


6-28-2017

# An Evidence-Based Approach to Designing Low-Income Housing Communities

Kaitlin Ward

Western Kentucky University, [kaitlin.ward023@topper.wku.edu](mailto:kaitlin.ward023@topper.wku.edu)

Follow this and additional works at: [http://digitalcommons.wku.edu/stu\\_hon\\_theses](http://digitalcommons.wku.edu/stu_hon_theses)

 Part of the [Historic Preservation and Conservation Commons](#), [Interior Architecture Commons](#), and the [Urban, Community and Regional Planning Commons](#)

---

## Recommended Citation

Ward, Kaitlin, "An Evidence-Based Approach to Designing Low-Income Housing Communities" (2017). *Honors College Capstone Experience/Thesis Projects*. Paper 709.  
[http://digitalcommons.wku.edu/stu\\_hon\\_theses/709](http://digitalcommons.wku.edu/stu_hon_theses/709)

This Thesis is brought to you for free and open access by TopSCHOLAR®. It has been accepted for inclusion in Honors College Capstone Experience/Thesis Projects by an authorized administrator of TopSCHOLAR®. For more information, please contact [topscholar@wku.edu](mailto:topscholar@wku.edu).

AN EVIDENCE-BASED APPROACH TO DESIGNING  
LOW-INCOME HOUSING COMMUNITIES

A Capstone Project Presented in Partial Fulfillment  
of the Requirements for the Degree Bachelor of Science  
with Honors College Graduate Distinction at  
Western Kentucky University

By

Kaitlin A. Ward

May 2017

\*\*\*\*\*

CE/T Committee:

Chair: Sheila Flener

First Reader: Travis Wilson

Second Reader: Cory Dodds

Copyright by  
Kaitlin A. Ward  
2017

I dedicate this thesis to my parents for teaching me that luxury is not what makes a house  
a home.

## ACKNOWLEDGEMENTS

I would like to thank my advisors Travis Wilson and Sheila Flener for their guidance throughout this capstone project, as well as my classmates for their invaluable criticisms and support. I would also like to thank the Honors College for providing me with the opportunity to independently explore this avenue of my career.

## ABSTRACT

In the field of interior design, functionality and aesthetics are combined to create spaces that are beautiful, but also serve a variety of purposes. Broadly categorized into residential and commercial sectors, interior design considers the health and wellness of users in a space, and strives to improve the standard of living. Quality interior design is often treated as a luxury afforded only to the wealthy, although the field can and should be applied to benefit a wider demographic. Intelligent design and space planning can be used as a tool for community-building, especially among populations often overlooked due to reasons such as financial inequalities. This particular design revolves around the reuse of a historic building in Bowling Green and its redesign as a living community for low-income members of the public. Public housing projects are often designed as drab, prison-like facilities, which stigmatize and “other” less fortunate community members. This complex is modeled to provide well-designed, fully accessible housing units that provide safe, clean environments for low-income residents who cannot afford the hefty price tag that comes along with “good design”, but still deserve that same sense of community and wellness.

## VITA

### *EDUCATION*

- Western Kentucky University, Bowling Green, KY May 2017  
B.S. in Interior Design – Mahurin Honors College Graduate  
Honors Capstone: *An Evidence-based Approach to Designing  
Low-Income Housing Communities*
- Powell County High School, Stanton, KY May 2013

### *PROFESSIONAL EXPERIENCE*

- Nashville Public Library, Nashville, TN June 2016-  
Interior Design Intern Aug. 2016

### *AWARDS & HONORS*

- Summa Cum Laude, WKU, May 2017  
Award of Excellence Academic Scholarship, WKU, 2013-2017

### *PROFESSIONAL MEMBERSHIPS*

- International Interior Design Association (IIDA)  
American Society of Interior Designers (ASID)

### *PRESENTATIONS*

- Ward, K. (2017, March). *An Evidence-based Approach to Designing Low-Income  
Housing Communities*. Poster presented at the WKU Student Research  
Conference. Bowling Green, KY.
- Ward, K. (2016, April). *Sunlight Designs*. Poster presented at the WKU Student Research  
Conference. Bowling Green, KY.

## CONTENTS

|                       |      |
|-----------------------|------|
| Acknowledgements..... | iv   |
| Abstract.....         | v    |
| Vita.....             | vi   |
| List of Figures.....  | viii |
| List of Tables.....   | ix   |
| Overview.....         | 1    |
| Case Studies.....     | 3    |
| Local Relevance.....  | 5    |
| Design Decisions..... | 7    |
| References.....       | 23   |



## LIST OF FIGURES

|   |    |
|---|----|
| Figure 1. Logo for proposed housing complex.....        | 8  |
| Figure 2. Aerial view of existing site.....             | 9  |
| Figure 3. Existing floor plan.....                      | 10 |
| Figure 4. Front view of building.....                   | 11 |
| Figure 5. Existing elevations.....                      | 11 |
| Figure 6. Proposed elevations.....                      | 11 |
| Figure 7. Preliminary blocking diagram.....             | 12 |
| Figure 8. First floor furniture plan.....               | 13 |
| Figure 9. Second floor furniture plan.....              | 13 |
| Figure 10. Aerial view of proposed complex.....         | 14 |
| Figure 11. Autodesk Revit rendering of courtyard.....   | 15 |
| Figure 12. Autodesk Revit rendering of bedroom.....     | 16 |
| Figure 13. Autodesk Revit rendering of living room..... | 17 |
| Figure 14. Autodesk Revit rendering of kitchen.....     | 17 |

## LIST OF TABLES

|  |    |
|--|----|
| Table 1. The distribution of bedrooms in Bowling Green’s low-income housing. ....      | 5  |
| Table 2. The division of Bowling Green’s low-income housing residents by ethnicity.... | 6  |
| Table 3. Key material and finish specifications.....                                   | 18 |

## OVERVIEW

The median market rate for rent in newly constructed multi-family housing complexes reached \$1,381 per month in 2016. Nationally, there are only 57 rental units available for every 100 renters classified as low-income, meaning those who earn less than 50% of the area's median income (Harvard University). Additionally, there are only 31 units available for those earning less than 30% of the area's median income (Harvard University).

Individuals and families who are severely cost-burdened by rent prices are consequently at risk in other areas of life. In 2014, families paying more than 50% of their income on rent were forced to pay 41% less on food and 74% less on healthcare than those who could easily afford rising rent prices in their area (Harvard University). Furthermore, even after spending more than 50% of their income on housing, 11% of these families have reportedly missed their last rent payment, and 9% are reportedly at risk of being evicted in the next two months (Harvard University).

Discussions of cost and value in the realm of affordable housing often neglect to consider the architecture of the housing project itself due to the misconception that the design of a space refers only to aesthetic decisions (Davis, 1995). In fact, planning and design in new construction can affect up to 70% of the project's total cost (Davis). Careful consideration of "interiors, views, public areas, outdoor spaces, and even facades" can drastically influence a project's budget (Wright, 2014, p. 70), meaning that with meticulous planning, structures can be built or renovated to accommodate for public housing units without resorting to the most inexpensive materials and furnishings.

With a lower cost of building, rent prices can be lowered to benefit those who are cost-burdened, and these individuals and families can experience the satisfaction of living in a safe, comfortable, and well-designed home regardless of their income level. The overarching sense of “NIMBY-ism”—the idea that low-income housing lowers community value and creates unsightly structures that should exist somewhere that is “not in my backyard”—is prevalent in many communities and can be combatted through the implementation of thoughtful design.

## CASE STUDIES

In designing large-scale projects such as housing complexes, success hinges upon careful consideration of how similar projects in the past have fared. An examination of positive and negative outcomes of other low-income housing structures can lead to a model for how to better improve standards for this project type. For this project, low-income and affordable housing units designed within restored historic buildings were analyzed to create a set of standards that can be mimicked in a proposed design located in Bowling Green, Kentucky.

The first case studied was an abandoned YMCA building in southern Los Angeles, which was restored and converted into the 28th Street Apartments by Koning Eizenberg Architecture. Originally designed by Paul Revere Williams in 1926, the YMCA became a hub for African Americans who were denied access to other segregated facilities. Because it was such a prominent structure within its Los Angeles community, Koning used the existing site to create housing for financially struggling citizens (HUD USER, 2014).

The structure was awarded recognition for excellence in affordable housing design soon after its completion. The exterior of the building was restored to a modernized Spanish Colonial revival facade, and the interior was fitted for 48 individual apartments. Of these units, 23 were reserved for residents earning 30% of the area median income, 7 for residents earning 40%, and 18 units for those earning 50% of the area median income (HUD USER).

In addition to the restoration of the YMCA, some new construction was completed to accommodate for additional housing units. The new residential wing

included a rooftop garden to be used as a central community space for residents of the complex. The juxtaposition of historic architecture with new construction and modern furnishings created a welcoming environment that did not appear to obviously house low-income and rent-burdened families, and historic interior and exterior elements were refinished so that they retained their integrity while adding to the structure's visual appeal (HUD USER).

Another successful adaptive reuse of a historic building as affordable housing units is the Van Allen & Son Department Store in Clinton, Iowa. The building was handed over to Community Housing Initiatives on the understanding that the abandoned Louis Sullivan-designed building would be rehabilitated into 17 one- and two-bedroom affordable housing units, along with two market rate apartments on the upper floor. The structure was preserved so that the ornate historic detailing was translated into a more contemporary design, although toxic materials such as lead paint were removed. The original retail space of the first floor remained so that the building could retain some of its historical integrity, and apartments were spaced around exterior walls to achieve maximum natural light (Case Studies in Affordable Housing Through Historic Preservation, 2006).

To further support the reuse of a preserved historic building as affordable housing, Low-Income Housing Tax Credits and Historic Rehabilitation Tax Credits were used as sources of funding for the project. By incorporating government subsidies into the rehabilitation, more funds than remained for the project's success inspired several subsequent rehabilitations of nearby historic structures into affordable housing units (Case Studies).

LOCAL RELEVANCE

To translate the proposed design from intangibility to its potential as a local project, examples of low-income neighborhoods within Bowling Green, Kentucky were also examined to establish a case for the city’s need for affordable housing units:

Table 1. The distribution of bedrooms in Bowling Green’s low-income housing.

| Neighborhoods    | 0  | 1  | 2  | 3  | 4 | 5 | Total |
|------------------|----|----|----|----|---|---|-------|
| Gordon Avenue    | -  | 60 | 38 | 38 | 7 | 4 | 147   |
| Summit View      | 11 | 48 | 50 | 52 | - | 6 | 167   |
| Phoenix Place    | -  | -  | 32 | 36 | - | - | 68    |
| Angora Court     | -  | 38 | 30 | 22 | - | - | 90    |
| Bryant Way       | -  | 12 | 64 | 24 | - | - | 100   |
| Proposed Complex | -  | -  | 6  | 4  | 6 | - | 16    |

As evidenced by data from the Bowling Green Housing Authority, there is a lack of housing units providing an adequate number of bedrooms for large families. With the design proposed in this capstone project, a total of (6) 2-bedroom, (4) 3-bedroom, and (6) 4-bedroom apartments will be created, housing a total of 16 families. With a maximum of two persons per bedroom, this will create a safe shelter for a total of 96 rent-burdened members of the Bowling Green community (Demographic).

The demographic of low-income families in Bowling Green reflects a correlation between economic status and other identifying characteristics such as race and ethnicity. This information can be translated into the design of the housing complex through the incorporation of community spaces that allow for the inter-mingling of residents of different cultures and faiths.

Table 2. The division of Bowling Green’s low-income housing residents by ethnicity.

| Ethnicity         | # of residents | Country of Origin                  |
|-------------------|----------------|------------------------------------|
| African American  | 435            | -                                  |
| Eastern European  | 173            | Yugoslavia, Bosnia, Russia, other  |
| Caucasian         | 301            | -                                  |
| African Immigrant | 209            | Burundi, Liberia, Ethiopia, other  |
| Asian             | 82             | Burma, Vietnam, Philippines, other |
| Multi-Racial      | 43             | -                                  |
| Hispanic          | 75             | -                                  |
| Middle Eastern    | 64             | Iraq, Pakistan                     |

\*these 1382 residents make up a total of 598 households, 67% of which are led by women



## DESIGN DECISIONS

The goal of this capstone project is to design an apartment complex in a historic building that can be used as housing--subsidized with the Low-Income Housing Tax Credit and the Historic Rehabilitation Tax Credit--for low- and extremely-low-income families and persons in the Bowling Green, KY area without contributing to “NIMBYism”, or the devaluing of a community based on unattractive buildings and spaces that contribute to discrimination against families living in poverty.

Throughout this capstone, I propose plans for a complex of low-income housing units named Greenway Homes, inspired by the concept of a new, safe, community-based way of living for struggling families in Bowling Green. The building plans consist of private apartments and public areas such as meeting rooms, courtyards, and fitness centers that allow for the intermingling of residents. The building’s rehabilitation will include space for two-, three-, and four-bedroom units, all of which must contain at least a bathroom, kitchen, and living area as per HUD standards. Materials will have a sufficient lifetime expectancy to minimize renovations and replacements. The use of stimulating colors and patterns will seek to deviate from the “prison-like” stereotype of public housing. Individual apartment units will provide a space to reflect tenants’ unique cultures and personalities.



Figure 1. Logo for proposed housing complex.

The chosen location for the proposed design is the Honey Krust Bakery building, a historic landmark located on Adams Street in Bowling Green, KY. The massive Art Deco structure was designed by James Maurice Ingram, a prominent local residential architect in Bowling Green, in 1936. Although originally intended to be a commercial space, the historic building has the potential to be rehabilitated and zoned for residential purposes. With proper funding, the space can be transformed into a multi-family complex to house members of the rent-burdened or low-income community in Bowling Green.



Figure 2. Aerial view of existing site.

The current floor plan consists of several interior walls that reach the full height of the building, originally intended to separate public office and sales spaces from the various production and manufacturing rooms.

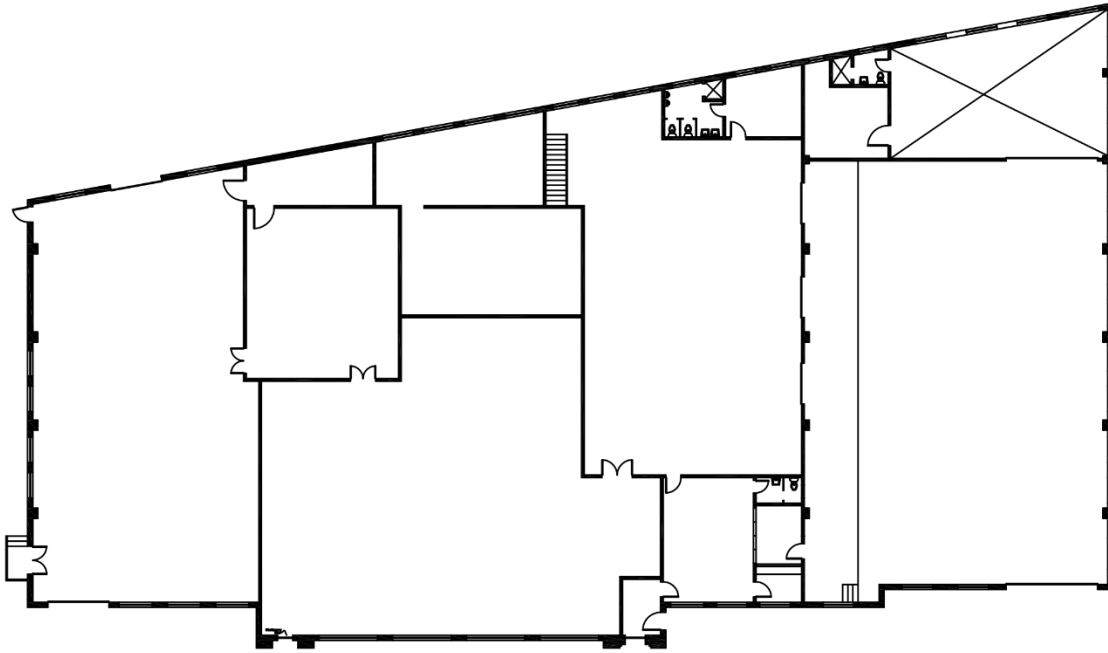


Figure 3. Existing floor plan. Not to scale.

The façade of the building consists of large, iconic Art Deco windows and decorative elements that will be mostly preserved and refinished so that the historic integrity of the building remains despite the reconstruction and modernization of the interior elements. To increase natural light and create a means of egress within individual rooms, additional windows will be added in a manner that seamlessly blends with the existing masonry.



Figure 4. Front view of building.

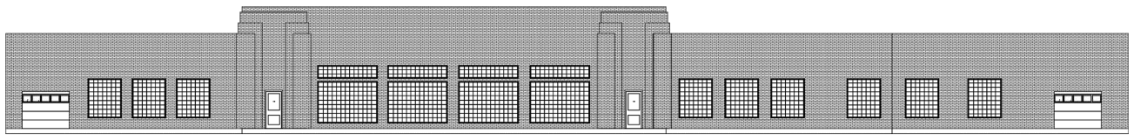


Figure 5. Existing elevations. Not to scale.

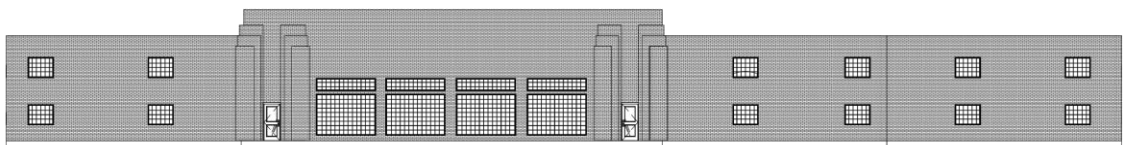


Figure 6. Proposed elevations. Not to scale.

The concept for the proposed floor plan revolves around a centralized outdoor space where residents of the complex can meet and engage with their neighbors within the safety and intimacy of their own community. A blocking diagram shows the initial plan for the layout of the complex, color-coded to differentiate between public and private spaces.

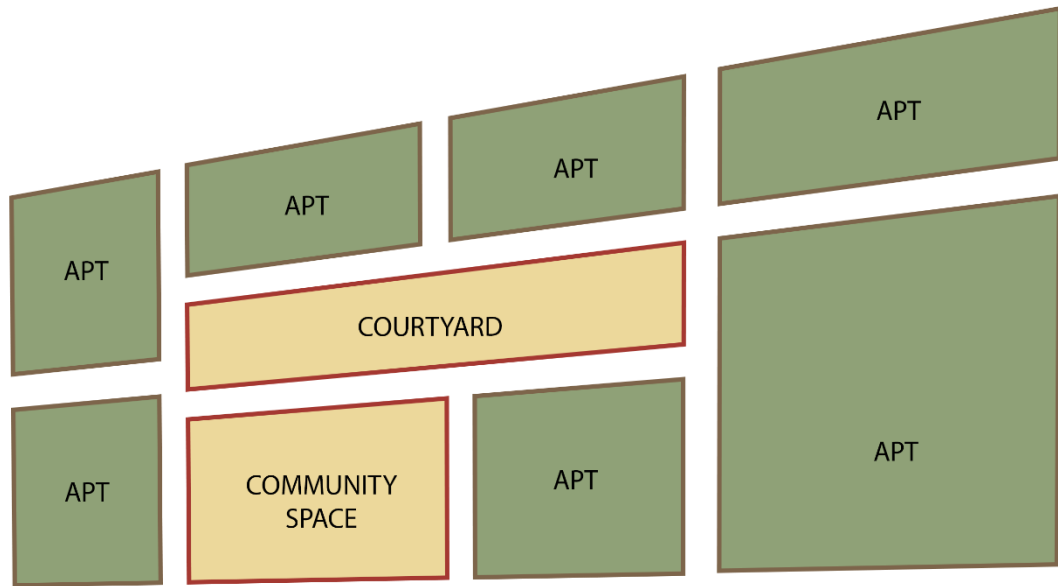


Figure 7. Preliminary blocking diagram.

After determining the basic layout with the blocking diagram, individual units are completed with interior walls, creating spaces that function for people of all abilities. The finalized plan for the first floor consists of eight housing units, a fitness room, a meeting room, a reception office and storage area, as well as an outdoor community space. The second floor houses eight apartments identical to the units located directly below them, while the public spaces of the first floor utilize the full height of the structure's ceiling

and consequently do not have a counterpart on the upper floor.



Figure 8. First floor furniture plan. Not to scale.



Figure 9. Second floor furniture plan. Not to Scale.

Entrances to the individual apartment units are located along the innermost walls of the building, with a primary entrance to the building located in the reception area, and two resident entrances along the opposite side of the building. Within the courtyard, three sets of stairs provide access to the upper floor at different points, and an elevator in the reception space opens onto the second floor balcony to accommodate for people who cannot utilize the stairs for various reasons.

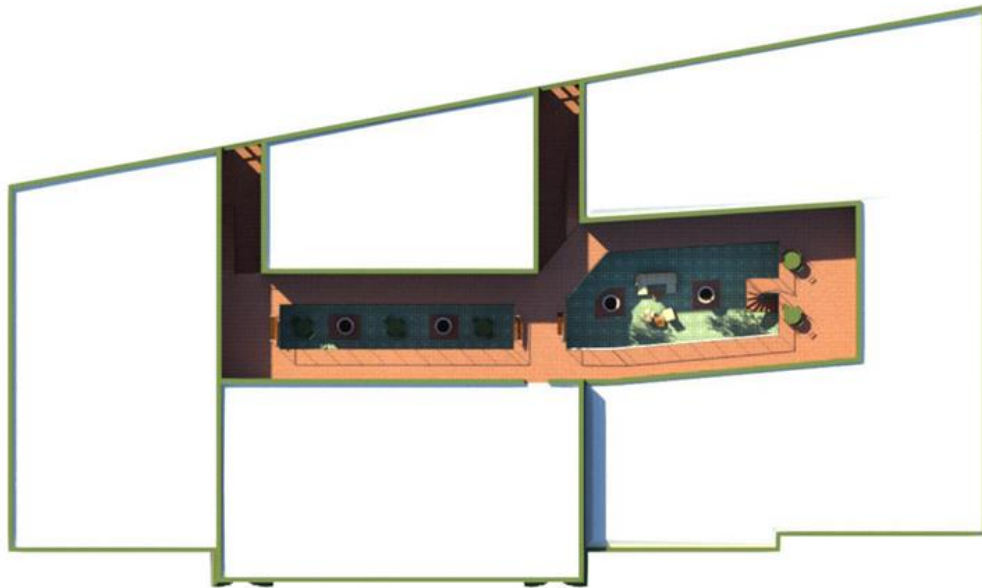


Figure 10. Aerial view of proposed complex.





Figure 11. Autodesk Revit rendering of courtyard.

Each unit consists of either two, three, or four bedrooms, each with a full-size bed or a twin-size bed that can be bunked to allow for two children to occupy the bedroom, as well as a nightstand and storage space in the form of dressers and/or closet space.

Apartments contain an adequate number of full and half-bathrooms, depending on the number of bedrooms.



Figure 12. Autodesk Revit rendering of typical bedroom with sample furniture.

An open living space includes a sitting area with sofa-beds and extendable dining tables to accommodate for guests, as well as a large pantry and island within a fully accessible kitchen. Laundry rooms are also located within each apartment so that families do not need to rely on time-consuming trips to public laundry facilities.





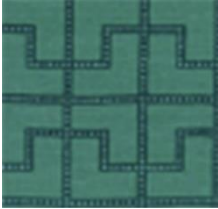


Figure 13. Autodesk Revit rendering of typical living room with sample furniture.



Figure 14. Autodesk Revit rendering of typical kitchen.

Throughout both the public and the private space, materials used for flooring, wallcoverings, and ceilings, as well as cabinetry and countertops are meant to be permanent and provide a simple yet visually stimulating base design for residents of the apartments. Non-fixed materials such as drapery and upholstery can be altered according to resident preference, and the finishes specified in the following table are intended to be used as an example of how the apartments can be transformed into interesting, exciting spaces in defiance of the stereotype of bland public housing.

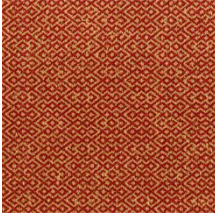
Table 3. Key material and finish specifications.

| Material  | Manufacturer            | Application |
|---|-------------------------|-------------|
|   | Schumacher:<br>Bleecker | Drapery     |
|  | Schumacher:<br>Tea Rose | Drapery     |
|  | Kravet:<br>34088.611    | Upholstery  |



Kravet:  
32625.1624

Upholstery



Schumacher:  
Mayan Pomegranate

Upholstery



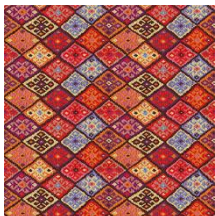
Kravet:  
31459.514

Upholstery



Sunbrella:  
Meander Wren

Upholstery



Kravet:  
33849.910

Upholstery



Armstrong:  
Circles

Ceiling



Armstrong:  
Metallare Bead

Ceiling



Ann Sacks:  
Paire Ascend

Wallcovering



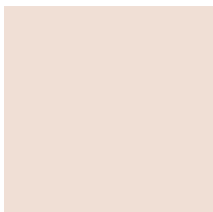
Sherwin Williams:  
Broccoflower

Wallcovering



Sherwin Williams:  
Sunbeam Yellow

Wallcovering



Sherwin Williams:  
Faint Coral

Wallcovering



MSI:  
Azurite

Countertops



Armstrong:  
Homestead Roasted

Flooring



Maharam:  
Bold

Flooring



Daltile:  
Rojo Alacante

Flooring



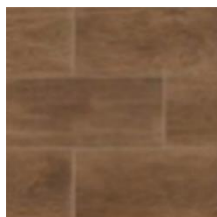
Original Mission:  
Laredo

Flooring



Mohawk:  
Golden Glow

Flooring



Daltile:  
Willow Bend

Flooring

Through the usage of visually interesting materials and a centralized floor plan that maximizes interaction between neighbors, the proposed Greenway Homes housing complex reflects a shift toward better public housing in Bowling Green. By utilizing design skills and considering the successes of other low-income housing communities, this capstone proves that the comfort of home is not something that is inherently tied to a family's wealth.



## REFERENCES

- Case Studies in Affordable Housing Through Historic Preservation (Rep.). (2006, August). Retrieved March 22, 2017, from U.S. Department of the Interior.
- Davis, S. (1995). *The architecture of affordable housing*. Berkeley, CA: University of California Press.
- Demographic. (n.d.). Retrieved March 17, 2017, from <http://habg.org/new/demographic/>
- Harvard University. (2016). The state of the nation's housing 2016 (rep.). Retrieved from <http://www.jchs.harvard.edu/sites/jchs.harvard.edu/files/son2016-key-facts.pdf>
- HUD USER. (2014). Retrieved March 20, 2017, from [https://www.huduser.gov/portal/about/housingCommDesign\\_2014\\_1.html](https://www.huduser.gov/portal/about/housingCommDesign_2014_1.html)
- Wright, G. (2014). *Design and affordable american housing*. *Cityscape: A Journal of Policy Development and Research*, 16(2), 69-86.