

First Community Housing

Innovative Practices for Healthier Homes

A Case Study



Acknowledgments

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Housing Choices Coalition
OJK Architecture and Planning

For a full list of contributors please refer to page 45.
Without their generous contribution this work would
not be possible. Many thanks.

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This research is part of the Healthy Affordable
Materials Project funded by a grant from The JPB
Foundation

This study was completed in July 2016



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Innovative Practices for Healthier Homes
A Case Study

San Jose, CA

Healthy Materials Lab
Parsons School of Design



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1. INTRODUCTION

1a. Case Study Methodology

This report is one of a series of five case studies undertaken by Parsons Healthy Materials Lab to record systems of processes and decision-making that go into the building of new affordable housing developments across the United States.

The team examines developments that incorporate healthier building products and developers that have a stated mission to advocate for and transform standard building practices within the affordable housing industry.

The case study approach is based on a systems thinking methodology that interrogates the quantitative and qualitative factors that determine key decision-making factors in the affordable housing sector. The reports examine and identify the important decision making relationships that exist within these systems to specifically identify how, why and when building product decisions are made. The case studies will create a current baseline of best practices for healthier buildings within the affordable housing industry. Understanding the various construction visions adopted by affordable housing developers allows us to catalogue the approaches that are characteristic of this sector.

The case studies have an intentional regional distribution. By understanding the variation of affordable housing across the US, we are able to identify key regional drivers and obstacles in the process of healthier construction. In particular, we explore healthy building product selection, procurement and installation processes.

A systems approach highlights the challenges, drawbacks and compromises that take place when specifying and installing building products. This approach enables a critical analysis of the current processes of funding, design and construction in place within the affordable housing sector. Ultimately, such research has the potential to impact the overall housing sector by demonstrating the health benefits for residents, staff and visitors associated with using healthier products, creating more demand for these products.

Finally, case studies also enable an examination of the existing benchmarks and certifications that exist in the industry, such as the Living Building Challenge, LEED, Enterprise Green Communities Criteria, Delos® Well Build, and state policies that promote better building practices. Positioning these tools within the context of affordability permits an analysis of their accessibility, implementability and replicability.

Case study analysis brings together both quantitative and qualitative research to draw conclusions, allowing a nuanced and in depth analysis of particular situations. We adopted research methods to capture the range of key factors including stakeholder interviews, videography, photography, analytical mapping and diagramming, media coverage, stakeholder analysis and a review of current census and other data sources.

The results of these studies reveal the innovative approaches that developer teams have utilized for achieving healthier, affordable housing. Additionally the results provide a list of existing healthier and affordable building products that can be broadly shared. This list will contribute to the making of a library of better building products to be showcased in a number of contexts, including the Donghia *healthier* Materials Library at Parsons School of Design, The New School. The case studies have also identified a number of notable affordable building products worthy of analysis. Finally, other evaluation tools used by designers nationwide can be collected and shared to ease the specification process and to continue paving the road to innovation through collaborative practices.

Healthier material
used:

Linoleum flooring
Low VOC paint

Cover: Cedar Facade of 1585
Studios, Mountain View.
P4: Green roof of Casa Feliz,
San Jose.
Left: Interior floor of 1585
Studios, Mountain View.



Left: Green roof with local wild flowers, Fourth Street Apartments, San Jose

Research demonstrates that substantial human health risks can result from exposure to toxic chemicals present in exterior and interior constructed environments. These health risks can include increased cases of asthma, cancer and developmental and reproductive health issues. The health risks are particularly high for children, pregnant women and people living in poverty. The research in this case study focuses on the interior environment within affordable housing developments. Residents and building occupants in the United States spend significant amounts of time indoors, and are therefore vulnerable to the health hazards posed by building products used in interior environments. Toxic chemicals are used in building products for a number of reasons including performance enhancement, maintenance, and cost.¹ The regulation of chemical use in building products is within the purview of the Toxic Substances Control Act, which has been largely ineffective in chemical oversight.² As a result, many typical interior building products may result in unintended chemical exposure for building occupants.³ The challenge for all of us working in the affordable housing sector is finding healthier, affordable building product alternatives.

Other building market sectors have larger budgets, allowing for the procurement of healthier products that are often associated with high premiums. The affordable housing sector, on the other hand, is subject to restricted budgets that often results in the installation of inexpensive construction products that can contain toxic chemicals. Additionally, poor and working class populations often work in or live near manufacturing facilities, and are therefore disproportionately exposed to environmental pollutants disposed from or emitted through the manufacturing process. As a result, low

¹ As noted by researchers in the environmental health field in the “Pilot Study of Urinary Biomarkers of Phytoestrogens, Phthalates, and Phenols in Girls” “Effects of hormonally active environmental agents on early child development have been of concern, as knowledge has become available about their biological activity and about effects in humans that might arise from exposure to phthalate are of concern” (Wolff MS. et al. 2014).

² The Toxic Substances Control Act of 1976 (TSCA) is the only U.S. law regulating toxic chemicals. 84,000 chemicals are in the current EPA inventory, 62,000 of existing chemicals were “grandfathered” in 1976, under the assumption that they were safe unless proven otherwise. Only 250 chemical have been required to be tested, and only 5 chemicals have been partially restricted. https://en.wikipedia.org/wiki/Toxic_Substances_Control_Act_of_1976

³ “75 substances linked to asthma are found in paints and adhesives — two products found in most typical indoor environments” (Perkins and Will, 2011).

income populations may experience the negative impact of chemical exposure in toxic building products throughout the entire product supply chain. Employees of manufacturing facilities, contractors and construction workers installing products on site, and apartment residents occupying in interior spaces all have contact with building products and the hazardous toxics they contain at different points in the supply chain.

Affordable housing development is situated within a complex system and must take into account (a) policies, funding and planning process (b) varying industry practices, from manufacturing, design, product specification and procurement, and construction, and (c) human health, including access to systems of education, employment, transportation, and health services, as well as post occupancy practices. Though research into these systems was not within the scope of this study, each of these factors provides an important context for the impact of product selection.

This case study research provides an example of current best building practices, including healthier product selection within the affordable housing industry. The intention of the reports is to share a range of resources that will support the transformation of construction practices in the affordable housing sector to create healthier housing for all people.

Our case study research will be disseminated through various channels, including written reports, short films and animations. The aim is to target a wide audience by communicating difficult and complex topics in a widely accessible manner. These reports and videos will be available on an ongoing basis.

This case study was initiated by Healthy Materials Lab in collaboration with First Community Housing, OJK Architects and Housing Choices Coalition in San Jose in November 2015. Each stakeholder provided critical information about the project during in person interviews with follow-up phone conversations and emails. Without their cooperation and input this case study would not be possible.

This study is supported by a grant from The JPB Foundation and is part of the Healthy Affordable Materials Project.

INTRODUCTION

FIRST COMMUNITY HOUSING

1b. Why First Community Housing?

First Community Housing (FCH) is an award-winning, nonprofit, Public Benefit Housing Development Corporation, located in San Jose, California. Since 1986, FCH has created housing for more than 3,200 low-income residents in over 1,380 units in 19 affordable rental housing developments throughout the San Francisco Bay region. The low-income populations served include families, senior citizens, formerly homeless, and special needs populations including chronically ill and developmentally disabled adults.

The mission of FCH is to provide quality and healthy environments for its residents. Dedication to this mission is apparent throughout the design, construction, leasing, and long term maintenance. “There is a need for everyone to have a place in the community”, explains Geoffrey Morgan, FCH President and CEO. This inclusive vision is further complemented by the design of each development to enhance and work in harmony with its unique neighborhood, and through each developments’ accessibility to all residents.

FCH applies an “integrated design” process from the earliest stages of a project. Members from the design teams, alongside the building management team and contractor, are involved in the design and procurement process to ensure collaborative and thoughtful development throughout. From the time of land acquisition, FCH engages with city officials and their partners, including architects, general contractors, and sustainability advisors to ensure the design promotes sustainability and health for the builders, residents and staff. Specific consideration is given to choosing less toxic products that can be sustainably recycled. Many partnerships have developed over the years. For example, FCH has worked with OJK Architects for over 21 years on many of their projects. These long term partners are exemplary of what Morgan describes as “the informed decision makers who break down the silos between housing and healthcare”(Geoff Morgan, 2015).

Over the last few decades, FCH has been developing a baseline approach for building healthier, more sustainable buildings. An important component of the approach is a long standing product list that guides specification for each project. This facilitates the procurement process, while reducing the cost of research and the risk of testing new materials. FCH also continues to learn from their design successes or

challenges through long-term active post occupancy work. Their in-house management leaders, namely the Sustainable Facilities Manager and the Sustainable Site Manager, train the building managers to incorporate healthier products in their practice. They also offer workshops with residents on how to use affordable and healthier products in their households. This ongoing relationship enables a feedback loop to learn what materials or spaces are working better than others, and informs future projects. It also ensures that buildings work efficiently, ultimately creating savings for FCH in maintenance and energy costs down the line.

FCH has been dedicated to building healthier buildings for decades. FCH is not a certification seeking organization, but has followed green practices “before green was cool” (Geoff Morgan, 2015). Their holistic approach and belief that “housing is healthcare” encourages developers to consider factors outside the certification standards by providing other services that encourage residents to be healthy, mobile and engaged within their city. For example, each resident living in any FCH property receives a free EcoPass which allows unlimited use of the network of VTA Bus, Light Rail and Express Bus service throughout San Jose, ensuring residents have convenient access to the city. In recognition of the importance of proximity to transportation and access to services, FCH’s properties are built within close proximity to public transportation and they are the largest private purchaser of EcoPasses in the VTA system

Although there is now an increased understanding that housing can be integrated with other services, such as healthcare, transit, and education, FCH has long practiced this integrated design approach. For example, a 2016 study conducted by Center for Outcomes Research & Education (CORE), with support from Enterprise Community Partners, focused on access to healthcare and explored how “we live in a profoundly interconnected world. In the emerging era of accountable care, health care systems and affordable housing providers may want to mutually consider the potential benefits of stronger cross-sector collaboration” (Saul, Amanda et al., 2016). FCH demonstrates their commitment to bettering lives through integrating their housing with services. Their vision that “housing is healthcare” extends to materials selection, ensuring access to healthy living options, as well as healthier living environments. All of these factors have led to positive effects for their residents.

The Healthy Affordable Materials Project case study focuses on three FCH developments, all of which are at different design or development stages: Mountain View Studios (opened June 2014), Japantown (opened December 2015) and Orchard Gardens (construction began 2016). Together these projects demonstrate FCH’s innovative process, the various types of housing and services provided, and a spectrum of materials and interior products installed.

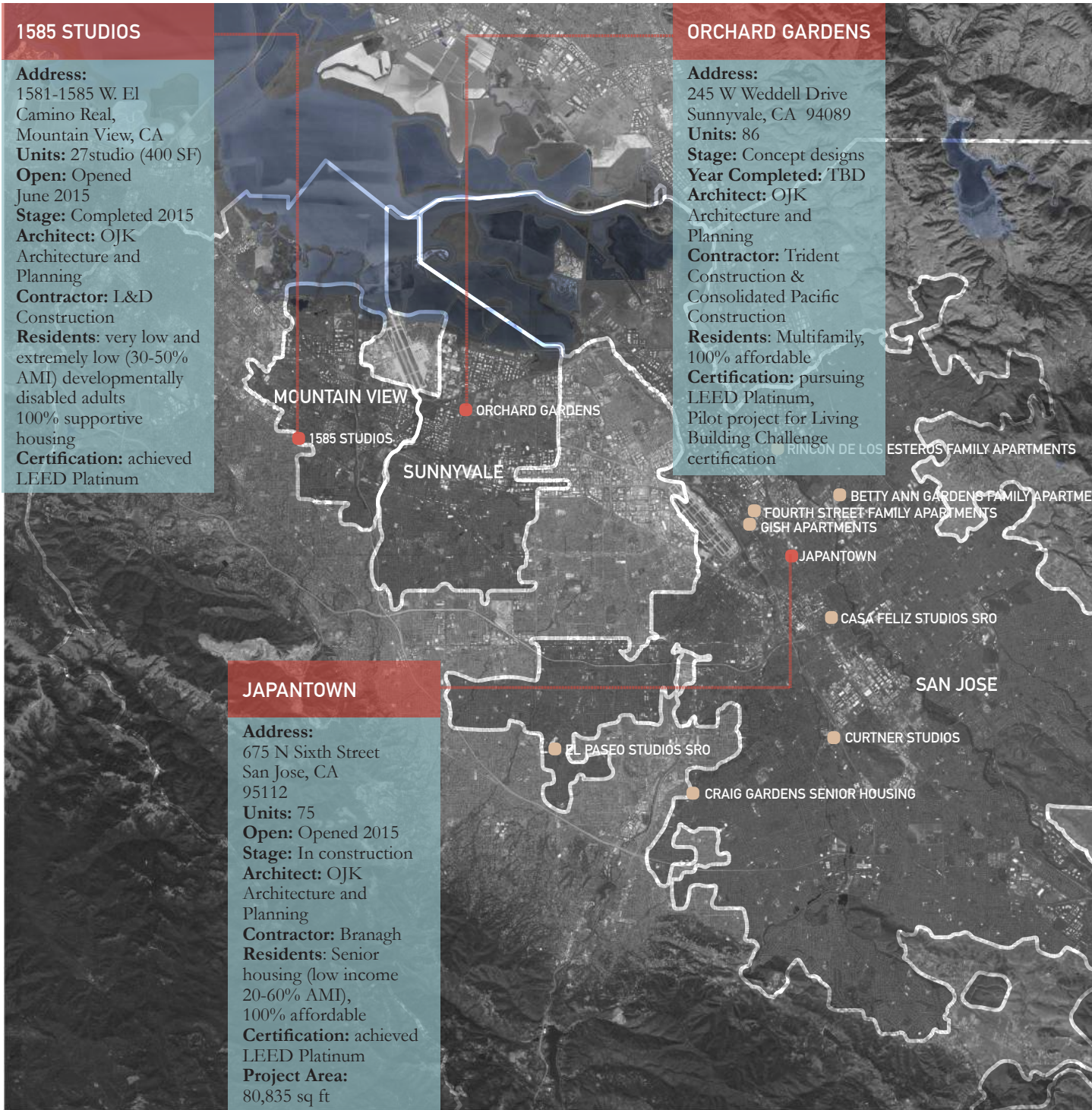
Healthier material used:

Glu-Lam structure,
Teak garden furniture,
Steel railings

Left: Internal courtyard of Casa Feliz, San Jose.

2. GENERAL OVERVIEW

CASE STUDY SITES



Orchard Gardens



Japantown



Photo Credit: Bernard Andre

1585 Studios



Photo Credit: Bernard Andre

LESSONS LEARNED

Integrated design process + Integrated developments

- FCH communicates expectations with project partners at the beginning of each project to ensure their mission is understood and goals are aligned from inception to facilitate communication and cooperation throughout development.
- All stakeholders participate in the early stages of the process informing the design concept, energy and health targets, population to be served, access to services, and future maintenance. This moves the responsibility of the developers beyond providing housing to producing an integrated support ecosystem for the tenants.
- The integrated design process benefits from reliable long-term partnerships, while also being flexible to allow for new partnerships. FCH often works with the same architects, contractors, vendors, community affiliate organizations and consultants for each of their housing developments.
- Over time, a feedback loop on design successes and challenges is created as part of the integrated design process as building managers report back to the sustainability manager who in turn participates and advises on the design process. This ensures a design evolution and refinement for new developments.

Baseline approach to health

- Through their developments FCH demonstrates that “housing is healthcare”. Their mission for sustainably built and operated housing drives their work and decisions with regards to product specification.
- The economic impact of healthier environments is experienced directly and indirectly through long-term savings on maintenance and energy bills, but also through cost savings to the public system, such as fewer visits to the emergency rooms, less wear and tear on the health care system, and fewer absences at work. In addition, better built environments can enhance overall economic productivity. Therefore, this mission contributes to both social and economic objectives.
- FCH selects their development sites with the intention of bringing residents closer to necessary services such as transportation, healthcare, education and support services for chronically ill and developmentally disabled residents. Access to these services ensures dignity and healthier living for residents.
- Practices in biophilia help inform FCH’s design. Recognizing the importance of connecting nature to construction, they incorporate natural elements in their developments when possible.

Innovative Procurement

- FCH has a procurement approach that reduces costs by specifying and buying in bulk products across their portfolio.
- Their relationship with vendors means that they are able to get the best price on products and can further bring cost down when buying in large quantity. Vendors also provide recommendations for new available products on the market, ensuring FCH is aware of green innovation in systems and materials available in the construction industry.
- From the beginning of the process, FCH considers a product’s entire life cycle. For example, during procurement, they ensure there is a plan for recycling products at the end of their life. This is often negotiated with suppliers.

Systems thinking approach

- FCH’s systems thinking approach to housing and health generates productive engagement with the surrounding communities and ensures stability for residents.
- FCH builds healthy environments through a holistic approach to designing sustainable buildings, avoiding toxic products, and engendering a sense of community through the provision of generous exterior spaces. Adherence to Transport Orientation Development (TOD) ensures residents have easy access to public transportation.
- Resident needs are understood at the pre-planning stages by collaborating with community organization affiliates, such as Housing Choices Coalition.
- Active community development programs are in place to engage residents and staff in sustainability initiatives and operations.

Challenging planning regulations creatively

- FCH studies planning and zoning codes in order to maximize usable space for residents to advocate for less parking and more housing units.
- FCH conducts research and parking studies that enables them to work with local officials to obtain parking variances.

Financing

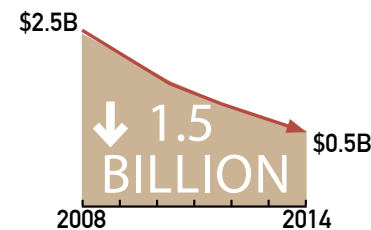
- FCH is currently dealing with a particularly volatile construction environment witnessed throughout California. This volatility is particularly high in San Jose due to the technology boom in Silicon Valley and an increasing demand for housing. Developers have experienced an annual increase in construction costs upwards of 18%.
- At the same time, FCH has weathered the dissolution of Redevelopment Agencies in California since 2010 and with it, large amounts of necessary local funding. This has influenced FCH in pursuing the highly competitive 9% Low Income Housing Tax Credit.
- Many of their projects are tailored to the financing available. For example, there is currently a focus on supportive housing and housing for extremely low income and homeless populations in San Jose, which means there is funding directed to addressing these needs. FCH is able to tailor their design and the materials to these projects securing financing needed to build in demand affordable housing.
- FCH often utilizes contingency funds later in the construction stage to cover the costs of additive alternates which include their ‘green wish list items’, such as photovoltaics. In order to prepare for this possibility, they ensure the structure for photovoltaics for example, is in place during construction even if funding is not available at the onset of the project.

Regional Regulatory Context

- In 1986, California passed Proposition 65, a regulation that requires the state to maintain and update a list of chemicals known to the state to cause cancer or reproductive toxicity, and requires businesses to declare when these chemicals are used in products. While Proposition 65 is a move towards transparency, it has not led to significant changes in construction. The list of healthier products available remains short and it appears little innovation has taken place to replace these chemicals.

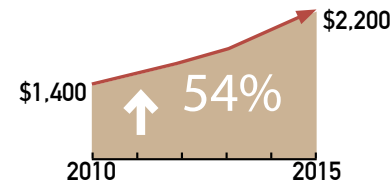
CONTEXT OF FIRST COMMUNITY HOUSING

Source: California Housing Partnership Corporation in "How California's Housing Market is Failing to Meet the Needs of Low Income Families" 2014.



State and Federal investment in affordable housing dropped every year from 2008 to 2014

Source: SAN JOSE, Calif. (KTVU) in "San Jose officials search for housing crisis solutions" 2015.



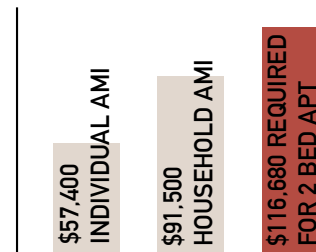
Average rent increased 54% since 2010

Source: Economic Roundtable in "Home Not Found The Cost Of Homelessness In Silicon Valley" 2015.



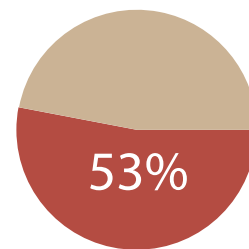
104,206 person experienced homelessness between 2007 and 2012. That equals to 5% of the population.

Source: SILICON VALLEY COMPETITIVENESS AND INNOVATION PROJECT in "Less than 25% of individual workers and only 40% of households in Silicon Valley can afford average-priced housing" 2015.



Both individual and household AMI are below the yearly income necessary to afford a 2 bedroom apartment.

Source: U.S. Census Bureau, Gross rent as a percentage of household income (GRPI), 2013.



53% of rental households spend more that 30% of their income on rent.

3a. The context of First Community Housing: Silicon Valley's affordable housing crisis

The housing crisis is well documented and today resonates throughout the United States. The South Bay of California is one of the most seriously affected areas in the country, where rents have increased upwards of 54% over the last five years. At the same time, wages in Santa Clara County have only risen 3.2% between 2012 and 2013 (Kelly, 2015). This growing gap between incomes and rents continues to apply financial pressure on some of the most vulnerable members of the community.

Considered the 'capital of Silicon Valley,' San Jose has seen increasing development spurred by its proximity to the headquarters of technology titans like Google (headquartered in Mountain View) and Apple (headquartered in Cupertino.) San Jose's Mercury News reported in December 2015 that both Google and Apple are beginning to acquire large sites in San Jose to expand their commercial facilities. For the Apple campus extension, "[u]p to 4.15 million square feet of offices and research space could be built on that site. That means potentially 20,000 Apple employees could work on the campus" (Avalos, 2015). While business booms, the housing market has not kept up with the increase in jobs. This represents the growing pressure of the technology industry and its job market on residents who do not earn comparable salaries. Within this already strained housing market, developers prioritize the

creation of market rate units. Without any regulation, the gap of affordability will grow wider, leaving the lowest-income families and individuals struggling to find housing.

The rental market in Silicon Valley is tight, with an estimated vacancy rate of 2.5% in 2014, according to HUD (U.S. Department of Housing and Urban Development, 2014). Rents were up 6.2% from 2013 while demand for rental units is almost twice as high as the planned construction accommodates. During a three-year forecast period, demand for rental units is expected to be 11,750 units, while units under construction will total 6,675 (U.S. Department of Housing and Urban Development, 2014). The present demand for housing, combined with future population growth of high earning professional earners, paints a grim picture of instability for those low income residents already burdened with high rents.

FCH has extensive experience in building affordable housing in San Jose since 1986. They are well aware of today's growing inequality and the effect this has on the local housing crisis throughout Santa Clara County. Geoff Morgan of FCH explains that "when you create 460,000 jobs in three years, but build 70,000 units of housing in three years, the rents go up and people will be displaced. That is just a given, it's basic real estate

San Francisco Chronicle

San Jose clears out the Jungle, but it won't end homelessness

December 7, 2014



Photo: Martin Jose Sanchez / Associated Press

Left: Demographic stats come from *US Census Bureau* (2015) and *Mercury News* - See references
Right: *San Francisco Chronicle* article on homelessness crisis in San Jose

economics. And why is that happening? Part of it is a measure of our success. Silicon Valley is a place where people get things done. It's an exciting place to be. You walk through a place like San Jose, it's very vibrant”(Geoff Morgan, 2015).

While job growth can be positive for a city, it also raises issues such as providing housing and services for an expanding population while continuing to address the needs of long term residents. At this time of growth, however, plans for housing solutions are not keeping up with the expansion of commercial sites. Local governments are not responding to this need for multiple reasons, including pressure to provide necessary services for residents. Geoff Morgan explains that “[h]ousing is often seen by agencies as a burden. They see it as a thing where you have to add services to take care of all these other folks. The jobs are seen as something that helps them get revenue in from sales tax.” (Geoff Morgan, 2015)

Construction Cost in California

One reason the creation of housing has not kept pace with a growing population is the rising costs of construction. These costs in California are amongst the highest in the United States. This has a tremendous impact on the economic and social influence of residents, particularly low-income households who struggle nationwide to afford increasing rents. High construction costs mean higher rents, which can lead to housing insecurity and frequent dislocation for low-income families. This in turn interferes with children’s education, steady employment, and access to stable health care.

The implications of rising construction costs have become an important public policy issue. According to the Release of the “2014 California Affordable Housing Cost Study” presented by a collaboration of California state offices, costs are impacted by multifaceted factors along with the influence of all stakeholders including local communities, developers, state and federal agencies. A major factor that determines cost is location. According to the report, construction costs in Santa Clara County are the 4th highest amongst 11 California regions. In 2012, the average cost per unit of affordable housing was \$326,000. (The California Department of Housing and Community Development, 2014, 31)



Left: homeless crisis in San Jose.
Below: Adobe headquarters, San Jose



Housing Climate, Growing Inequality + Homelessness in San Jose

As the tech industry attracts more people to move to Silicon Valley, pressure is placed on already limited housing stock. According to the 2013 US Census, 52.6% of rents are over \$1500, with around 25% over \$2000 in San Jose (Census Bureau, 2009-2013). Further, over 50% of homeowners pay more than 30% of their gross income on rent (Census Bureau, 2015). The Department of Housing and Urban Development (HUD) defines “affordability”as paying no more than 30% of household income on housing. The fact that more than half of San Jose’s population is paying more than a third of their income on housing highlights how precarious housing is throughout the city and the tremendous need for more affordable housing to lessen the burden.

Endemic in many cities throughout the US, homelessness in San Jose is alarmingly high. Homelessness is a major issue throughout California with almost one quarter of the nation’s homeless people living in California. (Calefati, 2016) Santa Clara County reports a particularly high rate of homelessness. “On any given night in San Jose, California, there are around 4,150 people sleeping on the streets, in parks, inside vehicles, or in tents beneath overpasses and along creeks. This accounts for one of the largest unsheltered homeless populations per capita of any US city.” (Noll, 2015)

Silicon Valley is considered the hub of innovation and creativity in the United States (and perhaps throughout the world) but the industry at the forefront of this innovation is also causing crushing pressure on the local population, particularly low income earners who are increasingly vulnerable to displacement and homelessness. Geoff Morgan explains: “We are in a great place of opportunity and in the midst of all this opportunity we walk through the streets and can’t go a single block without seeing a homeless person on the corner. It’s a place that has really shaped the world in terms of holding a phone in your hand that tells you more information than the library of congress. Creating all kinds of amazing interventions that have had tremendous impacts on the globe and in the midst of all this work, I think there are some people who have been marginalized” (Geoff Morgan, 2015).

Driven from Silicon Valley’s ‘Jungle,’ homeless face limited options

Barbara Grady
Thursday, 4 Dec 2014 | 8:24 PM ET
The New York Times



Getty Images

Partnership with Housing Choices Coalition

FCH is working to address the growing pressure of housing for low income communities in San Jose. As previously mentioned in this report, FCH has formed a partnership with Housing Choices Coalition (HCC), a non profit group providing resident services to developmentally disabled adults live independently, to help address needs. HCC partners with their communities in affordable housing developments to advocate for permanent affordable housing to be created and set aside for special needs residents. They then assist residents in researching and applying for housing. HCC works closely with their residents and families to facilitate communication with property managers to ensure they settle in and remain in their homes. They work with 9,000 people in Santa Clara, and 5,000 clients in 3 other counties.

Their partnership with FCH has formed over time to become a strong collaborative. Jan Stokley, Executive Director of HCC, attributes this to the fact that their missions are aligned. HCC also works with the families of the residents they aim to serve in order to understand their needs in a holistic way. Traditionally, primary care for disabled adults is provided by family members, for whom long term care is a concern as they grow older. It is therefore a major concern for this community that housing is created to serve their children going into the future.

A main challenge HCC faces is advocating for housing to be created in the northern part of Santa Clara County—neighborhoods such as Palo Alto, Sunnyvale, and Mountain View, where land prices are very high. At the same time, families of special needs adults who live in these areas want to see the creation of supportive affordable housing so that their family members can stay close to community ties. To address these needs, HCC mobilized some of these families in Sunnyvale a few years ago to participate in talks about housing needs with local council members. Out of this work, FCH and the city were able to talk about the future development of Orchard Gardens and how to incorporate developmentally disabled residents’ needs. In this way the parents and community members are a powerful advocacy group, whose capacity is built through partnerships with HCC and FCH.

3b. Using Federal and State funding for innovation in the affordable housing sector

Obstacles faced by FCH in financing developments

Like many developers across the country, FCH faces multiple obstacles in securing funding for their developments, particularly since the 2008 recession. Already a complex process, securing financing for affordable housing construction is becoming increasingly challenging as federal funding has been pulled from affordable housing initiatives, a process that has contributed to the affordable housing crisis experienced throughout California. This has led to more complicated, long term planning for some developers. In the case of FCH, they have seen projects that traditionally take around four years to complete now taking up to ten years. Furthermore, vacant properties and land incur long term costs for their owners rather than generating revenue through rents.

A major political change to affect affordable housing financing in California was the dissolution of Redevelopment Agencies (RDAs), which are local agencies that direct a percentage of an area’s property tax towards urban renewal projects. RDA’s served as the second largest source of funding for affordable housing development, with up to 12% of property taxes going towards RDAs. (Ciria-Cruz, 2012)

After the 2008 recession, the California Supreme Court ruled that control of property tax earnings should return to local governments, in part so they could cover bond payments and other obligations. This ultimately led to decreased available funding for affordable housing. In California, more than 400 RDAs were dissolved.

Without this funding, affordable housing developments in the pipeline lost financing and developers had to consider new strategies for putting together financing for future projects. According to a 2014 report released by HUD: “A total of 1,096 RDA units were planned for construction in the city of San Jose during 2013 and 2014, however, most of these units are not expected to receive funding, according to data from Housing California and the California Housing Consortium” (Blount et al., 2014). The overall effect of the dissolution of RDAs in California is expected to further reduce affordable housing construction, adding to an already beleaguered issue throughout the state and further widening the gap between need for housing and units being created.

In the face of reduced funding streams, affordable housing developers are obliged to develop new strategies to finance their projects. The greatly increased lag in development time means further burden on an already strained construction process.

Left: *The New York Times* article on homelessness crisis in San Jose

Funding for Innovation

FCH has faced several obstacles in the last decade that have influenced how they put together their financial structures before construction, such as high construction costs and policy changes like the dissolution of Redevelopment Agencies throughout California. They also seek a balance between fulfilling their mission of building healthy, green, and attractive construction while ensuring residents receive the best services. This is all within the context of cost containment, and a pressure to build in the most cost effective way from those allocating tax credits. This practice does not leave much margin for incorporating healthier products.

FCH responds to these pressures by being creative and adaptable in how they put together funding for projects. In addition to usual debt financing, FCH seeks public funds from both the federal and local governments. The usual sources of these funds include: tax credits, tax exempt bonds, gap funding from Affordable Housing Program (AHP), HOME Investment Partnerships Program, California Housing Rehabilitation Program - Rental (CHRP-R), and federal grants from Department of Housing and Urban Development (HUD).

FCH applies for funding through the Low Income Housing Tax Credits (LIHTC), which is a federal plan for affordable housing development that incentivizes the private sector to invest in housing for low-income populations. Applying for LIHTC is a highly competitive process. Developers are required to first apply for the Qualified Allocation Plan (QAP), a list of state established requirements and criteria that address specific local needs for affordable housing. In order to score higher points, a developer must show they have local support in terms of funding from their local government and that they are addressing local needs. Therefore, many of their projects are tailored to the funding available.

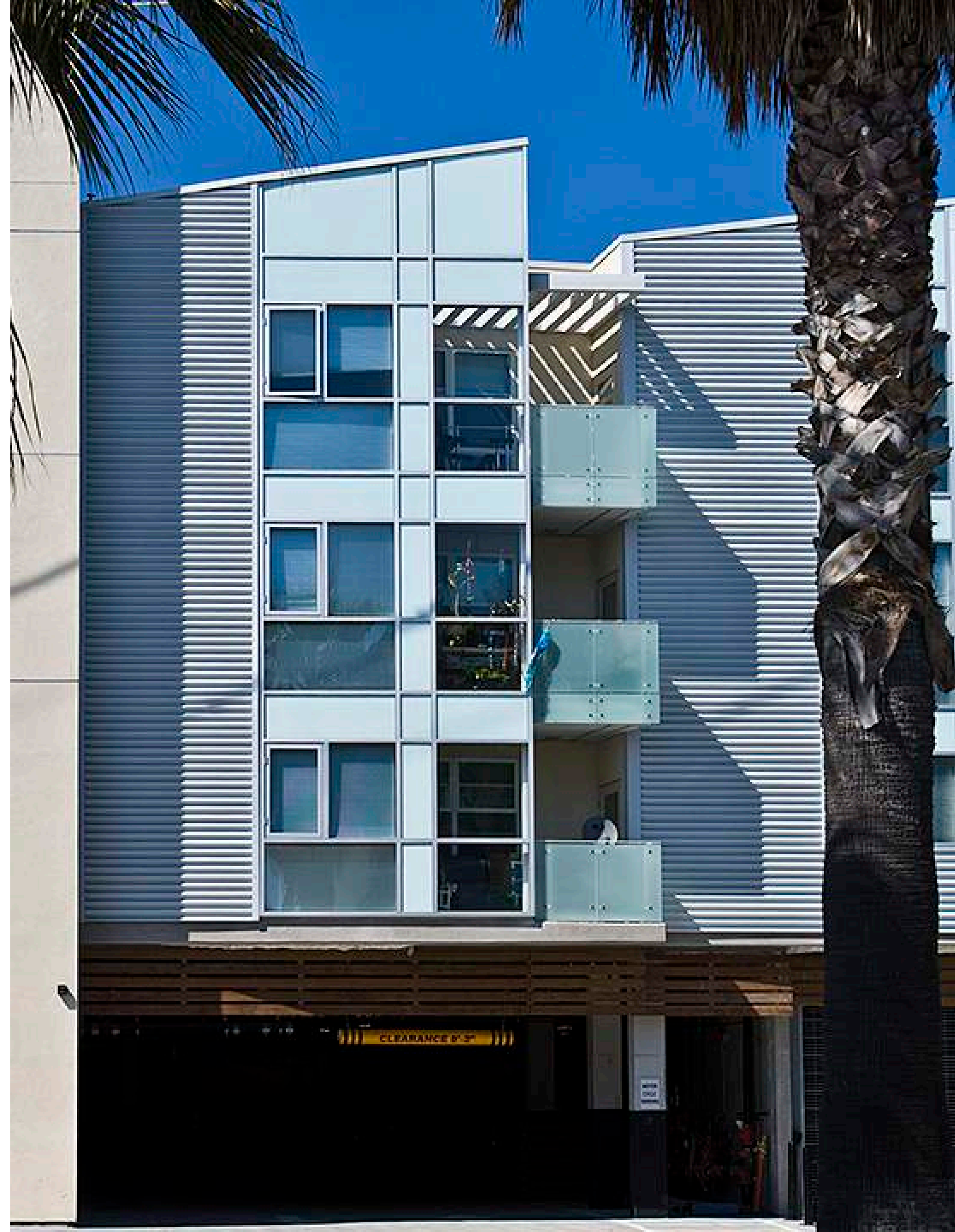
For example, there is a need for supportive housing and housing for the extremely low income and homeless in San Jose, which means there is funding available for projects addressing these needs. FCH is able to tailor their design and the materials to these projects in order to secure financing to build much needed affordable housing throughout the county. For the three projects—Mountain View, Japantown, and Orchard Gardens—FCH sought the 9% LIHTC which raises the most equity from the federal program.

FCH considers 'green materials' as integral to their design and do not consider cutting costs when it comes to certain material selection. FCH builds with the intention of owning their buildings in perpetuity and they recognize that by using better materials at construction, they are both fulfilling their mission as well as saving future maintenance costs in the long term. At the same time, to be successful at being awarded the 9% LIHTC, FCH must show that they can be cost efficient, which leaves little margin for higher cost materials. To address this FCH often utilizes their contingency funds later in the construction stage that allows for an alternate additive.

Healthier material used:

Laminated glass balconies, Standing seam metal cladding

Right: Gish Apartments has won many awards including the 2009 AIA COTE Award, top ten National Green Projects. Photo credit: Bernard Andre



4. FORMING LONG-TERM PARTNERSHIPS AND BUILDING TRUST

4a. Integrated Design Approach: The Design Team

FCH has adopted an integrated design approach for the development of their projects. This approach brings together experts that typically work independently of one another, in siloed fields of design, construction and maintenance. FCH explicitly communicates its mission to partners at the beginning of each project to ensure their goals are aligned from inception in order to facilitate communication and cooperation throughout development.

An initial meeting is held at the onset of a project to involve partners, including staff, external consultants, and services providers, at all stages of the process from land acquisition to financing, to design and construction, to the management of its operation. This way of working builds long term partnerships, while building in flexibility to allow for new partners to be incorporated in the design and construction process. These relationships, many of which are strengthened through time and experience, exist between investors, architects, engineers, general contractors, vendors, sustainability consultants and community organization affiliates. These partners are aligned with FCH's mission and dedication to building quality, environmentally and socially sustainable, affordable housing for residents of Santa Clara County.

Although FCH has exemplified the benefits of building ongoing relationships with stakeholders, it is not common practice in housing construction. Rather, the standard is often to work with new architects and contractors on each project, and to seek out the most economical responses from stakeholders who have not been involved in the early conception of the project. The success of FCH's strengthened partnerships allows future project teams the advantage of calling upon former experience in achieving stated goals.

FCH's integrated process also signifies an understanding of the importance of all roles in both the development process and the successful delivery of a project. This flattens the hierarchy between roles that is common in the industry, and encourages a transparent and collaborative work environment. This is critical for pushing innovation in the affordable housing sector, particularly with regards to constructing and maintaining healthier buildings. FCH further expands on this integrative work model by considering the building's entire lifecycle management at the very early stages of the project. The organization has an internal Sustainable

“For us, sustainability means a lot of collaboration, and it also means looking beyond the actual projects. So when you consider sustainability and you look at a material, if you look at vinyl for example, you have to think about the people who are making it, the whole process and their health. If you select linoleum instead of vinyl flooring for example, it is a much healthier process and a much healthier product all throughout the cycle.”

Marty Keller, 2015

Right: Courtyard of Orchard Gardens, Sunnyvale

Orchard Gardens

Facilities Manager and Sustainable Communities Coordinator whose roles are to ensure the healthy maintenance of the properties by working directly with hired property managers and residents. Their extensive experience with building products and designs enables them to advise on durability and maintenance. This feedback loop is central to the functioning of an integrated design process and will be further discussed in this report.

Everyone who comes into contact with the products, from the worker manufacturing the products, to the construction worker installing them, to the residents living with them, and the maintenance team ensuring upkeep—will benefit from the use of healthier, less toxic building products. These systems influence and work together.

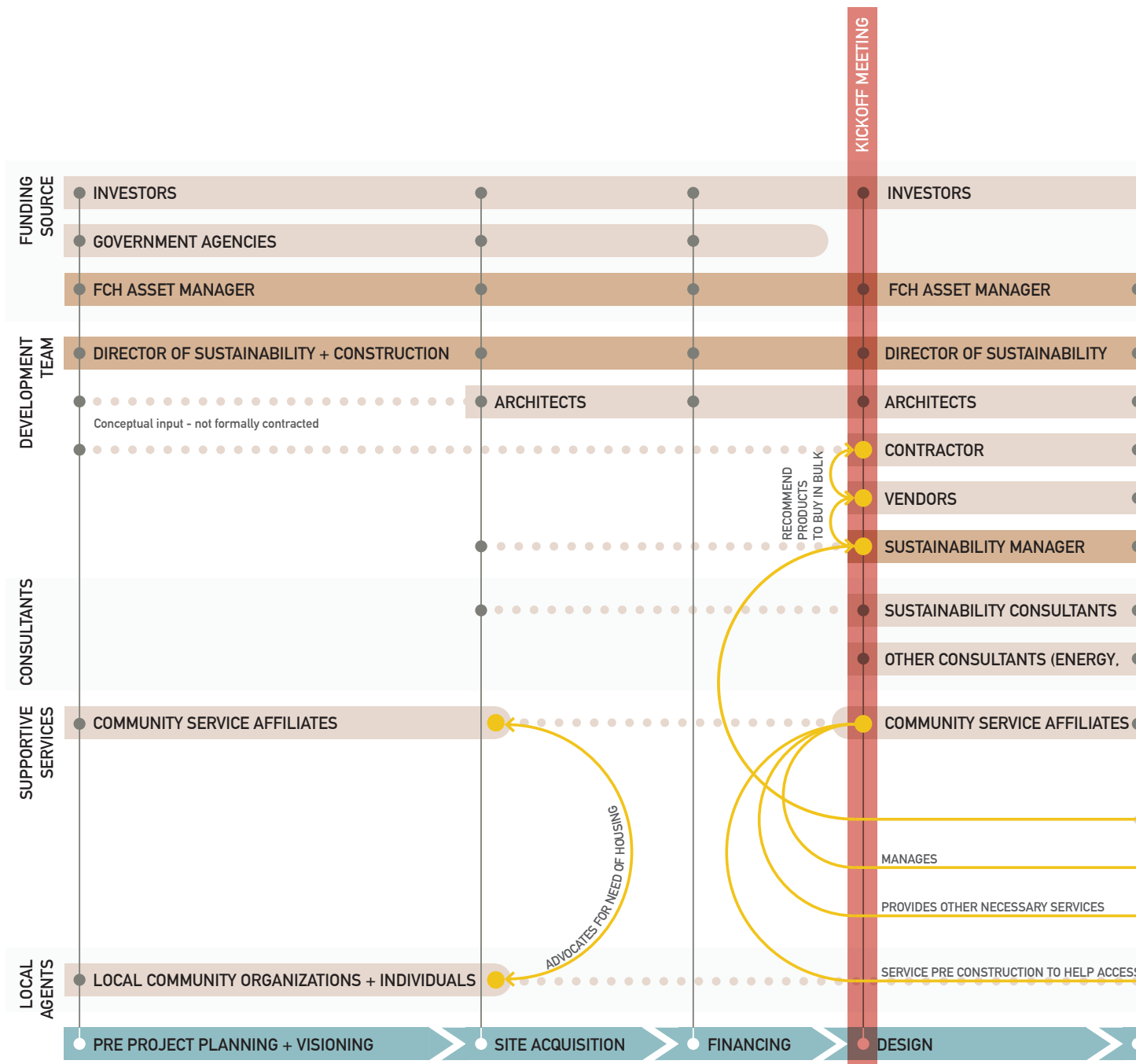
The three developments investigated in this study are all at different stages of the development process, from financing through post occupancy. Together they illustrate the workings of FCH's forward thinking practice.

Orchard Gardens, located in Sunnyvale, CA, is at the early stages of concept design and is seeking financing. Numerous meetings have been held between stakeholders to develop the best approach to develop the site. Orchard Gardens is unusual in that it already accommodates two housing blocks. One block is currently going through re-syndication to secure project funding and will be renovated as part of the first phase. The other requires full demolition and will be a new construction project. OJK Architects, who have worked on 9 projects over 20 years with FCH, have established preliminary planning drawings and devised a phasing strategy.

Phasing has become a core design aspect of the proposal as FCH has to work with the communities currently living on the site and minimize disruption while carrying the financial implications of temporarily relocating the families, as required by California law. FCH has worked closely with current residents of the building to be renovated to evaluate priorities of the renovation works. The focus groups and design charrettes carried out by FCH led to the prioritization of the replacement of windows. These participatory design efforts are rare in the industry and put the residents at the forefront of key decisions impacting their environment and life, enabling them to also become part of the integrated design process. FCH is working in partnership with The City of



INTEGRATED DESIGN PROCESS



Sunnyvale Planning and Community Development Division, as well as with Housing Choices Coalition and the developmentally disabled community members that they serve. Additionally, when the community design meetings begin, existing residents of Orchard Gardens and neighborhood residents will be included.

In 2016, FCH received \$8 million in funds from the city of San Jose, a commitment that can be leveraged for the required state and federal funding and to underwrite a mortgage.

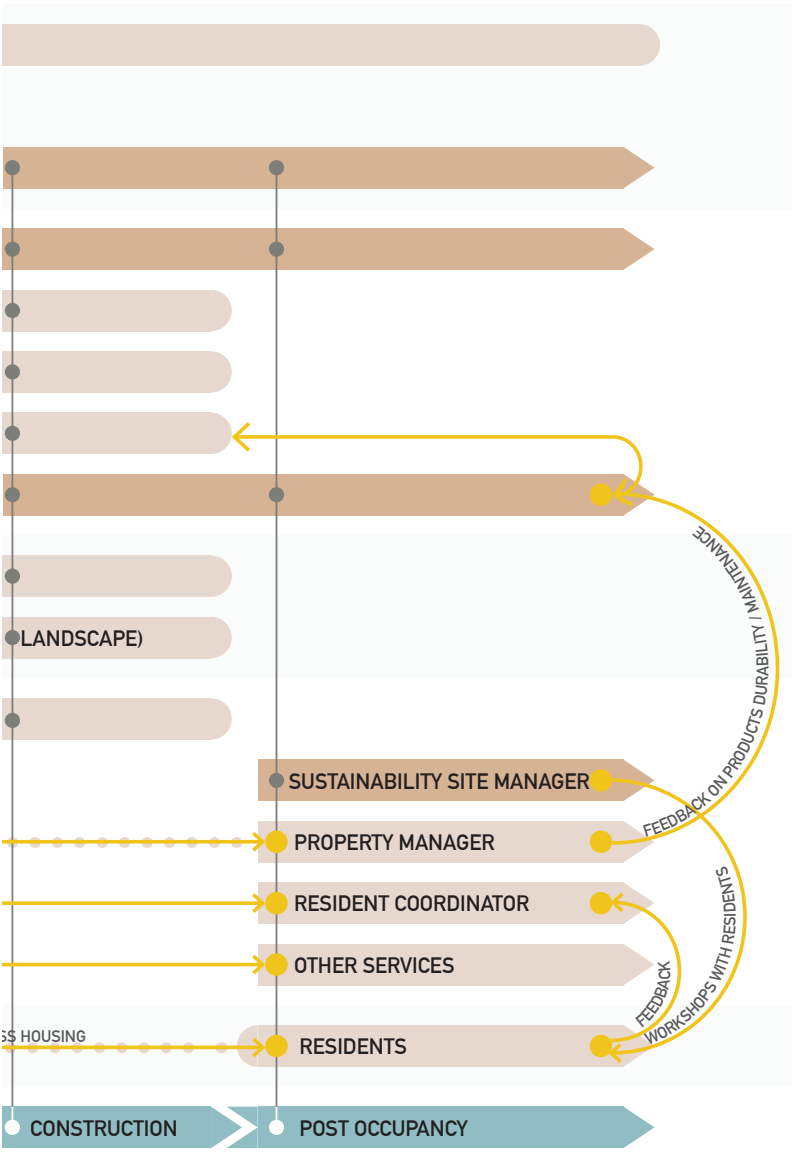
Japantown

Completed in December 2015, Japantown Senior Apartments is a 75-unit apartment development on an infill site in the Japantown neighborhood of San Jose. This development is home to low-income seniors earning 30-60% of the area median income.

Branagh Construction, the general contractor on the project, has worked with FCH on several past projects. This partnership exemplifies an important benefit of long term alliances since the contracting firm has already been involved in FCH projects when it is time for the product selection stage, and are therefore able to advise on the financial feasibility of such choices. As a result of this streamlined process, products can be both specified and installed during construction. As Andrew Whiting, Project Manager at OJK Architects, the designers of the development, states:

“It’s wonderful for us as architects to not have an adversarial relationship with the general contractors, where we are constantly contesting costs and trying to catch [substitutions] that have been installed. Since they have worked on the last half dozen buildings together, the general contractor already knows what FCH wants. They automatically meet the project’s needs, so if we miss anything as the architects, we know that the general contractor will catch it.” (Andrew Whiting, 2015)

The collaboration that exists between the developer, architect, and contractor is an important factor that ensures the mission of FCH is consistent throughout the duration of the project, from product selection to installation. Whiting adds: “[t]his is a design and build process where we get access to all of the [contractor] substitutions from those early planning stages to put together a design that is will be consistent cost wise throughout the length of the project. The general





contractor is instrumental in this being a success” (Andrew Whiting, 2015).

An example of the cost saving benefits of an integrative process in Japantown comes from the design team’s experimentation with a new design typology, which included open one bedroom and studio apartments. By using a design that avoided the need for doors to separate rooms or cupboards, the interior spaces are enhanced with more space, are more efficient to maneuver for its senior residents, and easier to keep clean. This simple design change, tailored specifically for the users, saved costs of interior doors that could then be invested in courtyard planters. FCH plans to assess successes and drawbacks from design decisions through ongoing post occupancy involvement and engagement. The results can then influence other developments.

The project was developed with the support of an Enterprise Rose Fellow, as well as the outreach of progressive standards such as the International Living Future Institute and Enterprise Green Communities Criteria, all which helped to inform quality and support the installation of sustainable products.

1585 Studios

Mountain View Studios was completed in June 2015 and consists of 27 studio units that provide permanent, affordable housing and independent living for low income, developmentally disabled adults (incomes between 30-50% of the area median income). For this project, FCH worked with Housing Choices Coalition (HCC), an organization that markets the property, supports future residents through the application and move-in process, and ensures the ongoing comfort of the tenants through contact with a site-based resident coordinator. The partnership is structured so that once HCC acquires funding for their services, FCH commits to providing long term units for people with developmental disabilities. Once again, this partnership is initiated at the very early stages of the project and informs design measures to support the services required to house this population, including offices and meeting spaces for service providers.

Healthier material used:
Cedar battens
Permeable hardscape surface,
Stainless steel railings

Jan Stokley from HCC affirms that, of their partnerships with affordable housing developers, the one with FCH is their strongest because HCC’s “mission is not an add on, it is really for [FCH] to serve all the aspects of the community and those most vulnerable members of the community is core to who they are and how they think about things. We do not have to go to the table to fight for them to include people with developmental disabilities, they look for opportunities because they want to be a vehicle for creating an inclusive community” (Jan Stokley, 2015).

The provision of such external services is core to the work of FCH, further demonstrating the systems thinking approach to delivering affordable housing. The developer considers not only the physical components of the development. Rather, they recognize that many other factors, such as access to employment and public transport, healthy maintenance of interiors, a sense of community, and on-site support and services are critical for long term success and health of residents. For example, in recognition that one of the biggest challenges for developmentally disabled individuals living independently for the first time is loneliness and isolation, HCC builds community connections by ensuring that residents are secure in their housing. They also help mitigate these specific risks by designing space to allow access to service providers, as well as space for building relationships with other residents.

Michael Santero, Asset Manager at FCH, reiterates that FCH’s work to facilitate service moves them far beyond what the typical affordable housing developer provides.

“As we are dealing with populations with greater needs, in order to keep people housed, we have had service coordinators that work with tenants who need help to match them to other services out in the field. As we have special needs, we need specialized service providers and formal MOUs [memorandum of understanding] with different service providers.” (Michael Santero, 2015)



The synergy that comes from bringing distinct stakeholders together who know the particular needs of the residents, namely the property managers, the design team, and service providers, at the beginning of the development process enables the project to respond to particular needs and functions holistically within its physical and social fabric. FCH works to continue making these collaborations richer, with the ambition to continually improve the larger ecosystem existing around affordable housing.

Left: Japantown senior housing, San Jose. Photo credit: Bernard Andre
Right: 1585 Studios, Mountain View. Photo credit: Bernard Andre

5. BASELINE APPROACH TO SUSTAINABILITY AND HEALTH: INNOVATION, FEASIBILITY AND REPLICABILITY

FCH's baseline approach to sustainability and health within their developments exceed most practices in the industry. Their main goal as affordable housing developers has always been to build durable, quality projects that "house people for a long time" (Marty Keller, 2015). This mission directs FCH towards building healthier, sustainable developments as they realize that the value gained through using quality products quickly outweighs the risks and future costs associated with less expensive, low quality products. In their holistic approach to housing, resident health and their relationship to their environment is of equal importance to product durability and maintenance efficiency.

Ensuring indoor environmental quality, specifying non-toxic materials, providing gardening and housekeeping classes, and securing sites that are Transit Oriented Developments (TOD), are some of the dynamic features of their mission to benefit the health of residents. To date, no quantitative metric exists to measure this impact, yet FCH continually demonstrates this much needed benchmark through their work.

"There may be some areas where you can supposedly 'cut out' the green premium products, but when you analyze what you are cutting out and the impact they have on the project, on the durability on wider aspects of health and the economy, you're really not saving anything." (Marty Keller, 2015)

It is important to note that California's legislative landscape further supports this objective. California has enforced a progressive law to inform citizens, designers, builders etc. on the toxic content of the products they might use, build with, specify or buy. Proposition 65 is a Californian State law which required the State to publish a list of chemicals known to cause cancer, birth defects or harm reproductive health. This legislation must be updated at least once a year and now includes approximately 800 chemicals (OEHHA, 2016). This law also enforces manufacturers to declare any of the toxic chemicals from the list, existing in their merchandise, allowing Californians to make informed decisions on the products they buy and their potential risks from toxic exposure.

"Required Warning Before Exposure To Chemicals Known to Cause Cancer Or Reproductive Toxicity. No person in the course of doing business shall knowingly

"We select quality products and the green part is part of that process" (Marty Keller, 2015)

and intentionally expose any individual to a chemical known to the state to cause cancer or reproductive toxicity without first giving clear and reasonable warning to such individual" (Proposition 65)

While Proposition 65 is a move towards transparency, it has not led to many changes in construction products. The list of healthier products available remains short and it appears little innovation has taken place to replace the use of these chemicals.

FCH has directly witnessed that building with quality products and encompassing an integrated, safe environment have direct impacts on the health of the residents. Geoff Morgan explains: "How can you put a price on a young man who's in an apartment, how he has literally 3 or 4 less emergency room visits? How do you put a price on somebody who is put in an environment that doesn't trigger other kind of longer term health impacts because they live in a place with no VOC paints. We don't quantify those things." (Geoff Morgan, 2015)

The economic significance of healthier environments is felt directly and indirectly through cost savings to the public system, through fewer visits to the emergency rooms, less wear and tear on the health care system, and fewer absences at work. Overall, such environments can enhance economic productivity. This conviction ties housing to healthcare and this undeniable link is at the core of FCH's mission when providing affordable housing developments. Geoff Morgan reinforces this point by affirming "ultimately, I think it would be a life well lived if I can get us to a point where medicaid dollars are broken free for subsidies for housing because I truly believe housing is healthcare." This is a particularly innovative thought that dramatically pushes developer boundaries of responsibility beyond the production of a building. This intent also expands the notion of health to other sectors and agents such as manufacturers, contractors, maintenance staff. In other words, all stakeholders involved in the building industry benefit by creating sustainable construction practices.

Feasibility + replicability

FCH has a strategic process to make durable, healthy construction feasible and replicable across projects. This process includes FCH's long term investment in their properties and the trusted long term relationship with their contractors and vendors. FCH's practice has demonstrated that the upfront cost associated with using healthier products balances out throughout its life cycle, and that the end results of good design can be a long term financial benefit. For this financial return to be significant, there is a requirement to maintain control over properties for a long period of time. It is this length of investment which makes such decisions truly rewarding. Long term ownership of their buildings also means that their portfolio continues to expand, allowing them to buy building products in larger quantities to be used in new constructions but also for small renovations at older properties, minimizing waste.

"Once we identify a product, just like we identify a team, we specify it again and again. So if we have a few projects coming up, the same flooring is going to go into all three of them and get a deal on that basis. The same light fixtures, if they work, are going to be specified again" (Marty Keller, 2015).

FCH has worked over the years to streamline their procurement process to attain achievable prices for building products. They work closely with trusted vendors to specify products that align with their mission to build quality, sustainable and healthy buildings. While

these products are often more expensive, FCH plans for purchasing across several projects, thereby raising purchases and lowering overall unit cost. Furthermore, FCH's mission to recycle products is supported through negotiations with long term trusted vendors who are able to commit to collecting products that need to be replaced. These longstanding relationships, built over time means that their vendors understand FCH's goals and needs and are able to suggest new, better products. In one FCH development, for example, their flooring supplier suggested a new, better, less expensive alternative. It was to be used when the supply of the previous flooring specification was finished. This scenario enabled FCH to get a better, less expensive flooring.

FCH did not start their innovative practice by subscribing to certifications. For them, building sustainably was a given, and rather than spending scarce resources on certifications they invested directly in their properties. In 2003 they started to work with certain certifications in order to further guide their mission, but more importantly, to join a network of people dedicated

Healthier material used:

Linoleum flooring
Rubber base
Concrete floor
Carpet flooring

Right: Flooring material in housing: Forbo Marmoleum and Shaw carpet tiles



Certifications

- Certifications that guide FCH Standard:**
- Enterprise Green Community
 - LEED (all projects expect to achieve Platinum)
 - Build it Green - GreenPoint Rated New Home Multifamily Standard
- Aspiration:**
- Living Building Challenge
 - Delos Well Build

FCH started to use the Leadership in Energy and Environmental Design (LEED) criteria for various developments including Villa Montgomery Apartments (which achieved LEED Gold) in 2007, Gish Family Apartments (LEED Gold) in 2007, Casa Feliz Studios SRO (LEED Gold) in 2009, Fourth Street Apartments (LEED Platinum) in 2012 and Salinas Gateway Senior Apartments (LEED Platinum) in 2013, 1585 Studios (LEED Platinum) in 2015, and Japantown (LEED Platinum) in 2016. Being part of this sustainability community has helped FCH advance their mission and share knowledge with other developers as well as building managers, architects and designers. From the beginning, they have recognized the importance of fostering relationships in order to achieve ambitious goals. FCH seeks to work with these organizations and sees them as partners needing “boots on the ground” (Marty Keller, 2015) to adopt the practices they are researching and promoting, a role FCH can take on because of their track record and expertise.

FCH has worked with several certifications and standards to continue pushing the boundary of what is possible for building healthier interiors in the affordable housing industry. In 2014, Hilary Noll, LEED AP BD+C, joined the FCH team as an Enterprise Rose Fellow. Noll is working with FCH to further expand

to this type of work and mission.

“We were green when green wasn’t cool. Green was just a cost”

Healthier material used:

- FSC solid wood cabinets
- Concrete floor and off form concrete wall
- Low VOC paint

Below: Shared kitchen in community space, Japantown.
Right: Japantown shared terrace with outdoor furniture.
Photo credit: Bernard Andre



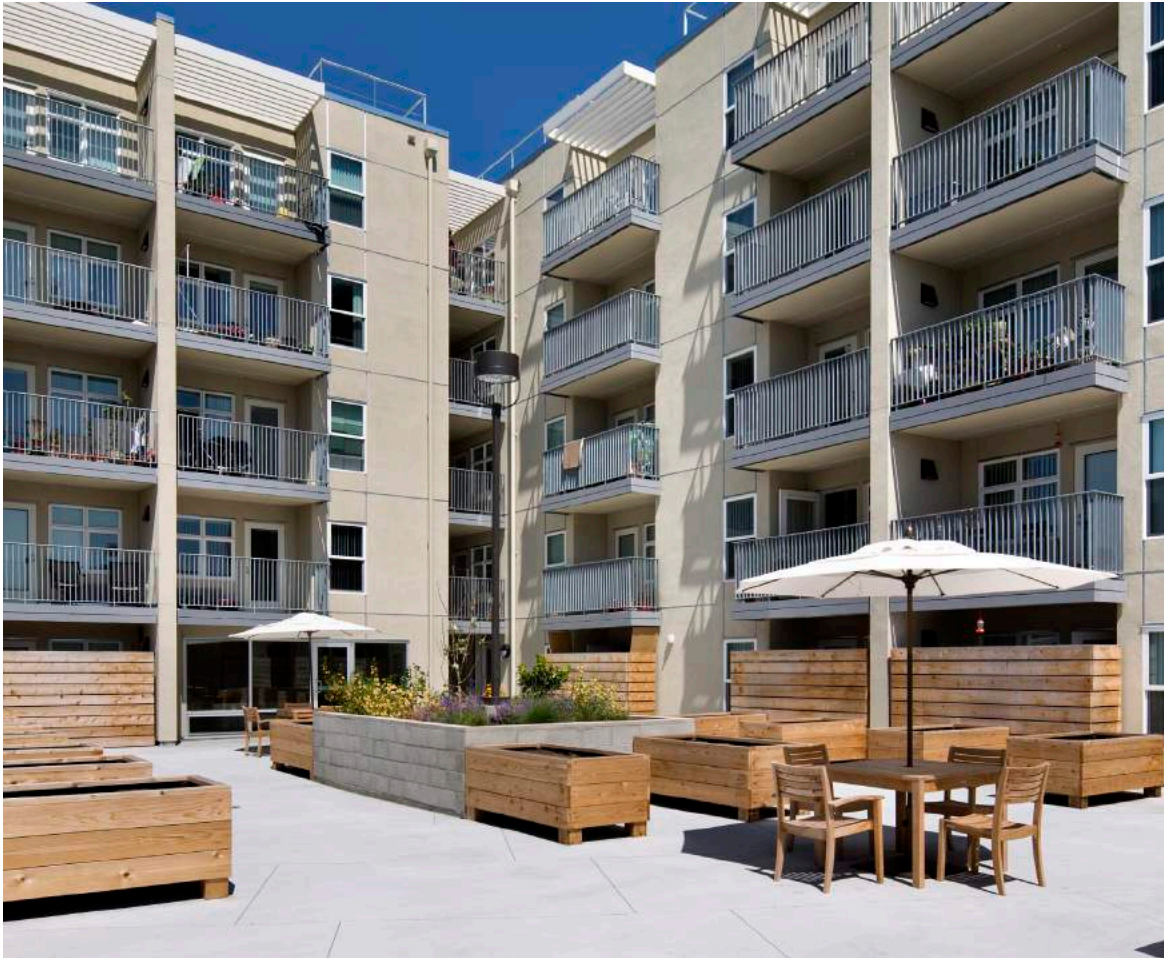
their network by considering the Living Building Challenge (LBC), the most stringent certification for healthy building construction, for the development of Orchard Gardens. South Second Street Studios project (construction to begin February 2016) is slated to be a pilot project for the LBC Affordable Housing program. The Delos® Well Build certification is also being considered for Orchard Gardens, along with further projects. LBC and Well Build are aspirational certifications which push the envelope on product specification.

FCH continues to contribute to the industry by sharing research and information collected through the exploration and implementation of these criteria.

“The opportunities to engage in green building, for what it means for the triple bottom line, are fairly compelling at this point. Whether you want to do it for a client who is in it for the money, or for a client who is in it for health, or whether you want to do it for a client who is really concerned about the people, all three of those needs can be taken care of by doing green building and the documentation is there, which is why we encourage people to do it” (Marty Keller, 2015).

Healthier material used:

- Sustainably harvested teak outdoor furniture



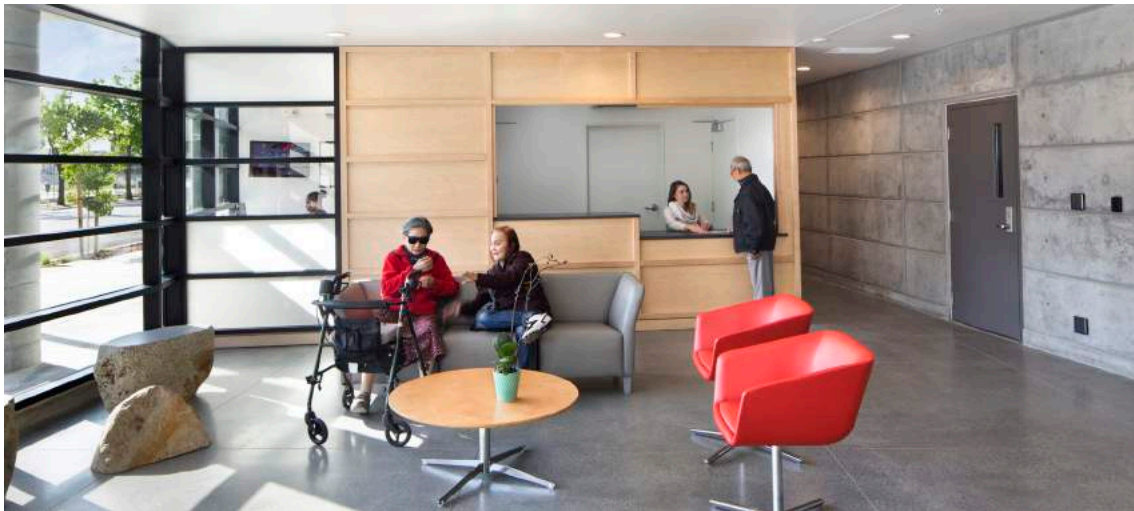
6. INNOVATION IN DESIGN

6a. Designing for ‘inclusion’

“It is the guy working at McDonalds, it’s your janitor, it’s your bus driver if you work at Google, it could be the receptionist working at your doctor’s office – These are the people who are not making the \$100k odd dollars that it costs to be able to have a reasonable standard of living and live in decent housing in our area. So we provide housing for seniors, we provide housing for families, for workers, for developmentally disabled as a group. And now we are going to be providing permanent supportive housing for homeless people which is a really underserved population in San Jose” (Marty Keller, 2015).

FCH’s approach to housing is to incorporate buildings into the surrounding community and equip residents to be part of that community. This notion of inclusion at both the physical and social level expands the responsibilities of design from housing to producing a dynamic relationship with a neighborhood, transportation, and a network of relationships and support. FCH designs their projects to ensure the inclusion of some of the most vulnerable populations in the county. More recently, with the change in the organization leadership and in reaction to a serious crisis, there are new initiatives to work with homeless populations, a group of citizens in particular need of support.

FCH’s dedication to supporting integration within the city is exemplified through their commitment to supplying each and every resident with an EcoPass that allows free access on all public transportation throughout San Jose. They do so at their own cost and are the largest private purchasers of eco passes in the VTA system. FCH also works closely with Housing Choices Coalition to ensure that the developmentally disabled residents served have positive transitions to independent living. This means designing services and space where resident coordinators can work directly with residents in order to achieve the overall mission of enabling each tenant the opportunity to pursue productive and dignified lives.



Left top: New window installation at Orchard Gardens improves air quality by improving natural ventilation and access to fresh air. Photo credit First Community Housing.
Left: Reception area at Japantown. Photo credit Bernard Andre.
Right: Diagram of design feedback loop

6b. Using a trusted building product list - cost savings and feedback loop

FCH has developed a trusted green interior product list that includes healthier, less toxic materials that are used across their properties. FCH and OJK Architects both report that there are very few substitutions during construction for the materials specified. Because these products have performed well over the years in multiple developments, they are trusted for use in future projects.

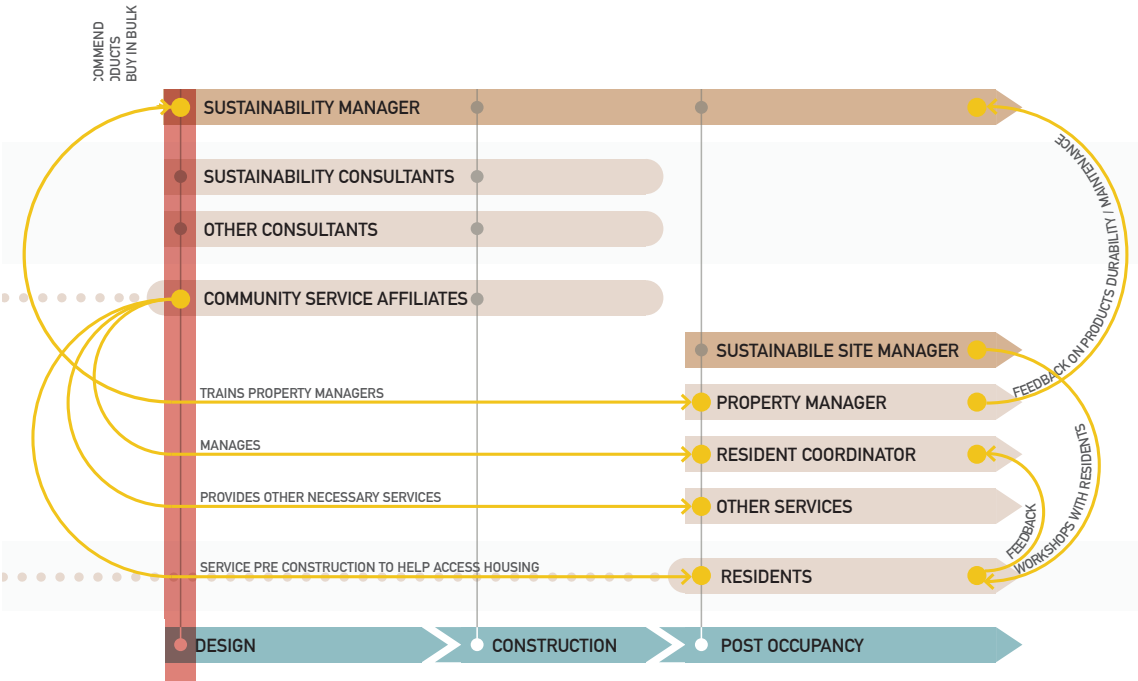
Design feedback loop

While developers tend to build on procedures they have already used and each project builds on existing specifications, FCH ensures that it also refines their practices, incorporating new technologies and materials. For example, members of the FCH team visit trade shows, participate in conferences, work with consultants, and reach out to their network in order to research new materials. This process is shared with their architect partners, who share their vision of incorporating healthier materials and the highest quality products, while recognizing the need to keep costs down and units affordable.

Community involvement in feedback loop

Housing Choices Coalition recognizes that with each property, they are learning more and more about residents’ needs. Because HCC is part of pre-development meetings, these lessons can be voiced at the early days of the future projects.

HCC also involves family members of adults with developmental disabilities to advocate for affordable housing in their existing communities. For The Orchard Gardens project in Sunnyvale, HCC organized clients and their family members to discuss special needs and required services. FCH and city officials were included in this conversation, which ultimately led to them providing some units for developmentally disabled residents at the future Orchard Gardens. This process will also have an effect on the designs of the development as stakeholders discuss how to change certain planning and zoning ordinances, such as parking space regulations, to better serve the needs of developmentally disabled residents. The parents turned out to be a powerful advocacy group in support of the project.



INSTALLED PRODUCTS JAPANTOWN

<div><div>DIVISION 3</div><div>Finished concrete floor slab and sealant</div><div></div><div></div><div>Notes: No VOC, no phthalate Some residuals can be problematic - see Quartz database for common building products for more information</div></div>	<div><div>DIVISION 6</div><div>Rubber Wall Base</div><div></div><div></div><div>Notes: Phthalate free, possible problematic recycled content</div></div>	<div><div>DIVISION 7</div><div>Fiberglass Insulation - External walls: Johns Manville</div><div></div><div></div><div>Notes: Formaldehyde free, Batt/blanket thermal shield free</div></div>
<div><div>DIVISION 7</div><div>Acoustic Insulation - Internal walls: Johns Manville's "Formaldehyde Free Sound Control Batt Insulation</div><div></div><div></div><div>Notes: Formaldehyde free, minimum 18% recycled content</div></div>	<div><div>DIVISION 8</div><div>FSC Certified hollow core wood door: Kelleher</div><div></div><div></div><div>Notes: FSC sustainably harvested</div></div>	<div><div>DIVISION 9</div><div>Resilient Sheet Flooring: Marmoleum Striato</div><div>RED LIST</div><div>TRANSPARENCY</div><div>Notes:</div></div>
<div><div>DIVISION 9</div><div>Carpet Tile backing: Broad loom glue down- Meadow Driftwood</div><div></div><div></div><div>Notes: Some residuals can be problematic - see Quartz database for common building products for more information</div></div>	<div><div>DIVISION 9</div><div>Wall Gypsum Board - National Gyp.Co Regular</div><div>RED LIST</div><div>TRANSPARENCY</div><div>Notes:</div></div>	<div><div>DIVISION 9</div><div>Wall Gypsum Board - National Gyp.Co Moisture resistant</div><div>RED LIST</div><div>TRANSPARENCY</div><div>Notes:</div></div>

Product research conducted by the Rose Development Team in Minneapolis

- Red List free LBC v2.1
Some level of transparency
- Red List free LBC v3.0
- Red list product LBC v2.1 and v3.0
- Trusted product list - procured across portfolio
- FCH better products choice

Japantown was completed at the end of 2015. The following list of materials used in construction demonstrate a range of interior finishes. For example exposed concrete, Marmoleum resilient flooring and carpeting used throughout the residential units and communal spaces. Some of these finishes are part of a trusted list FCH uses throughout their portfolio. Japantown represents a comprehensive study of products used.

Included in the chart below are products that are proven to be less toxic and satisfies FCH's stringent requirements. These products have been used across several projects and are included in ongoing specifications for future projects.

<div><div>DIVISION 9</div><div>Carpet Tile: Shaw Infinite 5T010</div><div>RED LIST</div><div>TRANSPARENCY</div><div>Notes:</div></div>		
<div><div>DIVISION 9</div><div>Interior Paint: Kelley Moore</div><div>RED LIST</div><div>TRANSPARENCY</div><div>Notes: Chosen as it contains low VOC</div></div>	<div><div>DIVISION 9</div><div>Textured finish: Kelley Moore</div><div></div><div></div><div>Notes: Chosen as it contains low VOC</div></div>	<div><div>DIVISION 10</div><div>Corner Guards: InPro "EnviroGT"</div><div></div><div></div><div>Notes: Contains no PVC Containing recycled HDPE plastic</div></div>
<div><div>DIVISION 10</div><div>Shower Enclosure: Fiberglass Reinforced Plastic Panel surround</div><div></div><div></div><div>Notes: Not enough information</div></div>	<div><div>DIVISION 12</div><div>Cabinetry: Oak veneer (FSC) doors</div><div></div><div></div><div>Notes: Formaldehyde free cabinets</div></div>	<div><div>DIVISION 12</div><div>Laminate Countertop: Formica #503-58 (stone grafix) matte finish</div><div></div><div></div><div>Notes: Contains no formaldehyde</div></div>

6c. Ongoing resident engagement and maintenance support

FCH’s dedication to ensuring residents have access to healthy and productive lives does not end at completion of construction. Their commitment to working with residents to build communities post occupancy starts in the pre-development phases as part of the integrated design approach. Their work with communities and residents continues to foster collaboration through the services provided residents, a strong partnership with building managers and maintenance workers, and through workshops and outreach led by FCH. FCH owns their buildings for a minimum of 55 years, so it is in their interest to ensure buildings are taken care of and run efficiently to keep overall costs down. This, in turn, supports their overall mission to create an environment where residents and building employees can thrive.

When residents move into FCH properties, they are educated about the building products that have been used in the buildings. In addition to providing new tenants with educational packets, tours and programs, plaques are placed throughout the building that explain the benefits of some of the products (such as flooring and paint) on human health. FCH also helps support programs that promote education of healthier products.

Residents are invited to a series of workshops developed by the Sustainable Site Manager to teach residents and maintenance workers about using less toxic cleaning products, which helps reduce overall long term toxicity in homes. These workshops also act to integrate different stakeholders of the community. With a mission for healthier products, they bring together the maintenance team, the residents and building management. This process reinforces a feedback loop where different members of the community are able to respond to and engage with healthier materials.

FCH also uses furniture, fixtures and equipment that are less toxic and do not off-gas. As part of the education component, FCH hosts charrettes that engage residents in choosing furniture. These charrettes provide the space to discuss why healthy products are important and why choosing local materials can have an overall impact on the environment. For example, the residents at Mountain View helped to choose locally sourced benches that do not off-gas for their community rooms. These programs are planned for new projects such as Orchard Gardens.



Right: Gardening workshop.
Source: First Community Housing

In order to ensure the sustainable maintenance and operation of their buildings, FCH has developed a robust maintenance program. There is a dedicated Sustainable Facilities Manager who works closely with maintenance staff to closely monitor every piece of equipment for proper maintenance. They are also dedicated to ensuring that disposal and replacement of any equipment is done in a responsible way. Marty Keller, Director of Sustainability & Construction, explains that “a lot of the maintenance people are really appreciative of the fact that where this is coming from is ensuring they are working in healthy environments and that we really care about them in that way.” (Marty Keller, 2015)

FCH continuously want to advance the healthy occupancy of their properties and have developed an initiative in collaboration with UC Davis and Green Science Policy Institute that engages affordable housing residents to consider exposures to and body burdens of flame retardants (FR)from furniture. The study has enrolled 12 households from FCH developments and will measure the health impact of removing flame retardants from their homes. FR free couches from Ikea were assembled and installed in these homes and samples will be collected every six months for two years.

Another innitiative includes post occupancy surveys to be conducted at Japantown in order to assess the effect of new design strategies that engage with Universal Design. Universal Design, often referred to as inclusive design, aims to produce buildings, products and environments that are accessible to all including older

people, people without disabilities, and people with disabilities. The surveys will also assess whether or not to incorporate these practices into pre-development design workshops to evaluate elements to be included in future developments.

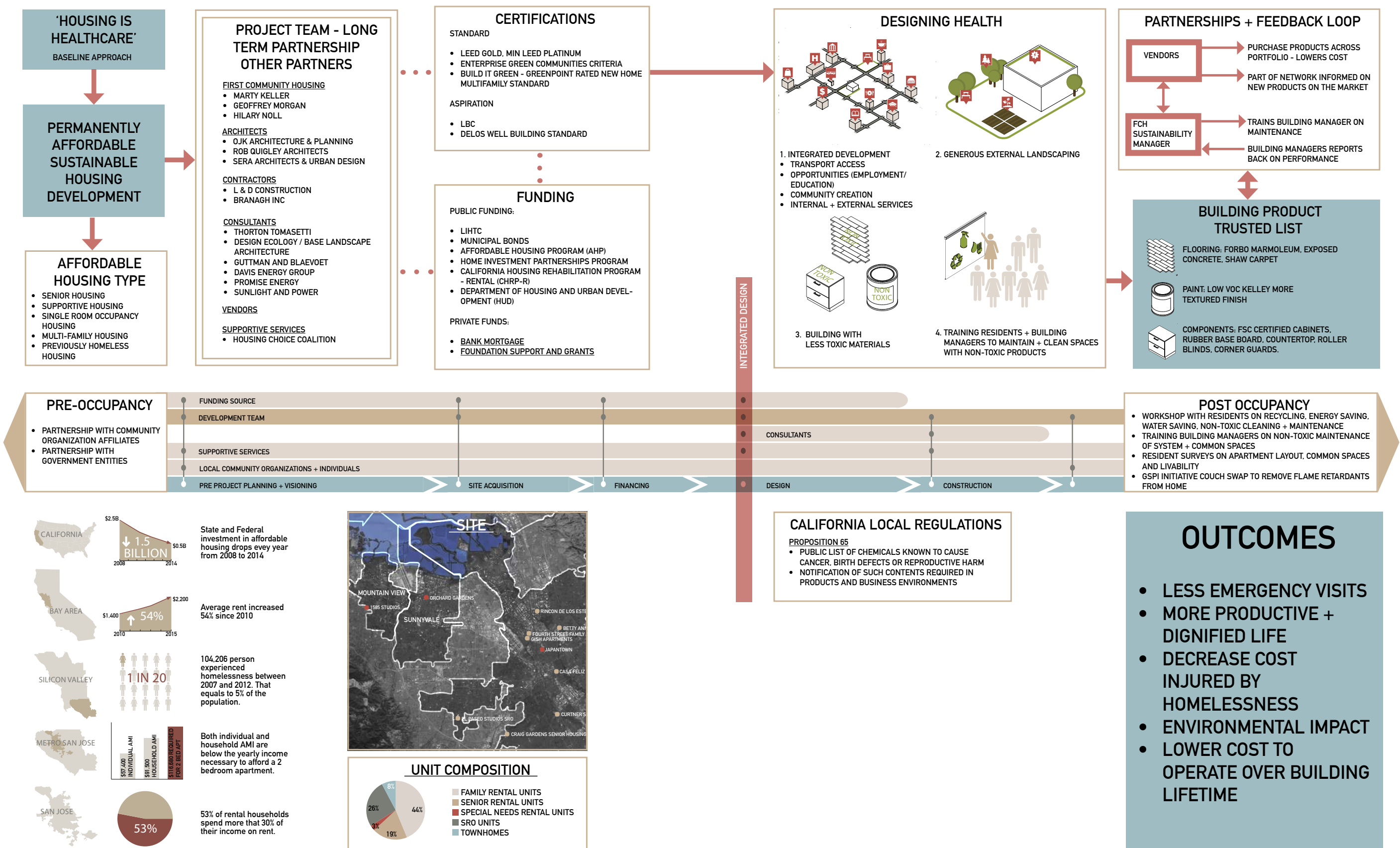
Although FCH has baseline practices that ensure their buildings are designed to have good air quality, non-toxic materials, gardening and nutrition classes, thoughtful project locations -- all of which impact health -- they recognize that there are not many metrics that confirm health benefits. Health metrics are complex and involve a long and complicated process of collection. Moving forward, FCH is dedicated to collecting the needed data for analysis with the hopes of moving the needle towards universal practices for use of less toxic, healthier products in interior construction.

Resident Manual Table of Contents	
Topic	Page(s)
Welcome	2
Green Building Japantown Apts	3
Maintaining Your Green Apartment	4
• Kitchen Appliances	5
• Flooring	5
• Energy Conservation	6
• Lighting	8
• Water Conservation	8
• Green Cleaning Supplies	8
• Laundry / Clothes Cleaning	10
• Recycling & Hazardous Waste	11
• Pest Control	13
Indoor Air Quality Guidelines	14
• Non-Smoking Policy	15
Green Materials and Systems	16



Above: Resident manual.
Source: First Community Housing
Right: Resident meeting
Source: First Community Housing

6d. MAPPING THE PROCESS



7. CONCLUSION

In order to understand the current challenges facing developers who are committed to building healthier housing, it is critical to take into account the role of the wider development construction ecosystem that impacts and shapes the affordable housing sector. By researching FCH practices, we were able to describe the tactics, along with the barriers encountered in the design, funding, procurement and construction processes of their affordable developments. The successes of FCH are rooted in the creative navigation of the complex systems involved.

Through their developments FCH remains committed to their belief that “housing is healthcare”. For FCH, this principle is two fold. Firstly, by creating housing for some of the community’s most vulnerable populations, pressures on healthcare and emergency services can be reduced as shown in the Economic Roundtables groundbreaking study, *Home Not Found: The Cost Of Homelessness In Silicon Valley*. Secondly, by focusing on healthier interior products, FCH limits the introduction of chemicals that are known to have negative effects on human health to the interior environments. FCH’s long term mission for sustainably built and operated housing drives their work and decisions with regards to product specification and upholds their core beliefs.

To address issues of health, FCH has adopted a systems thinking approach that demonstrates they consider ‘housing’ to be more than a physical structure. By ensuring indoor environmental quality, specifying non-toxic materials, providing gardening and housekeeping classes, facilitating service provision and securing sites that are Transit Oriented Developments (TOD), FCH delivers housing that benefits the overall health of residents. FCH continually demonstrates this much needed health benchmark through their work.

Furthermore, FCH employs an integrated design process, in which they communicate expectations with partners at the beginning of each project to ensure their mission is understood and goals are aligned from inception to facilitate communication and cooperation throughout development. Working in this way allows FCH to drive change within an industry that is often stymied by its own practices.

Many of FCH’s projects are tailored to the funding available. For example, currently in San Jose there is a focus on supportive housing and housing for extremely low income and homeless populations which means there is funding directed to addressing these needs. FCH is able to adapt their design and the materials to these projects securing financing needed to build in demand affordable housing.

Finally, FCH seeks collaboration opportunities to share their research and experience of sustainable practices within the affordable housing sector. Their commitment to moving the needle towards better practices reflects a growing market for healthier building products. This opens opportunities for many in the industry to join them on their path to innovation.

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Left: Courtyard garden at 1585 Studios

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