

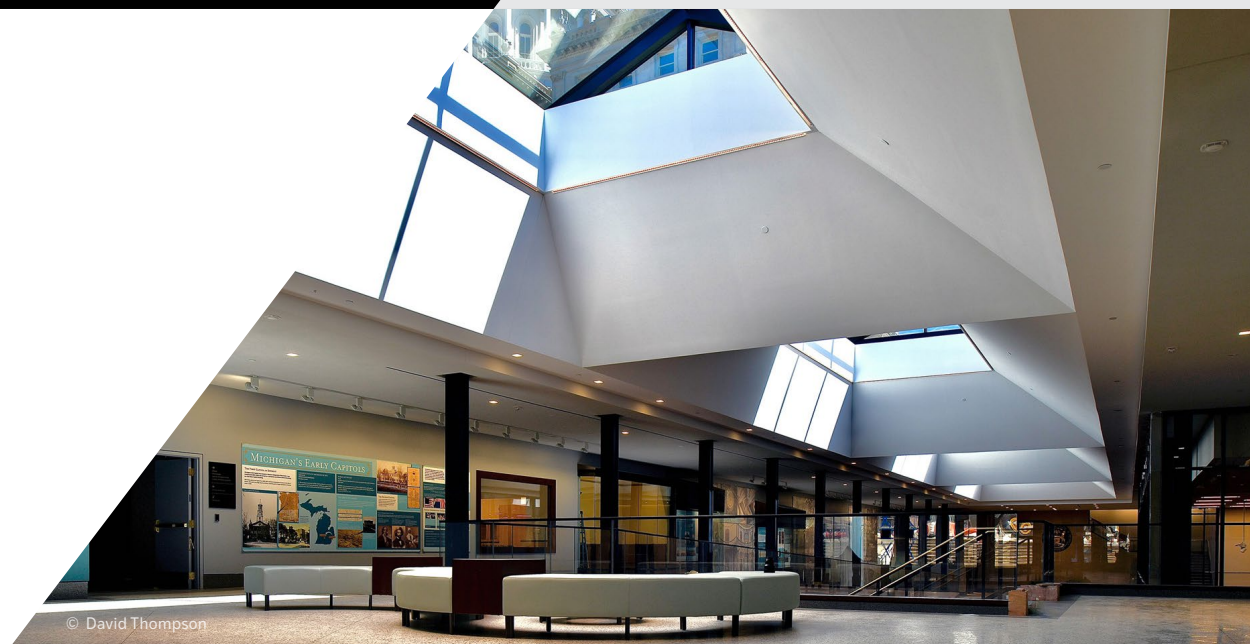


© Alan Karchmer/OTTO

Embodied Carbon Action Plan

TYLin

2026 — EMBODIED CARBON ACTION PLAN



© David Thompson



Table of Contents

01	Executive Summary	02	Education Plan
03	Knowledge Sharing Narrative	04	Reduction Strategy
05	Reporting Plan	06	Lessons Learned
07	Elective Documentation	08	Practice Leadership

Executive Summary

In 2020, TYLin, formerly Silman and AEC, became a signatory of the SE2050 Commitment Program, which commits firms to achieving zero carbon buildings by 2050. By signing onto this initiative, we have agreed to help educate the structural engineering profession, engage in an embodied carbon tracking program for our projects, and report embodied carbon impacts and trends. TYLin Building's in-house Sustainability Community of Practice (SCoP), which was also founded in 2020, shepherds the research on new environmentally-minded materials, advances sustainability focused knowledge sharing resources, and develops tools for the tracking and comparison studies of embodied carbon related to building structures throughout course of a project.

With the firm's history founded on an ethos of sustainability, TYLin was born out of asking deep, comprehensive questions about the totality of a building's service life and its ripple effect on the planet at large. Our expertise with respect to preservation and adaptive re-use compliments our portfolio of structurally expressive new construction. This experience emboldens us to find creative ways to save or re-use existing buildings that perhaps would otherwise be slated for demolition. By utilizing existing buildings and their structural elements, we can greatly reduce the embodied carbon of a project through a reduction of both new materials and waste of the existing. Within the realm of new construction, our extensive experience with cutting edge materials, such as engineered wood and mass timber, low carbon concrete, or recycled steel coupled with elegant detailing generates new buildings, low in embodied carbon.

Our SCoP team, which comprises of passionate, sustainability-minded structural engineers and computational designers, has been working over the last year towards many of the goals outlined in last year's Embodied Carbon Action Plan. As 2026 has kicked off, SCoP has also been developing our goals for the new year. All of our goals align with the ethos that have steered the work and progress of SCoP since its creation in 2020. These are outlined below:

- Meet the requirements of the SE 2050 Signatory Commitment.
- Educate the firm and provide resources on sustainability.
- Promote and assist in sustainability integration in projects.
- Provide internal tools and databases to assist in sustainability related calculations.
- Update specifications and track newly emerging sustainable materials for project integration.

The following outlines our progress on past goals from previous Embodied Carbon Action Plans, as well as our goals for 2026.

Education Plan

Education is the bedrock from which TYLin has been able to root sustainability within our project work. We've continued to grow on the resources created since 2020, updating existing resources and adding new ones. Focusing on multiple forms of outreach, our team has worked over the past year to ensure the internal resources are used by all offices and include regionally specific information. Over the next year, we plan to continue to foster our internal knowledge sharing and grow the resources available to our teams. Some of the educational initiatives we've worked on over the last year are outlined below.

CROSS-OFFICE OUTREACH

With nine TYLin Buildings offices, along with remote-work engineers stationed in other cities, outreach and collaboration across all offices was a key focus for the TYLin sustainability team. We've expanded our forms of communication throughout our teams, utilizing our internal website, e-mail blasts, and town halls to share updates and new information. Our team has also joined studio weekly calls or held meetings with regional leaders to share critical information and resources. This has allowed for increased engagement and raised the sustainability IQ overall of the firm.

INTERNAL ROUNDTABLES AND OFFICE HOURS

Our Sustainability Community of Practice has continued to host monthly meetings open to the entire office. These meetings provide a forum for sharing questions, project insights, and updates, whether related to resources, materials, policies, or certifications. During the second half of each meeting, different roundtable topics are chosen. Topics covered in the last year included low carbon concrete, optimizing construction sequencing, Design for Freedom, conference overviews, and internal embodied carbon

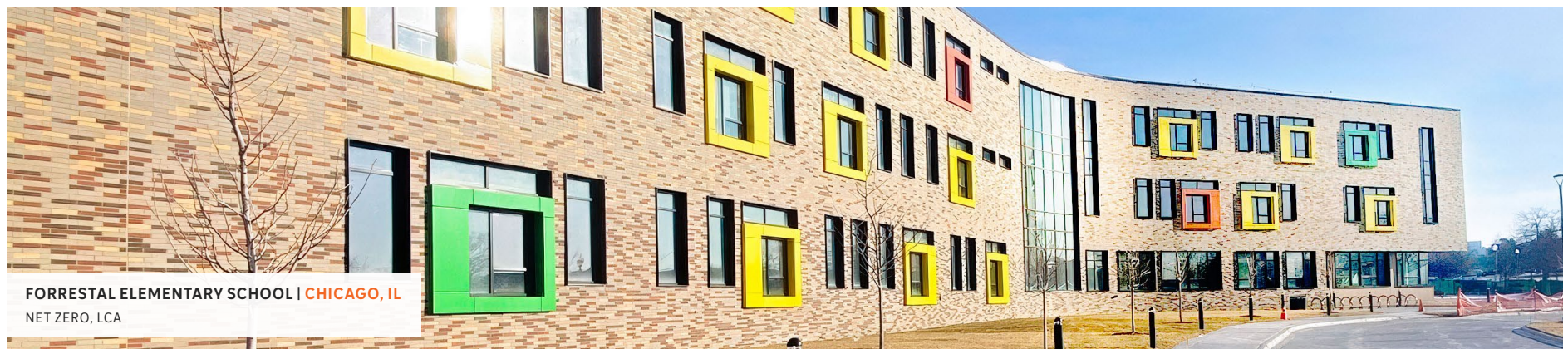
tools reviews. These meetings have allowed for anyone to join and increase their sustainability knowledge base.

FIRMWIDE RESOURCES

Since the inception of the Sustainability Community of Practice, the creation and maintenance of firmwide resources has been a priority. We have utilized our Technical Knowledge Items, or TeKIs, which are our firm's "Wikipedia"-style crowd-sourced articles, to continue to update the firm on the new topics and material updates. Our practice guide, which is a "one stop shop" for sustainability terminology, summaries, and links to internal and external resources, continues to be an easy way for engineers to find information. In 2026, we are also integrating quick embodied carbon references into our firmwide structural handbook to further grow access to resources.

REGIONAL ORGANIZATION ENGAGEMENT

Many of our staff are engaged and involved in external sustainability groups in their local areas. This includes local chapters of Carbon Leadership Forum (CLF), United States Green Building Council (USGBC), International Living Futures Institute, Build Reuse, and Structural Engineering Institute (SEI). Through the many initiatives and presentations, we are able to grow our collective knowledge to share throughout the firm. Members of our Sustainability Community of Practice have also attended sustainability-focused building conferences, including GreenBuild, Design for Freedom at Grace Farms, and Living Future Conference, as well as structural engineering conferences with sustainability focused sessions. Each team member attending a conference related to sustainability is expected to compile notes and lessons learned to share with the group.



Knowledge Sharing Narrative



Over the last year, outreach to both design collaborators and material fabricators has been a top priority. As our firm's sustainability initiatives have begun to be implemented more broadly, fostering an integrated design approach to embodied carbon reduction on projects has promoted creative solutions that meet a project's needs. Expanding our outreach beyond design professionals has helped expand our ability to share our lessons learned and promote further progress across the industry. Some of our efforts are outlined below.

COLLABORATION WITH PARTNERS

Throughout the last year, we have grown our efforts to collaborate with our design partners. We have used projects as opportunities to discuss potential structural reduction strategies with architects to develop creative and collaborative solutions. We've used our connections with Introba, an MEP firm who specializes in sustainability, to share our expertise and grow our abilities to build sustainable buildings. We've also partnered with architecture firms, such as Perkins and Will, to develop new tools that can identify the potential embodied carbon of projects during preliminary phases of design. We have also worked with our parent company, Sidara, to align our work with their sustainability goals and develop ESG reporting to support the World Green Building Council's New Zero Carbon Buildings Commitment.

MASS TIMBER ACCELERATORS

Mass Timber Accelerators across the country have been instrumental in increasing the ability to utilize mass timber within jurisdictions. Our team has had the opportunity to

work with some of these accelerator programs to expand the use of these low carbon, bio-based materials. As part of these accelerators, we have helped create publicly available documents that outline both the structural strategies and embodied carbon reduction opportunities.

MATERIAL ASSOCIATION AND FABRICATOR ENGAGEMENT

Throughout 2025, our team has focused on outreach to various material associations and fabricators. Based on our conversations with organizations, such as AISC, we have been able to not only adjust our practices to better align with the industry, but also provide feedback and lessons learned that could be used to refine recommendations by these organizations. Our engagement with sustainable material fabricators has allowed our team to understand what is available for use on projects, easing the ability to implement these materials. Reciprocally, we have been able to provide input on what the priorities and needs are of our projects overall, as well as regionally.

PRESENTATIONS AND LUNCH & LEARNS

Our team has made an effort to promote embodied carbon reduction and share lessons learned through a variety of presentations. This has included presentations at conferences, organization's webinars, and summits, as well as to university classes. We have also developed a series of AIA-accredited lunch and learn presentations for architects to share ideas on how our two disciplines can collaborate to find a reduction in embodied carbon on projects.

Reduction Strategy

Between the overhaul of our firmwide specifications and integration of embodied carbon strategies across more projects, TYLin has made strides towards hitting our reduction targets for projects across the firm. Over the next year, we are targeting a 5% reduction, with a larger goal of 20% reduction across projects over the next 5 years. Some of the methods to achieving these targets are outlined below.

SPECIFICATIONS

With our concrete specification updated in 2024, our team focused our efforts on our remaining specifications. Working with our internal material-specific communities of practice, we adjusted the language in our structural steel, metal deck, timber, and concrete masonry units (CMU) specifications. These updates, which include setting GWP limits, requiring EPDs, and prioritizing local sourcing, have ensured all projects meet a minimum baseline and align with our firm's reduction goals. Adjusting our specifications has pushed the contractors we work with to think about their products differently and find creative solutions to meet the project needs while providing a more sustainable option.

BUILDING REUSE

Since our founding, the preservation and renovation of existing buildings have been central to our mission, deeply embedded in our firm's identity. Projects in existing buildings benefit from our deep and broad knowledge of archaic structural systems. With this knowledge, our engineers are able to identify uncommon design opportunities in adapting these buildings for new uses, initiating these conversations early in the design process to leverage the strengths and capabilities of existing structures instead of demolishing them. We have used sustainability as a tool for advocating for the reuse of existing buildings, as opposed to demolishing them. We execute complex structural upgrades, vertical and horizontal additions to historic structures, and bring new life to existing structures via adaptive reuse. By utilizing the existing structure of a building, we've been able to dramatically minimize the overall embodied carbon of a project.

EARLY PHASE DESIGN MATRIX INTEGRATION

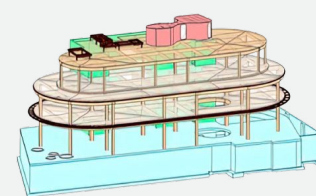
Over the last year, our team has focused on integrating sustainability and embodied carbon into early design conversations. As a baseline, we have added a sustainability section into our basis of design narrative for all projects to integrate. For projects with specific embodied carbon reductions or sustainability goals, a longer structural sustainability report has been provided to complement the basis of design narrative,

outlining reduction opportunities both in the materials and structural systems. When looking at multiple structural systems during early phases, the embodied carbon impact of each structural system has also been included. These help to initiate a conversation during the early phases of a project to help guide the project towards a more sustainable design. Discussing embodied carbon early has also led to more continuous conversations throughout a project to ensure those goals established are maintained.

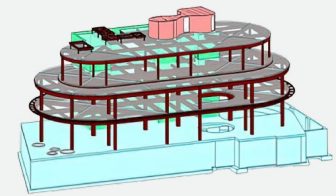
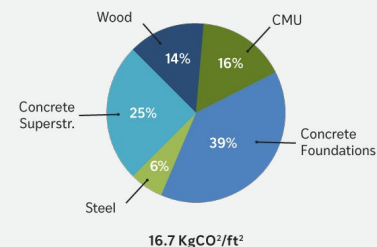
PROJECT ASSISTANCE

Since the initiation of our internal sustainability group, our firm's sustainability leaders have been assisting in project work. Over the last year, we've more broadly promoted assistance on projects across all offices. This includes assisting with specifications writing and embodied carbon calculations, as well joining sustainability focused project meetings and providing QA/QC reviews for drawing sets and calculations. This has also included participating in LEED and Living Future project design charrettes, where we are able to collaborate with the design team to find avenues to reduce carbon. This process has allowed our leaders to share our firm's knowledge, learn from our colleagues in the design industry, and assist in the reduction in embodied carbon on projects.

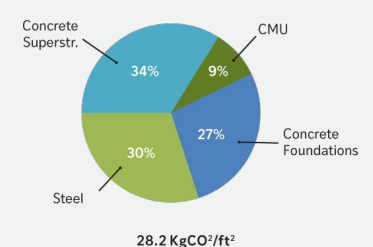
EMBODIED CARBON STUDY



CLT + Glulam



Slab on Metal Deck + Steel



Reporting Plan

Over the last couple of years, TYLin has worked to expand our internal tools to allow for simpler and continual assessment of embodied carbon of the structural systems throughout the design process. In doing so, it has also been critical to establish consistent analysis and reporting practices across the firm. Every project we complete embodied carbon calculations on is uploaded to the SE2050 database. Over the next year, we are aiming to expand beyond product stage lifecycle assessments and integrate cradle-to-grave analysis into our processes.

EMBODIED CARBON CALCULATOR AND REVIT PLUG-IN

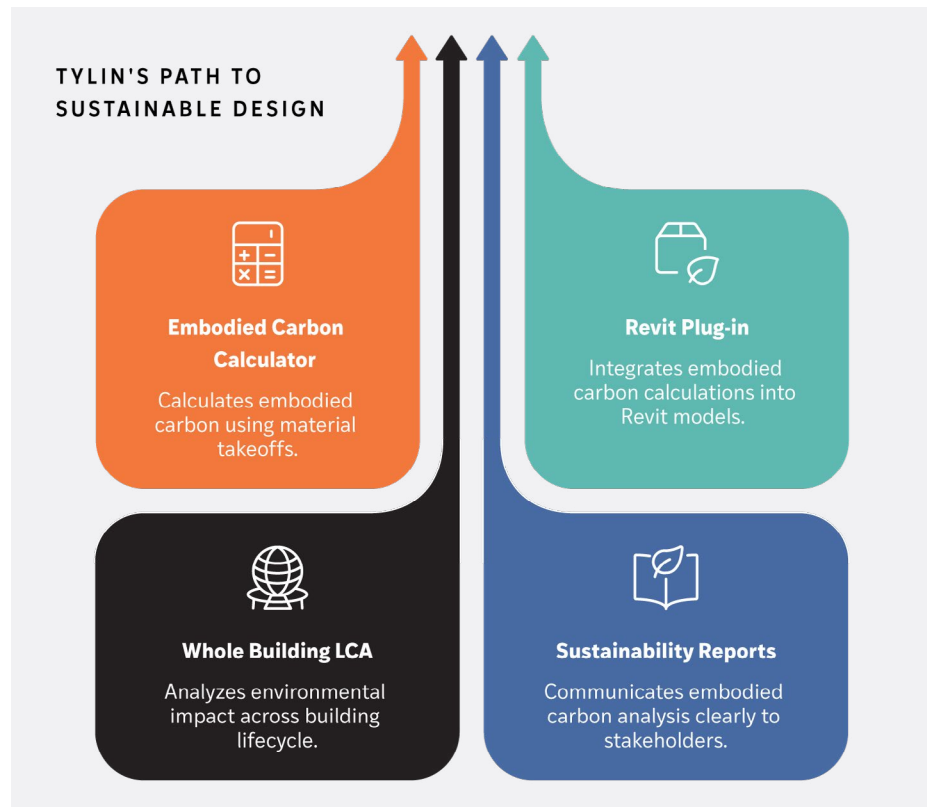
TYLin has developed two internal tools to determine the embodied carbon (scope A1-A3) of our structural systems. For early phases of a project, our embodied carbon calculator spreadsheet allows engineers to enter material takeoffs and provide preliminary embodied carbon calculations. An additional spreadsheet tool was created to allow a quick comparison between different structural systems' embodied carbon using our embodied carbon calculator. We have also developed a custom-written Revit Plug-in, which is typically utilized during later phases of a project. The Revit Plug-in pulls material quantities directly from our Revit models and then calculates the embodied carbon of a project. Both tools reference industry average EPDs, but the tools also allow for customization if a particular EPD will be implemented. All final embodied carbon calculations are collected in our firm's database and submitted to SE2050.

WHOLE BUILDING LIFECYCLE ASSESSMENT

Over the last year, we've worked on multiple projects that have required a whole building life cycle assessment (WBLCA), analyzing phases A-D. Oftentimes, these assessments are conducted by the project's sustainability consultant in collaboration with our team. While our team has provided material takeoffs at various phases from our Revit models to the sustainability consultant, we have also taken a more active role in the process. This has included reviewing the results of the WBLCA and providing detailed recommendations related to material specification and structural system adjustments to hit project goals and increase reductions. Over the next year, our team is also training with OneClick LCA. This will allow us to provide the structural components of a WBLCA and track the impact of our structural systems from cradle to grave and phase to phase of a project.

SUSTAINABILITY REPORTS

Over the last year, our team has been working to develop a standard for how we communicate the embodied carbon analyses we perform to owners, architects, contractors, and the public. The goal is that this information is clear and concise to allow for the team to assess the reduction opportunities and their impact on the architecture, budget, schedule, and sustainability goals of a project. We have developed a report standard that breaks out our analysis through a bulleted summary of the results, material reduction opportunities, structural system reduction opportunities, and a summary of the lifecycle process and results. We have found that, particularly during early conversations, this strategy has allowed all interested parties to understand and assess the best path for the project.



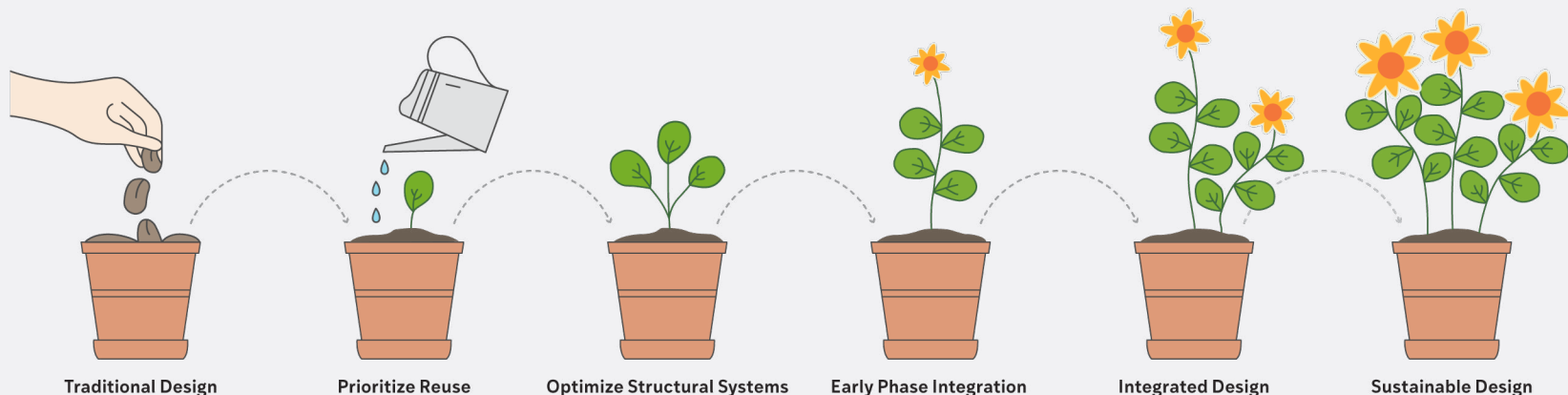
Lessons Learned

- 1. Think beyond specifications.** As our firm has been revising our specifications to implement benchmarks and set other sustainability standards, the material fabrication industry has been targeting similar goals to reduce the carbon impact of their materials. While all these initiatives are having large impacts on our reductions, they are not sufficient alone. We have begun to look at how optimizing our structural systems can amplify this effect. This process requires coordination throughout the design with various disciplines, pushing and pulling to find the right solution for each project.
- 2. Reuse is key to hitting reduction goals.** Over the last few years, our firm has had the opportunity to run several studies comparing reuse of all or part of a building's existing structure versus new ground-up construction. In all cases, we found significantly lower embodied carbon when reusing structures compared to building new, even when compared to new mass timber construction. These studies examined building additions and projects that required reinforcement of both the sub- and superstructure. Even with those interventions, reuse consistently resulted in greater carbon reductions than new construction. Retaining major structural elements reduces the need for new materials and meaningfully lowers overall embodied carbon. These findings highlight the importance of evaluating existing structures before pursuing full replacement. To meet embodied carbon reduction goals as an industry, we must prioritize and advocate for reuse of the structures we already have and find creative ways to revitalize them.

- 3. Prioritize embodied carbon reductions during early phases.** Through our projects, a trend has formed that prioritizing embodied carbon during early phases of design leads to a larger reduction than when integrated at later stages. As structural engineers, we can have the largest influence as we select which structural system will be implemented on a project and begin the initial coordination with the architectural massing and layout. Once these decisions have been made, it can be difficult to make large changes that could lead to greater reductions. Ultimately, keeping the impact of these structural and architectural decisions in mind during early phases, even on projects that do not have sustainability goals, directly correlates with a reduction in embodied carbon on a project.

- 4. Integrated design across disciplines will create the most sustainable building.** Over the last few years, we have learned that embodied carbon of the structure is not just dependent on the decisions the structural engineer makes. Our structural design reflects that of the architecture. We therefore require close coordination with the architectural team throughout the design process to adjust both the architectural and structural scopes to hit reduction targets. In addition, the design decisions made by structural engineers impact, for example, how and where a mechanical engineer can route their ductwork or how a landscape architect can layout a rooftop terrace. It is critical to the success of a project that all parties collaborate to find the best design decisions for each project's goals.

PATHWAYS TO LOWER EMBODIED CARBON



Elective Documentation

7

CATEGORY	REQUIREMENT
Education	✓ Provide a narrative of how the Embodied Carbon Reduction Champion will engage embodied carbon reduction at each office.
	✓ Present at least (1) webinar focused on embodied carbon and make a recording available to employees. This could be created internally, pulled from an external source (with permission), or pulled from a publicly available source such as the Boston Society for Architecture . Include this resource in your orientation and on-boarding program.
	✓ Incorporate embodied carbon education in your onboarding process for all new employees.
	✓ Initiate an embodied carbon interest group within your firm and outline their goals. This group may more broadly address sustainability, but they must include embodied carbon.
	✓ Create an Embodied Carbon digital resource wiki and/or forum on your firm's internal website for staff to create, share, and discuss Embodied Carbon educational resources.
	✓ Engage with a CLF Regional Hub. This could mean: Attending presentations or working sessions and reporting back to the firm Co-chairing a hub.
Reporting	✓ Submit a minimum of (2) projects per U.S. office with structural engineering services to the SE 2050 Database. You are not required to submit more than (5) total projects across your firm, but we encourage you to submit as many as possible! Firms are expected to follow the spirit of the SE 2050 Program in determining how many total projects your firm must submit. You do not need to consider offices that only offer construction administration services or offices with fewer than (5) full-time employees.
	✓ For multi-office firms, describe how each office is measuring and reporting embodied carbon. For single-office firms, describe how different project teams or managers are measuring and reporting embodied carbon.
	✓ Include all structural material quantities in your submissions to the SE 2050 database.
Reduction	✓ Set clearly stated, firm-wide reduction targets in the short-term (<1 year) and long-term (>5 years).
	✓ Submit a Circular Economy Narrative describing how a project supports the circular economy. This can be done by incorporating re-use or design for deconstruction into at least one project.
	✓ Develop and implement a workflow that makes it easier to make early design decisions based on embodied carbon.
	✓ Update your specifications to incorporate embodied carbon performance. Include embodied carbon in your submittal review requirements.
	✓ Communicate the embodied carbon impacts of different design options to clients with creative and effective data visualization. You are welcome to include these visualizations in your Elective Documentation, though it is not required if your firm would prefer to keep marketing materials private.
	✓ Compare different design options with embodied carbon as a performance metric during the project concept phase. Explain what you did and what the results changed (if anything).
	✓ Participate in a LEED, ILFI Zero Carbon, or similar project design charrette and speak to potential design considerations impacting embodied carbon.
	✓ Incorporate sustainably harvested biogenic materials in at least one project.
Advocacy	✓ Collaborate with your concrete supplier to reduce embodied carbon in a mix design below an acceptable baseline (e.g. NRMCA regional baseline values). Discuss what you found and what it means in your market.
	✓ Describe the value of SE 2050 to clients. How can your design teams collaborate to reduce embodied carbon? Please attach any associated marketing materials.
	✓ Publicly declare your firm as a member of the SE 2050 Commitment however you see fit (e.g. on your website, LinkedIn, or other social media).
	✓ Give an external presentation on embodied carbon that demonstrates a project success or lessons learned. Get connected at a CLF regional hub near you and be sure to post the recording.
	✓ Engage with local, state, and federal governments to communicate the importance of low-embodied carbon procurement and construction policies, and provide expert testimony to this effect.
	✓ Alternative advocacy method – engage sustainable material suppliers to identify potential structural use and connect to ongoing projects with associated scope.

Practice Leadership



Justin Den Herder, PE

VICE PRESIDENT, PRINCIPAL | NEW YORK, NY

justin.denherder@tylin.com



Jessica Haberstock

ASSOCIATE, BUILDINGS SUSTAINABILITY LEAD | CHICAGO, IL

jessica.haberstock@tylin.com



Ian Schmellick, PE, LEED AP

SENIOR ASSOCIATE | BOSTON, MA

ian.schmellick@tylin.com



Alex Vandenberg, PE

SENIOR PROJECT ENGINEER | PORTLAND, ME

alex.vandenberg@tylin.com



Chris Bird

SENIOR ENGINEER | WASHINGTON, DC

chris.bird@tylin.com



COLLEGE OF THE ATLANTIC | BAR HARBOR, ME
PHIUS



TYLin