



EMBODIED CARBON ACTION PLAN

2024



EDUCATION PLAN

Fortis Structural is committed to raising awareness and understanding of embodied carbon through internal education. Over the past year, we completed many of our education goals outlined in Year 1. We plan to keep the momentum going in Year 2 and continue to advocate for the importance of awareness and education.

AWARENESS

- Announced commitment to join SE 2050 on October 26, 2022.
- Host an annual internal Embodied Carbon presentation to discuss our firm's ECAP and provide SE 2050 Committee updates.

PARTICIPATION

- Formed an internal SE 2050 Committee to develop our firm's ECAP and analyze project data over the next year.
- Attend quarterly external educational programs provided by SE 2050, Carbon Leadership Forum (CLF), or other embodied carbon resources.

EDUCATION

- Distributed 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.
- Attended NCSEA's 3-part webinar series on embodied carbon in concrete, wood, and steel.
- Attend Low Carbon Concrete Symposium hosted by Building with Strength, NRMCA, and CRMCA.
- Review the recent Denver Green Code updates and create plan to implement in our project work.

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. Provide 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.
- 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



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 to meet the requirements of the Denver Green Code or other AHJ requirements.
- **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 better understand the embodied carbon impact of our projects and develop an appropriate reduction strategy, we collected data from two of our projects over the course of the past year to establish a baseline. The projects vary in size and primary vertical gravity system. Both utilize deep foundations and concrete shear walls as the lateral system, are located in Colorado, and are seismic design category B structures. These projects represent our largest markets as a company, and understanding the embodied carbon of each will help guide our reduction strategies moving forward. An outline of our recorded results from these two projects can be seen below:

PROJECT	SIZE	USAGE	PHASE LCA EVALUATED	# STORIES	VERTICAL GRAVITY SYSTEM	TOTAL GWP ¹
Experience Senior Living RidgeGate	322,755 sf	Multi-Family Residential	Construction	10	Steel: Cold-Formed	7,297,855 kg CO ₂ -e
Alexan Belleview Station	442,000 sf	Multi-Family Residential	Construction	18	Concrete: Post-Tensioned	6,624,747 kg CO ₂ -e

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

We also plan to continue collecting data from additional projects over the next year. We plan to increase the variety of material types and building use in the following projects we analyze so we can further establish a baseline. Possible projects we have identified to complete an LCA include:

PROJECT	SIZE	USAGE	# STORIES	VERTICAL GRAVITY SYSTEM
The Emerson	431,967 sf	Multi-Family Residential	17	Concrete: Post-Tensioned
Origin Hotel	71,585 sf	Hospitality	4+1	Steel: Cold-Formed (Concrete Podium)
The Amble	107,413 sf	Multi-Family Residential	3+2	Steel: Cold-Formed (Steel Podium)
Alta High Mile	298,540 sf	Multi-Family Residential	5+2	Wood: Light Frame (Concrete Podium)

Over the course of the past year, we were able to test multiple different Life Cycle Assessment (LCA) tools, including, EC3, Beacon, and the SE 2050 ECOM tool. We were able to find success utilizing the Beacon software and pulling data from the EC3 database to assist our GWP values.

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.

