



HAFENCITY HAMBURG

SUSTAINABLE CONSTRUCTION IN HAFENCITY

HAFENCITY ECOLABEL

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FOREWORD

The certification process 'Sustainable Construction in HafenCity' is of pivotal importance to the sustainable development strategy of HafenCity Hamburg. Essentially, the strategy is based on five levels:

1. reuse of an old port and industrial area;
2. high urban density and high degree of mixed-use in the proposed core area of HafenCity, leading to efficient and sustainable land use;
3. a sustainable transport concept which includes connecting the underground railway in HafenCity with the existing town center, hydrogen-fuelled buses and promoting HafenCity as a 'walkable' city;
4. a local and district heating network based on very low carbon limits which uses a significant amount of renewable energy sources; and
5. a certification system for buildings.

While the first three levels may now be considered as planning norms, as essential constituents of public goods in sustainable 21st century inner cities – albeit with enormous consequences for private investment – the other levels mainly result from market processes. The concepts for heating energy supply are based on two already closed deals (2003 and 2009) following a pan-European tender process, while the certification of buildings is an ongoing market development and learning process which will remain open until the last HafenCity project is completed in around 2025. Following the adoption of the Masterplan in 2000, sustainability activities were concentrated initially on the first four of the levels cited above. However, the lack of an existing German building certification system became increasingly apparent, particularly since those found elsewhere, e.g. the American or the British systems, could not be adapted to German requirements or the specific possibilities in HafenCity. In order to establish the most appropriate sustainable building standards for more than 2 million m² of gross floor area (GFA) of new builds, HafenCity Hamburg GmbH commissioned the consultants Gesellschaft für ökologische Bautechnik Berlin mbH (GföB) to develop a certification system for HafenCity on the basis of available international standards and preliminary German studies. The HafenCity Ecolabel is awarded at two levels, 'gold' and 'silver', and represents the first transparent and comprehensible standard for the certification of sustainable buildings in Germany.

The 'Sustainable Construction in HafenCity' certification system has been in use since 2007. Up to early 2010, around 200,000 m² GFA building volume had been pre-certified or was pending certification. Completed and preliminarily certified buildings include the Unilever building and Katharinen Primary School with its residential units; those currently under construction include the new Spiegel headquarters. The certification option has triggered a considerable sustainability drive in HafenCity.

Expectations of users and developers alike have grown – the latter wishing to increase and secure the competitiveness of their buildings in the long-term. By publishing and making available the catalog of criteria for the HafenCity Ecolabel, the aspirations of all involved parties were formulated at an early stage in the development process; this provides architects and consultants with a brief which affirms the desired ecological framework as an aid to finding creative solutions during the architectural competition stage. It also promotes the combination of aesthetic and technical design qualities alongside sustainability, with its inherent greater efficiency potential. This is of particular importance since the investment and rental markets are not willing to carry higher rental or investment costs for buildings of better quality at the present time. However, it is exactly such systematic use of ecologically sustainable building standards that will help expand markets, and it is in this context that tendentially expensive inner-city locations such as HafenCity can become a driving force for market development, both in Hamburg and in the inner-city markets of other large German property locations. Furthermore, the clustering of sustainable building projects in HafenCity helps to stimulate national and international awareness, also promoting

the issue of sustainable building through the media – especially when sustainable construction and outstanding architecture coincide successfully, as in the case of the Unilever building in HafenCity, dubbed the world’s best office building in 2009.

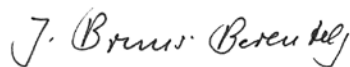
Since the development of a dense cluster of extremely sustainable buildings is so significant for the HafenCity sustainability concept, the HafenCity certification system has been completely revised and is available as of 2010. The new edition includes the revisions to the EnEV 2009 (German regulations for energy saving in buildings and building systems), which incorporates improvements gained from experience with certification since 2007 and its extension to cover new uses, primarily hotels, retail and mixed-use properties. As a result, all main building types in HafenCity now have their own certification class. This creates the pre-conditions for the target of having at least 30% of future buildings meet requirements for the gold Ecolabel and encourages clients and users to aim for this high standard.

The certificate will continue to be awarded by HafenCity Hamburg GmbH; it was also developed by GföB and is issued on the basis of independent certification by qualified institutional auditors. The revision was carried out in close collaboration and in conformity with the high standards of criteria of the Deutsche Gesellschaft für Nachhaltiges Bauen DGNB (German Sustainable Building Council), which has been issuing its own certificates since early 2009. However, there are three reasons for retaining an independent HafenCity system:

1. The HafenCity system focuses more specifically on possibilities in the HafenCity inner-city core.
2. It includes a contractual agreement between HafenCity Hamburg GmbH and clients with the aim not only of achieving built quality, but also, once sustainable buildings are in operation, ensuring actual quality of use by measuring energy efficiency.
3. It also makes it possible on the one hand to obtain a DGNB certificate in parallel at low cost due to the overlapping certification documentation; on the other hand, the HafenCity system is able to respond better and faster to new opportunities and requirements, due to its extensive market experience and flexibility, hence exploiting potential in HafenCity more effectively than the DGNB certificate.

We hope that the revisions and the transparency of the documentation criteria will increase the already immense willingness of developers and users to opt for certification of their buildings in HafenCity, to design and build particularly sustainable buildings and to use them in a sustainable manner. At the same time, we hope that the Ecolabel certification system of HafenCity Hamburg GmbH will help to encourage the establishment of sustainable construction in other areas of Hamburg and in the rest of Germany.

In this spirit, I wish the ‘Sustainable Construction in HafenCity’ certification process every success.



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INTRODUCTION

By the early 2020s, when the HafenCity development is finished, the built area of Hamburg's city center will have been enlarged by around 40% and enriched by a wide mix of uses – including housing, services, arts, recreation, tourism and commerce – just a stone's throw away from the city hall and main railway station. Urban planning objectives for the area prescribe the development of a fine-grained structure of urban land uses; modern inner-city density will be interspersed with a series of interesting public spaces, while the existing pattern of land and water areas characteristic of the port will be retained.

These are the most exciting development sites in Hamburg for investment continuing into the 21st century, providing more than 40,000 jobs and around 5,500 new homes.

The HafenCity development can make a very valuable contribution to sustainable development in Hamburg. Old port and industrial areas in a central location are making way for an area of high urban density, offering a wide variety of uses and excellent integration into the public transport network.

At the same time, health and environmental protection measures have become increasingly significant for potential investment recoverability in buildings in recent years, while public and private developers' willingness to take responsibility for managing the natural environment and its finite resources sustainably has also taken a great leap forward.



Western and central HafenCity

To reflect these trends, the HafenCity Ecolabel (in gold or silver) and the HafenCity Eco Award were introduced in 2007. They are designed to reward developers for sustainable management of energy, public goods and materials in construction and for delivering a healthy and comfortable environment in which the building's ultimate users can work, rest or play. By certifying the developers' sustainable innovations, the accolades also attract public awareness to the individual building projects, which increases the prestige of the HafenCity project as a whole.

Publication of this revised and updated edition replaces the previous series 'Sustainable Construction in HafenCity' (numbers 1-3), which was compiled for residential and office uses only. This single booklet now sets out the new unified system that embraces all uses – including various mixed uses in one building. The same criteria apply to all types of use, where relevant, although different criteria may apply where expedient. A building is deemed sustainable if the resources consumed for its construction and operation are modest, the comfort of users is high and operational costs remain low in the long term.

Certification differentiates between residential, office, hotel and retail uses. In the case of retail and hotel uses, two variants for each apply. Further variants such as gastronomy or education will be added in the future, if required. All types of use that occupy more than 10% of usable floor area (UFA)¹ must be listed and evaluated separately. Small-scale uses occupying less than 10% of UFA can be incorporated into evaluation of other types of uses. Award of a 'gold' or 'silver' standard Ecolabel can only be made to a building as a whole.



¹ Usable floor area (UA), in compliance with DIN 277 (2005), is the proportion of floor area that serves the function as scheduled in the specific land use allocation; not included are circulation areas (such as entrances, stairwells, lifts, corridors) and technical operation areas (heating, machinery and technical operation rooms)

HAFENCITY ECOLABEL

The Ecolabel is awarded in 'silver' or 'gold' by Hafencity Hamburg GmbH (HCH) to buildings that have achieved 'special' or 'excellent' rating in at least three of the five categories of sustainable construction detailed below. In each case, all criteria within the various categories must be fulfilled to achieve special or excellent rating (no choices available). To achieve the gold Ecolabel, all the criteria for the silver rating must also be attained. In every case, it is mandatory to fulfill the conditions of Category 1, which deals with the sustainable management of energy resources. The Ecolabel can be applied for early in the planning phase by site purchasers and developers (hereafter the 'applicant'). A preliminary certificate is issued after a contractual agreement has been signed, undertaking to implement the requirements. This means that the Ecolabel can be used for publicity purposes from the point at which marketing of the project gets under way, before construction commences.



Ecolabel for special achievement in the category concerned



Ecolabel for excellent achievement in the category concerned

The Ecolabel for excellent achievement rating (gold) demands higher standards for all requirements in the respective categories than the silver Ecolabel (for special achievement); in some cases, additional criteria must also be met. Certification is issued on the proviso that the applicant (property owner) enters into an agreement with HCH in which he or she undertakes to fulfill the required criteria in the selected categories and standards. The agreed 'special' and 'excellent' sustainable construction achievement ratings are documented by the applicant or his or her appointed consultants in a manner that will be comprehensible and verifiable by third parties after completion of the project. An Ecolabel is then awarded on condition that the terms of the agreement have been met.

Special achievement (silver) covers ecological building qualities that generate either no extra costs if stipulated at an early stage of the process or additional construction costs that are seen as economically justifiable. Investments are deemed justifiable if they can be largely amortized through operations in the short term.

Excellent achievement rating (gold) is concerned with the ecological qualities of a building that can be accomplished through innovative measures if some extra costs are incurred at the planning stage and during implementation and construction of the building project. To achieve 'gold', the criteria of both 'silver' and 'gold' must be met in the chosen categories. The various categories of sustainable construction are listed below, together with the essential requirements for each category and the two Ecolabel rankings. Differentiation in terms of type of use is covered in the introduction to each category.

ECOLABEL CATEGORY 1:

SUSTAINABLE MANAGEMENT OF ENERGY RESOURCES (MANDATORY CATEGORY)



Lower total primary energy demand than that of the reference building stipulated in the German regulations for energy saving in buildings and building systems (EnEV) or DIN V 18599 and undercutting permissible transmission heat loss or the permissible heat transfer coefficient



Markedly lower total primary energy demand and markedly undercutting permissible transmission heat loss or the permissible heat transfer coefficient

**ECOLABEL CATEGORY 2:
SUSTAINABLE MANAGEMENT OF PUBLIC GOODS**



Architectural competition, no heavy metal contamination of water bodies, modest demand for potable water, space efficiency, family-oriented design, bicycle parking



Public access to ground floors and basement floors (plinth level) or housing with low car ownership, limited potable water demand, use of roof area, increased space efficiency

**ECOLABEL CATEGORY 3:
USE OF ECOFRIENDLY CONSTRUCTION MATERIALS**



Compliance with requirements regarding construction materials containing halogen, biocides, heavy metals, organic solvents and construction materials described as sensitizing, ecologically harmful



Life cycle analysis of building materials used and undercutting of reference values for selected global impact parameters, wide use of renewable resources

**ECOLABEL CATEGORY 4:
SPECIAL CONSIDERATION OF HEALTH AND WELL-BEING**



Target values for indoor air quality (TVOC), thermal comfort (categories in accordance with DIN EN 15251), acoustic comfort (reverberation time) and user influence (regarding indoor climate, lighting and glare protection)



Lower target values for indoor air quality (TVOC), thermal comfort (categories in accordance with DIN EN 15251), acoustic comfort (reverberation time) and user influence (indoor climate, lighting and glare protection), plus 20% of area suitable for people with allergies

**ECOLABEL CATEGORY 5:
SUSTAINABLE FACILITY OPERATIONS**



Optimization of durability, flexibility of use and building operational costs, modularity of building and variability of design, barrier-free access to all floors



Special solutions for variable use of building components. Compilation of product documentation and its inclusion into building operation manuals or room data sheets

HAFENCITY ECO AWARD

The HafenCity Eco Award is to be awarded to buildings of every type of use in recognition of their outstanding ecological quality. Projects selected for a shortlist will be buildings that meet the criteria of the Ecolabel (silver or gold). Evaluation for the Eco Award will particularly focus on examining and considering the integration of individual ecological features into the overall concept and the form of the building.

The HafenCity Eco Award is designed to bolster the positive public impact of an outstanding ecological building. Following on from the concept of the Ecolabel, this additional distinction will honor an applicant's special commitment and highlight the special status of the building within HafenCity.

By default, the construction of new buildings takes away a little of our environment, i.e. architecture always has an initial negative impact on natural surroundings, which should then be made up for through 'ecological measures'. On the other hand, buildings can also be an attractive complement to our natural environment (not simply because they provide shelter or perform certain functions). The built environment represents something akin to a 'second nature', which offers a sense of stability in our social systems. Architectural and engineering achievements can contribute essential qualities to this 'second nature'.

Generally, outstanding green buildings imply higher costs for design services and implementation, with amortization only to be expected in the medium or long term. The positive impact of this commitment on the general public is difficult to measure in financial terms. The HafenCity Ecolabel and Eco Award will help to promote public awareness of that engagement.

HCH plans to present the HafenCity Eco Award every two years or so. The shortlisted building projects will be evaluated by a professional jury. There is no legal entitlement to the Eco Award.

CERTIFICATION PROCEDURE

In order to assess sustainable construction projects, criteria relevant to their content as well as instruments to quantify the success of ecological and engineering design targets are needed. Instruments for assessing quantity can be determined through the choice of indicators (e.g. energy demand or air quality), through simple 'fulfilled/not fulfilled' confirmation (e.g. of product properties) or, for qualitative assessment, through subjective evaluation of a result. The criteria for the Ecolabel were chosen with regard to practice-oriented aspects of ecological structural engineering possibilities on the one hand and economic, legal and building operations requirements on the other. Examples are given for each of the specified targets; each mandatory requirement regarding the selection of building products and construction methods was checked to confirm its suitability for tender and implementation and was tested positively. All requirements were checked for compliance with the relevant technical regulations and standards.

All design targets and evaluation procedures have been selected or described so that technical assessment can be carried out and is easy to comprehend. Assessment procedures that rely on indicators will be based on standard methods, or on processes and techniques well known to experts.

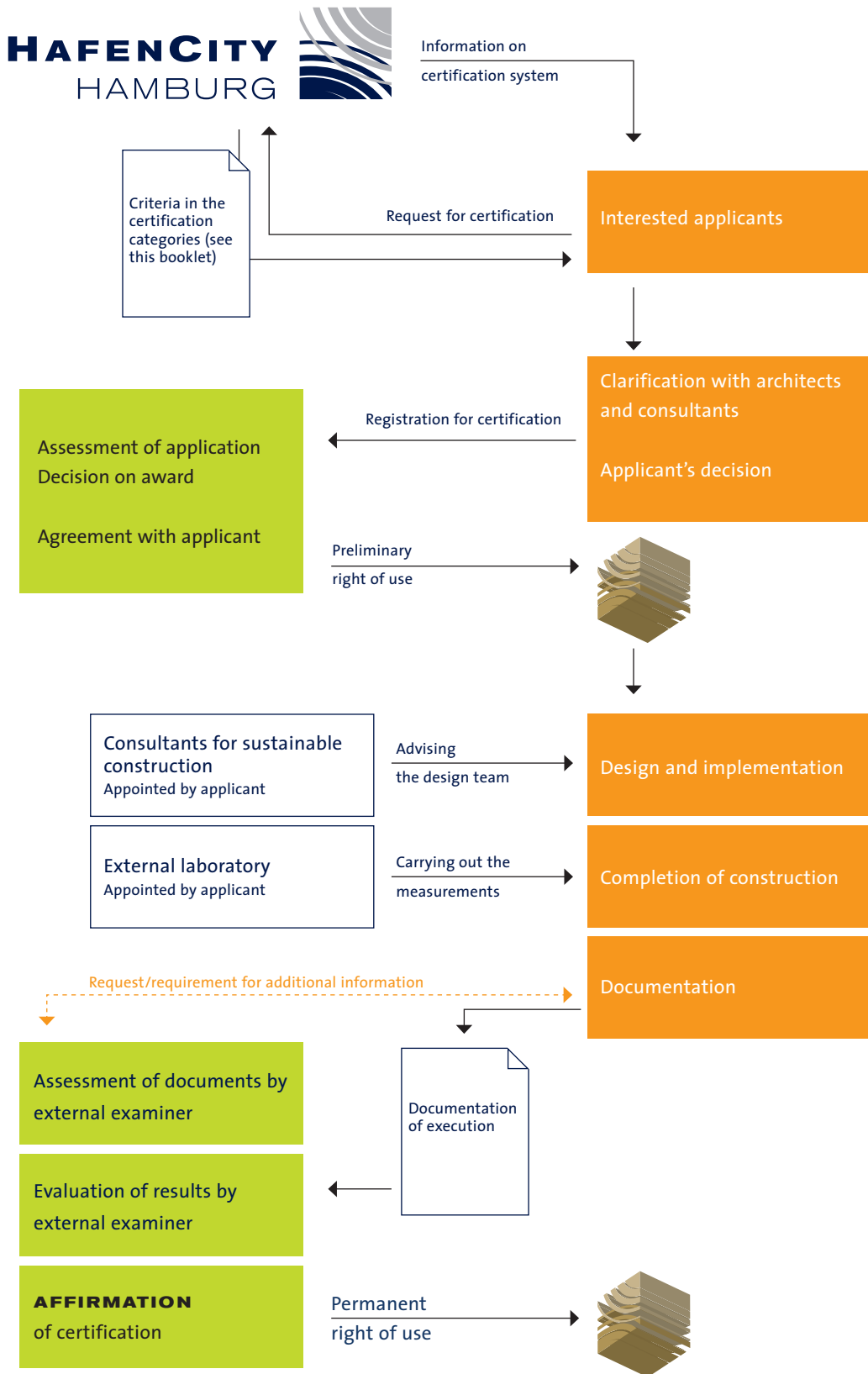
It is envisaged that applicants apply for the Ecolabel they are targeting in the chosen categories prior to the start of the design process or architectural competition. An early start is essential, as numerous subordinate targets must be taken into consideration in the early design stages and should be stated in the architects' competition brief. This will facilitate the timely and necessary cooperation between architects and consultants (building physics and building services engineers).

The Ecolabel is a graphic symbol and the copyright is owned by HCH. When applying for a HafenCity Ecolabel the applicant agrees to meet the pertinent criteria in the design and implementation of the project. Once the agreement on the Ecolabel has been signed and the preliminary certificate is issued, the applicant is given copyright to use the Ecolabel logo for marketing the building.

- **The certification procedure commences with a letter of intent and application by the applicant.**
- **After formal checking of the application, HCH enters into an agreement with the applicant in which he or she is contracted to meet the relevant design targets and to provide verifiable documentation.**
- **Non-compliance with the agreement will result in contractual penalties and if necessary withdrawal of the Ecolabel. If there is reasonable doubt of compliance with the agreement, independent experts may be called upon at the applicant's expense.**

The onus is on the applicant to meet the agreed certification targets, or on the professional consultant appointed by the applicant. The documentation for the final certification is checked by technical experts certified by the HCH and appointed by and paid for at the applicant's expense, not by HCH. The right to use the Ecolabel logo does not imply any quality or warranty claims against HCH whatsoever.

CERTIFICATION FLOW CHART



VERIFIABLE PROOF AND DOCUMENTATION

The proof and documentation necessary for assessing the project are to be compiled on the instructions of and at the expense of the applicant. Checklists of the required documentation are available for each category and quality target. Depending on the category and sub-target, the required documentation could include:

- **Description of the building physics concept and possibly numerical proof and simulation methods which would, in any case, be required for high-standard construction projects. These include, for example, calculations in accordance with EnEV, indoor climate calculations or climate simulations, calculations of fire loads, etc.**
- **Description of the building physics concept and numerical proof in excess of standard methods. This includes conversion of energy demand into primary energy figures, drawing up a construction waste balance sheet, additional indoor environment factors, etc. Calculation methods are given in the implementation guidelines where applicable.**
- **Documentation of specification texts, to verify the inclusion of the criteria in the additional technical contract terms (zusätzliche technische Vertragsbedingungen, ZTV) or in main items. Generally these are written specifications for the chosen construction products and/or specific features of the construction.**
- **Compilation of binding material declarations and documentation of materials by the appointed contractors in compliance with the tender documents. Information can be compiled by the project management, site management or the main contractor. Having binding declarations for all specified materials is a clear advantage for clients. Experience has shown them to be a valuable instrument, as they are legal proof of specified materials and quality of work, which may be useful to support any warranty claims by the client.**
- **Depending on the category, measurements can be taken to provide proof of the agreed properties, such as airtightness (blower door test), indoor air (TVOC), certain comfort indicators, etc. Measurements must be taken at the end of the construction works.**

The HafenCity Ecolabel contractual agreement attaches great importance to the documentation and proof of structural and technical results. Documentation on conformity and compliance with the required standards must be checked by an HCH-approved assessor appointed and paid for by the applicant. The final Ecolabel will not be issued until a positive performance assessment has been submitted.

If the documentation is not submitted on the due date, contractual penalties will be imposed; unverified performance will result in the termination of the right to use the Ecolabel emblem. Documentation must be presented for the whole building and, only where necessary, split into the relevant types of use. The required documentation is to be marked _G (Building) for the general category comprising all types of use or marked to indicate the specific types of use: _B (Office), _W (Residential), _H (Hotel) or _R (Retail). A detailed list of required assessment documents is available in the documentation guidelines (available upon request).

MIX OF USES AND USE VARIANTS

Certificates are issued for whole buildings only. Sub-areas with special uses cannot be certified separately. One of the express urban design objectives of HafenCity is to provide buildings with mixed uses. Category 2 defines the minimum requirements for an appropriate mix. All residential, hotel and office buildings, for example, should be open for public use on the ground floor or basement floor (plinth), if possible. Commercial buildings should as a rule include a combination of residential or office use.

If different types of use are combined in one building, all partial usable floor space that occupies more than 10% of the total building area must comply with the requirements outlined in the following chapters. This separation into different types of use does not affect the requirements of the EnEV for zoning buildings. Certification in a specific category and up to a specific performance rating implies that the criteria are met for all types of use. A combination of Ecolabel standards and categories for different uses within one building is not permitted (either 'gold' or 'silver' for the entire building).

Small uses that make up less than 10% of the total usable floor space can be added to other types of use within the building for assessment purposes. Allocating areas in this way is not mandatory; such areas can be counted separately, subject to agreement with HCH. For example, if in a five-story residential dwelling one third of the ground floor is being used for retail and offices, these areas can, for simplicity's sake, be counted as residential space, or they can be counted separately according to their respective use. However, if one type of use accounts for more than 10% of the total usable floor space, for example just over half a story, it must be counted separately. Differentiation of types of use is according to the gross floor area; shared circulation spaces must be accounted for proportionally. In borderline cases, the allocation of types of use must be agreed with HCH.

Two possible variants are available for hotel and retail uses. A separate variant for gastronomy (restaurant) does not exist. Space used for gastronomy within a hotel is allocated to the hotel area for purposes of certification; other gastronomy areas must be allocated to commercial areas.

HOTEL VARIANT

Irrespective of the classification of the hotel standard, two types of hotel are differentiated:

- 1. Hotel garni² (bed and breakfast hotel, including apartment hotels) without additional facilities such as restaurants, or similar**
- 2. Hotel² with additional facilities, such as event and conference rooms, restaurant, pool or spa (sauna, whirlpool, gym, etc.)**

² According to the definition of mode of use in the DIN EN ISO 18513

For simplicity's sake, a hotel garni includes all use concepts in which the area of hotel rooms exceeds 80% of the main usable floor space, irrespective of whether they are simply hotel rooms or apartments. Buildings in which more than 20% of the main usable floor space is allocated to gastronomy or other uses should have such areas assessed separately.

The actual primary energy demand of the hotel variant is harder to predict than that of the hotel garni variant, owing to the higher technical input. For that reason, a higher tolerance is permitted for this type of use during the monitoring phase. There are no other dissimilarities in the criteria for the variants.

RETAIL VARIANT

Retail use also covers such gastronomy areas that are not part of hotel uses. Irrespective of the size of the usable floor space, there are two options:

- 1. Retail 1: retail building with one occupier**
- 2. Retail 2: retail building with several occupiers, such as shopping centers, etc.**

In commercial buildings with one occupier (Retail 1), the occupier and his or her interests, certification included, are generally known. The requirements for certification can be planned for by the applicant and consequently will need little extra coordination.

In commercial buildings (Retail 2) designed for several users, only some of the prospective tenants will be known. For the applicant this means that requirements for a later certification cannot be planned for without risk, since they may not be of interest to future tenants. Parts of the construction, such as fitting out, are generally carried out by the tenants. The result is that a markedly higher degree of coordination is needed for documentation and measurements than with Retail 1.

For the Retail 2 variant, compliance with the required lower primary energy demand applies only to a part of the rental area. Due to the high degree of influence of individual tenants, the actual primary energy demand is more difficult to predict than for Retail 1. For this reason, a higher tolerance is allowed for with this type of use during the monitoring phase. Other dissimilarities in terms of requirements for the variants apply to Category 2, regarding space efficiency. In Categories 3 and 4, the rental area is only partly counted in; in Category 5 some partial aspects for Retail 2 are not considered; instead, the modularity of the building or the convertibility of its design have been included in the considerations.

K 1: SUSTAINABLE MANAGEMENT OF ENERGY RESOURCES

Innovative buildings have been associated with considerably lower energy demand in recent years in Germany than that stipulated by the respective version of the Energy Saving Ordinance EnEV. Examples of passive houses, zero energy houses or buildings generating an annual surplus of energy demonstrate that constructing new buildings can make a significant contribution to saving energy and resources. Furthermore, specifying non-fossil energy sources will improve the energy balance of building operations.

Looking at the overall primary energy demand of a building in accordance with DIN V 18599, the applicant has considerable freedom in the way in which energy saving components can be combined. The overall energy demand of a building can be optimized through insulation of the building envelope, type of heating system, hot water supply and cooling, as well as through electric power demand. In addition, the choice of energy source and the proportion of renewable energy can positively influence total primary energy demand. The very low primary energy performance for local or district heating supply in HafenCity allows the total primary energy demand $Q_{p,max}$ stipulated in the EnEV to be met with a comparatively high transmission heat loss. To prevent certification of buildings with low insulation standards, the relevant criteria for transmission heat loss must be met. In accordance with the criteria in the EnEV, additional undercutting of the maximum permissible transmission heat loss $H_{T,max}^t$ is stipulated for residential dwellings, and for non-residential dwellings the maximum permissible heat transfer coefficient (\bar{U} -value) must be undercut. Table 2 in Appendix 2 of the EnEV distinguishes between the heat transfer coefficients in non-residential dwellings according to room temperature zones ($>/<19^\circ$) and e.g. opaque or transparent façade elements. The EnEV stipulates the mean value for the building components to have a maximum \bar{U} -value (heat transfer coefficient) in compliance with DIN EN ISO 6946³. To achieve special performance rating, the above values must be generally undercut by 20%. To achieve excellent rating, the values must be undercut by 40% for opaque and 30% for all other building components. The required insulation standard must be reached using commercially available insulation materials and glazing.

DIN V 18599 does not yet consider unheated areas and lifts. As a result all endeavors to improve these areas are not reflected in the index values in the energy performance certificate. In order to include such evident endeavors for improvement of the overall evaluation, they will be considered during monitoring. In case of unfavorable location factors that are outside the applicant's influence, variations of the target value for the total primary energy demand of up to 10% are permissible. For buildings that are subject to specific provisions by the City of Hamburg as regards ventilation (e.g. because of ship's emissions), the general criteria for Category 1 for the calculation of the primary energy demand can be varied to omit the energy demand for ventilation (including the required filters, etc.) from the target and reference values. Exceptions must be agreed in advance with HCH. Energy efficient buildings can only function in the long-term if the surplus and demand of the different energy sources used are recorded and documented. The availability of the data, converted into the primary energy demand, allows the occupants to appreciate any savings made and to publicize the success of the project. This performance control is done by measuring the flows of electricity and media in buildings in accordance with EnMess 2001 or its superseding regulations. If the target values are not met, possible flaws can be detected, suitable areas modified (systems, structural components, etc.) and improvements recorded.

³ The Deutsches Gütesiegel Nachhaltiges Bauen (German Sustainable Building Certificate), Version 09, with reference to the EnEV 2009, demands in Criteria 35 comparable target values and interim target values for \bar{U} -values.

CRITERIA FOR SPECIAL ACHIEVEMENT (SILVER)

To qualify for special achievement for the sustainable management of energy resources, the following will be assessed for all types of use:

<ul style="list-style-type: none"> • Undercutting the permissible total primary energy demand $Q''_{p,max}$ of the EnEV 2009 by 30% and • Undercutting the permissible transmission heat loss $H'_{T,max}$ of the EnEV 2009 by 20% 	Residential
	Office
	Hotel
	Retail
<ul style="list-style-type: none"> • Undercutting the permissible total primary energy demand $Q''_{p,max}$ of the EnEV 2009 by 15% and • Undercutting the permissible heat transfer coefficient \bar{U} of the EnEV 2009 in compliance with Appendix 2 Table 2 by 20% 	Residential
	Office
	Hotel
	Retail 1
<ul style="list-style-type: none"> • Undercutting the permissible total primary energy demand $Q''_{p,max}$ of the EnEV 2009 by 15% and • Undercutting the permissible heat transfer coefficient \bar{U} of the EnEV 2009 in compliance with Appendix 2 Table 2 by 20% • Proof for all common areas and at least 70% of rental areas 	Residential
	Office
	Hotel
	Retail 2

For Retail 2 areas, up to 30% of rental area for which the need for cooling, lighting, etc. cannot be forecast may be omitted from the assessment of total primary energy demand. The exception is to be taken into consideration in the measuring concept for the monitoring.

CRITERIA FOR EXCELLENT ACHIEVEMENT (GOLD)

Excellent achievement rating in the management of energy resources is based on the following:

<ul style="list-style-type: none"> • Undercutting the permissible total primary energy demand $Q''_{p,max}$ in the EnEV 2009 by 45% and • Undercutting the permissible transmission heat loss $H'_{T,max}$ in the EnEV 2009 by 30% 	Residential
	Office
	Hotel
	Retail
<ul style="list-style-type: none"> • Undercutting the permissible total primary energy demand $Q''_{p,max}$ in the EnEV 2009 by 30% and • Undercutting the permissible heat transfer coefficient \bar{U} in the EnEV 2009 in compliance with Appendix 2 Table 2 Line 1 by 40% (opaque building components) and Line 2-4 by 30% (all other building components) 	Residential
	Office
	Hotel
	Retail 1
<ul style="list-style-type: none"> • Undercutting the permissible total primary energy demand $Q''_{p,max}$ in the EnEV 2009 by 15% and • Undercutting the permissible heat transfer coefficient \bar{U} in the EnEV 2009 in compliance with Appendix 2 Table 2 by 20% • Proof for all common areas and at least 85% of rental areas 	Residential
	Office
	Hotel
	Retail 2

For Retail 2 areas, up to 15% of rental areas for which the need for cooling, lighting, etc. cannot be forecast can be omitted from the assessment of the total primary energy demand. The exception is to be taken into consideration in the measuring concept for monitoring.

Note: The specification applies to the types of use marked in green.

CRITERIA FOR MONITORING

During the first two years of the building's intended use (occupied, rented out, etc.) the total energy demand must be recorded, converted into primary energy and checked against the target values. The intended use of the building is achieved when at least 70% of the area is used as planned.

The necessary data for the flow of electricity and media in the building should be recorded using the appropriate measuring techniques. The agreed calculation of the total primary energy balance is to be carried out on an annual basis. Preliminary checks at the end of the first year can help to identify trends and the possible need for corrections at an early stage.

The agreed corrections must be made if the characteristic value of the cumulative average consumption recorded during the two years – if applicable, corrected to include exceptional air conditioning/ventilation deviations and changes relative to the assumptions made in the EnEV regarding uses – is more than 5% above projected demand.

CORRECTING VARIATIONS

If the target values are exceeded by more than 5%, the weak points must be identified and rectified in the appropriate areas (systems, components, etc.). The improvement measures must be documented in the same way as the original construction work. The necessary improvements must be tested for effectiveness after a year, as described above. The results of the test must be made accessible for inspection.

CRITERIA FOR MONITORING RESULTS

The declared efficiency of a building is accomplished if the total primary energy demand does not exceed the tolerances listed in Table 1

Table 1: Monitoring tolerances

Type of use	max tolerance
Office	5%
Residential	5%
Hotel (B&B)	15%
Hotel	25%
Retail Type 1	15%
Retail Type 2	25%

Optimization in areas or systems (underground car park ventilation, lifts) which are not covered by the evaluation in DIN V 18599, can be, if different from the anticipated value in the monitoring, calculated with an additional 5%, providing this will achieve savings of more than 5% in relation to the areas in the buildings which have been accounted for as specified in the EnEV. Proof of the anticipated savings must be provided, including a clear description of the approach applied.

DOCUMENTATION OF ENERGY EFFICIENCY

If services in work stage 8, listed in Appendix 11, § 33 in the Official Scale of Fees for Services by Architects and Engineers (HOAI), regarding the required compilation and handing over of 'required documents, manuals and test records' have been commissioned and executed, a large part of the information will already be available and, presented in the form stipulated in the documentation guidelines, can be used as proof for this category.

Special services, such as the execution of performance and operational measurements, should be carried out by qualified experts. The following summary provides important information on the documentation of sub-sections. A complete list of requirements is included in the documentation guidelines.

STRUCTURAL INSULATION (DOCUMENTATION: K1_G_1)

- **Documentation of the construction and thermal protection index values of the most important exterior building components**
- **Test records for airtightness**

INDOOR CLIMATE, HEATING, VENTILATION (DOCUMENTATION: K1_G_2-4)

- **Technical documents, manuals and inspection documents**
- **Maintenance and servicing plans**
- **Records of the final acceptance procedures**
- **The detailed briefing of the occupiers by the contractor must be checked by the applicant and minuted**

HOT WATER DEMAND (DOCUMENTATION: K1_G_2)

- **Documentation of the fitted appliances with the connected load and operation manuals, etc.**

LIGHTING (DOCUMENTATION: K1_G_5)

- **Documentation of the installed building components/products in external walls, lighting (lamps) and control devices including technical and physical index values**
- **Maintenance and servicing plans**
- **Records of the final acceptance procedures**
- **Design documentation, simulations**

UNACCOUNTED ENERGY OPTIMIZATION MEASURES (DOCUMENTATION: K1_G_6)

- **Documentation of optimization measures for systems that have not been accounted for in the EnEV, such as ventilation systems in underground car parks, lifts, etc.**
- **Description of technical standards and achieved reduction in energy demand**

MONITORING (DOCUMENTATION: K1_G_7)

During the first two years of intended use, the energy consumption is to be measured, which is part of the evaluation in compliance with DIN V 18599. Consumption is to be converted into primary energy, as set out in the guidelines, and compared with the target values.

The required data for electricity and media flows in the building are to be measured using the measuring techniques described above. The agreed calculation of the total energy demand is to be prepared annually. A preliminary balance after one year can help to ascertain trends and necessary corrections recognized in advance.

K 2: SUSTAINABLE MANAGEMENT OF PUBLIC GOODS

The category 'Sustainable Management of Public Goods' addresses areas in which individual applicants take on special responsibility, beyond immediate control over building projects of their own, for the environment and society. The objective of architectural competitions is to promote high standards of urban design and architecture. Avoiding polluting the River Elbe or installing water-saving sanitaryware throughout contribute to the sustainable management of public goods. Similarly, providing public access to ground floors or basement floors (plinths) enhances the attractiveness of HafenCity and hence also contributes to the common good. This is also true for the car-free living alternative. People with disabilities rely on accessible buildings, and their lives or the time they spend in HafenCity would be restricted without a certain level of appropriately equipped areas, rooms and apartments.

Other qualities that make a contribution to common welfare are the provision of sufficient bicycle parking spaces, the design of family friendly shopping facilities and disruption-free delivery and waste management access to retail areas.

DESIGN QUALITIES

Incorporating all urban, functional, design-related, economic and ecological criteria in the design of a building and its associated open spaces is a huge challenge for the builder and planner. Architectural competitions provide builders with a choice of real design options and the opportunity to attain a high level of sustainable quality. During the process of architectural competition a great deal of attention is paid to all matters of public interest through the composition of the panels of judges (including representatives from politics, the Hamburg Ministry for Urban Development and Environment and HafenCity Hamburg GmbH). Requiring the winner of the competition to execute the design process until stages 1 to 4 at least, and part of work stage 5 (design of typical details), in compliance with § 15 HOAI, ensures that the winning design actually delivers quality.

Requirements of the 'fifth elevation', the roof, should ensure that additional areas are secured for the common good. These include green roofs, solar active surfaces or roof terraces. Areas required for technical equipment should be reduced to a minimum, and external technical structures which are visible should be of a high standard of design.

HEAVY METAL CONTAMINATION OF WATER

Copper or zinc roofing and façades may be specified for either a traditional or contemporary appearance of the building. Both materials have a long life but, through slight but constant erosion, contribute to the pollution of water bodies.

Within the context of sustainable construction, therefore, buildings with copper or zinc roofing, or guttering made of these metals, will be prescribed suitable filtering equipment to avoid pollution through heavy metals. The erosion of zinc from steel panels and steel sections that are exposed to weathering can be avoided by coating them. System-induced ancillary areas of zinc sheeting or copper and zinc panels with an exposed area covering less than 10% of the building's total footprint are tolerated within the scope of the guidelines.

CAREFUL MANAGEMENT OF FRESH WATER

Production and supply of potable water has not yet reached its limits in Central Europe, as in many other regions around the world, but does incur considerable expenditure. Sparing use of potable water is not limited to reducing consumption, but includes the use of stormwater and grey water.

Installing water-saving sanitaryware, such as monobloc mixer taps with flow regulators, toilet bowls designed for low flush volumes (6 liters), dual flush WCs and water-saving showers, will reduce operational costs for water and the energy needed to heat it. Substituting a proportion of water with processed water requires the installation of additional pipes for grey water as well as for the distribution of (treated) process water, for use in toilets for example. Installation of water-less urinals, which has already been successfully done in many public buildings, can directly reduce the consumption of potable water and cleaning.

Appendix 1 describes how the index value for water consumption⁴ (WKW) is to be calculated, by adding the (potable) water demand to the waste water quantity. The lower the index values for water consumption, the better the evaluation of the building. The demands of staff in offices are assessed, as are those of staff and clients in commercial buildings and of guests in hotels. The water demand for cleaning the building is added to this.

Reference values for office and commercial buildings are based on the statistical index values. Special rating is achieved by keeping within the reference value, while an excellent rating requires undercutting the reference value by 25%.

The assessment of potable water consumption in hotels is based on the operating figures published by the Hotelverband Deutschland (German Hotel Association IHA) for average water demand per person and per night in Germany, according to hotel classification. According to the Hotel- und Gaststättenverband⁵ (German Hotel and Catering Association), the installation of water-saving showerheads has met with a positive response from guests. Currently, there are no index values available for water consumption by central facilities in hotels, such as restaurants, swimming pools, etc. As a result, no difference is made in the assessment of the two types, hotel and hotel garni. The statistically recognizable differences⁶ between hotel categories are taken into account by applying a correction factor.

Water in hotel rooms is mainly used for showering/bathing, which can only be reduced by limiting the flow, but not by using process water. Potential savings are generally lower than in administration buildings for example, where water is mainly used to flush toilets, etc. The reference values for hotels take into account the use of widely available water-efficient sanitaryware. Therefore, savings of 10% over and above the reference value will achieve an excellent performance rating.

PUBLIC ACCESS

Giving public access to ground floor or basement floor (plinth) areas can enhance the urban quality of the district. Without public access to ground floor areas, the associated open spaces are less appealing to passersby. A hotel with a restaurant or other facilities open to the public on any ground or basement floor (plinth), will offer such qualities. The same applies to office and residential dwellings with small-scale areas for trade or commercial uses. In buildings primarily used for commerce this should be offset by the availability of cultural facilities. Buildings which

⁴ The calculation method for potable water demand is based on the criteria fact sheet No. 14 of the Deutsches Gütezeichen Nachhaltiges Bauen (German Sustainable Building Certificate)

⁵ http://energiekampagne-gastgewerbe.de/index.php?option=com_content&task=view&id=73&Itemid=104

⁶ according to a statement by the Hotel Association, dated 21.07.2009

are solely for residential and office use, or hotels garni, should incorporate additional public use in these areas (e.g. as rented space). At basement floor level, the use of plinth areas for shops, cafés or service industries, e.g. in the recreation sector (sports, etc.) will enhance the quality of the promenade. In many areas of HafenCity, provision for public use will constitute a part of an excellent achievement rating. For areas in HafenCity where such an increased mix of uses would not be needed or feasible, requirements for reduced-car residential areas, as outlined below, can be applied to offset this.

TRANSPORT AND MOBILITY CRITERIA

A large proportion of local private traffic is generated by residents of a building arriving and departing, or by people working for one of the firms based in the building. Noise and vehicle exhaust pollution is associated with motorized traffic and it endangers children and other non-motorized road users. Land taken up by transport infrastructure decreases the availability of open spaces. Reducing private car use can be seen as an important contribution to sustainable development in HafenCity.

The consumption of land for transport infrastructure within the site area is mainly laid down in the urban land use plan (Bauleitplanung) and, hence, individual applicants only have limited influence. However, the type and degree of use of traffic infrastructure is within the applicant's sphere of influence. By ensuring ease of transport for cyclists as well as providing local car-sharing opportunities, users and residents will have alternatives to car owning, which also include deliberately forgoing car ownership.

BICYCLE PARKING

Encouraging the use of bicycles is an important contribution to ecofriendly and energy efficient transport and is easy to achieve on a large scale, since most car journeys are of less than 5 km. To motivate people to cycle rather than use the car, the necessary bicycle infrastructure must be in place, ranging from appropriate numbers of accessible, covered bicycle parking spaces to facilities for changing clothes, showering and drying cycling kit.

Special achievement rating can be obtained through provision of a certain number of parking spaces per workplace, apartment or sales area in addition to a certain degree of comfort above and beyond the legal planning requirements. An excellent achievement rating must deliver a higher number of parking spaces, with a considerable degree of comfort.

LOW CAR-DEPENDENCY HOUSING

An assessment of private motorized transport per building can be adduced from the number of required car parking spaces. The Hamburger Globalrichtlinie 'Notwendige Stellplätze und notwendige Fahrradplätze' (Hamburg General Guideline 'Required car parking spaces and required bicycle parking spaces') demands evidence that 0.8 car parking spaces have been allowed for per apartment. At the Saarlandstraße⁷ project in Hamburg, a low car-dependency housing scheme with 210 residential units, only 0.15 car parking spaces per unit were provided for visitors and car-sharing. The residents entered into a contractual agreement renouncing the right to own a private car. In areas like HafenCity, which are not planned as car-free zones, a reduction to 'low car' status for specific buildings cannot be applied throughout, since the construction of plinth basements was necessary to make buildings flood resilient. Therefore, the target for a sustainable mobility concept is securing car parking for a maximum of 25% of the figure stipulated in the General Guideline. The standard for excellent achievement rating in

⁷ Low car housing at Saarlandstraße, with a car parking factor (car-sharing) of 0.15; for more information see www.wohnwarf.t.de

terms of low car-use housing will be accomplished by providing no more than 0.2 car parking spaces per apartment (in compliance with No. 2.5.4 in the Hamburger Globalrichtlinie). To ensure that car parking spaces and the related local traffic infrastructure remain minimal, all residents in the building have to declare in a contractual agreement that they will refrain from owning a car.

In buildings for residential use only, for which the local development plan (Bebauungsplan) does not make the compulsory requirement of ground floor heights of 5 m (the finished floor height of the first upper story must be at least 5 m above the adjacent road level), low car housing constitutes an excellent achievement rating, in place of the requirement to accommodate public uses on the ground floor or in the basement floor (plinth).

In view of the growing acceptance of car-sharing schemes, it is recommended that such measures should be considered during the design phase.

FAMILY FRIENDLINESS

Promoting family friendly structures and adapting the built environment to the needs of families is an important component for sustainable demographic development. In particular, public areas in retail spaces and hotels should be appropriately designed and fitted with the necessary technical equipment. Car parking spaces of at least 2.7 m width make getting in and out of a car with children easier. Automatic doors make entering and leaving a building with children or a pram easier. The safety of children will be ensured through installing finger protection or finger protection frames for the doors. Additionally, spaces for childcare and baby changing facilities are needed.

DEMANDS ON SPACE – LAND USE EFFICIENCY

The HafenCity urban development project is converting former industrial and port areas into inner-city urban, mixed-use spaces. The port extension of 1862 gave the site its characteristic appearance, much of which will be retained. Today, docks, quays and various historical buildings – refurbished and put to new uses – define the typical character of HafenCity. Some of the industrial legacy, for example the gas works and a railway depot, had to be demolished during decontamination of the soil. Conversion measures therefore not only release considerable potential by reversing soil sealing, but also recycle contaminated areas. For this reason, all buildings that are erected in HafenCity are deemed to have a low demand for land⁸. Within the new buildings, the optimized proportion of usable floor space to gross floor area (index value for area efficiency) not only enhances the costs of construction and operation, but also offers advantages through reducing environmental impact and sealing of ground surfaces.

If in Retail 2 buildings the characteristic value for area efficiency is larger than 0.5, special achievement rating is attained, and if it is higher than 0.65, excellent achievement rating is attained. Area efficiency is determined by calculating the ratio of rentable area (commercial premises) (MF-G) and non-rentable area (MF-o), in compliance with the 'Richtlinie zur Berechnung der Mietfläche für gewerblichen Raum (MF-G) der Gesellschaft für Immobilienwirtschaftliche Forschung e. V. (Gif)' (Society of Property Researchers' standard for calculation of rental area in commercial premises).

⁸ within Criterion No. 15 of the Certification System of the German Sustainable Building Council (DGNB) conversion is the target value with the highest number of points.

CRITERIA FOR SPECIAL ACHIEVEMENT (SILVER)

Special achievement in sustainable management of public goods is based on the following:

HOLDING AN ARCHITECTURAL COMPETITION (DOCUMENTATION: K2_G_1)

<ul style="list-style-type: none"> • Holding an architectural competition with representatives of public interests in the competition jury. The composition of the jury is to be agreed with the awarding body of the Ecolabel. Appointing the competition winner to perform work stages 1 to 5 in accordance with § 15 HOAI, at least, and work stage 5 in part (design of typical details), ensures that the awarded design quality is implemented. 	Residential
	Office
	Hotel
	Retail

PREVENTING HEAVY METAL CONTAMINATION IN WATER BODIES (DOCUMENTATION: K2_G_2)

<ul style="list-style-type: none"> • Preventing the discharge of heavy metals into water bodies and soil 	Residential
	Office
	Hotel
	Retail

LIMITING FRESH WATER DEMAND (DOCUMENTATION: K2_G_3)

<ul style="list-style-type: none"> • Adhering to the reference value for fresh water demand (water demand index value) in accordance with Appendix 1 	Residential
	Office
	Hotel
	Retail

FAMILY FRIENDLINESS (DOCUMENTATION: K2_G_4)

<ul style="list-style-type: none"> • 5% of all car parking spaces to be family friendly (min width 2.7 m) • Easy to use doors with automatic door openers for prams/push chairs • Child-safety ensured through doors with finger protection or finger protection frames • Baby changing room for fathers and mothers • Areas for childcare • Children’s play area with play equipment and seating 	Residential
	Office
	Hotel
	Retail

Note: The performance specification applies to all types of use marked in green

BICYCLE PARKING SPACES (DOCUMENTATION: K2_G_5)

<ul style="list-style-type: none"> • 1 bicycle parking space per 60 m² residential area • Bicycle stands are located 35 m max from the respective building entrance • Bicycle parking facilities offering medium comfort in accordance with Appendix 4 	<p>Residential</p>
<ul style="list-style-type: none"> • 1 bicycle parking space per employee for every 10 members of staff (250 max) • 1 bicycle parking space for visitors per 150 m² gross floor area in offices with visiting public • Bicycle stands are located 35 m max from the respective entrances • Bicycle parking facilities offer medium comfort in accordance with Appendix 4 	<p>Office</p>
<ul style="list-style-type: none"> • 1 bicycle parking space for visitors per 10 hotel rooms (50 max) • 1 bicycle parking space for staff per each 5% of staff/employees (5 min) • Bicycle stands are located 35 m max from the respective entrance • Bicycle parking facilities offer medium comfort in accordance with Appendix 4 	<p>Hotel</p>
<ul style="list-style-type: none"> • 1 bicycle parking space for visitors per 250 m² retail area (200 max) • 1 bicycle parking space for staff per each 5% of staff/ employees (5 min) • Bicycle stands are located 35 m max from the respective entrance (for buildings with more than 30,000 m² shop area visitor bicycle parking stands are located at 50 m max) • Bicycle parking facilities offer medium comfort in accordance with Appendix 4 	<p>Retail</p>

AREA EFFICIENCY (DOCUMENTATION: K2_G_6)

<ul style="list-style-type: none"> • The ratio of rental area MF-G to the total area (MF-G plus no rental area MF-o) is higher than 0.5 	<p>Residential</p>
	<p>Office</p>
	<p>Hotel</p>
	<p>Retail</p>

CRITERIA FOR EXCELLENT (GOLD)

Excellent achievement for the sustainable management of public goods is based on the following additional criteria:

ROOF DESIGN (DOCUMENTATION: K2_G_7)

<ul style="list-style-type: none"> At least 80% of the roof area is designed either as a green roof or as a solar active area and/or a roof terrace. The necessary areas for technical equipment to be reduced to a minimum and their visual appearance to be adapted to blend with other uses on the roof 	Residential
	Office
	Hotel
	Retail
<ul style="list-style-type: none"> At least 70% of the roof area is designed either as a green roof or as a solar active area and/or a roof terrace. The areas needed for technical equipment are to be reduced to a minimum and their visual appearance adapted to blend with other uses on the roof 	Residential
	Office
	Hotel
	Retail

LIMITING FRESH WATER DEMAND (DOCUMENTATION: K2_G_3)

<ul style="list-style-type: none"> Undercutting the reference value for fresh water demand (water demand index value) by at least 25% in accordance with Appendix 1 	Residential
	Office
	Hotel
	Retail
<ul style="list-style-type: none"> Undercutting the reference value for fresh water demand (water demand index value) by at least 10% in accordance with Appendix 1 	Residential
	Office
	Hotel
	Retail

PUBLICLY ACCESSIBLE USES (DOCUMENTATION: K2_G_8)

<ul style="list-style-type: none"> In the ground floor areas or basement floors (plinths) in buildings in which legal planning requirements stipulate a ceiling height of 5 m, at least one type of use is to be designated that is not only available to residents, staff or hotel guests. Corporate or hotel in-house facilities are eligible when made open to the public, as well as space rented by third parties 	Residential
	Office
	Hotel
	Retail

LOW CAR-DEPENDENCY HOUSING (DOCUMENTATION: K2_G_9)

<ul style="list-style-type: none"> • For residential dwellings in which there is no legal planning requirement for ceiling heights of 5 m on the ground floor, or this is not implemented, appropriate measures (car-sharing, agreements) for the provision of a maximum of 0.2 car parking spaces per apartment are to be implemented in compliance with No. 2.5.4 in the Hamburger Globalrichtlinie 'Notwendige Stellplätze und notwendige Fahrradplätze' 	Residential
	Office
	Hotel
	Retail

BICYCLE PARKING (DOCUMENTATION: K2_G_5)

<ul style="list-style-type: none"> • 1 bicycle parking space per 45 m² residential area • The bicycle parking facilities offer a high standard of comfort in accordance with Appendix 4 	Residential
<ul style="list-style-type: none"> • 1 bicycle parking space for every 5 members of staff • 1 bicycle parking space per 80 m² for administration offices with a high frequency of public visitors • The bicycle parking facilities offer a high standard of comfort in accordance with Appendix 4 	Office
<ul style="list-style-type: none"> • 1 bicycle parking space for guests per 5 hotel rooms (max 80) • 1 bicycle parking space for each 10% of staff/employees (min 5) • The bicycle parking facilities offer a high standard of comfort in accordance with Appendix 4 	Hotel
<ul style="list-style-type: none"> • 1 bicycle parking space per 150 m² retail area (max 250) • 1 bicycle parking space per 10% of members of staff/employees (min 5) • The bicycle parking facilities offer a high standard of comfort in accordance with Appendix 4 	Retail

AREA EFFICIENCY (DOCUMENTATION: K2_R_6)

<ul style="list-style-type: none"> • The ratio of rental area MF-G to the total area (MF-G plus no rental area MF-o) is higher than 0.65 	Residential
	Office
	Hotel
	Retail 2

K 3: USE OF ECOFRIENDLY CONSTRUCTION MATERIALS

Building construction and operation has a considerable impact on the environment and intrudes into the ecosystem. Not only the running of the building, but also the production of construction materials and the technical infrastructure necessary for their production cause high economic and ecological impacts. Applicants can therefore make a significant contribution to sustainable construction in HafenCity through the use of ecologically optimized building materials. Ecological optimization reduces not only the environmental impact but generally also the long-term risks and hence costs. Such impacts as emissions to indoor air, corrosive gases released in the case of fire, or toxic materials encountered during demolition can be prevented through ecological optimization.

Sustainable use of construction materials means selecting materials and products that have been manufactured with minimum processing input while achieving a high functionality and durability. It also involves the design of structures that fully exploit the functional strength of the construction materials and thereby limit the manufacturing expense and amount of maintenance.

Furthermore, the sustainable use of construction materials also implies the avoidance of certain hazardous materials, selecting renewable materials for suitable construction details and choosing materials with a comparably low manufacturing outlay and/or low impact in use.

Should one of the following product specifications not be feasible, exemptions from the requirements will be permitted. Deviations from the requirements must be recorded, stating the product type, technical application and quantity, and reasons given. Exemptions are only permissible if proof is given of no alternative construction method being available that meets the required standard or no functionally equal product being available on the market at a reasonable expense. Purely aesthetic grounds do not constitute a reason for exemption.

AVOIDANCE OF CONSTRUCTION MATERIALS AND PRODUCTS CONTAINING HALOGENS

Emissions of halogens such as chlorine or bromine into the environment have a negative impact on the climate and ozone layer as well as being potentially harmful to health. Avoiding construction materials that contain halogens, such as foam plastics with halogenated foaming agents (HCFC, HFC, FC), cable or flooring that contain polyvinyl chloride (PVC) or products with brominated flame retardants, can reduce environmental risks by limiting emissions during production and handling, as well as fire risks during use and during incineration on disposal. Substituting halogenated propellants is technically and economically straightforward. Specifying PVC-free cables incurs little or no extra cost but reduces the environmental impact during production and the fire risk (smoke gas) during use. Proof can be provided through EPD⁹ or similar manufacturers' declarations.

⁹ EPD = Environmental Product Declaration, international or European standards for product declarations; further information at <http://bau-umwelt.de/hp354/Deklarationen.htm>

AVOIDANCE OF VOLATILE ORGANIC COMPOUNDS

Avoiding the use of organic solvents in paints, varnishes, adhesives and auxiliary materials will reduce damage to the ozone layer, the greenhouse effect and near-surface, photochemical ozone-forming processes as well as health risks both for people who handle them and future occupants. Products containing very low amounts of organic solvents, such as varnishes carrying the Blauer Engel ecolabel (RAL-UZ 12a), are of a similar technical standard and will not incur extra cost if used correctly. Proof can be provided through EPD¹⁰, EmiCode, RAL-UZ 12a or equivalent manufacturers' declarations.

AVOIDING HEAVY METAL EMISSIONS DURING MANUFACTURE

Emissions from heavy metals such as zinc, chromium, copper, lead and cadmium are toxic. Depending on their concentration, their toxicity has a considerable impact on the environment. Besides any emissions into water, already addressed in Category 2 (K 2) above, emissions during manufacture can be avoided through the relevant choice of product. Lead and cadmium are primarily used as stabilizers in plastic mixtures and as pigments and drying compounds in varnishes. Chrome, in the oxidation stages chrome III and chrome IV, can occur in process-related waste from products that have had anticorrosive treatment. Proof can be provided through EPD or similar manufacturers' declarations.

AVOIDANCE OF BIOCIDES

Due to their toxicity, biocides pose a potential environmental risk during transportation, storage, application and disposal. As well as being used as a timber preservative, biocides are used as a temporary measure to control mold on surfaces and microbial contamination of casks (fungicides). According to the German Waste Wood Ordinance, timber treated with protective agents cannot be reused. Forgoing the use of biocides in sealants and paints reduces impact on the health of occupants and on the environment; it also reduces transport risks during production. In almost all cases the use of biocides can be prevented through both structural and organizational measures.

The Biocide Directive stipulates that by May 2010 all old substances were to be listed and systematically assessed. At the end of the assessment, a decision is to be made on their inclusion or otherwise into the 'list of permitted substances' (Annex 1 of the Biocide Directive).

AVOIDANCE OF ENVIRONMENTALLY HAZARDOUS SUBSTANCES AND PRODUCTS

Besides specific harm to the environment through halogens, organic solvents, heavy metals and biocides, there are numerous other substances and products which, according to the REACH guidelines, cause sensitization, are harmful to water, soil or air, or have properties that are generally harmful to the environment. Definition of potential harm to the environment by substances and mixtures can be based on the Risk Phrases (R-phrases) in the Ordinance on Hazardous Substances or REACH guidelines; however, they are not practicable as requirements in building specifications. They include R-phrases which, in compliance with Chapter 5 of the Dangerous Substances Directive 67/548/EEC, describe environmental impacts, and R-phrases 26-28 (very toxic) and 42/43 (may cause sensitization) describing the toxic risk to humans in individual life stages of the substance or product. Adapting hazard classifications to the Globally Harmonized System of Classification and Labeling of Chemicals (GHS) will not bring any changes in content, but in the format for describing hazards.

¹⁰ Product labelling by the *Gemeinschaft Emissionskontrollierte Verlegewerkstoffe (GEV)* (Association for the Control of Emissions in Products for Flooring Installation)

Until the introduction of future classification systems that are easy to integrate into the construction process, GISCODES or product codes of the German trade associations will be used to identify the potential hazards listed above. Proof can be provided through EPD, product labeling in accordance with GISBAU¹¹ or equivalent manufacturers' declarations.

AVOIDANCE OF USE OF TROPICAL HARDWOODS WITHOUT FSC CERTIFICATION

Ruthless depletion of tropical, sub-tropical and boreal forests has a severe ecological impact on the diversity of species and climate change. Such impacts can be avoided by specifying timbers which are from a sustainable source and have verifiable Forest Stewardship Council (FSC) certification.

CRITERIA FOR CONSTRUCTION

During construction there will be noise and environmental emissions on the building site. The impact can be reduced by using low noise construction machinery and readily degradable formwork release oil, and by guarding against oil pollution of the soil.

REDUCTION OF GLOBAL IMPACT

Production, transport, maintenance and disposal of construction materials can have high environmental impact contributing, for example, to global warming, soil acidification or eutrophication of both water and soils. Assessing the construction materials used in a life cycle assessment, in compliance with ISO 14040, allows their impact to be recorded and compared with other buildings. From buildings previously assessed in Germany, reference values¹² have been derived in conjunction with the German Sustainable Building Certificate (DGNB) for global warming potential (GWP), eutrophication potential (EP) and acidification potential (AP). For the impact parameter of ozone depletion potential (ODP) and photochemical ozone creation potential (POCP) no confirmed reference values are currently available, or their impact has already been acknowledged through restrictions on the use of certain products. Computations are to be based on the method of calculation set out in Appendix 2.

If it undercuts the reference values, the proposed building will make a contribution to reducing the global impact.

LARGELY RENEWABLE PRIMARY ENERGY DURING CONSTRUCTION

With the introduction of the Erneuerbare Energien Wärmegesetze EEWärmeG (Renewable Energies Heat Act) a raised proportion of renewable energies in heat generation is required. As a result, no further requirements are set in this certification. There are no legal requirements regarding construction materials at present. Using a large proportion of construction materials from renewable raw materials, such as wood, or from sustainable resources which require low industrial production input, such as clay, can increase this proportion, however. Excellent achievement is attained if a high percentage of the building's primary energy is renewable. Assessment is made in accordance with Appendix 2.

RETAIL 2

For the Retail 2 type of use, proof must be provided for the criteria set out below regarding construction materials (see Documentation K3_1 to K3_6) for all common areas and at least 40% of the rented areas. Evidence of the assessment of the construction materials employed must be provided as well as for undercutting of the reference values for all common areas and at least 70% of rental areas.

¹¹ Hazardous substances information system of the Construction Trade Association having Liability for Industrial Safety and Assurance

¹² The reference values are published in Criteria No. 1–5 of the German Sustainable Building Certificate (DGNB). Calculations were determined in the course of a research programme at the Bundesministerium Verkehr, Bauen und Stadtentwicklung (Federal Ministry of Transport, Building and Urban Development)

CRITERIA FOR SPECIAL ACHIEVEMENT (SILVER)

CONSTRUCTION MATERIALS AND PRODUCTS CONTAINING HALOGENS (DOCUMENTATION: K3_G_1)

<ul style="list-style-type: none"> • No insulation materials either in the building or technical insulation that have been manufactured with halogenated foaming agents • No cooling agents that are halogenated or part-halogenated 	Residential
	Office
	Hotel
	Retail

VOLATILE ORGANIC COMPOUNDS (DOCUMENTATION: K3_G_2)

<ul style="list-style-type: none"> • No surfacing products, e.g. for walls, floors or roofs, that have a VOC content of more than 15% by weight • No surface treatment products that are labeled Ö 60/70 for oil/wax • Only flooring adhesives in product categories EMICODE EC 1 or RAL-UZ 113 	Residential
	Office
	Hotel
	Retail

BIOCIDES OR FUNGICIDES (DOCUMENTATION: K3_G_3)

<ul style="list-style-type: none"> • No wood products treated with wood preservatives, labeled GISCODE HSM-W 60-90 (chromium-copper compounds) 	Residential
	Office
	Hotel
	Retail

HAZARDOUS SUBSTANCES AND PRODUCTS (DOCUMENTATION: K3_G_4)

<ul style="list-style-type: none"> • No extensive use of coatings, impregnation, adhesives or protective agents that contain polyurethanes, epoxy resin or bitumen labeled with one of the following GISCODES and product codes: <ul style="list-style-type: none"> - DD 1/2 (polyurethane seal) - PU 30/50/60 (polyurethane systems, harmful to health) - RE 2,5/4/5/6/7/8/9 (epoxy resin systems, sensitizing to toxic and carcinogenic) - BBP 30-70 (bitumen mass, harmful to health) 	Residential
	Office
	Hotel
	Retail

TIMBER FROM SUSTAINABLE CULTIVATION (DOCUMENTATION: K3_G_5)

<ul style="list-style-type: none"> • No timber or timber products from tropical, sub-tropical or boreal sources without FSC certification and the corresponding COC certificate 	Residential
	Office
	Hotel
	Retail

AVOIDANCE OF HEAVY METALS (DOCUMENTATION: K3_G_6)

<ul style="list-style-type: none"> • No pigments or drying compounds in varnishes containing lead, cadmium, chromium VI or their compounds (pigmented or containing drying compounds) 	Residential
	Office
	Hotel
	Retail

CRITERIA FOR CONSTRUCTION OPERATIONS (DOCUMENTATION: K3_G_7)

<ul style="list-style-type: none"> • On construction sites close to built areas only construction machinery is to be used that complies with the maximum sound power level as set out in Table 2 RAL-UZ 53. If there is no RAL certification, proof of the noise power levels is to be provided by a test certificate • During or after use of construction machinery, oily rags, remnants or surplus hydraulic oil must neither come into contact with the soil nor leak into the soil. This must be ensured, if necessary, through using oil-proof sheeting or pans. Waste oil is a waste material requiring special supervision • All formwork is to be done with formwork release oil that complies with RAL-UZ 64. Formwork release oil is to be stored in an oil-proof pan, and leakage or drip-off of residues must be effectively prevented 	Residential
	Office
	Hotel
	Retail

Note: The performance specification applies to all types of use marked in green

CRITERIA FOR EXCELLENT ACHIEVEMENT (GOLD)

Excellent achievement for use of ecofriendly construction materials is based on the following additional criteria:

CONSTRUCTION MATERIALS AND PRODUCTS CONTAINING HALOGENS (DOCUMENTATION: K3_G_1)

<ul style="list-style-type: none"> • No flooring materials and no cables containing halogens 	Residential
	Office
	Hotel
	Retail

VOLATILE ORGANIC COMPOUNDS (DOCUMENTATION: K3_G_2)

<ul style="list-style-type: none"> • Only anti-corrosion coating in the group GISCODE BS 10 • Only bitumen emulsions in group GISCODE BBP 10 • Non-mineral surfaces of buildings only with coatings that have a VOC content of 3% max of the installed product in accordance with 2004/42/EC (e.g. German GISCODE M DF 01, M GF 01, Ö 10, RE 0, PU 10) • Mineral-bearing surfaces of walls, floors or ceilings only with coatings that are labeled emission-free and solvent-free (e.g. RAL-UZ 102) 	Residential
	Office
	Hotel
	Retail

BIOCIDES OR FUNGICIDES (DOCUMENTATION: K3_G_3)

<ul style="list-style-type: none"> In Classes 1 and 2 in compliance with DIN 68800 protective timber preservation is exclusively achieved through structural measures or species-specific resistance 	Residential
	Office
	Hotel
	Retail

HAZARDOUS SUBSTANCES AND PRODUCTS (DOCUMENTATION: K3_G_4)

<ul style="list-style-type: none"> If epoxy resin-based products are specified, they must be labeled GISCODE RE 0 If polyurethane resin-based products are specified, they must be labeled GISCODE PU 10 Only bitumen emulsions in group GISCODE BBP 10 	Residential
	Office
	Hotel
	Retail

USE OF HEAVY METALS (DOCUMENTATION: K3_G_6)

<ul style="list-style-type: none"> No use of plastics containing lead, cadmium or zinc stabilizers Chromium oxide-free surface refinements for aluminum and stainless steel construction components on façades and internal walls. Small metal fittings (handles, etc.) can be excluded 	Residential
	Office
	Hotel
	Retail

REDUCTION OF GLOBAL IMPACT (DOCUMENTATION: K3_G_8)

<ul style="list-style-type: none"> Falling below the reference values for Global Warming Potential $GWP_{Kref} = 14.7 \text{ kg CO}_2\text{-Äqu.}/(m^2_{NGFa} \cdot a)$ Acidification potential $AP_{Kref} = 0.092 \text{ kg SO}_2\text{-Äqu.}/(m^2_{NGFa} \cdot a)$ Eutrophication potential $EP_{Kref} = 0.0076 \text{ kg PO}_2\text{-Äqu.}/(m^2_{NGFa} \cdot a)$ <p>(Kref = reference value; Äqui. = equivalent; NGF = net floor area)</p>	Residential
	Office
	Hotel
	Retail

LARGELY RENEWABLE PRIMARY ENERGY USED FOR CONSTRUCTION (DOCUMENTATION: K3_G_9)

<ul style="list-style-type: none"> The ratio of renewable energy (PE_e) to non-renewable energy (PE_{ne}) during production, maintenance, demolition and disposal (X_k) of a building, including the specified systems engineering, in accordance with Appendix 2, is greater than 0.1 $PE_{e,K}/PE_{ne,K} > 0.1$ 	Residential
	Office
	Hotel
	Retail

K 4: SPECIAL CONSIDERATION OF HEALTH AND WELL-BEING

Achieving higher standards as regards the indoor environment, comfort, acoustics, air quality and risk of fire will raise the overall quality of the building, while at the same time preventing a number of environmental impacts and health risks. Restriction to specific building materials, documenting the specified products, improving structural components (e.g. degree of noise absorption), testing the achieved values (e.g. minimum temperatures for structural components) and preventing fire risks will all make a significant contribution to sustainable construction in HafenCity.

By integrating passive and active measures into design at an early stage, high thermal comfort can be achieved with low energy demands for heating or cooling. Furthermore, providing thermal comfort by exploiting the potential of structural measures can also lower the operational costs of a building.

Avoidance of emissions from construction materials not only addresses the applicant's responsibility for the health of prospective occupants, but will also avoid complaints about odors.

THEMAL COMFORT IN COMPLIANCE WITH DIN EN 15251

The indoor environment has an effect on the health, productivity and comfort of its occupants. Assessment of the thermal indoor environment, in accordance with DIN EN 15251, specifies temperature intervals defined in consideration of typical activity levels and typical thermal insulation values of summer and winter clothing, as detailed in EN ISO 7730. The classification is based on the 'predicted percentage of dissatisfied' (PPD).

Air velocity and temperature gradients within the room are important parameters for comfort in addition to operative temperature. Compliance with Category B of DIN EN ISO 7730 on air velocity is a requirement. For buildings that do not have air conditioning and ventilation/technical systems, the criterion is taken as fulfilled. For thermo-active building systems for heating or cooling, the index values in Table 2 should be adhered to.

Table 2: Surface temperature of large-area structural elements

Structural element	Temperature in winter	Temperature in summer
Ceiling	35°C max	16°C min
Glazed areas in façade/wall	18°C min	18°C min
Glazed areas in façade/wall	35°C max	35°C max
Floor	29°C max	19°C min

Zonal thermal room simulation provides the appropriate testing procedure for operative temperatures. Measurements in compliance with DIN EN 15251 are also permitted. The permitted excess time is 3% of the period of use (per annum).

In buildings with a window area of < 40%, proof for the winter period can also be provided by means of heat load calculations, in compliance with DIN EN 12831, if the heating is predominantly convection type heating. For such buildings proof for the summer period can also be provided by means of a cooling load calculation in compliance with VDI 2078 if the building has exterior sun protection and cooling is achieved without radiation cooling.

CRITERIA FOR INDOOR AIR QUALITY

Indoor air generally contains a broad spectrum of inorganic and organic substances as well as dust and fibers. The sources are the people occupying the space (breathing, body odor) and their activities, such as smoking, cooking, etc. Additionally, construction materials and furnishings give off chemical compounds. Depending on concentration and composition, this can lead to excess levels in the indoor air, which is detrimental to well-being and can even constitute a health hazard; an unfavorable indoor climate will amplify this effect.

In particular, structural components made of organic materials such as plastics, varnishes, adhesives, etc. will add significantly to air pollution. Choosing pollutant-free materials for all interior building parts and using low-emission surface coatings will avoid exposing occupants to health hazards and encourage the use of green construction materials. The selection of products is based on available confirmed certificates and declarations as well as on the detailed specification of standards set out in tender documentation. Specifications for single construction materials are not made in the context of HafenCity certification.

Criteria for special achievement rating include keeping within the target value 1,000 µg/m³ for total volatile organic compounds (TVOC) and 120 µg/m³ for formaldehyde. To attain an excellent achievement rating, values must remain below 500 µg/m³ for TVOC and 60 µg/m³ for formaldehyde¹³, while keeping within the relevant applicable guide value II of the Adhoc AG IRK/AOLG. Since guide values are available for only a few substances, pollution from individual substances cannot be excluded, even if the total values are adhered to. To minimize such a risk, the values for single substances in indoor air measurements must be in line with the (statistically computed) benchmark for new builds (Neubau-Orientierungswert NOW) of the DGNB (German Sustainable Building Council). If the value of one substance is exceeded by more than 50%, its source must be stated and its abating characteristics described.

RETAIL 2

For the Retail 2 type of use, it may be difficult to take indoor air quality measurements, since tenants are responsible for their interior fitting out. Consequently, such measurements are not mandatory for this type of use. To ensure indoor air quality, the use of low emission construction materials and appropriate declarations are required. This is to be agreed with the tenants; in the case of special achievement rating (silver) for a minimum of 40% of the rental area, and for excellent achievement rating (gold) for a minimum of 70% of the rental area.

¹³ Criteria No. 20 of the German Sustainable Building Certificate (DGNB) stipulates an interim target value 1,000 µg/m³ and a target value of 500 µg/m³ TVOC; for formaldehyde 120 µg/m³ and 60 µg/m³ are stipulated. The benchmarks for new builds (Neubaurorientierungswert) were compiled for the DGNB on the basis of data from a research project by the Umweltbundesamt (Federal Environment Agency).

The design of the ventilation rate is a factor affecting the occupants' satisfaction. The design must consider both pollution by the occupants (biological exhalations) and pollution caused by emissions from the building and its systems. Ventilation of the building should either be via an appropriately designed technical system and/or apertures (windows), which can be controlled by the occupants.

In summary, the criteria for indoor air quality can be defined as the target values for pollution of the indoor air from organic contaminants found in construction products and from the individual ventilation rate per person. Buildings that have very low pollutant content in the indoor air and a high individual ventilation rate can be considered sustainable.

CRITERIA FOR ACOUSTIC COMFORT AND NOISE CONTROL

The acoustic quality of rooms has a major impact on performance at work and is consequently of particular significance in offices and conference spaces in hotels. For residential uses protection from noise is an increasingly important factor in terms of living quality. In meeting and seminar spaces, good speech intelligibility and adequately low background noise levels are essential requirements for the use of the rooms. All office and administration spaces share the same criteria for acoustic absorption through adequate areas of noise absorbent surfaces in the rooms, depending on their use. Designers can influence acoustic comfort through the geometry of the space and the choice of surface materials.

RESIDENTIAL

According to DEGA recommendation 103¹⁴, the noise control measures for residential dwellings described in DIN 4109 prevent unacceptable levels of noise pollution, but sound transmission is generally not lowered to a 'comfortable' level or acoustic comfort or well-being achieved. The recommendations define sound insulation classifications for assessing residential dwellings, or buildings with residential units, in addition to the sound insulation requirements in standard DIN 4109.

For residential dwellings, special achievement rating is based on DEGA's Class B, and excellent achievement rating is based on Class A. For the assessment of external noise DIN 4109 applies, and in the comfort class an increased sound insulation value of 5 dB(A). Examples of suitable specifications can be found in DIN 4109 -3 2009.

CELLULAR OFFICES

The quality of acoustic absorption in furnished and occupied individual offices is assessed by means of reverberation time. To attain good acoustic conditions, the reverberation time must be $\bar{T} \leq 0.8$ s. Conditions are comfortable if the reverberation time is $\bar{T} \leq 0.5$ s. The reverberation time in a furnished and occupied room very much depends on the furnishings and the number and type of objects in the respective room. Thus, the guaranteed basic acoustic dampening in rooms through sound absorption in the room partitions which are part of the building is assessed. Sound absorption by furnishings is not considered. Flooring can be considered. Proof is to be provided by calculating the reverberation time in a cellular office when empty, in accordance with the calculation methods in DIN 18041. Alternatively, measurements can be taken in accordance with the standard method set out in ISO 3382-2, in empty unfurnished rooms, while ensuring that the necessary diffusivity of the sound field is given. Calculations or measurements should be in the octave bands 125 Hz to 4,000 Hz. The arithmetic mean of the six octave bands is to be assessed. If the arithmetic mean is exceeded by a certain value in one or several octave bands, points are deducted. If the assessment of the part criterion 'cellular office, multi-person office ≤ 40 m²' results in negative points, the points of the sub-criterion will be set to zero.

¹⁴ DEGA recommendation 103 Noise in Residential Dwellings – Sound Insulation Certificate, Deutsche Gesellschaft für Akustik e.V.; Berlin 2009

MULTI-PERSON OFFICES

The quality of acoustic absorption in multi-person offices, which are furnished and occupied, can be assessed by the $\overline{A/V}$ ratio (quotient of the surface area A [m^2] and the volume V [m^3] of a building). Good acoustic conditions are obtained at an A/V ratio of $\leq 0.23 \text{ m}^{-1}$. Comfortable conditions are obtained at an $\overline{A/V}$ ratio of approximately $= 0.28 \text{ m}^{-1}$. The $\overline{A/V}$ ratio of the furnished and occupied room depends to a large degree on the furniture and orderliness of the respective occupants. Thus, the guaranteed basic dampening in rooms through sound absorption in room partitions, which are part of the building, is assessed. The sound absorption of furnishings is not considered. Flooring can be considered. In large multi-person offices with open layouts, very comfortable acoustic conditions can only be obtained with an acoustic ceiling extending over the total area. Acoustic absorption measures on ceilings are in any case much more effective in preventing sound propagation than at floor level. Sound absorption measures on ceilings will gain extra points. Partitions extending over the full room height with sound absorbing surfaces on both sides can achieve very comfortable acoustic conditions. Extra points are allocated for acoustic ceilings and acoustic partitions. Proof is to be provided by calculating the $\overline{A/V}$ ratio in multi-person offices when unoccupied, in accordance with the calculation methods in DIN 18041. Alternatively, measurements of the reverberation time can be taken, if the ratio of maximum room width/length and height is no more than 5. Measurements are to be in accordance with the standard method set out in ISO 3382-2, in an unoccupied, unfurnished room, while ensuring the necessary diffusivity of the sound field. Calculations or measurements should be in the octave bands 125 Hz to 4,000 Hz. The mean value of the six octave bands calculated in equation (1) or (2) is to be assessed.

$$\overline{A/V} = \frac{1}{6} \left(\sum_{i=1}^6 \frac{1}{A_i/V} \right)^{-1} \quad (1)$$

or

$$\overline{T} = \frac{1}{6} \sum_{i=1}^6 T_i \quad (2)$$

If the mean of one or several octave bands is exceeded by a certain value, points are deducted. If the assessment of the sub-criterion 'multi-person office' results in negative points, the points of the sub-criterion will be set to zero.

MEETING OR SEMINAR ROOMS

Sound dampening in meeting rooms can be assessed by measuring the reverberation time in furnished and occupied conditions. The basis for assessment is the reverberation time $\overline{T}_{\text{sol1, DIN 18041}}$ for conversation areas in compliance with Section 4.3.2 (equation No. 6) of DIN 18041.

Proof is to be provided by calculating the reverberation time in a furnished conference room, occupied to 80% by people, in compliance with the calculation methods in DIN 18041. Sound absorption of furniture and people is to be considered in accordance with the relevant provisions in DIN 18041, or the test results of measurements in test facilities in compliance with DIN EN ISO 354. Alternatively, measurements can be taken in accordance with the standard methods set out in ISO 3382-2, in a furnished room. 80% occupation can be assumed in the calculation.

Calculations or measurements should be in the octave bands 125 Hz to 4,000 Hz. The arithmetic mean of the six octave bands is to be assessed. If the arithmetic mean is exceeded by a certain value in one or several octave bands, downgrading will follow.

LOUNGES AND DINING AREAS WITH A FLOOR AREA $\gt 50 \text{ m}^2$

Sound dampening in lounges and dining areas can be assessed using reverberation time when the rooms are furnished and occupied. Good acoustic conditions are achieved with a reverberation time $\bar{T} \leq 1.0 \text{ s}$. Comfortable conditions are achieved with a reverberation time $\bar{T} \leq 0.5 \text{ s}$. Proof is to be provided by calculating the reverberation time in dining areas when furnished and occupied up to 50% by people, in compliance with the calculation methods in DIN 18041. Sound absorption of furniture and people is to be considered according to the relevant provisions in DIN 18041, or the test results of measurements in test facilities in compliance with DIN EN ISO 354. Alternatively, measurements can be taken in accordance with the standard methods set out in ISO 3382-2, in a furnished room. 50% occupancy can be assumed in the calculation.

Calculations or measurements are to be in the octave bands 125 Hz to 4,000 Hz. The arithmetic mean of the six octave bands is to be assessed.

CRITERIA FOR USER INFLUENCE

The acceptance of spaces, especially work spaces, largely depends on the degree of influence the user has on the climate in the room. Windows that cannot be opened or air conditioning systems that cannot be controlled lead to discomfort and even to occupants' feeling unwell. Criteria included in the assessment are user influence on ventilation, sun protection, anti-glare, temperatures during and outside the heating period as well as control of daylight and artificial lighting. In residential dwellings the above are generally controlled by the occupant. For this reason, additional assessment will not be carried out for certification.

USER INFLUENCE IN OFFICES

Acceptance of office workstations is strongly dependent on the degree of influence users have. For this reason, the entire spectrum of possible influence is assessed in this section. A high degree of influence is rated as a special achievement and extensive influence is rated as an excellent achievement.

USER INFLUENCE IN HOTELS

Some criteria applied in the hotel classification¹⁵ regarding furnishings in rooms and noise control/air conditioning deal with usability. The section air conditioning/ventilation only considers the usability of air conditioning systems; indoor climate concepts without air conditioning systems are not covered.

If the user of a hotel room has a high degree of influence over the indoor climate, lighting and sun protection/anti-glare devices, it is considered sustainable. Proof of user influence should be provided for at least 90% of the hotel rooms.

USER INFLUENCE IN RETAIL AREAS

For retail areas, the influence of staff on ventilation and temperatures during the heating period, as well as outside it, are considered.

¹⁵ Deutsche Hotelklassifizierung, Kriterienkatalog 2005–2009; Stand 09/2008 (German Hotel Classification, Catalogue of Criteria 2005–2009; Version 09/2008)

SAFETY OF USE IN THE EVENT OF DAMAGE

While the structural stability of buildings is generally implied if all technical regulations have been followed, there is room for improvement regarding the choice of products and materials that are potentially affected by fire.

Numerous plastics, chemical foams or surface coatings used on construction sites contain halogens, mostly chlorine or bromine. They are a basic compound in the mixture for PVC or an additive to mixtures, such as flame retardants in numerous plastics.

Burning plastics containing chlorine inevitably produce chloride and HCl aerosols. They are extremely aggressive and harmful to the human respiratory system as well as being damaging to fitted materials. Another potential danger arises because the smoke from such fires or smoldering fires is denser, increasing confusion and disorientation for evacuees as well as hindering operations by rescue teams. In the case of fire or flame impingement on materials containing halogens, polychlorinated dibenzodioxins (PCDD) or polychlorinated dibenzofurans (PCDF) can occur in smoke gas and settle in soot, making cleaning and disposal operations extremely difficult.

To reduce fire risks, building components containing halogens should not be specified for places where they would increase the smoke density or the toxicity in case of fire. Laying cables openly, in false floors or in shafts that are not to standard F 90 is to be avoided. For all interior surfaces, products containing halogens, such as PVC flooring, etc., are to be avoided.

RETAIL 2

For the Retail 2 type of use, proof must be provided that construction materials are halogen-free in all common areas and in at least 40% of rental areas. To attain excellent achievement rating, proof must be provided that such materials are specified for at least 70% of the rental areas.

FITTINGS AND FURNISHINGS SUITABLE FOR PEOPLE WITH ALLERGIES

Besides food allergies, allergies to pollen and house dust mites, which can cause asthma, are common. Occurrence of allergies is growing steadily, so much so that hotels not equipped for people who suffer from allergies may have difficulties in being accepted. 'It is already the case that many hotels and restaurants offer furnishings or foods suitable for people with allergies, providing information on edibles used and their ingredients.'¹⁶ Installing the necessary filters and converting to low dust cleaning methods (e.g. vacuum cleaners with HEPA filters) can ensure that guests who are allergic to pollen and house dust mites will suffer less discomfort during their stay. Additional measures for specific allergies, as recommended by the Deutscher Allergie- und Asthmabund (German Allergies and Asthma Association), should be taken into consideration in the design and operation of hotels. For example, the use of allergen-proof mattress covers and washable bedclothes can greatly reduce the risk for people suffering from house dust allergies.

¹⁶ DEHOGA president Ernst Fischer in a press release on the launch of the booklet 'Gute Gastgeber für Allergiker' ('Good hosts for people with allergies'), jointly published by Deutscher Hotel- und Gaststättenverband (DEHOGA) and Deutscher Allergie- und Asthmabund (DAAB), November 2008.

At least 20% of the areas in offices and residential buildings, and at least 20% of all guest rooms in hotels, are to be equipped to a standard suitable for people with allergies. Measures should include a central vacuum cleaner system for single apartments or areas in buildings, in compliance with DIN 60335. Ventilation/air conditioning systems are to be equipped with airborne-dust filters¹⁷. Underfloor and wall heating should be installed instead of radiators, or all fixtures must be easy to clean, as for example hinged radiators.

VISUAL COMFORT IN RETAIL AREAS

For both clients and staff, lighting (visual comfort) is an important factor in determining their well-being and the time spent in an environment as well as for efficient and performance-enhanced work. Studies¹⁸ have shown that daylight availability can have a positive impact on buying behavior.

Visual comfort in commercial buildings is determined by the availability of daylight, adaptation of artificial light to outdoor lighting conditions, the view from workstations and avoidance of glare. Other influences such as the quality of daylight and artificial lighting or light distribution and light color are not being considered in the current version. Efficient exploitation of daylight offers high potential energy savings on artificial lighting. Large window areas can have positive and negative impacts on energy expended for heating and cooling.

Supply of daylight is primarily achieved through sufficiently large apertures, appropriate positioning of apertures and room depth. Bright surfaces in a room improve the distribution of light, and thus the daylight levels. The daylight factor is the ratio of illuminance in a room to the unshaded illuminance outdoors (see DIN V 18599-4). The assessment differentiates between daylight entering a building via side windows or roof lights. A daylight factor of 1% or 2% is required for a certain proportion of space. In Retail 2, up to 50% of rental areas can be excluded from the assessment. All permanent workstations (in compliance with DIN 5034 Part 1) and all break rooms and staff rooms must have outside views.

¹⁷ at least filter grade H10 in compliance with EN 1822-1:1998 (HEPA = High Efficiency Particulate Air filter)

¹⁸ Criteria No. 22 of the German Sustainable Building Certificate (DGNB) for commercial buildings, version 2009

CRITERIA FOR SPECIAL ACHIEVEMENT (SILVER)

TARGET VALUES FOR THERMAL COMFORT (DOCUMENTATION: K4_G_1)

<ul style="list-style-type: none"> Adherence to the criteria for operative temperatures in compliance with DIN EN 15251 Category II Adherence to Category B in compliance with DIN EN ISO 7730 as regards air velocity Adherence to surface temperatures of thermo-active structural components 	Residential
	Office
	Hotel
	Retail

TARGET VALUES FOR INDOOR AIR QUALITY (DOCUMENTATION: K4_G_2)

<ul style="list-style-type: none"> Indoor air concentration in all tested rooms below 1,000 µg/m³ TVOC Indoor air concentration in all tested rooms below 120 µg/m³ formaldehyde Guide values II of Adhoc AG IRK/AOLG not exceeded For all substances > 1.5 * NOW (benchmark for new builds) information on source and abating characteristics are given 	Residential
	Office
	Hotel
	Retail 1
	Retail 2

TARGET VALUES FOR INDOOR AIR QUALITY (DOCUMENTATION: K4_G_2)

<ul style="list-style-type: none"> Specification of low emission products for all areas in which indoor air quality is relevant Proof for all common areas and for at least 40% rental areas 	Residential
	Office
	Hotel
	Retail 1
	Retail 2

Note: The performance specification applies to all types of use marked in green

TARGET VALUES FOR ACOUSTIC COMFORT – REVERBERATION TIME (DOCUMENTATION: K4_G_3)

<ul style="list-style-type: none"> For cellular offices or multi-person offices ≤ 40 m² the arithmetic mean of the reverberation time \bar{T} in s, in unoccupied, unfurnished conditions, must not exceed 1.5 and single octave bands must not exceed the mean value by more than 50% In multi-person offices the mean value of the \bar{A}/\bar{V} ratio (\bar{A}/\bar{V} in m⁻¹ of the octave bands 125 Hz to 4,000 Hz) must, in unoccupied, unfurnished conditions, and in accordance with equation (1), exceed 0.16 without single octave bands falling below the mean value by more than 50%. The arithmetic mean of the reverberation time \bar{T} in s, in accordance with equation (2), must not, in unoccupied, unfurnished conditions, exceed 1.0 and single octave bands must not fall below the mean value by more than 50% 	Residential
	Office
	Hotel
	Retail

<ul style="list-style-type: none"> • The arithmetic mean of the reverberation time $\bar{T}/\bar{T}_{\text{soll, DIN 18041}}$ with the octave bands 125 Hz to 4,000 Hz in conference and seminar rooms must not, in a furnished condition and occupied to 80% by people, exceed 1.5 and not fall below 0.7 • The arithmetic mean of the reverberation time \bar{T} in s with the octave bands 125 Hz to 4,000 Hz in lounges or dining areas, in a furnished condition and occupied to 50% by people, must not exceed 0.8 	Residential
	Office
	Hotel
	Retail

TARGET VALUES FOR NOISE CONTROL (DOCUMENTATION: K4_G_3)

<ul style="list-style-type: none"> • Compliance with noise control Class B according to DEGA No. 103 in living spaces • Protection against airborne noise in compliance with DIN 4109 	Residential
	Office
	Hotel
	Retail

TARGET VALUES FOR USER INFLUENCE (DOCUMENTATION: K4_G_4)

<ul style="list-style-type: none"> • Air exchange can be directly influenced zone by zone (more than 3 persons) • Sun protection/anti-glare can be directly influenced zone by zone (more than 3 persons) • Temperatures within and outside the heating period can be directly influenced zone by zone (more than 3 persons) • Daylight and artificial lighting can be directly influenced zone by zone (more than 3 persons) 	Residential
	Office
	Hotel
	Retail

<ul style="list-style-type: none"> • Direct influence on air exchange in each room • Central switch for lighting in room • Direct influence on sun protection/anti-glare in each room 	Residential
	Office
	Hotel
	Retail

<ul style="list-style-type: none"> • Direct influence on ventilation/air conditioning at workstation • Direct influence on temperature at workstation 	Residential
	Office
	Hotel
	Retail

AVOIDANCE OF CONSTRUCTION PRODUCTS CONTAINING HALOGENS (DOCUMENTATION: K4_G_5)

<ul style="list-style-type: none"> • No wiring containing halogens in areas that do not achieve minimum fire resistance class of F 90 • No construction components containing halogens for internal surfaces, such as walls and flooring 	Residential
	Office
	Hotel
	Retail 1
	Retail 1

<ul style="list-style-type: none"> • No wiring containing halogens in areas that do not achieve minimum fire resistance class of F 90 • No construction components containing halogens for internal surfaces, such as walls and flooring • Proof for all common areas and for at least 40% of rental areas 	Residential
	Office
	Hotel
	Retail 1
	Retail 2

CRITERIA FOR EXCELLENT ACHIEVEMENT (GOLD)

Excellent achievement rating for consideration of health and comfort is based on the following criteria in addition to the above mentioned for special achievement:

TARGET VALUES FOR THERMAL COMFORT (DOCUMENTATION: K4_G_1)

<ul style="list-style-type: none"> • Adherence to the criteria for operative temperature in compliance with DIN EN 15251 Category I 	Residential
	Office
	Hotel
	Retail

TARGET VALUES FOR INDOOR AIR QUALITY (DOCUMENTATION: K4_G_2)

<ul style="list-style-type: none"> • Indoor air concentration in all tested rooms must be below 500 µg/m³ TVOC • Indoor air concentration in all tested rooms must be below 60 µg/m³ formaldehyde 	Residential
	Office
	Hotel
	Retail 1
	Retail 2

<ul style="list-style-type: none"> • Proof for all common areas and for at least 70% of rental areas 	Residential
	Office
	Hotel
	Retail 1
	Retail 2

TARGET VALUES FOR ACOUSTIC COMFORT – REVERBERATION TIME (DOCUMENTATION: K4_G_3)

<ul style="list-style-type: none"> • In cellular offices or multi-person offices $\leq 40 \text{ m}^2$ the arithmetic mean of the reverberation time \bar{T} in s, in an unoccupied, unfurnished condition, must not exceed 1.0 and single octave bands must not exceed the mean value by more than 50% • In multi-person offices the mean value of the \bar{A}/\bar{V} ratio in m^{-1} of the octave bands 125 Hz to 4,000 Hz in accordance with equation (1), must, in an unoccupied, unfurnished condition, exceed 0.20, without single octave bands falling below the mean value by more than 50%. The arithmetic mean of the reverberation time \bar{T} in s, in accordance with equation (2) must not, in an unoccupied, unfurnished condition, exceed 0.8 and single octave bands must not fall below the mean value by more than 50% 	Residential
	Office
	Hotel
	Retail

<ul style="list-style-type: none"> • The arithmetic mean of the reverberation time $\bar{T}/\bar{T}_{\text{solI, DIN 18041}}$ in conference or seminar rooms, in a furnished condition and occupied up to 80% by people (octave bands 125 Hz to 4,000 Hz) must not exceed 0.7 • The arithmetic mean of the reverberation time \bar{T} in s in lounges or dining areas, in a furnished condition and occupied to 50% by people, must not exceed 0.5 (the arithmetic mean value is calculated with the reverberation time in the octave bands 125 Hz to 4,000 Hz) 	Residential
	Office
	Hotel
	Retail

TARGET VALUES FOR NOISE CONTROL (DOCUMENTATION: K4_G_3)

<ul style="list-style-type: none"> • Compliance with noise control Class A according to DEGA No. 103 in living spaces • Protection against airborne noise, exceeding the target values of the DIN 4109 by a minimum of 5 dB(A) 	Residential
	Office
	Hotel
	Retail

TARGET VALUES FOR USER INFLUENCE (DOCUMENTATION: K4_G_4)

<ul style="list-style-type: none"> • Air exchange can be directly influenced in each room (3 persons max) • Sun protection/anti-glare can be directly influenced in each room (3 persons max) • Temperatures within and outside the heating period can be directly influenced in each room (3 persons max) • Daylight and artificial lighting can be directly influenced in each room (3 persons max) 	Residential
	Office
	Hotel
	Retail

AVOIDANCE OF CONSTRUCTION PRODUCTS CONTAINING HALOGENS (DOCUMENTATION: K4_G_5)

<ul style="list-style-type: none"> • Proof of special achievement rating for all common areas plus at least 70% of rental areas 	Residential
	Office
	Hotel
	Retail 2

FURNISHINGS SUITABLE FOR PEOPLE WITH ALLERGIES (DOCUMENTATION: K4_G_6)

<ul style="list-style-type: none"> • At least 20% of the area or guest rooms should be equipped constructionally (ventilation systems, pollen screens), technically (vacuum cleaners with HEPA filters) and in terms of furnishings (placing furniture with sufficient back ventilation space) to meet the needs of people suffering from allergies 	Residential
	Office
	Hotel
	Retail

VISUAL COMFORT (DOCUMENTATION: K4_G_7)

<ul style="list-style-type: none"> • More than 40% on average of the usable floor space has a daylight factor of at least 1% via side windows or a daylight factor of 2% via roof lights or a combination of the two types of daylighting • At least 80% of all offices, break rooms and staff rooms within retail spaces have direct views to the outside • Proof of anti-glare devices for all workstations, including cashiers, must be provided; for Retail 2 up to 40% of rental areas can be excluded 	Residential
	Office
	Hotel
	Retail

Note: The performance specification applies to all types of use marked in green

K 5: SUSTAINABLE BUILDING OPERATIONS

The largest percentage of both cost and environmental impact is not incurred during a building's construction, but accrues during the course of its use over subsequent decades. In addition, there is the necessary expenditure required for its demolition and disposal. Running a building is linked to continuous use of primary energy and water on top of emission of pollutants (foul water, exhaust air). Most construction components are subject to wear and tear and must be replaced in due course. There may also be refurbishments and alterations following a change of use or redesign. Energy demand has been the focus of special attention for some time now, due to its growing importance for environmental and energy policy, and the relevant technical and legal regulations are to hand. For this reason, energy demand is treated separately in Category 1 (K 1).

The cost of maintenance, servicing and modernization during the life of a building depends on the quality of its construction, its technical facilities, on the adaptability of the structure and also the quality of the facility management. The kind of materials used and type of structure itself are factors which determine whether materials can be reused, salvaged or must be disposed of.

By specifying and using construction components which are either hard-wearing or easily replaced, in conjunction with quality control during construction, the cost and environmental expenditure involved in the operation of the building can be significantly reduced. Durability of materials and removable joints are factors which can further improve the economic and ecological balance when dismantling a building.

PERFORMANCE SPECIFICATION AND QUALITY CONTROL

A detailed specification that includes functional performance descriptions of the services as well as the demand for quality control, especially in the technical detailing of joints, surfaces and fittings, on top of obtaining written approval of these services, will increase durability and avoid premature renewal.

CLEANING OF GLASS

The time and cost for cleaning glass largely depends on its accessibility. The greatest accessibility for external glazed areas is to windows that can be opened and are no higher than 2.5 m above the finished floor level (FFL). The operational expense can be reduced for fixed windows or windows that cannot be reached from floor level by means of cleaning access 'catwalks' or permanently installed ladders. Any cleaning operations that require an elevating truck, climbing harness or similar involve the greatest time and cost.

LOW MAINTENANCE WINDOWS

The time and cost for servicing and maintaining windows and doors can be substantially reduced if the mechanical fixing of frames into the building structure is reversible and does not include foam insulation, and if a ten-year warranty for the coating is obtained.

LONG CYCLE FLOORING RENEWAL

Installing 'cleanwalk' zones will reduce the wear on flooring and thus significantly reduce the cycle for renewal. Cleanwalk zones include gratings or appropriate mats made of synthetic materials or natural fibers (with adequate wetness protection), which are installed in front of the entrance, or suitable synthetic or natural fiber mats placed directly inside entrance doors. Patterned, mottled or textured flooring is more dirt tolerant and less costly to clean. Removable skirtings will keep the cost of any necessary flooring renewals as low as possible.

WATER-SAVING SANITARYWARE

Installing water-saving sanitaryware in the building, such as monobloc mixer taps with flow regulators, toilet bowls designed for low flush volumes (6 liters), dual flush WCs and water-saving showers, will reduce the running costs (water charges) for the occupants. The installation of water-saving technology in residential, office and commercial buildings will, according to the experience of the Hamburg Ministry of Urban Development and Environment, reduce potable water consumption by more than 30%.

MODULARITY AND DESIGN CONVERTIBILITY

For Retail 2 type of use, sustainable operation is highly dependent on modularity and the degree to which designs can be converted subsequently. Assessment considers, among other aspects, whether the redesign, fitting or uninstalling of additions to boundaries between the rental areas and shopping mall can be carried out while the building is fully operational or while operations are marginally hindered.

To allow conversion, assembly and disassembly or additions to the boundaries between the rental areas and the shopping mall (shop fronts), easy to install or uninstall connection points should be fitted in the building structure. In rental areas, starting from the 'tenants' distribution box' onwards, electric and media cables should be routed in easily accessible utility shafts or cable ducts.

BUILDING OPERATION INFORMATION

By consistently compiling material declarations for all contracted services, including auxiliary products used in the course of performing the services, along with clear documentation to be used for running the building, it will be possible to optimize cleaning, servicing, maintenance and renewal. Such documentation is fundamental to sustainable building operations.

EARLY INVOLVEMENT OF FACILITY MANAGEMENT

Studies have shown that the influence of decisions taken on operational costs decreases noticeably during the course of the design process. Incorporating advice from facility management experts at the design stage can therefore influence design decisions that will ensure the efficient and environmentally aware running of the building.

BUILDING OPERATION MANUAL

Producing an operation manual for the building with operational guidance on the various functional areas and operational skills should prevent economically and ecologically based design and construction measures being undermined by incorrect operation. The manual should consist of one section for users, tenants or guests, one for mechanical and electrical services or service personnel and one for facility operations. So far there are no agreed standards for facility operations user manuals. As a minimum, they should include information contained in materials declarations on servicing, cleaning, care and maintenance. Descriptions of the building's functions, which are easy to understand and tailored to different users' needs, are important.

ACCESSIBILITY

The built environment in HafenCity should be equally accessible to all. Limited access mostly affects people with impaired motor skills or sensory disorders due to old age, illness, accidents or inborn disabilities. Demographic changes will result in an increased proportion of older people in the total population in the future. This fact must be addressed in forward looking and sustainable development. Hence, accessibility also enhances value and appeal for all sections of the population.

Assessment of accessibility, in accordance with the Equal Opportunities for People with Disabilities Act (Behindertengleichstellungsgesetz BGG), considers barrier-free access for people in wheelchairs as well as those with visual or hearing impairments or mental disorders.

ACCESSIBLE HOMES

Access to residential dwellings and nearby open spaces should be barrier-free. Entrance doors to the buildings should be power-operated and lifts should meet the requirements of the multi-sense principle (principle of being visible, audible, tactile; EN 81-70). Some car parking spaces should be 3.5 m wide.

Adequately dimensioned bathrooms and minimum widths for circulation areas (passage width of doors) not only ensure accessibility but also enhance the general comfort of apartments in the long-term. Bathrooms should be designed either with a flush floor shower and circulation areas of 1.2 m x 1.2 m or be easily convertible to accommodate those requirements. Conversions could be, for example, the removal of a bathtub that is not built in. The passage width of doors should be at least 80 cm.

ACCESSIBLE OFFICES

The entrance to the building should be barrier-free, with at least 90 cm passage width and be power-operated. Circulation areas in front of the door (and, if applicable, the lifts) should be at least 1.5 m x 1.5 m. Information on operating entrances and lifts should be provided for different disabilities (multi-sense principle). At least one washroom should be suitable for people with physical disabilities. Corridors should be designed with contrasting colors (e.g. door frames in different colors). For excellent achievement rating, direct access should be provided on each office floor to disabled toilets that conform to standard norms.

ACCESSIBLE RETAIL SPACES

All areas that are generally for public use should be accessible and designed according to the current standards or in consultation with the public authority's officer for people with disabilities. This should include a barrier-free entrance which is at least 90 cm wide, information on operating doors and lifts suitable for people with different disabilities (multi-sense principle), circulation areas in front of entrance doors (and lifts, if applicable) at least 1.5 m x 1.5 m, and at least one washroom suitable for people with physical disabilities. Excellent achievement rating will be attained by providing an accessible disabled toilet with direct access, conforming to standard norms.

ACCESSIBLE HOTELS

Assessment of hotels is based on the target agreement on accessibility in the hospitality trade, agreed between the DEHOGA Bundesverband, Hotelverband Deutschland (IHA), Sozialverband VdK Deutschland, Bundesarbeitsgemeinschaft Hilfe für Behinderte, Deutscher Gehörlosen-Bund, Deutscher Blinden- und Sehbehindertenverband and Interessenvertretung Selbstbestimmt Leben. The target agreement defines five categories for different disabilities:

- **Category A applies to guests with walking disabilities who may rely for part of the time on a non-motorized wheelchair or a walking aid**
- **Category B applies to wheelchair users who are unable to walk and always rely on a wheelchair**
- **Category C applies to guests who are visually impaired or blind**
- **Category D applies to guests who are deaf or hard of hearing**
- **Category E is a combination of Categories A-D**

The IHA guide already lists more than 60 hotels equipped with some rooms that are barrier-free and comply with the above criteria. A telephone survey conducted in autumn 2009 of around 20 of the listed hotels found that on average around 1% of the rooms were equipped according to Category B (wheelchair users). In addition, many of the hotels offered rooms that also complied with one or several of the other categories.

CRITERIA FOR SPECIAL ACHIEVEMENT (SILVER)

PERFORMANCE SPECIFICATION AND QUALITY CONTROL (DOCUMENTATION: K5_G_1)

<ul style="list-style-type: none"> • Performance specification demanding quality control, particularly for technical detailing of joints, surfaces and fittings • Written documentation of acceptance of work 	Residential
	Office
	Hotel
	Retail

CLEANING OF EXTERNAL GLAZING (DOCUMENTATION: K5_G_2)

<ul style="list-style-type: none"> • Less than 90% of external glazed areas: FFL to top of glazing = 2.5 m, for 100% of the remaining external glazed areas access catwalks/ ladders are permanently installed or FFL to top of glazed area is 20 m² max 	Residential
	Office
	Hotel
	Retail

LOW MAINTENANCE WINDOWS (DOCUMENTATION: K5_G_3)

<ul style="list-style-type: none"> • Reversible mechanical fixings for window and door frames to the structure in compliance with RAL assembly requirements, without use of expanding foam • 10-year warranty period for surface coating of wooden windows 	Residential
	Office
	Hotel
	Retail

LONG CYCLE FOR RENEWAL OF FLOORING (DOCUMENTATION: K5_G_4)

<ul style="list-style-type: none"> • 'Cleanwalk' zone at all entrances to building • Flooring differentiated between heavy wear and light tread zones • Reversible (mechanical) fixing of skirtings for carpet flooring 	Residential
	Office
	Hotel
	Retail 1
	Retail 2

WATER-SAVING SANITARYWARE (DOCUMENTATION: K5_G_5)

<ul style="list-style-type: none"> • Installation of sanitaryware in flow rate Class Z for basins • Installation of toilet bowls designed for a flush volume of 6 liters • Installation of dual-flush toilets for 4.5 liters max 	Residential
	Office
	Hotel
	Retail

<ul style="list-style-type: none"> • Installation of sanitaryware in flow rate Class A for showers • Installation of sanitaryware in flow rate Class Z for all basins • Installation of toilet bowls designed for a flush volume of 6 liters • Installation of dual-flush toilets for 4.5 liters max 	Residential
	Office
	Hotel
	Retail 1
	Retail 2

MODULARITY AND CONVERTIBILITY (DOCUMENTATION: K5_G_5)

<ul style="list-style-type: none"> • Conversions, installation and removal or additions to the boundaries between rental areas and shopping mall (shop fronts) can be carried out while the building is fully operational or while operations are marginally hindered • For conversions, installation and removal or additions to the boundaries between the rental areas and the shopping mall (shop fronts), connection points are to be supplied as part of the building that allow easy installation or deinstallation • Electric power supplies for the building and the rental areas are separate • In rental areas, electric and media cables, from the 'tenants' distribution box' onwards, to be routed in easily accessible utility shafts or cable ducts • Capacity of utility shafts and ductwork for electric and media cables as well as cable trays in the area up to the 'tenants' distribution box' less than 80% exhausted 	Residential
	Office
	Hotel
	Retail 1
	Retail 2

BUILDING OPERATIONS INFORMATION (DOCUMENTATION: K5_G_7)

<ul style="list-style-type: none"> • Documentation of all construction products 	Residential
	Office
	Hotel
	Retail

ACCESSIBILITY (DOCUMENTATION: K5_G_2)

<ul style="list-style-type: none"> • Building freely accessible (barrier-free entrance) • Information on operating entrances and lifts for different types of disabilities (multi-sense principle) 	Residential
	Office
<ul style="list-style-type: none"> • Accessibility of all floors in compliance with Category B in consideration of Category C and D • Installing at least 1% of the guest rooms in accordance with Category B and 2% with Category A; at least 10% of the rooms in accordance with criteria in Categories C or D 	Hotel
<ul style="list-style-type: none"> • All areas for general public use to be accessible and designed according to current standards or in consultation with the public authority's officer for people with disabilities. 	Retail

Note: The performance specification applies to all types of use marked in green

CRITERIA FOR EXCELLENT ACHIEVEMENT (GOLD)

Excellent achievement rating for consideration of sustainable building operations is based on the following criteria in addition to the above mentioned for special achievement:

LONG CYCLE FLOORING RENEWAL (DOCUMENTATION: K5_G_4)

<ul style="list-style-type: none"> • Minimum of 2.4 m long 'cleanwalk' zone at main entrances • 50% of all circulation and utilization areas are designed to tolerate light soiling 	Residential
	Office
	Hotel
	Retail

MODULARITY AND CONVERTIBILITY (DOCUMENTATION: K5_G_6)

<ul style="list-style-type: none"> • Sub-areas include measures for the retrofitting of areas for edibles and catering (flooring, condensate removal, installation of coolant pipes, disposal of greasy wastewater) while centrally located grease traps with external removal can be retrofitted • Technical measures are installed and floor space available that allow for an increase in the air exchange rate of 10-15% and the corresponding ventilation and air conditioning output • Space is available for the expansion of delivery areas (lifts, lifting devices), such reserves to be explained in an appropriate logistics concept 	Residential
	Office
	Hotel
	Retail 1
	Retail 2

ACCESSIBILITY (DOCUMENTATION: K5_G_8)

<ul style="list-style-type: none"> • All doors have a clear passage width of at least 80 cm • All bathrooms are either fitted with or built to allow easy conversion to accommodate a flush floor shower and a circulation area of 1.2 m x 1.2 m 	Residential
<ul style="list-style-type: none"> • All office floors have direct access to a barrier-free disabled toilet, conforming to standard 	Office
<ul style="list-style-type: none"> • Accessibility to at least 90% of all public areas in accordance with Category B in consideration of Categories C and D • Fitting at least 2% of the rooms in accordance with Category B and 10% in accordance with Category A; at least 20% of rooms comply with the requirements in Categories C or D 	Hotel
<ul style="list-style-type: none"> • All sales areas have direct access to a barrier-free disabled toilet, conforming to standard 	Retail

INCLUSION OF FACILITY MANAGEMENT (DOCUMENTATION: K5_G_9)

<ul style="list-style-type: none"> • Proof of the inclusion of facility management in decision-making during the design process 	Residential
	Office
	Hotel
	Retail

OPERATION MANUAL (DOCUMENTATION: K5_G_10)

<ul style="list-style-type: none"> • Supply of an operation manual for the building 	Residential
	Office
	Hotel
	Retail

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