ABSTRACT

Interior Design for Assisted Living Communities

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As the Baby Boomer generation retires over the next two decades, there will be a great need for a new place for them to call home that offers the opportunity for medical assistance as needed. As such, assisted living facilities are on the rise within the healthcare industry, providing a comfortable and familiar environment for the elderly who are no longer able to live entirely on their own. These facilities incorporate private apartments in addition to amenities and various gathering areas for social interaction amongst residents. Special considerations must be made for the aging population, due to common conditions such as poor vision, wheelchair confinement, and general mobility and strength impairment. A study of gerontology and evidence-based research on successful assisted living facility designs provides an essential basis for determining the needs of the elderly users of a space. Personal interviews with existing facility residents offer an internal perspective on the desires of the population for which these facilities are designed. By considering both the needs and desires of the users, a well-designed assisted living facility can be both accessible and beautiful, truly becoming a new home for its residents.

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INTERIOR DESIGN FOR ASSISTED LIVING COMMUNITIES

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By

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TABLE OF CONTENTS

CHAPTER ONE

Introduction

Assisted Living: The Definition

Interior design is a profession that has proven to have the power to

transform lives. This is especially true in the field of healthcare design, where the

smallest details can make the most significant impact on a user's emotional,

physical, and spiritual health and well-being. The healthcare design sector of

interior design comprises numerous different applications, one of which is assisted

living facilities. Assisted living is defined by the Assisted Living Federation of

America (ALFA) as

> [A] special combination of housing, supporting services, personalized
> assistance and healthcare designed to respond to the individual needs of
> those who require help with activities of daily living (ADL) and instrumental
> activities of daily living (IADL). Supportive services are available, 24 hours a
> day, to meet scheduled and unscheduled needs, in a way that promotes
> maximum dignity and independence for each resident and involves the
> resident's family, neighbors, and friends.[1]

As more of the growing elderly population seeks a semi-independent lifestyle while

requiring easy access to medical assistance, the rising necessity for assisted living

facilities becomes apparent. Special care must be taken when designing for the

distinct needs and preferences of this population. The physically and mentally frail

are placed in a particularly vulnerable situation both bodily and emotionally, and it

is the designer's duty to create a space in which they can feel holistically healthy,

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[1]Victor Regnier, *Design for Assisted Living: Guidelines for Housing the Physically and Mentally Frail* (New York: J. Wiley, 2002), 3.

happy, and peaceful. The environment they live in should emphasize, not minimize,

their feelings of worth and significance. Designers are called to make decisions that

will have a positive psychological impact on all end users. In addition to satisfying

user preferences through the design, it is equally important to follow codes and

restrictions in order to ensure the safety of the users. Assisted living facilities are

not intended for young and healthy adults: "The average resident of an assisted

living facility is likely to be in the 82- to 87-year age range."[2] The aging population

is susceptible to a multitude of illnesses and physical ailments that directly influence

design decisions, such as cataracts, wheelchair confinement, blindness, hearing

impairment, and memory loss. This thesis explores these ailments and how to

address them through particular design elements.

　　　　According to Victor Regnier, the requirements for a well-designed assisted

living facility boil down to nine items: the facility must "appear residential in

character, be perceived as small in size, provide residential privacy and

completeness, recognize the uniqueness of each resident, foster independence,

interdependence, and individuality, focus on health maintenance, physical

movement, and mental stimulation, support family involvement, maintain

connections with the surrounding community, and serve the frail."[3] First and

foremost, an assisted living facility serves as a home for the residents who live there.

The residents should not be made to feel as though they are in a hospital. Special

care should be taken when selecting materials, colors, and furniture to ensure the

interior spaces feel as much like a true home as possible. Secondly, the facility

[2]Ibid., 7.
[3]Ibid,. 4.

should be small—or at least feel small. Large-scale buildings have the potential to overwhelm residents with their vastness. It is also harder for residents to know their neighbors and the staff when there is a large number of occupants. In addition, the elderly living in these facilities should have the sense of privacy that they would otherwise get while living in their own residence. Each resident should feel important, wanted, and needed within the community. Designing spaces for communal activities such as sewing and gardening allow opportunities for the residents to get involved and find their place within their community. The elderly should be treated with respect and dignity and valued as individuals. Including areas for events that people of any ability can participate in is crucial—no one in the community should be left out because of a disability. Next, the facility should be designed to allow for and encourage family involvement. The residents will have family and friends visiting, and it is necessary to provide spaces for guests to relax during the day and stay overnight. It is also a great design idea to create a connection between the facility and other community locations such as churches, parks, or libraries. This encourages the residents to build friendships and relationships outside of the building. The facility should not feel like a jail imprisoning its residents. The residents need to know that they have the opportunity interact with the world outside of the facility and that they are not trapped inside due to physical ailments. Perhaps the most significant item on Regnier's checklist is to serve the frail: "Facilities should conform to the 30/40/50 rule, which suggests that about 30 percent of the population are incontinent, 40 percent are wheelchair and/or walker dependent, and 50 percent have the

beginning of memory loss. It is not at all uncommon for as many as 60 percent of

residents to be in need of bathing assistance and 25 percent to be in need of

toileting assistance."[4] Clearly, there are a variety of physical needs that the interior

design of an assisted living facility should address. The statistics Regnier mentions

directly impact the design of the space, for they introduce problems which each

require a solution. The codes laid out by universal design principles help guide

some of these directed design choices.

Universal Design: Silently Accommodating

One of the key principles of assisted living design is to not compromise the

dignity of the elderly in order to serve their physical needs. It is absolutely not

necessary to create a monotone, morose, flavorless living environment to make sure

codes are followed and needs are met. Designers have a responsibility to apply their

knowledge of good design and generate innovative, comfortable, and most

importantly homey facilities for all populations. This concept is summarized by one

of the most impactful philosophies of design in today's world: universal design.

Universal design is beautifully defined by Cynthia Leibrock, an expert on the

topic: "Universal design is silent and invisible. Although it must be accessible and

barrier free, it must go further to quietly meet the needs of all users. A silent and

invisible design isn't labeled by complicated signage or advertised as 'for the elderly

and disabled.' It is not a design prescription for a specific disease but a panacea that

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[4]Ibid., 7.

'heals' many diseases and accommodates many users without singling anyone out."[5] It can be said that human nature demands accommodation without drawing unwanted attention. For instance: a wheelchair user would not be able to physically maneuver a room with several levels without getting assistance. At the same time, having segregated areas within a room for wheelchair users is also not ideal, because this solution does not accommodate their emotional and psychological needs. A confined person would likely feel undervalued and very self-conscious of his frail health if his physical needs were accommodated this way. This type of challenge is precisely what universal design seeks to solve. Cynthia Leibrock alludes to the common issue of special populations getting singled out rather than being seamlessly incorporated into a living environment. This is especially a problem in older buildings; before codes and regulations were enforced, many public facilities were entirely inaccessible to the wheelchair confined. New codes and a burning obligation in designers to not allow these situations to exist any longer is what has led to the incorporation of universal design principles into everyday interiors and architecture.

Universal design is silent. It does not proclaim itself to be intended for use by special populations. Rather than flaunt accessibility, it smoothly incorporates all of the necessary elements to make it so. This prevents attention being drawn to those populations who would rather blend in as much as possible. Leibrock writes, "Universal design solutions transcend ability with innovation. The technology is in place, there is an enormous need, and with a little imagination designers and

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[5]Cynthia Leibrock and James Evan Terry, *Beautiful Universal Design: A Visual Guide* (New York: John Wiley, 1999), ix.

architects can literally free us from handicaps by design, providing a world without barriers."[6] The present day interior designer has a social responsibility to craft innovative barrier-free environments that enhance lives.

Universal design is not limited to provision for wheelchair access. Granted, this does encompass a large part of the standards associated with universal design. Specifically, the Americans with Disabilities Act (ADA) adopts minimum standards that are required for wheelchair maneuvering. These codes regulate such requirements as counter heights, toe kicks, turnaround areas, pull up spaces, signage, and reach heights, and by law they are required to be adhered to in commercial design applications. However, universal design accommodates much more than just the elderly and wheelchair users. Arthritis, hearing impairments, mental health problems, and even short stature are other conditions that universal design seeks to accommodate. While assisted living facilities are characteristically intended for the elderly, like all public buildings, users of all ages and abilities will be using the spaces at times, so it is imperative to follow the principles laid out in universal design.

Indeed, universal design also does not seek to accommodate just the elderly and other special populations. The entire point of designing universally is to provide for the collective body of users—not just the physically healthy, but not just the handicapped, either. A well-designed space will be barrier-free (easily maneuverable by those on feet or in a wheelchair) and accessible (by users of all heights, weights, and physical abilities), but it will also be comfortable for men and

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[6]Ibid., x.

women in ideal shape. Turning specifically to assisted living facilities again, though

it may be aging populations living in the building, they will have family and friends

who visit often, so designers must ensure that these visitors will not feel out of place

in such an environment.

Universal design is about providing a balance between code and aesthetics.

Following ADA codes must not compromise the appearance of the design, but the

codes still need to be adhered to. The needs of special populations have to be

answered; the needs of the general population must also be addressed. When an

interior effortlessly and silently serves every single user who will step foot in the

space, a universal design has been realized. The design for this assisted living

facility strives to incorporate elements of universal design and thereby suit the

needs of all users who will enter the facility.

Evidence-Based Design: a Scientific Approach to the Design Process

A key approach to designing an assisted living facility is to utilize evidence-

based design. Evidence-based design is defined as "An iterative decision-making

process that begins with the analysis of current best evidence from an organization

as well as from the field. It finds, at the intersection of this knowledge, behavioral,

organizational, or economic clues that when aligned with a stated design objective

can be hypothesized as a beneficial outcome."[7] Evidence-based design has recently

become extremely prevalent in all areas of healthcare design. It involves analyzing

past designs, the problems they solved, and the ways in which they solved them.

[7]Rosalyn Cama, *Evidence-Based Healthcare Design* (Hoboken, N.J.: John Wiley & Sons, 2009), 7.

Using that knowledge, a hypothesis is formed to serve as the basis of a new design.

Particularly in medical applications, using data analyses to discover which solutions

truly have an impact over time is crucial. Each time a designer begins a new project,

he or she forms a design concept that seeks to provide solutions to whatever

problems could potentially be faced. In the field of healthcare design, matters

requiring design solutions often relate to providing for the emotional, psychological,

and physical well-being of patients. A designer commits to intentionally utilize

design principles in order to create a stable, comfortable, and peaceful atmosphere

in which the health of all users of the space can flourish: "To design is to adventure!

The charge of the designer is to answer a need, solve a problem, and improve the

status quo. In order to do so one must investigate the need, clearly state the

problem, articulate a desired outcome, possibly implement prototypes, and be

accountable through completion. Some solutions are tried and true and others are

innovative."[8] Sometimes it is difficult to hypothesize exactly how to provide for the

needs of the space without knowing how past designers have addressed them. This

is where evidence-based interior design comes into play. Through a thorough

analysis of previous solutions and researching how they are currently performing,

designers can gain a better idea of what does and does not function well as a

solution. For example, when selecting a color scheme for an assisted living facility, a

designer should take into account color theory and how certain tones and hues can

make patients feel emotionally. He or she can research facilities of the past that

used particular color schemes to make patients feel a certain way, and then perform

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[8]Ibid., 121.

an analysis to see if the hypotheses of these past designers held true and the color

schemes did have the intended impact. Should a hypothesis have been proven

correct over time, this color scheme can be used as inspiration for the design of a

new assisted living facility. On the other hand, if the colors ended up having a

negative impact on the emotional health of patients, they should be avoided when

designing a new facility. Utilizing information from preceding designs is an

important part of the evidence-based design process.

Designers who commit to evidence-based design also carry an obligation to

share results from their own designs in order to inform the larger design

community and provide information for future evidence-based designs: "It does not

provide prescriptive solutions, but rather a platform from which to add to an

existing base of knowledge or to launch innovation. It espouses an ethical obligation

to measure outcomes and share knowledge gained for particular design successes

and failures, ideally in a peer-reviewed fashion, as is common in academia."[9]

Interior designers can feel as though they are doing their part to assist in providing

for the quality and safety of healthcare facilities by sharing the results of their

projects with the rest of the community. In turn, this provides a platform for future

designers to innovate and create even more advanced design solutions for the

betterment of generations to come.

One project that meticulously utilized the process of evidence-based design

is the Weill Cornell Medical Center in New York City. The design reflects a spa

theme that is derived from knowledge of the healing properties of spas. With the

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[9]Ibid., 7.

prior notion of a spa being a peaceful and calming environment, the design team

elected to visit various spas in New York City and to observe design characteristics

that could in turn be incorporated into the design for a medical center. Inspired by

the low lighting levels and the therapeutic effects that are produced in spas, the

designers reduced light levels in the clinical zones of the medical facility and limited

the amount of harsh overhead lighting. Living rooms are provided as waiting areas

that are warmer and more comfortable than a typical sterile medical waiting room.

The healing properties of water that spas capitalize on also inspired the design. A

feature art piece with prisms reminiscent of water droplets serves to relieve stress:

"At the core of the building is a multistory, light-reflecting mobile of prisms that are

strung to perfect perspective. The work of art captures the attention of all, as it is

accessible from each floor's balcony and can transform any stressful thought into

complete distraction."[10] In addition to this art piece, Weill Cornell also utilizes

colors that are drawn from water, taking advantage of the calming effect cool colors

have shown to have on customers in spas. As this project shows, an evidence-based

design for an assisted living facility does not have to be limited to observation of

other assisted living facilities or even other healthcare interiors; information about

design solutions to impose or avoid can be gathered from virtually any application.

The design for this assisted living facility utilizes evidence gathered from real-life

results, hypothesizing about the best design solutions to create an interior that

innovates while fostering the health and safety of all users.

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[10]Ibid., 57.

CHAPTER TWO

The Gerontological Perspective

Inside the Life of a Resident

While conducting research for the design of this assisted living facility, I had

the unique opportunity to sit down with a resident of a local Waco community and

discuss her life as well as the facility's design from her point of view. The Christian

facility Irene calls home is Providence Park, which houses units for long-term and

sub-acute care, independent living, and assisted living. Irene has been living at St.

Elizabeth Place, the assisted living division of Providence Park, since the spring of

2012, so she has become quite familiar with all that the facility has to offer. She has

lived in the Waco area for her entire life, so when she chose her next home she was

aware of the other facilities in the area and chose Providence Park above the others,

and she says she has not regretted her decision. The best thing about living there,

Irene told me, is that the entire community forms one huge family. Being away from

her blood relatives, this is especially important to her. She has formed a new family

at Providence, a family that not only provides much-needed love, support, and

encouragement but can also relate to her on levels that her blood relatives cannot.

Irene stressed that she receives attentive care from the nurses. She has

never felt neglected, but she has also not felt belittled. It quickly became clear to me

how important it is to establish a sense of independence within the elderly who live

in assisted living facilities. These residents do not want to feel as though they

cannot live without their nurses—even if this is not necessarily the case. They want

to be able to feel powerful, young, and thriving again. Irene shared with me that in her younger past she was strong and athletic. She would move around constantly, utilizing every opportunity to be on her feet and be active. Today, Irene gets two choices when she decides she would like to walk around: the heavy-duty walker and the walker that makes her feel stronger. When asked why she has two walkers, she sighed and told me about her fall the previous week. As Irene was headed out to meet up with her friends, the less sturdy walker rolled out from beneath her, causing her to fall and collide with her door. Though she did not suffer any trauma, she did end up with a small crack in her skull. Needless to say, the nurses determined she required a sturdier walker to prevent any further instances of unnecessary injury. The downside to the new walker is that Irene actually feels as though the walker controls her, rather than vice versa; she feels helpless. For this reason, she continues to use her old walker unless she leaves her room where the nurses can see her. We both got a good laugh out of her explanation for the two walkers, but I sensed a deeper meaning in her story. Irene is at heart still that independent, strong, thriving young woman she remembers herself as. Her body may be confined to a walking device, but her soul is just as liberated as ever. She loathes being seen as unable to manage her own body. She prefers to be viewed as the athlete she was for such a large part of her life. She wants nothing more than to be physically young again, constantly moving around and staying active. I felt great sympathy for Irene and her situation, but it motivated me even more to design an assisted living facility where residents feel nothing less than empowered to be as independent and youthful as they remember themselves being.

After our interview, Irene offered me the opportunity to eat dinner with her and her friends at Providence. As we walked the halls to the dining room, I watched Irene greet every resident and nurse who passed us by name. After each of them passed us, she would turn and give me a brief synopsis: previous occupations, family members, length of residence at Providence, and humorous anecdotes. As it turns out, Irene actually works at the front desk of St. Elizabeth Place, and this is how she gets familiar with her peers on such a personal level. Although she even admitted it herself, it is very clear that Irene is not a shy woman. She is very social and present in the community. Everyone we walked by greeted her warmly, and the "big family" atmosphere Irene loves about Providence was evident. She told me she loves to work for the front desk because she thrives on meeting new people. The more acquaintances she makes, the more at home she feels. She also often visits her neighbors in their apartments so that they can have company. Irene's son comes to visit her whenever he is in town, usually once or twice a month, but many of the residents do not have anyone to visit them. Recognizing this, Irene socializes with them so that they do not feel as lonely. There is certainly a positive impact made by having a tight-knit residential community within an assisted living facility. An interior designer has the ability to foster this closeness between the residents by creating spaces for communal activities where mutual interests can be discovered and friendships can be formed.

Irene has been quite impressed with the activities and amenities offered at Providence. The facility contains a beauty salon, exercise room, game room, library, activity room, gift shop, chapel, and communal dining room among other public

spaces. These spaces not only serve as conveniences, but also as opportunities to meet and socialize with fellow residents, something Irene is very grateful for. There are frequently concerts and other entertainment groups performing in the dining room, but Irene suggests that having a dedicated space for these events would be a nice addition. The exercises the residents participate in are typically limited to stretches, squats, breathing, and some bicycle workouts. A small exercise room with stationary bikes would suffice for machinery, but Irene also recommends designing some sort of stretch room or yoga studio. She is intrigued by the concept of having a Zen-like room for the more peaceful exercises. One activity space not offered at Providence that Irene would like to see implemented is a dedicated craft room. A few weeks before our interview, she was able to attend a crafting event in which an outside helper was brought in to assist residents in creating handmade Christmas cards. Irene enjoyed this event very much, and she also finds joy in other handcrafts and activities such as crocheting. In an ideal facility, there would be a room with supplies and table areas specifically intended for these various activities. Other events Irene regularly participates in are Bingo in the activity room, happy hour in the dining room, and church services in the chapel. These are all quite popular, and she stressed to make sure there is ample space for these in the design for this new assisted living facility.

Turning our conversation specifically towards the interior design of the facility, I asked Irene if her needs and preferences were being met at Providence. She is fond of the color palette, which consists of neutral pale greens, browns, and creams. The tones are calming and peaceful. Sharing my passion for nature, Irene

noted that natural colors are especially comforting to be surrounded with. While brown and cream tones are excellent selections for an assisted living facility's color palette, the greens in this particular facility are admittedly not the best option for a population in which cataracts are common. Residents with cataracts would easily distinguish between the warmer hues, but would see the cooler greens in grayscale.

Irene loves to feel fresh air and to be immersed in natural light. Although she is not technically allowed to, she frequently opens the window in her room to provide better access to nature. There are bird feeders placed on the exterior of the building, and Irene enjoys watching these animals bustle in their own environment. When asked about the possibility of a community garden of some sort, Irene advised against a vegetable garden due to the heavy amount of physical labor required to manage it. It simply would not be practical for most residents. However, her face lit up when she spoke of implementing a flower garden. Flowers are simple to maintain and yield a great aesthetic impact on the landscape. They also remind Irene of her youth and establish a connection with her thriving past, a key to helping her feel at home in an assisted living facility.

Irene is satisfied with her apartment, although she wouldn't mind a larger room. The space is practical and ADA compliant. There is a kitchenette with a miniature fridge, microwave, and sink, but there is no stovetop or oven. She does not mind the lack of these, for as she claimed, she can cook anything in her microwave. The residents of Providence are fortunate enough to have all three meals served in the community dining room each day, so there is little need for cooking within the apartments anyway. Irene's bathroom contains a roll-in shower

with grab bars for accessibility. There is no counter storage underneath the sink,

allowing for plenty of knee space if approached by a wheelchair. There are a few

pieces of furniture in the room that were existing prior to Irene moving in, but a

majority of the furnishings were brought in from her own house. This allows the

space to feel homier and more as if it is her own. Irene has only one major concern

in regards to her apartment: management has decided to replace all of the carpeting

in the units with some sort of hard surface flooring, most likely an easily cleanable

wood-look vinyl or tile. This worries her especially in light of her recent fall,

because the injuries she sustained could have been a lot more extensive if the fall

had not been broken by the soft surface of the carpet. Overall, though, Irene truly

enjoys living at Providence Park and would highly recommend it.[1]

A Brief Study of Gerontology

After interviewing Irene, I quickly realized how imperative it is to carefully

consider the elderly population that would be living in the environment when

designing an assisted living facility. This group of users has specific physical

limitations that need to be addressed in the interior design of the space.

InformeDesign has published several research summaries of studies pertaining to

issues faced by the aging demographic that are important to consider when

designing. Topics covered range from cataracts to slips and falls to wayfinding. One

intriguing study investigated the effects of natural daylight on color perception for

those with cataracts. Cataracts are a very common condition amongst the older

[1]Irene Tessin. Interview by author, personal interview, Waco, TX, November 13, 2014.

population and consist of a clouding of the eye lens, resulting in impaired vision. Cataracts alone affect perceived colors, often yellowing and desaturating the perceived hue. Experiments in this study show that in the presence of high levels of environmental daylight, the effects of cataracts actually increase. In one experiment, a color luminometer lens was used to measure perceived color purity and saturation. The measurements were taken on a clear day outdoors, and in the context of three distinct conditions: first, a subject with "normal" vision and no cataract-simulating goggles; secondly, a subject wearing cataract-simulating goggles with exposure to environmental daylight; third, a subject wearing cataract-simulating goggles without exposure to environmental daylight. The results were conclusive: the subjects who wore cataract-simulating goggles and were exposed to natural daylight perceived the least color saturation and purity. The author of the study concluded that the color haze that environmental light produces actually contributes to the desaturation of color that is observed by elderly persons with cataracts.[2] This will be important to address when planning locations and sizes of windows and other portals of environmental light in the assisted living facility. While it is imperative psychologically to provide natural light, utilizing methods of diffusion or finding the balance between natural and artificial light will be key.

A second, frequent problem faced by the elderly is the occurrence of slips and falls. With a suitable interior design, these accidents are not as large of an issue. As such, it is important to understand the frequency and seriousness of these moments of weakness that could end in tragic consequences if not properly addressed by a

[2]Mitsuo Ikeda and Tomoko Obama, "Desaturation of Color by Environment Light in Cataract Eyes," *Color Research and Application* 33, no. 2 (2007): 142–47.

designer. One study found that most slipping, which is responsible for

approximately 20% of all occupational falls and fractures, occurs during standard

walking activities or when there are camouflaged slick conditions present. The

most common factor that was shown to lead to occupational falls was the poor

traction between a heel strike and a slippery flooring surface. The chance of

slipping and extent of injuries resulting from accidents is greatly reduced if people

are made visually aware of the environment in which they are walking and any

areas that present a risk of slipping are noted.[3]

Falling is particularly prevalent among the senior population; according to a

third study, over 30% of this demographic experiences falls each year. Of these falls,

some lead to serious injuries that increase the danger of premature death and

decrease mobility. Falls "are the most common cause of injury deaths and the

majority of nonfatal injuries and hospital visits for traumatic injuries among people

65 years of age and older."[4] These injuries can include traumatic brain injuries and

hip fractures, both of which are very serious conditions. Fall fatality rates for men

are about 60% higher than those for women, which may be due to men falling from

greater heights or having more chronic health conditions than women of an

equivalent age. Risk factors for falls within the interior of a building are largely due

to failure to comply with ADA regulations: tripping hazards, unstable furniture, lack

of grab bars and stair railings, and poor lighting. Another significant cause for falls,

however, is not related to the interior design of the space at all; it is the lack of

[3]Sylvie Leclercq, "Prevention of Same Level Falls: A More Global Appreciation of This Type of Accident," *Journal of Safety Research* 30, no. 2 (1999): 103–12.
[4]Judy A. Stevens, "Falls Among Older Adults—Risk Factors and Prevention Strategies," *Journal of Safety Research* 36, no. 4 (2005): 409–11.

exercise as a preventative measure. Exercise has been shown to greatly decrease

the likelihood of falls: "While environmental modifications may reduce falling risks,

exercise (e.g., Tai Chi, balance and gait training, strength building) may be the most

effective single intervention for fall prevention."[5] When exercise strategies were

implemented in addition to the interior environmental risks being reduced, the

study found that the risk of falling decreased 18% and the average number of falls

that occurred decreased by 43%. This demonstrates the necessity of considering

the current and future agility and age of the occupants when designing an assisted

living facility or nursing home. The authors of this study recommend reducing

hazards by keeping circulation paths clear, providing handrails on both of the sides

of stairways, placing grab bars and non-slip mats in bathrooms, and improving

lighting. In addition to following these ADA regulations, the author also suggests

that including a space for exercise is crucial when designing for elderly populations

due to the contribution to fall reduction exercise has been shown to have.[6]

Yet another insightful study analyzed how aging affects wayfinding abilities.

For this experiment, a color presentation with 33 slides was shown to two groups of

people: one 25-40 years of age and one 60-75 years of age. The slides depicted a

route that was located in a residential Washington, D.C. suburb. Memory devices

that were given to the subjects varied. Some were given no route learning aid,

others were given a sketch of the route that was labeled "diagram", and still others

were given the same sketch labeled "map". A few of the aids were presented with

landmark labels and locations; others were not. After the slides were shown, the

[5]Ibid.
[6]Ibid.

subjects were asked to describe their memory of the route using free recall. The

study showed that while the older group of subjects was less likely to remember the

route, providing environmental supports (i.e., wayfinding aids, a diagram or map of

the route) drastically diminished the age-related differences. This study

demonstrates the importance of providing wayfinding aids within an assisted living

facility, especially those intentionally including landmark labels or titled "map".[7]

The last study that will be helpful to reference when designing this assisted

living facility followed senior subjects as they interacted with their kitchens. They

were observed either preparing or reenacting preparation of breakfast in their

homes. The results found that a standard kitchen is simply not appropriate for the

elderly population: the subjects had trouble reaching the upper wall cabinets as well

as the lowest shelves of base cabinets and the refrigerator. There was a

demonstrated need for more accessible storage. Only the two front burners on the

stovetop were utilized; the back burners were too difficult to reach. A large portion

of the elderly decided to use smaller appliances such as microwaves and toaster

ovens in lieu of the larger appliances, for there was no need for extensive cooking.

The author of the study recommends keeping the work triangle (the distance

between the oven/range, sink, and refrigerator) as small as possible so that the

amount of physical energy needed for meal preparation is decreased for the

residents. She also suggests using an L-shaped kitchen layout to provide a corner on

which individuals with limited strength can lean. Plenty of rollout shelves or

[7]Leslie J. Caplan and Paula Darby Lipman, "Age and Gender Differences in the
Effectiveness of Map-like Learning Aids in Memory for Routes," *Journal of
Gerontology: Psychological Sciences* 50B, no. 3 (1995): P126–P133.

drawers should be contained within base cabinets so that items can be reached

more easily. An interesting recommendation from this author is to use a mix of

counter depths. Results of her study indicate that people with mobility impairments

generally prefer shallower countertops, while those with visual impairments are

partial to deep counters to avoid spilling. To account for the issues with the range,

the author recommends selecting ranges that have controls on the front to be easily

viewed and reached by wheelchair bound users.[8] These studies provide helpful

background on the demographic for which this assisted living facility will be

designed.

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[8]Margaret A. Boschetti, "An Observational Study of Older People's Use of Standard
US Kitchens," *Housing and Society* 29, no. 1&2 (2002): 1–12.

CHAPTER THREE

The Fundamental Principles of Assisted Living Design

The Philosophy of Assisted Living

The design for an assisted living facility must adhere to both philosophical

and practical principles of design. It is equally important to be mindful of the

psychological requirements of the residents in addition to providing all necessary

design details to suit their needs and preferences. A brief examination of the

philosophical levels of design sets an overarching foundation on which more

practical codes can then be applied. William Brummett lays out the nine

fundamental principles of assisted living design, as made evident by successful

models: (1) dignity, (2) privacy, (3) independence, (4) choice/control/autonomy,

(5) familiarity and attachment with one's environment, (6) safety/security, (7)

accessibility, (8) adaptability, and (9) stimulation/challenge.[1] Dignity involves

respecting the residents as individuals with their own distinct rights, freedoms, and

abilities. The design should promote a feeling of value and adequateness in the

occupants. Privacy can be applied in design by creating spaces to which the

residents may retreat at will when they desire to be alone. Independence is

encouraged through both the ability to personalize one's own space and to perform

one's own tasks without constantly needing to ask others for help. By following

ADA codes and regulations, the environment in which the occupant lives is

[1]William J. Brummett, *The Essence of Home: Design Solutions for Assisted Living Housing* (New York: Van Nostrand Reinhold, 1996), 16.

accessible without need for excessive assistance. The principle of choice/control/autonomy implies that the residents have a feeling of being in power over their actions, choices, and activities. Providing spaces for a variety of activities fosters the opportunity for each resident to have control over his or her daily life.

Familiarity and attachment with one's environment is crucial in an assisted living facility. In an effort to make the building feel more like home, manipulating the materials and overall style of the space to be something with which residents can identify provides a level of comfort that is much needed in this application. Safety, security, and accessibility are also addressed by complying with ADA guidelines and universal design principles. Codes fashion an environment free of physical barriers and environmental hazards, allowing the occupants to be safe and secure.

Adaptability of the physical environment within the facility is also key. The physical needs and emotional desires of residents constantly change, and the design needs to be able to adapt to these changes seamlessly: "Human needs are by their nature dynamic….Structures—whether social or physical—designed for human beings must, therefore, emulate that dynamism by anticipating evolving needs."[2] Lastly, the principle of stimulation and challenge is particularly applicable to the elderly population because they have a desire to challenge their physical and intellectual limits while maintaining safety.

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[2]Richard Lyle Miller, Earl S Swensson, and J. Todd Robinson, *Hospital and Healthcare Facility Design* (New York: W.W Norton & Co., 2012), 20.

Designing for an Aging Population

Thus begins an examination of the more practical, concrete side of design. There are several areas to address when considering the elements and principles of design as required by both codes and the needs of aging occupants within an assisted living facility. These considerations include the services and activities offered by the facility, the colors, textures, and lighting to incorporate, the style of the space, the layout of resident rooms, and ADA regulations. To give a brief introductory overview, a few of these guidelines are: using clear and large letters for signs, avoiding the lighting of sign backgrounds, using very few green, blue, and neutral colors, diminishing glare and providing higher illumination levels, avoiding uneven lighting, using sound-absorbing materials to decrease background noise, providing plenty of seating with chair arms to assist with sitting and rising, enhancing orientation and wayfinding, providing ample handrails, planning for door widths large enough for wheelchair use, using lever-type door hardware that is easily operable by someone with poor dexterity, allowing for adequate wheelchair turnaround space in tight rooms, placing ramps throughout for wheelchair access, and using tactile warning strips on transitions between level surfaces to decrease the risk of tripping and falling.[3]

Services to Provide for: Public Areas

Most residents do not end up utilizing all services that are offered at the facility, but they nevertheless must be incorporated. Some residents are at more

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[3]Ibid., 71.

dependent levels than others, and their needs will be more bountiful. Brummett has

compiled an all-encompassing list of services: personal care, medical assistance,

security and protective oversight, meal preparation, social activities and community

connections, commercial connections, and transportation. Areas for dressing,

grooming, bathing, eating, toileting, transfer, ambulation, housekeeping, and

laundry fall into the category of personal care. Medical assistance involves

"monitoring of medication; intervention of conditions before a physician is needed;

counseling; appointment-making; supervision."[4] Meal preparation is executed at

least twice a day and a kitchen and dining room to serve all residents should be

provided. Different social activities that take place include therapeutic and

enjoyable opportunities both within the facility and in the community at large.

Some examples are religious activities, exercise classes, and planned outings. A few

common commercial connections that are often included in facilities are a grocery

or drugstore, a place to get a shave, manicure, or haircut, and a café. Transportation

should be accounted for in the way of a point of access to a community vehicle.

Rooms that provide the aforementioned services can be "larger, more active spaces

for group gatherings and events, as well as smaller, more intimate shared spaces;

dining room and service kitchen; a number of small assistance spaces, such as a

bathing room and a medicine storage location; a few smaller staff work spaces; and

a reception/oversight area…a small market or store, library, activity kitchen, beauty

parlor, food service entity, or chapel."[5]

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[4]Brummett, *The Essence of Home: Design Solutions for Assisted Living Housing*, 17.
[5]Ibid., 18.

In addition to these spaces for services, the public areas of an assisted living facility should feature access to nature. This can be accomplished through designing large windows, indoor courtyards, gardens, terraces, or balconies. These outdoor access points also help define different social layers, preventing the facility from uncomfortably lacking structure. Elderly residents tend to feel more comfortable when a series of rooms clearly defines the individual spaces on each floor, while large areas with no interior definition or compartmentation can lead to them feeling overwhelmed or lost: "Interior spaces should be small, intimate, and clearly defined. Interior social layers can be created by half walls, balconies, window seats, greenhouse enclosures, and atriums. Glassed-in porches can provide the dual benefit of a social layer as well as access to nature in a safe environment for socialization. Exterior views of nature keep residents alert to the weather and to seasonal changes."[6] A connection with nature reminds occupants in the interior of the season and time of day, and they aid in regulating circadian rhythm, improving overall psychological and physical health. It is critical that this assisted living facility take advantage of landscaping, interior courtyards, and access points to the outdoors to establish this connection.

Resident Apartments

The design of the apartments is particularly important because they serve as the main private retreat for residents. They are the places in which the residents feel the most at home, independent, and in control within a facility: "Apartments are

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[6]Cynthia Leibrock and Debra Harris, *Design Details for Health: Making the Most of Interior Design's Healing Potential* (Hoboken, N.J.: Wiley, 2011), 17.

private; facilities are not. When people are shuffled from level to level [from private apartments to public regions], possessions must be eliminated and physical territory is reduced. The value of privacy and independence increases dramatically."[7] In addition to the public spaces in an assisted living facility, between 12 and 130 apartments are typically provided for the residents. The individual apartments should contain "private baths with accessible fixtures and roll in showers; kitchenettes with a sink, stove/oven (often removable or switchable), and refrigerator; lockable doors; and individual Heating, Ventilation, and Air-Conditioning (HVAC) controls are provided."[8] The more successful apartment plans seamlessly incorporate design elements that are specifically intended to screen or shelter private areas such as the bedroom or sleeping area from direct view from the apartment's entry. In addition to the units themselves, the hallways and walls immediately outside each apartment are a great opportunity to personalize the facility and make it feel more like home for the residents. One assisted living community in California, the Fran and Ray Stark Villa, showcases this design feature: "Memorabilia and personal photos, pictures, and artwork adorn the walls of the Villa. Giving residents the authority to decorate their own space—private and public—is probably the best strategy for deinstitutionalizing the facility. Just as in the homes the residents left, they can leave their mark on the wall, not only for personalization but as a record and validation of their accomplishments, hobbies,

[7]Ibid., 24.
[8]Brummett, *The Essence of Home: Design Solutions for Assisted Living Housing*, 22.

and knowledge."[9] Designing with the personalization of apartments in mind is

imperative. Having access to cherished possessions such as photo albums, crafts,

and furniture from home establishes a link with a resident's young and healthy past.

It makes an unparalleled, positive, psychological impact to be reminded of a more

thriving time. Personal memorabilia and photos displayed outside apartments for

other residents to see can also serve as conversation starters amongst residents,

allowing them the opportunity to form friendships based on common interests and

foster community with their neighbors. Well-designed models typically include

access to the outdoors, such as a deck, balcony, or private outdoor space. Outdoor

areas, as previously mentioned, are known for being therapeutic for residents, and

they also help facilities feel less rigid and lifeless. The Fran and Ray Stark Villa is

also an excellent example of incorporating the outdoors and nature into the design:

"Indoor-outdoor connections are one of the strongest parts of the design: corridors

are single loaded [rooms are located on only one side of the corridor], every unit has

a balcony or patio, terraces give residents on every floor the chance to go outside

without taking an elevator…constant views of trees, lawn areas, and outdoor plaza

eliminate any institutional character."[10] Simply bringing in ample natural light

through large windows or designing units to have a balcony makes an immense

impact on the living environment for these residents.

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[9]Jeffrey W. Anderzhon, Ingrid L Fraley, Mitch Green, American Institute of
Architects, and Design for Aging Knowledge Community, *Design for Aging Post-
Occupancy Evaluations: Lessons Learned from Senior Living Environments Featured in
the AIA's Design for Aging Review* (Hoboken: John Wiley & Sons, 2007), 117-118.
[10]Ibid., 119.

Universal Design Considerations

When designing an assisted living facility, a designer must adhere to universal design principles and ADA codes. Cynthia Leibrock is an expert in this field of design and lays out standard guidelines to follow in her book *Beautiful Barrier-Free: A Visual Guide to Accessibility*. Codes of particular importance to follow shall now be noted. To begin, ramps, stairs, and elevators throughout the facility must follow strict codes in order to be maneuvered by all users. Wheelchair ramps should have a slope of around 1:16 to be most accessible. Hallways and corridors should be at least 5 feet wide to allow two wheelchairs to pass each other. Any place to which mobile occupants would approach on foot must leave space to be pulled up to by a wheelchair, a 30"x48" approach. Throughout the facility, especially at corners or spots that act as a natural turning point, 5-foot wide wheelchair turning radiuses need to be allowed for. By code, stairs should have 7-inch high risers and 11 inch deep treads. Contrast in color between the treads and risers is helpful for the visually impaired to distinguish between them. Light switches should be placed at 2'-6" above the finished floor, and outlets should be placed at 15". These heights are for ease of access by wheelchair users, as their reach range is very limited. Drinking fountains, sinks, countertops, desks, and tables all need to provide ample knee space for a wheelchair user to pull up beneath. Signage is extremely important; using both audio and visual signage with contrasting colors will account for physical imparities. Restrooms must be accessible. Water closets have to be mounted at an accessible height and roll-in shower stalls work best for the wheelchair bound.

Lighting is an immensely important element to carefully design. Good

lighting not only makes for a more beautiful space, but also is necessary for the

safety and welfare of all users. Lighting should be kept consistent from room to

room. Suddenly adjusting levels of light can put strain on elderly eyes. Transition

spaces from the outdoors to the interior can ease the adaptation of eyes to the

changing light levels. Glare is also a problem for aging eyes, "increasing the

deterioration rate of the retina."[11] Glare can be reduced by using diffusers, drapery,

or shades on all light sources. Lighting needs to be increased in areas where

decision-making can occur or danger is present. In an assisted living application,

the entryway, reception room, bathroom, and kitchen all benefit from greater levels

of luminance to prevent accidents. Throughout the entire facility, there should be

adequate levels of ambient light.

The materials and finishes of the facility's interior also play a large role in

overall comfort for all users. Sound-absorbing materials are always welcome: "In

health care environments, noise has been shown to contribute to more wandering

by patients, less visits by family and friends, and more staff turnover."[12] Wall, floor,

and ceiling finishes all have the potential to aid in sound absorption. Soft surface

flooring like carpet, acoustical ceiling tiles, and draperies are simple to incorporate

into the design and have a profound effect on decreasing background noise.

Color theory is another very significant topic to cover when designing an

assisted living facility. Using contrasting colors for finishes can aid in way-finding

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[11]Cynthia Leibrock and Susan Behar, *Beautiful Barrier-Free: A Visual Guide to Accessibility* (New York: Van Nostrand Reinhold, 1993), 21.
[12]Ibid., 27.

for the visually impaired. It is easier to distinguish between colors contrasting in

value (lights and darks) than in hue (cools and warms). This is greatly due to the

common presence of cataracts in aging eyes: "Eighty-five percent of older people

experience yellow tinting of the human lens. The yellowed lens filters out short

wavelengths. Cool colors, like blue-green and blue-violet, become grayed. It

becomes nearly impossible to see the edge of a blue chair or ottoman situated on a

blue carpet, a contributing factor to falls."[13] Using cool colors in the design should

be avoided as much as possible. First of all, a cool color scheme makes the interior

appear gray and colorless to those with cataracts, so they do not receive the full

visual impact of the space. In addition, the lack of color actually becomes a safety

hazard. When objects appear to blend together because there is no color

differentiation, it can lead to accidents. A monochromatic color scheme is also a

poor option; it can become boring and monotonous after being viewed for extended

periods of time. This also defeats the purpose of bringing color into the interior.

Given these considerations, it is best to use a variety of colors within the warm end

of the spectrum for the interior finishes.

It is also ideal to use varying textures throughout the interior finishes.

Textures assist in defining rooms and establishing familiarity. For flooring, glossy

or slick surfaces should be avoided because they lead to slipping and are therefore a

safety hazard. Carpeting is a much better option, offering value as an insulator and

giving a tactile feeling of comfort. It can also help reduce ambient noise since it is a

soft surface. Low-pile carpet is most appropriate for ease of wheelchair

[13]Leibrock and Harris, *Design Details for Health: Making the Most of Interior Design's Healing Potential*, 88.

maneuvering. Hard-surface flooring options include ceramic tile, rubber, wood, and vinyl. Careful attention should be paid to these surfaces and their level of traction.

Most assisted living facilities allow residents to bring in a majority of their furniture from their home, but any pieces that are furnished must have rounded corners to prevent injuries from sharp corners. Armrests on chairs permit wheelchair users and strength-impaired residents to more easily rise from and lower themselves into the seat. Firm cushions are best for upholstered seating; soft cushions make wheelchair transfer difficult. Open spaces for a wheelchair user to pull up and transfer should be planned adjacent to major pieces of furniture.

CHAPTER FOUR

The Design Concept

The starting point of any fully developed design is a concept statement, a written description dictating a particular aesthetic and intent for a space. The following is a concept statement for the design of The Wren's Nest, to be located in an existing historic building in Charleston, South Carolina that has been slated to be remodeled as an assisted living facility. Given the Charleston historic preservation guidelines, certain architectural features such as supporting columns and staircases were required to remain, but complete freedom was given to place interior walls. The design has been guided by the preceding research and has culminated in a capstone interior design project. This full-scope design project involved research and programming, conceptual development, space planning, selecting finishes, furniture, fixtures, and equipment, and designing the floor, furniture, electrical, voice, data, life safety, and lighting plans.

The Wren's Nest Assisted Living Facility

Located in the heart of historic downtown Charleston on King Street, The Wren's Nest assisted living facility reflects the charm and romance of the beloved city by retaining the classical architectural features, original brick, and intricate tin ceiling tile of the original structure. This elegant, classic interior design is a subtle continuation of the delicate and ornate exterior. Inspired by the state bird of South Carolina, the Carolina Wren, and the warm and homey connotations of a bird's nest,

both individual apartments and the public spaces of the facility feel welcoming and comforting to all who enter. Both residents and their visitors will appreciate the variety of amenities: a television lounge, beauty salon and barber shop, craft and activities room, game area complete with pool and shuffleboard tables, exercise studio, library, and restaurant. Individual apartments contain ample provisions for performing the daily activities of sleeping, dining, bathing, and lounging within the comfort of each resident's own space. Universal design is closely adhered to in both private units and public areas.

Textures add variety to the design and also function as a wayfinding element, to help users with poor vision or memory to recognize where in the facility they are located. Ornamentation and accessories augment the "lived-in" aura and are kept within ADA regulations. Ambient interior light mimics natural daylight to ease strain on the residents' eyes. Ample decorative light is carefully incorporated to add to the romance and elegance of the design. Natural light is used in abundance to establish a connection with the outdoors, while being carefully balanced with artificial interior light to ease the amplified effects of cataracts, which daylight has been shown to have. Sustainable materials, appliances, and electrical components in the space all contribute to LEED credits and make the facility safer and healthier to live in.

Furniture in the facility is classically designed and appropriate for an older population. Subtle curves within the pieces not only add an elegant flair, but also provide a universal design solution by eliminating sharp corners and edges. Wood flooring with an aged patina is selected to make the space feel lived in, a

characteristic that will help residents feel more at home. Pops of white keep the design clean and timeless, so as not to be weighed down too much by the abundance of wood. The resident population, which has statistically been shown to be primarily female, will respond well to the rest of the color palette of warm neutral greys, browns, beiges, dark reds, and hints of dusty rose. Warm tones are intentionally selected with the prevalence of cataracts amongst residents in mind. Sparkling crystal chandeliers and live native flowers throughout emphasize the romantic charm of the facility, once again alluding to the Charleston atmosphere. These touches also give a more luxurious vibe to enrich the rustic design elements. The Wren's Nest is a facility that is designed to meet the needs of an older adult while maintaining a romantic, elegant, and classic design aesthetic, appropriate for both the population of users and the building location.

Evidence-Based Design Solutions

Taking into account the preceding research, the design for the Wren's Nest incorporates several evidence-based solutions. Since the facility is located within an existing building, there were a few inflexible architectural obstacles that needed to be addressed. The first is the large double-volume space that encompasses the lobby and reception area. Due to the structural architecture, the space was required to remain a large, open area. This could be a potential issue for the residents, as overly large spaces have been shown in studies to overwhelm and intimidate the aging population. Prevailing before the modern-day move toward open floor plans, this generation is accustomed to living in houses with a very defined and structured

series of smaller rooms, all enclosed spaces. They are simply not used to very grand

and open areas, and for this reason they tend to feel uncomfortable within them. As

a solution to this, a half-height partition wall is strategically placed behind the

reception desk. The wall serves a dual purpose: first of all, it functions as a

backdrop for the reception desk, and second of all, it breaks up the lobby into more

manageable and structured sections. The living-room style furniture arrangements

also aid in defining space. Rather than incorporating open, systems-style furniture,

the lobby of the Wren's Nest contains clearly defined seating areas for various layers

of socialization amongst residents and their guests. By breaking up the large space

into individual areas, the double volume room feels smaller and more manageable.

Figure 1: A Half-Height Wall and Furniture Arrangements Create Structure

Another issue created by a double volume space is the potential for

background noise and echoing throughout the mezzanine. As a solution for this, I

have designed a custom water feature wall in the center of the space. The lower half

of the wall houses resident mailboxes, and the upper half contains the waterfall itself. Water gracefully flows over a glass partition, offering a visually interesting element. The look and sound of water has been shown to promote peace and stress relief in all populations. Specifically for the elderly, the white noise created by the waterfall serves to mask stress-inducing echoes and background noise.

Figure 2: A Custom Water Feature Wall Promotes Stress Relief

A major consideration when designing for the aging population is the prevalence of memory loss. It is typical for around half of the residents in an assisted living facility to suffer from the beginnings of memory loss. This can lead to residents getting lost within the facility, especially in long corridors. To combat this, "memory alcoves" are provided at the door of each apartment. Within every alcove is placed a console table on which residents may display personal memorabilia,

family photos, or any other accessories that will signal to them that it is their apartment as they walk down the corridor.

Figure 3: A Typical Apartment Entry with Memory Alcove

One last challenge I faced was to create, as Cynthia Leibrock says, a "silent and invisible" universal design. When designing the kitchen and restroom in each apartment, I knew I had an obligation to create a space that was not only fully accessible, but would also be seen as beautiful by people of all ages and abilities. The goal was to seamlessly blend accessible design features such as lower countertop heights, easily reachable cabinetry, and sink kneespace without drawing attention to them. In the kitchen, I selected an apron-front sink that complies with ADA guidelines for a wheelchair approach and adds a special touch to the design. Granite countertops, a full-height glass tile backsplash, top-of-the-line appliances, a custom Baroque-style range hood, and antiqued brass hardware bring the kitchen a level of luxury. The restrooms, much like the kitchens, are intended to be silently

universal. The counter's kneespace, roll-in shower, and grab bars throughout are all

accessible features, yet they blend seamlessly into the rest of the space.

Figure 4: A Silently Accessible Apartment Kitchen

Figure 5: A Silently Accessible Apartment Restroom

All in all, the private and public areas of the Wren's Nest are both universal and beautiful. The facility silently and invisibly incorporates evidence-based accessible design solutions that were discovered in the preceding research. The Wren's Nest is a place users of all ages and abilities will feel comfortable, empowered, and at peace in, truly becoming a new home for its residents.

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