

The background image shows a modern building with a glass and steel structure. The building has large windows and a red vertical stripe. In the foreground, there is a courtyard with a black metal railing. Several large, red, spherical planters with green plants are visible. The sky is overcast.

Foundation Communities

Innovative Practices for Healthier Homes

A Case Study

Acknowledgments

Project Team

Foundation Communities
Hatch Ulland Owen Architects
Forge Craft Architecture and Design
Spawless Construction
BEC General Contractors

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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Foundation Communities

Innovative Practices for Healthier Homes
A Case Study

Austin, TX

Healthy Materials Lab
Parsons School of Design



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1. INTRODUCTION

1a. Case Study Methodology

This report is the fourth in a series of five which document case studies undertaken by the Parsons Healthy Materials Lab to record systems processes and decision-making that go into the building of new affordable housing developments across the United States. The team investigates developments that incorporate healthier building products and affordable housing developers that have a stated mission to advocate for and transform standard building practices within the affordable housing industry.

The case studies 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 existing 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 distinct lenses and the variety of approaches that are characteristic of this sector.

The case studies have an intentional regional distribution. By understanding the regional 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 products 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 through demonstrating both the health benefits for residents associated with using healthier products and also future new market potential for sales of better products. Finally, case studies enable a critique 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 a range of research methods including primary research - stakeholder interviews, videography, photography, analytical mapping and secondary research - media coverage, stakeholder analysis, diagramming federal, state and local documents and a review of current census and other data sources.

The results of these studies reveal the innovative approaches that various developer teams utilize for achieving healthier, affordable housing. Additionally the results provide a list of existing healthy and affordable building products that can be broadly shared. This list contributes to a library of better building products showcased in a number of different contexts, including the Donghia healthier Materials Library at Parsons School of Design and the Healthy Materials Lab online resource (<https://healthymaterialslab.org/building-products>). The case studies have also revealed a number of notable affordable building products worthy of analysis. Finally, other evaluation tools used by the various designers nationwide can be collected and shared to ease the specification process and to continue paving the road to innovation through collaborative practices.

This case study was initiated by the Healthy Materials Lab in collaboration with Foundation Communities (FC), Austin TX, in March 2016. FC are affordable housing developers whose mission goes far beyond standard practices. Every development is designed to be integrated into the wider community and provides a range of services to ensure that ‘families can succeed’. FC positions education and healthy living at the core of their developments. They have made learning centers part of every multi-family developments providing day care facilities, after school activities as well as adult classes and community workshops providing information healthier home cleaning and building maintenance practices. Notions of health here include access to well designed housing, easy access to transportation and a longterm commitment to designing healthier interiors. The Learning Centers are at the center of each housing development and are primarily used by children who are most vulnerable to the impact of their environment. The Learning Center building is used as a ‘laboratory’ to test healthier building products using the Living Building Challenge criteria to develop a healthier palette of products. The learnings from such an endeavor can potentially be scaled up and incorporated in future housing developments. Each stakeholder provided critical information about the project via in person interviews and follow-up phone conversations and emails. Without their cooperation and input this case study would not be possible.

Healthier material
used:
Type of cladding?

Cover: Interior courtyard, Capital Studios, Austin City Center.
P.4: Interior courtyard, Capital Studios, Austin City Center.
Left: Day care provided at M station multi-family development



Healthier material
used:

**Windows
manufacturer?**

Left: Learning Center at
M Station multi-family
development

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 Foundation Communities, Hatch Ulland Owen Architects, Forge Craft Architecture and Design, Spawless Construction and BEC General Contractors in March 2016. 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

FOUNDATION COMMUNITIES

1b. Why Foundation Communities?

Foundation Communities is a 25 year old non profit affordable housing developer based in Austin, TX. Their properties are primarily located in Austin, with 3 additional properties in the Dallas/ Fort Worth Area. Their Austin region portfolio includes 19 properties, including 3 properties currently in development in 2015-2016. Their mission is to provide affordable, healthy, attractive homes and free on-site support services for thousands of families, as well as veterans, seniors, and individuals with disabilities. They integrate a supportive model through their on site learning center to empower residents and neighbors to achieve educational success, financial stability, and healthier lifestyles.

Green building strategies have been used as a baseline approach for Foundation Communities development. They have pursued the Enterprise Green Communities certification since its inception in 2003, and continue to pursue LEED (Leadership in Energy and Environmental Design) Platinum criteria for all buildings. Foundation Communities has been aligned with Austin's S.M.A.R.T. (Safe, Mixed income, Accessible, Reasonably priced, Transit oriented) Housing™ Initiative, a municipal program, launched in 2000, that incentivizes the construction of quality affordable housing. One of the program's requirements is to meet a minimum threshold under the Austin Energy Green Building, which was one of the first municipal green building programs in the country. Other requirements include the proximity to public transportation and access to green space. FC has now adapted these guidelines for all of their projects and they have become core to their mission.

Foundation Communities is also exploring new standards, including the Living Building Challenge (LBC), a performance standard that includes a commitment to using healthier materials. They pursued the LBC for the Lakeline Station Learning Center (construction to begin in 2016) as a pilot project.

In order to ensure ongoing interior air quality and the functioning of the integrated green initiatives into the occupancy phase of their development, FC reaches out to the maintenance team and residents by providing workshops with a focus on energy efficiency practices, on-site recycling, and community gardening. In 2014 Foundation Communities doubled their solar capacity to 433 kilowatts, making them the largest private solar owner in Austin. Their dedication to health, financial stability and green education encourages residents to conserve energy, use homemade cleaning products, and consider less toxic interior furnishings, to maintain indoor air quality.

Construction of healthier residences supports the holistic approach FC adopts to help families succeed. Included in the organization's planning are broader initiatives including access to jobs and school. In addition, project sites are chosen in close proximity to public transportation, commercial districts and schools.

Healthy Materials Lab has focused their study of Foundation Communities on three sites: M Station (multi family housing opened in 2011), Capital Studios (supportive housing opened in 2014) and Lakeline Station (multi family housing opening in 2016). These developments were chosen because of process of product selection was evident though the entire design process, from early design stages to construction. Particular focus if given to the Lakeline learning center. This Building while not incorporating housing was seen as a test case for FC to install healthier building products that met the stringent LBC criteria.

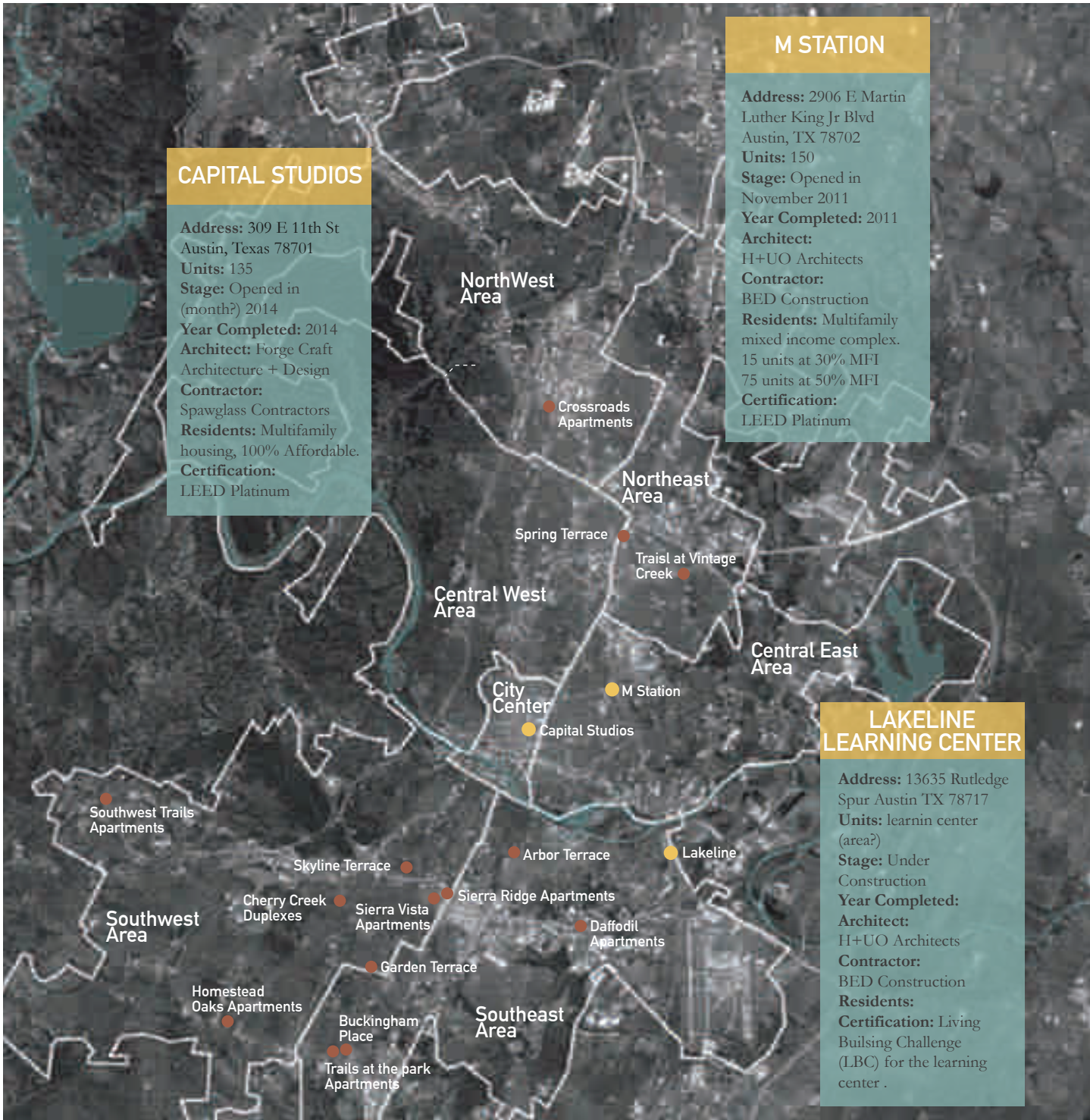
Healthier material
used:
Fiberglass insulation

Left: Installation of insulation at
Lakeline construction site

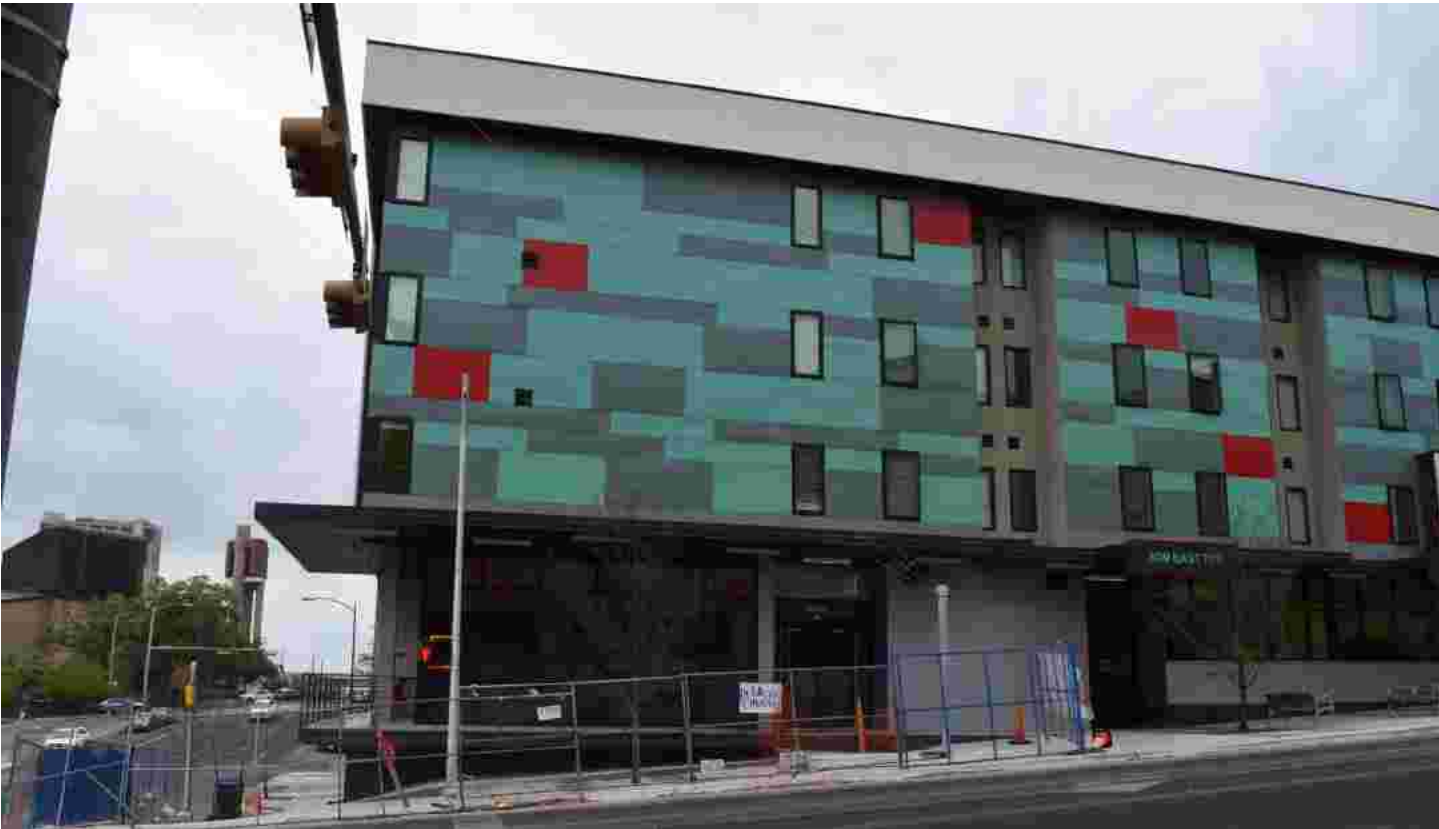


2. GENERAL OVERVIEW

CASE STUDY SITES



Capital Studios supportive housing



Lakeline construction site



M Station multi family development



LESSONS LEARNED

Housing and services model: healthy occupancy

- FC’s mission is to “create housing where families succeed”. Success here is rooted in a family’s ability to access education and public transport enabling them to achieve financial stability and healthy living.
- Learning Centers are now part of all multifamily developments.
- This holistic approach creates a stable environment with health and financial programs for residents, located within the Learning Centers in each multi-family development.
- Programs at learning centers cater to residents but are sometimes open to the neighborhood, helping to build community both within the residence as well as greater neighborhood.

Systems thinking approach

- Through their mission FC has prioritized initiatives and programs and evaluated each for their impact. Their focus on education and health has influenced what products they specify in their developments. They have found a healthier product palette that balances durability, health and cost.
- FC strives to communicate health practices to residents while ensuring residents have the agency to bring these practices into their own lives.
- The team considers the overall system of material production, installation and use, this ensures that when a new product is specified, the entire lifecycle, maintenance and replacement of these is take into account.

Financing strategy

- In the early days FC worked mostly in acquisition rehabilitation, but now develops new construction in response to LIHTC and the criteria preferences set in the QAP.
- FC prioritizes investment in ‘green building’ allowing a long term beneficial return; because they own their buildings in perpetuity, they can go ‘deeper on green building’ and have a long payback period.
- Funding for the learning centers is built into the development costs. The operation of the centers are 80% incorporated within rents making it a sustainable model. FC also benefits from having over 2000 volunteers who also participate in the programming.

Innovation in design and construction

- FC is at the forefront of pursuing new sustainability certifications making them an organization that participates in advancing better building practices in affordable housing.
- They were early adopters of Enterprise Green Communities Criteria which included a pilot projects for EGCC
- FC had one of the first Rose Fellows working with them. A Rose Fellow works to facilitate an inclusive approach to development to create green, sustainable, and affordable communities. They work to advance the organization’s practices in community engagement, sustainability and design excellence. FC’s fellow-Michael Gato participated in pushing the organization to pursue the EGCC while also shaping community engagement which has lead to successes and an integration of the developments within the wider community.
- FC have worked with Austin Energy Green Building since the inception of the program in 1990, making them early adopters of green practices.
- FC use The Learning Center as a smaller space to experiment with the Living Building Challenge certification and test new design concepts and better building materials.
- FC has a typical material palette for their residential developments which they update according to industry innovation and feedback from their occupied developments.

Strong partnerships and design team aspirations

- Contractors are involved at 50% through design development, to help with pricing and scope of work under the Integrated Project Delivery (IPD) contract.
- FC has a strong working relationship with their design teams and often work with them on projects facilitating the design process.
- The team does not use procurement strategies across projects to reduce material cost due to timing and coordination difficulties.

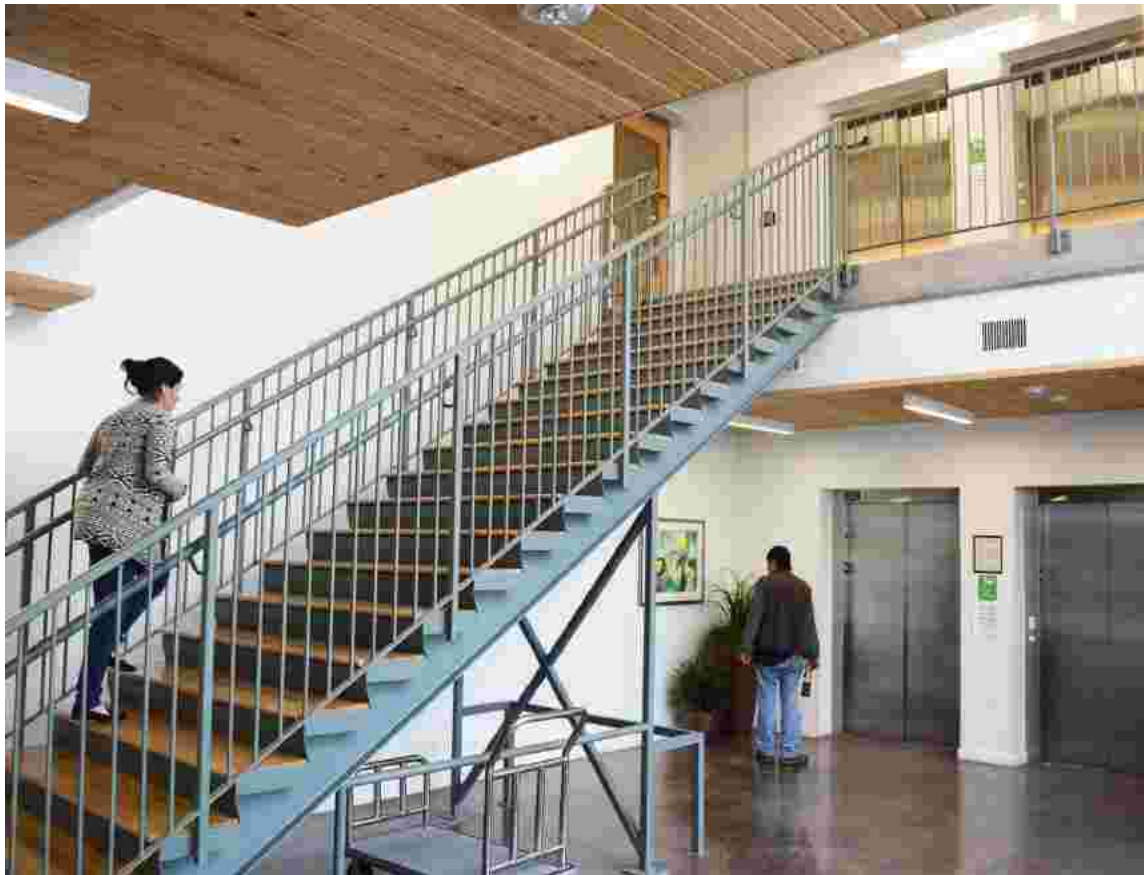
Regional Regulatory Context

Follow up question:

Are there any particular local regulations or incentive that have influenced how you approach and construct your developments?

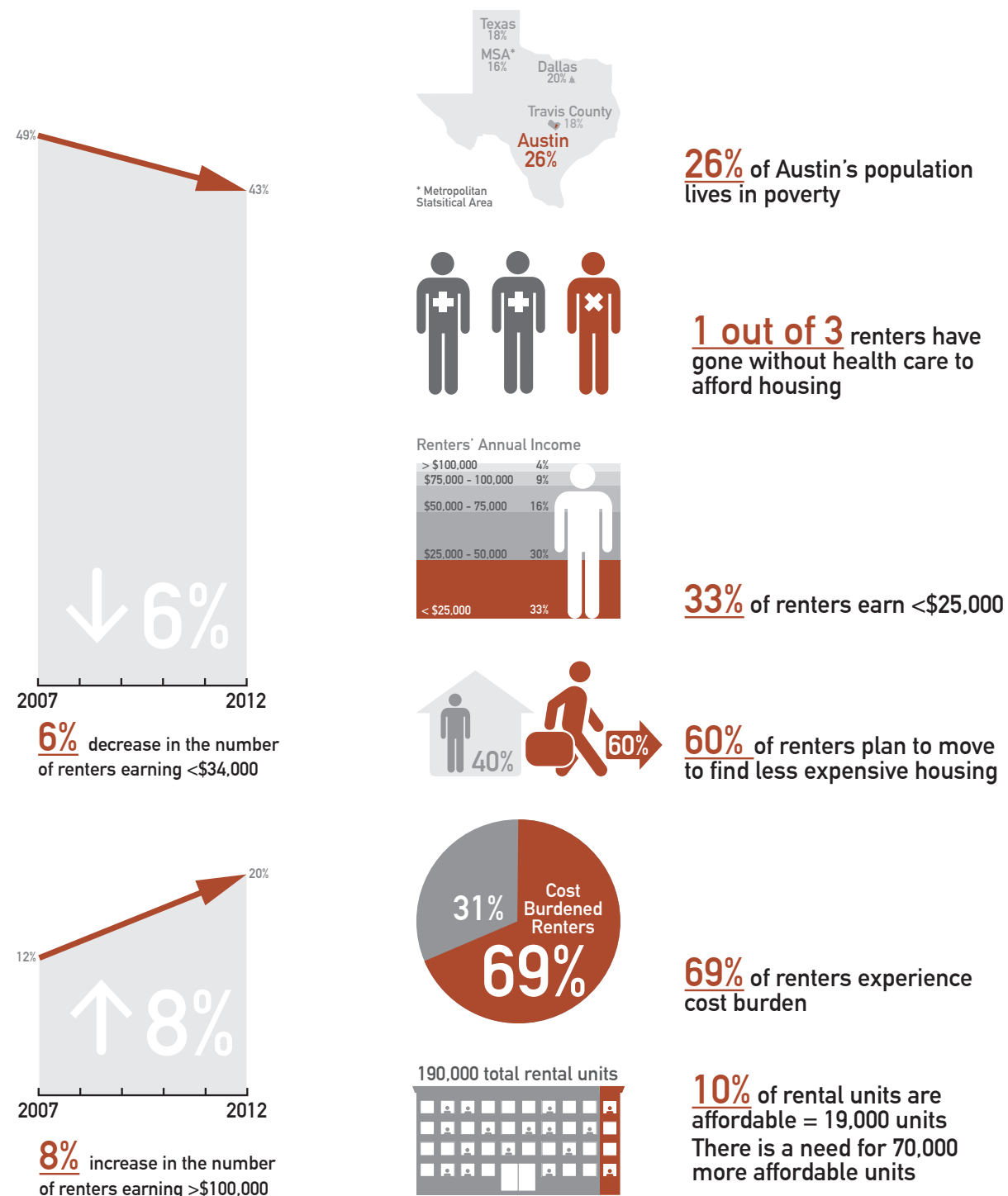
Healthier material used:
Finished concrete floor and steel railings

Right: Interior entrance lobby at Capital Studios supportive housing development



3. CONTEXT OF FOUNDATION COMMUNITIES

Austin, TX



Left: Statistics taken from Neighborhood Housing and Community Department. 2014 Comprehensive Housing Market Analysis. By BBC Research and Consulting. Austin, TX, 2014.

3. Austin's current landscape

Austin, Texas has seen unprecedented growth in the last decade. The expansion of the technology sector into the region has created new employment opportunities that are bringing new residents into the city. Included in the expansion is an increase in the service and leisure industry to cater for this new population. This has led to a severe housing shortage and a construction boom in the area. However, the housing needs for all residents new and old have not been met and the city is currently 97% occupied inevitably impacting rent prices. Austin has witnessed an average rent increase of 50 percent from 2004 to 2013 while median incomes rose by only 9 percent. What's important to note is that 60% of 100,000 new jobs created pay less than \$45,000 and 26,000 of these jobs are in the hospitality and leisure industry and, pay less than \$20,000. (Affordable Austin: building the Housing We Need at Prices We Can Afford, RECA). The majority of new developments are targeting higher earners making affordable options more and more scarce. Further, these new developments have participated in escalating land values and eliminating existing affordable units through the deregulation of rent control or stabilized units. In two years between 2012 - 2014 the city lost 7,000 affordable units for people earning less than \$25,000. (Affordable Austin: building the Housing We Need at Prices We Can Afford, RECA)

In 2014, only 10% of the Austin's housing market was affordable while 33% of the population makes less than \$25,000 a year (City of Austin, Comprehensive Housing Market Analysis and Barriers to Housing Choice). "The average rent for all apartments in the Austin area hit \$1,190 a month in 2015, a 7.5 percent increase from the year before. The average rent for a 1-bedroom, 1-bathroom apartment in Austin was \$1,037 in December" (Hawkins and Novak, 2015).

The current situation makes rent unaffordable for over 50% of the population. Austin has an affordability crisis which FC's developments are attempting to address. Families living in FC properties earn around \$20,000 to \$50,000 a year. According to Walter Moreau, families making up to \$50,000 of household income a year could afford a rent of \$600 - \$800 for a two bedroom apartment. This rent is affordable but very hard to find in Austin. FC targets this income bracket, along

with supportive housing for single person on disability income (rents around \$450/month). FC affordable housing development goals are in line with the City of Austin's 2014 Comprehensive Housing Market study. The study outlines key problems with the housing market of the City:

1. A shortage of deeply affordable rental units (primarily those renting for less than \$500/month) for renters earning less than \$25,000 per year.
2. Rising housing costs in a handful of redeveloping neighborhoods, which could cause longtime residents to seek more affordable housing elsewhere (displacement).
3. A growing need for affordable housing near transit and services—to enable seniors to age in place, to provide a wider array of housing choices for persons with disabilities and to mitigate the financial impact of rising transportation costs." (Austin Housing Plan, May 2016)

Another important factor is that currently 60% Austin workers come from other surrounding cities. There is a potent risk that housing deficiency within the city boundaries will increase that number and have further negative impact on roads, pollution, and overall degradation of environment. FC development strategically locate themselves in neighborhood with transit options other than automobile to alleviate the burden of travel on their residents but also for the city infrastructure. Further they target both inner city neighborhoods as well as suburban areas to ensure that they participate in distributing income diversity across all neighborhoods of the city.

Finally, FC's learning centers serve a key role in responding to the rising level of children living in poverty. Austin's poverty levels have dramatically increased to 30% of children under 18 years live in poverty in 2012, versus 17% in 2002 (2014 CHMA, page 10). Learning Centers provide a range of educational opportunities, as well as a safe and accessible space for children after school and during holidays alleviating the extra financial burden of additional child care cost for working parents.

4. A TRADITION IN INNOVATIVE PRACTICE

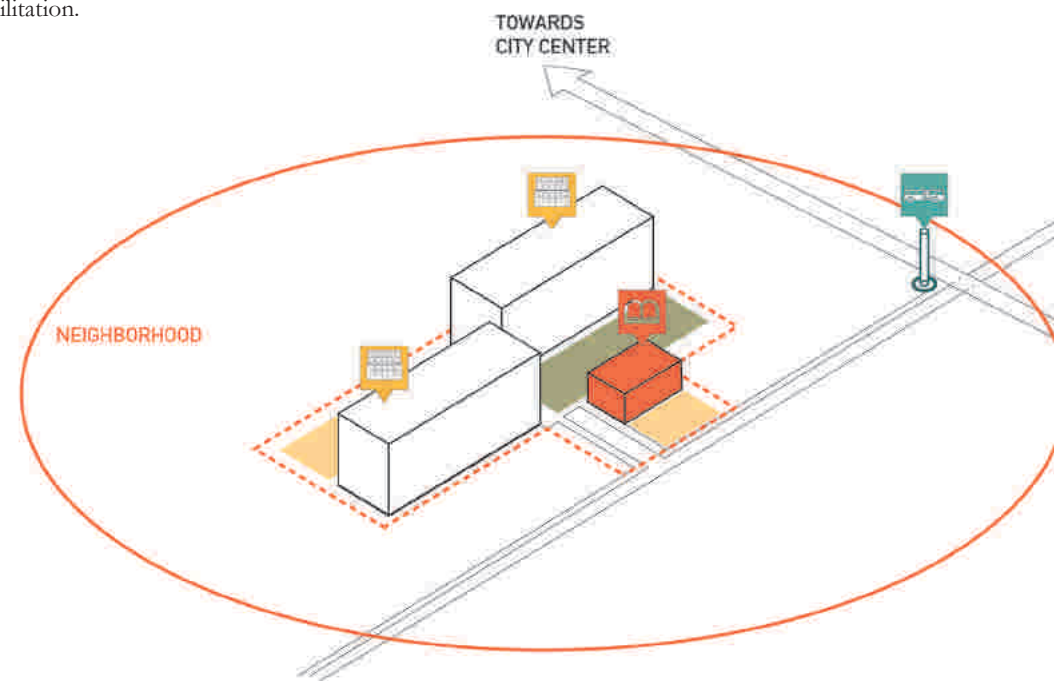
Foundation Communities' motto is: "Creating housing where families succeed". They adopt an integrated approach bridging housing with financial stability, education for youth and adults, while also providing opportunities for residents to access healthcare and transportation. This approach provides residents with housing that offers them the promise of a more stable life.

Of the 19 properties owned by Foundation Communities, 14 serve families with 2 and 3 bedroom apartments. While typical market rent for a 2 bedroom apartment in Austin is around \$1200- \$1300, FC apartments are in the \$700 range (source: interview with Walter Moreau). As aforementioned, the housing market in Austin has exploded in the last 10 years creating an immense gap in affordability for 1/3 of Austin's family households. "In the span of two years, households making \$25,000 a year – that's 60,000 households, or a third of Austin's renters – lost access to nearly 7,000 affordable rental units, according to the city's 2014 housing stock analysis. That leaves about 12,000 apartments available for those families to rent" (Scaccia, 2016). FC's remaining 5 properties offer supportive housing, and provide small studio and efficient apartments for very low income single resident occupancy (SRO). Some of these residents are formerly homeless and veterans. These properties have case managers on site to provide additional support services that include free bus passes, psychiatric support and rehabilitation.

Inception of the organization - mission and evolution

The first Director of Foundation Communities - Nancy Ferguson - started her involvement in housing after participating in the University of Texas in Austin, student co-op housing development. This inspired her to incorporate a model of permanent affordable housing in Austin. Initially the group's focus was on resident organizing, aiming to involve residents on co-op boards and include them in the everyday operation of the property. This was a progressive endeavor for the time but proved to be challenging as most families were working one or two jobs and didn't have the time or resources to manage their property. This is when the mission of the organization in response to this challenge by proposing educational initiatives to build resident capacity. In 1994, with the addition of Walter Moreau (currently Executive Director), Foundation Communities started its first after school program for residents, recognizing the need of a place for children to go when their parents were still at work. Moreau recalls:

"I remember Tonya, the social worker we hired, within three weeks she had 20 kids and then 40 kids and we were like "we should have done this a long time ago!" Kids need a place to go after school especially if their parents are working. That's valuable time we can spend on academics and physical fitness." (Walter Moreau, 2016)



Follow up Questions

- Which grant was received for Spring terrace?
- Are the grants you receive for construction or materials or/and also operations of your Learning Centers?

In 2000, FC built their first Learning Center at Trails at the Park development, their first new build property. Later a learning center was opened at an older property, Sierra Ridge. It was at this time that the vision of the organization grew into a housing and services model. "It's not just about a cheap apartment. It's really about creating that foundation for families with education programs, health programs, financial programs, right at their doorstep. We wouldn't think about building a new property without building a learning center." (Walter Moreau, 2016)

Since then, all multifamily projects have included a learning center, which serve around 700 children a year in after school programs. Learning Centers are now developed alongside any new multifamily project. The centers provide free programming for all residents including: Pre-K and Teen programs, ESL classes, fitness classes, and health centric groups for people with for example, diabetes.

Healthier material used:
Windows?
Interior furniture?

Left: Diagram of development amenities and integration into neighborhood and City.
Below: Common Space at Capital studios



The path towards green practices

Michael Gato was an early Enterprise Rose Fellow, and worked with Foundation Communities from 2003 to 2006. He was an early adopter of the Enterprise Green Community Certification (EGCC) launched in 2004 and worked with FC to pursue it for the first time. Spring Terrace was a pilot project for the EGCC and received a grant to help cover costs that come with undertaking a certification, such as specific site, design and material research as well as additional costs associated with specifying and installing healthier products. In this instance, most of the funds were used towards research related to materials, particularly around recycled content and options for paints with low VOCs. Foundation Communities continued to be awarded grants for further projects, including Skyline Terrace and M Station.

FC's mission driven approach to address the overall health of their residents directly translates into design decisions. The use of certifications to guide the construction process has directly supported this mission and FC continues to experiment with expanding which they pursue. Their latest attempt was to undertake the Living Building Challenge (LBC) for the Learning Center at Lakeline Station multi-family development.

FC retains long term ownership of their properties so they construct with durability in mind. They use quality building products that will last over time, which has helped determine building practices that address both human health, as well as long term efficient operations of building costs. For example, as Walter Moreau explains: “I think we’ve historically had a real interest in green building in general. We have a had a billion dollars’ worth of real estate, we’ve got a huge carbon footprint, huge energy bills and water bills, some bills are paid by residents and many bills that we pay. So there’s huge economic benefits to being green and sustainable. I think our whole interest and mission to helping people where they live to be healthier brings that into the mix.” FC applies this reasoning to their specification process. For example, FC has stopped using carpet because they constantly had to replace it. Instead, they now use a ceramic tile flooring or exposed concrete floor throughout the apartments. This decision also contributes to both better indoor air quality and durability.

Vicki MacDonald, the Director of Assets Management at Foundation Communities, explains that they began an initiative a few years ago to change their operations around choosing products when renovating their units. They began to use ceramic tiles, low VOC paints, Formaldehyde free cabinets, and advised on using

less toxic cleaning supplies for the maintenance of the buildings. In order to ensure long term changes in practice, her team focused on educating staff to encourage a ‘culture’ of green thinking throughout the organization. It is a bigger challenge to change resident behavior but they are constantly working to transmit this educational piece to residents in a way that supports the adoption of better cleaning practices in their own lives and homes.

“Because we’re a long term owner, we can go deeper on green building – we have a long payback period. Our mission comes in because we want to take a holistic approach”

(Walter Moreau, 2016)

Healthier material used:

Balustrade?
External facade?



Healthier material used:

Stucco facade?
Door types?

Left: Lakeline multi-family development Construction site
Right above: Transportation board located at M Station
Right: Shared balcony space at Capital Studios

Neighborhood Community engagement

NIMBYism (Not in My Backyard) sentiment is a battle for most affordable housing developers who have to develop community support for new projects in neighborhoods that have not traditionally included affordable housing. FC has a strong history of building community support for their building projects. As Walter Moreau explains: “I think we’re 11 and 0 on winning neighborhood support. It helps that people know us, they see our properties, they see that they are nice and well maintained.” (Walter Moreau, 2016) One way FC helps to gain community support is through tours of their property, where they show neighbors that buildings are well built and maintained, they also explain how the learning centers operate. Around 500 visitors a year visit FC properties and integration of the development into the wider community and neighborhood is core to its success. FC realizes community engagement as a key goal for the organization and the learning centers play an important role in realizing this aspiration.



5. THE LEARNING CENTER

HEALTHY OCCUPANCY

5.a Education and health

Learning Centers make up 7500 square foot indoor space, with an additional 1500 square foot screened outdoor. Eleven Learning Centers are operated by FC at their multifamily properties, and serve over 700 kids a year, as well as adults. The centers provide after school and summer programs for school children. Since the centers are located close to their residences, it is easy and accessible for parents to pick up their kids, which often incentivises children participating in the programs. Marisela Montoya, Director of Education, explains that the goal of the Learning Centers is to build the achievement gap between students who come from low income families compared to those who may have a more affluent background. Montoya explains:

“Whereas a middle class family or well to do family might be able to offer their children violin classes and summer camp, our families are not, and so we want to bring some of those activities to them and have them accessible right where they live. And that’s the clincher right there - where they live” (Marisela Montoya, 2016).

The learning centers have been consistently successful in providing the support necessary to increase academic achievement. Literacy rates amongst residents are increasing, and children’s grades are improving, with more than 700 students attaining an average GPA of 3.58 in 2015 (Pew Charitable Trust, 2016)

Various initiatives undertaken by FC also supports different groups and their specific needs. For example, Children’s Home Initiative (CHI) targets extremely low income parents with young children and provide an intensive on-site case management services, employment assistance, as well as access to the learning center’s programs. Currently, Foundation Communities has 103 apartments for CHI families

“Of the 45 families that graduated from the 18-month program this year, 87% fulfilled a financial literacy component and 98% of the children in the program improved or maintained their academic performance. (FC blog, December 2, 2015)

Another initiative is the summer programming at the learning centers. Educational opportunities during summer months are particularly critical as they helps narrow the achievement gap and prevent what is known as “summer slide.” Research has demonstrated that low-income students tend to fall behind during these months

because of limited access to year-round academic support. (FC blog, August 5, 2014). The initiative fills this gap at no cost to the parents while also mitigating the difficulty summer months can be on working parents.

Finally, FC also use their learning centers for adult learning, and they have developed Free Minds, a two-semester college humanities course for low income adults. The program is run in partnership with UT Austin and Austin Community College (ACC). The classes take place on site and allow participants to bring their children who also are provided with an activity, once again providing the support single or working parents might have when pursuing a degree.

The Center for Housing Policy report on The Impacts of Affordable Housing, explain the many benefits that having access to affordable housing has on the health of residents. They describe 10 pathways through which access to affordable housing influences the health of residents, these include:

“Affordable Housing Can Improve Health Outcomes by Freeing Up Family Resources for Nutritious Food and Health Care Expenditures

By Providing Families with Greater Residential Stability, Affordable Housing Can Reduce Stress and Related Adverse Health Outcomes

Well-Constructed and Well-Maintained Affordable Housing Can Reduce Health Problems Associated with Poor-Quality Housing

Green Building Strategies and Location-Efficient Housing Reduce Environmental Pollutants, Lower Monthly Energy Costs, and Improve Home Comfort and Indoor Environmental Quality.” (Maqbool, Viveiros, Ault, 2015)

The Learning Centers, all of which are located at the residential properties, engage with these health outcomes. Marisela Montoya explains:

“Right where they live is really important and I think a lot of the community centers really become a little central point. Families start realizing there are people there that have resources they need access to. Not just educational opportunities, but if they need financial

Photograph of interior of learning Center

Could you provide us with a photograph?

assistance, help them find where to get vaccinations, where to get eyeglasses. We have food pantries available there. And then on top of it we hope that they trust us with their kids to come to us everyday after school and to teach them something.” (Marisela Montoya, 2016)

The Learning Centers have a well developed, child centered curriculum including both academic and physical activity. Some of the programming is focused on sustainability issues such as recycling and use of resources. These include the Green and Healthy curriculum which covers health and hygiene and the EcoSmarts curriculum which covers environmental education topics such as air, energy, and waste. These programs are meant to engage children in understanding both the problems but also encourages them to take action and have agency over making change in their lives and in their homes.

Right: Event poster at M Station for Healthy living workshop



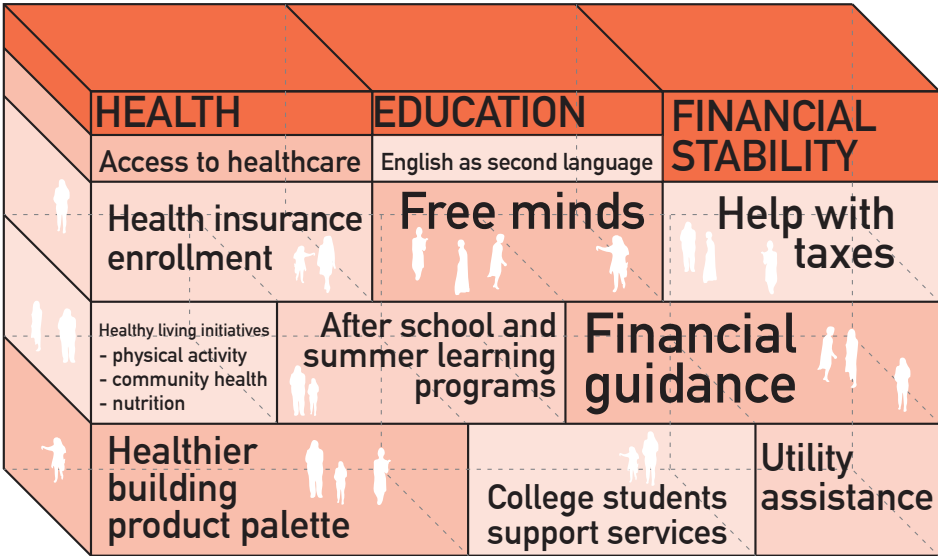
Follow up Questions:

- Do you have images of the Lakeline Learning Center construction site / completed interior spaces?

The design of the Learning Centers directly embodies educational goals. For example energy consumption systems such as electrical and water usage are physically and visually revealed to children by exposing the systems such as wiring and cisterns in the space. This knowledge is then often brought home and shared with family members expanding the potential for impacting behavior. Vicki MacDonald explains that “we definitely try to get the message out to people - we treat it as a marketing tool for leasing in terms of the green features of our properties and how that benefits residents, not only for utility savings, but just the environment they live in terms of air quality. Asthma is a big problem with children now, so people appreciate that we do not install carpeting and the low VOC paints. That makes a difference.” (Vicki MacDonald, 2016) The hope is that

through youth and adult education programs, residents will consider both resource conservation and the health benefits associated with good indoor air quality when making choices in all aspects of their lives including their own apartment.

FC also works closely with maintenance staff to ensure they are certified in green building management, which includes using less toxic cleaning and maintenance products for building upkeep. They provide a list of vetted products and 16 hours of maintenance training following the Credential for Green Property Management™ (CGPM™) set out by The National Affordable Housing Management Association (NAHMA) and National Apartment Association Education Institute (NAAEI). This is further



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

complemented by a four hour workshop annually in house. FC also conducts staff training and creates informational graphic materials for staff to ensure easy references are available for future.

Ensuring healthy occupancy is core to FC's mission and this dedication is rare in the industry. The resources provided on site to residents are large contributors to the success of the housing developments. Placing priority on providing access to these services while also ensuring durable, sustainable and healthier constructions demonstrates that such developments can be achieved within an affordable budget.

“I think as people become more educated about the impact of toxicity of things and what they can do, they are more aware and are beginning to question and use, alternatives such as vinegar as a cleaning product. It’s about staying in tune with what’s happening in the world and taking a leadership role in teaching people how to think differently. And for our residents, to provide healthier environments for them and their families to live in. We want the same thing for our employees and our staff.” (Vicki MacDonald, 2016)



Left: Services provided in Learning Centers
Right: Children playing outside of M Station multi-family developments

Follow up Questions:

5.b Learning Center as space of innovation - Pursuing the LBC certification

The Lakeline Learning Center, which started construction in Spring 2016, is part of a larger multi-family affordable housing development located near Lakeline station, north of Austin. FC chose to pursue the Living Building Challenge (LBC) certification for the development’s learning center. The LBC is a stringent performance standard. FC chose the learning center because there would be relatively smaller cost impact for a smaller building. Secondly the building does not have such a strict construction time frame and does not need to be operational within the timeline dictated by the LIHTC (the residential buildings build using the tax credits have to follow very strict timeline, and be open within 2 years). Thirdly the learning center is the ‘pedagogical’ heart of the site, there are many residents that participate in the space and being able to build an exemplary construction can be inspiring. The LBC certification embodies many of the fundamental principles of the learning centers.

- Which petal from the LBC did you prioritize?
- How was that decision made?

Lakeline Learning Center served as a pilot for the FC but also served the International Living Futures Institute’s desire to learn from the certification and how implementable it is in the affordable sector. The goal was to learn by prototyping the learning center and subsequently potentially scaling up to the residential development on following project. The LBC is an extremely stringent certification that can add substantial cost in research of alternate material specification, construction and oversight management and up front cost of materials, making it difficult to meet the LBC criteria on a limited budget. After many challenges FC could not achieve the full certification but continued to follow the ethos and guidelines of LBC where feasible.

Learning Centers have acted as the community hub for all FC’s multi-family development. These have also been spaces for experimenting with design concept and materials and dissemination hubs for youth and adult education. It is an ideal space to try work through the LBC and continue to innovate in design and construction practices.

Healthier material used:

Linoleum flooring
Quartz countertop
Plywood cabinetry

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



Left: Image of the future learning center at Lakeline multi-family development. © Hatch Ulland Owen Architects

5.c The Living Building Challenge - Process of prioritization

The Living Building Challenge (LBC), involves a comprehensive design process, a high standard of sustainability, energy and water efficiency considerations, and the use of healthier materials in construction, amongst many other prerequisites. The LBC (version 2.0 and 2.1) process consists of 20 imperatives divided into seven petals based on seven themes: Site, Water, Energy, Health, Materials, Equity, and Beauty. These imperatives necessitate an integrated design process, involving many stakeholders including the full design team and contractor from the start of the project. Thus, in order to enact these successfully, a strong collaboration and dedication from the entire project team including the developers, designers, contractors, and consultants is mandatory, making this certification a useful tool for increased and more transparent teamwork.

Project integration and strong working relationships are crucial in the creation of better affordable housing. Productive and efficient site meetings demonstrate clear goals and alignment between different team members. These relationships are initiated at the beginning of the design phase of the project, ensuring all parties are on board with the project objectives while keeping these goals realistic by inviting early input on construction feasibility and construction cost by the contractor.

It is important to note that the LBC is currently the only national certification to take such a strong stance on materials for both residents of new construction and the surrounding communities. The LBC’s mission is driven by its ability to make long term impact; “what if every active design and construction made the world a better place?” (International Living Futures Institutes, Living Building Challenge website)

The LBC not only requires the design team to incorporate certain design guidelines and a strict material specification process, but also demands that they become advocates for more transparency in the industry. Through the LBC’s Red List material criteria (see list on the left), designers have to ensure that they do not specify any materials from the list, and also contact a minimum of 10 manufacturers to campaign for the declaration of the chemical content of their products. Advocacy simultaneously advances transparency in the construction industry while radically diminishing the use of the hazardous materials in new constructions. This demand, while important and forward thinking, is time consuming and requires allocated resourcing from the project team to carry out material research effectively, adding a substantial cost to the project.

FC pursued a large grant to help cover the project and construction cost difference between the “baseline learning center” and a fully certified LBC learning center. However the grant was considerably less than what they needed. As FC was confronting a shortfall in funding they had to prioritize which petal to pursue. They developed a rubric to help the process of evaluating which paths to take. This was not only specific to materials but also considered the water, energy, site, beauty etc. petals. The rubric included various benchmarks based on the level of direct impact of a design decision. This included health impact on the residents (for example redlist free, not redlist free), educational potential, replicability, systemic change potential and cost. This rubric aimed to quantify the associated cost versus direct impact.

LBC Red list

- Alkylphenols
- Asbestos
- Bisphenol A (BPA)
- Cadmium
- Chlorinated Polyethylene and Chlorosulfonated Polyethylene
- Chlorobenzenes
- Chlorofluorocarbons (CFCs) and Hydrochlorofluorocarbons (HCFCs)
- Chloroprene (Neoprene)
- Chromium VI
- Chlorinated Polyvinyl Chloride (CPVC)
- Formaldehyde (added)
- Halogenated Flame Retardants (HFRs)
- Lead (added)
- Mercury
- Polychlorinated Biphenyls (PCBs) Perfluorinated Compounds (PFCs)
- Phthalates
- Polyvinyl Chloride (PVC)
- Polyvinylidene Chloride (PVDC)
- Short Chain Chlorinated Paraffin
- Wood treatments containing Creosote, Arsenic or Pentachlorophenol
- Volatile Organic Compounds (VOCs) in wet applied products

As a result of this process, it became very clear that FC should prioritize the building envelope for the LBC material compliance enabling substantial cost savings. All materials enclosed within the wall and not in direct resident contact were not considered, saving time and resource in the decision making process. Further thought went into what interior product to prioritize and again resident contact was a key factor. For example, in the case of windows, FC initially preferred not to specify vinyl windows, but on consideration this is a product that children do not often interact with directly. Instead walls and floors were considered to be more important products that can have a much larger impact on the occupants.

While this certification undeniably supports a path to innovation for the construction industry, one cannot avoid asking the questions: how can these requirements become standard practice? And, are they able to be achieved within all of the complexities of the affordable housing sector? Lakeline Learning Center's challenging process demonstrates that the feasibility of the LBC certification in that sector still has some way to go.

Through the advocacy work that the LBC promotes there is an opportunity for transformation in manufacturing practices. However, in order to impact a range of other practices in the affordable housing market, more support must be provided to developers and designers wanting to participate in this drive for change. The values of the LBC were wholly embraced by The Lakeline team throughout the design process; however, without some changes to the certification, the expansion of the applicability of the requirements into the affordable housing market is questionable. Despite this challenge, positive change can incrementally take place as transparency and collaboration are promoted by teams using the LBC process as a guideline. Finally, using the LBC certification can change the baseline practice of designers, developers and contractors in future projects, moving the needle toward new healthier possibilities in the affordable housing sector.

Site construction image

Could you provide us with a photograph?

Right: M Station learning center in use



6. INNOVATION IN DESIGN AND CONSTRUCTION



Building long term partnerships is important to the design and construction practices of FC. While there are different types of contracts between developers and general contractors, FC's contractors are brought on as "Construction Manager as Advisor", or CMAs. As Robbie Keithly of Spawless Construction (who has worked on multiple projects with FC) explains: "This practice allows us to jump in early on for 50% of the design and development phase documents and participate in constructability reviews" (Robbie Keithly, 2016). This helps the construction team to vet materials, work out feasibility and budgets at early phases of the project and helps streamline the entire project making other steps, such as financing, easier in the long run. With the volatility of Austin's construction costs, Robbie Keithly explains that it "really helps us set the budget and design" (Robbie Keithly, 2016). Through early collaboration, contractors can offer guaranteed maximum price, which helps to streamline future steps of the design, financing, and construction process.

Keith Pool of BEC Construction also supports early collaboration in order to look at cost feasibility. While they do not directly get involved in the project design,

they will look at concept design in order to advise on keeping cost down and economically manageable. This is also an opportune time to get aligned themselves with the vision and mission of FC. Early participation by contractors enable them to work with developer and architect to research less toxic products, a step that needs to be done at early stages to allow for additional time for research prioritization and procurement.

While many developers in the region push for LEED certification, Robbie Keithly of Spawless Construction (who had worked on multiple projects with FC), recognizes FC push for higher standards than most developers and seeks LEED Platinum as a baseline practice. In their pursuit of better materials, FC proposed using the Living Building Challenge, which required earlier collaboration with their contractors and architects. Hatch Ulland Owen Architects, who have worked on many projects with FC, were chosen to be the architects on the Lakeline project because they had shown particular dedication to researching the LBC criteria, a role that is necessary for driving these changes in practice.

Healthier material used:

What will be the floor finish at Lakeline residential development?

FC works with architects who understand their goals to use healthy building products. As Tom Hatch of Hatch Ulland Owen Architects, who have worked on multiple projects with FC, explains: "I have been in the practice for a long time, and we've been trying to use pretty clean materials for a long time" (Tom Hatch, 2016). Hatch explains that since beginning his work designing affordable housing in 1978, he has seen big changes such as a switch to non-Formaldehyde products and less carpeting, two practices that contribute to better interior air quality.

Certification criteria is a jumping point for FC to work with their architects to research healthier products. Scott Ginder of Forge Craft Architecture and Design explains that FC will ask them to push manufacturers for products that will meet specification. Even if these products are not available, they communicate to manufacturers that there is a need for them and this hopefully moves the dial for the next project.

The team also includes consultants and civil engineers that must understand the goals in order to deliver quality housing, while driving innovation. Tom Hatch explains that they will change their consultants depending on what the project requires. Their civil engineering team has worked on multiple project collaborations. This is important in an area like Austin where they deal with varying geological conditions (hard rock and soft clay) as well as heavy rains that can cause rapid flooding.

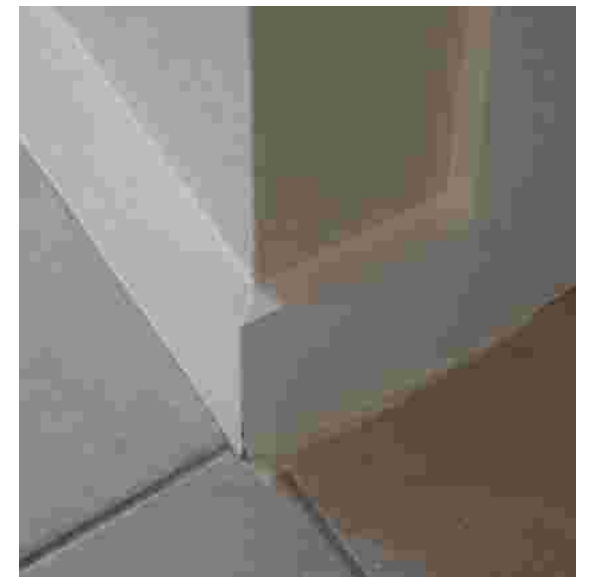
A major benefit of bringing the team together early on is that future steps can be implemented quickly and efficiently. For example, they can bring together concept designs and budgets in order to apply early on for LIHTC. This means that once they have the go ahead on this major source of financing, they are ready for the next stage of design and construction.



Healthier material used:

Ceramic floor tiles
Painted pine base boards

Left: Common stairwell in entrance lobby at Capital studios
Right above: Construction site at Lakeline Station development
Right: Typical material palette including ceramic tiled floors, wooden baseboards and low VOC paint



6.b Construction Challenges

Construction costs in Austin are volatile. Population in Austin is growing at a rapid rate, (some estimates indicate 100 to 150 people move to Austin each day) and the demand for housing is growing. Residential construction struggles to keep up, which drives overall construction costs up. Along with pressures on labor and material costs, the price of land also rises as demand increases. In order to handle these challenges FC's contractors try to use the same subcontractors in order to limit surprises, and they work out budgets and contracts well in advance so that the construction goes smoothly. The volatility of these costs has lead FC to change their typical floor finish in some of their development to exposed concrete floors which require less labor while remaining a healthier product for indoor air quality.

Keith Pool of BEC General Contractors explains another challenge they face is product performance. It is important that installed products are durable and long lasting, but in Pool's experience, some new products such as non VOC paints have not performed so well in the past. However, he notices that as the market demand for these types of products grows, more options have become available and now they are able to find healthier paints that perform well for interior walls. This demonstrates that if a demand for better, affordable products is created, material innovation and the market will follow.



Healthier material used:
Interior furniture?
Aluminum windows?

Right: Lakeline Station development construction site
Left: Shared lobby area at Capital Studios

Follow up questions:

- Fundraising campaigns are typically for construction cost or operations cost?
- How do you acquire financing for the construction of the Learning Centers?

6.c Funding strategy

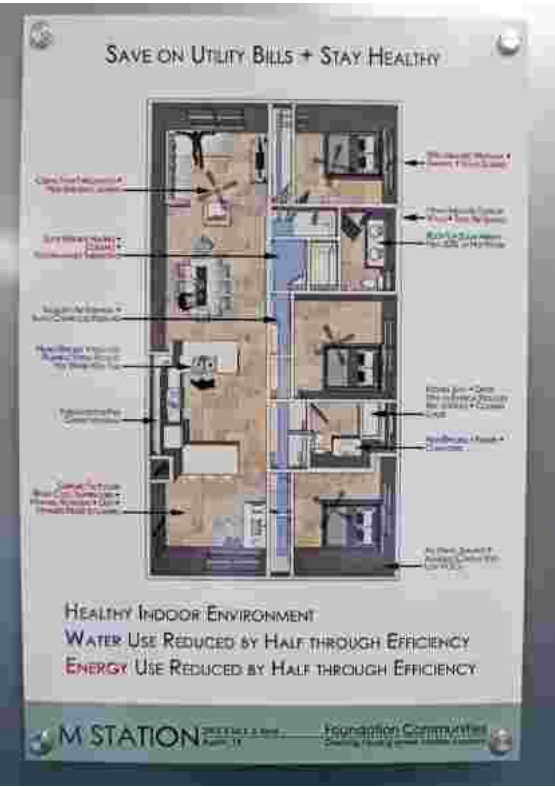
The 9% The Low-Income Housing Tax Credit (LIHTC), a funding program for encouraging the investment of private equity in the development of affordable rental housing, is highly competitive in Texas and the credits are oversubscribed by 5 to 1 every year (Walter Moreau, 2016). FC received all 3 tax credits available for their region in 2015. FC has been effective at winning high points through the Qualification Allocation Plan (QAP) process. The area in which they are able to succeed the most in the point system is when they propose developments in areas where there is a lack of, or no affordable housing at all. These developments are valued highly by the tax credit board as they address the recent changes made in the QAP criteria to specifically target these neighborhoods. FC has a history of being successful in acquiring land in these areas lacking affordable housing. FC uses an array of funding sources to fund their developments, learning centers and their operation. They pride themselves in ensuring that their model is sustainable and 80% of the operation cost is covered by the residents rent. Funding sources include:

- NeighborWorks America provides \$400,000 to \$500,000 in capital grants each year.
- Federal Home Loan Bank Affordable Housing Program grants help fund almost all FC projects.
- Each Austin project has had investment from the city for \$1million to \$4million which can come from affordable housing bonds or a mix of funds from HOME and the Community Development Block Grant Program.
- Funding from the state comes from HOME funds or Tax Credit Assistance Program (which closed out after 2012).
- FC are working on more fundraising campaigns and have support from the Michael and Susan Dell Foundation, who are focused on children's success so help funding for the Learning Centers
- St David's Healthcare Foundation has been a major investor for new projects due to their focus on Health Programming
- FC have started a small capital campaign, going to major donors to get some funding for the construction of projects.

Additional funding:

- Topfer Family Foundation
- Kendeda Fund
- Enterprise Section 4 Grants - HUD Capacity Building for Community Development and Affordable Housing Program (Every Section 4 dollar must be matched directly by \$3 of private funding for capacity building)

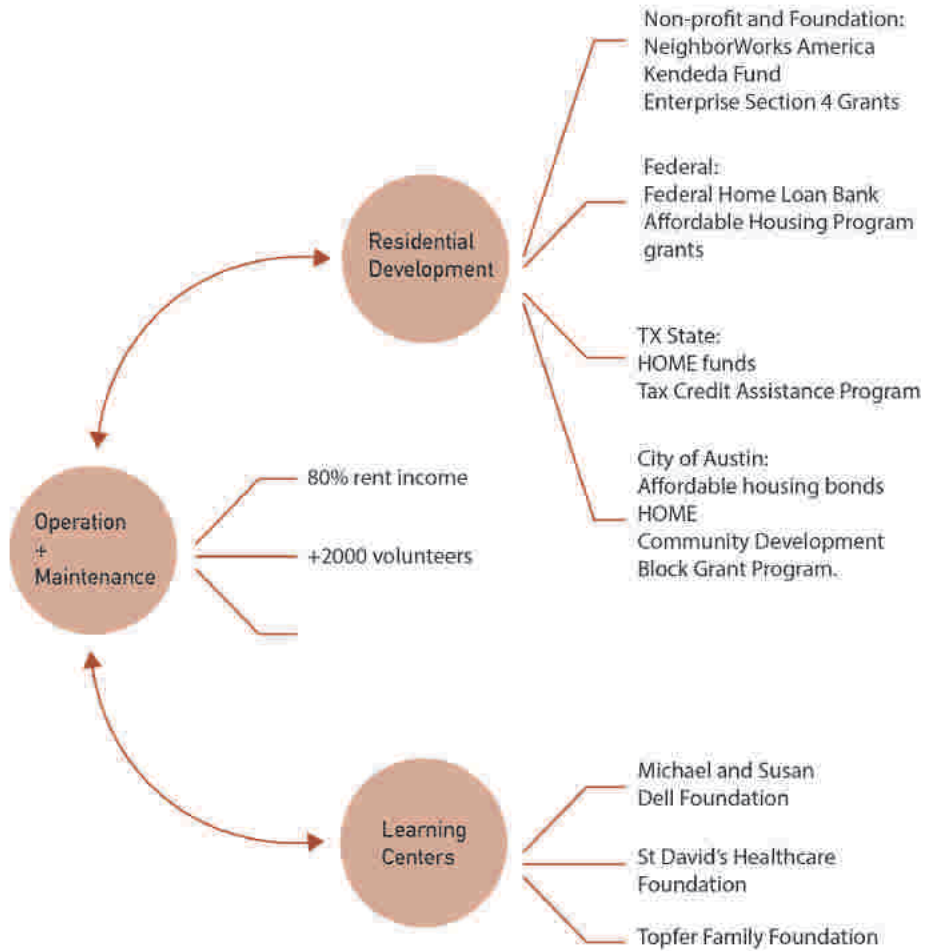
We have learned from other case studies that the allocated contingency budget has enabled the late upgrade to healthier products during construction. FC may use the contingency for these purposes, but often prioritize using it to funding amenities for residents such as upgrading elevators. BEC General Contractors also explained that in many case, the contingency becomes available late in the construction process, when most materials have already been ordered, making a change order very difficult.



Right: Panel located at M Station outlining ways to maintain a healthy indoor environment

FUNDING STRATEGY

Please check and add to this funding diagram



Tradeoffs/ Challenges

FC exhibit a deep commitment to exploring new practices in design and construction in order to deliver quality and healthy housing. By pursuing new certifications, such as the Living Building Challenge, their team and partners have explored using less toxic materials in order to improve indoor air quality for residents. Changes in practice have also highlighted several challenges when it comes to product selection.

The largest obstacle is cost. Many healthier products are not feasible because they far exceed budget allocations. There is also an additional cost to maintaining new systems, particularly when needing to train maintenance staff for these new practices. There is a question of

how to best use scarce resources. For FC, who prioritize education, they chose what represents the most value and impact on residents. Vicki MacDonald explains the challenges in reaching some certification goals: “For cost benefit analysis, would you rather have another teacher to be able to serve the children, teaching them to succeed at school, or have someone taking out the compost and moving it somewhere every week? (Vicki MacDonald, 2016). Establishing such priorities is what all developers need to incorporate in their mission and practice. FC’s commitment to education and health encompasses a shift in the housing industry to work across sectors in order to achieve resident’s success.

Above: Diagram outlining main funding sources

INSTALLED PRODUCTS LIST - RESIDENTIAL

Follow up questions:

- Please confirm this material palette
- Are there any typical product missing from this list?
- What was the saga Walter mentioned over experimenting with a new type of insulation?

<div>DIVISION 3</div> <div>Finished concrete floor slab and sealant</div> <div></div> <div>Notes: In its installed state, concrete is considered to be one of the more inert building materials. During production, additives and flyash can introduce problematic chemicals. see Quartz database for common building products for more information</div>	<div>DIVISION 6</div> <div>Pine Wall Base Boards</div> <div>RED LIST</div> <div>TRANSPARENCY</div> <div>Notes:</div>	<div>DIVISION 7</div> <div>Fiberglass Insulation - External walls:</div> <div></div> <div>Notes: Formaldehyde free. Batt/blanket thermal shield free</div>
<div>DIVISION 7</div> <div>Cellulose Insulation - Internal walls: US Greenfiber LLC</div> <div></div> <div>Notes: Why are you choosing this product?</div>	<div>DIVISION 8</div> <div>FSC Certified hollow core wood door: Manufacturer?</div> <div></div> <div>Notes: FSC sustainably harvested</div>	<div>DIVISION 9</div> <div>Ceramic tiles: Various local manufacturers</div> <div>Do they have anti-microbial coating?</div> <div>Notes: No lead content</div>
<div>DIVISION 9</div> <div>Carpet Tile backing: Manufacturer?</div> <div></div> <div>Notes:</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>DIVISION 9</div> <div>Wall Gypsum Board - National Gyp.Co Moisture resistant</div> <div>RED LIST</div> <div>TRANSPARENCY</div> <div>Notes:</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
- FC better products choice

<div>DIVISION 9</div> <div>Carpet Tile: Manufacturer?</div> <div>RED LIST</div> <div>TRANSPARENCY</div> <div>Notes:</div>
<div>DIVISION 9</div> <div>Interior Paint: Sherwin Williams</div> <div>RED LIST</div> <div>TRANSPARENCY</div> <div>Notes: Chosen as it contains low VOC</div>
<div>DIVISION 10</div> <div>Shower Enclosure: Fiberglass Reinforced Plastic Panel surround</div> <div></div> <div>Notes: Not enough information</div>

<div>DIVISION 9</div> <div>Textured finish: Sherwin Williams</div> <div></div> <div>Notes: Chosen as it contains low VOC</div>	<div>DIVISION 10</div> <div>Corner Guards: Manufacturer?</div> <div></div> <div>Notes: Contains no PVC Containing recycled HDPE plastic</div>
<div>DIVISION 12</div> <div>Cabinetry: Oak veneer (FSC) doors</div> <div></div> <div>Notes: Formaldehyde free cabinets</div>	<div>DIVISION 12</div> <div>Laminate Countertop: NAUF</div> <div></div> <div>Notes: Contains no formaldehyde</div>

6.d Material palette

FC typically uses the same material palettes for floors, wall finish, kitchen cabinetry and countertop across their residential developments. Ceramic tile and poured concrete floor are used as floor finishes. Keith Pool reported that the ceramic tile comes from Dallas or other local sources and are usually a relatively inexpensive and durable. Ceramic tiles without a toxic glaze can be a low impact material. Have the tiles made in the USA means there is no lead content (HBN, Homefree website). Labor costs for installation are more volatile and therefore exposed concrete floors have also become an option.

FC explored using quartz for their countertop, however the more affordable options come from China and therefore the team decided that the carbon footprint outweighs the direct health benefits. The team consistently looks for innovation in the material development sector and are willing to try out new products. For example, FC experimented with a new type of insulation. (Which insulation? Walter mentions the 'saga' this led to? Can you elaborate on this?)

INSTALLED PRODUCTS LAKELINE LEARNING CENTER

Follow up questions:

- Please confirm this material palette
- Are there any product missing from this list that was chosen particularly to achieve the LBC material petal?
- What were the spec for the plywood cabinetry?

<div><div>DIVISION 6</div><div>Pine Wall Base Boards</div><div>RED LIST</div><div>TRANSPARENCY</div><div>Notes:</div></div>	<div><div>DIVISION 5</div><div>Plywood cabinetry FSC? Formaldehyde free?</div><div></div><div></div><div>Notes:</div></div>	<div><div>DIVISION 7</div><div>Cellulose Insulation - Internal walls: US Greenfiber LLC</div><div></div><div></div><div>Notes:</div></div>
<div><div>DIVISION 7</div><div>EPS board Insulation - External walls:</div><div></div><div></div><div>Notes: Why is this a better product?</div></div>	<div><div>DIVISION 7</div><div>Vinyl windows: Milguard and Sierra Pacific</div><div></div><div></div><div>Notes: Cost issue lead to value engineering fiberglass windows to this product</div></div>	<div><div>DIVISION 7</div><div>Composite wood and aluminium skylight: Velux</div><div></div><div></div><div>Notes:</div></div>
<div><div>DIVISION 9</div><div>Ceramic wall tiles: Dal-Tile Corp</div><div></div><div></div><div>Notes:</div></div>	<div><div>DIVISION 9</div><div>Linoleum resilient flooring: Forbo Marmoleum Tile</div><div>RED LIST</div><div>TRANSPARENCY</div><div>Notes:</div></div>	<div><div>DIVISION 9</div><div>Carpet Tile: Nylon Mohawk Group</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

<div><div>DIVISION 12</div><div>Roller blinds: Vinyl blinds UrbanShade System and EcoFlex</div><div></div><div></div><div>Notes: Cost issue lead to value engineering PVC free 100% recycled blinds to this product</div></div>	<div><div></div><div>Quartz countertop: Ceasarstone</div><div>RED LIST</div><div>TRANSPARENCY</div><div>Notes:</div></div>
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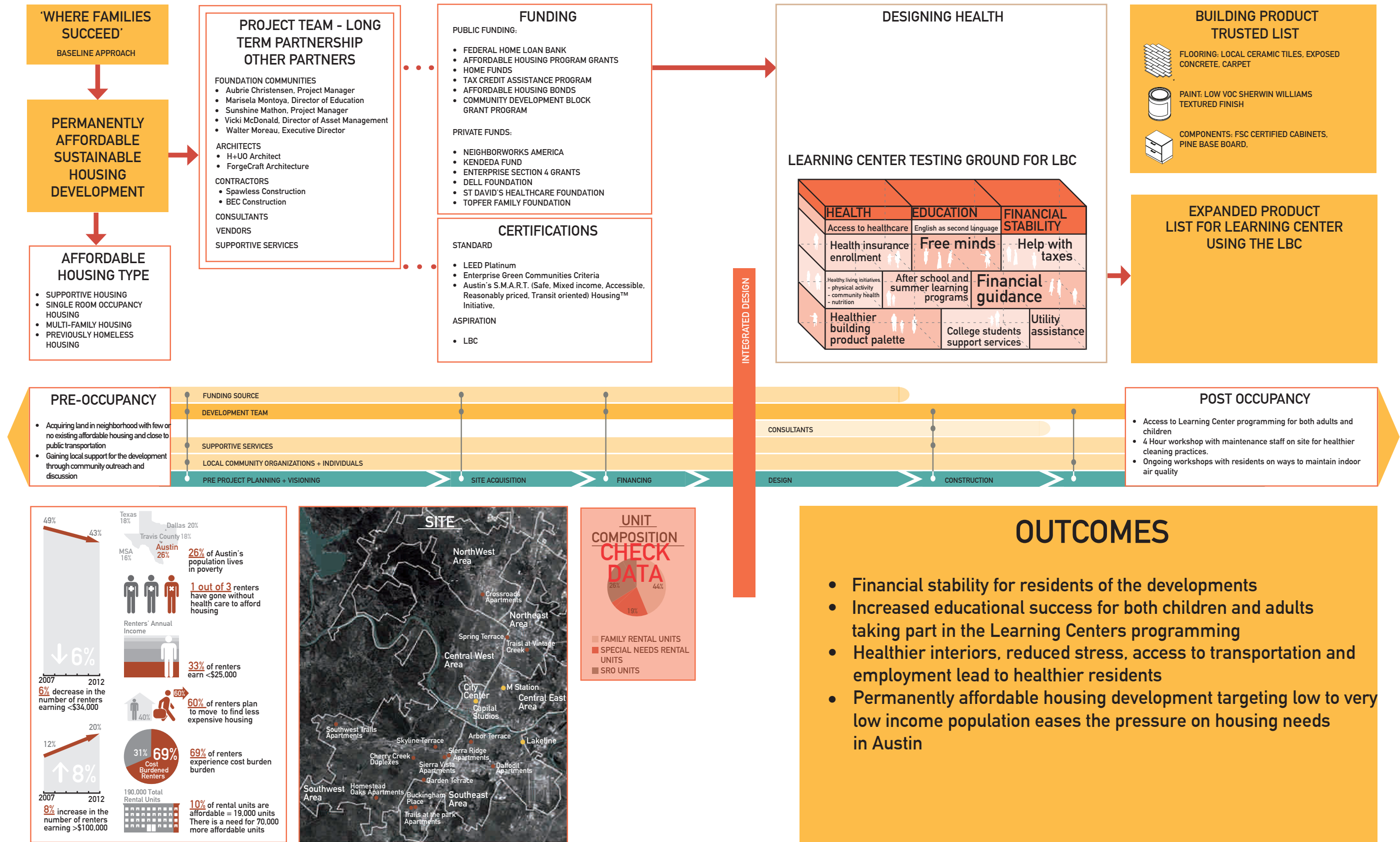
6.d Material palette

The LBC material petal guided FC to research and use alternative options of products that do not contain ingredients from the ‘red list’ published in the certification criteria. This initially included fiberglass windows, 100% recycled and PVC free blinds and solid wood exterior and internal kitchen carcasses. These three items had to be replaced with cheaper options as the material cost for the learning center exceeded the budget. FC prioritized keeping the healthier products that would be in direct contact with children using the center such as flooring material, wall finishes. FC found no alternative but to install vinyl windows and blinds and use plywood for the cabinetry.

Sustainable environmental building practices integrated in the learning center also include:

- Low flow toilets and shower heads
- Efficient air conditioning and heating systems
- Rainwater collection system
- Wood framing techniques of opening corners to use less lumber

6d. MAPPING THE PROCESS



See references for stats on page 22

7. CONCLUSION

Follow up Questions

- Are there any important key moments, challenges or successes that should be added to this report?

- What is your most valuable recommendation to share with other developer or designers embarking on a similar path?

8. REFERENCES

Affordable Austin: Building the Housing We Need at Prices We Can Afford. Report. RECA Real Estate Council of Austin. RECA White Paper, 2015.

Annamarya Scaccia, Fri., Sept. 2, 2016. “AISD Sees Uptick in Homeless Youth.” Lack of Affordability Jeopardizes Housing Stability for Austin Families - News - The Austin Chronicle. Accessed June 22, 2016. <http://www.austinchronicle.com/news/2016-09-02/aisd-sees-uptick-in-homeless-youth/>.

Austin Energy. *2013 Multifamily Rating Guidebook*. Report. Austin Energy. Austin, TX, 2013.

Capen, Alison, James Connelly, Krista Elvery, Marisa Hagney, Kathleen Smith, Amanda Sturgeon, and Sam Wright. *Living Building Challenge Framework for Affordable Housing*. 2014. International Living Future Institute, WA, Seattle.

“Credential for Green Property Management™ (CGPM™) - NAHMA.” NAHMA. Accessed November 30, 2016. <https://www.nahma.org/education/credential-for-green-property-management/>.

Farrah, Kim, Breeze Glazer, Carolyn Roose, Peter Syrett, Chris Youssef, and Kristina Buller. HEALTHY ENVIRONMENTS A Compilation of Substances Linked to Asthma. July 2011. NY, New York City.

Foundation Communities. Foundation Communities. <https://foundcom.org/>. Accessed 09/12/16

Foundation Communities. “IRAQI FAMILY FINDS COMFORTS OF HOME AT SIERRA RIDGE” *Foundation Communities* (blog), December 02, 2015. Accessed October 2, 2016.

Foundation Communities. “SUMMER LEARNING KEEPS LOCAL STUDENTS ENGAGED.” *Foundation Communities* (blog), August 05, 2014. Accessed October 2, 2016.

“Health Product Declaration Collaborative - HPD Collaborative.” HPD Collaborative. Accessed April 14, 2016. <http://www.hpd-collaborative.org/>.

Klruweb. “Free College Course Lowers Barriers to Education for Adults on KLRU.” Klru.org. Accessed September 12, 2016. <http://www.klru.org/blog/2015/10/free-college-course-lowers-barriers-to-education-for-adults/>.

Living Building Challenge V.2.0. December 2010. International Living Future Institute, WA, Seattle.

Living Building Challenge V.2.1. May 2012. International Living Future Institute, WA, Seattle.

Living Building Challenge V.3.0. 2014. International Living Future Institute, WA, Seattle.

Lori Hawkins and Shonda Novak - American-Statesman Staff. “As Austin Apartment Market Booms, Still No Relief for Renters.” Austin Investigative News from Austin American-Statesman. Accessed November 30, 2016. <http://www.mystatesman.com/news/business/as-austin-apartment-market-booms-still-no-relief-f/nm6j/>.

Maqbool, Nabihah, Janet Viveiros, and Mindy Ault. *The Impacts of Affordable Housing on Health: A Research Summary*. Report. Center for Housing Policy. Washington, DC: National Housing Conference, 2015.

Pewtrusts. “Developing Communities With Health in Mind.” The Pew Charitable Trusts. Accessed September 12, 2016. <http://www.pewtrusts.org/en/research-and-analysis/analysis/2016/01/15/developing-communities-with-health-in-mind>.

Press, Associated. “Keeping Austin Expensive: Rents Spike in Capital City.” NBC 5 Dallas-Fort Worth. 2016. Accessed August 4, 2016. <http://www.nbcdfw.com/news/local/Keeping-Austin-Expensive-Rents-Spike-in-Capital-City-364040921.html>.

“Six Classes.” September 22, 2013. Accessed April 14, 2016. <http://greensciencepolicy.org/topics/six-classes/>.

Saul, Amanda, Cheryl Gladstone, Maggie Weller, Keri Vartanian, Bill Wright and Grace Li. *Health in Housing: Exploring the Intersection Between Housing and Health Care*. Center for Outcomes Research and Education (CORE) and Enterprise Community Partners, 2016.

United States. City of Austin. *Annual Report on Imagine Austin Comprehensive Plan*. Austin, TX, 2016.

United States. City of Austin. Austin Housing Finance Corporation. *RENTAL HOUSING DEVELOPMENT ASSISTANCE (RHDA) PROGRAM*. Austin, TX, 2012

United States. City of Austin. Quality and Standards Management Division Public Works Department. *CITY OF AUSTIN CIP CONSTRUCTION PROJECTS QUALITY ASSURANCE PROGRAM*. By G. Jay Ulary. Austin, TX, 2012.

United States. City of Austin. Neighborhood Housing and Community Department. *2014 Comprehensive Housing Market Analysis*. By BBC Research and Consulting. Austin, TX, 2014.

United States. City of Austin. Neighborhood Housing and Community Department. *Austin Strategic Housing Plan - Draft*. Austin, TX, 2016.



Left: Lakeline Station
development construction site

Interviews:

United States. City of Austin. *S.M.A.R.T. HousingTM: A Strategy for Producing Affordable Housing at the Local Level*. Austin, TX, 2005.

Wolff, Mary S., Susan L. Teitelbaum, Kathleen MCGovern, Susan M. Pinney, Gayle C. Windham, Maida Galvez, Ashley Pajak, Michael Rybak, Antonia M. Calafat, Lawrence H. Kushi, and Frank M. Biro. “Environmental Phenols and Pubertal Development in Girls.” *Environment International* 84 (2015): 174-80. doi:10.1016/j.envint.2015.08.008.

Wolff, Mary S., Susan L. Teitelbaum, Gayle Windham, Susan M. Pinney, Julie A. Britton, Carol Chelimo, James Godbold, Frank Biro, Lawrence H. Kushi, Christine M. Pfeiffer, and Antonia M. Calafat. “Pilot Study of Urinary Biomarkers of Phytoestrogens, Phthalates, and Phenols in Girls.” *Environmental Health Perspectives* 115, no. 1 (2006): 116-21. doi:10.1289/ehp.9488.

Wolff, M. S., S. L. Teitelbaum, K. MCGovern, G. C. Windham, S. M. Pinney, M. Galvez, A. M. Calafat, L. H. Kushi, and F. M. Biro. “Phthalate Exposure and Pubertal Development in a Longitudinal Study of US Girls.” *Human Reproduction* 29, no. 7 (2014): 1558-566. doi:10.1093/humrep/deu081.

Keith Pool, Contractor, Bailey Elliott Construction, “Foundation Communities Development Process.” Interview by author. March 7, 2016.

Marisela Montoya, Director of Education at Foundation Communities, “Foundation Communities Development Process.” Interview by author. March 8, 2016.

Robbie Keithley, Contractor Spawglass, “Foundation Communities Development Process.” Interview by author. March 7, 2016.

Scott Ginder, Architect at ForgeCraft Architecture, “Foundation Communities Development Process.” Interview by author. March 7, 2016.

Sunshine Mathon, Aubrie Christensen, Project Managers at Foundation Communities, “Foundation Communities Development Process.” Interview by author. March 8, 2016.

Tom Hatch, Architect at H+UO, “Foundation Communities Development Process.” Interview by author. March 7, 2016.

Vicki McDonald, Director of Asset Management at Foundation Communities, “Foundation Communities Development Process.” Interview by author. March 8, 2016.

Walter Moreau, Executive Director at Foundation Communities, “Foundation Communities Development Process.” Interview by author. March 8, 2016.

Attended site meeting At Lakeline
(attended 03/08/2016)

