

Embodied Carbon Action Plan



Photographer: Ellyce Moselle

SUBMISSION

| 2025

 **element**
structural engineers, inc.



Meet Element

Element Structural Engineers (ESE) is a full-service structural engineering firm providing structural consultation, analysis, and design services for a wide range of projects throughout Northern California.

Element was founded in 2011 by Principal, Thuy Fontelera. Our team of licensed engineers has more than 70 years of combined experience, with the capacity to provide creative and economical design solutions while assisting with controlling construction costs.

Our commitment to excellent service is comprised of being responsive, strict attention to detail, and being conscious of the project schedule. We pride ourselves on these values which have been the core success of our business and repeated clientele.

Our Mission

To elevate our client’s vision with passion, creativity and purpose

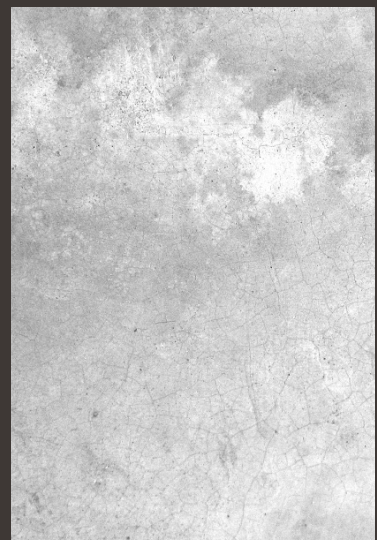
Our Services

- Structural design and analysis
- Structural condition assessment
- Construction support
- Feasibility studies
- Seismic studies
- Renovation and adaptive reuse
- New building design
- Retaining walls and foundations

Our Office Locations

Newark Office: 39899 Balentine Dr. Ste 185 Newark, CA 94560

Oakland Office: 580 2nd Street, Suite 255 Oakland, CA 94607



Our Mission and Commitment

The ESE team's commitment to the community is at the center of everything we do. Our mission is to elevate our client's vision with passion, creativity, and purpose. For this to happen, it is imperative that community is at the heart of it all.

Our commitment to our community comes from our actions. From our leadership team to our junior engineers, we're committed to positively impacting the communities where we live and work. Our local philanthropic efforts include support for affordable housing and gender equality, providing educational opportunities through our internship program at Ohlone College, partnering with Cristo Rey De La Salle East Bay High School to develop hands-on training for students and much more.

We continually seek opportunities to contribute our time, funds, and expertise to supporting local organizations that encourage growth and education - because it's not just what we do, but how we do it that makes a difference.

Our Community Partnerships



Diversity

is our strength

A passionate and creative structural engineering firm based in the Bay Area, we serve all of Northern California, and soon—beyond.

Woman and minority-owned, we own the concept of diversity, from our projects to materials, skillset and staff. We empower our engineers to lead.

At ESE, we strive to stay on the leading edge of technology. In addition to standard CAD software, we also offer Revit® and BIM 360 integration, which allows for stronger collaboration between the architect, builder, and engineers.

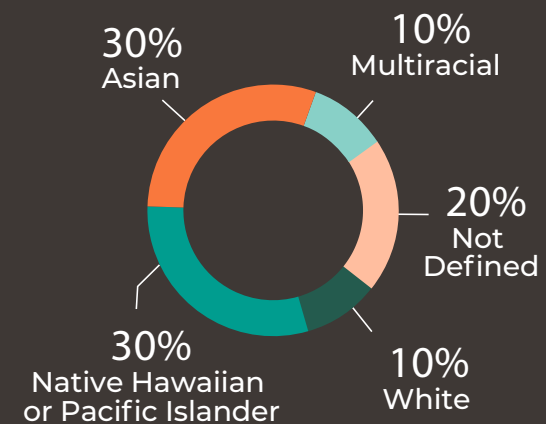
Each project is assigned to a single design team that manages it from inception to completion. This allows the team to fully understand the project inside and out. Clients benefit from having a single point of contact throughout the project lifecycle.

Our clients know they can count on ESE to consistently deliver quality and highly detailed work at competitive prices.

Even more importantly, we provide outstanding, responsive customer service and are committed to seeing each project through from start to finish.

The diversity of the ESE team

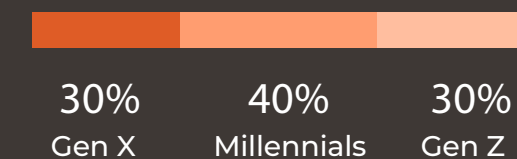
ETHNICITY



GENDER



GENERATION



We engineer the change we want to see.

As a structural engineering firm that is founded and led by women and people of color, we know through experience that intentional inclusivity creates stronger concepts, deeper understanding and more vibrant communities.

At Element we strive to create a sense of belonging in our team, partners, clients and the communities we represent. From developing and empowering diverse talent to championing affordable housing and gender equality, we're in it for the IMPACT.

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Our Vision

Executive Summary

Structural engineers must not take a passive role in addressing embodied carbon in the structural systems we design. Structural systems typically represent about half of the embodied carbon in a building project. Therefore structural engineers must be an active part of the green building project team in order to reach carbon emissions reduction targets. The leaders at Element SE have recognized this problem and are not satisfied with the status quo.

At Element Structural Engineers, we are committed to achieving net-zero embodied carbon in structural systems by 2050. The following Embodied Carbon Action Plan (ECAP) outlines our vision, strategy, reporting, reduction, and communication with which we have implemented for the coming year.

Engineering community together,



Thuy Fontelera | PE, SE, LEED AP BD+C
Principal & Founder

Our Strategy

Our Path To Achieve Net Zero

Path to Continuing To Achieve Net Zero

Q1 2024	Q2 2024	Q3 2024	Q4 2024
Present at least (1) webinar focused on sustainability.	Create an embodied carbon digital wiki for employees to access. FAQ SE 2050 Blog Post. SE 2050 Social Media Campaign Calendar.	Map out SE 2050 roadmap for preparing for next ECAP submittal.	Evaluate another LCA software and determine if Athena or another program will be used moving forward. Selected a new LCA software EC3 for use by our office.

After submittal of ECAP

Q1 2025	Q2 2025	Q3 2025	Q4 2025
Presented at least (1) webinar focused on embodied carbon and make a recording available to employees. Completed LCA for at least two ESE projects. Submit ECAP.	Develop standard procedure for data collection and reporting using our selected LCA software. Completed LCA for at least one ESE project.	Attend signatory meetings with SE 2050. Internal review of material specification and general notes. Provide suggested edits to leadership for review.	Attend signatory meetings with SE 2050. Complete LCA for at least one ESE project.

As the Embodied Carbon Reduction Champion, I will lead efforts to measure, reduce, and advocate for embodied carbon reductions in alignment with SE2050.

Element Structural Engineers is committed to the following.

Education & Awareness:

- Conduct workshops and share resources on embodied carbon reduction.
- Establish a knowledge-sharing platform for best practices.

Project Integration:

- Implement tracking of embodied carbon in projects.
- Promote low-carbon materials and efficient structural designs.
- Utilize LCA tools to compare reduction strategies.

Firm Commitments:

- Embed SE2050 goals into firm policies and project standards.
- Encourage leadership to commit to and report on embodied carbon reduction.

External Engagement:

- Participate in industry forums and collaborate with peers.
- Advocate for material transparency and sustainable sourcing.

Tracking & Reporting:

- Collect and assess data on embodied carbon.
- Report progress annually and refine strategies accordingly.

By integrating these strategies, our firm will drive meaningful progress toward net-zero embodied carbon by 2050.

James Enright | Associate Principal | PE, SE, LEED AP
Embodied Carbon Champion



EDUCATION

Meet Our Experts

At Element Structural Engineers, we are committed to living up to our standards of "Engineering the Change We Want to See."

Our leaders have a shared vision to be part of that change and have committed to researching and learning more about SE 2050.

Our team began the SE 2050 process in January 2023 and continue to make progress in monitoring the carbon emissions of the structures we design.



THUY FONTELERA

PRINCIPAL & FOUNDER | PE, SE, LEED AP BD+C

Mrs. Fontelera is a licensed structural engineer with over 24 years of experience and expertise in structural engineering, including project management and executive experience in QA /QC roles. She is a passionate supporter of resolving the housing crisis, using her skills to engineer the change she hopes to see.



JAMES ENRIGHT

ASSOCIATE PRINCIPAL | PE, SE, LEED AP
EMBODIED CARBON CHAMPION

Mr. Enright brings over 14 years of structural engineering experience in a broad range of project types including project types including residential, commercial, healthcare, education, tenant improvement, adaptive reuse, and seismic retrofit.



CALVIN ALEJANDRINO

ENGINEERING INTERN

Mr. Alejandrino graduated from San Jose State University graduate with a B.S. in Civil Engineering. He is passionate about creativity and problem-solving in structural engineering and loves to explore innovative solutions with our team. He is also contributing to our SE 2050 initiatives to help shape the industry towards a more sustainable future.



JENNIFER VANDERAREND

PEOPLE CULTIVATOR

Ms. VanderArend is a marketing and people strategy leader with 16+ years of experience in marketing, employee programs, and leadership development. As the People Cultivator at Element Structural Engineers, she drives HR and marketing initiatives, community partnerships, and the firm's B-Corporation certification process. She also helps develop the Embodied Carbon Action Plan (ECAP), aligning sustainability efforts with company values. Passionate about growth and inclusivity, she thrives on building programs and turning vision into reality.

Our Framework

Elements Of Our SE 2050 Initiative

In order to make this a successful program, the SE 2050 team has created a framework that will create role clarity, communication and outreach efforts both externally and internally, planning and goal setting, documentation and processes for consistency, and more. This will be our guide to keep us focused on our efforts.



Internal Announcements


Key Highlights

- We shared with the team our ECAP.
- We did an SE 2050 Recap with our team to reinforce the message while also showcasing what we've accomplished as a firm.
- We presented to our team a webinar focused on embodied carbon and made a recording available to employees.

Future Initiatives

- Continued campaigns for SE 2050.
- Project case study.

Staff Presentation



SE 2050 RECAP


Engineering Community Together

Why is this important?


- It has been documented that there is an issue with an excess amount of carbon emissions created by the materials from our designed structures.
- On the SE 2050 website, they provide a [link](#) of all the sources that provides evidence of the increase of carbon emissions throughout the years.



And most importantly....

Here at Element Structural Engineers, we value the importance of not overlooking the opportunities presented to us. With SE 2050, we take initiative to ensure that our designs has great quality of sustainability.



- Net zero means that the future buildings that structural engineers design do not perpetuate more emissions into the environment.
- Carbon emissions are the “the release of carbon compounds such as carbon dioxide (CO2) and methane (CH4) into the atmosphere.”
- It is important to consider the carbon impacts of the components in our structural systems for all stages of a building's life-cycle.





AGENDA

- Overview
- How Embodied Carbon is Reported
- Life-Cycle Assessment Softwares
- Embodied Carbon in Structural Systems
- Case Study of Embodied Carbon
- Resources

External Announcements

Key Highlights

- Announced our continued commitment to sustainability.
- Shared our involvement with industry sustainability-driven events.
- Shared projects with sustainability elements.
- SE 2050 social media campaign content calendar created.

Future Initiatives

- Continued campaigns for SE 2050.
- Project case study.

Social Media Posts



1,008 followers
5mo • 

Element Structural Engineers

Did you know that design choices play a crucial role in a building's sustainability? We recognize our responsibility in reducing carbon emissions and are committed to driving the change we want to see. That's why we're reaffirming our ...more





SE 2050

SIGNATORY

2024





1,006 followers
5mo • 

Element Structural Engineers

Pimentel Place is an affordable housing project located in Hayward, CA that consists of 57 units and makes up a total of 81,000 square feet. Within those 57 units, there will be a variety of 1-3 bedroom apartments. The building stands 5 stories high with multiple community amenities such as a Children's Play Area, Community Room, On-Site Offices, and more.

The design approach was focused on housing families with income levels ranging from 20%-60% of the Local Area Median Income (AMI). It is additionally stated that 15 units will be set aside for households of those experiencing chronic homelessness.

Energy is being conserved by the solar panels on the roof and the concrete podium and foundation systems utilize a sustainable concrete mix provided by concrete supplier Cemex.

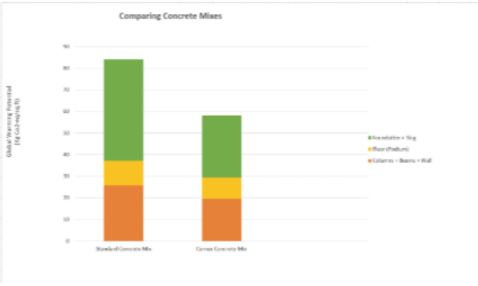
With our company's calculations for Pimentel Place, we have identified that the mix provided by Cemex in comparison to the industry's standards has a difference of lowering the global warming potential by at least 20%. The choice in the concrete mix has helped us be a step closer to achieving net zero.


Interested in learning more about SE 2050 and our company's commitment? Visit our SE 2050 page here: <https://lnkd.in/g484D8IX>


Architect: DAHLIN Architecture | Planning | Interiors
Client: EAH Housing
GC: Nibbi Brothers General Contractors

#BuildWithElementSE #architecture #construction #structuralengineering #AffordableHousing #MultiFamilyHousing #SE2050 #sustainability

Cemex vs Industry Standard





1,006 followers
5mo • 

Element Structural Engineers


Last Thursday, we attended the **WoodWorks: Celebrating Women in Wood Design** event. It was an informative event with valuable insights gained from keynote speakers.


A few key takeaways included:

- Compared to materials like steel and concrete, wood has a lower embodied carbon footprint, making it a more sustainable choice.
- Wood is a renewable resource that can be regrown, reused, and recycled.
- Unlike other materials that release carbon dioxide during production, wood actually stores carbon dioxide—about 50% of its weight is carbon stored.

Overall, the event reinforced the benefits of wood as a sustainable design choice.

#BuildWithElementSE #SE2050 #Sustainability





with Bao Hoa Pham

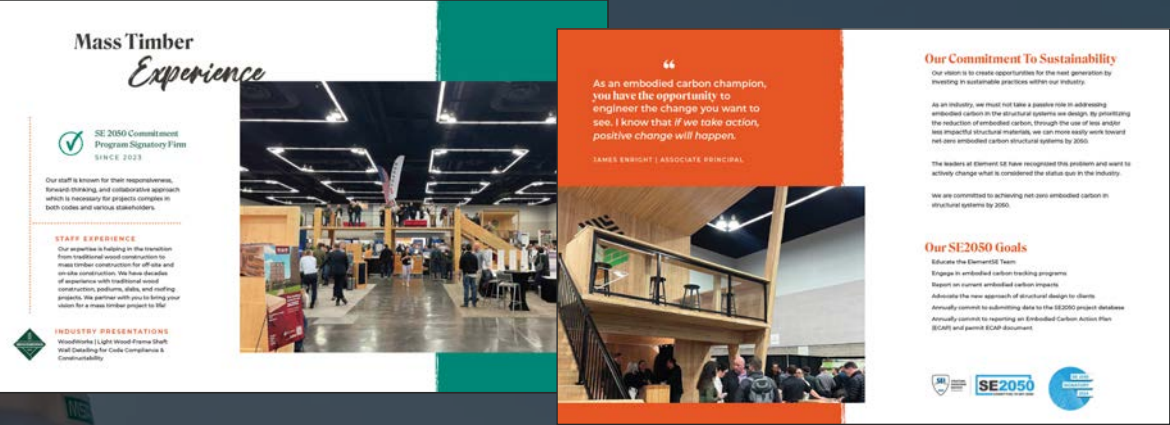
KNOWLEDGE SHARING NARRATIVE

Spreading The Word!

Sharing Our Embodied Carbon Reduction

- The creation of our qualification package that is sustainability-focused.
- Communicating our SE 2050 goals in presentations to clients and vendors.
- Continue expanding on SE 2050 section on ESE's website.
- Featured in Firm Highlight SE 2050 newsletter.

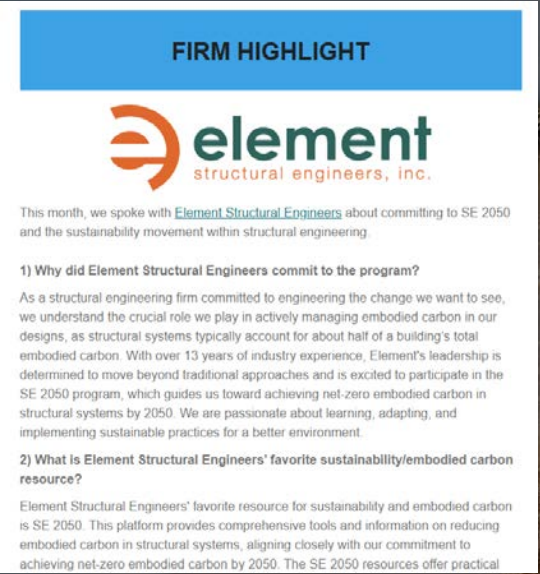
Qualification Package



Social Media



Website



SE 2050 Frequently Asked Questions

As an SE 2050 signatory firm committed to reducing embodied carbon in structural design projects to net zero by the year 2050, providing educational awareness of SE 2050 is critical. With so much information that is out there, we wanted to provide a list of the most frequently asked questions that we've seen come up.

Q1: What is SE 2050?

SE 2050 is abbreviated for the Structural Engineers 2050 Commitment Program. It is a program to advocate that structural engineers take action in lowering carbon emissions in the design of our structures and reduce the percentage to reach net-zero emissions by the year 2050.

Q2: Who developed the program?

It was developed by the Structural Engineering Institute of Civil Engineers (ASCE) and challenge brought to attention (CLF).

Q3: Define embodied carbon

Embodied Carbon refers to when extracting raw material building materials. It is the atmosphere.

Q4: The term "net zero" k zero?

In simple terms, net zero m produce gas emissions into that net zero happens when in the structural system ad emissions during its life cycle.

Q5: How can you take par

The main objective is a coll company and includes, hav continuous education with and/or finding resources, sh collecting data on projects the materials are affecting reflecting on the actions th improve for the following year, and more.

Q6: What are the SE 2050 commitment program goals?

The SE 2050 commitment program goals include educating ourselves and the people we engage with participation in

Strength In Sustainability

When it comes to sustainability, the increasing need of sustainable engineering design is critical due to several factors. First, it allows for minimization of the impact caused by construction on natural resources and the environment. In particular, the emissions of greenhouse gasses due to structural materials and construction processes, are a primary global concern that all structural engineers should consider. The trends in steel and concrete consumption worldwide demonstrate the growing environmental impact of structural design. There are many steps each structural engineer can take to mitigate this environmental impact, which includes engineers understanding the environmental impact of their designs by improving operational efficiency, specifying salvaged or recycled materials, and using alternative building materials such as CLT (cross-laminated timber).

A few examples of how Element Structural Engineers integrates sustainability throughout our projects includes: strategies to reduce overall building weight that has domino effects on gravity and lateral framing systems and the foundations that support these elements. We also work closely with local concrete suppliers to utilize sustainable concrete solutions such as: specifying low carbon mixes with supplementary cementitious materials (SCMs) and the use of recycled concrete aggregates whenever possible.

In addition, our leadership team is LEED certified, which provides direction regarding LEED prerequisites and pursued credits for each project we work on.

Staff Experience

We have decades of experience with traditional wood construction, podiums, slabs, and roofing projects.

Industry Presentations

WoodWorks | Light Wood-Frame Shaft Wall Detailing for Code Compliance & Constructability

Future Initiatives

- Collaboration with SEAONC.
- Q&A webinar with clients.

Our Approach

Our Commitment Declaration



Element Structural Engineers
1,006 followers
5mo • 

Did you know that design choices play a crucial role in a building's sustainability? We recognize our responsibility in reducing carbon emissions and are committed to driving the change we want to see. That's why we're reaffirming our dedication to the Structural Engineers 2050 Commitment Program for the upcoming year!

As a signatory firm since 2023, we've gained valuable insights into monitoring carbon emissions through SE 2050's guidelines on education, reporting, reduction, and advocacy.

Learn more about our commitment: <https://lnkd.in/g484D8iX>

For further details about SE 2050 or to view our Embodied Carbon Action Plan (ECAP), visit the SE 2050 website: <https://lnkd.in/gBDhkCK>.

#BuildWithElementSE #SE2050 #Sustainability #EngineeringSustainableChange #StructuralEngineering #Architecture #Construction



SE 2050

SIGNATORY

2024



Inputting Project Information

- At this time we have completed the SE 2050 Database reporting process for four of our projects. The projects are The Meridian located on Santa Clara, CA and Pimental Place located on Hayward, CA.
- We use Athena Impact Estimator to calculate the embodied carbon of our projects.
- We have been able to access Environmental Product Declarations (EPD) when needed. Typically we have to request them as they are not part of the standard submittal contents.
- Our scope is A1-A5, C1-C4, and D.
- At this time we calculate the material quantities on using Revit, Bluebeam, and Microsoft Excel during the construction stage of the project.

Completed Initiatives

- Experiment with other life-cycle assessment (LCA) software programs and determine if we should continue with Athena Impact Estimator or switch to another software.
- After careful consideration our team decided to move to EC3: Embodied Carbon in Construction Calculator. The EC3 tool and its underlying digitized EPD database encourage low-carbon specification and procurement to meet building and infrastructure project sustainability goals in line with the level of action needed to mitigate climate change.

Future Initiatives

- Finalize internal material takeoff and LCA process document.

Future Initiatives

- Finalize internal material takeoff and LCA process document.

Our Approach

Reduction Targets - Short-Term

- Collaborate with project specific concrete supplier to reduce embodied carbon in a mix design.

The SE 2050 Team to reach out to Central Concrete for example specs. Also Check with SE2050 resources.

- Integrate embodied carbon mitigation strategies in your General Notes.

Reduction Targets - Long-Term

- Develop standard language and process for asking clients if they want to have increased sustainability and embodied carbon reduction targets than our standard specifications.
- This may be tailored to specific client and construction types.

Ongoing & Completed Actions

- Use the SE 2050 Database to record data of our projects.
- Staff users can create an account as a firm user and view the SE 2050 Database User Guide under "Resources" folder in shared SE 2050 Google Drive.
- Before a project is submitted into SE 2050's Project Database, there will be a check-in with our Carbon Champion to ensure that the project is being submitted properly.
- Our proposal template includes information regarding what SE2050 is and reaffirms our commitment to SE2050 as a signatory firm.

Our standard proposal template includes language around our sustainability goals and opportunities.

- Work with contractors during material procurement to meet an embodied carbon performance criteria.

Many of our affordable housing projects have sustainability charrettes and we also bring the General Contractor in for these discussions if they are on board. If they are not yet on board we typically meet with them when construction starts.

Our Communication

- **Describe the value of SE 2050 to clients. How can your design teams collaborate to reduce embodied carbon?**

As a firm committed to SE 2050, it is important that we live up to our company's tagline of "engineering the change we want to see." Since becoming one of the signatory firms committing to SE 2050, we are actively learning about materials that produce carbon emissions and finding ways to reduce their percentages.

One of the ways we are doing this through the use of the software such as Athena Impact Estimator and inputting ESE projects' material data. These software programs help us calculate the Global Warming Potential (GWP) of our designed structures and brings awareness to what materials produced the most emissions, which leads to further brainstorming alternatives for replacement or reduction of these materials.

We know that our commitment to SE 2050 will continue to improve industry standards in designing more sustainable structural systems and create a positive impact for our community, our clients, and our environment.

- **Declare your firm as a member of the SE 2050 Commitment with boilerplate proposal language.**

Our current proposal template includes language around sustainability and our commitment to SE 2050.

- **Share your commitment to SE 2050 on your company website.**

For the following 2 previous bullet points, it is done on our company's SE 2050 website that can be found [here](#).

- **Share education opportunities with clients.**

Our firm is sharing resources of SE 2050 through our website, social media, and are exploring more educational methods to showcase to our clients.

Future Initiatives

- Email newsletter sent to clients with a dedicated section for SE 2050 insights and information.

Ancora

TOTAL
77
UNITS

TOTAL
95,325
SQ. FEET

AFFORDABLE FAMILY

WOOD-FRAMED

Ancora

OAKLAND, CA

Ancora Place is a five-story, publicly-funded affordable housing development on International Boulevard in East Oakland. Created by SAHA, it combines several parcels to join other affordable properties like Eastside Arts & Housing and Camino 23. The ground floor will be a vibrant community hub with 2,100 square feet of retail space and an interactive courtyard connecting to live-work lofts. Inspired by the diverse San Antonio neighborhood, Ancora Place aims for GreenPoint Rated Platinum certification, featuring fresh air intakes and solar panels. Next door, SAHA is building a 77-unit family project at 2255 International Blvd, adding a community room, event space, and courtyard for residents to enjoy.

DETAILS

Architect: Pyatok Architects

Client: Satellite Affordable Housing Associates

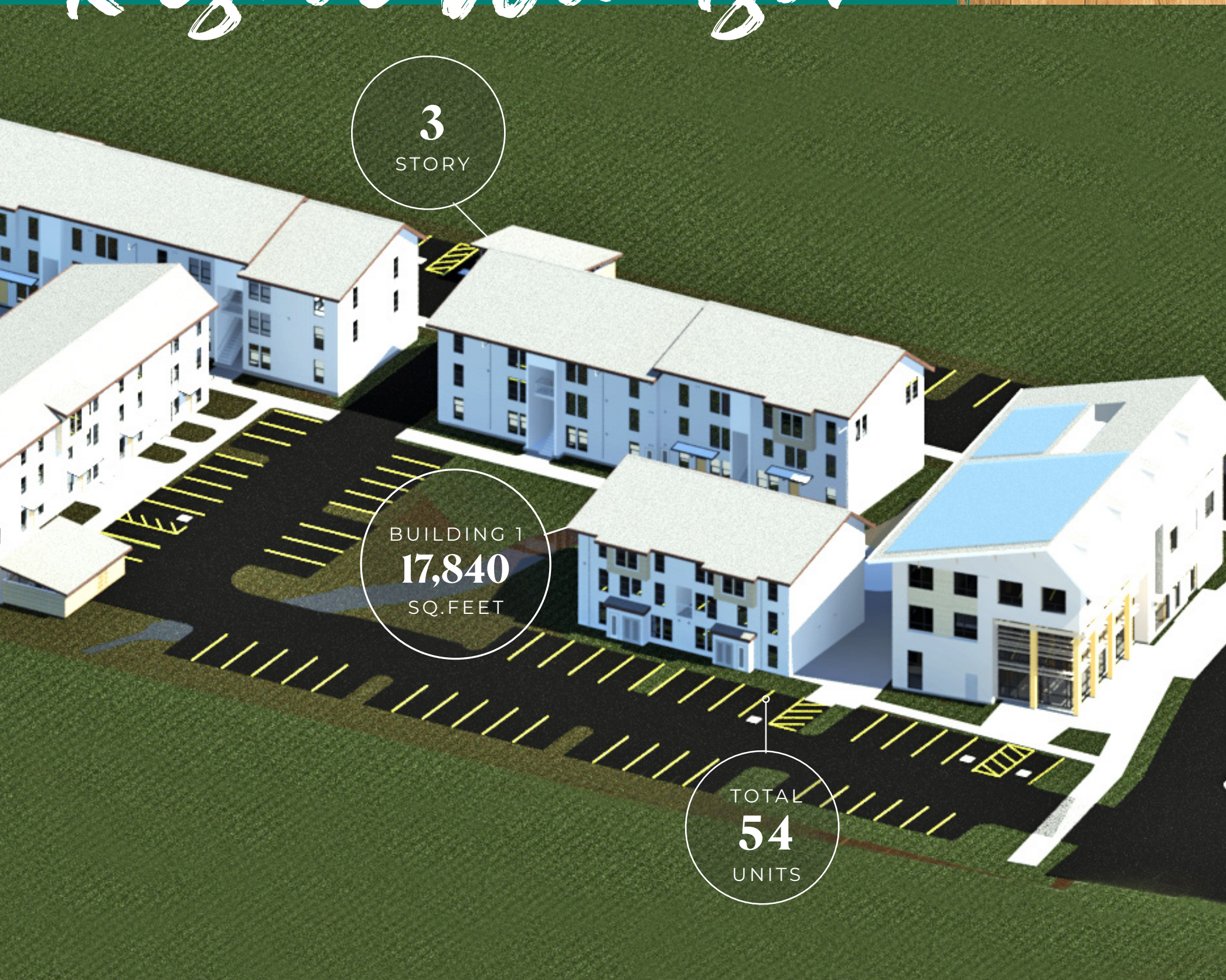
Contractor: Cahill Contractors

Density: 77 units

Status: Under construction

Construction: Type V over concrete podium, Type I for the ground floor

Kashia Windsor



AFFORDABLE HOUSING

MASS TIMBER

MULTI-FAMILY

Kashia Affordable Housing

WINDSOR, CA

Kashia Affordable Housing will provide 54 units of affordable rental housing, ranging from 1-bedroom to 3-bedroom units in size. The housing will be located in a total of 4 buildings, each 3 stories tall. The buildings are garden-style walk-up apartments, with 100% of ground floor units being accessible or adaptable, and 2 to 4 upper floor units sharing a common stair. Upper floor units are a mix of townhomes (for 2- and 3-bedroom units) and stacked flats (for 1-bedroom units). The site includes various spaces that serve the on-site residents, the Kashia Tribe's government operations, and also the community at large. The project is targeting a GreenPoint Gold rating with building 1 utilizing cross-laminated timber.

DETAILS

Architect: Pyatok Architects

Client: Kashia Band of Pomo Indians of the Stewarts Point Rancheria and Burbank Housing Development Corporation

Contractor: TBD

Status: In Design

Construction budget: TBD

Construction: Type VA

Mill Valley Residence

NEW BUILD

CUSTOM HOME

Mill Valley Residence

MILL VALLEY, CA

Located in Mill Valley, the Mill Valley Residence, a 2,104 sq. ft. home in Marin is designed with sustainability at its core. Featuring Structurally Insulated Panel (SIP) construction for the walls, roof, and floors, this highly efficient building method enhances thermal performance, reduces material waste, and accelerates construction.

Collaborating with Studio Maven and contractor Clarum Homes, our team optimized the SIP system to maintain architectural integrity while improving energy efficiency. Sustainable features include fire-resistant materials for durability, a hydraulic elevator for aging-in-place accessibility, and rooftop solar panels to maximize renewable energy use. Additionally, thoughtful engineering solutions ensured airtight construction, reducing heating and cooling demands for long-term energy savings.

This project demonstrates the power of prefabrication and structural innovation, reinforcing our commitment to environmentally conscious residential design.

DETAILS

Architect: Studio Maven Architecture

Contractor: Clarum Homes

Status: Completed

Construction: Type VB

TOTAL
2,104
SQ. FEET

2
STORIES

Solar
Panels

Structurally
Insulated Panel
(SIP) construction
system through-
out- floors, roof,
walls

Hydraulic
elevator

Photographer: Ellyce Moselle

Lessons Learned

Lessons learned from doing the LCA

- We found that each LCA software has challenges in terms of user interface, data input, data reporting, and how easy it is to make edits to LCA project files. This led us to select a new LCA software for the year.

What did we learn from the previous ECAP or Software/QAQC

- Since the previous ECAP we performed a study of available LCA software. The available programs were evaluated on several important criteria so that a new LCA software could be presented to leadership and selected.

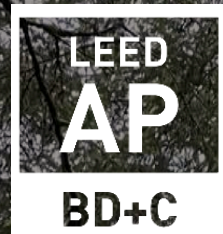
What are the improvements that we made including Software/QAQC

- In the past year we have streamlined our LCA data gathering process in several ways. First we selected a new LCA software. We also provided training for new staff on material take-offs and how and when to coordinate with our internal engineering and BIM project team.

Future Initiatives

- Develop internal process for completing LCA for different project and construction types to continue to streamline our process.

Certifications



Women's Business Enterprise (WBE)
Minority-Owned Business Enterprise (MBE)
Disadvantaged Business Enterprises (DBE)
Small (Micro) Business Enterprise (SBE)
Alameda County: Small Local Emerging Business (SLEB)



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[**SE 2050**](#)