

From: [Danielle Kleinhans](#)
To: [es](#)
Subject: Submission of Comments on AC574
Date: Wednesday, April 23, 2025 5:02:02 PM
Attachments: [image001.png](#)

Dear ICC-ES,

Below I submit to you my comments on AC574 – Proposed Acceptance Criteria for Seawater Concrete for Use in Plain or FRP Reinforced Concrete Members. Each comment is referenced to the section number from the criteria document.

Section 2.1 – What is the standard test method for chemical composition of seawater? What elements must be reported? What will ICC-ES do with this information, and will there be some form of acceptance criteria and/or approval of the seawater based on this?

Section 2.4 - This states that the FRP bars must be compliant with ACI 440.11, however ACI 440.11 refers to ASTM D7957. Would it be preferable to reference ASTM D7957 directly, and possibly add in the recent ASTM D8505, which is not currently referenced in the ACI 440.11?

Section 2.5 – Is the packaging requirement for the seawater or the seawater concrete?

Section 3.1.1 – Define “seawater source”. Is that by geographic location, and if so, how much area (distance) is covered ?

Following on from this point in Section 1.4.5 – Major Environmental Event should include flooding of rivers, which would alter the composition of the seawater close to a river mouth, etc.

Section 3.3 – Since GFRP reinforced concrete is not allowed for fire-rated construction in the USA, it is ill-advised to include this optional provision. This may be a regional consideration.

Section 3.1.7 If there is any treatment of the seawater, then the seawater composition (as per 2.1) samples should undergo the same treatment before testing to ensure they are representative.

Section 3.3.1 – Correct typo “ASTM” and not “ASTEM”

Section 4.5 – Is a 10% variation acceptable for all elements? Should the limit be +10% with a negative limit of -100% (i.e. Is there a problem if the seawater is ‘more like’ freshwater)?

Section 4.6 – Is the inspection verification required for every seawater concrete batch?

Section 4.6 – Is the 10% variability between batches? If not, between what properties or items is the variability measured?

Table 2 – For compressive strength, what test ages are required for non-seawater concrete? Is a one-year test age excessive? Even a 6-month test seems excessive. Strength versus age curves have been established for seawater concrete, so surely these could be used to extrapolate beyond 3 months (with factor of safety applied).

Table 2 – Footnotes 5 and 6 can be removed as they are redundant to the test method information included in the second column of the table for all properties.

Overall – What is the expectation for submittals for acceptance under this criteria? There are

infinite possible mix designs even without considering seawater. It would seem that the water itself could just be tested in a similar manner to the existing water standard test method ASTM C1602; perhaps an addition to that standard test could suffice.

I will also sign up for the June hearings online and await any further requests or instructions. I generally support the direction here and hope that these comments will improve the use of this AC for the development of seawater concrete.

Sincerely,

Danielle

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DATE: April 16, 2025
TO: ICC-ES
FROM: Antonio Nanni
SUBJECT: Comment to AC574

A handwritten signature in blue ink, reading 'Antonio Nanni'.

I am in full support of the proposed AC574. I would suggest a revision as shown below.

Thanks for your consideration and regards.

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Rationale

Given the unique chemical environment presented by seawater concrete, it would be beneficial to explicitly specify the curing conditions as well. ASTM C31 and ASTM C192 currently prescribe curing specimens in fresh (potable) water only, as only fresh water is currently being used, and, thus, do not address curing in seawater environments. Clarifying whether curing should occur in freshwater, seawater, or if both methods are acceptable would ensure consistency across laboratory and field applications, aiding accurate assessment of long-term durability and performance.

Proposed revisions

- Add definition for Seawater Curing:

1.4.9 Seawater Curing: Moisture curing of concrete samples in seawater in accordance with the procedure of ASTM C192.

- Add Section 3.3 for Seawater Curing

3.3 Seawater Curing (Optional): Seawater concrete cured in seawater shall demonstrate the performance requirements listed in Table 3 when compared with reference samples cured under standard curing conditions.

3.3.1 Physical requirements specified in Table 3 shall be evaluated. Test specimens shall be prepared and tested in accordance with the ASTM standards or alternative test standards specified in Table 4.

Exception: The relative durability factor measured by the freezing and thawing test per ASTM C666 as specified in Table 3 is applicable only if the admixture is intended for use in air-entrained concrete that may be exposed to freezing and thawing while wet.

3.3.2 For the results of compressive and flexural strength, the specimens shall be tested for compliance at each time interval specified by the physical requirements of ASTM C260 and C494, as applicable, and shall be determined in comparison to reference samples. The starting point (time zero) for each of these time intervals is the time at which the test specimens are initially cast.

Exception: For initial evaluation, submittal of the six months and one-year compression strength tests may be supplied within nine months of evaluation report issuance, provided reports of tests demonstrate provisional compliance with the alternative compressive strength requirements in Table 3.

- Split Table 2 into two tables as follows:

TABLE 2–REQUIRED FRESH PROPERTIES OF CONCRETE

PROPERTY	TEST METHOD	NUMBER OF TEST AGES	NUMBER OF SPECIMENS PER MIX	ACCEPTANCE CRITERIA
Slump	ASTM C143	1 ¹	3 (one per batch)	+ - 1 inch of reference mixture
Fresh Density	ASTM C138	1 ¹	3 (one per batch)	+ - 5 percent of reference mixture
Air content	ASTM C231	1 ¹	3 (one per batch)	+ - 1 percent of reference mixture-
Initial Time of setting	ASTM C403	1 ¹	3 (one per batch)	Not 1:00 earlier nor 1:30 later
Final Time of setting	ASTM C403	1 ¹	3 (one per batch)	Not 1:00 earlier nor 1:30 later
Bleeding	ASTM C232	1 ¹	3 (one per batch)	Max. 2% over reference sample

Footnotes are included under Table 3

TABLE 3–REQUIRED HARDENED PROPERTIES OF CONCRETE

PROPERTY	TEST METHOD	NUMBER OF TEST AGES	NUMBER OF SPECIMENS PER MIX	ACCEPTANCE CRITERIA
Compressive strength	ASTM C39	6 ²	9 (three per test age from 3 separate batches)	Min. 90% of reference sample
Flexural strength	ASTM C78	3 ³	9 (three per test age from 3 separate batches)	Min. 90% of reference sample
Length change	ASTM C157	1	3 (one per batch)	Same as reference mixture length change or less
Freezing and Thawing ⁴	ASTM C666	1	3 (one per batch)	Min. 90% of reference Sample
Sulfate attack resistance	ASTM C1012	1 ⁵	6 (two per batch)	Must be within permitted level in accordance with ACI 318 - Table 26.4.2.2(c)

Alkali silica reaction	ASTM C1260	1 ⁶	3 (one per batch)	Must be class R0 in accordance with ASTM C1778 (i.e., <0.10% expansion)
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¹Fresh Concrete

²Test shall be conducted at 3 days, 7 days, 28 days, 90 days, 6 months, and 1 year.

³Test shall be conducted at 3, 7, and 28 days.

⁴Applicable only if the admixture is intended for use in air-entrained concrete that may be exposed to freezing and thawing while wet.

⁵Test shall be conducted in accordance with ASTM C1012.

⁶Test shall be conducted in accordance with ASTM C1260.