EMBODIED CARBON ACTION PLAN

BY

PES STRUCTURAL ENGINEERS

JULY 2023

SE2050 MEMBER YEAR - 1

PES STRUCTURAL ENGINEERS

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INTRODUCTION

In 2019, the Sustainability Committee of the Structural Engineering Institute developed the SE 2050 Commitment Program. The vision of this program is that: *All structural engineers shall understand, reduce, and ultimately eliminate embodied carbon in their projects by 2050*. Buildings and construction account for approximately 40% of energy-related CO_2 emissions[1], so there is considerable opportunity for structural engineers to make an impact on decarbonizing the built environment.

PES Structural Engineers is proud to publish our first Embodied Carbon Action Plan, affirming our commitment to the vision of the SE 2050 program. Since submitting our commitment letter on December 20, 2022, we have been developing this plan to address the four focus areas identified by the SE 2050 governing body: Education, Reporting, Reduction, and Advocacy. Within this plan, we will detail our approach for completing not only the program requirements but also several additional electives to further demonstrate our commitment to the program. We look forward to reviewing our Embodied Carbon Action Plan on an annual basis, and refining our procedures based on lessons learned from the previous year.

[1] "How to Calculate Embodied Carbon" *The Institution of Structural Engineers*

PES STRUCTURAL ENGINEERS

PRINCIPALS

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December 20, 2022

Laura Champion
Structural Engineering Institute

RE: Letter of Commitment to the SE 2050 Program

Dear Laura:

PES Structural Engineers, a 54-person firm located in Atlanta, GA and Hartford, CT, is hereby signing on to the SE 2050 Commitment Program. We support the vision that structural engineers shall understand, reduce, and ultimately eliminate embodied carbon in their projects by 2050.

We are pleased to endorse the vision of the SE 2050 program, as it resonates clearly with our firm's core values. To achieve the goal of SE 2050, a collaborative approach is necessary, and at PES we are always striving to ***win as a team***. We are committed to being an industry leader, seeking opportunities to ***drive for improvement*** through innovation. Most importantly, we recognize the severity and critical nature of the issue at hand and agree that it is time for our profession to ***own it*** – the work that we do as structural engineers can make a difference.

We therefore commit PES Structural Engineers 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.

Sincerely,

Michael Planer P.E., S.E.
Principal | President

EDUCATION

At PES Structural Engineers, we have always promoted knowledge sharing within the company and consider it to be a key practice for internal development. It will take a team effort to achieve the SE 2050 program goal, and as such we recognize the importance of providing all firm employees with the information and resources to be involved in the process. Below we have outlined the action items that we will take to educate our employees on the topic of embodied carbon. As this is our first year as a member of the program, we will place an emphasis on education and pursue some additional program electives as indicated.

Program Requirements

Provide a narrative of how the Embodied Carbon Reduction Champion will engage embodied carbon reduction at each office.

The embodied carbon reduction champion will serve as the chair for the sustainable design committee. This person will organize and lead committee meetings, where focused discussions can take place. While most of our firm is located in Atlanta, we will ensure that the New England office is represented at committee meetings to maintain consistency across the firm. Through this committee, knowledge will be shared with all firm employees to provide education around the topic of embodied carbon as well as communicate lessons learned and best practices for reducing embodied carbon in our projects.

Present at least (1) webinar focused on embodied carbon and make a recording available to employees. Include this resource in your orientation and on-boarding program.

The webinar "Embodied Carbon 101: Structure" published by the Boston Society for Architecture in combination with the Carbon Leadership Forum provides a good introduction to the topic and is a great resource for our firm in its first year of membership. We will make this webinar available to both current employees as well as new employees as part of the on-boarding program. In future years as we become more familiar with embodied carbon, we will distribute webinars firm-wide on more advanced topics around this subject.

***Additional Elective* - Initiate an embodied carbon interest group within your firm and outline their goals. This group may more broadly address sustainability, but they must include embodied carbon.**

The sustainable design committee has been formed here at PES in conjunction with our commitment to the SE 2050 program. The primary focus of this committee will be on maintaining an active membership in the program, ensuring that we are appropriately championing the four focus areas of education, reporting, reduction, and advocacy. The sustainable design committee will lead the firm through completing the program requirements while also promoting an interest in embodied carbon internally.

***Additional Elective* - Create an Embodied Carbon digital resource wiki and/or forum on your firm's internal website for staff to create, share, and discuss Embodied Carbon educational resources.**

We are planning to leverage multiple digital resources to promote knowledge sharing and foster discussions around the topic of embodied carbon within the firm. The sustainable design committee currently has their own internal channel for SE 2050 program tracking, meeting planning, and sharing information for discussion. Additionally, we are developing a resource page accessible to all employees that will provide introductory information about embodied carbon as well as updates as to what the committee is currently working on. By employing both resources, we can keep committee activities focused to maximize efficiency while also ensuring that other employees are informed on recent developments surrounding embodied carbon.

REPORTING

The SE 2050 project database hosts embodied carbon information for projects that are submitted by the program member firms. We recognize the importance of building this database to identify current baselines and establish reduction targets for the future. As a firm with 35 years of experience in a wide variety of project types, we are excited about the opportunity to strengthen the database with our contributions.

Program Requirements

Submit a minimum of (2) projects per U.S. office with structural engineering services to the SE 2050 Database.

PES Structural Engineers has offices in both Atlanta, GA and Hartford, CT. We will submit (4) projects to the database during our first year. As we refine our process for tracking embodied carbon on our projects, we will increase the number of projects that we are submitting in order to further strengthen the database.

***Additonal Elective* - For multi-office firms, describe how each office is measuring and reporting embodied carbon.**

We will ensure consistency with the project information that we are submitting by employing the same method of embodied carbon tracking across the firm. At PES we recognize the importance of producing accurate BIM models to effectively communicate design information to our clients, and plan to leverage this information to assist with our embodied carbon tracking. There are many tools available to track embodied carbon, one of which being the Revit plug-in Tally Climate Action Tool (TallyCAT). This tool permits synchronization between material quantities in Revit and information hosted on the Embodied Carbon in Construction Calculator (EC3) database. While TallyCAT will be able to capture the embodied carbon associated with many of the larger structural elements, it is not efficient to model every structural element in Revit and therefore we will develop our own tool to capture any remaining items. As this is our first year as members of the program, we will continue to refine this process as more projects are analyzed and consider additional tools to assist with this process as they are published.

REDUCTION

PES Structural Engineers is committed to reducing embodied carbon on our projects, while also maintaining the high level of quality that our clients have come to expect. In our first year as members of the program, we will focus on gathering information and evaluating our current practices to identify opportunities for embodied carbon reduction. Please see below for more information on our plan to fulfill the program requirements in this area.

Program Requirements

Update your specifications to incorporate embodied carbon performance. Include embodied carbon in your submittal review requirements.

We will develop our specifications to incorporate embodied carbon performance and provide these for projects with sustainability goals. We support the movement towards performance-based specifications and will review our specifications to remove unnecessary limits for concrete mix designs, depending on the application. Additionally, we will request Environmental Product Declarations (EPDs) to be provided in tandem with concrete mix design submittals.

***Additional Elective* - Collaborate with your concrete supplier to reduce embodied carbon in a mix design below an acceptable baseline (e.g. NRMCA regional baseline values).**

During our first year of membership in the program, we will communicate with concrete suppliers to evaluate the availability of EPDs as well as explore the opportunity for a collaborative effort in optimizing mix designs. By providing suppliers with more freedom for certain concrete applications, the hope is that we can to achieve mix designs with a reduced embodied carbon content.

ADVOCACY

As members of the SE 2050 commitment program, we also plan to serve as advocates in the industry and the community for decarbonizing the built environment. The growing number of SE 2050 program member firms is very encouraging, but there is still plenty of opportunity to communicate the importance of this program to our clients and to the public. By sharing our progress in reducing embodied carbon for our projects, we hope to motivate others to also become engaged on the subject. We will achieve this through several task items outlined below.

Program Requirements

Describe the value of SE 2050 to clients. How can your design teams collaborate to reduce embodied carbon? Please attach any associated marketing materials

During our first year in the program, we will work on developing resources that can be used to promote sustainability goals on our projects. External marketing materials will be helpful in communicating to clients that we can contribute to achieving project sustainability goals. Additionally, we are planning to develop internal reference guides to assist our engineers with making sustainable design decisions and communicating these opportunities to the client. Project kickoff meetings with the design team is a great opportunity to have these discussions, and we will incorporate it into our standard practice.

Publicly declare your firm as a member of the SE 2050 Commitment however you see fit (e.g. on your website, LinkedIn, or other social media).

After submitting our commitment letter and officially being accepted into the program, we proudly announced our membership on our website as well as on our LinkedIn page. Additionally, we published our commitment letter and linked to the SE 2050 website to further advocate for the program.

***Additional Elective* - Engage with structural material suppliers in your region to communicate the importance of Environmental Product Declarations (EPDs) and low-carbon material options.**

As previously mentioned in our "reduction" section of this plan, we are excited for the opportunity to engage with material suppliers and explore any low-carbon material options that are available. We will establish a standard practice of requesting EPDs for concrete mix designs and work with suppliers to utilize low-carbon concrete in alignment with the project objectives.

CLOSING REMARKS

Since joining the SE 2050 program in December 2022, our sustainable design practice at PES Structural Engineers has grown tremendously and we will continue that development through implementation of this action plan. As mentioned in our commitment letter, the vision of the SE 2050 program aligns closely with our core values and we are proud to join the group of structural engineering firms working to solve the growing challenge of reducing embodied carbon. We look forward to reviewing our action plan next year and incorporating updates from what we have learned during our first year of membership.