

Artificial Intelligence for Concrete

Q. *During a recent jobsite meeting, the architect's representative presented information on concrete surface finish categories SF1 to SF5, stating that the information was from ACI SPEC-301, "Specifications for Concrete Construction," published in 2023. We are confused because we cannot find ACI SPEC-301-23, and our copy of ACI SPEC-301-20¹ has only three surface finish categories: SF1 to SF3. What (or who) does the architect know that we don't?*

A. You are correct—ACI SPEC-301-23 does not exist, and the latest version of ACI SPEC-301 was published in 2020. We spoke with several members of ACI Committee 301, Specifications for Concrete Construction, at the ACI Concrete Convention – Fall 2025 in Baltimore, MD, USA. They were unaware of any discussions of added finish categories, and they expressed no desire to change the current surface finish categories, SF-1 to SF-3.

Although we cannot trace the precise origin of this erroneous information, we have heard of similar experiences. About 6 months ago, for example, an engineer attending a jobsite meeting presented information on tolerances in ACI SPEC-117.² The concrete contractor at the meeting was confused by the engineer's statements and subsequently reached out to members of Joint ACI-ASCC Committee 117, Tolerances, for their opinions. The committee members were baffled and asked the contractor to ask the engineer for the source of the tolerance requirements. The answer: ChatGPT!

As you probably know, ChatGPT is a large language model (LLM), a form of artificial intelligence (AI) developed by OpenAI. As with other LLMs, ChatGPT is prone to hallucinating—fabricating information that may have a convincing tone but containing entirely fictional details.³ To determine if your architect also used an LLM, we conducted a test by prompting ChatGPT regarding concrete surface finishes. After several attempts, we produced a prompt that resulted in a detailed description of surface categories SF1 to SF5 in ACI SPEC 301-23 (Fig. 1).

Here's a clear summary of the **ACI 301-23** (Specifications for Concrete Construction) **Surface Finish (SF) categories SF1 through SF5** – as defined in the newest edition of the standard:

ACI 301-23: Surface Finish Categories (SF1–SF5)

These categories define the *appearance and workmanship* requirements for **formed concrete surfaces** after form removal.



Fig. 1: A ChatGPT response to a prompt regarding ACI 301 surface finish categories. "ACI 301-23: Surface Finish Categories (SF1 – SF5)" is erroneously presented as factual information

We investigated this behavior further by asking the LLM about itself. When prompted to describe its training, ChatGPT responded, "The model has been trained on large datasets derived from books, websites, articles, and other publicly available written content. This extensive dataset allows ChatGPT to understand a broad range of topics and conversational contexts."⁴ However, when prompted with, "Do you have access to American Concrete Institute documents," ChatGPT responded: "I don't have direct access to ACI documents because they are copyrighted and sold by the American Concrete Institute."⁴ It went on to report that it could "reference and discuss publicly available information about ACI documents (such as summaries, definitions, and revisions)."⁴

Questions in this column were asked by users of ACI documents and have been answered by ACI staff or by a member or members of ACI technical committees. The answers do not represent the official position of an ACI committee. Comments should be sent to lacey.stachel@concrete.org.

Table 1:**ChatGPT's self-assessment included a summary of its accuracy relative to other resources**

Source	Typical Accuracy	Notes
ACI document itself	100%	Official reference; required for compliance.
Experienced concrete engineer	95 to 100%	It depends on specialization.
ChatCPT (GPT-5)	80 to 95% general 60 to 80% detailed	Great for summaries when the topic is general, well-documented, and does not require access to proprietary ACI standards. Poor for citations. Weak if asking about the latest ACI standard because ACI documents are paywalled; ChatGPT can only discuss public summaries.
General web article/blog	50 to 80%	Often outdated or oversimplified.

When prompted to discuss its “accuracy on concrete engineering,” ChatGPT responded, without references, with the summary in Table 1.

ChatGPT was then prompted about the licensed design professional's responsibility for using its generated content. The response was—“excellent question and an important one for professional and legal clarity,”⁴ and it continued with these comments:

“1. Responsibility always lies with the licensed design professional under U.S. law and engineering ethics (per state licensing boards and National Society of Professional Engineers [NSPE] Code of Ethics), only a licensed engineer or architect may take professional responsibility for design decisions, interpretations, or signed documents. That means: Only the licensed design professional is responsible for:

- Design assumptions and calculations;
- Use of codes (for example, ACI 318, 301, 350);
- Drawings, specifications, and reports issued for construction; and
- Judgments made from advice or artificial intelligence (AI) tools like ChatGPT.

2. ChatGPT's role is as an informational assistant, not a professional engineer.

It can:

- Summarize or explain ACI, ASTM, or American Cement Association (ACA) principles;
- Help draft technical documents;
- Support training or research; and
- Suggest alternatives or checks for conceptual understanding.

But it cannot:

- Approve or seal design work;
- Replace a code-compliant design;
- Interpret contract documents officially; and
- Be cited as an “authority” in submittals, specifications, or RFI responses.

3. ACI and Licensing Context: ACI standards (for example, ACI CODE-318-25, Section 1.2, ‘Licensed Design Professional’) define that: ‘The Licensed Design Professional (LDP) shall be responsible for the design and shall determine compliance of the design with ACI 318 requirements.’⁴

That means even if you use ChatGPT to draft or review text, the LDP must verify all content before inclusion in contract documents or submittals. However, note that ChatGPT cites Section 1.2, General, in ACI CODE-318-25⁵ instead of Section 1.7, Licensed design professional. While ChatGPT might believe that 1.2 General infers “LDP” requirements, we believe that Section 1.7 would have been the most appropriate citation. Furthermore, “The Licensed Design Professional (LDP) shall be responsible for the design and shall determine compliance of the design with ACI 318 requirements,” does not appear in ACI CODE-318-25. Although we do not disagree with the statement, it is another example of erroneous information.

In an October 29, 2025, policy update, OpenAI provided a list of items for which ChatGPT should not be used. One of these is “provision of tailored advice that requires a license, such as legal or medical advice, without appropriate involvement by a licensed professional.”⁶ Obviously, this advice would also apply to engineers and architects.

Both the American Society of Civil Engineers (ASCE) and National Society of Professional Engineers (NSPE) have AI policies: ASCE's “Policy statement 573—Artificial Intelligence and engineering responsibility,”⁷ and NSPE's “Position Statement No. 03-1774—Artificial Intelligence.”⁸ ASCE recognizes that “AI has already made substantial contributions to the field of civil engineering,”⁷ and that “Protecting public health, safety, and welfare remains the primary focus in the use of AI under the direction of a licensed professional engineer.”⁷

During our investigation of ChatGPT's behavior, we took note of cautionary statements made by the model itself:

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“ChatGPT is not a fully reliable source of information; while it can provide useful insights, its responses may contain inaccuracies and should be fact-checked against trusted sources...always verify data or standards directly (e.g., ACI, ASTM, or manufacturer specs) instead of relying on summaries.”⁴

We agree that licensed design professionals should “verify” information received from ChatGPT and other AI models. We encourage ACI to develop a position statement on this topic and for ACI Committee 132, Responsibility in Concrete Construction, to issue a TechNote clarifying the role of the licensed design professional with respect to using AI.

References

1. ACI Committee 301, “Specifications for Concrete Construction (ACI SPEC-301-20),” American Concrete Institute, Farmington Hills, MI, 2020, 69 pp.
2. Joint ACI-ASCC Committee 117, “Specification for Tolerances for Concrete Construction and Materials and Commentary (ACI SPEC-117-10) (Reapproved 2015),” American Concrete Institute, Farmington Hills, MI, 2010, 76 pp.
3. Marr, B., “ChatGPT: What Are Hallucinations And Why Are They A Problem For AI Systems,” Bernard Marr & Co., Mar. 22, 2023, [https://bernardmarr.com/chatgpt-what-are-hallucinations-and-why-are-they-a-](https://bernardmarr.com/chatgpt-what-are-hallucinations-and-why-are-they-a-problem-for-ai-systems)

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4. Text generated by ChatGPT, OpenAI, Dec. 17, 2025, www.chatgpt.com.

5. ACI Committee 318, “Building Code for Structural Concrete—Code Requirements and Commentary (ACI CODE-318-25),” American Concrete Institute, Farmington Hills, MI, 2025, 702 pp.

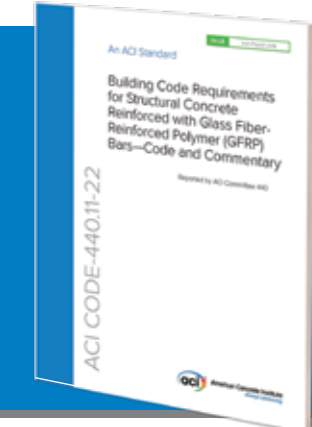
6. OpenAI, “Usage Policies,” Oct. 29, 2025, <https://openai.com/policies/usage-policies>. (last accessed Jan. 21, 2026)

7. ASCE, “Policy Statement 573 – Artificial Intelligence and Engineering Responsibility,” American Society of Civil Engineers, July 18, 2024, www.asce.org/advocacy/policy-statements/ps573---artificial-intelligence-and-engineering-responsibility.

8. NSPE, “NSPE Position Statement No. 03-1774—Artificial Intelligence,” National Society of Professional Engineers, Sept. 11, 2023, www.nspe.org/sites/default/files/sites/default/files/resources/PSdownloadables/ArtificialIntelligence.pdf.

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The Standard for GFRP-Reinforced Concrete Design



Design with Confidence Using GFRP Bars

This ANSI-approved Code sets the design, material, and construction requirements for concrete structures reinforced with glass fiber-reinforced polymer (GFRP) bars.

It covers strength, serviceability, durability, reinforcement detailing, and inspection standards.

