

Embodied Carbon Action Plan 2025

SE 2050



Introduction

Ehlert Bryan is a 40-person structural engineering consulting firm with offices in Tysons, VA, Washington, DC, and Orlando, FL. As one of the leading firms in the Washington metropolitan region, we support **SE2050**'s vision for a future with net zero embodied carbon in the built environment. In 2023, we joined the **SE2050** initiative and are thrilled to continue our commitment to a low carbon future.

In 2024 we uploaded data from two of our projects to the **SE2050 Life Cycle Assessment (LCA) Database**. Throughout the year, Ehlert Bryan has been pushing our clients to consider sustainable designs for our buildings. Our aim is to maintain and build upon our goal of reducing the embodied carbon and global warming potential of structural building materials on our property by:

- Fully optimizing structural systems and avoiding “overdesigning”
- Specifying low cement concrete wherever practical
- Working with building owners and architects to develop embodied carbon reduction plans in the early stages of our projects
- Collaborating with architects to optimize column layouts, reduce transfer beams and slabs, and minimize structure required for non-structural features
- Collaborating with owners and contractors to use locally sourced structural building materials

Part 1: Education

Ehlert Bryan's Embodied Carbon Champions are **Chris Heckmann, PE** and **Brian McSweeney, PE, SE, FBRSE**. They began promoting embodied carbon education in EB's offices in 2023. In 2024, they continued these internal seminars as well as organizing presentations from external parties, including:

- Structural Steel Sustainability - Nucor
- Thermal Breaks - Climaspec
- Internal Ehlert Bryan Embodied Carbon Reduction Practices
- Revit Learning Seminar on how to perform **LCAs** with Tally

Our plan in 2025 is to again present a minimum of four training sessions related to embodied carbon as well as to continue to expand our reference material on embodied carbon and sustainability.

Chris Heckmann, PE is a member of the **Structural Engineers Association - Metropolitan Washington (SEA-MW) Sustainable Design Committee**. He attends monthly meetings and the committee holds two workshops every year. He will also attend **Carbon Leadership Forum (CLF)** meetings quarterly.

Brian McSweeney, PE, SE, FBRSE is a member of the national **Structural Engineering Institute (SEI) Sustainability Committee** and attends monthly meetings on ongoing code development related to sustainability.

Embodied Carbon Champions



Chris P. Heckmann, PE



Brian M. McSweeney, PE, SE, FBRSE



Part 2: Reporting

Ehlert Bryan's main office is located in Tysons, VA with two smaller satellite offices in Washington, DC (4 employees) and Orlando, FL (3 employees). Due to the size of the satellite offices, we are counting them as part of our headquarters for reporting.

We have been using and will continue to use the Tally plugin for Revit to perform our LCAs, which creates comprehensive reports automatically. We have started and will continue to expand on an embodied carbon database in our office to track and compare embodied carbon performance by project. We model elements accurately in Revit as follows:

- **Concrete:** all concrete elements (including deep foundations, small curbs, slab folds, etc.) are modeled.
- **Concrete Reinforcing:** reinforcement quantities are provided to Tally manually for floors, walls, beams, columns, and foundations. Miscellaneous concrete uses a preset "medium" reinforcing percentage.
- **Steel Framing:** all structural steel framing members are explicitly modeled.
- **Secondary Steel:** estimates are made in the software for steel connections, kickers, and any other additional supplementary steel not specifically modeled.
- **Mass Timber Framing:** all mass timber framing members, including beams, columns, floor panels, etc. are explicitly modeled. Estimates are made for wood connectors and other fastening members.
- **Light Wood Construction:** structural walls and floors from the architectural model are assigned properties in Revit and those properties are used to estimate the volume of wood.
- **Masonry:** all structural concrete masonry units (CMUs) are explicitly modeled and actual reinforcing put into the software. Brick veneer is not included in our structural LCAs.

The results of our in-office LCAs are presented to the entire engineering staff with a step-by-step guide on how the LCA was performed and reported at the end of each calendar year. In 2025, we will also show all staff how results are uploaded to the **SE2050** database.

Part 3: Embodied Carbon Reduction Strategies

Ehlert Bryan intends to reduce the embodied carbon in the four projects we report to **SE2050** in 2025 by 20 percent from the benchmark Global Warming Potential (GWP). The benchmark will be based on the schematic design of each project, which is determined based on past experience and preliminary analysis and will include no specific design considerations for embodied carbon.

For each project, once the schematic design model is complete, we will run an LCA in the design development phase to establish the benchmark. We will then optimize the material and structural designs to reduce the GWP by at least 20 percent.

We will create project-specific Embodied Carbon Reduction Plans for the four projects that we will report to **SE2050** in 2025. Our Embodied Carbon Reduction Plans are simple and informal, typically consisting of a Word document with bulleted points.

In 2023, we updated our concrete specifications to a performance-based concrete mix design with GWP targets. In 2024, we included this modified specification on a few projects, including projects that did not have any set sustainability goals from the client. We plan to continue to expand on this practice in 2025 and put the new concrete specification in more projects.

For at least one project in 2025 we plan to collaborate with the concrete supplier to obtain a mix design that reduces embodied carbon on the project beyond the requirements of our new specifications. In 2024 we had limited new building projects to implement this goal, but are confident in a better outlook of new projects in 2025.



A photograph of a modern building with a glass facade, showing reflections of the sky and surrounding environment. The building is multi-storied and has a clean, architectural design.

Part 4: Advocacy

Ehlert Bryan proudly announced our commitment to **SE2050** on our website in February 2024. We plan to continue collaborating with our clients to reduce embodied carbon in our projects in 2025. We have encouraged all our project managers to include a sustainability meeting in the early design phase of all substantial projects, which will involve the building owner, architect, and all other engineering disciplines. We believe these meetings have the ability to sufficiently educate owners and architects who may not be as informed on embodied carbon and reduction techniques.

For 2025, we plan on incorporating sustainability goals into our project proposals as an additional optional service of a Lifecycle Assessment for our clients. This option to perform an LCA based on our commitment to a low-carbon future will be included on projects determined to have potentially substantial carbon footprints. The determination of which projects meet this description will be made on a case-by-case basis, but will typically involve large new-build and renovation projects. Projects such as tenant fit-outs, renovations with limited structural scope, and small new-builds will typically not be included.

Reducing embodied carbon in the built environment is one of the most important issues facing our industry. As a firm, we believe it is imperative that the buildings we design take every measure possible to reduce embodied carbon. **SE2050** is a commitment we made along with hundreds of other structural engineering firms in the United States to achieve net zero embodied carbon in our projects by the year 2050. And we cannot do this without you! We look forward to working with you to achieve this goal and make the built environment more sustainable for future generations.



Ehlert Bryan Consulting Structural Engineers was founded in 1981 on the belief that structural engineers should go beyond designing columns and beams and should be involved from project conception to project completion as a cohesive and creative part of the building process. Since then, we have continued to provide specialized structural engineering services for federal agencies, local governments, building owners, architects, and contractors throughout the Washington, DC metro area as well as in 37 states, Canada, and overseas.

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