2017

Active Design: Creating a Blue Zones model for interior environments

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integrity
approach work honestly and openly
intention
define concept and plan clearly and articulately
integrity
give meaning and order to materials
integrity
respect and care for people and the earth

I am committed to making design that serves many
and is universal, because that is
economical, sustainable and ethical.

but I honor design that celebrates the individual,
because that is
personal, poetic and joyful.

Design is power
designers have a responsibility to help people experience
and manage their time and place on earth.

― Alexis Holcombe
“It is a question of environment.”

That was the assessment of Dr. Pekka Puska, a cardiologist and public health professor with Finland’s National Institute for Health and Welfare (THL). I was sitting at a cozy kitchen conference table with Dr. Puska and his associate, Vesa Korpe- lainen. They had agreed to meet me at their office in Joensuu, Finland, a seven-hour journey by train from Helsinki, through endless miles of thick Baltic birch forest.

I visited Joensuu and Helsinki to discover the connections between interior environments and public health. Dr. Puska had reservations that he could provide any useful insights to a researcher looking for clues to well-being and indoor health. Yet as our conversation continued, it was clear that both men noticed the same growing awareness that I had intuitively grasped after reading Dr. Buettner’s book. The germ of an idea that grew into this book started in the summer of 2015. I had just finished reading The Blue Zones Solution before entering the master’s program at Virginia Commonwealth University’s department of interior design. After a six-week immersion in the department’s summer intensive workshop that prepares master’s students for the rigors of a two-year design program, I started to wonder whether interior design could help people live longer, healthier lives.

I learned about Dr. Puska’s effort to address a public health crisis in Joensuu from reading Buettner’s work on the Blue Zones. Although it was one thing to define areas of the world where people already were living long, healthy lives, Buettner’s challenge was to discover a way one could create a Blue Zone from a community where people led comparatively unhealthy lives.

Dr. Puska explained how, as an obstetrician-gynecologist in the 1970s, he proceeded to help bring Joensuu back from the brink of a serious public health crisis. North Karelia, the eastern province where Joensuu is located, had the highest mortality rate for men under the age of 35 in Finland. Through soil and river, Puska and his associates learned that they couldn’t make a lasting difference by treating people individually. Instead, they discovered that a community approach based on lifestyle was the most effective, long-term solution to addressing the problem. And so they took an ecological approach and worked with grocers, restaurant owners, teachers, parents, doctors, students — anyone from the community who wanted to participate.

Using this example, I conceived of a mixed-use building project in Richmond, Virginia — one where one could live healthfully and participate in a mind-body strengthening program. In doing so I hope to provide a blueprint for a micro-Blue Zone living within the context of modern-day urban Richmond.

I am grateful to Dr. Puska, Mr. Korpelainen and their associate, Dr. Tiina Laatikainen, for initiating this research and design process.

— Alexis Holcombe

I Was Told, by Alexis Holcombe. Mixed media on fifteen cards, front and back. The author’s artist statement addresses the journey a designer makes in the long process of acquiring artistic maturity. This project’s emphasis on flaws and imperfection is a wabi-sabi principle used to emphasize the acceptance of change and the imperfections and uniqueness of all life.
How might interior environments play a role in promoting lifelong well-being? According to Passarino, et al., genetic variety only accounts for about 25% of the variation of human longevity. A combination of diet, environment and exercise comprise the greatest factors.

The amount of time Americans spend indoors presents a challenge to increasing physical activity: the Environmental Protection Agency (EPA) states that Americans spend 93% of their lives indoors (Roberts, 2016). Therefore, if physical activity is crucial to living longer, the design of interior environments could logically be a critical factor in promoting natural movement and sustaining lifelong well-being.

National Geographic fellow Dan Buettner identified five “Blue Zones” throughout the world where people naturally live longer: Ikaria, Greece; Okinawa, Japan; Olgiastra Region, Sardinia; Loma Linda, California; and Nicoya Peninsula, Costa Rica. These regions have unusually high concentrations of centenarians who had grown old without noticeable signs of heart disease, obesity, cancer or diabetes (Buettner, 2015).

Buettner identified nine common principles that universally characterize well-being in the Blue Zones. The first, and most crucial to design in the built environment, is to “move naturally.” Healthy centenarians, Buettner says, “live in environments that constantly nudge them into moving” (Buettner, 2015). This research will seek to translate Blue Zone principles aimed at promoting continued well-being through natural movement that can inform principles for the creation of interior environments and promote natural movement and increased longevity.

RESEARCH METHODOLOGIES

Further analysis of Blue Zones principles will address specific conditions and behaviors that encourage natural movement. A literature review and case studies will be presented that show a correlation between natural movement within the built environment and measurable increases in healthy outcomes. The example projects include La Maison de Verre, Paris, France; L’Unité d’Habitation à Marseille, France; and Tea House, Bethesda, Maryland.

Interior design that encourages regular natural movement occurs primarily in the design of a building’s major circulation systems and its program (Center for Active Design, 2010). Corridors, elevators and lobbies that connect other spaces in the program encourage walking. Elements like stairs, bicycle storage and furniture that promote micro-movement promote activity when they are visible, safe and attractive. Programmed spaces that encourage physical activity like dance/movement studios and those that promote healthy foods also lead to increases in healthy behaviors, which ultimately lead to increased longevity.

Using these guides, a building in Richmond, Virginia will be redesigned as a micro-Blue Zone that could be used as a model for promoting increased lifelong well-being. This two-level adaptive reuse, mixed use commercial project will address vertical transitions, social spaces and outdoor relationships that encourage residents and visitors to move through the day.

how can interior design help us live longer, healthier lives?
There are many factors that work against creating healthy life habits for most Americans. Cheap, high caloric food with little nutritional value adds pounds and degrades our bodies’ ability to fight disease. Technological advances make life easier but also make us more inclined to be sedentary.

Previous generations moved more because they had to and ate simpler diets. Scarcity and hardship created an environment where people’s bodies worked harder to maintain health. As researcher Dan Buettner notes in *The Blue Zones Solution* (2015), most Blue Zones residents, such as those in Sardinia and Ikaria, for example, live in communities that are physically isolated from many modern conveniences. These individuals live largely in the same way they did a century earlier. Their simpler lifestyles hold the key to understanding their long and healthy lives.

Buettner’s research on the Blue Zones shows that it is possible to create modern day environments that mirror the experiences of Blue Zones centenarians. The results from these Blue Zones community “makeover” projects has produced noticeable results in 31 communities across the U.S., with an impact on more than 2,000,000 lives.

The Blue Zone principle of moving naturally means people can add more exercise to their daily routine without going to the gym. Making your food choices, more social connections and having a profound outlook are all Blue Zones’ blueprint.

This project’s proposed mixed use, adaptive reuse addresses three major program areas: nine residential apartments, a tai chi studio, and a modern day Japanese tea room.

**HOW TO BLUE ZONE THE HOME**

A  deconvenience the home to maximize movement
B  create an efficient kitchen layout
C  have plenty of cleared kitchen counter space and good lighting
D  make the bedroom a sanctuary for a good night’s sleep
E  own only one TV
F  have indoor plants for better air quality
G  create a quiet destination space for relaxing and meditating
H  place seating on the floor
I  ride a bike and walk to get moving outdoors

**HOW TO BLUE ZONE THE ENVIRONMENT**

J  move naturally throughout the day
K  have a sense of purpose and live for something beyond work
L  make food and dining sacred by eating a plant-focused diet with friends and family
M  bring together a group of mutually committed friends
N  deconstruct and shed stress by meditating, napping or praying

**POWER NINE**

*The Power Nine are principles common to all five Blue Zones. These same principles are also being applied in the Blue Zones Project, a program that brings measurable results to 31 U.S. communities.*

01 neighborhood People in Blue Zones live in communities that build movement into their daily routines.

02 purpose Have something to live for when waking up each day. Having a sense of purpose adds seven years of extra life expectancy.

03 plant slant Beans are the backbone of Blue Zones diets, while meat is eaten in limited quantities.

04 down shift Make a daily habit of taking time to meditate, pray or nap.

05 wine @ five All Blue Zones centenarians drink alcohol moderately and regularly — one to two glasses a day.

06 family first Children who are cherished care for aging parents, while having a life partner can add three years’ life expectancy.

07 80% rule In Japan’s Okinawa region people remind themselves to stop eating when they are 80% full with the concept of hara hachi bu.

08 community Attending faith-based services adds four to fourteen years of life expectancy regardless of the denomination or practice.

09 right tribe Social circles support healthy behaviors. Okinawans create moais — five friends who support each other for life.
Buildings and sites can have a measurable impact on occupants’ health. Building site and the form of buildings, as well as amenities, programming, and circulation have all been shown to affect physical activity (Zimring, Nicoll, and Tsepas, p. 188-90). Likewise, building elements can promote or deter physical activity. Stairs are the building element that have the greatest potential for affecting human health positively. Studies have shown measurable impacts on weight reduction and risk of stroke or death when occupants use stairs rather than elevators or escalators.

Yet while behavioral choices are governed by the built environment, cultural norms, economics and social trends also play a crucial role in defining the ways in which we use buildings. The social behavioral model of individual behavior change is governed by societal, community, organizational, interpersonal and individual factors.

Adults with low self-efficacy only increase their participation in physical activity if they have increased access to sports facilities. Adults with high self-efficacy, on the other hand, find a way to maintain a consistent program of physical fitness regardless of their access to sports facilities. High self-efficacy is also linked to better knowledge about nutrition and social support for eating fruits and vegetables (Zimring, Nicoll and Tsepas, pp. 265-66).

The feature staircase at the Buckingham County Primary and Elementary School is located near the building’s entrance. Colorful handrailings are placed at kids’ heights, while the stair connects important shared common spaces and acts as a social hub. Source: Tom Daly.

Blue Zones residents incorporate instrumental and hybrid activity in their daily lives. People in Blue Zones live in environments that build movement into their daily routines. For modern societies that rely on convenience, such activity must be more deliberately considered.

Concern for well-being and the environment can be encouraged by positive social trends: "A built environment (and associated policies and social marketing) may both improve individual health and help the community achieve environmental sustainability." (Zimring, Nicoll and Tsepas, pp. 188-90)

Equally as important as hybrid physical activity are the smaller and more subtle forms of movement that we engage in every day. A new study tracking 10,000 smartphone users shows that “inactivity, which has been linked to poor physical health, is also linked to poor psychological health” (Lathia, Sandstrom, et al., p. 1).

Research on self-reported levels of happiness and physical well-being has mostly focused on exercise. This new research shows a link between happiness and even exercise movement by using a smartphone app to track self-reports of happiness.

Humans spend a great deal of time sitting, most of it while sitting sedentary. "Leaders of movement promotion need to understand that most of us spend between eight and 10 hours each week seated. During that time, our bodies need, in particular, our legs need 'exercise' (Davison)."

This causes a clear decline in the flow of blood to our legs, and lowered blood flow results in hardening of the arteries. Standing can improve this by causing leg muscles to contract and blood to flow. But it’s not always acceptable to stand in some situations, such as a long meeting or during a long trip.

A study in The American Journal of Physiology Heart and Circulatory Physiology testing a small number of healthy young people shows that fidgeting could produce enough lower body muscle movement to significantly elevate blood flow to the legs.

A diagram titled "Five identifiable dimensions of the interior built environment could affect human health by impacting stress levels, which in turn has been shown to affect overall physical health by affecting our ability to cope with the stress." shows:

- **Stimulation**: loud noise, bright light, strong smells, bright colors
- **Affectance**: using building features and technologies
- **Affordances**: corners, entries, stairs, barriers
- **Restorative**: retreat, fascination, exposure to nature
- **Control**: inflexible resources and arrangements prevent effective interaction with interiors
- **Coherence**: identity, meaning and location of objects and spaces

Movement and happiness

Building and stress
Building developers and designers have only recently recognized the importance of encouraging stair use to benefit human health. Interestingly, visual appeal is not a significant indicator of whether stairs will be used regularly. A recent study suggested that spatial characteristics of stairs are much more important than attractiveness or a pleasing view in determining stair use, suggesting “a well-placed stair has more impact on stair use than a well-dressed stair” (Nicoll, p. 351).

The study concludes that convenience and legibility are the most important factors in determining stair use, and that “building managers may design interventions to remediate spatial deficiencies such as the lack of stair visibility or intelligibility” (Nicoll, p. 352).

**Design and stair use**

<table>
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Stairs on the New York City University campus have been updated to encourage use. "Stairs are better, and more people are using them," says school Dean Anthony G. Caperton. Source: Anthony G. Caperton.

**New York City addresses stair use**

The New York City Council recently passed a bill that increases stair visibility by allowing some stair doors to be held open by magnetic devices that will close automatically in case of an emergency. These devices make code-compliant fire stairs more visible and therefore more likely to be used.

Before this, special permission needed to be granted by the city to install magnetic hold-open devices on stairway doors.

The Center for Architecture in New York City uses hold-open devices on the door of its main circulation stair. Rick Bell, Executive Director of the New York City chapter of the American Institute of Architects, says "The Center welcomes 5,000 visitors a month, and of those visitors, ninety-five percent take the stairs to reach our gallery spaces and lecture halls” (Center for Active Design).

A pending NYC bill ensures that all new construction provides building occupants with stair access to all floors. The bill also will allow the use of fire-rated glass and point-of-decision stair prompts “as in other stair systems in new buildings.”

**Fire-rated glass and stair use**

Using fire-rated glass assemblies can make stairs more visible, even in existing buildings. In addition to making stairs more appealing for everyday use, naturally lit glass stairwells can be better lit, more accessible and usable.

According to the amended 2012 International Building Code (IBC), codes for fire exit doors require a minimum dimensioned glass panel of 100 square inches, whether or not the building is fully sprinklered. However, this requirement applies only to traditional “safety” wired glass and ceramic products. Recently developed special fire-rated glass assemblies can be used to limit temperature rise and to block radiant heat.

While fire-resistance times are not specified in IBC, 1-hour or 2-hour fire ratings on products for use in stairways are specified in NFPA 80 (2007). Products such as SuperLite II-XL can be used to form glazing assemblies for fire exit enclosures, such as this one at a St. Cloud University stairway in Minnesota. Source: SaftiFirst.

**Signage is used at the Buckingham County Primary and Elementary Schools to encourage students to use stairs to increase physical activity. Source: Alan Karchmer or Tom Daly.**

**Signs placed near stair and elevators to encourage stair use can encourage building occupants to consider health benefits of using stairs.**

A review of sign use has shown that 10 of 11 studies of such ‘point-of-decision prompts showed more people used stairs when signage was used as long as signs are decorative, informative and consider the targeted user population (The Community Guild).
Well-being research connects to practice.

Several recent initiatives are addressing the connections between well-being and interior environments. While each of these initiatives centers around a specific topic or scope, they share several overlapping criteria.

The Blue Zone principle of natural environment is evident in each of these programs. In most cases, the focus is on one or more aspects of building performance for active movement, and integrated parks of novel that enable and encourage.

The Center for Active Design in New York City is a non-profit organization that uses research to promote healthy and engaging communities. The center’s building design checklist focuses on a building’s circulation. The Center also awards the U.S. General Services Administration Award and the Center for Disease Control and Prevention Award for designing the mostExcellent green building.

The Urban Land Institute has developed a similar matrix for designing healthy spaces. The Building Healthy Places Toolkit has been designed in cooperation with the Center for Active Design to promote the ULI’s educational and research mission. The toolkit aims to help architects, designers, planners, and policymakers create healthy and vibrant communities.

Many cities and states have implemented programs to encourage healthy and active lifestyles. The New York City Department of Health and Mental Hygiene, for example, has developed a program to promote physical activity and healthy lifestyles in the city’s public spaces.

The Well Building Standard, developed by Delos Living, LLC, a wellness real estate concern, is the world’s first lab devoted to studying human health in the built environment. The Well Building Lab, a building designed to promote healthy living, has been designed in cooperation with the Center for Active Design in New York City.

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The Well Building Standard and the affiliated Well Living Lab are supported by the International Well Building Institute. The Well Living Lab is a joint center between Moxy China and Delos Living, LLC. A wellness real estate concern. The Center is a world’s first lab devoted to researching human health in the built environment. The Well Building Lab, located in a rating system that scores with the LEED Green Building Rating System.

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The Well Living Lab in Rochester, Minnesota simulates real life indoor living and working environments. Created as a joint venture between Rochester’s Mayo Clinic and Delos Living, LLC, a wellness real estate concern, the lab studies indoor environments to identify factors that make homes healthier places to live in.

While the evidence-based methodology used by the Well Living Lab does not specifically address the Blue Zones principles identified by Dan Buettner, the lab’s mission taps into the same critical environmental factors and quantifies them.

The lab uses advanced biometric and wearable sensor technology that allows study participants to move about naturally. Sensors monitor and record the body’s response to stimuli such as sound, motion, air flow, light, and sleep. The lab uses advanced architectural design features like reconfigurable mechanical and structural systems designed by Steelcase to simulate a wide range of living situations and other features such as sound and noise simulators, residential modules and open office environments (welllivinglab.com, 2017).

The research methodology uses large and small groups of subjects with varying demographic and health measurements. Outcomes such as sleep, performance, stress, fitness and nutrition are studied in a variety of environmental configurations. Jolene Bernau, Innovation Coordinator for the lab, says the first study tested the lab’s capabilities in addition to collecting performance data. She stresses that this is a simulation of a real world environment, not a recreation of one.

In an interview at the lab’s Rochester facility, Bernau notes that the best way to measure productivity in the simulated office environment is to measure cognitive function. Preliminary data already show that stress and fatigue lead to lower levels of productivity. Results like this can give employers, designers and contractors a sense of where the best return on investment lies for installing upgraded lighting systems, for example.

The project began when Delos Ventures approached the Mayo Clinic’s Center for Innovation (CFI). Barbara Spurrier, the lab’s Administrative Director, said in an interview that the CFI’s work network with standard healthcare models that led them to think about what it would mean to simulate real world environments. In 2016 Delos convened a group of lab participants to test the lab’s environment, and on May 2016 the lab opened its doors.

Spurrier says that while the fundamentals in place as the lab’s metrics are starting to include “design thinking,” they have included 17 designers on the lab team. They are now working on making remote connections with other Mayo entities such as a senior center and a fitness center to extend the work of the lab.

“Scalability” is therefore one of the lab’s highest priorities. According to Alfred Anderson, the lab’s Information Technology Director, a system designed to grow organically requires “a system that can scale organically.” Anderson says going remote enables clients to see the lab’s results in the real world.

The field of wellness research in interior environments is just beginning. As part of its effort to establish accountability in healthy building design, the International Well Building Institute (IWBI) released the WELL Building Standard v.1 in 2015. Developed in partnership with the U.S. Green Building Council, the standard is modeled on the Leadership in Energy & Environmental Design (LEED) credentialing program. Candidates can become WELL Accredited Professionals (WELL AP) by successfully passing the WELL AP exam and buildings can receive WELL AP certification.
Tai Chi Chuan, or Tai Chi, is a form of martial arts using simple movements that are combined into a series of continuous movements (Hong, 2008). Increased muscle strength, flexibility, balance, and the prevention of falls are the main physical benefits (Hong, Min. Li, 2008). Additional benefits include the stress reduction and revitalization of mind-body connection through focused attention, eye-hand coordination, and the calming state of mind that results.

Research shows that Tai Chi offers both a physical component as well as a mental, meditative component that is believed to contribute to overall well-being (Yau, 2008). These qualities make a Tai Chi studio an effective programming choice for a Blue Zone.

How does a Tai Chi studio meet Blue Zones criteria?

1. Move Naturally:
The lower body support and direction of movement are more effective than daily walking for simulating the body’s natural positions that are required for daily activities (Hong, Mao, Li, 2008). The slow movements and sustained poses increase the lower body workout. The moderate workout intensity is appropriate for all ages and can be adjusted for participants of various fitness levels (Lan, Chen, Lai, 2008). Finally, Tai Chi can be practiced virtually any time and any place without special equipment.

2. Purpose:
Tai Chi has been shown to improve quality of life. Meaningful and productive activities such as Tai Chi enhance quality of life by providing meaning to and a pattern for living daily life (Yau, 2008).

3. Downshift:
Tai Chi effectively reduces stress and anxiety while it promotes tranquility and relaxation.

4. Right Tribe:
The positive atmosphere in the group setting promotes a strong social support component beyond the actual time spent in Tai Chi practice.
Chado, the Way of Tea, also known as Teaism, was introduced in China thousands of years ago by Zen Buddhist monks to prevent sleep. After water, tea is the most frequently consumed beverage in the world. Yet while the tools and processing of tea originated in China and India, Teaism is a full expression of Japanese character. Also known as Cha-no-yu, literally “Hot Water for Tea,” the ceremony of drinking tea in Japan embodies the simplicity and restraint of Buddhist philosophy.

As A.L. Sadler notes, the devotion to a calm and simple life in Japanese society was enforced on Japan out of postwar necessity. The rejection of the ego and public display of vulgarity was an effective way to moderate “the disruptive forces of society” and emphasize “esthetics, economics and etiquette” (pp. xxi-xxii).

As early as 4,000-5,000 years ago, the Chinese understood that tea could promote health and prevent some human diseases (Chen and Lin, p. 87). In the 1980s a more modern approach was begun to assess the medicinal benefits of tea, with over 800 academic papers published between 2012 and 2015 on this subject. (p. 87). A survey of these studies points to several important benefits of drinking tea.

**Tea and human health**

- Active compounds called catechins were found to have protective effects on health, including prevention of some types of cancer. Six studies show there is a likely reduction of breast cancer risk with regular consumption of green tea (Chen and Lin, p. 87).
- Ten studies indicate that green tea could reduce body weight and body fat. The type of catechin in green tea could be linked to drinking three to five cups of tea a day. Catechins in tea could reduce blood pressure or inflammation.
- Studies in Japan and the US suggest mortality from cardiovascular disease was decreased when more than 6 cups of tea per day are consumed. Black and green tea “may reduce risk of heart, coronary heart disease and stroke by 20% - 40%.” (Chen and Lin, p. 87).
- Source also found a connection to the prevention of some degenerative diseases. “Tea drinking could reduce the risk of Alzheimer’s and Parkinson’s disease by thirty to fifty percent and cognitive ability was shown to be significantly higher in a group drinking black tea” (Chen and Lin, pp. 92-93).

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- In Japan’s Okinawa region people remind themselves to stop eating when they are 80% full with the concept of Hara hachi bu.
- Beans are the backbone of Blue Zones diets, while meat is eaten in limited quantities.
- The Japanese practice of taking a moment to utter “Hara hachi bu” before each meal is an ancient Confucian practice that reminds centenarians in the Okinawan Blue Zone to stop eating when their stomachs are eighty percent full.
- By waiting 20 minutes for the sensation of fullness during a meal, Okinawans carefully control healthy portion control and under the meal “a time to enjoy, relax and relieve stress” (Buettner, p. 48).
- “For them, growing, preparing, serving, and eating are all sacred practices with power to bring their families, their homes, their communities, their beliefs, and the natural world together in daily rhythms and harmonies” (Buettner, p. 77).
- Researcher Buettner notes that people in all the Blue Zones drink tea. “Okinawans nurse green tea all day. Green tea has been shown to lower the risk of heart disease and several cancers. Ikarrians drink brews of rosemary, wild sage, and dandelion – all herbs known to have anti-inflammatory properties.” (Buettner, p. 77)
Plan of a four-mat tea room called Kansui-an to have been given by the third Shogun Iemitsu to Okudaira, lord of Nakatsu in Kyushu.

- tokonoma
- board floor
- mizuya
- nijiri-agari
- shelf
- setsuin
- waiting arbor
- windows
- crouching basin
- lantern
- nobleman’s entrance
- garden gate

Illustrations, The Japanese Tea Ceremony

Buddhist monks and craftsmen designed temples and mansions, "[a]nd since Teaism was the art of making a house as well as living in it, the Tea Master was the architect in many cases" (Sadler, p. xxi). A professional Tea Master could also be known as an artist, architect, decorator and connoisseur.

Using the ken, a measurement of 3 feet by 6 feet, or the dimensions of a Japanese tatami mat, the plan of the house is designed to fit around the plan of the garden, with all ornamentation and construction clearly in view.

The Japanese home and garden

Viewing life from a different angle leads to a greater sense of place in the universe.
Created in close consultation with architect Lucio Dalbat,
and the clients, Dr. and Mrs. Dalbat, La Maison de Verre is
so richly detailed that its interior is equally if not more signif-
cant than its architecture. In fact, in his 1969 essay, the architect
Koenraad Kamps wondered whether it would be more
accurate to call La Maison “a greatly enlarged piece of furni-
ture” (Kamps, p. 77), noting that architect Pierre Chareau
was largely interested in interiors.

While adhering to principles of modern design proposed by Le
Corbusier, La Maison shows a greater sense of liveability and
suitability for its occupants. Serving as a medical office for the
owner, Dr. Dalbat, and a family home, the building features
moving parts such as screens and staircases. The complex path
of travel shifts from floor to floor, providing constant move-
ment. Simple forms and materials support the flow.

This project has been selected because of its unique circulation
and arrangement of many moveable elements. By displacing the
major horizontal planes and organizing a complex but orderly
path-through the house, Chareau’s house is an excellent model
for organization of this thesis site.

The glass block facade of La Maison de Verre, as seen from the forecourt,
allows in light while maintaining
privacy. At the time, the use of
glass block “lenses” on such a scale
for residential architecture was
relatively unknown. The material was
originally developed in Japan and
indeed contributes to the Japanese
character of the house. Photo source:
Subrealistsandu/Arch Daily.
The pivoting door leading from the medical suite to the private quarters with perforated metal sub-screens. (Photo source: Francois Halard via Edwards and Gjertson.)

Axon of the main stair. (Image source: Michael Carapetian via Perspecta.)

(top) Retractable stair from Madame Dalsace’s day room. (bottom) Plan and section of the retractable master bedroom stair. (Both images: Michael Carapetian via Perspecta.)

Four different stair solutions in the house include (01) an auxiliary stair for the doctor’s access to the study, and the extraclinical suites in the office/dining area, (02) access stair to the main stair to the second floor to access the study, dining area, and library, (03) a retractable ship’s stair to the master bedroom. (Photo sources 04, Michael Carapetian. 01 02 03 04)

A mobile stepladder can be moved to access the double height bookcase in the main salon. Critic Kenneth Frampton notes the mobility evident in such elements are typical of the transformational quality of the house. (Photo source: Subrealistsandu/Arch Daily.)

The family dining area on the first floor facing the hallway to the butler’s pantry. The family meeting space is a source for the IIème décoration trend to large scale pieces. (Photo source: Francois Halard via Edwards and Gjertson.)

The family dining area on the first floor facing the hallway to the butler’s pantry. The family meeting space is a source for the IIème décoration trend to large scale pieces. (Photo source: Francois Halard via Edwards and Gjertson.)

A view of an area with bookshelves designed by Pierre Chareau. The second floor facing with suitable doors and gallery access. (Photo source: Francois Halard via Edwards and Gjertson.)

The family dining area on the first floor facing the hallway to the butler’s pantry. The family meeting space is a source for the IIème décoration trend to large scale pieces. (Photo source: Francois Halard via Edwards and Gjertson.)

A view of the main salon facing the hallway to the butler’s pantry. The family dining area on the first floor facing the hallway to the butler’s pantry. The family meeting space is a source for the IIème décoration trend to large scale pieces. (Photo source: Francois Halard via Edwards and Gjertson.)
1. tunnel entrance
2. forecourt
3. 2-car garage
4. existing 18th century building
5. entrance to house
6. entrance to house above
7. service wing
8. garden access
9. consulting room terrace
10. ground key
11. grass and shrubs
12. gravel play court

1. entrance lobby
2. central corridor
3. garden corridor
4. service foyer
5. servants’ entrance
6. recreation room
7. waiting room
8. consulting room
9. examination room
10. attendance room

A. dumb waiter
B. passenger elevator
C. auxiliary stair to study
D. stair to basement
E. stair to kitchen
F. main stair to salon
G. changing cubicle
H. refuse

1. main landing
2. main salon
3. dining area
4. pantry
5. study
6. wide over foyer
7. wide over consulting room
8. kitchen
9. kitchen entrance
10. wash-up
11. storage wall

A. dumb waiter
B. passenger elevator
C. auxiliary stair to study
E. stair to kitchen
H. waste disposal
J. storage unit
K. storage unit
L. book rack
M. rotary cleaning cupboard
O. pass-through
P. telephone kiosk
Q. retractable stair to master bedroom
R. plant conservatory

1. void over salon
2. master bedroom
3. bedroom
4. master bathroom
5. terrace
6. gallery access
7. guest bathroom
8. washroom
9. maid’s bedroom
A. dumb waiter
B. passenger elevator
C. cupboard
I. cupboard
L. book rack
N. cleaning cupboard
S. storage unit
T. wardrobe unit
V. shower
W. toilet unit
X. w.c.
34 35

Transverse section through main stair. Source: Perspecta magazine.

Longitudinal section through two story salon. Source: Perspecta magazine.
Vertical living was one of Swiss modernist architect Le Corbusier’s signature achievements. The ideal of providing mass housing cheaply for as many inhabitants as possible was realized in 1952 with the Rochebien City known popularly as the Marseille Block.

Building vertical housing made efficient use of scarce land resources, gave all dwellers the same basic advantages and allowed them to equally benefit from shared services in the building complex (Choay and Herve, 1961).

Le Corbusier’s unique plan allowed the apartment units to be inserted onto a common skeleton, which he believed to serve better than buildings in a row in a line. The units wrapped up and over, or down and under, a common interior “street,” making a highly efficient use of space that gave all units windows on either end and two-level living (Boesiger, 1967).

This project has been selected because of its vertical orientation and adaptability to a constrained volume. The long, narrow apartments maximize movement, both along length of each level and in transitioning between levels.

Le Corbusier, 1946–1952
Marseille, France

section perspective showing the access to natural light, vertical transitions and generous volume in a narrow space (Source: Choay and Herve, 1961).

view of the living area looking into the kitchen (Source: Choay and Herve, 1961).

exterior view from Boulevard Michelet (Source: Boesiger and Girsberger, 1961).

Le Corbusier likened the apartments to wine bottles inserted into a rack (Source: Boesiger and Girsberger, 1961).

vertical section plan looks across the block from a level above (Source: Choay and Herve, 1961).

this vertical section detail shows the access to natural light, vertical transitions and generous volume in a narrow space (Source: Choay and Herve, 1961).

view of the living area looking into the kitchen (Source: Choay and Herve, 1961).
Architect David Jameson’s tea house, located in a lush backyard of a suburban Maryland residence, appears suspended, like a lamp, on two wood fantastic strings. While it appears to hang from a steel structure, cantilevered over the garden’s edge, the tea house is in fact fully anchored to the ground. The structure’s frame holds the building in place while lighting accentuates the apparent suspension.

This space can be used for meditation or as a quiet space to entertain and serve tea, or to simply relax.

This project can be a model for the Japanese tea room in a model Blue Zone, addressing the principles of Downshift, Plant Slant, and Community.

**purpose**

Have something to live for when waking up each day.

Having a sense of purpose adds seven years of extra life expectancy.

**down shift**

Make a daily habit of taking time to meditate, pray or nap.
RICHMOND AND THE FAN DISTRICT

POPULATION
City of Richmond population (2015) 217,938, projected population (2020) 229,383
Richmond metropolitan area population 1.25 million

Richmond is the 39th most populous city and the 64th largest metropolitan area in the U.S., and is one of only five cities in Virginia with a population of 200,000 or more, higher than the national average of 198.

Richmond is home to VCU, Virginia’s largest university, with an enrollment of 31,361.

Median household income (2014) of $47,947, above the U.S. average of $43,449.

GEORGIA

Richmond's cost of living is more than 5% below the national average.

Housing, groceries, transportation are all lower than the national average.

Health care and utilities costs are higher than the national average.

The average monthly apartment rental is $867 for a 950-square-foot two bedroom, excluding all utilities but water.

The region has more than 4,100 physicians and 19 acute care and specialty hospitals.

VCU's Medical College of Virginia is the most comprehensive teaching hospital in Virginia.

COSTS AND SERVICES

Richmond is one of America's 50 Best Running Cities by Runner's World (August 2016).

Top 10 Cities for Creatives by Thrillist (July 2016).

Top City for Foodies by National Geographic (January 2016).

No. 3 on international list of Best Places to Travel in 2016 by Travel + Leisure (November 2015).

Richmond ranked among 10 Most Walkable Mid-Sized Cities of 2015 by Redfin (August 2015).

Richmond's Fan District among Top 10 Great Neighborhoods by American Planning Association (October 2014).

ACCOLADES

LOCATION

Situated at the midpoint of the East Coast/mid-Atlantic region of the United States.

Lies on the I-95 corridor, the major north-south highway on the East Coast.

Also bisected by I-64, a major Virginia artery connecting Richmond with Norfolk, Newport News and Virginia Beach to the east and Charleston, South Carolina to the west.

Served by Richmond International Airport (RIC) and Chesterfield Airport.

Amtrak passenger rail stops in Staples Mill and the Main Street Station in historic Shockoe Bottom.

The Richmond metropolitan statistical area is the 44th largest metro in the US.

56% of the population is in the prime working ages of 25-64, higher than the national average of 53%.

48% male, 52% female.

62% white, 30% black, 3% asian, 1.6% other.

Median household income (2014) of $47,947, above the U.S. average of $43,449.

High school graduate 87.8%, some college or associates degree 28.4%, bachelor's degree or higher 32.5%.
Development of the Historic Fan District grew from a late 19th-century trolley transit line. Subdivided in 1817, the district was a magnet for Richmond’s emerging middle class following the end of the Civil War. Building in the Fan was largely completed by 1920.

As Drew St. J. Carneal notes, a rich tapestry of late 19th C. architectural styles is represented. Because a relatively small number of architects designed the majority of Fan structures, the district has a sense of visual unity, in spite of the variety of styles. Although the district is largely residential, the commercial corridors of West Main, North Lombardy, North Robinson and Strawberry Streets continue to serve residents.

The streetscape is very walkable, with sidewalks edging all streets and set backs that keep commercial buildings within reach of pedestrians. The limitation of building height throughout the district creates a very human scale and sense of repose.

Geographically, many streets “fan” out radially from Monroe Park in the eastern region of the quarter, which creates the most dominant node for travel and for understanding the district’s geometry (fanofthefan.com). This arrangement also creates several triangular shaped parks throughout the Fan. According to the nomination form for the district’s National Register of Historic Places inventory, the grid of linear streets and square blocks is mediated by the small parks and many trees that line the streets, softening its edges. Visual scope is increased by the varied “rooflines, turrets, dormers, bay windows, cornices, projecting porches and recessed arched entrances.”
The proposed project site is located at the intersection of West Main and North Vine Streets in the Fan District. It is a 15 minute walk from the Fan’s landmark Monroe Park at the heart of Virginia Commonwealth University’s main campus. For dining and cultural events, the popular Carytown shopping district and the Virginia Museum of Fine Arts are each less than a 10 minute walk away. For hiking, rafting and kayaking, Brown’s Island and Belle Isle on the James River can be reached by bike in 15 minutes.

Several restaurants, cafes and bars are located within a four block radius of the project site. Many galleries are also located along this part of West Main Street, with regular gallery openings and other special cultural events.

The dense development is well over 100 years old. Many old trees provide shade and frame the streetscape. While the site is located just three blocks from the busy I-195 Downtown Expressway corridor, the neighborhood’s density creates a barrier to highway noise and traffic. 1700 West Main Street has a high Walk Score rating of 94. This makes the building an ideal location as a model Blue Zone, one that encourages natural movement by walking and biking to nearby amenities. The location also serves residents of all ages. Young professionals can appreciate the social amenities while families will feel secure and supported by nearby schools and the residential character. Older residents can take advantage of many cultural opportunities within a safe and stimulating environment.
Binford Middle School at 1701 Floyd Avenue was designed in 1914 by Richmond architect Charles M. Robinson. The school and its site are the most dominant feature of the block.Built in the Tudor Gothic Revival style, it features “castellated parapets, a Tudor-arched stone entrance with decorative carving, and an ornate window-turret in stone” (National Register of Historic Places).

Eight attached rowhouses (Nos. 1, 3, 5, 7, 9, 11, 11 1/2, and 15) occupy North Allen Avenue from the northeast corner of West Main Street to Floyd Avenue. Vernacular and Colonial Revival in style and built c. 1910, all are brick 6-course American in construction. Two- to two-and-a-half stories, the first six have pedimented dormers, while several feature slate mansard roofs, Tuscan columns, and porches.

An asphalt parking lot/football playground occupies the center of the block. The building at 1700 West Main is a church that defines the northeast corner and creates a boundary between the street and the school’s “backyard.” A tree line shades a school garden, establishing a boundary along West Main Street. It buffers the playground from street activity and creates a sense of security for the children.

West Main Street is a two-lane, one way street that flows toward the west end of Richmond. There is no traffic light at the intersection of West Main and North Vine Streets, so the traffic passes by the project site at a very high rate. The city has placed crossing stripes at the intersection to assist pedestrians with crossing West Main Street. However, this measure has done little to make crossing safer and easier.

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Michael Middle School

Bike park

Mosaic Garden

Playground/parking

Rain Garden

North Allen Street residences

Heritage restaurant

Law Office

Traffic calming measures
The property at 1700 West Main Street is a two-story, fully detached 19,800 gross sf. rectangular block with five bays, a flat parapet roof and a central pediment that caps the middle three bays. Originally built as a warehouse for the James Robertson Mfg. Co., a plumbing supply firm based in Baltimore, it was constructed in 1920 of six course American brick by Davis Brothers Inc. The building was then expanded and doubled in size sometime between 1920 and 1924. There is no architect of record so Davis Brothers was likely both designer and builder. The scale and detailing nod to the district’s late 19th century residential buildings in materiality and form.
BUILDING AND SITE

SECTION TITLE

SECOND FLOOR PLAN

FIRST FLOOR PLAN

6 20 40

(Source: Johannes Design Group).

down
A 1924 photo from Sketches of Richmond shows 1700 West Main Street four years after it was built by the James Robertson Mfg. Co., a plumbing supply firm based in Baltimore.

(Source: Johannes Design Group).
Aged concrete penetrates the worn antique floor boards in the Capital Mac showroom on the first floor southeast corner of the building. Awnings and blinds shade the Capital Mac showroom from the intense mid-day sun.

Sunny apartments at 1700 West Main Street celebrate the building’s warehouse structure and material palette. Mechanical systems are exposed, making use of the 12-foot ceiling height.

Without any adjacent structures to overlook the building at 1700 West Main Street, the south and east elevations receive intense sun while the north side facing the parking lot receives filtered sun, mainly in the winter. While the most recent renovation added several balcony niches to the west elevation, the original solid brick west elevation had no windows or doors.
One can see the strong relationship between the original rectangular block and its historic twin, built within four years of one another. The regular column grid, symmetry along both major axes and massing make it immediately recognizable as a warehouse structure. Yet the building’s two story building height and sympathetic material palette allows it to fit easily into the residential character of the Fan District.
CONCEPT AND PROGRAM
This building in Richmond, Virginia will be redesigned as a micro-Blue Zone that could be used as a model for promoting well-being. The two-level adaptive reuse, mixed-use project addresses vertical transitions, social spaces and outdoor relationships. The Blue Zones principle of natural movement as defined by Active Design is the primary driver for the project’s design. Japanese design principles guide the use of form and materials for the project.

The apartments, exercise studio and restaurant each occupy two levels. The tai chi studio and tea room are open to the public and to residents. Visitors include patrons and employees of the tea room and studio. Building owners control the leasing of spaces, residential and commercial, so that all use is aligned with Blue Zones principles.

Interior design that encourages regular natural movement occurs primarily in the design of a building’s major circulation systems and its program (Center for Active Design, 2010). Corridors and lobbies that connect other spaces in the program encourage walking. Elements like stairs and bicycle storage and furniture that produces micro-movement all promote activity when they are visible, safe and attractive. Programmed spaces that encourage physical activity and those that promote healthy diets also lead to increases in healthy behaviors.

The tai chi studio is open from 6am to 9pm. Tai chi classes take place in the studio and the Binford Middle School garden. The tea room is open from 8am to 9pm for breakfast, lunch and dinner. Residents come and go throughout the day.

### Summary
- **Tai Chi Studio**
  - 1,440 sft net
  - 288 occupants allowed, 25 intended based upon research and observation of Richmond T’ai Chi studio class and Pure Barre, Alexandria
  - 1,080 sft for studio/class floor and chair space
  - 360 sft for all other functions
  - 121 sft for reception
  - 76 sft office
  - 3 changing cubbies, 24 sft each, total 72 sft
  - 2 single user restrooms, 45.5 sft each, total 91 sft
- **Tea Room**
  - 1,440 sft net
  - 96 occupants allowed, 96 intended, based on research of Starbucks coffee shop
  - 60% of space, 864 sft for Front of House functions (sales, bar, cafe)
  - 40% of space, 576 sft for Back of House functions (workroom, 2 single restrooms/restroom vestibule)
- **Residential Apartments**
  - 14,400 sft gross, 8,640 sft net
  - 72 occupants allowed, 72 intended

### Exit Requirements
- No. of water closets required per gender
  - T’ai Chi Studio (A-3, 40 person occ) 1/125 male, 1/65 female
  - Tea Room (A-2, 96 occ) 1/40 male, 1/40 female
  - Residential (R-2, 72 person occ) 1/10 male, 1/10 female
- No. of lavatories required per gender
  - T’ai Chi Studio (A-3, 40 person occ) 1/200 male, 1/200 female
  - Tea Room (A-2, 96 occ) 1/75 male, 1/75 female
  - Residential (R-2, 72 person occ) 1/10 male, 1/10 female
- No. of water fountains
  - T’ai Chi Studio (A-3, 40 person occ) 1/500 W
  - Tea Room (A-2, 96 occ) 1/500
  - Residential (R-2, 72 person occ) 1/100

### Plumbing Requirements
- No. of water closets required per gender
  - T’ai Chi Studio (A-3, 40 person occ) 1/125 male, 1/65 female
  - Tea Room (A-2, 96 occ) 1/40 male, 1/40 female
  - Residential (R-2, 72 person occ) 1/10 male, 1/10 female
- No. of lavatories required per gender
  - T’ai Chi Studio (A-3, 40 person occ) 1/200 male, 1/200 female
  - Tea Room (A-2, 96 occ) 1/75 male, 1/75 female
  - Residential (R-2, 72 person occ) 1/10 male, 1/10 female
- No. of water fountains
  - T’ai Chi Studio (A-3, 40 person occ) 1/500 W
  - Tea Room (A-2, 96 occ) 1/500
  - Residential (R-2, 72 person occ) 1/100

### Type III-A construction
- 5,600 gross sf/level, two floors
- 1,600 sf attic
- total gross area
- 8,000 sf attic
- 13,600 net area

- Assume three estimated program areas
  - 5,400 sft for studio areas
  - 4,000 sft for residential apartments
  - 1,000 sft for tea room

- efficiency ratio = .60 (generous/excellent)
  - 9,600 sft X .60 = 5,760 net sft/level

- 5,760 net sft + 5,760 net sft = 11,520 total net area

- Assume these estimated program areas
  - 2,400 gross sft for T’ai Chi studio
  - 2,400 gross sft for tea room
  - 14,400 gross sft for residential apartments

- 2,400 sft X .60 = 1,440 net sft for T’ai Chi Studio

- 2,400 sft X .60 = 1,440 net sft for tea room

- 14,400 sft X .60 = 8,640 sft for residential apartments

- T’ai Chi Studio A-3 occupancy type, standing (5 net/sft)
- tea room A-2 occupancy type, unconcentrated (15 net/sft)
- residential apartments R-2 occupancy type (200 gross/sft)

- T’ai Chi 1,440 net sft/5 = 288 occupants
- tea room 1,440 net sft/15 = 96 occupants
- residential apartments 14,400 gross sft/200 = 72 occupants

- 288 + 96 + 72 = 456 occupants in the building allowed

- 456/2 = 228 men, 228 women
GRAPHIC PROGRAM AND ADJACENCIES

- Total for entire building: 19,220 sft gross
- Tea Room
  - Front for house functions: 1,728 sft
  - Back for house functions: 3,168 sft
  - 2 single user rest rooms, total 72 sft
- Tai Chi Studio
  - Two 3 Bedroom Apartments: 1,920 sft net each
  - Two 1 Bedroom Apartments: 960 sft net each
- Front for studio/class floor and chair space: 1,440 sft
- Total 2,880 sft net
- Back for storage lockers/retail: 200 sft
- Total 3 Bedroom Apartment: 2,880 sft net
- Total for entire building: 11,520 sft net
- Total residential: 8,640 sft net
- Two 3 Bedroom Apartments: 1,920 sft net each
- Two 1 Bedroom Apartments: 960 sft net each
- Sleeping space: 432 sft total (144 sft ea)
- Dining/Kitchen space: 225 sft
- Living space: 446 sft
- Office space: 72 sft
- Bathing space: 70 sft total
Although they live in vastly different parts of the world, inhabitants of the original Blue Zones share many common traits. Their lives are nurtured in environments that encourage them to move, socialize, and get outside on a daily basis. They seek purpose in life, maintain regular sleep cycles that are short and place a high value on family and friends. Moreover, they have found ways to adapt to life’s challenges.

Blue Zones environments live in the real world, not in utopia. That is why the research into how and why they live as long as they do is so meaningful. For those communities, families or individuals who seek a long-lasting framework for life-long well-being, it is best to examine the lives of those who have already lived well.

The concept of “a fully lived life” concerns all of the traits that are present in the programming for creating a “micro-Blue Zone” project in Richmond. Study of active design, tai chi and Japanese tea traditions shows many intersecting characteristics that strengthen the mind-body connection that is so important for overall health.

While heredity plays a role in measuring relative health, lifestyle still plays the dominant role.
Well-being is most durable when a mind-body balance is supported within a naturally active micro- and ambient environment. Strong social and family connections supported by a healthy diet and purposeful meditation practices provide the energy needed to adapt to the disruptive challenges that we all face. 

The Japanese Yagasuri (arrow) pattern initiated the project’s vertical movement concept. (Above) an old pair of the author’s jeans illustrates the patch and repair philosophy that Blue Zones residents use to mend and make do.

(Left) folded paper concept models continue to explore verticality and (right) a wall of concept displayed at VCU’s department of interior design.
The Japanese philosophy of wabi-sabi embraces the flawed and imperfect. The Japanese highly value marks of wear and use in objects and have developed the basis for the selection of materials for this model Blue Zones project.

Rather than throw away broken or torn objects, the Japanese have made an art form of their repair. The kintsugi technique highlights cracks in pottery as a chapter in the object’s life story. The Japanese treat torn textiles with the same reverence as other objects. Boroboro textiles, from the time, celebrate the ingenuity and thriftiness of the Japanese peasantry. Generations of families pass along these mended garments, narrating their shared history. The raku pottery technique likewise celebrates imperfect forms and surfaces.

Wabi-sabi reflects the acceptance of change and fate as natural and necessary aspects of human life. In the Blue Zones, such life experiences strengthen the mind and body.

Building materials such as soapstone, copper, brick and charred wood will age and patina with use, embedding the character of the building’s occupants in their surface.
The schematic design phase focused on understanding adjacencies for the three program areas of the project: apartments, a tai chi studio and a tea room. Additional considerations included bicycle access for storage and repairs. This was seen as an important Blue Zone amenity for building occupants and a magnet for Binford Middle School's students who could benefit from a safe place to repair and park their bikes near school.

Privacy and acoustics from West Main Street traffic were additional considerations for residents. Similar issues were considered for Tai chi students, who could use privacy and quiet to help focus during classes. On the other hand, tea room patrons could welcome varied exposure to audio and visual stimulation from the street.

The schematic design phase 01 placed the tea room on the street level along West Main Street and the tai chi studio on the second level along Vine Street. This was seen as an important Blue Zone amenity for building occupants and a magnet for Binford Middle School's students who could benefit from a safe place to repair and park their bikes near school.

Privacy and acoustics from West Main Street traffic were additional considerations for residents. Similar issues were considered for Tai chi students, who could use privacy and quiet to help focus during classes. On the other hand, tea room patrons could welcome varied exposure to audio and visual stimulation from the street.

The schematic design phase 02 placed the tea room and tai chi studio at the corner of West Main Street and Vine Street on the first and second levels. This was seen as an important Blue Zone amenity for building occupants and a magnet for Binford Middle School's students who could benefit from a safe place to repair and park their bikes near school.

Privacy and acoustics from West Main Street traffic were additional considerations for residents. Similar issues were considered for Tai chi students, who could use privacy and quiet to help focus during classes. On the other hand, tea room patrons could welcome varied exposure to audio and visual stimulation from the street.

The schematic design phase 03 began to address the overall circulation in the building. A social porch was added to address social connections necessary for healthy Blue Zone living. The nine apartments originally planned for programming were eventually reduced to four.

Privacy and acoustics from West Main Street traffic were additional considerations for residents. Similar issues were considered for Tai chi students, who could use privacy and quiet to help focus during classes. On the other hand, tea room patrons could welcome varied exposure to audio and visual stimulation from the street.

The schematic design phase 04 then explored new relationships among the structural columns in the front half of the building and their relationship to the windows and doors. Privacy and acoustics from West Main Street traffic were additional considerations for residents. Similar issues were considered for Tai chi students, who could use privacy and quiet to help focus during classes. On the other hand, tea room patrons could welcome varied exposure to audio and visual stimulation from the street.

This discovery led to identifying an organization of oblique lines in the plan of the front half of the building that could be used to enhance social connections necessary for healthy Blue Zone living. Privacy and acoustics from West Main Street traffic were additional considerations for residents. Similar issues were considered for Tai chi students, who could use privacy and quiet to help focus during classes. On the other hand, tea room patrons could welcome varied exposure to audio and visual stimulation from the street.

The schematic design phase 05 used this plan information to organize a new schematic design that was explicit in the plan of the front half of the building. An atrium was designed for the southwest corner of the building to organize the social connection among the three program areas of the project. Privacy and acoustics from West Main Street traffic were additional considerations for residents. Similar issues were considered for Tai chi students, who could use privacy and quiet to help focus during classes. On the other hand, tea room patrons could welcome varied exposure to audio and visual stimulation from the street.

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Design development progressed from schematic design by analyzing new case studies. The two unique halves of the building, front and back, could not successfully be joined while addressing the three program areas of the project. Therefore a new plan was developed that paired a new case study with the apartments in the rear of the building. And further research on Japanese architecture provided a map for organizing the commercial portion of the project.

The linear arrangement of architect Le Corbusier’s plan for L’Unite d’Habitation a Marseille provided a standardized framework. Each apartment unit becomes its own individual self within the unified whole of the building. Each of the four apartments (two have three bedrooms and two have one bedroom) is situated on both levels, thus allowing vertical transitions that satisfy the need for natural movement. The one bedroom apartments are narrow, at just twelve feet across, but their length and generous two level plan make them spacious enough for two.

Using principles of Japanese design of the garden and tea house informed the development of the tai chi studio, tea room, and overall circulation of the project. The meandering path of the Japanese garden was a conceptual metaphor for Blue Zone living as a means for living life as a progressive journey. This path also functions as a literal organizing plan from the main entry on West Main Street.

Finally, the foot movements of Yang style tai chi suggested a flowing pattern that organizes the first level of the studio. Vertical movement by means of different staircases through La Maison de Verre formed a model for addressing stairs in the project. La Maison also has many built-in elements that are movable and thus inspired the addition of some movable features in the apartments.

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The tracing of the garden path, below, was simplified into rectilinear shapes. These shapes were layered in a series of repetitive diagrams that tested the possibilities for organizing the plan of the project.

The final result of the new study shows the apartments in the back of the building and the new entry gate, main staircase, atrium and social porch in the front half of the building.

Solid/void relationships in the new design show how the atrium and general circulation connect the residential and commercial halves of the building.

Tracing a path through a Japanese garden, such as the example on the left, forms a framework for designers' study of space above.
UNIFYING THE PROGRAM

Before the atrium is developed, the relationship among the three program elements is strengthened around the entry gate and main staircase.

FRESH DESIGN DEVELOPMENT shows the four apartments in the rear of the building. The tai chi studio occupies two levels of the building in the southwest corner and the tea room is to the right.
**DESIGN REALIZATION**

**SECTION VIEW**
FIRST AND SECOND LEVELS

*Exterior view of 1700 West Main Street shows the new roof monitor over the atrium.*

**APARTMENTS**
1. 1 BR apt
2. 3 bedroom apt
3. 3 bedroom ADA apt
4. 1 bathroom
5. WC
6. Bedroom
7. Closet
8. Floor seating
9. To 1st floor
10. To mezzanine
11. Residential elevator

**TAI CHI STUDIO**
1. Studio
2. Mirror
3. Storage
4. To studio floor

**ENTRY AND GENERAL CIRCULATION**
1. Main entrance
2. Main gate
3. Service entrance
4. Main stair
5. Emergency stair
6. Residential elevator
7. To 2nd floor
8. To mezzanine
9. Main staircase
10. Recessed floor lighting
11. Display casework
12. Auxiliary kitchen
13. Dumbwaiter
14. Reception
15. Retail display
16. Lounge
17. Changing carrels
18. Storage lockers
19. To studio floor
20. To reception/lounge
21. Reception
22. Entrance
23. Mail drop
24. WC
25. Mechanical
26. Elevator
27. Emergency stairs
28. Host stand
29. Lounge
30. Retail display
31. Tea cabinet
32. Tea room kitchen
33. Dumbwaiter

**TEA ROOM**
18. Tea island
19.盟
20. Mirror
21. Display
22. Tea room kitchen
23. Dumbwaiter

**FIRST LEVEL PLAN**

**SECOND LEVEL PLAN**

**SECTION VIEW**
FIRST AND SECOND LEVELS

**NORSE TRAVEL 3101**

1/8" = 1'-0"1 Level 2 New Construction

1/8" = 1'-0"1 Level 1 New Construction

**FIRST LEVEL PLAN**

**SECOND LEVEL PLAN**

**ENTRY AND GENERAL CIRCULATION**
25. Main entrance
26. Main gate
27. Service entrance
28. Main stair
29. Emergency stair
30. Residential elevator
31. To 1st floor
32. To mezzanine
33. Residential elevator
34. Ladder
35. Mezzanine
36. Reception
37. Retail display
38. Lounge
39. Changing carrels
40. Storage lockers
41. To studio floor
42. To reception/lounge
43. Reception
44. Entrance
45. Mail drop
46. WC
47. Mechanical
48. Elevator
49. Emergency stairs
50. Host stand
51. Lounge
52. Retail display
53. Tea cabinet
54. Tea room kitchen
55. Dumbwaiter
56. Recessed floor lighting
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63. Storage
64. To studio floor

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108. Display casework
109. Auxiliary kitchen
110. Dumbwaiter

**TEA ROOM**
111. Tea island
112. Mirror
113. Display
114. Tea room kitchen
115. Dumbwaiter

**SECTION VIEW**
FIRST AND SECOND LEVELS

**ENTRY AND GENERAL CIRCULATION**
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119. Main stair
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126. Mezzanine
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148. Display casework
149. Auxiliary kitchen
150. Dumbwaiter

**TEA ROOM**
151. Tea island
152. Mirror
153. Display
154. Tea room kitchen
155. Dumbwaiter

**SECTION VIEW**
FIRST AND SECOND LEVELS

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184. Tea cabinet
185. Tea room kitchen
186. Dumbwaiter
187. Recessed floor lighting
188. Display casework
189. Auxiliary kitchen
190. Dumbwaiter

**TEA ROOM**
191. Tea island
192. Mirror
193. Display
194. Tea room kitchen
195. Dumbwaiter
The sunny atrium on the second level allows light into the back of the apartments and creates a breathing space for occupants, inspired by the random breath control technique used by tai chi students.
Two one-bedroom apartments feature an open staircase that leads to a mezzanine. A bar cabinet rotates to serve dining and living areas while the media cabinet’s sliding screen hides the TV when not in use.

One-bedroom apartments feature an open stair-case that leads to a mezzanine. A bar cabinet rotates to serve dining and living areas while the media cabinet’s sliding screen hides the TV when not in use...

Silhouetted sketch showing progress on apartment bar cabinet under the apartment stairs leading to the mezzanine. Initial plans called for floor seating under the staircase; later the floor seating was moved up to the mezzanine.

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As in a Japanese garden, the Entry Gate acts as an entry point for all points in the building on both levels. The tokonoma display niche features Japanese shibori textiles and serves as a mail and parcel pick up for building residents.

ENTRY AND STAIRCASE

(above) sketch showing progress on developing the tokonoma display niche in the entry gate. The niche also serves as a mail and parcel drop for the building residents.
The tea room’s menu celebrates the healthful qualities of tea and features a selection of mostly plant-based meals. The lower level retail display case holds several varieties of domestic and imported teas for sale.

**TEA ROOM LEVEL 1**

Silkwood sketch showing progress on patinated copper soffit and the screens covering the windows facing North Vine Street.
The bar and lounge on the lower level serve casual dining and tea service while the upper level caters to lunch and dinner patrons.

- Mute acoustic felt pendant
- Existing brick wall
- Charred cypress paneling
- Feature wall first level
- Display cabinets both levels

The boro dining chair celebrates imperfection and flaws by skewing the lumbar seat support. The maple seat and back are supported by painted solid maple legs and an aluminum lumbar.

- Charred white oak flooring both levels
The tai chi studio is a calm space that is finished in gentle, smooth materials. The curves and cylinders in the space recall the flowing foot patterns of the Yang-Style Tai Chi Chuan 24 forms, or movements.

TAI CHI STUDIO LEVEL 1

Coalesse Ginger maple coffee table
Tatsu side chair with copper leather
Saiba side chair with copper leather
Uki Tri ceramic pendant

(above) sketch showing progress on developing the flowing forms of the tai chi studio.

(above) sketch showing the foot patterns of 24 form Yang style tai chi.
TAI CHI STUDIO
LEVEL 2

Illustrated the tea room screen appears in the entry gate, the tea room second floor entry and the partition between the tea room and tai chi studio on the second level.
**Reflection**

My designer’s workflow—always present during the formation of this project’s concept and execution.

**Design Progression**

Reflections include student work, models, concept work and posters in honor of the MFA 2017 IDES Thesis show on April 28, 2017 at the Anderson Gallery on VCU’s Monroe Park campus.

Long-term projects demand stamina and a great sense of humor. Luckily, the graduating class of interior design MFA students at Virginia Commonwealth University for 2017 has both in great supply. From the first day we met in July 2015 until the present day, we have worked hard to support one another. The days and nights have been long and certainly there were times when it seemed the process would never end. Yet here we are, at the end of our road, getting ready to turn on to another one.

With an undergraduate degree in political science and a master’s in journalism and public affairs, I’ve naturally gravitated to exploring issues that impact the public welfare. Studying the public health angle and mind-body connection that is crucial for long-term health was a natural fit for me as an emerging interior designer. I hope to continue this passion for understanding the human dimensions in interior design for many years to come.

I thank my studio colleagues and the VCU interior design faculty for helping to focus my passion and pushing me to reach further than I thought possible.

— Alexis Holcombe, May 2017
Interview with Pekka Puska and Vesa Korpelainen on May 30, 2016 in Joensuu, Finland.

Interview with Tiina Laatikainen on June 1, 2016 in Helsinki, Finland.


THESIS ABSTRACT


ACTIVE DESIGN FOR WELL-BEING


THE WELL LIVING LAB
Interviews with Barbara Spurrier, Administrative Director, Well Living Lab and Senior Vice President, Delos Ventures; Jolene Bernau, Innovation Coordinator, Well Living Lab; and Alfred Anderson, Information Technology Director. Well Living Lab on February 17, 2017.


TAI CHI CHUAN


Interview with Floyd Herdich and Sondra Sealine of Richmond Tai Chi on November 1, 2016.

http://travel2health.blogspot.com/2015/05/yang-style-tai-chi-chuan-24-forms.html?m=1

TEAISM


CASE STUDIES


RICHMOND AND THE FAN DISTRICT


SITE STUDY
108 109 BACK


The patient process of learning through discovery is rewarding and challenging. Thanks to my studio colleagues for making this journey so enjoyable: An Liu, Lauren Prisco, Mingming Zhao, Heather Overby, Lucy Dabney and M.J. Rhodes. Special thanks to An for assistance with laser cutting and graphic design guidance.

Dr. Pekka Puska and Dr. Tiina Laatikainen, National Institute for Health and Welfare (THL), Helsinki, Finland, and Vesa Korpelainen, North Karelia Center for Public Health, Joensuu, Finland welcomed me to their offices without reservation in May 2016 to discuss the relationship between interior environments and health. Their collective experience in Finland’s public health sector helped to confirm my growing interest in well-being and environment.

I would like to gratefully acknowledge the wisdom and experience of the faculty of the Department of Interior Design at VCU. Roberto Ventura, thesis mentor and all-around super teacher, has been with our cohort from the start. Camden Whitehead, Christiana Lafazani, Sara Reed, Jillian Chapin, Emily Smith, Jen Fell, Rob Smith and Hillary Fayle have also guided me in this thesis work. VCU alum Roy Abdun-Nur has been a generous advisor and friend. Andrea Alvarez and Lauren Ross assisted with curation and exhibition at Anderson Gallery. Additionally, several people generously gave their expertise and time to assist with research on this project: Meg Hughes, curator at the Valentine Museum for historic documents; Anne Durkin, architect, Johannes Design Group for documentation of 1700 West Main Street; Floyd Herdich and Sondra Sealine of Tai Chi Richmond; and Patrick Bell, Nicole Killian, and David Shields for advice on graphic design. Carla Mae Corkendale of VCU’s Cabell Library assisted with research and Marnie Wolfford of CapitalMac gave me permission to visit and record their store at 1700 West Main Street.

Special thanks to VCU associate professor of fashion design Kristin Caskey, who helped me articulate the concept of this project with critical insight on wabi-sabi and materiality. Elizabeth Bolka of Worth Higgins & Associates in Richmond handled my printing requests readily and professionally. The staff of the Well Living Lab in Rochester, Minnesota likely set aside a busy Friday to give me a tour of their facility and present their methodology: Jolene Bernauer, Barbara Spurrer, Brent Bauer, Nicholas Clements, Alfred Anderson, Anja Jacquemain, and Carolina Campanella all took the time to offer insights about public health and Blue Zone principles.

Many thanks to my beautiful children, Claire and Peter. Being your mom is still the most creative and rewarding job I’ll ever have. You are the reason I care about design as much as I do. Finally, I could not have made it this far without the love and gentle hand of Robert, who has poured many cups of coffee and tea for me, rubbed my sore shoulders and kept the fire going so I could lose myself in the world of design.

This thesis is dedicated to my grandmothers, Ada and Erna, who ignited the spark of creativity for me so many years ago.