EMBODIED CARBON ACTION PLAN (ECAP)
MARTIN/MARTIN CONSULTING ENGINEERS

MARCH 2026

SEI ASCE STRUCTURAL ENGINEERING INSTITUTE

SE2050 COMMITTING TO NET ZERO

MARTIN/MARTIN CONSULTING ENGINEERS

"All structural engineers shall understand, reduce and ultimately eliminate embodied carbon in their projects by 2050"

INTRODUCTION

Martin/ Martin, Inc is a full-service civil and structural consulting engineering firm built on experience and industry leadership cultivated since the 1940s. Headquartered in Denver, with nine office locations and a staff of more than 350, our engineers perform work throughout the Rocky Mountain Region and across the United States.

Martin/ Martin acknowledges its obligation to improve the health and resiliency of the planet and we are proud signatories of the SE2050 initiative. The future of our community and our client needs center on addressing climate change, including the significant emissions associated with the construction industry and structural materials. We are motivated to create change and establish sustainability and embodied carbon as a design constraint on our projects and we are intrigued by the creativity and engineering challenge required to solve these issues. SE2050 creates a framework that holds our firm accountable while also providing a platform that allows us to go beyond the minimum requirements of the program to pursue interests that align with our strengths and to meet the needs of our communities and clients.

We have seen a lot of change and growth in our sustainability efforts since becoming signatories of SE2050 in 2021. We regularly bring sustainability content to department and company wide presentations. We have submitted twenty-five projects to the SE2050 database and many of our engineers have a strong working knowledge of embodied carbon reduction strategies and embodied carbon assessments. Most importantly, we are starting to see more and more projects engaging with reduction strategies and targeting specific sustainability and embodied carbon goals.

EMBODIED CARBON ACTION PLAN KEY SECTIONS

EDUCATION, PG 4

REPORTING, PG 6

REDUCTION STRATEGIES, PG 7

ADVOCACY, PG 9

ON THE COVER: General Services Administration Denver Federal Center Building 48 Modernization, Lakewood, CO.
The Building 48 Modernization project includes the complete renovation of an existing 140,000 SF warehouse building into a cutting-edge, modern office space. The project is a model for all future federal projects with regard to green building and Low Impact Development practices, and will achieve LEED Gold, SITES Silver, and Net Zero Carbon and Energy certifications.

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SUSTAINABILITY LEADERSHIP

Michael Lyons, SE, LFA
Sustainability Lead, SE2050 Champion

Michael has over 13 years of experience in the industry focusing both on sustainability and the design of mid-rise commercial buildings. He sees embodied carbon as an exciting opportunity for the industry to develop as a design constraint. He is involved in many committees and professional organizations and currently serves as the co-chair of the SEI Sustainability and as the chair of the SEAC Sustainable Design Committee.

Kevin Haas, PE, SE, LEED AP
Principal-in-charge, Sustainability

With 20 years of experience in structural engineering, Kevin is adept at blending steel, masonry, precast, and mass timber structural systems to support innovative and flexible designs that account for diverse needs. His background in the evaluation of structural types, materials, and methods informs innovative approaches to engineering. He focuses on close collaboration with owners, stakeholders, and the design team to consider alternatives for addressing project goals, schedules, budgets, and sustainability.

Emily M Guglielmo SE, PE, F. SEI
Principal-in-Charge, Sustainability

Emily leads Martin/Martin's California offices and brings expertise across both new design and the assessment, retrofit, and reuse of existing structures. She is an active and influential leader in numerous industry organizations, including ASCE, SEI, NCSEA, SEAOC, and the Charles Pankow Foundation. Emily is also engaged in several forward-looking sustainability initiatives, including the Charles Pankow Foundation's CURE (Code Updates for Reduction of Embodied Carbon) initiative, the American Cement Association (ACA) Structural Optimization Working Group, and the ICC Adaptive Reuse Working Group. As a recognized leader in structural engineering, she is driven to advance the profession by improving performance and reducing the embodied carbon of the built environment.

SUSTAINABILITY ADVOCATES

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EDUCATION

Our education efforts are driven by a goal of ensuring every engineer in our company has the knowledge and tools available to them to support the sustainability needs of the projects they work on. We believe every engineer should have a basic understanding of the impacts of their project and what can be done to create reductions when challenged to do so.

While we have engineers with specific responsibilities to manage the sustainability initiatives of the department, the ultimate goal is to ensure as many as possible of the over 200 structural engineers working at our firm understand the sustainability implications of their projects at a similar level to other key project constraints. We want to ensure they know who to contact for support, how to execute reduction strategies, and how to communicate with the remainder of the project design team about these issues.

COMMITMENT TO CONTINUING EDUCATION

An essential tool for our education goals is a weekly continuing education class series. In 2025, four different sustainability presentations were held during this series including a two part series on Life Cycle assessments, a guest lecture from an architectural client highlighting the embodied carbon goals that they incorporate into their design work, and a presentation provided at external conferences titled “Design Criteria and Design Constraints for Sustainability and Embodied Carbon” which was also provided to internal staff.

Additional presentations held by an internal innovation committee also supported sustainability messaging, highlighting how to execute innovative ideas and a local innovative material supplier working on alternative cement technologies. Looking ahead into 2026, we will continue to provide embodied carbon and sustainability information through these internal presentations and are planning a two part case study series titled “Embodied Carbon and Martin/ Martin” with a goal to highlight how projects are incorporating sustainability into their projects.

IMAGE ABOVE: A group of architectural clients and Martin/ Martin employees tour a local building focused on renewable energy and sustainable building product research located at the National Laboratory of the Rockies.

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EDUCATION

ACCESS TO RESOURCES AND SUBJECT MATTER EXPERTS
Continued effort will be made to highlight key resources and information while also making subject matter experts on sustainability available to the company. We will continue to update and reference a 3-page, internal, sustainability guide which defines key terms, discusses how to approach sustainability on projects and includes a summary of key reduction strategies based on common structural materials. Key external and internal resources are organized and available in a search-able format on our intra-net, named after our founder, Milo S. Ketchum, who always challenged his engineers to use a minimum amount of structural material in the firm's designs. A Microsoft Teams channel is also available for all employees to be able to ask questions on sustainability and receive a quick and detailed answer from a subject matter expert.

THE IMPORTANCE OF PROJECT LEVEL DECISION MAKING
It has become increasingly apparent that while our education efforts have resulted in increased awareness and knowledge of the basics of embodied carbon across the company, many of our engineers are still lacking the confidence and knowledge to guide their projects towards achieving emissions reductions. Throughout 2025 and moving into 2026 we have focused on connecting the dots between lectures or webinars and the realities of project work. Over the last year we held a series of successful, informative, and insightful sessions to understand the needs of our staff. Specific activity included conducting over a dozen one-on-one interviews with principals and conducting a survey through a Microsoft form with the firm's project managers. The results of this activity were analyzed and organized into four distinct themes. These themes and the overall results of the interviews and survey were then shared with principals and project managers through a series of meetings and discussions. The results of this work will heavily influence our education related efforts heading into 2026.

2026 ACTION ITEMS:

- Continue to evaluate effectiveness of engagement with satellite offices and work with these offices to ensure the education curriculum is adequately addressing their regionally specific needs.
- Present at least (2) times to the structural department on topics focused on embodied carbon and make the recordings available to all employees.
- Incorporate embodied carbon education into the on-boarding process for new employees.
- Train all of the department's structural engineers on the core concepts and skills required to measure, reduce and report embodied carbon.

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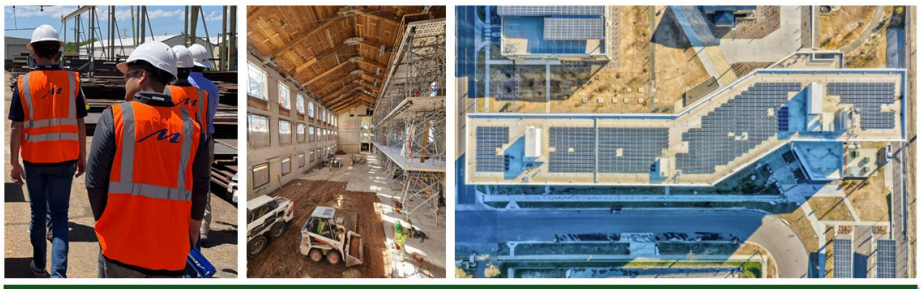

RESULTS FROM THE PRINCIPAL SURVEYS
MARTIN/MARTIN APPROACH TO SUSTAINABILE DESIGN

MARTIN/MARTIN SE2050 EDUCATION SUBCOMMITTEE FINDINGS

Theme 1	Theme 2	Theme 3	Theme 4
Life cycle assessments and material quantification	Lack of historical precedence and experience	Engaging in sustainability conversations	Job satisfaction, productivity, and employee retention

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REPORTING

Life Cycle Assessments (LCA) are an essential tool to quantify environmental impact and facilitate embodied carbon reductions. Our reporting and LCA efforts over the last year have focused on a combination of increasing access to data, improving clarity on when an LCA is needed, and increasing our understanding of LCA results to inform decision making.

WIDESPREAD EMBODIED CARBON ASSESSMENTS

A major initiative implemented in 2025 and that will continue to be highlighted and further developed in 2026 is a Revit tool that allows for streamlined and automated determination of material quantities for a project. This tool also allows us to incorporate allowances for both modeled and non-modeled scope and organizes the information in a way that facilitates an embodied carbon assessment. The embodied carbon assessment being performed by this tool is similar in scope and detail to an ECOM analysis performed through the SE2050 website. There are a few key items that we hope to achieve with the continued support of this tool including increasing access to LCA information for more of our engineers and allowing for better informed decision making in real time. The output of the tool is organized in PowerBI to allow the user to graphically interpret their results and share them with the design team.

IMPROVEMENT AND INTERNAL EDUCATION

While we work towards making basic embodied carbon assessment proficiency more widespread across the department we also intend to reinvest in the individuals who have completed reporting requirements in years past. We intend to use the soon to be released *SEI Prestandard for Assessing the Embodied Carbon of Structural Systems* and other key resources from CLF, SEI, and IStructE to strengthen our knowledge in key LCA topics including uncertainty, functional equivalence, biogenic carbon, carbonation, and end-of-life assumptions. We also plan to develop at least one case study related to how LCA supported a project's sustainability goals and collaborate with the architect on the case study's development.

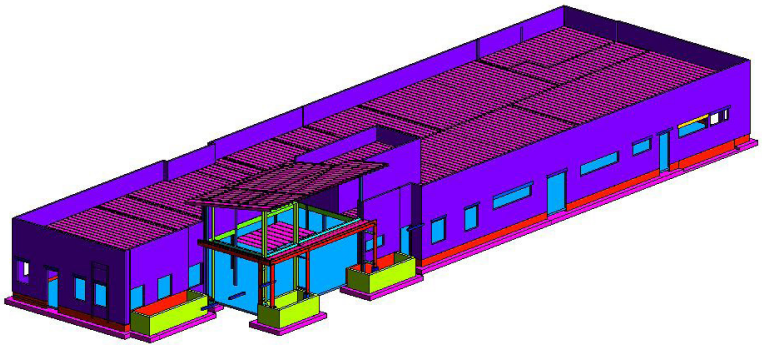
SE2050 DATABASE AND LCA AS A CONVERSATION STARTER

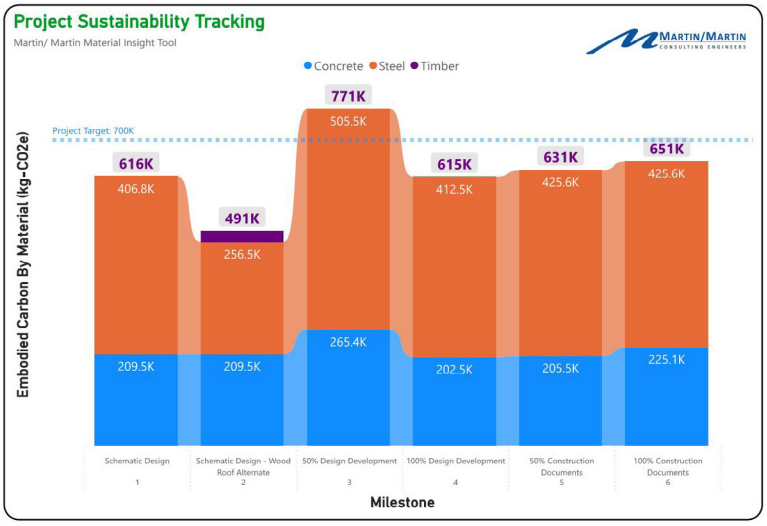
For last year's reporting requirements a total of 7 projects have been submitted to the database. The analyses performed this year focused on implementation of our newly released Martin Martin Material insights tool which provided detailed calculation of structural material quantities while also performing a cradle-to-gate embodied carbon assessment.

Last year we intended to share results from reporting to the wider department outside of the committee. This proved to be difficult due to a lack of internal reporting standards and confusion on the purpose of the meetings. Moving into 2026, we will be reflecting on the information sharing process and work to develop ways to clearly articulate the outcomes of this year's analyses to the firm. As we continue to increase the quantity of projects analyzed by our firm we are also intending to organize results in a way that sets us up to establish intermediate internal goals and baselines for the company.

2026 ACTION ITEMS:

- Submit a minimum of (12) projects to the database utilizing our new REVIT tool and a cradle-to-gate scope.
- Submit a minimum of (6) projects to the database with a cradle-to-grave scope.
- Include all structural material quantities in our submissions to the SE2050 database.





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EMBODIED CARBON REDUCTION STRATEGIES

Throughout 2025, our embodied carbon reduction strategies were expanded to include detailed guidance related to design efficiency, system selection and highlighting how design decisions and the coordination process impact the sustainability of a project. These will continue to be important themes for the company as we head into 2026.

DESIGN STRATEGIES AND CONNECTING THE DOTS

There are two components to consider when implementing design strategies in an effort to reduce the embodied carbon of a project. The first is to understand the tools available and items to consider. These are becoming increasingly well documented through resources such as the SE2050 design guidance. We also have summarized these in many internal resources, most notably our "Sustainability Guide" featured in the education section of our 2025 ECAP. The second component involves data - engineers must distill the various strategies down to ones that are both applicable and impactful for their project.

In 2025, we intended to develop a series of Design FAQs, or white papers describing how common design decisions and coordination items impact a project's embodied carbon. While we are still interested in developing these resources, we received feedback throughout the year that analyzing specific decisions being made on a project and developing project specific case studies provided more value to our engineers.

Throughout 2025 and into 2026 we are intending to continue to support projects directly and help engineers understand decisions that are available to them for their specific projects.

Many of these case studies are being performed during the design process, while others are taking a backwards look at previous projects to help us understand how decisions could have been made differently or how a decision that was made which was driven by other project constraints impacted the embodied carbon of the project. Studies have ranged from the reductions achieved through the incorporation of wood roof framing, the impact of alternate facade systems, the impact of value engineering revisions on embodied carbon and comparison of similar projects with different foundation systems (impact of site selection).

THE IMPORTANCE AND POWER OF PUBLIC POLICY

We will continue to monitor changes to buy clean policies at the national, state, and local level. Public policy and standards adoption are a tool that can immediately create change and one that we need to be up to speed on to educate our clients and project teams. They also are valuable frameworks for projects with clients that are interested in sustainability and help us establish project sustainability goals. Of particular interest to our firm over the next year to review and incorporate into a project is Buy Clean Colorado, CALGreen, ACI 323, LEED V5 and the *SEI Prestandard for Assessing the Embodied Carbon of Structural Systems for Buildings.*

2026 ACTION ITEMS:

- Set clearly stated, firm-wide reduction targets in the short term and long term. We will focus on comparing our results to the benchmarking work being done by the SE2050 database and other organizations like CLF and determine any underlying reasons our data may differ from the conclusions of those reports/organizations.
- Develop and implement a work flow that makes it easier to make early design decisions based on embodied carbon. This elective is supported by the activity discussed in the reporting section.
- Compare different design options with embodied carbon as a performance metric during the project concept phase. Specifically, work with a project team to evaluate the potential for reuse of an existing building as a key conceptual reduction strategy compared to new construction.
- Incorporate sustainably harvested biogenic materials in at least one project. Specifically, we will work with a project team to gain a project wide understanding of the definition of sustainably harvested material that is appropriate to the project and acceptable to the design team. This action item is related to both reduction strategies and advocacy efforts strategy compared to new construction.

POLICY
- A KEY REDUCTION STRATEGY

At Martin/ Martin we are continuing to see projects impacted by Buy Clean and embodied carbon policies. In particular the Buy Clean Colorado act has worked its way into many projects within our higher education team who have become our internal office experts as they have now incorporated Buy Clean provisions and GWP limits into three different project across the state at three different higher education campuses.

Another policy program that our firm is excited about and that will continue throughout 2026 is the City of Denver Embodied Carbon Pilot Program. Martin/ Martin has received funding for two different projects from the City of Denver to quantify, reduce and educate the owner on the embodied carbon emissions of their projects and potential reduction strategies available to them. Deliverables for thiss program include a Schematic Design structural system comparison, a Design Development embodied carbon assessment, and more detailed Life Cycle Analyses performed in the Construction Documentation and Construction phases.

TOP: Adams State University Facilities Service Center Replacement, Alamosa, CO; 2-story, 30,000 sf building with buy clean requirements for structural materials including steel, concrete, cold-formed framing, and reinforcing steel. Rendering courtesy of Hord | Coplan | Macht.

LEFT: Metro State University Gina and Frank Day Health Institute, Denver, CO; 5-story, 60,000 sf addition to an existing building with buy clean requirements for structural materials including steel, concrete, cold-formed framing, and reinforcing steel. Rendering courtesy of SmithGroup.

DENVER
CLIMATE ACTION, SUSTAINABILITY & RESILIENCY

BOTTOM LEFT: Denver's Embodied Carbon Pilot Program is being administered by the office of Climate Action, Sustainability and Resilience. Their goal is for the data collected from projects in the program to inform future policy related to embodied carbon.

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ADVOCACY

We will call attention to embodied carbon reduction to our clients and industry partners through SE2050. We will also engage with our clients and material suppliers to further our understanding of the full picture of sustainability including their constraints and goals. Facilitating shared knowledge through a common goal will help all of us achieve a more sustainable and promising future.

ARCHITECTS AND BUILDING OWNERS

As an engineering consulting firm, our clients are always our first priority. They are also increasingly interested in guidance and data relative to embodied carbon. A major goal for 2025 was to update an existing sustainable design AIA class. This was completed over the last year and we are now offering two AIA certified courses, one titled “Sustainability and the Built Environment” and one titled “Embodied Carbon and Design”. These classes were given three times total in 2025 and four times in the first quarter of 2026. We are excited to continue offering these courses in 2026 and refining the content based on feedback from our clients.

STRUCTURAL ENGINEERING AND THE CONSTRUCTION INDUSTRY

Martin/Martin places high value on thought leadership and sharing our knowledge with the structural engineering industry. We have a long history of involvement in code and standards development and education. We are committed to supporting engineers through leadership roles in the SEAC (Colorado) Sustainable Design Committee and SEI’s Sustainability Committee. We also plan to actively participate in SE2050 outside of our firm requirements, NCSEA’s Sustainable Design Committee, and CLF regional hubs near our office locations (including Rocky Mountain, San Francisco, and Atlanta).

We are excited to have gotten involved in many additional industry efforts in 2025 that we will continue to support in 2026. This includes discussions and standards development for structural optimization of concrete being led the the American Cement Association, promoting changes to building codes through the CURE initiative (Code Updates for Embodied Carbon) organized by NCSEA, and active involvement in ASCE-7 committee efforts to provide guidance on future environmental conditions in response to global warming.

An additional highlight from 2025 for the firm was participation in the SE2050 Towards Zero Carbon symposium and boot camp event held in Boulder, Colorado. We had multiple employees participate in each of the tracks offered and an M/M employee, Sheng Zheng, provided insight into AI and its potential influence on embodied carbon and structural engineering as part of the symposium.

Our sustainability experts also provided multiple presentations across the country related to embodied carbon, including a presentation on policy at the NCSEA summit, and presentations on Embodied Carbon and Design Criteria for SEAoO (Ohio) and SEAC (Colorado).

MATERIAL SUPPLIERS

Through our sustainability efforts and project experience we have developed many industry contacts with contractors and material suppliers. In acknowledgment of the rapidly changing landscape related to concrete materials and ready mixed

ADVOCACY

concrete production we plan to continue an effort that began in 2025, working to engage with many of our local ready mix suppliers to understand where the industry is headed and how they are reacting to buy clean policy requirements.

Throughout 2025, connections with suppliers have been made through events held in our office, which have created opportunities to engage with suppliers on sustainability issues. Over the last year we have connected with engineered wood producers, steel producers, local innovative material suppliers, and pre-cast concrete producers.

2026 ACTION ITEMS:

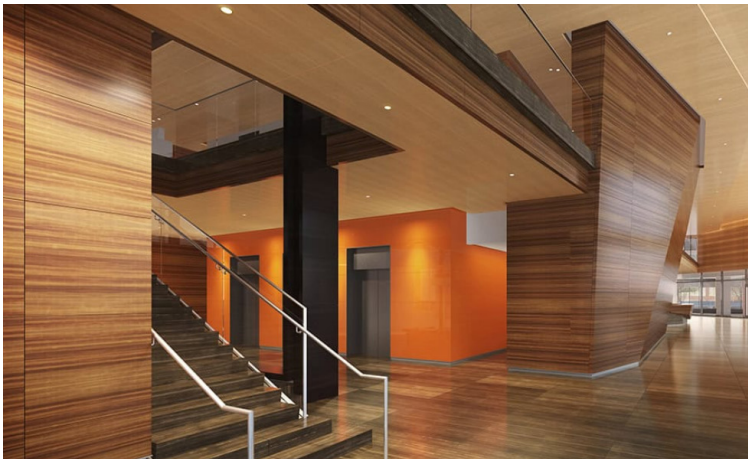
- Continue to describe the value of SE2050 to our clients and collaborate with them on their embodied carbon and sustainability goals.
- Publicly declare our firm as a member of the SE2050 commitment through sharing of this ECAP document on LinkedIn and with key clients.
- Engage with structural material suppliers in our region to communicate the importance of Environmental Product Declarations (EPDs) and low-carbon material options.
- Give an external presentation on embodied carbon through SEAC and/or NCSEA.

AIA CONTINUING EDUCATION COURSES

Sustainability and the Built Environment

1 LU|HSW

This course explores sustainable practices in civil and structural engineering, from defining sustainability to examining operational and embodied carbon, regenerative design, and resource use. Topics include material impacts, site solutions, water reuse, and the circular economy, with frameworks such as legislation, buy clean policy, and life cycle assessments.



Embodied Carbon and Design

1 LU|HSW

This course explores how design decisions shape embodied carbon emissions in buildings. Learn the fundamentals of embodied carbon, material impacts, and their role in climate change. Through project-phase strategies, goal setting, and case studies, participants will gain practical tools to reduce carbon impact from concept through construction.

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MISSION STATEMENT

**Exceptional engineering solutions
through our culture of integrity, service, creativity, and quality
to benefit our clients, employees, and community.**

SUSTAINABILITY

**Sustainability is embedded in everything we do,
and we acknowledge our obligation to improve the health of our planet.**

**Corporate Investment Embodied Carbon Reduction Strategies Life Cycle Assessment
Civil Site Solutions Mass Timber Existing Buildings Adaptive Reuse Colorado Water Reuse Law**