

# CONCRETE DESIGN CERTIFICATE



Design Certificate 1005279758 Quotation Number 1005165103  
 Date 20.12.2013 Your Ref.

To: **VOLKENSSTEYN**  
**HERTFORD ROAD**  
**WODDSESSON**  
**HERTFORDSHIRE**  
**EN11 9BX**

Site: **ROMER COASTAL DEFENCE**  
**ROMER**

C & H Quickmix  
 Longwater Business Park  
 Ernest Gage Avenue  
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 Norwich  
 NR5 0TX  
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Our Representative: CUSTOMER SERVICES

Specification	Our Ref.:	Sheringham Concrete	Sheringham Concrete	Sheringham Concrete
Plant		Sheringham Concrete	Sheringham Concrete	Sheringham Concrete
Concrete Grade		C40/50	GEN3	GEN1
Cement Type		CEM I	CIIIA	CIIIA
Maximum Aggregate Size (mm)		20	20	20
Target Slump (mm)		S3	70	20
Minimum Cement Content		380	220	180
Max Water / Cement Ratio		0.40	220.00	180.00
Chloride Class			220.00	180.00

Mix Design: Materials & Mix Proportions: kg/m <sup>3</sup> at SSD			
CEM I 52.5N (P.C.)			
BLI, Tunstead Works	420	114	90
GGBFS			
Purfleet		114	90
4/20mm Gravel			
Lafarge Tarmac Ltd, Bittering	988	946	1077
0/4mm Concrete Sand			
Drayton Stone - Beeston Regis	743	967	901
MICROSILICA			
OPENDOME	40.00		
Plasment 180			
Sika Ltd		0.91	
Glenium SKY 569			
BASF Construction Chemicals Lt	2.94		
Water	168	179	153
Aggregate/ Cement Ratio	4.12	8.39	10.99
Water/ Cement Ratio	0.40	0.79	0.85
Percentage Fines	42.92	50.55	45.55

**PLEASE NOTE:**

**HEALTH & SAFETY**

There is a real danger of contact dermatitis or serious burns if skin comes into contact with wet cement mixes such as fresh concrete, mortar or screed. Wear suitable protective clothing and eye protection. Where skin contact occurs either directly or through saturated clothing wash immediately with soap and water. For eye contact, immediately wash out the eyes thoroughly with clean water. If allowed wash out mouth and drink plenty of water.

For and on behalf of  
 C & H Quickmix

This design is relevant to the above quotation of which it is a part thereof and subject to our Standard Conditions of Sale

Technical Services Department

This certificate is for illustrative purposes only, the materials and mix design(s) are those in current production, these may be changed and/or modified when material properties vary or supply sources change.

C & H QUICKMIX LIMITED

REGISTERED IN ENGLAND NUMBER 839216

REGISTERED OFFICE DRAYTON, NORWICH, NORFOLK, NR8 6AH



**Table 6-1: Concrete Mix Requirements C40/50 (Apron and Encasement)**

Parameter	Limiting value
Minimum strength class	C40/50
Minimum cement/combination content	360 kg/m <sup>3</sup>
Maximum cement/combination content	500 kg/m <sup>3</sup>
Maximum water-cement ratio	0.45
Permitted cements and combinations	All permitted within BS 8500 with the following restrictions: GGBS content ≤ 50% PFA content ≤ 25% Microsilica ≥ 5% For CEM I only cement types C3A < 10%  All above either as cement or cement combination
Minimum Concrete Cover	75mm generally, 100mm to faces exposed to flint abrasion as indicated on drawings.
Exposure category	XS3
Design Life	50 years
Chloride class	Cl 0,20 if sulphate resisting PC Cl 0,30 if ordinary PC
Consistency class	S3 except where stated otherwise on the drawings
Maximum Aggregate size	≥ 20mm unless stated otherwise on the drawings
Sulphate Content	Less than 3.6% by mass of cement/cement combination
Alkali Content	Limited in accordance with BRE Digest 330 for the avoidance of ASR based on potential reactivity of aggregate combination
Max internal concrete temperature & max temperature differential (internal-external face)	68°C max internal temp 20°C Max differential internal/external faces

*This is from works INFO*

*This is the concrete we're having problems with*

**Table 6-2: Concrete Mix Requirements (GEN 3) General Mass Concrete**

Parameter	Limiting value
Minimum cement/combination content	220 kg/m <sup>3</sup>
Consistency class	S3 except where stated otherwise on the drawings
Maximum Aggregate size	20mm

**Table 6-3: Concrete Mix Requirements (GEN 1) Concrete Blinding**

Parameter	Limiting value
Minimum strength class	C6/8
Consistency class	S3 except where stated otherwise on the drawings

Construction shall proceed sequentially and infill pours shall be avoided. Construction joints shall be made as instructed on the construction drawings and the proposed construction joint arrangements shall be submitted to the Supervisor for review. Joints shall be limited as far as practicable and placed at positions which do not affect durability, structural integrity or appearance of the structure.

### **6.3 Materials**

#### **6.3.1 Cement/Cement Replacement Combination**

The permitted cement/cement replacement combinations shall be as stated in Section 6.2 above.

#### **6.3.2 Water for Concreting**

Water shall comply with requirements of BS EN 1008 and BS 8500.

#### **6.3.3 Admixtures and Additives**

Admixtures shall conform to BS EN 934-2

#### **6.3.4 Aggregates**

Aggregates shall conform to BS 8500-2 and BS EN 12620 except that recycled concrete aggregate (RCA) and recycled aggregate (RA) shall not be used.

The soundness loss in accordance with BS EN 1367-2 shall not be greater than 12%.

The water absorption in accordance with BS EN 1097-6 shall not exceed 3%.

The flakiness index of the coarse aggregate in accordance with BS EN 933-3 shall not exceed FI35

Aggregates classified as having high potential alkali-silica reactivity in accordance with BRE Digest 330 shall not be used.

A resistance to Fragmentation of Course Aggregate in accordance with BS EN 1097-2 shall not exceed LA30 except where testing [carried out by contractor] of the gravel/shingle sourced in the locality justifies a higher value.

#### **6.3.5 Concrete Repair Mortar**

To be a polymer modified cementitious repair mortar, suitable for the depth of repair required. To be Renderoc S by Fosroc Ltd, Tamworth, Staffordshire (or similar