Elite Concrete techical specifications

Block quality submission

If in doubt after reading this guide contact 01952 588885 for technical advice.

Manufacturer's details

Elite Precast Concrete
Halesfield 9, Telford, Shropshire TF7 4QW
Established 1st January 2008

Contact names
Owen Batham Director
Richard Doody Director

Telephone: **01952 588885**
Fax: **01952 582011**
Mobile: **07920 147503**
Email: **sales@eliteprecast.co.uk**

Block quality submission

Concrete specification

RC32/40 Equivalent
Minimum cement content = 320kg/m³ for 14mm aggregate size
(actual cement content 340kg/m³)
Maximum w:c ratio = 0.55
Cement type = CEM1 52.5N
Coarse Aggregate = Aggregate Industries, Haughmond Hill Quarry
Magnesium Sulphate Soundness = MS18 or better
Fine Aggregate = Cemex, Doves Holes

Durability

The use of an RC32/40 equivalent concrete ensures suitability for use in XF2 conditions as defined in BS 8500-1:2013 table A1:

Freeze-thaw attack (XF classes) (where concrete is exposed to significant attack from freeze-thaw cycles whilst wet)

Class designation	Class description	Informative examples applicable in the United Kingdom
XF2	XF2 Moderate water saturation with de-icing agent	Concrete surfaces such as parts of bridges, which would otherwise be classified as XF1, but which are exposed to de-icing salts either directly or as spray or run-off

The units are unreinforced and have a design working life of 100 years as defined in BS EN1990:2002+A1:2005

ASR – the total alkali content of the concrete is calculated as:
340 x 0.75/100 = 2.55kg/m³ Na^2O equivalent
Limiting value 3.5kg/m³ for normal reactivity aggregates
(BS EN 8500-2 Annex B

Lifting points

All units are provided with a central galvanized “Pin Anchor” lifting anchor recessed into the concrete surface
Euro Accessories 2.5 tonnes capacity x 170mm length

Quality management

All products are manufactured under a Factory Production Control System equivalent to that required by EN1917, BS5911-3 and BS5911-6

ELITE PRECAST CONCRETE

Quality policy statement

Rev001/PR/Nov2015

Elite Precast Concrete Limited is a company which specialises in the manufacture and supply of precast concrete products for the construction, water management and ancillary industries.

Elite Precast Concrete Limited sees itself as a high-end supplier and places particular emphasis on experience, capability, reliability, quality and customer satisfaction.

This Policy Statement commits Elite Precast Concrete Limited, it's management and employees to providing precast concrete products conforming to customer, contractual and regulatory requirements through the establishment, maintenance and implementation of an effective Quality Management and Factory Production Control System.

This manual defines the policies, processes and procedures that Elite Precast Concrete Limited will adopt to ensure conformity to requirements, and to drive improvement in both the business processes and the products supplied.

Quality objectives consistent with this policy have been established and performance levels will be monitored.

Signed

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Richard Doody
Commercial Director
Elite Precast Concrete Limited

ELITE
PRECAST CONCRETE

Annex A

Factory Production Control Manual – contents page

Section	Section Heading	BS EN ISO 9001	BS EN 1917	BS 5911 -3	BS 5911-6
0	Contents				
1	Amendments				
2	Quality Policy	4.2.2			
3	Scope and interaction of processes	4.2.2			
4	Management Structure / Organisation / Communication	5.5.1 8.4 8.5	F.1.1 F.1.2	←	E.1.1 E.1.2
5	Management Review	5.6	F.1.3	←	E.1.3
6	Control of Documents and Records	4.2.3 4.2.4	F.1.4	←	E.1.4
7	Production Control		F.2	←	E.2
8	Inspection and Test	6.2 6.2 8.2.3 8.2.4	F.3	←	E.3
9	Control of Nonconforming Product	8.3	F.3.1 F.4.1- F.4.3	←	E.3.2 E.4.1- E.4.3
10	Protection and Preservation of Quality	7.5.5	F.5.1- F.5.3	←	E.5.1- E.5.3
11	Marking	7.5.3	F.5.4 F.5.5	←	E.5.4 E.5.5
12	Training and Competence	6.2.2	F.6	←	E.6
13	Internal Audit				
14	Corrective Action (Systems and Product deficiencies and Customer Complaints)	8.5.2	F.3.5	←	E.3.5
15	Preventive Action	8.5.3			
16	Inspection Schedules	7.6	F.7- F.10	←	E.7- E.10
17	Standard Operating Procedures	4.2.1	F.5.1	←	E.5.1
18	Standard Forms	4.2.1	F5.5	←	E.5.5

ELITE PRECAST CONCRETE

Kitemark Licence

bsi.

By Royal Charter

Kitemark™ Certificate

This is to certify that:

Elite Precast Concrete Limited
Unit L
Halesfield 9
Telford
Shropshire
TF7 4QW
United Kingdom

Holds Certificate Number: KM 642263

In respect of:

BS EN 1917 & BS 5911-3
Concrete manholes and inspection chambers

This issues the right and licence to use the Kitemark in accordance with the Kitemark Terms and Conditions governing the use of the Kitemark, as may be updated from time to time by BSI Assurance UK Ltd (the "Conditions"). All defined terms in this Certificate shall have the same meaning as in the Conditions.

The use of the Kitemark is authorized in respect of the Product(s) detailed on this Certificate provided at or from the above address.

For and on behalf of BSI: Gary Fenton, Global Product Certification Director

First Issued: 04/07/2016 Latest Issue: 04/07/2016

Page: 1 of 2

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This certificate has been issued by and remains the property of BSI Assurance UK Ltd, Kitemark Court, Davy Avenue, Knowlhill, Milton Keynes MK5 8PP, United Kingdom and should be returned immediately upon request.
To check its validity telephone +44 (0) 345 080 9000. An electronic certificate can be authenticated online.

BSI Assurance UK Limited, registered in England under number 7805321 at 389 Chiswick High Road, London W4 4AL, UK.
A member of BSI Group of Companies.

ELITE PRECAST CONCRETE

Cement DOP

Premier Cement Ltd

Irish Cement

DECLARATION OF PERFORMANCE
No. 050 – CPR - 0261

1. Unique identification code of the product-type:
   Portland cement EN 197-1 – CEM I 52,5N
2. Type, batch or serial number or any other element allowing identification of the construction product as required under Article 11(4):
   See 1.
3. Intended use or uses of the construction product, in accordance with the applicable harmonised technical specification, as foreseen by the manufacturer:
   Preparation of concrete, mortar, grout etc.
4. Name, registered trade name or registered trade mark and contact address of the manufacturer as required under Article 11(5):
   Irish Cement Ltd, Castlemungret, Co. Limerick
5. Where applicable, name and contact address of the authorised representative whose mandate covers the tasks specified in Article 12(2):
   Not applicable
6. System or systems of assessment and verification of constancy of performance of the construction product as set out in CPR, Annex V:
   System 1+
7. In case of the declaration of performance concerning a construction product covered by a harmonised standard:
   Notified product certification body No. 050 performed the determination of the product-type on the basis of type testing (including sampling), the initial inspection of the manufacturing plant and of factory production control, the continuous surveillance, assessment and evaluation of factory production control and the audit-testing of samples taken before placing the product on the market under system 1+ and issued the certificate of constancy of performance.
8. Declared performance

Essential characteristics	Performance	Harmonised technical specification
Common cements (subfamilies) constituents and composition	CEM I	EN 197-1:2011
Compressive strength (early and standard)	52,5 N	
Setting time	Pass	
Insoluble residue	Pass	
Loss on ignition	Pass	
Soundness - Expansion - SO_3 content	 Pass Pass	
Heat of hydration	Pass	
Chloride content	Pass	
C_3A in clinker	Pass	

9. The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 8. This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.
   Signed for and on behalf of the manufacturer by:

Jimmy Kehoe – Technical Director

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July 1st 2013

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ELITE PRECAST CONCRETE

Coarse Aggregate DOP

Product: **6/14 Conc. SS Greywacke EN12620/PD6682-1 TC1**
Aggregate Industries Product Code: **EN42319DM**

AGGREGATE INDUSTRIES

CE

Aggregate Industries UK Ltd, Bardon Hill, Coalville, Leicestershire, LE67 1TL
0086-CPD-600710
2013

EN42319DM / 1342100

EN12620
Aggregates for concrete

Haughmond Hill Quarry

Aggregate	Type	Gritstone	
Particle Size	Designation	6/14	
Grading Category	Category	$G_C85/20$	
Particle Shape	Category	FI_{20}	
Fines Content	Category	f_4	
Particle Density Apparent	Declared Value	2.80Mg/m³	
Water Absorption	Declared Value	0.9%	
Resistance to Fragmentation	Category	LA_{20}	
Durability against Freeze Thaw	Category	MS_{18}	
Acid Soluble Sulfates	Category	$AS_{0.8}$	
Total Sulfer	Threshold Value	% S	Pass

No Performance Determined (NPD) or No Requirement (NR) for the following properties

Rate of Setting and Hardening	*NPD*	*Fines Quality*	*NPD*
Emissions of Radioactivity	*NPD*	*Release of Heavy Metals*	*NPD*
Polyaromatic Carbons	*NPD*	*Release of Other Dangerous Substances*	*NPD*
Dry Shrinkage	*NPD*		

Philippe Frenay
Director of Aggregates and Cementitious Materials

ELITE PRECAST CONCRETE

Coarse Aggregate Petrographic Description

celtest
INDEPENDENT MATERIALS TESTING | DIAMOND DRILLING & SAWING

Bardon Aggregates
Bardon Hill
Coalville
Leicestershire
LE67 1TL

Date: 18 August 2015
Test Report Ref: STR 423556

Contract: Haughmond Hill

LABORATORY TEST REPORT

TEST REQUIREMENTS: Petrographical examination of aggregate sample in accordance with **BS EN 932-3: 1997.**

SAMPLE DETAILS:

Certificate of sampling received:	**Yes**
Laboratory Ref. No:	**S53713**
Client Ref. No:	**6.3/14mm**
Date and Time of Sampling:	**14/07/2015**
Date of Receipt at Lab:	**15/07/2015**
Date of Start of Test:	**30/07/2015**
Sampling Location:	**Current Production**
Name of Source:	**Haughmond Hill**
Method of Sampling:	**EN 932-1**
Sampled By:	**Client**
Material Description:	**6.3/14mm**
Target Specification:	**N/A**

RESULTS:

See attached

Comments
None

Certificate Prepared by:- N. Hughes
Neil Hughes
Job Coordinator

Approved by: - Eric Goulden
Eric Goulden
Technical Manager

Trefelin Bangor Gwynedd LL57 4LH T +44 (0)1248 355269 F +44 (0)1248 351563 E postmaster@celtest.com W www.celtest.com

Coarse Aggregate Petrographic Description

celtest

Test Report Ref: STR 423556 - Page 2 of 2

RESULTS:

Summary of Findings:

Aggregate Property	Observations
Advised grading	6/14mm
Aggregate type	Crushed sandstone

Simplified Petrographic Description of Aggregate – BS EN 932-3:1997

Visual Observations

Discrete Constituent		Particle Shape	Surface Texture	Coatings / Encrustations	Grade[3]
Major (≥10%)	Sandstone	Angular to subangular	Rough to moderately rough	Sporadic iron oxide staining	I
Minor (2 to <10%)	--	--	--	--	--
Trace (<2%)	Tuff	Subangular	Moderately rough	None	I
	Basaltic fragments	Subangular	Moderately rough	None	I
	Quartz	Subangular	Moderately rough	None	I
	Siltstone	Subangular	Moderately rough	None	I

Comments:

The work was carried out by our accredited, competent, sub contracted laboratory.

Based on UK experience, the above aggregate combination could be classified as potentially having normal alkali-silica reactivity in accordance with BRE Digest 330[2]. However, we would recommend a full high-power microscopical examination of a representative portion of the aggregate sample in order to reach a more conclusive classification.

Notes:

1 Major >10 %, Minor 2<10 %, Trace <2 %.

2 BRE Digest 330, alkali-silica reaction in concrete, 1997, Building Research Establishment, Garston, UK.

3 Grade I (Fresh): unchanged from original state
Grade II (Slightly Weathered): slight discolouration, slight weakening
Grade III (Moderately Weathered): Considerably weakened, penetrative discolouration, large pieces cannot be broken by hand
Grade IV (Highly Weathered): large pieces can be broken by hand, does not readily disaggregate (slake) when dry sample immersed in water
Grade V (Completely Weathered): considerably weakened, slakes, original texture apparent
Grade IV (Residual Soil): soil derived by in situ weathering but retaining none of the original texture of fabric.

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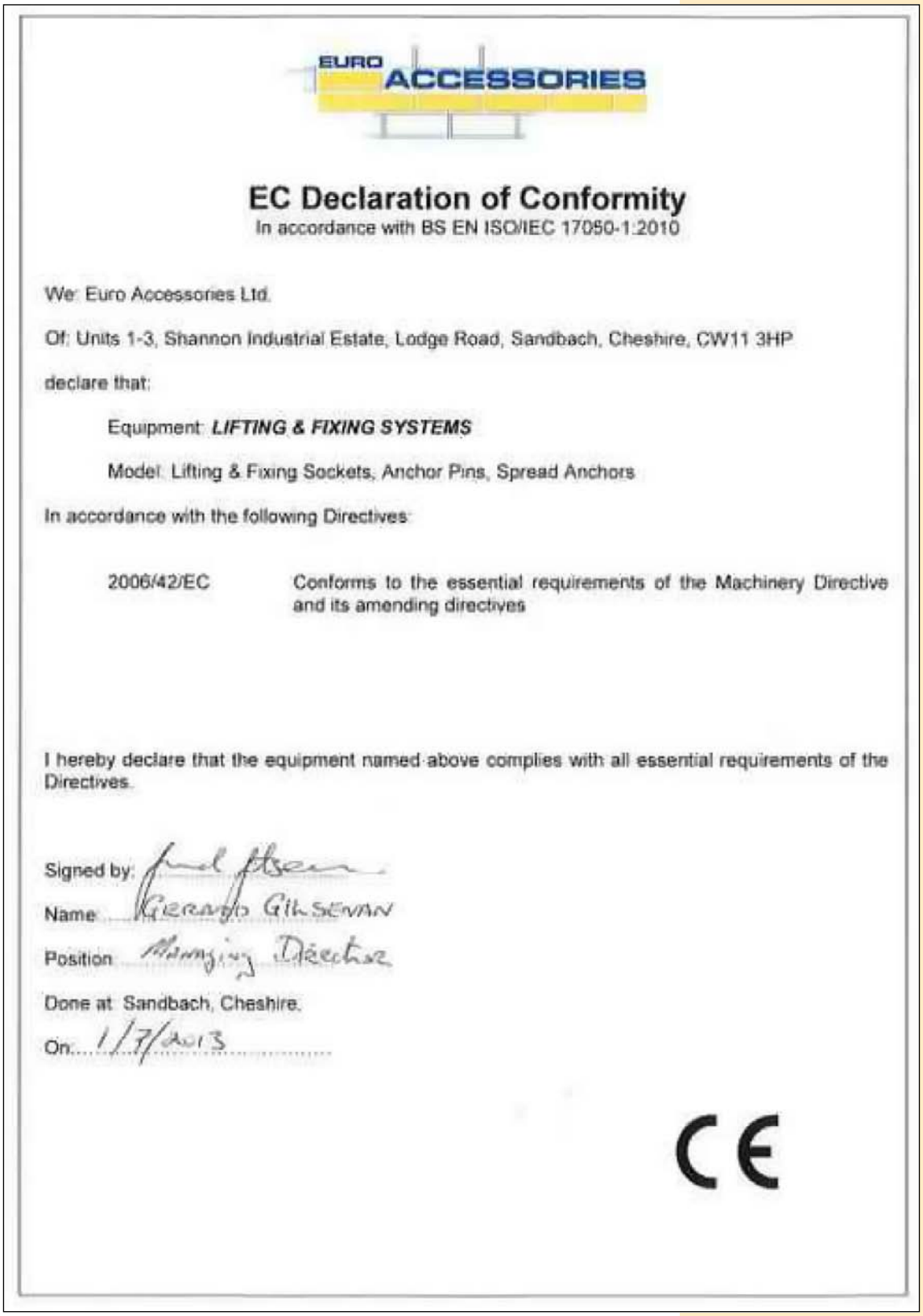
Declaration of conformity



EURO ACCESSORIES

EC Declaration of Conformity

In accordance with BS EN ISO/IEC 17050-1:2010

We: Euro Accessories Ltd.

Of: Units 1-3, Shannon Industrial Estate, Lodge Road, Sandbach, Cheshire, CW11 3HP

declare that:

Equipment: ***LIFTING & FIXING SYSTEMS***

Model: Lifting & Fixing Sockets, Anchor Pins, Spread Anchors

In accordance with the following Directives:

2006/42/EC	Conforms to the essential requirements of the Machinery Directive and its amending directives

I hereby declare that the equipment named above complies with all essential requirements of the Directives.

Signed by:

Name: Gerard Gilsenan

Position: Managing Director

Done at: Sandbach, Cheshire.

On: 1/7/2013

CE

ELITE PRECAST CONCRETE

Design statement

C L P Structures
STRUCTURAL ENGINEERING CONSULTANTS

Elite precast concrete block retaining walls – Design Statement

Elite Duo, Legato and Vee blocks stacked to form a retaining structure are designed as follows:-

The walls are designed as a 'mass or gravity' retaining wall this means that the stability of the wall is based on the self weight of the wall, and no tensile forces are present on the inside retained face of the wall.

Overturning and sliding forces on the wall are calculated thus:-

1. Pressures due to retained materials:-

- The forces exerted on the walls are calculated using 'Rankines Formula' this is a widely recognised method for calculating retaining forces and takes into consideration the following elements:-
    - The density of the retained material.
    - The natural angle of repose of the material i.e. the angle at which the material will stand up unsupported.
    - The height of the retained material
    - The surcharge load – i.e. the uniformly distributed load on top of the retained material.
    - The angle at which the material is to be stored (the angle of the material at the top of the wall).

2. Pressure due to Impact Loads:-

- Standard recognised formula are used to calculate the impact load on the wall based on:-
    - Vehicle speed
    - Vehicle mass
    - Total anticipated deflection, both from the vehicle and the wall combined.

CLP Structures Ltd.
8 The Grove, Hallatrow, Bristol. BS39 6ES.
TEL: 0117 3706357 EMAIL: mail@clp-structures.co.uk

Registered No. 8929503 England.

ELITE PRECAST CONCRETE

Design statement

C L P Structures
STRUCTURAL ENGINEERING CONSULTANTS

The stability of the wall is then calculated thus:-

3. *Overturning* – Each block and the wall as a whole is calculated for overturning based on standard equilibrium calculations which are dependent on the blocks width and weight.
4. *Sliding* – Each individual block sliding over one another is resisted by the 'nibs' on the blocks. Overall sliding resistance is calculated using a conservative widely accepted 'friction factor' of 0.5 combined with the weight of the wall.
5. *Bearing Pressure* – The bearing pressure directly beneath the walls are calculated and passed on to the client. The walls are constructed on numerous different types of ground/foundations, therefore it is made clear to the client that they are responsible for ensuring that the ground/foundation is suitable to safely support the calculated pressures.
6. *Factor of Safety* - A minimum factor of safety of 1.5 is required for the overturning of each block, overturning of the wall as a whole, and sliding of the wall as a whole.

Chris Lyons AMIStructE. BTech. Ieng.
Director

July 2016

ELITE PRECAST CONCRETE

EN 206 conformity criteria

Minimum individual result at 28 days = fck-4 = 36N/mm^2
Minimum mean strength at 28 days = Fck+1.48s = 49N/mm^2*
* assumes a standard deviation of 6N/mm^2

ELITE PRECAST CONCRETE

Model Quality Plan for the production of Duo Block Retaining Wall Units (BS EN 13369 and BS EN 15258)

INSPECTION EQUIPMENT

No	ITEM	FREQUENCY	METHOD
1	Cube testing machine	Annual	External EN12390-4
2	Laboratory scales	Annual	Procedure Cal 1
3	Tape measures	On issue	Procedure Cal 2
4	Thermometers	Annual	Procedure Cal 5
5	Cube moulds	N/A	Procedure Cal 6
6	Slump Cones	N/A	Procedure Cal 7

PRODUCTION EQUIPMENT

No	ITEM	FREQUENCY	PURPOSE
1	Raw materials and raw materials storage	Daily – visual	Condition and absence of contamination
2	Batching Equipment	Daily – visual	Normal operation
3	Batching Equipment	Annual	Calibration – External
6	Moulds	Daily - visual	Suitability for casting

MATERIALS INSPECTIONS

No	ITEM	FREQUENCY	PURPOSE
1	All raw material receipts**	Each delivery – visual	Material as ordered, correct source, grade, condition and absence of contamination
	Cement**	Annual and as required	Evidence of conformity to EN197
	Aggregates**	Annual and as required	Evidence of conformity to EN12620
	Admixtures**	Annual and as required	Evidence of conformity to EN934-2
	Steel**	Each delivery – visual	Evidence of conformity to technical spec.
2	Inserts, spacers etc **	Each delivery – visual	As ordered, correct source, grade
3	Lifting anchors**	Each delivery – visual	As ordered, correct source, grade
	Lifting anchors**	Each delivery	Conformity to technical specification

PROCESS INSPECTIONS – concrete

No	ITEM	FREQUENCY	PURPOSE
1	Concrete Composition (Mix recipes)	Daily for each composition (recipe) used	Conformity with intended composition and purpose
	Concrete composition (recipe change)	Every recipe change to be formalised and notified to: (add list of persons here)	To ensure impact on other factors (eg chloride content) is evaluated and new BOM established if change is longer term

ELITE PRECAST CONCRETE

Model Quality Plan continued

No	ITEM	FREQUENCY	PURPOSE
2	Water content of the fresh concrete	Daily	Evidence of conformity to w:c / design constraints
3	Chloride content of the concrete	Annual and as required	Evidence of conformity to specification limits: Reinforced <= 0.4% Prestressed <= 0.1% (by weight of cement)
4	Potential strength of the concrete (cube strength)	2 cubes daily for each type of concrete, factory and each casting: 1 x 7 day 1 x 28 day	Evidence of achievement of design characteristic strength (analysis as EN 206 cl 8.2.1.3)
5	Consistence (slump or flow test as appropriate)	Daily for each composition (recipe) used	Evidence of conformity to technical spec.: SCC – flow Vibrated – slump
	Concrete Temperature	Daily for each composition (recipe) used where the air temperature falls below 2°C	Evidence of conformity to the minimum concrete temperature of 5°C at placing and to prevent wastage through manufacture with frosted concrete

PROCESS INSPECTIONS – other process subjects

No	SUBJECT	FREQUENCY	PURPOSE
1	Reinforcement cages and lifting inserts	Daily inspection against the approved product drawing for each mould to be cast	Conformity with required type, quantity, shape dimensions position and correct cover to reinforcement
2	Moulds and beds (pre-pour inspection)	Visual inspection for cleanliness, oiling, wear and deterioration	Ensuring product conforms to the required quality standards
3	Moulds and beds (new moulds or following major modification)	Measuring of each new mould or after major modification	Ensuring product conforms to the required quality standards and dimensional tolerances
4	Concrete placing	Daily visual for correct compaction	Ensuring correct compaction and achievement of potential strength
5	Protection against drying out	Daily for correct curing	Ensuring correct curing environment and achievement of the potential strength
6	Accelerated hardening	Daily for relevant curining conditions (temperature)	Conformity with factory documents, achievement of transfer / striking strength and prevention of thermal cracking

MATERIALS INSPECTIONS

No	ITEM	FREQUENCY	METHOD
1	Dimensional accuracy: length, height, cross section, straightness of edges, flatness of the moulded face (if required for aesthetic reasons) and protruding reinforcement	Measured each 5 production days with a minimum of 1 unit each week (rotating through the product types to ensure all are captured)	Conformity to drawings and specified tolerances (see EN 15258 cl.5.2.2 and 5.2.3 and EN 13369 annex J and cl 4.3.1)
4	Surface characteristics (roughness and general appearance)	Daily visual inspection for conformity to product quality standards	Ensuring product conforms to the required quality standards

ELITE PRECAST CONCRETE

Model Quality Plan continued

Dimensional accuracy (extracted from EN13369 clause 4.3.1

Target Dimension	Maximum permitted variance from that declared	Recommended maximum variance from that declared (to be agreed)
L≤150 mm	+10 / -5 mm	+/- 5 mm
L=400 mm	+15 / -10 mm	+/- 10 mm
L≥2500	+/ -30 mm	+/- 10 mm

Maximum deviation from planeness (based upon EN13369 Table J2) under a 200 mm straight edge

Mould Face (to be agreed)	Trowelled Face (to be agreed)
+/- 2 mm	+/- 4 mm

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