## EMBODIED CARBON ACTION PLAN 2024







#### INTRODUCTION

Embodied carbon, representing the carbon footprint associated with materials and construction processes throughout a building or project's life cycle, has emerged as a critical component of comprehensive sustainability efforts. As the built environment undergoes significant expansion, understanding and mitigating the carbon released during material production, transportation, and construction phases becomes paramount to our collective pursuit of a carbon-neutral future. This Embodied Carbon Action Plan provides a roadmap to implementing new strategies and solutions within our workflow that will allow us to systematically evaluate and reduce the embodied carbon footprint of our projects. Through these efforts, we hope to arrive at a future where sustainable design focuses not just on how buildings operate, but fundamentally changes how they are conceived and constructed.

#### OUR COMMITMENT

As rapid and dramatic climate change becomes inescapable, we recognize our responsibility to implement a paradigm shift in the conventional approach to structural engineering design. Whereas our design focus has historically centered on life-safety considerations, recent environmental changes have made it apparent that our focus must broaden to include consideration for sustainability and resilience in equal measure.

Instrumental to this shift in priority is the establishment of a strategy for the reduction of embodied carbon in structural design. New to the SE2050 pledge, we have developed a series of near-term and long-term goals that will help us to establish a knowledge base to grow our understanding of current reduction strategies, determine internal benchmarks by which to evaluate our progress, and initiate conversations with our clients and partners to support reduction objectives.

Our embodied carbon action plan is outlined by our approach to **EDUCATE** our team, **REPORT** our data, **REDUCE** embodied carbon in our projects, and **ADVOCATE** for embodied carbon-conscious design choices.







The Lund Opsahl Reducing Embodied Carbon & Sustainability (LORECS) team will be responsible for planning and implementing our embodied carbon education curriculum and reduction initiatives. HITTIN

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Our **digital resource folder** will include items such as the "Top 10 Carbon Reducing Actions for Structural Engineers" and "How to measure and report embodied carbon" documents.

## EDUCATE

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Education empowers us with the knowledge and context to make informed decisions to effectively reduce the embodied carbon in our practice. The long-term vision for our education program is for embodied carbon reduction to be seamlessly integrated into our continuing education experiences in the office: in-house mentoring, external program participation, and internal presentations will all incorporate concepts of sustainability. The main objective is to reduce embodied carbon in our projects. As a baseline for our long-term goals, we aim to achieve the following:

- Curate up-to-date in-house educational resources
- Orchestrate regular continuing education initiatives
- Integrate embodied carbon reduction into onboarding and training
- Send office representatives to relevant workshops and conferences

Realizing the long-term vision for our education program requires an immediate effort to get our team up-to-speed on the fundamentals of embodied carbon-conscious design and practice. In short, we need to educate our staff and grow our sustainability team. To achieve this, our initial education goals include the following:

- Establish an in-office embodied carbon interest group (LORECS)
- Provide an introductory embodied carbon webinar for all staff
- Schedule quarterly continuing education presentations
- Develop a **digital resource folder** on Sustainability & Embodied Carbon Reduction for staff



#### REPORT

For measuring and calculating embodied carbon, we plan to use **Tally** in conjunction with **Embodied Carbon Construction Calculator (EC3)** leveraged by **TallyCAT**. This first year will involve defining and integrating LCA-focused modeling practices to ensure metrics are accurately measured and tracked within these programs. These methods may evolve overtime as best practices are developed and resources advance.

Our preliminary reporting plans are as follows:

- Submit two projects to SE 2050's database for 2023
- Focus on the "Product Stage" of the building life cycle (Module A1-A3) for reports
- Include Structural Material Quantities and Global Warming Potential (GWP) data
- Support carbon-reducing strategies by measuring and tracking metrics during all project phases, but contributions to the database will be reported at the end of the Construction Design phase only

Our intent for the long-term is to automate embodied carbon evaluations in our REVIT workflow for real-time project reporting. Further, we aim to progressively report more projects to the SE 2050 database as we gain experience each year.









### N K REDUCE

Educating and reporting alone will not bring forth the dramatic change required to meet the challenge of reducing and ultimately eliminating embodied carbon in our projects by 2050. Essential to achieving this core goal is implementing reduction practices. In addition to immediately taking steps to reduce embodied carbon in our projects, our first year of involvement in the SE 2050 program will consist of examining our current embodied carbon performance to establish baselines for future reduction goals.

Our first steps for reduction include the following:

- Introduce embodied carbon reduction criteria in material specifications
- Incorporate embodied carbon guidelines in our General Notes
- Analyze our prevalent public-sector designs to set embodied carbon benchmarks.
- Start conversations with local concrete suppliers to reduce embodied carbon in mix designs

In future years, we will set quantifiable goals for carbon reduction and continue to implement more ambitious strategies for reduction.

# ADVOCATE

Central to our commitment to SE 2050 is our motivation to contribute to industry-wide, cross-disciplinary collaboration to accelerate adoption of embodied carbon reducing strategies. This will be achieved by increasing awareness, sharing knowledge and data, and advocating for design choices that reduce embodied carbon.

The value of our commitment to SE 2050 to clients is clear: a **sustainable structure** is economical and **resilient**. Material efficiency results in greater economy, and strategically robust design choices reduce repair and maintenance costs and downtime after a hazard event.

Our advocacy goals for this first year reflect our drive to rapidly incorporate embodied carbon awareness into our practice:

- Indicate our status as a committed member of SE 2050 in our proposals, company website, marketing materials, etc.
- During schematic design, provide our clients with an overview of the difference in embodied carbon between design options, and discuss the use of specific EPDs
- Add language to feasibility studies regarding the impacts of the embodied carbon of proposed construction

As we develop and refine our embodied carbon practices, we aspire to grow our advocacy efforts:

- Display an embodied carbon "nutrition label" on every project cover sheet to showcase performance against industry standards
- Shift client discussions to include sustainability and resilience alongside safety and efficiency





The key to achieving our embodied carbon goals and meeting the needs of a changing climate requires an emphasis on both **sustainability** and **resiliency.** 

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#### CONCLUSION

As we navigate escalating climate concerns and a rapidly changing environment, our structural engineering philosophy is shifting from simple lifesafety to a comprehensive design approach that integrates sustainability and resilience. As leaders of the built environment and stewards of the natural one, we acknowledge our role in achieving balance between built structure and the planet. We view our commitment to SE 2050 as just the beginning of our actions to address this changing paradigm. Our embodied carbon action plan outlines the first steps in our plan to understand embodied carbon, share data, reduce embodied carbon in our practice, and to advocate for sustainable design.

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