



Flad

Flad Structural Engineers

SE 2050 Embodied Carbon Action Plan

Flad Structural Engineers is pleased to submit this Embodied Carbon Action Plan. This plan outlines our ongoing strategies to advance our commitment to achieve net-zero embodied carbon in structures by the year 2050.

As outlined in the guidance documents provided by the SE 2050 committee, there are five components to our plan:

Lessons Learned | Education | Advocacy | Reporting | Reduction

Lessons Learned

A summary of what you have learned as a firm over the previous year of embodied carbon reduction. Use this to inform your strategies for the coming year.

Flad Structural had three key take-aways from our first year in the SE 2050 Commitment.

1. We learned the importance of reaching out to manufacturers to understand regional market options early. Low-carbon technologies have been adopted at different rates and scales in different regions, so understanding what is already available helps the team understand what can be done in design. We also discovered that some concrete plants will create EPDs if given adequate advance notice, and the best way to ensure that manufacturers have enough time is to call early in design to talk about embodied carbon and product-specific EPDs. Even if that conversation does not ultimately provide us with the ability to specify a mix-specific EPD from that manufacturer, it helps us advocate for advancing low-carbon concrete.
2. We learned that our current modeling practices are not detailed enough to work seamlessly with BIM-integrated LCA softwares. We have been working with our internal design technology team and re-evaluating our modeling process to find ways to get our models ready for a better LCA workflow.
3. We learned that whole-building design studies are too time-consuming to be reasonable for most projects in early design, so Flad is trying to establish a toolkit of benchmarked projects, benchmark comparisons for concrete mix designs, and bay study comparisons to help us understand the impact of structural design choices in concept and schematic design phases.

In addition to our key take-aways, we have been talking to manufacturers, peers, and industry leaders about how to best write our specifications to encourage transparency and carbon reduction without limiting project schedule or impacting budget.

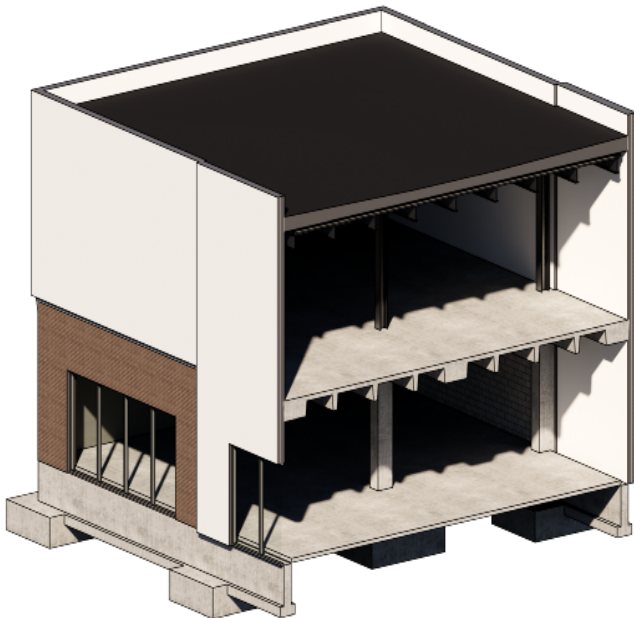


Image: Test model for reviewing BIM to LCA software workflow.

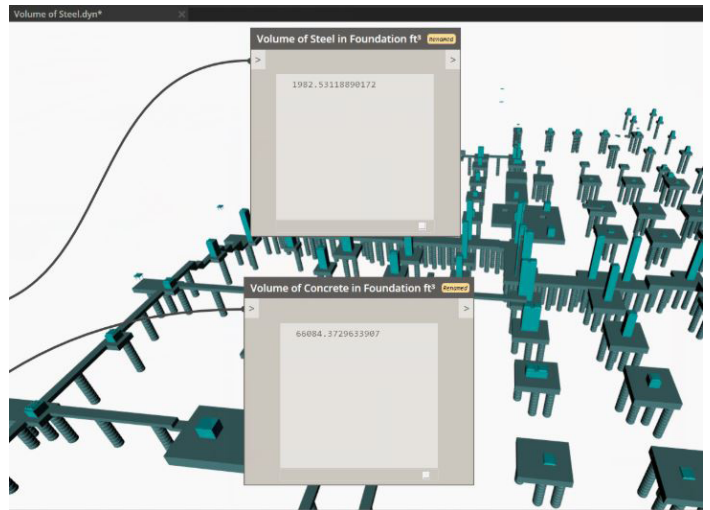


Image: Dynamo script to calculate materials that we don't traditionally model.

Education

Distribute firm-wide announcement of your firm's pledge to join the SE 2050 Commitment. After the first year, make an announcement sharing your ECAP from the previous year.

Flad has made multiple firm-wide announcements regarding our SE 2050 Commitment, and will continue to share our progress on our ECAPs within our structural practice and with our entire firm.

Nominate a minimum of (1) employee per office to participate in a CLF Community Hub and/or task force.

Our embodied carbon reduction champions are working with others in Wisconsin to evaluate creating a local CLF Community Hub, and would both participate in the hub if it is formed.

Minimum (1) employee attends a presentation or demo of an LCA-based tool used to calculate embodied carbon, such as Tally, Athena IEB, or One Click LCA.

Both embodied carbon reduction champions have attended demos for multiple LCA-based tools, and have received in-depth training for One Click LCA. Our champions are also training others on One Click LCA.

Share the SE 2050 library of resources with technical staff.

The SE 2050 library of resources is available to all technical staff through our internal sustainability intranet page, and we have promoted our SE 2050 resources via all-staff and structural group meetings. We have provided several training sessions which educate staff regarding our SE 2050 commitment, and we have shared resources that focus on designing for low embodied carbon in structural materials. We will continue to provide training to technical staff and incorporate lessons learned as well.

Embodied Carbon Reduction Champions



Tim Liebhold PE, SE, LEED AP
Structural Engineer, Madison office

Tim has 16 years of engineering experience working on new and existing facilities in corporate, research, healthcare, and academic markets. Tim is dedicated to improving sustainability in structural design and leads Flad's SE 2050 efforts.



Kimberly Reddin AIA, LEED AP, WELL AP
Director of Sustainability, Madison office

Kimberly has 16 years of design experience spanning the academic, science and technology, corporate, and healthcare markets. The driving force behind her work is the belief that good design improves communities and helps both current and future generations to flourish.

Advocacy

Give an external presentation on embodied carbon that demonstrates a project success or lessons learned (Tip: Get connected at a CLF local hub near you!).

Flad has had some participation in efforts like this already, sharing embodied carbon lessons learned as part of presentations given at the AIA Wisconsin Convention in 2022. We will look for opportunities in the next year to share examples of project success and lessons learned with our community.

Encourage industry and policy change by promoting and using low-carbon and carbon-sequestering materials.

As noted in our lessons learned, our structural group has been reaching out to industry representatives in the regions where we work, sharing our commitment to use low-carbon materials, and asking for low-carbon options and transparency documentation in the early design phases. Early advocacy has proven effective to get manufacturer support in achieving our goals on projects.

Start an embodied carbon community of practice or mentorship program in your office.

Tim Liebhold has spearheaded efforts to reduce embodied carbon in our structural practice, but has also acted as a resource for our architectural teams who need guidance regarding embodied carbon, particularly in steel and concrete materials. Tim is active in Flad's comprehensive sustainability efforts, creating a strong connection between the SE 2050 commitment, Flad's AIA 2030 Commitment, and our AIA Materials Pledge efforts.

Reporting

Submit an annual minimum of (2) projects per U.S. structural office but need not exceed (5) total projects for the firm to the SE 2050 Database.

Two projects have been identified to be submitted by January of 2023.

Report a greater percentage of projects than you did the previous year.

In addition to the two projects already identified, the team will look for an additional two projects to submit in 2023, with the stretch goal of doubling our 2022 submission.

Reporting Plan

Measure

Flad Structural utilizes our BIM models with One Click LCA to calculate embodied carbon for structural materials. Wherever possible, we ask for and utilize product-specific EPDs. Where this is not possible, we look for industry or regional average EPDs. We calculate at least stages A1-A3, and C1-C4. In early design, our goal is to compare materials or bay studies, only calculating complete building material quantities after construction documentation is complete.

Track

Flad has an internal project database where we track whole-building embodied carbon for AIA 2030 Commitment reporting. We currently keep a separate data sheet of just SE 2050 reporting, but may look to incorporate it into our internal project database in the future.

Report

Project reporting will be uploaded to the SE 2050 in January of 2023. Flad's sustainability team is trying to find synergies between projects reported for embodied carbon in SE 2050 and projects reported with embodied carbon information in the AIA 2030 Commitment.

Reduction

Set an EC reduction goal for the coming year and an implementation narrative.

Our first year goal was geared towards establishing a baseline for our project types and construction methods. For our second year, we will work with stakeholders (architects, planners, engineers) to share how different building designs and material specifications impact embodied carbon. We will target a minimum 10% GWP reduction on the projects we report for the SE 2050 in 2023, with the intent to begin setting goals for all projects in 2024.

Project case study sharing embodied carbon reduction successes and lessons learned.

To help our own teams understand the major drivers in embodied carbon, we plan to put a project case study together sharing how we reduced embodied carbon on a project reported for the SE 2050. Lessons learned can be extended to other projects for a more aggressive reduction target in future years. If beneficial, we will share any project case studies publicly.

Have an Environmental Product Declaration (EPD) created for a project.

We have successfully had EPDs created for two projects in the past year, and we will continue to stress to manufacturers the importance of mix-specific EPDs in quantifying embodied carbon reductions.

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

As noted in our lessons learned, we have been reviewing specification options. We have included EPDs in our submittal requirements, and will be evaluating how to incorporate embodied carbon performance on projects. We anticipate updating our master specifications in the next year.