CASE STUDY

Magnolias

THE MAGNOLIAS, AFFORDABLE MODULAR HOUSING, MORGAN HILL, CALIFORNIA

PRODUCT CATEGORIES

Type | Name

FLOORING

Linoleum | Forbo Marmoleum

COUNTERTOPS

Quartz | Daltile Quartz

INSULATION

Unfaced Fiberglass Batts | Owens Corning EcoTouch

Mineral Wool Board | Rockwool

Polyisocyanurate | Firestone

PAINT

Low VOC Content | Sherwin Williams Superpaint Interior Latex Satin

APE-free, Low VOC Content, & Low VOC Emissions | Sherwin Williams ProMar 200 Zero VOC Interior Eg-Shel and Semi-gloss

Magnolias is a 66-unit, affordable modular housing development located in Morgan Hill, CA., developed by First Community Housing (FCH) in partnership with SERA Architects, Factory_OS, and Synergy modular. This multifamily rental property will become home for low-income individuals, families, and veterans, and provide support services including short-term rental assistance.

The project aims for LEED Platinum certification and places a strong emphasis on equity and community-centered design. The project team collaborated with Healthy Building Network (HBN) to identify healthier material options to improve occupant health and reduce impacts on fenceline communities.

Healthier Material Recommendations and Lessons Learned

Get it right from the start

To kick things off, the project team convened the owners, architects, and modular factory to confirm the project's healthier material goals and emphasize the importance of adopting a product type approach to support healthier material selection. This meant using HBN's Hazard Spectrums early in the design process to prioritize product types that minimize impact on the health of occupants, workers, and fenceline communities. HBN's Hazard Spectrums facilitate this process by using a red to green (worse to better) approach to rank different product types within a product category based on their content and associated hazards.

HBN HomeFree

Figure 1 shows the hazard spectrum rankings of the materials chosen for this project. As a general rule, the project team sought to avoid products ranked red while preferring products ranked yellow or better.

> "HBN's Product Guidance is invaluable for gaining a quick and holistic understanding of products."
>
> — Walter Currin, SERA

Seize opportunities to transform future practice

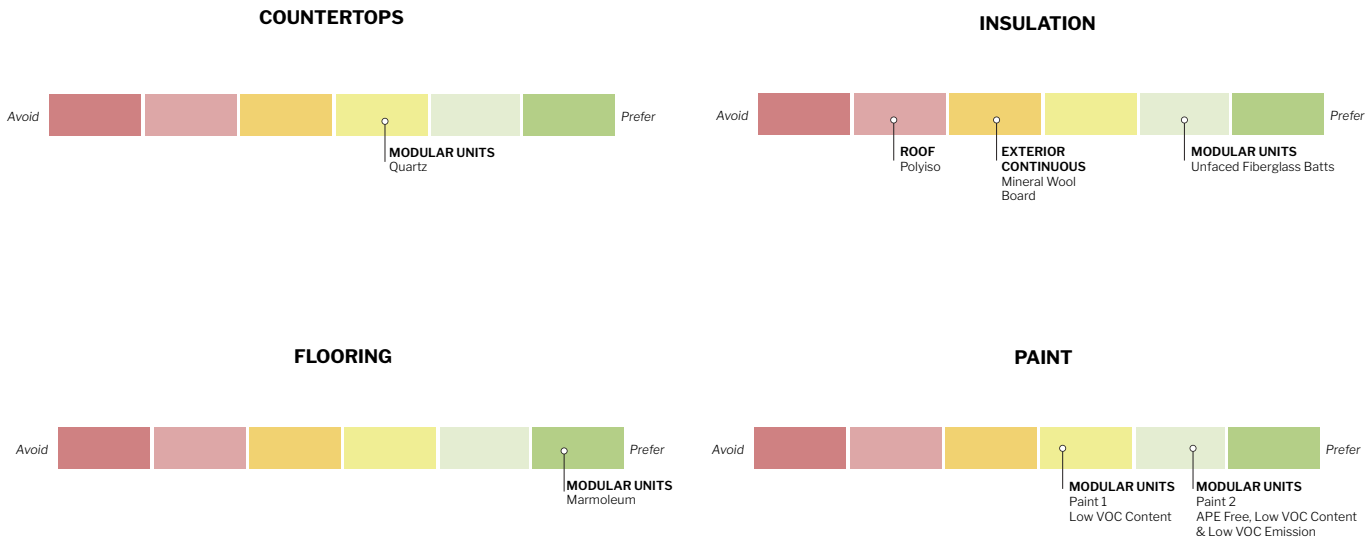
While safer product selection was not always possible, the team seized opportunities to inform their future practice and that of their suppliers. For example, the roofing system warranties required the project team to procure both insulation and roofing from the same manufacturer. For the roofing membrane, the team selected thermoplastic polyolefin (TPO). Although TPO is made out of plastic, it avoids key chemicals of concern including vinyl (polyvinyl chloride / PVC) and phthalates, making it a good option from a material health perspective.

However, there were tradeoffs for the insulation, where the only option offered by the manufacturer was a polyisocyanurate board. Though it's an established industry standard material, it contains halogenated flame retardants, which can be toxic and persistent in the environment. While the potential for resident exposure to the halogenated flame retardant in this application is limited, there are potential exposures at other life cycle stages. The team used this as an opportunity to relay to the manufacturer their preference for a halogen-free polyiso option for future projects.

Recycled content can include hazardous chemicals

Using products with recycled content can help mitigate the human and environmental impacts related to the extraction of raw materials and manufacturing of new products. However, recycled content can bring along hazardous chemicals from the source material into new products. When products contain recycled content, it's important to know more about the origin of the recycled content and how the content was screened to avoid hazards. Walter Currin, Associate at SERA Architects, noted, "Working with HBN opened our eyes to the fact that recycled content is not always the healthier and more sustainable content. Specifically for this project, we learned that drywall with higher recycled content often has higher mercury emissions during drywall manufacturing." (Learn more on the Drywall Hazard Spectrum page.)

Figure 1. Hazard Spectrum Rankings of Materials Specified in the Project

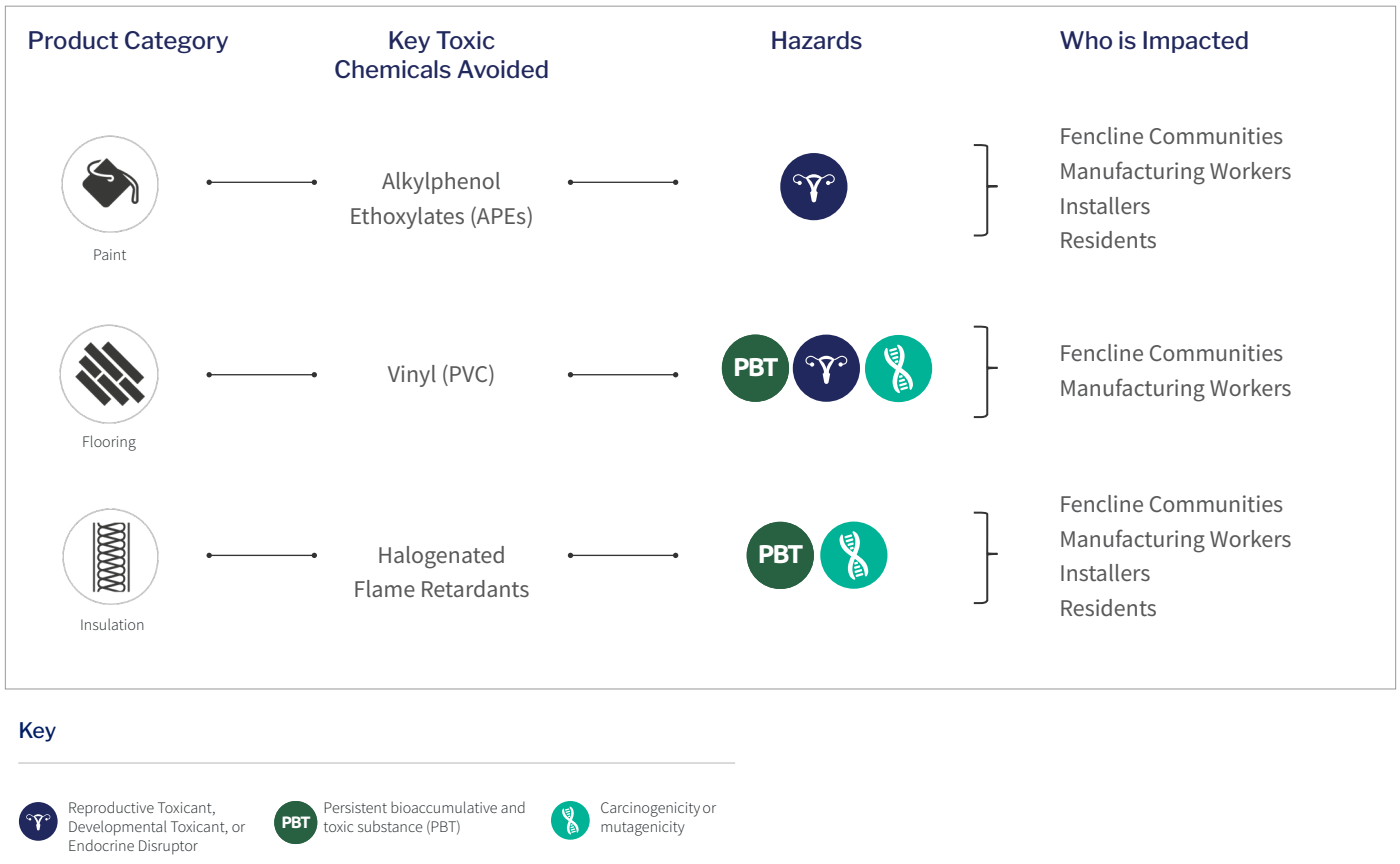


Healthier Materials and Environmental Justice

Although toxic chemicals affect all of us, they disproportionately impact the health of communities of color, low-income families, and children. In addition to occupant exposures during the use-phase, products and the chemicals used to make them can have impacts throughout the entire life cycle. Figure 2 highlights three of the highest priority chemicals avoided in this project through the selection of safer building product types, indicating their impact on human and environmental health.

For example, all paints specified for use in the units are APE-free, avoiding dozens of pounds of endocrine-disrupting chemicals (chemicals that interfere with how hormones work in the body). Avoiding APEs protects the health of the residents of the Magnolias, the manufacturers of the modular units, and the fenceline communities that surround manufacturing plants. Similarly, by choosing linoleum over vinyl (PVC) flooring, the project avoids highly toxic chemicals that are released during the manufacturing of PVC, which impact the health of workers in those factories and the communities nearby. It also avoids toxic pollution that may be generated when vinyl is disposed of. Lastly, halogenated flame retardants can be persistent and bioaccumulative toxicants (PBTs), meaning that they last for long periods of time, and they accumulate in your body; they can also be carcinogens, making their avoidance in insulation a high priority. Avoiding halogenated flame retardants supports the health of residents, installers, manufacturing workers, and fenceline communities.

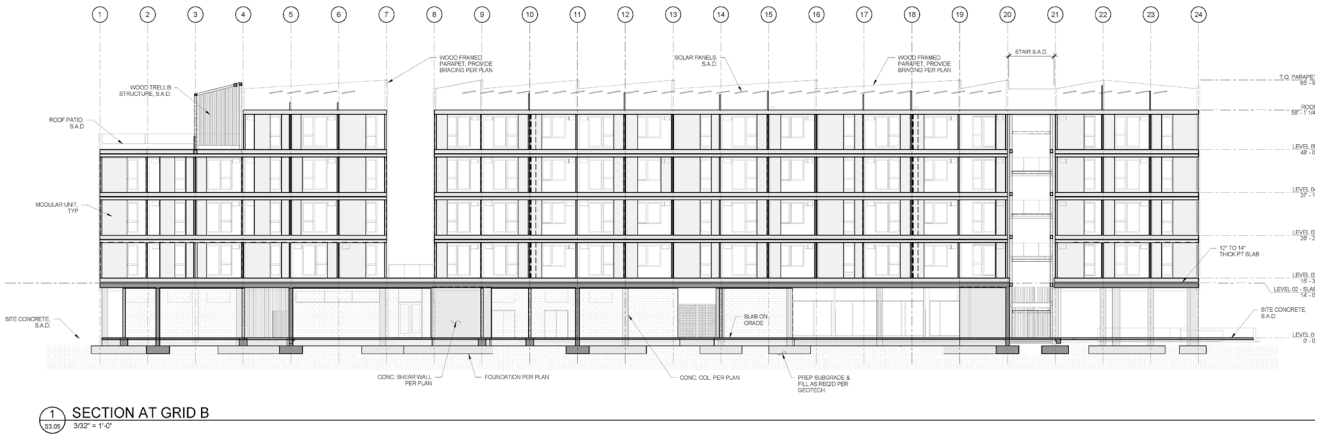
Figure 2. Key toxic chemicals avoided for paint, flooring, and insulation along with associated hazards and impacted groups



IN THEIR OWN WORDS | SERA'S CALL TO ACTION

"Material selection and specification is typically driven by short-term cost and familiarity, among other factors. Assessing, selecting, and convincing clients and builders to use healthier materials can be a lengthy and challenging process for design teams. In spite of this, design teams, owners, builders, and the general public are becoming more concerned about the health impacts of buildings and are beginning to understand the impacts of toxic and forever chemicals in our built environment. It is up to building professionals to make a commitment to learn about and implement many of the better alternatives that are emerging in the market and disrupt the status quo. Interrogating materials while managing a design can be unfamiliar and hard-work for design teams, but it is essential that we demand better to help push the industry forward and improve the health and longevity of the spaces we create. As you set out on your journey to choose safer materials, don't hold yourself to being perfect. Start with what you know best, and define your goals early, incrementally building on past experience and the learnings of others. Every project will have a different path to safer materials. Make the path your own, and stand by it."

SERA Architects, 2021



FOR MORE INFORMATION and WAYS TO ACT, VISIT: homefree.healthybuilding.net

Neither HBN nor its HomeFree program endorses or certifies products. Products in this case study are included for informational purposes, and demonstrate choices made by HomeFree users based on multiple factors including cost and availability, utilizing HomeFree guidance to make healthier material choices within project constraints.