ICC EVALUATION SERVICE®

ICC Evaluation Service, LLC
Eastern Regional Office
900 Montclair Road, Suite A
Birmingham, AL 35213
t: 1.800.423.6587, ext. 1
f: 205.202.5738
www.icc-es.org

March 29, 2024

TO: **PARTIES INTERESTED IN INTERNAL CURING CONCRETE ADMIXTURE**

SUBJECT: Proposed Acceptance Criteria for Internal Curing Concrete Admixture, Subject AC564-0624-R1 (MG/MS)

Hearing Information:
WebEx Event Meeting
Tuesday, June 25, 2024
8:00 am Pacific Daylight Time
Click the date above to register

Dear Colleague:

You are invited to comment on proposed Acceptance Criteria for Internal Curing Concrete Admixture (AC564), which will be discussed at the Evaluation Committee hearing noted above. The proponent of this criteria is Berger Paints Emirates Ltd Co. LLC. with the support of Dubai Municipality.

The proposed criteria is being developed to evaluate the use of internal curing concrete admixtures as an alternative to the traditional field curing practices outlines in ACI 308.1 under the 2024 and 2021 *International Building Code*® (IBC), the 2021 *Dubai Building Code*® (DBC), and the 2018 *Saudi Building Code*® (SBC). The criteria contains provisions to evaluate the effect of internal curing admixtures on the fresh and hardened properties of concrete, as well as the internal curing performance of the admixture.

You are invited to submit written comments on this or any other agenda item and attend the Evaluation Committee hearing to support your written comments in person. If you wish to contribute to the discussion, please note the following:

1. Regarding written comments and presentations:

   a. You should submit these via e-mail to es@icc-es.org by the applicable due date.

   b. The deadline for submitting written comments is **April 25, 2024.** These comments will be forwarded to the committee and posted on the ICC-ES web site shortly after the deadline. Comments that are not submitted by this deadline will not be considered at the meeting.

c. The deadline for submitting rebuttal comments, from the proponent noted in this letter, is **May 16, 2024**. These comments will be forwarded to the committee and posted on the ICC-ES web site shortly after the deadline. Comments that are not submitted by the deadline will not be considered at the meeting.

d. The deadline for submitting a presentation is **May 30, 2024.** If a company wants to present a visual presentation at the hearing, it shall be received in PowerPoint format. These will be forwarded to the committee and posted on the ICC-ES web site approximately two weeks before the hearing. Presentations that are not submitted by the deadline cannot be presented at the meeting. **Note:** Videos will not be posted on the web site.

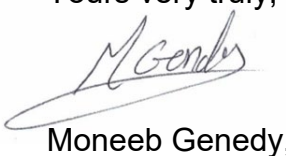
e. ICC-ES staff memo addressing public comments, rebuttal comments, and presentations (as deemed necessary) will be posted to the ICC-ES web site on **June 11, 2024**.

2. Keep in mind that all materials submitted for committee consideration are part of the public record and will not be treated as confidential. It is the presenter's responsibility to certify to ICC-ES staff that no materials infringe copyright.

3. Please do not communicate with committee members before the meeting about any items on the agenda.

We appreciate your interest in the work of the Evaluation Committee. If you have any questions, please contact me at (800) 423-6587, extension 5697, or Melissa Sanchez, S.E, P.E., Principal Structural Engineer, at extension 3230. You may also reach us by e-mail at es@icc-es.org.

Yours very truly,



Moneeb Genedy, Ph.D., P.E.
Staff Engineer

MG/MS/ls

Encl.

cc: Evaluation Committee

ICC EVALUATION SERVICE, LLC, RULES OF PROCEDURE FOR THE EVALUATION COMMITTEE

1.0 PURPOSE

The purpose of the Evaluation Committee is to review and approve acceptance criteria on which evaluation reports may be based.

2.0 MEMBERSHIP

2.1 The Evaluation Committee has a membership of not fewer than nine, with one of the members named by the ICC-ES president each year to serve as the chairman–moderator.

2.2 All members of the committee shall be representatives of a body enforcing regulations related to the built environment.

2.3 Persons are appointed to the committee by the ICC-ES president, from among individuals who have formally applied for membership.

2.4 The ICC-ES Board of Managers, using simple majority vote, shall ratify the nominations of the president.

2.5 Committee membership is for one year, coinciding with the calendar year. Members may be renominated and reappointed.

2.6 In the event that a member is unable to attend a committee meeting or complete a term on the committee, the ICC-ES president may appoint a replacement to fill in at the meeting or for the remainder of the member's term. Any replacement appointed for only one meeting must have prior experience as a member of the Evaluation Committee. Appointments under this section (Section 2.6) are subject to ratification as noted in Section 2.4.

3.0 MEETINGS

3.1 The Evaluation Committee shall schedule meetings that are open to the public in discharging its duties under Section 1.0, subject to Section 3.0.

3.2 All scheduled meetings shall be publicly announced. There shall be three to six meetings per year (as necessary).

3.3 More than half of the Evaluation Committee members, counting the chairman, shall constitute a quorum. A majority vote of members present is required on any action. To avoid any tie vote, the chairman may choose to exercise or not exercise, as necessary, his or her right to vote.

3.4 In the absence of the chairman–moderator, Evaluation Committee members present shall elect an alternate chairman from the committee for that meeting. The alternate chairman shall be counted as a voting committee member for purposes of maintaining a committee quorum and to cast a tie-breaking vote of the committee.

3.5 Minutes shall be kept and shall be the official record of each meeting.

3.6 An electronic record of meetings may be made by ICC-ES if deemed necessary; no other audio, video, electronic recordings of the meetings will be permitted. Visual aids (including, but not limited to, charts, slides, videos, or presentation software) viewed at meetings shall be permitted only if the presenter provides ICC-ES before the presentation with a copy of the visual aid in a medium which can be retained by ICC-ES with its record of the meeting and which can also be provided to interested parties requesting a copy.

3.7 Parties interested in the deliberations of the committee should refrain from communicating, whether in writing or verbally, with committee members regarding agenda items. All written communications and submissions regarding agenda items must be delivered to ICC-ES and shall be considered nonconfidential and available for discussion in open session of an Evaluation Committee meeting. Such materials will be posted on the ICC-ES web site (www.icc-es.org) prior to the meeting. Comments and submissions not meeting the following deadlines will not be considered at the meeting:

- Initial comments on agenda items shall be submitted at least 28 days before the scheduled meeting.
- A rebuttal comment period shall follow, whereby rebuttal comments to the initial comments may be submitted by the proponent at least 21 days before the scheduled meeting.
- Those planning on giving a visual presentation at the meeting must submit their presentation, in PowerPoint format only, at least 10 days before the scheduled meeting.

The committee reserves the right to refuse recognition of communications which do not comply with the provisions of this section.

4.0 CLOSED SESSIONS

Evaluation Committee meetings shall be open except that at the discretion of the chairman, staff counsel may be necessary. Also, matters related to clients or potential clients covered by confidentiality requirements of ICC-ES Rules of Procedure for Evaluation Reports are discussed only during closed meetings.

5.0 ACCEPTANCE CRITERIA

5.1 Acceptance criteria are established by the committee to provide a basis for issuing ICC-ES evaluation reports on products and systems under codes referenced in Section 2.0 of the Rules of Procedure for Evaluation Reports. They also clarify conditions of acceptance for products and systems specifically regulated by the codes.

Acceptance criteria may involve a product, material, or method of construction. Consideration of any acceptance criteria must be in conjunction with a current and valid application for an ICC-ES evaluation report, an existing ICC-ES evaluation report, or as otherwise determined by the ICC-ES President.

EXCEPTIONS: The following acceptance criteria are controlled by the ICC-ES executive staff and are not subject to committee approval:

- The Acceptance Criteria for Quality Documentation (AC10)
- The Acceptance Criteria for Test Reports (AC85)
- The Acceptance Criteria for Inspections and Inspection Agencies (AC304)

5.2 Procedure:

5.2.1 Proposed acceptance criteria shall be developed by the ICC-ES staff and discussed in open session with the Evaluation Committee during a scheduled meeting, except as permitted in Section 4.0 of these rules.

5.2.2 Proposed acceptance criteria shall be available to interested parties at least 30 days before discussion at the committee meeting.

5.2.3 The committee shall be informed of all pertinent written communications received by ICC-ES.

5.2.4 Attendees at Evaluation Committee meetings shall have the opportunity to speak on acceptance criteria listed on the meeting agenda, to provide information to committee members. In the interest of fairness, each speaker requesting to testify on a proposed acceptance criteria or proposed changes to an existing acceptance criteria will be given the same amount of time, as follows:

a. A 10-minute time limit applies to speakers giving their first testimony on any item, which applies to both verbal testimony and/or visual presentations.

b. A 5-minute time limit applies to speakers returning to the microphone to offer additional testimony and/or to rebut testimony given by others.

c. A 2-minute time limit applies to speakers offering testimony on the staff recommendation to criteria.

Should a company have multiple speakers, the speaker time limits above apply the company, in that multiple speakers from the same company shall share the testimony time, i.e., multiple speakers from the same company shall not each get their own testimony times. Time limits do not include time needed to answer questions from the staff and/or committee members. The chairman–moderator shall have limited authority to modify time limitations on testimony. The chairman–moderator shall also have the authority to adjust time limits as necessary in order to get through the hearing agenda.

An automatic timing device shall keep time for testimony and shall provide the time remaining to the speaker testifying. Interruptions during testimony will not be tolerated. It is the responsibility of the chairman–moderator to maintain decorum and order during all testimony.

5.3 Approval of any action on an acceptance criteria shall be as specified in Section 3.3 of these rules. Possible actions made by the Evaluation Committee include: Approval; Approval with Revisions; Disapproval; or Further Study. The Evaluation Committee must give the reason(s) for any Disapproval or Further Study actions with specific recommendations.

5.4 Actions of the Evaluation Committee may be appealed in accordance with the ICC-ES Rules of Procedure for Appeal of Acceptance Criteria or the ICC-ES Rules of Procedure for Appeals of Evaluation Committee Technical Decisions.

6.0 COMMITTEE BALLOTING FOR ACCEPTANCE CRITERIA

6.1 Acceptance criteria may be revised without a public hearing following a 30-day public comment period and a majority vote for approval by the Evaluation Committee (i.e., alternative criteria development process), when at the discretion of the ICC-ES executive staff, the subject is a revision that requires formal action by the Evaluation Committee.

6.2 Negative votes must be based upon one or more of the following, for the ballots to be considered valid and require resolution:

a. *Lack of clarity*: There is insufficient explanation of the scope of the acceptance criteria or insufficient description of the intended use of the product or system; or the acceptance criteria is so unclear as to be unacceptable. (The areas where greater clarity is required must be specifically identified.)

b. *Insufficiency*: The criteria is insufficient for proper evaluation of the product or system. (The provisions of the criteria that are in question must be specifically identified.)

c. *The subject of the acceptance criteria is not within the scope of the applicable codes*: A report issued by ICC-ES is intended to provide a basis for approval under the codes. If the subject of the acceptance criteria is not regulated by the codes, there is no basis for issuing a report, or a criteria. (Specifics must be provided concerning the inapplicability of the code.)

d. *The subject of the acceptance criteria needs to be discussed in public hearings*. The committee member requests additional input from other committee members, staff or industry.

6.3 An Evaluation Committee member, in voting on an acceptance criteria, may only cast the following ballots:

- Approved
- Approved with Comments
- Negative: Do Not Proceed

7.0 COMMITTEE COMMUNICATION

Direct communication between committee members, and between committee members and an applicant or concerned party, with regard to the processing of a particular acceptance criteria or evaluation report, shall take place only in a public hearing of the Evaluation Committee. Accordingly:

7.1 Committee members receiving an electronic ballot should respond only to the sender (ICC-ES staff). Committee members who wish to discuss a particular matter with other committee members, before reaching a

decision, should ballot accordingly and bring the matter to the attention of ICC-ES staff, so the issue can be placed on the agenda of a future committee meeting.

7.2 Committee members who are contacted by an applicant or concerned party on a particular matter that will be brought to the committee will refrain from private communication and will encourage the applicant or concerned party to forward their concerns through the ICC-ES staff in writing, and/or make their concerns known by addressing the committee at a public hearing, so that their concerns can receive the attention of all committee members.■

Revised November 2023

ICC EVALUATION SERVICE

www.icc-es.org | (800) 423-6587 | (562) 699-0543 *A Subsidiary of the International Code Council®*

PROPOSED ACCEPTANCE CRITERIA FOR INTERNAL CURING CONCRETE ADMIXTURE (AC564)

AC564

Proposed March 2024

PREFACE

Evaluation reports issued by ICC Evaluation Service, LLC (ICC-ES), are based upon performance features of the International family of codes, and may include other codes, as applicable. For alternative materials design and methods of construction and equipment, see Section 104.2.3 of the 2024 International Building Code® (IBC), Section 104.11 of the 2021 IBC and earlier editions, and Section R104.11 of the 2021 IRC and earlier editions.

ICC-ES may consider alternate criteria for report approval, provided the report applicant submits data demonstrating that the alternate criteria are at least equivalent to the criteria set forth in this document, and otherwise demonstrate compliance with the performance features of the codes. ICC-ES retains the right to refuse to issue or renew any evaluation report, if the applicable product, material, or method of construction is such that either unusual care with its installation or use must be exercised for satisfactory performance, or if malfunctioning is apt to cause injury or unreasonable damage.

Acceptance criteria are developed for use solely by ICC-ES for purposes of issuing ICC-ES evaluation reports.

PROPOSED ACCEPTANCE CRITERIA FOR INTERNAL CURING CONCRETE ADMIXTURE (AC564)

1.0 INTRODUCTION

1.1 Purpose: The purpose of this acceptance criteria is to establish requirements for evaluation of internal curing chemical admixture in concrete, in ICC Evaluation Service, LLC (ICC-ES), evaluation reports under the 2024 and 2021 *International Building Code*® (IBC), the 2021 *Dubai Building Code*® (DBC), and the 2018 *Saudi Building Code*® (SBC). This criteria addresses the use of special admixtures used in concrete that comply with the requirements of the codes.

The reason for the development of this criteria is to provide a guideline for evaluation of chemical admixtures used for internal curing of concrete to comply with the provisions and requirements in Chapter 19 of the IBC and to address performance characteristics of internal curing chemical admixture in concrete as an alternative to the field curing practices outlines in ACI 308.1.

1.2 Scope: The acceptance criteria is limited to chemical admixtures used in concrete under Section 1903 of the IBC, Section F.6.2 of the DBC, and Section 1903 of SBC 201-CR of the SBC.

1.3 Referenced Documents: Where standards are referenced in this criteria, these standards shall be applied consistently with the code upon which compliance is based. Standards editions listed in this section apply to all IBC, DBC, and SBC editions referenced in this criteria. Where standards editions are not listed in this section, Table 1 summarizes the specific date applicable to each code year.

1.3.1 2024, 2021, 2018, and 2015 *International Building Code*® (IBC), International Code Council.

1.3.2 2021 *Dubai Building Code*® (DBC), Government of Dubai.

1.3.3 2018 *Saudi Building Code*® (SBC), Saudi Building Code National Committee.

1.3.4 ACI 308.1, External Curing of Cast-in-Place Concrete—Specification, American Concrete Institute.

1.3.5 ACI 318, Building Code Requirements for Structural Concrete, American Concrete Institute.

1.3.6 ASTM C39, Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens, ASTM International.

1.3.7 ASTM C78, Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading), ASTM International.

1.3.8 ASTM C138, Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete, ASTM International.

1.3.9 ASTM C143, Standard Test Method for Slump of Hydraulic-Cement Concrete, ASTM International.

1.3.10 ASTM C157, Standard Test Method for Length Change of Hardened Hydraulic-Cement Mortar and Concrete, ASTM International.

1.3.11 ASTM C192, Practice of Making and Curing Concrete Test Specimens in the Laboratory, ASTM International.

1.3.12 ASTM C231, Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method, ASTM International.

1.3.13 ASTM C232, Standard Test Method for Bleeding of Concrete, ASTM International.

1.3.14 ASTM C260, Standard Specification for Air-Entraining Admixtures for Concrete, ASTM International.

1.3.15 ASTM C403, Standard Test Method for Time of Setting of Concrete Mixtures by Penetration Resistance, ASTM International.

1.3.16 ASTM C494, Standard Specification for Chemical Admixtures for Concrete, ASTM International, ASTM International.

1.3.17 ASTM C666, Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing, ASTM International.

1.3.18 ASTM C1218, Standard Test Method for Water Soluble Chloride in Mortar and Concrete, ASTM International.

1.3.19 ISO 21930-2017 Sustainability in Buildings and Civil Engineering Works - Core Rules for Environmental Product Declarations of Construction Products and Services, International Organization for Standardization (ISO).

1.4 Definitions:

1.4.1 Air Curing: Air curing of curing concrete samples in air in controlled environment with a relative humidity less than 50%.

1.4.2 Compressive Strength Ratio: Compressive strength ratio is the ratio between the compressive strength of the air cured concrete sample containing internal curing admixture and the compressive strength of the reference sample.

1.4.3 Field Curing Conditions: Initial and final curing of concrete samples in conditions that represent field curing in accordance with ACI 308.1.

1.4.4 Flexural Strength Ratio: Flexural strength ratio is the ratio between the flexural strength of the air cured concrete sample containing internal curing admixture and the flexural strength of the reference sample.

1.4.5 Internal Curing Admixture: Internal curing admixture is a chemical admixture added to concrete during mixing to allow air curing of concrete samples while achieving similar performance to moist-cured concrete.

1.4.6 Initial/Final Setting time deviation: Initial/Final setting time deviation is the difference between initial/final setting time of the air cured concrete sample containing internal curing admixture and the initial/final setting time of the reference sample.

1.4.7 Length Change Ratio: Length change ratio is the ratio between the length change of the air cured concrete sample containing internal curing admixture and the length change of the reference sample.

1.4.8 Reference Samples: Reference samples are concrete samples that do not include the internal curing admixture.

1.4.9 Relative Durability Factor Ratio: Relative durability factor ratio is the ratio between the relative durability factor of the air cured concrete sample containing

internal curing admixture and the relative durability factor of the reference sample.

1.4.10 Standard Curing: Moisture curing of concrete samples in accordance with ASTM C192.

2.0 BASIC INFORMATION

2.1 Product Description: Description of the product, including weight, packaging, labeling, and shelf life.

2.2 Installation Instructions: Installation instructions, including dosage rate, mixing instructions, and limitations on use. Installation instructions for admixture used in concrete for internal curing with Section 3.1 of this criteria shall specify the expected range of compressive strength ratio, flexural strength ratio and relative durability factor ratio of concrete produced using internal curing admixture.

2.3 Packaging and Identification: A description of the method of packaging of the internal curing admixtures shall be submitted. Product labeling shall include the evaluation report number. Product Identification shall be in accordance with the product identification provisions of the ICC-ES Rules of Procedure for Evaluation Reports. The ICC-ES mark of conformity, electronic labeling, and/or the evaluation report number (ICC-ES ESR-XXXX) along with the name, registered trademark, or registered logo of the report holder [and/or listee] must be included in the product label.

2.4 Testing Laboratories, Reports of Tests and Product Sampling:

2.4.1 Testing laboratories shall comply with Section 2.0 of the ICC-ES Acceptance Criteria for Test Reports (AC85) and Section 4.2 of the ICC-ES Rules of Procedure for Evaluation Reports.

2.4.2 Test reports shall comply with AC85.

2.4.3 Sampling of the internal curing admixture for the tests required in Section 3.0 of this criteria shall comply with Section 3.2 of AC85. The preparation of the test specimens for the tests required in Section 3.0 of this criteria shall be completed by the testing laboratory.

2.5 Qualification Test Plan: A qualification test plan shall be submitted to and approved by ICC-ES staff prior to any testing being conducted.

3.0 REQUIRED DATA TEST AND PERFORMANCE REQUIREMENTS

3.1 Admixture Effect on Concrete: Tests must indicate that the internal curing admixture will not have an adverse effect on the properties of concrete. Reports of tests must demonstrate that concrete containing the internal curing admixture, cured under standard curing conditions in accordance with ASTM C192, complies with the minimum performance requirements for chemical admixture described in ASTM C494 Type S and ASTM C260 when compared with reference samples cured under standard curing conditions in accordance with ASTM C192, as applicable, with the following conditions:

3.1.1 Physical requirements specified in ASTM C260 and ASTM C494 shall be evaluated. Test specimens shall be prepared and tested in accordance with the ASTM standards or alternative test standards specified in Table 2.

Exception: Relative durability factor measured by freezing and thawing test per ASTM C666 as specified in ASTM C494 is applicable only if the admixture is intended for use in air-entrained concrete that may be exposed to freezing and thawing while wet, as indicated in Footnote F in Table 1 of ASTM C494.

3.1.2 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 one-year compression strength tests may be supplied within six months of evaluation report issuance, provided reports of tests demonstrate provisional compliance with the alternative compressive strength requirements in Table 1 of ASTM C494. See footnote C in Table 1 of ASTM C494 for additional details.

3.2 Internal Curing Performance: Air-cured concrete containing the internal curing admixture shall demonstrate the minimum performance requirements for chemical admixture described in ASTM C494 Type S and ASTM C260 when compared with reference samples cured in field curing conditions in accordance with ACI 308.1, as applicable, with the following conditions:

3.2.1 Physical requirements specified in ASTM C260 and ASTM C494 shall be evaluated. Test specimens shall be prepared and tested in accordance with the ASTM standards or alternative test standards specified in Table 2.

Exception: Relative durability factor measured by freezing and thawing test ASTM C666 as specified in ASTM C494 is applicable only if the admixture is intended for use in air-entrained concrete that may be exposed to freezing and thawing while wet, as indicated in Footnote F in Table 1 of ASTM C494.

3.2.2 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 one-year compression strength tests may be supplied within six months of evaluation report issuance, provided reports of tests demonstrate provisional compliance with the alternative compressive strength requirements in Table 1 of ASTM C494. See footnote C in Table 1 of ASTM C494 for additional details.

3.3 Chemical admixtures containing chloride from sources other than impurities in admixture ingredients shall not be used in concrete containing embedded aluminum or in concrete cast against stay-in-place galvanized steel forms in accordance with Section 26.4.1.4.1(c) of ACI 318.

3.4 Internal Curing Chemical Admixture Used in Reinforced Concrete: Chemical admixtures shall comply with Sections 3.1 and 3.2 of this criteria. Additionally, reports of tests in accordance with ASTM C1218 shall demonstrate that the chemical admixtures comply with Table 19.3.2.1 of ACI 318, as applicable, for maximum water-soluble chloride ion (Cl^-) content in concrete.

3.5 Internal Curing Chemical Admixture Used in Prestressed Concrete: Chemical admixtures shall comply with Section 3.1 and 3.2 of this criteria. Additionally, chemical admixtures containing chloride from sources other than impurities in admixture ingredients shall not be used in prestressed concrete in accordance with Section 26.4.1.4.1(c) of ACI 318.

4.0 QUALITY CONTROL

4.1 Quality documentation complying with the ICC-ES Acceptance Criteria for Quality Documentation (AC10) shall be submitted.

4.2 A qualifying inspection shall be conducted at each manufacturing facility in accordance with the requirements of the ICC-ES Acceptance Criteria for Inspections and Inspection Agencies (AC304).

4.3 An annual inspection shall be conducted at each manufacturing facility in accordance with AC304.

5.0 EVALUATION REPORT REQUIREMENTS

5.1 The evaluation report shall state that chemical admixtures used in concrete under the IBC, DBC, or SBC is subject to prior approval by the registered design professional.

5.2 For chemical admixtures containing calcium chloride or chemical admixtures containing chloride from other than impurities in admixture ingredients, the evaluation report shall state the prohibited uses for the chemical admixtures in accordance with Table 19.3.2.1 and Section 26.4.1.4.1(c) of ACI 318, as applicable.

5.3 The evaluation report shall state whether the chemical admixture is evaluated for the use in air-entrained concrete that may be exposed to freezing and thawing while wet or not.

5.4 The initial setting time deviation, final setting time deviation, compressive strength ratio, flexural strength ration, length change ration, and relative durability factor of the chemical admixtures as determined in accordance with Section 3.1 shall be reported in the evaluation report, as applicable.

6.0 ENVIRONMENTAL PRODUCT DECLARATION (Optional):

Environmental impacts shall be assessed via an Environmental Product Declaration (EPD) based on a Life Cycle Assessment (LCA). The LCA and EPD shall be conducted in accordance with ISO 21930 and the appropriate Product Category Rule(s) for the product type.■

TABLE 1 – 2024 IBC, 2021 IBC, 2021 DBC, and 2018 SBC APPLICABLE EDITIONS OF REFERENCED STANDARDS[1]

STANDARDS INCLUDED IN CRITERIA	2024 IBC	2021 IBC	2018 IBC	2015 IBC	2021 DBC	2018 SBC
ACI 308.1	-08	-08	-08	-08	-08	-08
ACI 318	-19	-19	-14	-14	-19	-14
ASTM C39	-18	-18	-14a	-14a	-18	-14a
ASTM C78	-22	-22	-22	-22	-22	-22
ASTM C138	-17a	-17a	-17a	-17a	-17a	-17a
ASTM C143	-20	-20	-20	-20	-20	-20
ASTM C157	-17	-17	-17	-17	-17	-17
ASTM C192	-18	-18	-18	-18	-18	-18
ASTM C231	-17a	-17a	-14	-14	-17a	-14
ASTM C232	-21	-21	-21	-21	-21	-21
ASTM C260	-10a(2016)	-10a(2016)	-10a(2016)	-10a(2016)	-10a(2016)	-10a(2016)
ASTM C403	-23	-23	-23	-23	-23	-23
ASTM C494	-17	-17	-17	-17	-17	-17
ASTM C666	-15	-15	-15	-15	-15	-15
ASTM C1218	-17	-17	-99(2008)	-99(2008)	-17	-99(2008)

[1]When a specific edition of a standard is referenced in this table under a specific edition of the code, products must be shown to comply with the specified edition of the standard.

TABLE 2– TEST STANDARDS FOR REQUIRED PHYSICAL PROPERTIES OF CONCRETE

PHYSICAL PROPETIES	ASTM STANDARD	ALTERNATIVE STANDARD
Slump	ASTM C143	BS EN 12350-2
Fresh Density	ASTM C138	BS EN 12350-6
Air content	ASTM C231	BS EN 12350-7
Time of setting	ASTM C403	BS EN 196-3
Compressive strength	ASTM C39	BS EN 12390-3
Flexural strength	ASTM C78	BS EN 12390-5
Length change	ASTM C157	BS EN 12390-16
Freezing and Thawing[1]	ASTM C666	-
Bleeding	ASTM C232	-

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