

SE2050 YEAR 5 PLAN



O'DONNELL &
NACCARATO
STRUCTURAL ENGINEERS



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Cover: Ellis Town
Center Phase 2

2025: Building on Progress

INTRODUCTION

In 2020, O'Donnell & Naccarato (O&N) joined the SE 2050 program, pledging to reduce and ultimately eliminate embodied carbon in structural engineering. Now, as we enter 2025—Year 5 of our Embodied Carbon Action Plan (ECAP)—our commitment remains stronger than ever. We continue to prioritize education, advocacy, and actionable strategies to drive meaningful carbon reduction across our projects. This year, we will further our collaboration with project partners, pushing for impactful change while championing sustainability within the AEC community. The growing momentum toward reducing embodied carbon reinforces our dedication to building a more sustainable future.

WHAT WE'VE ACCOMPLISHED

During Year 4, O&N strengthened its commitment to reducing embodied carbon by actively collaborating with local material providers to integrate lower-carbon alternatives into our projects. Through close partnerships, we refined project documents to incorporate these solutions while engaging with sustainability groups such as the DVASE Sustainable Design Committee, NYC's EDC Mass Timber Studio, and the Carbon Leadership Forum. Our involvement in the SE 2050 program further connected us with industry experts, fostering knowledge-sharing and innovation. Additionally, we presented over a dozen seminars on alternative construction materials to our clients, expanding awareness and adoption of sustainable practices.

As part of our Embodied Carbon Action Plan, we submitted five diverse projects to the SE 2050 Database, covering sectors such as Healthcare, Education, and Residential. By contributing project data, we continue to support industry-wide benchmarking and drive progress toward meaningful carbon reduction.



Above: Ellis Town Center Phase 2 - Interior

Project Spotlight: The Inquirer Building

"Philadelphia's industry and buildings, historic and modern, account for nearly 70% of citywide carbon emissions. For Philadelphia to meet its climate goals, we need to make our buildings of all ages more energy efficient."

O'Donnell & Naccarato provided structural engineering and facade restoration services to transform the historic Philadelphia Inquirer Building, originally constructed in 1924, into a state-of-the-art Essential Services Facility for the City of Philadelphia. This adaptive reuse project preserved the architectural character of the 520,000 SF landmark—listed on the National Register of Historic Places—while modernizing it to house critical city operations, including the Philadelphia Police Department

high-performance, green municipal facilities, the project prioritized both structural integrity and sustainability. Historic preservation inherently minimizes embodied carbon by “reusing” existing structures, reducing the need for energy-intensive new materials. Retrofitting these buildings with modern technology and energy-efficient upgrades further decreases operational emissions, making a lasting environmental impact. According to the World Economic Forum, retrofitting an existing building can reduce embodied carbon by 50-75% compared to new construction while also lowering operational emissions by at least 40%. In many cases, it can take 10 to 80 years to offset the carbon impact of demolishing an old structure and replacing it with a new, energy-efficient building—highlighting the value of preservation-first strategies.

O'Donnell & Naccarato's scope extended beyond structural renovations to include a comprehensive facade investigation, assessing the existing masonry and providing a detailed report with repair recommendations. Our role expanded to the development of facade repair construction documents, material specifications, and construction administration services for the restoration of the building's tower and annex, ensuring its long-term durability while maintaining its historic aesthetic.



51,000

Square feet of facade restoration to the Tower and Annex structures.

headquarters, the Homicide Unit, the Police & Fire Communication Center, the Medical Examiner's Office, the city Morgue, 911/411 Centers, and the Department of Health Laboratory Services.

As part of the city's broader initiative to adapt its historic buildings into



The project achieved LEED Silver certification, integrating numerous energy-saving measures such as high-performance lighting with occupancy sensors, advanced building control systems for optimized energy use, and enhanced insulation and weatherization to improve heating and cooling efficiency. A white reflective roof mitigates the urban heat island effect, while the building's central

location—offering access to public transportation and bike routes—encourages sustainable commuting options for employees and visitors.

Honoring its successful blend of historic preservation and forward-thinking sustainability, the project was awarded the 2022 Preservation Achievement Grand Jury Award by the Preservation Alliance for Greater Philadelphia.

Photo: Facade cleaning and restoration of the 360-foot tower portion of the structure.

Restore! Don't Replace.

Why replace when you can restore? O&N has restored over 5 million square feet of parking garage space, extending structure lifespans, reducing material waste, and cutting the carbon footprint of new construction. Restoration preserves existing materials, significantly lowering embodied carbon while enhancing durability, safety, and long-term performance.

O&N also champions low-carbon concrete for our parking restoration projects, which reduces emissions without compromising strength. By modifying mix designs—replacing some cement with calcined clays, fly ash, or blast-furnace slag, or using Portland Limestone Cement (PLC)—we further minimize environmental impact. Through strategic restoration and sustainable materials, we're building a greener, more resilient future—one parking garage at a time.



Above: Before and after of a garage restoration project.

Below: Replacing the concrete slab on an existing parking deck.



Continuing Our Commitment



In Year 5, O&N continues to prioritize education, advocacy, and collaboration in advancing sustainability within structural engineering. Our team members play an active role in sustainability-focused committees, including the DVASE Sustainable Design Committee, New York City's EDC Mass Timber Studio, and the Carbon Leadership Forum. These organizations are at the forefront of promoting sustainable design, and O&N is dedicated to supporting their efforts through leadership, outreach, and the implementation of innovative, low-carbon strategies.

Beyond committee engagement, we are committed to reducing the environmental impact of our projects by prioritizing carbon-sequestering materials and advocating for the adaptive reuse of existing structures. Repurposing buildings significantly reduces embodied carbon by minimizing the need for new materials, aligning with industry research that suggests retrofitting an existing structure can cut embodied carbon by up to 75% compared to

new construction. By integrating sustainable methodologies into our projects, we aim to not only enhance building performance but also drive meaningful progress toward carbon reduction in the built environment.

Education remains a cornerstone of our mission. Through our highly successful "O&N University" program, we actively engage with the AEC community, offering AIA-accredited seminars that provide valuable insights into sustainable design. These sessions highlight emerging trends such as mass timber construction, the benefits of reusing existing structures, and strategies for integrating sustainable materials into projects. By fostering a culture of continuous learning and collaboration, we empower our peers to embrace sustainability and implement forward-thinking design solutions that contribute to a lower-carbon future.

This year, O&N installed a Bevi Smart Water Dispenser, thus far saving nearly 7,000 bottles from the landfill.

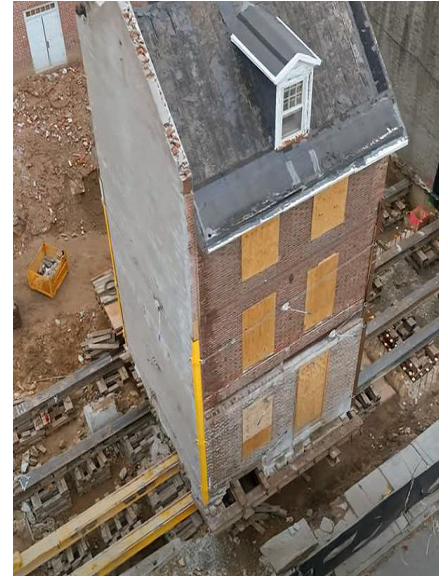
Project Spotlight: Old First House

In 2025, the Old First Reformed Church's Passive House-certified expansion will be completed, delivering 34 supportive housing units alongside church offices, classrooms, and commercial space to serve the community.

The 7,000 SF parcel was originally occupied by two row houses, requiring creative solutions to balance preservation with new construction. The project team relocated The Fox Building—a structure dating back to the 1760s—to the southern edge of the site, preserving its historic character while integrating it into the new development. A second structure, a 1970s replica home, was demolished due to its poor condition, allowing more space for the creation of the energy-efficient affordable housing built to Passive House standards.



Above: The near-completed Passive House-certified expansion.



Above: Relocating an existing historic rowhome on the Old First House site.

Because Passive House is a performance standard rather than a prescribed construction method, the new design successfully blends contemporary and historic elements while meeting strict energy demand targets. Sustainable features include exceptionally high levels of insulation, well-insulated windows, thermal bridge-free design, an airtight building envelope, and a high-efficiency ventilation system with heat and energy recovery. By preserving and repurposing existing structures while incorporating Passive House principles, the project significantly reduces embodied carbon and operational energy use, setting a new standard for sustainable urban development.

Reporting Plan & Reduction Strategy

O&N remains committed to identifying and tracking embodied carbon across projects in various sectors, ensuring measurable progress toward reducing environmental impact. At the outset of each project, our team utilizes our Project Design Criteria Form to establish a structured approach for calculating embodied carbon and exploring structural strategies for reduction.

Throughout the design process, we leverage life-cycle assessment (LCA) software to evaluate structural materials, optimize systems, and guide decision-making with sustainability in mind. To obtain material-specific Environmental Product Declarations (EPDs), we rely on the Embodied Carbon in Construction Calculator (EC3), allowing for data-driven material selection.

Our design and documentation modeling software enables us to monitor material quantities at every stage of the design process, integrating seamlessly with LCA tools to provide a comprehensive view of embodied carbon impacts.

In 2025, we reaffirm our commitment to the program by completing the SE 2050 database document and submitting a minimum of five projects, contributing valuable data to industry-wide carbon benchmarking efforts. sustainable structural engineering.

Below: Our A & Indiana adaptive reuse project took home three awards in 2024, proving that old buildings can learn new tricks!





Our team not only teaches others about reducing carbon, but we participate in local events to reduce and prevent pollution.



Sharing the Knowledge



O&N remains dedicated to sharing insights on successful projects and emerging trends in carbon reduction through our social media platforms and company website. By actively raising awareness, we aim to educate our clients, as well as our design and construction partners, on the critical role of carbon reduction in the built environment.

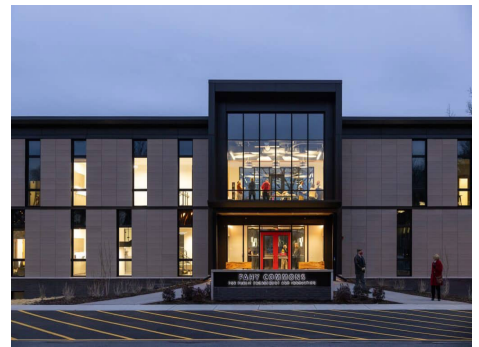
This educational initiative is seamlessly integrated into our project delivery process and extends to our collaborations with external organizations that advocate for sustainable practices. As part of our ongoing commitment, O&N proudly highlights our participation in the SE 2050 program across firm qualifications, marketing materials, and project pursuits.

Additionally, we are enhancing our outreach efforts through a dedicated sustainability section on our newly designed website, set to launch this year. By prominently featuring our commitment to carbon reduction, we reinforce our role as industry leaders in sustainable structural engineering and continue to drive meaningful change within the AEC community.

161,945

That's how many pounds of CO₂ our team saves per year by taking mass transit to work!

Our "Muhlenberg College Fahy Commons for Public Engagement & Innovation" project was not only recently awarded **Phius Passive House Certification, but is the first building in the world to achieve **Core Living Building Certification**.**



Our Electives for 2025

According to the American Institute of Architects, reusing structures reduces embodied carbon by 50-70%.



EDUCATION:

- + We distribute our Year 5 Embodied Carbon Action Plan (ECAP) within our firm materials as part of our on-boarding process for all new employees.
- + Our Embodied Carbon Reduction Champion spends time in all our offices educating and engaging our staff on carbon reduction strategies and how to effectively implement them on regional projects.
- + To enrich the knowledge and comprehension of our employees, we schedule at least one webinar per year focused on the topic of embodied carbon. This webinar serves as a valuable tool to educate and engage our staff on this significant subject.

- + To provide our technical staff with easy access to valuable resources, we share resources through our ECAP Teams Channel, a comprehensive collection of relevant materials and information related to embodied carbon reduction.
- + As part of our continuous professional development, we mandate that at least one employee attends a presentation or demonstration of an LCA-based tool used to calculate embodied carbon. This requirement ensures that our team stays abreast of the latest methodologies and tools available for precise carbon calculation.

These initiatives collectively contribute to our firm's continuous learning and improvement in carbon reduction.

REPORTING:

+ In Year 5, our goal is to submit a minimum of five projects to the SE 2050 Database. In Year 4, our office successfully submitted five projects to the database, showcasing our proactive involvement in advancing carbon reduction efforts. Through consistent contributions to the SE 2050 Database, we aim to facilitate industry-wide benchmarking and cultivate a culture of transparency and accountability in addressing embodied carbon challenges.

REDUCTION:

+ We are steadfast in our commitment to collaborating with concrete suppliers to continue reducing embodied carbon in mix designs. Over the past years, we have effectively coordinated the integration of Supplementary Cementitious Materials (SCMs) with our concrete suppliers across numerous projects. These collaborative endeavors have enabled us to incorporate sustainable alternatives into our concrete mix designs, furthering our efforts toward reducing environmental impact.

+ We continue to prioritize the use of Portland Limestone Cement (PLC) as a substitute for Ordinary Portland Cement (OPC) whenever feasible. PLC offers a lower carbon footprint compared to OPC, contributing to our ongoing efforts to reduce embodied carbon in our concrete specifications.

+ Expanding on our collaboration with concrete suppliers, we continually revise our concrete specifications to reflect recent coordination efforts and the availability of diverse Supplementary Cementitious Materials (SCMs). By staying abreast of the latest advancements and the availability of sustainable materials, we ensure that our concrete specifications are in line with our objectives of minimizing embodied carbon in our projects.

Through these ongoing efforts, we endeavor to optimize our concrete mix designs and specifications, thereby making a significant contribution to a more sustainable built environment.

ADVOCACY:

+ Through these ongoing efforts, we endeavor to optimize our concrete mix designs and specifications, thereby making a significant contribution to a more sustainable built environment.

+ Our project proposals proudly proclaim our firm as a participant in the SE 2050 Commitment. This language effectively conveys our commitment to carbon reduction and bolsters our firm's qualifications and expertise in sustainable design. We integrate this declaration into our marketing materials, which we utilize during project pursuits to demonstrate our alignment with SE 2050.

Using locally sourced materials in construction reduces carbon emissions by cutting transportation distances and fuel consumption, making projects more sustainable while supporting regional economies.

+ We prominently display our commitment to SE 2050 on our company website. By highlighting this commitment, we strive to demonstrate our values and inspire others in the industry to join the global movement towards reducing embodied carbon.

+ As part of our commitment to educating clients on embodied carbon reduction, we offer webinars and AIA-accredited lunch-and-learn sessions focused on sustainable materials and carbon-reducing strategies. These initiatives encourage open dialogue, enhance collaboration, and empower our clients with the knowledge to make informed, sustainable decisions in their projects.

These initiatives highlight our proactive commitment to client engagement, advocacy for SE 2050, and the collective pursuit of reducing embodied carbon.

Photo: Associate Ben Bruening, PE, SE, breaking ground on Centra Health's new Medical Office Building, which uses locally sourced materials in its construction.

What We've Learned

O&N's commitment to the SE 2050 Program reflects our dedication to reducing the environmental impact of building construction. This past year, we've seen growing enthusiasm among our staff and partners for embodied carbon education, inspiring project teams to actively engage in decarbonization efforts.

A key focus has been refining our data reporting plan from the outset of each project. Early coordination ensures accurate material tracking, enhancing the reliability of our carbon assessments and informing decision-making.

We also prioritize flexible project specifications that support low-carbon materials. By incorporating supplementary cementitious materials (SCMs) in concrete mixes and offering multiple carbon-conscious options, we create more opportunities for impactful reductions during construction.

These efforts reinforce the value of early collaboration and adaptable strategies, strengthening our ability to drive sustainable construction and carbon reduction across the industry.



Above: The Philadelphia Boys a& Girls Club adaptive reuse project took home a Grand Jury Award from the Preservation Alliance.

LOCATIONS

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