



## Industrial Ecology Consultants

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### Verification Report: Athena EPD Calculator

ASTM International commissioned Industrial Ecology Consultants to perform an external independent verification of the **Athena Sustainable Materials Institute (Athena) EPD Calculator** for concrete in accordance with:

ASTM International. (2016). *ASTM Program Operator for Product Category Rules (PCRs) and Environmental Product Declarations (EPDs), General Program Instructions*. Version 8.0, revised April 29, 2020.

International Organization for Standardization. (2000). *Environmental labels and declarations -- General principles* (ISO 14020:2000).

International Organization for Standardization. (2006). *Environmental labels and declarations -- Type III environmental declarations -- Principles and procedures* (ISO 14025:2006).

International Organization for Standardization. (2020). *Environmental management -- Life cycle assessment -- Requirements and guidelines* (ISO 14044:2006/Amd 2:2020).

International Organization for Standardization. (2014). *Environmental management -- Life cycle assessment -- Critical review processes and reviewer competencies: Additional requirements and guidelines to ISO 14044:2006*. (ISO/TS 14071:2014).

International Organization for Standardization. (2017). *Sustainability in buildings and civil engineering works -- Core rules for environmental product declarations of construction products and services*. (ISO 21930:2017).

NSF International. (2019). *Product Category Rule (PCR) for Environmental Product Declarations: PCR for Concrete*. Version 1. February 22, 2019.

The independent verification was conducted by:

Thomas P. Gloria, Ph.D.  
Founder, Chief Sustainability Engineer  
Industrial Ecology Consultants



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### REVIEW SCOPE

The **Athena EPD Calculator** for concrete has the capacity to generate self-declared EPD results for ready mixed concrete based on user provided technosphere and emission flows, in accordance with the NSF PCR for concrete. The scope of this review involved reviewing the Athena EPD Calculators for Ozinga Brothers Inc., Lehigh Hanson Heidelberg Cement Group, and the Vulcan Materials Company along with sample EPDs generated from each location for all three companies.

### REVIEW PROCESS

The review involved the update of two review matrices for each of the three companies based on the requirements set forth by the applicable standards, NSF International PCR, and ASTM International GPIs. The first review matrix was used to assess the conformance of the update to the life cycle assessment calculation system, and the other to verify the system generated EPD output by way of examining several sample EPDs from the locations for each company. The two review matrices served as documentation that all requirements had been identified and addressed upon completion of this review. As per ISO 14025, Clause 8.1.4, this report shall be made available to any interested party upon request.

The review covered more than 400 identified requirements specified by the PCR, GPIs, and applicable ISO standards. All items were checked and determined to be satisfied. Moreover, considerable effort went into verifying that when used properly, the EPD generator system and associated databases generate consistent and plausible results for clinker, cements and concrete products as well as conform to the applicable PCR.

### VERIFICATION STATEMENT

Based on the independent verification objectives, the update to the **Athena EPD Calculator** for concrete was determined to be *in conformance* with ASTM International's General Program Instructions, core and subcategory product category rules and applicable ISO standards. The plausibility, quality, and accuracy of the LCA-based data and supporting information as captured in the generator tool are confirmed.

I confirm that I have sufficient knowledge and experience of cement and concrete products, the relevant core PCR, subcategory PCR for cement, ISO standards and the geographical areas intended to generate EPDs to carry out this verification.

Sincerely,

A handwritten signature in black ink, appearing to read 'Thomas P. Gloria'.

Thomas P. Gloria, Ph.D.  
Founder, Chief Sustainability Engineer  
Industrial Ecology Consultants