



# **What to Expect From the New RICS Whole Life Carbon Assessment for the Built Environment**

**Professional Standard, 2nd Edition**

January 2024

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## Overview

Published by the Royal Institute of Chartered Surveyors (RICS), the 2<sup>nd</sup> edition of the Whole life carbon assessment for the built environment, Professional standard (WLCA PS) – based on EN 15978 – provides specific guidance for teams wanting to assess whole of life carbon emissions for construction projects and built environment assets. The standard, published in September 2023, is effective from 1 July 2024. It applies to RICS members and is to be used as the framework for the Built Environment Carbon Database (BECD).

Very specific in places, the WLCA PS expands significantly on EN 15978 and on the previous RICS guidance from 2017. There are notable changes to the following areas:

- Reporting modules
- Element categorisation for buildings and infrastructure
- Defined Parameters and emissions factors
- Transport impact calculations
- Biogenic carbon
- Uncertainty analysis
- Decarbonisation

## Reporting Modules

There are new (optional) reporting modules.

Module	Description
A0	Non-physical pre-construction activities, such as surveys and activities associated with the design of the asset
B8	User activities not covered in B1-B7

Table 1: New (optional) reporting modules

And new sub-modules for reporting.

Sub-Module	Description
A5.1	Pre-construction demolition (if applicable)
A5.2	Construction activities
A5.3	Waste and waste management
A5.4	Worker transport (optional)
B1.1	In-use material emissions and removals
B1.2	In-use fugitive emissions (refrigerants)
B4.1	Replacement of construction products, components, and systems
B4.2	Replacement of industrial systems (e.g. accidental release of refrigerants)
B6.1	Operational energy from regulated integrated systems
B6.2	Operational energy from un-regulated integrated systems
B6.3	Operational energy from un-regulated plug-loads
B7.1	Water used by integrated systems
B7.2	Water used by other integrated systems
B7.3	Water used by non-integrated systems
B8.1	Impacts associated with building user mobility/transport not covered in B6
B8.2	Impacts associated with user charging of electric vehicles on-site

B8.3	Other impacts associated with user activities relating to the building's intended use
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Table 2: New sub-modules for reporting

## Element Categorisation

For buildings the detailed construction category scope groups have slightly changed from the original New Rules of Measurement referred to by the previous professional statement. In general, there are now fewer reporting groups. Full categorisation for buildings, and the detailed changes can be found in Appendix 1.

Infrastructure projects should now use the ICMS 3<sup>rd</sup> edition categorisation groupings for civil engineering works. Full categorisation details can be found in Appendix 2.

Reporting templates for both buildings and infrastructure have been made available by RICS, and can be downloaded here (correct as of January 2024 – visit <https://www.rics.org/> for the latest version):

- [Reporting Template - Buildings](#)
- [Reporting Template - Infrastructure](#)

## Defined Parameters and Emissions Factors

The new WLCA PS includes emissions factors and prescribed parameter inputs that should be used when product specific details are not available. These include emissions factors for:

- Transport emissions
- End of life emissions
- Refrigerant emissions
- Energy/electricity grid emissions
- Water use emissions

And prescribed parameter inputs for:

- Transport distances
- End of life treatments
- Product lifespans

The standard recommends that these parameters be used when no better information (such as from an EPD or from direct measurement) is available. Transport distance assumptions (for UK-based projects), end of life assumptions and indicative product lifespans can be found in Appendix 3.

## Transport Impact Calculations

Despite likely deviating from EN 15978, the WLCA PS specifies that delivery vehicle return journeys are to be included in the impact calculation for module A4. Return road journeys are to be accounted for using an 'empty running factor' and 0% laden vehicle

emission factor. Return journeys are not applicable for sea and rail as these are assumed to be always laden with new products.

Note that transport of construction workers is not to be counted under A4, but (optionally) under A5.4.

## Biogenic Carbon

Under the WLCA PS, biogenic carbon is to be treated in accordance with EN 15804+A2:2019. This means that biogenic carbon from sustainably sourced materials must be treated as 100% released/transferred to nature at end of life, and biogenic carbon from non-sustainably sourced materials is treated as LULUC carbon (no sequestration, emissions only).

## Uncertainty Analysis

The new WLCA PS stipulates that uncertainties are to be accounted for across three areas:

- Project phase
- Carbon data type
- Quantities

The project phase contingency factor applies to all life cycle stages and modules per Table 3:

Project phase	Contingency factor
Early design	15%
Technical design and construction	6%
Post-completion	0%

Table 3: Project phase contingency factors

A carbon data uncertainty factor of between 0% - 7% is determined after calculating the carbon data confidence score. The carbon data confidence score is calculated by assessing the source data for 10 most impactful products or materials (in terms of the percentage of the asset's embodied carbon) against a carbon data quality matrix. The data quality matrix qualitatively assesses the carbon data for geographical relevance, technological relevance, temporal relevance, data granularity and data verification.

The quantities uncertainty factor is also based on the top 10 most impactful products or materials and provides an indication of the uncertainty associated with the quantities used in the WLCA. For each of the top 10 products or materials a quantity uncertainty level (QUL) score is assessed. The weighted average QUL score is then used to calculate the quantities uncertainty factor between 0% - 4%.

The WLCA uncertainty factor is the sum of the contingency factor, the carbon data uncertainty factor, and the quantities uncertainty factor.

The carbon figures in the WLCA are increased by the WLCA uncertainty factor for reporting.

## Decarbonisation

Under the WLCA PS results must be reported both with and without decarbonisation of the electricity grid (affecting modules B6, B7, B8 & D2), and of materials.

For the UK, the most recent Future Energy Scenario (FES) falling short scenario should be used. Decarbonisation of the electricity grid also needs to be applied to water use and water treatment reported in module B7.

Material decarbonisation is estimated using a matrix that sets out various decarbonisation factors for the life cycle modules based on the reference study period year. This can be found in Appendix 4.

## Appendices

### Appendix 1 Old and New Categorisation for Buildings

#### Facilitating Works Old Categorisation:

0.0 Facilitating works	0.1 Toxic/hazardous/contaminated material treatment	0.1.1 Toxic/hazardous material removal
		0.1.2 Contaminated land
		0.1.3 Eradication of plant growth
	0.2 Major demolition works	0.2.1 Demolition works
		0.2.2 Soft strip works
	0.3 Temporary support to adjacent structures	0.3.1 Temporary support to adjacent structures
	0.4 Specialist groundworks	0.4.1 Site dewatering and pumping
		0.4.2 Soil stabilisation measures
		0.4.3 Ground gas venting measures
	0.5 Temporary diversion works	0.5.1 Temporary diversion works
	0.6 Extraordinary site investigation	0.6.1 Archaeological investigation
		0.6.2 Reptile/wildlife mitigation measures
		0.6.3 Other extraordinary site investigation

#### Facilitating Works New Categorisation:

0.1 Treatment and demolition works Facilitating works	0.1.1 Toxic/contaminated material treatment Demolition works	0.1.1.1 Toxic/contaminated material treatment
		0.1.1.2 Demolition works
	0.1.2 Facilitating works	0.1.2.1 Temporary supports
		0.1.2.2 Facade retention
		0.1.2.3 Specialist groundworks
		0.1.2.4 Temporary diversion works
		0.1.2.5 Extraordinary site investigations
		0.1.2.6 Site preparation works

#### Substructure Old Categorisation:

1 Substructure	1.1 Substructure	1.1.1 Standard foundations
		1.1.2 Specialist foundations
		1.1.3 Lowest floor construction
		1.1.4 Basement excavation
		1.1.5 Basement retaining walls

### Substructure New Categorisation:

1 Sub-structure	1.1 Foundations and piling	1.1 Foundations and piling
	1.2 Basement retaining walls and lowest slab	1.2.1 Lowest slab
		1.2.2 Suspended slabs
		1.2.3 Basement retaining walls

### Superstructure Old Categorisation:

2 Superstructure	2.1 Frame	2.1.1 Frame
	2.2 Upper floors	2.2.1 Floors
		2.2.2 Balconies
		2.2.3 Drainage to balconies
	2.3 Roof	2.3.1 Roof structure
		2.3.2 Roof coverings
		2.3.3 Specialist roof systems
		2.3.4 Roof drainage
		2.3.5 Rooflights, skylights and openings
		2.3.6 Roof features
	2.4 Stairs and ramps	2.4.1 Stair/ramp structures
		2.4.2 Stair/ramp finishes
		2.4.3 Stair/ramp balustrades and handrails
		2.4.4 Ladders/chutes/slides
	2.5 External walls	2.5.1 External enclosing walls above ground level
		2.5.2 External enclosing walls below ground level
		2.5.3 Solar/rain screening
		2.5.4 External soffits
		2.5.5 Subsidiary walls, balustrades and proprietary balconies
		2.5.6 Façade access/cleaning systems
	2.6 Windows and external doors	2.6.1 External windows
		2.6.2 External doors
		2.6.1 Security and Fly Screens
	2.7 Internal walls and partitions	2.7.1 Walls and partitions
		2.7.2 Balustrades and handrails
		2.7.3 Moveable room dividers
		2.7.4 Cubicles
	2.8 Internal doors	2.8.1 Internal doors

### Superstructure New Categorisation:

2 Super structure 2.1 Frame 2.2 Upper floors 2.3 Roof 2.4 Stairs and ramps	2.1 Frame	2.1.1 Frame (vertical) - columns/ structural walls & braces
		2.1.2 Frame (Horizontal) - beams, joists & braces
	2.2 Upper floors	2.2.1 Upper floor and roof - structural slabs
	2.3 Roof	



		2.2.2 Upper floor and roof – non-structural slabs
	2.4 Stairs, ramps and safety guarding	2.4.1 Stairs
		2.4.2 Ramps
		2.4.3 Safety and access ladders, chutes, slides and guarding
Super structure 2.5 External envelope including roof finishes 2.6 Windows and ext doors	2.5 External envelope including roof finishes	2.5.1 External – opaque envelope
		2.5.2 External – full height glazing systems
		2.5.3 External – roof finishes/coverings
		2.5.4 External – safety systems
	2.6 Windows and ext doors	2.6.1 Windows – vertical
		2.6.2 Windows – roof or horizontal
2.6.3 External doors		
Super structure 2.7 Internal walls and partitions 2.8 Internal doors	2.7 Internal walls	2.7.1 Internal walls –solid
		2.7.2 Internal walls – non-structural glazed walls, windows and vision panels

#### Internal Finishes Old Categorisation:

3 Internal finishes	3.1 Wall finishes	3.1.1 Wall finishes
	3.2 Floor finishes	3.2.1 Finishes to floors
		3.2.2 Raised access floors
	3.3 Ceiling finishes	3.3.1 Finishes to ceilings
		3.3.2 False ceilings
		3.3.3 Demountable suspended ceilings

#### Internal Finishes New Categorisation:

3 Finishes	3.1 Wall finishes	3.1 Wall finishes
	3.2 Floor finishes	3.2.1 Raised access floor or specialist sprung floors
		3.2.2 Non-structural screed
		3.2.3 Floor finishes
3.3 Ceiling finishes	3.3 Ceiling finishes	

#### Fittings, Furnishings & Equipment Old Categorisation:

4 Fittings, furnishings and equipment	4.1 Fittings, furnishings and equipment	4.1.1 General fittings, furnishings and equipment
		4.1.2 Domestic kitchen fittings and equipment
		4.1.3 Special purpose fittings, furnishings and equipment
		4.1.4 Signs/notices
		4.1.5 Works of art

		4.16 Non-mechanical and non-electrical equipment
		4.17 Internal planting
		4.18 Bird and vermin control

### Fittings, Furnishings & Equipment New Categorisation:

4 FF&E	4 FF&E	4.1 General FF&E
		4.2 Kitchen equipment
		4.3 Special equipment
		4.4 Loose FF&E
		4.5 IT
		4.6 Audio and visual

### Services Equipment Old Categorisation:

5 Services equipment	5.1 Sanitary installations	5.1.1 Sanitary appliances
		5.1.2 Sanitary ancillaries
	5.2 Services equipment	5.2.1 Services equipment
	5.3 Disposal installations	5.3.1 Foul drainage above ground
		5.3.2 Chemical, toxic and industrial liquid waste disposal
		5.3.3 Refuse disposal
	5.4 Water installations	5.4.1 Mains water supply
		5.4.2 Cold water distribution
		5.4.3 Hot water distribution
		5.4.4 Local hot water distribution
	5.5 Heat source	5.5.1 Heat source
	5.6 Space heating and air conditioning	5.6.1 Central heating
		5.6.2 Local heating
		5.6.3 Central cooling
		5.6.4 Local cooling
		5.6.5 Central heating and cooling
		5.6.6 Local heating and cooling
		5.6.7 Central air conditioning
		5.6.8 Local air conditioning
	5.7 Ventilation systems	5.7.1 Central ventilation
		5.7.2 Local and special ventilation
		5.7.3 Smoke extract/control
	5.8 Electrical installations	5.8.1 Electric mains and sub-mains distribution
		5.8.2 Power installations
		5.8.3 Lighting installations
		5.8.4 Specialist lighting installations
		5.8.5 Local electricity generation systems
		5.8.6 Earthing and bonding systems
	5.9 Fuel installations	5.9.1 Fuel storage
		5.9.2 Fuel distribution systems

	5.10 Lift and conveyor installations	5.10.1 Lifts and enclosed hoists
		5.10.2 Escalators
		5.10.3 Moving pavements
		5.10.4 Powered stairlifts
		5.10.5 Conveyors
		5.10.6 Dock levellers and scissor lifts
		5.10.7 Cranes and unenclosed hoists
		5.10.8 Car lifts, car stacking systems, turntables and the like
		5.10.9 Document handling systems
		5.10.10 Other lift and conveyor installations
	5.11 Fire and lightning protection	5.11.1 Fire-fighting systems
		5.11.2 Fire suppression systems
		5.11.3 Lightning protection
	5.12 Communication, security and control systems	5.12.1 Communication systems
		5.12.2 Security systems
		5.12.3 Central control/building management systems
	5.13 Specialist installations	5.13.1 Specialist piped supply installations
		5.13.2 Specialist refrigeration systems
		5.13.3 Specialist mechanical installations
		5.13.4 Specialist electrical/electronic installations
5.13.5 Water features		
5.14 Builder's Work in Connection (BWIC) with Services	5.14.1 BWIC with services	

### Services Equipment New Categorisation:

5.1 Public Health	5.1.1 Sanitaryware	5.1.1 Sanitaryware
	5.1.2 Cold water systems	5.1.2.1 Cold water systems
		5.1.2.2 Cold water storage
	5.1.3 Drainage and rainwater	5.1.3.1 Surface water/rainwater/foul water drainage
		5.1.3.2 Water reuse systems
5.2 Heating, Ventilation and Cooling (HVAC)	5.2.1 Space heating and hot water	5.2.1.1 Heat & Hot water generation equipment
		5.2.1.2 Heat & hot water distribution, control, ancillaries, emitters, exchangers/ terminal units
		5.2.1.3 Heat storage equipment
	5.2.2 Dedicated cooling installations	5.2.2.1 Cooling generation equipment
	<i>(If the system does both</i>	

	<i>heating and cooling, include it in heating)</i>	5.2.2.2 Cooling emitter, exchangers/ terminal units, ancillaries and control, distribution, storage
	5.2.3 Air movement	5.2.3 Air movement
	5.2.4 Ventilation air terminals, ductwork and ancillaries, control dampers, attenuation, fire safety related to ventilation equipment	5.2.4.1 Air terminals
		5.2.4.2 Ductwork & ancilleries
		5.2.4.3 Control dampers, attenuation and fire safety related to ventilation equipment
5.3 Electrical installations	5.3.1 Lighting	5.3.1.1 Internal lighting
		5.3.1.2 External lighting (building mounted)
		5.3.1.3 Emergency lighting
		5.3.1.4 Other lighting
	5.3.2 Electrical services for power, communications, security, IT and fire detection	5.3.2.1 Electrical power
		5.3.2.2 ELV/ Communications/Security
		5.3.2.3 IT & Data
		5.3.2.4 BMS
		5.3.2.5 Electricity back up generation
		5.3.2.6 Fire detection & alarm
5.4 On site renewable energy generation	5.4.1 On site renewable energy generation	5.4.1.1 Renewable energy – electrical generation onsite and building mounted
		5.4.1.2 Renewable energy – storage onsite
5.5 Systems including Life safety, Fuel installations, Lift and conveyor installations, Services equipment Disposal installations, Specialist installations, Builders work in connection with services	5.5.1 Life safety	5.5.1.1 Sprinkler system
		5.5.1.2 Fire fighting systems
		5.5.1.3 Lightning protection/earth bonding
	5.5.2 Fuel installations	5.5.2 Fuel installations
	5.5.3 Lift and conveyor installations	5.5.2.2 Lift, stair lift, lifting platform
		5.5.2.3 Escalators and moving walkways
	5.5.4 Specialised and communal waste disposal	5.5.4 Specialised and communal waste disposal
	5.5.5 Specialist installations & maintenance	5.5.5 Specialist installations & maintenance
5.5.6 Builders work in connection with services	5.5.6 Builders work in connection with services	

### Prefabricated Buildings and Units Old Categorisation:

6 Prefabricated buildings and building units	6.1 Prefabricated buildings and building units	6.1.1 Complete buildings
		6.1.2 Building units
		6.1.3 Pods

### Prefabricated Buildings and Units New Categorisation:

6 Pre-fabricated buildings and units	6 Pre-fabricated buildings and building units	6 Pre-fabricated buildings and building units
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### Work to Existing Buildings Old Categorisation:

7 Work to existing building	7.1 Minor demolitions and alterations	7.1.1 Minor Demolitions and Alterations
	7.2 Repairs to existing services	7.2.1 Repairs to existing services
	7.3 Damp proof course/fungus and beetle eradication	7.3.1 Damp Proof Course/Fungus and Beetle Eradication
	7.4 Façade Retention	7.4.1 Façade Retention
	7.5 Cleaning Existing Surfaces	7.5.1 Cleaning Existing Surfaces
	7.6 Renovation work	7.6.1 Renovation Work

### Work to Existing Buildings New Categorisation:

7 Works to existing buildings	7 Works to existing buildings	7.1 Alterations
		7.2 Repairs to existing Cleaning existing surfaces General Renovation works
		7.3 Damp-proof courses/fungus and beetle eradication

### External Works Old Categorisation:

8 External works	8.1 Site preparation works	8.1.1 Site clearance
		8.1.2 Preparatory groundworks
	8.2 Roads, paths and pavings	8.2.1 Roads, paths and pavings
		8.2.2 Special surfacings and pavings
	8.3 Soft landscaping, planting and irrigation systems	8.3.1 Seeding and turfing
		8.3.2 External planting
		8.3.3 Irrigation systems
	8.4 Fencing, railings and walls	8.4.1 Fencing and railings
		8.4.2 Walls and screens
		8.4.3 Retaining walls
		8.4.4 Barriers and guardrails
	8.5 External fixtures	8.5.1 Site/street furniture and equipment

		8.5.2 Ornamental features
	8.6 External drainage	8.6.1 Surface water and foul water drainage
		8.6.2 Ancillary drainage systems
		8.6.3 External chemical, toxic and industrial liquid waste drainage
		8.6.4 Land drainage
	8.7 External services	8.7.1 Water mains supply
		8.7.2 Electricity mains supply
		8.7.3 External transformation devices
		8.7.4 Electricity distribution to external plant and equipment
		8.7.5 Gas mains supply
		8.7.6 Telecommunications and other communication system connections
		8.7.7 External fuel storage and piped distribution systems
		8.7.8 External security systems
		8.7.9 External/street lighting systems
		8.7.10 Local/district heating installations
	8.7.11 BWIC with external services	
8.8 Minor building works and ancillary buildings	8.8.1 Minor building works	
	8.8.2 Ancillary buildings and structures	
	8.8.3 Underpinning to external site boundary walls	

#### External Works New Categorisation:

	8.1 Roads, paths, pavings, surfaces Fencing, railings, walls External fixtures	8.1.1 Roads, paths, pavings, surfaces
		8.1.2 Fencing, railings, walls
		8.1.3 External fixtures
	8.2 Soft landscape, planting, irrigation	8.2 Soft landscape, planting, irrigation
	8.3 External drainage External services Minor building works	8.3.1 External drainage
		8.3.2 External services
		8.3.3 Minor building works, ancillary

#### Appendix 2 Categorisation for Infrastructure Projects

01 Demolition, site preparation and formation	01.010 Site survey and ground investigation
	01.020 Environmental treatment
	01.050 Demolition of existing structures and support to adjacent structures

	01.060 Site surface clearance (clearing, grubbing, topsoil stripping, tree felling, minor earthwork, removal)
	01.080 General site formation and slope treatment (including embankments/cuttings)
	01.090 Temporary surface drainage and dewatering
	01.110 Temporary protection, diversion & relocation of and connection to public utilities
	01.640 Excavation (of soft silt, peat, sands, gravels, clay, rock, etc.)
	01.650 Dredging (of soft silt, peat, sands, gravels, clay, rock, etc.)
	01.660 Special disposal and treatment of contaminated materials
	01.670 Reclamation or filling (with imported rock, concrete, or other hard materials)
02 Substructure	02.010 Embankments/cuttings
	02.020 Excavation, disposal and lateral supports (specifically to receive any substructure construction but excluding general site formation and slope treatment)
	02.025 Geotextile or other geomembranes
	02.030 Trenching/common trenches
	02.040 Drilling/boring
	02.050 Piling/anchoring
	02.060 Structural backfill/ground remediation
	02.070 Earth-retaining structures
	02.080 Abutments/wing walls
	02.090 Pile caps/footings/bases
	02.100 Sub-base to pavements and rail track structures
	02.110 Bases to supports for tanks, pipes, well heads, etc.
	02.120 Beds and surrounds to underground pipes
	02.600 Pile retaining walls (combi walls/H-pile walls/secant piled walls/sheet piled walls/gravity quay walls/relieving structures/pile supported structures/special types)
	02.610 Diaphragm walls
	02.620 Quays/docks/wharfs/moorings/piers/dry dock structure foundations
	02.630 Marine anchor systems
	02.640 Mooring dolphins
	02.650 Breakwaters (Cores/primary armour/secondary armour)
	02.660 Rock revetments/gabions
	02.670 Cofferdams
	02.680 Bank protection
03 Structure	03.010 Piers and towers
	03.020 Suspension system
	03.030 Decks

	03.040 Bearings
	03.050 Tunnel/shaft lining
	03.060 Roads/track bases
	03.070 Pavements
	03.080 Service roads and approaches
	03.090 Parapets/edge treatment
	03.100 Main structures
	03.105 Service stations and houses for district utility services
	03.110 Tanks, rigs, storage containers, etc.
	03.120 Supports for tanks, pipes, etc.
	03.130 Civil pipework
	03.140 Valves and fittings
	03.600 Seawalls
	03.610 Lake and river lining
	03.620 Prefabricated marine structures – off-site fabrication
	03.650 Slipways/gangways/linkways
	03.660 Dock and lock gates
	03.670 Pontoons
	03.680 Coastal protection systems
	03.690 Deck/surface structures (ground bearing or suspended concrete slabs)
	03.700 Locks and guidance structures
	03.710 Revetments
	03.720 Flood defences
	03.730 Navigational aids
	03.740 Dry docks structures
	03.750 Weirs
	03.760 Aqueducts
04 Non-structural works	04.010 Non-structural removal and alterations
	04.020 Non-structural construction
	04.030 Running surface
	04.040 Signage, markings, etc.
	04.050 Gantries, etc.
05 Services & equipment	05.005 District heating, ventilating and cooling systems
	05.010 Mechanical systems
	05.020 Lighting systems
	05.040 Low-voltage power supply
	05.050 Cables/cable trays
	05.060 Other electrical services
	05.070 Control systems and instrumentation
	• signalling systems
	• telecommunications systems
	05.080 Pipe racks / supports (localised)
	05.090 Water supply



	05.100 Refuse and waste disposal systems
	05.110 Fire services
	05.115 Gas services
	05.120 Movement systems: lifts/elevators/conveyors
	05.600 Boat lifts
	05.610 Cranes/rigs/rails
	05.620 Under water/sea service pipe installation
	05.630 Under water/sea electrical/data cabling
06 Surface and underground drainage	06.010 Surface water drainage
	06.020 Storm water drainage
	06.030 Foul and waste water drainage
	06.040 Pumping systems
07 External and ancillary works	07.010 Site enclosures and divisions
	07.020 Ancillary structures
	07.030 Roads and paving (not amounting to a separate project)
	07.040 Landscaping (hard and soft)
08 Preliminaries   Constructors' site overheads  <i>Temporary works</i>	08.020 Temporary access roads and storage areas, traffic management and diversion
	08.025 Temporary concrete batching yard, precast concrete casting yard
	08.030 Temporary site fencing and securities
	08.045 Bespoke plant and equipment - specifically fabricated for the project e.g. Tunnel Boring Machines (TBMs), ships/barges/vessels, floating cranes, dredgers and drill rigs, cofferdams, caissons, etc.)
	08.055 Workpeople living accommodation
	08.060 Other temporary facilities and services
12 Production and loose furniture, fittings and equipment	12.020 Fixed production, process and operating furniture, fittings and equipment installed before completion

### Appendix 3 Default Parameters for Transport Distances, End of Life Treatments, and Product Lifespans

Transport scenario (both road and sea to be used)	km by road*	km by sea**
Locally manufactured (ready-mixed concrete)	20	-
Locally manufactured (general), e.g. aggregate, earth, asphalt	50	-
Regionally manufactured, e.g. plasterboard, blockwork, insulation, carpet, glass	80	-
Nationally manufactured, e.g. structural timber, structural steelwork, reinforcement, precast concrete	120	-

European manufactured, e.g. cross-laminated timber (CLT), facade modules	1,500	100
Globally manufactured, e.g. specialist stone cladding	500	10,000

Table 4: Default transport distances for UK-based projects

Material/product	WR (waste rate)
Concrete in situ	5%
Concrete precast (floor, beams and frames)	1%
Concrete (sprayed)	10%
Steel reinforcement	5%
Steel frame (beams, columns, braces)	1%
Concrete blocks (lightweight AAC)	10%
Concrete blocks (dense/medium density)	5%
Brickwork (clay)	6%
Stone (cladding)	5%
Stone (landscaping)	10%
Mortar and render (internal and external)	4%
Screed	8%
Floor finish (tile)	6%
Floor finish (carpet)	6%
Timber frames (beams, columns, joists, braces)	2%
Timber floors (boards)	10%
Timber formwork	10% (in addition to end-of-life usage rates, see section 4.11.1)
Aluminium sheet	1%
Aluminium extruded profiles/frames	1%
Plasterboard	4%
Insulation	7%
Aggregate	10%
Glass	1%
Coatings (paint, intumescent coatings)	6%
Sprayed cementitious fire protection to steel	10%
Asphalt	6%
Bitumen	6%
Roof cladding	5%

Table 5: Default waste rates

Material	Details	Reuse	Recycling	Incineration with/ without energy from waste	Disposal (landfill and losses)
Concrete	Cast in situ	0%	97.50%	0%	2.50%
	Precast[2]	<1%	96.50%	0%	2.50%
Steel	Hot-rolled structural sections, including plate and tubes	7%	93%	0%	0%
	Light gauge galvanised steelwork, e.g. studwork, cladding framing	5%	93%	0%	2%
	Piles (sheet or bearing)	15%	71%	0%	14%
	Rebar	0%	98%	0%	2%
Masonry	Blockwork	0%	97.50%	0%	2.50%
	Brickwork	<1%	97.50%	0%	2.50%
Timber	Solid timber (untreated, uncoated)	<1%	78%	20%	1%
	Treated, coated timber (non-hazardous)	0%	30%	69%	1%
	Engineered timber (CLT, glulam, etc.)	5%	35%	59%	1%
	Wood-panel products	0%	0%	99%	1%
Aluminium	Sheet	0%	96%	0%	4%
	Profile	<1%	96%	0%	4%
Plasterboard	General	<1%	17%	0%	83%
Glass	All types	0%	61%	0%	39%
Plastics	All types	0%	0%	100%	0%
Coatings	Paints, intumescent coatings, cementitious sprays	0%	0%	0%	100%
Insulation	Mineral-based		<1%		99%
	Hydrocarbon-based			95%	5%
	Biobased			95%	5%
Asphalt	All types	0%	97.50%	0%	2.50%
Unbound aggregate	All types	0%	97.50%	0%	2.50%
Soils	Includes topsoil and inert non-hazardous earth	0%	97.50%	0%	2.50%

MEP equipment	Heat-generation equipment	0%	70%	0%	30%
	Pipes	0%	90%	0%	10%
	Lights	0%	45%	0%	55%
	Ventilation system	0%	40%	0%	60%
	Radiators	0%	80%	0%	20%
	Wire cables	0%	50%	0%	50%

Table 6: Default end-of-life scenarios

Building part	Building elements/components	Expected lifespan
Substructure	Piling and foundations Lowest ground floor	60 years (or building lifespan)
Superstructure: frame, upper floor and roof structure	Structural elements, e.g. columns, walls, beams, upper floor and roof structure	60 years (or building lifespan)
Facade	Opaque modular cladding: Rain screens, timber panels Brick, stone, block and precast concrete panels	30 years 60 years
	Glazed cladded/curtain walling	35 years
	Windows and external doors: Hardwood/steel/aluminium windows Doors	30 years 20 years
Roof	Roof covering: Single-ply membrane Standing seam metal Tiles, clay and concrete	30 years 30 years 60 years
Superstructure	Internal partitioning and dry lining: Studwork Blockwork	30 years 60 years
Finishes	Wall finishes: Render/paint	30/5 years respectively
	Floor finishes: Carpet/vinyl Stone tiles Raised access floor (RAF) pedestal/tile	7 years 25 years 50/30 years respectively
	Ceiling finishes: Substrate/paint Suspended grid (ceiling system)	10 years 25 years
FF&E	Loose furniture and fittings	10 years
Services/MEP	Heat source, e.g. boilers, calorifiers	20 years
	Heat source, e.g. heat pumps (except ground source)	15 years (20 years)
	Space heating and air treatment	20 years

	Central cooling systems (cooling only), e.g. fan coil systems, variable air volume, variable refrigerant volume	15 years
	Ductwork: Galvanised Plastic or flexible	40 years 15 years
	Electrical installations	30 years
	Lighting fittings	15 years
	Communications installations and controls	15 years
	Water and disposal installations	25 years
	Rainwater harvesting and grey water collection	30 years
	Sanitaryware	20 years
	Lift and conveyor installations	20 years
Hard landscaping	Asphalt Concrete and stone paving Timber decking	35 years 60 years 15 years

Table 7: Indicative component lifespans

#### Appendix 4 Decarbonisation Scenarios for Embodied Impacts

Module	Year of RSP		Decarbonisation Scenario
	Buildings	Infrastructure	
A0–A5	Year 0	Year 0	No decarbonisation.
B1.1 (emissions and removals from materials)	0–60	0–120	No decarbonisation.
B1.2 (fugitive refrigerant emissions)	0–60	0–120	50% decarbonisation for all predicted impacts.
B2–B4	0–60	0–120	50% decarbonisation for all predicted impacts.
B5 (excluding biogenic carbon)	0–30	0–30	Decarbonisation % based on 1.66 x year of performance change for all predicted impacts (e.g. 16.6% if planned change occurs in year 10).
B5 (excluding biogenic carbon)	30–60	30–120	50% decarbonisation for all predicted impacts.
B5 (biogenic carbon only)	0–60	0–120	No decarbonisation.
C1–C2	Year 60	Year 120	50% decarbonisation for all predicted impacts.
C3–C4	Year 60	Year 120	No decarbonisation.
D1	Year 60	Year 120	50% decarbonisation for all predicted impacts.

Table 8: Embodied impact decarbonisation scenarios