



KHH SE 2050 Embodied Carbon Action Plan (ECAP)

28 December 2022

1. Commitment Letter

- a. Done - 17 June 2022

2. Internal Announcement

- a. Done - Staff meeting, June 2022

3. Education Plan

- a. We will develop and present an annual in-house education session for all structural engineers about embodied carbon emissions from structural materials and systems. Topics to include:
 - i. Review of the company's SE 2050 Action Plan.
 - ii. Review of SE 2050 resources.
 - iii. Information about embodied carbon emissions from structural materials.
 - iv. Any recent updates on issues that impact the carbon emissions of structural materials from NY State or from local construction markets.
 - v. Encouragement of structural engineers to consider volume-reduction foundation systems such as frost-protected shallow foundations.
 - vi. Discouragement of structural engineers from over-specifying concrete strength.

4. Knowledge Sharing Narrative

- a. Include an explanation of SE 2050 on the company website.
- b. Include an article about our SE 2050 Commitment in the spring issue of our company newsletter, and regular updates in the newsletter to communicate things we have learned ("The SE 2050 Corner").

5. Reduction Strategy

- a. Track embodied carbon on several representative structural projects for (1) year to establish a baseline.
- b. Include in company Master Specifications the following:
 - i. Require a minimum of 20% Supplementary Cementitious Materials in all structural concrete.



- ii. Prohibit the use of rigid insulation with high GWP blowing agents, including XPS (i.e., only allow the use of low-GWP XPS).
- c. Suggest that structural engineers ask Clients if there are carbon reduction goals or a "carbon budget" at the beginning of the design phase of projects.

6. Reporting Plan

- a. For (2) projects, we will calculate the embodied carbon for the structural materials.
- b. Project stage: Completion of contract documents phase.
- c. Methodology:
 - i. Develop an in-house spreadsheet of material quantities and carbon.
 - ii. Tally quantities of structural materials.
 - iii. Multiply quantities by industry-average EPDs for Cradle-to-Gate carbon, unless manufacturer-specific EPDs are available.
 - iv. Add approximate additional carbon for construction phase and waste.
 - v. Determine embodied carbon in lbs. of CO₂ per square foot of building.

7. Elective Documentation

- a. Education
 - i. Distribute ECAP within the firm upon publishing.
 - ii. Have (1) webinar focused on embodied carbon available to all employees.
- b. Reporting
 - i. Identify and submit (2) projects with structural engineering services to the SE 2050 database.
 - ii. For a project submitted to the database, ask the Architect or Owner if the project has a carbon budget or if there are established project sustainability goals at the project kickoff meeting.
- c. Reduction
 - i. Create a project-specific embodied carbon reduction plan on at least (1) project.
 - ii. Collaborate with a project's concrete supplier to reduce embodied carbon in a mix design.
- d. Advocacy
 - i. Develop an SE 2050 marketing sheet that describes the value of SE 2050 to clients.
 - ii. Share our commitment to SE 2050 on the company website.