EMBODIED CARBON ACTION PLAN

2024

Wight

Wight & Company.

Embodied Carbon Action Plan (ECAP)

Wight & Company's award-winning structural design team is ready to take on the industry challenge of eliminating embodied carbon in buildings.

Images above: top left: Rhodes Elementary Classroom Addition, top right: Knoch Knolls Nature Center, bottom left: Lincoln Elementary School, bottom right: Downers Grove North High School Commons Roof

Wight & Company is an integrated delivery firm comprised of design and construction professionals and has offices in Darien, IL, Chicago, IL, and Denver, CO. As an industry leader in sustainable design and zero energy buildings, we support the vision that our staff must become well-versed in reducing the carbon impact of our projects – both from operational energy as well as embodied carbon

Having reached many sustainability milestones including one of the first LEED certified project in the world, multiple PHIUS+Source Zero and ILFI Zero Energy projects, and the first verified net zero energy building in Illinois, the natural progression of our practice is to take a proactive and intentional approach to reducing the embodied carbon in our projects. As an integrated design and delivery firm, we are uniquely positioned to address embodied carbon through both design and construction specifications and processes. Led by our structural engineering team, we intend to continue to learn, grow, and reduce the embodied carbon impact of all of our projects.

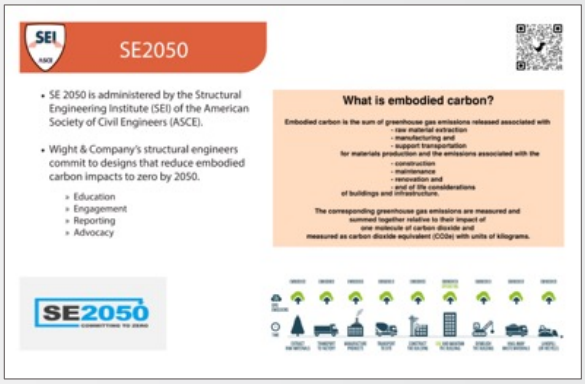
This Embodied Carbon Action Plan is the trail map for our structural engineers, as well as other staff, to understand, reduce, and ultimately eliminate embodied carbon in our projects by 2050.

Education

Understanding the problem and our role in a solution

SE 2050 Commitment

Wight & Company has made public our commitment to SE 2050 through social media posts and internal communications. We regularly share information to reinforce our SE 2050 pledge with staff using multiple mediums and touchpoints including email, weekly announcements, and in-office posters.



This poster explaining SE 2050 is among several Wight & Company industry commitments displayed in our office.

Promoting a firm-wide education program for embodied carbon reduction

Education of staff is an important element of our commitment to sustainability and carbon reduction. We host regular opportunities for staff to learn about sustainability, with carbon reductions being a major driver. Trainings include internal topical and project presentations, tours of projects, speaker series presentations, and 3rd party vendor lunch n' learns. A sustainability training calendar is maintained by the sustainability team and includes training on embodied carbon and LCA tools.

We are actively in the process of growing our structural engineering and sustainability teams. All new structural engineers are required to view the Embodied Carbon 101 webinar upon joining Wight as part of our on-boarding process.

Embodied Carbon Reduction Champions

Matt Aquino PE, SE is Vice President and Director of Building Engineering for Wight & Company. As the leader of our structural design department, Matt serves as a primary champion for Embodied Carbon in the firm. He is supported by John Mlade, Director of Sustainable & Healthy Environments.

MATTHEW AQUINO, PE, SE
VICE PRESIDENT, DIRECTOR OF BUILDING ENGINEERING
maquino@wightco.com
630.739.6528

JOHN MLADE, LFA, WELL FACULTY, LEED FELLOW
DIRECTOR, SUSTAINABLE & HEALTHY ENVIRONMENTS
jmlade@wightco.com
630.739.6939

Education (Cont.)

Understanding the problem and our role in a solution

Presentations & Webinars

As part of our regular sustainability programming, we provide frequent webinars to our team, and invite outside speakers to elevate our collective understanding around the urgency of operational and embodied carbon reductions and further our technical knowlege these topics. The following is a list of some of the presentations/webinars we've held in the past in our office.

2021:

- Covetool - Embodied Carbon Module
- AIA 2030 Embodied Carbon Reporting
- Using the EC3 tool - The Why and How
- Wight Climate Summit

2022:

- Ozinga - Low-Carbon Concrete
- Nucor Steel - Econiq: The World's First Net-Zero Steel
- WholeTrees Structures
- In-house Mass Timber Structures presentation
- Lessons learned from attending Mass Timber Conference
- Various Woodworks Webinars

2023:

- Greenbuild Carbon Recordings
    - The Carbon Balance: Harmonizing Operational and Embodied Carbon
    - Moving from "Net Zero Energy" to "Grid Adaptive"
- St. Mary's Cement - Top 10 Ways To Reduce Embodied Carbon in Concrete

Embodied Carbon Interest Group

Our emobdied carbon champion is engaged with Carbon Leadership Forum (CLF) and reports back to our embodied carbon intrest group. This group includes our structural engineers, mechanical engineers, civil engineers, architects, and BIM managers. The group meets on a regular basis to share resources and new learnings, case studies, project updates, and other technical resources.

LCA Tools

Our structural engineers have been utilizing One-Click LCA tool for Embodied Carbon Analysis. However, this past year we have worked on training ourselves to use EC3 and EC3 Tally CAT plugin for Revit. We are still in the process of learning and streamlining our workflows using these different programs and seeing which one is best suited for us.

Education Goals for the Coming Year

This coming year we plan to continue hosting speakers and showing webinars to staff in our office. We plan to train all of our structural engineers in the core concepts and skills to measure, reduce and report embodied carbon, which will help us in increasing the number of projects we report. Having all of our structural engineers fluent in performing embodied carbon LCAs will also allow us to perform comparative studies in early project stages on multiple projects and help us make informed decisions leading to embodied carbon reduction. We also plan on continuing to be engaged with Carbon Leadership Forum and to meet regualrily with our internal embodied carbon interest group.

Reporting

Measuring to Manage

Measuring, tracking, and reporting

As long-time signatories of AIA 2030, Wight & Company has been reporting predicted energy consumption of projects on an annual basis. The AIA 2030 is now also requiring that we collect embodied carbon values. We are in a unique position to report to both AIA 2030 and SE 2050. The SE 2050 reporting will dovetail into our regular AIA 2030 reporting for projects.

We currently use One-Click LCA program and EC3 Tally CAT to measure embodied carbon in our buildings. We are also working on developing an internal database of local material EPDs as well as internal tools for pulling material quantities from Revit and quantifying embodied carbon at early stages of projects to make informed decisions on choice of structural materials. No matter the software used, we have been consistent in our methodology and additional material quantity assumptions for items that are not directly modeled in our structural Revit models.

Also, our specifications currently ask for all project partners, subcontractors and vendors to provide product specific environmental and health documentation, including EPDs. We strive to collect as many product specific EPDs as possible so that we could more accurately quantify the embodied carbon of our completed projects. However, there are instances where manufacturers/suppliers have not yet developed EPDs. We continue to connect with and encourage local materials suppliers to align with industry needs and develop associated documentation.

Reported Projects

Projects reported for 2021

- Lincoln Elementary School
- Field Elementary School

Projects reported for 2022

- Rhodes Elementary Classroom Addition
- Stevenson High School Fitness Addition

Projects reported for 2023/2024:

- Naper Settlement - Ag Center
- Naper Settlement - Innovation Gateway Center

Lessons Learned and Goals for the Coming Year

This year was the first year we used EC3 Tally CAT tool an EC3 to do embodied carbon LCA on the two projects that we reported. We have found that the process was very similar to using One-Click LCA, in that there was significant effort required to validate the quantities of materials imported from Revit. So far we have measured and reported embodied carbon based on project construction documents at the end of our projects. In the comming year, in addition to reporting a minum of 2 projects, we plan to track the embodied carbon of those projects throughout the design stages, and compare to data from previously reported similar projects.

Naper Settlement - Ag Center

Reduction

Making a plan to implement

Reduction Strategies

The following are the carbon reduction startegies we currelty implent in our design:

- We have included “directional reductions” in our base project specifications including the use of Alternative Cementitious Materials (ACMs) and CO2 infusion in the concrete mixes we specify. For all concrete mix classes on all our projects we require a mininimum of 10-15% reduction from regional NRMCA baselines.
- We specify regional steel that utilizes electric arc furnaces to reduce the embodied carbon in our steel structures.
- We continue to work with our architects and designers to program and layout spaces that reduce structural materials quantities.
- We continue to look for opportunities to utilize biogenic carbon in the form of sustainably harvested heavy timber or glulam structural members. Recently we have completed a wildlife hospital project for the DuPage County Forest Perserve, that utilized a hybrid structual system which included sustainably harvested glulam roof beams.

Willowbrook Wildlife Center

Lessons Learned and Goals for the Coming Year

Use of comercially available sofware requires a very rigorous process for embodied carbon calculations care must be taken to ensure there are no erros in quantities imported. Use of commercially available programs, such as OneClick LCA or EC3, for early design stage carbon calculations continues to be a chalelnge for us. We continue to look for efficents ways to introduce embodied carbon calculations into our workflow to help with evaluating best strategies for carbon reduction. We’re continuing to develop internal tools that will help us with making comparisons early on.

We found that reducing carbon content in our concrete mixes below the average NRMCA baselines may prove difficult with small suppliers on smaller projects, and that typically only large suppliers have resources and ‘lower-carbon’ mixes available. Nevertheless we will continue to specify ‘low-carbon’ mixes on our projects and continuously try to push and educate the concrete contractors on the importance of embodied carbon reduction in concrete. We plan on being more agreessive and specifying higher concrete emobdied carbon reduction from regional baselines, pushing it to a minimum of 20%. Additionally we will continue to limit specifying lightweight concrete as it is siginificantly more carbon intensive.

Advocacy

Building a culture to bring change to the AEC industry

Knowledge Sharing

Wight will report embodied carbon to SE 2050 and AIA 2030 for applicable projects. Our team, apart from sharing information, is a participant in the Chicago Decarbonization Working Group, Chicago Building Decarb Advocacy Group, and also the GSA's Green Building Advisory Committee (GBAC) currenty producing a recommendation on decarbonizing the federal portfolio. Our work with local and national organizations will help us leverage influence for smart decarbonization policies.

As our structural engineering team becomes more fluent in embodied carbon modeling, we will expand the group to include additional architects, interior designers, construction professionals, and other disciplines. As a Design Led-Design Build firm, Wight & Company is uniquely positioned to address carbon across all disciplines and in all stages of design and construction.

Recently our internal MEP group has signed on to the MEP2040 commitment and our land development group is making continuous efforts to engage in the embodied carbon conversation within their field of practice.

We will educate partner design and construction firms on how to reduce embodied carbon in buildings and also our clients on the value of reducing embodied carbon in addition to operational carbon.

Client Outreach

When speaking to clients, the conversation is more fully about sustainable and healthy design. As an integrated firm, our architects are able to support the SE 2050 banner as it closely relates to other sustainability commitments our firm has made including Architecture 2030 and AIA Materials Commitment. In addition, we have developed the Wight Sustainability Standard, in-house baseline requirements for all projects. Following our in-house standard, Wight considers and implements practices in structural design that are beyond industry standards.

The success of carbon reductions in projects is celebrated in our marketing material, although we are careful not to greenwash our progress. This is a work in progress and we hope to have a clear message to more effectively market this aspect of sustainable design in the coming year.

Wight & Company will include a declaration of our commitment to SE 2050 on associated structural engineering proposals. Depending on the specific project pursuit, we may also leverage this ambitious commitment on our architectural and construction projects.

Material Supplier Engagement

In the past year we have met on several occasions with representatives from Ozinga, the local ready-mix concrete supplier to discuss most effective ways of specifying low-carbon concrete on our projects. In the comming year we plan to check-in with Ozinga and reach out to other suppliers to maintain the momentum.

wightco.com

211 North Clinton Street, Ste 3N
Chicago, IL 60661
312.261.5700

2500 North Frontage Road
Darien, IL 60561
630.969.7000

8181 Arista Place, Ste 100
Broomfield, CO 80021
720.432.4435