the DBO tenderer shall provide a technical report and a workplan of the design activities, indicating the mixing and laying techniques and the maximum temperatures required by these techniques.</p>
<p>B3. Excavated materials and soil management plan</p> <p>Waste production during excavation, excluding construction and demolition waste, shall be recorded.</p> <p>An excavation materials and soil management plan shall be prepared establishing systems for the separate collection of:</p> <ul style="list-style-type: none"> (i) excavated materials resulting from excavation activities (for example from site preparation and levelling, foundation, basement and trench excavation), typically soil and stones, including subsoil (ii) topsoil. <p>Closed loop reuse on-site for both excavated materials and topsoil should be maximised according to the results of the carbon footprint or LCA performance assessment (see criterion B14).</p> <p>Separate excavated material collection for re-use, recycling and recovery shall respect the waste hierarchy in Directive 2008/98/EC.</p> <p>Verification: The design team <i>or</i> DB tenderer <i>or</i> the DBO tenderer shall provide a extracted materials and topsoil management plan consisting of:</p> <ul style="list-style-type: none"> (i) A bill of quantities with estimates for excavated materials based on good practices, as defined in the Code of practice on soil management of DEFRA (2009) and/or in the ENCODE Protocol (2013) 	<p>B3. Excavated materials and soil management plan</p> <p>Waste production during excavation, excluding construction and demolition waste, shall be recorded.</p> <p>An excavation materials and soil management plan shall be prepared establishing systems for the separate collection of:</p> <ul style="list-style-type: none"> (i) excavated materials resulting from excavation activities (for example from site preparation and levelling, foundation, basement and trench excavation), typically soil and stones, including subsoil (ii) topsoil. <p>Closed loop reuse on-site for both excavated materials and topsoil should be maximised according to the results of the carbon footprint or LCA performance assessment (see criterion B14).</p> <p>Separate excavated material collection for re-use, recycling and recovery shall respect the waste hierarchy in Directive 2008/98/EC.</p> <p>Verification: The design team <i>or</i> DB tenderer <i>or</i> the DBO tenderer shall provide a extracted materials and topsoil management plan consisting of:</p> <ul style="list-style-type: none"> (i) A bill of quantities with estimates for excavated materials based on good practices as defined in the Code of practice on soil management of DEFRA (2009) and/or in the ENCODE Protocol (2013)

(ii) Estimates of all materials diverted from landfill and identification of potential hazardous substances (iii) Estimates of the % reused and/or recycled materials on site, (iv) Estimates of the % reused and/or recycled materials off site, (v) Total amount of topsoil and strategies to preserve its quality	(ii) Estimates of all materials diverted from landfill and identification of potential hazardous substances (iii) Estimates of the % reused and/or recycled materials on site, (iv) Estimates of the % reused and/or recycled materials off site, (v) Total amount of topsoil and strategies to preserve its quality
<p>B4. Performance requirements for water pollution control components in drainage systems</p> <p><i>(Unless sewer connections are specifically required by local regulations or specific circumstances)</i></p> <p>Road drainage systems shall not be connected to mains sewers.</p> <p>The drainage system shall also contain drainage components that aid the removal of any sediment and solid particles from storm-water.</p> <p>Verification: The design team <i>or</i> DB tenderer <i>or</i> DBO tenderer shall make it clear where drainage water shall be routed to and where and which sediment removal devices shall be incorporated into the drainage system.</p>	<p>B4. Performance requirements for water pollution control components in drainage systems</p> <p><i>(Unless sewer connections are specifically required by local regulations or specific circumstances)</i></p> <p>Road drainage systems shall not be connected to mains sewers.</p> <p>The drainage system shall also contain drainage components that aid the removal of any sediment and solid particles from storm-water.</p> <p>Verification: The design team <i>or</i> DB tenderer <i>or</i> DBO tenderer shall make it clear where drainage water shall be routed to and where and which sediment removal devices shall be incorporated into the drainage system</p>
<p>B5. Performance requirements for storm-water retention capacity in drainage systems</p> <p><i>(When local or national legislation requires, or when specifically requested by the contracting authority)</i></p> <p>The drainage system shall be designed so as to be capable of:</p> <ul style="list-style-type: none"> Retaining the rainfall from a design storm⁷ with a return period (frequency) of 1 in X years and duration of Y minutes across a defined drained area. Restricting maximum runoff rates from the drainage system to no more than that of an equivalent greenfield site or another specific value clearly defined by the procuring authority in the invitation to tender. <p>Verification: The design team <i>or</i> DB tenderer <i>or</i> DBO tenderer shall be provided with the appropriate rainfall data for the design storm by the procuring authority.</p> <p>Using this data, they shall run a hydraulic simulation using appropriate modelling software. The simulation shall show that:</p> <ul style="list-style-type: none"> At no point during the design storm event is the capacity of the drainage system 	<p>B5. Performance requirements for storm-water retention capacity in drainage systems</p> <p><i>(When local or national legislation requires, or when specifically requested by the contracting authority)</i></p> <p>The drainage system shall be designed so as to be capable of:</p> <ul style="list-style-type: none"> Retaining the rainfall from a design storm with a return period (frequency) of 1 in X years and duration of Y minutes across a defined drained area. Restricting maximum runoff rates from the drainage system to no more than that of an equivalent greenfield site or another specific value clearly defined by the procuring authority in the invitation to tender. <p>Verification: The design team <i>or</i> DB tenderer <i>or</i> DBO tenderer shall be provided with the appropriate rainfall data for the design storm by the procuring authority.</p> <p>Using this data, they shall run a hydraulic simulation using appropriate modelling software. The simulation shall show that:</p> <ul style="list-style-type: none"> At no point during the design storm event is the capacity of the drainage system

⁷ See Figures A.7 and A.8 in Annex 5 of the technical report.

<p>exceeded and,</p> <ul style="list-style-type: none"> At no point during the design storm event does the runoff rate exceed the value specified by the procuring authority. 	<p>exceeded and,</p> <ul style="list-style-type: none"> At no point during the design storm event does the runoff rate exceed the value specified by the procuring authority.
<p>B6. Performance of noise emission during construction and maintenance <i>(When planning permission or local/national legislation requires, or when specifically requested by the contracting authority)</i></p> <p>The design team or DB tenderer or DBO tenderer shall provide details of how temporary noise barriers (or permanent if part of the final design) shall be erected to reduce noise levels in the defined receptor area to less than X dB(A) as averaged L_{den} and Y dB(A) as averaged L_{night} values as defined in Annex I of the Environmental Noise Directive (2002/49/EC).</p> <p>Verification: The design team or DB tenderer or DBO tenderer shall submit:</p> <ul style="list-style-type: none"> A plan of the works site and receptor area as defined by the Environmental Impact Assessment, legislation or contracting authority where relevant. A timetable of works, highlighting when the most noisy works are to take place. Specification of the noise barrier location and approximate properties coupled with basic acoustic calculations that demonstrate that noise mitigation in the receptor area will be feasible. 	<p>B6. Performance of noise emission during construction and maintenance <i>(When planning permission or local/national legislation requires, or when specifically requested by the contracting authority)</i></p> <p>The design team or DB tenderer or DBO tenderer shall provide details of how temporary noise barriers (or permanent if part of the final design) shall be erected to reduce noise levels in the defined receptor area to less than X dB(A) as averaged L_{den} and Y dB(A) as averaged L_{night} values as defined in Annex I of the Environmental Noise Directive (2002/49/EC).</p> <p>Verification: The design team or DB tenderer or DBO tenderer shall submit:</p> <ul style="list-style-type: none"> A plan of the works site and receptor area as defined in the Environmental Impact Assessment, legislation or contracting authority request where relevant. A timetable of works, highlighting when the most noisy works are to take place. Specification of the noise barrier location and approximate properties coupled with basic acoustic calculations that demonstrate that noise mitigation in the receptor area will be feasible.
<p>B7. Minimum requirement for low-noise pavement <i>(When local or national legislation requires, or when low noise levels from this road are considered a priority)</i></p> <p>The design team or DB tenderer or DBO tenderer shall provide basic technical details of the proposed low-noise pavement with claims, supported by their own technical data and any third party published reports indicating that:</p> <ul style="list-style-type: none"> Conformity of production: A minimum 3.0 dB(A) reduction in noise emission will be achieved in the new pavement compared to a reference dense asphalt concrete (0/16) surface (or other reference material defined by the contracting authority). Durability of performance A minimum 2.0 dB(A) reduction in noise emission will be achieved in the pavement during the first 5 years of service life compared to a reference dense asphalt 	<p>B7. Minimum requirement for low-noise pavement <i>(When local or national legislation requires, or when low noise levels from this road are considered a priority)</i></p> <p>The design team or DB tenderer or DBO tenderer shall provide basic technical details of the proposed low-noise pavement with claims, supported by their own technical data and any third party published reports indicating that:</p> <ul style="list-style-type: none"> Conformity of production A minimum 4.5 dB(A) reduction in noise emission will be achieved in the new pavement compared to a reference dense asphalt concrete (0/16) surface (or other reference material defined by the contracting authority). Durability of performance A minimum 3.0 dB(A) reduction in noise emission will be achieved in the pavement during the first 5 years of service life compared to a reference dense asphalt

<p>concrete (0/16) surface or other reference material defined by the contracting authority.</p> <p>Verification: The design team or DB tenderer or DBO tenderer shall describe the nature of the proposed low noise pavement such as aggregate grading, aggregate maximum size, binder used, expected voids volume and expected minimum noise reduction of at least 3.0 dB(A).</p> <p>The expected noise reduction performance of the new pavement values shall be based on laboratory and real life measurements of test road sections, either by the tenderer themselves or from peer-reviewed published literature.</p> <p>The expected noise reduction performance during the 5 year service life will be estimated based on the tenderers experience and relevant data, where available.</p> <p>With respect to the reference surface, this shall be defined by any national or local systems in place. In the absence of such a system, noise reduction should be compared to a "virtual" reference road and corrections applied for aggregate size where necessary⁸.</p>	<p>concrete (0/16) surface or other reference material defined by the contracting authority.</p> <p>Verification: The design team or DB tenderer or DBO tenderer shall describe the nature of the proposed low noise pavement such as aggregate grading, aggregate maximum size, binder used, expected voids volume and expected minimum noise reduction of at least 4.5 dB(A).</p> <p>The expected noise reduction performance of the new pavement values shall be based on laboratory and real life measurements of test road sections, either by the tenderer themselves or from peer-reviewed published literature.</p> <p>The expected noise reduction performance during the 5 year service life will be estimated based on the tenderers experience and relevant data, where available.</p> <p>With respect to the reference surface, this shall be defined by any national or local systems in place. In the absence of such a system, noise reduction should be compared to a "virtual" reference road and corrections applied for aggregate size where necessary.</p>
<p>B8. Noise barrier design and material properties <i>(When planning permission or local/national legislation requires, or when low noise levels from this road are considered a priority)</i></p> <p>The design team or DB tenderer or DBO tenderer shall provide basic technical details about the noise barrier placement, dimensions and material(s). For barriers using modular or prefabricated elements, the details shall include as a minimum the performance class according to EN 1793-2 for reflective noise barriers, EN 1793-1 for absorbing noise barriers and the expected durability of performance according to EN 14389-1 for either type of barrier. The tenderer shall also declare a minimum noise reduction performance of X dB(A) across the noise barrier from a fixed point on the road to a defined receptor area that shall be achieved with their proposed design.</p> <p>Verification: The tenderer shall provide design details of the proposed noise barrier as well as a test report of noise barrier material assessment carried out in accordance with the requirements of EN 14389-1 and EN 1793-1 or EN 1793-2 (or equivalent). The tenderer shall state the minimum claimed noise reduction performance across the noise barrier between defined points.</p>	<p>B8. Noise barrier design and material properties <i>(When planning permission or local/national legislation requires, or when low noise levels from this road are considered a priority)</i></p> <p>The design team or BD tenderer or DBO tenderer shall provide basic technical details about the noise barrier placement, dimensions and material(s). For barriers using modular or prefabricated elements, the details shall include as a minimum the performance class according to EN 1793-2 for reflective noise barriers, EN 1793-1 for absorbing noise barriers and the expected durability of performance according to EN 14389-1 for either type of barrier. The tenderer shall also declare a minimum noise reduction performance of Y dB(A) across the noise barrier from a fixed point on the road to a defined receptor area that shall be achieved with their proposed design.</p> <p>Verification: The tenderer shall provide design details of the proposed noise barrier as well as a test report of noise barrier material assessment carried out in accordance with the requirements of EN 14389-1 and EN 1793-1 or EN 1793-2 (or equivalent). The tenderer shall state the minimum claimed noise reduction performance across the noise barrier between defined points.</p>

⁸ See Sandberg, U., The global experience in using low-noise road surfaces: A benchmark report, 2009, p.30-33.

<p>B9. Performance requirement for lighting installations</p> <p>All lighting shall be equipped with lamps and signals that are in compliance with the criteria for street lighting and traffic signals.</p> <p>EU GPP criteria for street lighting and traffic signals</p> <p>http://ec.europa.eu/environment/gpp/pdf/criteria/street_lighting.pdf</p> <p>Verification: See the respective EU GPP criteria documents.</p>	<p>B9. Performance requirement for lighting installations</p> <p>All lighting shall be equipped with lamps and signals that are in compliance with the criteria for street lighting and traffic signals.</p> <p>EU GPP criteria for street lighting and traffic signals</p> <p>http://ec.europa.eu/environment/gpp/pdf/criteria/street_lighting.pdf</p> <p>Verification: See the respective EU GPP criteria documents.</p>
<p>B10. Traffic congestion mitigation plan</p> <p>A traffic congestion mitigation plan shall be presented including:</p> <ul style="list-style-type: none"> • Timeline with expected construction and/or maintenance activities for the road service life. • Alternative routes for diverted traffic during such activities, if necessary. <p>If the design team, DB tenderer or DBO tenderer includes congestion solutions based on tidal flow lanes or hard shoulders to be used as lanes, they shall present a LCCA analysis, including user cost externalities due to congestion.</p> <p>For those roads where Intelligent traffic systems (ITS) are implemented for traffic management, the road shall be equipped with the devices needed to support the ITS: cameras, traffic lights, information screens and variable road signs</p> <p>Verification: The design team <i>or</i> DB tenderer <i>or</i> DBO tenderer shall provide the detailed traffic congestion mitigation plan, the LCCA in accordance with ISO 15686-5 (if required) and the descriptions of the ITS devices (if required).</p>	<p>B10. Traffic congestion mitigation plan</p> <p>A traffic congestion mitigation plan shall be presented including:</p> <ul style="list-style-type: none"> • Timeline with expected construction and/or maintenance activities for the road service life. • Alternative routes for diverted traffic during such activities, if necessary. <p>If the design team, DB tenderer or DBO tenderer includes congestion solutions based on tidal flow lanes or hard shoulders to be used as lanes, they shall present a LCCA analysis, including user cost externalities due to congestion.</p> <p>For those roads where Intelligent traffic systems (ITS) are implemented for traffic management, the road shall be equipped with the devices needed to support the ITS: cameras, traffic lights, information screens and variable road signs</p> <p>Verification: The design team <i>or</i> DB tenderer <i>or</i> DBO tenderer shall provide the detailed traffic congestion mitigation plan, the LCCA in accordance with ISO 15686-5 (if required) and the descriptions of the ITS devices (if required).</p>
<p>B11. Performance requirements for durability of pavement surface and rehabilitation</p> <p>The road pavement road shall comply with the following minimum durability:</p> <ul style="list-style-type: none"> • 5 years for the surface course • 10 years for the binder course (excluding the surface) • 40 years for the course base <p>Verification: The Design team <i>or</i> DB tenderer <i>or</i> DBO tenderer shall provide a technical report specifying the minimum durability (service life) of the surface, binder and base courses. The report shall include the evaluation of the bearing capacity and the fatigue resistance, the viscoplastic and fracture strains of the road pavement layers and materials. The report shall include appropriate data and information, specifically related to materials physical-mechanical performances, construction technologies and process, design activities workplan.</p>	<p>B11. Performance requirements for durability of pavement surface and rehabilitation</p> <p>The road pavement shall comply with the following minimum durability:</p> <ul style="list-style-type: none"> • 5 years for the surface course • 10 years for the binder course (excluding the surface) • 40 years for the course base <p>Verification: The Design team <i>or</i> DB tenderer <i>or</i> DBO tenderer shall provide a technical report specifying the minimum durability (service life) of the surface, binder and base courses. The report shall include the evaluation of the bearing capacity and the fatigue resistance, the viscoplastic and fracture strains of the road pavement layers and materials. The report shall include appropriate data and information, specifically related to materials physical-mechanical performances, construction technologies and process, design activities workplan.</p>

<p>B12. Maintenance and rehabilitation (M&R) plan</p> <p>The design team, DB tenderer or DBO tenderer shall include in the detailed design a maintenance plan. For each section of road specifically characterised by specific construction methods, materials, environmental conditions, meteorological conditions and use, the tenderer shall define as a minimum the following aspects:</p> <p>a) Monitoring plan:</p> <ul style="list-style-type: none"> • Including performance parameters to be monitored, frequency of monitoring, data acquisition method, threshold values, and the maintenance actions triggered by the thresholds values. • Including also; safety, service quality and durability parameters and their respective frequency: <ul style="list-style-type: none"> • (to be defined by the Road Authority) <p>b) Maintenance and rehabilitation (M&R) plan</p> <ul style="list-style-type: none"> • Including routine, periodic and rehabilitation actions • Optimizing the cost-benefit ratio of the maintenance works • Aligning with the environmental performance of the main road element (carbon footprint CF if applicable). • Including the cost, the first year after the construction, frequency, the congestion mitigation plan (according to the criterion B10) and the waste management plan (according criterion E2) for each action. <p>Verification: The Design team <i>or</i> DB tenderer <i>or</i> DBO tenderer shall provide a technical report including appropriate data and information and the design activities workplan</p>	<p>B12. Maintenance and rehabilitation (M&R) plan</p> <p>The design team, DB tenderer or DBO tenderer shall include in the detailed design a maintenance plan. For each section of road specifically characterised by specific construction methods, materials, environmental conditions, meteorological conditions and use, the tenderer shall define as a minimum the following aspects:</p> <p>a) Monitoring plan:</p> <ul style="list-style-type: none"> • Including performance parameters to be monitored, frequency of monitoring, data acquisition method, threshold values, and the maintenance actions triggered by the thresholds values. • Including also; safety, service quality and durability parameters and their respective frequency: <ul style="list-style-type: none"> • (to be defined by the Road Authority) • The monitored parameters shall include MPD and noise, if the respective award criteria on rolling resistance and noise apply <p>b) Maintenance and rehabilitation (M&R) plan</p> <ul style="list-style-type: none"> • Including routine, periodic and rehabilitation actions • Optimizing the cost-benefit ratio of the maintenance works • Aligning with the environmental performance of the main road element (LCA if applicable). • Including the cost, the first year after the construction, frequency, the congestion mitigation plan (according to the criterion B10) and the waste management plan (according criterion E2) for each action. <p>Verification: The Design team <i>or</i> DB tenderer <i>or</i> DBO tenderer shall provide a technical report including appropriate data and information and the design activities workplan</p>
<p>AWARD CRITERIA</p>	
<p>B13. N/A</p>	<p>B13. Performance requirements on traffic fuel consumption due to rolling resistance</p> <p>OPTION 1</p> <p>For those motorways and highways, main roads or national roads designed to bear high AADT⁹ (Annual Average Daily traffic) at steady speed, points will be awarded to those offers that commit to a lower MPD of the road surface.</p>

⁹ High AADT may vary across EU countries and regions, therefore the range regarded as 'high' should be evaluated by each Road Authority. As a general rule of thumb, relevant literature indicates that the threshold between high and low traffic volume is around 2000-3000 AADT.

	<p>The MPD shall ensure the compliance with the skid resistance required by national, regional and/or local legislation.</p> <p>The MPD declared shall be guaranteed along the lifetime of the road, therefore, the maintenance plan shall include the monitoring of MPD on a regular basis (at least every 5 years) and the maintenance works to be implemented.</p> <p>Verification: The design team, DB tenderer or DBO tenderer shall provide the detailed design including the performance parameters declared together with test results on a representative test sample of the surface, according to the standard ISO 13473-1. Tests shall be carried out by an independent laboratory</p> <hr/> <p>OPTION 2</p> <p>For those motorways and highways, main roads or national roads designed to bear high AADT (Annual Average Daily traffic) at steady speed, points will be awarded to those offers that commit to a road surface which will reduce traffic fuel consumption.</p> <p>The contracting authority will provide the tenderers with the Excel tool including the planning data (route, traffic flow, average degree of curvature, Rise and fall/gradient). The tenderer shall include the design parameters influencing the fuel consumption declaring those values together with their error margins.</p> <p>The MPD shall ensure the compliance with the skid resistance required by national, regional and/or local legislation.</p> <p>The MPD declared shall be guaranteed along the lifetime of the road, therefore, the maintenance plan shall include the monitoring of MPD on a regular basis (at least every 5 years) and the maintenance works to be implemented.</p> <p>Verification: The design team, DB tenderer or DBO tenderer shall evaluate the fuel consumption by means of the MIRAVEC tool or, where existing, other assessment tools including the parameters:</p> <ul style="list-style-type: none"> • Fuel consumption model for free flow traffic based on: <ul style="list-style-type: none"> ○ Vehicle characteristics (type, fuel used, Euro class) ○ Rolling resistance, Air resistance, Average degree of curvature, Rise and fall/gradient, Velocity • Rolling resistance dependent on ambient temperature, IRI, MPD • Vehicle velocity, based on posted speed, vehicle type, traffic volume, gradient, IRI and rutting present • Idle time <p>They shall also provide the detailed design including the performance parameters declared together with test results on a representative test sample of the surface, according to the standard ISO 13473-1. Tests shall be carried out by an independent laboratory.</p>
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B14. LCA performance of the main road elements

This criterion may only be applied where a Bill of Quantities for a reference road is to be provided to bidders as the basis for comparison or where designs submitted by different bidders are to be compared during a competitive process.

Additional technical guidance shall be followed during the procurement process, as provided in Annex A (Carbon Footprint option).

A technical evaluator specialised in LCA shall assist in preparing the ITT and shall carry out a critical review of the submissions.

Points will be awarded on the base of the improvement of the carbon footprint (CF) of the road including at least the main road elements listed in Table (c) in comparison with a reference road or other competing designs.

The basis for the comparison shall be specified in the ITT.

Table (c) Scope of the road elements to be evaluated

New construction or major extension	Maintenance and rehabilitation
<ul style="list-style-type: none"> • Sub-grade, including earthworks and ground works • Sub-base • Base, binder and surface or concrete slabs • Additional ancillary road elements (optional) 	<ul style="list-style-type: none"> • Base, binder and surface or concrete slabs

Option 1: Carry out a Carbon footprint (CF)

The performance shall be evaluated by carrying out a Carbon Footprint (CF) of the road in accordance with ISO 14067 or equivalent. The ITT shall specify the method that shall be used for the evaluation (see Annex A).

The bidder that shows the lowest carbon footprint will be ranked with the highest value.

The successful tenderer shall prepare a handover document including the assumptions and results with specific regard to:

- *earthworks and groundwork solutions*
- *materials suggested to be used, techniques applied such as WMA, HWMA, CMA and recycled content*
- *transportation distances from production site to the worksite (baseline mass haul plan)*
- *% of recycling, reuse of excavated materials and construction and demolition waste on-*

B14. LCA performance of the main road elements

This criterion may only be applied where a Bill of Quantities for a reference road is to be provided to bidders as the basis for comparison or where designs submitted by different bidders are to be compared during a competitive process.

Additional technical guidance shall be followed during the procurement process, as provided in Annex B (LCA option).

A technical evaluator specialised in LCA shall assist in preparing the ITT and shall carry out a critical review of the submissions.

Points will be awarded on the base of the improvement in life cycle assessment performance (LCA) of the road including at least the main road elements listed in Table (d) in comparison with a reference road or other competing designs.

The basis for the comparison and the option to be used shall be specified in the ITT.

Table (d) Scope of the road elements to be evaluated

New construction or major extension	Maintenance and rehabilitation
<ul style="list-style-type: none"> • Sub-grade, including earthworks and ground works • Sub-base • Base, binder and surface or concrete slabs • Additional ancillary road elements (optional) 	<ul style="list-style-type: none"> • Base, binder and surface or concrete slabs

Option 2: Carry out a Life Cycle Assessment (LCA)

The performance shall be evaluated by carrying out a Life Cycle Assessment (LCA) of the road in accordance with ISO 14040/14044 or equivalent. The ITT shall specify which of the following methods shall be used for the evaluation (see Annex B):

- Impact Category results: The aggregated characterisation results for each indicator obtained using the specified LCA method; or
- LCA tool score: A single score obtained using a national or regional LCA tool used by public authorities;

In each case the methodology shall include, as a minimum, the Lifecycle Impact Category Indicators specified in Annex B.

The successful tenderer shall prepare a handover document including the assumptions and results with specific regard to:

<p><i>site and off-site</i></p> <ul style="list-style-type: none"> • <i>Maintenance activities and frequencies</i> <p>Verification: The Design team or the DB tenderer or the DBO tenderer shall provide a bill of materials for the proposed design. The comparison with the reference road shall be written up in a concise technical report that compares the proposed design option(s) and calculates the improvement potential.</p> <p><i>The handover document will be used by the procurer for the future ITT in case of separated design and built contracts or will be updated and further improved by the main construction contractor or the DB contractor or the DBO contractor before starting the construction phase.</i></p> <p><i>The successful tenderer shall conclude the design phase with the preparation of the handover document.</i></p> <p><i>The successful DB tenderer or DBO tenderer shall prepare the handover document before starting the construction phase.</i></p> <p><i>The technical report shall be subject to a critical review by the contracting authorities appointed LCA technical evaluator. The critical review shall follow the guidelines in Annex C.</i></p>	<ul style="list-style-type: none"> • <i>earthworks and groundwork solutions</i> • <i>materials suggest to be used, techniques applied such as WMA,HWMA,CMA and recycled content</i> • <i>transportation distances from production site to the worksite (baseline mass haul plan)</i> • <i>% of recycling, reuse of excavated materials and construction and demolition waste on-site and off-site</i> • <i>Maintenance activities and frequencies</i> <p>Verification: The Design team or the DB tenderer or the DBO tenderer shall provide a bill of materials for the proposed design. The comparison with the reference road shall be written up in a concise technical report that compares the proposed design option(s) and calculates the improvement potential.</p> <p><i>The handover document will be used by the procurer for the future ITT in case of separated design and built contracts or will be updated and further improved by the main construction contractor or the DB contractor or the DBO contractor before starting the construction phase.</i></p> <p><i>The successful tenderer shall conclude the design phase with the preparation of the handover document.</i></p> <p><i>The successful DB tenderer or DBO tenderer shall prepare the handover document before starting the construction phase.</i></p> <p><i>The technical report shall be subject to a critical review by the contracting authorities appointed LCA technical evaluator. The critical review shall follow the guidelines in Annex C.</i></p>								
<p>B15. Incorporation of recycled content</p> <p>Points will be awarded to tenderers that achieve greater than or equal to 15% by weight of recycled content, reused content and/or by-products ¹⁰ for the sum of the main road elements in Table (e). Points will be awarded in proportion to the total percentage reached.</p> <p><i>Table (e) Scope of the road elements to be evaluated</i></p> <table border="1"> <thead> <tr> <th>New construction or major extension</th><th>Maintenance and rehabilitation</th></tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> • Sub-grade, including earthworks and ground works • Sub-base • Base, binder and surface or concrete slabs </td><td> <ul style="list-style-type: none"> • Base, binder and surface or concrete slabs </td></tr> </tbody> </table>	New construction or major extension	Maintenance and rehabilitation	<ul style="list-style-type: none"> • Sub-grade, including earthworks and ground works • Sub-base • Base, binder and surface or concrete slabs 	<ul style="list-style-type: none"> • Base, binder and surface or concrete slabs 	<p>B15. Incorporation of recycled content</p> <p>Points will be awarded to tenderers that achieve greater than or equal to 30% by weight of recycled content, reused content and/or by-products ¹¹ for the sum of the main road elements in Table (f). Points will be awarded in proportion to the total percentage reached.</p> <p><i>Table (f) Scope of the road elements to be evaluated</i></p> <table border="1"> <thead> <tr> <th>New construction or major extension</th><th>Maintenance and rehabilitation</th></tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> • Sub-grade, including earthworks and ground works • Sub-base • Base, binder and surface or concrete slabs </td><td> <ul style="list-style-type: none"> • Base, binder and surface or concrete slabs </td></tr> </tbody> </table>	New construction or major extension	Maintenance and rehabilitation	<ul style="list-style-type: none"> • Sub-grade, including earthworks and ground works • Sub-base • Base, binder and surface or concrete slabs 	<ul style="list-style-type: none"> • Base, binder and surface or concrete slabs
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¹⁰ A by-product is defined in art. 5 of the Waste Framework Directive as 'A substance or object, resulting from a production process, the primary aim of which is not the production of that item.....'

¹¹ A by-product is defined in art. 5 of the Waste Framework Directive as 'A substance or object, resulting from a production process, the primary aim of which is not the production of that item.....'

<p>The recycled content shall be calculated on the basis of an average mass balance of reused, recycled materials and/or by-products according to how they are produced (<i>as applicable</i>):</p> <ul style="list-style-type: none"> • The total number of ready mixed batches delivered to site in accordance with standards on <ul style="list-style-type: none"> – aggregates EN 13242, EN 13285 or equivalent; – asphalt pavement EN 13043, EN 13108-1, EN 13108-2, EN 13108-3, EN 13108-4, EN 13108-5, EN 13108-6, EN 13108-7, EN 13108-8 or equivalent; – concrete pavement EN 206, EN 12620, EN13877 or equivalent; – hydraulically bound granular mixtures EN 14227 part 1 to 5 – Stabilised soil EN 14227 part 10 to 15 • On an annual basis for factory made slabs and elements with claimed content levels in accordance with EN 12620 and EN 206, EN 13877 and national legislation or equivalent. <p>Verification: The Design team <i>or</i> the DB tenderer <i>or</i> the DBO tenderer shall quantify the proportional contribution of the recycled content and/or re-used content to the overall weight of the specified road elements, based on the information provided by the supplier(s) of the construction material.</p> <p>This information must include the average mass balance calculations as described above, supported by batch documentation and/or factory production control documentation. In each case this shall be verified by a third party audit.</p>	<p>The recycled content shall be calculated on the basis of an average mass balance of reused, recycled materials and/or by-products according to how they are produced (<i>as applicable</i>):</p> <ul style="list-style-type: none"> • The total number of ready mixed batches delivered to site in accordance with standards on <ul style="list-style-type: none"> – aggregates EN 13242, EN 13285 or equivalent; – asphalt pavement EN 13043, EN 13108-1, EN 13108-2, EN 13108-3, EN 13108-4, EN 13108-5, EN 13108-6, EN 13108-7, EN 13108-8 or equivalent; – concrete pavement EN 206, EN 12620, EN13877 or equivalent; – hydraulically bound granular mixtures EN 14227 part 1 to 5 – Stabilised soil EN 14227 part 10 to 15 • On an annual basis for factory made slabs and elements with claimed content levels in accordance with EN 12620 and EN 206, EN 13877 and national legislation or equivalent. <p>Verification: The Design team <i>or</i> the DB tenderer <i>or</i> the DBO tenderer shall quantify the proportional contribution of the recycled content and/or re-used content to the overall weight of the specified road elements, based on the information provided by the supplier(s) of the construction material.</p> <p>This information must include the average mass balance calculations as described above, supported by batch documentation and/or factory production control documentation. In each case this shall be verified by a third party audit.</p>
<p>B16. Performance requirements for CO2e emission from materials transportation</p> <p><i>This criterion shall be applied in cases when the criterion on CF or LCA performance B14 is not applied</i></p> <p>Points will be awarded on the base of the reduction in the CO2e emission/tonne of transported materials that are employed as a minimum in the main road elements listed in Table (g) in comparison with a reference road <i>or</i> other competing designs.</p>	<p>B16. Performance requirements for CO2e emission from materials transportation</p> <p><i>This criterion shall be applied in cases when the criterion on CF or LCA performance B14 is not applied</i></p> <p>Points will be awarded on the base of the reduction in the CO2e emission/tonne of transported materials that are employed as a minimum in the main road elements listed in Table (h) in comparison with a reference road <i>or</i> other competing designs.</p>

Table (g) Scope of the road elements to be evaluated

New construction or major extension	Maintenance and rehabilitation
<ul style="list-style-type: none"> • Sub-grade, including earthworks and ground works • Sub-base • Base, binder and surface or concrete slabs • Additional ancillary road elements (optional) 	<ul style="list-style-type: none"> • Base, binder and surface or concrete slabs

Methods and tools to evaluate the CO2e emissions of transported materials shall be specified in the ITT.

The Bill of Quantities (BoQ) of materials, the transportation distances from the production site to the work site and the CO2e/tonne of transported material shall be included in a baseline mass haul plan that constitutes part of the handover document prepared by the successful tenderer. The mass haul shall be used by the procurer for the future ITT in case of separated design and built contracts or optimised by the main construction contractor or the DBO contractor.

Verification: The Design team or the DB tenderer or the DBO tenderer shall provide the CO2e/tonne of transported material and the transportation distances from the production site to the work site and multiply this by the relevant quantities as stated in the BoQ.

The handover document will be used by the procurer for the future ITT in case of separated design and built contracts or will be updated and further improved by the main construction contractor or the DB contractor or the DBO contractor before starting the construction phase

The successful tenderer shall conclude the design phase with the preparation of a handover document.

The successful DB tenderer and DBO tenderer shall prepare the handover document before starting the construction phase

B17. Requirements for water pollution control "soft engineered" components in drainage systems

Points shall be awarded for drainage systems that incorporate "soft engineered" components (often referred to as SuDS) that incorporate storm-water pollutant load removal, improved aesthetics and potential habitat creation in drainage infrastructure as follows:

- Filter trenches with low or no kerbs at roadside covering at least 40% of the roadside

Table (h) Scope of the road elements to be evaluated

New construction or major extension	Maintenance and rehabilitation
<ul style="list-style-type: none"> • Sub-grade, including earthworks and ground works • Sub-base • Base, binder and surface or concrete slabs • Additional ancillary road elements (optional) 	<ul style="list-style-type: none"> • Base, binder and surface or concrete slabs

Methods and tools to evaluate the CO2e emissions of transported materials shall be specified in the ITT.

The Bill of Quantities (BoQ) of materials, the transportation distances from the production site to the work site and the CO2e/tonne of transported material shall be included in a baseline mass haul plan that constitutes part of the handover document prepared by the successful tenderer. The mass haul shall be used by the procurer for the future ITT in case of separated design and built contracts or optimised by the main construction contractor or the DBO contractor.

Verification: The Design team or the DB tenderer or the DBO tenderer shall provide the CO2e/tonne of transported material and the transportation distances from the production site to the work site and multiply this by the relevant quantities as stated in the BoQ.

The handover document will be used by the procurer for the future ITT in case of separated design and built contracts or will be updated and further improved by the main construction contractor or the DB contractor or the DBO contractor before starting the construction phase

The successful tenderer shall conclude the design phase with the preparation of a handover document.

The successful DB tenderer and DBO tenderer shall prepare the handover document before starting the construction phase

B17. Requirements for water pollution control "soft engineered" components in drainage systems

Points shall be awarded for drainage systems that incorporate "soft engineered" components (often referred to as SuDS) that incorporate storm-water pollutant load removal, improved aesthetics and potential habitat creation in drainage infrastructure as follows:

- Filter trenches with low or no kerbs at roadside covering at least 40% of the roadside

<p>(0.25X points)</p> <ul style="list-style-type: none"> Grassed swales covering at least 40% of the roadside (0.5X points) Vegetated retention basins with unlined bases for infiltration through which all road drainage is directed prior to reaching the local surface watercourse (0.5X points) Vegetated retention ponds with linings to create artificial wetlands and/or a permanent water body in all or part of the basin which all road drainage is directed through prior to reaching the local surface watercourse. (0.75X points) <p>More than one SuDS feature may be incorporated into the drainage design and may be combined with other "hard engineered" drainage components..</p> <p>These systems shall be designed in accordance with best practice guidelines, for example as detailed in "The SUDS Manual C697" published by CIRIA in 2007 or other similar but more recent literature.</p> <p>Verification: The design team or DB tenderer or DBO tenderer shall provide details of these drainage solutions and clearly indicate them in the design. Where relevant, reference shall be made to best practice design details and how these are incorporated in the design</p>	<p>(0.25X point)</p> <ul style="list-style-type: none"> Grassed swales covering at least 40% of the roadside (0.50X points) Vegetated retention basins with unlined bases for infiltration through which all road drainage is directed prior to reaching the local surface watercourse (0.50X points) Vegetated retention ponds with linings to create artificial wetlands and/or a permanent water body in all or part of the basin which all road drainage is directed through prior to reaching the local surface watercourse. (0.75X points) <p>More than one SuDS feature may be incorporated into the drainage design and may be combined with other "hard engineered" drainage components.</p> <p>These systems shall be designed in accordance with best practice guidelines, for example as detailed in "The SUDS Manual C697" published by CIRIA in 2007 or other similar but more recent literature.</p> <p>Verification: The design team or DB tenderer or DBO tenderer shall provide details of these drainage solutions and clearly indicate them in the design. Where relevant, reference shall be made to best practice design details and how these are incorporated in the design</p>
<p>B18. Requirements for storm-water retention capacity in drainage systems that incorporate "soft engineered" components</p> <p>Points shall be awarded for drainage systems that incorporate "soft engineered" components (often referred to as SuDS) that incorporate storm-water retention devices that improve site aesthetics and contribute to potential habitat creation as follows:</p> <ul style="list-style-type: none"> Grassed swales with check dams and an orifice plate at the base to act as retention devices during intense rainfall events but normally be dry (0.50X points) Vegetated retention basins with unlined bases for infiltration and overflows for severe conditions through which all road drainage is directed prior to reaching the local surface watercourse (0.50X points) Vegetated retention ponds with linings to create artificial wetlands and/or a permanent water body in all or part of the basin which all road drainage is directed through prior to reaching the local surface watercourse. (0.75X points) <p>Any one or all features may be incorporated into the drainage design and may be combined with other "hard engineered" drainage components as per site requirements.</p> <p>These systems shall be designed in accordance with best practice guidelines, for example as detailed in "The SUDS Manual C697" published by CIRIA in 2007 or other similar but more</p>	<p>B18. Requirements for storm-water retention capacity in drainage systems that incorporate "soft engineered" components</p> <p>Points shall be awarded for drainage systems that incorporate "soft engineered" components (often referred to as SuDS) that incorporate storm-water retention devices that improve site aesthetics and contribute to potential habitat creation as follows:</p> <ul style="list-style-type: none"> Grassed swales with check dams and an orifice plate at the base to act as retention devices during intense rainfall events but normally be dry (0.50X points) Vegetated retention basins with unlined bases for infiltration and overflows for severe conditions through which all road drainage is directed prior to reaching the local surface watercourse (0.50X points) Vegetated retention ponds with linings to create artificial wetlands and/or a permanent water body in all or part of the basin which all road drainage is directed through prior to reaching the local surface watercourse. (0.75X points) <p>Any one or all features may be incorporated into the drainage design and may be combined with other "hard engineered" drainage components as per site requirements.</p> <p>These systems shall be designed in accordance with best practice guidelines, for example as detailed in "The SUDS Manual C697" published by CIRIA in 2007 or other similar but more</p>

<p>recent literature.</p> <p>Verification: The design team <i>or</i> DB tenderer <i>or</i> DBO tenderer shall provide details of these drainage solutions and clearly indicate them in the design. Where relevant, reference shall be made to best practice design details and how these are incorporated in the design</p>	<p>recent literature.</p> <p>Verification: The design team <i>or</i> DB tenderer <i>or</i> DBO tenderer shall provide details of these drainage solutions and clearly indicate them in the design. Where relevant, reference shall be made to best practice design details and how these are incorporated in the design</p>
<p>B19. Performance requirements for wildlife corridors across the road</p> <p>Points shall be awarded for drainage infrastructure (culverts or underpasses) that aids the safe passage of small fauna and amphibious or aquatic species across the road. Points shall be awarded as follows:</p> <ul style="list-style-type: none"> Filter trenches with low (<25 mm) or no kerbs at roadside covering at least 40% of the roadside (0.5X point). At least 60% of all culverts shall provide flat and dry walkways for small fauna (0.5X point). All culverts that channel permanent surface water courses do not prevent the upstream migration of fish or amphibious species (0.5X point). <p>Culverts that permit the passage of small fauna or aquatic species shall be designed according to best practice guidelines, for example as published in the COST 341 Handbook or any similar documentation suggested by the procuring authority.</p> <p>Verification: The design team <i>or</i> DB tenderer <i>or</i> DBO tenderer shall highlight the details of any filter trenches or culverts that meet the award criteria in the road drainage design and comparison shall make to the best practice guidelines in relevant literature.</p>	<p>B19. Performance requirements for wildlife corridors across the road</p> <p>Points shall be awarded for drainage infrastructure (culverts or underpasses) that allows the safe passage of small fauna, and amphibious or aquatic species across the road. Points shall be awarded points as follows:</p> <ul style="list-style-type: none"> Filter trenches with low (<25 mm) or no kerbs at roadside covering at least 40% of the roadside (0.5X point). At least 60% of all culverts shall provide flat and dry walkways for small fauna (0.5X point). All culverts that channel permanent surface water courses do not prevent the upstream migration of fish or amphibious species (0.5X point). <p>Culverts that permit the passage of small fauna, or aquatic species shall be designed according to best practice guidelines, for example as published in the COST 341 Handbook or any similar documentation suggested by the procuring authority.</p> <p>Verification: The design team <i>or</i> DB tenderer <i>or</i> DBO tenderer shall highlight the details of any filter trenches or culverts that meet the award criteria in the road drainage design and comparison shall make to the best practice guidelines in relevant literature.</p>
<p>B20. Performance of low noise surface pavements</p> <p>Points will be awarded if the pavement design claims to achieve a noise reduction performance that exceeds the minimum technical requirements (see B7). The allocation of points shall be as follows:</p> <p>Conformity of production</p> <ul style="list-style-type: none"> That the new pavement performance claim is >1.0dB(A) better than the minimum technical requirement (0.25X points) That the new pavement performance claim is >2.0dB(A) better than the minimum technical requirement (0.50X points). 	<p>B20. Performance of low noise surface pavements</p> <p>Points will be awarded if the pavement design claims to achieve a noise reduction performance that exceeds the minimum technical requirements (see B7). The allocation of points shall be as follows:</p> <p>Conformity of production:</p> <ul style="list-style-type: none"> That the new pavement performance claim is >1.0dB(A) better than the minimum technical requirement (0.25X points) That the new pavement performance claim is >2.0dB(A) better than the minimum technical requirement (0.50X points).

<p>Durability of performance</p> <ul style="list-style-type: none"> That the pavement performance after 5 years of service life is >1.0dB(A) than the minimum technical requirement (0.25X points) That the pavement performance after 5 years of service life is >2.0dB(A) than the minimum technical requirement (0.50X points) <p>Verification: The design team <i>or</i> DB tenderer <i>or</i> DBO tenderer shall describe the nature of the proposed low noise pavement such as aggregate grading, aggregate maximum size, binder used, expected voids volume and expected minimum noise reduction of at least 3.0 dB(A).</p> <p>The expected noise reduction performance of the new pavement values shall be based on laboratory and real life measurements of test road sections, either by the tenderer themselves or from peer-reviewed published literature.</p> <p>The expected noise reduction performance during the 5 year service life will be estimated based on the tenderers experience and relevant data, where available.</p> <p>With respect to the reference surface, this shall be defined by any national or local systems in place. In the absence of such a system, noise reduction should be compared to a "virtual" reference road and corrections applied for aggregate size where necessary¹².</p>	<p>Durability of performance</p> <ul style="list-style-type: none"> That the pavement performance after 5 years of service life is >1.0dB(A) than the minimum technical requirement (0.25X points) That the pavement performance after 5 years of service life is >2.0dB(A) than the minimum technical requirement (0.50X points) <p>Verification: The design team <i>or</i> DB tenderer <i>or</i> DBO tenderer shall describe the nature of the proposed low noise pavement such as aggregate grading, aggregate maximum size, binder used, expected voids volume and expected minimum noise reduction of at least 4.5 dB(A).</p> <p>The expected noise reduction performance of the new pavement values shall be based on laboratory and real life measurements of test road sections, either by the tenderer themselves or from peer-reviewed published literature.</p> <p>The expected noise reduction performance during the 5 year service life will be estimated based on the tenderers experience and relevant data, where available.</p> <p>With respect to the reference surface, this shall be defined by any national or local systems in place. In the absence of such a system, noise reduction should be compared to a "virtual" reference road and corrections applied for aggregate size where necessary.</p>
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¹² See Sandberg, U., The global experience in using low-noise road surfaces: A benchmark report, 2009. p.30-33.

C. Construction

Core criteria	Comprehensive criteria
TECHNICAL SPECIFICATIONS	
<p>C1. Testing of in-situ constructed noise barrier</p> <p>During an agreed period after construction of a noise barrier, the tenderer shall submit to conformity of production testing of the noise barrier by an independent body, in accordance with EN 1793-6 or other standard tests specified clearly in the invitation to tender. Results shall comply with the minimum X dB(A) noise reduction requirements stated in the original proposal.</p> <p>Verification: A test report produced by an independent body stating compliance with the in-situ sound insulation values (if tested according to EN 1793-6) shall be provided.</p>	<p>C1. Testing of in-situ constructed noise barrier</p> <p>During an agreed period after construction of a noise barrier, the tenderer shall submit to conformity of production testing of the noise barrier by an independent body, in accordance with EN 1793-6 or other standard tests specified clearly in the invitation to tender. Results shall comply with the minimum Y dB(A) noise reduction requirements stated in the original proposal.</p> <p>Verification: A test report produced by an independent body stating compliance with the in-situ sound insulation values (if tested according to EN 1793-6) shall be provided.</p>
CONTRACT PERFORMANCE CLAUSE	
<p>C2. Commissioning of the road construction</p> <p>The main construction contractor or the DB constructor or the DBO contractor has to ensure that the commissioning of the road construction conforms to the agreed designs and specifications. Particular attention should be paid to the following aspects:</p> <ul style="list-style-type: none"> • CF/LCA performance of the main road elements (criterion B14) or the CO2 emissions per tonne of transported materials (criterion B16) • water pollution control components, storm-water retention capacity and wildlife corridor design in the drainage system (criteria B4, B5, B18, B19) • Pavement durability (criterion B11) • Congestion mitigation plan implementation (criterion B10) <p>The contracting authority should foresee rules for remediation in the case of unsatisfactory or non-compliant results regarding any set design values or performance indicators for the above listed technical aspects and/or penalties for non-compliance.</p>	<p>C2. Commissioning of the road construction</p> <p>The main construction contractor or the DB constructor or the DBO contractor has to ensure that the commissioning of the road construction conforms to the agreed designs and specifications. Particular attention should be paid to the following aspects:</p> <ul style="list-style-type: none"> • pavement macrotexture (MPD) (see criterion B13) • CF/LCA performance of the main road elements (criterion B14) or the CO2 emissions per tonne of transported materials (criterion B16) • water pollution control components, storm-water retention capacity and wildlife corridor design in the drainage system (criteria B4, B5, B18, B19) • Pavement durability (criterion B11) • Congestion mitigation plan implementation (criterion B10) <p>The contracting authority should foresee rules for remediation in the case of unsatisfactory or non-compliant results regarding any set design values or performance indicators for the above listed technical aspects and/or penalties for non-compliance.</p>
<p>C3. N/A</p>	<p>C3. Quality of the completed road - monitoring of the performance parameters</p> <p><i>(to be included only when an award criterion on performance requirements on traffic fuel consumption due to rolling resistance in the ITT for the design phase has been set)</i></p> <p>The main construction contractor or DBO contractor shall monitor the agreed rolling resistance performance parameters affecting the traffic fuel consumption after the construction before the road opening and 6 months after the opening (in-service road), and provide the test results of the monitoring.</p>

	In case of unsatisfactory or non-compliant results, refer to general contract performance clause text in C2
<p>C4. Incorporation of recycled content</p> <p>When materials are delivered to the work site, recycled content claims with clear traceability shall be verified for each representative batch/batches of product.</p> <p>The main construction contractor <i>or</i> the DB contractor <i>or</i> the DBO contractor shall verify claims by providing either:</p> <ul style="list-style-type: none"> - an independent third party certification of the traceability and mass balance for the product and/or recycle - <i>or</i> equivalent documentation provided by suppliers 	<p>C4. Incorporation of recycled content</p> <p>When materials are delivered to the work site, recycled content claims with clear traceability shall be verified for each representative batch/batches of product.</p> <p>The main construction contractor <i>or</i> the DB contractor <i>or</i> the DBO contractor shall verify claims by providing either:</p> <ul style="list-style-type: none"> - an independent third party certification of the traceability and mass balance for the product and/or recycle - <i>or</i> equivalent documentation provided by suppliers
<p>C5. Monitoring of the low temperature asphalt</p> <p>The laying temperature of the low temperature asphalt shall be verified for each representative batch/batches of product at the worksite.</p> <p>Verification: The main construction contractor <i>or</i> the DB contractor <i>or</i> the DBO contractor shall provide either:</p> <ul style="list-style-type: none"> - an independent laboratory certification of the maximum temperature of the asphalt - <i>or</i> equivalent documentation provided by asphalt supplier 	<p>C5. Monitoring of the low temperature asphalt</p> <p>The laying temperature of the low temperature asphalt shall be verified for each representative batch/batches of product at the worksite .</p> <p>Verification: The main construction contractor <i>or</i> the DB contractor <i>or</i> the DBO contractor shall provide either:</p> <ul style="list-style-type: none"> - an independent laboratory certification of the maximum temperature of the asphalt - <i>or</i> equivalent documentation provided by asphalt supplier
<p>C6. Commissioning of the excavated materials and soil management plan</p> <p>The main construction contractor <i>or</i> DB contractor <i>or</i> DBO contractor shall implement a system to monitor and report on actions involving excavated materials and soil during the progress of construction work on site. This system shall include data accounting for the weights generated (topsoil and excavated materials), the percentages reused/recycled on site and percentages reused and/or recycled off site.</p> <p>It shall also track and verify the destination of consignments of excavated materials. The monitoring and tracking data shall be provided to the contracting authority and to the NRA or local authority on an agreed periodic basis.</p>	<p>C6. Commissioning of the excavated materials and soil management plan</p> <p>The main construction contractor <i>or</i> DB contractor <i>or</i> DBO contractor shall implement a system to monitor and report on actions involving excavated materials and soil during the progress of construction work on site. This system shall include data accounting for the weights generated (topsoil and excavated materials), the percentages reused/recycled on site and percentages reused and/or recycled off site.</p> <p>It shall also track and verify the destination of consignments of excavated materials. The monitoring and tracking data shall be provided to the contracting authority and to the NRA or local authority on an agreed periodic basis.</p>

<p>C7. Inspection of water pollution control components in drainage systems</p> <p>The contractor shall perform site inspection to establish the drainage system dimensions, pathways and connections between drainage components and that these are in accordance with the design plans. Information shall be sent to the NRA or local authority based upon an agreed timetable.</p> <p>In case of unsatisfactory or non-compliant results, refer to general contract performance clause text in C2.</p>	<p>C7. Inspection of water pollution control components in drainage systems</p> <p>The contractor shall perform site inspection to establish the drainage system dimensions, pathways and connections between drainage components and that these are in accordance with the design plans. Information shall be sent to the NRA or local authority based upon an agreed timetable.</p> <p>In case of unsatisfactory or non-compliant results, refer to general contract performance clause text in C2.</p>
<p>C8. Construction of water pollution control "soft engineered" components in drainage systems</p> <p>The contractor shall perform site inspections both during and after the installation of the vegetated drainage components and ensure that appropriate measures are taken in accordance with best practice guidelines for the establishment of vegetated covers in SUDS drainage components. Information shall be sent to the contracting authority based upon an agreed timetable.</p> <p>In case of unsatisfactory or non-compliant results, refer to general contract performance clause text in C2.</p>	<p>C8. Construction of water pollution control "soft engineered" components in drainage systems</p> <p>The contractor shall perform site inspections both during and after the installation of the vegetated drainage components and ensure that appropriate measures are taken in accordance with best practice guidelines for the establishment of vegetated covers in SUDS drainage components. Information shall be sent to the contracting authority based upon an agreed timetable.</p> <p>In case of unsatisfactory or non-compliant results, refer to general contract performance clause text in C2.</p>
<p>C9. Inspection of storm-water retention capacity in drainage systems</p> <p>The main construction contractor or DBO contractor shall inspect the drainage system during the construction stage to ensure that it follows the agreed design and ensure that it meets the dimensions, slopes and other technical details specified in the design.</p> <p>In case of unsatisfactory or non-compliant results, refer to general contract performance clause text in C2.</p>	<p>C9. Inspection of storm-water retention capacity in drainage systems</p> <p>The main construction contractor or DBO contractor shall inspect the drainage system during the construction stage to ensure that it follows the agreed design and ensure that it meets the dimensions, slopes and other technical details specified in the design.</p> <p>In case of unsatisfactory or non-compliant results, refer to general contract performance clause text in C2.</p>
<p>C10. Inspection of storm-water retention capacity in drainage systems that incorporate "soft engineered" components</p> <p>The main construction contractor or DBO contractor shall be responsible for carrying out site inspections both during and after the installation of the vegetated drainage components and ensure that appropriate measures are taken in accordance with best practice guidelines for the establishment of vegetated covers in SuDS drainage components.</p> <p>In case of unsatisfactory or non-compliant results, refer to general contract performance clause text in C2.</p>	<p>C10. Inspection of storm-water retention capacity in drainage systems that incorporate "soft engineered" components</p> <p>The main construction contractor or DBO contractor shall be responsible for carrying out site inspections both during and after the installation of the vegetated drainage components and ensure that appropriate measures are taken in accordance with best practice guidelines for the establishment of vegetated covers in SuDS drainage components.</p> <p>In case of unsatisfactory or non-compliant results, refer to general contract performance clause text in C2.</p>

<p>C11. Inspection of wildlife corridors across the road and other measures</p> <p>The main construction contractor or DBO contractor shall undertake inspection of any filter trenches or culverts included in his offer both during and immediately after construction and ensure that they meet the minimum requirements of the technical details specified in the design and that they meet the conditions required for the award of points.</p> <p>In case of unsatisfactory or non-compliant results, refer to general contract performance clause text in C2.</p>	<p>C11. Inspection of wildlife corridors across the road and other measures</p> <p>The main construction contractor or DBO contractor shall undertake inspection of any filter trenches or culverts included in his offer both during and immediately after construction and ensure that they meet the minimum requirements of the technical details specified in the design and that they meet the conditions required for the award of points.</p> <p>In case of unsatisfactory or non-compliant results, refer to general contract performance clause text in C2.</p>
<p>C12. Monitoring noise emission during construction</p> <p>During construction/maintenance works, the main construction contractor, DB contractor or DBO contractor shall ensure that:</p> <ul style="list-style-type: none"> • an appropriate noise barrier is in place in accordance with or exceeding the design, • noise levels in the receptor area shall be monitored during the timetable agreed with the contracting authority. • noise data is processed to produce singular L_{den} and L_{night} values for each day during the works timetable that can be compared to the limits agreed upon with the contracting authority. <p>If the L_{den} and or L_{night} values during the agreed monitoring period are found to exceed the limits defined in the accepted tender, the contracting authority can stop the works or introduce penalties as defined in the invitation to tender. Any penalties shall increase in proportion to the product of the number of dB(A) by which the limits were exceeded and the time during which non-compliance occurred.</p>	<p>C12. Monitoring noise emission during construction</p> <p>During construction/maintenance works, the main construction contractor, DB contractor or DBO contractor shall ensure that:</p> <ul style="list-style-type: none"> • an appropriate noise barrier is in place in accordance with or exceeding the design • noise levels in the receptor area shall be monitored during the timetable agreed with the contracting authority • noise data is processed to produce singular L_{den} and L_{night} values for each day during the works timetable that can be compared to the limits agreed upon with the contracting authority. <p>If the L_{den} and or L_{night} values during the agreed monitoring period are found to exceed the limits defined in the accepted tender, the contracting authority can stop the works or introduce penalties as defined in the invitation to tender. Any penalties shall increase in proportion to the product of the number of dB(A) by which the limits were exceeded and the time during which non-compliance occurred.</p>
<p>C13. Minimum requirements for low-noise pavement</p> <p>The main construction contractor, DB contractor or the DBO contractor shall submit to testing of noise emissions from the road surface and provide test reports using SPB and CPX data gathered according the methodology defined in ISO 11819-1 and ISO/CN 11819-2 respectively.</p> <p>Where CPX equipment is not available, certain other techniques may be used as proxy measures by following the guidance set out in the SILVIA Guidance Manual.</p> <p>The initial measurements shall be taken within 1-3 months after the opening of the road surface and used to demonstrate conformity of production with 3.0 dB(A) (or other higher claimed value) of noise reduction.</p> <p>After 4-5 years of service life, the noise emission measurements shall be repeated on the same test sections and ideally under the similar meteorological conditions as when the</p>	<p>C13. Minimum requirements for low-noise pavement</p> <p>The main construction contractor, DB contractor or the DBO contractor shall submit to testing of noise emissions from the road surface and provide test reports using SPB and CPX data gathered according the methodology defined in ISO 11819-1 and ISO/CN 11819-2 respectively.</p> <p>Where CPX equipment is not available, certain other techniques may be used as proxy measures by following the guidance set out in the SILVIA Guidance Manual.</p> <p>The initial measurements shall be taken within 1-3 months after the opening of the road surface and used to demonstrate conformity of production with 4.5 dB(A) (or other higher claimed value) of noise reduction.</p> <p>After 4-5 years of service life. The noise emission measurements shall be repeated on the same test sections and ideally under the similar meteorological conditions as when the</p>

<p>conformity of production test was carried out.</p> <p>The noise reduction performance claims for low noise pavements that are made by the design team, DB contractor or DBO contractor at the design stage shall be used as a benchmark to determine if any penalties or bonuses shall apply when the "<i>conformity of production</i>" testing of new pavements and "<i>durability of performance</i>" testing of 5 year old pavements is carried out.</p> <p>The framework for any applicable penalties, bonuses or remedial action shall be clearly stated in the invitation to tender.</p>	<p>conformity of production test was carried out.</p> <p>The noise reduction performance claims for low noise pavements that are made by the design team, DB contractor or DBO contractor at the design stage shall be used as a benchmark to determine if any penalties or bonuses shall apply when the "<i>conformity of production</i>" testing of new pavements and "<i>durability of performance</i>" testing of 5 year old pavements is carried out.</p> <p>The framework for any applicable penalties, bonuses or remedial action shall be clearly stated in the invitation to tender.</p>
<p>C14. In-situ performance of the noise barrier</p> <p>The contracting authority shall provide plans of the site drawn to scale and with existing features marked and a clearly defined receptor area or areas which should be protected by the noise barrier. Reference points shall be marked which shall be used to define where noise measurements should be taken to later measure the in-situ performance of the constructed noise barrier. A minimum required noise reduction performance of X dB(A) shall also be clearly communicated in the invitation to tender..</p> <p>After construction, the main construction contractor or DBO contractor shall submit to independent testing of the in-situ performance of the noise barrier. Testing may be carried out according to EN 1793-6 or other relevant and equivalent methods that are agreed upon with the contracting authority.</p> <p>If the noise reduction performance across the noise barrier fails to meet the minimum technical requirements, the main construction contractor or DBO contractor shall undertake remedial action at no additional cost to the contracting authority.</p>	<p>C14. In-situ performance of the noise barrier</p> <p>The contracting authority shall provide plans of the site drawn to scale and with existing features marked and a clearly defined receptor area or areas which should be protected by the noise barrier. Reference points shall be marked which shall be used to define where noise measurements should be taken to later measure the in-situ performance of the constructed noise barrier. A minimum required noise reduction performance of Y dB(A) shall also be clearly communicated in the invitation to tender..</p> <p>After construction, the main construction contractor or DBO contractor shall submit to independent testing of the in-situ performance of the noise barrier. Testing may be carried out according to EN 1793-6 or other relevant and equivalent methods that are agreed upon with the contracting authority.</p> <p>If the noise reduction performance across the noise barrier fails to meet the minimum technical requirements, the main construction contractor or DBO contractor shall undertake remedial action at no additional cost to the contracting authority.</p>
<p>C15. Commissioning of the traffic congestion mitigation plan</p> <p>The main construction contractor or the DB contractor or DBO contractor shall provide documentary evidence of the correct implementation of the congestion mitigation plan.</p> <p>The Road authority will verify the specific requirements for congestion (ITS devices, tidal flow lanes and hard shoulder) after the construction before the road opening and 6 months after the opening (in-service road).</p> <p>In case of unsatisfactory or non-compliant results, refer to general contract performance clause text in C2</p>	<p>C15. Commissioning of the traffic congestion mitigation plan</p> <p>The main construction contractor or the DB contractor or DBO contractor shall provide documentary evidence of the correct implementation of the congestion mitigation plan.</p> <p>The Road authority will verify the specific requirements for congestion (ITS devices, tidal flow lanes and hard shoulder) after the construction before the road opening and 6 months after the opening (in-service road).</p> <p>In case of unsatisfactory or non-compliant results, refer to general contract performance clause text in C2</p>

D. Use	
Core criteria	Comprehensive criteria
TECHNICAL SPECIFICATIONS	
<p>D1. Commissioning of the maintenance and rehabilitation (M&R) plan</p> <p>The main construction contractor or the DB contractor or DBO contractor shall commit to monitor the road performance parameters according to the monitoring plan presented in the design phase (see criterion B12). Any update/improvement of this plan shall be previously discussed with the contracting authority and the NRA/local authority.</p> <p>Verification: The main construction contractor <i>or</i> the DB contractor <i>or</i> DBO contractor shall provide a report with the results of the monitoring for all the performance parameters, and the maintenance activities carried out.</p>	<p>D1. Commissioning of the maintenance and rehabilitation (M&R) plan</p> <p>The main construction contractor or the DB contractor or DBO contractor shall commit to monitor the road performance parameters according to the monitoring plan presented in the design phase (see criterion B12). Any update/improvement of this plan shall be previously discussed with the contracting authority and the NRA/local authority.</p> <p>Verification: The main construction contractor <i>or</i> the DB contractor <i>or</i> DBO contractor shall provide a report with the results of the monitoring for all the performance parameters, and the maintenance activities carried out.</p>

E. Maintenance (and operation)	
Core criteria	Comprehensive criteria
TECHNICAL SPECIFICATIONS	
<p>E1. Tar-containing asphalt</p> <p><i>(For pavements older than X years that could possibly contain tar according to the public authority)</i></p> <p>The possible tar content of surface layers (surface + binder) shall be analysed before reclaiming asphalt by means of initial non-destructive tests, sampling and laboratory analytical tests.</p> <p>If the tar content of reclaimed asphalt exceeds the limit set by the national legislation, best available techniques to treat or, eventually, reuse reclaimed asphalt containing tar shall be specified in a technical report.</p> <p><i>X shall be fixed by the contracting authority according to the knowledge, the available database and inventory</i></p> <p>Verification: The main construction contractor or DB contractor or DBO contractor shall submit a technical report consisting of:</p> <ul style="list-style-type: none"> (i) results of the sampling and analytical tests; (ii) best available techniques to treat or, eventually, use reclaimed asphalt containing tar through cold mixing on site and/or off site options <p>A system shall be used to monitor and account for tar-containing reclaimed asphalt and to track off-site destination and on-site reuse, specifying amount of materials and identifying the location (maps, GIS). Monitoring data shall be provided to the contracting authority and to the NRA or local authority.</p>	<p>E1. Tar-containing asphalt</p> <p><i>(For pavements older than X years that could possibly contain tar according to the public authority)</i></p> <p>The possible tar content of surface layers (surface + binder) shall be analysed before reclaiming asphalt by means of initial non-destructive tests, sampling and laboratory analytical tests.</p> <p>If the tar content of reclaimed asphalt exceeds the limit set by the national legislation, best available techniques to treat or, eventually, reuse reclaimed asphalt containing tar shall be specified in a technical report.</p> <p><i>X shall be fixed by the contracting authority according to the knowledge, the available database and inventory</i></p> <p>Verification: The main construction contractor or DB contractor or DBO contractor shall submit a technical report consisting of:</p> <ul style="list-style-type: none"> (i) results of the sampling and analytical tests; (ii) best available techniques to treat or, eventually, use reclaimed asphalt containing tar through cold mixing on site and/or off site options <p>A system shall be used to monitor and account for tar-containing reclaimed asphalt and to track off-site destination and on-site reuse, specifying amount of materials and identifying the location (maps, GIS). Monitoring data shall be provided to the contracting authority and to the NRA or local authority.</p>
<p>E2. Demolition waste audit and management plan</p> <p>A minimum of 70% by weight of the non-hazardous waste generated during demolition, including backfilling, shall be prepared for re-use, recycling and other forms of material recovery. This shall include:</p> <ul style="list-style-type: none"> (i) Concrete, RAP, aggregates recovered from the main road elements; (ii) Materials recovered from ancillary elements. <p>Backfilling shall not be allowed in greenfield outside the roadway. Backfilling in permeable areas of the roadway shall be realised only with excavated materials and soils.</p>	<p>E2. Demolition waste audit and management plan</p> <p>A minimum of 90% by weight of the non-hazardous waste generated during demolition, including backfilling, shall be prepared for re-use, recycling and other forms of material recovery. This shall include:</p> <ul style="list-style-type: none"> (i) Concrete, RAP, aggregates recovered from the main road elements; (ii) Materials recovered from ancillary elements. <p>Backfilling shall not be allowed in greenfield outside the roadway. Backfilling in permeable areas of the roadway shall be realised only with excavated materials and soils.</p>

<p>The main construction contractor <i>or</i> DB contractor <i>or</i> DBO contractor shall carry out a pre-demolition audit in order to determine what can be re-used, recycled or recovered. This shall comprise:</p> <ul style="list-style-type: none"> (i) Identification and risk assessment of hazardous waste; (ii) A bill of quantities with a breakdown of different road materials, (iii) An estimate of the % re-use and recycling potential based on proposals for systems of separate collection during the demolition process. <p>The materials, products and elements identified shall be itemised in a Demolition Bill of Quantities.</p> <p>Verification: The main construction contractor <i>or</i> DB contractor <i>or</i> DBO contractor shall submit a pre-demolition audit that contains the specified information.</p> <p>A system shall be implemented to monitor and account for waste production. The destination of consignments of waste and end-of-waste materials shall be tracked using consignment notes and invoices. Monitoring data shall be provided to the contracting authority.</p>	<p>The main construction contractor <i>or</i> DB contractor <i>or</i> DBO contractor shall carry out a pre-demolition audit in order to determine what can be re-used, recycled or recovered. This shall comprise:</p> <ul style="list-style-type: none"> (i) Identification and risk assessment of hazardous waste; (ii) A bill of quantities with a breakdown of different road materials, (iii) An estimate of the % re-use and recycling potential based on proposals for systems of separate collection during the demolition process. <p>The materials, products and elements identified shall be itemised in a Demolition Bill of Quantities.</p> <p>Verification: The main construction contractor <i>or</i> DB contractor <i>or</i> DBO contractor shall submit a pre-demolition audit that contains the specified information.</p> <p>A system shall be implemented to monitor and account for waste production. The destination of consignments of waste and end-of-waste materials shall be tracked using consignment notes and invoices. Monitoring data shall be provided to the contracting authority.</p>
<p>E3. Commissioning of the maintenance and rehabilitation (M&R) plan</p> <p>The main construction contractor <i>or</i> the DB contractor <i>or</i> DBO contractor shall commit to maintain the road according to the maintenance and rehabilitation (M&R) plan presented in the design phase (see criterion B12). Any update/improvement of this plan shall be previously discussed with the contracting authority and the NRA/local authority.</p> <p>Verification: The main construction contractor <i>or</i> the DB contractor <i>or</i> DBO contractor shall provide a technical report including appropriate data and information and the activities workplan.</p>	<p>E3. Commissioning of the maintenance and rehabilitation (M&R) plan</p> <p>The main construction contractor <i>or</i> the DB contractor <i>or</i> DBO contractor shall commit to maintain the road according to the maintenance and rehabilitation (M&R) plan presented in the design phase (see criterion B12). Any update/improvement of this plan shall be previously discussed with the contracting authority and the NRA/local authority.</p> <p>Verification: The main construction contractor <i>or</i> the DB contractor <i>or</i> DBO contractor shall provide a technical report including appropriate data and information and the activities workplan.</p>
<p>CONTRACT PERFORMANCE CLAUSES</p>	
<p>E4. Commissioning of the road maintenance</p> <p>The main maintenance contractor <i>or</i> the DB constructor <i>or</i> the DBO contractor has to ensure that the commissioning of the road maintenance conforms to the agreed designs and specifications. Particular attention should be paid to the following aspects:</p> <ul style="list-style-type: none"> • CF/LCA performance of the main road elements (criterion B14) <i>or</i> the CO2 emissions per tonne of transported materials (criterion B16) • water pollution control components, storm-water retention capacity and wildlife corridor design in the drainage system (criteria B4, B5, B18, B19) 	<p>E4. Commissioning of the road maintenance</p> <p>The main maintenance contractor <i>or</i> the DB constructor <i>or</i> the DBO contractor has to ensure that the commissioning of the road maintenance conforms to the agreed designs and specifications. Particular attention should be paid to the following aspects:</p> <ul style="list-style-type: none"> • pavement macrotexture (MPD) (see criterion B13) • CF/LCA performance of the main road elements (criterion B14) <i>or</i> the CO2 emissions per tonne of transported materials (criterion B16) • water pollution control components, storm-water retention capacity and wildlife

<ul style="list-style-type: none"> • Pavement durability (criterion B11) • Congestion mitigation plan implementation (criterion B10) <p>The contracting authority should foresee rules for remediation in the case of unsatisfactory or non-compliant results regarding any set design values or performance indicators for the above listed technical aspects and/or penalties for non-compliance.</p>	<p>corridor design in the drainage system (criteria B4, B5, B18, B19)</p> <ul style="list-style-type: none"> • Pavement durability (criterion B11) • Congestion mitigation plan implementation (criterion B10) <p>The contracting authority should foresee rules for remediation in the case of unsatisfactory or non-compliant results regarding any set design values or performance indicators for the above listed technical aspects and/or penalties for non-compliance.</p>
<p>E5. Incorporation of recycled content</p> <p>When materials are delivered to the work site, recycled content claims with clear traceability shall be verified for each representative batch/batches of product.</p> <p>The main construction contractor <i>or</i> the DB contractor <i>or</i> the DBO contractor shall verify claims by providing either:</p> <ul style="list-style-type: none"> - an independent third party certification of the traceability and mass balance for the product and/or recycle - <i>or</i> equivalent documentation provided by suppliers 	<p>E5. Incorporation of recycled content</p> <p>When materials are delivered to the work site, recycled content claims with clear traceability shall be verified for each representative batch/batches of product.</p> <p>The main construction contractor <i>or</i> the DB contractor <i>or</i> the DBO contractor shall verify claims by providing either:</p> <ul style="list-style-type: none"> - an independent third party certification of the traceability and mass balance for the product and/or recycle - <i>or</i> equivalent documentation provided by suppliers
<p>E6. Monitoring of the low temperature asphalt</p> <p>The laying temperature of the low temperature asphalt shall be verified for each representative batch/batches of product at the worksite.</p> <p>The main construction contractor <i>or</i> the DB contractor <i>or</i> the DBO contractor shall provide either:</p> <ul style="list-style-type: none"> - an independent laboratory certification of the maximum temperature of the asphalt - <i>or</i> equivalent documentation provided by asphalt supplier 	<p>E6. Monitoring of the low temperature asphalt</p> <p>The laying temperature of the low temperature asphalt shall be verified for each representative batch/batches of product at the worksite .</p> <p>The main construction contractor <i>or</i> the DB contractor <i>or</i> the DBO contractor shall provide either:</p> <ul style="list-style-type: none"> - an independent laboratory certification of the maximum temperature of the asphalt - <i>or</i> equivalent documentation provided by asphalt supplier
<p>E7. Monitoring noise emission during maintenance</p> <p>During construction/maintenance works, the main construction contractor, DB contractor or DBO contractor shall ensure that:</p> <ul style="list-style-type: none"> • an appropriate noise barrier is in place in accordance with or exceeding the design, • noise levels in the receptor area shall be monitored during the timetable agreed with the contracting authority. 	<p>E7. Monitoring noise emission during maintenance</p> <p>During construction/maintenance works, the main construction contractor, DB contractor or DBO contractor shall ensure that:</p> <ul style="list-style-type: none"> • an appropriate noise barrier is in place in accordance with or exceeding the design • noise levels in the receptor area shall be monitored during the timetable agreed with the contracting authority

<ul style="list-style-type: none"> noise data is processed to produce singular L_{den} and L_{night} values for each day during the works timetable that can be compared to the limits agreed upon with the contracting authority. <p>If the L_{den} and or L_{night} values during the agreed monitoring period are found to exceed the limits defined in the accepted tender, the contracting authority can stop the works or introduce penalties as defined in the invitation to tender. Any penalties shall increase in proportion to the product of the number of dB(A) by which the limits were exceeded and the time during which non-compliance occurred.</p>	<ul style="list-style-type: none"> noise data is processed to produce singular L_{den} and L_{night} values for each day during the works timetable that can be compared to the limits agreed upon with the contracting authority. <p>If the L_{den} and or L_{night} values during the agreed monitoring period are found to exceed the limits defined in the accepted tender, the contracting authority can stop the works or introduce penalties as defined in the invitation to tender. Any penalties shall increase in proportion to the product of the number of dB(A) by which the limits were exceeded and the time during which non-compliance occurred.</p>
<p>E8. Commissioning of the traffic mitigation plan</p> <p>The main construction contractor or the DB contractor or DBO contractor shall provide documentary evidence of the correct implementation of the congestion mitigation plan.</p> <p>The Road authority will verify the specific requirements for congestion (ITS devices, tidal flow lanes and hard shoulder) after the construction before the road opening and 6 months after the opening (in-service road).</p> <p>In case of unsatisfactory or non-compliant results, refer to general contract performance clause text in E4</p>	<p>E8. Commissioning of the traffic mitigation plan</p> <p>The main construction contractor or the DB contractor or DBO contractor shall provide documentary evidence of the correct implementation of the congestion mitigation plan.</p> <p>The Road authority will verify the specific requirements for congestion (ITS devices, tidal flow lanes and hard shoulder) after the construction before the road opening and 6 months after the opening (in-service road).</p> <p>In case of unsatisfactory or non-compliant results, refer to general contract performance clause text in E4</p>

F. End of Life (EoL) - decommissioning

Core criteria	Comprehensive criteria
TECHNICAL SPECIFICATIONS	TECHNICAL SPECIFICATIONS
<p>F1. Demolition waste audit and management plan</p> <p>A minimum of 70% by weight of the non-hazardous waste generated during demolition, including backfilling, shall be prepared for re-use, recycling and other forms of material recovery. This shall include:</p> <ul style="list-style-type: none"> (i) Concrete, RAP, aggregates recovered from the main road elements; (ii) Materials recovered from ancillary elements. <p>Backfilling shall not be allowed in greenfield outside the roadway. Backfilling in permeable areas of the roadway shall be realised only with excavated materials and soils.</p> <p>The main construction contractor <i>or</i> DB contractor <i>or</i> DBO contractor shall carry out a pre-demolition audit in order to determine what can be re-used, recycled or recovered. This shall comprise:</p> <ul style="list-style-type: none"> (i) Identification and risk assessment of hazardous waste; (ii) A bill of quantities with a breakdown of different road materials, (iii) An estimate of the % re-use and recycling potential based on proposals for systems of separate collection during the demolition process. <p>The materials, products and elements identified shall be itemised in a Demolition Bill of Quantities.</p> <p>Verification: The main construction contractor <i>or</i> DB contractor <i>or</i> DBO contractor shall submit a pre-demolition audit that contains the specified information.</p> <p>A system shall be implemented to monitor and account for waste production. The destination of consignments of waste and end-of-waste materials shall be tracked using consignment notes and invoices. Monitoring data shall be provided to the contracting authority.</p>	<p>F1. Demolition waste audit and management plan</p> <p>A minimum of 90% by weight of the non-hazardous waste generated during demolition, including backfilling, shall be prepared for re-use, recycling and other forms of material recovery. This shall include:</p> <ul style="list-style-type: none"> (i) Concrete, RAP, aggregates recovered from the main road elements; (ii) Materials recovered from ancillary elements. <p>Backfilling shall not be allowed in greenfield outside the roadway. Backfilling in permeable areas of the roadway shall be realised only with excavated materials and soils.</p> <p>The main construction contractor <i>or</i> DB contractor <i>or</i> DBO contractor shall carry out a pre-demolition audit in order to determine what can be re-used, recycled or recovered. This shall comprise:</p> <ul style="list-style-type: none"> (i) Identification and risk assessment of hazardous waste; (ii) A bill of quantities with a breakdown of different road materials, (iii) An estimate of the % re-use and recycling potential based on proposals for systems of separate collection during the demolition process. <p>The materials, products and elements identified shall be itemised in a Demolition Bill of Quantities.</p> <p>Verification: The main construction contractor <i>or</i> DB contractor <i>or</i> DBO contractor shall submit a pre-demolition audit that contains the specified information.</p> <p>A system shall be implemented to monitor and account for waste production. The destination of consignments of waste and end-of-waste materials shall be tracked using consignment notes and invoices. Monitoring data shall be provided to the contracting authority.</p>

PROPOSED TECHNICAL ANNEXES

Annex A

Supporting guidance for criterion B14 (core criterion): Option 1 – Carbon footprint (CF)

The award criterion B14 (core criterion) states that Carbon Footprint (CF) could be used by bidders in order to demonstrate how they have reduced the environmental impact of a road construction. This brief guidance note describes:

- When this criteria can be used;
- The rules required to ensure that bids are comparable; and
- The technical support required for bid selection.

All use of CF shall be carried out with reference to ISO 14067 or equivalent.

1.1 When can CF option 1 be used?

The use of criteria B14 is only recommended where a comparison can be made of improvement options against a reference road design and/or between different road designs. It is therefore relevant to the following procurement scenarios:

- Where the client already has a reference road design and bill of quantities that has been appraised in order to provide a guide price for comparison with bids;
- Where a design competition is to be used to encourage proposals of innovative road designs by design teams and/or contractors;

In these scenarios a CF analysis can be made an award requirement.

1.2 Will additional expertise be required to evaluate bids?

In any tender process for road construction and maintenance the procurer is likely to require supporting design and technical expertise in order to set requirements and evaluate designs. The procurer may therefore wish to call upon this expertise at two stages in the procurement process:

1. When putting together the design brief and performance requirements: Bidders shall be instructed on what technical requirements they should follow in order to ensure that the designs submitted are comparable.
2. When evaluating designs and improvement options: A technical evaluation of tenderers' responses to this criterion should be carried out in order to support the procurer.

A technical evaluator shall be required to carry out a critical review of each tenderer's CF analysis according to the guidance in Annex C.

1.3 What instructions should be given to bidders?

The following technical instructions should be incorporated into the ITT in order to ensure that bids are comparable. Where designs are to be evaluated against a reference road, this shall be clearly stated and the bill of materials provided.

Technical instructions for bidders using CF for road evaluations

Technical point to address	What this means in practice
a. Method and inventory data	The impact assessment method and life cycle inventory (LCI) data to be used by each design team shall, as far as possible, be specified to ensure comparability. Verified primary data may be used to supplement gaps following the guidance in ISO 14067 or equivalent, and for data from EPDs, ISO 14025 or equivalent. EN 15804 and ISO 21930 could also be used as underlying standards, if relevant
b. Comparison on the basis of functional equivalence	The following characteristics of the road shall be specified as a reference point for each design (see ISO 14067 or equivalent): <ul style="list-style-type: none">- Relevant technical and function requirements, as described in the performance requirements;- The requested service life. A common functional unit shall then be used to present the results (see ISO 14067 or equivalent).
c. Definition of the road life cycle and boundaries	The boundary for the analysis shall be cradle-to-grave including construction (including materials production and transportation) maintenance and operation and EoL. Allocation for recycled or re-used materials either as inputs (product stage) or outputs (end of life or maintenance stages) shall be made according to the rules in ISO 14067.
d. Road elements within the scope of the	The scope of the criteria shall, as a minimum, comprise the following road

criteria	elements: <ul style="list-style-type: none"> • Sub-grade, including earthworks and ground works • Sub-base • Base, binder and surface or concrete slabs • Additional ancillary road elements (optional)
e. Lifecycle category indicator to be used for evaluation purposes	-Global warming potential (GWP).

Annex B

Supporting guidance for criterion B14 (comprehensive criterion): Option 2 - LCA analysis

The award criterion B14 states how Life Cycle Assessment (LCA) could be used by bidders in order to demonstrate how they have reduced the environmental impact of an road construction. This brief guidance note describes:

- When this criterion can be used;
- The rules required to ensure that bids are comparable; and
- The technical support required for bid selection.

All use of LCA shall be carried out with reference to ISO 14040/14044 or equivalent.

2.1 When can LCA option 2 be used?

The use of criteria B14 is only recommended where a comparison can be made of improvement options against a reference road design and/or between different road designs. It is therefore relevant to the following procurement scenarios:

- Where the client already has a reference road design and bill of quantities that has been appraised in order to provide a guide price for comparison with bids;
- Where a design competition is to be used to encourage innovative road designs to be brought forward by design teams and/or contractors;

In these scenarios an LCA analysis can be made an award requirement.

2.2 Will additional expertise be required to evaluate bids?

In any tender process for road construction and maintenance the procurer is likely to require supporting design and technical expertise in order to set requirements and evaluate designs. The procurer may therefore wish to call upon this expertise at two stages in the procurement process:

1. When putting together the design brief and performance requirements: Bidders shall be instructed on what technical requirements they should follow in order to ensure that the designs submitted are comparable.
2. When evaluating designs and improvement options: A technical evaluation of tenderers' responses to this criterion should be carried out in order to support the procurer.

A technical evaluator shall be required to carry out a critical review of each tenderers LCA analysis according to the guidance in Annex C.

2.3 What instructions should be given to bidders?

The following technical instructions should be incorporated into the ITT in order to ensure that bids are comparable. Where designs are to be evaluated against a reference road, this shall be clearly stated and the bill of materials provided.

Technical instructions for bidders using LCA for road evaluations

Technical point to address	What this means in practice
a. Method and inventory data	<p>The impact assessment method and life cycle inventory (LCI) data to be used by each design team shall, as far as possible, be specified to ensure comparability.</p> <p>Verified primary data may be used to supplement gaps following the guidance in ISO 14040/14044 or equivalent, and for data from EPDs, ISO 14025 or equivalent. EN 15804 and ISO 21930 could also be used as underlying standards, if relevant</p>
b. Comparison on the basis of functional equivalence	<p>The following characteristics of the road shall be specified as a reference point for each design (see ISO 14040/14044 or equivalent):</p> <ul style="list-style-type: none"> - Relevant technical and function requirements, as described in the performance requirements; - The requested service life.

	A common functional unit or reference unit shall then be used to present the results (see ISO 14040 or equivalent).
c. Definition of the road life cycle and boundaries	The boundary for the analysis shall be cradle-to-grave including construction (including materials production and transportation) maintenance and operation and EoL (see ISO 14040). Allocation for recycled or re-used materials either as inputs (product stage) or outputs (end of life stage) shall be made according to the rules in ISO 14044, Section 4.3.4.3.
d. Road elements within the scope of the criteria	The scope of the criteria shall, as a minimum, comprise the following road elements: <ul style="list-style-type: none"> • Sub-grade, including earthworks and ground works • Sub-base • Base, binder and surface or concrete slabs • Additional ancillary road elements (optional)
e. Lifecycle category indicators to be used for evaluation purposes	As a minimum the following three of the impact category indicators shall be used: <ul style="list-style-type: none"> - global warming potential (GWP) - primary energy demand (PED) (non-renewable (PED-NR) and renewable (PED-R)) - photochemical ozone creation potential (POCP) - secondary resources (in mass) Where an LCA tool generates an aggregated scoring for the road then only the result for these impact categories shall be taken into account.

Annex C

Brief for LCA technical evaluator

The role of the technical evaluator will be to assist the procurer in setting the ground rules for the tenderers, with reference to either Annex A or B depending on the option chosen.

Once tenders have been opened they will either:

- (i) Carry out a critical review of the CFs for methodological choices, data quality and comparability, or
- (ii) Carry out a critical review of the LCAs for methodological choices, data quality and comparability.

The critical review will be carried out with reference to ISO 14044, section 6, ISO 14065 in case of carbon footprint, and the following sections of the European Commission's Product Environmental Footprint (PEF) Guide:

- Critical review (section 9, p-68)
- Data collection checklist (Annex III)
- Data quality requirements (section 5.6, p-36)
- Interpretation of results (section 7, p-61)

The technical evaluator shall agree with the procurer the weighting of the LCIA indicator results that shall be indicated in the ITT.

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