EMBODIED CARBON ACTION PLAN

2022

Wight

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: Lewis University Brother James Gaffney Student Center (left) and Ravinia Festival Dining Pavilion & Music Box Experience Center (right).

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.

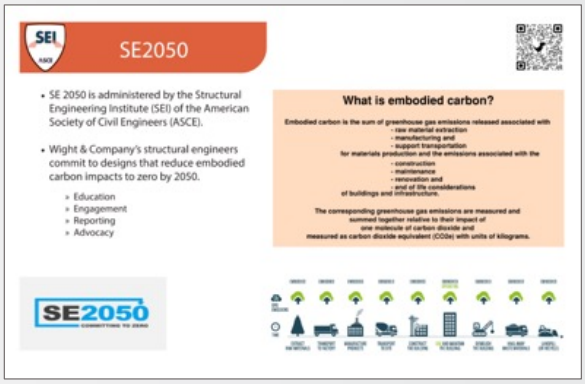
This Embodied Carbon Action Plan is the trail map for our structural engineers, as well as other staff, to understand, reduce, and ultimately eliminate embodied carbon in our projects by 2050.

Education

Understanding the problem and our role in a solution

Distribute firm-wide announcement of your firm's pledge to join the 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

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. In the past year we hired a new chief sustainability officer, Megan Zack, who has experience with mass timber buildings. As the chief sustainability officer, Megan will lead our firm in embodied carbon research and implementation of latest technologies and alternative materials on our projects to reduce their carbon footprint. Also this year, we've hired embodied carbon interns who have helped us develop internal embodied carbon benchmarks using our most recent projects.

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.

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Education (Cont.)

Understanding the problem and our role in a solution

Set a date within the first year to present the "Embodied Carbon 101" webinar to your firm. Include this resource into your orientation/ on-boarding programs

Wight & Company has hosted a viewing of Embodied Carbon 101 open to all employees. All new structural engineers are required to view the webinar upon joining Wight.

As part of our regular sustainability programming, we are also using other webinars and trainings to elevate our collective understanding around the urgency of operational and embodied carbon reductions.

Minimum (1) additional elective to educate your firm about embodied carbon and a narrative of its significance.*

Wight & Company is committed to reducing carbon in our buildings and meeting our commitment to the SE 2050 to the greatest extent possible. Reflective of our commitment to SE 2050 is our selection of all applicable electives. We anticipate completing each of the electives on an annual basis and intend to maintain momentum moving forward.

We will ensure a minimum of one staff member is engaged with Carbon Leadership Forum (CLF) for quarterly education programs within the first year of our commitment, and that our staff is also participating in the CLF Community Hub.

- Associated resources will be shared amongst the structural team and collaborating team members from other disciplines.
- Our Embodied Carbon team, including all structural engineers and the Wight & Company Director of Sustainable & Healthy Environments, meets every other Friday to share new learnings, case studies, project updates, and other technical resources.
- Our teams currently utilize OneClick LCA, Covetool, and EC3, and have participated in demos of other tools including Tally.

Presentations to staff:

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

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 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 in order to make informed decisions on choice of structural materials.

Internal Training

- Training on One-Click LCA, our current firm software, is provided by One-Click on an annual basis and additional support is provided through staff collaboration.
- Covetool Embodied Carbon module training was provided Q3 2021 and will be revisited periodically.
- Lunch n' Learn opportunities are scheduled as they arise – recent topics included mass timber framing and Carbon Cure for concrete.

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

In a typical year, our structural team works on 3-4 major new construction projects and will focus reporting on these. Major adaptive reuse projects are also of interest, although do not represent a significant amount of the work of our structural team. Other work is more limited in scope and not conducive to reporting.

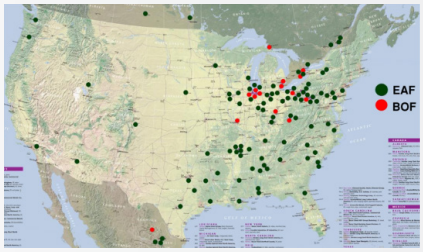
Adlai E. Stevenson High School District 125 fitness addition.

Reduction

Making a plan to implement

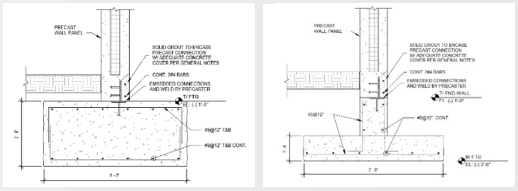
Embodied Carbon Reduction Goals

- We are working to include "directional reductions" in our base project specifications including the use of Alternative Cementitious Materials (ACMs) and CO2 infusion.
- We are also researching regional steel manufacturing/fabrication to identify partners that utilize electric arc furnaces as a way for us to reduce emissions of specified products.



Electric Arc Furnaces (EAF) have less than 50% of the emissions of Basic Oxygen Blast Furnaces (BOF). The graphic shows the relative density and location of each type of furnace. 65% of domestic steel is from EAF. Image: source unknown

- In addition to completing our first embodied carbon study, our goal for year 1 is to prove out our specifications on current projects (ensuring there were no hang-ups from contractors) and resolve our questions about steel manufacturing. Parallel to our efforts, our architectural teams are evaluating cladding, windows, and insulation.
- Our specifications currently ask for all project partners, subcontractors and vendors to provide product specific environmental and health documentation, including EPDs. We are connecting with and encouraging local materials suppliers to align with industry needs and develop associated documentation to provide to customers.
- We are working with our architects and designers to program and layout spaces that reduce structural materials quantities.
- Moving forward, the Wight & Company team will more robustly explore reuse strategies including deconstruction and repurposing, reduction strategies through planning & design, optimization, and low carbon materials, and sequestration strategies including the use of CO2 injection into concrete, timber products/wood framing, and other biomaterials.
- Importantly, our early LCA studies will help us define a baseline against which we can compare projects moving forward.



We recently performed an LCA on the foundation system for a warehouse-type facility. Our team compared trench footing (detail on left) with a formed foundation (right) and found that the formed foundation realized a 45% embodied carbon reduction through the use of less concrete and rebar. The formed foundation was more costly due to the additional labor, formwork, multiple pours and backfilling operations, however, the premium was deemed acceptable for the project as a whole.

Lessons Learned

In the past year we have learned that a very rigorous process for embodied carbon calculations is required, and that relying solely on commercial software could lead to user errors. Also, use of commercially available programs at the moment does not seem to be an efficient way to quantify embodied carbon in early stages of projects, to make decisions on materials, structural system configurations, etc. Thus we started to develop internal tools that will help us with making comparisons early on with respect to embodied carbon content in our structures.

Also in the past year we have been specifying limits on carbon content in concrete mixes. 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 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 also learned that lightweight concrete is much more embodied carbon intensive than normal weight concrete and going forward we will strive to limit our use of lightweight concrete mixes.

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, and other disciplines. Wight & Company is uniquely positioned to address carbon from 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.

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