

An Architectural Response to Local Chronic Homelessness: Creation and Utilization of a Architectural Design Criteria

Janna De Vera (Flintridge Sacred Heart Academy, jannadevera20@fshamail.org)

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Abstract

With the increase of homelessness, especially in Los Angeles County, there is a critical need for affordable housing. An Architectural Design Criteria was created to streamline the design of affordable developments. Taking inspiration from a design guideline already created, current successful affordable housing developments, and in-depth research, the criteria will allow architects to evaluate and adjust their designs to increase the likelihood that a project will contribute to decreasing homelessness. The criteria contains seven different elements that are shown to be crucial in a successful affordable housing development, and the criteria are tested against three existing developments and four model communities.

1.0 Introduction

The chronic homelessness population has increased by 16% in LA County since 2018 (Beres, 2019). Enterprise Community Partners suggests that “access to decent, affordable housing would provide critical stability for these families, and lower the risk that vulnerable families become homeless” (Enterprise Community Partners, "Impact of Affordable Housing on Families and Communities: A Review of the Evidence Base", 2014). The lack of effective affordable housing options is exacerbated by high housing costs relevant to income, population growth, and poor housing quality (including unsafe and unsuitable environments) of available affordable units all contribute to chronic and episodic homelessness. Because people see their homes, or where they live, as a reflection of themselves, architects who design homes for people earning low incomes are responsible for creating a space residents can have pride in and feel emotionally and economically stable (Megbolugbe & Linneman, 1993).

Many organizations make positive impacts through their response to chronic and pervasive homelessness on a local, national, and global level. Four of these organizations are Habitat for Humanity,

SquareOne Villages, Co-Housing, and Heritage Housing Partner communities. These organizations have been and are successful for multiple reasons, but the two most important reasons are that their developments are affordable and provide residents with a sense of community. Heritage Housing Partners is a local, non-profit organization building affordable homes that blend high-quality new construction with the re-use of older buildings and are for sale to low- and moderate-income first-time homeowners (Heritage Housing Partners, "Strengthening neighborhoods through affordable homeownership since 1998."). By creating self-managed communities of cost-effective tiny homes for people with low-incomes in need of housing, SquareOne aims to solve the homelessness crisis in Oregon. This non-profit organization is funded by generous donations from community members, grants, and local architecture firms that donate the homes (SquareOne Villages, 2017). Co-housing prioritizes the use of common, public space along with smaller, private living areas; it values connected relationships, a small footprint, private homes, common spaces, and community participation (Gimmig, 2019). Habitat for Humanity focuses on the need for affordable housing on a local, national, and global level; this organization attempts to provide a solution to housing instability by repairing homes, establishing titles and land ownership, and new construction (Habitat for Humanity, 2016).

In her guidebook called "Design Guidelines for Low Income Housing", University of Minnesota undergraduate student Samantha Matuke offers developers a set of guidelines for successfully designing low-income communities (Matuke, 2016). Matuke's guidebook includes elements such as local amenities, public space, variety of space, ownership, and density, each one including a yes/no checklist as a means for evaluation and a passage explaining each elements' significance. These elements, she argues are relevant across all income levels, but are often left out in low-income developments. Although these elements are not all that should be considered in the process of designing low-income communities, they were selected due "to their direct ability to influence success, either to assist in a resident's rise from poverty or to remain an integrated part of the community" (Matuke, 2016). Matuke uses domestic and

international case studies to evaluate the effectiveness of her guide and demonstrate comparisons of one international and two national low-income communities in order to show it could be used on a global scale. The purpose of the case study comparison was not to criticize or highlight faults in designs, but, to identify successful uses of the elements in different contexts.

By taking inspiration from current, successful communities and the guidebook previously mentioned, an Affordable Design Criteria for architects has been developed that focuses on affordable/low-income housing designs. In Section 2 of this report, the design criteria are described along with a testing protocol. Section 3 shows the utility of the criteria by applying them to several case study properties and Section 4 provides an in-depth discussion about the results and offers future work suggestions.

2.0 Methods

2.1 Architectural Development Criteria

To increase the effectiveness of an architect's ability to design new projects while simultaneously maintaining affordability for the eventual residents, an Affordable Design Criteria (ADC) was created. The criteria takes inspiration from Samantha Matuke's "Design Guidelines for Low Income Housing" and includes specific quantities that are measurable early in the design phase of development. These criteria are: Affordability, Resident Participation, Passive Sustainability, Density, Use of Land, Effective Interior Space, Presentation, and Safety. The full criteria is seen in Appendix 7.4. The ADC is scored out of 28 points that are distributed among those criteria, with affordability, density, and use of land weighted heavier because of their importance. The intent is for architects to use the ADC to evaluate projects in the design phase and make adjustments to design that will increase the ADC score prior to entering entitlement and construction phases.

2.2 Existing Development Case Studies

Three local developments were selected as case studies to use with the ADC. The three developments that were selected, Fair Oaks Court, Eight Twenty, and Mission Meridian (see Appendix 7.1-7.3), all are located in the greater Pasadena area. Each development varied in size, location, affordability, design, etc. and highlighted key factors in what makes a development successful and unsuccessful. These properties were selected because along with providing variety, they were easy to visit and drive around. The process of using the ADC to evaluate these developments resulted in modifications to the ADC categories and scoring system. In addition, a tour and interview with a resident of Fair Oaks court led to further revisions of the ADC that can be found in Appendix 7.4.

2.3 Design Models for New Development

Using the ADC, four new architectural layouts were created for a one acre plot of land. Each layout was varied in density, landscaping, and unit style and then scored using the ADC. A fourth model was created in an attempt to maximize an ADC score (see Appendix 7.6). These case studies demonstrate how the ADC is intended to be used in the architectural design process, highlighting how small design decisions impact the affordability profile of a development. Additionally, they offer design models that could be used as templates for future affordable developments.

3.0 Results

Three existing developments (Case Study 1-3) and four new designs (Design 1-4) were scored using the ADC (see Table 1). For more details of the scoring process, see tables in Appendix 7.1-7.3 and 7.7.

| | Case S. 1 | Case S. 2 | Case S. 3 | Model 1 | Model 2 | Model 3 | Model 4 |
|---------------------|---------------------------|--------------------------------|---------------------------|-------------------------|---------|---------|---------|
| Type of Development | High Income Housing | Low to Moderate Income Housing | High Income Housing | | | | |

| | | | | | | | |
|----------------------------|-------|-------|-------|-------|-------|-------|-------|
| Affordability (4) | 0/4 | 2/4 | 0/4 | N/A | N/A | N/A | N/A |
| Resident Participation (4) | 3/4 | 4/4 | 4/4 | 4/4 | 3/4 | 4/4 | 4/4 |
| Presentation (6) | 4/6 | 4/6 | 5/6 | 4/6 | 4/6 | 4/6 | 6/6 |
| Use of Land (3) | 2/3 | 2/3 | 2/3 | 2/3 | 2/3 | 3/3 | 3/3 |
| Density (DU) (3) | 2/3 | 2/3 | 3/3 | 2/3 | 2/3 | 1/3 | 3/3 |
| Interior Space (6) | 2/4* | 4/6 | 3/6 | 2/4* | 2/4* | 2/4* | 2/4* |
| Safety (2) | 1/2 | 2/2 | 1/2 | 2/2 | 2/2 | 2/2 | 2/2 |
| Total Score | 14/26 | 20/28 | 18/28 | 16/22 | 15/22 | 16/22 | 20/22 |
| Total Success % | 54% | 70% | 64% | 73% | 68% | 73% | 91% |

Table 1: Architectural Design Criteria (ADC) scoring for Case Study 1-3 and New Design 1-4

* scored out of 4 points rather than 6 -- furniture or appliances could not be evaluated

3.1 Case Studies

As it is presented in the table, Case Study 2: Fair Oaks Court scored a 20/28, or 70%, earning the highest score of the case studies. This development was the only one to be fully evaluated in all the categories. Case Study 1: Eight Twenty, was the lowest scoring of the three developments and scored 14/26, or 54% and Case Study 3: Mission Meridian, scored an 18/28, or 64%. Internal furniture and appliances could not be evaluated in Case Study 1 resulting in a maximum score of 26 (instead of 28).

3.2 New Architectural Designs

Design 1: Score 16/22

Design 2: Score 15/22

Design 3: Score 16/22

Design 4: Score 20/22



The first three models (Design 1-3) were created consecutively and scored relatively similar to one another. Model 1 scored a 16/22 (73%), Model 2 scored a 15/22 (68%), and Model 3 scored a 16/22 (73%). Although the models differ in layout and design, their scores were still similar (68%-73%). Model 4 was created specifically to maximize the ADC and scored a 20/22 (91%). All four models were evaluated in all categories except for affordability and one element of interior space, leaving the total score out of 22 points rather than 28.

4.0 Discussion

4.1 Case Studies

Through the evaluation of existing developments, the usefulness and easy use of the ADC was demonstrated. The fact that Case Study 2 (Fair Oaks Court) scored the highest with a 20/28 or 70% is consistent with expectations for multiple reasons: it was the only property specifically developed intentionally for affordability, it was completely private, it had a very efficient use of land, and the residents expressed a strong sense of community. Fair Oaks Court (Case Study 2) was the only development that allowed a tour and interview with a resident and its director, resulting in a qualitatively better understanding of the details needed for accurate ADC scoring.

Case studies 1 and 3 were not affordable housing developments by design. These are important to include because it shows the significant impact on the overall ADC score of a low affordability. Case Study 1 (Eight Twenty) was the lowest scoring of the three developments, earning a 14/26 or a 54%. When testing it with the criteria, how equipped the units were in terms of furniture and appliances was not evaluated, resulting in a score based on the development's design (an external assessment). The affordability aspect affected its total score (0/4 in

affordability). Even so, without affordability factored in, Case Study 1 still scores, 14/22, or 64%. Likewise, Case Study 3 (Mission Meridian) earned a relatively low score of 18/28 or 64%. A big contributor to the lower grade is that the development was not an affordable housing development, so if it was scored without the affordability category it would have received an 18/24, or 75%. Both these case studies show that a development can be perfectly designed with all the criteria that you are looking for except affordability. Both cases had a very strong presentation and scored high in resident participation, but overall those couldn't make up for the points lost in the affordability section.

4.2 New Architectural Designs

As a demonstration of how the ADC would be practically useful to architects in the design phase of development, three things are worth noting. 1) Similar scores of models Design 1-3 suggest developments with various layouts, but similar densities can achieve similar scores. This suggests that architects will have flexibility to be creative with designs while still working to maximize ADC score. 2) The fourth model with a maximized ADC score shows how prioritizing density, use of land, and presentation can result in a more successful development. 3) Incorporating a variety of unit sizes and styles, rather than all one style, allows for a variety of residents in the community.

In creating Design 1-3, specific focus was placed on the use of land and density. Each design varied in number of units, size of units, and layout. Models 1 and 3 had the same scores, with a 16/22 or a 73%, even though their layouts and density differed (Model 3 scored higher in use of land and Model 1 scored higher in density). Model 2 scored lower (15/22 or a 68%) primarily because the layout lacked significant communal space, potentially inhibiting resident interactions and the development of a strong community.

The fourth model (Design 4) was developed with the intention of maximizing the ADC score (earning a 20/22 or a 91%). Falling short of 100% was based on proposed internal furnishings (units were equipped with appliances, but not furniture). None of the four models could be evaluated based on their affordability. The basic and simple nature of the design diagrams did not provide enough detail to calculate development costs.

The development and ADC scoring of these models demonstrated the main function of the ADC: an evaluation of a potential, affordable housing development during its design phase. It highlights the importance of density, use of land, and resident participation as key elements to help create successful communities for those earning low-incomes.

4.3 Future Work

While the ADC has been shown to be a useful way to differentiate properties based on affordability, resident participation, passive sustainability, density, use of land, effective interior space, presentation, and safety, several areas for improvement are clear. First, developing a clear, measurable way of evaluating affordability would help the ADC's usefulness. This could include potentially finding a way to connect affordability with construction or land cost. Secondly, performing more case studies could have a significant impact in further revising the ADC, whether it's adding more elements or editing the ones already established. Lastly, exploring more complex modeling of new designs could help create more practical layouts that have a greater potential of being used. Features such as scale renderings, 3D models, increased detail designs, and adding a variation in land size and shape are examples of modeling approaches that could help.

5.0 Conclusion

An Architectural Design Criteria has been created to help evaluate the potential success of projects and proactively increase the likelihood that these projects contribute to decreasing homelessness.

Through the use of case studies and model diagrams, the process for using the criteria has been demonstrated. Using the work done here as a starting point, in-depth understanding of the connection between affordability and construction and developing detailed community models could increase the usefulness of the criteria.

6.0 References

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7.0 Appendices

7.1 [Case Study 1: Eight Twenty](#)

7.2 [Case Study 2: Fair Oaks Court](#)

7.3 [Case Study 3: Mission Meridian](#)

7.4 [Criteria](#)

7.5 [Manual](#)

7.6 [Model Diagrams](#)

7.7 [Model Evaluations](#)

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