

Embodied Carbon Action Plan

anthem
structural engineers

2026 – 2027



Downing Residence



STRUCTURAL
ENGINEERING
INSTITUTE





PROFESSIONAL • INNOVATIVE • RELIABLE

About Anthem & SE 2050 Goals

Anthem is committed to supporting the push towards more sustainable design practices across the construction industry. Anthem is a signatory firm of the SE 2050 Challenge, a commitment in the structural engineering industry to reduce and eventually eliminate embodied carbon in projects by 2050. Our passion and commitment to providing our clients with the most innovative, yet low carbon-impact project solutions makes us a leader in the structural life cycle assessment market. We offer detailed embodied carbon impact reports, structural life cycle assessments, and education materials, completely integrated with your unique needs and requirements for any project type.

The Anthem team has 20 employees spread across the U.S., with physical office locations in the Colorado cities of Boulder, Steamboat Springs, and Golden, as well as an office in Bend, Oregon. The Boulder office serves as our home base and the headquarters of the Sustainability Team.

2010

year established

20

full-time staff

14

of states licensed

4

office locations

PASSIONATE • CREATIVE • COLLABORATIVE

Our team provides the best possible combination of:

- + Broad structural experience
- + Creative solutions
- + Unmatched client service



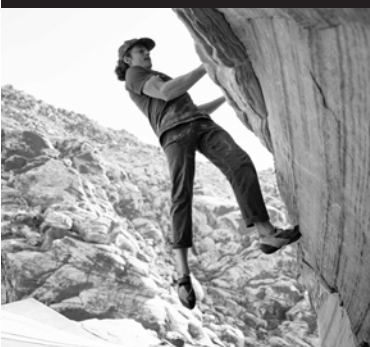
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Project Engineer
Embodied Carbon Champion
SE2050 Advocacy Lead
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SE2050 Reduction Lead



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Anthem Structural Engineers combines innovation, creativity, and practicality to deliver complex designs, while offering personal, responsive client service across a broad range of project types including healthcare, advanced industry, luxury residential, multi-family, municipal, and commercial.

Our team is a dynamic, relationship-driven group of innovative problem-solvers committed to delivering creative and economical solutions that are good for our clients and beneficial for our environment.

The Anthem Sustainability Team spans across three states, offering a unique advantage by allowing us to draw from a diverse range of policies, codes, and literature. This multi-state reach enables us to tap into varied expertise and to participate in Structural Engineers Association (SEA) committees unique to each region, enriching our approach to sustainability. We hold regular meetings to discuss key initiatives like SE 2050, life cycle assessments (LCAs), and other sustainability-focused topics. Additionally, we actively engage in our local seminars and events, staying connected with cutting-edge developments in sustainable structural engineering across our regions.

Education Plan

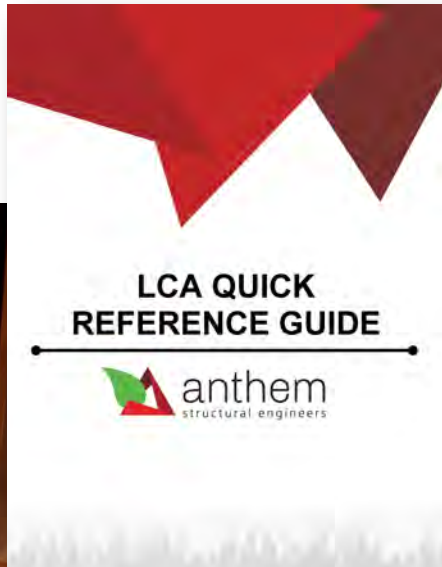
At Anthem Structural Engineers, we are committed to continuously improving our firm-wide understanding of the environmental impacts of our projects. Because sustainable design is not taught in the traditional engineering curriculum, we are first gaining insight on the fundamentals and building blocks, then working towards mastering increasingly nuanced topics regarding embodied carbon reduction strategies and measurements.

Our Embodied Carbon Champion is leading the initiative to promote embodied carbon reduction strategies across all Anthem teams and offices. Our past internal webinars have focused specifically on embodied carbon fundamentals, key terminology, and practical methods for integrating these principles into everyday project workflows. We have shared accessible tools and resources firm-wide, and recordings of these webinars are now incorporated into our formal onboarding process. This ensures that new hires receive foundational training in embodied carbon concepts and gain a clear understanding of Anthem's firm-wide sustainability approach.

As part of our ongoing Professional development, our team members will be attending the Structures Congress and the SE2050 Signatory Summit in Boston later this year to further explore advancements in structural sustainability, embodied carbon reduction, and resilient design. Our Embodied Carbon Champion recently attended SEI's 2nd North American Structural Engineering Sustainability Symposium, and all Sustainability Team members are actively pursuing LEED accreditation to strengthen their knowledge of sustainable design frameworks and best practices.

To support consistent implementation across project teams, we have also developed a concise internal quick reference guide focused on Life Cycle Assessment terminology, SE 2050 and Anthem's embodied carbon strategies. This guide provides practical, business-focused messaging and technical insights to help our staff confidently integrate sustainability discussions into client conversations and project decision making.

Looking ahead, Anthem will continue engaging embodied carbon scholars and industry leaders to provide educational sessions for our team. These presentations, along with the tools and resources developed internally will foster meaningful discussion, strengthen technical expertise and further embed sustainability into our firm's culture and project delivery approach.





Elegance Residence

Advocacy

As part of our commitment to the SE 2050 initiative, Anthem Structural Engineers aims to educate our clients on the importance of sustainability in structural engineering. We are leveraging multiple platforms to promote our embodied carbon reduction strategies and engage clients in meaningful discussions about their projects. Our Sustainability Team will continue to have discussions with contractors and material suppliers, encouraging open communication about the impact of choosing lower embodied carbon materials.

To further advance these conversations, Anthem now intentionally incorporates sustainability-focused language into our proposals. While the Life Cycle Assessment (LCA) services are considered an add-on, our teams are required to consider included and presenting LCA as a proposed scope items so that it is consistently introduced and formally considered on every project.

By embedding embodied carbon discussions directly into our proposal language, we ensure that carbon reduction strategies are part of early project conversations and that clients are given the opportunity to evaluate LCA services alongside our core structural scope. Anthem's LCA Questionnaire will help facilitate these conversations should the client choose to proceed with these services. This approach promotes transparency and reinforces our commitment to integrating sustainability into standard practice.

Knowledge Sharing

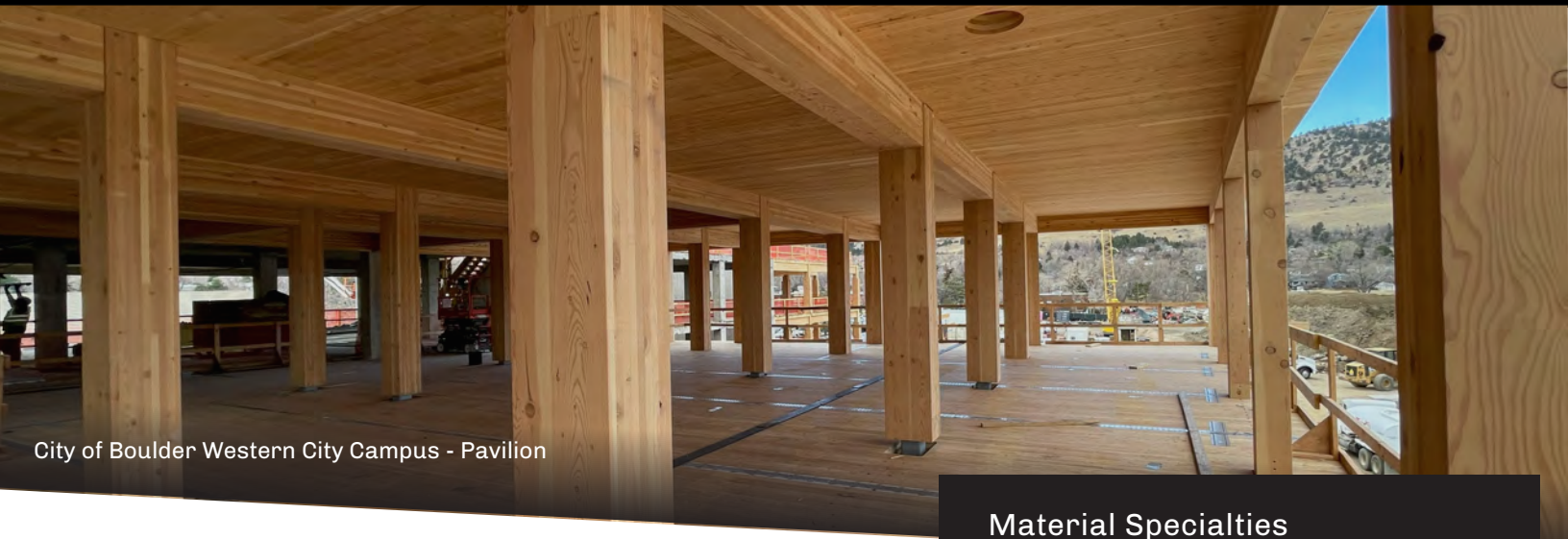
Anthem is actively enhancing our external presence within the SE 2050 space and the broader structural engineering community. We maintain a dedicated sustainability page on our website highlighting our embodied carbon initiatives, reduction strategies, and firm-wide commitments.

In addition to our [website](#), we share educational and project-based content through digital and social media platforms, including [LinkedIn](#) and [Instagram](#), where we have publicly declared our commitment to SE 2050.

Anthem also seeks opportunities to engage in industry conversations through conferences, webinars, and collaborative forums, contributing to knowledge exchange within the structural engineering profession. By openly sharing our successes, challenges, and technical takeaways, we aim to promote transparency, encourage dialogue, and help advance embodied carbon reduction practices across the industry.

“**Sustainability is no longer about doing less harm. It is about doing more good.**”

Jochen Zeitz



City of Boulder Western City Campus - Pavilion

Embodied Carbon Reduction

Anthem's Embodied Carbon Action Plan (ECAP) focuses on two primary strategies for reducing embodied carbon across our projects. The first strategy emphasizes educating both internal teams and external partners on embodied carbon and practical methods to reduce it through structural design. The second strategy centers on developing, refining, and implementing standards aimed at achieving measurable embodied carbon reductions.

Material Specialties

- + Timber
- + Steel
- + Masonry
- + Glass
- + Concrete
- + Passive Houses
- + Cold-formed steel
- + Tilt-up concrete
- + Precast concrete
- + Post-tensioned concrete
- + Mass timber (NLT, CLT, MPP)
- + Modular Panelized Systems

Strategy 1 Reducing embodied carbon begins with educating Anthem's engineers on what embodied carbon is and how design decisions influence it. With a strong internal understanding in place, this knowledge is extended to our clients through the use of an Embodied Carbon Questionnaire and ongoing project discussions.

Anthem utilizes EC3 (Embodied Carbon in Construction Calculator) and our internal Embodied Carbon calculator coined "The Sapling" to quantify and communicate the embodied carbon impacts of structural systems. These tools allow our team and our clients to evaluate material selections and design alternatives using transparent, comparative data. This approach helps clients better understand how material choices and design decisions affect the overall embodied carbon of a project. Our internal calculator is used during the preliminary SD phases of a project and EC3 is utilized once a structural BIM model has been generated.

The Anthem Sustainability Team has developed standardized processes for measuring and reporting embodied carbon, tailored to the project phase at which carbon reporting is introduced. These processes ensure consistent, repeatable reporting and support informed decision-making throughout the design process.

Strategy 2 To support our second strategy, Anthem continues to establish and refine embodied carbon baselines using data from previously completed projects. These baselines inform the implementation of target Global Warming Potential (GWP) limits for key structural materials, including concrete and steel. As part of this effort, Anthem requires Environmental Product Declarations (EPDs) to be submitted and reviewed for all specified concrete mixes. Anthem has also implemented listing GWP limits for concrete and minimum recycled steel quantities in the general structural notes for new construction projects.

Anthem's long-term reduction strategy focuses on integrating embodied carbon reduction measures into project designs while maintaining design intent and aligning with client goals. This is achieved by presenting structural design alternatives during the Schematic and Design Development phase, supported by both internal calculators and EC3-based analysis. Additional strategies include specifying lower-carbon concrete mix designs, incorporating wood and other renewable materials—such as cross-laminated timber—where appropriate, and consistently advocating for more sustainable structural solutions in collaboration with owners and architects.

THE ANTHEM LCA PROCESS

1 Pre-Design

If Anthem is brought in during the Pre-Design phase of a project, the first task is to define the desired Life Cycle Assessment (LCA) scope with the client using a standardized questionnaire. This helps us define the general building properties and whether the LCA will report on structural, structural and enclosure, or whole building elements. In the Pre-Design phase, we also clarify the software version and intended level of development for Building Information Modeling (BIM). We synchronize this with our in-house BIM team to ensure a smooth analysis in future phases.

2 Schematic Design

Most commonly, Anthem is engaged during the Schematic Design phase of the project. In this case, the same steps apply – use a questionnaire to understand building properties, confirm LCA scope, and synchronize modeling processes. During this phase, Anthem provides a project-specific analysis assessing embodied carbon impacts of structural system options using an in-house tool (The Sapling). The analysis supports design by quantifying embodied carbon, identifying carbon-efficient opportunities, and supporting sustainability goals. Deliverables include a report (i.e., kg CO₂e/sq ft) evaluating structural systems and comparing them to industry benchmarks.

3 Design Development

During this phase, Anthem provides a refined analysis of realistic embodied carbon values using EC3. The analysis quantifies embodied carbon and identifies advanced reduction strategies (i.e., low-carbon concrete, optimized members). Deliverables include a report that supports code compliance submittals and provides recommendations when embodied carbon exceeds limits. The LCA report provided at Design Development becomes the new baseline moving into the Construction Documents and Administration phase.

4 Construction Documents & Administration

In the Construction Documents and Administration phase, the impact of sustainability-driven design changes on a large scale is unlikely. However, because embodied carbon reporting is not yet a commonplace practice in structural engineering, Anthem provides advanced analysis and includes reporting on changes throughout the project. The goal of this analysis is to report an embodied carbon value for the project, then review decision-making that affected this value. Deliverables include a comprehensive report with lessons learned for future projects to meet or exceed target limits.



Reporting

The Anthem Sustainability Team believes that a data-driven approach to embodied carbon reporting is key to making meaningful progress in structural engineering. By quantifying the carbon footprint of materials and construction processes, we can make informed decisions that lead to substantial reductions in emissions. Carbon accounting provides the foundation for tracking improvements, establishing benchmark projects, and ultimately driving the industry toward sustainable practices and carbon neutrality.

We are utilizing the Embodied Carbon in Construction Calculator (EC3) tool to give our clients a graphical representation on how different design decisions throughout the course of a project have an impact on the embodied carbon of the structure. EC3 enables our team to perform swift analyses of structural embodied carbon. EC3 is easily customizable and adjustable within the software interface to provide both different iterations of product manufacturers, as well as structural systems.

Anthem details Life Cycle Stages based on the ASCE Prestandard for Assessing the Embodied Carbon of Structural Systems for Buildings. Anthem can report the Product Stages [A1-A3], Transportation Stage [A4], Maintenance and Replacement Stages [B2-B5], End of Life Stages [C2-C4] as well as Module D [D] information. If requested by the client, Anthem will report data from biogenic carbon separately as additional information.



Lessons Learned

Through the development and implementation of Anthem's ECAP, several key lessons have emerged. These include the importance of having quick and efficient methods for estimating Global Warming Potential (GWP) during the early Schematic Design (SD) and Design Development (DD) phases, the ongoing challenges associated with both internal and external education on embodied carbon and reduction strategies, and the need for clear, concise documentation to effectively track and advocate for embodied carbon reductions.

To improve efficiency during early project phases, Anthem developed an internal embodied carbon tracking tool known as "The Sapling." This spreadsheet-based tool streamlines preliminary embodied carbon calculations and supports early decision-making when material and system choices have the greatest impact.

To address educational challenges, Anthem plans to host a Sustainability Month, consisting of weekly company-wide meetings focused on explaining embodied carbon, life cycle assessments (LCAs), and practical strategies for both performing analyses and reducing embodied carbon in structural design.

Lastly, Anthem will continue to develop and refine internal and client-facing documentation to clearly define embodied carbon, communicate its significance, and reinforce the importance of reducing the GWP impacts of buildings and other structures.



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