SEI STRUCTURAL ENGINEERING INSTITUTE ASCE

SE2050 COMMITTING TO NET ZERO

2026

Embodied Carbon Action Plan

BVE established 1971

Ramona Community Resource Center, Ramona, CA
Zero-Net Energy | LEED Gold
Photo Credit: Alex Nye

Executive Overview

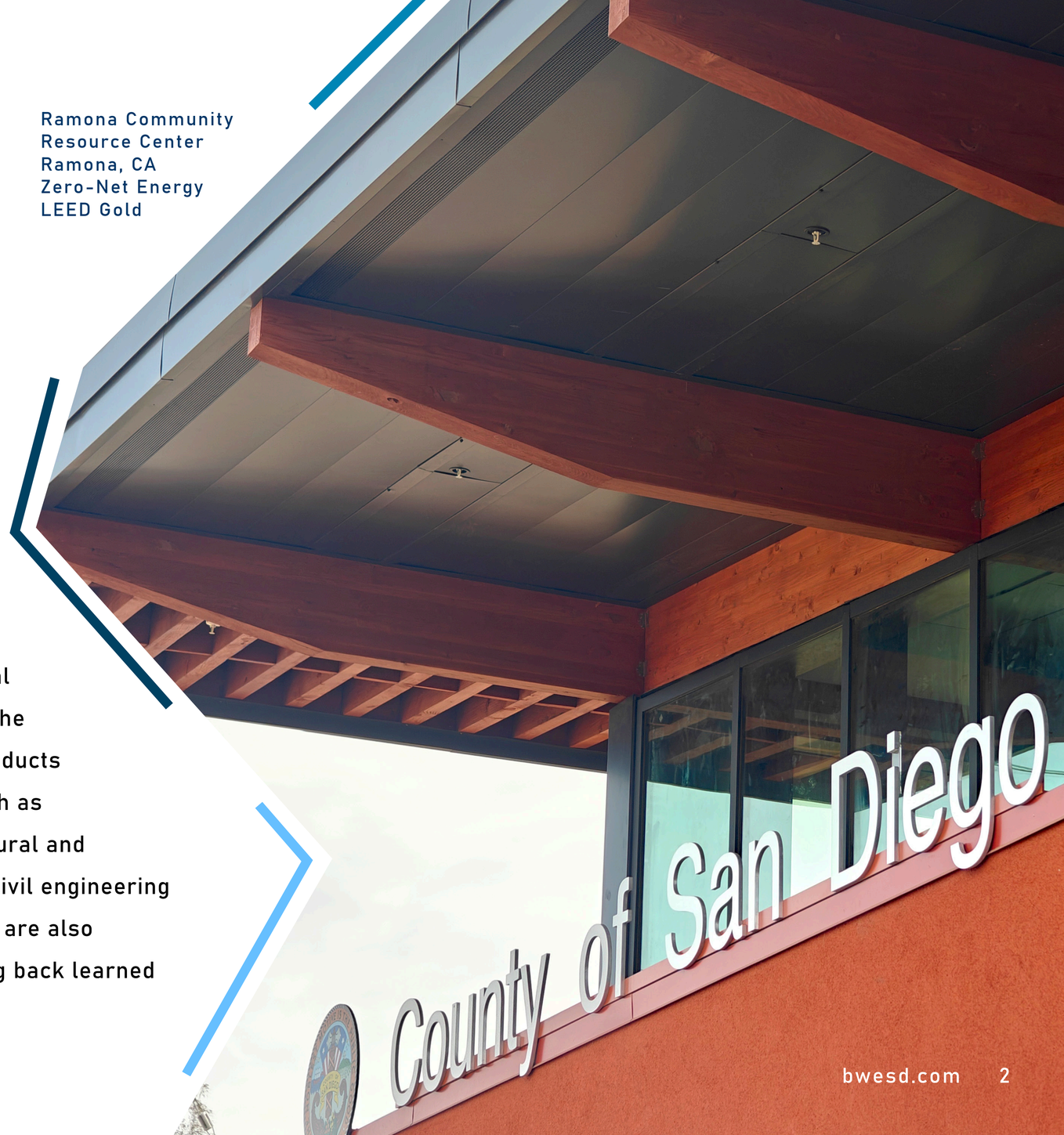
BWE is proud to be committed to the SE2050 movement with the goal of reducing and ultimately eliminating embodied carbon from our projects by 2050. As we observe the increasingly detrimental effects of climate change in everyday life, we are motivated to do what we can as structural engineers to strive for net zero carbon emissions, preserving a sustainable and habitable environment for generations to come.

Since 1971, we have completed over 14,000 projects throughout the Southern California region and beyond. Throughout that time, we have focused on sustainable structural designs, oftentimes with client goals in mind, such as meeting LEED certification requirements at all rating levels, including LEED Platinum.

Joining SE2050 has empowered us to make our own embodied carbon reduction goals and implement them on all of our projects going forward. After joining the movement in 2024, we are in our third year of the program and are continuing to see tangible results from the changes we have made. We look forward to continuing to contribute to the industry-wide effort of striving for net-zero embodied carbon in our structural systems.

Education Plan

Ramona Community
Resource Center
Ramona, CA
Zero-Net Energy
LEED Gold



At our firm, Structural Engineering leadership actively mentor staff on SE2050 goals during monthly meetings, ensuring all team members—from Principals to interns—are involved in data collection and sustainability initiatives. We make new sustainability-focused webinars available to staff, viewing them together as an office, and distribute updated educational materials on sustainability through the SE2050 Microsoft Teams channel within our firm. Viewing a webinar about the basics of embodied carbon is part of our on-boarding process for all new employees.

We have an active internal embodied carbon interest group within the structural department to discuss sustainability goals and strategies to implement them. The committee routinely invests time in researching the latest carbon-reducing products on the market, which has resulted in implementing some into our projects, such as ProZERO carbon negative cement. As a multi-disciplinary firm with both structural and civil engineers, we are working to share carbon reduction strategies with our civil engineering counterparts to implement in their drawings. Some members of our committee are also actively engaged in the SEAOSD and SEAOC sustainability committees and bring back learned information to our internal committee.

Advocacy

BWE remains committed to building decarbonization and furthering our role in a sustainable future through two key methods of advocacy. Using these methods, we advocate to our clients externally for driving collective action toward achieving net-zero by 2050.

DESIGN COLLABORATION

Many of our architectural clients are members of AIA 2030, and as such, are also committed to reducing embodied carbon in our designs where possible. When starting a new project, we make an effort to discuss with clients the pros and cons from a sustainability standpoint of using different building materials. We strive to balance sustainable solutions with cost objectives of the client and owner in order to demonstrate how embodied carbon reduction is also an effective and impactful method of design.

EXTERNAL PRESENTATIONS

We have made it a goal to extend our efforts beyond the firm by delivering presentations to architects on “Sustainability Innovations in Concrete,” highlighting how these innovations play a key role in specifying concrete mix designs with reduced embodied carbon. This year our office hosted a SEAOSD sustainability lunch seminar on a low-carbon cement product to enable knowledge sharing within the structural engineering community. By engaging with architects and engineers and educating them on current carbon-reducing methodologies, we are enabling the decision-makers on our projects to help us pave the path forward toward carbon neutrality.

BWE Embodied Carbon Champion, Mara Cordon, SE, onsite at the Kimball Highlands Clinic in National City, CA

Makers Quarter Block D Office Building
San Diego, CA | LEED Platinum

Reduction Strategy

Embodied Carbon Reduction Goals

Our current goal is a 5% overall reduction of embodied carbon for selected projects. This will be achieved by reducing the embodied carbon of our concrete mix designs a minimum of 10%. We have updated our concrete general notes to include a carbon budget with a minimum of a 10% GWP reduction of baseline GWP for concrete mix designs in the Southwest region as published by the NRMCA.

These efforts have already begun to pay dividends. Our engineers have learned how the amount and type of concrete used in a project significantly affects the amount of embodied carbon. Consequently, we have revamped our approach to concrete mix design requirements for all of our new projects. We now use a performance-based design that allows for the use of more efficient and sustainable cementitious materials, such as Portland Limestone Cement (PLC), fly ash, and slag, to meet both strength and performance requirements. This approach gives contractors the flexibility to use the most efficient and sustainable mix available without being constrained by a maximum water to cement ratio on the structural drawings.

Our long-term goal includes tracking projects over the years to see how these methods have been able to reduce embodied carbon in our projects.

Reporting Plan

EMBODIED CARBON DATA COLLECTION & ESTIMATION

We are using the Embodied Carbon Estimator tool to calculate the Embodied Carbon Order of Magnitude (ECOM) of our projects that are completed or in construction. This tool utilizes applicable industry-wide Environmental Product Declarations (EPDs) to estimate the amount of embodied carbon for a project. To facilitate the data collection and reporting process, we are utilizing schedules within our Revit template to track material quantities of modeled elements for all projects. As we gather more data through the years, we will make comparison charts that graph the total embodied carbon per project type to ensure we are reducing embodied carbon in our projects.

Pomona Water Resources Department, Corporate Yard, Pomona, CA
LEED Silver
Photo Credit: Alex Nye

Southwestern Community College Warehouse Facilities, Chula Vista, CA

Photos Courtesy of Rudolph & Sletten

Elective Documentation

Education

Provide a narrative of how the Embodied Carbon Reduction Champion will engage embodied carbon reduction at each office. *(Required)*

Present at least (1) webinar on embodied carbon and make a recording available to employees. Include this resource in your orientation and on-boarding program. *(Required)*

Initiate an embodied carbon interest group within your firm and outline their goals.

Create an Embodied Carbon digital resource wiki and/or forum on your firm's internal website for staff to create, share, and discuss Embodied Carbon educational resources.

Reporting

Submit a minimum of (2) projects per U.S. office with structural engineering services to the SE2050 Database. *(Required)*

Include all structural material quantities in your submissions to the SE2050 Database.

Reduction

Set clearly stated, firm-wide reduction targets in the short-term (<1 year) and long-term (>5 years). *(Required)*

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

Advocacy

Describe the value of SE2050 to clients. *(Required)*

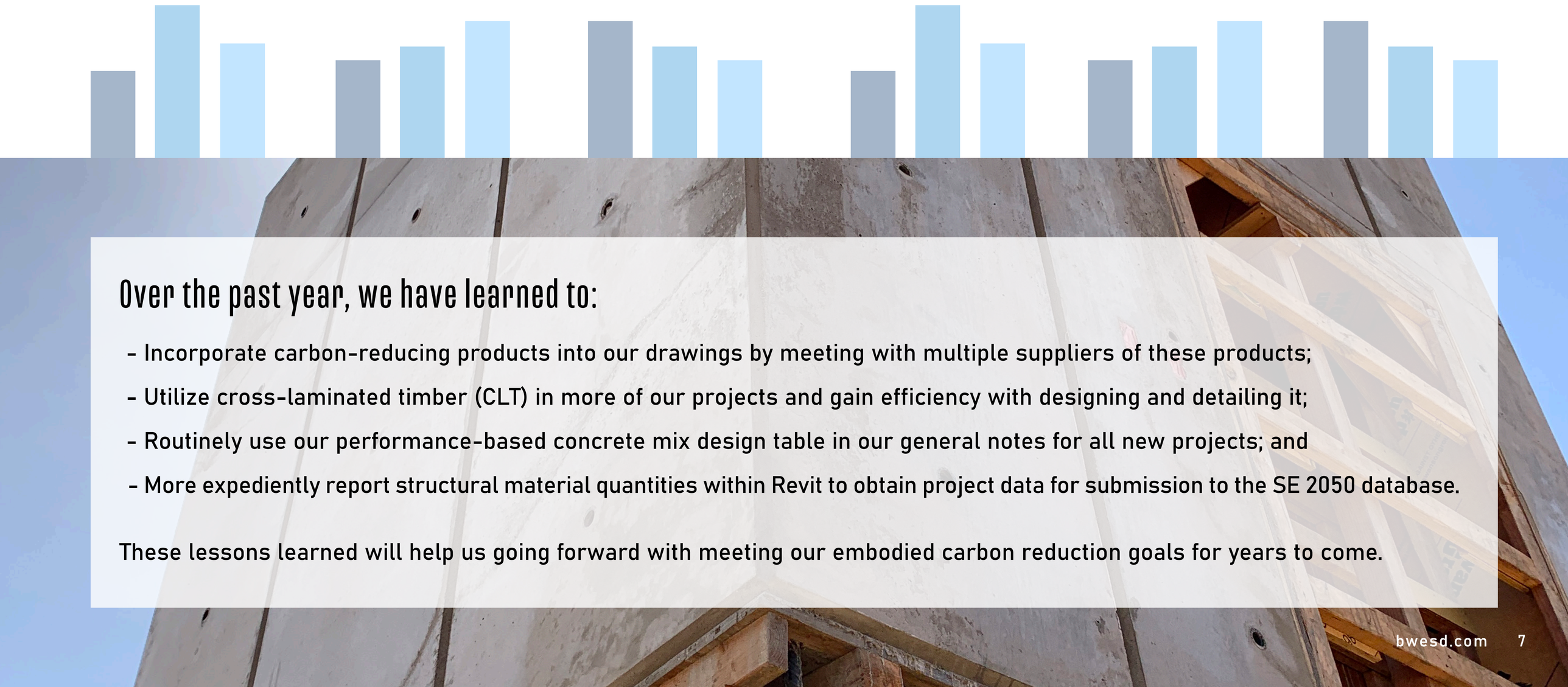
Publicly declare your firm as a member of the SE2050 Commitment. *(Required)*

Give an external presentation on embodied carbon that demonstrates a project success or lessons learned.

LA Trade-Technical College,
Art & Culinary Arts Facility
Los Angeles, CA | LEED Silver

Photo Credit: Alex Nye

Lessons Learned



Over the past year, we have learned to:

- Incorporate carbon-reducing products into our drawings by meeting with multiple suppliers of these products;
- Utilize cross-laminated timber (CLT) in more of our projects and gain efficiency with designing and detailing it;
- Routinely use our performance-based concrete mix design table in our general notes for all new projects; and
- More expediently report structural material quantities within Revit to obtain project data for submission to the SE 2050 database.

These lessons learned will help us going forward with meeting our embodied carbon reduction goals for years to come.