**UGE2** *MADE*-Project

# Dense low-rise residential building

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***„One can spend years planning a house. The greatest problem is building a residence to the point when even the smallest relevant details have been considered"***
(Egon Eiermann,[1] 1909-1970, Architect and University Professor, quoted in: *Schöner Wohnen*, 1965, p. 64)

## Preparation stage

### Introduction

Residential construction has always presented the most important building challenge. Without a protective roof over one's head, man could not live long. Our word "living" originates from the gothic "wunian", meaning " to be satisfied".

"Living" is part of the basic *needs of any human being*. Regardless of whether a hole, a tent or a caravan, whether a room, dwelling or a building[2] - they offer on the one hand protection from the elements, strangers and other causes of disturbance, on the other hand they provide a sphere of privacy to be alone or together with those close to one. Everyone aims for "security, protection and comfort", "consistency and familiarity, "to let oneself go", "self-realisation" and "self-expression" as well as "contact and communication", "care and hobbies".(*Living needs*)

These various needs[3] were the drivers for the lecturer to take this complex topic and incorporate it as a project task.

***Whoever has learned to design a functional residential building appropriate for all needs will also be able to deal with any other building task he/she may face in the course of his/her professional career.*** (Ralph Johannes)

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[1] **Eiermann** (born September 29, 1904, Neuendorf, died July 20. 1970, Baden-Baden) was one of Germany's most prominent architects in the second half of the 20th century.
Eiermann studied at the Technical University of Berlin. He worked for the Karstadtbuilding department for a time, and before World War II had an office with fellow architect Fritz Jaenecke. He joined the faculty of the university in Karlsruhe in 1947. (Wikipedia)

[2] „**Buildings** are independently usable, roofed constructions, erected for the long term, which can be entered by people and are suitable or intended to protect people, animals or artifacts ..." (4)

[3] „The real basic needs of living (and living space) are:

- The pursuit of safety, protection and comfort,
- The desire to have consistency and familiarity
- The search for a spatial frame that provides the possibility of self-realisation
- The need for contact and communication
- The wish for self-presentation (showing social status)" (Andritzki, 1979, p. 106)

# Organisation stage

To carry out a *MADE* Project in the best possible manner, the lecturer was obliged to devote attention to teaching procedures and design activities, and their related organisational problems, one of which was the fact that the University of Essen does not provide students with drawing boards or other relevant facilities for design work, thus they have to work at home. They only 'commute' to the university for lectures, seminars and the correction of their designs. The lecturer's decisions with regard to the course requirements (e.g. for the achievements expected of the students and the schedules to be maintained) were thus set down in the Project Plan. This included the following six parts:

# Project Plan

1. ***Project Task***
2. ***Project Program***
3. ***MADE Phase Plan***
4. ***Project Learning Result Catalogue***
5. ***Project Time Schedule***
6. ***Project Literature List***

***1. Project Task***

A dense low-rise residential building[4] must be designed for a four member family (married couple with two children between the ages of 8 months and 3 years) in an urban area, and as a single storey, two storey or split level building.

1.1 ***Room Program***

Family room with dining corner 20 m²
"Gute Stube"(Sitting room)[5] 16 m²
Parent's bedroom 16 m²
Children's room 10 m²
Children's room 10 m²
Kitchen with snack corner 12 m²
Utility room 6 m²
Storage space (in the living area) 1 m²
Bathroom 6 m²
WC-shower room 3 m²
WC-room 2 m²
Storage space (in the sleeping area) 1 m²
Porch
Reception room and wardrobe
"Schmutzschleuse" (Mud room)[6]

[4] "The **dense low-rise building** is a form of settlement with a high building density despite a low number of floors. Single- and two-storey terraced houses, carpet housing, houses with small yards (atrium houses), sloped housing (where stacked housing units are and – sometimes – on top of the slope). This construction form and residential form respectively are preferable for detached housing: Garden or terrace right next to the dwelling, own groundfloor level entrance, no direct neighbours as with a multi-storey building." (Institut Wohnen und Umwelt, 1978, p. 435-436)

[5] "**Gute Stube"** (Sitting room) serves as a representative room, as a room for retreat, for adult residents and, at times, as an individual's room and, if necessary, as an overnight stay room for guests.

Heating room
House service connection space
Multi purpose room (near to house entrance for prams, toys, bikes etc.)
10 m²
Garden tool storage area or room (at garden level)
Car parking area.

1.2 ***Requirements***

- The land surface dimensions in 1.1 are to be maintained with +/- 5 %.
- Both children's rooms should be put together so that, depending on the situation, one large room can be created from both.
- The site development area within the residential building should not overstep 10 % of the total residential surface area.
- The residence width of the chosen construction form, e.g. terraced houses = 10 m to 15 m, garden houses = 13 m to 20 m, terraced houses = 6 m to 8 m, is to be kept to an absolute minimum.
- The land for construction must be self-chosen.
- You may choose from the following construction systems: HEBEL gas concrete construction, or BROCKHOUSE steel construction system, or CLASP-system, or timber frame construction.
- Heating system may be chosen individually.

**2. *Project Program***

**3. *MADE-Phase Plan***

**4. *Project Learning Result Catalogue***

**5. *Project Time Schedule***

**5. *Project Literature List***

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[6] "**The Forgotten – Mud Room**
by Emily Anderson
The Mud Room is typically the homeowner's entry. Have you ever thought about it this way before? A lot of thought, energy and money is often spent on the front entry. We want our guests to feel welcome and to have a good first impression of our home. Yet the place where we enter our home day after day is a room that is often pushed to the bottom of the "re-do" list. If designed well, the Mud Room can become a welcoming, functional space. If designed poorly, it can be the first overwhelming image we see when we walk in the door.
Imagine a mud room that includes a place for wet/dirty shoes and snow boots, hats and mittens, backpacks and bags, homework, mail, pet supplies, the kids' sports equipment, sunscreen and bugspray, gardening equipment, ice skates, skis, jackets and coats, the list is endless. This space should also welcome you and complement your home's aesthetic with finishes that are easy to maintain. Check out these rooms, where function meets beauty."
(Google)

## Explanation of the parts:

**Part 2.**
***Project Program***
which specifies, inter alia, the textual and graphic presentation of project results and the dates for submission. These rules on presentation contribute to uniformity and the exchange of information between those involved in the project, and thus permit 'more objective' evaluation of the learning results.

**Part 3.**
***MADE-Phase Plan***
serves the purpose of arranging the teaching/learning and design processes in clearly distinct main and subsidiary phases, and can be regarded as a macro-strategy for the designing and teaching of those processes. All in all, the ***MADE*** **Process Plan** represents a standardised, generally applicable pattern which is compatible with the most divergent specifics of various project tasks, and thus has a unifying and clarifying effect on the variety of possible design activities.

**Part 4.**
***Project Learning Result Catalogue***
This consists of:

**a)** Specific tutoring/learning goals (Explanation: Learning Goals) of the corresponding ***MADE*** projects during the **foundation – and primary degree ARCHITECTURE** or the **primary degree course CONSTRUCTION ENGINEERING**, as follows:
Three fundamental goals:

I. Provide the basics,
II. II. Create a design,
III. III. Obtain building permission and

Seven general goals:

A. Organise project execution,
B. Record the situation and process any information,
C. Plan and measure usage, formation, and technique,
D. Weight and mark quality,
E. Create and evaluate possible solutions,
F. Work over preliminary design,
G. create data entry documents.

**b)** Performance of individual or group, as the result of the project sub-tasks to be carried out for the corresponding ***MADE*** **Project Task**.

**Part 5.**
***Project Time Schedule***
This is used to plan the sequences and dates for the teaching/learning and designing processes. Following a set pattern, a bar chart whose simplicity and clarity makes it easy to handle is drawn up for each ***MADE*** **Project**. This chart contains the following data:
Horizontal = time divisions (days, weeks, months)
Vertical **=** ***MADE*** phases (following the ***MADE*** Process Plan).

The work submission dates set down in the ***Project Program*** are marked by a submission symbol. The students can therefore clearly see how much time they have between the

proposed submission dates to achieve the project learning results required by the *Project Learning Result Catalogue*.

A correction symbol identifies successful corrections of achieved learning goals. The schedule-related work strategy allows for better evaluation, there are fewer 'surprises', making studying and designing more efficient.

**Part 6.**
***Project Literature List***
with notes on relevant specialist literature and sources of information, such as architectural periodicals, bibliographies, catalogues of building research work and bookseller listings.

**Listed focus points of the *MADE* Project:**
***"Dense low-rise residential building"***

**Data lists**

**Goal catalogues**

**Quality list**

**Designs**

# Realisation stage

***„Designing residential houses may seem like a small task! The massive, the great project, with such a decisive role for architecture in general, and the national economy is, although impressive, also deceiving. It is not the place to learn or gain experience."***
(Richard Neutra: Auftrag für morgen. Hamburg 1962, S. 277)

## Subsidiary phase A: manage project procedures

What was previously described and created by the lecturer in the *Project Plan* was passed on and explained to the interested students at the beginning of the semester.

- The total project time stretches through the winter semester and into the lecture free study period.
- During the semester, four hours of study per week have been planned for the study course.
- The project group will meet regularly two days per week.

Beginning with the

## Subsidiary phase B: identify the situation and acquire information

the students now start with the ***MADE* Project** under the supervision of the lecturer.

Under the motto "An architect must understand what he / she is designing", the recognition of the correct information originating from relevant subject literature was practiced[7] as part of

## *Project module B 01: collect, elicit, select and order relevant information*

There were two major publications that served as a basis and were handed out to the project members:

- "Bauherren-Kurs bauen, modernisieren, einrichten - 1. Doppelstunde"[8] and
- "das handbuch des bauherrn '95"[9]

Certain texts were selected and read as part of group[10] work and discussed concerning their relevance for the building to be designed[11].

**Example** of a selected text: "**Porch**"

**"Porch"**
*Temperature and wind locks must be of a minimum size so that opening the door is possible without hindrance, even when there are visitors. Or: Cloakroom or WC should be reachable from the porch. In case of a renovated attic, stairs from the porch to the attic should make direct access possible (a slight separation should be possible later, in case the attic should be converted into a granny-flat), stairs to the cellar below, free-standing or separated, radiators and reinforced floor surface (tiles, stone, synthetic material), mat fixed to the floor via a frame."*
(Excerpt from: Bauherren-Kurs, 1992, o. S.)

First of all, the text was analysed for its building feature-oriented terms. Those terms found were:

- Porch
- Cloakroom
- WC
- Granny flat

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[7] The Internet is an additional source of information for teaching which, via its own technical structure, more so than other classical media forms (such as lexica, subject- literature and journals) requires systematic strategies for extracting information efficiently.

[8] Bauherren-Kurs
Heinze GmbH (Hrsg. u. Verlag)
1. Doppelstunde
Einführung in das Baugeschehen
Planung und Gestaltung
13. edited edition, June 1992
Celle 1992 (18 pages)

[9] handbuch des bauherrn '95
Heinze GmbH (Hrsg. u. Verlag)
bauen modernisieren einrichten - das handbuch des bauherrn
Edition 1995 (936 pages)
Celle 1995
Note: This text book is newly released every year. It can be ordered under www.heinze.de

[10] The reason for **group reading** is the processing of information (extracting information – finding, selecting, processing and using) with the inexperienced students in order to use the information.

[11] „**Objects** are buildings, other structures, outdoor constructions and interior constructions" (2)

- Cellar

In the next step, the text was analyzed for its design-oriented information. With reference to this point, the following information was found:

- Temperature and wind locks
- Cloakroom or WC should be reachable from the porch
- Must be of a minimum size so that opening the door is possible without hindrance, even when there are visitors
- Stairs from the porch to the attic
- (a slight separation should be possible later, in case the attic should be converted into a granny-flat)
- Radiators
- Stairs to the cellar below
- Reinforced floor surface
- Floor blanket.

After this exercise the students were challenged to find other building feature-oriented and design-oriented information in the subject literature that had been made available to them, to list it and bring it to the next session.

In order to separate the wheat from the chaff, those building feature-oriented terms were taken into the next training session and sifted through for their relevance for the **1.1 Room Program** (see "***Project Plan***" ). After extensive discussion, the features "Conservatory" and "Hobby room" were added. Finally, the feature-oriented terms were ordered hierarchically and presented in a *Object Structural Plan*.[12]

This process took a lot of time to carry out because the structuring of the building features was completely new territory for the students.

> ***„Trial and error is also good, because one learns through trial and error."***
> (Johann Wolfgang von Goethe, 1749 – 1832, German Poet)

The design oriented information could only be looked at in more detail in the next exercise. As part of an intensive decision process, the 'correct' design-oriented information was selected according to crucial content characteristics, for example:

- Temperature and wind locks = ***purpose***
- must be of a minimum size so that opening the door is possible without hindrance, even when there are visitors = ***spatial requirements***
- Cloakroom or WC should be reachable from the porch = ***allocation***
- stairs from the porch to the attic = ***development***
- (a slight separation should be possible later, in case the attic should be converted into a granny-flat) = ***flexibility***
- Radiators = ***heating***
- stairs to the cellar below = ***allocation***
- reinforced floor surface = ***floor covering***

[12] A **Object Structural Plan** divides the building to be designed into its respective elements (e.g. object areas, parts) and puts these in order with a number system. The naming and ordering of these object elements allows for further adaptation in future developments.

- floor blanket = ***dirt collection point***

After completion of this time-intensive procedure, the individual project members received the task of taking over responsibility for a building area or part from the overall structural plan (e.g. student X = entrance area, or student Y = kitchen and standing dining area). Each candidate would be responsible for researching the information already to hand as well as the information still to be discovered in subject literature, to filter and structure it, and then, finally, to order it in a ***Data List***[13] according to certain key words.

## *Project module B 02: Draw & analyse a "Dense low-rise residential building" in plans, sections, elevations in scale of 1:100 & siteplan in scale of 1:500*

During the preliminary planing phase, various garden court houses-, split level- and two-storey row houses were examined for possible usage deficiencies in Essen and the local area, with the help of the so-called ***BuildingAnalysisProcedure*** (BAP).

For example:

**Garden court house**

**Row house/Town house**

The examination criteria were taken from DIN- standards 18011 and 18022 of the construction standards in North-Rhein Westphalia, the basic principles of construction work. New understanding as a result of detailed analysis formed the basis for the designing of the residential building.

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[11]**Data Lists** are object-oriented, verbal and visualized (e.g. through graphics, drawings, sketches and photos) information stores for the building to be designed, and provide the basis for the solution to a project task. The available information must satisfy those charged with designing the building, they must be complete but without ballast.

**Stimulation for the Reader to Produce Data Lists with reference to „Feng Shui"**
The term ***feng shui*** (literally translates as "wind-water") is based on Chinese Daoist Philosophy. The aim of Feng Shui is to create a living and working environment in harmony with nature and the flow of energy.

**Literature:**

Rossbach, Sarah: Feng Shui – The Chinese Art of Placement.
E.P. Dutton, Inc., New York 1983

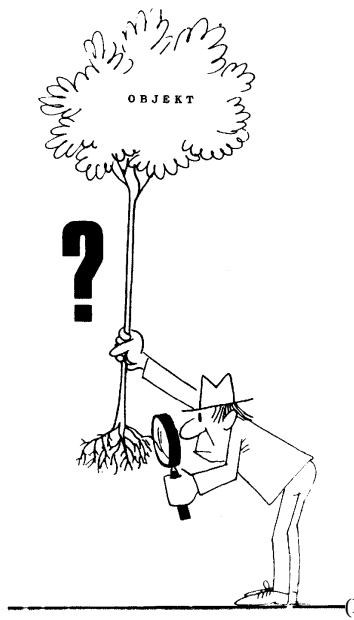
Rossbach, Sarah: Interior Design with Feng Shui.
E.P. Dutton, Inc., New York 1987

Bruun, Ole; Kalland, Arne (eds.) : Fengshui and the Chinese Perception of Nature.
In: Asian Perceptions of Nature: A Critical Approach.
Curzon, Surrey 1995, p. 173-188

Bruun Ole: An Introduction to Feng Shui.
Cambridge University Press, Cambridge 2008

Bender, Tom: Building with the Breath of Life: Working with Chi Energy in Our Homes and Communities.
Fire River Press, 2000

The ***Projectmodule B 0.2*** could draw to a close by "understanding"[14] the building design object "*Dense low-rise residential building*" in the



(Hanel)

## *Project module B 3: determine and define the Object Characteristics*

The agreement on ***Object Characteristics***[15] serves, on the one hand, the purpose of distinguishing it from similar objects, and on the other hand, that only a precise description could help solve future problems. On the basis of experience, this phase is of particular importance because the overall goal of the project is articulated and the points for the next phase of the project are put in place.

The group now had to find clarity concerning the exact meaning of the terminology of this building. This happened with the aid of four types of design-relevant **Object Characteristics**:

**1. User Characteristics**
Characteristics of user express who or what will use the building (people, particular groups of people, plants or objects).

**2. Type Characteristics**
Type characteristics provide information about what kind of building object one is dealing with (to what type of building object it belongs).

**3. Usage Characteristics**
These determine the purpose of the building object.

**4. Individual Characteristics**

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[14] Some students behave in such a way that they try to take a more comfortable route by avoiding a thorough **Object Terminology Analysis** (**Link >** Object Terminology Analysis) or they are impatient or they try to begin with a previously established idea. At the very best, these attitudes can only produce mediocre results.

[15] **Characteristic:** element of thought which reflects a property of an object and which serves to form and delimit its concept.
Example: One of the characteristics of the concept „fish" is „having fins" (1).

These are so-called “messengers” through which the architect or user can identify him/herself. They express something about the external/internal appearance of the object, for example “country manor”, “city house”, “post modern” or “eco house”.

For the object as a “*Dense low-rise residential building*”, the following attributes were established:

To No. **1:** The **User characteristics** were set in the 1. **Project Task** (see: ***Project Program***) and transpired as “*married couple with two children aged 8 months and 3 years*” .

To No**. 2**: **Type characteristics** for “*a concentrated, low-rise building*” were taken from the following sources

a) “Wohnung“ = Einheit von mehreren Räumen als ständige Unterkunft für eine oder mehrere Personen.” (Duden Bedeutungswörterbuch, 1985, S. 761)

*“Self contained dwelling” = a unit consisting of several rooms as a form of permanent accommodation for one or more persons.*

b) “*Gebäude* sind selbständig benutzbare, überdachte Bauwerke, die auf Dauer errichtet sind und die von Menschen betreten werden können und geeignet oder bestimmt sind, dem Schutz von Menschen, Tieren oder Sachen zu dienen. ...” (Bauordnung für das Land Nordrhein-Westfalen, 1995, S. 19)

*“Buildings”= are roofed constructions for independent use, built for long term use and to be entered by people, and are also suitable for the purposes of protection of people, animals and objects.*

c) “*verdichteter Flachbau*” = „Als verdichteter Flachbau gelten ein- und zweigeschossige Reihenhäuser, Teppichsiedlungen, Gartenhofhäuser (Atriumhäuser) und Hangbebauung .... Diese Bauform bzw. Wohnform erhält die Vorzüge des Einfamilienhauses ...” (Institut Wohnen und Umwelt (Hrsg.) 1978, S. 435-437)

“*Dense low-rise building*” *= A concentrated low-rise building consists of single- or two-storey row houses, carpet houses, houses with gardens (atrium houses), slope construction. This construction form and residential form respectively demonstrate the preferences of detached houses.*

d) “*Einfamilienhaus* ” = “Wohngebäude mit einer Wohnung. Hierzu gehören: u.a. Eigenheime, Bungalows, Reihenhäuser, Ferienhäuser, ...” (Statistisches Bundesamt Wiesbaden, 1978, S. 23)

*“Detached buildings” with a dwelling. Belonging to this category are owner home, bungalows, terraced houses and holiday homes.*

In the following, the “***Dense low-rise residential building***” belongs to the following categories:

- Roofed units for independent use, that can be entered by people,
- Residential buildings with a dwelling,
- A unit with several rooms as a form of separate accommodation for one or more people,
- Dense low-rise building.

To No. **3: The Usage characteristics** relevant to the project were extracted from the terminology "building" and "residential building"

"*Gebäude*" = „... dem Schutz von Menschen, Tieren oder Sachen zu dienen. ..."
(Bebilderte Bauordnung NRW, 1995, S. 19)
***Building****"… serve for the purposes of protection of people, animals and objects.*

Wohngebäude" = "*Wohngebäude* sind Gebäude, die mindestens zur Hälfte Wohnzwecken dienen." (Statistisches Bundesamt, 1978, S. 9)
***Residential buildings*** *are buildings where at least half is used for dwelling purposes.*

Accordingly, residential buildings serve as:

- Used for dwelling
- The protection of people, animals and objects.

To No**. 4: Individual Characteristics.** No project member that had chosen a 'real' builder-owner wanted to be pinned down concerning the **Individual Characteristics**.

The results of the **Object Characteristic Analysis** decisions made see **Object Characteristics Definition. (Link >** Object Characteristics Definition)

**Note:**
Instead of an anonymous family, consisting of a married couple with children aged from 8 months to 3 years, the project members could choose a real builder-owner in order to make the design task more realistic. In doing so, the following individuals with user-specific demands were chosen:

- Husband is shift-worker with free-time hobby building model airplanes, wife loves flowers and leafed plants, free-time used for sewing, daughter 8 months, 2 year-old son very lively.
- Husband self-employed business man, eats lunch at home with midday nap straight after, regularly works from home, enjoying watching TV undisturbed in free-time. Wife is music teacher by profession, gives lessons from home, free-time for playing piano, reading and inviting guests who do not like her husband.
- Husband is employed tax consultant, wife is hobby painter. 1 dog. Cooking and eating in same room, no dining room, 2 antique cupboards, large crockery and glass cupboard have to be brought in to "Gute Stube" (Sitting room), room for model car collection required.
- Husband is editing and advertising salesman: quiet study (must be a locked room), with a shelving system for subject literature and other books as well as storage space, computer work station and space for stereo. Wife is technical drawer /graphic designer – needs enough space for computer station, scanner and display screen (could also be located in e.g. lounge or "Gute Stube" (Sitting room), room with good (in)direct light for drawing and painting as well as space for the easel, low cupboards and work surface, storage space for large picture formats and a hardened floor surface.
- The land should be as small as possible. A small yard as opposed to a garden. The house should require very little work.
- Husband 36: architect. Working room with space for computer station, text screen, desk and shelves, garden house as a form of retreat (with gardening tools), hobby work room. Wife: 28, housewife. Peaceful reading and writing area, greenhouse well-lit room for storage of weather sensitive garden- and greenhouse plants. Child: 3 years old. Playing area near to, in view and speaking range of the kitchen where a person can work, play house in the garden, child 8 months old, crawling/playing area with no risk of injury or falling down the stairs.

It is not easy for a prospective architect to conduct analyses and designations based purely on terminology, simply because the individual's ability to view and imagine the actual building object is a particular talent. I am, however, as a lecturer, convinced of the importance of such a procedure. Only when walking the path can it be decided what "directive intuition" really is. It is my intention to achieve this. Only when it has been ascertained WHAT is being created and FOR WHOM, can the problem of 'how' be dealt with.

***"… Houses are built to live in, and not to look on; therefore let use be preferred before uniformity, except where both may be had. …"*** (Francis Bacon, 1501 – 1626)

# Subsidiary Phase C: plan and ascertain use, gestalt and technology factors

This Subsidiary Phase is the pivot point around which everything else in ***MADE*** revolves. ***How*** the course is set for a solution to the **Project Task** depends on the creative, clever and consistent handling of this (solution-oriented) phase. The basis of this work is the information processed into a body of knowledge in the previous **Subsidiary Phase B**.

## *Project module C1: determine, structure and link object users, functions and spaces*

Setting out from the users with their own needs and possible hindrances, functions[16] can be deduced to which the rooms[17] themselves can be ordered, from which the resulting residential house should be put together.

[16] "A **function** is the mode (perhaps we could also say *way* or *method*) of a subject's self-realisation vis-a-vis the external world." Mukarovský, 1978

"A **function** is described by a noun and a verb. It should be ensured that the data given only refers to the "mode", e.g. of an object, and not to the means by which the function is fulfilled.
For example, a function should not be articulated as „climbing stairs", but as „changing level".
Designations which express the manner in which a function is fulfilled, e.g. „changing level safely" are also to be avoided, as this formulation already contains a design objective."

**Ref.: Literature „Function"**

Bouwcentrum Rotterdam (ed.)
A 12 Woningbouw
A. 12.1 / UDC 721:001:728
1 Studies van elementen
Functional grondslagen van de woning
1 Houses
Studies of elements
Functional principles of housing
Rotterdam 1957

Grillo, Paul Jacques:
Form Function and Design
Dover Publications, Inc.
New York 1960

Blach, K:
The list of functional requirements as a tool for creative building design
In:

CIB 3. Congress 1965
Group H, H 2/1: Functional Requirements
S. 5-

Ministry of Public Building and Works
Directorate of Development
Activity Data Method
A method of recording user requirements
London 1966

Canter, D.:
The Need for a Theory of Function in Architecture
In:
University of Strathclyde (Ed.)
Building Performance Research Unit
GD/15/DC/ML
14th March, 1968

Farbstein, Jay:
The definition and description of activity
In:
Journal of Architectural Research
January, 3/1, 1974, pp. 18 - 25

Cronberg, Tarja:
Performance requirements for buildings. A study based on user activities
(Swedisch Council for Building Research)
Document D3; 1975, 83 p.
Stockholm 1975

Englund, Marianne.; Hallberg, Gun.:
A system for the description and classification of movement behaviour
(Statens rad för byggnadsforskning)
Document D 12; 1975, 52 p.
Stockholm 1975

Handler, Benjamin, A.:
Systems Approach to Architecture
New York 1970
(Siehe: Part I. Function and System in Architecture, S. 5-22)

Englund, Marianne; Hallberg, Gun:
Full-scale test methods applicable in building function analysis - review, analysis and evaluation
National Swedish Institute for Building Research
Document D12:1973, 65 p.
Stockholm 1973

Bredberg, Ulf:
Analys av planegenskaper vid projektering av bostäder (Analysis of planning characteristics in the design of dwellings)
Report R1:1975
Statens râd för byggnadsforskning
Stockholm 1975

Hallberg, Gun:
Individual characteristic descriptions in building function research
Statens rad för byggnads-forskning Stockholm

Document D13:1975, 72 p.
Stockholm 1975

Mukarovský, Jan:
Structure, Sign and Function
Selected Essays by Jan Mukarovský
Yale University Press
New Haven and London 1978

Preziosi, Donald:
Architecture, Language and Meaning
The Origins of the Built World and its Semiotic Organization
Mouton Publishers
The Hague, Paris, New York 1979
(See: Chapter 3, The Functions of the Built Environment, S., 46-57)

Department of Scientific and Industrial Research (Building Research Station) (ed.):
Principles of Modern Building
Volume One
Third Edition
London 1959
(See: Part I)

Simmons-Forbes, Maree:
Functional Creativity in the Practice of Design
Diss. Union Graduate School
The Union for Experimenting Colleges and University, Ann Arbor, Michigan
Ann Arbor, Mich. July 1983

Ligo, Larry L.:
The Concept of Function in Twentieth-Century Architectural Criticism
UMI Research Press
Ann Arbor, Mich. 1984

Johnson, A. L.:
Designing by functions
In:
Design Studies, Vol. 12, No. 1, January 1991, S. 51-57

Fawcett, William:
Architecture: Functional Approach of the Case for User Research
In:
arq, No. 3, Vol. 1, Spring 1996, S. 8-15

Forty, Adrian:
Words and Buildings
A Vocabulary of Modern Architecture
Thames & Hudson
London 2000
Siehe: Function, S. 174-195

West, Beverly N.; Emmitt, Stephen:
Functional design?
An analysis of new speculative house plans in the UK
In:
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The connection of these three independent complexes (1. User 2. Functions 3. Object / Rooms) was made possible with the assistance of the order raster "*Matrix*"[18] (*Principle of Object Matrix*)

Whoever wishes to plan and design a residential building, must be provided with design objectives. Only then is one in a position to design a building object in keeping with societal developments: e.g. to design a residential building with an absolute understanding of the functions it (the building) has to fulfill on a daily basis and last but not least the sensuous effects on the user. (*Sensuous effects of "Building"*).

As stated in the BGB (Federal German Civil Law), from paragraph § 633 onwards, there are continuous references to the contexts involved. It is stated here, for example, where the duties of the respective planner begin and end: *„An architect or construction engineer is responsible for planning, constructing and forming a building so that it is free of defects"*.

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[17] ***Spaces*** - in the sense of ***MADE*** - are to be understood either as indoor spaces (e.g. rooms with walls or delimited by pillars) or as outdoor spaces (e.g. natural spaces in the environment or designed open spaces).

[18] The ***Object Matrix*** is an order matrix in which the relationships between the three components 1. USERS 2. FUNCTIONS and 3. SPACES are presented.
Lead by the users, ( *User characteristics*) the relevant functions of the building object to be designed were to be established according to the users requirements. At first, the establishment of the overall purpose was priority. This had previously been made clear by the application characteristics already set up:
a) *Achieve safety and health* (taken from the characteristic: *"for the purposes of protection for people, animals or objects."*)
b) *To reside* (taken from the characteristic *"to serve purposes of residency"*)

The so-called complete functions under (a), along with the main-, part- and basic functions, are general functions, that means that they are generally relevant for all buildings and do not have to be extracted from new information every-time. They were provided to the students in a hierarchically-structured as a "finished product".

The complete function under (b) and the resulting main-, part- and basic functions are specific functions, that means that they must be newly extracted from the data for the specific type of building to be designed.

The following implementation of the general and specific functional requirements of the users (in this case it was the project leader and project team workers and builder-owner respectively) in the creation of rooms from which the residential building was to be formed, became unnecessary because the required rooms were already known in the room program (see **Project Plan** under 1.1 Room Program). Never the less, every single one of the rooms had to fulfill the complete-, main-, part- or basic function (whether general or specific) to an optimum level.

Critics state that by fostering this form of thought process, an unreasonably high amount of time must be invested, and that not enough would be invested in the actual "designing" (an architect's favourite activity). In contradiction of this it can be noted that this form of thought training places great emphasis on the user processes for the architect-apprentice (e.g. living, working or playing) than on the building object and its production (without actually neglecting this). Thinking in terms of functions is an principle part of ***MADE*** because, in doing so, it should prevent that

- the object (not the user) should be the focal point
- originality is neglected.

In order to be sure that the rooms of the residential building being planned function correctly, meaning of course that they are able to fulfill their designated functions[19] with regard to use, form and technical", the following section:

## *Project module C2: identify, order and group design objectives for the object*,

is where so-called **MUST**-, **SHOULD**-, **CAN**- and **WISH** goals are formulated and entered into categories their respective categories. (*Explanation: Goal Catalog*), (*Goal Catalogues*)

The 'MUST goals' for the "concentrated low-rise residential building" are taken from the book of regulations[20], containing the rules and prohibitions as well as the situational factors of the building plot and the surrounding environment.

The 'SHOULD goals originate from the rules and agreements of the "builder-owner" (the lecturer) with the students, possibly also from the 'real' builder-owner.

This 'CAN' goals are taken from data lists and chosen by way of discussion between the lecturer and students. Furthermore, every student could add more possible and WISH goals from a "archive of ideas"[21] he or she may have, or possibly those formulated by the 'real' builder-owner.

Goal catalogues are then created for all rooms within the residential building.

Below is an example of three goal catalogues "Residential building", "*Dwelling*" and "*Entrance area* ", "*Kitchen with Snack space*".

## *Project module C3: link the spaces inside and outside the object*

The design goals collected in the respective goal catalogues were drawn with respect to the connection of rooms within the **Room relation plan** (**Link >** Room relation plan).

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[19] An important condition for the determination of the performance of a building in its entirety and in its parts in the sense of function-orientated methods such as the „Performance Concept".
(Cronberg, Tarja: Performance requirements for buildings. A study based on user activities.
Swedisch Council for Building Research, Document D3; 1975, 83 p.
Stockholm 1975)

[20] The regulations determine the type of interaction with the surrounding environment, the static, physical and hygienic demands placed on the building for the protection of those people using the building, as well as the rules concerning the neighbourhood. These were made possible with the aid of the "Vorschriften-Informations-System (VIS)" (Regulation Information Service). VIS is part of the databank library of the "Deutsche Bau-Dokumentation" (German Construction Documentation). By presenting information on the building to be designed as well as the federal state in the form of an inquiry, a free list could be withdrawn containing all the relevant laws that had to be considered, executive law order, administrative regulations and other requirements.
(Heinze GmbH, Postfach 1505, Bremer Weg 184, 29219 Celle). Internet address is:
*www.baunetz.de/arch/baurecht*

[21] Many ideas cannot be evaluated and applied straight away. It often occurs that they gain in significance later on. This problem can be solved with the introduction of a "archive of ideas", that means that every student can store any personal ideas he or she may have while reading through literature or during other moments.

## Subsidiary Phase D: weight and rank aspects of quality

In ***MADE*** Projects, evaluating systems are used as a design aid (*Explanation: **MADE** Quality systems*) in order to evaluate more accurately the quality of a building object, e.g. the dwelling quality of a housing object.

During the **foundation course**, a simplified process is used due to time limitations, the **Point Valuation Process (PVP)** which takes place in two separate phases: **Step 1** before starting, and **Step 2** after completing the **Subsidiary-Phase E**.

### *Project module D1: select, grade and evaluate quality objectives*

In **Step 1**, the **CAN-** and **WISH- goals**[22] are used with respect to **use, form** and **technology**. They are given the status of goal criteria and are entered in to a ***Quality List***. By way of discussion with the project members, these goal criteria are awarded a number of points within a scale system. Additionally, a minimum of three individual criteria are required of every project member.

The next phase can then be initiated:

## Subsidiary Phase E: create and evaluate possible solutions,

within which at least **two variations**[23] of the ***Dense low-rise residential building*** to be sketched out. As part of this process, the surface area restrictions of the building project and other additional requirements are to be fulfilled on the one hand, while the newly acquired knowledge from specific project sub-tasks within the project catalogue must be considered on the other hand **(***Project Learning Result Catalogue*), (*Explanation Project Learning Result Catalogue*)

- Room Program
- Requirements
- Goal catalogues
- Room relation scheme
- Quality list.

A **Working model** could also be put together if required in order to alleviate the forming process.

### *Project module E1: sketch at least two variant solutions in plans and elevations, scale 1:100*

### *Project module E2: check and select variant solutions*

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[22] ***MUST*** and ***SHOULD*** Objectives are not normally used for assessment, as compliance with these is mandatory.

[23] ***Variant*** = a design solution to the same or only slightly different requirements as another.
***Alternative*** = a design solution to fundamentally different requirements.

**Step 2** sees the initiation of the point awarding scheme. The quality of the sketched potential solutions (variations) were examined in pairs according to the established criteria and evaluated according to the extent to which they fulfilled that criteria.

The second stage of the **Point Valuation Process (PVP)** (see above) then started: the quality of the possible solutions sketched (variants) was assessed in pair by pair comparison using the criteria established in the first stage, and marked for fulfilment of these in **Evaluation Tables**. The variant with the higher total in each case constituted the **Scheme Design**, which was used as a basis for the last Subsidiary Phase.

The most beneficial variation represented the pre-design. This was to be graphically presented and described in detail in:

## Subsidiary Phase F: complete the scheme design

with the

### *Project module F1: compile final drawings of the scheme design, floor plans, sections and elevations in a scale of 1:100,*

and followed by the

### *Project module F2: describe final design.*

Finally, it had to be presented in 3 D in:

### *Project module F3: construct a demonstration model of the object in a scale of 1:50*

The quality of the demonstration model is of great value as a model is more ascertainable in comparison to the original: It provides the complete picture from all sides and with all details.

It frequently shows all relationships and size dimensions better than they can be experienced in reality (*Designs*)

All project results are collated and presented in the form of a **Project Report**.

## END

***of the MADE* - Project: *"Dense low-rise residential building"***

## Epilogue

Why is it so important to meticulously learn and acquire the skills for designing residential buildings? Based on the experience and extensive research of the lecturer, the conclusion was reached that the majority of architects, in their quest for self-fulfillment mis-plan or mis-design by neglecting the wishes of the user[24] and client.

The typical statement "only we architects, as real specialists, know how one lives" is formed from arrogance, over-estimation of oneself and delusions of grandeur. Interestingly, those specialists with their modern ideas of home living space improvements[25] lived, and continue to live, not in those self-developed dwelling concepts but rather in old residential buildings and villas respectively with large, high rooms, or in a comfortable, rustic house with small-medium sized window, thick solid walls and old wooden paneling, or on a beautiful former farm with surrounding greenery.

In ***MADE*** it is the user who stands in the spotlight. His/her desires must be precisely studied, and all the minor details taken into consideration that make a difference to the "value of usage" and "value of feeling" in a living space. Suitable living space can only be created between these two poles. This means training task-oriented thinking and awakening empathy.

## Literature


Heinze Verlag (Hrsg.):
Schulze, Georg-Wilhelm, Redaktion
Bauherren-Kurs
bauen, modernisieren, einrichten
1. Doppelstunde Einführung in das Baugeschehen Planung und Gestaltung
15. überarbeitete Auflage Juni 1994
Celle 1994

handbuch des bauherrn '95
Heinze GmbH (Hrsg. u. Verlag)
bauen modernisieren einrichten - das handbuch des bauherrn
Ausgabe 1995 (936 Seiten)


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[24] „The dwellings were designed by forward-thinking architects who belonged to a very different social class, with very different ideas on living and living requirements. It was not at all seldom that their own standards and ideas flowed into the design process – all be it in a smaller form - without any real investigation in to the others' requirements, for whom the dwellings were meant. In principle, there has been little change in this respect until the present day. (Andritzki, 1979, S. 137)

Or as Le Corbusier put it: "The house for the typical person, 'for the very best', means to rediscover the basis of being human, the human benchmark, the need type, the function type, the mindset. And that is all! That is the main point, that is everything." (Le Corbusier, 1926)

[25] And so lived, for example:
"Mies van der Rohe, not in a dwelling designed and constructed by himself, at the top floor of the Lake-Shore apartments, a flats building built of steel and glass. No; he felt better living in an old-style house with many walls where he could hang up his picture collection of Paul Klee. (Borcherdt, 1988, S. 118)

Le Corbusier did not live in one of his 'dwelling machines' à la Unité d'Habitation but rather, from 1934 until his death, in a residential building with a rooftop garden on the seventh and eight floor on the 24 Rue Nungesser-et-Coli in Paris. (Carl, 1988, S. 65-75)

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Rughöft, Sigurd:
Wohnökologie - Grundwissen.
Uni-Taschenbuch 1679
Stuttgart 1992, S. 135

Institut Wohnen und Umwelt (Hrsg.):
Planungsbegriffe - Ein Leitfaden durch das Labyrinth der Planersprache
1. Auflage,
Opladen 1978

„Geschäftsstelle Kinderfreunde“ der Stadt Herten (Hrsg.):
Kinderfreundliches Wohnen
Herten 1993

Borcherdt, Helmut:
Architekten
München-Wien 1988

Carl, Peter:
Le Corbusiers Penthouse in Paris, 24 Rue Nungesser-et-Coli.
In:
Daidalos 1988, Nr. 28, S. 65-75

DIN 4109 Schallschutz im Hochbau, Ausgabe August 1992, Beiblatt 2 Hinweise für Planung und Ausführung

Bauordnung für das Land Nordrhein-Westfalen
-Landesbauordnung- (BauO NW)
Essen 1992

Haag, Lüpke von (Hrsg.):
Bauordnung im Bild (BiB)
Kissing 1993

Institut Wohnen und Umwelt (Hrsg.):
Planungsbegriffe
Ein Leitfaden durch das Labyrinth der Planersprache
3. Auflage
Opladen 1978

Loewe, Ludwig:
Bebilderte Bauordnung
7. Auflage
Düsseldorf 1989

Rennhofer, A.:
Der Arbeitsplatz Küche - richtig gestaltet
In:
Die moderne Küche, Heft 22, 1963

Schüler-Duden
Hrsg. Meyers Lexikonredaktion
Mannheim 1989