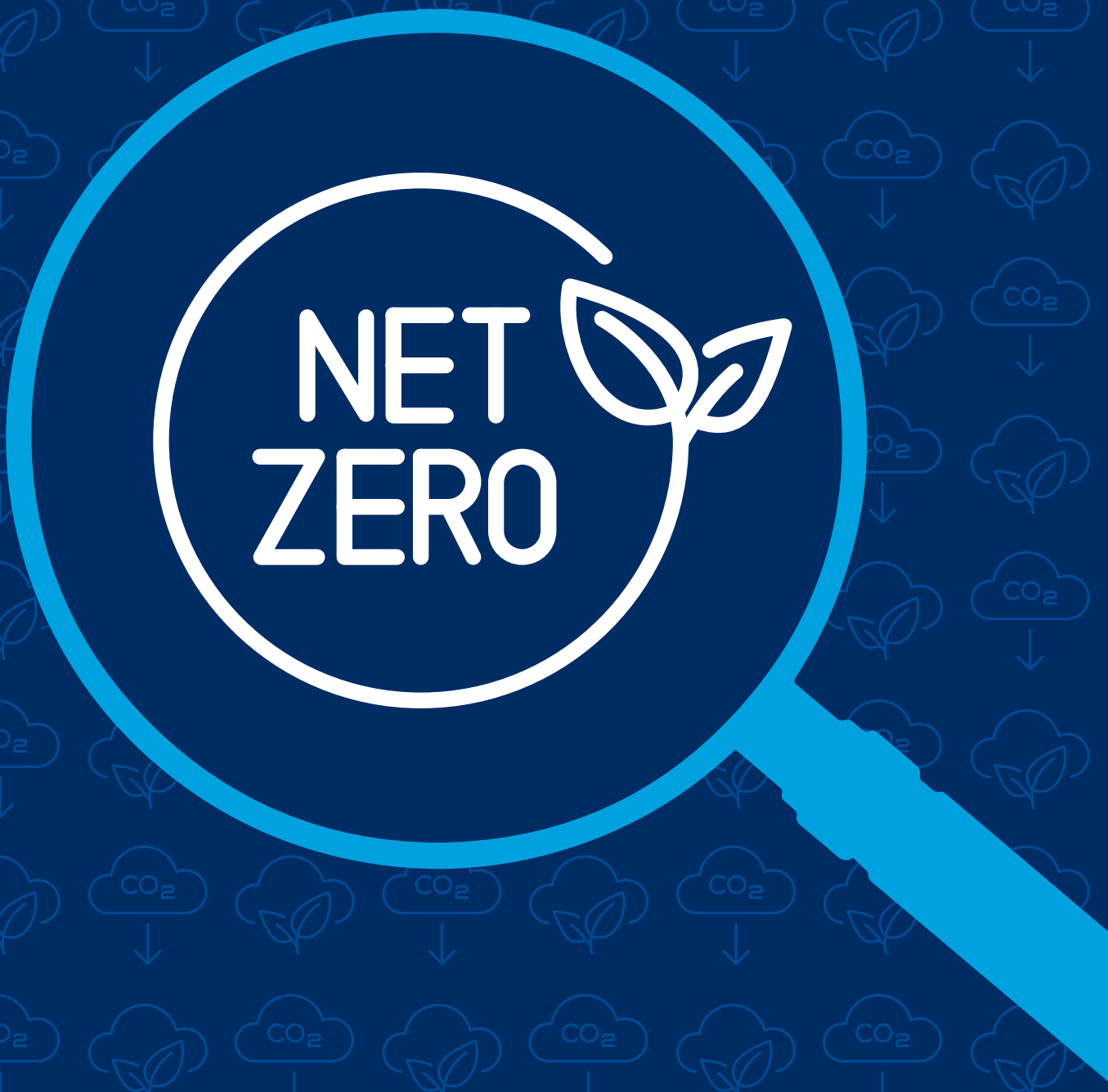
MARCH 2025



STRUCTURAL ENGINEERING INSTITUTE

SE2050
COMMITTING TO NET ZERO

Mead & Hunt

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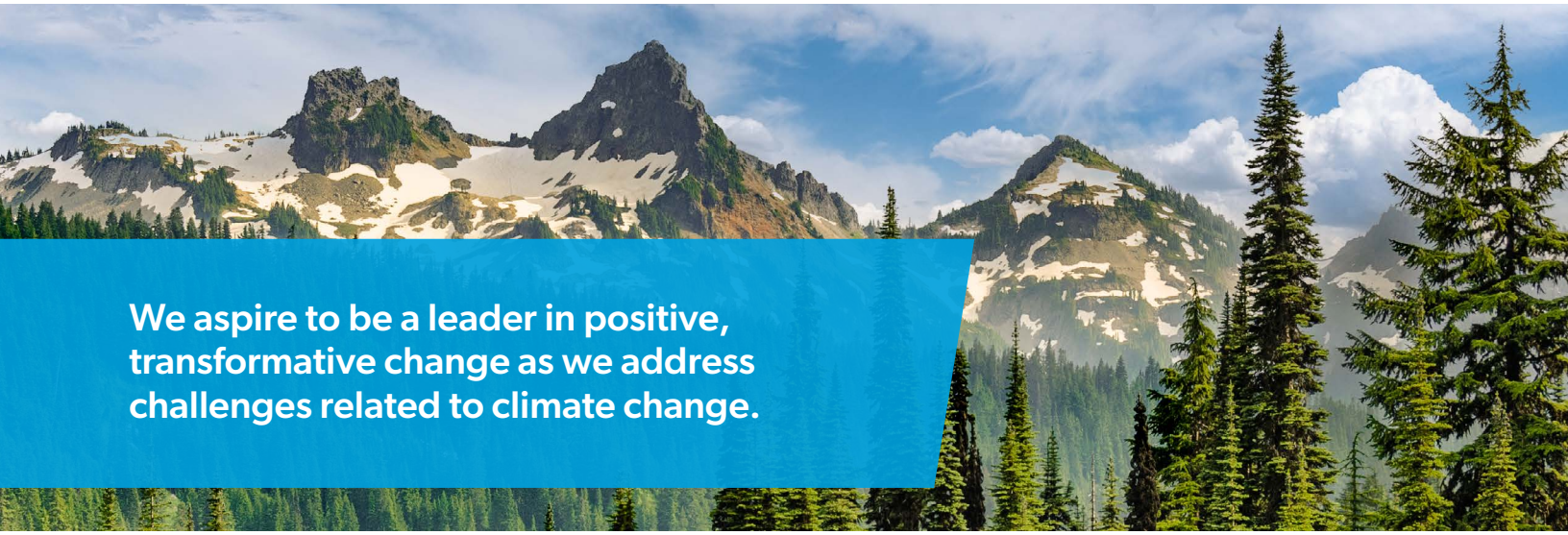


Introduction

Every day, the work we do impacts our clients, teaming partners, coworkers, and communities. We view this as an opportunity and a responsibility to make life better for those around us. Mead & Hunt's founder, Daniel Mead, was well known for his stance on ethical engineering. This strong moral obligation continues to be a core tenet of our values 125 years later and still guides our actions today.

As a top 100 Green Design Firm (ranked by Engineering News-Record (ENR)), we are aware of the effect that the built environment has on climate change. We are committed to working with clients on education, awareness, and successful projects that aim to reduce operational and embodied carbon emissions.

Throughout a project lifecycle, we ask ourselves critical questions: Does what we do every day serve our purpose of shaping the future by putting people first? Do we put people first in our internal business practices? Is our work focused on creating sustainable and responsible solutions? How are we incorporating broad-scale solutions that address climate change? Are we doing the right thing?

We strive to focus on environmental responsibility, with an emphasis on carbon and water use reduction, by reducing the impact of our corporate offices and through our client's projects. We aspire to be a leader in positive, transformative change as we address challenges related to climate change.

Our efforts to meet our sustainability and environmental responsibility goals include:

- Sponsoring national Carbon Leadership Forum (CLF) research since 2019
- Becoming an AIA 2030 Commitment signatory firm in 2021
- Publishing the company's first Responsibility and Resilience Report in 2023 and updating on an annual basis
- Becoming a SE 2050 Commitment signatory firm in 2024

Mead & Hunt's SE 2050 Commitment Team

This year, our internal engagement has grown, and we have a committed team dedicated to several focus areas related to our SE 2050 reduction goals. Our diverse team is located in offices throughout the country, which increases the opportunity to collaborate and innovate. We have created an embodied carbon interest group where each thought leader provides updates on industry innovations and trends, as well as provides insights on ways to further achieve reductions.

Brent Ballweg
Structural Steel Reductions Lead

Felicia Brady
Deconstruction and Circularity Lead

Ben Cashin
Concrete Reductions Lead

Josh Fenske
Masonry Reductions Lead

James Hall
Mass Timber Lead

Victoria Herrero-Garcia
Embodied Carbon Champion and Advocacy Lead

Donny Matthews
Education Lead

Transforming our world through inspiring, innovative, and sustainable design.

Education

Engaging Our Team

Mead & Hunt is a full-service architecture, engineering, planning, and construction services firm that has been serving clients for 125 years. Since our founding, we have grown significantly in size and diversity. Today, the company serves clients in the aviation, education, transportation, energy, food and beverage, and water sectors and employs more than 1,400 engineers, architects, sustainability consultants, planners, and support staff located in 50 offices throughout the country.

Our structural engineering team, which is focused on developing vertical work, is aggregated in our "Architecture and Building Engineering" (A&BE) group and is concentrated in four different states. Since 2021, we have been engaging with our architectural and structural teams to educate them on embodied carbon reduction strategies on a project-by-project basis. Due to our firm's size, breadth of services, and unique markets, we identified this method to be more efficient than conducting a "per office" engagement process.

Additionally, our structural engineering team receives regular embodied carbon content refreshers during our weekly scheduled team meetings, offering the opportunity to exchange ideas and discuss new technologies and project success stories. We also have a Microsoft Teams channel where we share embodied carbon resources.

Providing Educational Opportunities

Training and education are strong pillars of Mead & Hunt's culture—something that sets us apart from competitors.

Our employees have access to the "Embodied Carbon: What Is It and Why Does It Matter?" webinar provided by Kevin Flynn and Victoria Herrero-Garcia via MyMHU, the firm's internal digital continuing education platform. As part of the SE 2050 commitment, this webinar is a required training for all new structural engineers. The training must be completed within two months from the hiring date. This is tracked through a completion report that verifies requirements have been fulfilled.

Education continued

In May 2024, Mead & Hunt offered three options to attend a webinar on embodied carbon policies and their relevance to our work across various regions, clients, and project funding types. This webinar was also recorded and is available companywide on MyMHU.

Our 2025 goal is to present embodied carbon reduction case studies to the structural team. We plan to present at least one project per year to share the process and lessons learned. Through this, we hope to spark creative thinking and empower engineers to take initiative to include reduction strategies in all of their projects. The case studies will be recorded and made available to all employees on MyMHU.

Fostering Embodied Carbon Reduction Expertise

We have been actively engaged with the Carbon Leadership Forum (CLF) since 2019, and we are committed to expanding our relationship with the organization. We recently collaborated with the CLF providing several of our projects' Whole Building Life Cycle Assessments (WBLCA) for their Benchmarking Study v2.

Victoria Herrero-Garcia is the co-founder and co-chair of the CLF Rocky Mountain Hub, where she dedicates her time and expertise to organizing presentations, panels, and working with peers on educating the AEC industry on embodied carbon reduction strategies. Felicia Brady recently joined the San Francisco CLF Hub, and Donny Matthews is in the process of joining the Southeast CLF Hub as soon as it becomes operational.

The structural team aims to enhance its resources and expertise this year. Our objective is to provide engineers with the tools they need to engage in detailed discussions about embodied carbon with our clients and have a comprehensive understanding of how to measure, reduce, and report embodied carbon for our projects.

Additionally, our structural team aims to adopt a more proactive approach to our designs, shifting away from the traditionally reactive nature of the structural-architectural design process. We are promoting early design and programming discussions that set embodied carbon reduction goals and outline strategies to achieve them.

Types of discussions our structural engineers have with architects early in design include considerations for building geometry, repetitive structure, proper bay sizing, and so forth.

Reporting

Mead & Hunt is committed to reporting a minimum of three projects per year. This year, we are submitting four projects, including all structural material quantities to the SE 2050 database. Our goal is to increase the number of reported projects by 25% each year.

We use One Click LCA to calculate embodied carbon reductions at any stage in the design process. We have several ways of calculating the embodied carbon of structural materials:

1. We use Carbon Designer (by One Click LCA) for early stage/concept design conversations. These calculations and results are very broad and include numerous assumptions that provide a "big picture" assessment of the major structural embodied carbon contributors. During this stage, we also compare different material design options and provide recommendations.
2. For early schematic design, when a Revit model has not yet been developed, our structural engineer provides quantities that are added manually to One Click LCA. Industry-wide Environmental Product Declarations (EPDs) are then selected to determine the total project Global Warming Potential (GWP).
3. When there is a Revit model, quantities are extracted from the model and verified with drawings during different stages in design. Our structural team also provides information on which elements were not modeled and need to be accounted for moving forward.
4. For the final as-built quantities, we rely on the general contractor to provide a completed "Environmental Impact Calculator" (part of the specifications submittal requirements) that includes quantities as well as EPDs from the installed materials.

Depending on the purpose of the embodied carbon analysis, our system boundary is either cradle-to-grave, per LEED guidance, or cradle-to-grave plus A5 life cycle stage. One Click LCA allows us to run calculations for both scopes simultaneously.

Mead & Hunt plans to report our findings for multiple projects across our firm in next year's ECAP. In 2025, we plan to start an internal database of projects with reported embodied carbon quantities. This will allow us to determine trends and make further reductions once we identify the most successful ways to achieve them. The database will include the following building types:

- Hangars
- Airports (including landside and airside building types)
- Fire Stations
- Higher Education
- Food & Beverage Facilities
- Offices
- Laboratories
- Libraries
- Police Stations

Reduction

Although we are reporting four projects to the SE 2050 database, we currently do not have enough data to effectively establish an internal embodied carbon intensity baseline. Mead & Hunt will continue to analyze our projects to establish an internal embodied carbon intensity ($KgCO_2e/m^2$) baseline not to be exceeded in future projects. In the meantime, we will utilize the SE 2050 reported 80th percentile embodied carbon intensity of 350 $kgCO_2e/m^2$ as our baseline.

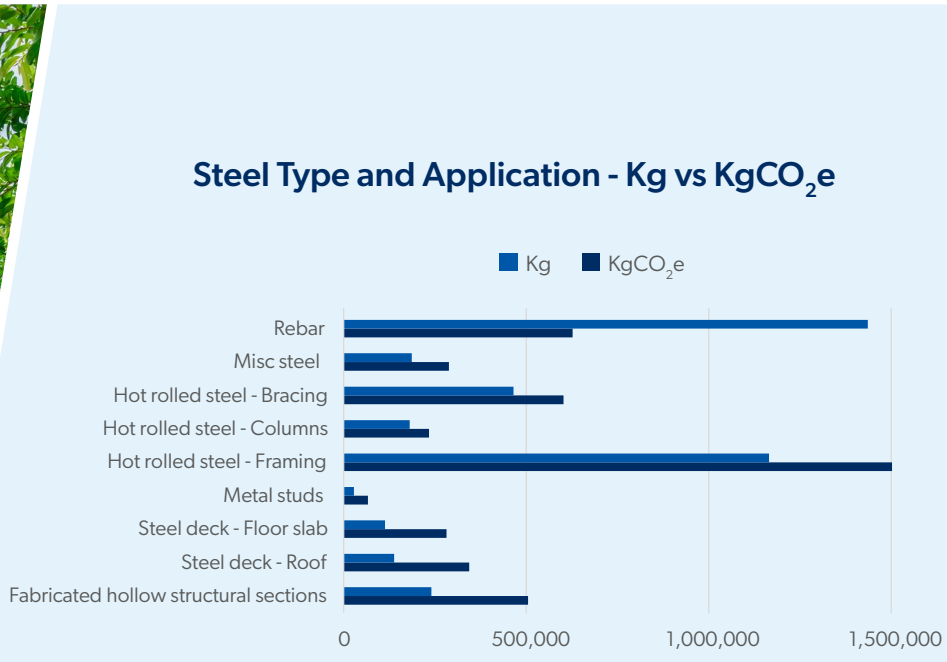
Our short-term goal is to achieve a firm-wide 5% reduction from the baseline annually. We will continue to work to define our long-term reduction target for our 2026 ECAP. The long-term reduction strategy will also be influenced by industry innovations and advancements, as well as material reuse and circularity.

As part of the commitment to track and report embodied carbon for AIA 2030, Mead & Hunt provides WBLCA for all our internal projects where we are the architect of record and the building is over 10,000 square feet. If we are the structural engineer of record on these projects, we will also track and report embodied carbon to SE 2050.

We also track and report embodied carbon to SE 2050 for projects with external architects if we are the structural engineer of record and the building is over 10,000 square feet. For these types of projects, structural engineers and the embodied carbon champion participate in early design charrettes and discuss potential design considerations that will impact embodied carbon and reductions.

Furthermore, to increase our internal embodied carbon database, we are committing to completing structural LCAs at the end of the design phase for all new construction projects that are over $10 million in construction cost.

In 2025, we will create a workflow document that focuses on ways to make early design decisions that reduce embodied carbon. The engineers will have this document for reference. This will also be shared with architects during pre-material programming when we can make the most significant impact in reductions.



Reduction continued

For the past three years, we have been including embodied carbon requirements in our specifications and requesting action submittals for EPDs and an Environmental Impact Calculator, which includes as-built material quantities and GWP thresholds. We have collaborated with concrete suppliers and the National Ready Mix Concrete Association (NRMCA) to assist with EPD development when suppliers do not have EPDs. Concrete mix design EPDs are in development for some projects if suppliers did not have EPDs available for their mixes.

We are committed to working with clients on education, awareness, and successful projects that aim to reduce operational and embodied carbon emissions.

Circularity

Mead & Hunt is currently working on various projects that incorporate reuse, often in the form of building reuse. On one of our projects, we are currently working with the design team, estimator, and client to determine the cost of deconstruction versus demolition. We are continuously investigating ways to promote a circular economy by researching available structural steel and wood from reuse or surplus.

Although many of our airport projects have the potential for circularity with deconstruction and on-site materials reuse, the design requirements impose significant limitations on what can be reused. There is also a need to further educate the construction industry and the inclusion of monetary incentives for circularity to realize its potential growth and application in every project.

Advocacy

Mead & Hunt announced we were becoming an SE 2050 signatory in late December 2023 using our website and social media accounts including LinkedIn. We have included the SE 2050 Signatory logo on our marketing materials, including presentations to our clients and prospective clients where we discuss our commitment.

https://meadhunt.com/se-2050/

We are analyzing the cost impacts of our embodied carbon reduction strategies to better communicate the value of the SE 2050 commitment to clients. We aim to create helpful educational materials to advocate embodied carbon reductions to our clients.

Collaborating with Design Teams on Embodied Carbon Reduction Strategies

In the early design stages of our projects, we conduct an embodied carbon kickoff meeting. During this meeting, we educate the team on what it means to reduce carbon emissions from the materials we use in our projects and discuss architectural and structural elements with the highest embodied carbon and potential reduction strategies.

During the programming phase, we encourage the architectural team to reduce finishes, incorporate simple repetitive structures, and plan for future expansions.

For Mead & Hunt projects where structural engineering services are provided by other firms, we educate our structural engineering partner on the SE 2050 commitment and share our knowledge in overall embodied carbon reductions strategies, specifications, and other relevant areas.

External Presentations

We have developed a presentation on embodied carbon and LEED v5 to demonstrate to our clients the value of a WBLCA for their projects. This presentation includes a project case study where we share lessons learned. This presentation will potentially be presented to the CLF Rocky Mountain Hub during Q2 of 2025.

Additionally, the Mead & Hunt team has presented on the CALGreen Embodied Carbon requirements for our clients in California.

Our team will also present at the Getting to Zero Forum – Embodied Carbon Summit, and we will share a case study of a building reuse project in Madison, WI.

Mead & Hunt will continue to advocate for sustainability and embodied carbon reduction in the broader conversation to advance the development of tools, language, and actionable skills for designers, suppliers, and contractors to use that facilitate increased collaboration.

Policy Engagement

Mead & Hunt continues to collaborate with the Colorado Office of the State Architect (OSA) as a peer reviewer of the Buy Clean Colorado (BCCO) Act documentation requirement process.

Mead & Hunt has also provided comments and feedback to the following policies and suggested standards: Colorado Model Green Code, Greenprint Denver, and Wisconsin State Division of Facilities Development Sustainability Guidelines.

Commitments and Collaborations

AIA 2030 COMMITMENT

SE 2050 SIGNATORY 2024

Sponsor of the CLF Carbon Leadership Forum since 2019

Lessons Learned

Concrete Reductions in Remote Locations

We have noticed that concrete suppliers in remote locations are not as familiar with embodied carbon terminology, how to achieve reductions in their concrete mixes, or how to provide the required EPDs. This can be challenging due to construction schedules and the timing of submittals.

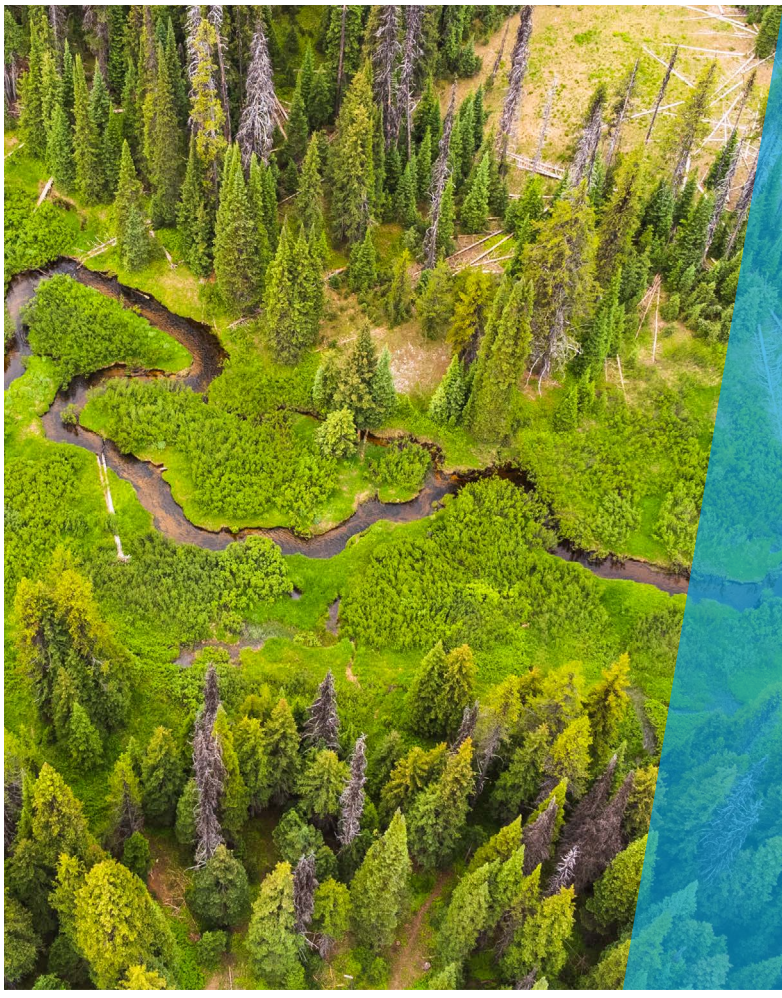
To meet this challenge, we have become proactive in the early stages of construction to educate concrete suppliers. We engage the National Ready Mixed Concrete Association (NRMCA) to assist us in educating concrete suppliers and general contractors on embodied carbon reduction goals and EPD development. By coordinating with NRMCA, we minimize impacts to the construction schedule while maintaining our SE 2050 commitment reductions plan. As a firm, we will continue to reach out to industry contacts, including NRMCA, local and national chapters of the American Concrete Institute (ACI), and the International Masonry Institute (IMI) to seek points of collaboration on embodied carbon reduction.

Material Quantities and Quality Control

We have been implementing a quality control process for all our LCAs because we have learned that although LCA software can be a very powerful tool to speed up the LCA process and calculations, sometimes it can provide unreliable results. How things were modeled, how materials were assigned, how phases are defined, and the incorporation of existing models are some of the factors that can affect reliability of the analysis. Therefore, we use Revit schedules to verify material quantities included in the LCA software and double-check that EPDs have been properly assigned to each material type. We include a quality assurance/quality control of embodied carbon calculations prior to deliverables to verify quantities.

Compliance with Local Regulations

California's Green Building Code (CALGreen) offers three pathways for compliance with embodied carbon regulations for buildings that meet the threshold triggers. One compliance path is building reuse, which requires 45 percent of the building structure and enclosure to be resused. In locations of higher seismicity, buildings may require an seismic evaluation and retrofit. In our experience, with buildings requiring seismic retrofit, building reuse can become infeasible due to the extent of structural upgrades required. In this case, a better compliance path may be the WBLCA if retrofit includes new structural elements and the building is no longer reusing 45% of the existing structure and enclosure. We provide guidance to our clients during design to help them determine the right pathway for them to meet the compliance requirements.



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