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Photo on the front cover: Camilla Ryhl

ACCESSIBILITY AND SOCIAL INCLUSION

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Abstract

In recent decades, the idea of accessibility has been discussed and applied to architecture and planning across various fields, scales and policies. Continuous efforts to eliminate body-based discrimination in built environments have improved everyday life, especially for persons with physical impairments. In the same breath, accessibility's legitimised requirements and their uses present a number of problems and highlight potential limits of the concept interpreted and operated in the field of architecture.

Central to Danish contexts, this paper intends to take this current framework of accessibility one-step further. Universal design's holistic approach could relativise roles of accessibility by considering what follows when equitable access and use are obtained. Notably universal design embraces the importance of social inclusion in line with the United Nations Convention on the Rights of Persons with Disabilities. The realisation of an inclusive society relies on the existence of accessible environments that in the first place allow everyone, with or without impairments, to be placed on an equal footing. By embracing the importance of social inclusion, this paper aims to contribute to strengthen the implementation of the concept of accessibility in order to advance spatial planning and design of architecture and built environments. The paper is based on the author's PhD thesis *Spatial dimensions of accessibility*.

Introduction

In recent decades, the issue of accessibility has secured an increasingly prominent position in public debates. Contemporary demographic transformations – such as population aging occurring in Denmark, as in other developed countries in the Western world, have prompted society to develop interests in the realisation of inclusive environments. While the rhetoric surrounding our future environments suggests our longing for diversity, equality and inclusiveness, the built environment remains central to a progression of our society (Danish Ministry of Children, Gender Equality, Integration and Social Affairs, 2013; Danish Ministry of Culture, 2014; Danish Ministry of Housing, Urban and Rural Affairs, 2014). Accessibility has been, and therefore remains, one of the essential factors as it contributes towards the elimination of obstacles and barriers in the built environment.

Accessibility has indeed reduced inequalities of access caused by disabling built environments; and yet it can, and often ends as provisions for segregated and/or special access: add-on design solutions that can be socially exclusive and discriminatory (Goldsmith and PRP Architects (Firm), 2000; Imrie, 2006; Ryhl, 2009). The realisation of inclusive architecture, which includes liberating persons from the problems posed by disabling environments, relies largely on codified rules and standards that intend to ensure the level of building's function. Through this process of codification, however, accessibility is reduced to the system of rules, which associates itself with limited types of impairments; and is experienced often as dry, generic or other regulatory pressures that many architects consider as restrictions rather than positive incentives (Goldsmith and PRP Architects (Firm), 2000; Imrie and Hall, 2001; Imrie, 2006). This current situation of accessibility might be leading towards the standardisation of access solutions, despite the fact that accessibility has much more to offer.

This is a matter of concern, and therefore this paper aims to contribute for improving the current situation in which accessibility is discussed and practiced. Based on the conceptual base shaping universal design (UD) discourse, this study (re)introduces the social dimension into the framework of accessibility; and further proposes a synthesis of these three elements – 1) practice of accessibility; 2) social interaction; and 3) spatial analyses, as a new framework. UD relativises the concept of accessibility; and together they could contribute for producing better built environments that are accessible and inclusive. With an intention for improving practical instrumentality of codified access rules and standards, this study questions: how does this triad of three elements enable a clearer understanding of the spatial implication of accessibility?

Background

Continuous efforts to eliminate body-based discrimination in built environments have improved the everyday lives of many; and yet those who have benefited the most are persons with mobility impairment, particularly those who use wheelchairs. When one considers the fact that accessibility originates – as a currently recognised legal norm – in the field of rehabilitation (Goldsmith and PRP Architects (Firm), 2000; Steinfeld and Tauke, 2002), it is not so hard to acknowledge accessibility's associations with the reduced or lost ability of persons. After World War II, the practice of rehabilitation had advanced its capacity to provide skills and technology for people with reduced abilities. Meanwhile, it became evident that barriers and obstacles in built environments need to be eliminated, in order to sustain an independent everyday life improved within rehabilitation centres or similar facilities. This recognition grew into the idea of "barrier-free". This "social" model sees disability within the interaction between person and the environment, with disability being socially constructed given the environmental barriers. Systemic barriers and poorly designed environments, which reflect ignorance and negative attitude, disable persons.

With this shift in focus towards the environment, it has long been considered that the success (and failure) of an accessible environment can be measured according to levels of "fit" between individuals' abilities and environmental features (Steinfeld and Danford, 1999). It was a central objective, and still is, to intervene in the environment in order to advance the independence of persons with reduced abilities. This social model forms a foundation for the current codified rules and standards which draw upon the first standards to present the criteria for designing facilities and programmes for the use of disabled individuals: the *American National Standard A117.1* codified in 1961 (American National Standard Institute, 2011).

This linear causal relationship between individual abilities and environmental features, however, exhibits a number of problematics, and its central drawback can be articulated by a general consensus among experts that an accessible environment is one in which individuals with impairments can "function independently"; and there is some level of function that can be defined as "minimally acceptable" (Steinfeld and Danford, 1999). Not only would this observation suppress the differences of human bodies, but importantly attempts to define an accessible environment through the measure of "fit" simplify the actual relationships between individuals and their environments. This generalisation of diverse human bodies and their relations to the built environment furthers the separation of the lives of persons from contexts, which can lead to segregated and/or special design solutions that can be discriminatory (Goldsmith and PRP Architects (Firm), 2000; Imrie, 2006; Ryhl, 2009).

This critical view on generalising human bodies and their relation to the built environment is reflective of the recent progression of official documents which seek to accommodate a broader definition of the population who could benefit from improving environmental accessibility (European Commission, 2003; United Nations, 2007). This challenge aligns with WHO's International Classification of Functioning, Disability and Health (ICF) approved in 2001. In this progressed "biopsychosocial" model, disability is viewed as "the outcome or result of a complex relationship between an individual's health condition and personal factors, and of the external factors that represent circumstances in which the individual lives." Differences in individuals' functioning and abilities can be viewed as equal to personal factors such as gender, race and age. These differences between individuals are fundamental conditions of the human being, which makes no inherent difference between a person "with" or "without" impairments. And importantly, this inter-connected relation of complex attributes articulates that abilities of individual and possibilities of participation are viewed contextually (WHO, 2001).

A number of approaches have emerged that promote designed environments that are more responsive to different personal conditions and circumstances. The most significant is universal design (UD) coined by Ronald Mace as "the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design (North Carolina State University, The Center for Universal Design, 1997)." Since Mace's introduction, UD has secured an increasingly prominent position. The adoption of the concept in the United Nations Convention on the Right of the Persons with Disability (UNCRPD) consolidated its status as an international governing term, and has found its way into accessibility codes, as well as the codification of UD itself in a regulatory framework has begun in an international context. UD is in the process of institutionalisations shaped by the rationale of administrative functions, and in part, by the language of construction industries.

Despite the advancement of the conceptual framework of disability, however, current codified rules and standards in both accessibility and UD still draw attentions to particular types of impairments. This is the inevitable dilemma caused by inseparable relationships between diverse differences in people's bodies and abilities, as well as the necessarily generalisation processes of these attributes in order to apply them to practices of all sorts (Imrie and Hall, 2001; Iwarsson and Ståhl, 2003). Accordingly, it raises a question of how far the legislation can respond to the manifold interactions between diverse bodily varieties and material environments (Imrie, 2012). In addition, such regulatory framework, due to its nature of being perceived as rules that should simply be followed, may have been a drive causing the standardisation of solutions with the potential of furthering stigma and social exclusion. On the other hand,

the minimum level of access specified in codified rules and standards has always provided the point of reference which contributes to reduce inequalities in the built environment.

Approach

UD, at the most fundamental level, aims to make the contexts of life – such as built environments, products, programmes and services – as enabling as possible (Steinfeld and Maisel, 2012). UD increases accessibility, functionality, health, usability, and safety through its design and operation. In the theoretical framework, UD can therefore be considered as a holistic expansion of accessibility (Steinfeld and Tauke, 2002; Ryhl, 2009; Ryhl, 2010). As an essential constituent of the holistic expansion of accessibility, which largely owes to the evolution in the interpretation of disability, UD views abilities of individual and possibilities of action as well as participation contextually. Accordingly, UD embraces the importance of social inclusion. This uplift of "the social" aspects aligns with and is espoused by the NCRPD, which aims for "full and effective participation and inclusion in society" (United Nations, 2007, Article 3: General principles) by aiming at the realisation of all human rights. The NCRPD underlines that it is through social participation that the most essential outcome of UD, an inclusive society, is realised.

Social participation is experienced through interpersonal interaction in the physical environment. Accordingly, to encourage successful participation in society, consideration of interpersonal relationships and their interaction distances (and closeness) is essential. In its simplest form, social interaction is based on actions taken by individuals, and their interactions through social actions and contacts (Giddens, 1986). Spaces for social interaction provide the support for persons who need to adjust their relationships to each other and to the public at large, and are experienced in the material environment (Steinfeld and Maisel, 2012).

Social relations and interactions are performed by human beings and take place between human beings; however against the background of material environments. And yet, these backgrounds are also produced and used by human beings, and play active parts in constructions of meaning. The material environment comes into existence in a social sense only by means of human practice, which embodies "social interaction" as one key activity (Simonsen, 1996). The realisation of an inclusive society is based on the experience of interpersonal interaction; and its success relies on the existence of material environments that – in first place – allow everyone to be on an equal footing.

By embracing the importance of social interaction as the key to realising effective participation and inclusion in society, UD provides an opportunity for the role and use of accessibility to be re-framed. In this paper,

"social interaction" is the focus penetrating two concepts of accessibility and UD. However, it should be highlighted that the UNCRPD describes the intention behind the application of accessibility, which is to "enable persons with disabilities to live independently and participate fully in all aspects of life" and it shall be "on an equal basis with others" (United Nations, 2007, Article 9: Accessibility). This definition does not only reflect the turn from the "social" to the "biopsychosocial" model of disability, but also underpins accessibility as a foundation for providing a better opportunity for enjoying and participating in society by ensuring access to and uses of a building and its facilities. It clarifies the role of accessibility and, by so doing, provides an opportunity to transcend the framework of accessibility one step further: architects and spatial designers should consider what follows after equitable access and use are obtained (Figure 1).
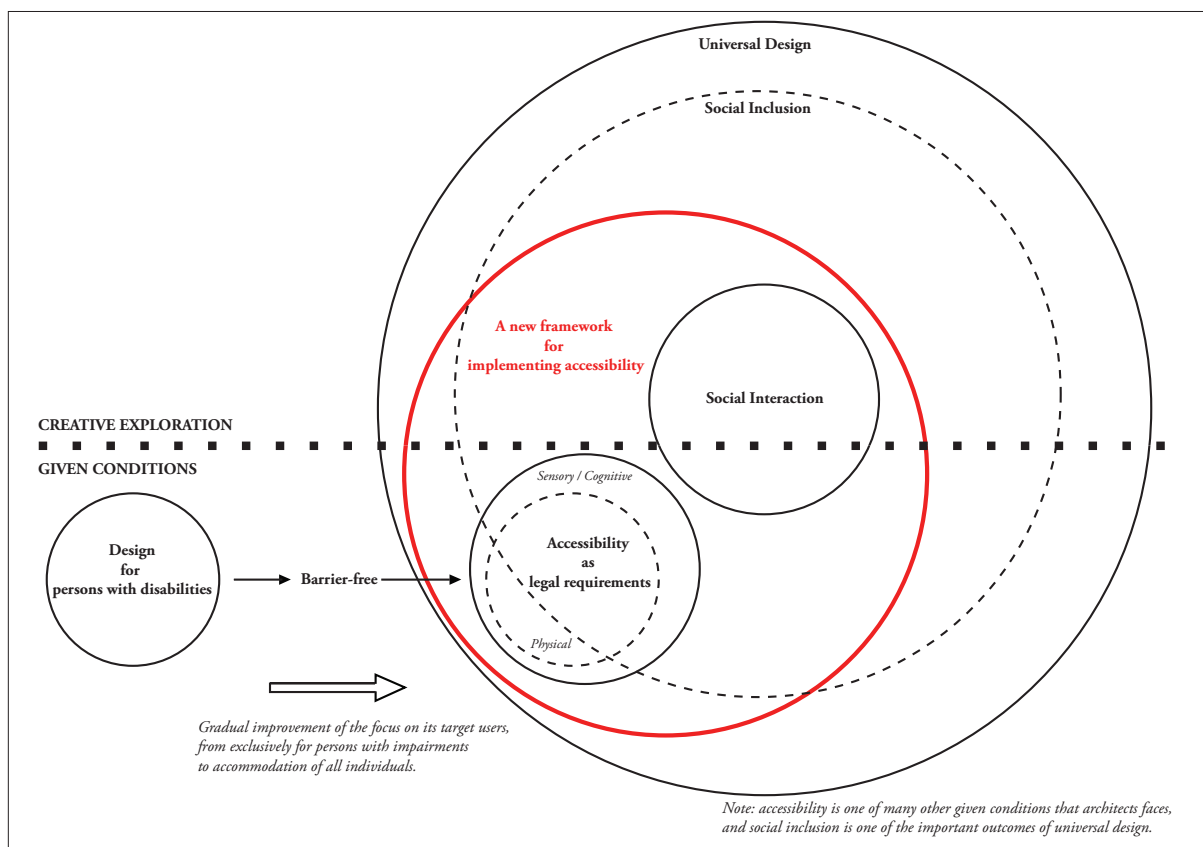
New framework for accessibility

The introduction of social elements into the framework of accessibility reiterates that knowledge of accessibility is a prerequisite for realising an inclusive society. Meanwhile, this surfacing of social meanings in relation to environmental barriers, qualifies accessibility as the foundation for discussing the relationship between built spaces and the social. Noting the fact that Modernism in architecture has been dreaming of improving the condition of social life through the fusion of the social with

Figure 1
Diagram: new framework for implementing accessibility

the physical (Forty, 2000), it presents an opportunity to redress accessibility into a vocabulary of modern architecture. This enlightens the path to conjoin accessibility and the creativity of architects in the production of the built environment.

There is a whole range of given conditions in the designing of architecture (client's requirements, site conditions, planning restrictions and so forth), and the legitimised accessibility requirements (noting that they still draw attention to the limited type of impairments) are one set of these conditions. These given conditions challenge architects: conditions need to be answered and problems need to be solved when realising built environments. However, one could and should always aim for more than just responding to the given conditions. Many consider that the creative process when designing architecture begins with setting up appropriate hypotheses rather than finding good solutions for various conditions given (Sakamoto, 2001; Atelier Bow-Wow, 2006; Hasegawa, 2011). In this schema, it is essential for architects to set constructive hypotheses or even to perceive and conceive design tasks as an integrated process of hypothetical questioning and answering. The introduction of social elements might well support architects to set constructive hypotheses by provoking architects' capacity of imagining form and space, which could in turn change legitimised accessibility requirements into positive incentives rather than restrictions.

The realisation of accessible environments is partially yet inevitably dependent on the developments of conventions, laws and guidelines. However, it also largely depends on effective utilisation of these conventions, laws and guidelines (Kajita, 2014). The creative minds of architects could play a great role as one of the key element in the successful realisation together with their sincere understandings of the necessity of fulfilling the requirements. The legitimised requirements and the creativity of architects (for interpreting requirements and forming values as well as giving forms) do not only depend on, but should also complement each other. This challenge must contribute for making designed environments sensitive to diverse complexities of human body in different contexts.

To sum up, central to the social dimension of accessibility, this study introduces three elements, and as such formulates a synthesis of the three elements as a new framework. These elements are: 1) practice of accessibility; 2) social interaction; and 3) spatial analysis (Figure 2). This new framework intends to explore the potential of accessibility by consciously challenging the means of addressing social qualities in architecture, and incorporating this into the production of physical spaces. Accordingly, this study questions: how does this triad of three elements enable a clearer understanding of the spatial implication of accessibility?

With the intention of strengthening the practical instrumentality of accessibility in practice, this new framework is, in this study, used in order to analyse existing buildings; and the processes and outcomes evaluate the relevance and appropriateness of the synthesis of the three elements. The spatial analysis looks into and aims to clarify the rhetoric on composition of architectural elements and components, which form physical spaces that are to be used and experienced. It is important that the spatial analysis contextualises the accessibility requirements into spatial discussions; but also that it supports social analyses that study social interactions between users in diverse social contexts.

This approach – an introduction of a new framework for implementing accessibility – acknowledges the validity and essential instrumentalities (as well as the problematic aspects) of accessibility requirements that currently regulate deliveries of planned and designed building, as well provide the bases for architects to work with. A number of attempts had been made to operationalise the design ideology of UD, such as *Universal Design: A manual of practical guidance for architects* by British architect Selwyn Goldsmith[1] and *Universal Design Voluntary Consensus Standards* by Global Universal Design Commission, Inc.[2]. Notably, both approaches did not replace but complement the existing accessibility requirements. Keeping the independence of the legitimised requirements, they both aims to expand the scope of requirements: they discuss the performance of buildings and built environments with the emphasis on a person's capabilities to function that are specific to context.

The new framework introduced in this paper, follows this schema; however, the difference is that the approach of this new framework emphasises bringing accessibility closer to the ideal of UD – not vice versa: it works from within the delimitation of the accessibility requirements. By employing the conceptual framework of UD with a focus on social inclusion, this new framework aims to turn legitimised accessibility requirements into positive incentives.

1 In 1963, Selwyn Goldsmith published the first edition of Designing for the disabled – a comprehensive architectural planning manual providing guidance on access for persons with disabilities in buildings and facilities – which was a striking phenomenon in the UK at the time (Goldsmith, 2001, pp. 42–44).

2 Global Universal Design Commission, Inc. is a non-profit corporation, and was established to develop and promote the understanding and use of UD in the design fields of buildings, products, environments and services. See the website: http://www.globaluniversaldesign.org/. The central body of GUDC is the Center for Inclusive Design and Environmental Access (the IDeA centre), located at the School of Architecture and Planning, State University of New York at Buffalo. See the website: www.ap.buffalo.edu/idea.
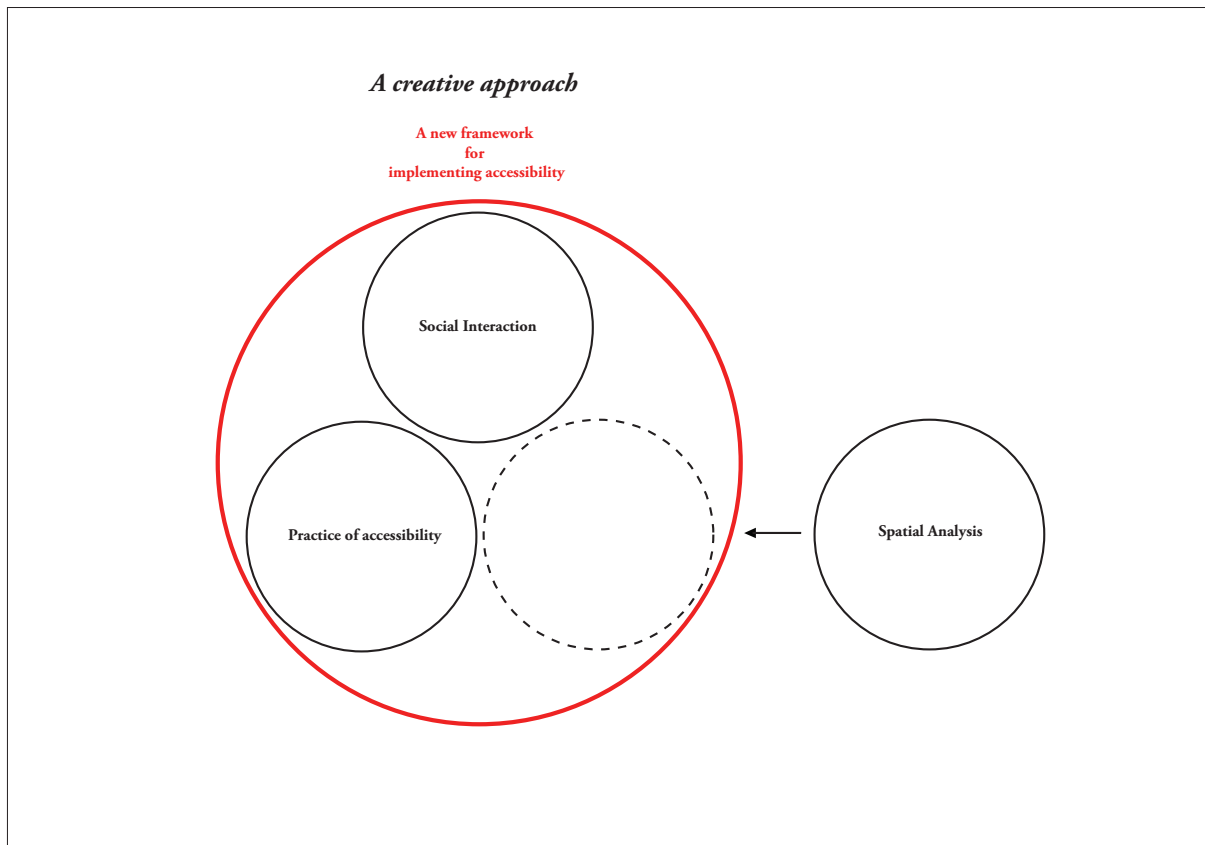
Method

To examine the implications and to discuss the relevance of the new framework, case studies were conducted in projects with blocks of flats and row houses in Denmark. On a strategic level, the cases were selected through the typological mapping of different access types that emerged by classifying them according to the way various dwelling units were organised in relation to circulation options. For circulation, the vertical and horizontal modes form the bases for distinguishing various access types (Sherwood, 1978; Sting, 2004; Leupen, 2006; Ebner, et al., 2010). However, this study extended to address the oblique (which includes multi-dimensional) mode, responding to the challenges of oblique (Johnston, 1996) and more recent developments of multi-dimensional circulation (Vyzoviti, 2003; Lynn, 2004).

Based on these three circulation options, the study distinguished six types of access; street, stairs, stairwell, gallery, corridor and ramp[3] (Figure 3); and further organised into four groups: 1) Street; 2) Ramp; 3) Stairs/Stairwell; and 4) Gallery/Corridor[4]. Following this order, the cases analysed in this paper are: Egebakken (2004) by Tegnestuen Vandkunsten; 8TALLET (2010) by Bjarke Ingels Group (BIG); Emaljehave (2007) by Entasis/Creo arkitekter; and Pærehaven (2004) by Juul and Frost Arkiteker[5].

Figure 2
Diagram: introduction of spartial analysis into the framework

3 Each access type represents the "dominant" characteristic of the circulation system, which indicates that some buildings combine different types of circulation systems

4 Access types of street and ramp could have been grouped into one category. However, the use of ramp access is rare and this thesis found this to be a fine opportunity to qualify both as separate entities. Access types of stairs and stairwell are grouped together, representing a vertical circulation system. Access types of gallery and corridor are also grouped, representing a horizontal circulation system.

5 All of the housing projects analysed were completed after 2000 allowing for sufficient duration of time for building occupation. As an imprecation, building permits were granted on the basis of the Danish Building Regulations 1995 (BR95).

These selected cases are located within the capital region that stretches over an area 40–45 km in all directions. This geographical spread provides sufficient differences in discussing urban morphology. The selected cases also cross private and subsidised organisations – which often reflect the differences in the socio-economic and socio-political situations – with the intention of avoiding samples that have homogenised formal expressions and/or homogenised types of inhabitants. Yet, these cases were mainly selected due to their architectural competencies, which exhibit significant qualities and intentions that assure access and use of the buildings and their facilities, as well as inspiring people to partake in the social experiences of everyday life.

This study focuses on the quality of shared access routes of these selected cases. The shared access route organises and defines the form(s) of a building; but also it articulates and integrates spaces that hold different layers of territorial claims: this includes territorial negotiations that might occur between the different characteristic or functional spheres, and/or in-between public and private domains. As the immediate surrounding of everyday lives, the shared access route is an essential architectural element that could amplify one's relations to each other, ambient environments and society as a whole. Accordingly, as a subject of analyses, the shared access route allows for an examination of the theoretical implications for a reinterpretation and facilitation of accessibility, through which one could aim to contribute to the production of urban dwellings that envisage socially inclusive urban situations. With this intention to contribute to the design of future inclusive environments, this study investigated how shared access routes – as both thoroughfare networks and defined physical spaces – can: 1) improve accessibility: movement and flow of people in circulation; 2) enrich individuals' experience and social relations in everyday life by forming relationships between individual dwelling units and their urban environments.
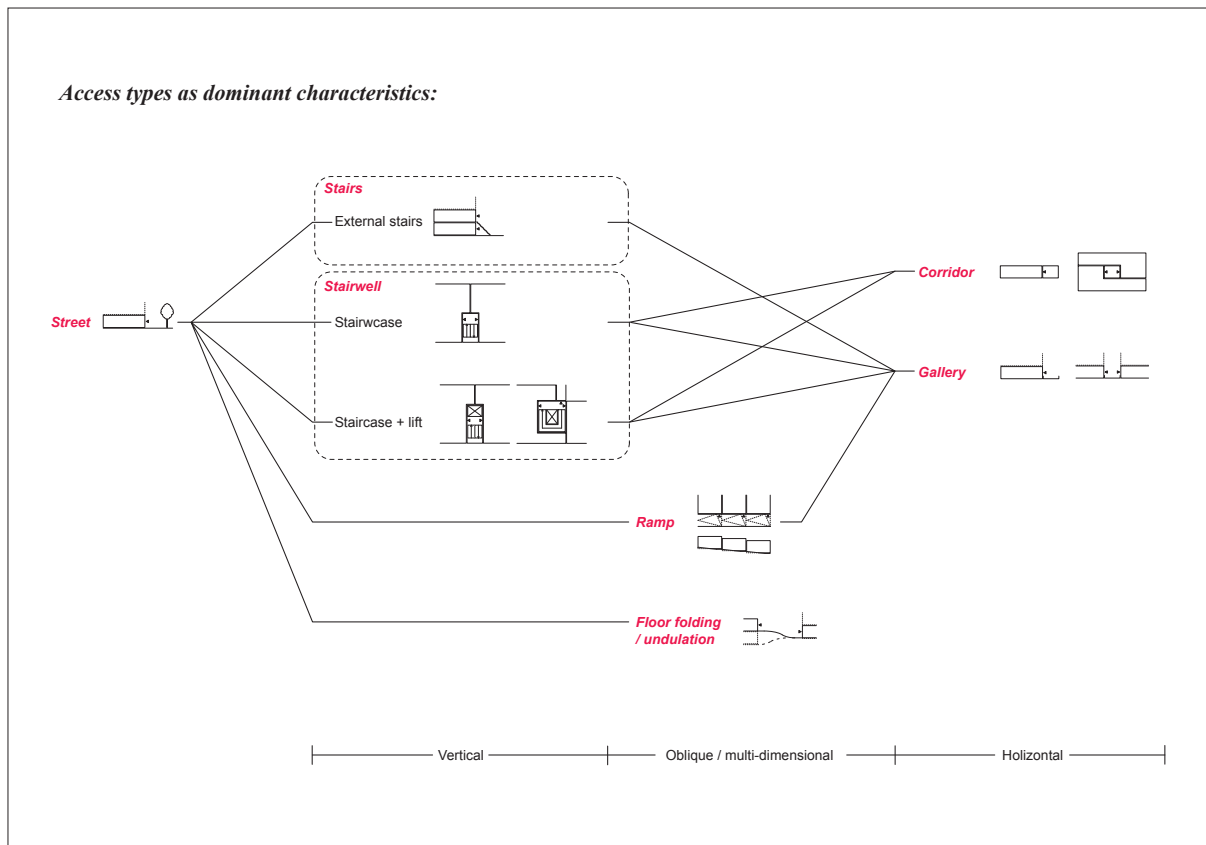
Mixed-method research approach

At the tactical level for collecting data, this paper employed a mixed-method research approach. For detailed "on site" study, operational analytical tools used are as follow (Figure 4). At first, this paper employed spatial analyses that clarify architectural rhetoric on the composition of architectural elements (i.e. walls, floors, façades and so forth) and components (i.e. doors, windows and so forth) that form the physical space to be used and experienced. The emphases were put on dimension and size, as well as the positioning of architectural elements and components vis-à-vis organisational and proportional aspects of space (i.e. layout plan).

Figure 3
Diagram: access type as dominant characteristics

	Practice of accessibility	Study of uses and processes
	• Analyses of practices of implementing accessibility requirements	• Investigations into social interactions through observations of inhabitation
Spatial analysis • Clarification of the rhetoric on composition of architectural elements and components that form physical space to be used and experienced • Emphases on dimension and size, as well as positioning of architectural elements and components vis-à-vis organisational aspects of spaces	**D) Accessibility checklist**	**E) Registration of furnishing and placement of belongings** **F) Qualitative interviews**
A) GA (general arrengement) drawing and section, or three-dimensional axonometric drawing: • coordinate following two drawings in relations to the entirety of housing complex		
B) Three-dimensional axonometric drawings • focus on shared access route		
C) floor plan • focus on dwelling unit		
		Plus: G) Supplementary information

These spatial analyses were performed by using drawings analytically. The analytical drawings are illustrations of physical spaces as built, which support diagrammatic yet scientific understandings of spatial constitutions. These employed illustrations can be distinguished into three different types according to the level of abstraction involved, and these are: A) a GA (general arrangement) drawing and section or three-dimensional arrangement drawing with site information that depict the entirety of housing complex in relation to the surrounding context; B) a three-dimensional axonometric drawing that places its focus on a shared access route; and C) a floor plan that predominantly focus on a dwelling unit.

Subsequently the study analysed the practice of accommodating accessibility requirements by utilising the check list that developed by reviewing provisions and guidance on accessibility in the Danish Building Regulations 2010 (BR10) with regards to recently built residential buildings. The study seeks to explore how legal requirements could be integrated into processes through which the overall quality of housing and urban environments can be improved. The above-described spatial analyses were utilised in order to contextualise accessibility requirements into the spatial discussions.

Figure 4
Diagram: operational analytical tools

The analyses of spatial constructions as recorded on the set of drawings described above formed the foundation on which spatial fields, patterns of circulation and the social dynamics of the residents were also discussed. The drawings supported diagrammatic understandings of spatial constructions, which were then used to contextualise the uses and experience of the residents into spatial discussions (Evans, 1978). Observations of uses by registering furnishing and placement of belongings, accompanied by photographic registrations and qualitative interviews, deepened the understanding of the residents' everyday life. The dwelling is seen as a dialectical process between the dwelling unit and those who dwell in it: hence, the analyses of spatial structure must be combined and coordinated with the narratives of experienced spaces (Lefebvre, 1991).

Semi-structured, open-ended qualitative interviews were initially conducted with a number of the residents between June and December 2011 (as part of the author's PhD thesis); which was then followed by another set of interviews in July 2014. The central role of these interviews was to support spatial understanding of the built environments by uncovering the experience of users. Interviews were conducted on the premises as well as immediate surroundings of the interviewees in order to articulate their responses in relation to actual spaces where people conduct their everyday life. The interviewer walked together with the residents and asked questions, which were intended to stimulate the interviewees to tell their stories and describe their everyday life (Kvale and Brinkman, 2008). During (also before and after) interviews, numbers of photographs were taken in order to represent a part of events and circumstances.

These combined multiple data sources allowed the study to reconcile and intertwine discussions on the relationships between distinct phenomena of the physical and the social in relations to a multitude of contextual factors. It follows Yin's definition of a case study as "an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (1994). Due to the richness of the data collected in context, the case study is applicable to the questions that require detailed understandings of the social and/or physical constitutions and processes of the environment(s).

Findings and analysis

During the analysis of the four selected cases, synthesising the significant and appropriate findings, three reflective themes emerged. They are: 1) Normative guidelines: access requirements as the point of references; 2) Decontextualisation: add-on design features; and 3) User-sensitive approach and social concerns. Each of these is summarised thematically and is also described below with specific examples from the cases.

Importantly, these themes are described through relations that exist within the triad of the three elements of the new framework: practice of accessibility, social interaction, and spatial analysis.

Normative guidelines: access requirements as the point of references

Each case – streets of Egebakken, ramps of 8TALLET, stairwells of Emaljehaven as well as galleries of Pærehaven – demonstrated that the accessibility requirements, where the body is expediently reduced to a physical object subsumed by the rationality of geometry and mathematics, were used to negotiate with a restricted surface area, but also to organise spaces according to spatial functions and qualities in one way or another. One must, however, (re)acknowledge that the accessibility requirements are one set of many other essential pre-conditions for architecture including economic implications, the given socio-political frameworks and so forth.

On reviewing these selected cases, the employment of the minimum widths (including the width of corridors, doors and so forth) appears to be a common practice in general. One conspicuous example, which embodies the utilisation of the accessibility requirements provided as the minimum criteria, is the width of galleries at the project Pærehaven. These access galleries have a minimally specified dimension (in the BR10) of 1.3 m in width (Figure 5). Considering the main objective of the project, parties obligated to design and construct contemporary and stimulating housing with very low construction cost, this employment of the minimum width specified in the BR10 can be justifiable. And yet, in Pærehaven, social interaction as a key activity, considerations into the creation of "community" transcended the legitimised given criteria into resourceful design resources, lifting the project above other typical projects that employ the access gallery as a simple means of circulation (Figure 6).

Such progress can evidently be recognised, at first, in the employments of double-loaded system of access galleries in combination with urban villa-type building blocks (Figure 7). It is unusual to employ the access gallery as the Urban Villa type buildings, which conventionally employs stairwell access. At second, it introduced platforms as front terrace that bridge entrance spaces with access galleries of the minimally specified dimension (see also Figure 5). These platforms that bridge the access gallery and entrances have dimensions of 2.5 m in width and 1.8 m in depth. The depth of the platforms provides a distance that offsets the circulations space from the building façade. This distance supports to secure privacy of dwelling areas. However, importantly, the residents use the platform itself as their front garden. This example highlights that the required spatial constraints specified in the building regulations are well embedded in the designs of this contemporary housing project; codified rules exemplified in BR10 are deeply involved in the production. The de-

sign of the above examples across schematic, strategic and detail levels highlights that the negotiations of areas and organisations of spaces were conducted creatively and hand-in-hand with legitimised requirements.

In addition and essentially, the users appreciate access spaces produced as immediate surroundings of their everyday lives, and appropriate them for required functions accordingly. Working with spatial constraints and opportunities, the residents did not only decorate but also used the spaces to participate in many aspects of their everyday lives. One of the residents stated that:

> These paths [galleries] are navlestrengen [umbilical cord] of this place. This is where we meet with other people: we say hallo to each other... I feel like that this is our corridor... just it is placed at outside. Like today, we often use it as part of our apartment. Shamelessly hang our cloths to dry... So we take an advantage and use it as ours. If weather is good like today, we tend to keep our doors open. In fact, we try to keep it open as much as we can.

This example – although it is highly selective and even limited – underlines in an articulate way not only the effective uses of normative guidelines, but also the successful concurrency of legitimised requirements and the social intentions of both architects and users.

Figure 5
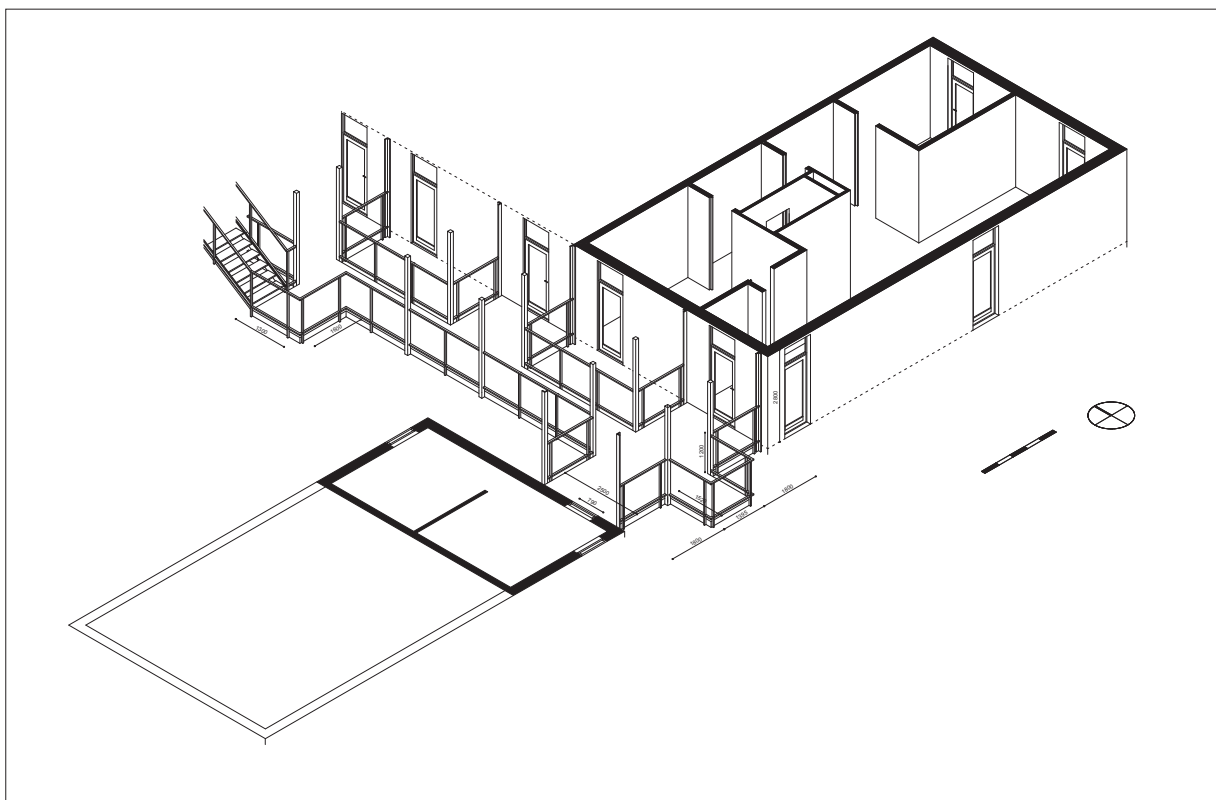Illustration: axonometric drawing of shared access route, Pærehaven (2004)
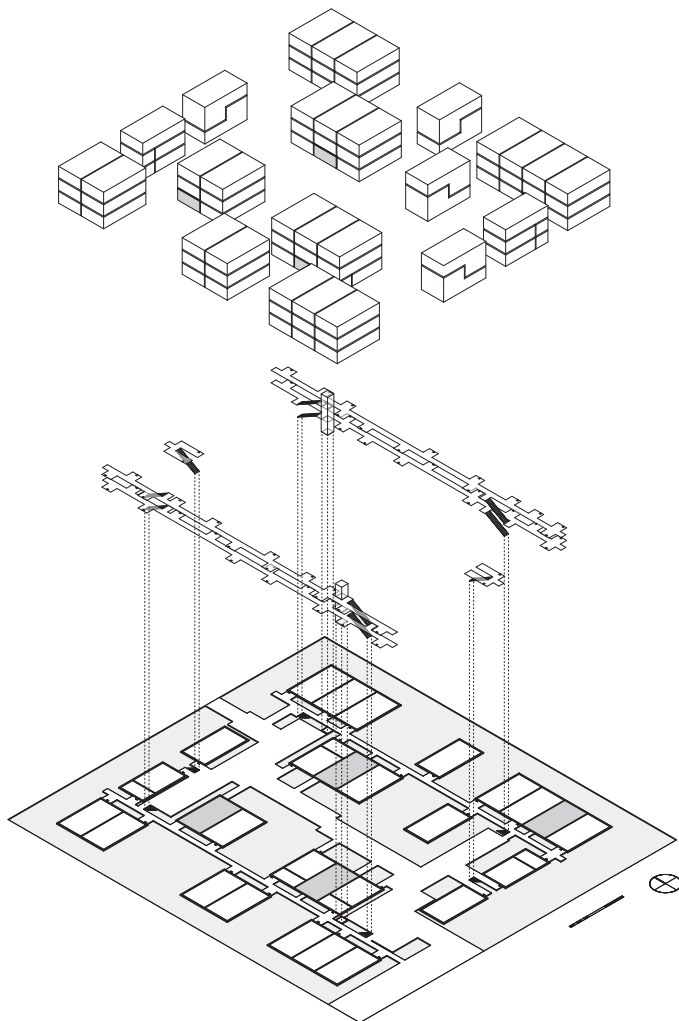
Figure 6
Photograph: Pærehaven (2004)

Figure 7
Illustration: axonometric arrangement
drawing of Pærehaven (2004)

Decontextualisation: add-on design features

In contrast, many dissatisfactory design decisions were made, throughout all four cases, without complying with the given requirements. Such mistakes, of not providing necessary spaces and equipment for many who might require more time and space for getting around as well as for socialising, were remarkably noticeable in the project Emaljehaven. Notably, these problematic design features – ramps (with a steep gradient of 1:12 that were not supplemented by steps in a number of places), landscaping (without a hard surface and inaccessible in many ways and places), lifting platforms (which are not allowed in accordance with BR10; moreover, they are often out of order) and so forth – were of "add-ons" and not well coordinated into a core design of the project.

Fortunately they could, therefore, be solved independently of each other; however some remain as specialised design that still bear the label of disability. Not living up to the requirements is beyond neglectful. However, simply responding to or finding solutions for given criteria will not necessarily increase the potential of architecture. Without falling into such a deficient routine (or failing to comply with the requirements), architects must engage creatively with these given conditions by setting higher objectives or even constructive visions. Otherwise, legitimised requirements could easily turn into checklists, which might cause architects to produce "add-on" design features, as in the case of Emaljehaven. Instead, performance of buildings should be assessed by considering a person's capabilities to function that are specific to context.

On the contrary, the project made a number of successful schematic moves that encompass different spatial scales. One good example is the building's small footprint, which left a large park available for both the residents and the general public. This green area exhibited many of the concerns with regard to accessibility, leaving the impression of neglect. For example, there is no hard surface leading towards the main entrances from the park side: there was limited consideration of users with different abilities as well as preferences (Figure 8). However, the park together with terraces and balconies facing the park compensate for such disadvantages, and play a greater role in the everyday life of residents (regardless of with or without impairments). The residents, with or without impairments, appreciate the visual qualities and the atmosphere in the park.

The strategy of opening residents' collective territories towards public realms evidentially enhanced the overall quality of the park. It created a domain where collective and public realms can co-exist. Consequently, the successful integration of the large park into the housing project brought the private realm within the sphere of influence of the public realm and vice versa. The project contributes to creating a lively neighbourhood in the area. In this opening of collective domain, the shared access routes, especially transverse entrance halls at access floor level, which secure physical and visual access connecting a street with the green area, also contributed a great deal (Figure 9).

Figure 8
Photograph (left); and illustrations (right): site plan of Emaljehaven (2007). A drawing was provides by Entasis.

Figure 9
Photograph (left); and illustrations (right): plan drawing of Emaljehaven (2007)
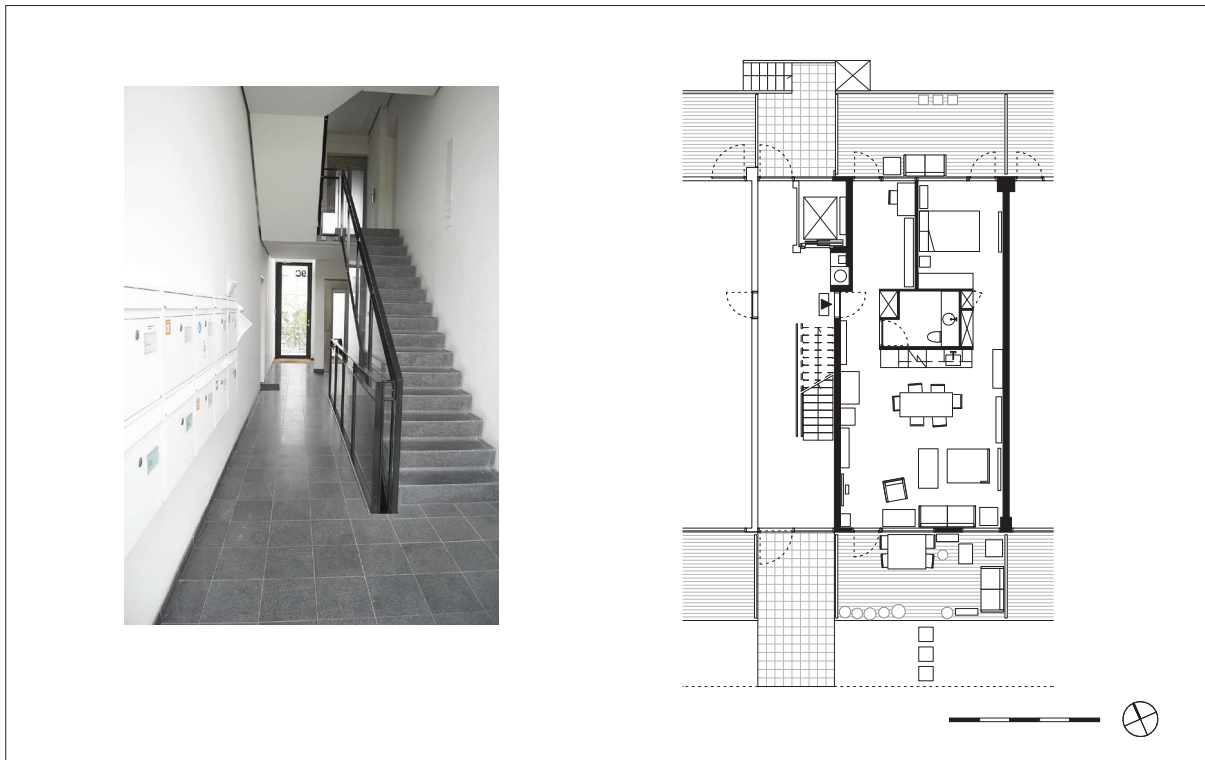
By so opening the building successfully to urban contexts, the project highlighted the essential importance of the consideration towards the social relation and its enhancement in immediate as well as larger contexts. However, the project also demonstrated that one could easily be excluded when environments are not accessible, although the project had good intentions of promoting an inclusive neighbourhood. This paper, therefore, conceives of the project as the embodiment of the inter-relations of social inclusiveness and environmental accessibility in both advantageous (since one attribute can enhance qualities and achievements of the other) and disadvantageous (in contrast one attribute could prevent enhancing the other or even let the other down) manners. This is due to the challenge of making inclusive space and producing enabling environments were not coordinated. And it appears that the co-ordination of the this two aims of achieving environmental accessibility and social inclusiveness, on many levels, depends largely on knowledge, skill and competences through which architects formally and physically express spaces that are to be used by users.

User-sensitive approach and social concerns

The users encountered in this study had adopted the ideas which the architects brought (partly) into the projects and effectively utilised these ideas in their everyday lives. Streets and front terraces of the Egebakken project, for example, highlighted the effective integration of implemented guiding principle and social considerations of the architects, which was then reflected in uses by residents and visitors. The voices of the

residents at Egebakken proved the fact that the composition of elements – a front terrace full of personal belongings, a covered entrance porch, a carefully placed large window on the front façade and so forth – were essential in their everyday lives (Figure 10).

Figure 10
Photograph: Egebakken (2004)

Egebakken is a co-housing scheme for senior citizens. The scheme intends to allow residents to stay as long as possible in their own home, and all of the founding members participated in the design processes. Accordingly, the scheme developed with a sensitive design approach fulfilling requirements of seniors who might later develop some forms of impairments. Care for persons with less abilities, but also a commitment to the social nature of built spaces – considering what equitable access and use bring about – contextualised the accessibility requirements into the spatial planning.

Emphasising the importance of providing choices and flexibility of use, Steinfeld and Maisel (2012, p.166) described that: "When designers give more attention to social interaction spaces, they not only provide a more inclusive environment that encourages participation by a larger number and variety of people, they also provide an environment that responds to individual differences." Conjoining the intentions of improving environmental accessibility and achieving social inclusiveness, the instrumentality of form and space in Egebakken was increased. This in turn, encouraged or spurred users to play active parts in the construction of meaning for those spaces.

Throughout the analyses of four selected cases, one essential quality of the shared access route was prominent and at the fulcrum of the investigations namely its ability to evolve urbanity as an immediate surrounding of residents' domestic lives. The study identified that successful incorporations of accessibility and the social contributions of architec-

ture embrace such a quality. Moreover, the importance of residents' participation – through the appreciation and appropriation of space – was emphasised.

In the example of 8TALLET, the incorporation of the oblique circulation of ramps into a mega structure posed many discussions. These ramps as secondary circulation routes have lots to offer. The architects had been through many discussions with the authorities with regard to the accessibility of the building, because these ramps actually do not live up to the requirements. Yet the project was granted a dispensation to make the steeper ramps, so that the building might provide better accessibility compared with a conventional block of Copenhagen flats. Accordingly, the project defines 24 stairwells (with lifts) as the primary circulation route for the building.

Controversially, the zigzag pattern on its surface indicates the route that one must take in order to use the ramp with the correct gradient (Figure 11). Accordingly the ramp was given the width of 2.3 m (plus 0.3 m of open gutter), which can be seen as being extremely generous compared with the minimum requirement of 1.3 m specified in BR10. This extended width of the ramp beyond requirements and circulation pragmatics simultaneously indicates its intended use as a social space (Figure 12).
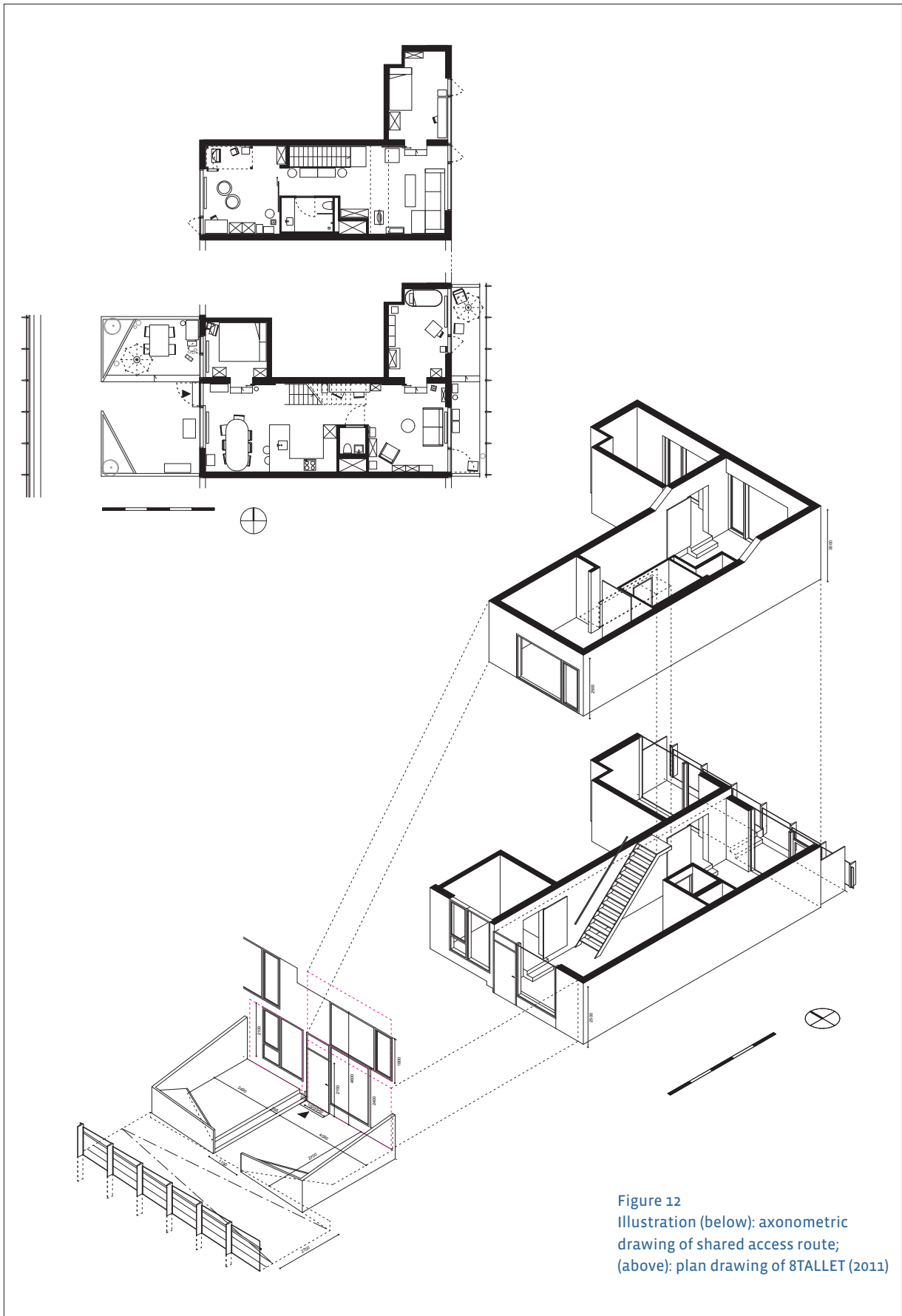
Figure 12
Illustration (below): axonometric
drawing of shared access route;
(above): plan drawing of 8TALLET (2011)

These ramps were introduced as a means of circulation; however designed at an early stage, with a strong intention of providing areas for social purposes. In fact, these ramps proved to connect diverse individuals and their domestic lives to the realms of the collective and the public physically, psychologically and socially: they embody the idea of "street-in-the-air". Careful design considerations, despite the disadvantage of the steepness of ramps, proved to improve qualities of these inevitable collective spaces.

A few elements were interwoven with each other: 1) the façade that has a high transparency (49 % of the glazed surface in one of the units studied); 2) the dimensions of the openings that are coordinated well with the spatial layout of the flat and the front terrace; and 3) the sets back of the façade that is 2.7 m from the ramp which also has a generous width of 2.7 m (see also Figure 12). The combination of these design decisions had led the project to succeed in accommodating collective uses of shared spaces but also contribute to opening the building to surrounding contexts.

Reviewing the findings from the investigations, the residents generally perceive the architects attempt at rooting the lives of residents in the oblique surfaces positively. The users appreciate the ramps and the terraces regardless of age, sex or even circumstances (i.e. users pushing a baby carriage). Furthermore, the findings, through descriptions of spatial fields and uses, qualify the dwelling (and immediate surroundings) as an active player in the social process. The organisation of the internal spaces and composed openness of the façade play an important role in the functioning of the shared access route as a resourceful social space. One problematic issue which remains critical is the steepness of the ramps: they do not comply with the required level of gradient. Their gradients are empirically too steep for wheelchair users or potentially for other walking-aid devices. The author did not encounter any wheelchair users or users of any sort of walking-aid device on site; nor did the residents know anybody with impairments. This might directly relate to the fact that these collective spaces with oblique surface are simply inaccessible for particular types of users. However, a gentleman in his late 60s mentioned that his walks along the ramps as positive exercises. As issues of aging and (dis)ability have become important factors in our aging society, it is an essential problem to be solved. Accordingly, the ramps better integrating into the realised built form remains a future challenge for architects who might work with the oblique surface.

The success of 8TALLET is due largely to the fact that the social intensions of the architects came first and dominantly included the fulfilments of legitimised requirements, not vice versa. Yet, these are all closely connected to issues of spatial organisation and the composition of architectural elements and components that form the physical space(s). Howev-

er, one must be careful not to "put the cart before the horse". Too much focus on the social qualities might even lead architects and spatial designers to neglect and reduce an essential ability of architecture in its capacity to enable persons to use and enjoy their environments to the greatest extent possible.

Conclusion

Each of three reflective themes described above, as well as their synthesis, shows that the introduced three elements – 1) practice of accessibility; 2) social interaction; and 3) spatial analyses – are tightly interconnected. Importantly, the relations between these three elements are neither simple or stable, nor positive in the sense in which pragmatic uses and social functioning of the built environment are always advanced. Yet, the findings demonstrate that social interaction is a key; and the integration of intentions for accessible environment and inclusive society contextualise the accessibility requirements into the planning and designing of physical spaces, though which the quality of the built environment can be improved.

The new framework elucidates that conscious challenge of addressing social qualities in architecture contextualise the uses and experience of users into spatial discourses, in which accessibility is underpinned as a foundation to provide opportunities for participating in society. Through the observations and analyses of the shared access routes, successful incorporation of these elements appears to embrace our challenges for evolving urbanity. Urbanity, in this study, embodies strong intentions for the realisation of civil society in line with individual self-fulfilment. The relevance and appropriateness of the framework, which integrates accessibility as resolute architectural element, is substantiated to inform future design of the built environment.

Failing to comply with the required standards prevents persons (not all but many) from gaining equal opportunities in their lives. Yet, complying with the requirements does not necessarily always advance the built environment in both pragmatic uses and social functioning. As such, the legitimised requirements cannot accommodate all the differences of persons' abilities and preferences: these differences vary widely, and at times, seem to be in conflict. In contrast, a space with better functioning can be achieved by meeting with the minimum levels specified in the requirements; however, the achievement of spatial inclusiveness requires careful considerations of spatial designers to integrate these criteria into coherent design ideas and strategies. Importantly, an essential key here is architects' and spatial designers' commitment to the social value of the built environment.

Nonetheless, it should be stated that this study set a focus on the three elements, despite there are much more elements and conditions which should be taken into consideration in discussing the production of space. This fact might reduce the scope of UD in this study, and therefore the effectiveness of the new framework can be questioned. However, it should be reiterated that the overall aim of this study is to contribute for making better built environments that promote active inclusion and participation of persons in society. In addition, the paper did not reached the point at where it discusses how this new framework can be implemented in practice, which remains as an issue to be unfolded in future.

Some of the most though-provoking literature on UD calls for further interpretation and articulation of the concept, as well as for its translation into a pragmatic tool. However, there is an awareness of difficulties for bringing UD into a regulatory framework. As Steinfeld and Maisel pointed out:

> Some experts, the authors included, argue that codifying universal design in a regulatory framework could slow adoption of better universal design practices. They believe it would raise the bar for accessibility codes but reduce aspirations on a project-by-project basis and limit flexibility, product innovation, and experimentation (Steinfeld and Maisel, 2012, p. 189).

This should be reflected in unfolding discussions.

To this end, UD still needs to face these challenges; however, it provides an opportunity for relativising and contextualising accessibility to be better implemented. By (re)centring "the social" at the fulcrum of theory and practice of architecture, UD successfully transcends accessibility into effective design criteria. Providing equal opportunities for diverse individuals forms a foundation to refine urbanity's evolutions. The true potential of accessibility in architecture can be explored by questioning and challenging the means for incorporating the acts of finding social qualities in architecture and incorporating this into the production of physical spaces.

References

American National Standard Institute, 2011. *Accessible and usable buildings and facilities*. New York: American National Standard Institute, International Code Council.

Atelier Bow-Wow, 2006. *Bow-wow from post bubble city*. Tokyo: INAX.

Danish Ministry of Children, Gender Equality, Integration and Social Affairs, 2013. *Disability policy action plan 2013 – One society for all*. http://sim.dk/media/946360/8_disability_policy_action_plan_2013_-_one_society_for_all.pdf (accessed 15/05/2015).

Danish Ministry of Culture, 2014. *Danish architectural policy – Putting people first*. Available from the web site, http://english.kum.dk/uploads/tx_templavoila/Danish%20architectural%20policy_putting%20people%20first.pdf (accessed 19/6/2015).

Danish Ministry of Housing, Urban and Rural Affairs, 2014. *Fællesskaber i forandring – Tænketanken BYEN 2025*. Available from the web site, http://www.mbbl.dk/publikationer/faellesskaber-i-forandring-taenketanken-byen-2025 (accessed 19/6/2015).

Ebner, P., Herrmann, E., Höllbacher, R., Kuntscher, M. and Wietzorrek, U., 2010. *Typology+: Innovative residential architecture*. Basel, Boston: Birkhäuser.

European Commission, 2003. *2010: A Europe accessible for all*. Luxembourg: European Commission.

Evans, R., 1978. Figures, doors and passages. In: R. Evans, 1997. *Translations from drawing to building and other essays*. London: Architectural Association. pp. 54–91.

Forty, A., 2000. *Words and buildings: A vocabulary of modern architecture*. London, New York: Thames & Hudson.

Frandsen, A.K., Kirkeby, I.M., Ryhl, C. and Pedersen, L.S., 2012. *Bygningsreglementets tilgængelighedsbestemmelser set i forhold til byggeprocessen* (The accessibility requirements in the Danish building regulations and the building process; a mapping of compliance and barriers). SBi 2012:16. Hørsholm: Statens Byggeforskningsinstitut, Aalborg universitet.

Giddens, A., 1996. *Modernity and self-identity: Self and society in the late modern age*. Cambridge [England]: Polity Press.

Giddens, A., 1986. *The constitution of society: Outline of the theory of structuration*. Berkeley, Los Angeles: University of California Press.

Goldsmith, S., 2001. Access all areas. *Architects' Journal* (15 March). pp. 42–44.

Goldsmith, S. and PRP Architects (Firm), 2000. *Universal design: A manual of practical guidance for architects*. Oxford, Boston: Architectural Press.

Groat, L. and Wang, D., 2002. *Architectural research methods*. New York: J. Wiley.

Hartley, J., 2004. Case study research. In: Catherine Cassell, and Gillian Symon, eds. 2002. *Essential guide to qualitative methods in organizational research*. London, Thousand Oaks: SAGE Publications. pp. 323–333.

Hasegawa, G., 2011. *Thinking, making architecture, living*. Tokyo: INAX Publishing.

Heidegger, M., 1962. *Being and time*. New York: Harper.

Imrie, R., 2012. Universalism, universal design and equitable access to the built environment. *Disability and Rehabilitation*, 34(10), pp. 873–882.

Imrie, R., 2006. *Accessible housing: Quality, disability and design*. Agingdon [England], New York: Routledge.

Imrie, R. and Hall, P., 2001. *Inclusive design: Designing and developing accessible environments*. New York: Spon Press.

Iwarsson, S. and Ståhl, A., 2003. Accessibility, usability and universal design positioning and definition of concepts describing person environment relationships. *Disability and Rehabilitation*, 25(2), pp. 57–66.

Johnston, P., ed., 1996. *The function of the oblique: The architecture of Claude Parent and Paul Virilio 1963–1969*. London: AA Publications.

Lefebvre, H., 1991. *The production of space*. Malden, Mass.: Blackwell Publishers.

Leupen, B., 2006. *Frame and generic space*. Rotterdam: 010 Publishers.

Leupen, B. and Mooij, H., 2011. *Housing design: A manual*. Rotterdam: NAi Publishers.

Lid, I.M., 2009. What can be achieved by universal design? An investigation of various aspects of the concept. *FORMakademisk*, 2(1). Available from http://www.formakademisk.org/.

Lynn, G., 2004. *Folding in architecture*. Chichester, West Sussex; Hoboken, NJ: Wiley-Academy.

Kajita, M., 2014. *Spatial dimensions of accessibility – inclusive urban dwellings*. Copenhagen: the Royal Danish Academy of Fine Arts.

Kvale, S. and Brinkman, S., 2008. *Interviews: Learning the craft of qualitative research interviewing*. 2nd ed. Los Angeles: Sage Publications.

North Carolina State University, The Center for Universal Design, 1997. *The principle of universal design, version 2.0*. Available from the web site, http://www.ncsu.edu/ncsu/design/cud/about_ud/udprinciplestext.htm (accessed 2/24/2015).

Ryhl, C., 2010. Implications of ratifying the United Nations convention: An assessment of the Danish model. Paper presented at *Proceedings for the 3rd International Conference for Universal Design, IAUD, Hamamatsu, Japan*.

Ryhl, C., 2009. *Tilgængelighed – udfordringer, begreber og strategier* (Accessibility – challenges, concepts and strategies). SBi 2009:12. Hørsholm: Statens Byggeforskningsinstitut.

Sakamoto, K., 2001. *House: Poetics in the ordinary*. Tokyo: TOTO Shuppan.

Sherwood, R., 1978. *Modern housing prototypes*. Cambridge, Mass.: Harvard University Press.

Simonsen, K., 1996. What kind of space in what kind of social theory? *Human Geography*, 20(4), pp. 494–512.

Steinfeld, E. and Danford, G.S., 1999. Theory as a basis for research on enabling environment. In: Edward Steinfeld, and G. Scott Danford, eds. 1999. *Enabling environments: Measuring the impact of environment on disability and rehabilitation*. New York: Kluwer Academic/Plenum Publishers. pp. 11–34.

Steinfeld, E. and Tauke, B., 2002. Universal designing. In: Jon Christophersen, ed. 2002. *Universal design: 17 ways of thinking and teaching*. Oslo: Husbanken. pp. 165–190.

Steinfeld, E. and Maisel, J., 2012. *Universal design: Creating inclusive environments*. Hoboken: John Wiley & Sons.

Sting, H., 2004. The significance of access. In: Friederike Schneider, ed. 2004. *Floor plan manual: Housing*. Third ed. Basel; Boston: Birkhäuser. pp. 40–49.

United Nations, General Assembly, 2007. *Convention on the rights of persons with disabilities and optional protocol*. New York: United Nations.

Vyzoviti, S., 2003. *Folding architecture: Spatial, structural and organizational diagrams*. Amsterdam: BIS.

WHO, 2001. *International classification of functioning, disability and health: ICF*. Geneva: World Health Organization.

WHO, 1980. *International classification of impairments, disabilities, and handicaps: A manual of classification relating to the consequences of disease*. Geneva; Albany, N.Y: World Health Organization.

Yin, R.K., 1994. *Case study research: Design and methods*. Thousand Oaks: Sage Publications.

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