Attachment

7.2.2.1

1. Background

Dubai Municipality (DM), through Section F.6.2.3 (Table F.3) of the Dubai Building Code (DBC) and Circular No. 7.2.1 (Attachment 7.2.1.4), currently mandates the use of supplementary cementitious materials (SCMs), specifically Ground Granulated Blast-furnace Slag (GGBS) and Fly Ash, in all structural concrete mixes used in the Emirate. These requirements were introduced to enhance the durability of concrete structures in Dubai's aggressive service environment and to support sustainable concrete practices.

To safeguard project continuity while maintaining the structural integrity and durability of new buildings, Dubai Municipality is issuing this temporary amendment to the SCM requirements stipulated in DBC Section F.6.2.3 (Table F.3) and Circular No. 7.2.1 (Attachment 7.2.1.4). The provisions herein have been aligned strictly with BS 8500-1:2023 Tables A.4a (XC exposures) and A.4c (XS exposures) for an intended working life of at least fifty (50) years.

Cement eligibility under this Circular is expressed using BS 8500-1:2023 Combined Performance Category framework (Table A.6) rather by reference to CEM I alone. In addition to CEM I, further cements approved by Dubai Municipality are admitted.

All structural concrete mixes produced under this Circular shall respect the DBC minimum compressive (cube) strength of 35 MPa for structural concrete (i.e., grade C28/35).

2. Scope of Application

This Circular applies to the design and specification of concrete mixes used in new and ongoing building projects within the Emirate of Dubai, subject to the conditions set out below.

2.1 Superstructures (Temporary Relaxation Permitted)

The amendments in this Circular apply to superstructure concrete only, including columns, walls, beams and suspended slabs above the structural ground-floor level.

2.2 Substructures (No Change)

The requirements of DBC Section F.6.2.3 (Table F.3) and Circular No. 7.2.1 (Attachment 7.2.1.4), remain fully applicable to all substructure concrete, including foundations, pile caps, rafts, basement walls, and retaining walls. GGBS or Fly Ash shall continue to be mandatory in substructure mixes as currently specified, and no relaxation is granted under this Circular for substructures.

3. Exposure Classes Addressed

The following exposure classes are addressed in this Circular in accordance with BS 8500-1:2023:

- **XC1** – Internal vertical elements located within permanently enclosed, air-conditioned and low-humidity spaces not exposed to condensation, water leakage, or external atmospheric moisture (e.g., internal columns and internal walls in enclosed rooms, excluding poorly ventilated or high-humidity spaces).
- **XC3/XC4** – External vertical and horizontal elements and internal horizontal elements cast monolithically with external elements (e.g., suspended slabs covering internal areas and adjoining balconies, external walls, parapets and beams).
- **XS1** – Reinforced concrete superstructures in coastal areas, defined for the purposes of this Circular as locations within approximately one (1) kilometer of the coastline, or otherwise where airborne chloride exposure is reasonably anticipated by the design engineer but not for elements in direct contact with sea water.

Other chloride-related exposure classes (XS2, XS3, XD-series) and projects subject to splash, tidal, submerged, or direct marine exposure are explicitly excluded from this Circular. For such projects, the design Engineer shall develop a durability specification on a project-specific basis in line with Dubai Building Code Part F, Section F.5.6.2 and BS 8500-1.

4. Temporary Concrete Mix Requirements – Standard Superstructures

During the validity period of this Circular, superstructure concrete may be produced using cement combinations falling within BS 8500-1:2023 Combined Performance Category A1 or B1, without mandatory inclusion of GGBS or Fly Ash, subject to the minimum requirements set out in Tables 1, 2 and 3 below. Values are taken directly from BS 8500-1:2023 Tables A.4a (XC) and A.4c (XS) for an intended working life of at least fifty (50) years.

Permissible Cements – Combined Performance Categories

Category A1 comprises CEM I (Ordinary Portland Cement) and equivalent-performance cements, including CEM II/A-P (Portland-pozzolana cement) and other cements listed against A1 in BS 8500-1:2-2023 Table A.6.

Category B1 comprises CEM II/A-L of strength class ≥ 42.5 (Portland-limestone cement), and the equivalent Portland-composite cements listed against B1 in BS 8500-1:2023 Table A.6.

Eligibility of the cements is exposure dependent. Reference shall be made to the relevant table for each exposure condition to determine the eligibility of a cement type. Except for CEM I and CEM I – SRC, only cement products approved under the Dubai Sustainable Concrete Baseline (DSCB) scheme may be used.

4.1 XC1 – Internal Vertical Elements

Applies to internal columns, internal walls and similar vertical elements within permanently enclosed and air-conditioned spaces.

Table 1 – XC1 Standard Superstructure Mix

Exposure	Min. Cover (mm)	Min. Strength Class (cyl/cube)	Max. w/c Ratio	Min. Cement Content (kg/m³)	Cement Type / Notes
XC1	20	C28/35	0.55	--	Category A1 or B1 (e.g. CEM I; CEM II/A-P; CEM II/A-L 42.5N)

4.2 XC3/XC4 – External Elements and Internal Horizontal Elements

Applies to all suspended slabs, beams and external walls and columns in the superstructure (including elements cast monolithically with balconies, terraces and other rain-exposed surfaces). The Engineer may select one of the concrete-cover options in Table 2 below based on the structural detailing and aesthetic constraints of the project. Strength classes follow BS 8500-1:2023 Table A.4a strictly.

Table 2 – XC3/XC4 Standard Superstructure Mixes (Engineer to Select Cover Option)

Exposure	Min. Cover (mm)	Min. Strength Class (cyl/cube)	Max. w/c Ratio	Min. Cement Content (kg/m³)	Cement Type / Notes
XC3/4	25	C45/55	0.35	--	Category A1 or B1
XC3/4	30	C40/50	0.40	--	Category A1 or B1
XC3/4	35	C35/45	0.45	--	Category A1 or B1
XC3/4	45	C32/40	0.50	--	Category A1 or B1

4.3 XS1 – Coastal Superstructures (Within approximately 1 km of Coastline)

Applies to reinforced concrete superstructure elements in coastal areas exposed to airborne salt but not in direct contact with sea water. BS 8500-1:2023 Table A.4c does not permit Combined Performance Category A1 for XS1 at minimum covers below 45 mm. Accordingly, where a Category A1 or B1 cement is used, the minimum cover shall be 45 mm, with the limiting values shown in Table 3 below.

Table 3 – XS1 Standard Superstructure Mix (CEM I, 45 mm Cover)

Exposure	Min. Cover (mm)	Min. Strength Class (cyl/cube)	Max. w/c Ratio	Min. Cement Content (kg/m³)	Cement Type / Notes
XS1	45	C45/55	0.35	380	Category A1 or B1

Note (XS1 lower-cover option): *Where a minimum cover lower than 45 mm is required, the Engineer shall instead specify a cement or combination from BS 8500-1:2023 Combined Performance Category A2, which includes CEM III/A (blast-furnace cement), CEM II/B-S with S ≥ 25 % (Portland-slag cement), CEM II/B-V (Portland fly-ash cement) and equivalent combinations, and apply the corresponding limiting values for XS1 (A2) in BS 8500-1:2023 Table A.4c. This option intentionally reintroduces SCMs to compensate for the reduced cover. Category B (limestone) cements are not permitted below 45 mm cover for XS1.*

4.4 Blinding Concrete

Blinding concrete is non-structural in nature (it does not carry permanent design loads). The Dubai Building Code specifies a minimum compressive (cube) strength of 20 MPa for blinding, i.e., grade C16/20.

Under this Circular, blinding concrete may be produced using either CEM I (Ordinary Portland Cement, BS EN 197-1), CEM II/A-P or CEM II/A-L, or Sulfate Resisting Cement (SRC; BS EN 197-1 CEM I-SR or equivalent), without mandatory inclusion of GGBS or Fly Ash. A sulfate-resisting cement or equivalent shall be selected where the Aggressive Chemical Environment for Concrete (ACEC) classification of the supporting ground (in accordance with BS 8500-1:2023 Annex A and BRE Special Digest 1) warrants enhanced sulfate resistance.

Table 4 — Blinding Concrete (Standard and Villa Projects)

Exposure	Min. Cover (mm)	Min. Strength Class (cyl/cube)	Max. w/c Ratio	Min. Cement Content (kg/m³)	Cement Type / Notes
Blinding	N/A	C16/20	--	--	CEM I, CEM II/A-P or CEM II/A-L; SRC or Equivalent where the ACEC class requires enhanced sulfate resistance

4.5 General Notes Applicable to Tables 1 to 3

a) Minimum cement contents are stated for 20 mm maximum aggregate size. For other aggregate sizes, adjust in accordance with BS 8500-1:2023 Table A.7.

b) The cover values stated are minimum cover to reinforcement. Nominal cover shall be obtained by adding the design allowance for deviation (Δc), in accordance with the relevant design code.

c) The Engineer retains discretion to require GGBS, Fly Ash, Silica Fume or other approved SCMs in any superstructure mix where, in their professional judgement, the project's exposure conditions, service life, geometry, or specific durability requirements warrant their use. The relaxation herein is permissive, not prescriptive.

d) Silica fume may be added at the Engineer's discretion to improve strength and/or durability.

e) Standard 28-day testing applies to all mixes produced under this Circular.

f) OPC (CEM I) and the higher-clinker Category B1 cements may increase heat of hydration and thermal cracking risk. For mass concrete or heavily restrained elements, the Consultant and Contractor shall consider the impact of increased heat of hydration associated with CEM I mixes and implement suitable temperature-control and crack-mitigation measures where necessary. Where heat of hydration is a concern, the lower-clinker Category A1 cements containing pozzolana may offer an advantage.

g) The use of Category B1 (Portland-limestone) cements is confined to the XC exposure classes and to XS1 at 45 mm cover, as set out in Table A. They shall not be relied upon to satisfy the reduced-cover XS1 option, which requires a Category A2 (SCM-bearing) cement.

h) Slab-on-grade shall not be classified as part of the substructure; therefore, the existing substructure requirements do not apply.

5. Additional Provisions for Private Villas

Recognizing the lower structural loading, limited height, and reduced exposure complexity typical of private villa construction, Dubai Municipality permits further leniency for private villa projects during the validity of this Circular, subject to the conditions set out below.

5.1 Eligibility

The provisions of this Section 5 apply only to private residential villas (single-family dwellings) up to (G+2) stories, where the building is not part of commercial complex or mixed-use scheme.

5.2 XC1 – Internal Vertical Elements in Villas

No additional relaxation is granted for XC1 in villa projects. The standard XC1 requirements in Section 4.1, Table 1 already sit at the DBC minimum compressive (cube) strength of 35 MPa (grade C28/35), which is the absolute floor for structural concrete in Dubai, and the minimum cement content is already left open under this Circular.

Table 5 – XC1 Private Villa Mix

Exposure	Min. Cover (mm)	Min. Strength Class (cyl/cube)	Max. w/c Ratio	Min. Cement Content (kg/m³)	Cement Type / Notes
XC1	20	C28/35	0.55	--	Category A1 or B1

5.3 XC3/XC4 – External and Internal Horizontal Elements in Villas

For villas, the Engineer may select one strength class lower than the standard requirement at each cover option.

Table 6 – XC3/XC4 Private Villa Mixes (Engineer to Select Cover Option)

Exposure	Min. Cover (mm)	Min. Strength Class (cyl/cube)	Max. w/c Ratio	Min. Cement Content (kg/m³)	Cement Type / Notes
XC3/4	25	C40/50	0.40	--	Category A1 or B1
XC3/4	30	C32/40	0.50	--	Category A1 or B1
XC3/4	35	C28/35	0.55	--	Category A1 or B1

5.4 XS1 – Coastal Villas

In view of the long-term durability risks associated with airborne chlorides on residential property, no additional villa-specific relaxation is granted for XS1. The provisions of Table 3 (Section 4.3) apply equally to coastal villas: Category A1 or B1 cements may be used at 45 mm cover and identical limiting values, while a reduced cover requires a BS 8500-1:2023 Combined Performance Category A2 (SCM-bearing) cement.

5.5 Notes Applicable to Villa Provisions

a) All substructure concrete for private villas shall continue to comply with the existing requirements of DBC Section F.6.2.3 (Table F.3) and Circular No. 225.

b) Notes (a) to (h) under Section 4.5 apply equally to villa mixes.

6. Responsibilities of Consultants and Engineers

Dubai Municipality urges all Consultants to avoid over-specifying concrete strength and durability parameters during the validity period of this Circular. Over-specification places additional pressure on a constrained supply chain, increases material consumption unnecessarily, and inflates the embodied carbon of construction without appropriate durability benefit.

Consultants shall in particular:

(a) specify the lowest grade and cement content compatible with the structural and durability requirements of each element, selecting the appropriate cover option from the tables herein in line with BS 8500-1:2023.

(b) avoid applying the most onerous specifications to all elements of a project where lower exposure classes are appropriate.

(c) clearly identify on the structural drawings the exposure class, strength class, maximum w/c ratio and minimum cement content (if required), cement category, and minimum cover for each concrete element.

(d) retain caution to require GGBS, Fly Ash, Silica Fume or other approved SCMs in any specific element where project-specific conditions justify their use; and

Contractors and Ready-Mixed Concrete Producers shall provide accurate mix design, batching records and conformity test results, and shall not unilaterally substitute mixes or cement categories without the Consultant's approval.

7. Items Unchanged by this Circular

Except as expressly amended in Sections 4 and 5 above, all other provisions of DBC Part F (Structure), Section F.6.2.3, Table F.3, Circular No7.2.1 (Attachment 7.2.1.4), and the Dubai Sustainable Concrete Baseline (DSCB) in DBC Section F.11 remain in full force and effect. In particular:

(a) minimum cover to reinforcement requirements for substructures remains at 50 mm or 75 mm as set out in DBC Note (f) of Section F.6.2.3.

(c) temporary works (shoring, shotcrete, etc.) and non-structural screeds are unaffected; and

(d) the alternative DSCB route under DBC Section F.11 remains available for projects that prefer to specify concrete on a performance/embodied-impact basis.

(e) this Circular does not modify the requirements of the applicable structural design codes relating to serviceability, crack-width control, structural safety, or reinforcement detailing.

8. Validity and Review

This Circular shall remain in force from the date of issuance until further notice by Dubai Municipality. Dubai Municipality may modify, suspend, or terminate the provisions of this Circular through a subsequent circular or official notice, based on prevailing market conditions, technical considerations, and regulatory requirements.

Following the termination of this Circular, all concrete mixes used in new and ongoing projects shall revert to full compliance with the requirements of DBC Section F.6.2.3 (Table F.3) and Circular No. 7.2.1 (Attachment 7.2.1.4). Concrete already cast in accordance with this Circular during its validity period shall be deemed compliant. Concrete mixes formally approved prior to expiry of this Circular may continue to be used for the transition period specified by Dubai Municipality as per the official notice.

9. Enquiries

Technical enquiries regarding this Circular shall be addressed to the Research and Building Systems Section of the Building Permits Department at the contact details below.

Email: dscb@dm.gov.ae