ARION.GREEN OFFICE BUILDING

TECHNICAL SPECIFICATIONS

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1. BUILDING PROGRAM AND ARCHITECTURAL CONCEPT

The subject property is an office building, with the subsequent technical functions, built on a 366 m^2 plot of land, situated at 24 Italiana Street, 2nd District, Bucharest, Romania.

Considering the approved urban coefficients for the specified plot of land, the project technical data are as following:

Footprint area: 212.80 m^2

Project total gross area: 1,854.30 m^2

Gross area underground: 603.00 m^2

Gross area above ground: 1,251.30 m^2

Rentable space (according to method A of BOMA): 1,075 m^2

The building functions are distributed on 8 levels as following: 2 underground parking levels comprising also the technical rooms and 6 above ground office levels.

The office typical floor can be used as an open space, designed and equipped so it offers excellent functional flexibility, or at the tenant's choice, interior partitions are attainable. Each level is served by a single core of one egress staircase and one passenger elevator for 6 persons, endowed with access door for wheel chairs.

The building complies with all the Romanian standards and regulations. In the event that there are no such regulations for certain applications or designs or the DIN requires a stricter standard, the relevant DIN sections shall apply.

1.1. Basement Level 2

This floor accommodates a total of 7 parking places; other adjacent functions include circulation (staircase, car elevator, passenger elevator), technical spaces (elevator engine, water tank pump room), and civil protection area.

1.2. Basement Level 1

This floor accommodates a total of 7 parking places; other adjacent functions include circulation (staircase, car elevator, and passenger elevator), technical spaces (electrical panels' room, low currents room, mechanical room) and garbage room.

1.3. Ground Floor

This floor accommodates the main entrance lobby with the reception, circulation (staircase, car elevator, passenger elevator) and the rentable office space including the adjacent spaces for the office: 2 restrooms, server room and kitchenette.

1.4. First Floor

This floor accommodates circulation (staircase, car elevator, passenger elevator) and the rentable office space including the adjacent spaces for the office: 2 restrooms, server room and kitchenette.

1.5. Second and Third Floor

This floor accommodates circulation (staircase, car elevator, passenger elevator) and the rentable office space including the adjacent spaces for the office: 2 restrooms, server room and kitchenette.

1.6. Fourth Floor

This floor accommodates circulation (staircase, car elevator, passenger elevator) and the rentable office space including the adjacent spaces for the office: 2 restrooms, server room and kitchenette.

1.7. Fifth Floor

This floor accommodates circulation (staircase, car elevator, passenger elevator) and the rentable office space including the adjacent spaces for the office: 2 restrooms, server room, kitchenette and a 12m^2 terrace.

1.8. Roof Level

This level accommodates a green roof with sedum type plants, which demand rare maintenance and will reduce the cooling and heating demand of the building. There is no technical equipment on the roof.

2. EXTERIOR FINISHES

2.1. Facades

The building will be covered with lasting finishes, as presented below:

South side:

- curtain wall: aluminum and insulated vision glass system with operable shading panels (k value= 1.25w/m^{2}K)
- white/green glass panels on metal structure attached to 10 cm thermal insulation and painted gypsum board at the interior
- plating with natural stone
- plating with TRESPA panels

West side:

- curtain wall : aluminum and insulated vision glass system with operable shading panels (k value= 1.25w/m^{2}K)
- plating with TRESPA panels

North side:

- Baumit plastering over masonry, with 10cm thermal insulation (k value= 0.377w/m^{2}K)

- Glass windows, with aluminum frame, double glazing low-e (k value= 1.25 w/m^2K)

2.2. Exterior Doors

Main entrance:

The main building access is from Italiana Street, through a glass door.

Balcony door:

The balcony at the 5th floor can be accessed from the office area, through a balcony glass door, aluminum framed, the same type as the curtain wall.

2.3. Windows

All office areas are equipped with operable windows, which are integrated in the curtain walls or are constructed as separate elements in the masonry wall. The technical characteristics correlate to the curtain walls.

2.4. Roof

The roof is accessible for maintenance purpose only. There is a 2% min pitch requirement. The roof assembly consists in: 5 cm lean concrete, protection foil against moisture, 15 cm thermal insulation, waterproofing membrane, special membrane for water retention, 10-15 cm soil layer, sedum type plants (k value= 0.273 w/m^2K).

2.5. Terraces / Balconies

The terrace accessible from the office space is located at the fifth floor and created by setbacks in the building configuration.

The terrace assembly is green roof type with concrete pavers and plants.

2.6. Exterior Paving

Pedestrian and car access are made from Italiana Street only. Parking is indoor, the access at the 2 basement levels being ensured by a car elevator type LIFTECH. The pedestrian alley which separates the car elevator from the building itself is made of paving tiles.

3. INTERIOR FINISHES

3.1. Interior Doors

Interior doors are steel (basement area and technical rooms) or wooden doors, painted and fire rated as required.

The main entrance door is equipped with self-closing mechanism.

The restroom doors, kitchenette doors and server-room doors are wooden with wooden frame.

3.2. Wall, Ceiling and Floor Finishes

3.2.1. Basement Levels:

Parking area and all adjacent spaces: painted concrete walls

Staircase and halls: painted concrete walls

Elevator lobby: painted plaster

Floor parking area and technical spaces: sealed concrete with epoxy resin

Floor Staircase: sealed concrete with epoxy resin

Ceiling, all areas: free height H=2.70m

3.2.2. Ground Floor:

Entrance lobby:

Walls: white painted gypsum board

Floor: heated/cooled floor with natural stone/ceramic tiles plating

Ceiling: free height=3.00m

Office area:

Walls: white painted gypsum board

Floor: heated/cooled floor with natural stone/ceramic tiles plating

Ceiling: white painted gypsum board on metallic structure, free height=2.80m

Restrooms, kitchenette:

Walls: white painted water resistant gypsum board

Floor: heated/cooled floor with natural stone/ceramic tiles plating

Ceiling: white painted water resistant gypsum board on metallic structure, free height=2.80m

3.2.3. Floors 1-5:

Office area:

Walls: white painted gypsum board

Floor: heated/cooled floor with natural stone/ceramic tiles plating

Ceiling: white painted gypsum board on metallic structure, free height=2.80m

Restrooms, kitchenette:

Walls: white painted water resistant gypsum board

Floor: heated/cooled floor with natural stone/ceramic tiles plating

Ceiling: white painted water resistant gypsum board on metallic structure, free height=2.80m

4. PARTITION WALLS

4.1. Concrete Walls

Reinforced concrete walls; thickness and finish as specified in the drawings; thermal insulation where required.

4.2. Gypsum Board

Gypsum board on 10 cm or 15 cm metal stud; finish and fire rating as specified in the drawings; thermal insulation where required.

4.3. Brick Walls

Brick walls at shafts and technical spaces; thickness, fire rating and finish as specified in the drawings.

5. STRUCTURAL CONCEPT

The building has raft foundation poured on a 15cm lean concrete, reinforced with steel concrete net ϕ6/200/200mm. The basements are realized within a shoring structure with 400mm piles on the perimeter, from reinforced concrete walls, slabs and perimeter beams. The superstructure is mix type with reinforced concrete frame and steel concrete diaphragm.

6. PERFORMANCE SPECIFICATIONS – HVAC

6.1. HVAC data

6.1.1. HVAC systems and equipments provided for the building

- Under floor heating system from ground level to level 5
- Under floor cooling system combined with water cooled dehumidification units from ground level to level 5, one separate unit for each level
- Fresh air supply with heat recovery from ground level to level 5, one separate unit for each level
- Exhaust ventilation system for spaces with an advanced degree of pollution: restrooms, garage
- Central mechanical room with geothermal heat pump
- Ground water drills supplying heat exchanger for geothermal pump

6.2. Indoors climatic parameters

6.2.1. Summer

Indoor temperature: +24 ºC ±1.0 ºC D.B.

Relative humidity: ≈45 %

6.2.2. Winter
Indoor temperature: +22 ºC ±1.0 ºC

Relative humidity: ≈45 %

6.3. Outdoors climatic parameters

6.3.1. Summer
Outdoor temperature: +33 ºC D.B.

Relative humidity (moisture content): 90 %, (wet bulb temperature +22 ºC) conf. STAS 6648/2.

6.3.2. Winter
Outdoor temperature: -15 ºC D.B.

Relative humidity (moisture content): 38 %, conf. STAS 1907/2.

6.3.3. Heating System
Heating is accomplished by an under floor heating system, independent for each property. Hot water for the heating system is provided by a geothermal heat pump, using underground water.

Room temperature is controlled individually in each property.

6.3.4. Ventilation System
In each floor a ventilation/dehumidification unit is installed. The unit provides fresh air in the office area through an energy saving heat recovery system, while it also dehumidifies the air. Each unit has a flow rate of 1850 m^3/h with a fresh air supply of 900m^3/h.

Sanitary rooms have separate independent ventilators (ceiling type).

In each level of the garage area a fan section type ventilator is installed for extracting air. Each ventilator has a capacity of 2100 m^3/h.

An air supply ventilator (fan section type) with a capacity of 480 m^3/h provides the necessary overpressure in the halls outside the technical rooms.

6.3.5. Cooling System
During summer time the cooling loads are covered partially by the under floor system and partially by the dehumidifiers.

The under floor network is supplied by water at temperature of 17^{o}C without the use of the main geothermal heat pump (free cooling).

The cooling/dehumidification units work during summer time as individual geothermal pumps using the water in the under floor circuit.

In the server room an individual geothermal unit is installed, so that cooling can be provided during all seasons.

6.4. Metering Concept

For the office areas the metering for heating and cooling will be carried out with energy meters for floor. In that way the energy consumption can be identified for each tenant separately. The Building Management System collects data from the energy meters.

7. PERFORMANCE SPECIFICATIONS – ELECTRICITY

The electrical works include equipments and materials as required to incorporate all functions and features indicated for the followings systems:

Low voltage installations

- Main distribution panels (normal, emergency)
- Secondary distribution panels (normal, emergency, UPS)
- Lighting circuits (normal and emergency)
- Sockets circuits (normal, UPS)
- Equipment power supply
- Earthing – lightning protection

Low current installations

- Voice – data network
- Fire detection
- Security system
- CO detection
- Security system
- CCTV
- Video Interphone
- R-TV-SAT
- Building Management System (BMS)

7.1. Power Distribution

Each property has an independent power consumption meter place in the 1st basement of the building. Consumptions of common use facilities have a separate meter.

A power generator, with a sound proof casing, supplies the critical loads of the building:

- Safety lighting in offices / common areas
- Emergency lighting in offices / common areas
- Garage ventilators

- CO detection system
- Lifts
- Pumping stations

Supply circuits for computer sockets are connected through local UPS units for each property area.

7.2. Lighting Installations

The lighting in the various areas of the building meets the following criteria:

a. Technical rooms	300 Lux
b. Offices	400 Lux
c. WC - storage rooms	150 Lux
d. Parking area	200 Lux

The uniformity Emin/Emax will be > 0.33

7.3. Lighting Control

Lighting is controlled by presence sensors in the basement and common areas, and local control points in the office area.

7.4. Luminaries

Offices

Recessed down lights with 2 PLC 26W lamps.

Recessed linear luminaries with fluorescent type lamp T5

WCs - Kitchens

Recessed down lights with 2 PLC 26W lamps

Recessed down lights with 2 PLC 13W lamps

"Linestra" type fluorescent luminaries

Staircases

Wall mounted luminaries with fluorescent lamps 1x26W

Technical rooms, parking area

Watertight luminaries wall or surface mounted with fluorescent lamps 2x18W / 2x36W

Some luminaries in offices as well as common areas will have integrated Ni-Cd 90min batteries and will be supplied by the emergency panel. Safety lights will be supplied in the same way

7.5. Sockets

Each floor will have sockets supplied by normal electrical panels and sockets supplied through the local UPS.

Sockets for office use will be wall mounted. Each working place will have 4 power sockets, 2 on normal supply and 2 through the UPS circuits, and 2 voice-data sockets. Sockets in technical rooms will be watertight.

7.6. Voice – Data Network

The voice-data sockets will be installed in the floor outlet boxes. All outlets will be RJ45 Cat6 and will be connected to the patch-panel rack, which will also contain the communication center of each floor.

The communication center of each property is connected to the general patch-panel rack, located in the 1st basement.

7.7. R-TV-SAT Installation

R-TV-SAT sockets are installed in every office. Each socket is connected separately to the center mixing amplifying unit locate in the 1st basement.

R-TV-SAT antennas can be installed on the building's terrace.

7.8. Security System

A conventional local security panel will be installed in every floor. The security system contains infrared motion detectors, a keyboard and a sounder with a flashing strobe.

7.9. Fire Detection

The fire detection panel, installed at the entrance of the building will be addressable type. Smoke or heat detectors will be installed according to the use of each room. The fire detection system contains also manual call points and sounder with integrated flashing strobe.

7.10. CO Detection

The paring area will contain CO detectors, warning signs and sounders. The main panel, which controls the ventilators and the warning indications, will be installed in the entrance of the building.

7.11. CCTV

Each property entrance as well as the basements, property limits and interior yard will be monitored by a videocamera. All cameras are connected to the main unit located in the entrance lobby.

7.12. Building Management System (BMS)

The BMS of the building monitors and controls various parameters of the equipment installed in the building like:

- Water tank level
- Potable water pump station
- Drainage pump station
- Water meters
- Energy meters
- HVAC functions (temperature, humidity, alarms)
- Exterior temperature, luminance
- Heating room (heat pump, drills, distribution pumps)
- Generator
- Garage fans
- Fire detection system
- CO detection system
- Lifts
- Façade shading system through dynamic blinds louvers, controlled by light sensors following the solar path.

8. PERFORMANCE SPECIFICATIONS – PLUMBING

8.1. Domestic Water Service

Potable water is stored in 1.000 l tank located in the second basement. A pressure-boosting pump set with inverter-controlled pumps, which adapt the flow rate to the demand, provides the distribution.

Instantaneous electrical water heaters in each sanitary group provide hot water.

Consumption meters are installed for every floor. A separate meter is installed for common consumptions. Data from the water meters is monitored by the BMS.

8.2. Drainage System

The rooms at the ground floor and above are connected by gravity to adjacent sewers in the street. Storm water from the roof drains, terraces, balconies dewater by gravity into the urban storm water sewer.

A pump station is installed in the second basement for dewatering accidental water in the parking area and the technical rooms. Before entering the pump station water passes through a mud and oil separator.

8.3. Sanitary Equipment

Equipment Type	Detailed Specifications
Sink Faucet	Wash basin thermostatic faucet mixing valve : „ESSENCE" crom-producer GROHE
Sink & cabinet (standard)	Wash basin:"CONNECT" model cube 60x46, mounted on furniture DOMINO 60, front capucino, lateral wenge L.60xA.48.5xH.37cm
Water Closet (standard)	Ideal Standard Water closet, suspended, "CONNECT" Dolomite (including the water reservoir and the support), with "CONNECT" cover
Complete Sink Installation	Installation for wash basin: 'Bottle" type syphon, 2 corner valves 1/2" / 3/8" with filter, mirror Domino Cappucino 60x80cm, soap dispenser, paper towel dispenser.
Water Closet Installation	Installation of water closet: toilet paper dispenser, push button

8.4. Metering

Water and electrical energy consumption will be measured separately for each floor and the building common areas and charges on an m^2 ratio basis.

9. ELEVATOR SPECIFICATIONS

The building is equipped with 1 Kone Passenger Elevator for 6 persons, with 8 stops, a 90 cm door width and a Kleemann car hydraulic platform.

The elevators have the following technical specifications:

9.1. Passenger Elevator

General Data

- Elevator Type: MonoSpace, Kone

- Total Capacity: 6 persons
- Speed: 1.0 m/s
- Travelling Distance: ~ 27 m
- Number of landings: 8/8, all in line (-2 till 5)
- Number of commands per hour: 180

EcoDisc

- Power supply: 400/240V 50 Hz
- Energy Consumption: 2.8 Kw with invertor

Elevator Cabin

- Cabin walls and ceiling finishing: Inox "Asturias Satin", mirroor on half of the back wall
- Lighting: LED Spot
- Cabin Ventilation: 83m³/h
- Cabin doors: 900 x 2000mm, brushed Inox, safety curtain photocell

9.2. Car Hydraulic Elevator

General Data

- Elevator Type: KTS vehicle platform, Kleemann
- Total Capacity: 2,200 kg
- Speed: 0.15 m/s
- Travelling Distance: ~ 5.95 m
- Number of landings: 3, all in line (-2 till 0)
- Power supply: 380V- 50 Hz
- Energy Consumption: 7.7 kW
- Doors: automatic roller type, dimensions 2,100 x 2,000 mm, safety curtain photocell
- Platform dimensions: 2,500 x 5,150 mm

10. MISCELLANEOUS

10.1. Waste disposal

Waste storage space provided on the basement including recyclable waste.