



EMBODIED CARBON ACTION PLAN

2023



INTRODUCTION

Fortis Structural, LLC, a 25-person firm located in Denver, Colorado, is hereby signing on to the SE 2050 Commitment Program. We support the vision that all structural engineers shall understand, reduce, and ultimately eliminate embodied carbon in their projects by 2050.

We believe it is our responsibility to our local and global communities to take an active role in sustainable building practices, specifically as it relates to structural engineering, building materials, and construction. We recognize the importance of committing to the goal of a Net Zero built environment and are motivated to take action to achieve this.

We therefore commit Fortis Structural, LLC to take the following steps which are part of the SE 2050 Commitment Program:

Within six months and annually henceforth, we commit to reporting an Embodied Carbon Action Plan (ECAP) and permit the ECAP document or form be made public on the SE 2050 website.

Within one year and annually henceforth, we commit to submit data to the SE 2050 project database in a collaborative effort to understand embodied carbon in structural engineering projects and to set attainable targets for future projects.

We look forward to joining this coalition and industry effort to achieve the goals of the SE 2050 Program.



EDUCATION PLAN

Fortis Structural is committed to raising awareness and understanding of embodied carbon through internal education. In order to achieve the goals of the SE 2050 commitment, we present the following education plan:

AWARENESS

- Announced commitment to join SE 2050 on October 26, 2022.
- Kick off implementation of the Embodied Carbon Action Plan (ECAP) with an Embodied Carbon 101 presentation during Fortis University, a firmwide educational series.

PARTICIPATION

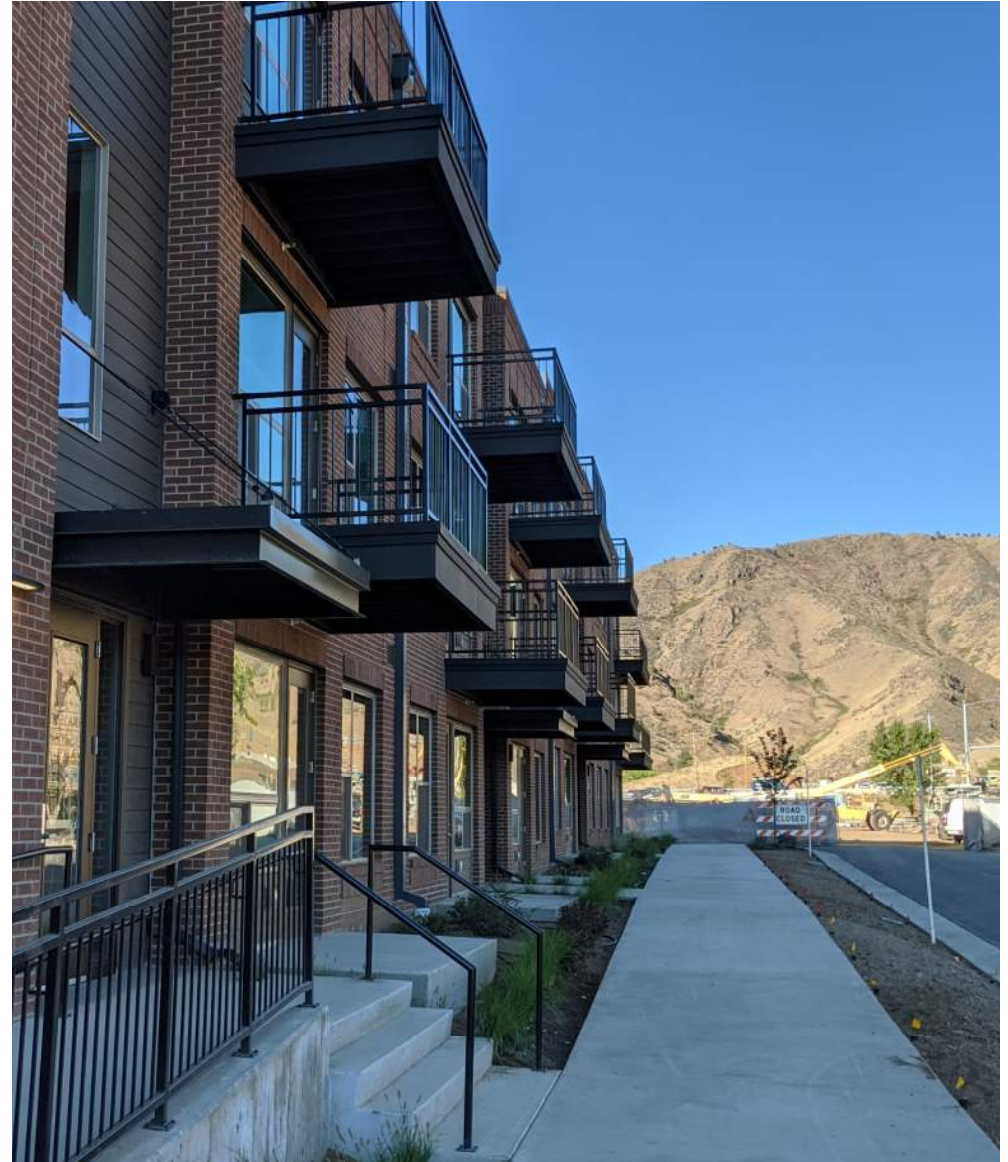
- Form an internal SE 2050 Committee to develop our firm's ECAP and analyze project data over the next year.
- Elect one or more representatives to attend quarterly external educational programs provided by SE 2050, Carbon Leadership Forum (CLF), or other embodied carbon resources. Representative(s) will distribute notes to all employees.
- Elect one or more representatives to attend a presentation or demonstration of an LCA-based tool used to calculate embodied carbon. Representative(s) will distribute notes to all employees.

EDUCATION

- Distribute the document "How to calculate embodied carbon" to all employees and host an internal meeting to review the document.
- Present an internal demonstration of an LCA-based tool used to calculate embodied carbon.

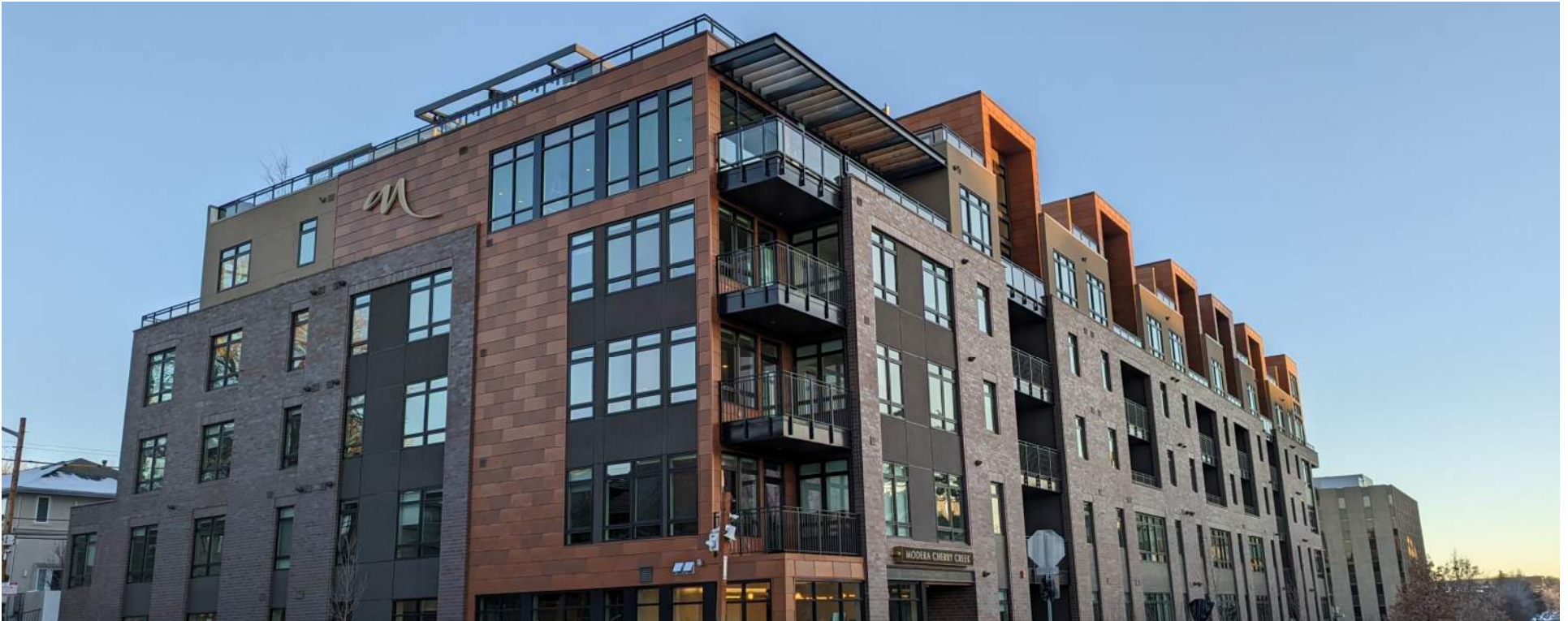
RESOURCES

- Share the SE 2050 library of resources with all employees.
- Share embodied carbon reduction strategies as outlined in the SE 2050 Top 10 Carbon Reducing Actions for Structural Engineers with all employees.



ADVOCACY

- Collaborate with the Architect/Ownership's Sustainability Team at the project kickoffs and provide guidance and insight on the embodied carbon of structural materials, including the positives and negatives of different materials and structural systems, and reduction methods that can be taken advantage of. Providing insight into structural efficiencies that can reduce carbon emissions early in the project and help the team meet sustainability goals.
- Provide option for a Life Cycle Assessment (LCA) in the project RFP and convey to ownership that Fortis Structural can assist with cost-savings and embodied carbon reduction strategies.
- Work with local jurisdictions (i.e. Denver Green Code) to help guide policies that are achievable and progress our industry toward meeting the goals of SE 2050.
- Update company website to include Fortis Structural's commitment to SE 2050, publish our Embodied Carbon Action Plan, and outline our sustainability goals.
 - Publish data from our internal Life Cycle Analysis of buildings and collaborate with other local firms to share data and insights.
 - Affirm our commitment to SE 2050 on LinkedIn and share embodied carbon reduction strategies, information, and knowledge.
- Work with local NCSEA Sustainability Committee to collaborate with other SE 2050 Signatory Firms in Colorado and establish allies in sustainability within our community.



REDUCTION STRATEGY



EMBODIED CARBON ACTION PLAN

Through our experience working with clients on structural system(s) selection, material specifications, and optimization of structural elements, we have already taken steps toward reducing our carbon footprint. In addition to these measures, we have identified areas where we could further reduce the embodied carbon in our projects:

- **UPDATE** Project Specifications and General Notes
 - **CONCRETE:**
 - ◆ Specify Portland Limestone Cement, Type IL, and take advantage of up to a 15% reduction in CO2 emissions over Type I/II cement.
 - ◆ Specify longer cure times where possible.
 - ◆ Utilize recycled materials where possible.
 - **REINFORCING STEEL:**
 - ◆ Utilize a high recycled content of steel material.
 - **WOOD:**
 - ◆ Specify OSB sheathing in lieu of plywood sheathing.
 - ◆ Utilize Advanced Framing techniques where permitted by architectural requirements to reduce material quantities.
 - ◆ Specify certified wood to assure sustainable forest-management practices.
- **ADD** Specification section requesting embodied carbon data (i.e. Environmental Product Declarations) from the General Contractor for structural materials.
- **WORK** with contractor during material procurement to meet an embodied carbon performance criteria on at least (1) product.
- **COLLABORATE** with the General Contractor on reducing waste:
 - Panelize projects over a certain size.
 - Recycle or donate unused material.
- **USE** locally available products:
 - Collaborate with steel manufacturers/contractors locally and see what sizes are available and specify in structural drawings.
 - Collaborate with local cement producers to develop performance based mixed designs with a focus on reducing carbon emissions.
 - Collaborate with timber suppliers locally and understand what wood products, species, and connectors are available nearby.

REPORTING

To fully understand the embodied carbon impact of our projects and develop an appropriate reduction strategy, we must first collect data from our projects and establish a baseline. Fortis's goal for the first year is to collect data from four to five projects that vary in both material type (concrete, cold-formed steel, and wood) and building use (multi-family residential, senior living, and hospitality). These projects represent our largest markets as a company, and understanding the embodied carbon of each will help guide our reduction strategies moving forward. Possible projects we have identified to complete an LCA include:

PROJECT	SIZE	USE	# STORIES	VERTICAL GRAVITY SYSTEM
Alexan Bellevue Station	442,000 sf	Multi-Family Residential	18	Concrete: Post-Tensioned
Origin Hotel	71,585 sf	Hospitality	4+1	Steel: Cold Formed (Concrete Podium)
Experience Senior Living Spokane	67,065 sf	Senior Living	3	Wood: Light Frame
123 Speer	506,850 sf	Multi-Family Residential	10+4	Steel: Cold Formed (Concrete Podium)
Alta Mile High	298,540 sf	Multi-Family Residential	5+2	Wood: Light Frame (Concrete Podium)
Armour Troost SE	44,745 sf	Multi-Family Residential	4+1	Steel: Cold Formed (Steel Podium)

Because we have limited experience with developing a Life Cycle Assessment (LCA) and working with the various tools available, our plan is to test a few different tools and evaluate which we feel is most beneficial to our company goals. Our ideal LCA tool is simple to use and easy to learn, efficient, and provides reliable results for our projects. The three tools we have identified to investigate are EC3, Beacon, and the SE 2050 ECOM tool.

Looking toward the future, our long-term goal as a company is to perform an LCA for each building we design and create a robust, internal database specific to our work, demographics, and market. We feel this will give us the greatest insight into how we can reduce embodied carbon within our own buildings and will allow us to implement these strategies effectively. Furthermore, we can leverage this analysis as a service to our clients and help better educate our community about the impacts of embodied carbon and what we can do to achieve net-zero structures.

