MEASUREMENT CODE

Applicable to the buildings of the institutions and other bodies of the European Union

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1 INTRODUCTION

This Measurement Code applies to the buildings of the institutions and other bodies of the European Union (see section 6). It sets out the definitions used and rules for carrying out building-related measurement uniformly and consistently.

Systematically applying this Code will ensure that a uniform measurement system is applied to all the buildings of the institutions and other bodies that have decided to apply the 'DIN 277' standard for their building measurements. Each institution is free to apply more detailed rules as it sees fit, or to deviate from the standard on minor points.

The Measurement Code will be referred to in the rest of this document simply as the '**Code**'.

2 REFERENCE FRAMEWORK

In general, the standards applied to the measurement of buildings are **DIN 277-1:2016-01, 277-2:2005-02 and 277-3:2005-04**[1]. The Code complements the **DIN 277 standard**, specifying how it is to be applied and clarifying the exceptions and derogations. This series of standards will be referred to throughout this document simply as the **DIN 277 standard**.

The buildings are composed of enclosed and thermally insulated spaces, which are generally well lit, ventilated and air-conditioned. They are subdivided into different main occupancy levels, also known as 'floors'. They generally contain one or more basement levels.

In practice, two measurement techniques are used:

- in situ measurement refers to the surveying of an existing building by a professional surveyor using appropriate measuring instruments;
- on plan measurement refers to the graphic measurement done on the basis of 'as built' documents and computer files[2].

Although the Code is universally applicable, exceptional situations cannot be ruled out. In such cases the measuring method will then be specified in agreement with the parties concerned, on the basis of architectural, technical and legal criteria.

In the standards and reference documents varying names are used to identify types of area. The code sets out the following principal areas:

- **gross floor area – GFA** (*Brutto-Grundfläche (BGF)* in the DIN 277 standard)
- **net floor area – NFA** (*Netto-Grundfläche (NGF)* in the DIN 277 standard)

[1] Author: Deutsches Institut für Normung - http://www.din.de

[2] Architectural plans are usually encoded using computer-aided design (CAD) software or spatial management software for calculating surface areas.

These two types of area are detailed in points 3.2 and 3.3 respectively.

3 MEASUREMENT RULES

3.1 General principles applicable to all areas

3.1.1 Occupancy

In the case of private occupancy of the whole building, the whole area is available to the occupant.

If the use of the building is shared among several occupants, the area of each occupant is made up of the area restricted to their legally private area; depending on the specific case, a proportion of the area for common use may be added to that area.

3.1.2 Unit

The standard unit of area[3] of a floor is the square metre (m²). The total area of the building, calculated by adding the areas of each floor, is rounded to the nearest square metre.

3.1.3 Measurement

The floor area is always measured at the level of the finished floor, even where there is a non-vertical façade or a sloping roof. The area of ramps, sloping floors and flights of stairs is determined by measuring their vertical projection on a horizontal plane. The area of each part measured between two floor levels[4] is considered to form part of the closest floor[5].

3.1.4 Area above ground and below ground.

The areas above and below ground are measured separately. The definitions and criteria are detailed in point 3.4.

3.1.5 Types of corridor

This Code distinguishes between two types of corridor:

- Primary corridors comprise evacuation routes, including security access doors, and meet the conditions set out in the rules and requirements on fire prevention and accessibility for people with reduced mobility currently in force. Their area is included in the 'circulation area' (CA) – see point 3.5.3);

[3] In rural areas, the area of a plot of land is measured in ares (1 are = 100 m²). An are is subdivided into 100 centiares (1 ca = 1 m²). A hectare is composed of 100 ares and measures 10 000 m². References to these units can be found in the root of title of official records.

[4] Ramp, staircase, intermediate landing, etc.

[5] It is split 50% between two floors if it is located at half-height (e.g. ramps or landings).

- Secondary corridors do not form part of the evacuation route. These corridors conform to accessibility requirements. Their area is taken into account in the 'circulation area' (CA).

The movement areas inside rooms (e.g. between the various sections of open-plan offices, between the machines in workshops or the passageways for visitors to exhibitions) form part of the 'useful area' (UA), with the exception of the evacuation routes described above, which are considered part of the circulation area (CA).

3.2 Gross floor area

3.2.1 Definition

*The **gross floor area** (GFA) relates to the outer edge of construction features[6] delimiting the building, including floor coverings, measured at floor level.*

The GFA extends to the physical limits of the building which mark the separation between the building and its external environment. It is referred to as the internal area.

3.2.2 Measuring method

The GFA of a level is the area of the closed polygon surrounding the floor. Its sides are formed of:

- exterior faces of façade features delimiting the edge of enclosed spaces on the level under consideration;
- the line of the partitions or walls between two adjacent spaces;
- the line of party walls between different buildings;
- where applicable, the line of construction features separating co-owned areas.

The GFA excludes empty spaces in courtyards, patios and atriums of more than $4m^2$.

3.2.3 Exceptions and/or further details concerning the DIN 277 standard

In basements, where it is not possible to measure the actual thickness of walls underground, the agreed view is that the outline of the polygon of the GFA lies within the outer wall and runs along the visible face of the wall.

In the case of rooms or enclosed spaces several floors high, the GFA includes solely the lower floor area (where people walk) and not the area of virtual floors.[7] (see point 4.1).

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[6] Construction features are all the elements making up the shell of the building (masonry, reinforced concrete, steel structures) and fixed partitions (in blockwork or plasterboard).

[7] Virtual floors can be found in rooms where the headroom is greater than one storey.

The GFA does not take into account alcoves, cantilevers and decorative features of façades where the area projected vertically is ≤ 0.5 m² (see point 4.3). This does not apply to bay windows and French windows (see point 4.4).

Moreover, the GFA **does not include** the area of:

- access routes[8];
- outdoor gardens;
- external stairs and escalators;
- unusable roof voids[9];
- metal walkways used for maintaining the building[10];
- roof platforms[11];
- pitched roofs;
- terraces[12];
- empty spaces, courtyards and patios (with an area > 4 m²), except for the lower floor;
- uncovered balconies.

The GFA **does include** the area of:

- usable roof voids;
- open, external technical areas serving the building;
- walkways or passages between two parts of the building;
- lift shafts.

The GFA also includes the construction area, which itself includes vertical structural features (walls, pillars, screens, etc.), chimneys and other non-accessible shafts with an area of < 1 m².

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[8] Access routes are open areas allowing access to the building.

[9] Roof voids form the part of the building situated directly under the roof and are not used to accommodate people. A roof void is declared unusable if there is no floor, if the structure obstructs the space, if the height is too low (≤ 1.60 m) or if access is very difficult (by access hatch).

[10] Unless the walkway leads to internal areas.

[11] The roof of the building is composed of:

- terraces: areas which are accessible to occupants of the building, the surface of which where people walk is of a hard material which is resistant to piercing;
- roof platforms: areas which are accessible solely for maintaining the building and which are covered by a watertight layer (roofing), or automatically protected (aluminium), or filled (shingle);
- pitched roofs: areas which are sloping and inaccessible.

[12] A terrace is a feature of the architecture of a building which is outside the building. It is an external area on the ground floor, on a floor or on the roof of the building. Unlike a balcony, a terrace lies on a projection from the floor below, or from the ground in the case of the ground floor.

3.3 Net floor area

3.3.1 Definition

*The **net floor area** (NFA) refers to the internal edge[13] of all construction features, measured at floor level.*

The NFA constitutes the floor area which can actually be used by the occupants of the building. It is referred to as the internal area and excludes all construction features.

3.3.2 Measuring method

The NFA of a level is the sum of the areas of polygons whose edges are formed by the visible internal faces of construction features: façade walls, party walls, internal walls and screens, columns and fixed partitions.

3.3.3 Exceptions and/or further details concerning the DIN 277 standard

When measuring, account need not be taken of features whose influence on the NFA may be regarded as insignificant, namely:

- vertical penetrations[14] ≤ 1 m² (see point 4.3);
- alcoves, cantilevers and decorative features (plinths, cladding, etc.) of façades where the vertically projected area is ≤ 0.5 m² (see point 4.3)
  This does not apply to bay windows and French windows (see point 4.4).

The NFA **does not include** the area of:

- unusable[15] roof voids[16];
- metal walkways and stairs used for maintaining the building;
- columns and pillars with a diameter of > 0.1 m², construction features.

The NFA **does include** the area of:

- usable roof voids;
- maintenance rooms and service shafts with an area of > 1 m²;
- open technical areas serving the building;
- lift shafts;
- closed walkways between two parts of the building;
- parts of the floor under heater casings[17];

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[13] The internal edge of construction features is the edge which can be seen directly and measured by the occupants of the building.

[14] Vertical penetrations are chimneys, shafts and technical drillings. Stairs and lifts are not regarded as vertical penetrations.

[15] Roof voids form the part of the building situated directly under the roof and are not used to accommodate people.

[16] A roof void is declared unusable if there is no floor, if the structure obstructs the space, if the height is too low (≤ 1.60 m) or if access is very difficult (by access hatch).

[17] This area is regarded as residual area (RA).

- parts of the floor with headroom ≤ 1.60 m[18].

The NFA is composed of the following types of area (see point 3.5):

- usable area (UA)
- technical area (SA)
- circulation area (CA)
- residual area (RA)

The division into sub-areas is shown in the Annex (see section 8).

3.4 Determining the area above ground/below ground

A building is composed of volumes above and below ground. The same is true for floors, and therefore their areas.

It is important to make a distinction between above ground and below ground because the possibility of housing permanent workstations depends inter alia on health and safety conditions and daylight.

However, there is no standard which provides an exact definition of the conditions which must be satisfied in order for a floor to be declared 'below ground' or 'above ground', as the distinction depends on the architecture of the building and the profile of walkways and is not always apparent.

This Code proposes a method to make that distinction:

- Divide each floor into adjoining areas and consider each area as isolated and independent;
- Determine whether the area under consideration receives sufficient daylight and ventilation to enable office work;
- Plot the profile of the ground or the pavement along the length of each façade and attribute conventionally the level 0.00 to the middle point of that profile along the pavement;
- Plot the line of floors if it is not the same as the profile of the ground or the pavement along the perimeter of the building.

There are two possible scenarios:

1. A single façade along the pavement (see point 4.5) In this case, a floor situated between levels 0.00 and -1.50 m is regarded as above ground. Floors at a level below -1.50 m are regarded as below ground.

2. Several façades along the pavement (see point 4.5) In this case, the position of floors is examined in relation to each façade in isolation. If certain floors may be regarded as both above and below ground in accordance with criterion 1, each floor area is examined individually and declared as being above ground if it receives sufficient daylight and ventilation to enable office work.

[18] This area is regarded as residual area (RA).

In this case, the area considered to be above ground is comprised of rooms which can be used as offices themselves, as well as the access corridors to these rooms and any associated sanitary facilities.

3.5 Definition of sub-areas

3.5.1 UA: usable area

Preliminary note: The table annexed to the Code lists all the categories of areas in accordance with DIN 277.

The usable area denotes the spaces which, by their nature, are intended to be used for the activities of occupants and where the headroom is > 1.60 m.

It applies to spaces above and below ground.

It is composed of the following categories:

- UA1: Living, social and catering areas;
- UA2: Office work;
- UA3: Production, manual and mechanised work, research;
- UA4: Storage, distribution and sale;
- UA5: Conferences, training and culture;
- UA6: Medical services;
- UA7: Secondary usable area:

3.5.2 TA8: Technical area

This constitutes all the technical areas of the building. It may be that part of a floor or a whole floor is dedicated to technical requirements. In that case, the technical area also includes the horizontal passages serving solely that area.

3.5.3 CA9: Circulation area

This constitutes the spaces used for the circulation of occupants, including the lift shafts.

3.5.4 RA10: Residual area

The residual area constitutes spaces which cannot be fully used by occupants. This area is, however, heated, ventilated and serviced by cleaners, maintenance teams and security.

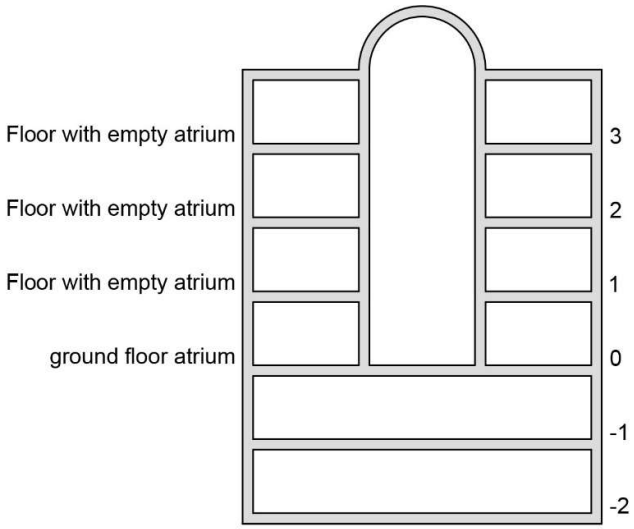
It includes:

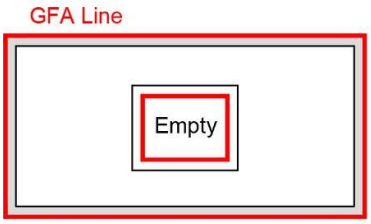
- internal spaces with headroom of ≤ 1.60 m;
- spaces occupied by heater casings[19].

[19] Derogations on this point are possible on a case-by-case basis, as specified in section 1.

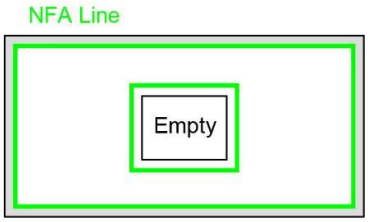
4 DIAGRAMS AND FIGURES

4.1 Covered areas - Atrium

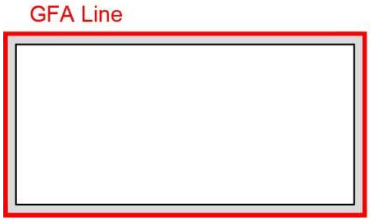




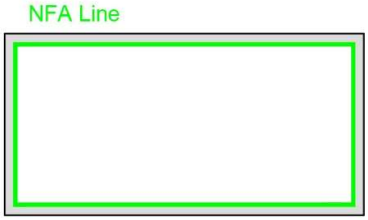
Plan levels "1-2-3"



Plan levels "1-2-3"

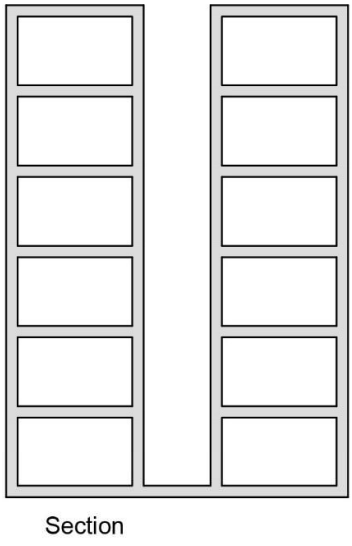


Plan level "0"

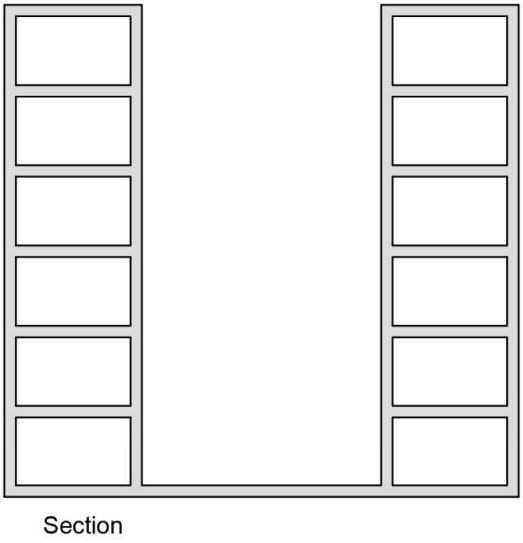


Plan level "0"

4.2 Uncovered areas, courtyards and patios



Section



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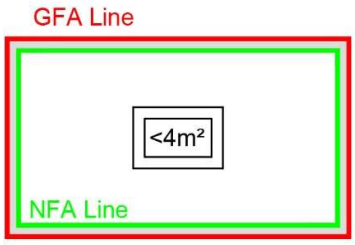
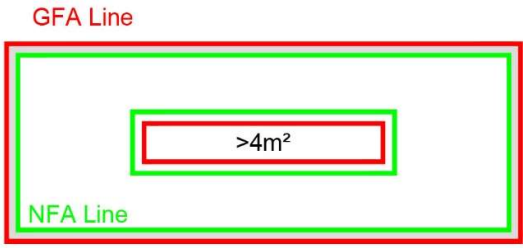
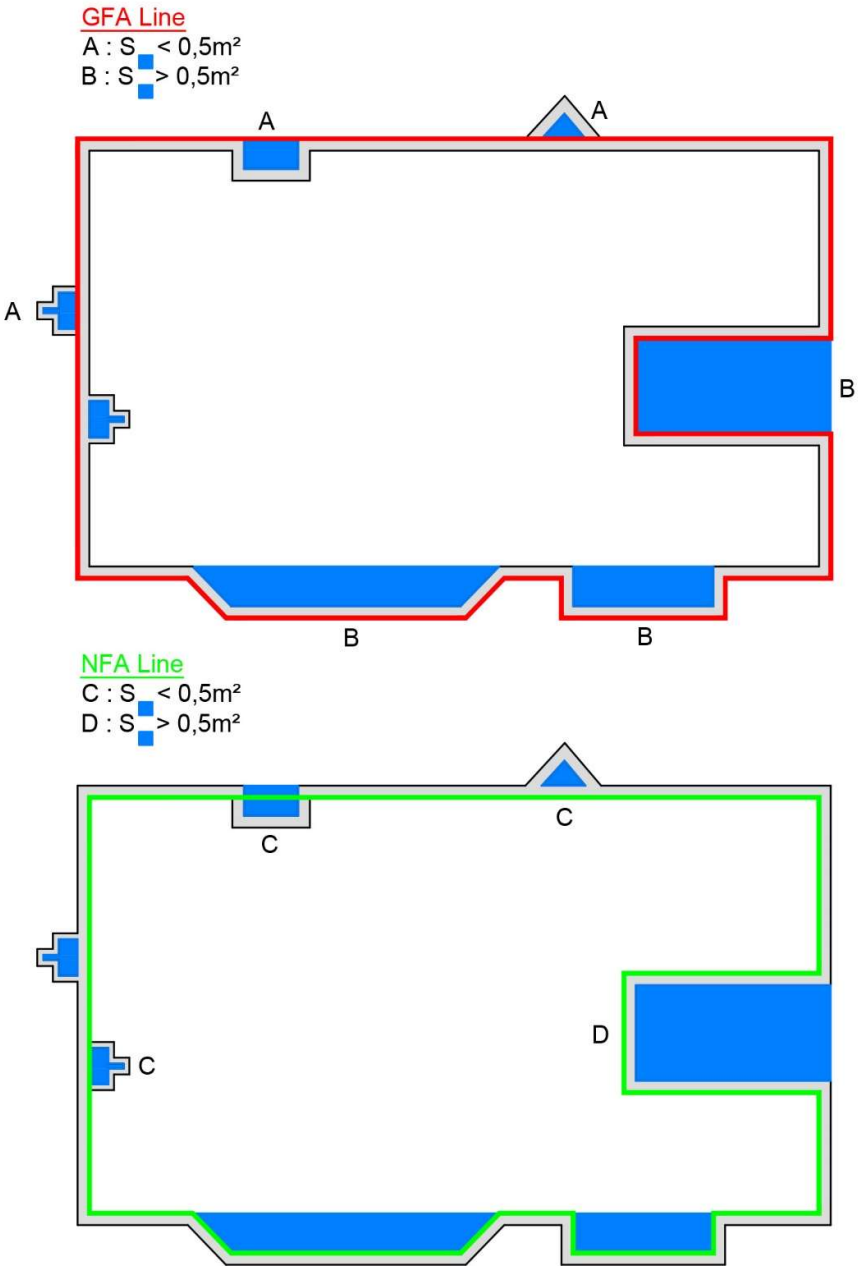


Plan

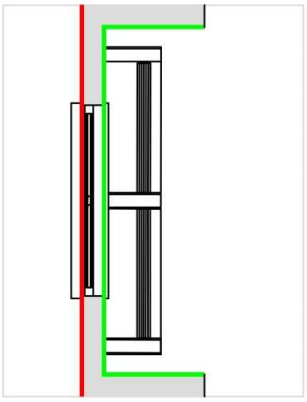


Plan

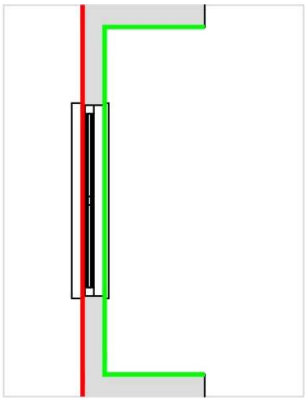
4.3 Alcoves and cantilevers



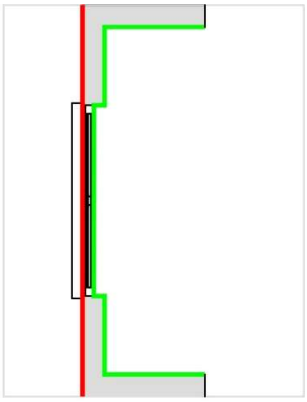
4.4 Windows and French windows



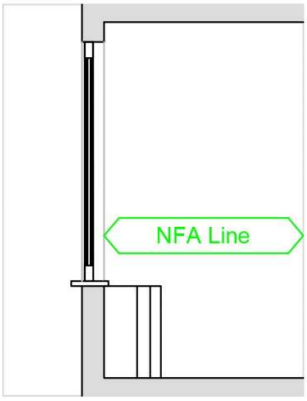
Windows embrasure with convector



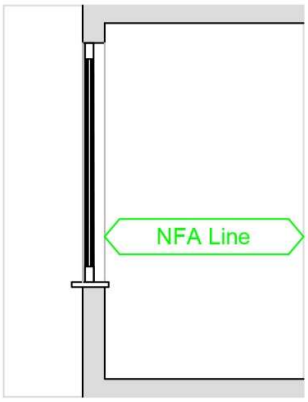
Windows embrasure



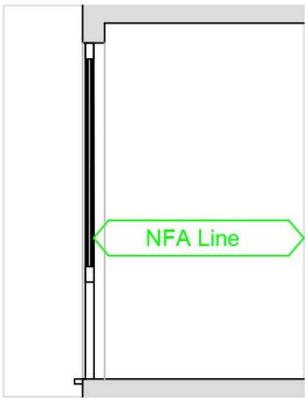
Windows-door



Windows embrasure with convector

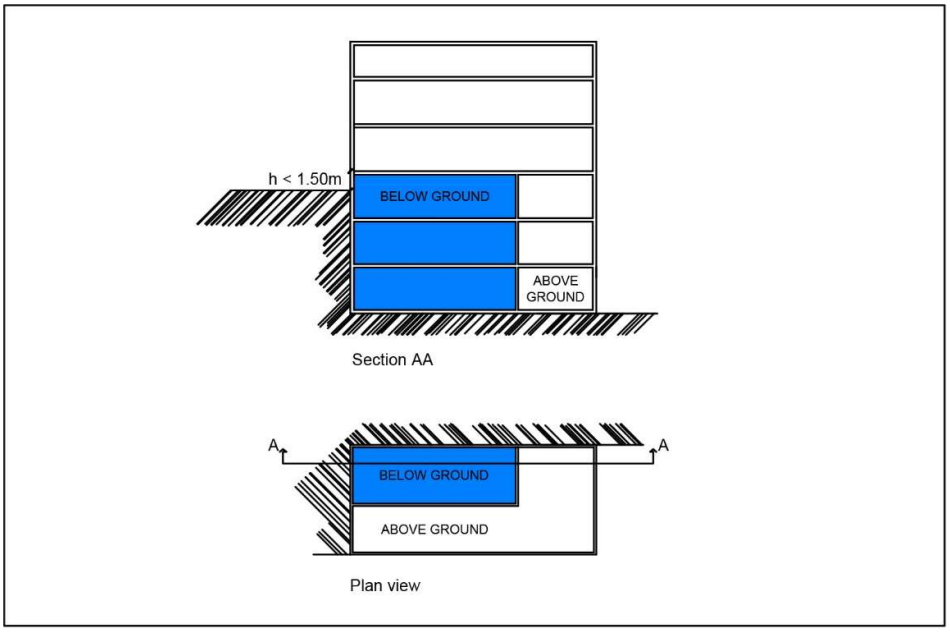


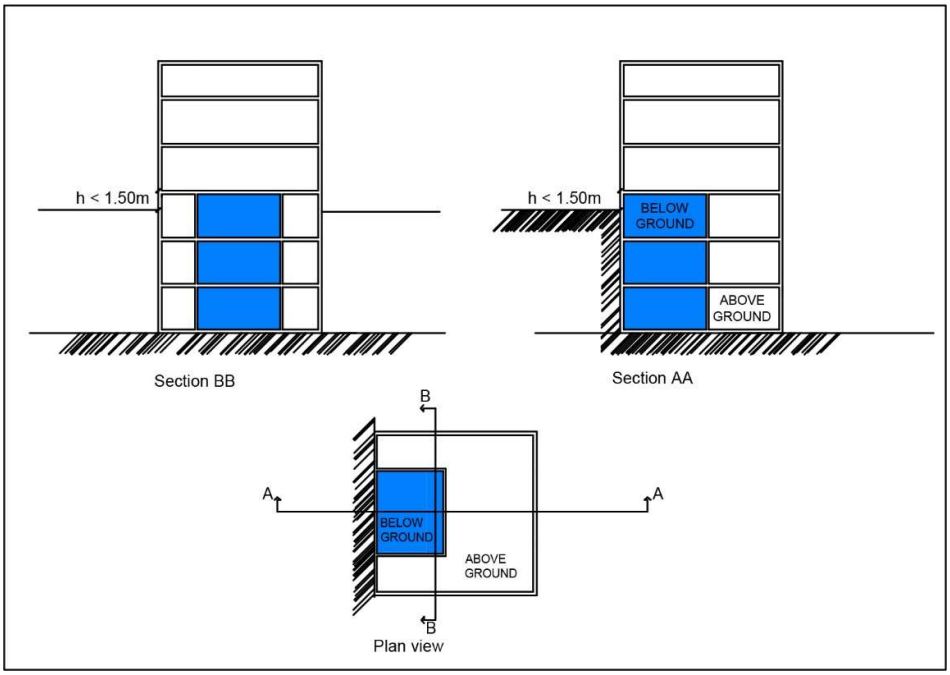
Windows embrasure



Window and apron

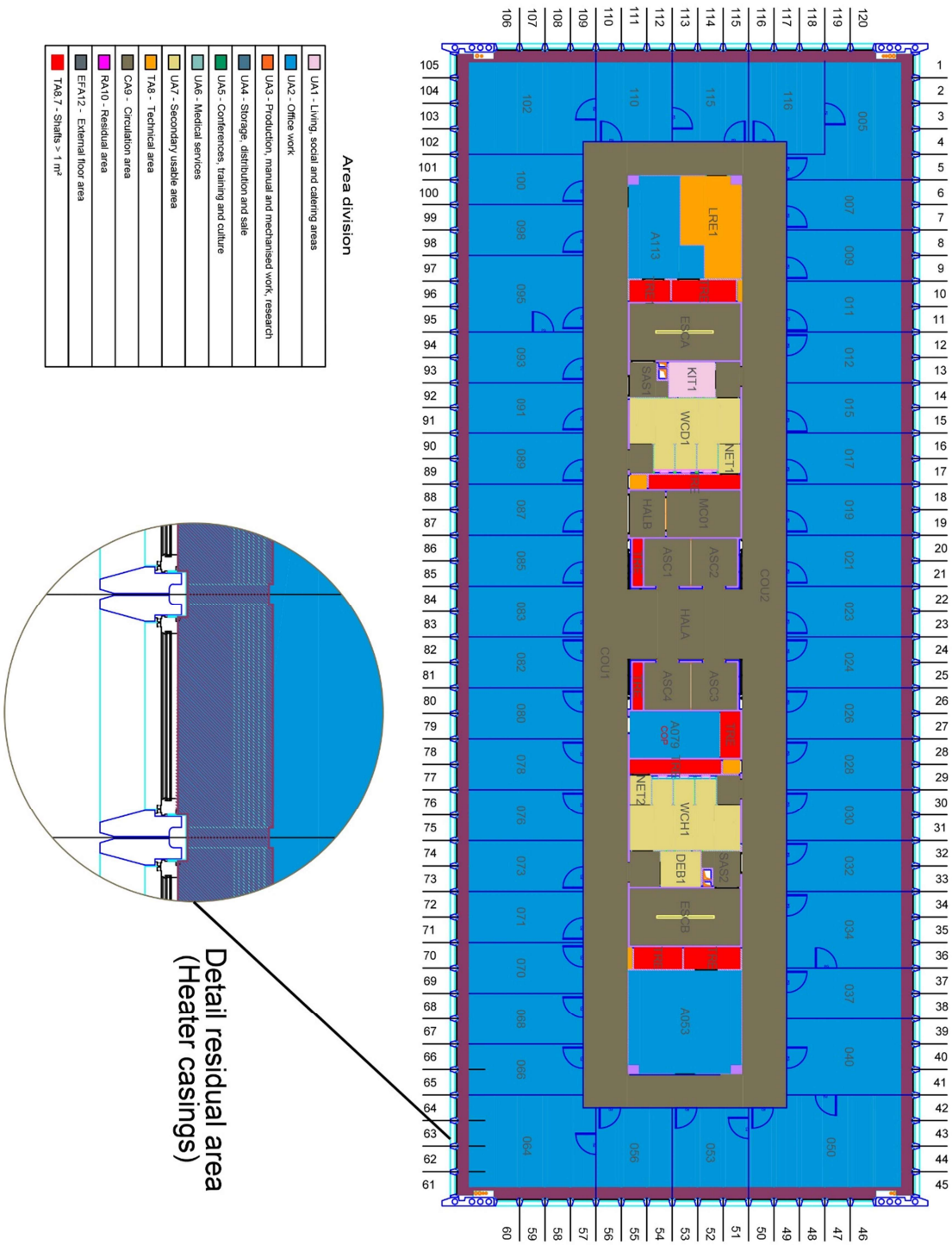
4.5 Method for determining the area above ground and below ground



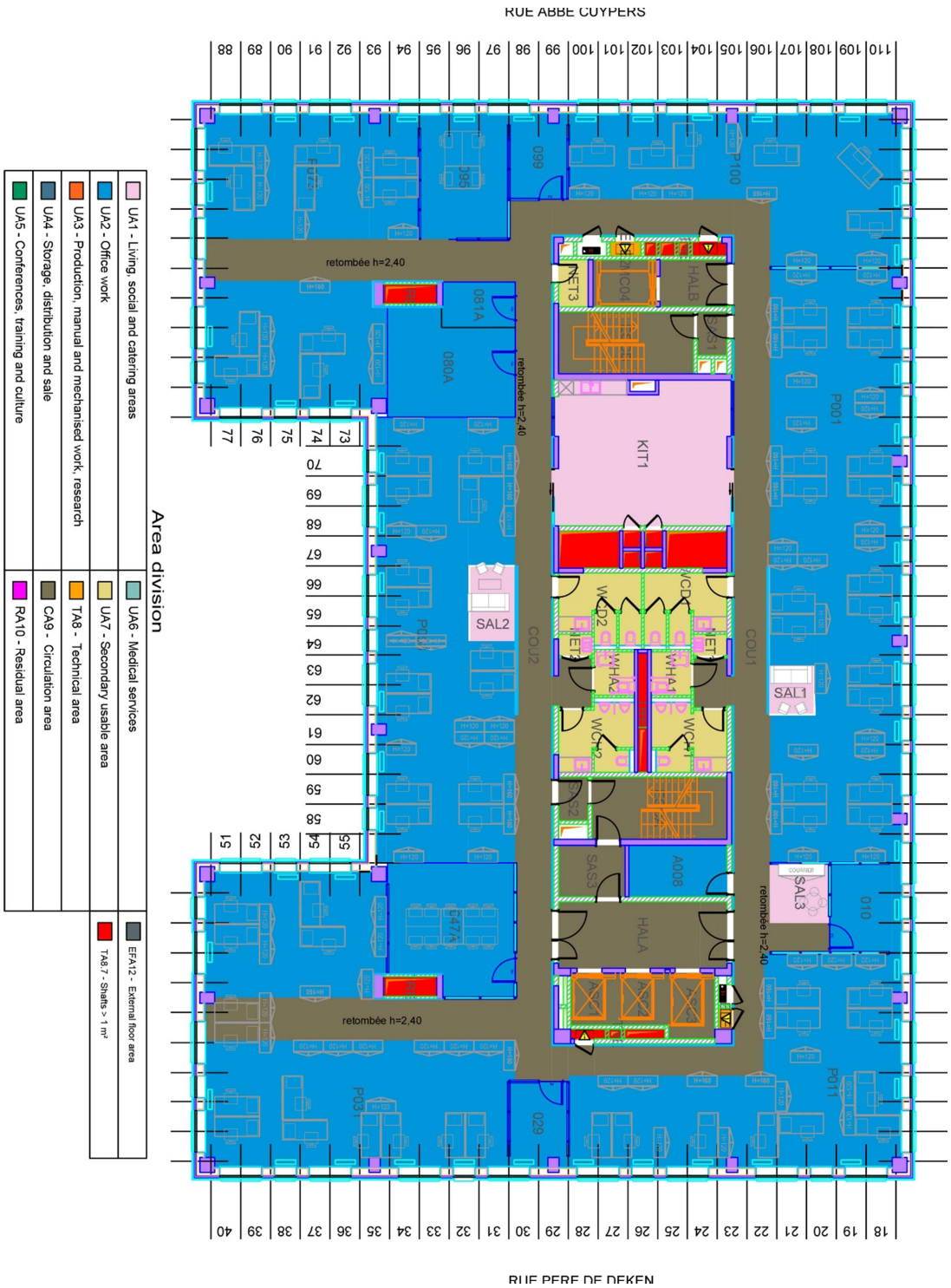


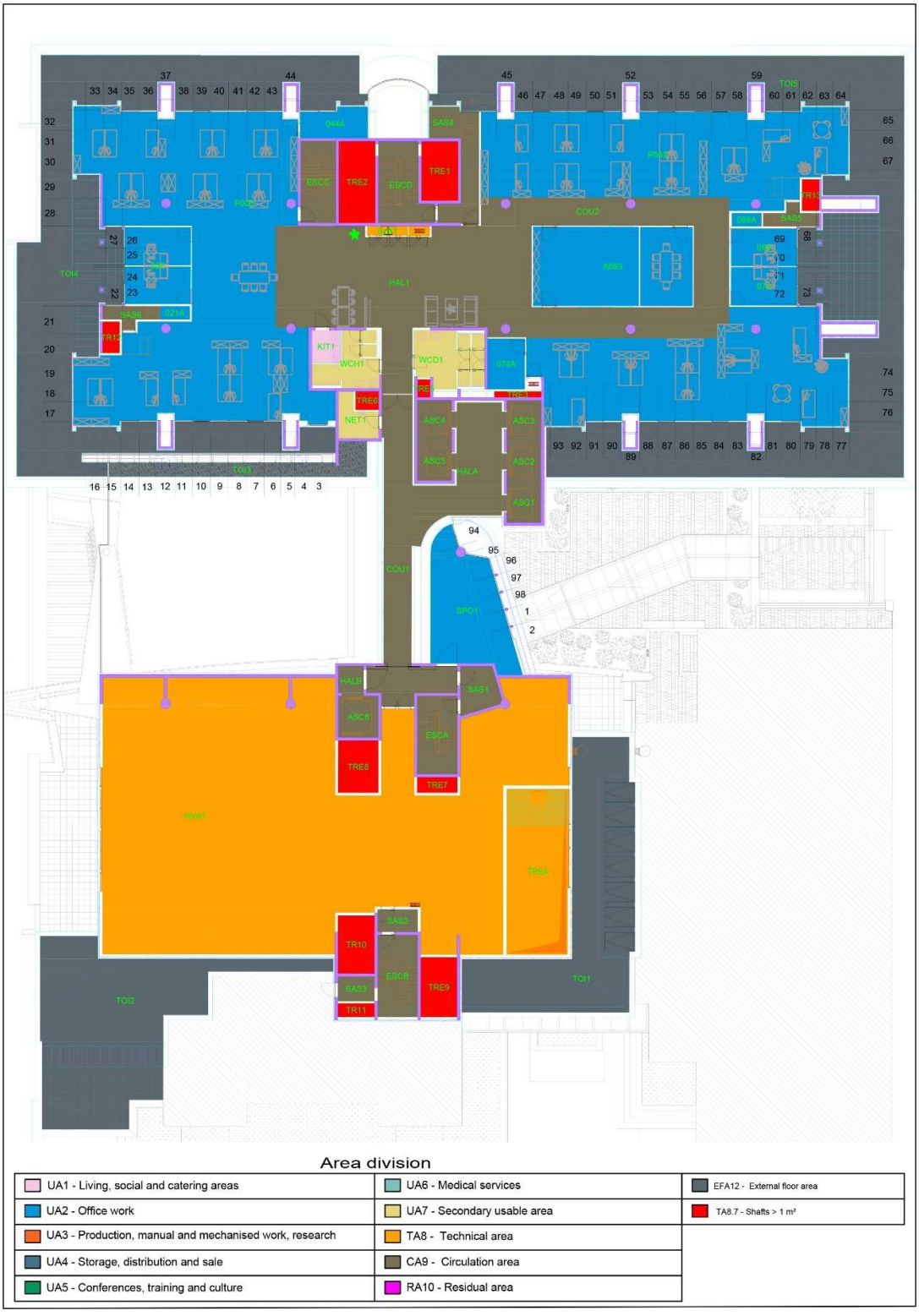
4.6 Diagrams showing the division into areas

Plan of building with individual offices with continuous convector covers



Plan of building with open-plan offices




Area division
UA1 - Living, social and catering areas
UA2 - Office work
UA3 - Production, manual and mechanised work, research
UA4 - Storage, distribution and sale
UA5 - Conferences, training and culture
UA6 - Medical services
UA7 - Secondary usable area
TA8 - Technical area
CA9 - Circulation area
RA10 - Residual area
EFA12 - External floor area
TA8.7 - Shafts > 1 m²

5 TYPES OF AREA

In order to improve the monitoring and understanding of their buildings, the European institutions have decided to group the net areas of the buildings into four main types:

- **Office areas (OA)** comprise all premises assigned (or capable of being assigned) as offices for staff, including small meeting rooms and the like, except those covered in the following points;
- **Institutional areas (IA)** comprise all premises assigned to the institution's political or specific activity: offices of members of the courts, areas allocated to political parties, meeting rooms, deliberation rooms, offices of delegations, etc. Support rooms are considered to be institutional areas when their use is strictly reserved (e.g. internal circulation on VIP floors inaccessible to staff, VIP restaurants, VIP toilets);
- **Specific areas (SpA)** comprise areas linked to other specific activities of the institution, such as: the Chamber, large meeting rooms with or without interpreting booths, bureaux de passage, libraries, audiovisual studios and other rooms for the press, concession-holders, production workshops, sports and recreation rooms, training rooms, childcare facilities, etc.
- **Facility areas (FA)** comprise technical and sanitary facilities, catering areas such as canteens, kitchens or kitchenettes, circulation, storage, office equipment and parking areas.

The correlation between these area types and the categories in the DIN 277 standard is set out in the Annex.

6 INSTITUTIONS CONCERNED AND THEIR DEPARTMENTS

EUROPEAN PARLIAMENT
Directorate-General for Infrastructure and Logistics
Directorate for Infrastructure

COUNCIL OF THE EUROPEAN UNION,
Directorate-General for Organisational Development and Services
Directorate for Buildings and Logistics

EUROPEAN COMMISSION
Office for Infrastructure and Logistics – Brussels
Office for Infrastructure and Logistics – Luxembourg

COURT OF JUSTICE OF THE EUROPEAN UNION
Directorate-General for Administration
Directorate for Buildings and Security

EUROPEAN COURT OF AUDITORS
Directorate for Information, Work Environment and Innovation

EUROPEAN EXTERNAL ACTION SERVICE
Directorate-General for Budget and Administration
Directorate for Security and Infrastructure

EUROPEAN ECONOMIC AND SOCIAL COMMITTEE
COMMITTEE OF THE REGIONS
Joint services of the European Economic and Social Committee and the European Committee of the Regions
Directorate for Logistics

EUROPEAN INVESTMENT BANK
Corporate Services Directorate
Buildings and Logistics Directorate

EUROPEAN STABILITY MECHANISM
Facilities Management

TRANSLATION CENTRE
Administration Department
Infrastructure and Security Group

7 REVISION HISTORY

Version	Date of revision:	Description of changes	Author
01	29/11/19	First version	Ad hoc group on the methodology for calculating the area of buildings

8 ANNEXES

DIVISION OF AREAS IN ACCORDANCE WITH THE DIN 277 STANDARD, ADAPTED FOR USE BY THE EUROPEAN INSTITUTIONS

Note: The Annex is an integral part of the Code.