
LUWIGANA
RESIDENCE

COMMERCIAL TECHNICAL DESCRIPTION

Annex of the general terms of sale

The situation of the building

The building is located on the land with parcel numbers:
3/1 part, 3/2 part, 3/3 part, 3/4 part, 3/5, 3/6, 3/7 part, 3/8, 3/9 part, 3/10, 4 part, 612/7, 612/13, 612/14, 612/15, 612/16, 612/70, 612/71, 612/72, all in cadastral community of Prule in Ljubljana.
It lies between the Karlovška cesta on the NE and the Zvonarska ulica and Tesarska ulica, which borders it on the SE and the NW. On the SW, it is bordered by the land with a multi-apartment building along the Pijateljeva ulica in Prule.
Both lower wings of the building (marked "A" and "B") are placed in the space parallel to the Karlovška cesta, with the western part of the "B" wing adapting to the direction of the building on the Prijateljeva ulica and running parallel to it. Both upper, i.e. the transverse wings of the building (marked "C" and "D") are arranged in such a way that they run parallel to the Tesarska ulica and Zvonarska ulica.
The location is an excellent starting point for walks in the old town centre, and the bypass is also quickly accessible.
(Križanke – 8 min walk, 3 min by bicycle, Central Market – 12 min walk, 5 min by bicycle, Maximarket – 14 min walk, 5 min by bicycle, Tromostovje – 12 min walk, 4 min by bicycle, Špica – 10 min walk, 3 min by bicycle, Bypass – 7 min by car)

Architectural design of the building

The building is designed as 4 interlaced wings, with two wings (A and B) parallel to the Karlovška cesta, while the wings C and D are transversely laid on the lower two wings. Units A and B form in the lower floors an open space in the east - west direction, in the upper floors, the units C and D open the space in the north - south direction, overlooking the Castle hill.
The design principle, the choice of colours and materials of all units are harmonised. Façades A and B are designed as ventilated stone façades, with intermediate hand-carved elements and bronze elements on Zvonarska ulica. Wings A and B are formed with a series of French balconies, which turn in the direction of the Prijateljeva ulica into classic balconies and loggias. Ground floor apartments have as an extension the proprietary atria.
The façades of the upper two wings will be made as ventilated façades whose final material is a large format reinforced thin-layer ceramics with various treatments. Terraces are on side shorter façades, roofs. Certain apartments have loggias along the wings. The upper storey is slightly shifted into the interior, and its terraces are spread over the living part of the apartment.
The roofs of the units are flat, with a slight inclination. The roofs of the upper two wings are partly extensively greened, partly rubbled with the river gravel, while the roofs of the wings A and B are arranged as walkable roofs, on which the proprietary terraces of the apartments from the 3rd floor are located, the rest part of the roofs is walkable for the needs of maintenance and evacuation in case of fire. Mainly on the wing A. The terraces are separated from this part by green barrier.

The design of the external arrangement

The inner square is arranged as a combination of green, paved surfaces, playground equipment, gathering areas and water elements. Contrary to the surrounding area, this space is closed with a transparent fence and is intended exclusively for the owners of the apartments and their guests.

A platform on Karlovška cesta, stairs between Karlovška cesta and Zvonarska ulica and between Karlovška cesta and Tesarska ulica will be also arranged during the construction.. Along the Karlovška cesta, a platform will be build, which will serve both as public passage and access to the business area. A row of trees separates it from the main road.
The proprietary atria of the ground-floor apartments are partially covered by a wooden covering, partly greened, with elements of the river gravel. They are separated from each other by barriers. For atria on the Prijateljeva ulica side, a maintenance corridor accessible from the outside is envisaged.

Accesses and driveways

Entrance into the building for passenger cars, which then lead through the one-way ramps in the building to the basement parking areas, is planned from Tesarska ulica, and the exit from the building to Zvonarska ulica. The traffic through the garage is one-way, the traffic on the access streets is also one-way.
The building has four entrances into the residential part, because four separate staircase cores are envisaged for the building. The entrances to them are from the covered parts of the inner courtyard, and the accesses to the courtyard are envisaged only from the Tesarska ulica and Zvonarska ulica. The access from the Tesarska ulica and also the access from the Zvonarska ulica are envisaged by the access ramp with the purpose to surmount the altitude difference between the street level and the level of the inner courtyard.
The entrances to the business premises are from the platform along the building, which runs parallel to the Karlovška cesta and is separated from it by a green belt. The platform is raised above the road level by approx. 0 - 0.3m. The business premises do not have the possibility of access from the level of the inner courtyard. Accesses for pedestrians to the platform along the building, which is parallel to Karlovška cesta, are from the level of Zvonarska ulica and Tesarska ulica are envisaged by staircases on one and the other side of the platform.

PROGRAM AND FUNCTIONAL DESIGN

Storeys below ground

The parking areas with an entrance and exit ramp, parking stores for motorcycles, storage rooms for residents in cores J1 and J2 (to a lesser extent also for J3 and J4) and vertical cores with staircase, a room for cleansers and a lift connecting it to the rest of the building are envisaged in the basement storey below the wing „A". A part of the parking areas will be carried out with independent Parklift parking systems.
The parking areas for vehicles, parking stores for motorcycles, bicycle room, and beside these the technical room for water supply installations, storage rooms for residential units and vertical cores with staircase and lift connecting it to the rest of the building are envisaged in the basement storey below the wing „B". In each of the cores there is a room for cleansers and antechamber. A part of the parking areas will be carried out with independent Kombilift parking system.

In total, 137 parking spaces (PS) are planned in the basement floors of the building, and partly they can also be used for the premises where the city spa and wellness is carried out. Other parking areas for business premises are envisaged outside the building at the terrain level, both at the Tesarska ulica and Zvonarska ulica.
In the basement there are also additional spaces for bicycle rooms, stores and stores for motorcycles that will be proprietary.

Ground floor

Bicycle rooms are located on the ground floor level, beside each staircase core. At this level, there is also in the core J4 the room for the collection of special waste and in the core J2 a common room with the BMS of the building. The remaining part is residential, with the exception of the part at the Karlovška cesta, which is intended for business activities.

External areas of the building

In the inner courtyard, which is located within the building's dimensions, a private square will be constructed, which is intended for use by all residents and is closed to the surrounding area. Security is carried out by a transparent fence.
In the middle of the square is the water element (fountain) on the western edge of the platform, elements and programs for play, gathering and resting are placed on the platform between the entrances into the cores J2 and J4.
Before the apartments on the ground floor, adjacent to the inner square of the building, private atria will be carried out, in accordance with the Preliminary plan of condominium, in such a way as to prevent other residents the view and access directly to the dwellings.
Along the wing B, in the direction to the Prijateljeva ulica, each apartment has a proprietary atrium, which is from the adjacent building separated by an RC wall and an additional maintenance hallway, the view of the apartment is a cascading garden. Barriers are made between the atria. The atria are shown in the Preliminary plan of condominium.
Access to the Karlovška ulica is arranged over staircases on Zvonarska ulica and Tesarska ulica. In front of the building on the side of Karlovška cesta, there is a platform in front of the business premises with a row of trees, which creates a dividing line between the road and the building.
Along the Zvonarska ulica and Tesarska ulica are arranged outdoor parking spaces for business premises.

Storeys above the ground floor

The program in the storeys is predominantly residential, with the associated technical parts and common rooms, partly also the individual proprietary stores in the wings A and B.

CONSTRUCTION

The building is designed to be seismically safe, taking into account the Ljubljana seismic zone, in accordance with European and Slovenian standards.

Construction ground plan grid

Ground plan grid of the bearing structure of the object above the terrain (wings A and B) is derived from a ground plan grid in the basement part, which is subordinate to the best utilisation of parking areas. Therefore a span of approx. 8.0 m is envisaged and carried out in the longitudinal direction (direction parallel to Karlovška cesta) and in transverse direction of approx. 7.0 m.

Foundations

The foundation of the building was planned and carried out in accordance with the results of the research and geotechnical report on the composition of the foundation ground and the conditions of foundation and construction of the building. Deep foundation on reinforced concrete piles bored into the ground was carried out, construction of RC foundation bearers and foundation plate d = 40 - 50 cm. The foundation plate and the circumferential basement walls are constructed as RC walls using the white tub system.
The protection of the construction pit was carried out with the RC pile wall (so called Berliner wall), temporarily anchored in the surrounding earth. The circumferential basement RC wall is approx. 10cm away from the pile wall. The contact between the pile wall and the RC wall of the basement is fully filled.

Basement

The basement comprises the entire ground plan of the building above the terrain, and on all sides it goes beyond it. The bearing elements of the basement are RC walls of four communication cores d = 30cm and d = 20cm, circumferential d = 30cm and inner d = 20cm walls from reinforced concrete and pilasters or pillars of different dimensions. The ceiling plates are constructed as monolithic RC cross-reinforced plates d = ca 25cm, the plate above the 1st basement under the wings A and B is d = ca 25cm, the edge part of the plate above the 1st basement is d = ca.25 or 30cm, the plate of the central platform is approximately 40 cm thick. Under the façade walls of the building, falling outside the ground plan grid of the supporting walls or pillars in the basement are made RC bearers of different height (20 - 85 cm) and different thickness d = 20 - 30 cm or more.
The thickness of foundation plate is uniform with reinforcements over the piles. The lift shafts are deepened by 1.15m from the basement level.

The above-ground part

Vertical bearing elements of the structure of the above-ground part of the building (wings A and B) are AB walls of the communication cores and RC walls in both rectangular directions (d = 20 cm). The ceiling plates are envisaged and partly constructed as RC cross-reinforced plates (d= 20 cm).
Vertical bearing elements of the bridging part of the building (wings C and D) will be as expected central RC wall-like prestressed bearers with apertures (d = 30cm) that extend approximately in the longitudinal axis of the wings and the façade prestressed parapet RC bearers = 20-30 cm) and RC pilasters between them, which in this way form the frame bearer. The transverse walls will be RC (d= 20 cm). The ceiling plates will be AB cross-reinforced (d= 20 cm and d=16cm). The vertical bearing structure of terrace storeys is skeletal metallic from HEA profiles.

Roof

The roof plate, which lies in one level, is carried out as monolithic RC cross-reinforced plate d= 16 cm. The same applies to the roof plate of the lift shaft.

Balconies on SW façade of the wing B

The bearing structure of the balconies is the cantilever AB plate (d min. = 13cm) with the interrupted heat bridge in the SCHOCK system.
The supporting structure of glazed fences and canopies is metallic.

Terraces and balconies in the 3rd storey of the wing D on the SE façade of the building

The bearing structure of the balconies is envisaged as a metal steel consisting of Fe profiles HEA 100 horizontally anchored in the RC wall structure on the inner side and supported at the place of the graduated offset by metal supports from Fe profiles HEA 100 anchored vertically in the RC wall of the lower wing.

MUNICIPAL DUCTS

The municipal infrastructure will be completely newly built on the Tesarska ulica and Zvonarska ulica. The internal sewage system of the building is based on a separate systems for faecal and rainwater. Wastewater is connected to the public sewage system, partly to Tesarska ulica and partly to Zvonarska ulica.
For the needs of sanitary drinking and fire water, a water supply network is built. For the preparation of heated water and hot sanitary water, the facility with the heat station will be connected to the gas network.
The building is connected to the public telecommunication and electrical network. A new transformer station will be built for the needs of the building.
A local distribution system for TV, radio, telephone and Internet access is planned for all dwellings (different operators will be available).
The public lighting of the Tesarska ulica and Zvonarska ulica will be newly carried out, while the building and the internal square will be illuminated with its own lighting. Lighting the external space appurtenant to the building is private and is owned by all the owners of the building.

COLLECTION OF WASTE

Collection of municipal waste will be done on public areas in the immediate vicinity of the building, and the collection of special and bulky waste will be carried out in the facility on a designated area in the wing B.

LIFTS AND LIFTING MECHANISMS

There is one lift in each staircase core of the building, the manufacturer is OTIS, the type of lift is GEN2 Comfort, with a capacity of 1000 kg or 13 persons, which allow little utilization of space, energy efficiency and high level comfort for users with numerous interior design options.
Lift parking systems are manufactured by WOHR, namely Combilift 543 and 551 with custom dimensions for installation in this building, in total there is 51 PS in parking areas.

TECHNICAL CHARACTERISTICS OF APARTMENTS AND COMMON PARTS

Façade

Façades A and B are designed as ventilated stone façades, with the thermal insulation of 18 cm thick stone wool with a black voile and with intermediate hand-carved elements and bronze elements on Zvonarska ulica. The stone is Galit, the origin of the stone is the Marmor Hotavlje quarry in Bosnia and Herzegovina.
Wings A and B are formed with a series of French balconies, which turn in the direction of the Prijateljeva ulica into classic balconies and loggias. Ground floor apartments have as an extension the proprietary atria. The fences of French balconies, as well as standard balconies and loggias, are glassy, of safety-tempered glass, in accordance with the required standards and regulations. The sheets of glass are clamped in points. The glass is transparent. In accordance with the agreement, it will be possible to carry out the standardized printed film according to the designer's proposal for the purpose of providing the privacy at the request of the buyer.
The façades of the upper two wings will be made as ventilated façades whose final material is a large format reinforced thin-layer ceramics with various treatments. The thickness and type of thermal insulation is the same as with the lower two wings.
Both ventilated façades are mounted on a standardized aluminium substructure. The ventilated layer is protected by a mesh against insects.
Along the upper two wings a certain apartments have loggias with envisaged a fence with partially RC parapet and partially glass fence, so that the overall minimum fence height of 1 m from the final pavement is obtained.
The upper, (penthouse) storey is slightly shifted into the interior, and its terraces are spread over the living part of the apartment. The façade in this part is predominantly glassy, with suitable sound insulating three-pane glass, on smaller parts there are fillers that are covered with the dry mounted plates from the inside, the vertical RC pilasters are clad with thin-layer ceramics. The top storey is encircled by flower troughs.

WINDOWS, DOORS, GLAZING ON THE FAÇADE

Windows

All windows and balcony doors on the building are dimensioned according to the purpose and the area of the rooms. The glazing

is expected to meet the requirements for the necessary thermal and acoustic insulation (three-pane glass with gas), suitable sun protection (blinds, stopsol glass) are provided on the outside and only partially on the inside (glazing façade of the business premises on Karlovška cesta).
All windows and balcony doors are with standardized aluminium profiles, the profiles are manufactured by Wicona.
All external blinds are envisaged as »Z« type manufactured by Sonal in carried out in aluminium, profiled, trimmed and with rubber seals along the entire length of each edge, which helps to better dimming the room and dampening the noise.

Exterior doors on the façade

All external entrance doors are treated in the context of façades or façade glazing and are also made in a combination of glass or grid (depending on the purpose of the room) and standardized aluminium profile Wicnoa.

Exterior doors on the entrance and exit of the basement

High-speed turbo doors in metallic design with supporting metal parts and guides (both galvanized and coloured) and closing plate made of perforated and full aluminium slats, enabling air inlet into the basement storey are envisaged. The spiral is closed in a sheet metal box, adequately protected and at the end lacquered.

Automatic sliding doors at the vestibules

Automatic slide single-wing glass doors are envisaged. The wings consist of 20mm system profiles, glazing with safety single glass 10 (8) mm in standardized rubber gaskets. The door will be installed on the evacuation route.

ROOF

The roofs of all 4 wings are flat. The roofs of the wings C and D are made as partly walkable, with a minimum slope and a finishing layer with an extensive greening. The edge of the roof is covered with coloured sheet metal. Electric heating of roof drains is foreseen. A service route is running along the entire perimeter of the greened roof. It is made of concrete plates. On the roof are installed machine elements, which are adequately hidden, separated from the rest, so that the transmission of noise and vibration are not possible.
Access to these two roofs is intended only for maintenance work and possible repairs.
The roofs of the wings A and B are completely walkable. On these two roofs, the part is intended for ownership terraces, while the rest to access for maintenance and in emergency situations for the evacuation of residents. The greenery of these roofs is in flower troughs, the remaining final pavement in the proprietary terraces is wooden (IPE Lapacho), the public part is partial ceramics and tartan coverings. The whole pavement is laid on the Buzon pedestals. The roofs are accessible either from the apartments or from the staircases in the 3rd storey.

All the exhausts on the roofs are covered with the aluminium masks.
The drainage system Geberit pluvia is envisaged for draining the rainwater from the roofs in the 5th floor. This system, like the classic drains, also lead into the collecting shafts, namely trough four separate branches for the upper and lower wings (two in each wing C and D and two at the wing A and two at the wing B).
The rainwater sewage system from both common terraces on the 3rd storey, including those parts of terraces belonging to individual apartments alongside them, from the loggias in the upper wings and from terraces on the 5th storey, is conducted classically, partly as Pluvia through the verticals in the substructure or TI suspended façades to the ground floor and from there into the collecting shafts.
Water on terraces and loggias is collected into »drainage channels« and then flows into vertical drains of various dimensions. Drainage channels on the terraces on the 5th storey and loggias on the other storeys are carried out with waterproofing, while on the terrace on the 3rd storey it is carried out with waterproofing and protection with standardized grille elements as Dachfix standard of the manufacturer HAURATON.
Water from the canopies in 5th storey is collected in gutters and flows along the drainage vertices in the substructure or TI suspended façades to the ground floor and from there into the collecting shafts. The same applies to water from the canopies above the balconies and ground floor terraces in the wing B and water from balconies in wing B. The outflows from these are mostly connected to the verticals that discharge water from the terraces in 3rd storey.

CEILING UNDER THE WINGS

The ceiling under wings will be constructed as a ventilated ceiling, according to the ventilated façade principle, as stated above. Under the ceiling there is a sewage system of the building. Access to the building is also illuminated through the ceiling.

INNER SQUARE

The inner square of the building will be partially greened (grass, shrubs, etc.), partly with sand and wood (IPE Lapaco) paved surfaces, and in most cases the pavement will be of stone or imitation of stone of higher price bracket.
In the middle, the fountain will be made, whose engine room is located in the basement storey.
Playground equipment and benches will be also suitably installed on the square. The square will be fenced on the sides of Tesarska ulica and Zvonarska ulica with the fences up to 1 m high and will be reserved exclusively for the residents of the building.

PROPRIETARY ATRIA

In accordance with the Preliminary plan of condominium, part of the inner square will be for the owners of the ground floor apartments and will be appropriately separated from the public

part by a green barrier (shrubs). On this part, the pavement will be wooden (IPE Lapaco.)
The proprietary atria on the side of Prijateljeva ulica will be separated from adjacent building with the RC wall and the corridor for the maintenance needs of the atria. The corridor is accessible from Tesarska ulica and Zvonarska ulica and has access control. Along the maintenance corridor, the trough for greenery are arranged in terraces. 1st trough is greened by our side, the rest is provided afterwards by the owner of his own choice. In each atrium there is a connection for water and electricity and a discrete ambient lighting. The pavement is mostly wooden IPE Lapacho, partially river gravel, and the possibility of greening. The atria are fenced from each other.

INTERNAL TREATMENT OF ROOMS

WALLS

Basement

In the garage part of the basement and on the entrance exit ramps, all RC walls are clad with perforated sheet metal, visible parts of RC plates, pillars and pilasters are made in visible concrete, sanded and/or painted with concrete paint. All concrete and masonry walls of a hollow brick in other rooms or parts of the basement are rendered with the extended cement mortar and, after prior levelling, painted with semi-dispersion interior paints.
The walls of the lifts are covered with polished stone (artificial stone or granitogres of higher price bracket). All siporex walls are rendered with machine mineral plaster, levelled and painted with semi-dispersion interior paint.

Ground floor and storeys

All concrete and masonry brick walls of the building in apartments are rendered with the extended cement mortar and, after prior levelling, painted with semi-dispersion interior paints or covered with ceramic or other covering by buyer‘s or investor‘s choice, which is glued to the substrate with a layer of polymer cement adhesive. Ceramic covering is envisaged in all bathrooms up to the height of the suspended ceiling, in all day toilets and utility rooms to the same height
In kitchens, the ceramic covering is not envisaged for the flexibility of choosing a wall covering (by the buyer or investor) with regard to the selection of kitchen elements.
In bathrooms, RC and masonry walls around the bathtub or the shower are rendered and, after prior levelling, they are treated with a single layer of Mapelastic and are covered with ceramics glued with a layer of suitable adhesive.
All siporex walls are rendered with machine mineral plaster, levelled and painted with semi-dispersion interior paints or covered with ceramic or other covering by buyer‘s or investor‘s choice glued with a layer of flexible cement adhesive. Prefabricated plaster cardboard partitions are, after preliminary bandaging of junctures and levelling with plaster levelling mass, also painted with semi-dispersion interior paints or covered with ceramic or other covering by buyer‘s or investor‘s choice glued with a layer of flexible cement adhesive.
All concrete and masonry walls of the building in access corridors to the apartments and staircases are rendered with the extended cement mortar and, after prior levelling, painted with latex interior paints or covered with covering.
All inner walls of the lift shafts are treated with anti-dust coating. The lift portals are stony.
The prefabricated wall of the staircase on intermediate landings on the façade side in the 3rd to the 5th storey is carried out as a typical prefabricated wall with double plaster cardboard plates (EI60) coated with a laminate coating on the inside of the staircase. The prefabricated wall closing the installation shafts (gas, electric and other installations) along the centre bearing wall in the staircase is envisaged to be carried out in the same way as the prefabricated plaster cardboard wall described above.

CEILINGS

Basements

The same as for the walls on this storey applies also to all massive ceilings in the garage part of the basement and at the entrance exit ramps. Except those parts of the ceilings (under the wings A and B) which are covered with the layer Tl. The ceilings in staircases with vestibules, rooms with stores, technical and common premises and other premises or parts of the basement are rendered with the extended cement mortar and, after prior levelling, painted with semi-dispersion interior paints or covered with other covering.

Ground floor and storeys

All massive ceilings in residential part of the building, where the ceiling cooling or suspended ceiling is not envisaged are rendered with the extended cement mortar and, after prior levelling, painted with semi-dispersion interior paints.
First of all, a dense cementitious splash in the ratio 1: 2 (cement / sand) is applied on all massive ceilings in the residential part of the building, where the ceiling cooling is envisaged. A coarse plaster is applied to a completely dried cementitious splash, so as to cover the registers of ceiling cooling. With a fine plaster mass or adhesive, a glass façade mesh is then installed and a finishing layer of fine plaster is applied to it and, after prior levelling, painted with semi-dispersion interior paints.

CEILINGS

Basements

In the basement is envisaged the construction of suspended ceilings in all longer access corridors to staircase cores and to stores for residents (under wing A at cores 1 and 2) If necessary, the height of the suspended ceiling is adjusted to the installations installed under the ceiling. The configuration of the ceiling is conditional – upon prior approval by the investor.

Ground floor and storeys

The construction of suspended ceilings is envisaged in the anterooms and hallways, in storage rooms, in toilets and bathrooms, and in some places also in utility rooms of the apartments of the lower and upper wings. It is necessary for the installation of ventilation connections and the distribution of other installations between the bearing plate and the suspended ceiling.
Suspended ceilings are carried out as smooth plaster cardboard ceilings from moisture resistant plates, which are, after preliminary bandaging of junctures and levelling with plaster levelling mass (according to the manufacturer's instructions), painted with semi-dispersion inner paint. Standardized audit openings are made at places where access to installations is required.
The construction of suspended ceilings made of plaster cardboard plates on a standardized metal substructure is also envisaged on certain landings of staircases (on floor level) and in all corridors of individual wings. It is necessary due to the passage of certain installation ducts from core shafts to apartments and levelling the levels. Standardized audit openings are made at places where access to installations.
In addition, the construction of MK cascades for the needs of the distribution of ventilation channels is envisaged in individual rooms of the apartment.

FLOOR

The composition of new floorings is in accordance with the requirements for the necessary thermal and acoustic protection. The minimum thickness of the flooring in the residential parts of the building (apartments, corridors, stairways) is adapted to the distribution of installations in the flooring i. e. min. 17cm. Floor rabbets h = 15mm are envisaged at the entrances to individual apartment units, as well as in bathrooms or utility rooms in the apartments.

Basements

Smooth concrete flooring is envisaged on the drivable surfaces in the basement. The implementation of floor markings (horizontal floor signalization) with the appropriate paint or material with regard to the selected substrate is also envisaged on the drivable surfaces. Ceramic covering is envisaged in the rooms for cleansers, and a covering made of natural stone or a high-quality granitogres glued on the substrate is envisaged on the staircase.
The stores will be laid with granitogres.

Ground floor and storeys

A covering made of natural stone or a high-quality graitogres glued on the substrate is envisaged on the staircases and common corridors.
The implementation of granitogres is envisaged in stores and bicycle rooms.
A covering from three-layer finished oak parquet for floor heating glued on cast reinforced cement screed for floor heating and levelling mass is envisaged in apartments (rooms, rooms, kitchens, etc.).
A ceramic covering glued to the substrate with a polymer cement adhesive is envisaged in wet rooms of the apartment.

The flooring on balconies, loggias and terraces is wood IPE lapacho laid on Buzon pedestals.

Entrance doors to apartments

All entrance doors to the apartments are in a uniform design in that they are safe, soundproof, fireproof EI 30-c and surface coated with laminate. The installation is carried out on a metal blind frame on the inside of the wall, and after the installation, the padding of the reveal is carried out on the outside. The door has the rabbet h=15mm.

Inner doors

The inner door has hidden hinges, the door wing is aligned with the edge of the embracing frame, the filler is iverokal.

Entrance doors to stores

All the entrance doors in the stores are in a single metal design, with the safety frame with a metal frame and a wing painted with covering paint.
Entrance doors to staircases in basement
All entrance doors to the staircases are in a uniform design with the fire protection (EI 30-c or EI 30).

Doors to individual garage and to parking stores for motorcycles in basement

All doors are lifting sectional in the same design as type »LPU 40« manufactured by HOERMANN with a metal frame and a wing made of double-sided slats painted with a covering colour. The other door elements are made of aluminium tube profiles. The doors are powered by a motor.

STAIRCASE RAILINGS

The railings of the interior staircases are partially glassy, partly fitted with a wooden handrail on the RC wall with permanent indirect lighting of the staircase.

SYSTEMS OF MECHANICAL INSTALLATIONS

In designing the Luwigana Residence building and mechanical installations, energy-rational and efficient systems have been envisioned to ensure a high level of comfort and energy saving.
The high level of comfort in residential units is provided by systems of mechanical installations, such as underfloor heating in all apartments, all habitable rooms are centrally cooled and ventilated. As the first multi-apartment building in Ljubljana, the Luwigana Residence has in the sleeping rooms built-in ceiling cooling for maximum comfort in the room without annoying noise and draft.

ENERGY PRODUCT SUPPLY AT REZIDENCA LUWIGANA:

The Rezidenca Luwigana building is connected to the available municipal utilities and energy product supply networks:

- natural gas supply connection;
- drinking water supply connection;
- sewage network connection.

SPACE HEATING

Water heating

Hot water for space heating is produced centrally using gas condensation boilers with each stairwell having its own system.
To this end, boiler rooms are to be built on the mezzanine above the 5th floor, equipped with condensation boilers rated at approximately 100 kW each, two boilers for each stairwell.
The boiler room will be fitted with all required security systems ensuring the safe functioning of the gas boiler room. All necessary distribution systems and tanks to deliver hot water to the apartments will also be installed in the boiler room.
In addition to that, in the periods between the seasons, water for heating can also be generated using a reversible heat pump installed above the boiler room on the roof of the building. The primary purpose of the heat pump is however to generate cooling water to provide cooling to the apartments.

Main heating distribution network

The main heating distribution network of the building will run from the boiler room on the mezzanine of the 5th floor to the vertical shafts located in the building's stairwell. The main branch of distribution network will run through the vertical shafts down to the ground floor. From the vertical shafts, the heating distribution pipes will run under the ceiling of each floor to individual apartments.
The main distribution network as well as installations in the apartments leading to the installation niche will use thin-walled hot-dipped galvanised carbon steel pipes connected with the press system. The pipes to be used are made by a renowned European manufacturer.
All of the distribution piping will be shielded with appropriate insulation in accordance with the guidelines and standards in force in the Republic of Slovenia.

Heating distribution network to and in the apartments

The pipes for the connection of each apartment to the heating network of the building will feature stop valves installed in front of the entrance to each apartment. From this connection point of each apartment to the network, the pipes will run through the suspended ceiling to the installation niche where the heating pipes will connect to the apartment's heating systems.
A heat meter will also be built in each installation niche to measure the amount of heat energy used by an apartment.
The installation within each apartment will consist of multi-layer composite pipes joined using the press-fit method or by welding.
The heating distribution pipe installations in the apartments will also be insulated using appropriate materials in accordance with the guidelines and standards in force in the Republic of Slovenia.

Heating inside the apartments

The living and sleeping areas as well as other spaces forming part thereof will be heated using under-floor pipes with electronic temperature regulation for each area. Along the edges of the areas, especially next to glass surfaces, the design calls for tighter spacing zones for the under-floor heating.
In the areas with large outer glass walls from the floor to the ceiling (living areas with exit to the terrace), floor convectors will be installed with forced airflow.
The bathrooms of the apartments will not only feature electronically regulated under-floor heating, but also a bathroom radiator, which is to be regulated independently of the electronic regulation, via a thermostatic valve with an appropriate thermostatic head.
In principle, lavatories (WC) located within the warm areas of the apartments have no heating of their own – the heating of these areas depends on the size of the room and heat requirements.
In order to distribute the heated water in the loops of under-floor heating pipes, manifolds will be installed in the walls of the apartments. The number of the manifolds and their location depends on the size of each apartment and its room layout. The primary manifold of the under-floor heating will be placed in the installation niche and will feature the required distribution valves, regulation assembly consisting of the regulation valve and pump, and electro thermo drives to close the valves and shut off the loops of the heating, depending on the temperature of the rooms. In the case of larger apartments, an additional manifold is installed in the hallway and adapts to the layout of the rooms, its equipment being identical to the primary manifold.
The under-floor heating system to be installed is a systemic solution from a well-established European under-floor heating systems manufacturer. Under-floor pipes will be laid onto corresponding systemic panels from the same manufacturer.
Appropriate functioning of the under-floor heating system and maintaining of desired temperature of each heated area is regulated by each apartment's CCS system through the thermic drives of loops in each area.
The electronic temperature regulator will be part of the CCS system of each apartment.

Heating of the corridors and stairways

The heating of the corridors that give access to the apartments and landings of the stairways will also use an under-floor solution. The heating will be regulated through the building's central control system.

SPACE COOLING

In the warmer months, the quality of everyday living in the Rezidenca Luwigana building will be guaranteed thanks to the cooling of all living and sleeping areas of the apartments.
Due to the variety in the way the areas will be used and to ensure the flexibility of managing the cooling, two different apartment cooling systems have been designed. The living area (kitchen and living room) are equipped with a wall fan convector. The selected fan convector to be built-in is a state-of-the-art device acclaimed for its quiet operation and housed in a thin enclosure

with a contemporary yet timeless design. The system selected for installation in the living areas can react quickly to the temperature requirements of the room, it ensures high cooling power and is in the opinion of the designers of the building the most appropriate solution for the areas in question.
The sleeping areas will be equipped with a ceiling cooling system using inserted pipes from an established European manufacturer of ceiling cooling systems. The building's designers opted for radiant ceiling cooling of sleeping areas because it enables noise-free cooling of interiors with appropriate temperature profiles and thus maximum comfort in the areas in question.

Generation of cooling water/coolant

In order to generate the coolant for the cooling of the apartments, a cooling plant/reversible heat pump with waste heat recuperation for cooling will be installed.
The designs call for a compact heat pump with an attached hydro-module and all required regulation and safety equipment for safe operation.
The cooling and heating system via the heat pump will be a twin-circuit system with a separate external and internal circuit. In order to transfer heat between the external and internal circuit, a heat transfer panel will be installed in the boiler room. The external cooling/heating circuit of the heat pump will be filled with a mixture of glycol and water for a minimum temperature of -20 ºC. All equipment required to transport the coolant and to ensure the safe operation the cooling system will be installed in the boiler room.

Main distribution network of cooling water

The main coolant distribution network of the building will be done in a manner identical to that of the heating network. Thus the main coolant distribution network will run from the boiler room on the mezzanine of the 5th floor to the vertical shafts located in the building's stairwell. The main branch of distribution network will run through the vertical shafts down to the ground floor. From the vertical shafts, the coolant distribution pipes will run under the ceiling of each floor to individual apartments.
The main distribution network as well as installations in the apartments leading to the installation niche will use thin-walled hot-dipped galvanised carbon steel pipes connected with the press system. The pipes to be used are made by a renowned European manufacturer.
All of the distribution piping will be shielded with appropriate insulation in accordance with the guidelines and standards in force in the Republic of Slovenia.

Coolant distribution network to and in the apartments

The pipes for the connection of each apartment to the coolant network of the building will feature stop valves installed in front of the entrance to each apartment. From this connection point of each apartment to the network, the pipes will run through the suspended ceiling to the installation niche where the coolant pipes will connect to the apartment's cooling systems.
A heat meter will also be built in each installation niche to measure the amount of cooling energy used by an apartment.
The installation within each apartment will consist of multi-layer composite pipes joined by welding.
The coolant distribution pipe installations in the apartments will also be insulated using appropriate materials to prevent condensation in accordance with the guidelines and standards in force in the Republic of Slovenia.

Cooling the apartments

As mentioned previously, all of the living and sleeping areas will be cooled, which in principle means rooms like living rooms, kitchens, bedrooms, suspendedies and children's rooms.
Sleeping areas, such as bedrooms, suspendedies and children's rooms will be cooled using ceiling radiant cooling where the cooling modules are built into the plaster ceiling. The cooling modules are connected to the ceiling cooling manifold that is as a general rule located in the double ceiling of hallways or bathrooms. The ceiling cooling manifolds are equipped with electro-thermic drives.
Temperature in a ceiling-cooled room is regulated via a thermal sensor built into the wall of that room.
The living areas are cooled with wall fan convectors, and in some cases, floor fan convectors.
The temperature of the interior is also regulated by the central control system of the apartment.

WATER SUPPLY AND SEWAGE

Cold potable water

The Rezidenca Luwigana building will be connected to the water infrastructure of the City of Ljubljana.
The basement of the building will thus house the main water meters, separate for the residential part of the building and for the commercial premises. This area will also house the system to increase the pressure of cold potable water.

The main distribution network of cold potable water

The main distribution network of cold potable water will use stainless pipes suitable for drinking water to be connected with the press system, and made by a renowned European manufacturer. The main water supply network inside the building thus runs from the water meters next to the underground parking bays to each stairwell where it branches through the installation shafts located in each stairwell. The potable water pipes then pass horizontally on each floor through the suspended ceiling to the installation niche in each apartment. The cold domestic water consumption meter will also be located in the installation niche.

Producing hot domestic water

Hot domestic water for the apartments of each stairwell will be produced in the building's boiler room. The continuous flow heating system for the production of hot domestic water will be connected to the heating system in the boiler room of each core. The

system for the production of hot domestic water is also designed to feature a runs from the hot domestic water circulation system that runs from the heat exchanger for the continuous flow of hot water to each apartment where the circulation ends in front of the hot domestic water consumption meter. Bigger apartments have been designed with the hot water circulation inside as well, so that the remote bathrooms will be fitted with an additional hot domestic water meter in front of which the hot domestic water circulation will end as well.

The main distribution network of hot domestic water and circulation

The main distribution network of hot domestic water and circulation will use stainless pipes suitable for drinking water to be joined with the press system, and supplied by a reputable European manufacturer.
The hot water and circulation pipes in the building will thus run from the boiler room on the mezzanine of the 5th floor along the suspended ceiling of the same floor, then to and down the installation shaft to the basement of the building.
On each floor, the branches of the hot domestic water and circulation distribution network will run through the suspended ceiling of each floor to each apartment.

Hot and cold domestic water distribution network inside apartments

In front of the entrance to each apartment, stop valves for cold and hot domestic (potable) water and circulation will be installed. Additionally, the circulation system will also feature a built-in modular thermostatic regulation valve to balance the circulation.
The distribution of cold and hot water within each apartment, starting from the installation niche, uses diffusion-tight multilayer pipes joined by the press-fit method. All cold water distribution system pipes will be sheathed accordingly using systemic insulation.

Drainage network

The Rezidenca Luwigana building will be equipped with the most advanced low-noise pipes from Geberit. The SILENT PRO pipe model that will be installed enables maximum absorption of sounds generated in the drainage system.
On the building's car park level, the horizontal drainage network will be consist of nodular alloy pipes joined with stainless HKS fittings.
The selected high-end ground siphons will feature and anti-odour strap and stainless covers.

Bathroom fixtures and fittings

Bathroom equipment (wash basins, toilets, showers, baths, taps and mixers, etc.) is from high-end brands carefully selected by the investor.
The toilets will use concealed flush cisterns from a reputed European manufacturer for drywall installation.

VENTILATING THE APARTMENTS

Ventilating the apartments

All areas of the apartments will have mechanical ventilation. To this end, the installation niche will also house an individual mechanical ventilation unit with heat recovery from a renowned European manufacturer.

Air distribution system inside the apartments

The air distribution inside the apartments uses plastic flexible ventilation pipes that run partially underneath the floors and partially above the suspended ceiling.
In principle, the flexible pipes to supply fresh air will run under the floor as floor injection elements have been foreseen to deliver air. The aforementioned flexible air supply pipes will then run vertically under a dry wall to the suspended ceiling where a ventilation supply chamber will be installed, to which the plastic ventilation pipes will be connected. The distribution chamber will connect with the ventilation and heat recovery unit using a sheet metal duct.
The elements for the removal of air from indoor areas will be located on the walls or ceilings. Flexible ventilation pipes for exhaust air will also lead to the collection chamber that will connect to the heat recovery unit using a sheet metal duct.
The exhaust element placed in the kitchen will feature an additional exchangeable filter to enable air filtration.

Distribution of fresh and removal of exhaust air – connection to the ventilation/heat recovery unit

The primary distribution of fresh and exhaust air will pass through galvanized sheet metal ventilation ducts leading to outside air.

Kitchen extractor hood

The Rezidenca Luwigana does not feature air extraction ducts to which kitchen hoods could be connected. If a hood is installed in the kitchen, then the selected model should allow for air recirculation and eliminate odours and cooking steam using a carbon filter.

Chimneys

The designs for Rezidenca Luwigana do not call for an chimneys.

ELECTRICAL INSTALLATIONS

Electricity is supplied from a substation located on the ground floor but separated from the residential part with its own entrance. The power supply to certain consumers (mainly lighting and active fire protection systems) passes through a diesel generator located in the vicinity of the building.
Electrical installations encompass lighting, general power, universal wiring of all areas and central control system of the living areas – described in greater detail in a separate chapter.

ELECTRIC POWER SUPPLY TO THE BUIDLING

Grid supply

The building is supplied with electricity from a newly built substation connected to the SN 10/20kV grid. In is located on the ground floor of the building. The substation contains a 1000kVA transformer and one reserve slot. The transformer thus serves to supply power to the building and other consumers – in accordance with the distributor's requirements.

Auxiliary power supply

The auxiliary power source is a diesel generator used to provide electricity to consumers such as:

- Smoke and heat exhaust fans
- Smoke and heat exhaust fire hatches and windows
- Car park doors
- Video intercom (common use)
- Access control
- Video control
- Fire control station
- …

The diesel generator is located outside the building.

Electrical power metering

Electrical power consumption metering equipment will be easily accessible, installed in the meter switchboards in the basement of the building next to the communications cores.

Switchboards

The building features the following switchboards:

- Metering hubs (consumption – distribution of electricity)
- Common use
- Car park
- Lifts
- Residential units
- High-power mechanical installations
- Commercial units
- …

In addition to that, switchboards are installed to control small machinery, heating of gutters, drains and the like. The residential units are equipped with standard switchboards.
Common use splitter box cabinets are installed in the basement next to the metering switchboard cabinets
Gutters, trench drains and roof drains are heated.

Power distribution

The electrical power distribution inside the building is based on a raster grid and connections running on cable trays and ladders. Special attention has been placed on physically separating heavy current and universal power distribution.

HEAVY CURRENT

Common use

A common use power distribution switchboard is installed in each structure (Core J1 to Core J4 and car park).
Common use entails the use in areas such as stairwells and other shared spaces (e.g. bicycle storage room), machinery and other technical installations (lifts, smoke and heat exhaustion systems, etc.). All common use consumers are powered from the common use switchboard.
Power sockets are fitted to the walls of the stairwells and corridors for cleaning purposes.

General and security lighting

General lighting includes the lighting of stairwells and other common areas. The lights are switched on either manually or automatically using movement sensors in the stairwells and at the entrances. Part of the ambient lighting is on permanently. The lights in the car park are automatic – switches with sensors are located in several sectors. About one third of the lights in the car park are switched on permanently.
The lighting in other common areas that are not used very frequently (technical rooms) is turned on locally using regular switches.
All common areas have security lighting in place that complies with the findings the fire safety study.

Residential units

All residential units are powered from their own respective switchboards. NY-M cables are used of appropriate diameters and number of cores, placed into PVC conduits in walls/ceilings/screed layers inside the residential units. The power supplied to the pantry that belongs to each apartment runs from that apartment's switchboard, as does power towards the consumer in the basement (e.g. the power socket in the parking bay).
Lights are switched on locally.
Whenever possible, the parking bays are equipped with a wall socket to help with vehicle maintenance. The cable runs to the connector box where the individual sockets connect with the power supply belonging to the owner of the parking bay in question. Electricity is thus fed from the distribution switchboard of the apartment that the parking bay belongs to.
The apartments are equipped with galvanic equipotential bonding.
The residential units are equipped with a Central Control System. Each unit has a touch screen that allows the user to control and change the parameters if required.

Basement – car park

The basement level is intended as a car park, and in parts also used as a pantry. The basement level is powered from its own switchboard.
The basement level is fitted with lighting, fire alarm, general power, access control and video surveillance installations.
The pantries of the residential units are equipped with a single power socket and light with local switching powered from the switchboard of the corresponding apartment.

UNIVERSAL WIRING

Telecommunications connections

The telecommunications signal cabling is connected to the building's control room, from which an optical cable distribution network branches out to individual consumers. The cabinet used to connect the signal from the telecommunication service operators with the optical connections of the apartments enables easy switching between a minimum of two operators. The power to the active equipment is provided from the common use distribution switchbox.

Internal installations

In each residential unit, a part of the control cabinet is a separate section intended for the installation of a particular operator's equipment. This section is also where all internal connections of the apartment terminate and are marked appropriately.
Internal installations use CAT 6 cables that terminate in a separate part of the control cabinet of the apartment. To the locations of the TV connection, an additional KOAX RG59 link has been installed.

Video intercom and access control

The building is equipped with an access control system and video intercom manufactured by 2N. Inside the apartments, communication uses an internal unit (display), while the external unit and electrical locks are located on the entrance to the building, passageways and common areas such as the bicycle storage room.
Access to the building is granted to the possessors of magnetic cards that have to be placed on a reader to open the electrical locks. The cards are programmable. To enter and exit the car park, RF cards are used (longer range – no need to touch the reader) with a dislocated reader – an additional inductive loop is placed in the pavement.
The synchronisation of the intelligent installations (CNS SAUTER) and of the video intercom system is guaranteed.

Video surveillance

A video surveillance (CCTV) system is installed to protect the building. Cameras are placed on the main entrances to the building and at the entrance and exit from the car park.
The control room is equipped with a recording device with appropriate autonomous power supply and a workplace with monitor, keyboard and mouse.
The system is independent and separated from other systems in the building.

CCS – Controlling the CCS apartments

The apartments are equipped with a central control system (CCS):

- Heating settings
- Cooling settings
- Window blinds control

Ventilation

Access control with video communication
Integration of data from the weather station
The control also enables remote control over the functioning of the systems, as well as administration to a certain degree.
To ensure optimal operation, a unified system was selected for the entire building. The provider of the aforementioned equipment is SAUTER. The control/surveillance system enables access via applications on at least two smartphone OS platforms. The main access point of the CCS is a touchscreen, and control of and access to its operation is also possible by using smartphones, tablet computers and e-access.

GSM signal

Due to insufficient GSM coverage detected after examination of the building and based on a coverage study, the common areas of the building (its basement, stairwells, etc.) are equipped with signal repeaters that ensure good coverage. The system is independent and separated from other systems in the building.

Fire alarms

All installations and measures required by the Fire Security, Prevention and Control Study are in place, such as automatic alarms and fire detection, safety lighting, mechanical smoke and heat extraction, etc.
The fire alarm station is installed in the control room where it is safe from unauthorised tampering and vandalism.

Grounding and equipotential bonding

The main switchboard has main equipotential bonding, and each common use switchboard features an equipotential bonding socket.

Lighting conductor

The building is fitted with lighting conductor protection in the form of a Faraday cage. The raster grid is the aluminium conductor. Connections are made to the ground rods from the initial stage of construction. The measuring equipment is located on the roof of the building. The conductor run through protective conduits underneath the façade.

The Investor shall reserve the right to make changes.
The drawings of the equipment in the rooms shown are for information purposes only.
The list price does not include the fees to connect to the electricity and gas supply networks, and the costs of TV, radio, internet and telephone connections.