Active Design in Buildings

BETA office for architecture and the city

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Dear reader,

In Amsterdam we want everyone, both young and old, to get enough exercise. Unfortunately not all citizens of Amsterdam manage that now. ‘De Bewegende Stad’ is a programme where we try to stimulate physical activity by organizing public space in such a way that exercise is encouraged. Think of car-free neighbourhoods, wider sidewalks to play on, more room for surface swimming, outdoor sports facilities such as continuous jogging routes, urban sports zones and alternative bike paths. But many citizens of Amsterdam spend the majority of their days indoors; in the office or at home. It is precisely here, inside buildings, where much can still be achieved in terms of encouraging physical activity. An example is making the stairs more easily accessible than the elevator. Or knowingly placing frequently used functions within walking distance. Other ways of encouraging physical activity is by placing the entrance on the first floor, or providing stair access to the roof.

These, and dozens of other inspiring examples can be found in this book. I invite anyone working on buildings in Amsterdam, to configure space in such a way that it invites physical activity.

I hope you enjoy this inspiring read,

Eric van der Burg,

Deputy Mayor City of Amsterdam,
Alderperson Spatial Planning, Sports, Health and Welfare

Prologue

This book presents a study of how building design can encourage people to engage in physical activity. It is part of 'The Moving City' (*De Bewegende Stad*), a programme by the City of Amsterdam.

The Moving City focuses on the interface between human activity and the urban form. Combining expertise in the fields of human behaviour and urban planning is a major challenge in this regard. This challenge lies in shaping the physical domain to create conditions that help make physical activity an ongoing and intrinsic part of the lives of those who live and work in Amsterdam, as well as visitors to the city.

In their 2010 paper *Bewegen moet beloond worden!* (Movement should be rewarded!) Gadet et al. concluded that people walk and cycle more in a high-density urban environment with a close-knit functional mix and logical, attractive routes for slow traffic. (1) An international study performed in twelve countries demonstrates that, all over the world, spatial conditions play an important role in the degree of human physical activity. (2)

The Moving City encompasses all levels of urban planning. At the urban level, key factors include networks, building density and the location of amenities. In neighbourhoods, street patterns and the presence of green space are among the elements that influence the physical activity of its residents. At street level, pavements need to be wide enough for children to play, while benches at regular intervals enable the elderly to take a brief stroll.

Finally, the design of buildings also determines if, and to which degree people are inclined to move. This forms the focus of this book. It offers clues for active design in buildings and thereby invites developers and architects to incorporate this aspect into the development of housing, schools and office buildings.

Reading Guide

The goal of this study is multifaceted. The first is to introduce active design in buildings as a theme by drawing on existing literature and precedent research. In addition, a *Toolkit* has been developed, aimed to inspire designers, developers and policy makers to work with this theme.

The study is divided into five chapters:

1. The *Introduction* establishes the direct link between physical activity, health and happiness. Various sources are cited to underline the importance of physical activity.
2. The second chapter, *Buildings and Physical Activity* explores the relationship between buildings and physical activity in greater depth. Following an analysis on why many buildings discourage activity, this chapter puts forward an approach aimed at reincorporating physical activity into architecture.
3. In the third chapter, the so-called *Toolkit*, this approach is translated into a set of principles which can be applied in buildings. In the Toolkit, the principles that encourage physical activity are examined individually and categorized along various lines.
4. The fourth chapter, *Toolkit and Building Types*, applies the Toolkit's principles as interventions in four different building types. Following to the Toolkit's principles, physical activity is described in relation to the following building types: the High-rise, the Residential Block, the School and the Office Building.
5. In the *Appendices*, all material relevant to the research is summarized. Besides a list of sources, it features summaries of interviews conducted with a number of specialists.

References

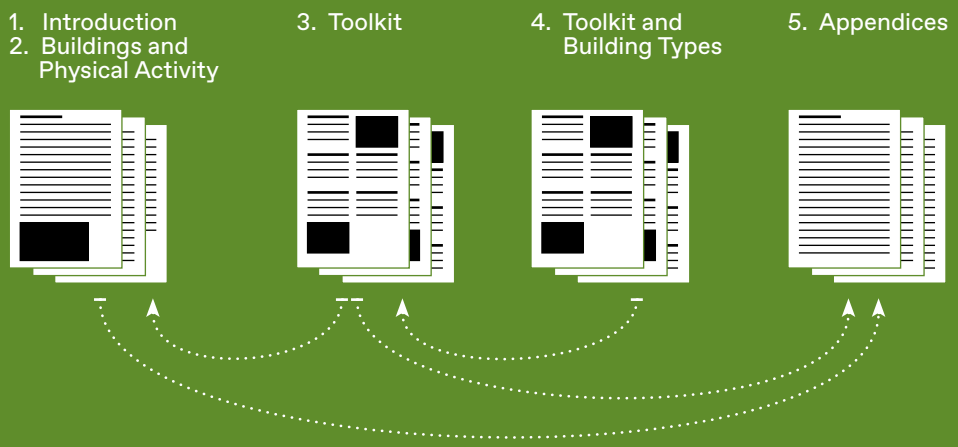
Cross-references are used throughout the book to provide context for the issues discussed. These references are clearly marked in green.

The first two chapters refer to external literature sources or the four experts interviewed by the authors. The Toolkit contains references to either the introductory chapters, literature sources or the interviews. In the fourth chapter, Toolkit and Building Types, references are only made to the Toolkit.

Two types of code are used in the body text:

(#) Incrementing numbers between brackets. These refer to a source in the bibliography in the appendices.

(X) Letters A, B, C, D between brackets. These refer to one of the four experts interviewed by the authors. Summaries of these interviews can be found in the appendices.



Introduction

Who wouldn't want to live a long, happy and healthy life?

Evidence has shown that physical activity is an important precondition for achieving this goal. Numerous studies have demonstrated how physical activity contributes to a sense of happiness and vitality. Physical activity increases the number of healthy years we live and holds the promise of an enhanced quality of life as we age. It also reduces the risk of obesity and helps combat school dropout rates while leading to better overall performance, lower healthcare costs and less absenteeism at work.

Regular exercise and playing outdoors, in particular, are key to an improved physical and mental health. Research shows that participating in sports gives young people a better self-image, more rewarding social interaction and lowers the risk of psychological problems such as depression, anxiety or aggressive behaviour. (3)

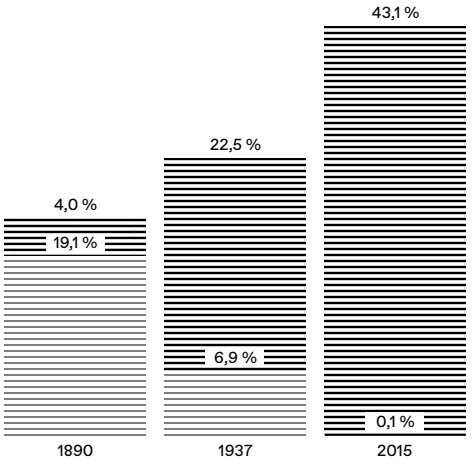
FROM INFECTIOUS TO CHRONIC DISEASES

Over the past 150 years, humanity has made enormous progress in creating a healthier living environment. In 1890, infectious diseases were accountable for 19.1% of all deaths in Amsterdam (4) but by 1937 this figure had fallen to 6.9%. (5) This dramatic decline can be attributed not only to the significant advances in medical treatment but also to the Housing Act of 1901. This Act included regulations to address abuses in the housing sector such as overcrowding, and shortcomings in weather resistance, ventilation, water supply and sanitation. (6)

In 2016, chronic diseases are the leading cause of death in the Netherlands. Figures compiled by Statistics Netherlands also show that while life expectancy is increasing, the number of healthy years we live is decreasing, also in absolute terms. On average, a Dutch citizen now lives with a chronic disease for almost 38 years. (7)

The impact of this development is significant. The Harvard School of Public Health forecasts that the annual loss in gross national product (GNP) due to chronic diseases will rise exponentially from 3 trillion US dollars in 2015 to almost 47 trillion by 2030. (8) If we factor in the rising costs of healthcare and the declining workforce, an undesirable situation gradually begins to emerge, from both a humane and an economic perspective. (B)

INFECTIOUS VS. CHRONIC DISEASE IN AMSTERDAM



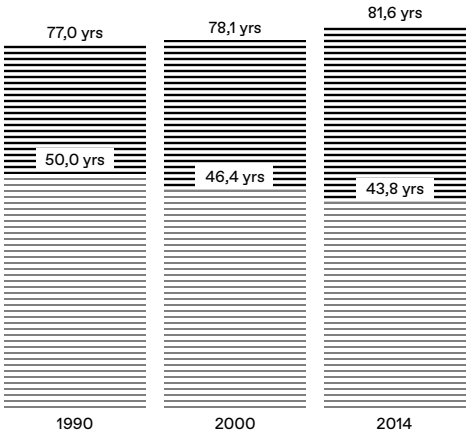
As a percentage of annual mortality rates

thick = chronic disease: cancer, hart and circulatory disease, diabetes millitus, cara

thin = infactious disease: measles, scarlet feaver, smallpox, typhus, coup, diphtheritis, whooping cough, cholera, tuberculosis, dysentery, diarrhoea

(source: City of Amsterdam, Bureau of Statistics)

HEALTHY LIFE EXPECTANCY IN THE NETHERLANDS

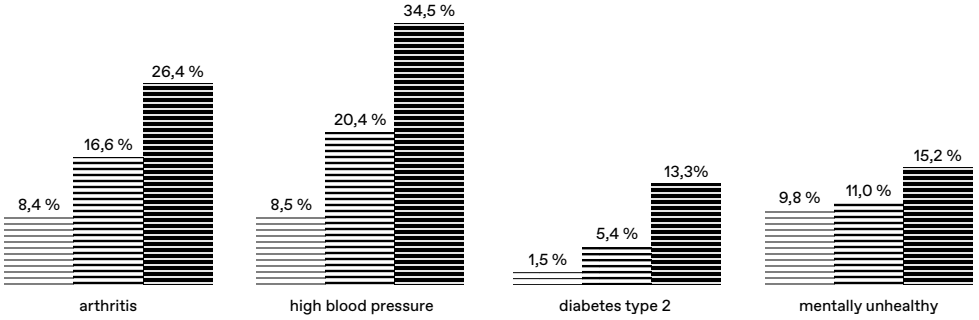


thick = average number of years with a chronic illness

thin = healthy life expectancy at birth

(source: Statistics Netherlands, Statline)

CHRONIC DISEASE AND OVERWEIGHT



thin = no overweight, BMI < 25,0 kg/m2
thick = moderately overweight, 25,0kgm2 < BMI < 30,0 kg/m2
extra thick= seriously overweight (obesity), BMI > 30,0 kg/m2

(source: Statistics Netherlands, Statline)

When it comes to chronic diseases, the healthcare system in Western countries is primarily geared towards combating symptoms. This results in expensive hospital admissions and specialist treatments, while many chronic diseases can be prevented by lifestyle changes. (B) Research shows that incorporating more physical activity into our daily lives makes a significant contribution to reducing chronic diseases.

CHRONIC ILLNESS AND PHYSICAL ACTIVITY

Directly or indirectly, many chronic diseases are the result of our economy. Modern comfort, combined with sedentary labour, stress, poor eating habits and alcohol consumption contribute to the unhealthy lifestyle of the average Dutch citizen. Most of us are not sufficiently active and fall well short of the 30 minutes of moderate-intensity physical activity a day recommended by the Dutch Standard for Healthy Exercise (NNGB). (9) Lack of exercise causes approximately 8000 deaths in the Netherlands each year (6% of total deaths). Research by Statistics Netherlands shows that insufficient exercise directly increases the risk of chronic diseases. (10)

Obesity, whether or not due to physical inactivity, is a proven cause of chronic complaints. People with obesity are five and a half times more likely to suffer from type 2 diabetes than people who are not overweight, three times more likely to have high blood pressure and twice as likely to suffer from arthrosis and cardiovascular disease. The incidence of mental health problems also tends to increase as the Body Mass Index (BMI) rises. One particularly alarming development is that a disease such as type 2 diabetes was once confined almost entirely to the elderly, but now regularly occurs in overweight children. (11)

HUMAN NATURE

If there is such a clear correlation between exercise and human (mental) health, then why are we still so inactive? Of all primates, human beings consume metabolic energy at the highest rate (27% higher than chimpanzees), mostly to fuel our larger brains. (12) In order to provide the brain with energy, the human body has developed numerous energy-saving measures in the course of its evolution. These include efficient locomotion (13) and the capacity to store energy as fat for use in times of scarcity. (12) Ways of saving energy, also through inactivity, are a product of evolution.

Never before have human beings consumed as many calories as they do today. Meanwhile, physical activity, once the mainstay of our daily routine, has been marginalized by advances in design and technology. Sedentary jobs and automation have replaced physical labour, driving has supplanted cycling and walking, mechanical systems prevent us from having to climb stairs and outdoor play has lost ground to electronic entertainment. (14) The Dutch spend nine hours a day sitting down, which makes them the most passive population of Europe. (15) The risks associated with a sedentary lifestyle are becoming more widely accepted. ‘Sitting is the new smoking’ is on its way to becoming a truism.

DAILY ROUTINE AND PHYSICAL ACTIVITY

Many different factors contribute to our lack of physical activity. At the same time, the solutions that promote activity are versatile in nature and scope. Participating in sports on a weekly basis would make up a lot of the damage, but unfortunately not everyone possesses the necessary discipline to achieve this. Luckily opportunities for physical activity can be found in the most insignificant daily routines. Identifying these opportunities, reinforcing them and increasing their frequency can provide a considerable boost to physical activity.

Buildings and Physical Activity

Buildings are promising environments for stimulating physical activity: after all this is where we spend 90% of our time. Yet the design of the average building often leaves quite some room for improvement. All too often, the emphasis is placed on the efficient use of resources such as materials, time and money rather than on the potential benefits for its users.

Encouraging physical activity means understanding the biological and psychological needs of human beings and taking these as a starting point. (C) A renewed understanding of these human needs and the subsequent decision making process enables us to design buildings that influence behavioural patterns. On the one hand, design can discourage sedentary and passive behaviour; on the other it can enhance the appeal of healthy choices.

MODERNITY AND PHYSICAL ACTIVITY

The past century has brought us many innovations driven by technological possibility or economic potential. While making our lives more comfortable, these innovations have often rendered physical activity superfluous. In 1854 the safe passenger elevator was invented by Elisha Otis, a development which would pave the way for increasingly tall buildings. This in turn generated new revenue models in real estate demanding a greater yield in higher densities. Technology met this demand in the form of elevators, escalators, pneumatic tube systems and air conditioning, not to mention the steel frame and reinforced concrete. (16)

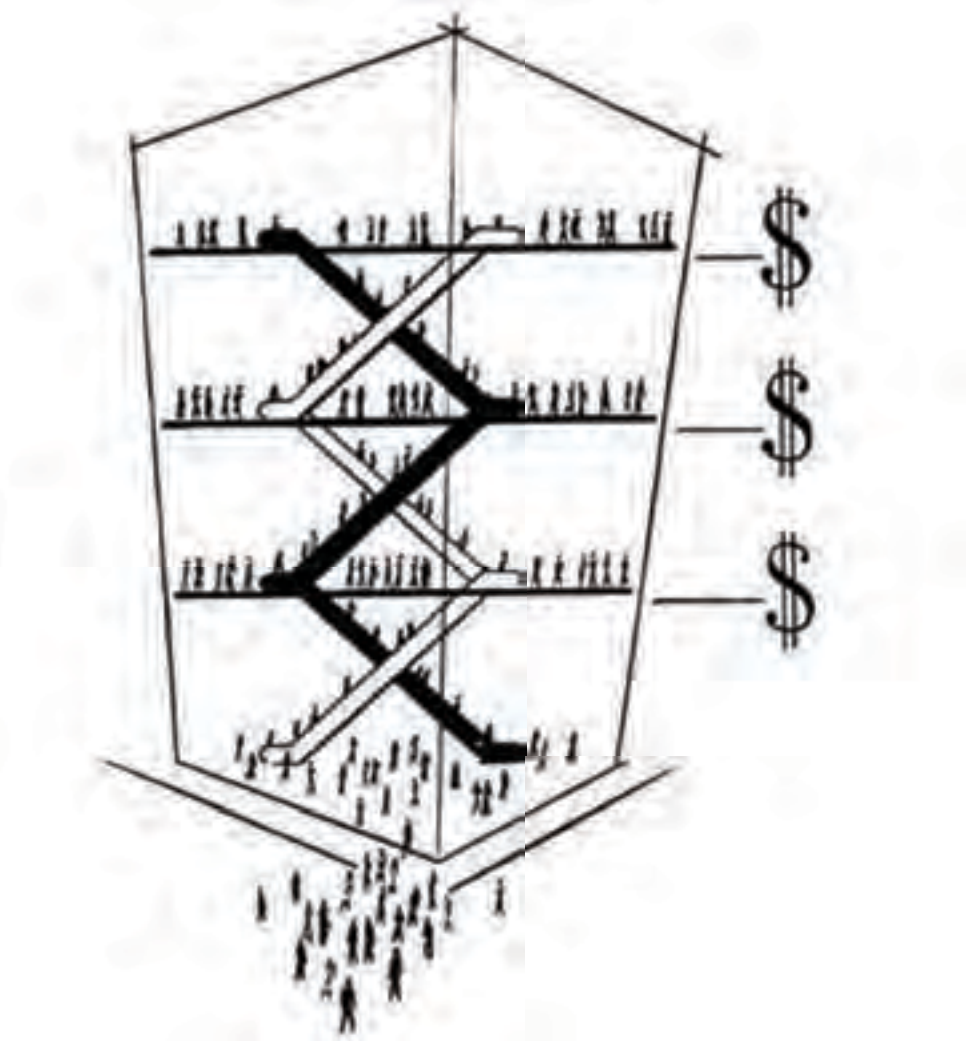
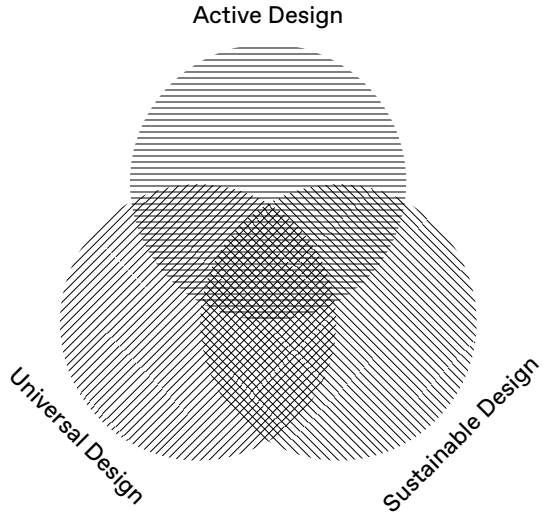


illustration from an OTIS Elevator Co. brochure (1949)
(source: Harvard Design Guide to Shopping)



(source: Active Design Guidelines New York)

Automation and communication technology are contemporary examples of innovations that inhibit physical activity. The Hoge Heren high-rise development in Rotterdam, designed by Wiel Arets Architects, was completed back in 2000 with an Integrated Residential Services system – a major advance at the time. Residents could order groceries from the comfort of their apartment and collect them in grocery lockers on the ground floor. (17) This luxury, which rendered regular trips to the supermarket unnecessary, has since become common practice with the rise of home delivery services such as AH.nl, Foodora and HelloFresh. Recent advances in home automation (domotics, smart homes) and general advances in (mobile) communication allow us to access all sorts of functionalities from the comfort of our homes.

These innovations make our lives comfortable or contribute to an improved nutrition. They free up leisure time that could be used for more exercise. In any case they transfer many of our daily routines to mechanical and electronic innovations, with an increase in greenhouse gas emissions as one of the consequences.

THE SYNERGY OF ACTIVE DESIGN

Encouraging physical activity is therefore also synergetic with other objectives in spatial planning, such as sustainable design and universal access. Choosing the stairs over the elevator, cycling rather than driving, taking part in active recreation instead of watching television, do not only promote and benefit a healthy lifestyle but also reduce energy consumption and greenhouse gas emissions. Wider stairs with fewer steps per flight not only invite physical activity, but improve accessibility for people with minor disabilities. (14)

Sustainability became relevant in the building industry once the benefits of such design strategies could be demonstrated in both human and economic terms. When designing buildings that encourage physical activity, initial investments can be set off against benefits such as improved accessibility, energy efficiency, increased productivity, improved egress times, reduced absenteeism and of course a healthier society. A critical review of active design in buildings is therefore long overdue.

A RICHER ARCHITECTURE

People cannot be instructed to engage in physical activity. However, we can try to persuade them to do so by making it a more attractive option for them. This starts with the realization that our environment provides us with impulses that influence our behaviour. Patrick Whitney, dean at the Illinois Institute of Technology, promotes human-centred design:

> *I think that if architects limit the core of their discipline to the aesthetic form of buildings, architecture will be marginalized as a field. However, if architects take a broader view [...] then they will develop deeper specialties. Architecture will be healthy if it has lots of 'hooks'.* (18)

Whitney is critical of an architecture dominated by aesthetic considerations, favouring instead a broader approach that embraces the many aspects of what it is to be human. That said, he does not seek to deny the importance of aesthetics in architecture; on the contrary, he cites aesthetic appeal as a primary factor in the success of a design. He simply points to a broader palette from which to create a richer architecture.

ACTIVE DESIGN IN ARCHITECTURE

Architecture that incorporates human physical activity in the design process can be regarded as an example of what Whitney describes. After all, both the end and the means of such architecture are reasoned from the human perspective and human needs. Encouraging physical activity starts with understanding why we make certain (sub-)conscious decisions; with understanding what we find attractive or unappealing.

The approach that leads to active buildings can be divided roughly along two lines:

1. Discouraging passive behaviour by making the passive choice unattractive or unfavourable, either consciously or subconsciously;
2. Encouraging active behaviour by making the active choice attractive or favourable, either consciously or subconsciously.

We will go on to explain this dual approach. In the subsequent *Toolkit*, this approach is translated into principles that can be applied in buildings.

Discouraging passive behaviour

In the introduction we have seen how human nature leads us to conserve energy; amongst others through inactivity. In encouraging physical activity in buildings, creating obstacles for passive behaviour is therefore an important starting point.

Because of their high density, city centres form an unintentional barrier against car ownership and encourage residents to travel on foot or by bicycle more often than residents in the urban periphery. In this context, car ownership is less of a consequence of lifestyle choices than is sometimes assumed. It is more a matter of balancing opportunities and constraints: will I be able to find a parking space near the store, or: will the parking space in front of my house still be available when I return? (1)

Within buildings, the elevator is an innovation that eliminates a great deal of daily physical activity. Passive behaviour can be discouraged by questioning the position of the elevator, both in literal and figurative terms. Giving the elevator less prominence in the design increases the likelihood of people taking the stairs.

People make constant trade-offs between effort and efficiency; making the passive choice impractical can therefore also encourage physical activity. In high-rise buildings, for example, the majority of the elevators can be programmed to stop on every fourth floor, giving users the choice between being passive and having to wait longer, or making the active choice; taking the stairs and arriving at their destination more quickly.

The strategic distribution of essential building functions throughout a building leaves users with no other option than the active choice. In residential buildings, for example, central mailboxes or laundry rooms can necessitate movement, while in an office building the dispersal of printing facilities or meeting rooms can have the same effect.

Encouraging active behaviour

Discouraging passive behaviour can be an effective means of promoting physical activity, but at the same time it may be perceived as patronizing or even harassing. Encouraging active behaviour is a more attractive prospect for architecture, since interventions that promote physical activity are almost always accompanied by added (spatial) value.

Human beings act both rationally and instinctively. For this reason, this section examines the conscious and subconscious decisions humans make with regard to physical activity.

CONSCIOUS DECISION MAKING

An environment can provide an impulse and present an option for the conscious man. For instance, elementary signage can inform building users about the destinations in a building or prompt physical activity by setting goals. In this case, humans use their cognitive capacity to make a conscious decision whether or not to act on the signage.

Attractive places in a building such as a pleasant communal space, the beautiful view from a rooftop terrace, or spaces for concentration or tranquillity can provide an incentive to move towards these destinations. Spaces directly related to physical activity (gyms, showers or bicycle parking facilities) can also provide such a conscious incentive, linked to exercise in a more direct manner.

SUBCONSCIOUS DECISION MAKING

Humans also make decisions on other grounds: the human brain combines a range of sensory perceptions and prompts us to take unknowingly competent action. Architecture is exceptionally capable of addressing various senses at once and if carefully composed, it can determine human behaviour. (A) In his seminal work 'Architecture as Space', Bruno Zevi describes the complexity of the appreciation of space:

> *We cannot lay down fixed proportions of space as architecturally right. Space value in architecture [...] is affected by a hundred considerations, such as lighting, shadow, colour and vertical / horizontal emphasis.* (19)

A meticulous combination of the subtlest sensory stimuli can evoke subconscious action. Neuromarketing has been studying these mechanisms for decades, usually geared towards increasing the turnover of retail areas or improving safety in and around stations. As such, research indicates that rhythmic music makes people walk faster, while bright lighting tends to attract human activity. Such studies also emphasize that coherence between sensory stimuli is necessary to achieve a desired effect. A chocolate-scented flower shop will lead to confusion, despite the fact that the smell of chocolate is generally perceived as being pleasant. (20)(A)

The way in which subconscious perception affects the success of (public) space is neatly demonstrated in William Whyte's documentary 'The Social Life of Small Urban Spaces'. It features experiments which show, amongst others, that humans have a collective sense of the maximum number of people a space can hold. It also demonstrated that in one instance in Paley Park, this collective sense was transformed through the auditory addition of a fountain. (21) This demonstrates that it is possible to influence subconscious decision-making, albeit through a concerted effort on the part of the designer.

Toolkit

In the previous chapters, the theme of active design in buildings has been laid down. The proposition to stimulate physical activity in buildings entails a two-fold and combined approach: on the one hand discouraging inactivity and on the other hand encouraging activity.

In this section, the proposed approach is translated into a so-called Toolkit: a collection of practical principles that can be used to promote physical activity in buildings. The principles are divided into the four domains that stimulate physical activity: 1) Routes, 2) Destinations, 3) Activity Programme and 4) Building Surroundings. The principles are further classified according to their performance in areas such as sustainability and universal accessibility.

The content of the Toolkit system relies heavily on several precedents. One of these is the 'Active Design Guidelines', a similar study on a larger scale commissioned by the City of New York. The guidelines are a comprehensive design manual in this regard, covering both the level of the building as well as the urban scale. Another precedent is the 'WELL Building Standard'. WELL is a relatively new certification label, similar to LEED AP and BREEAM, but covering human health in buildings.

Knowledge has also been acquired through discussions with various experts, including experts in the field of regulation. Supplemented by the authors' own experience, this has resulted in the Toolkit, a system that is more tailored to the situation in the Netherlands.

Using the Toolkit

The Toolkit is intended to inspire; it considers principles of active design individually and categorizes them along different lines. It goes without saying that the collection of proposals cannot be applied simultaneously within a project. It is nevertheless worth walking through the Toolkit at least once in order to obtain an idea of the possibilities available. It is also important to note that the Toolkit has not been drawn up as an assessment tool. While it might constitute the first step towards a workable assessment guideline, an additional effort is required from experts from various disciplines to make such a translation work.

THE FOUR DOMAINS OF ACTIVE DESIGN

The principles that encourage physical activity are divided into four domains, with the occasional overlap. Most attention is focused on the domains Routes and Destinations, as these do not only account for the most physical activity, they also have the greatest impact on the building structure.

ROUTES

Routes are the lines along which people move; they link the programmed spaces in a building. Routes consist of stairs, corridors, elevators, ramps and other accessibility features. Physical activity and stair use in particular are facilitated through the strategic configuration and careful elaboration of routes. The following key principles apply to routes:

> Focus on the stairs instead of elevators as the principal means for vertical transport: ensure that any elevators and escalators occupy a less prominent spatial position than the stairs.

> Encourage stair use by providing informing and motivational signage in places where users have to decide between the stairs and the elevator.

> Enhance the sensory appeal of routes: play with the use of materials, transparency, lighting (especially daylight), spatial and programmatic differentiation to reward walking and stair use.

> Limit escalators and multiple elevators to places where large flows of people make them indispensable.

DESTINATIONS

Destinations are the functions or programmed spaces where people spend any number of time and which form a focal point for movement. The strategic positioning of necessary or attractive destinations in a building can evoke movement between them. The key principles for destinations are as follows:

> Ensure that frequently used destinations in a building are placed strategically to promote walking, standing or wheelchair use. Locate these building functions in such a way that (pleasant) walking distances are created.

> Ensure that users are aware of destinations in and around the building: make these visible or use signage.

> Incorporate outdoor spaces as destinations in the design. Green outdoor areas in particular tend to be valued highly.

> Consider rethinking the configuration and positioning of various building functions. Centralizing some functions and decentralizing others can promote social contact and physical activity.

ACTIVITY PROGRAMME

Activity Programme concerns building functions that relate directly to increased physical activity. These include gyms, bicycle storage and active office furniture. These elements encourage physical activity by providing facilities and/or comfort in relation to sports activities.

BUILDING SURROUNDINGS

A building influences its immediate surroundings through its massing, materials, degree of transparency and programming. Annoying gusts of wind and monotonous building facades are examples of how buildings can adversely affect the walkability of the neighbourhood. By way of contrast, varied programming, multiple entrances and a pleasant human scale actually contribute to physical activity in public spaces. A qualitative spatial connection between a building and its surroundings also encourages movement in between.

S/M/L PRINCIPLES

Some active design principles are easy to apply, even in the operational phase of a building. Others must be incorporated into the earliest sketches due to their large impact on the building structure. As such a distinction has been made between far-reaching and less far-reaching principles with the aim of creating a system applicable to various levels of ambition and for both new and existing buildings.

We define three categories in this regard: small, medium and large. It is important to note that this classification refers solely to the implications for a building's structure and not to the impact a principle might have. A 'small' principle with limited structural implications can nevertheless have a profound effect on physical activity. Some extra attention is given to the two most comprehensive domains; Routes and Destinations.

(S) SMALL

A small principle is not connected to the structure of a building. It is often an intervention that involves colour, material, furnishings, fittings or lighting (including daylight). Though relatively inexpensive, these principles can have a major effect on walkability and can often be deployed in the operational phase of a building.

(M) MEDIUM

A medium principle involves limited modification to the spatial structure with a view to encouraging physical activity. Such interventions often evoke activity through horizontal or vertical variations or the strategic ordering of programme. These can often be realized with a minimal change to the building's structure or its detailing.

(L) LARGE

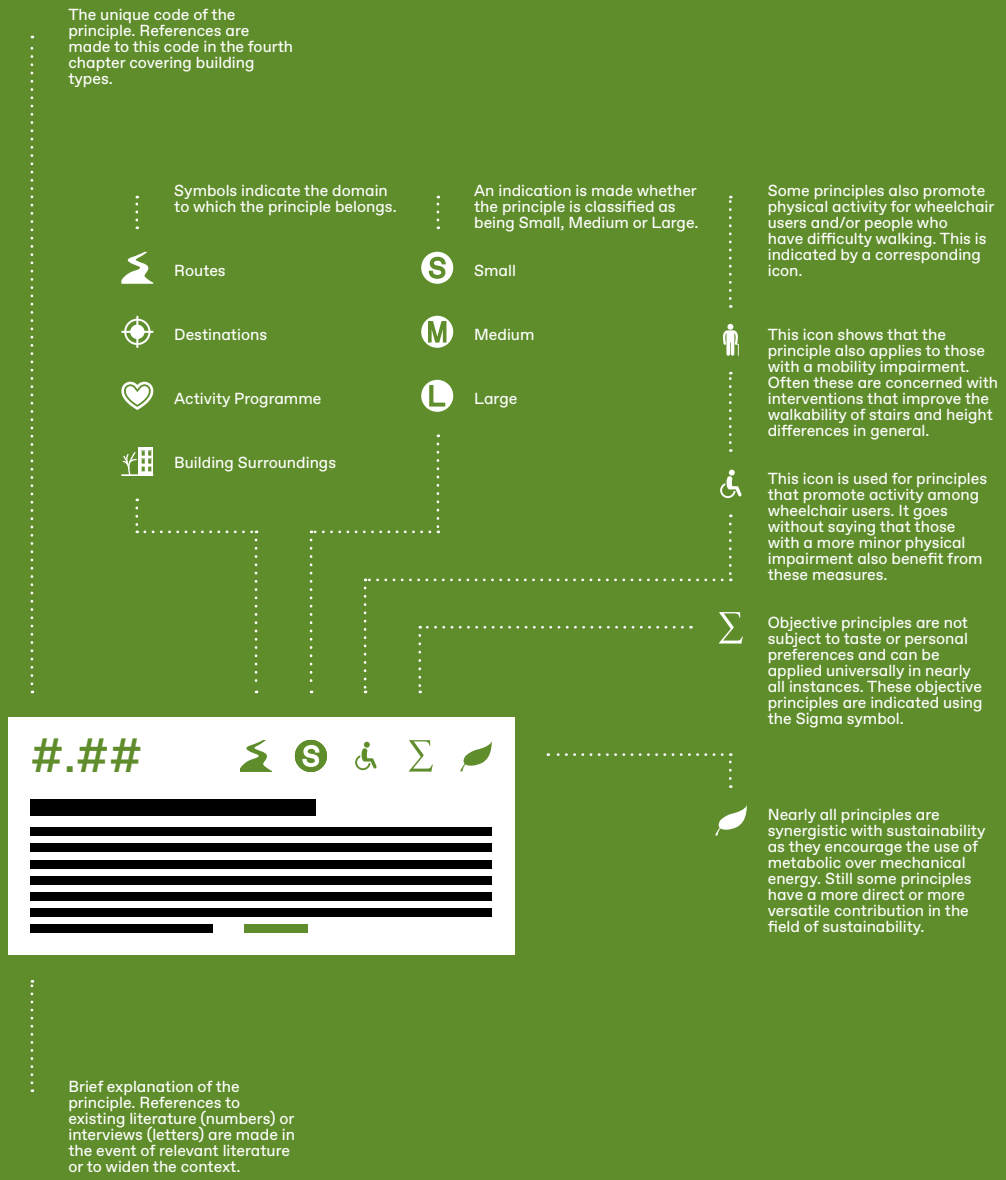
A large principle has a major influence on the building's structure and must therefore be incorporated into architect's earliest ideas. They determine the spatial organization of the building and include aspects such as the configuration of access systems, creating views within a building or combining Routes and Destinations.

The Toolkit and the Dutch Building Code

Bouwbesluit 2012 (the Dutch Building Code) determines to a large extent how buildings in the Netherlands can be configured. In the Toolkit some extra attention is given to the safety issues in the domains Routes and Destinations as these domains have a direct relationship with the emergency evacuation of a building. The points listed should be used as additional notes to the relevant articles of the building code.

TOOLKIT 'CARD' EXPLANATION

Each principle encouraging physical activity is described as a card and follows a fixed pattern.



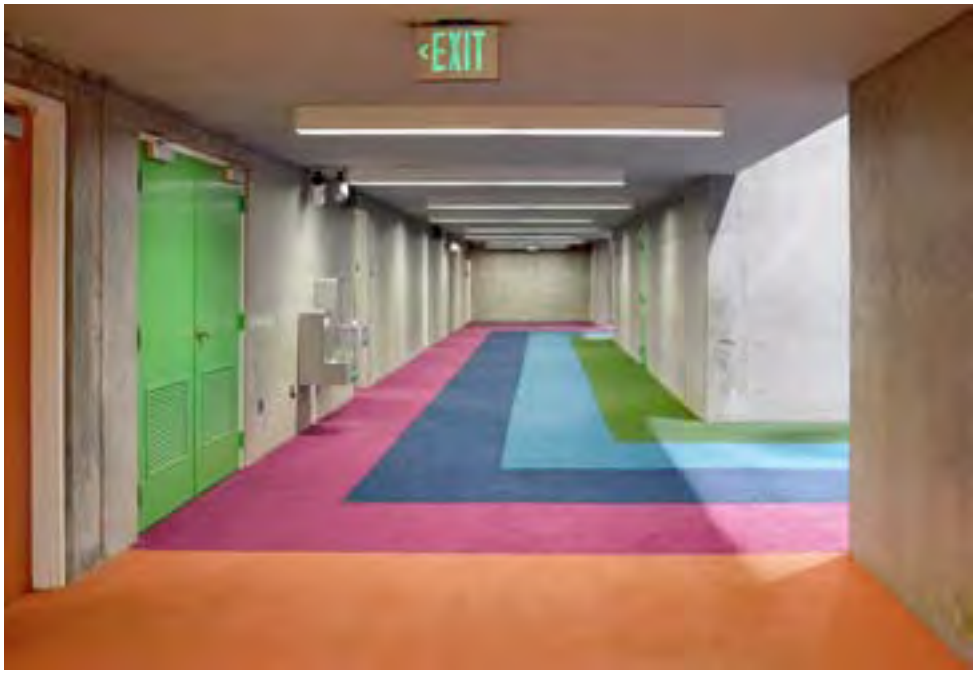
Index Toolkit

		routes	destinations	activity programme	building surroundings	small	medium	large	mobility impaired	wheelchair bound	sustainable	objective
1.01	senses ask to be stimulated	●				S						
1.02	make stairs as appealing as adjacent areas	●				S						
1.03	high-quality materials last longer	●				S						∑
1.04	safe staircases are used by more people	●				S			●			∑
1.05	well-lit stair environments are safer and more inviting	●				S			●			∑
1.06	signage encourages physical activity	●				S						
1.07	visible signage is effective	●				S						
1.08	a programmed elevator makes climbing stairs more favourable	●				S				●	●	∑
1.09	natural ventilation makes a welcome change	●					M					
1.10	curiosity evokes movement	●					M					
1.11	daylight attracts	●					M					
1.12	visible stair environments stimulate use	●					M		●			
1.13	hidden elevators are used less frequently	●					M			●	●	∑
1.14	wide stairs are more appealing	●					M		●			∑
1.15	stairs with a lower inclination are easier to climb	●					M		●			∑
1.16	horizontal variation enhances experience	●						L		●		
1.17	combining routes and destinations creates experience	●						L				
1.18	interior and exterior views are rewarding	●						L				
1.19	stairs near the entrance are more likely to be used	●						L			●	∑
1.20	stairs near the elevator are more likely to be used	●						L			●	∑
1.21	stairs on main routes are more likely to be used	●						L			●	∑
1.22	unique stair configurations invite use	●						L				
2.01	a variety of moods makes people move		●			S						
2.02	social hubs attract		●			S						
2.03	drinking fountains encourage short breaks		●			S					●	∑
2.04	centralization benefits activity and the environment		●			S					●	∑
2.05	keep distances reasonable and practical		●			S						
2.06	collective spaces attract		●				M					
2.07	grouping auxiliary functions generates social contact		●				M					
2.08	dispersal of auxiliary functions prompts physical activity		●				M					∑
2.09	unique building functions invite physical activity		●				M					∑
2.10	communal outdoor spaces form a destination		●				M					∑
2.11	entrance functions on alternate floors prompt movement		●					L				∑
2.12	combine destinations and routes		●					L				
2.13	place frequently used functions at a distance		●					L				∑
2.14	combine outdoor spaces and routes		●					L				
3.01	active furniture promotes health			●		S						∑
3.02	exercise equipment prompts physical activity			●		S						∑
3.03	activity spaces encourage physical activity			●				L				∑
3.04	visible activity spaces are more frequently used			●			M					
3.05	activity spaces with a view are more frequently used			●				L				
3.06	broadly oriented activity spaces are more frequently used			●			M					
3.07	changing rooms and showers encourage sports			●				L				∑
3.08	storage encourages sports			●				L	●		●	∑
4.01	variety and continuity encourage physical activity				●		M					
4.02	multiple entrances and transparency activate public space				●			L	●			
4.03	well integrated entrances generate movement between interior and exterior				●		M					
4.04	canopies and awnings provide shelter				●		M					∑
4.05	prevent adverse effects on liveability				●			L				∑
4.06	stairs and ramps act as a buffer between private and public spaces				●		M			●		∑
4.07	destinations in public space encourage physical activity				●	S						

Routes

Routes are the lines along which people move and combined they form the access system of a building. Programmed spaces are strung together by a system of entrances, corridors, staircases and elevators. People already move along these lines, so principles in this area are mainly aimed towards increasing physical activity and intensity of use. The access system focuses on walking, the most common physical activity. With universal accessibility in mind, stairs with fewer steps per flight and/or ramps also lead to an increase in physical activity among the physically impaired.

The design of individual building elements such as stairs and corridors can promote physical activity, depending on spatial and aesthetic quality, accessibility, safety and comfort. Meanwhile the emphasis on escalators and elevators, but also barriers such as closed doors can have an adverse effect on movement. Attractive routes lead to both a higher frequency and a longer duration of use.



Routes: Small Principles

The interior finishing of a building is the first line capable of providing building users with sensory impulses. It offers a simple means to encourage a user to engage in physical activity. Small principles in routes are matters which should preferably be incorporated into a building's design to maintain a certain degree of consistency in the experience throughout the building. Yet many concepts can also be applied in the operational phase as they have no direct effect on the building's structure.

1.01

SENSES ASK TO BE STIMULATED

The probability of sensory stimuli attracts use. Stimulate the senses along routes through the use of colour, pleasant materials, art, music and plants. Note that objects in stairwells must be virtually non-combustible and should not obstruct the escape route. (14) (18) (A) (C) (D)

1.02

MAKE STAIRS AS APPEALING AS ADJACENT AREAS

Ensure continuity of experience between stairs and adjacent areas through consistent quality in the finishing of walls, floors, stairs, and of the lighting. This makes stair environments hierarchically more equivalent to adjacent travel and living/working/learning locations, increasing the likelihood that they will be used. For example, utilize warm materials or fresh, energizing colours to invite use. (14) (22)

1.03

HIGH-QUALITY MATERIALS LAST LONGER

Stair environments are often overlooked when a building is upgraded during its operational phase. Use therefore durable, high-quality materials that are easy to clean and vandal-proof. This makes stair environments easier to maintain and more pleasant to use. (14)

1.04

SAFE STAIRCASES ARE USED BY MORE PEOPLE

Use slip-resistant materials for stair treads and colour contrast for tread nosing. Reducing the risk of falling will encourage stair use among the physically impaired. (14)

1.05

WELL-LIT STAIR ENVIRONMENTS ARE SAFER AND MORE INVITING

People are attracted to light. Make sure the illumination of stair environments is at least 75% of levels in adjacent areas, with a minimum of 100 lux. By comparison, the Dutch Building Code requires at least 1 lux on stair treads to ensure safety along escape routes. (14) (22) (C)

1.06

SIGNAGE ENCOURAGES PHYSICAL ACTIVITY

Install signage that points out the benefits of taking the stairs so that users are less likely to take the elevator. Provide information about pedestrian routes and facilities in and around the building. Place distance markers so users can set personal goals and estimate the amount of physical activity in their daily routine. Present information in a way that reflects the cultural and linguistic background of the building users. (14) (22) (A)

1.07

VISIBLE SIGNAGE IS EFFECTIVE

Make sure motivational signs are clearly visible and positioned near the elevator to influence the users' decisions. These can include signs mounted on a wall or suspended from the ceiling, or footprint decals on the floor to guide elevator users to the stairs. (14) (A)

1.08

A PROGRAMMED ELEVATOR MAKES CLIMBING STAIRS MORE FAVOURABLE

Programming an elevator can encourage users to take the stairs as longer waiting times do not weigh up to walking a flight of stairs. Program the elevators so they do not automatically return to the ground floor and/or do not rest with their doors open. Reduce the speed at which elevators' doors open and close; this also promotes accessibility for people with restricted mobility. (14)

Small Routes and the Building Code

> Pay particular attention to requirements regarding the combustibility of materials in stairwells and on escape routes.

> Attention should also be paid to the placement of objects in or near escape routes which might restrict egress capacity.

> The Dutch Building Code requirements with respect to the illumination of escape routes are very minimal and fall short on user comfort and spatial quality.

Routes: Medium Principles

Having considered the finishing of a route, this deeper category of principles involves the form and configuration of the route. Medium principles relate to the design and orientation of corridors, stair environments, hallways and elevators.

1.09

NATURAL VENTILATION MAKES A WELCOME CHANGE

Natural ventilation in stairwells can provide a differentiated and pleasantly perceived interior climate, boosting the appeal of a stair environment. In buildings with mechanical ventilation, natural ventilation can also provide a pleasant change in perceived levels of noise and air quality. (22)

1.10

CURIOSITY EVOKES MOVEMENT

Human beings are curious in nature. Configure routes in such a way that people's curiosity is aroused, even in spaces that are frequented daily. This can be achieved by either showing or concealing elements from view. Horizontal and vertical variation provides an ever-changing sensory experience and will stimulate the user. (21) (19)

1.11

DAYLIGHT ATTRACTS

Human beings instinctively love the outdoors and are drawn towards daylight. Configure routes that run to and from sources of daylight. These will often be points that offer a view of some kind, providing a natural reward for engaging in physical activity. (C)

1.12

VISIBLE STAIR ENVIRONMENTS STIMULATE USE

Fire stairs in particular are often not visible from a building's main spaces because they are encased in opaque fire-resistant material. Replacing this with transparent materials such as fire-resistant glass makes a stair environment visible and encourages stair use. Open staircases between floors (within a single fire compartment) are another way to increase stair use. (14)

1.13

HIDDEN ELEVATORS ARE USED LESS FREQUENTLY

Make elevators subordinate to stairs. Ensure the elevator is not directly visible upon entering the building, for example by placing the elevator entrance at a ninety degree angle. Remember to use signage to guide physically challenged users to the elevator. (14) (22)

1.14

WIDE STAIRS ARE MORE APPEALING

Research indicates that wider staircases are more frequently used. Stairs wider than 120 cm can accommodate people travelling in two directions. Wider stairs make it possible to walk side by side, turning the staircase into a place for social interaction. (14) (23)

1.15

STAIRS WITH A LOWER INCLINATION ARE EASIER TO CLIMB

Stairs with fewer steps per flight are not only more pleasant to climb; they are also safer and more accessible. Research indicates that the ideal stair ratio is approximately 30 degrees. A riser of approx. 17 cm and a tread of approx. 29 cm results in 10 cal. being burned per kg/m. Provide landings at regular intervals to give physically challenged users an opportunity to rest. (14) (23)

Medium Routes and the Building Code

> The Building Code sets minimum requirements for the dimensions of stairs, including measurements for risers and treads, and the height between landings. These requirements represent the lower limit with regard to safety and are not optimal from an ergonomic perspective.

> Interventions that involve making stairs wider or less steep, or the addition of more landings, can improve evacuation capacity and boost accessibility in a building.

> Increasing the visibility of stairs promotes their use. This also familiarizes users with the escape routes in a building. Although not measurable in the Buildings Code, frequent stair use has a favourable effect on safety in the event of an emergency.

> In the interests of smoke control, some emergency stairwells are pressurized relative to the surrounding spaces. In such cases, special requirements apply and the stairwells cannot be ventilated naturally.

Routes: Large Principles

The application of a Large principle to a Route has an impact on the building's structure and is usually incorporated into the very first ideas for a building. These are often principles that add a rich experience to a route and therefore offer a considerable reward for engaging in physical activity. Given their largely fundamental character, they will have a defining impact on the architecture of the building.

1.16

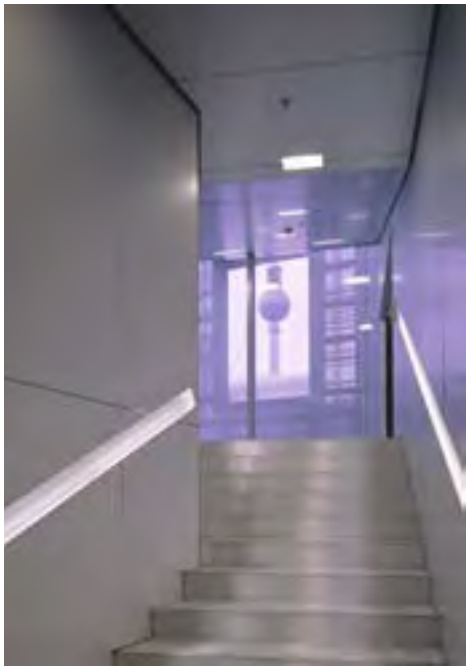
HORIZONTAL VARIATION ENHANCES EXPERIENCE

Long, straight corridors are less likely to evoke activity than routes that feature spatial variety between adjacent sections. Ensure that horizontal routes feature spatial variation. (1) (19)

1.17

COMBINING ROUTES AND DESTINATIONS CREATES EXPERIENCE

A route that takes users past several destinations in a building offers a heightened experience and is more likely to be used. The differentiation and variety of programme, activity, and/or living/working/learning locations also increases the probability of human interaction.



1.18

INTERIOR AND EXTERIOR VIEWS ARE REWARDING

Incorporate interesting views along the route to reward the user and promote movement. These may be internal views, views of buildings or green spaces in the immediate vicinity, or views of social activity. (1) (19)

1.19

STAIRS NEAR THE ENTRANCE ARE MORE LIKELY TO BE USED

Research indicates that stairs are more likely to be used if they are located within 7.5 metres of the entrance. (14) (22)

1.20

STAIRS NEAR THE ELEVATOR ARE MORE LIKELY TO BE USED

While waiting for the elevator, users may decide that taking the stairs is a more favourable choice. The visual and physical proximity of the staircase to the elevator makes the choice easier in such an event. (14)

1.21

STAIRS ON MAIN ROUTES ARE MORE LIKELY TO BE USED

Ensure that staircases form an integral part of the building's main access routes. Ensure that stairs are an extension of commonly used areas, such as entrances and walkways. Appealing stairs, clearly visible from elevator waiting areas, entrances and frequently used horizontal access routes are more likely to encourage daily use. (14)

1.22

UNIQUE STAIR CONFIGURATIONS INVITE USE

Use striking staircase configurations to encourage stair use. Think of a grand, sculptural staircase in a central atrium. In less spacious settings, loving use of detail in stair design can attract use. (14)

Large Routes and the Building Code

> When programming Routes, it is important to ensure that escape routes are not obstructed.

> Exceptionally wide staircases should take the need for additional handrails into account.

> Up to a floor height of 8 metres above ground level, less stringent requirements apply to escape routes. Beyond 8 metres, more stringent requirements apply.

> With a view to smoke control, it is often favourable to opt for routes (especially escape routes) that pass through the open air.

Destinations

Destinations are attractive or useful building functions that form a focal point for physical activity. They may relate to a building's main or auxiliary functions. In an office building, a destination might be anything from a toilet to a workstation; in a residential building it could be an apartment or a central garden. In a school it might be the gym or a corridor containing lockers.

Dispersing destinations strategically throughout a building increases physical activity by requiring users to frequently travel short distances on a daily basis. It is important to make walking a pleasant experience: the travel distance should not be excessive and the route must be perceived as rewarding.

Destinations: Small Principles

A Small principle in relation to destinations is usually reversible and easy to apply, even in the operational phase of a building. Mobile and fixed furniture, colour and/or materials can be instrumental in defining the atmosphere of a place and thereby attract users. Offering a variety of moods and/or destinations makes it attractive to incorporate more physical activity into the daily routine.

2.01

A VARIETY OF MOODS MAKES PEOPLE MOVE

Humans love variety and seek out a range of moods during the course of a day. By offering a variety of activities and environments, a building can encourage physical activity. The use of various colour schemes or lighting tones (natural vs artificial, warm vs cold, strong vs weak, energizing vs relaxing) also creates differentiation. Activity is encouraged through an alternation between activity and relaxation, and individual or collective activity. (C)

2.02

SOCIAL HUBS ATTRACT

Human beings are social in nature and are attracted to places that offer the potential for social exchange. These are often informal locations in the vicinity of main routes. Structure and furnish spaces in such a way that personal interaction is promoted over the use of smart phones or other electronic devices. (14)

2.03

DRINKING FOUNTAINS ENCOURAGE SHORT BREAKS

Drinking is a basic human need. However people tend not to drink enough water, especially at work. Placing drinking fountains or water refilling stations at various points in a building invites the taking of short breaks. (14) (22)

2.04

CENTRALIZATION BENEFITS ACTIVITY AND THE ENVIRONMENT

Consider centralizing some functions. Why not provide a central, well-ventilated print and photocopy room instead of printers on every desk? This not only promotes movement to and from the central facility but can lead people to print less, and it offers the ability to remove occasionally harmful emissions. Another option could be a central recycling station instead of wastepaper baskets under each desk. This would not only encourage activity, it also offers an opportunity for waste separation and the promotion of awareness.

2.05

KEEP DISTANCES REASONABLE AND PRACTICAL

Auxiliary destinations can be distributed throughout a building and can therefore promote physical activity. However, human beings are pragmatic: the effort must be proportionate to the objective. If users have to walk too far to deposit an apple core in a recycling station, waste paper baskets will reappear under every desk in no time.

Small Destinations and the Building Code

> As soon as a space is likely to be used more intensively, the requirements applied to the space itself and the adjacent escape routes will become more stringent.

> The maximum egress distance through an as yet undefined space (e.g. a flexible space or one awaiting layout) must be multiplied by 1.5.

Destinations: Medium Principles

The application of a Medium principle in Destinations involves the strategic modification of the layout of a building. Dispersing destinations throughout a building creates walking distance in between daily destinations. The routes between destinations should be a design focus to ensure that this physical activity is perceived as pleasant and rewarding. The distance should not be so long that it becomes frustrating: users will come up with other means to an end.

2.06

COLLECTIVE SPACES ATTRACT

Consider introducing collective functions into a building. For instance, a shared laundry room, kitchen or gym may constitute an attractive destination in a residential building. In addition to creating a goal, adding such a function may benefit social contact and the amenity level in a building. (14)

2.07

GROUPING AUXILIARY FUNCTIONS GENERATES SOCIAL CONTACT

Grouping frequently used functions provides a reason to take a break with colleagues, neighbours or classmates. Such clustering encourages social exchange: an important focal point for movement.

2.08

DISPERSING AUXILIARY FUNCTIONS PROMPTS PHYSICAL ACTIVITY

Auxiliary functions can also be dispersed in order to prompt physical activity. The strategic positioning of toilets, cafeterias, photocopy and print rooms, mailrooms and laundry rooms at pleasant distances from the apartment, workstation or classroom provides opportunities for a brief stroll. (14)

2.09

UNIQUE BUILDING FUNCTIONS INVITE PHYSICAL ACTIVITY

Consider allocating space for special functions such as newsstands, small shops that sell healthy food, and other functions which can form a focal point for movement. (14)

2.10

COMMUNAL OUTDOOR SPACES FORM A DESTINATION

Communal outdoor spaces such as rooftops and courtyards are all too often cut off from the rest of a building system. Elemental interventions can transform such spaces into an attractive destination. Make sure that users are aware of these destinations by making them visible and/or announcing them through signage.

Medium Destinations and the Building Code

> Features located in different fire compartments are often divided by fire separations. If certain functions are closely related, it is advisable to locate them in the same compartment.

Destinations: Large Principles

The application of a Large principle to Destinations involves the thorough contemplation about how the allocation of building programme contributes to physical activity. Major attractors are placed in opposite ends of the building, and a concerted effort is made to combine destinations and routes. This combination creates a rich experience throughout the entire building and encourages the user to move throughout.

2.11

ENTRANCE FUNCTIONS ON ALTERNATE FLOORS PROMPT MOVEMENT

Consider accommodating primary entrance features on another floor. Make sure that this floor has a direct spatial relationship with the entrance and easy access via a generously proportioned staircase and a less prominent elevator. This frees up space near the entrance for other functions and/or activities. (14)

2.12

COMBINE DESTINATIONS AND ROUTES

Attractive destinations are more likely to be used if they are accessed by high-quality routes. The combination of routes and destinations in a single system enhances the spatial experience of a building and increases the probability of human interaction.

2.13

PLACE FREQUENTLY USED FUNCTIONS AT A DISTANCE

Consider placing frequently used, irreplaceable functions at a greater walking distance from living/working/learning spaces in the building. Examples include gyms or meeting rooms.

2.14

COMBINE OUTDOOR SPACES AND ROUTES

Communal outdoor spaces are potential focal points for movement. Make sure these spaces border directly on routes and offer a pleasant environment, for example by incorporating seating and/or plants.

Large Destinations and the Building Code

> The Building Code stipulates accessibility for the physically challenged. Make sure that as many destinations as possible are accessible for wheelchair users or people who have difficulty walking.

Activity Programme

Activity Programme is the collective name for spaces or furnishing that directly contribute to increased physical activity. These include gyms, swimming pools, gymnasiums and multifunctional spaces, in addition to bicycle parking and showers. Active furniture, such as height-adjustable desks, also stimulates movement, encourages people to change position and contributes to mental wellbeing. (22)

3.01

ACTIVE FURNITURE PROMOTES HEALTH

Although research has shown prolonged sitting to be unhealthy, we still carry out most of our daily activities in a sedentary position. When socializing we often sit and talk with friends, when we could just as easily stand at the kitchen counter. In the working environment, it is worth considering solutions like standing desks with ergonomic stools next to the usual desks and chairs. Furniture differentiation in general ensures more movement. (14) (22)

3.02

EXERCISE EQUIPMENT PROMPTS PHYSICAL ACTIVITY

Climbing frames or exercising equipment in general invite young and old to engage in physical exercise. Incorporate such elements into the design of indoor and outdoor communal spaces. (14) (22)

3.03

ACTIVITY SPACES ENCOURAGE PHYSICAL ACTIVITY

The presence of communal spaces designed specifically for physical activity (e.g. exercise, play and multipurpose recreation) increases the likelihood that the users of public buildings, offices and residential blocks will engage in sports activities. Lower income groups in particular have less access to private activity spaces and these are precisely the demographic groups where inactivity and obesity are more prevalent. (7) (14)

3.04

VISIBLE ACTIVITY SPACES ARE MORE FREQUENTLY USED

Ensure that activity spaces are visible from central locations or routes, in and around a building. Awareness of these spaces increases the likelihood that they will be used. Central information on facilities, group activities and their availability can motivate and encourage users to participate. (14) (22)

3.05

ACTIVITY SPACES WITH A VIEW ARE MORE FREQUENTLY USED

Research indicates that exercise is perceived as pleasant when it takes place in spaces with a view of other human activities or the natural surroundings. (14)

3.06

BROADLY ORIENTED ACTIVITY SPACES ARE MORE FREQUENTLY USED

Designing activity spaces for a range of target groups increases the likelihood that they will be used. For example, it is advisable to take small children into account when designing activity spaces. Locating a playroom next to a gym allows parents to exercise while keeping an eye on their (actively) playing children. (14)

3.07

CHANGING ROOMS AND SHOWERS ENCOURAGE SPORTS

The presence of showers and changing rooms encourages physical activity. Knowing they can take a shower and change clothes makes people more inclined to cycle, walk or run to and from work, or to be active during their lunch break. These facilities can be incorporated in a building's activity spaces or in a toilet block on the ground floor. (14) (22)

3.08

STORAGE ENCOURAGES SPORTS

Secure and accessible bicycle parking near the ground floor encourages the daily commuter to cycle to work. In residential buildings, additional storage space makes bulkier sports equipment such as kayaks or surfboards easy to reach and use. In buildings with older users, it is advisable to fit electrical sockets for e-bikes in the bicycle parking area. (14) (22)

Building Surroundings

Buildings have an impact on their immediate surroundings, amongst others due to their use, materiality, massing, and due to their shadow effects. A building's exterior and application of the human scale can directly and indirectly contribute to the walkability of public space.

Research indicates, for example, that variations in activity in the façade contribute to a feeling of safety around a building. Incorporating awnings and stairs in a building's exterior can also contribute directly to physical activity in the public space and tp the accessibility of the building. (14) (21)

4.01

VARIETY AND CONTINUITY
ENCOURAGE PHYSICAL ACTIVITY

The programming and detailing of the two lowest floors are key to achieving an attractive pedestrian environment. Moreover 'eyes on the street' provide a sense of security in public space. (1) (14)

4.02

MULTIPLE ENTRANCES AND TRANSPARENCY ACTIVATE PUBLIC SPACE

An activated public space is more pleasant to wander through. The use of multiple entrances generates activity at street level and contributes to accessibility and experience on a human scale. In lower density areas, sidewalk cafés, porches and wide pavements can facilitate social exchange and foster a feeling of safety. These factors also make a significant contribution to the character of a neighbourhood or street. (14)

4.03

WELL INTEGRATED ENTRANCES GENERATE MOVEMENT BETWEEN INTERIOR AND EXTERIOR

Position entrances and openings in such a way that contact with the surrounding urban fabric is maximised. Good connections between indoors and outdoors will encourage movement in between. (21)

4.04

CANOPIES AND AWNINGS PROVIDE SHELTER

Canopies and awnings encourage physical activity by providing shelter from bad weather or shade from the sun. A covered outdoor space can provide shelter while waiting briefly on the sidewalk, strolling around the building or can also offer protection from adverse wind conditions (the downdraught effect) around high-rise buildings. (14)

4.05

PREVENT ADVERSE EFFECTS ON LIVEABILITY

Pedestrians do not like having to walk in the shadow or being buffeted by sudden gusts of wind. Try to prevent or at least take account of the adverse effects of building on a large scale (e.g. shadow, downdraughts) during the design phase. (14) (21)

4.06

STAIRS AND RAMPS ACT AS A BUFFER BETWEEN PRIVATE AND PUBLIC SPACES

In residential buildings, exterior stairs and short ramps can provide a welcome zone in between the private and public realms. Ramps also make buildings more accessible to people with a disability. (14) (21)

4.07

DESTINATIONS IN PUBLIC SPACE ENCOURAGE PHYSICAL ACTIVITY

Add an external destination if part of the plot remains undeveloped. Examples include a bench, a drinking fountain or clusters of easy-to-move tables and chairs. Elements such as a water feature, a garden or a work of art can similarly contribute to physical activity in public spaces. (14) (21) (22)

Toolkit and Building Types

Along the lines of the four domains of physical activity, the *Toolkit* deals with how individual active design principles can stimulate physical activity. By way of inspiration, the Toolkit principles have been applied to four different building types.

This application results in an (incomplete) list of practical interventions for buildings. It goes without saying that all Toolkit principles remain just as relevant, hence the references to Toolkit principles with every intervention. This chapter primarily deals with building-type-specific elaborations of active design.

High-rise

Residential Block

School

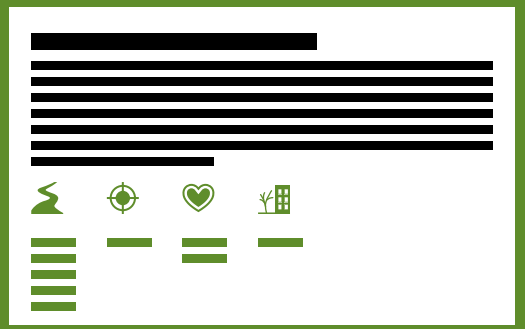
Office Building

INTERVENTION ‘CARD’ EXPLANATION

The building types are dealt with in a way that is comparable to the Toolkit section. Individual interventions are discussed along the lines of the four domains of activity. To expand the context, references are made back to relevant Toolkit principles. Each intervention is walked through in a fixed pattern.

Brief explanation of the intervention in relation to the building type.

The explanations are related to the Toolkit. Per domain, a list of Toolkit principles is given which underlie the intervention.



Building Types and the Building Code

Each building type is briefly outlined in relation to the Building Code. Since it is impossible to summarize all aspects of the regulations in this document, we only include the main issues most likely to have a major impact on implementing active design in the different building types.

Index High-rise

ROUTES IN HIGH-RISE BUILDINGS

> access bottom floors through a grand staircase
> use elevators strategically
> make stairwells pleasant and visible
> connect related floors to each other
> provide roof access
> vary routes in terms of configuration and perception
> avoid fire-escape routes on the ground floor

DESTINATIONS IN HIGH-RISE BUILDINGS

> concentrate building functions
> place entrance functions on the first floor
> introduce new functions or relocate existing ones
> introduce destinations within floor clusters
> make the rooftop attractive

ACTIVITY PROGRAMME IN HIGH-RISE BUILDINGS

> make activity spaces attractive and visible
> provide visible information
> create activity spaces for various target groups
> provide storage space and bicycle parking

BUILDING SURROUNDINGS IN HIGH-RISE BUILDINGS

> distinctive street-level frontage
> orient the building towards its surroundings
> provide shelter using awnings and canopies
> make entrances numerous and transparent
> use active design for the surrounding area
> introduce attractive urban functions

Index Residential Block

ROUTES IN RESIDENTIAL BLOCKS

> ensure entrances connect and are transparent
> make unique staircases with loving use of detail
> make stairwells feel like the outdoors
> make basement areas attractive
> combine stairwells and intermediate destinations
> ensure that access corridors contribute to quality

DESTINATIONS IN RESIDENTIAL BLOCKS

> make the roof accessible with attractive programme
> introduce intermediate destinations
> make the basement attractive
> make the courtyard attractive

ACTIVE PROGRAMME IN RESIDENTIAL BLOCKS

> make activity spaces attractive and visible
> provide visible information
> create activity spaces for various target groups
> create storage space and bicycle parking
> use the courtyard as activity space

BUILDING SURROUNDINGS IN RESIDENTIAL BLOCKS

> tune the number of entrances to the surrounding area
> make the detailing of street-level frontages unique
> ensure ‘eyes on the street’
> make the courtyard semi-public
> introduce attractive urban functions

Index School

ROUTES IN SCHOOLS

> make routes appeal to the senses
> use access systems as differentiated space
> provide multiple use in access spaces
> make the access system encourage social exchange

DESTINATIONS IN SCHOOLS

> strategically position destinations in the building
> turn the roof into a unique destination
> turn the access system into a destination
> ensure destinations are pleasant places to linger
> strategically disperse auxiliary functions
> surround auxiliary functions with quality
> place indispensable destinations at a distance

ACTIVE PROGRAMME IN SCHOOLS

> encourage active play in children
> turn the gymnasium into a prominent feature
> provide secure bicycle parking
> add markings to playgrounds
> provide additional storage space

BUILDING SURROUNDINGS IN SCHOOLS

> open up the school to the neighbourhood
> design the open space for a variety of ages
> tune school and surroundings to one another
> make bicycle parking visible

Index Office Building

ROUTES IN OFFICE BUILDINGS

> ensure stairwells are transparent and attractive
> enhance the sensory appeal of routes
> provide (visual) connections between floors
> combine vertical and horizontal routes
> place auxiliary functions along routes

DESTINATIONS IN OFFICE BUILDINGS

> stimulate the mobile workplace
> introduce a variety of atmospheres
> provide spaces for resting
> disperse collective functions
> combine functions to create social spaces
> centralize functions
> add unique collective programme

ACTIVITY PROGRAMME IN OFFICE BUILDINGS

> encourage the active posture
> combine labour and activity
> encourage employees to cycle to work
> ensure that employees can take a shower
> make activity spaces attractive and visible
> provide visual information

BUILDING SURROUNDINGS IN OFFICE BUILDINGS

> avoid empty lots after office hours
> make entrances numerous and transparent
> introduce attractive urban functions

High-rise

As discussed earlier, the invention of the safe passenger elevator paved the way for high-rise buildings. While elevator use is at odds with increased physical activity, this does not mean high-rise buildings are unable to incorporate active design.

Opportunities in high-rise buildings do not primarily lie in attempting to transfer all daily vertical travel from the elevator to the stairs. Most users of high-rise buildings will always prefer the elevator for their daily vertical transport. The potential for physical activity lies mainly in increasing the frequency of activity by adding destinations to encourage movement within the building.

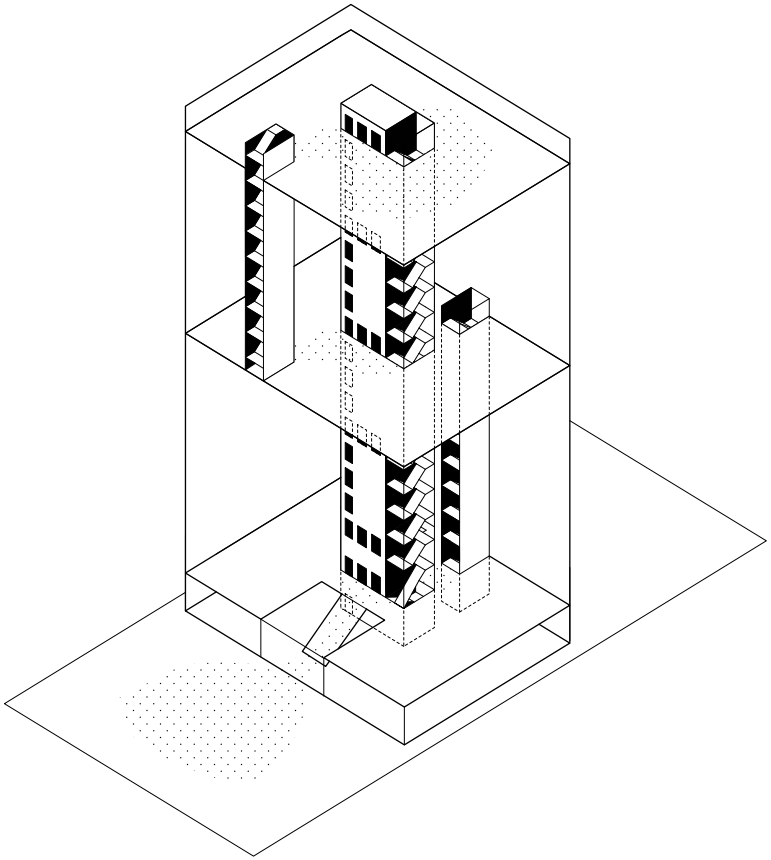
This means taking the so-called ‘climbing limit’ into account (approximately 4 floors) and allocating destinations accordingly. As an example, a constellation of floor clusters can be conceived, each containing a destination within walking distance.

Street-level façades have a special status in high rise buildings as nearly every user enters the building through a single entrance and lobby. The same applies to the roof zone of high-rise buildings: these spaces deserve special attention.

High-rise Buildings and the Building Code

> As a rule, the higher the building and the more people that depend on any given escape route, the more stringent the requirements set by the Building Code.

> Additional requirements apply to high-rise buildings (20 m and higher in The Netherlands) compared to lower buildings. From 70 m onwards, requirements become even more stringent and several emergency escape concepts become possible. More information can be found in the document *Handreiking voor Hoogbouw* (Guidelines for High-rise Buildings).



Routes in High-rise Buildings

ACCESS BOTTOM FLOORS THROUGH A GRAND STAIRCASE

For the first few floors, use an over-sized, open staircase and place the staircase within 7-8 metres from the main entrance.

1.12
1.13
1.14
1.19
1.22

2.05
2.11
2.12

3.03

MAKE STAIRWELLS PLEASANT AND VISIBLE

Use colour, transparency or signage to make stairwell doors visible. Make stairwells more pleasant using colour, light and possibly views onto access routes or other features of the building.

1.01
1.02
1.04
1.12
1.21

2.03
2.08
2.13
2.12

USE ELEVATORS STRATEGICALLY

In a group of elevators, program one elevator to stop on every floor and turn the remainder into express elevators that stop every four floors. This encourages users to take the stairs without sacrificing accessibility. This may also reduce the need for elevators, making the core of the building more compact.

1.06
1.07
1.08
1.20

CONNECT RELATED FLOORS TO EACH OTHER

Use open staircases to link floors that have a programmatic relationship.

1.01
1.12
1.14
1.15
1.22

2.06

3.04

AVOID FIRE-ESCAPE ROUTES ON THE GROUND FLOOR

Consider moving emergency escape routes from the ground floor to the basement. Keeping these enclosed routes underground and connecting them with ground level outside the building frees up ground floor space for alternate use.

1.12
1.16
1.17
1.18
1.21

4.02
4.03

VARY ROUTES IN TERMS OF CONFIGURATION AND PERCEPTION

Shift vertical routes in order to create variety and quality. For example, lead them along the façade or through an outdoor space.

1.01
1.05
1.11
1.12
1.18

2.01
2.06
2.04
2.10
2.13

3.05

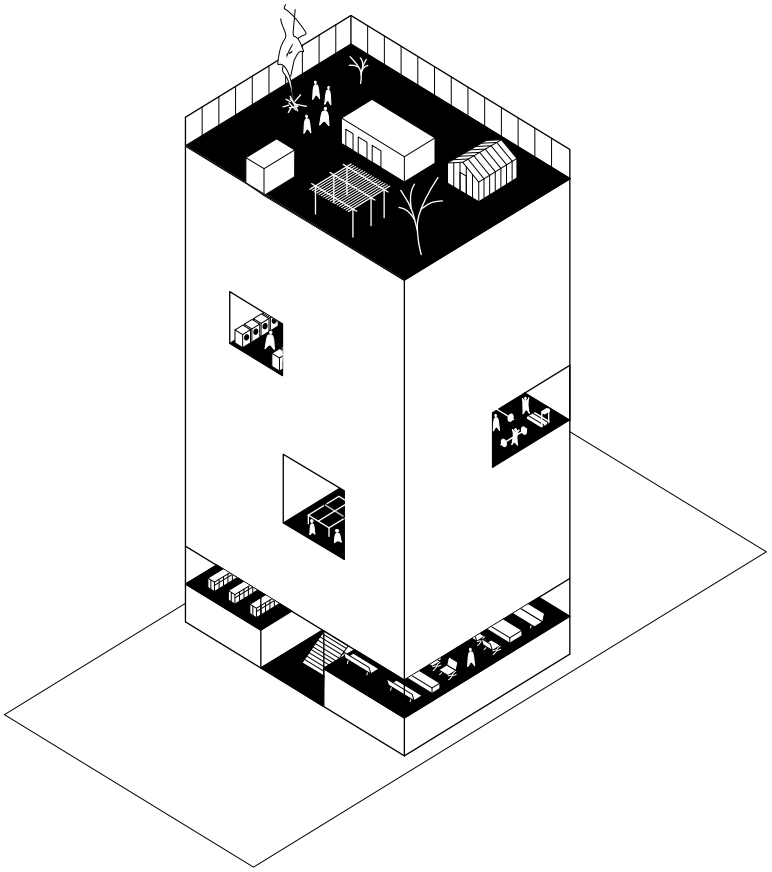
PROVIDE ROOF ACCESS

Extend staircases to the roof to provide access to rooftop destinations. Try to incorporate daylight from above to enhance the sensory experience inside the stairwell.

1.01
1.09
1.11
1.17
1.18

2.01
2.04
2.06
2.10
2.13

3.05



Destinations in High-rise Buildings

CONCENTRATE BUILDING FUNCTIONS

Group frequently used building functions such as mailboxes, laundry rooms and waste collection areas on a small number of floors (instead of on every floor) to encourage short walks.

1.17

2.02
2.04
2.06
2.07
2.08

3.03

PLACE ENTRANCE FUNCTIONS ON THE FIRST FLOOR

Consider locating entrance features on the first floor, with a grand open staircase providing access from the ground floor. This encourages short walks.

1.12
1.19

2.02
2.06
2.07
2.08
2.11

3.04
3.07

4.03
4.04

INTRODUCE NEW FUNCTIONS OR RELOCATE EXISTING ONES

Introduce special functions or remove them from the usual building programme. Examples are a central laundry room, a space to play snooker or table tennis, a gym, swimming pool or sauna. This not only promotes movement towards these destinations, it also boosts the amenity level of a building.

2.02
2.04
2.06
2.08
2.09

3.02
3.04
3.07

4.07

INTRODUCE DESTINATIONS WITHIN FLOOR CLUSTERS

Disperse elements of the joint programme throughout the building at distances of up to six floors. This way each floor has a destination within a walkable distance (1-3 floors).

1.12
1.13
1.14
1.20
1.21

2.06
2.08
2.09
2.10

3.03
3.05
3.07
3.08

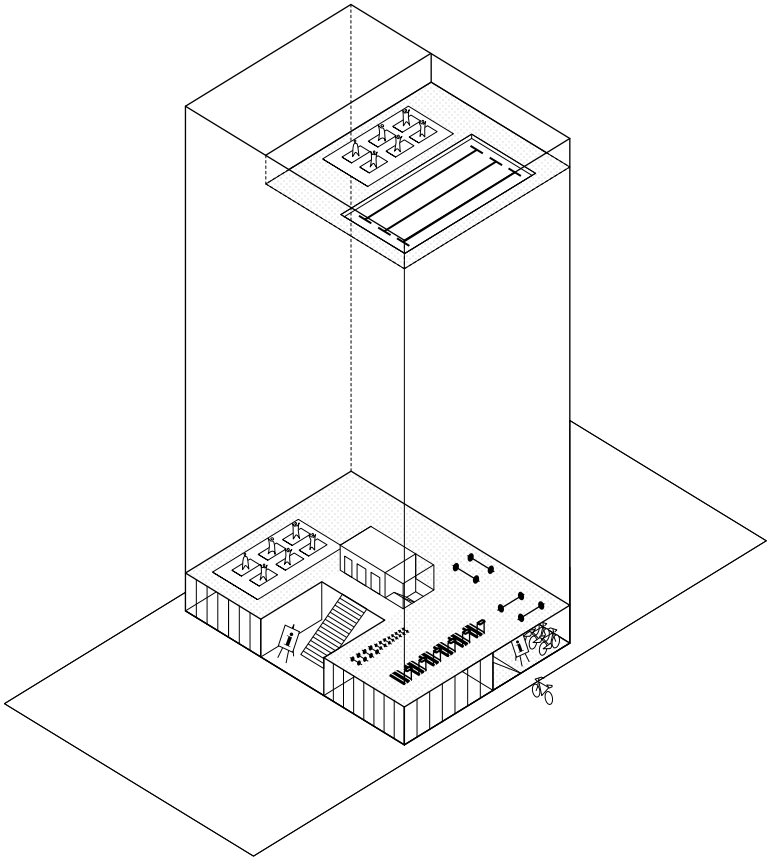
MAKE THE ROOFTOP ATTRACTIVE

Use the top floor and/or roof terrace as an attractive destination. Consider making these locations a site for communal programme, using the appeal of daylight, fresh air and views.

1.08
1.17
1.18

2.01
2.06
2.10
2.13

3.05
3.06



Activity Programme in High-rise Buildings

MAKE ACTIVITY SPACES ATTRACTIVE AND VISIBLE

Place gyms or activity spaces in visible places such as the first floor or the ground floor, with views onto the surrounding area. This underlines the presence of these functions and adds to the experience while exercising.

1.07	2.02	3.02	4-xx
	2.04	3.04	4-xx
	2.06	3.05	4-xx
	2.09	3.06	4-xx
	2.13		4-xx

CREATE ACTIVITY SPACES FOR VARIOUS TARGET GROUPS

Consider the various target groups who use the building when conceiving activities and designing activity spaces. The inclusive nature of activity spaces promotes use.

1.06	2.01	3.02	4.07
1.07	2.02	3.03	
	2.06	3.04	
	2.09		

PROVIDE VISIBLE INFORMATION

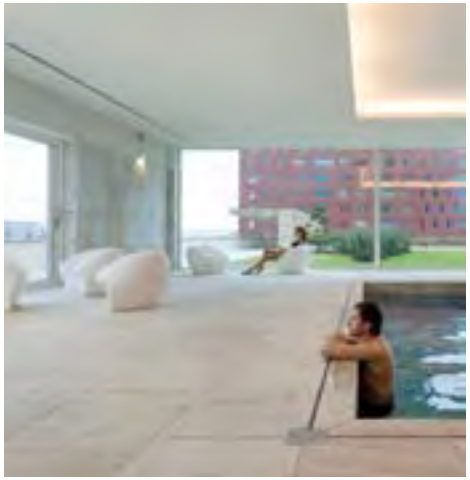
Provide central or digital information on the availability of sports facilities and any activity programmes in order to encourage users to exercise.

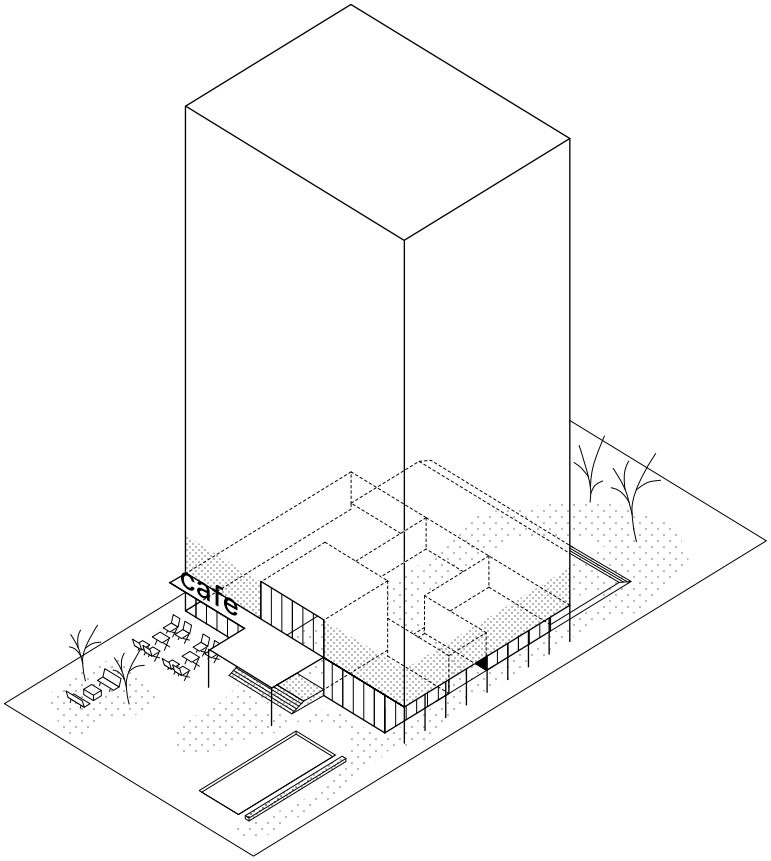
1.01	2.06	3.02	
1.06	2.09	3.03	
1.07		3.04	

PROVIDE STORAGE SPACE AND BICYCLE PARKING

Provide secure, sheltered bicycle parking near the ground floor. Tailor the number of e-bike sockets to the building's intended users. Consider creating storage space for bulky sports equipment. These facilities increase comfort for commuters and athletes.

	2.04	3.02	4.02
	2.05	3.07	4.03
		3.08	4.04
			4.05





Building Surroundings in High-rise Buildings

DISTINCTIVE STREET-LEVEL FRONTAGE

Pay extra attention to detailing the exterior and interior of street-level frontages and the main entrance. The entrance lobby is used by everyone in the building and determines the building's relationship with its surroundings.

1.01
1.03

2.10

3.04

4.01
4.02
4.03
4.04
4.05

ORIENT THE BUILDING TOWARDS ITS SURROUNDINGS

Respond to surrounding parks, squares, pavements and open spaces with the building's massing and position of entrances and exterior stairs. Make elements reinforce one another with a view to creating a pleasant walkable public space.

1.16
1.18
1.19
1.21
1.22

2.10
2.11

3.05
3.08

4.02
4.03
4.04
4.05
4.17

USE ACTIVE DESIGN FOR THE SURROUNDING AREA

Activate the square in front of the building by providing seating (mobile if possible), a water feature, art or landscaping. These elements constitute focal points for movement, but also offer a sensory stimulus beneficial for walking.

1.01
1.03
1.16

2.02
2.03
2.04
2.06
2.07

3.01
3.03
3.07
3.08

4.05
4.06
4.07

INTRODUCE ATTRACTIVE URBAN FUNCTIONS

Consider public programme for the ground floor, such as a newsstand, a grocery store or a nursery. This creates destinations for physical activity in the immediate vicinity and generates urban variety within the building.

1.10

2.01
2.02
2.09
2.13

3.03
3.06
3.08

4.01
4.02
4.03
4.07

MAKE ENTRANCES NUMEROUS AND TRANSPARENT

Create multiple, transparent entrances at street level to enhance the experience of the pedestrian area from inside, and of the entrance lobby from outside. This facilitates people flows around the building.

1.01
1.02
1.10
1.11
1.19

4.02
4.03

PROVIDE SHELTER USING AWNINGS AND CANOPIES

Ensure that entrances offer shelter from rain and wind (downdraught). Make these pleasant places to enter the building but also to linger for some time.

1.01
1.03

2.12
2.14

3.08

4.02
4.03
4.04
4.05

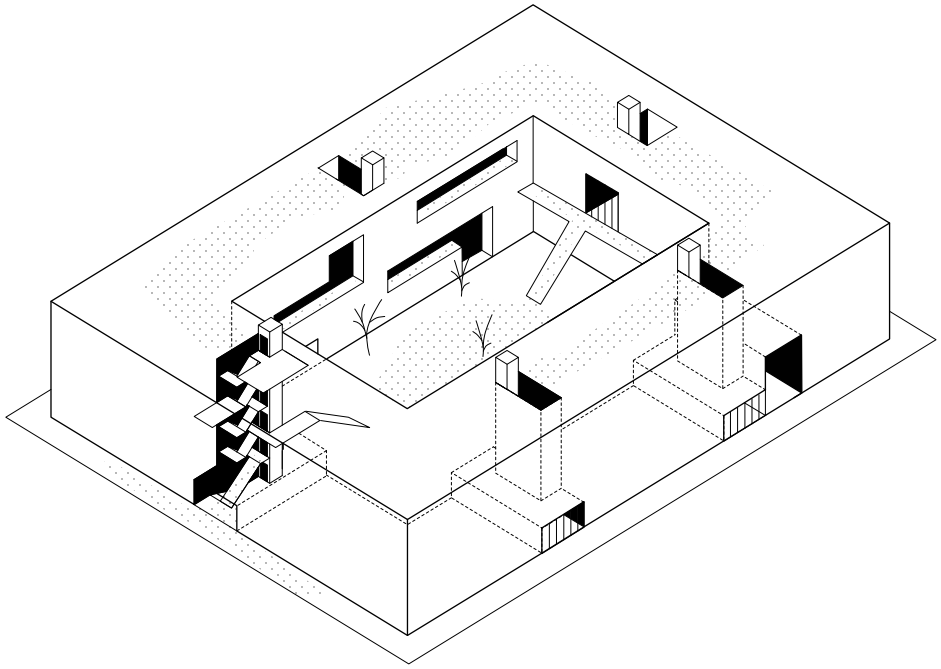
Residential Block

An urban residential block with 4-8 floors is a promising environment for physical activity through stair climbing, even to the upper floors. In contrast to high-rise buildings, most residential blocks have several small, often equally prominent entrance lobbies. An important feature of these entrances is how they connect several different features within walking distance: the sidewalk, the courtyard, the basement, the roof and the residential units in between.

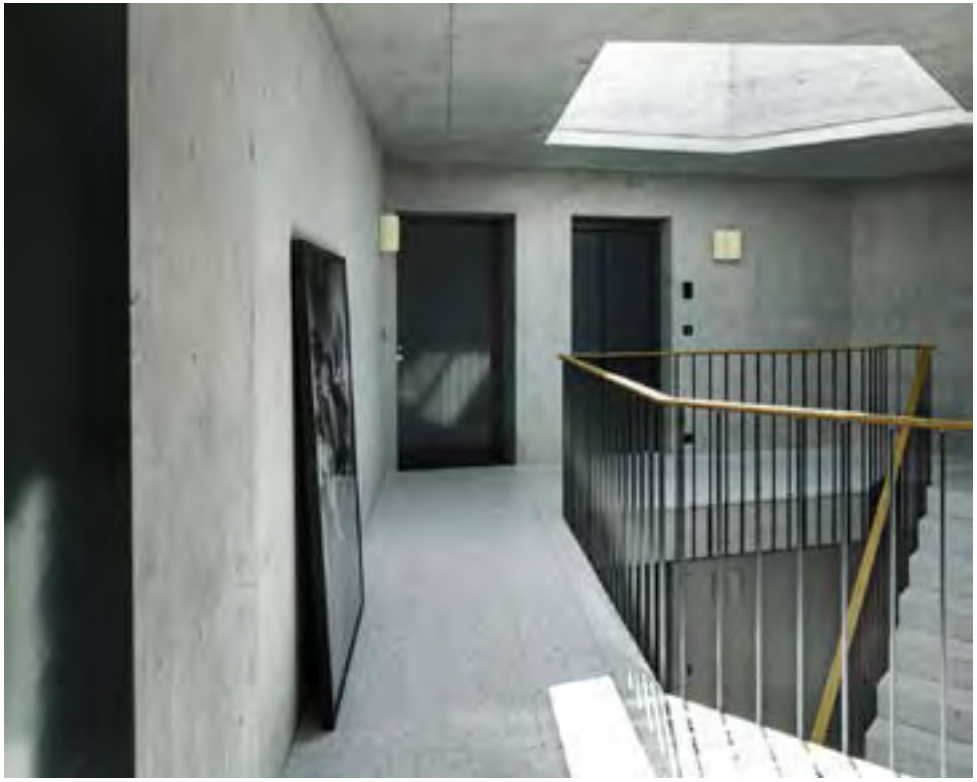
A residential block has a social and communal character. The dwelling units look out on one another and surround a (communcal) courtyard. The roof of a residential block is within sight and walking distance of every dwelling.

Residential Blocks and the Building Code

- The proportions of a residential block mean it can contain a multitude of access- and housing types. Even more than with high-rise buildings, it is possible to vary with access and egress concepts due to the proximity of outdoor space.
- If horizontal escape routes are also used for other functions, make sure that any objects do not obstruct the route.
- Open access up to 8 metres is possible, provided a second escape route is available for functions on higher floors, for example through the courtyard or leading to an adjacent building or stairwell.
- An escape route that leads to the roof is counterintuitive in an emergency and is therefore less desirable.



Routes in Residential Blocks



MAKE UNIQUE STAIRCASES WITH LOVING USE OF DETAIL

Design staircases to encourage use: focus on the design, the application of materials, lighting and colours. In this building type, the stairs should have the obvious preference over the elevator as the mode of everyday vertical transport.

1.01
1.03
1.10
1.14
1.22

2.01

4.01
4.06

MAKE STAIRWELLS FEEL LIKE THE OUTDOORS

Make unique stairwells by incorporating daylight from above. Placing a staircase along the façade creates opportunities to use daylight and views onto the surrounding area.

1.01
1.02
1.09
1.11
1.12

2.01
2.03

4.01

ENSURE ENTRANCES CONNECT AND ARE TRANSPARENT

The entrance is an important intersection between various routes and can encourage physical activity by establishing qualitative connections. It links the street with the courtyard and the roof with the basement. Try to make the entrance lobby transparent and open, both horizontally and vertically.

1.06	2.04	3.08	4.02
1.12	2.10	3.04	4.03
1.13	2.11		4.04
1.18	2.12		4.05
1.21	2.14		4.07

MAKE BASEMENT AREAS ATTRACTIVE

Create a pleasant route to the basement and try to incorporate daylight if possible. In this building type, the basement is a frequent destination because storage, bicycle parking and other auxiliary functions are located there.

1.05	2.01	3.05	
1.06	2.02		
1.07	2.07		
1.11	2.08		
	2.09		

ENSURE THAT ACCESS CORRIDORS CONTRIBUTE TO QUALITY

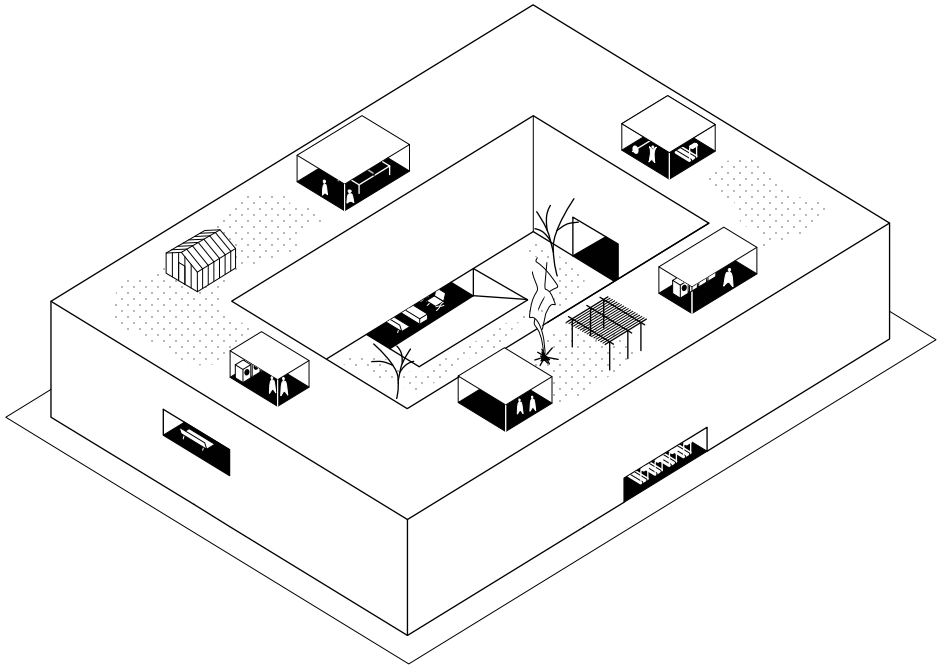
Access corridors are efficient but have the added risk that they are little more than circulation space and therefore tend to lack appeal. Focus on the design of corridor or split-level access systems. Consider using oversized dimensions to facilitate alternate use. Try to make the architecture contribute to the spatial quality of the courtyard.

1.02	2.10		4.01
1.03	2.12		4.05
1.12	2.14		
1.22			

COMBINE STAIRWELLS AND INTERMEDIATE DESTINATIONS

Try to enhance the experience in vertical routes. Consider programming vertical routes with adjacent collective functions.

1.02	2.01	3.03	
1.05	2.06	3.04	
1.11	2.08	3.06	
1.17	2.09		
1.18	2.12		



Destinations in Residential Blocks

MAKE THE ROOF ACCESSIBLE WITH ATTRACTIVE PROGRAMME

The roof can be an attractive destination as it is within walking distance of every end of the building. Make the roof accessible or part of communal programme.

1.01
1.09
1.10
1.11
1.18

2.01
2.04
2.06
2.09
2.10

3.03
3.05
3.06

INTRODUCE INTERMEDIATE DESTINATIONS

Try adding intermediate destinations to the heart of the building. These may include a communal reading area, a table-tennis room or a garden.

1.01
1.10
1.17
1.18

2.01
2.03
2.06
2.09
2.14

3.03
3.04
3.05

MAKE THE COURTYARD ATTRACTIVE

Turn the courtyard into a destination by granting access to the general public. Provide seating (mobile if possible), trees and other sources of shade, drinking fountains and possibly even sports equipment to encourage a multitude of use. Consider offering courtyard access not only from the ground floor but from other floors through stairs and/or ramps.

1.01
1.06
1.17

2.01
2.03
2.06
2.10
2.14

3.01
3.02
3.03
3.05
3.08

4.02
4.04
4.05
4.07

MAKE THE BASEMENT ATTRACTIVE

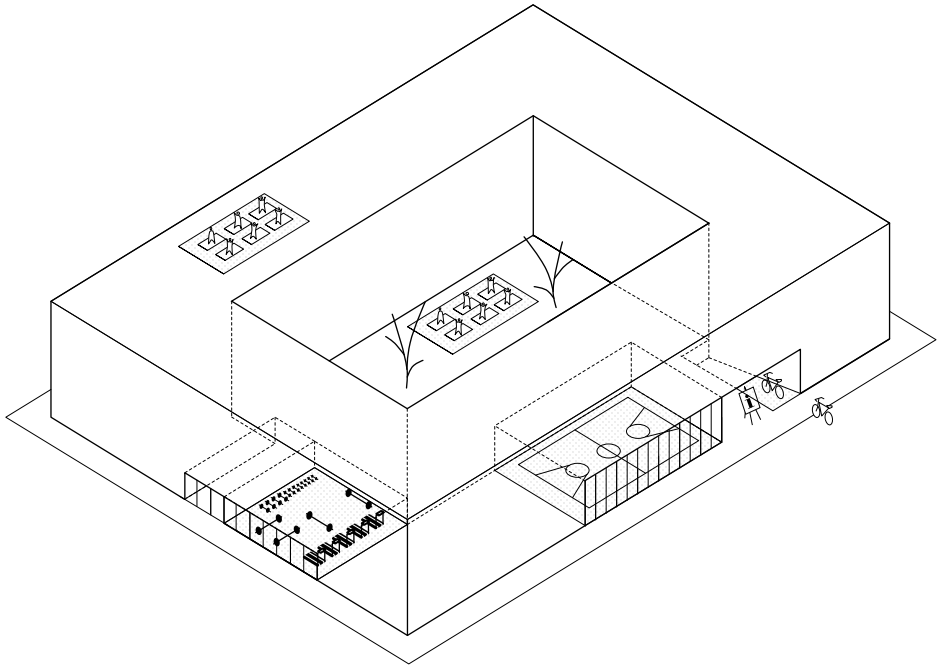
If there is a basement, try to make it a pleasant destination, for example by letting in daylight. The basement is often directly accessible from the entrance lobby and is therefore ideal for collective functions.

1.01
1.11
1.21

2.01
2.07
2.09
2.11
2.13

3.05
3.07
3.08

4.01



Activity Programme in Residential Blocks

MAKE ACTIVITY SPACES ATTRACTIVE AND VISIBLE

Place gyms or activity spaces in visible places such as the first floor or the ground floor, with views onto the courtyard and the street. This underlines the presence of these functions and adds to the experience while exercising.

1.01
1.10
2.06
3.03
3.04
3.05
4.02

CREATE STORAGE SPACE AND BICYCLE PARKING

Provide secure, sheltered bicycle parking near the ground floor. Tailor the number of e-bike sockets to the building's intended users. Consider creating storage space for bulky sports equipment. These facilities increase comfort for commuters and athletes.

3.07
3.08

PROVIDE VISIBLE INFORMATION

Provide central or digital information on the availability of sports facilities and any activity programmes in order to encourage users to exercise.

1.06
1.07
3.09

USE THE COURTYARD AS ACTIVITY SPACE

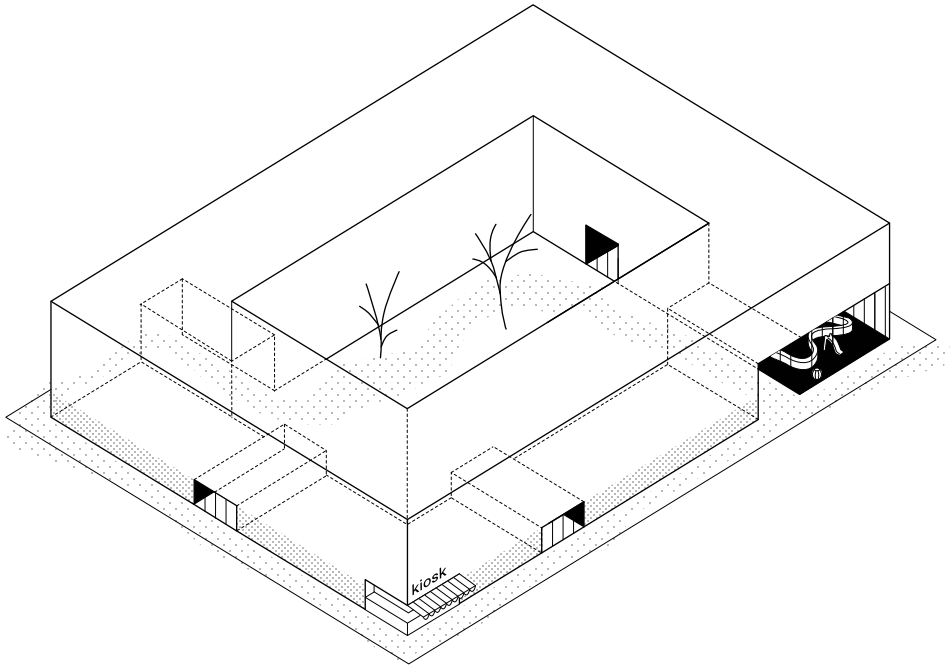
Use the courtyard and/or the roof terrace as a space for (organized) physical activity.

3.01
3.02
3.04
3.05
3.06

CREATE ACTIVITY SPACES FOR VARIOUS TARGET GROUPS

Consider the various target groups who use the building when conceiving activities and designing activity spaces. The inclusive nature of activity spaces promotes use.

3.02
3.03
3.06



Building Surroundings in Residential Blocks

MAKE THE DETAILING OF STREET-LEVEL FRONTAGES UNIQUE

Try to give an experience to the surrounding public space. Use consistent high-quality materialisation and design on a human scale. Consistent detailing whilst alternating open and closed portions makes for a lively pedestrian environment along the (often considerable) length of the façades.

1.01
1.03

4.01
4.04
4.05
4.07

ENSURE ‘EYES ON THE STREET’

‘Eyes on the street’: a building’s street-level frontage can positively affect the sense of safety in public spaces, thereby contributing to walkability. Try to limit closed (or non-programmed) sections on the first two floors. Make entrance lobbies transparent and incorporate awnings or canopies. Try to make vertical routes and the courtyard visible from the street.

1.05
1.11
1.18

4.02
4.03
4.04
4.05

TUNE THE NUMBER OF ENTRANCES TO THE SURROUNDING AREA

Try to increase the building's accessibility and try to make it more inviting. Place several street-level entrances at a pleasant distance from one another and maximize their transparency to the surrounding area.

1.18
1.19
1.21

4.02
4.03
4.05
4.06

MAKE THE COURTYARD SEMI-PUBLIC

Make the courtyard accessible to other city residents as a destination or as an element in a secondary urban route. This can enliven and upgrade the courtyard. Access can be restricted to certain hours (e.g. until sunset) to prevent nuisance.

2.02
2.06
2.10
2.14

4.05
4.06
4.07

INTRODUCE ATTRACTIVE URBAN FUNCTIONS

Consider introducing supporting (public) programme at street level such as a newsstand, a grocery store or a nursery. This creates destinations in the immediate vicinity and generates urban variety within the building.

2.02
2.09
2.08
2.11

3.04
3.06
3.08

4.01
4.02
4.04

School

At school, children do not only learn subjects such as English and mathematics, they also learn what it means to move through space. The spatial impressions made by assembly halls, classrooms, wide corridors and staircases have a lasting effect on a child's spatial awareness.

School buildings tend to have 3-4 floors. These relatively low-rise structures often facilitate vertical circulation through open staircases. Several times a day, the corridors and stairs are used simultaneously and intensively by the building users and are therefore generously proportioned. In addition to spacious routes that provide opportunities for active design principles, the access areas of a school are often multifunctional.

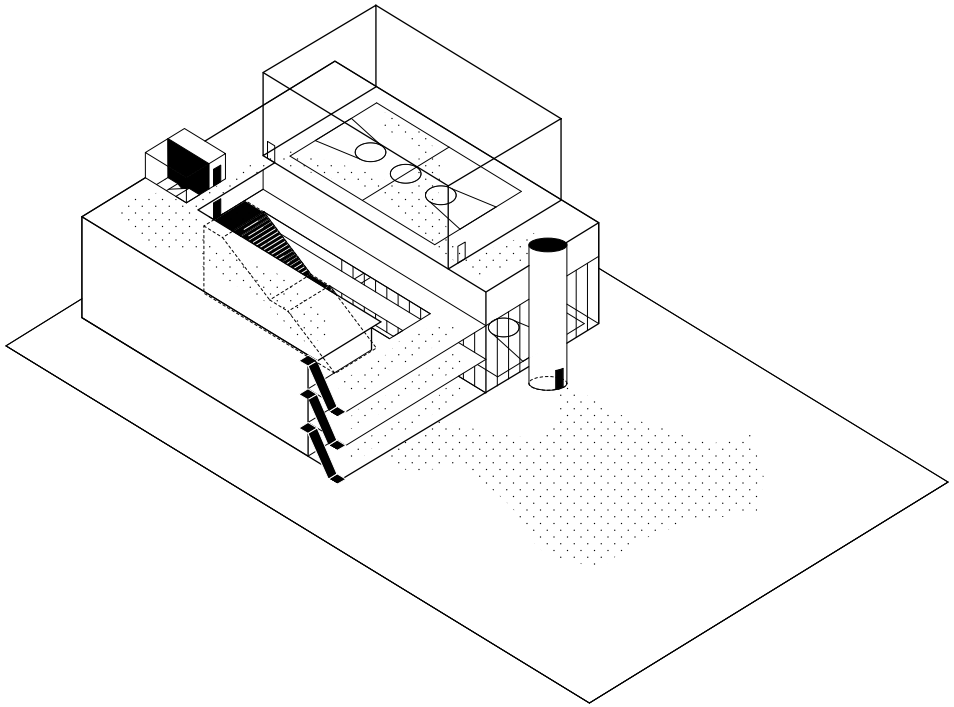
The spatial relationship between the main entrance and the school playground deserves some attention. The transparency of the building envelope and ground-floor accessibility can reinforce this relationship and encourage movement between the two. Larger programme components (e.g. auditorium, gymnasium) deserve to be generously connected to the access system and the outdoor areas.

Schools and the Building Code

> Multifunctional use in access spaces means that it must be taken into account that furnishings do not affect calculated egress widths or the fire load factor.

> For floors up to 8 metres above ground level, a combined access/escape system may be sufficient.

> Functions on a higher floor require an additional escape route.



Routes in Schools

MAKE ROUTES APPEAL TO THE SENSES

Enhancing routes with daylight and a variety of colours, materials and spatial characteristics stimulates the senses and encourages physical activity.

1.03
1.11
1.12
1.16
1.22

2.01
2.05
2.09
2.12
2.14

3.01
3.04

PROVIDE MULTIPLE USE IN ACCESS SPACES

Consider how corridors can be replaced by access spaces that encourage lingering and a multitude of use.

1.02
1.10
1.12
1.18
1.22

2.01
2.02
2.03
2.06

3.01

USE ACCESS SYSTEMS AS DIFFERENTIATED SPACE

Use the spacious access system as a space in its own right by installing furniture (concentration areas, desks, lockers, etc.) or by configuring stairs that double as an auditorium or a landscape encouraging physical activity.

1.17
1.22

2.01
2.02
2.06
2.07
2.12

3.01

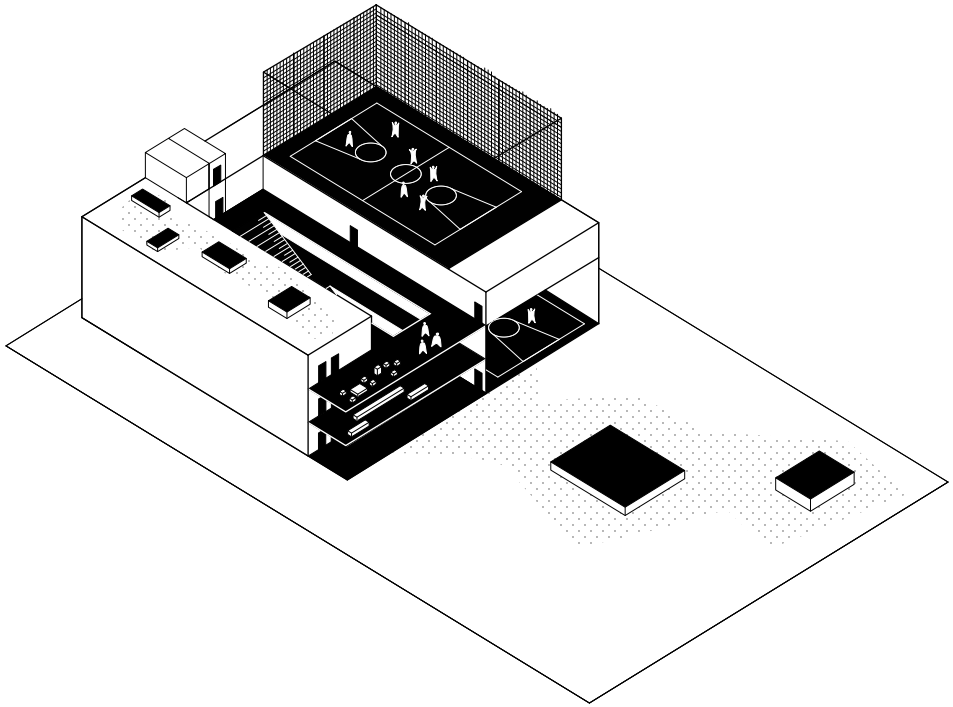
MAKE THE ACCESS SYSTEM ENCOURAGE SOCIAL EXCHANGE

Try to use access spaces to bring about social exchange throughout the building. Up to a floor height of 8 metres, try to make access as open as possible. Try to give functions on higher floors a qualitative connection to the rest of the building and/or outdoor space.

2.02
1.10
1.12
1.18
1.22

2.01
2.02
2.06
2.07
2.12

3.01
3.06



Destinations in Schools

STRATEGICALLY POSITION DESTINATIONS IN THE BUILDING

The auditorium, gymnasium, classrooms and toilet blocks are focal points for movement during the course of a day. The strategic placement of these various programme elements can promote physical activity.

1.02
1.06
1.10
1.17
1.18

2.06
2.07
2.08
2.09
2.13

3.03
3.06

4.07

TURN THE ACCESS SYSTEM INTO A DESTINATION

The main entrance can be a destination in its own right. Inspired design can turn it into an attractive building element where the alternation between lingering and passing through becomes a central theme.

1.03
1.16
1.17
1.22

2.01
2.02
2.06
2.07

3.01

ENSURE DESTINATIONS ARE PLEASANT PLACES TO LINGER

Destinations such as the playground, the auditorium and the corridors are used more intensively if they are also pleasant places to linger. Stimulate use through attention to design, orientation and a range of moods.

1.01
1.02
1.03
1.17

2.01
2.02
2.06
2.07
2.08

3.01
3.05

4.05
4.07

PLACE INDISPENSABLE DESTINATIONS AT A DISTANCE

Functions such as auditoriums and gymnasiums are visited regularly. Physical activity may be stimulated by placing these spaces at a distance from the places where pupils usually spend their time.

1.02	2.01		4.07
1.06	2.05		
1.12	2.06		
1.13	2.09		
1.17	2.13		

TURN THE ROOF INTO A UNIQUE DESTINATION

Use the roof of the school as a possible destination. A playground on top of the building is a unique place and will attract children for play or exercise.

1.09	2.01	3.03	4.05
1.12	2.09	3.04	4.07
1.16	2.10	3.05	
1.17	2.13	3.06	
1.22	2.14	3.07	

SURROUND AUXILIARY FUNCTIONS WITH QUALITY

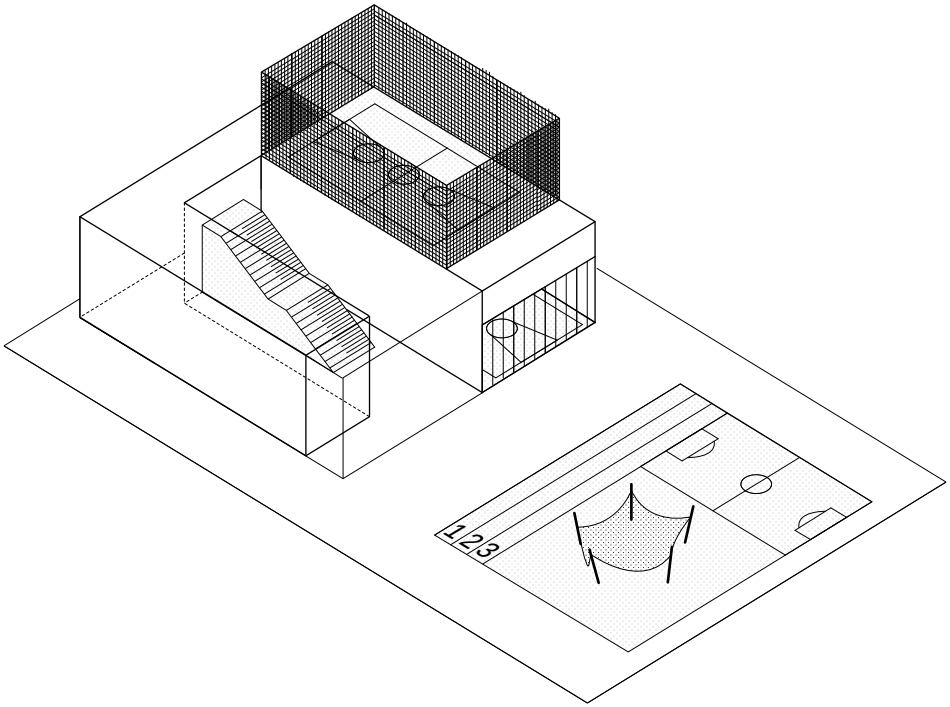
Enhance the vicinity of frequently used services such as toilets, lockers and water fountains by introducing daylight and other spatial features. This makes these places more attractive to linger en encourages social exchange.

1.05	2.01	3.05	
1.11	2.02		
1.16	2.07		
1.17	2.12		
	2.14		

STRATEGICALLY DISPERSE AUXILIARY FUNCTIONS

Brief walks between classes can be encouraged by positioning commonly used functions such as toilets and water fountains within a reasonable walking distance of one another.

1.02	2.01	3.04	
1.11	2.02	3.07	
1.13	2.03	3.08	
1.17	2.08		
	2.12		



Activity Programme in Schools

ENCOURAGE ACTIVE PLAY IN CHILDREN

Turn as many spaces as possible into landscapes for play and/or physical activity. An exciting spatial environment encourages children to play and to engage in physical activity.

1.10 1.11 1.12 1.16 1.22 | 2.01 2.02 2.10 2.11 2.14 | 3.02 3.03 3.04 | 4.07

PROVIDE SECURE BICYCLE PARKING

Make sure sufficient secure bicycle parking is offered. Ensure that these facilities are clearly visible from the surrounding area.

1.03 | 2.05 | 3.01 3.08 | 4.05 4.07

ADD MARKINGS TO PLAYGROUNDS

Encourage sports activities during breaks by adding markings to the playground.

3.01 3.02 3.03 3.04 3.06 | 4.05

TURN THE GYMNASIUM INTO A PROMINENT FEATURE

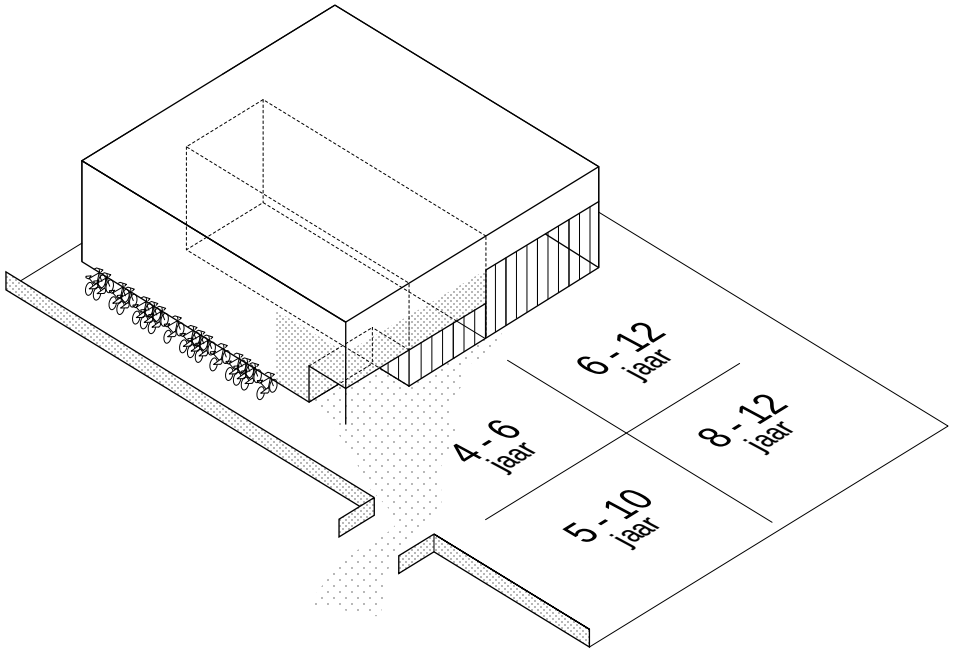
Make the gymnasium a visible and prominent part of the design to attract use. Offer adequate transparency and generous daylight access. Make the gymnasium available for sports and games, also after regular school hours.

1.11 1.17 | 2.06 2.09 2.13 | 3.02 3.03 3.04 3.05 3.06

PROVIDE ADDITIONAL STORAGE SPACE

Provide adequate storage space near the playground for toys. Try to provide sufficient storage for bulkier after-school sports equipment such as hockey sticks and tennis rackets.

3.01 3.02 3.08



Building Surroundings in Schools

OPEN UP THE SCHOOL TO THE NEIGHBOURHOOD

Consider making school facilities available to the neighbourhood. A school playground or gymnasium can also be used as a neighbourhood playground outside school hours. Consider using pupils or local residents to help manage access. This can turn the school into a key amenity for a neighbourhood.

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TUNE SCHOOL AND SURROUNDINGS TO ONE ANOTHER

Design the transition from school to playground on a human scale using consistent materials and rich detailing. This reinforces the spatial relationship between interior access routes, the entrance to the building and the school playground.

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DESIGN THE OPEN SPACE FOR A VARIETY OF AGES

Consider equipping the school playground with a range of equipment and playgrounds to suit various age groups. Variety attracts mixed age groups, which in turn promotes social control.

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MAKE BICYCLE PARKING VISIBLE

Ensure that bicycle parking facilities are pleasant places. For example, place them in a direct relationship with the school playground to encourage social control.

3.08

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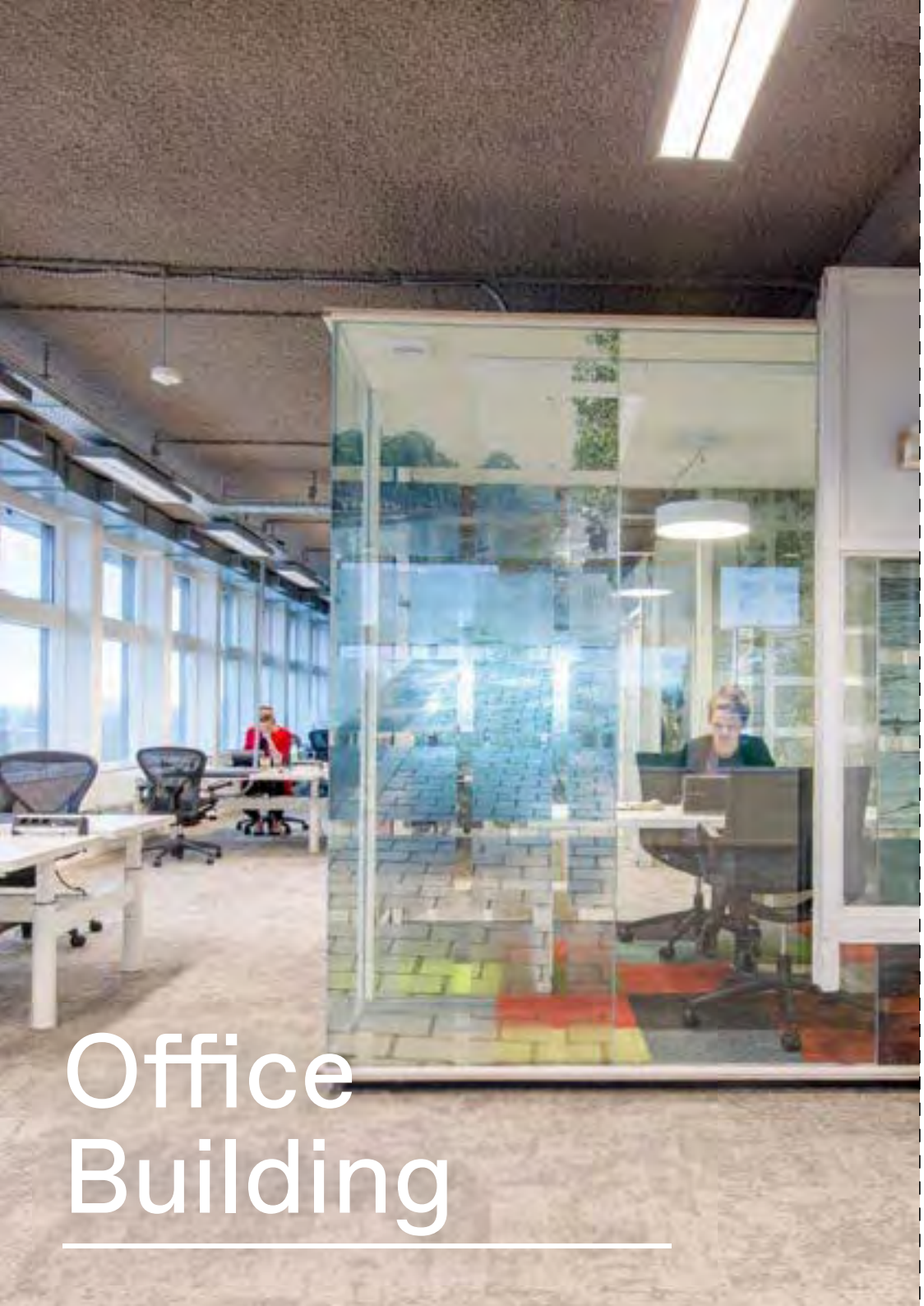


Office Building

Sitting behind a desk for hours on end is the daily reality for many people. Concepts such as Alternative Workplace Strategies and mobile technology offer opportunities to increase diversity in posture and physical activity.

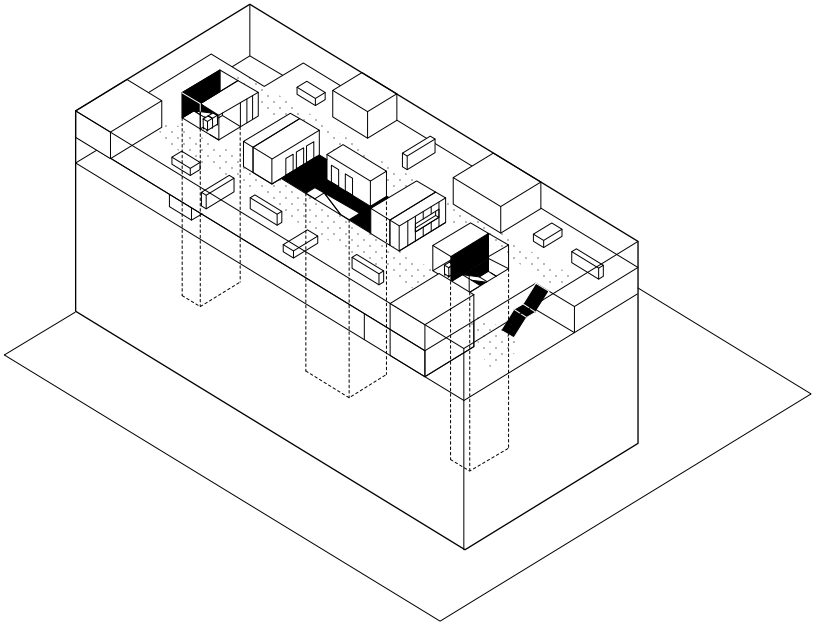
Office spaces are often planned on a large scale and may span several floors. For reasons of flexibility, these are often open floor spaces that easily lend themselves to differentiated programming with elements such as concentration areas, coffee corners, meeting rooms of various sizes and workplaces for groups or individuals.

Depending on the size and organisation a company, a variety of programmatic distributions are possible and/or desirable throughout a building. In the event of multiple companies leasing space in a building, sharing functions can be an attractive option. This results in pleasant walking distances between destinations and promotes social interaction. During (both short and long) breaks, employees are free to divide their time and this too provides opportunities for physical activity.

Office Buildings and the Building Code

> In a flexible floor space or one where the layout is not yet defined, the length of an escape route is 1.5 times the linear distance. This may affect fire compartments and/or the position of stairwells.

> Building Code requirements for functional transformations are less stringent than those for new buildings. Safety aspects of any proposed solutions need to be assessed in collaboration with relevant authorities.



Routes in Office Buildings

PROVIDE (VISUAL) CONNECTIONS BETWEEN FLOORS

Vertical views between floors stimulate the senses. Try to establish open connections between floors that have (or could have) a functional relationship.

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ENSURE STAIRWELLS ARE TRANSPARENT AND ATTRACTIVE

Make stairwells transparent and attractive to encourage use. Use colour, light, material and interior views to turn the stair environment into a pleasant space.

1.01
1.02
1.09
1.12
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2.08
2.12
2.13

ENHANCE THE SENSORY APPEAL OF ROUTES

Try to provide a rich sensory experience to reward physical activity. Apply horizontal variation to walking routes: this results in fluid spaces and changing views.

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1.22

2.01
2.14

COMBINE VERTICAL AND HORIZONTAL ROUTES

Try combining routes to form rich and rewarding experiences. Establish visual and physical connections between horizontal and vertical routes.

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PLACE AUXILIARY FUNCTIONS ALONG ROUTES

Ensure that routes are programmed with auxiliary functions to encourage short breaks and walks. Ensure routes pass kitchenettes, coffee corners, lounge areas, concentration areas, toilets or other auxiliary spaces.

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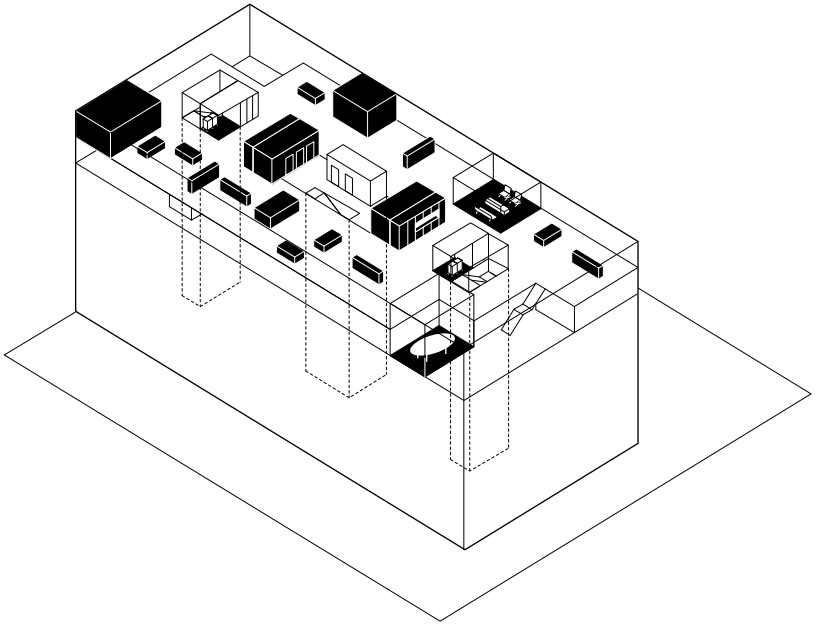

Destinations in Office Buildings

STIMULATE THE MOBILE WORKPLACE

Try to encourage a variety of physical postures. For example, give employees a laptop instead of a desktop workstation. This gives them more freedom to find suitable working environments and/or positions.

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PROVIDE SPACES FOR RESTING

Provide areas for personal resting and relaxation which simultaneously act as destinations. Productivity can be boosted when staff can trade the busy workplace for a tranquil spot where peaceful acoustics, natural light, greenery and fresh air are plentiful.

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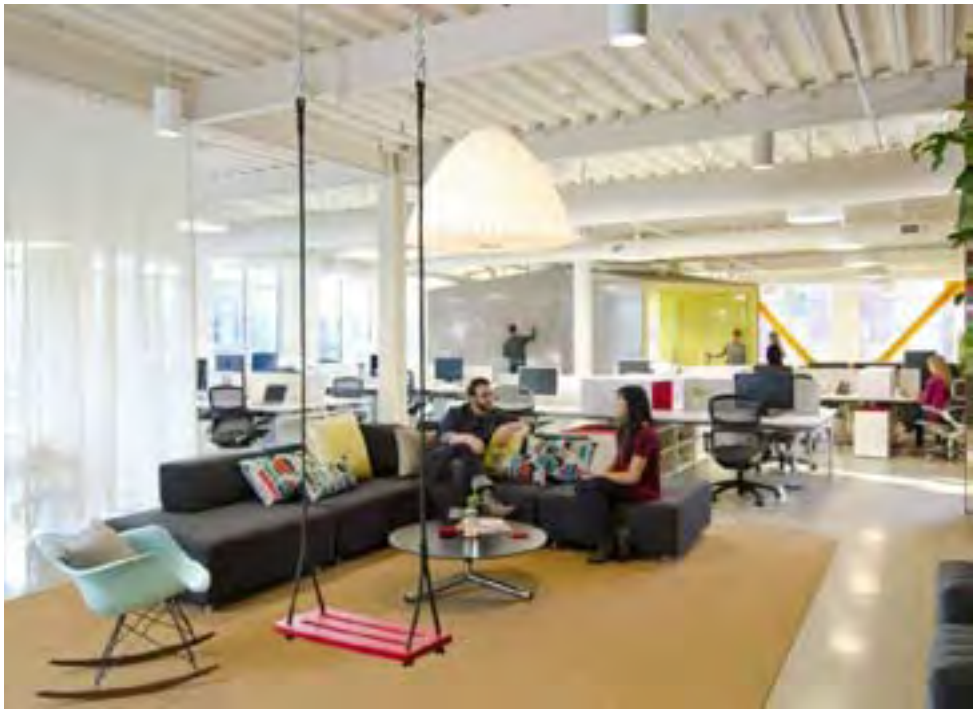

INTRODUCE A VARIETY OF ATMOSPHERES

Try to create a variety of atmospheres in the workplace environment. Human beings feel the need for various moods during the course of a day (brightly/dimly lit, busy/tranquil surroundings). Offering such diversity can provide the opportunity for a brief stroll.

1.01 1.10 1.11 1.16 1.18 | 2.01 2.02 2.04 2.08 2.13 | 3.01 3.06 | 4.07

DISPERSE COLLECTIVE FUNCTIONS

Position the communal functions of different companies or departments (e.g. consultation rooms, concentration areas, coffee corners) within comfortable walking distance of each other and the workplace.

1.06 1.19 1.20 1.21 | 2.02 2.04 2.08 2.13 | 3.04 3.07 3.08

COMBINE FUNCTIONS TO CREATE SOCIAL SPACES

Combining auxiliary functions such as toilets, kitchenettes and printers can provide a setting for social interaction and thereby form a destination.

1.10 1.17 1.16 | 2.01 2.02 2.07 2.13

CENTRALIZE FUNCTIONS

Consider centralizing functions. These might include a central, well-ventilated print and photocopy room instead of printers at every workplace. Another option might be a central recycling station instead of wastepaper baskets beneath every desk. This not only encourages physical activity but also facilitates the separation of waste and the promotion of awareness.

1.06 1.11 1.17 | 2.02 2.04 2.08 2.12 2.13 | 3.04

ADD UNIQUE COLLECTIVE PROGRAMME

Add unique (collective) programme functions such as a boardroom, a projection room or a garden room for informal meetings. In addition to creating added value for tenants, these functions act as destinations encouraging activity.

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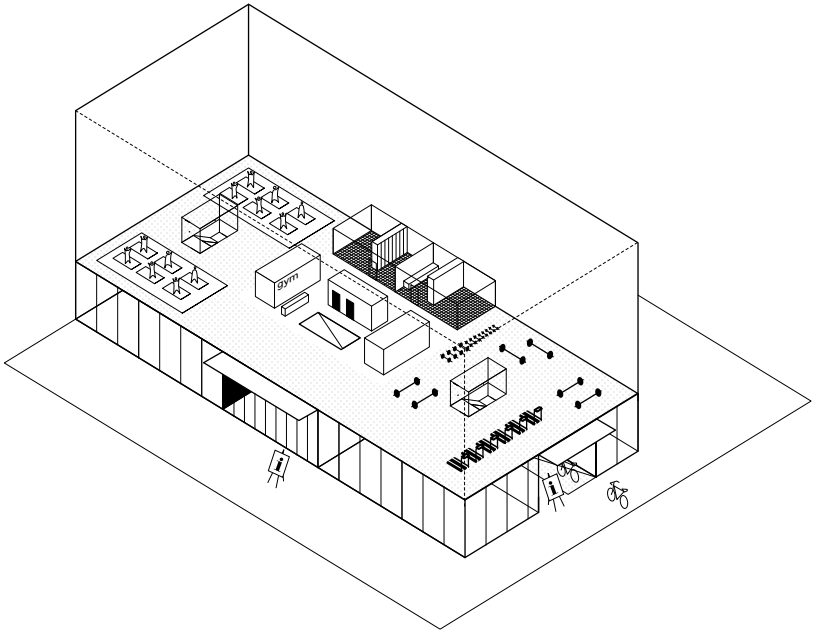

Activity Programme in Office Buildings

ENCOURAGE THE ACTIVE POSTURE

Furnish the office with ergonomic furniture encouraging activity. Height-adjustable desks, high stools and high tables are examples of furniture that encourages active and a variety of postures throughout the day.

2.01
3.01
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ENCOURAGE EMPLOYEES TO CYCLE TO WORK

Provide secure, sheltered bicycle parking near the ground floor. Tailor the number of e-bike connections to the building's intended users.

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COMBINE LABOUR AND ACTIVITY

Experiment by integrating exercise facilities into the workplace (e.g. a bike pedal exerciser under the desk).

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4-xx
4-xx
4-xx
4-xx

ENSURE THAT EMPLOYEES CAN TAKE A SHOWER

Provide changing rooms and showers to encourage active commuting. These spaces also make lunch-hour exercise a comfortable option.

3.03
3.07

MAKE ACTIVITY SPACES ATTRACTIVE AND VISIBLE

Locate gyms or activity spaces in visible places such as the first floor or the ground floor, with views onto the surrounding area. Consider making these spaces available outside office hours to people who live or work locally.

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PROVIDE VISUAL INFORMATION

Provide central or digital information on the availability of sports facilities and any activity programmes to encourage users to exercise.

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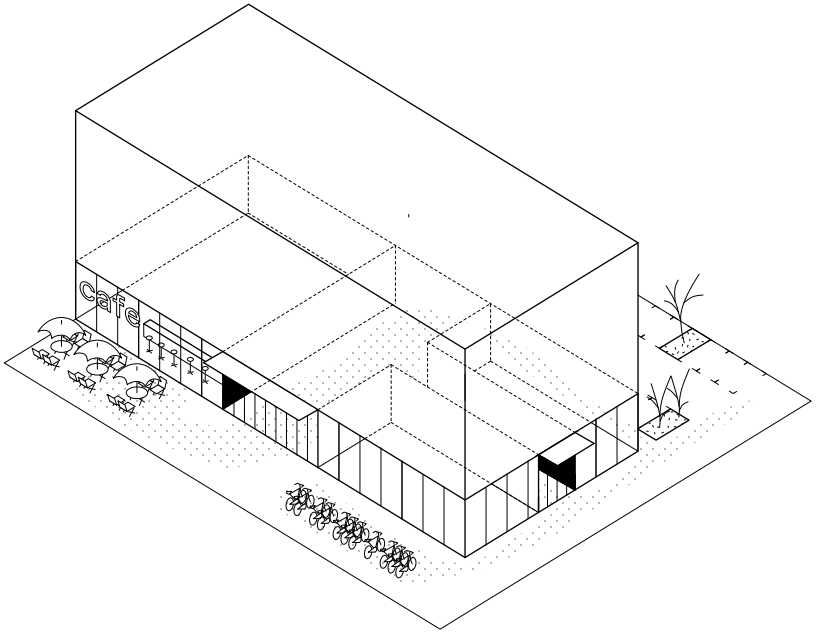

Building Surroundings and Office Buildings

MAKE ENTRANCES NUMEROUS AND TRANSPARENT

Create multiple street-level entrances that are clearly recognizable, safe and transparent so that the pedestrian area and the entrance lobby may be experienced. This not only encourages movement between the interior and the exterior but also promotes social control in the public space.

1.19

4.02
4.03
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AVOID EMPTY LOTS AFTER OFFICE HOURS

After office hours, parking spaces for cars and bicycles are not in use. These empty lots can negatively affect the walkability of a neighbourhood. Consider upgrading these areas using pedestrian routes, seating (mobile if possible), water features, public artworks and greenery.

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INTRODUCE ATTRACTIVE URBAN FUNCTIONS

Consider introducing public programme by adding a street-level cafeteria or lunchroom. This stimulates diversity at the urban level, it provides a destination for physical activity, and it adds social value to the surrounding area.

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Appendices

Interviews

A: Henri Snel

Henri Snel is an architect, researcher and head of the Inter-Architecture department at the Gerrit Rietveld Academie in Amsterdam. Henri was confronted with the realities of Alzheimer's when his mother was diagnosed with this disease not long after the turn of the century. Since then he has pioneered ongoing interdisciplinary research into the relationship between Alzheimer's disease, cognitive systems and architecture.

Henri's expertise in the fields of sensory perception and architecture is what drew him into the project. His substantive contribution to this study involved conducting a series of discussions with the authors, introducing relevant literature and his professional network.

B: Adnan Mirza

Adnan Mirza was born in Pakistan and has worked on creating a healthier world from six different continents. Adnan's career encompasses a stint as a competitive glider pilot. He is currently the CEO of Heartbeat Ventures, an Amsterdam-based consultancy focused on prevention in the healthcare sector.

WE LIVE LONGER AND UNHEALTHIER LIVES

Human life expectancy continues to rise, yet our healthy life expectancy is decreasing, even in absolute terms. This decrease is mainly due to the prevalence of unhealthy lifestyle choices and the chronic diseases they lead to.

THE RESILIENCE OF THE HUMAN BODY

Many people (un-) wittingly abuse their bodies with chronic illness as a result. Unhealthy diets, insufficient exercise, lack of rest and excessive stress levels are all major causes of chronic diseases. The human body can function perfectly well for 20 to 30 years before it starts to show signs of dysfunction. After this period, wear and tear takes its toll and bodily functions start to fail. In other words, the human body is actually incredibly resilient.

UNHEALTHY CHOICES

Chronic diseases are the result of personal choices, but not necessarily a lack of personal responsibility. Issues of this kind are influenced by social relations, society, the urban environment and of course individual personality. Do you see health as something that happens to you? Or is it a result of self-control and competence? How much awareness, responsibility and discipline can you muster with the aim of staying healthy?

TREATMENT VERSUS PREVENTION

Adnan explains that as a society we primarily invest in the treatment of chronic disease and the suppression of symptoms. In other words, we as a society only start to invest when the damage has already been done. Adnan likes to compare the situation with his stint as a glider pilot. Although pilots are trained to use their superior flying skills in crash situations, these skills are primarily used to prevent such situations from ever occurring. Adnan believes that healthcare system is currently focused exclusively on the crash situation and far too little on prevention.

INVESTING IN PREVENTION

We should not expect insurance companies to initiate a shift towards investment in prevention. After all, it is difficult to produce hard data demonstrating the impact of a prevention-based approach. A modest disruption is required if change is to be effected. The driving forces behind such a revolution are companies such as Nike, which are utterly committed to exercise and health. 'Believers' are what is needed.

INFLUENCING BEHAVIOUR

Not everyone wants to be healthy, so there will always be winners and losers in healthcare. It is therefore important to be realistic about the situation and to focus our energies on people who are willing to adopt a healthier lifestyle. The focus should be on companies such as Nike, not on people with the lowest levels of physical activity. The motto should be: 'Make the easy choice the healthy choice'.

C: Toine Schoutens

Toine Schoutens is a light-therapist for performance enhancement in top-level sports, aviation (jet lag), welfare and working conditions. He is affiliated with the Coronel Institute for Occupational Health at AMC in Amsterdam and the Light and Health Research Foundation (SOLG) in Eindhoven. He also advises the Dutch Olympic Committee and various sports teams. Toine Schoutens was interviewed to gain a better understanding of how light affects us on a daily basis. This knowledge is useful in designing spaces where the use of light appeals to our subconscious decision-making.

HUMANS AND DAYLIGHT

Human evolution has shaped us for a life lived outdoors, in daylight. We are built for prolonged exposure to daylight, but since the Industrial Revolution people have spent long periods indoors, thanks in part to the invention of artificial light. However, humans have not yet adapted to this change in rhythm and can experience it as biologically disruptive.

BIOLOGICAL RESPONSE TO LIGHT

In theory, increasing light intensity results in better concentration and productivity in humans. However, at certain times of day we experience a need for lower light levels in order to rest. In countries in Southern Europe, taking a siesta is commonplace and this suggests that humans cannot consistently function in a very bright environment. One reason people take a siesta is the need for contrast.

FUNCTIONAL LIGHT

Biologically, human beings need various light intensities during the course of a day. But instead we spend long periods staring at screens that require a static functional light level. Discrepancies between our biological needs and visual functionality are commonplace during the working day. Almost inevitably, visual functionality is given priority but the resulting static lighting conditions are often not good for our concentration or our wellbeing.

TYPES OF LIGHT

The intensity and colour of light have a major impact on how people feel in a situation. Red and blue light can be used to influence human performance, for example, by causing a shift in the rhythm of night and day. Older people often suffer from yellowing of the eye and homes for the elderly therefore often employ variations of blue light to create situations that are better suited to the biological clock of their residents.

LETTING DAYLIGHT IN

Our 24-hour economy has completely disrupted our original daylight condition. The best way to re-attune to our biology is to use as much natural daylight as possible in our buildings.

However, this is not always possible and sometimes we have to resort to artificial light. Human Centric Lighting can replicate the outdoor situation, including changes in light intensity and colour. In this regard, O-LED is the 'biological' version of LED lighting, enabling the use of ambient light instead of a point light source. This provides greater light intensity with lower brightness and is better attuned to human biology.

D: Erik Platvoet

Erik Platvoet is a trained architect and went on to work as a project architect at agencies such as ADP, developing major projects for leading architects including Álvaro Siza, Josep Lluís Mateo and Juan Navarro Baldeweg. He is currently prevention advisor and spokesman for the Amsterdam-Amstelland Fire Department. Erik was interviewed about the combination of physical activity and safety in buildings.

BACKGROUND: THE BUILDING CODE

The Building Code defines the minimum safety level in buildings and is used by the Fire Department to assess building designs. As a designer, it is important to understand the basics of fire safety. The legislation assumes that there can never be an autonomous fire in two separate fire compartments simultaneously. In addition to this precondition, two principles form the basis for all articles in the Building Code:

1. Neighbouring areas may not be affected by the fire in your fire compartment.

2. You must be able to egress safely from your fire compartment.

If a design meets these two conditions it is regarded as safe. The Building Code should be seen as an aid to keep this complex subject measurable and workable for different building types.

DEVIATING FROM THE BUILDING CODE

The reasoning behind the Building Code is fairly binary and most architects dutifully comply with its stipulations. Although the Code is very well-suited to assess all aspects of a building's fire safety and emergency evacuation measures, alternatives may be proposed. The Fire Department may discuss alternative concepts, as long as the basic principles of the Building Code are observed. For example, Required Safe Egress Time (RSET) calculations can offer scope to take a more realistic look at a specific situation.

Under specific conditions, situations complying with the Code may in fact be unsafe and vice versa. Evacuation concepts can turn out differently in practice because people often act instinctively rather than rationally in an emergency.

RAISING THE ALARM IN AN EMERGENCY

It always takes a while for the fire department to arrive. Until then, building users must to be alerted about the situation and must be guided to safety outside of the building. Some studies have shown that sirens or other mechanical signals are not the most effective way to evacuate a building. People react more quickly to instructions from a person (spoken-word).

The Fire Department is currently experimenting with concepts that pair senior citizens with students living nearby or in the same building. This way the students can help senior citizens to leave the building until the Fire Department arrives. As such, mixing various types of users in this way may also contribute to safety.

EMERGENCY ESCAPE ROUTES

The essence of fire evacuation is enabling people to exit the affected fire compartment and reach a safe place by means of an escape route void of smoke and fire. The greater the alternatives for reaching safety, the less stringent the requirements imposed on escape routes. Multiple access systems therefore contribute to the safety of a building.

In larger buildings, stairs often limit the evacuation capacity of a building. Dividing a building into fire compartments creates areas that can function as assembly points, i.e. spaces where people escaping a fire can wait for a given time before moving on to a safer place.

MAXIMUM EGRESS DISTANCES

Maximum egress distances to an emergency exit can be calculated specifically or according to fixed formulas. Distances in spaces where the layout has yet to be defined are multiplied by 1.5. Please note that the calculation of a maximum travel distance should also take account of the situation in the event of a fire. A maximum distance of 30 metres in an empty warehouse is obviously safer than the same length in a labyrinth.

OUTDOOR EMERGENCY ESCAPE ROUTES

Emergency escape routes which pass through outdoor spaces are preferable because they reduce the influence of smoke. Outdoor space can thus be used to divide up an escape route, and to reduce the requirements imposed upon the route. Escape routes of this kind can be combined with recreational spaces such as gardens or areas with other communal functions. However, care should be taken not to obstruct the route with furniture or other objects.

EMERGENCY EVACUATION AND PHYSICAL ACTIVITY

It is important to mention that both the Building Code and the preventive measures imposed by the Fire Department assume self-reliance on the part of a building's users. Fire fighters do not automatically enter a burning building. Their primary task on arriving at the scene is to prevent the fire from spreading.

Modern innovations geared towards convenience and comfort such as mobility scooters, home automation and communications equipment discourage physical activity and therefore have an indirect adverse effect on self-reliance, especially in the elderly. Efforts made to keep the elderly fit and active can therefore be seen as contributing to safety.

Sources

Bibliography

1. Gadet, J. et al. Bewegen moet beloond worden! Amsterdam : Gemeente Amsterdam, Dienst Ruimtelijke Ordening, 2010.
2. International study of perceived neighbourhood environmental attributes and Body Mass Index. De Bourdeaufhuij et al. sl : International Journal of Behavioral Nutrition and Physical Activity, 2015.
3. Possible Mechanisms Explaining the Association Between Physical Activity and Mental Health. Monshouwer, K., et al. Utrecht : Trimbos Institute, 2012.
4. Gemeente Amsterdam. Statistisch Jaarboek. Amsterdam : Het Bureau van Statistiek der Gemeente, 1899.
5. Gemeente Amsterdam. Statistisch Jaarboek. Amsterdam : Het Bureau van Statistiek der Gemeente, 1939.
6. Woningwet (1901). [Online] Wikipedia, 2016. https://nl.wikipedia.org/wiki/Woningwet.
7. Centraal Bureau voor de Statistiek. Statline. [Online] Centraal Bureau voor de Statistiek, 2016. http://statline.cbs.nl/Statweb/.
8. Bloom, D.E. et al. The Global Burden of Non-communicable Diseases. Geneva : World Economic Forum, Harvard School of Public Health, 2011.
9. 30 minuten Bewegen. 30 Minuten Bewegen. [Online] 2016. http://www.30minutenbewegen.nl/.
10. Nationaal Kompas Volksgezondheid. [Online] Rijksinstituut voor Volksgezondheid en Milieu, 2016. http://www.nationaalkompas.nl/gezondheidsdeterminanten/leefstijl/lichamelijke-activiteit/wat-zijn-de-mogelijke-gezondheidsgevolgen-van-lichamelijke-activiteit/.
11. Obesitas gaat vaak samen met chronische aandoeningen. [Online] Centraal Bureau voor de Statistiek, 2014. https://www.cbs.nl/nl-nl/nieuws/2014/05/obesitas-gaat-vaak-samen-met-chronische-aandoeningen.
12. Humans are the highest energy apes, making us smarter – but also fatter. Gibbons, A. sl : Science Magazine, 2016.
13. Passive Energy-Saving Mechanisms in Human Locomotion. Zelik, K. E. sl : University of Michigan, 2012.
14. City Of New York. Active Design Guidelines: Promoting Physical Activity and Health in Design. sl : The Mayor of New York, 2010. pp. 6-17; 68-91; 110-122.
15. Nederlanders zitten veel, jongeren het meest. [Online] Rijksinstituut voor Volksgezondheid en Milieu, 2016. http://www.rivm.nl/Documenten_en_publicaties/Algemeen_Actueel/Nieuwsberichten/2016/Nederlanders_zitten_veel_jongeren_het_meest.
16. Koolhaas, R., et al. Guide to Shopping. Cambridge, Massachusetts : Harvard Graduate School of Design, 2001.
17. De Hoge Heren, Gedempte Zalmhaven 47-749. [Online] Rotterdam Woont, 2016. http://www.rotterdamwoont.nl/items/view/150/.
18. Haptic Architecture Becomes Architectural Hap. Herssens, J., Heylighen, A. Leuven : Katholieke Universiteit Leuven, Dept. of Architecture, Urbanism & Planning, 2007.

19. Zevi, B. Architecture as Space. 1948.

20. Multisensory Safety: zintuigbeïnvloeding in de veiligheidszorg. Eysing Smeets, M. et al. sl : Hogeschool InHolland, Politieacademie, Centrum Criminaliteitspreventie Veiligheid, 2012.

21. Whyte, William H. The Social Life of Small Urban Spaces. 1980.

22. International Well Building Institute. The Well Building Standard v1. sl : International Well Building Institute, May 2016.

23. Haak, prof. ir. A.J.H. De Menselijke Maat. Delft : Delft University Press, 2005.

24. Sensing Spaces: Architecture Reimagined. Gregory, R. London : Royal Academy of Arts, 2014.

25. Holl, S. Preface to "The Eyes of the Skin" by Juhani Pallasmaa. Chichester : Wiley-Academy , 2005.

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Notes

Notes

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