Technical Submittal – Concrete Mix Design

Project Name & Number:	Project Olympus MCL3111
Document Reference:	LCY11-KTB-ZZ-XX-TS-C-00005
Revision:	P01
Purpose Of Issue	S5 - Suitable for Review and Acceptance

Document Control Sheet

Rev.	Status	Date	Revision Note	Author	Approver
P01	S5	14-02-25	First Isse	GS	GS

Technical Submittal Information: (to be completed by Sub-Contractor)

Sub-Contractor:	Keltbray
Works Package Number:	
Description:	Piled Foundation Concrete Mix Design
Associated Specification Reference(s):	LCY10-CDL-XX-XX-SP-GE-50001
Associated Drawing Number(s):	LCY11-BGL-B1-BF-DR-S-30220 LCY11-BGL-B1-BF-DR-S-30221 LCY11-BGL-B1-XX-DR-S-01005 LCY11-BGL-B1-XX-DR-S-01006 LCY11-BGL-B1-XX-DR-S-01007
Manufacturer(s):	Capital Concrete
Material:	Concrete
Size:	20mm
Type:	
Model Number:	
Manufacture Process:	Plant Wet Batched
Area/Location for installation:	Piled Foundation Building 1,2 & 3
Finish/Texture/Pattern/Print:	n/a
Colour:	n/a
Other/Comments:	

Sustainability Information:

Item		**Included (Y / N / N/A) & Comments**
Responsible Sourcing Certification	**Environmental Product Declaration**	Yes
	TM65 Calculation	no
	BES6001	Yes
	ISO14001	Yes
	CARES	n/a
Product Information	**A1-A3 emissions in tCO2e/t or m3**	Yes
	Recycled Content Percentage	Yes
	VOCs Levels	n/a

Please Note:

1. *Index – detailing everything within the technical submittal*
2. *Technical compliance check against schedule and specification of equipment and data sheet (if CDE log not included)*
3. *Project Specific supplier Data Sheets (not maintenance documentation or sales brochure)*
4. *detailed drawings of the equipment if required*
5. *CDE log completed where required*

If relevant points have not been addressed, the Submittal will be QA Rejected.

PROPOSED CONCRETE MIX COMPOSITION

Date : February 14, 2025

Our Ref: 109344

Rev: 005

Keltbray Built Environment Ltd

St Andrews House
Portsmouth Road
Esher
KT10 9TA

Capital Concrete

Brett House
St Michael's Close
Aylesford
Kent
ME20 7XE

Tel: 0203 974 0520

For the attention of:

Delivery Address: Project Olympus North Woolwich Rd
E16 2AB

Supplying Plant: Silvertown

All mixes in accordance with BS 8500-2 (except proprietary mixes) unless otherwise agreed. Batch weights of materials calculated on a SSD basis for 1.0m3 of fresh compacted concrete. Mixes are quality controlled and actual mix proportions may vary in response to control systems.

CONCRETE SPECIFICATION			
BP1 C40	Mix no:	DC Class: DC4	CL Class: 0.4
Cement Type: CIIIA+SR	Max Agg: 20mm	Min. Cement: 380	W/C Ratio: 0.35
Slump: S4	Total Embodied CO2 kg per m3 241.24		

SSD MIX DESIGN PER CUBIC METRE				
Material	Source / Supplier		Quantity	Units
CEMI	TUDELA	Used where early strength required, ie Working test piles and anchors, tower crane piles. Increased strength has no impact on pile performance.	238	kg
GGBS	Tudela GGBS		238	kg
4/20mm Gravel	Cliffe Brett		594	kg
4/10mm Gravel	Cliffe Brett		251	kg
Sand 0/4	Cliffe Brett		845	kg
Water	Water		165	li
Superplasticiser	SikaVF3400		2,138	ml

W/C Ratio: 0.35	Alk Kg: 1.77	Cl% 0.16	SO4%: 1.76

Notes:

CONCRETE SPECIFICATION			
BP2(56days)LC40	Mix no:	DC Class: DC4	CL Class: 0.4
Cement Type: CIIIB+SR	Max Agg: 20mm	Min. Cement: 380	W/C Ratio: 0.45
Slump: S4	Total Embodied CO2 kg per m3 143.00		

SSD MIX DESIGN PER CUBIC METRE				
Material	Source / Supplier		Quantity	Units
CEMI	TUDELA	Main bearing pile mix, McLaren confirmed piles not loaded until 11-12 weeks after piles installed. Steel work erection generally follows pile installation sequence.	122	kg
GGBS	Tudela GGBS		284	kg
4/20mm Gravel	Cliffe Brett		627	kg
4/10mm Gravel	Cliffe Brett		265	kg
Sand 0/4	Cliffe Brett		907	kg
Water	Water		160	li
SikaVF3400	SikaVF3400		2,025	ml

W/C Ratio: 0.40	Alk Kg: 1.19	Cl% 0.20	SO4%: 1.12

Notes:

The Company reserves the right to vary the mix design details given above subject to production demands and quality control requirements. No variation will be made below specified minimum cement contents or above specified maximum free w/c ratios. Aggregates are a natural product and therefore may contain natural defects such as lignite and pyrities.

Jack Sindhu
Technical Manager

14 February 2025 13:00

THE QUALITY SCHEME FOR READY MIXED CONCRETE 009

PROPOSED CONCRETE MIX COMPOSITION

Date : February 14, 2025

Our Ref: 109344

Rev: 005

Keltbray Built Environment Ltd

St Andrews House
Portsmouth Road
Esher
KT10 9TA

Capital Concrete

Brett House
St Michael's Close
Aylesford
Kent
ME20 7XE

Tel: 0203 974 0520

For the attention of:

Delivery Address: Project Olympus North Woolwich Rd
E16 2AB

Supplying Plant: Silvertown

All mixes in accordance with BS 8500-2 (except proprietary mixes) unless otherwise agreed. Batch weights of materials calculated on a SSD basis for 1.0m3 of fresh compacted concrete. Mixes are quality controlled and actual mix proportions may vary in response to control systems.

Notes:

CONCRETE SPECIFICATION			
BP1 B C40 DC4	Mix no:	DC Class: DC4	CL Class: 0.4
Cement Type: CIVB-V	Max Agg: 20mm	Min. Cement: 380	W/C Ratio: 0.40
Slump: S4	Total Embodied CO2 kg per m3 251.66		

SSD MIX DESIGN PER CUBIC METRE			
Material	Source / Supplier	Quantity	Units
CEMI	TUDELA	270	kg
PFA	PFA Zonguldak Main bearing pile backup mix in case of supply issues with GGBS	180	kg
4/10mm Gravel	Cliffe Brett	258	kg
4/20mm Gravel	Cliffe Brett	602	kg
Sand 0/4	Cliffe Brett	860	kg
Water	Water	165	li
SikaVF3400	SikaVF3400	2,450	ml

W/C Ratio: 0.37	Alk Kg: 1.95	Cl% 0.17	SO4%: 2.05

Notes:

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Jack Sindhu
Technical Manager

14 February 2025 13:00

THE QUALITY SCHEME FOR READY MIXED CONCRETE 009

PROPOSED CONCRETE MIX COMPOSITION

Date : February 14, 2025

Our Ref: 109344

Rev: 005

Keltbray Built Environment Ltd

St Andrews House
Portsmouth Road
Esher
KT10 9TA

For the attention of:

Delivery Address: Project Olympus North Woolwich Rd
E16 2AB

Supplying Plant: Silvertown

Capital Concrete

Brett House
St Michael's Close
Aylesford
Kent
ME20 7XE

Tel: 0203 974 0520

All mixes in accordance with BS 8500-2 (except proprietary mixes) unless otherwise agreed. Batch weights of materials calculated on a SSD basis for 1.0m3 of fresh compacted concrete. Mixes are quality controlled and actual mix proportions may vary in response to control systems.

CONCRETE SPECIFICATION			
P50 BACKFILL	Mix no:	DC Class:	CL Class:
Cement Type: CEMI	Max Agg: SANDCEMmm	Min. Cement:	W/C Ratio:
Slump: F5	Total Embodied CO2 kg per m3 50.96		

SSD MIX DESIGN PER CUBIC METRE			
Material	Source / Supplier	Quantity	Units
CEMI	TUDELA Coring Back fill mix	50	kg
Sand 0/4	Cliffe Brett	1,441	kg
Water	Water	225	li
Sika Air Pak	SIKA AIR PAK	0.38	kg
Betocarb 80ST	Betocarb 80ST	50	kg
SikaVF3400	SikaVF3400	1,600	ml

W/C Ratio: 4.58	Alk Kg: .70	Cl% 0.121	SO4%: 3.61

The Company reserves the right to vary the mix design details given above subject to production demands and quality control requirements. No variation will be made below specified minimum cement contents or above specified maximum free w/c ratios. Aggregates are a natural product and therefore may contain natural defects such as lignite and pyrities.

Jack Sindhu
Technical Manager

14 February 2025 13:00

THE QUALITY SCHEME FOR READY MIXED CONCRETE 009

Certificate of Registration

QSRMC

2025

Capital Concrete Ltd

Eclipse House, Eclipse Park, Maidstone, Kent ME14 3EN

Ready mixed concrete *produced from the above Company's plants is certified to conform to the QSRMC Quality and Product Conformity Regulations, with the associated quality management system further certified to conform to the requirements of BS EN ISO 9001. The QSRMC Regulations require ready mixed concrete to be compliant with the relevant parts of BS EN 206 and BS 8500 and/or the requirements of the specifier/user. Product conformity certificates are awarded on the basis of an assessment of conformity control systems and process control covering contract review, product design, production facilities, quality control systems and testing of the product, all coupled with assessment of the supporting quality management system. QSRMC is accredited by UKAS for certification in respect of Product Conformity and Quality Management Systems (ISO/IEC 17065 and ISO/IEC 17021-1). This Certificate is issued within the scope of QSRMC's accreditation.*

Registration No: M 006/04

Shane Edwards
Chief Executive

Date Authorised: 1 January 2025

THIS CERTIFICATE IS VALID FROM 1 JANUARY 2025 TO 31 DECEMBER 2025

subject to continued compliance with the QSRMC Regulations as confirmed by routine assessment Confirmation of the current status of Certification may be obtained by enquiry to the QSRMC Central Records Office

Please note that certificates are reissued annually.

Date of first registration: 01/10/2018

The Quality Scheme for Ready Mixed Concrete

1 Mount Mews
High Street, Hampton
Middlesex TW12 2SH
Telephone: 020 8941 0273
www.qsrmc.co.uk

UKAS PRODUCT CERTIFICATION 009

UKAS MANAGEMENT SYSTEMS 009

Certificate of Conformity

QSRMC

2025

CAPITAL CONCRETE LTD

CERTIFICATED LOCATION:

SILVERTOWN

Peruvian Wharf, North Woolwich Road, Silvertown, London E16 2AB

Ready mixed concrete *produced by the above plant is certified to conform to the QSRMC Quality and Product Conformity Regulations, with the associated quality management system further certified to conform to the requirements of BS EN ISO 9001. The QSRMC Regulations require ready mixed concrete to be compliant with the relevant parts of BS EN 206 and BS 8500 and/or the requirements of the specifier/user. Product conformity certificates are awarded on the basis of an assessment of conformity control systems and process control covering contract review, product design, production facilities, quality control systems and testing of the product, all coupled with assessment of the supporting quality management system. QSRMC is accredited by UKAS for certification in respect of Product Conformity and Quality Management Systems (ISO/IEC 17065 and ISO/IEC 17021-1). This Certificate is issued within the scope of QSRMC's accreditation.*

Plant Registration No: PR 03583

Shane Edwards
Chief Executive

Date Authorised: 1 January 2025

THIS CERTIFICATE IS VALID FROM 1 JANUARY 2025 TO 31 DECEMBER 2025

subject to continued compliance with the QSRMC Regulations as confirmed by routine assessment Confirmation of the current status of Certification may be obtained by enquiry to the QSRMC Central Records Office

This plant forms part of a multi-site certification. The validity of this certificate depends on the validity of the Capital Concrete Ltd main certificate number M 006

The Quality Scheme for Ready Mixed Concrete

1 Mount Mews
High Street, Hampton
Middlesex TW12 2SH
Telephone: 020 8941 0273
www.qsrmc.co.uk

UKAS PRODUCT CERTIFICATION 009

UKAS MANAGEMENT SYSTEMS 009

Certificate of Conformity

QSRMC

2025

CAPITAL CONCRETE LTD

CERTIFICATED LOCATION:

BOW

7-9 Chapman Road, Bow, Greater London E9 5DW

Ready mixed concrete *produced by the above plant is certified to conform to the QSRMC Quality and Product Conformity Regulations, with the associated quality management system further certified to conform to the requirements of BS EN ISO 9001. The QSRMC Regulations require ready mixed concrete to be compliant with the relevant parts of BS EN 206 and BS 8500 and/or the requirements of the specifier/user. Product conformity certificates are awarded on the basis of an assessment of conformity control systems and process control covering contract review, product design, production facilities, quality control systems and testing of the product, all coupled with assessment of the supporting quality management system. QSRMC is accredited by UKAS for certification in respect of Product Conformity and Quality Management Systems (ISO/IEC 17065 and ISO/IEC 17021-1). This Certificate is issued within the scope of QSRMC's accreditation.*

Plant Registration No: PR 03566

Shane Edwards
Chief Executive

Date Authorised: 1 January 2025

THIS CERTIFICATE IS VALID FROM 1 JANUARY 2025 TO 31 DECEMBER 2025

subject to continued compliance with the QSRMC Regulations as confirmed by routine assessment Confirmation of the current status of Certification may be obtained by enquiry to the QSRMC Central Records Office

This plant forms part of a multi-site certification. The validity of this certificate depends on the validity of the Capital Concrete Ltd main certificate number M 006

The Quality Scheme for Ready Mixed Concrete

1 Mount Mews
High Street, Hampton
Middlesex TW12 2SH
Telephone: 020 8941 0273
www.qsrmc.co.uk

UKAS PRODUCT CERTIFICATION 009

UKAS MANAGEMENT SYSTEMS 009

Certificate of Conformity

CPC
Construction
Products
Certification

Responsible Sourcing of Construction Products

Construction Products Certification certifies that

Ready Mixed Concrete

produced and supplied by

Capital Concrete Ltd

Eclipse House, Eclipse Park, Maidstone, Kent ME14 3EN

from its production plants

listed on the attached schedule

conforms to the following standard:

BES 6001:Issue 3.1
Framework Standard for Responsible Sourcing

with a Performance Rating of

Very Good

★★★

Certificate No: CPRS 00058 Issue No 7

Colin Head
Chief Executive

Date Authorised: 9 April 2024
Date of issue of first certificate: 1 October 2018

THIS CERTIFICATE IS VALID FROM 9 APRIL 2024 TO 31 DECEMBER 2025

subject to continued compliance with the above standard as confirmed by routine surveillance. Confirmation of the current validity status of Certification may be obtained by enquiry to the CPC Central Records Office or by reference to BRE's Green Book Live website: www. greenbooklive.com

This Responsible Sourcing certification has been carried out under licence using BRE's Responsible Sourcing scheme methodology, scheme documentation and underpinning processes

1 Mount Mews
High Street, Hampton
Middlesex TW12 2SH
Telephone: 020 8481 9640
Facsimile: 020 8979 4558
www.qsrmc.co.uk

Certificate of Conformity

CPC
Construction
Products
Certification

Appendix 1 to Certificate No CPRS 00058 Issue No: 8

Capital Concrete Ltd

Eclipse House, Eclipse Park, Maidstone, Kent ME14 3EN

Scoring Table

Section		Score					
		1	2	3	4	5	Bonus
3.2.1	Responsible sourcing policy	C					
3.2.2	Legal compliance	C					
3.2.3	Quality management system	C					
3.2.4	Supplier management system	C					
3.3.1	Material traceability through supply chain	C					
3.3.2	EMS in the supply chain	C					
3.3.3	H&SMS in the supply chain	C					
3.4.1	Greenhouse gas emissions	C					
3.4.2	Energy management						
3.4.3	Resource use	C					
3.4.4	Waste prevention and management	C					
3.4.5	Water abstraction	C					
3.4.6	Life cycle assessment (LCA)	C					
3.4.7	Ecotoxicity						
3.4.8	Transports impacts	C					
3.4.9	Employment and skills	C					
3.4.10	Local community engagement	C					
3.4.11	Business ethics						

	Key		Points Scored
			Possible maximum clause score
		C	Compulsory

	Total Section Score	C+	Sections 3.2 and 3.3	**13**
		C+	Section 3.4	**28**
	Overall Rating		**Very Good**	

In accordance with the scheme requirements, CPC must be notified of any changes in circumstances so that the certification details can be amended.

Colin Head
Chief Executive

Date Authorised: 9 April 2024
Date of issue of first certificate: 1 October 2018

THIS CERTIFICATE IS VALID FROM 9 APRIL 2024 TO 31 DECEMBER 2025

subject to continued compliance with the above standard as confirmed by routine surveillance. Confirmation of the current validity status of Certification may be obtained by enquiry to the CPC Central Records Office or by reference to BRE's Green Book Live website: www. greenbooklive.com

1 Mount Mews
High Street, Hampton
Middlesex TW12 2SH
Telephone: 020 8481 9640
Facsimile: 020 8979 4558
www.qsrmc.co.uk

Schedule to Certificate No CPRS 00058 Issue No: 8

Capital Concrete Ltd

Eclipse House, Eclipse Park, Maidstone, Kent ME14 3EN

Manufacturing Plants Table

Plant	*Address*	*Postcode*
BOW	7-9 Chapman Road, Bow, London	E9 5DW
CRICKLEWOOD	Cricklewood Railway Yard, 400 Edgware Road, Cricklewood, London	NW2 6ND
CROYDON	Endeavour Way, Beddington Farm Road, Croydon, Surrey	CR0 4XB
ENFIELD	Jeffreys Road, Enfield, Middlesex	EN3 7UA
FELTHAM	Falcon Way Trading Estate, Feltham, Middlesex	TW14 0UQ
RAINHAM	Launders Lane, Rainham, Essex	RM13 9GS
ROMFORD	Hainault Road, Little Heath, Romford, Essex	RM6 5SS
SILVERTOWN	Peruvian Wharf, North Woolwich Road, Silvertown, London	E16 2AB
STAINES	Queen Mary Quarry, Ashford Road, Laleham, Middlesex	TW18 1QF
WEMBLEY	Neasden Rail Siding, The Rail Yard, Drury Way, Neasden, London	NW10 0JJ

Certificate of Conformity

CPC
Construction
Products
Certification

Brett Group

Robert Brett House, Ashford Road
Canterbury, Kent CT4 7PP

The Occupational Health and Safety Management System in operation at the above location for the following scope of activities:

Provision of Occupational Health and Safety Management Services, with ancillary support services from I.S, SHE, to the Brett Group of Companies

is certified to conform to the following management system standard:

BS ISO 45001:2018

This Certificate is issued within the scope of the UKAS accreditation of CPC

Certificate No: CP OHS 00025 – Issue 3

Colin Head
Chief Executive

Date Authorised: 19 December 2023
Date of original certificate: 1 January 2019

THIS CERTIFICATE IS VALID FROM 1 JANUARY 2024 TO 31 DECEMBER 2026

subject to continued compliance with the above standard as confirmed by routine surveillance. Confirmation of the current status of Certification may be obtained by enquiry to the CPC Central Records Office.

1 Mount Mews
High Street, Hampton
Middlesex TW12 2SH
Telephone: 020 8481 9640
Facsimile: 020 8979 4558
www.qsrmc.co.uk

UKAS MANAGEMENT SYSTEMS
009

Certificate of Registration

QSRMC

2024

Capital Concrete Ltd

Eclipse House, Eclipse Park, Maidstone, Kent ME14 3EN

Ready mixed concrete *produced from the above Company's plants is certified to conform to the QSRMC Quality and Product Conformity Regulations, with the associated quality management system further certified to conform to the requirements of BS EN ISO 9001. The QSRMC Regulations require ready mixed concrete to be compliant with the relevant parts of BS EN 206 and BS 8500 and/or the requirements of the specifier/user. Product conformity certificates are awarded on the basis of an assessment of conformity control systems and process control covering contract review, product design, production facilities, quality control systems and testing of the product, all coupled with assessment of the supporting quality management system. QSRMC is accredited by UKAS for certification in respect of Product Conformity and Quality Management Systems (ISO/IEC 17065 and ISO/IEC 17021-1). This Certificate is issued within the scope of QSRMC's accreditation.*

Registration No: M 006/04

Colin Head
Chief Executive

Date Authorised: 9 April 2024

THIS CERTIFICATE IS VALID FROM 9 APRIL 2024 TO 31 DECEMBER 2024

subject to continued compliance with the QSRMC Regulations as confirmed by routine assessment Confirmation of the current status of Certification may be obtained by enquiry to the QSRMC Central Records Office

Please note that certificates are reissued annually.

Date of first registration: 01/10/2018

The Quality Scheme for Ready Mixed Concrete

1 Mount Mews
High Street, Hampton
Middlesex TW12 2SH
Telephone: 020 8941 0273
www.qsrmc.co.uk

UKAS PRODUCT CERTIFICATION 009

UKAS MANAGEMENT SYSTEMS 009

ENVIRONMENTAL PRODUCT DECLARATION

as per /ISO 14025/ and /EN 15804/

Owner of the Declaration	British Ready-Mixed Concrete Association
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-RMC-20180095-CBG1-EN
Issue date	24/08/2018
Valid to	23/08/2023

UK manufactured generic ready-mixed concrete

Produced by members of the British Ready-Mixed Concrete Association (BRMCA) part of the Mineral Products Association (MPA)

www.ibu-epd.com / https://epd-online.com

Institut Bauen und Umwelt e.V.

mpa essential materials sustainable solutions

brmca

General Information

British Ready-mixed Concrete Association

Programme holder
IBU - Institut Bauen und Umwelt e.V.
Panoramastr. 1
10178 Berlin
Germany

Declaration number
EPD-RMC-20180095-CBG1-EN

This Declaration is based on the Product Category Rules:
Concrete components made of in-situ or ready-mixed concrete, 07.2014
(PCR tested and approved by the SVR)

Issue date
24/08/2018

Valid to
23/08/2023

Prof. Dr.-Ing. Horst J. Bossenmayer
(President of Institut Bauen und Umwelt e.V.)

Dipl. Ing. Hans Peters
(Managing Director IBU)

Generic Ready-Mixed Concrete

Owner of the Declaration
BRMCA
Gillingham House,
38-44 Gillingham Street,
London, SW1V 1HU

Declared product / Declared unit
1m³ of generic ready-mixed concrete.

Scope:
This is an association declaration which uses manufacturing data covering 93% of production from member companies of the British Ready-Mixed Concrete Association and a defined mix design to form an average 1m³ of generic ready-mixed concrete. It is based on data covering a period of 12 months (From January to December 2015). All data was collected from UK factories.

The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

Verification

The CEN Norm /EN 15804/ serves as the core PCR
Independent verification of the declaration according to /ISO 14025/
☐ internally ☒ externally

Mr Carl-Otto Neven
(Independent verifier appointed by SVR)

Product

Product description / Product definition
The product is a generic 1 m³ of ready-mixed concrete, where the constituent proportions are 310 kg of cementitious material, 1915 kg of natural aggregate, 137 litres of mains water, 2 litres of recycled water and 1.6 litres of a chemical admixture. The fresh wet density is a representative 2380 kg/m³. With many sources of cementitious materials and natural aggregates this generic concrete can be assumed to be at a consistence class not less than S3 and strength class not less than C30/37. Due to the wide variation of cements and natural aggregates available throughout the UK confirmation of consistence and strength class for any concrete should be confirmed by the producer before supply.

Ready-mixed concrete is made by mixing coarse and fine aggregates, cement and water in controlled proportions. Chemical admixtures are used to reduce water content and improve fresh and hardened concrete properties. Delivered to site on a just-in-time basis, ready-mixed concrete may be cast into any conceivable shape with almost no limit on volume. When hardened, concrete can carry substantial compressive loads by itself, but is more frequently reinforced to substantially increase its tensile and flexural strength.

Concrete to /EN 206/ and /BS 8500/ is not covered by the EU Construction Products Regulation. For the use and application of the concrete in the UK refer to /BS 8500/ *Concrete – Complementary British Standard to /BS EN 206/*

Application
Nearly all foundations, floors and the majority of building structures are made of concrete. Concrete is also often key to the architecture of our buildings, contributing greatly to their energy efficiency and visual appeal.

Technical Data
Concrete is specified and supplied in accordance with /BS 8500-2/ and /BS EN 206/.

Constructional data

Name	Value	Unit
Thermal conductivity	1.6	W/(mK)
Gross density	2380	kg/m³
Characteristic compressive strength, cube/cylinder	30/37	MPa
Characteristic tensile strength	2.9	MPa
Modulus of elasticity	33	GPa

Concrete to /EN 206/ and /BS 8500/ is not covered by the EU Construction Products Regulation. Concrete is supplied in accordance with the project specification and the appropriate requirements of /EN 206/ and /BS 8500/. Third party product conformity certification is recommended but any requirement is at the discretion of the specifier. Concrete to /EN 206/ and /BS 8500/ is not subject to CE Marking.

Base materials / Ancillary materials
The concrete constituent proportions used to generate this EPD are:
CEM I - 200kg
GGBS - 95kg
Fly Ash - 15kg
Natural aggregate - 1915kg
Water – 139 litres
Chemical admixture - 1.55kg
These values represent a generic factory produced ready mixed concrete. The composition of products complying with the EPD will vary depending on client specification and application. More detailed information is available in the respective manufacturer's documentation (e.g. product data sheets).
No /REACH/ substances of very high concern are included.

Reference service life
For most common applications and with suitable design and execution the service life of concrete is normally assumed to be not less than fifty years but may be 100 years or more. Requirements for durability in the UK, for either not less than 50 or not less than 100 years, are set out in /BS 8500-1/ Annex A.

The reference service life is declared as 100 years.

Packaging

Ready-mixed concrete is supplied without packaging.

LCA: Calculation rules

Declared Unit
The product is a generic 1 m³ of ready-mixed concrete, comprising 310 kg of cementitious material, 1915 kg of natural aggregate, 137 litres of mains water, 2 litres of recycled water and 1.6 litres (1.55 kg) of chemical admixture. The fresh wet density is a representative 2380 kg/m³.

Declared unit

Name	Value	Unit
Density (mean value)	2380	kg/m³
Declared unit	1	m³
Declared unit	2.38	t

System boundary
Type of EPD: Cradle to Gate with all options declared. The modules considered in the Life Cycle Assessment are modules A1-C4 inclusive.

Environment and health during manufacturing
Members of the BRMCA have formal Environmental Management Systems to put in place environmental protection measures which extend beyond national guidelines.

Cut-off criteria
/EN 15804/ requires that where there are data gaps or insufficient input data for a unit process the cut-off criteria shall be 1% of renewable and non-renewable primary energy usage and 1% of the total mass of this unit process. The total neglected flows from a product stage must be no more than 5% of product inputs by mass or 5% of primary energy contribution.
In this assessment, all information gathered from data collection for the production of concrete has been modelled, i.e. all raw materials used, the electrical energy and other fuels used, use of ancillary materials and all direct production waste. Transport data on input and output flows are also considered. Scenarios have been developed to account for downstream processes such as fabrication, installation, demolition and waste treatment. No cut-offs have been made. Hence this study complies with the cut-off criteria defined in the /PCR/.

Background data
Background data is based primarily on a generic dataset /GaBi ts 2014 software database/ integrated into the IBU verified bespoke British Precast Envision EPD tool. The background data also includes UK specific cement data supplied by members of the Mineral Products Association (MPA). (Tool Verified 07/03/17).

Allocation
All allocation is performed according to the /PCR/. As no co-products are produced, the flow of materials and energy and also the associated release of substances and energy into the environment are related exclusively to the concrete produced.

Comparability
Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to /EN 15804/ and the building context, respectively the product-specific characteristics of performance, are taken into account.
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LCA: Scenarios and additional technical information

The following information supports the declaration of modules A1-B1 and C1-C4 inclusive.

Transport to the building site (A4)

Name	Value	Unit
Transport distance	12	km
Capacity utilisation (including empty runs)	50	%

Installation into the building (A5)

Name	Value	Unit
Material loss	3	%

This EPD contains an allowance of 3% to represent the average difference between ready□mixed concrete delivered and that accounted for in the permanent works. This difference may be due to the reliability of measurement, the use of surplus concrete as extra blinding or fill, or comprise inert material recovered from chute washing and invariably incorporated somewhere into the works. This material is not waste but it may be colloquially identified as wastage by the contractor.

Use or application of the installed product (B1)
In practice, given the nature of the product and its application in the structure of the building, no impacts are associated with the use stage of concrete over the lifetime of the building. However, carbonation of concrete will occur during the lifetime of the building and is included in module B1. Carbonation is calculated using the approach recommended by the Mineral Products Association and BPCF and follows the methodology developed by Pommer et al. /Pommer 2005/, with reference to the work of Engelsen and Justnes /Engelsen 2014/, who have made further refinements related to the amount of CaO that can carbonate and the carbonation of slag.

For concrete carbonation factors based on MPA research and expert judgement have been used. The depth of carbonation on each surface has been modelled as 1.59mm based on average conditions for a concrete element. The surface area is assumed to be 2 m^2.
The study period is assumed to be 100 years (the RSL).

Modules B2 - B7 (Maintenance, Repair, Replacement, Refurbishment, Operational Energy Use, Operational Water Use)

It is assumed that the concrete covered by this EPD does not require maintenance, repair, replacement or refurbishment during its lifetime. Consequently, the impacts associated with these lifecycle stages are zero. There is no operational energy or operational water requirement associated with the product, however, it is acknowledged that any building material choice will have an impact on the operational energy and, in some cases, the operational water demand of the final building.

In case a **reference service life** according to applicable ISO standards is declared then the assumptions and in-use conditions underlying the determined RSL shall be declared. The same holds for a service life declared by the manufacturer.
Reference service life

Name	Value	Unit
Reference service life	100	a

End of life (C1-C4)

Name	Value	Unit
Recycling	90	%
Landfilling	10	%

LCA: Results

In Table 1 "Description of the system boundary", all declared modules are indicated with an "X"; Module D which is not declared is indicated with "MND". Indicator values are declared to three valid digits.

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	MND

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1m3 Generic Ready-mixed Concrete

Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
GWP	[kg CO_2-Eq.]	246.00	2.01	0.19	-19.90	0.00	0.00	0.00	0.00	0.00	0.00	-0.84	8.27	-18.90	1.98
ODP	[kg CFC11-Eq.]	1.69E-6	2.37E-13	2.00E-13	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	9.73E-13	6.01E-12	3.90E-12
AP	[kg SO_2-Eq.]	3.98E-1	8.39E-3	1.28E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.45E-2	3.85E-2	2.27E-2
EP	[kg $(PO_4)^{3-}$-Eq.]	4.90E-2	2.02E-3	3.07E-4	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	8.29E-3	9.21E-3	3.09E-3
POCP	[kg ethene-Eq.]	1.18E-1	-3.20E-3	1.39E-4	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-1.32E-2	4.16E-3	1.79E-3
ADPE	[kg Sb-Eq.]	4.54E-4	3.26E-8	3.36E-7	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.34E-7	1.01E-5	1.38E-6
ADPF	[MJ]	1.52E+3	2.76E+1	3.57E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.14E+2	1.07E+2	4.97E+1

Caption	GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources

RESULTS OF THE LCA - RESOURCE USE: 1m3 Generic Ready-mixed Concrete

Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
PERE	[MJ]	76.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PERM	[MJ]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PERT	[MJ]	76.90	0.68	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.78	8.49	6.00
PENRE	[MJ]	1.65E+3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PENRM	[MJ]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PENRT	[MJ]	1.65E+3	2.77E+1	3.65E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.14E+2	1.10E+2	5.14E+1
SM	[kg]	30.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RSF	[MJ]	41.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NRSF	[MJ]	258.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	[m^3]	3.85E-1	2.37E-4	9.81E-4	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	9.73E-4	2.94E-2	9.79E-3

Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: 1m3 Generic Ready-mixed Concrete

Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
HWD	[kg]	6.98E-2	1.13E-7	1.29E-7	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.66E-7	3.86E-6	8.13E-7
NHWD	[kg]	8.62E+1	3.03E-4	1.68E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.24E-3	5.05E-2	2.38E+2
RWD	[kg]	5.22E-2	3.03E-5	3.42E-5	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.25E-4	1.02E-3	7.03E-4
CRU	[kg]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MFR	[kg]	0.00E+0	0.00E+0	7.14E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.08E+3	0.00E+0
MER	[kg]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EEE	[MJ]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EET	[MJ]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Caption	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EEE = Exported thermal energy

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thinkstep
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Certificate of Conformity

CPC
Construction
Products
Certification

Capital Concrete Limited

Eclipse House, Eclipse Park, Maidstone, Kent ME14 3EN

The Environmental Management System

in operation at the above company covering the

Production and Sale of Ready Mixed Concrete

from the locations shown on the attached schedule

is certified to conform to the following international standard:

BS EN ISO 14001:2015

This Certificate is issued within the scope of the UKAS accreditation of CPC

Certificate No: CP E 00055

Colin Head
Chief Executive

Date Authorised: 9 April 2024
Date of original certificate: 1 October 2018

THIS CERTIFICATE IS VALID FROM 9 APRIL 2024 TO 31 DECEMBER 2025

subject to continued compliance with the above standard as confirmed by routine surveillance. Confirmation of the current status of Certification may be obtained by enquiry to the CPC Central Records Office.

Construction Products Certification is an operating division of the Quality Scheme for Ready Mixed Concrete. A UKAS accredited certification body

1 Mount Mews
High Street, Hampton
Middlesex TW12 2SH
Telephone: 020 8481 9640
Facsimile: 020 8979 4558
www.qsrmc.co.uk

UKAS MANAGEMENT SYSTEMS
009

Certificate Schedule

(attached to and forming part of Certificate No: CP E 00055)

Environmental Management System Certification – ISO 14001:2015

CapitalConcrete Ltd
Eclipse House
Eclipse Park
Maidstone
Kent
ME14 3EN

Location	*Address*	*Activity*
BOW	7-9 Chapman Road, Bow, London E9 5DW	Production and sale of ready mixed concrete.
CRICKLEWOOD	Cricklewood Railway Yard, 400 Edgeware Road, London NW2 6ND	Production and sale of ready mixed concrete.
CROYDON	Endeavour Way, Beddington Farm Road, Croydon, Surrey CR0 4XB	Production and sale of ready mixed concrete.
ENFIELD	Jeffreys Road, Enfield, Middlesex EN3 7UA	Production and sale of ready mixed concrete.
FELTHAM	Flacon Way Trading Estate, Feltham, Middlesex TW14 0UQ	Production and sale of ready mixed concrete.
RAINHAM	Launders Lane, Rainham, Essex RM13 9GS	Production and sale of ready mixed concrete.
ROMFORD	Hainault Road, Little Heath, Romford, Essex RM6 5SS	Production and sale of ready mixed concrete.
SILVERTOWN	Peruvian Wharf, North Woolwich Road, Silvertown, London E16 2AB	Production and sale of ready mixed concrete.
STAINES	Queen Mary Quarry, Ashford Road, Laleham, Middlesex TW18 1QF	Production and sale of ready mixed concrete.
WEMBLEY	Neasden Rail Siding, The Rail Yard, Drury Way, Neasden, London NW10 0JJ	Production and sale of ready mixed concrete.

Issue date: 9 April 2024

This Certificate Schedule is valid from 9 April 2024 to 31 December 2025

SUSTAINABILITY & RESPONSIBLE SOURCING POLICY

At Capital Concrete we are serious about our business and our responsibilities and we believe that risk minimization, legal compliance, responsible sourcing and purchasing, together with the continual improvement of our products, services and operating methods are fundamental to a sustainable business.

This approach is achieved through specific policies which are supported by our integrated management systems: QHEST (Quality, Health, Environment, Safety Sustainably Together), HR, Purchasing and IT. We promote responsible sourcing to our employees and throughout our supply chain in line with our business values and to ensure the values of customer care, quality and integrity are maintained.

Capital Concrete recognises that its directors play a key role in delivering our policies through leadership and commitment. They will:

- be accountable for the effectiveness of the management systems and be personally involved on key matters
- ensure that all policies, objectives and targets are established and are compatible with the strategic direction and the context of the organisation and their importance is communicated and performance measured through a series of business-wide indicators
- ensure the management systems requirements are integrated into business processes, as applicable, ensuring the resources needed to deliver are available
- direct and support the entire management team in demonstrating their leadership and encouragement to all employees to contribute to the effectiveness of the management systems and the business
- promote continual improvement
- continue to put in place measures to reduce the level of carbon emissions and energy consumption
- locally source products and services where appropriate and practical
- establish a business improvement plan, which is reported upon annually
- monitor and review objectives and targets appropriate to the business and aligned to industry targets for inclusion in the business improvement plan
- maximise responsible resource use through improved operational efficiency
- increase where possible the use of recycled materials.

Capital Concrete holds certification to recognised standards as appropriate to their business; these include BS EN ISO 14001 (Environmental Management System), BS EN ISO 9001 (Quality Management System), BS ISO 45001 (Health and Safety Management System) and BES 6001 (Responsible Sourcing of Construction Products). They comply with the requirements of the appropriate standards and/or any industry specific requirements and specifications to which its products and services are supplied.

To demonstrate our ongoing commitment to continual improvement, Capital Concrete have signed up to the following industry initiatives:

- Sustainable Construction Strategy for the UK Concrete Industries
- MPA Precast Sustainability Charter
- BRMCA Sustainability and Responsible Sourcing Targets.

Group Directors take a leadership role on the boards of:

MPA, BRMCA Chair and Sustainable and Responsible Sourcing Strategy, QSRMC Chair, UK Concrete and Cement Steering Group, UK Concrete Sustainable Construction.

Bill Brett
Group Chairman

capitalconcrete.co.uk