

The Behavioural Basis of Design in Cohousing

To what extent does the architectural design of Vindmøllebakken promote
social sustainability?

Visual Arts Extended Essay

Word Count: 4000

Personal code: jbr885

Table of Contents

Introduction.....	3
Function and purpose.....	5
Design process	7
Designing for the common and the private	10
Balance between the common and the private.....	10
Movement	10
The “Amfirom”.....	13
The “Allrom”	17
Integration of nature within architecture.....	20
Other factors promoting social sustainability	21
Conclusion	22
List of Figures	24
Bibliography	26
Appendices.....	28



Fig. 1. Exterior of Vindmøllebakken. (Photograph by Helen & Hard, *Vindmøllebakken*, Arkitektfirma Helen & Hard AS).

Introduction

The language of architecture, whether that lies in material, light, or other spatial elements, is definitive of a human's experience; our architectural understanding lies within the very essence of the buildings individuals interact with daily. Yet, contemporary scholarship on architecture has been subject to a growing critique of modern urbanism, noting the recent growth in the impersonality of architecture.¹ As argued by urban theorist Gehl, the 'human dimension has been an overlooked and haphazardly addressed'² issue, a notion which architect Pallasmaa places to be the cause of the growing experiences of alienation, detachment, and solitude in the urban context.³ Such discourse inheres in the lack of advancement of social sustainability in urban planning,⁴ constituting the development of 'physical, cultural and social places that support people's wellbeing and encourage a sense of community'.⁵ A residential solution to issues presented by modern urban fabric is cohousing, delineated by architects McCamant and Durrett as a movement predicated on greater sharing and cooperation between households

¹ Juhani Pallasmaa, *The Eyes of the Skin: Architecture and the Senses* (Chichester: John Wiley & Sons, 2012), 22.

² Jan Gehl, *Cities for People* (Washington, DC: Island Press, 2010), 3.

³ Pallasmaa, *The Eyes*, 22.

⁴ Natasha Palich and Angeliq Edmonds, "Social Sustainability," *Environment Design Guide*, 2013, 4, <http://www.jstor.org/stable/26151925>.

⁵ Palich and Edmonds, "Social Sustainability," 2.

grown directly from the dissatisfaction of estranged housing choices.⁶ One such example is Vindmøllebakken (see fig. 1), the first sustainable cohousing complex located in Stavanger, Norway, completed in 2019.⁷ Through Vindmøllebakken's analysis, this investigation seeks to determine the extent to which architecture and design can promote social sustainability and sustain diverse interpersonal relations among residents. The behavioural basis of its design will be determined qualitatively, using interviews from both residents and Randi Augenstein, CEO and senior architect of Helen & Hard (H&H), the practice responsible for Vindmøllebakken's realization, and placing such empirical findings in conjunction with literature and academic articles pertaining to the design of residential architecture, as well as a personal site visit. The exploration of Vindmøllebakken's design and appraisal of its success in promoting social sustainability will be placed in a visual arts framework through analysis of function and purpose, its design process, and structural characteristics with particular reference to the design of the common and the private. This study, ergo, aims to provide a cohesive discourse on the extent to which design promotes social sustainability.

⁶ Kathryn McCamant and Charles Durrett, *Creating Cohousing: Building Sustainable Communities*, 3rd ed. (New York: New Society Publishers, 2011), 9.

⁷ Siv Helene Stangeland, "Our House - Inspiring Architecture for Our Future," speech presented at TEDx Stavanger, Stavanger, September 9, 2019, video, YouTube, posted by TEDx Talks, September 9, 2019, accessed September 6, 2020, <https://www.youtube.com/watch?v=mjH1AIEqa9c&t=387s>.

Function and Purpose

As of April 2020, communal residential housing in Norway makes up only 2.5 per cent of the national housing stock,⁸ in stark contrast to detached housing which instead constitutes half of the census.⁹ Vindmøllebakken, as the pilot project of the recently created ‘Gaining by Sharing’(GbS), a housing model developed by H&H architects and property developers Indigo Vekst, Kruse Smith and Gaia Trondheim,¹⁰ attempts to respond to contemporary living trends and societal issues, of which ‘segregation, loneliness, health issues and our carbon footprint’¹¹ are most pertinent, to cite Siv Helene Stangeland, partner of H&H. GbS presents a housing model based on the desire to create a sustainable mode of life, principally through the reduction of resource consumption by sharing; whether that is time, land, or facilities.¹² As architect Pallasmaa eloquently states, ‘architecture initiates, directs and organises behaviour and movement’,¹³ supporting several lines of scholarly thought in suggesting that physical design is able to unconsciously choreograph the behaviour of residents.¹⁴ Hence, one of the primary purposes of Vindmøllebakken was to create the physical environment to facilitate the sustenance of diverse communal relations.

An intention behind the project, and theory advocated most prominently by architects such as Léon Krier and Aldo Rossi, is the question of new urbanism. The design movement which constitutes new urbanism advocates architectural design that is characterized by the use of traditional building typologies whilst taking ‘full account of modern technological, social,

⁸ *Dwellings (occupied and Vacant), by Building Type*, table (Oslo: Statistisk Sentralbyrå, 2020), accessed July 15, 2020, <https://www.ssb.no/en/bygg-bolig-og-eiendom/statistikker/boligstat>.

⁹ *Dwellings by Building Type*, table.

¹⁰ Helen & Hard, "Vindmøllebakken - Gaining by Sharing," Helen & Hard, accessed July 27, 2020, <https://helenhard.no/work/vindmollebakken/>.

¹¹ Stangeland, "Our House," speech, TEDx Stavanger.

¹² Helen & Hard Architects, *Vindmøllebakken: Bærekraftige bofellesskap Kompetansetilskudd Sluttraport* (Stavanger, Norway: Gaining By Sharing, 2016), 12.

¹³ Pallasmaa, *The Eyes*, 68.

¹⁴ Alain De Botton, *The Architecture of Happiness* (New York: Vintage Books, 2008), 106.

and economic realities'.¹⁵ This in turn promises to renew cities and restore their 'vitality, beauty and sense of community'.¹⁶ A notion frequently raised by the project's architects in reference to GbS and cohousing is the reintroduction of the village in the modern context.¹⁷

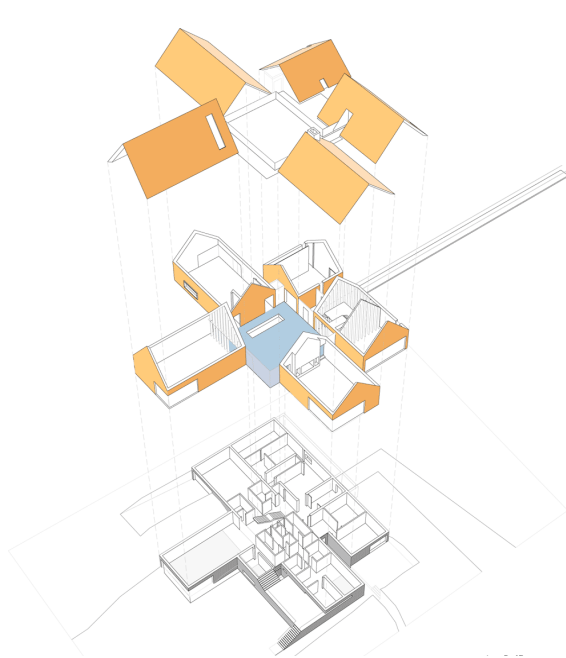


Fig. 2. Diagrammatical rendering of the traditional Norwegian tun; common land in blue. (Illustration by Mir, *Mountain lodge on Sognefjord*, Dezeen).

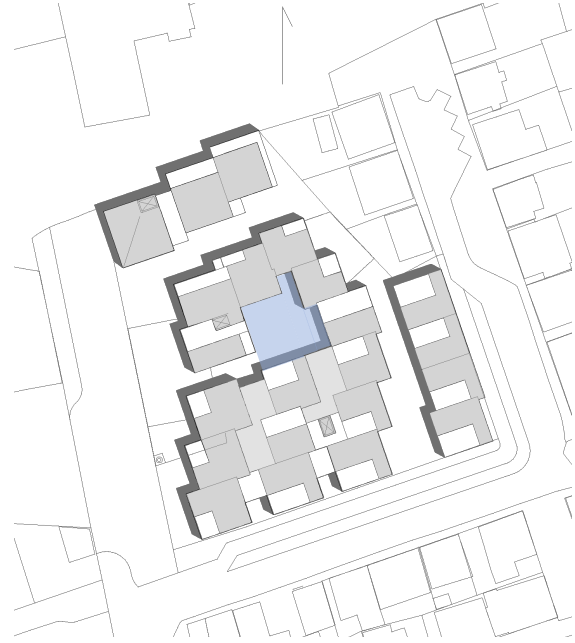


Fig. 3. Floor plan of Vindmøllebakken; built around the communal courtyard in blue. (Illustration by Helen & Hard, *Vindmøllebakken*, Arkitektfirma Helen & Hard AS).

Vindmøllebakken functions as a rejection to the trend of suburban sprawl, a phenomenon characterized by 'nuclear family homes and high-rise apartments'¹⁸ which have fragmented modern communities.¹⁹ Cohousing mirrors past villages whereby 'through cooperation and proximity, the members of cohousing communities build social relationships and work together to address practical needs'.²⁰ Particular to Norway is the concept of the "tun", the traditional central outdoor living space around which surrounding farms are arranged (see fig. 2), which

¹⁵ Stacey Swearingen White and Cliff Ellis, "Sustainability, The Environment, and New Urbanism: An Assessment and Agenda for Research," *Journal of Architectural and Planning Research* 24, no. 2 (2007): 128, <http://www.jstor.org/stable/43030796>.

¹⁶ Jill Grant, "Exploring the Influence of New Urbanism in Community Planning Practice," *Journal of Architectural and Planning Research* 20, no. 3 (2003): 235, <http://www.jstor.org/stable/43030662>.

¹⁷ Stangeland, "Our House," speech, TEDx Stavanger.

¹⁸ Randi Augenstein, "Vindmøllebakken bofellesskap i Stavanger - Om prosess, samarbeid og utfordringer," speech presented at BYLIVKonferansen, Oslo, September 18, 2019, video, ArkitekturNO, posted September 18, 2019, accessed July 8, 2020, <https://www.youtube.com/watch?v=jDoFbspPR2c>

¹⁹ McCamant and Durrett, *Creating Cohousing*, 4.

²⁰ McCamant and Durrett, *Creating Cohousing*, 24.

project leader Augenstein describes as an arrangement ‘where everyone knew everyone and you had a sense of belonging’.²¹ Vindmøllebakken hence functions as a model replicating the Norwegian architectural tradition of the village (see fig. 3), with the intention of facilitating community and enhancing the quality of contemporary life.

Design Process

Another element crucial to the question of social sustainability in Vindmøllebakken is the approach that has defined its realization, namely the user-inclusive design process. User participation delineates the presence of future residents in the creative process, a concept stressed throughout the construction of Vindmøllebakken.²² This unusual approach to commercial residential housing, to cite Randi Augenstein, has both informed the physical structure of the complex and begun a community-building process.²³ The theory of user participation lies in the belief that a work of architecture should be arranged less as the representation of the architect and more the representation of its users,²⁴ creating appropriate material conditions of those for whom it is built. Such user participation has been promoted throughout the conceptualization of Vindmøllebakken through resident workshops (see fig. 4), both before and following purchase of the apartments, which a resident claims to be argument for the sense of community, as decisions were made on ‘how [they] wanted it [at Vindmøllebakken], what [they] needed and how it should be arranged’.²⁵ Initial seminars were organized as early as 2013, introducing to the residents the ‘possibility to meet their potential neighbours, to become aware of the concept of what it means to live closer to others,

²¹ Augenstein, "Vindmøllebakken bofellesskap," speech, ArkitekturNO.

²² Helen & Hard Architects, *Vindmøllebakken: Bærekraftige*, 21.

²³ Randi Augenstein, in discussion with the author, August 24, 2020. (see Appendix A).

²⁴ Giancarlo De Carlo, "An Architecture of Participation," *Perspecta* 17 (1980): 74, <https://doi.org/10.2307/1567006>.

²⁵ Resident 3, in discussion with the author, August 2020. (see Appendix B).



Fig. 4. Workshop led by Helen & Hard. (Photograph by Helen & Hard, Arkitektfirma Helen & Hard AS).

and to express the way in which they wish the building should be organized'.²⁶ Such seminars and workshops continued through until 2019, with the intention to promote residents to engage in a continuous dialogue between architect and community.²⁷ This facilitated process has been highly endorsed by the residents, placing it to be the cause for the heightened sense of community.²⁸ Furthermore, these workshops aided the process of democratization in community decision-making,²⁹ for example by encouraging monthly meetings to make decisions, which H&H architect and resident Siv Stangeland believes is where 'the essence of building a community happens, where we are able to step outside our separate selves and create shared realities'.³⁰ The inclusivity and user-based design process has allowed for a flexibility in the structural organization of the complex, such as the building patterns, floor plans, and the transition zones between private and communal spaces.³¹ The praxis of user participation can be seen on a direct level of dialogue between individual residents and architects, where residents were given the opportunity to make minimal adjustments to their own apartments.³²

²⁶ Augenstein, "Vindmøllebakken bofellesskap," video.

²⁷ Helen & Hard Architects, *Vindmøllebakken: Bærekraftige*, 21.

²⁸ Resident 2, in discussion with the author, July 2020.

²⁹ Randi Augenstein, in discussion with the author, August 24, 2020.

³⁰ Stangeland, "Our House," speech, TEDx Stavanger.

³¹ Helen & Hard Architects, *Vindmøllebakken: Bærekraftige*, 21.

³² Augenstein, "Vindmøllebakken bofellesskap," speech, ArkitekturNO.

The illustration seen in figure 5 is revelatory of the level of consideration of design on individual bases, with changes such as ‘the placement or size of windows, places for their dog, and even sound-proofing’ in private units.³³ The design process led by H&H has hence ‘set the frame for community to grow’.³⁴ This open exchange between architect and resident speaks of social sustainability in that it has created networks within Vindmøllebakken’s community and has empowered people through engagement in the decision making about their private and communal spaces.³⁵ The process that has defined Vindmøllebakken is hence indicative of the fundamental role the design process plays in the promotion of community.

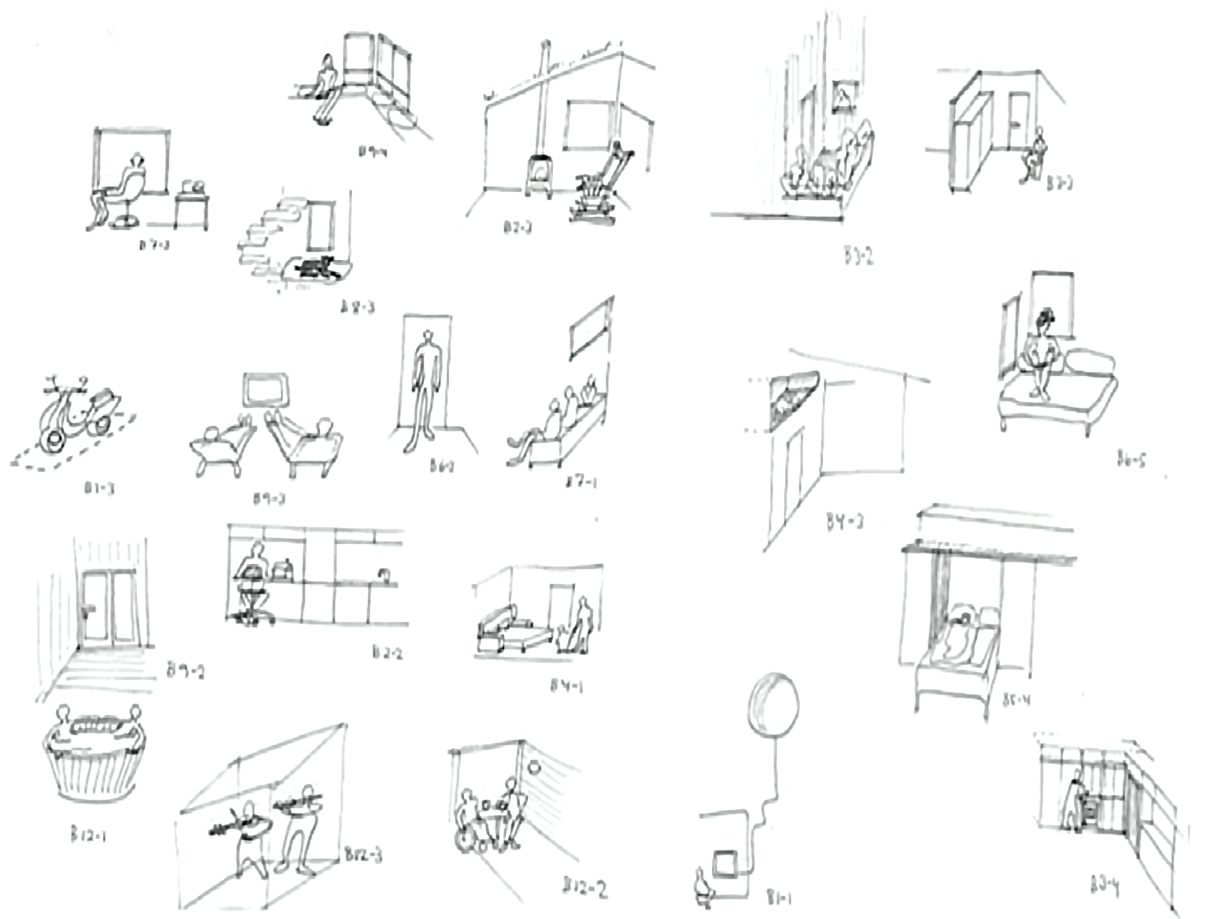


Fig. 5. Individualized apartment adjustments. (Illustration by Ane Dahl, *Apartment adjustments Vindmøllebakken*, Arkitektfirma Helen & Hard AS).

³³ Randi Augenstein, in discussion with the author, August 24, 2020.

³⁴ Randi Augenstein, in discussion with the author, August 24, 2020.

³⁵ Palich and Edmonds, "Social Sustainability," 5.

Designing for the common and the private

Balance between the common and private

The architectural design of common land in housing is characterised by its ability to allow inhabitants to ‘feel connected to a larger social system’³⁶ and secondly, acting as ‘a meeting place for people’.³⁷ The richest social environments, as argued by Montgomery, are those in which humans ‘feel free to edge closer together or move apart’³⁸ as they wish; yet this proves a difficulty in the design of cohousing complexes, due to the challenge of a successful and effective realization of common space which complements the private realm.³⁹ As Montgomery continues, places that feel overly crowded ‘can leave us so overstimulated and exhausted that we retreat into solitude’.⁴⁰ Cohousing must thus be designed carefully ‘to strike the optimal balance between these two opposing needs’ of privacy and community.⁴¹ One of the goals of the project outlined is the achievement of an ‘architecture that facilitates both sharing and safeguarding privacy, and for informal meeting places and communities in everyday life’,⁴² speaking directly to a sensitivity in the principle of design of balance.

Movement

As H&H partner Siv Helene Stangeland stated ‘our houses are part of larger infrastructural systems and spatial sequences that we do not see, but which influence our daily life a lot’,⁴³ an argument which highlights the importance of movement as a design element in architecture. In the conceptualization of Vindmøllebakken a high degree of importance was

³⁶ Christopher Alexander et al., *A Pattern Language: Towns, Buildings, Construction* (New York, NY: Oxford Univ. Press, 1977), 337.

³⁷ Alexander et al., *A Pattern*, 337.

³⁸ Charles Montgomery, *Happy City: Transforming Our Lives through Urban Design*, reprint ed. (New York: Farrar, Straus and Giroux, 2014), 239, Apple Books.

³⁹ Greg Bamford, "Cohousing – An Introduction to a Residential Alternative," *Environment Design Guide*, 2008, 3, <http://www.jstor.org/stable/26148994>.

⁴⁰ Montgomery, *Happy City*, 227.

⁴¹ McCamant and Durrett, *Creating Cohousing*, 253.

⁴² Helen & Hard Architects, *Vindmøllebakken: Bærekraftige*, 4.

⁴³ Stangeland, "Our House," speech, TEDx Stavanger.

placed on the creation of a good transition from the private realm to the communal spaces,⁴⁴ as to guarantee these spatial sequences to draw people together in neighbourly contact.⁴⁵ An example of design in Vindmøllebakken which promotes such social fabric is the varying degrees of transparency in the connecting sequences of different spaces, such as corridors and stairwells, as pictured in figure 6.

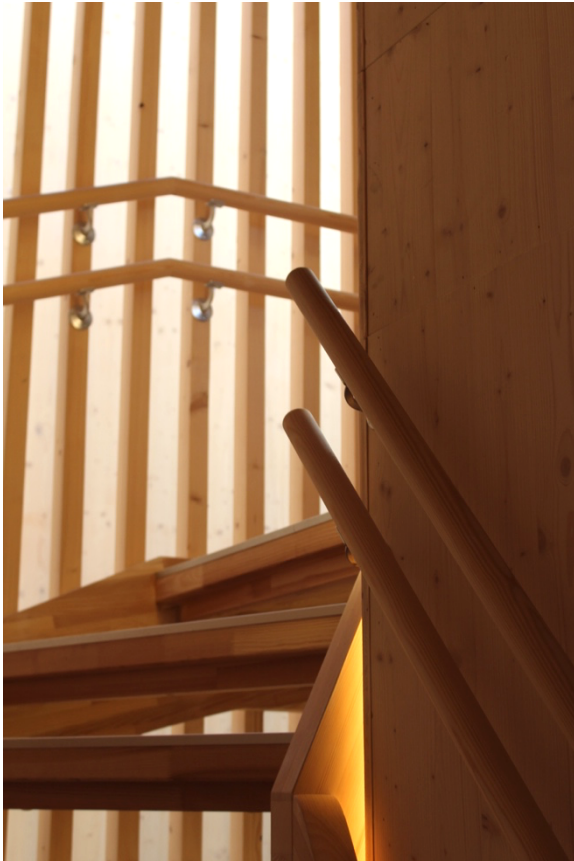


Fig. 6. Detail of staircase. (Photograph by author, *Vindmøllebakken*).



Fig. 7. Corridor. (Photograph by Helen & Hard, *Vindmøllebakken*, Arkitektfirma Helen & Hard AS).

Such transition zones, which allow for an intermediary zone whereby the residents can ‘understand what is going on in the house’,⁴⁶ are opened up by elements such as windows (see fig. 7) which allow residents to ‘have views and connect with people’,⁴⁷ resulting in an

⁴⁴ Augenstein, "Vindmøllebakken bofellesskap," speech, ArkitekturNO.

⁴⁵ McCamant and Durrett, *Creating Cohousing*, 199.

⁴⁶ Augenstein, "Vindmøllebakken bofellesskap," speech, ArkitekturNO.

⁴⁷ Stangeland, "Our House," speech, TEDx Stavanger.

openness between spaces in the house. Such variations in transparency and privacy intensify relations between the buildings' architectural forms, with the space creating a certain visual depth in the building and further allowing residents to retreat into privacy if wished for.⁴⁸ This architectural choice presents a visual interest in its dialectic between exterior and interior, and communal and private; a transparency which gives the impression of spacious and open forms.



Fig. 8. Floor plan of Vindmøllebakken; common space in blue. (Illustration by Helen & Hard, *Vindmøllebakken*, Arkitektfirma Helen & Hard AS).

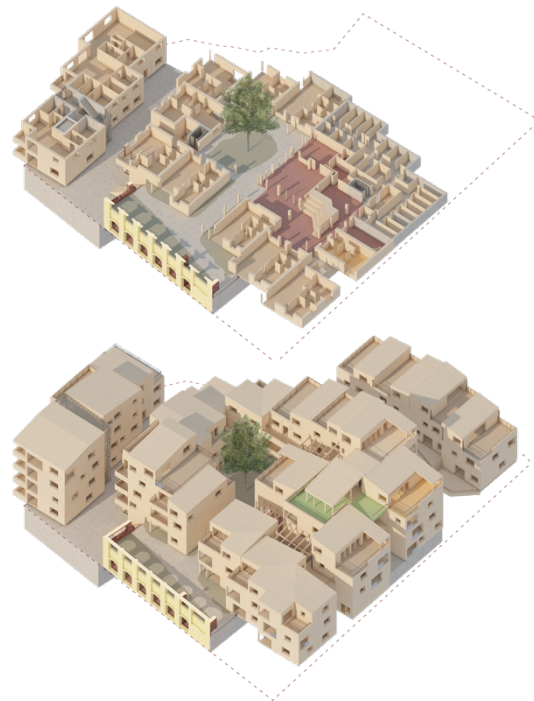


Fig. 9. Floor plan of Vindmøllebakken; common space in red, yellow and green. (Illustration by Helen & Hard, *Vindmøllebakken*, Arkitektfirma Helen & Hard AS).

When asked whether the architectural space allows for a sense of community, a resident revealed that the ‘fact that the shared spaces are very accessible and indoors, makes it easy to meet with neighbours’,⁴⁹ a notion that became personally evident when walking through the sequences of space which define the building, myself meeting several residents simply passing through these shared areas. The floor plans of the Vindmøllebakken (see fig. 8 and fig. 9) illustrate the accessibility of the communal spaces, which are mainly concentrated in the centre

⁴⁸ Randi Augenstein, in discussion with the author, August 24, 2020.

⁴⁹ Resident 1, in discussion with the author, June 2020.

of the complex; requiring residents to pass through them and encouraging residents to interact, subsequently enhancing the social life of the building. A resident comments on this exact design feature in stating ‘the fact that common areas are where we travel makes it more natural to use them’.⁵⁰ The resident continued by stating ‘the basement is used less because no one walks past it every day’,⁵¹ evidencing the significance of an effective spatial arrangement to ensure usage that promotes community. The arrangement of the apartments and their relationship with the communal space in Vindmøllebakken succeeds in preventing such difficulties, and the generous circulation of the architecture helps promote healthy social fabric.⁵²

The “Amfirom”



Fig. 10. The “amfirom”. (Photograph by Helen & Hard, *Vindmøllebakken*, Arkitektfirma Helen & Hard AS).

A communal space which embodies the importance of intermediary zones and spatial sequences in cohousing is the “amfirom”, deemed a ‘buffer zone’⁵³ by architect Augenstein. It serves the function of a space for unplanned interactions, in addition to hosting larger

⁵⁰ Resident 2, in discussion with the author, July 2020.

⁵¹ Resident 2, in discussion with the author, July 2020.

⁵² Alexander et al., *A Pattern*, 628.

⁵³ Augenstein, "Vindmøllebakken bofellesskap," speech, ArkitekturNO.

community meetings.⁵⁴ This dual feature is symptomatic of architects Durrett's and McCamant's spatial theory that 'adequate places for social engagement — both formal and informal — are key design characteristics of a successful site plan'.⁵⁵ The room is so placed that residents naturally pass through it, allowing residents to linger for a few moments without reducing or disrupting the overall movement of the building. Located at the centre of gravity of the project, paths which go in and out of the building lie tangent to the "amfirom", again facilitating social interaction.



Fig. 11. The "amfirom". (Photograph by Helen & Hard, *Vindmøllebakken*, Arkitektfirma Helen & Hard AS).

There seems to be homogeneity in architectural theory that 'when there are areas in public spaces which are both slightly raised and very accessible, people tend to gravitate towards them',⁵⁶ making the steps in the "amfirom" (see fig. 11), an effective feature in drawing residents together. The steps themselves act as a space, a volume, an instrumental part of the room, and as the research of design theorist Alexander suggests, 'wherever there is action in a place,

the spots which are most inviting, are high enough to give people a vantage point, and low enough to put them into action',⁵⁷ perfectly defining the properties of the steps. As architect and resident of the complex Stangeland outlines 'meeting [a resident] on the stairwell we take our time to talk about the weather or about the upcoming shared dinner, and that is how we

⁵⁴ Augenstein, "Vindmøllebakken bofellesskap," speech, ArkitekturNO.

⁵⁵ McCamant and Durrett, *Creating Cohousing*, 33.

⁵⁶ Alexander et al., *A Pattern*, 604.

⁵⁷ Alexander et al., *A Pattern*, 604.

practice our intentions and values’,⁵⁸ delineating the quality of this room to inspire casual greetings. The informality and ‘casualness’⁵⁹ of meeting other residents in this space allows the residents to feel as if social interaction is not imposed upon them, with a resident claiming ‘[they] found it easier to socialize in a less planned way; there is often someone available to chat with without having to plan it’⁶⁰ and hence, through an organic and unforced approach to community and spatial design, individuals are encouraged to interact when passing by each other.



Fig. 12. Detail of the “amfirom”. (Photograph by the author, *Vindmøllebakken*).

Another architectural choice made by the designers which characterizes this room, as well as the entire interior or the building, is the exposed timber (see fig. 12) contributing to architect Stangeland’s objective of a ‘warm atmosphere’.⁶¹ The complex is built entirely out of timber,⁶² a characteristic particularly unique to Vindmøllebakken and the surrounding buildings, namely inside the Stavanger area named ‘trehusbyen’, or otherwise ‘wooden house city’.⁶³ The use of such simple material is a testament to the minimalistic Scandinavian

⁵⁸ Stangeland, "Our House," speech, TEDx Stavanger.

⁵⁹ Augenstein, "Vindmøllebakken bofellesskap," speech, ArkitekturNO.

⁶⁰ Resident 1, in discussion with the author, June 2020.

⁶¹ Stangeland, "Our House," speech, TEDx Stavanger.

⁶² Helen & Hard, "Vindmøllebakken - Gaining," Helen & Hard.

⁶³ Randi Augenstein, in discussion with the author, August 24, 2020.

approach to design; combining essentialist architectural geometry with traditional building material. Visually, the material is seen to generate a continuity and coherence, as the raw quality of the timber is maintained throughout the interior of both communal and private spaces. A resident revealed that the exposed timber made for a better indoor climate and overall ‘better feeling’.⁶⁴ This design choice can thus be seen to have a direct impact on resident well-being, explicit to the question of social sustainability.

Further contributing to the warm and approachable ambience of the space is the natural light which comes in from the glass roof and façade, seen in figure 13. Light is often deemed an element of architecture due to its significance in defining form and its ability to animate interiors of structures. Yet, contemporary practice has resorted to artificial lighting, a feature condemned by professor Mary Anne Steane, noting that the ‘too brief compilation of the



Fig. 13. The “amfirom”. (Photograph by Helen & Hard, *Vindmøllebakken*, Arkitektfirma Helen & Hard AS).

impact of electric lighting on architectural design underlines that its defects largely concern sustainability and mental health’;⁶⁵ two issues instead taken into consideration by H&H in the design of *Vindmøllebakken*. The common area, due to its glass roof, exploits the natural benefits of daylight and in doing so fosters a visual and sensory richness. Natural light allows

⁶⁴ Resident 4, in discussion with the author, August 2020.

⁶⁵ Mary Ann Steane, *The Architecture of Light: Recent Approaches to Designing with Natural Light* (Abingdon: Routledge, 2011), 2.

space to feel ‘bright and cheery’,⁶⁶ improving the ambience and attracting usage of the room. It is also worth adding that the glass façade and ceiling help to frame a particular visual interest in the context of this simple timber interior, with the fractured light and rhythmic divisions displaying an interesting play of shape and line. Walking through this space, it is the intricate juxtaposition of light and raw wood that attracts the observer; materials playing off one another and amplifying their individuality. As stated by famed architect Louis Kahn ‘artificial light is a single tiny static moment in light and can never equal the nuances of mood created by the time of day’;⁶⁷ nuances of mood Vindmøllebakken instead successfully captures through the tension between the textures of natural light and raw material. These features create ‘high-architectural quality’⁶⁸ spaces which promote resident usage.

The “Allrom”



Fig. 14. The “allrom”. (Photograph by Helen & Hard, *Vindmøllebakken*, Arkitektfirma Helen & Hard AS).

⁶⁶ Alexander et al., *A Pattern*, 645.

⁶⁷ Jean France, *Louis Kahn’s First Unitarian Church*, http://www.rochesterunitarian.org/Building_desc.html, quoted in Steane, *The Architecture*, 7.

⁶⁸ Randi Augenstein, in discussion with the author, August 24, 2020.

As delineated in *A Pattern Language* a socially cohesive communal space must be placed at the centre of gravity of the space, it must lie in such a way that entrances and paths lie tangentially to it, and it must allow for communal activities such as eating or having seats as to allow for discussion.⁶⁹ In all such criteria the “allrom” (see fig. 14), translated in English as the “family room” or “common room”, succeeds. The “allrom” is located at the physical centre of the building, and as opposed to the “amfirom” promotes longer and more formal encounters with the residents.⁷⁰ It has been repeatedly referred to as the ‘heart of the building’,⁷¹ and standing within the space it is made obvious that communal activity concentrates itself in the room, and thus it is necessary to consider the design elements of the “allrom” which augment and facilitate the overriding sense of community.

Fig. 15. The exterior of the “allrom”. (Photograph by Helen & Hard, *Vindmøllebakken*, Arkitektfirma Helen & Hard AS).



Architects Durrett and McCamant propound that residents and architects alike must consider the question “Do I feel like being there? Is this a cold and clammy space or is it a warm and giving place?”,⁷² an answer to which, in reference to the “allrom” is arguably the latter. Such a proposition owes to its structure being defined by a double height ceiling and glass façade with views of the communal courtyard (see fig. 15). This allows for a spatial transparency which enhances the sense of invite and welcome. Transparent façades, a quality believed important by architect Ralph Erskine, have a significant influence on activity patterns and the aesthetic sensibility of city space,⁷³ as visually rich buildings at eye level are

⁶⁹ Alexander et al., *A Pattern*, 620.

⁷⁰ Augenstein, “Vindmøllebakken bofellesskap,” speech, ArkitekturNO.

⁷¹ Helen & Hard, “Vindmøllebakken - Gaining by Sharing,” Helen & Hard, accessed July 27, 2020, <https://helenhard.no/work/vindmollebakken/>.

⁷² McCamant and Durrett, *Creating Cohousing*, 261.

⁷³ Gehl, *Cities for People*, 81.

often subject of greater interest and tend to gravitate people's attraction, subsequently enhancing the buildings' overall vitality.⁷⁴ The residents are thus subject to an interplay between the interior and the natural exterior, and the room's architectural simplicity allows to accentuate the materials that define it. Standing within the room, one appreciates the open structural composition of the room, with the double height ceiling and extensive glass façade, likewise to the "amfirom", articulating the sensitive treatment of light and material. This simplicity in line and shape proves successful in creating an attractive space, and further does not distract from the primary function of the room – communal gathering. The organization of the "allrom" is thus specifically programmed as an inviting space, facilitating and promoting community.

Another feature of the "allrom" which works to promote social sustainability is the adjacent kitchen, as pictured in figure 16. Agreed upon by literature on cohousing, communal eating finds itself as an 'important aspect of the community life for both practical and social reasons'.⁷⁵ In an anthropological framework, it



Fig. 16. Communal kitchen. (Photograph by the author, *Vindmøllebakken*).

is clear that communal eating has played a vital role in almost all human societies 'as a way of binding people together and increasing the extent to which [residents] feel like "members" of a group'.⁷⁶ Thus the particular architectural choice in placing a communal kitchen as a feature of the "allrom" directly speaks to the success of this spatial sequence.

⁷⁴ Jan Gehl, conversation with Ralph Erskine quoted in Gehl, *Cities for People*, 82.

⁷⁵ Bamford, "Cohousing – An Introduction," 3.

⁷⁶ Alexander et al., *A Pattern*, 698.

Integration of nature within architecture

Social sustainability within the built environment not only refers to the promotion of community, but the creation of the physical places that support people's wellbeing.⁷⁷ In reference to human health, it is thus instrumental to consider the recent increase in study in the biophilic benefits of nature in architectural design. As urbanist Montgomery asserts, green space in cities should no longer be considered an optional luxury, and instead promoted to be a crucial part of a healthy urban environment.⁷⁸ Designated areas in Vindmøllebakken have been dedicated to gardening, such as a terrace pictured in figure 17 where each resident has been given responsibility of a garden bed (see fig. 18).⁷⁹ The infusion of architectural spaces with natural diversity, and, most of all, opportunities for residents to interact and work with nature, results in urban fabric becoming increasingly able to respond to biophilic challenges.⁸⁰



Fig. 17. Garden terrace. (Photograph by the author, Vindmøllebakken).



Fig. 18. Garden terrace. (Photograph by the author, Vindmøllebakken).

Horticulture, when accessible to all residents, allows for the provision of ‘healthy food and it can be a place of learning and a place for experimenting’,⁸¹ and is additionally an instrumental social act. With Vindmøllebakken forming part of “den spiselige bydel”, namely the “eating district” of eastern Stavanger, gardening has been considered by the developers of

⁷⁷ Palich and Edmonds, "Social Sustainability," 2.

⁷⁸ Montgomery, *Happy City*, 214.

⁷⁹ Resident 4, in discussion with the author, August 2020.

⁸⁰ Montgomery, *Happy City*, 219.

⁸¹ McCamant and Durrett, *Creating Cohousing*, 259.

Vindmøllebakken ‘an area with the possibility of a large degree of participation’ by users,⁸² owing to its promotion of collaboration within the resident community. Thus, it can be established that in the effective promotion of social sustainability in contemporary residential models, density of nature must be a prerequisite for architectural design, an aspect which Vindmøllebakken succeeds in.

Other factors promoting social sustainability

In discussion of all aforementioned architectural design, one must ask: Is it truly design that promotes community? To assess the true efficacy of architectural design in promoting social sustainability it is instrumental to consider other grounds to Vindmøllebakken’s success. As a resident notes ‘regardless of architecture, it is people in the community which are the most important factor’⁸³ raising a polemic pertinent in architectural theory, namely whether it truly is design that accommodates, expresses, and reinforces human behaviour.⁸⁴ The argument of the ‘experience of a home [being] structured by distinct activities - not by visual elements’⁸⁵ propounded by architect Pallasmaa is compelling in its suggestion that architecture rather than being defined by its design, is instead defined by human activity. Krier supports this argument in stating that community, the central force of cohousing, is governed as a result of coherent visions and aims;⁸⁶ a parallel that can be extended to the residents of Vindmøllebakken due to their collective and shared aim of living in a community-dependent model rather than the detached house symptomatic of contemporary urban fabric.

⁸² Helen & Hard Architects, *Vindmøllebakken: Bærekraftige*, 30.

⁸³ Resident 2, in discussion with the author, July 2020.

⁸⁴ Denise L. Lawrence and Setha M. Low, "The Built Environment and Spatial Form," *Annual Review of Anthropology* 19 (1990): 456, <http://www.jstor.org/stable/2155973>.

⁸⁵ Pallasmaa, *The Eyes*, 68.

⁸⁶ Léon Krier, *The Architecture of Community* (Washington: Island Press, 2009), 101.

The resident continued by stating that it is ‘the initiators and the enthusiasts’⁸⁷ which guarantee a successful community. This argument is evidenced by the twenty-six self-organized interest groups initiated by the residents,⁸⁸ ‘making the community function and take care of the different shared spaces and communal tasks’.⁸⁹ Moreover, it was expressed by a resident that ‘it is a danger to the community if a person whose mere presence makes life difficult for many’,⁹⁰ a statement revelatory of the importance of congenial interpersonal relationships among residents in guaranteeing a successful community. From Vindmøllebakken’s beginnings as a collaborative enterprise, a consensus decision-making process has been utilized, creating a ‘substantive democracy that both encourages and demands the participation of members’.⁹¹ Arguably, the relevance of architectural influence can only be defined by human occupancy; placing the factor of residents as instrumental in promoting social sustainability.

Conclusion

As Palich and Edmonds assert ‘the framework, metrics and indicators [of social sustainability] are still in the early stages of development and have yet to cover the breadth and focus to fully address’ its question.⁹² However, through the substantiated discourse on the architecture of Vindmøllebakken, it can be concluded that design notably affects the social interaction of residents. Although having presented other grounds to Vindmøllebakken’s successful promotion of community, the argument of residents as solely responsible for community is trivial when conflated with discussion of the architect’s intention, the inclusive

⁸⁷ Resident 2, in discussion with the author, July 2020.

⁸⁸ Randi Augenstein, in discussion with the author, August 24, 2020.

⁸⁹ Stangeland, "Our House," speech, TEDx Stavanger.

⁹⁰ Resident 2, in discussion with the author, July 2020.

⁹¹ Bamford, "Cohousing – An Introduction," 14.

⁹² Palich and Edmonds, "Social Sustainability," 3.

design process and specific architectural features and elements that define the space of Vindmøllebakken. When examining the spatial sequences which characterize the movement of rooms in the complex, the dialectic and tensions between light and raw material, the integration of nature within the building and the degrees of transparency and openness, it can be determined that it is primarily the architectural design that facilitates community and promotes the long-term social sustainability of the building. As Durrett and McCamant claim, ‘community does not happen accidentally’⁹³ and is instead a highly deliberate process,⁹⁴ an issue addressed by the design of Vindmøllebakken.

Montgomery notes the duality in human requirements of the ‘need to connect, but also the need to retreat, [...] the conveniences of proximity, but [these] conveniences can come with the price of overstimulation and crowding’.⁹⁵ Vindmøllebakken resolves the tensions between these contradictory forces, providing spaces with a targeted concern for the human dimension. As Robert Sommer states ‘with or without [...] explicit recognition of the fact, designers are shaping people as well as buildings’,⁹⁶ hence, it can be concluded that the architecture of Vindmøllebakken, through its challenging of conventional practices, has been designed in such a way to promote the social sustainability of its residents.

⁹³ McCamant and Durrett, *Creating Cohousing*, 238.

⁹⁴ McCamant and Durrett, *Creating Cohousing*, 238.

⁹⁵ Montgomery, *Happy City*, 190.

⁹⁶ Sommer, *Personal Space*, vii.

List of Figures

Fig. 1

Vindmøllebakken. Photograph. Helen & Hard. Accessed September 8, 2020.
<https://helenhard.no/work/vindmollebakken/>.

Fig. 2

Mountain Lodge on Sognefjord: Norwegian Tun. Illustration. Dezeen. June 9, 2012. Accessed September 10, 2020. http://static.dezeen.com/uploads/2012/06/dezeen_Mountain-Lodge-on-Sognefjorden-by-Haptic_6_1000.gif.

Fig. 3

Floor plan, Vindmøllebakken. Illustration. Helen & Hard. Accessed September 10, 2020.
<https://helenhard.no/work/vindmollebakken/>.

Fig. 4

Workshop Led By Helen & Hard. Photograph. Gaining By Sharing. Accessed September 10, 2020.
<http://biblioteket.husbanken.no/arkiv/dok/Komp/Vindmollebakken%20barekraftig%20bofellesskap.pdf>.

Fig. 5

Dahl, Ane Skarpnes. Apartment Adjustments (00:15:12). Illustration. Accessed September 10, 2020. <https://www.youtube.com/watch?v=jDoFbspPR2c&t=911s>.

Fig. 6

Detail of Staircase, Vindmøllebakken. Photograph by author. September 2, 2020.

Fig. 7

Corridor, Vindmøllebakken. Photograph. Helen & Hard. Accessed September 10, 2020.
<https://helenhard.no/work/vindmollebakken/>.

Fig. 8

Floor plan, Vindmøllebakken. Illustration. Helen & Hard. Accessed September 10, 2020.
<https://helenhard.no/work/vindmollebakken/>.

Fig. 9

Diagram of Floor plan. Illustration. Accessed September 10, 2020.
<https://helenhard.no/work/vindmollebakken/>.

Fig. 10

“Amfirom”, Vindmøllebakken. Photograph. Helen & Hard. Accessed September 10, 2020.
<https://helenhard.no/work/vindmollebakken/>.

Fig. 11

“Amfirom”, Vindmøllebakken. Photograph. Helen & Hard. Accessed September 10, 2020.
<https://helenhard.no/work/vindmollebakken/>.

Fig. 12

Detail of the “amfirom”, Vindmøllebakken. Photograph by author. September 2, 2020.

Fig. 13

“Amfirom”, Vindmøllebakken. Photograph. Helen & Hard. Accessed September 10, 2020.
<https://helenhard.no/work/vindmollebakken/>.

Fig. 14

“Allrom”, Vindmøllebakken. Photograph. Helen & Hard. Accessed September 10, 2020.
<https://helenhard.no/work/vindmollebakken/>.

Fig. 15

“Allrom”, Vindmøllebakken. Photograph. Helen & Hard. Accessed September 10, 2020.
<https://helenhard.no/work/vindmollebakken/>.

Fig. 16

Communal kitchen, Vindmøllebakken. Photograph by author. September 2, 2020.

Fig. 17

Garden terrace, Vindmøllebakken. Photograph by author. September 2, 2020.

Fig. 18

Detail of garden terrace, Vindmøllebakken. Photograph by author. September 2, 2020.

..

Bibliography

- Alexander, Christopher, Sara Ishikawa, Murray Silverstein, Max Jacobson, Shlomo Angel, and Ingrid King. *A Pattern Language: Towns, Buildings, Construction*. New York, NY: Oxford Univ. Press, 1977.
- Augenstein, Randi. "Vindmøllebakken bofellesskap i Stavanger - Om prosess, samarbeid og utfordringer." Speech presented at BYLIVKonferansen, Oslo, September 18, 2019. Video. ArkitekturNO. Posted September 18, 2019. Accessed July 8, 2020. <https://www.youtube.com/watch?v=jDoFbspPR2c>.
- Bamford, Greg. "Cohousing – An Introduction to a Residential Alternative." *Environment Design Guide*, 2008, 1-10. <http://www.jstor.org/stable/26148994>.
- De Botton, Alain. *The Architecture of Happiness*. New York: Vintage Books, 2008.
- De Carlo, Giancarlo. "An Architecture of Participation." *Perspecta* 17 (1980): 74-79. <https://doi.org/10.2307/1567006>.
- Dwellings (occupied and Vacant), by Building Type*. Table. Oslo: Statistisk Sentralbyrå, 2020. Accessed July 15, 2020. <https://www.ssb.no/en/bygg-bolig-og-eiendom/statistikker/boligstat>.
- Gehl, Jan. *Cities for People*. Washington, DC: Island Press, 2010.
- Grant, Jill. "Exploring the Influence of New Urbanism in Community Planning Practice." *Journal of Architectural and Planning Research* 20, no. 3 (2003): 234-53. <http://www.jstor.org/stable/43030662>.
- Helen & Hard. "Vindmøllebakken - Gaining by Sharing." Helen & Hard. Accessed July 27, 2020. <https://helenhard.no/work/vindmollebakken/>.
- Helen & Hard Architects. *Vindmøllebakken: Bærekraftige bofellesskap Kompetansetilskudd Sluttraport*. Stavanger, Norway: Gaining By Sharing, 2016.
- Krier, Léon. *The Architecture of Community*. Washington: Island Press, 2009.
- Lawrence, Denise L., and Setha M. Low. "The Built Environment and Spatial Form." *Annual Review of Anthropology* 19 (1990): 453-505. <http://www.jstor.org/stable/2155973>.
- McCamant, Kathryn, and Charles Durrett. *Creating Cohousing: Building Sustainable Communities*. 3rd ed. New York: New Society Publishers, 2011.
- Montgomery, Charles. *Happy City: Transforming Our Lives through Urban Design*. Reprint ed. New York: Farrar, Straus and Giroux, 2014. Apple Books.
- Palich, Natasha, and Angelique Edmonds. "Social Sustainability." *Environment Design Guide*, 2013, 1-13. <http://www.jstor.org/stable/26151925>.

Pallasmaa, Juhani. *The Eyes of the Skin: Architecture and the Senses*. Chichester: John Wiley & Sons, 2012.

Sommer, Robert. *Personal Space: The Behavioral Basis of Design*. Upper Saddle River: Prentice Hall, 1969.

Stangeland, Siv Helene. "Our House - Inspiring Architecture for Our Future." Speech presented at TEDx Stavanger, Stavanger, September 9, 2019. Video. YouTube. Posted by TEDx Talks, September 9, 2019. Accessed September 6, 2020. <https://www.youtube.com/watch?v=mjH1AIEqa9c&t=387s>.

Steane, Mary Ann. *The Architecture of Light: Recent Approaches to Designing with Natural Light*. Abingdon: Routledge, 2011.

White, Stacey Swearingen, and Cliff Ellis. "Sustainability, the Environment, and New Urbanism: An Assessment and Agenda for Research." *Journal of Architectural and Planning Research* 24, no. 2 (2007): 125-42. <http://www.jstor.org/stable/43030796>.

Appendix A

Transcript of interview between author and Randi Augenstein, CEO of Helen & Hard (August 24, 2020)

I wanted to start off by asking about the inclusive design process. Why was this user participation so fundamental to the project and how did it in the end improve the project?

First of all, I think it is important to say that it is very unusual to have this process in a normal commercial housing project and it has been crucial as alongside building the physical building we started building a community. And it is a pilot project so we kind of tested a way of having user participation before selling the housing units and we also had participation after selling it and in these workshops we both worked with how users ... they got information on how the project would become but also got information on what it would mean to share facilities and live in a collective housing and also got the opportunity to get to know possible neighbours. So, in many ways it has been crucial as we raised attention on wanting to share and live together in a different way than normal housing projects. And also we worked with organisation models like how they should run the project after taking over and how they create democracy, how do they take decisions, how do they organise their everyday life; so we have a lot of topics in the workshops and also it has given them actually quite practical tools like now when they are having meetings they use the information given to them in the workshops, so of course it is very important and the product has been adapted to special needs and wishes for both private units and common areas.

Are there any examples these adaptations?

Yeah, many. I mean we have done a drawing of all the individual things; so on an individual level it has been everything from people wanting to adjust some windows to get the view from the reading chair, to fitting in a big dog, one couple is playing for the symphony orchestra so we made sure that the sound-proofing was important, so in many ways. But also, it also influenced the common areas, we actually made the workshop bigger, so we changed the plan solution because of an interest for the workshop was very big and made that function bigger. Also, in terms of the use of the spaces, there was a lot of participation, for example finding out what the rooftop should be more like a calm library or yoga area instead of a party room, so on many levels. And also, there was a big interest in the group for gardening, so this also became a part of the rooftop gardening room and all made spaces inside and outside for growing.

Do you see user participation as a prerequisite for cohousing planning, at these early stages, to have a successful community?

Yes, I would say so- we think it is crucial because it is like you are setting the frame or a foundation for the community to grow, but we have just made the framework, so it is up to the residents to see how it is going to work and how such they are together. But by putting the structure we are making it possible - it gives a bigger chance that a community can grow.

But there are other things to consider, for example we found out that it is important to have a diverse group of people- not only elderly, not only young adults.

So now I will move on to specific architectural elements. In the ‘allrom’, there is a double height ceiling and a glass façade, could you explain a bit about the process behind having this very open space?

What we worked a lot with is how you can move from a private space to common space; and a question of translucency/transparency, but in a way that you can always retreat to your private unit, and that’s a question we found very important, so you can choose yourself. But also we worked with making all the common areas very high-quality and inviting so people would be encouraged to use the common areas, as in normal housing you might see making the basement made into some sort of party room or common function but it is often in a less attractive area so we actually gave the best areas to the rooftop spaces and also we made sure that all the common areas were of high quality and inviting. And also, the allrom is the heart of the project and it is placed in the middle, hence it is very open as this is where everyone should be able to look into it for example to see if neighbours are hanging out there and hence it is very inviting and easy to join the social activity there; but then again there are areas that are not that programmed and that was also very interesting to make some areas that the inhabitants could program on their own.

There is a clear difference between the ‘allrom’ and the ‘amfirom’, where the “allrom” is more formal whereas the “amfirom” allows for more spontaneous meetings. How important was it to have this difference of formal vs. informal spaces?

Well in normal housing projects you often find that people don’t know their neighbours - there are no places to stop and talk, and often is made with cheap materials and cheap quality and isn’t very inviting, so what we wanted to do was make spaces where there is enough space for groups to meet and in the allrom the rule is that you can’t have private party or meetings there- if you are going to have a party or a dinner everyone is invited. But in between the very social spaces we wanted to make space for more coincidental meetings - so in the amfirom you can just chat with your neighbours and it is isn’t something you have to plan.

You mentioned spatial sequences from the private to the common, how was this achieved?

It is also interesting as in the beginning we only thought it would be 16 units; because everyone was very unsure about the market and the interest in Stavanger; but then it grew so we have a diverse relation between the private units and the common areas so in some units there are direct entrances from the allrom, but again they can withdraw because they have all the functions they need; but others can walk through an outdoor courtyard home. If you are having a bad day for example, you can retreat to private space, so we worked on it in several ways. But in every situation we tried to work with making the area in front of the apartment a space where you could meet or hang out.

A concept which I also found interesting was bringing the concept of the “tun” or the village into the modern context; how important was this notion of new urbanism and retranslating the Norwegian village into the modern building; how was this used in the design of Vindmøllebakken?

A good question- I think it is more in terms of the scale, it is almost as if we have made a small village and community within the bigger city, but also focuses if you look at architecture, it is module based houses and they are referring to the footprint of the old timber houses around.

It was mainly to be able to nurture community in the city, as this is not often present nowadays.

One last question, do you see ‘Gaining by Sharing’ being more popular in Norway, seeing as there was such an interest in Vindmøllebakken?

I think yes- but I think of course developers of houses are very sceptical on choosing solutions, but I think by building this pilot, we have been met with enormous interest both from the commune and the developers but also from the users. So, I think we are getting there but it is a difficult market to change, because it is so falloff risks, economically, for the developers so that is why they fear innovation. But I think we will see a lot of similar projects coming, but maybe in different scales. I mean in Vindmøllebakken they share quite a lot so maybe we will find different alternatives. But I think it will take time to produce more interest.

There seems not be such a good connection between the market(demand) and the developer, as end users have shown a lot of interest.

Appendix B

Interview questions for residents

1. Do you feel that you have become more social after moving into Vindmøllebakken? If so, how?
2. Which parts of the building have allowed you to become more social and interact more with the community?
3. How do the residents work together to maintain a sense of community? (activities etc.)
4. Do you feel that the architectural space allows you to have a sense of community? If so, how?
5. Do you feel that there is a balance between privacy and community? How is this achieved? Has it been successful?
6. Any other comments: