KNOWLEDGE BASE

Elemental Knowledge Base
v1.5 2 May 2025

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1. ABOUT ELEMENTAL

Elemental is a tool which supports the landscape industry to reach best outcomes for climate and nature. Elemental considers impacts on sustainability from things like materials use, carbon accounting, biodiversity, water, communities and society. In doing so the tool offers information to help professionals understand how these interact in their work.

Elemental is sponsored by Royal Horticultural Society, British Association of Landscape Industries, Society of Garden and Landscape Designers, Landscape Institute, Nicholsons, and John and Vicky Wyer, and Liz and Niel Nicholson. Elemental is supported by the Association of Professional Landscape Designers; The Horticultural Trades Association.

Our values

Sustainability, Collaboration, Integrity, Simplicity.

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2. RESOURCES

2.1 SUMMARY OF LINKS

The links below are some of those available as guidance within the knowledge base. If you just want to find a link, or start exploring then start here. If you find any of the below links no longer work let us know.

Resource	Guidance
BwN Standards Framework BwN 2.0	A set of quality standards for placemaking and place-keeping, covering the themes of Wellbeing, Water and Wildlife.
Green Infrastructure for Roadside Air Quality (G4RAQ)	Estimating site-specific changes in exposure to road transport pollution close to source
MAGIC Maps Tool - Natural England	Authoritative geographic information about the natural environment from across government.
Natural England - Green Infrastructure Principles, 2023	The principles cover the Why, What and How to do good green infrastructure.
Natural England – National Character Area Profiles	Interactive profiles which describe each of England's 159 National Character Areas (NCAs)
Outdoor Recreation Valuation Tool (ORVal: Version 2.0)	Generate estimates of public and private site usage, how visitation and welfare values may change, and the site's potential monetary value in terms of household recreational benefit.
Rodwell, J.S. (2006) NVC Users' Handbook, JNCC	Assists in understanding the National Vegetation Classification.
Soilscapes viewer	Soilscapes is a 1:250,000 scale, simplified soils dataset covering England and Wales.
Sustainable Drainage Systems: Non-statutory technical standards for sustainable drainage systems, 2015 (pdf)	The non-statutory technical standards for the design, maintenance and operation of sustainable drainage systems to drain surface water have been published by DEFRA. The standards apply to systems that drain surface water from housing, non-residential or mixed use developments for the lifetime of the developments.
The Construction (Design and Management) Regulations 2015 - HSE	The Construction (Design and Management) Regulations 2015 (CDM 2015) are intended to enable those involved in construction, from design to build, to control relevant safety risks in a sensible manner.
Hirons, Andrew & Sjöman, Henrik. (2019). Tree species selection for green infrastructure - a guide for specifiers	This guide includes information for over 280 species on their use-potential, size and crown characteristics, natural habitat, environmental tolerance, ornamental qualities, potential issues to be aware of, and notable varieties.
The Ecological Site Classification (ESC) decision support tool - Forest Research	Free tool allowing users to Assess the current and future suitability of tree species for a forest site.
The National Biodiversity Network Atlas	UK's largest repository of publicly available biodiversity data.
The Plant Healthy Certification Scheme	Certification scheme aiming to unite growers, garden retailers, landscapers and arborists, to help protect against destructive pests and diseases.
The Site Waste Management Plans Regulations 2008	Government regulations relevant to waste management.

The statutory (official) biodiversity metric - DEFRA	This official calculation tool measures all types of habitat and produces results in standardised biodiversity units.
UK Soil Observatory (UKSO) map viewer	Some of the most accurate soil data for the UK available in a graphical format.
UKCEH Countryside Survey	Insight into how UK plants, soil, woodlands and small water bodies have changed over time.
UKHab Ltd (2023) Habitat Classification Manual 2.01	The UK Habitat Classification - classification, survey and monitoring of habitats.
What will climate change look like in your area' - BBC, Dale and Stylianou.	A quick way of assessing predicted weather patterns.

3. KNOWLEDGE BASE

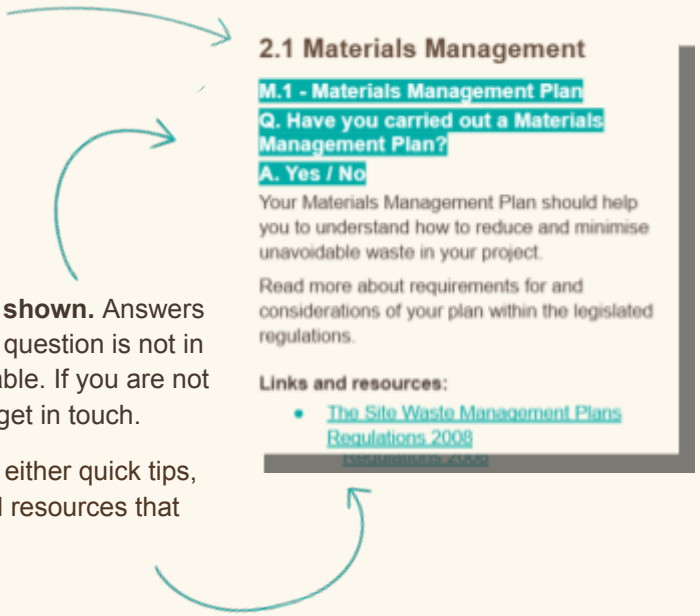
As you progress through your report, you may come across questions you have not thought about before. We know this can be challenging, but we encourage you to consult the knowledge base when you have the opportunity and return to your report once you have the answers needed.

3.1 USING THE KNOWLEDGE BASE

The below information is found within the tool alongside each question, but is also listed in full online here - you may find it more useful to access this online. If you prefer to print or save this information offline read on!

The Knowledge Base is organised into the **6 elements of sustainability** found within the tool:

- Materials Management
- Soils
- Water & Air
- Biodiversity
- People
- Emissions.



The question, and available answers are shown. Answers are either Yes or No, or multiple choice. If a question is not in the Knowledge Base - no guidance is available. If you are not sure about these questions make sure you get in touch.

Guidance and links then follow which give either quick tips, or more in-depth guidance around tools and resources that you may require to answer the question.

3.1 MATERIALS MANAGEMENT

M.1 - Materials Management Plan

Q. Have you carried out a Materials Management Plan?

A. Yes / No

Your Materials Management Plan should help you to understand how to reduce and minimise unavoidable waste in your project.

Read more about requirements for and considerations of your plan within the legislated regulations.

Links and resources:

- The Site Waste Management Plans Regulations 2008

M.2 - Material component's specifications

Q. Have you specified all features to be made from material components that are: - Able to be sustainably maintained - Long lasting - Involve end of life re-use whether repurposed or recycled - Designed with consideration for the conservation of resources?

A. All ; Most ; None

You may start by considering the life cycle assessment of your materials. You can investigate their toxicity, water usage, impact on habitat loss, impact on human health, societal impacts, and materials which make use of limited resources here.

For more information check out the included downloadable EcoDesign methodological guidance material - EcoDesign Audit has been developed by Sustainable Design Lab (SDL) of Estonian Academy of Arts. It aims to increase the awareness of eco-design among the region's SMEs, design organizations and designers.

Links and resources:

- EcoDesign audit manual (pdf)

M.3 - Design life considerations

Q. Have you considered the design life of the materials and the project?

A. Yes / No

Tip - You may want to consider designing for the dismantling and repurposing of products at end of life.

M.4 - Landfill waste

Q. What percentage of your waste including any packaging will go to landfill?

A. less than 25% ; 25 - 75% ; more than 75%

Tip - To find this out you may need to ask your waste service provider for their information.

M.5 - Repurposing site materials

Q. Have you considered reusing or repurposing existing site materials within the site or locally?

A. Yes / No

Tip - Consider the efficiency of transport in your repurpose plans and where relevant add this transport into your carbon equation in the emissions section.

M.6 - Monitoring of recycling

Q. Is your waste management contractor recycling, and monitoring, recording and reporting this to you?

A. Yes / No

Tip - Note - your waste management contractor may be a landscape contractor.

M.7 - Single use plastics

Q. Can you avoid using any single use plastics?

A. Yes / No

Tip - Be aware that some quality turf products have plastic web embedded in them. Check with your supplier to see whether this is the case for the product you are using.

M.8 - Plant pot recycling

Q. If using container grown plants, can all plant pots be recycled?

A. Yes / No

Tip - If your plant pots are indicated as recyclable - make sure you check by what method so you can ensure this is achievable.

M.9 - Treatment of green waste

Q. How are dealing with green waste / natural plant tissue arisings?

A. Left in situ ; Composted / Biochar ; Burnt / Exported

Tip - Cut and drop method is favoured in this instance. If composting, your compost heap maintenance should ensure it does not become anaerobic and therefore methane producing or at risk of creating leachates.

M.11 - Timber certification

Q. Do proposed timber structures use FSC / PEFC (Programme for the Endorsement of Forest Certification) or GiB accredited material?

A. Yes / No

Tip - FSC refers to the Forest Stewardship Council and PEFC refers to the Programme for the Endorsement of Forest Certification.

3.2 SOILS

S.3 - Soil health

Q. Has the soil health been assessed and species chosen accordingly?

A. Yes / No

Tip - Assessments of soil health may include pits assessing for earth worms, organic material, roots within the soil profile.

S.4 - Soil structure

Q. Has the soil structure been assessed and only essential corrective measures considered?

A. Yes / No

Tip - Assessments of soil structure would allow you to consider the presence of compaction and sub soiling for example.

S.5 - Land contamination

Q. Have you considered the risk of historic contamination? And if required have you taken steps to ensure the soils will not be used for food production

A. Yes / No

Land contamination can harm: human health, drinking water supplies, groundwater and surface water, soils, ecosystems including wildlife, animals and wetlands. It can also affect the current and future land use. Dealing with land contamination helps make the environment clean and safe.

For more information on this topic read the Environment Agency's Land contamination: technical guidance in the link provided.

Links and resources:

- Land contamination: technical guidance

S.6 - Soil type

Q. Has the soil type been assessed and species chosen accordingly?

A. Yes / No

Here you should consider the local geology, soil series mapping and water availability in the soil.

On your site you may dig soil pits to assess the horizon.

Check out the link to see the UK Soil Observatory (UKSO) map viewer which is free and easy to use, and has some of the most accurate soil data for the UK available.

Links and resources:

- UK Soil Observatory (UKSO) map viewer

S.7 - Soil nutrients

Q. Has the soil nutrients been assessed and species chosen accordingly?

A. Yes / No

Soil analysis should include measures of pH, P, K, Mg.

For projects in England and Wales you can search the LandIS Soilscapes Viewer at the link provided. Soilscapes is a 1:250,000 scale, simplified soils dataset. LandIS, or the Land Information System is one of the offerings of the Cranfield Environment Centre (CEC).

Links and resources:

- Soilscapes viewer

S.8 - Soil survey

Q. Are you using a topographical survey or other on-site level survey?

A. Yes / No

Alongside your survey consider reducing soil movement or minimising interventions to reduce the associated land use change emissions.

Read more in the download link provided - Mapping Carbon Emissions & Removals for the Land Use, Land Use Change & Forestry Sector published by the Centre for Ecology & Hydrology.

Links and resources:

- Mapping Carbon Emissions & Removals

S.9 - Minimising cultivation

Q. If cultivation is necessary, are you minimising cultivation?

A. Yes / No

Tip - Minimising cultivation may include shallow tillage for example.

S.10 - Soil movements

Q. How much soil will be removed from site?

A. No movement ; Cut and fill ; Soil off-site

Soil disruption causes large losses of soil carbon. If soil movements are unavoidable, cut and fill is preferable to taking off site. The sustainability score is based on estimates of how soil carbon stocks will likely change as a result of the project.

To read more about our estimate you see The Countryside Survey: Soils Report from 2007 (Emmett et al., 2010) or the Elemental methodology.

Links and resources:

- UKCEH Countryside Survey
- The Countryside Survey: Soils Report

S.11 - Soft landscape

Q. What percentage of your project is soft landscape?

A. more than 70% ; less than 50% ; less than 30%

Tip - Soft landscape refers to areas which are not otherwise sealed e.g. black top tarmac and sealed terraces etc.

S.12 - Construction Soil Management Plan

Q. Do you have a Soil Management Plan agreed with the constructor for use during the construction phase?

A. Yes / No

Tip - Items to consider within this plan may include retaining existing materials, the use of haul roads and trackway, the safe storage of materials and careful placement etc.

S.13 - Mulch sustainability

Q. Have you carried out due diligence checks on your mulch supply chain to ensure it's sustainability?

A. Yes / No

Whilst mulch use for establishment is beneficial in most projects, the import of mulch can deplete resources at the site of their source.

Read more about how these considerations look in practice in the download provided: 'Material comparators for end-of-waste decisions; Materials applied to land: PAS 100 compost' provided by the Environment Agency.

Links and resources:

- Material comparators for end-of-waste decisions; Materials applied to land: PAS 100 compost

S.14 - Use of substates

Q. Have you considered the wider value of on-site substates?

A. Yes / No

Tip - You may consider for example, brick dust or waste aggregate on-site.

S.15 - Plant growing materials

Q. Have you considered the impact of your plant growing materials?

A. Peat free ; No new peat (from Jan 2026) ; Grown in peat

Tip - Minimise the impact of your plant growing materials by using bare root or peat free substrate.

S.16 - Herbicide use

Q. Are you minimising herbicide use in your build?

A. No use ; Occasional economic use ; Regular use

Tip - To reduce herbicide use you may consider repression, strimming or covering, hand weeding or the use of lawn in poor areas with a regular growing regime.

3.3 WATER & AIR

W.1 - Water movement

Q. Have you examined where water arrives and leaves the site?

A. Yes / No

Tip - All sources of water should be considered including - mains tap water, groundwater, springs, surface water flow, grey water, rainfall.

W.2 - Sustainable Drainage Systems

Q. Have Sustainable Drainage Systems (SuDS) been incorporated into the design proposal in accordance with DEFRA standards and Environment Agency recommendations?

A. Yes / No

Useful guidance here comes from the Building with Nature Water Standard - Standard 9, which states that Green Infrastructure 'Delivers Climate Resilient Water Management Is integral to sustainable drainage using above ground features to manage flood risk, maintain the natural water cycle and improve water quality within the boundary of the project and at a catchment scale. The green infrastructure is

designed to be drought resistant and wherever possible, includes measures for the retention and reuse of rainwater.' Read more in the link provided to access and download the BwN Standards Framework BwN 2.0.

Follow also the link to familiarise yourself with DEFRA's Sustainable Drainage Systems: Non-statutory technical standards for sustainable drainage systems, 2015

Links and resources:

- BwN Standards Framework BwN 2.0
- Sustainable Drainage Systems: Non-statutory technical standards for sustainable drainage systems, 2015 (pdf)

W.3 - Infiltration

Q. What percentage of the site allows infiltration?

A. More than 90% ; 70-90% ; Less than 70%

Tip - You may want to check whether you have maximised soils areas on the site or ensure the scheme uses permeable surface material wherever possible. Some examples include: Permeable paving which could be permeable block paving, gravel or other aggregates, or natural surfaces.

W.4 - Control of runoff

Q. Has the control of runoff been considered?

A. Yes / No

Controlled runoff should support the management of flood risk and maintain and protect the natural water cycle. Flow of water should be at least as effective than if it was a green field site. Ideas may include attenuation and/or storage, which might include scrapes, rainwater storage, aerated soils, permeable paving, or bioretention planters.

Full guidance is available in the linked manual: The SuDS Manual (C753F) which is available free to CIRIA members via the link provided. The manual provides you with the latest technical advice and adaptable processes to assist in the planning, design, construction, management and maintenance of good SuDS.

Links and resources:

- Access The SuDS Manual (C753F)

W.5 - Runoff pollution

Q. Have you managed the quality of the runoff to prevent pollution?

A. Yes / No

Consider the water source for water features since, for example, mains water carries high levels of phosphates.

You may consider the importance of planting for water quality and about water running through green systems - grass, aquatic plants or a full cover mixed planting - will catch silt, hydrocarbons, oils, nitrates, and phosphates.

Full guidance is available in the linked document: Guidance on the construction of SuDS (C768F) which is available free to CIRIA members via the link provided. The construction guidance includes discussion on the construction of the different SuDS components using photographs of actual site works to illustrate both good practice and what can go wrong.

Links and resources:

- Access The SuDS Manual (C753F)

W.6 - SuDS maintenance

Q. Has long-term SuDS maintenance been secured?

A. Yes / No

Long-term is considered to mean a minimum of 10 years for establishment, with repair or renewals thereafter. This question is supported by the Natural England Green Infrastructure (GI) Principles, and 'Principle Why 4: Improved Water Management,' found in the document on the site linked here. More resources are linked within this document should you wish to explore further too.

Links and resources:

- Natural England - Green Infrastructure Principles, 2023

W.7 - Nitrate vulnerability

Q. Is any part of the site within a nitrate vulnerable zone and are you aware of regulations affecting your scheme?

A. Yes / No

Regulation may include riparian ownership responsibilities for example, or on larger schemes the requirement for a Catchment Area Management Plan.

To check your site use the MAGIC Maps Tool linked here. Once you are in the tool, locate

your site, and filter the map data on the left hand side by Designations > Statutory > Nitrate Vulnerable Zones. MAGIC Maps Tool, or the Multi-Agency Geographic Information for the Countryside Tool, is managed and maintained by Natural England.

Links and resources:

- MAGIC Maps Tool - Natural England

W.9 - Targeted watering

Q. Does the scheme propose targeted watering or otherwise minimise the need for irrigation?

A. Yes / No

Tip - Targeted watering minimises extensive water use and ensures maximum water efficiency and includes things like watering via a drip line.

W.13 - Biodiversity benefits

Q. Has water been used to create and sustain better wet places for nature?

A. Good ; Acceptable ; Poor

You are asked to rate the acceptability of your proposals in terms of their benefits to biodiversity. Use your judgement, and consider the range of habitats being created or preserved.

The flow of water through your site and the impact this will have is important. Read more in the linked reference to DEFRA's Guidance on Understanding biodiversity net gain for land managers.

Links and resources:

- Guidance on Understanding biodiversity net gain for land managers - DEFRA

W.14 - Amenity benefits

Q. Has water been used to create and sustain better places for people?

A. Good ; Acceptable ; Poor

You are asked to rate the acceptability of your proposals in terms of their benefits as an amenity. Use your judgement, and if you need to, more guidance is found within the Building with Nature Standards Framework. Their Water Standard 10 states, 'The green infrastructure is designed to integrate water, including areas of standing water, flowing water, seasonal and ephemeral features, to bring additional amenity and wildlife benefits.' Read more in the link provided to access and download the BwN Standards Framework BwN 2.0.

Links and resources:

- BwN Standards Framework BwN 2.0

W.15 - Roadside air quality

Q. Applicable only for urban schemes: Have you used the GI4RAQ tool to optimise your design to improve roadside air quality?

A. Yes or N/a ; No

This question refers to the use of the Green Infrastructure for Roadside Air Quality (G4RAQ) tool found in the link provided. This tool helps you estimate site-specific changes in exposure to road transport pollution close to source.

The flow of air in the urban environment will be highly dependent on the details of a site. Planting in these areas should therefore be designed based on the site context.

Links and resources:

- Green Infrastructure for Roadside Air Quality (G4RAQ)

3.4 BIODIVERSITY

B.1 - Baseline survey

Q. Has a baseline ecology or biodiversity survey been completed?

A. Yes / No

Where possible the preservation of vegetation and habitat should follow within your design. For more helpful information and guidance read through The UK Habitat Classification which is available to those who register via the link. This free classification documentation helps those classifying habitats, and is designed to provide a simple and robust approach to survey and monitoring. The classification covers terrestrial and freshwater habitats, and is flexible enough for use in a wide range of survey types from walkover surveys of small urban sites to regional and national scale rural habitat mapping.

To assist you refer also to the The NVC Users' Handbook also linked. This gives you an authoritative introduction to the National Vegetation Classification (NVC) and explains how to identify plant communities and other parts involved in carrying out an NVC survey of a site.

Links and resources:

- UKHab Ltd (2023) Habitat Classification Manual 2.01.
- Rodwell, J.S. (2006) NVC Users' Handbook, JNCC.

B.2 - Arboriculture assessment

Q. Have you carried out an arboriculture assessment and/ or an arboricultural method statement where there are existing trees?

A. Yes / No

Tip - An arboricultural assessment is a written report that evaluates how a development will affect trees on a site. The following are considered within most assessments: Veteran tree - a tree which shows characteristics such as low, fat shape, a wide trunk, hollowing of the trunk. Ancient tree - as with Veteran tree but of a certain age dependent on species, e.g. Birch @ 150 years, Oak @ 400 years. Heritage tree - part of history and culture, connected with certain people or events. Notable tree - a tree which is significant locally. Long established woodland - woodlands that have been in situ since 1840. An Arboricultural Method Statement would be required when trees are present on the site already. This document outlines how to work around trees during construction without damaging them.

B.3 - Predicted weather patterns

Q. Have considered future predicted weather patterns for associated impacts on the site and species choice?

A. Checked weather patterns and responded ; Checked weather patterns - no changes made ; Not checked weather patterns

To get started using predicted weather patterns why not have a look at the free resource in the links provided. Here the BBC has collaborated with Met Office scientists to bring together Met Office weather measurement records and models - from the the UK Climate Projections (UKCP) project. Within the tool the present-day data shows averages of observed measurements for 1991-2019 and allows you to inspect future data for a location which shows projected temperature and rainfall measurements produced by climate models for two different levels of global warming: if global average temperatures rise 2C above records from the mid-19th Century, the start of major industrialisation, and if that rise is 4C.

Links and resources:

- What will climate change look like in your area - BBC, Dale and Stylianou

B.4 - Planting mix

Q. Does your planting mix reflect existing and future site conditions?

A. Yes / No

Tip - Think here about soil moisture, drought tolerance, the seed bank, wildlife, etc.

B.5 - Climate resilience of trees

Q. Have you considered the climate resilience of trees in your design, if applicable?

A. Yes / No

A user-friendly guide to climate-resilient tree selection, ‘Tree Species Selection for Green Infrastructure: A Guide for Specifiers,’ based on research by Henrik Sjöman & Andrew Hirons is found in the accompanying link. This tool includes information for over 280 species on their use-potential, size and crown characteristics, natural habitat, environmental tolerance, ornamental qualities, potential issues to be aware of, and notable varieties.

You may also benefit from the classification of species for a particular site or region can be found using the The Ecological Site Classification (ESC) decision support tool created by Forest Research and found in the accompanying link. This tool allows you to assess the current and future ecological suitability of tree species for a forest site, with users providing site and soil information. ESC considers six climatic and soil variables and provides information for over 50 tree species.

When using the tool, use the following future climate scenario: Medium-High 2050(A1b 3q0/AWC), then locate your area and select species categorised as either 'marginal', 'suitable' or 'very suitable' as indicated by the tool.

Links and resources:

- Hirons, Andrew & Sjöman, Henrik. (2019). Tree species selection for green infrastructure - a guide for specifiers
- The Ecological Site Classification (ESC) decision support tool - Forest Research

B.6 - Tree diversity

Q. Have you considered a diverse tree species mix where appropriate?

A. No one species represents more than 20% of the trees ; 20-50% of the trees represented by one species ; More than 50% of the trees belong to one species

Using the BNG conditions calculated using the The statutory (official) biodiversity metric as an example: - 'woodland habitat' aims for 80% native for 'good' condition score, 50-80% for 'moderate' - 'scattered trees' aims for 70% native - 'hedgerow' aims for 7 native species or more, or 5-6 with other desirable features, e.g. emergent trees, walls or ditches, or important ground flora.

Links and resources:

- The statutory (official) biodiversity metric - DEFRA

B.8 - Non-woody species diversity

Q. Have you considered a diverse non-woody species mix where appropriate?

A. No more than 20% of non-woody plants are a single species ; 20-50% of non-woody plants are a single species ; More than 50% of non-woody plants are a single species

Tip - Non-woody species include grasses, bulbs, herbaceous plants. To incorporate a more diverse mix you may think about layering, consider flower timing and foliage cover.

B.9 - Wildlife food sources

Q. Does your planting scheme provide wildlife food sources?

A. Yes / No

You will find useful free and paid-for resources at the Plants For A Future (PFAF) website in the links provided. PFAF provide free access to a database of detailed information on over 8000 useful plants, offer a native plants search facility, and sell digital and print reference books featuring selections of plants by type and growing conditions. PFAF rely mainly on many small donations to cover their costs.

Links and resources:

- Plants For A Future - About
- PFAF - Main site

B.10 - Food webs

Q. Have you considered food webs both above and below ground?

A. Yes / No

Tip - When thinking about the food webs of the ecosystem you are creating, think about whether you are creating habitats to support broad groups of species with plant diversity as a foundation. Within this you may also want to consider nitrogen fixing and differing rooting depths. Listed are a number of Essential plant groups and habitat types:

Essential plant groups:

1. Umbellifers and flatheads (supports bees, hoverflies, lacewings, butterflies, moths, predatory wasps, ladybirds)
2. Spikes (supports bumblebees, honeybees and small solitary bees, some birds)
3. Dots and Daisies (supports bees, hoverflies, butterflies)
4. Panicles (supports bees, hoverflies, butterflies)
5. Grasses (supports winter homes for ladybirds, solitary bees and lacewings, nest building material, seed for birds)
6. Bulbs, corms and tubers (supports bees, hoverflies, butterflies)
7. Trees and shrubs producing berries, seeds, and catkins.

Essential habitat types:

1. Nectar cafés planted in sunny or shaded areas
2. Spatial Planting in groups or drifts
3. Seasonal Early spring and autumnal-flowering plants
4. Habitats Bug hotel(s), bird houses
5. Un-managed habitat patche(s), log piles
6. Vegetation for larval stages.

B.11 - Habitat mix

Q. Is there a mix of habitats - arboreal, terrestrial, and aquatic - to offer opportunities to a wide range of species?

A. Three habitat types ; Two habitat types ; One habitat type

More guidance is found within the Building with Nature Standards Framework. Their Wildlife Standard 11 states, 'The green infrastructure optimises long term and climate resilient net benefits for nature, by retaining and enhancing existing ecological assets and creating locally relevant new habitats within the boundary of the

project. Wildlife measures are secured at all stages of implementation and where applicable, across multiple phases of development.' Read more about the purpose this speaks to in the link provided to access and download the BwN Standards Framework BwN 2.0.

Links and resources:

- BwN Standards Framework BwN 2.0

B.12 - Habitat connectivity

Q. Does the planting scheme propose habitat connectivity within the boundary of your project?

A. Yes / No

Common solutions to foster habitat connectivity include: hedgerows, areas of unbroken habitats, and connected tree canopies. More guidance is found within the Building with Nature Standards Framework. Their Core Standard 1 states, 'The green infrastructure optimises multifunctionality and connectivity within the boundary of the project and links with existing and planned for green infrastructure in the surrounding area.' Read more about the next steps to take in the link provided where you can access and download the BwN Standards Framework BwN 2.0.

Links and resources:

- BwN Standards Framework BwN 2.0

B.13 - Wider green infrastructure

Q. Have you considered and taken into account green infrastructure beyond your project boundary?

A. Yes / No

The considerations here depend on the local context and scale of your project. In an urban setting you might consider extensions of wildlife corridors beyond your project - like 'hedgehog highways'. On larger projects it may help to consult a Local Nature Recovery strategy if possible, and consider the connectivity of your project to nearby hedgerows, Sites of Special Scientific Interest and other formal land designations.

Three links are provided: First, guidance on this front is found within the Building with Nature Standards Framework. Their Wildlife Standard 12 states, 'The green infrastructure creates effective links with existing and planned for ecological features and networks beyond the boundary of the project to support the creation and restoration of resilient ecological networks in the wider landscape.' Read more about the next steps to take in the link provided where you can access and download the BwN Standards Framework BwN 2.0.

Second, you may find it useful to explore the The National Biodiversity Network Atlas from The National Biodiversity Network Trust. This Atlas combines for you of multiple sources of information about UK species and habitats, and gives you the ability to interrogate, combine, and analyse these data yourself. The NBN Trust is a charity supported by members and donations.

Lastly, check the location of your site use the MAGIC Maps Tool. Once you are in the tool, locate your site, and filter the map data on the left hand side by relevant fields. MAGIC Maps Tool, or the Multi-Agency Geographic Information for the Countryside Tool, is managed and maintained by Natural England.

Links and resources:

- BwN Standards Framework BwN 2.0
- The National Biodiversity Network Atlas - The National Biodiversity Network Trust
- MAGIC Maps Tool - Natural England

B.14 - Habitat management and development

Q. Does the scheme propose a long-term management and development programme for the preservation of its' habitat?

A. Yes / No

More guidance is found within the Building with Nature Standards Framework. Their Core Standard 6 states, 'The green infrastructure is subject to management arrangements that demonstrate a commitment to effectively implement, establish and maintain features at all stages of the development process. This should include details of funding, governance, maintenance, monitoring, remediation and, where appropriate, community involvement and stewardship.' Read more about the next steps to take in the link provided where you can access and download the BwN Standards Framework BwN 2.0.

Links and resources:

- BwN Standards Framework BwN 2.0

B.15 - Endangered species

Q. Does the scheme propose areas of reintroduction of endangered species?

A. Yes / No

Tip - Core to your answer is whether native planting (of local provenance) has been included within your scheme. It is important to note that native planting should still be sympathetic and selective. Many species, whilst native, may not be appropriate in a particular local area. For example, Scot's Pine rarely occurs naturally in most of England, whereas Viburnum lantana is characteristic of limestone grassland, and Downy Birch is naturally found on peated soils. Some species are locally rare (eg. Sorbus Torminalis are rare in Oxfordshire) however it may be appropriate to include species that are rare but of local provenance (e.g. Black Poplar in Buckinghamshire). Where possible consider extra habitats of wildlife ponds, tussocky grassland, scrub planting.

B.16 - Lighting and impacts

Q. Where lighting is required is this lighting designed to minimise impacts on wildlife?

A. No lighting, or minimal warm lighting, or wildlife friendly lighting ; Significant lighting incorporating consideration for wildlife ; Significant lighting, wildlife not considered

Where lighting plans are fixed you may consider also the timing of operation. More information and ideas - in particular, in relation to Bats, is available via the Bat Conservation Trust's Guidance Note 8: Bats and Artificial Lighting. This great resource raises awareness of the impacts of artificial lighting on bats but also offers potential solutions to avoid and reduce this harm.

Links and resources:

B.18 - Supplier certification

Q. Are your plant suppliers Certified under the Plant Health Certification Scheme?

A. Plant Healthy Certified supplier ; Not Plant healthy Certified but biosecurity has been checked ; Not Plant Healthy Certified. Not been checked

You may wish to visit suppliers - asking about certification. The Plant Healthy Certification Scheme is based on the Plant Health Management Standard - begun under Defra's Plant Biosecurity Strategy for Great Britain (2014) to counter the threat from pest plants and improve biosecurity in the UK horticultural sector. The Scheme was developed by specialists from industry, government and the third sector. Certification is performed by one of two bodies: Grown in Britain, and NSF. Read more in the link provided and on resources therein.

Links and resources:

- The Plant Healthy Certification Scheme

B.19 - Biodiversity assessment

Q. Have efforts been taken to increase wildlife habitat or avoid losses, or have impacts on biodiversity been minimised and losses compensated for?

A. Increased wildlife habitat, or losses avoided ; Habitat loss minimised and compensated for ; No action taken to avoid, minimise, or compensate for habitat loss

There is quite a lot to think about within this question but you may have already undertaken the necessary tasks. Choose your answer once you have the available evidence to back it up. To work out first whether you can demonstrate a net gain in biodiversity you might include for example the creation of larger areas of new wildlife habitats and enhancement of existing ones; and then within this whether pollination, egg laying or other opportunities are set increase.

To provide some clarity on this use DEFRA The statutory (official) biodiversity metric is the way of measuring biodiversity value for the purposes of BNG. The statutory (official) biodiversity metric calculation tool measures all types of habitat and produces results in standardised biodiversity units. The tool calculates: How many units a habitat contains before development takes place; and how many units are needed to replace the units of habitat lost and to achieve 10% BNG, through the creation or enhancement of habitat. The formula takes different factors into account, including the habitat's size, condition, strategic significance, type. Follow the link provided to read information on who is required to use this tool; who might be contracted to complete it and much more besides. User-guidance is found within the tool itself. Negative values in this tool indicate a net loss of biodiversity.

Links and resources:

- The statutory (official) biodiversity metric - DEFRA

3.5 PEOPLE

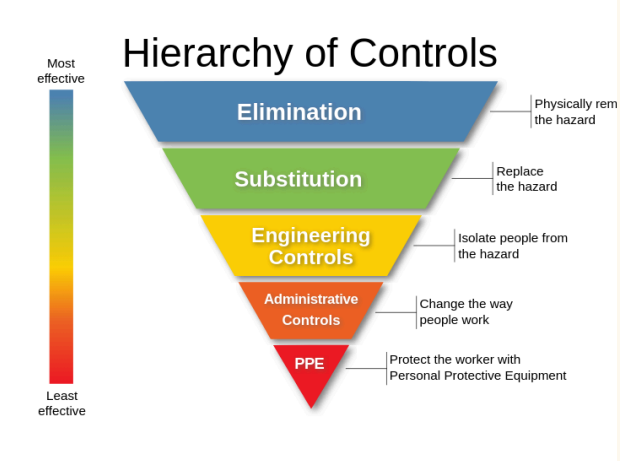
P.1 - Design Risk Assessment

Q. Have you carried out a Design Risk Assessment?

A. Yes / No

Under the UK's Construction, Design & Management (CDM) Regulations, a principal designer's role involves ensuring that safety is considered from the very beginning of the design process and this includes completing a Design Risk Assessment - a register that identifies all risks associated with the system design. Within this, consider how the health and safety and wellbeing of the teams who will build, plant, and manage and maintain the project.

It may help to think about the risk mitigation hierarchy demonstrated.



Eliminate - materials that require less processing, or create less dust for example; Substitute - may be looking for materials with lower impacts; Engineering Controls - may include lifts, over other means of working at height; Administrative Controls may include better job rotation. We provide links which assist with thinking about risks and hazards within a project: for the Health and Safety Executive, which is a site you can further explore for more information.

1. Vibration (e.g. Hand Arm Vibration and whole body exposure) - see link
2. Noise
3. Manual Handling - see link
4. Asbestos
5. Control of Substances Hazardous to Health (COSHH)
6. Electricity
7. Lifting operations & lifting equipment
8. Use of work equipment
9. Working at height
10. Hazardous waste - see link
11. New roads & street works

Links and resources:

- HSE - COSHH guidance
- HSE - The hand-arm vibration exposure calculator
- HSE - Manual Handling Guidance

P.2 - Safety of users

Q. Have you considered the safety of the users of the landscape under CDM?

A. Yes / No

End users of your landscape should be considered under the UK's Construction, Design & Management (CDM) Regulations - think here about everything from slips and trips, areas of open water, and falling from height.

It will be necessary to read more on this and links are provided to the CDM regulations, and The British Standards Institution where information can be found on appropriate standards, training, and certification in this area.

Links and resources:

- The Construction (Design and Management) Regulations 2015 - HSE
- The British Standards Institution

P.3 - Security of users

Q. Have you considered safe places and security in your design?

A. Yes / No

Follow the link to visit the pages of 'Secured by Design' - an Official Police Security Initiative and membership scheme. Here you will find a series of authoritative Design Guides to assist the building, design and construction industry to incorporate security into developments to comply with the Building Regulations in England, Scotland and Wales.

Links and resources:

- Guides - Secured by Design

P.4 - Physical and mental health and wellbeing

Q. Has green infrastructure been incorporated such to maximise physical and mental health and wellbeing?

A. Yes / No

Some ideas to consider include for all users; sensory spaces, community spaces, and safe spaces. More guidance is found within the Building with Nature Standards Framework. Their Wellbeing Standard 7 states, 'The green infrastructure is close to where people live, work, learn, play and/or visit and is designed to optimise use and enjoyment for everyone across the year, to maximise health and wellbeing outcomes and to promote active living for existing and future communities.' Read more about the purpose this speaks to in the link provided to access and download the BwN Standards Framework BwN 2.0.

Links and resources:

- BwN Standards Framework BwN 2.0

P.5 - Inclusion and belonging

Q. Has green infrastructure been incorporated such to maximise inclusion and belonging?

A. Yes / No

More guidance is found within the Building with Nature Standards Framework. Their Wellbeing Standard 8 states, 'The green infrastructure is designed to encourage and enable everyone, including those from vulnerable or excluded groups, to use and enjoy it, to help reduce health inequalities and to build a shared sense of community and belonging.' Read more about the purpose this speaks to in the link provided to access and download the BwN Standards Framework BwN 2.0.

Links and resources:

- BwN Standards Framework BwN 2.0

P.6 - Local context

Q. Have you considered and responded to the local character, social, economic and environmental context of the project?

A. Yes / No

More guidance is found within the Building with Nature Standards Framework. Their Core Standard 4 states, 'The green infrastructure positively responds to the local context, including the physical environment, such as landscape and urban character and social, economic and environmental priorities, including the evidenced needs and strengths of existing and future local communities.' Read more about the purpose this speaks to in the link provided to access and download the BwN Standards Framework BwN 2.0.

Links and resources:

- BwN Standards Framework BwN 2.0

P.7 - Capturing a sense of place

Q. Has local distinctiveness been captured to inform a sense of place?

A. Yes / No

In England, you might first like to check whether your area sits within one of Natural England's 159 National Character Areas (NCAs). Each NCA represents an area of distinct and recognisable character at the national scale. Their boundaries follow natural lines in the landscape instead of county or district boundaries and this makes them a good framework for decision-making and planning for future change. In the link provided you can reach a profile of your area by searching or using the map.

You might also consult the linked document from Historic England where applicable - Conservation Principles, Policies and Guidance - which sets out principles to guide management within an historic environment.

More guidance is found within the Building with Nature Standards Framework. Their Core Standard 5 states, 'The green infrastructure is integral to the project and is designed to reinforce local distinctiveness and/or create a distinctive sense of place.' Read more about the purpose this speaks to in the link provided to access and download the BwN Standards Framework BwN 2.0.

Links and resources:

- Natural England – National Character Area Profiles
- Conservation Principles, Policies and Guidance - Historic England
- BwN Standards Framework BwN 2.0

P.8 - Recreational value

Q. Has the site's recreational value been assessed using the Outdoor Recreational Valuation Tool?

A. Yes / No

Follow the link to explore and use the Outdoor Recreation Valuation Tool (ORVal: Version 2.0). This tool provides you with estimations for public and private use of your site, how visitation and welfare values might change with the

introduction of your plans, as well as estimates of the site's potential monetary value in terms of recreational benefit to households. ORVal was developed by the Land, Environment, Economics and Policy Institute (LEEP) at The University of Exeter with funding provided by DEFRA.

Links and resources:

- Outdoor Recreation Valuation Tool (ORVal: Version 2.0)

P.9 - Sustainable access

Q. Is access available by sustainable transport?

A. Yes / No

Tip - Consider all forms of public transport, as well as access infrastructure including public footpaths or accessible routes, and associated supportive infrastructure like cycle and scooter storage, or charging for EV vehicles etc.

P.12 - Site interpretation

Q. Does the scheme propose interpretation points for users?

A. Yes / No

Tip - Interpretation takes many forms but offers opportunities for users to understand the environment presented to them: Signage, information points, educational facilities, or other informative design tools which encourage understanding or appreciation of nature. You may in your answer also give a brief description of the means offered.

P.14 - Accessibility

Q. How many of the 10 listed user groups will be able to access significant areas of the site?

A. Most of the groups (6-10 of listed user groups) ; Up to half of the groups (1-5 of listed user groups) ; None of the user groups

(1) Wheelchair user, (2) Mobility scooter user, (3) Walking aid user (4) Long cane user, (5) Guide dog user, (6) Residual sight user, (7) Deaf or hard of hearing (8) Acquired neurological impairment, (9) Autism/Sensory processing diversity, (10) Developmental impairment. These user groups and requirements are set out in Part M of Schedule 1 to the Building Regulations 2010 which is linked here. This document ensures reasonable provision made for access and use to a building and its facilities. You may also consider in your answer the long term sustainability of the project by assessing what other adaptations may be required over time to reflect changing user needs.

Links and resources:

- Part M, Schedule 1 to the Building Regulations 2010

3.6 EMISSIONS

E.1 - Carbon calculations

Where do I find information about the carbon calculations in my report?

For each item entered the associated carbon footprint is calculated. The calculations underpinning these values in your report are identified in the resources linked below.

For guidance about what to include and think about when completing this section - see the guidance which appears when you add various emissions items to your report.

Links and resources:

- Elemental Resources Section

4. CONTACTING US

Elemental welcomes enquiries relating to your reports, or about sustainability. For assistance contact Nicholsons: **elemental@nicholsonsgb.com**

If you are experiencing issues with accessing the software or are experiencing issues of a technical nature contact: **calculator@farmcarbontoolkit.org.uk**

As we develop Elemental, we believe it's critical to listen to the views, requests and questions of our users, ensuring we are as relevant, up to date and user-friendly as possible. Send your feedback at any time.

DOCUMENT VERSION

Version	Date	Description
Version 1.3	18 March 2025	**Knowledge Base finalised**

We encourage you to share this document with anyone who might find it useful. Because it can be updated at any time however - please send a link to where the latest version can be found: https://calculator.farmcarbontoolkit.org.uk/elemental

Elemental Knowledge Base
v1.5 2 May 2025

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