


Interreg



EUROPEAN UNION

Austria-Czech Republic

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# CIVIL ENGINEERING

## Typology of residential and civic buildings



UNIVERSITY  
OF APPLIED SCIENCES  
UPPER AUSTRIA



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# I. BASIC TERMS, SPACING DISTANCES, ARCHITECTURAL COMPOSITION

Typology – theory of building design

Architecture – art to build; building facility

Composition – deliberate arrangement of individual components of the work in the whole unit

Purpose of the construction - the reason why architecture is built for

Building - above-ground structure spatially concentrated and outwardly predominantly enclosed by peripheral walls and roof structure

Room - a spatially enclosed part of the building, defined by the floor, ceiling or roof structure and solid walls

Tract - the space part of the object defined by two vertical parallel structures (longitudinal, transverse, street, middle, courtyard)

Disposition = layout arrangement - deliberate spatial arrangement of the rooms of one unit in a building or building as a whole

Floor - part of the building defined by two consecutive levels of the upper surface of the supporting part of the ceiling structures; at the lowest floor on the raised terrain is defined the lower level of the floor structure (aboveground, underground)

Loft - accessible interior above the last above-ground floor, defined by the truss construction and other building structures, designed for purposeful use

Attic - accessible interior above the last above-ground floor, defined by the truss construction and other building structures, designed without a purpose

## I.I. Building requirements

Health requirements (creating environment with the best microclimate):

- biological (fresh air, light, sun, ...)
- physiological (breathing, blood circulation, ...)
- prophylactic (clean air, accident prevention, ...)

Psychological requirements (beneficial effects on human psyche - safety, privacy, choice, ...)

Safety requirements:

- psychological (feeling of security)
- physical (design limitation of injury potential)

Structural requirements (design system, span size, material, ...)

Economical requirements:

- direct (cost of own construction)
- indirect (operating and maintenance costs)

Aesthetic requirements (shape, size, light and shadow, color, structure, ...)

Spacing distance - the shortest connection between the outer surfaces of the peripheral walls, balconies, loggias, terraces, land borders or road edges; the distance values for the buildings for housing and the objects of individual recreation are laid down in Decree No. 501/2006 Coll. (for Czech Republic)

Distinctions between residential buildings with each other or with residential buildings and other purpose buildings must be such that all apartments meet the requirements for daytime sunshine.

If the family houses form free space between them, the distance between them must not be less than 7 m. The distance of houses from the common boundaries of the parcels must not be less than 2 m. In particularly tight conditions, the distance between family houses can be reduced up to 4 m if there are no living room windows in any of the opposite wall portions; in this case, the requirement to distance from the common boundaries of land does not have to be applied.

Distinction of buildings in which the living room windows are located shall be at least 3 m from the edge of the roadway or local road. This requirement does not apply to buildings located in building loops of row buildings and to buildings whose location is dealt with in

a binding part of the planning documentation.

## 1.2. Architectural composition

Factors influencing the composition:

- aesthetic aspect
- the environment
- natural conditions
- technical options
- economic aspect

Composition categories:

- composition closed x composition open
- static composition x dynamic composition

Composition elements:

- symmetry - mirror, axial, radial, congruence
- asymmetry - equilibrium, non-equilibrium
- rhythm - simple, open, closed
- gradation - vertical, oblique, horizontal, central
- scale - natural, relative
- proportions
- contrast
- color
- structure
- tectonics
- correction and optical deceit

## 2. APARTMENT AND ITS ZONING

Apartment - a set of rooms or a single living room which meets the requirements for permanent housing and is used for this purpose - in its construction and equipment

Room for living – a part of an apartment, that meets requirements prescribed by Decree No. 268/2009 Coll.; is intended for permanent living and has the floor area of at least 8 m<sup>2</sup>; a kitchen which has an area of at least 12 m<sup>2</sup> and has direct daylight, direct ventilation and heating with the possibility of heat regulation, is a living room; if the apartment is formed by one living room, it must have a floor area of at least 16 m<sup>2</sup>; in rooms with sloping ceilings, the area of the living room does not include an area with a clear height of less than 1.2 m

Movement space – is influenced by the dimensions of the human, it is the space that human needs when moving, at work and in different conditions (eg door and corridor dimensions, through width between furniture - 600 mm)

Workspace - is related to the dimensions of areas intended for objects and aids to a particular job (eg table areas, kitchen assemblies, control panels)

Handling space - space for moving or storing the object, most notably for seats and working and storage areas

Space demands of a human

- the dimensions of the rooms and equipment must correspond to the dimensions and needs of the human so as to best serve him
- dimensional proportions have been determined by artists, architects, ...:
  - Leonardo da Vinci - Vitruvius man
  - Le Corbusier (Charles-Edouard Jeanneret) – Modulor

### 2.1. Apartment accessories

- entrance space
- cooking area
- room for storing food
- room for personal hygiene

- space for the toilet bowl
- space for storing cleaning items
- other spaces, e.g.: loggia or balconies or terraces, cloakrooms, chambers, non-habitable room for homework, ...
- apartment buildings must have extra spaces for the placement of letter boxes, prams (baby carriers) and bikes, cellars, garbage areas, parking spaces
- family houses must have on their land the parking of the inhabitants of the house, the storage room for waste, the letter box

Basic apartment accessories – bathroom or a shower, flush toilet (can be placed outside the apartment, but only for one apartment)

Living space:

- the size and zoning of the flat is designed with regard to the number of users, their professions, social status and activities
- space for rest, sleep, eating, personal hygiene, childcare

## 2.2. Apartment size

- 1+0 apartment with one room with accessories, the kitchen is designed in an improvised way, eg an electric cooker on the cabinet
- 1+kk apartment with one room with kitchenette, bathroom with toilet, hall
- 1+1 apartment with one living room and separate kitchen, bathroom with toilet, hall
- 2+kk apartment with two living rooms, one with kitchenette, bathroom with toilet, hall
- 2+1 apartment with two living rooms, separate kitchen, bathroom, toilet, hall
- 3+kk apartment with three living rooms, one with kitchen, bathroom, toilet, hall
- 3+1 apartment with three living rooms, separate kitchen, bathroom, toilet, hall, etc.,



- studio flat (apartment) - one-room apartment, type 1+0 or 1+kk

## 2.3. Orientation towards cardinal directions

Apartment zoning:

### social zone (public):

living room  
hall  
kitchen  
dining room  
workplace for profession  
separate toilet with washroom  
bathroom

### rest zone (private):

bedroom  
dressing room  
children 's room  
interior corridor  
workplace for homework  
private toilet  
private bathroom

Area pointer:  $UA = LA + AA$

- UA - utility area = sum of areas of all rooms of the apartment
- LA - living area = sum of areas of rooms for living
- AA - accessory area = sum of areas with apartment accessories

# 3. FAMILY HOUSES, APARTMENT BUILDINGS

Family house:

= a housing structure which, in its building structure, meets the requirements for family housing and in which more than half of the floor space of the rooms and spaces is intended for housing; the family house can have up to three separate apartments, two above ground and one underground floor and the attic

## 3.1. Types of family houses

According to the way of construction and urban structure:

- isolated (stand-alone) - separate, belt, chain, nesting
- associated - semi-detached, triple house, quadruple house
- group - row, atrium, terraces
- mobile

According to the height of the building:

- ground floor
- ground floor with attic
- about two-storey
- about a two-storey with attic
- two-level and multi-level
- the basement, partially cellar or non-cellar

According to the terrain configuration:

- on the plane
- in a slope

According to the ground plan:

- circular
- square
- rectangular
- in the shape of T, L, Z and U
- closed

According to the shape of the roofing:

- with a flat roof
- with sloping roof – rack roof, saddle, semi-hipped roof, hipped roof, pyramid hip, mansard....
- by type of housing:
  - urban
  - suburban
  - rural
- by use of building:
  - residential
  - multifunctional

Apartment building - a building with more than half of its floor area corresponding to permanent residence requirements and is intended for this purpose

Functional division of the interior of the block of flats:

- main space - flats
- communication spaces
- vertical - staircases, elevators, ramps
- horizontal - corridors, exterior corridors
- additional areas - home furnishings, technical background

## 3.2. Typological types of apartment buildings

- by access communication:
  - staircases
  - corridors
  - exterior corridors
  - duplex
  - combination
- by height and shape:
  - point
  - tower
  - plate
  - in the shape of L, T, Y, O
  - the terrace on the slope
  - the terrace on the ground
  - structural

# 4. OBJECTS OF PUBLIC ACCOMMODATION AND CATERING

## 4.I. Accommodation facilities

Hotel division by function:

- hotel, hotel garni
- motel
- pension
- hotelresort
- dormitory (tourist, sports, student, working)
- hostel (= auberge = jugenherberge)
- hotel „Formula“
- hotel-apartma
- terminal
- kemp
- cottage settlement

Hotel division by location:

- in urban areas
- in suburban area
- in spa areas
- in holiday areas
- in mountain areas

Demands on the surroundings:

- peaceful and dust-free surroundings
- good transport accessibility (public transport, parking, attendance)
- proximity to the area's attractions
- sufficient lighting and sunshine for guests
- nice view

Hotel division by level and equipment:

- \* cost-effective
- \*\* economy class
- \*\*\* middle class
- \*\*\*\* first class
- \*\*\*\*\* luxury class

Superior

(in the Czech Republic, the evaluation is optional, since 2015 the effort to unite with the EU)

Division of hotels by size:

- small (10-100 beds)
- medium (101 - 250 beds)
- large ( $\geq 251$  beds)

Orientation to the world:

- for guests - S, event. E, W
- sunshine requirements - min. 40 minutes a day

Distances and relations to the surroundings:

- protection zones, regulation
- min. distance distances
- infrastructure connections (water, sewerage, heating, electricity, telephone and data signals, transport, municipal waste disposal, ...)

## 4.I.I. Division of hotel operations

Guest operation:

- entrance and reception area (reception lobby - lobby + communication)
- accommodation (entrance, undressing, luggage, sleeping, resting, hygiene - 4 m<sup>2</sup>)
- restaurant section (restaurant, café, confectionery, wine bar, snack-bar, pub, canteen; ...)
- social, sports and relaxation part (ballroom, lecture hall, billiard, wellness, sports facilities - tennis courts, ping-pong, gym, swimming pool, rental and storage of bicycles, skis, etc.).
- services for guests (sale of small goods, service of vehicles, dry cleaning, exchange, hairdresser, manicure, cosmetics, massages, ...)

Staff operation:

- administration (management offices, reception and booking offices, additional offices - reception, warehouse, ...)
- production of dishes (kitchens, warehouses, service - waiters, ...)
- warehouses, workshops, auxiliary facilities (furniture storage, laundry, hygienic equipment, workshops, engine rooms, heating, ...)
- hygienic and social background of employees (dressing rooms, washrooms + WC - clean, dirty, day room, accommodation, ...)

Vehicle operation (especially for motels):

- parking (accommodation + passage + employees)
- supply
- pumping of fuel, dishwasher, service, ...

## 4.2. Catering facilities

Division by purpose:

- open (restaurants, canteens, drives, pubs, cafes, pub, buffet, pizzeria, ...)
- purposeful
- semi-open (school canteens, refectories, canteens, ...)
- enclosed (nurseries, prisons, dormitories, hospitals, hospitals, ...)

Basic types:

- restaurant
- pub
- motorway rest.
- pizzeria
- café, tearoom
- wine bar, bar
- the pub
- snack bar, grillbar, express
- buffet, bistro, ....

## 4.3. Operations

Sales operation:

- entrance and cloakroom
- social facilities - WC (vestibule and cabins, entrance hall, optical screen and cabin)
- phones
- space of consumption:
  - with regular table service
  - dining room with self-service system
  - food at the bar counter
  - outlet over the counter
  - operation only in exceptional cases (parties, terraces, ...)

Production and preparation of food:

- rough preparation of raw materials (meat, poultry, fish, potatoes, root vegetables, ...)
- clean preparation of raw materials (meat, poultry, fish, potatoes, root vegetables, ... - before heat treatment)
- dough preparation
- cold finishing
- confectionary workshop
- coffee / tea kitchen
- hot finishing
- dishwashing (kitchen = black, tableware = white, glass, coffee / tea utensils)
- dispensing areas

Supply and storage operations:

- receipt of goods
- handling spaces (weight, warehouse office, ...)
- dry warehouses (t = 10-15 ° C, humidity 10-15%, flour, sugar, rice, legumes, ...)
- cold stores (t = 6-10 ° C, humidity 70-80%, vegetables, fruits, potatoes, canned foods, wine and spirits, ...)
- chilled warehouses (t = 0-8 ° C; humidity 70-95%; fresh meat, poultry, fish, ...; sausages, milk, cheeses, butter, delicatessen, semifinished products, beer, beverages; foods, ...)
- freezer storage (t = -1-50 ° C; humidity 90-95%; meat, fish, poultry, ...; ready meals; creams, fruits, vegetables, ...)
- warehouses daily
- auxiliary warehouses (packaging, washing and cleaning products, waste - chilled and uncooled, laundry - clean and dirty, ...)

#### Administrative operation:

- leadership
- accountant / accountant
- chef
- warehouseman, ...

#### Staff accessories:

- two room cabinets or a clean and dirty dressing room
- the washrooms
- WC clean and dirty traffic
- day room
- for  $\geq 10$  employees - room for eating
- technical, auxiliary and economic operation
- telecommunication connections
- air conditioning
- engine rooms
- technical room
- measurement and regulation, ....



# 5.SPORTS BUILDINGS

## 5.1. Spaces of sports facilities

Spaces for athletes:

- own areas for sports:
  - in the open air (longitudinal axis in direction S-J, illumination)
  - covered = gyms, halls, ... (acoustics, lighting)
- accessories for athletes:
  - cloakroom
  - hygienic facilities (WC, showers)
  - tool storage and game supplies (approximately 10-15% of the game area)
  - referee background
  - rehabilitation line (massage, sauna, ...)
  - medical background (injury treatment, consultations with a health professional at the top of the sport)
  - trainer and administration areas

Spectators spaces (gathering areas - evacuation at risk - direct stairs, ramps, ...):

- entrance areas (ticket sales, check-up, ...)
- auditoriums (good visibility - distance, obstacles eliminated, spatial understanding of the story):
  - fixed / standing stands (fixed seats, folding seats, benches, standing)
  - telescopic / movable stands
  - mounted tribunes
- social background:
  - cloakroom
  - the toilets

Complementary spaces:

- refreshments, additional sale - souvenirs, ...
- honorable guests, press room, ...

- administration, meeting rooms, ...
- accommodation
- clubrooms
- technical and technological background (surface cooling, skating, rolling space, water filtration and monitoring, air conditioning and heating, ...), ...

Special requirements for spa facilities, playgrounds, bowling, shooting range, aquapark,  
...

# 6.SCHOOL BUILDINGS

## 6.1. Kinds of schools and educational facilities in the Czech Republic

- children's groups (formerly crèches - canceled as of 1. 4. 2012)
- kindergartens:
  - classic
  - forest
- primary schools:
  - basic nine-year schools
  - basic practical schools - canceled as of 1 September 2016 - they became ZDŠ
  - special elementary schools (for pupils with mental disabilities)
- secondary schools:
  - gymnasia
  - secondary vocational schools
  - vocational schools
- conservatory
- higher vocational schools
- college
- primary art schools
- language schools (with the right to stand for language exams, ...)
- educational facilities:
  - houses of children and youth
  - leisure center, ...

## 6.2. Settlement in the territory

- basic education - daily attendance / commuting from home:
  - dense network within walking distance
  - commuting - school buses
- secondary and higher education - no daily migration to the place of residence is necessary:
  - public transport
  - schools with accommodation (boarding schools)
- in the center of the residential area - living areas
- outside the traffic-loaded arteries - a quiet and safe environment
- good transport accessibility - public transport stops
- connection to greenery and scattering surfaces
- proximity to leisure activities

## 6.3. Spaces

Basic division:

- entrance, reception / gatekeeper
- walk-in wardrobes (with hangers - cages rooms, cabinets, counter rooms)
- classrooms (tribal, language teaching, laboratories, workshops, kitchen, ...), library, study room, ...
- social facilities (vestibule with washbasins, WC) - outside children's groups and kindergarten: separate for girls, boys and teachers
- cabinets, common room for teachers, office, director´s office, tea kitchen
- halls, corridors, stairways, elevators or platforms for handicapped pupils
- cleaning rooms / chambers
- janitor´s apartment
- gym

- dining / canteen
- school physician, dentist, psychologist, ...

Division according to the movement system in the building:

- static system (school in place) – pre-primary education, primary elementary school
- dynamic system (school in motion) - secondary elementary school, high school and higher education
- semi-dynamic system (previous combination) - secondary elementary school

Communication system in the building:

- direct entry into the department - pre-primary education, small objects
- corridor arrangements - pre-primary, elementary education, high school
- hall arrangement - pre-school and primary elementary school; floor planes – secondary elementary school
- stair arrangement - elementary school; little used
- point layout - elementary school, high school; exceptionally used
- combined arrangement - large objects / complexes with complex structure

# 7. BUILDINGS FOR EDUCATION OF THE PUBLIC, CULTURE AND SPIRITUAL SERVICES

- amphitheater - a cultural object for multipurpose use in the summer, with stepped auditoriums usually in terrain, usually roofless
- cultural house - an object designed to satisfy the cultural needs and interests of citizens, besides clubrooms, it also includes a multi-purpose hall (dance, lecture, social ...)
- drama theater - a theater without an orchestra dedicated to performing theater performances with a spoken word
- portal – a fixed or movable construction that frames the spectator's optical perception of the stage
- portal mirror - a hole in the vertical dividing area between the auditorium and the stage that allows viewing the acting area of the stage
- proscenium theater space - a theater space in which the stage and one-sided auditorium are separated by a portal mirror strictly into two separate parts
- Elizabethan theater space - a theater area where the stage is surrounded by a three-sided auditorium

## 7.1. Buildings for culture

- theaters
- cinemas
- museums
- concert halls
- galleries, ...

## 7.2. Buildings for education

- libraries - public, scientific...
- congressional buildings

## 7.3. Buildings for spiritual services

- churches (chapels, chantries, cathedrals, temples, mosques, synagogues, ...)
- monasteries
- spiritual centers, ...

## 7.4. Theater Forms

- theaters with proscenium theater space
- theaters of other scenic types (without a portal)
- puppet theater with a viewing area
- puppet theater with hanging puppets
- puppet theater with bottom puppets

Theater - usually the dominant building of the residence, the need to solve the parking areas and the continuity of the public transport, the requirements for scattered areas, the construction of the gathering type - the evacuation route

Basic theater /cinema structure:

- entrance section - for viewers (entrance, cash desk, foyer, dressing room, social background)
- communication spaces
- auditorium
- additional service (refreshments)
- screen stage / stage (stage - main, side - back, side, orchestra, rope space, rehearsal rooms, cloakroom and background of actors / performers, dressers, wardrobe, workshops, media equipment, warehouses, ...)
- background (administrative part, technical room)

## 7.5. Museums

- general (national history)
- archaeological
- artistic
- historical
- ethnographic
- natural sciences
- geological
- museums of science
- military
- industrial, ...

## 7.6. Gallery, exhibition hall

- pinacot = painting exhibition
- glyptotheca = exhibition of sculptural works
- exhibition hall - usually associated with the sale of works
- sales gallery

## 7.7. Sacred structure

Church:

- a sacred structure serving Christians for worship
- a rectangle is a common plan view is, a cross with a major axis in the direction W (entrance) - E (altar)
- the rotunda (the small church of the circular ground plan, most often the Romanesque style)
- the cathedral (the main church of the diocese, the bishop's settlement church, in architecture - the great Gothic church)
- the basilica (in the ancient Greece the space, where the archons officiate, a church with three or more naves, the main nave is taller with its own windows for illumination, the settlement church of the church dignitaries)
- the emporium church (emporium church = the manor tribune ...)



## Monastery:

- a monumental building / complex, that houses the religious persons (monks, religious) of the same Church Order (eg Benedictines, Franciscans, Cistercians, Clarisians, ...), divided into a section accessible to laymen (people who did not make the promise) and a clause (part not accessible to laymen and the public), where there is a convent church
- cloister = ambulatory, chapel, garden / courtyard, chapter hall, kitchen, refectory = dining room, dormitory = bedroom, event .. prelatura (the dwelling of the superiors), the parlatorium = the talking room, the library and the scriptorium; other possible parts of the monastery are the hospital, economic buildings and areas...

## Synagogue:

- Jewish churches serving in addition to worship and social gatherings and teaching of religious studies; a flat of the rabbi or sham (the object manager) may also be a part
- the Orthodox synagogues separate the space for men and women (behind the wall or the gallery on the floor); the main ground planning is eastward, respectively to Israel, Jerusalem, the Temple Mount; at the head is the aron, in the middle is a raised platform (bima, armemor = stage with counter = chazan to read prayers and the Torah)

## Mosque:

- a building primarily serving Muslims to worship the Islamic Allah
- the size is based on the number of believers - they must all come in on Friday prayer, which is secondary to the center of the given area - education; movement inside is without shoes; Haram division (ritually pure part) and sân (court, cleansing and deferment of shoes)
- decoration with geometric and plant motives (prohibition of the display of living beings) and Arabic calligraphy (texts from the Koran); the basic part is mihrab = prayer niche oriented towards Mecca or Kaaba, respectively, to the right of it is minbar = room for Friday prayer
- in the prayer the space for men and women is separated (from the mihrab, the children are on the level of women), the free movement is free of prayer; the mosque can be complemented by a minaret (usually in the corner of the mosque, may be even more) from which muezzin = the singer calls for prayer

Other spiritual buildings:

- stupa (Buddhist building that is circumvented, India, Nepal, Tibet)
- pagoda (Buddhist tower that evolved from the stupa, East and Southeast Asia)
- mandir (Hindu Shrine, India), ...

# 8. SELECTED BUILDINGS FOR HEALTH CARE

- present
- past

Hygienic requirements largely outweigh the feelings of patients.

Humanization of hospitals emphasizes patient comfort and "home environment".

## 8.1. Ambulant care facilities

- primary operating areas - physician's offices, professional offices, waiting room, intervention hall, preparation for performances, toilet for patients
- secondary operating areas - sanitary facilities for staff, storage areas, staff lounge, cleaning facilities

## 8.2. One-day care facilities

- primary operating areas - room for performances, intervention or surgery room, waiting room, preparation for performance, toilet and shower for patients, room for watching of patients after surgery, examination room or physician's office
- secondary operating areas - sanitary facilities for staff, storage areas, staff lounge, cleaning facilities:
  - according to individual care settings

## 8.3. Pharmacy care facilities

- primary operating areas - dispensary room, room for treatment and preparation of medicinal products, tool and packaging washroom, storage room for medications and medical devices, room for receipt of supplies, workplace for preparation of sterile preparations, gases and radiopharmaceuticals, consulting room
- secondary operating areas - sanitary facilities for staff, pharmacist's room, staff lounge, room for cleaning agents

## 8.4. Medical rescue services facilities

- primary operating areas - medical operation center, auxiliary operational center (if established), space for computing and communication technology, emergency preparedness workplace, exit base with stand of transport means, educational and training center
- secondary operating areas - sanitary facilities for staff, storage areas, staff lounge, cleaning facilities

## 8.5. Hospital - operating areas

- entrance section - entrance / lobby, hall, reception / information, refreshments
- polyclinic – ambulant treatment
- examination and treatment part - diagnostics and treatment; used by the polyclinic and the bed section
- a bed section
- administrative management part - hospital management
- employee background
- economic part - hospital operation, supply, waste disposal, ...

## 8.6. Bed care facilities

- primary operating areas - rooms for patients, examination rooms, nursing workplace, cloakroom, toilet and shower for patients, day room for patients, dairy kitchens in children's section
- secondary operating areas - sanitary facilities for staff, storage areas, staff lounge, cleaning rooms, cleaning aids and biological waste disposal, room for the deceased persons
- special spaces and requirements according to individual care settings

## 8.7. Spa treatment – operating areas

- entrance and reception area
- accommodation (bed) area
- examination part
- therapeutic part
- catering part
- the social part
- the economic part

# 9. BUILDINGS FOR TRADE AND SERVICES

## 9.1. Civic amenities

= basic functional component determining the standard of living in the city:

- buildings for upbringing and education
- buildings for physical education and sport
- health and social care buildings
- buildings for business
- administrative buildings
- public catering buildings
- buildings for accommodation
- buildings for culture
- buildings for non-production services
- buildings for production and repair services

## 9.2. Division of buildings for trade

According to the size and character of the objects:

- individual shops in separate buildings
- selling areas in objects of another purpose
- multi-shops buildings - shopping centers, department stores, markets, market-places, supermarkets (up to 2500 m<sup>2</sup>) and hypermarkets (over 2500 m<sup>2</sup>), shopping arcades, retail parks

According to range of goods:

- single and small-scale sales (eg groceries, drugstores, footwear, horticulture, etc.)
- multi-scale sales (eg, drugstore and household items)
- full-sale sales (eg hypermarkets)

or

- grocery
- non-food goods

According to the style and culture of sales:

- serviced = counter
- self-serviced
- order

### 9.3. Requirements for the location of buildings for trade and services

- traffic accessibility of localities (supply, passenger car, public transport, pedestrian) with parking areas and vehicle shutdown, minimizing collision crossing of car and pedestrian routes
- sufficient scattering surfaces against entrances and exits of objects
- locations without conflict of functions - must not be within reach of undesirable environmental influences and must not negatively affect already existing buildings by their functions and operation
- fulfillment of technical requirements and hygienic requirements (distance, safety performance, civil protection, lighting, thermal and acoustic comfort, air exchange requirements, psychological comfort of working and visitors, aesthetic requirements, etc.)

Handling of goods in trade facilities:

- moving goods
- storage
- preparation of sales
- own sale
- sales records

Operational functional units of buildings for trade:

- primary:
  - the entrance part
  - the sales part

- secondary:
  - warehouses (goods receipt, main warehouses - dry, chilled, frozen, divided according to the range of goods, auxiliary warehouses - packages of packaging, waste)
  - administration (management, inventory, bookkeeping, meeting room)
  - employees background (dressing rooms, sanitary facilities - WC, showers, washrooms; day room, kitchen)
  - technical facilities (heating, ventilation, cooling equipment)
  - auxiliary operations (security, maintenance, cleaning, arranging)

## 9.4. Service buildings

Service buildings in meaning of wide range of business activities aimed at meeting the needs of people in areas which they cannot satisfy with their own possibilities and abilities (e.g. hairdressing, dressmaking, clothing cleaning, custom footwear, pedicure, etc.) – can be divided into:

- services of a non-productive nature - associated with customer care; for example: hairdressing, manicure, cosmetics, solariums, massages, clothes dryers, shoe repair, key production, tool grinding, translation, financial consultancy, travel agencies, cleaning, legal services, etc.
- services of a manufacturing nature - as a result, the tangible product usually requires the use of technological equipment; such as printing, copying and bindery services, photo-collections and photo-labs, tire service and repair of motor vehicles, custom tailoring, etc.

Operational building units for services:

- entrance space
- waiting room (not necessarily to be used at manufacturing)
- receipt and dispatch of goods (for non-production receptions and cashier)
- warehouses and workshop (for non-production hand-held storage)
- social background for customers (WC, cloakroom, ...)
- social facilities for staff (dressing room, toilet, washroom, day room)
- internal communication
- wastes



# 10. ADMINISTRATIVE BUILDINGS

Office building - a building with a minimum of ½ utility spaces designed for offices

Office - a construction site designed to place one or more workplaces for administrative, conceptual or managerial activities

CTS 73 5305 Administrative buildings and spaces are subject to:

- buildings for public administration:
  - about a building for self-government
  - about a building for executive power
  - about a court building
- administration buildings related to production, trade and services:
- buildings for banking - banks, insurance companies, stock exchanges, etc.
- buildings of scientific and research institutions
- buildings of transmission and information media
- universal administrative buildings - commercial administrative complexes

Division in terms of public access:

- buildings with limited access to persons (e.g. administrative facilities in manufacturing plants)
- buildings with unrestricted access (e.g. city authorities, banks, insurance companies)

## 10.1. Operating functional units

Primary - offices, offices

Secondary - entrance rooms (reception, reception, cabinets), meeting rooms (meeting rooms, halls), sanitary facilities, cloakrooms, social and operational facilities (tea kitchens,

Communications - corridors, staircases, escalators, elevators

Layout and orientation:

- layout is influenced by the construction system, most preferably it appears as a three-stroke or five-stroke - offices; double-tract - laboratories, special operations; single-tract - large office space

- building distances must meet architectural requirements in terms of local conditions and planning documentation, technical and hygienic conditions arising from legislation (requirements for lighting, air exchange, thermal and acoustic comfort, etc.), operational safety requirements (technical building requirements, fire safety solutions, etc.) and others
- suitable orientation is on the N, NE and NW side; in other orientation it is necessary to design suitable facade shading - due to the use of computer technology (reflection of light in the monitors) and overheating on sunny days; the same precautions apply to glass roofs
- in buildings and spaces for more than 20 employees, the employment of persons with reduced ability mobility should be taken into account; the spaces intended for public visit must be barrier-free (Decree No. 398/2009 Coll.)
- communication and transport at rest - number and size according to CTS 73 6056 Parking and parking areas, CTS 73 6110 Design of local roads and Decree No. 268/2009 Coll., On technical requirements for constructions

## 10.2. Types of offices

- cellular office:
  - individual - contains 1 workplace
  - associated - contains 2 workplaces
  - common - contains 3-10 workplaces
- large office space = open space - contains 11 or more workplaces, instead of hallways are the communication corridors that are part of the workplace
- combined office - contains 11 or more workplaces, is a combination of a cellular and a large office space
- flexible office - does not have a constant number of workplaces, the equipment is mobile, the arrangement is time and space variable

Office workplaces:	minimum area (m2)	recommended area (m2)
no room for negotiation, no storage space	5	8
no room for negotiation, with storage space	8	10
with room at the meeting, no storage space	10	12
with a meeting space, with a storage area	12	16

# II. BUILDINGS FOR AGRICULTURAL PRODUCTION

## II.1. Basic division

- buildings for animal production - for livestock breeding and their additional buildings
- buildings for crop production - buildings for storage of extracts and additional buildings

Design process:

- analysis of construction conditions
- concept of solution
- design variants
- consultation with the investor and the prospective user
- optimizing the variation
- creation of project documentation

Factors affecting design:

- the type of breeding livestock
- breed / production technology
- technology transport
- the transport infrastructure of the area and its own area
- technical infrastructure object construction system
- working environment hygiene
- environmental impacts on the environment
- veterinary protection of animals fire safety of buildings
- architectural composition and aesthetics
- etc.

## II.2. Types of buildings for common breed livestock in the Czech Republic

- cattle (dairy cows, breeding bulls, bulls for bullocks, primates, heifers, calves) - free stables, box stables, free housing in the exterior + milking parlors + dairy + hay-stacks + straw storage + nursing facilities

- horses (working - pulling, breeding, sporting, recreational, hippotherapeutical) - stables binding, boxing, loose, free housing in the exterior + preparation and storage of feeds + harness and saddlery + patrol room + social care of nurses and riders + washing box + riding hall + circular enclosure + manure and slurry tank
- pigs (breeding, breeding farms - sows + piglets, utility breeds) - grate stables, stalls - grouped split hutches, individual hutches + feed preparation and storage + storage and slurry treatment + veterinarian background + social facilities for nurses + disinfection passage at the entrance space
- sheep - grate barn or deep litter barn, free housing in exterior with shelter, permanent or mobile chalet, closed or semi-open + preparation and storage of feed + storage of litter + cutting + storage of wool + bathing pool + wadding + milking parlor + dairy + social background of shepherd
- goats - stables = halls with deep litter (group, individual boxes) + milking parlor + dairy + preparation and warehouses for feed + litter storage + nursing home
- poultry (chickens, ducks, geese, turkeys, beads) - breeding, breeding, hunting, utility
- rabbits, pigeons, fur animals, etc.

### II.3. Types of buildings for crop production

- warehouses for agricultural production:
  - storage of grain - horizontal (on floors, in halls) and vertical (battery cells = silos); temperature 12 ° C, humidity 14 – 15 %
  - storage of root crops:
    - potatoes (seed, table, industrial, forage) - in crackers, in storage boxes, in palletizing cases, in hatcheries
    - sugar beet - in heaps
    - beetroot - short-term in heaps, long-term in storage boxes and palletizing boxes
    - root vegetables - in chips, in palletizing cases

- storage of fruit and vegetable - constant temperature 2 - 6 ° C, humidity 85 %, good ventilation:
  - short-term - spinach, salad, cauliflower, plums, summer fruits, etc. - lightening of the market at the peak of production - warehouse + sorting room + packing room + expedition
  - long-term - apples, carrots, celery, onions, garlic, etc. - warehouses (transport cages, pallets, big boxes) + sorting room + packing room + expedition
  
- gardening buildings (hotbeds, foil beds, greenhouses) - permanent, portable; re-production, product speed up
  
- stockpiles of feed
  
- Stalls
  
- dryers
  
- fertilizer storage facilities
  
- composting plants
  
- mechanical background

# 12. INDUSTRIAL BUILDINGS

## 12.1. Division of industrial production in the Czech Republic

- light industry - textile, food, pharmaceutical,
- medium-heavy industry – e.g. engineering
- heavy industry - metallurgy, power engineering, mining, etc.
- special industry – e.g. chemical

Banding of the industrial area:

- production objects
- energy objects (to produce or convert energy for production) - oxygen stations, heating plants, power stations, substations, etc.
- warehouses
- traffic objects - garages, service stations, fuel stations
- social facilities - staff background (dressing rooms, hygienic boxes, catering, relaxation)
- input zone objects – managing components / administration, health facilities, fire brigade, development, laboratories, business and representative buildings / premises, reception / gatekeeper

## 12.2. Production objects

- single-purpose - designed for a particular technology and its design adapted to it, the technology needs to be rebuilt; e.g. boiler rooms, waterworks, cooling towers, etc.
- multi-purpose - type halls / objects that can be universally used for different technologies without major building interventions
- free production equipment - characterized by uncovered technological equipment, the construction part is made up of a bearing function and work platforms; such as blast furnaces, mining towers, reservoirs, etc.

Further division:

- one-storey
- two-storey
- multi-storey

Location of industrial buildings/sites:

- availability of raw materials
- proximity to the market / outlet
- availability of workforce

## 12.3. Basics for industrial area planning

- operating scheme
- material flow plan - crucial for economy
- plan of machine placement
- labor force resources
- a spatial plan
- a list of objects

Input factors of the preparatory phase of the proposal:

- cost-effective solutions - an efficient and minimalist solution
- technological backgrounds - area and volume requirements, internal transport, technical distribution, etc.
- legislative and normative requirements - hygiene, safety of work, functional spatial requirements, etc.

Work environment requirements:

- architectural appearance / aesthetic requirements - volume and design solutions in relation to aesthetics, volume, proportions and surrounding areas
- implementation conditions - construction system, possibilities of type and single-purpose objects, foundation conditions, snow area, etc.



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