
# EMBODIED CARBON ACTION PLAN

2025

FORTIS structural, llc

# EDUCATION PLAN

Fortis Structural is committed to raising awareness and understanding of embodied carbon through internal education. Each year, we continue to educate our team about embodied carbon and sustainability initiatives, both locally and nationally. In our third year commitment to SE 2050, we are looking to deepen firm-wide understanding of embodied carbon and its role in structural engineering.

## GOALS AND OBJECTIVES

- Expand training of carbon reduction strategies and Life-Cycle Assessment studies throughout the firm.
- Develop a company standard and process for conducting Life-Cycle Assessments and task each employee with completing a study in the next year.
- Engage clients, design teams, and industry partners in embodied carbon education.
- Track and assess the effectiveness of educational efforts.

## INTERNAL EDUCATION STRATEGIES

- Conduct quarterly sessions on topics such as Life Cycle Assessment development, low-carbon material selection, project case studies, and green code requirements.
- Create and maintain a shared resource library with reports, guidelines, and project case studied on embodied carbon.

## TRACKING AND CONTINUOUS IMPROVEMENT

- Conduct periodic surveys to gauge understanding and identify knowledge gaps.
- Discuss lesson learned and project experiences with enacting carbon reduction strategies.
- Evaluate and refine the education plan based on lessons learned and new industry developments.


# ADVOCACY

As part of our ongoing commitment to the SE 2050 program, our firm recognizes the importance of advocacy in driving industry-wide changes toward a more sustainable built environment. Our firm encourages staff involvement in advocacy initiatives through:

- Collaboration with Industry Partners: working alongside architects, contractors, and material suppliers to advocate for low-carbon material selection and design strategies focused on structural and carbon efficiency.

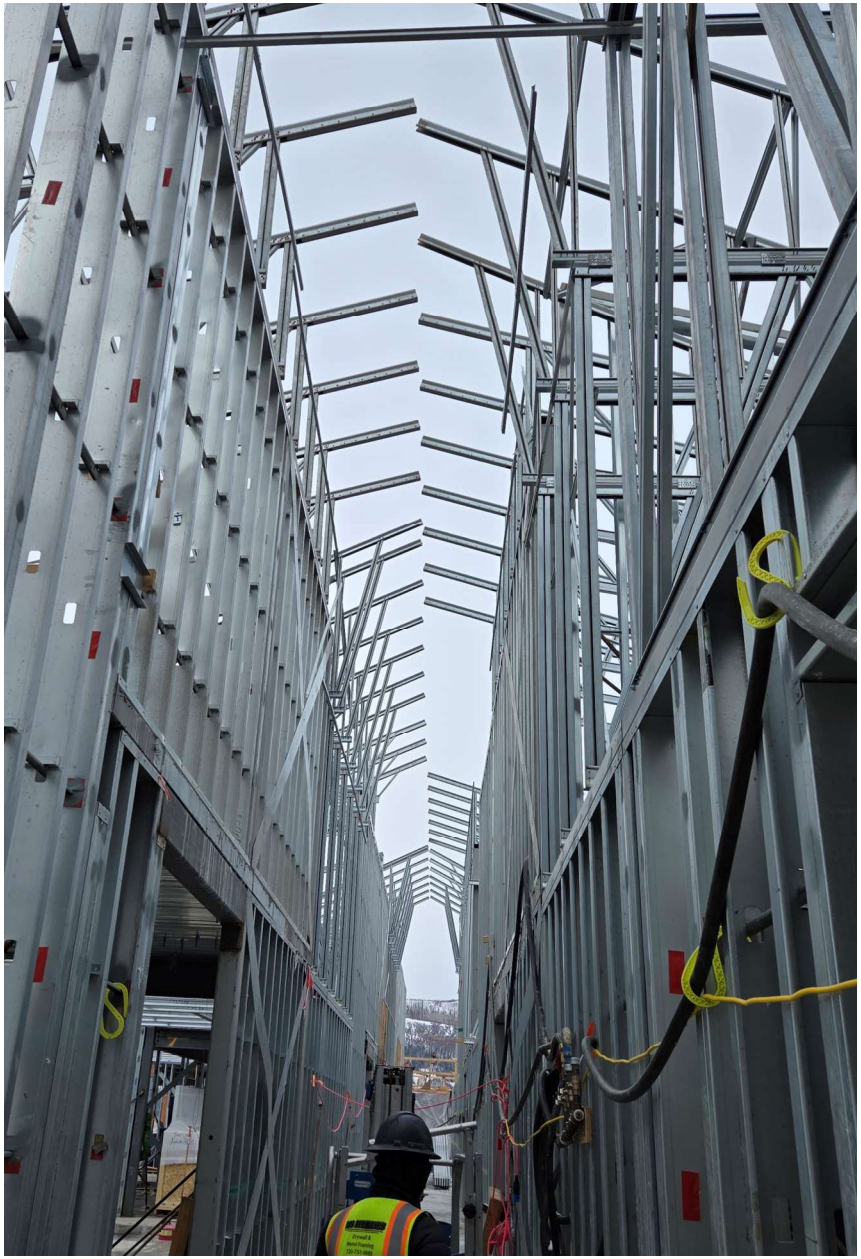
- Engagement with Professional Organizations: supporting team members with involvement in local and national organizations, including the Structural Engineers Association of Colorado Sustainable Design Committee, Carbon Leadership Forum, and the Structural Engineering Institute.

- Client and Project Advocacy: engaging in early-stage discussions on projects to introduce embodied carbon as a key design consideration, and suggesting structural efficiencies and alternate material selection as options for reducing our carbon footprint.

- Policy and Code Development: staying engaged and informed about local policy changes and code developments, as well as educating our clients on new and future requirements to reducing embodied carbon in our buildings.

By championing embodied carbon reduction beyond our own projects, we aim to foster a culture of sustainability across the structural engineering profession and contribute to a resilient, low-carbon future.

# REDUCTION STRATEGY



We are continuously refining our strategies to reduce and understand embodied carbon in structural systems. Through our experience working with clients on structural system(s) selection, material specifications, and optimization of structural elements, we have taken the following steps in reducing our carbon footprint:

- Updated our concrete specifications to require mix designs meet the limitations set forth in the Denver Green Code.
- Updated our concrete specifications to request contractors submit Environmental Product Declarations (EPDs) for each mix design, so that we can use this data to accurately track the concrete embodied carbon of our buildings and ensure transparency in carbon impacts.

Looking ahead to the next year, our reduction strategy will continue to focus on integrating carbon-conscious decision making into our design process, optimizing material efficiency, and collaborating with industry partners. As a firm we aim to:

- Conduct preliminary LCA studies during concept design to compare structural system options and present the lowest-carbon solutions to the client.
- Focus on material efficiency: reducing material use is one of the most effective strategies for lowering embodied carbon. Our firm employs the following best practices:
    - Designing and encouraging architects to provide efficient load paths and minimizing material usage.
    - Exploring the use of high-strength concrete, optimized steel sections, and mass timber, where feasible.
    - Promoting off-site fabrication of wood or cold-formed panels to reduce waste and improve construction efficiency.
- Engage material suppliers and builders early to identify low-carbon alternatives and innovative construction techniques.
- Document embodied carbon data for a larger number of projects firm-wide and comparing against industry benchmarks so we can continue to assess our progress toward effectively reducing carbon.

# REPORTING

As part of our SE 2050 commitment, our firm is dedicated to transparent reporting on embodied carbon metrics across our projects. By analyzing and sharing data, we aim to track progress, identify trends, and contribute to industry-wide benchmarking efforts. This section provides an overview of embodied carbon data from three recent projects, highlighting key performance indicators:

| PROJECT | SIZE (sf) | USAGE | PHASE LCA EVALUATED | # STORIES | VERTICAL GRAVITY SYSTEM | TOTAL GWP[1] |
|---|---|---|---|---|---|---|
| 2nd and Adams | 133,681 | Office | Construction | 5 + 2 Below Grade | Concrete: 2-Way Mild Reinforced Slab (Levels P2-L1) and Concrete:1-Way Post-Tensioned Slab and Beam (Levels 2-Roof) | 1,955,914 kg $CO_2$-e |
| The Col | 227,396 | Multi-Family Residential | Construction | 4 + 1 Below Grade | Concrete: Post-Tensioned and Wood: Bearing Walls | 2,184,062 kg $CO_2$-e |
| Sojourn | 16,402 | Multi-Family Residential | Construction | 3 | Wood: Bearing Walls | 97,532 kg $CO_2$-e |

1. GWP = Global Warming Potential for life-cycle stages A1-A3, cradle-to-gate.

We conducted all our Life Cycle Assessments using Beacon, ensuring a consistent and data-driven approach to measuring embodied carbon. Moving forward, we aim to standardize our firm-wide process for conducting LCAs to improve efficiency and comparability across projects. We will compare our project data against SE 2050 baselines to assess performance and help us identify carbon-intensive materials and explore opportunities for reduction.

**Lessons Learned and Future Improvements:**

- Challenges and Opportunities: constraints such as cost, availability of low-carbon materials, and project-specific design requirements (including architectural or owner-driven requirements) influence GWP outcomes, highlighting the continual need for education and understanding of embodied carbon.
- Next Steps: we look to continue to refine our data collection process and involve more people firm-wide in data collection, expand our project analysis, and engage with project design teams to drive reductions.

By consistently reporting embodied carbon metrics and increasing the number of projects we assess, we aim to refine our reduction strategies and contribute valuable insights to the SE 2050 community.