UZUN +CASE

Structural Engineers + Creative Partners

EMBODIED CARBON ACTION PLAN 2025

SEI ASCE STRUCTURAL ENGINEERING INSTITUTE

SE2050 COMMITTING TO NET ZERO

OUR FIRM

Founded in 1993 by principals Tamer Uzun, James Case, Martin Cuadra and Larry McDowell, Uzun + Case has expanded to over 70 employees and is one of the largest structural engineering firms in the Southeastern US. Our growth has been fueled by our technical expertise, creative design approach and teamwork orientation. We approach our work as creative collaborators, not as specialized consultants. In doing so, we strive for synergistic designs for which the whole is greater than the sum of the parts.

We are committed to making our projects sustainable by proactively advocating environmentally sound principles and ideas. These include the use of fly ash, slag, limestone, and other sustainable materials in concrete. Structural steel is designed using shapes produced in American mills, ensuring maximum recycled content. Timber elements are designed using species that can be regionally sourced and, in some cases, reclaimed materials. By focusing on the structural efficiency, we reduce material usage while providing economical designs for our clients. In addition, we provide embodied carbon content for structural elements to support a Life Cycle Assessment.

OUR SUSTAINABILITY LEADERS

James W. Case
PE, SE
Senior Principal

A presenter and participant at multiple sustainability conferences

Philip Hatcher
PE, SE
Principal

Member of NCSEA Sustainable Design Committee

Martin Cuadra
PE, SE, FACI, FPTI
Senior Principal

Former chair of the PTI DC-100 Committee – Sustainability of Post-Tensioned Concrete Structures

Jeffrey Milheizler
PE, SE
Principal

Chair of Uzun+Case Sustainability Committee

James Jones
PE, SE
Senior Principal

Principal In-Charge of Uzun+Case Sustainability Committee

Thomas Trotter
PE, SE
Associate

Head of Uzun+Case SE 2050 Subcommittee
SE 2050 Embodied Carbon Reduction Champion

Robert Weilacher
PE, SE
Principal

Member of the ACI 130 Committee – Sustainability of Concrete

Clarice Hill
Intern

Uzun+Case Embodied Carbon Tracking Developer and Educator

2025/2026 EDUCATION GOALS

We will build off the successes of the previous year by continuing to improve embodied carbon literacy within the firm and engage outside resources to better understand and implement ways of reducing embodied carbon in our structures.

SUSTAINABILITY COMMITTEE

Our Sustainability Committee is promoting a firm-wide education program by regularly incorporating updates on sustainability initiatives including SE 2050 into our company meetings and internal blog posts.

The Embodied Carbon Subcommittee meets regularly to advance the goals of further understanding embodied carbon tracking and reduction strategies and tools while promoting their use within our firm.

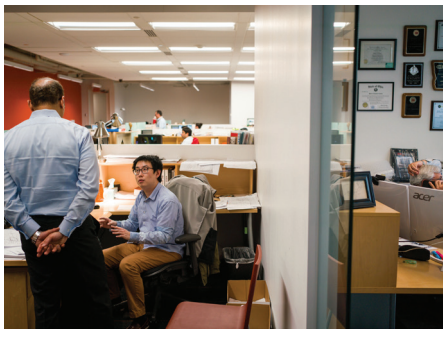
Our internal website features a Sustainability page dedicated to sharing resources including the SE 2050 library of resources with all of our technical staff. We regularly provide introductions and updates to these resources in our company meetings and blog post.

EMBODIED CARBON PRESENTATIONS

In addition to annual introductory embodied carbon presentations (Embodied Carbon 101) hosted by our Embodied Carbon Champion, we regularly present embodied carbon focused webinars and lunch & learns for both the Atlanta and Raleigh offices. The presentations are announced to encourage participation and recorded presentations are available firm-wide.

NEW HIRE TRAINING

Sustainability and embodied carbon literacy are being incorporated into our new hire training and onboarding process. We direct new hires and interns to the Sustainability Committee page of our internal website and encourage them to explore the various resources including the links to SE 2050 library of resources. In addition, new hires and interns are educated on BIM modeling practices for enabling embodied carbon tracking, introduced to the tracking process, and informed on the overall goals of SE 2050 and our commitment to achieving net zero. We are also planning a topic on sustainability initiatives to be given at our monthly teaching hour event geared toward educating young engineers.



EXTERNAL EDUCATION

Building off the well received lunch and learns provided to architects and contractors in past years, we plan to continue to have a representative from our firm attend quarterly external education programs provided by SE 2050 including signatory calls. We plan to have a representative from each office get involved in the local Carbon Leadership Forum. In addition, we are planning a sustainability lunch and learn to be presented by one of our employees to a group of peers and clients.

2025/2026 REPORTING GOALS

In 2024, Uzun+Case reported data for more than 10% of our projects by billing. For the upcoming year, we will continue developing our in-house tools for tracking embodied carbon. while expanding the number of projects tracked.

MODELING AND TRACKING

We are continuing to develop our procedures for calculating the embodied carbon in our structures using a combination of commercially available Life Cycle Assessment software and tools developed in-house.

We are tracking embodied carbon in our structures by integrating expanded material properties to include embodied carbon quantities with existing Revit families and modeling elements. Using customized smart schedules developed in-house, we are able to perform material takeoffs and track embodied carbon based on specific concrete mix designs, anticipated reinforcement intensities, and project specific Environmental Product Declarations. These tracking tools allow us to periodically extract quantities from Revit to visualize and track embodied carbon across the project phases to help better understand how material selections impact overall embodied carbon in our structures.

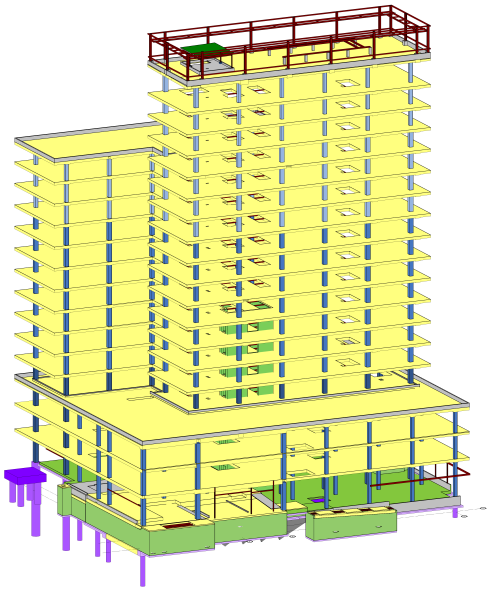
Moving forward, we will further refine our embodied carbon data as additional Environmental Product Declarations (EPD's) for specific project regions and product manufacturers become available through Embodied Carbon in Construction Calculator (EC3) as well as continuing to obtain EPD's directly from manufacturers.

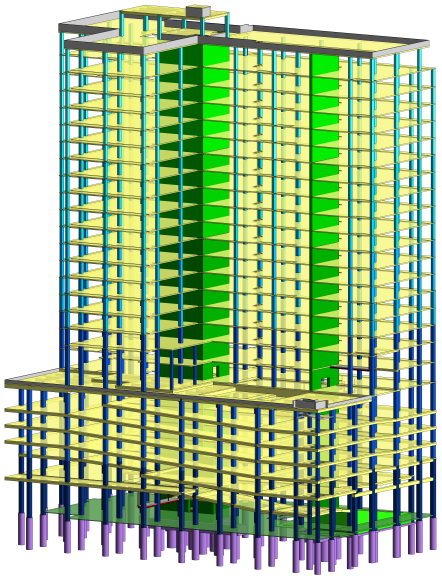
DATA PROCESSING

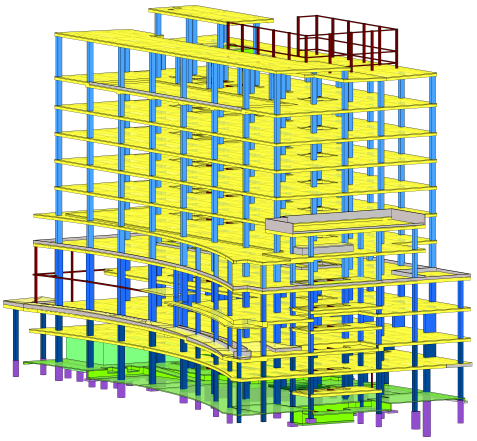
As we obtain data for more projects, we plan to compare the embodied carbon emissions from multiple projects to better understand embodied carbon in our structures as it relates to construction materials, project location, usage, and other relevant categories. We plan to use the data to continue to develop and improve on our embodied carbon estimation techniques that can be employed in the early stages of a project (before Revit models are available for tracking) to help guide programmatic level decision making through the lens of embodied carbon and total global warming potential.

TRAINING

We will continue to provide training via our internal wiki page, blog posts, and presentations on topics including the use of Life Cycle Assessment software and in-house tools for tracking embodied carbon. We have expanded the comprehensive training guide for all staff modeling structures in Revit to incorporate the embodied carbon material properties and stresses the importance of accurate and intentional material selections.







2025/2026 REDUCTION GOALS

We will continue to expand our implementation of embodied carbon reduction strategies into our documentation and improve our ability to assess embodied carbon as a performance metric and communicate the embodied carbon impacts of design options with clients.

CASE STUDY: TECH SQUARE

Tech Square Phase III is a 19 story post-tensioned concrete educational facility located in Atlanta, Georgia. [1] To meet LEED Platinum certification requirements a cement replacement range and maximum embodied carbon was defined in the General Notes. [2] During construction administration, engineers, contractors, and concrete design specialists worked to negotiate concrete mix designs to meet strength and embodied carbon reduction goals. Through use of the integrated in-house Revit tracking tools engineers were able to provide real time estimates of the change in total project GWP during negotiations to meet carbon reduction goals.

Tech Square Phase III Rendering [1]

USE	MIN. COMPRESSIVE STRENGTH (28-DAY, UNO)	TYPE	MAX. W/C RATIO	NOMINAL MAX. AGGREGATE SIZE	EXP. CLASS[2]	AIR CONTENT (± 1.5%)	CEMENT REPLACEMENT[3]	MAX. GLOBAL WARMING POTENTIAL (kg CO_2-eq/m^3)
DRILLED PIERS	4,000 PSI (56-DAY)	NORMAL WEIGHT	0.50	1-1/2"	F0	-	30-70%	250
SHALLOW FOUNDATIONS AND LEVELING CONCRETE BENEATH	3,000 PSI (56-DAY)	NORMAL WEIGHT	0.50	1-1/2"	F0	-	30-70%	250
BASEMENT WALLS (INTERIOR)	3,000 PSI	NORMAL WEIGHT	0.50	3/4"	F0	-	30-50%	250
RETAINING WALLS (EXTERIOR)	4,000 PSI	NORMAL WEIGHT	0.45	3/4"	F1	5%	30-50%	250
SLAB-ON-GROUND (INTERIOR)	3,500 PSI	NORMAL WEIGHT	0.50[4]	1-1/2"	F0	-	0-50%[4,6]	250
FRAMED FLOOR SLABS & BEAMS (INTERIOR)	5,000 PSI[4]	NORMAL WEIGHT	0.45	3/4"	F0	-	0-50%[4,6]	315 TYPICAL; 375 FOR HIGH EARLY
FRAMED FLOOR SLABS & BEAMS (EXTERIOR)	5,000 PSI	NORMAL WEIGHT	0.45	3/4"	F2	5.5%	0-50%	315 TYPICAL; 375 FOR HIGH EARLY

Tech Square Phase III Concrete Specifications [2]

SPECIFICATIONS

We will continue to update our specifications and general notes to include practices consistent with embodied carbon reduction. Over the last two years, we have updated our concrete specifications and general notes section to address sustainable practices including minimum/maximum cementitious replacements for each mix design, sourcing of raw materials, carbon dioxide mineralization, reduced carbon mixtures, 56-day strength criteria for select structural elements, and requirements for documenting each mix design with a Type III product-specific Environmental Product Declaration.

In addition to carbon reduction measures written into our specifications, we will continue to communicate with concrete suppliers to incorporate more sustainable mix designs (Type IL cement, supplemental cementitious materials, blended cements, carbon sequestration) as they become available in our project markets. We will communicate with contractors to continue developing and advocating for strategies which reduce the need for mix designs with high quantities of cement.

ADDITIONAL REDUCTION STRATEGIES

In addition to developing in-house tools for extracting and visualizing embodied carbon data from our Revit models, we will be incorporating embodied carbon metrics into our project database to establish a firm average benchmark for embodied carbon. We will develop methods of comparing embodied carbon across our projects with a specific focus on understanding how reduction strategies are impacting total embodied carbon and project costs.

We will continue to advocate for the use of biogenic and recycled materials on our projects and expand our expertise in mass timber construction.

DECLARATION OF COMMITMENT

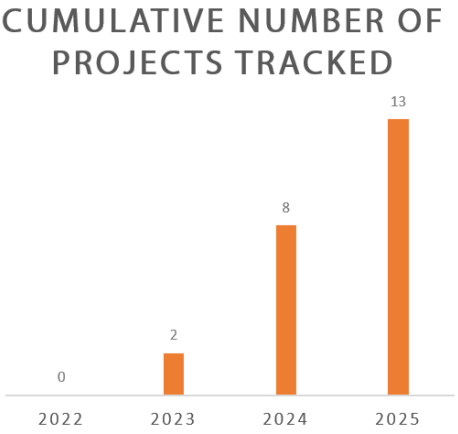
In 2022, we publicly announced our commitment to SE 2050 on our firm's website and social media accounts. We continue to advocate for the program with regular updates on embodied carbon reduction initiatives. In addition, employees email signatures now include the SE 2050 logo to further promote our involvement in the program.

We have incorporated language into our proposals and marketing material to reflect our commitment to reduce embodied carbon in our structures.

SHARING KNOWLEDGE

In addition to contributing to the SE 2050 database, we will share the knowledge we have gained with our clients through meetings, presentations, and information in our proposals.

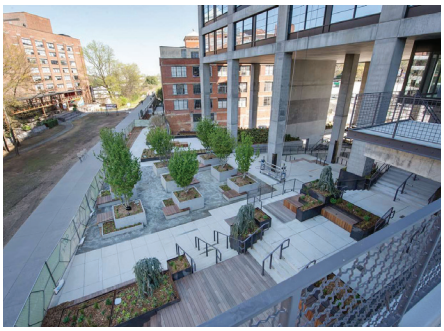
In the coming year, we plan to get connected with our local Carbon Leadership Forum hubs with the goal of finding opportunities to give external presentations on embodied carbon and lessons learned.



CORRESPONDENCES AND COLLABORATION

We will continue to describe to our clients the value of reducing embodied carbon in structures and advocate for an active role for the structural engineer in formulating the sustainability goals at the beginning of projects. We will discuss with clients the importance of requiring that some of the structural materials come with product-specific EPD's in an effort to make embodied carbon reduction part of the project scope.

We plan to continue compiling correspondences with owners, architects, contractors and suppliers to share across our firm as a resource for answering common questions and providing important talking points regarding embodied carbon.



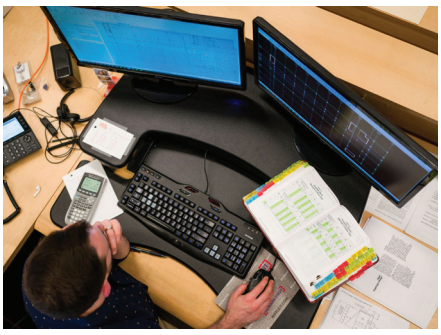
COMMUNICATION

We strongly believe that communication will continue to be an integral component of successfully educating, reporting, reducing and advocating for embodied carbon reduction. Internal communication and collaboration between committees within our firm including the sustainability, specifications, concrete, and training committees has been fundamental to increasing embodied carbon literacy across the firm while developing reporting and reduction strategies into implementable changes to our design process.

External communication will also continue to be critically important to successfully coordinating with and learning from architects, contractors, suppliers, and other engineers including those sharing resources through SE 2050.

BIM TRACKING AND EMBODIED CARBON ESTIMATING

Over the last year we have continued to expand the capabilities of BIM modeling in the effort to track and visualize embodied carbon data. Material takeoff functionality coupled with intentional material modeling supports a very accurate embodied carbon data collection methodology that can be coupled with material specific EPDs to facilitate precise estimates and guide decision making. The learning curve to develop and implement these methods has been steep; however, we believe they will facilitate efficient and accurate data collection on many projects as we work toward or reporting goals for the forthcoming year.



In addition, we have learned the importance of simplified calculators for embodied carbon estimates in concept design phase. We plan to continue development of these tools by utilizing data from our more accurate BIM techniques to understand embodied carbon content of our frequently utilized structural systems.