

WIRING DIAGRAMS

Address:

Owner:

Contractor:

Designer:

Director:

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SPECIFICATIONS

Technical conditions:

Introductionary cable: AXPR 4G240

Main fuse: 3x425A

Power supply:

voltage: Y+N 230/400V

type of current: ~3 AC

frequency: 50Hz

type of power system: 3-phase

Ground:

missing (voltage doesn't exceed 50V)

TN-C

TN-C-S

TN-S

T-T

I-T

M+ and M- with grounded tap

Substation:

breaking current: min. 6kA

transformer: TAC-1000
0.99 MW

Installation properties:

Voltage drop: 3.27%

cos ϕ : >0.9

Wiring way:

- overhead powerline
- underground power cable
- cable shaft
- cables on wall surface
- cables inside the wall
- cables in cable tray
- other: _____

type of cabling: NYM and NYM-J

Main panel:

wall surface

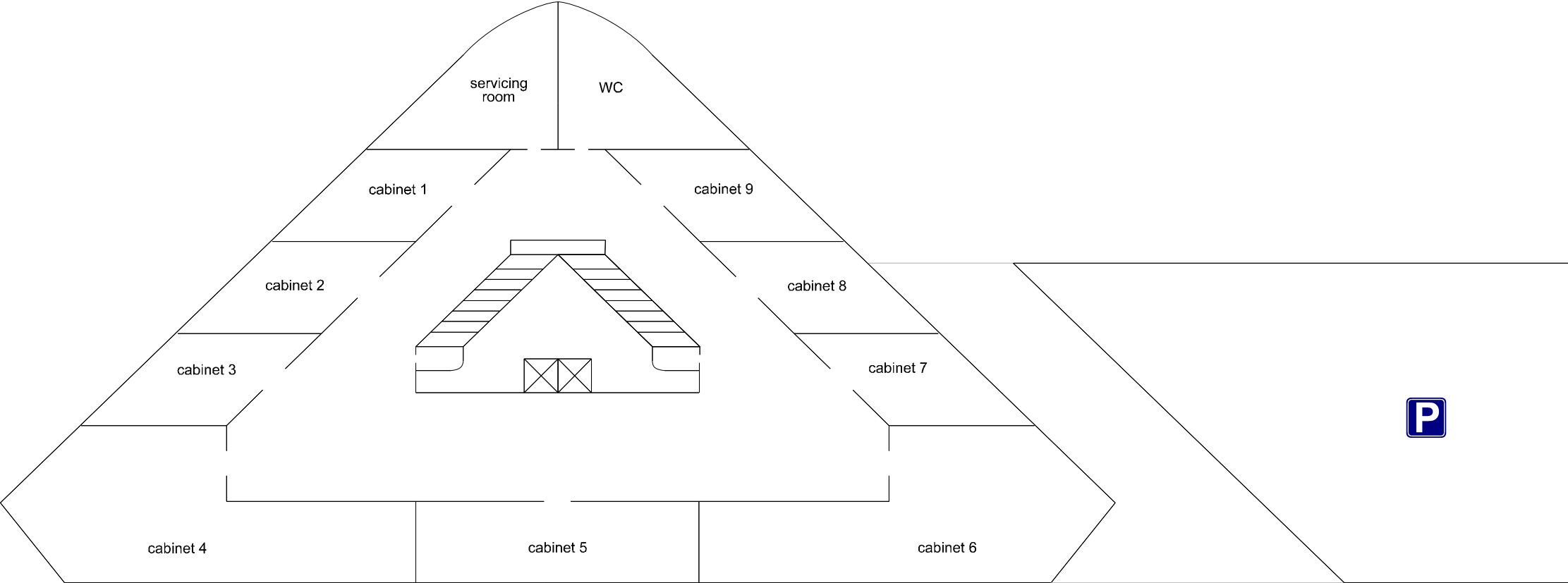
inside the wall

other: utility
cabinet

Ingress Protection Rating: min. IP20

Ground impedance: 2.9 Ohm

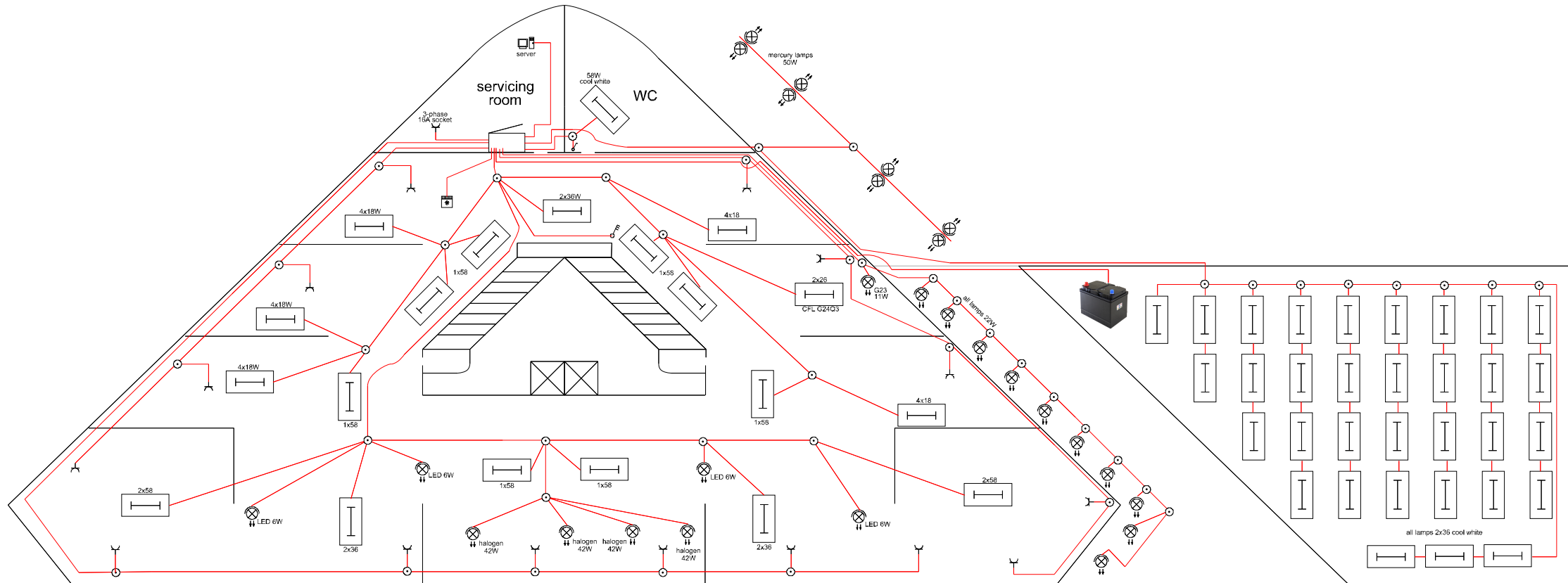
BUILDING PLANT



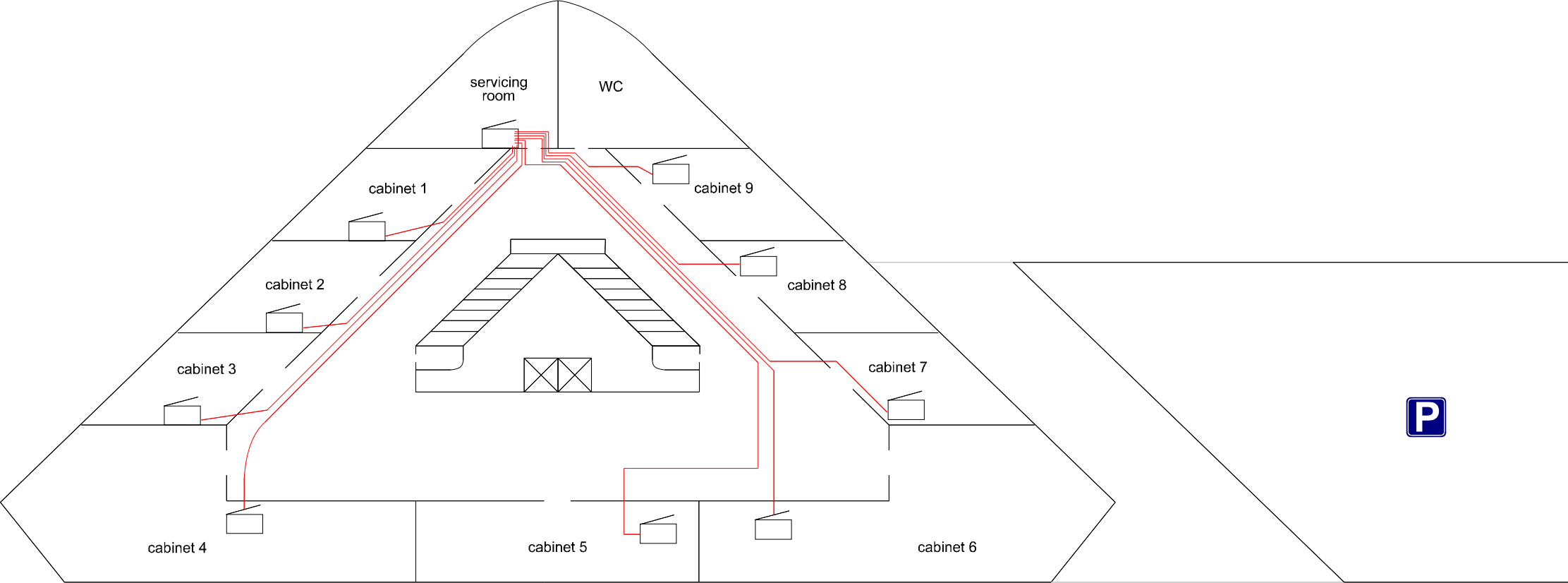
POWER DISTRIBUTION BETWEEN SECTIONS



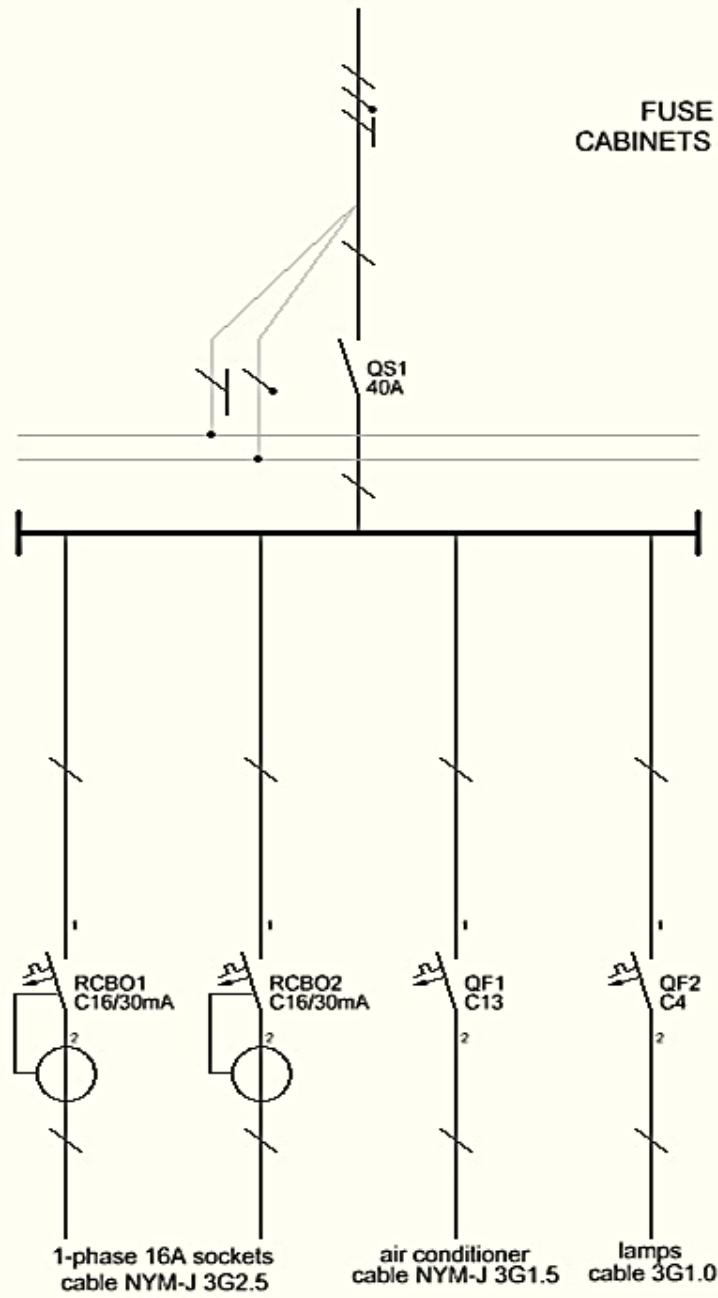
CIRCUITS ON 1st FLOOR



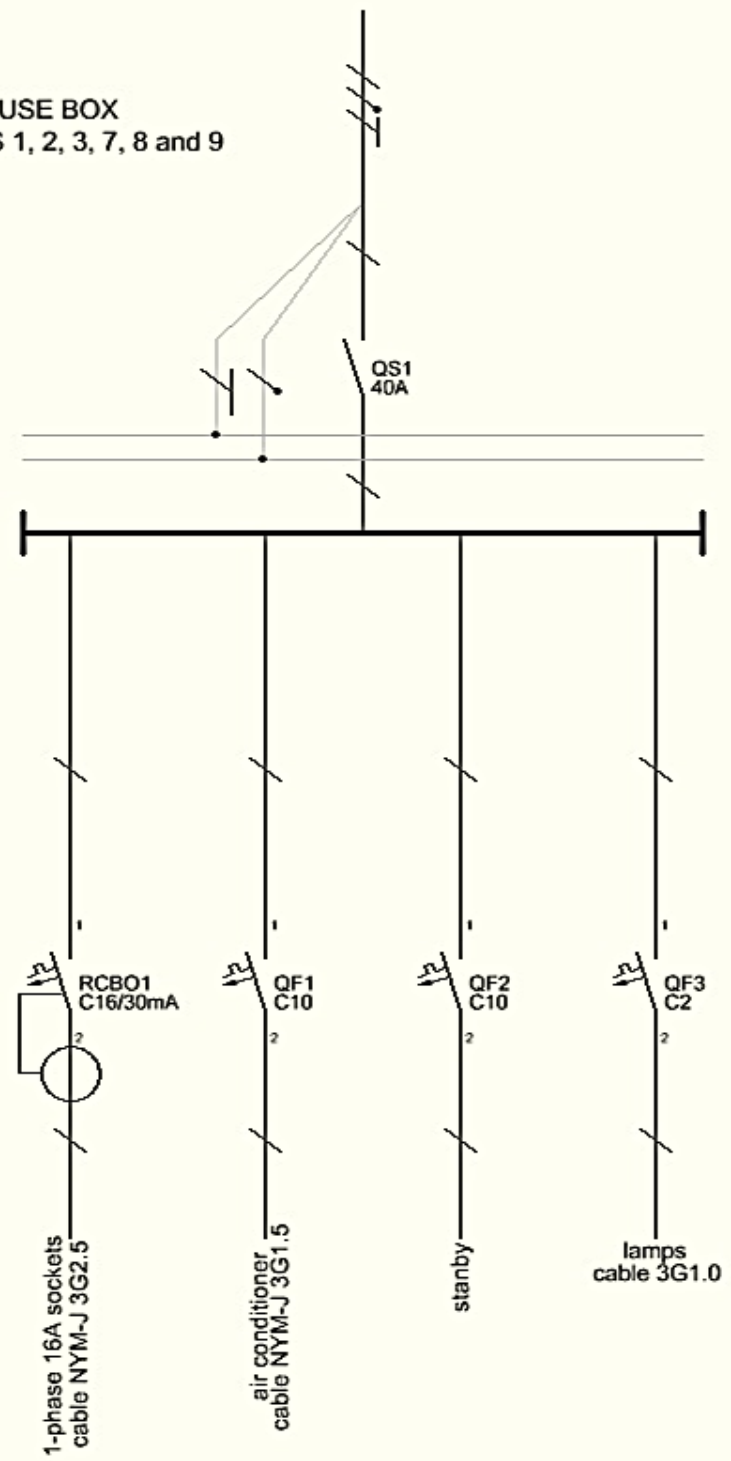
ELECTRICITY DISTRIBUTION BETWEEN FLOORS



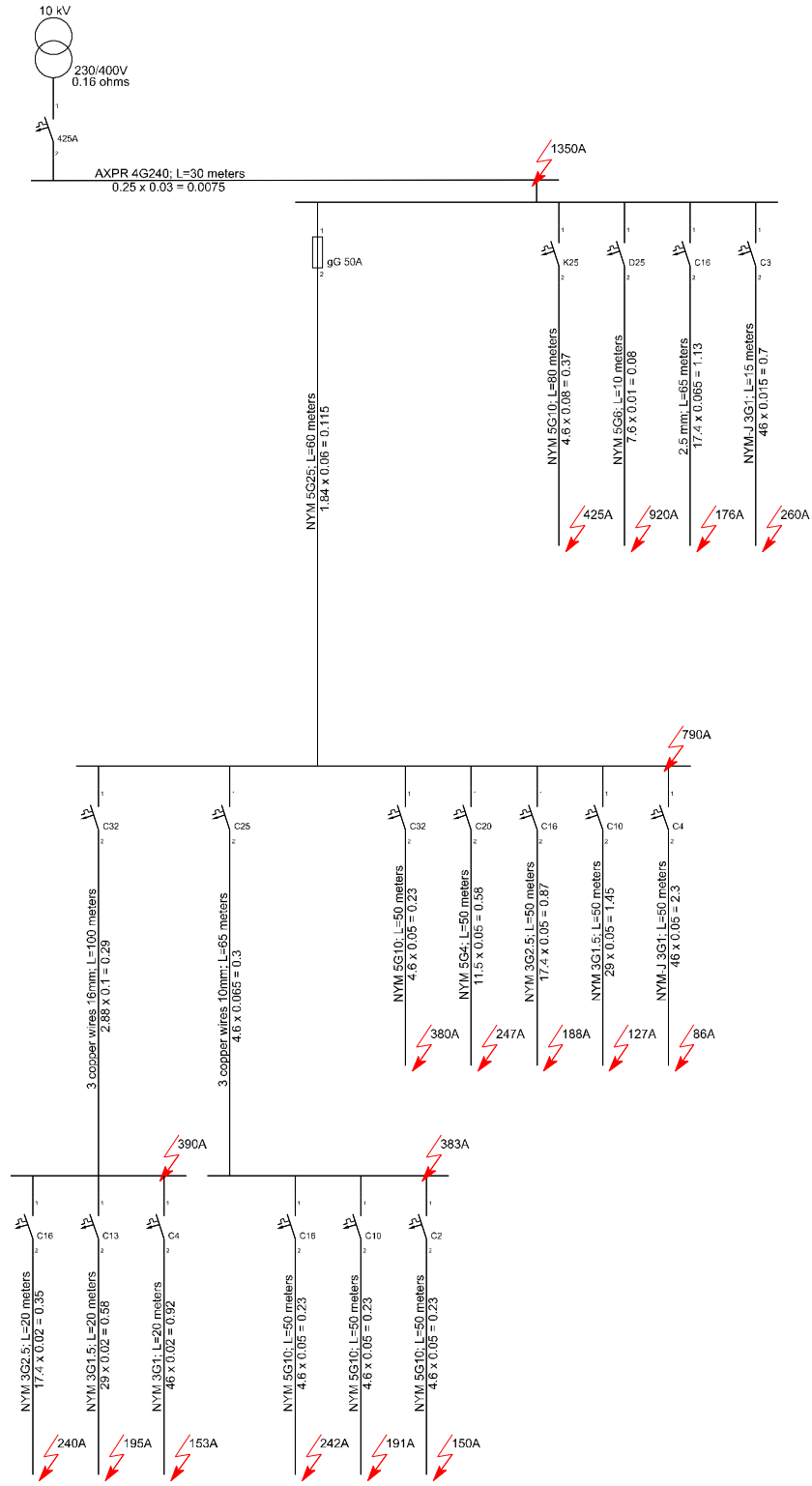
FUSE BOX
CABINETS 4, 5 and 6



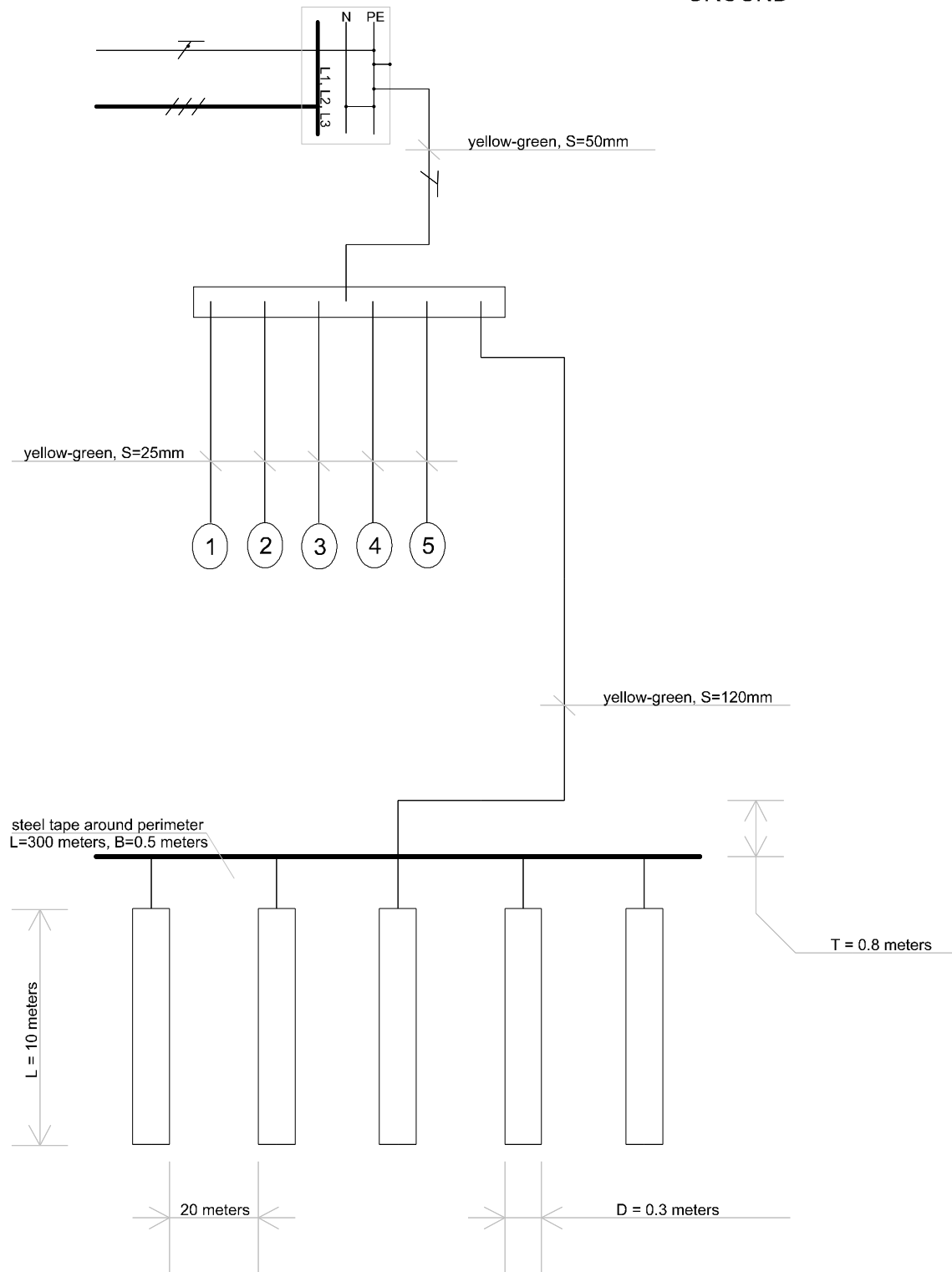
FUSE BOX
CABINETS 1, 2, 3, 7, 8 and 9



SHORT CIRCUIT CALCULATION



GROUND



Calculation:

Ground material: limestone; 5000 ohm/meter

1) metal tape around perimeter

$$\frac{0.336 \times \rho}{L} \times \lg \frac{2 \times L^2}{B \times T}$$

$$6.1 \times \lg 450000 = 34.54 \text{ ohm}$$

2) 5 electrodes attached to steel tape

2.1) for 1 electrode:

$$\frac{0.336 \times \rho}{L} \times \left(\lg \frac{2 \times L}{D} + 0.5 \times \lg \frac{4T + L}{4T - L} \right)$$

$$6.1 \times (1.83 + 0.24) = 12.63 \text{ Ohm}$$

2.2) for 5 electrodes:

$$R = \frac{R(1)}{K_p + N} = \frac{12.63}{0.8 \times 5} = 3.16 \text{ Ohm}$$

3) full ground impedance:

$$R = \frac{R(t) \times R(e)}{R(t) + R(e)} = \frac{34.53 \times 3.16}{34.53 + 3.16} = 2.9 \text{ ohm}$$

MATERIALS

Fuse boxes:

Distribution board 1500x2000	1
Fuse box 650x1200	8
Fuse box 51M + energy meter	1
Fuse box 42M, metal	1
Fuse box 24M, PVC	65
DIN-rail	5 meters

Busbars:

Copper busbar 30x5	10 meters
FORK busbar 16mm, 3-phase	105M
FORK busbar 10mm, 1-phase	192M
Benched busbar holder 30x5	1
Busbar N and PE 4x16+14x10	8
Busbar N and PE 10x16+30x10	2
Busbar blue 7 terminals	65
Busbar green 7 terminals	65
Equipotential busbar	1

Disconnectors and releases:

Load switch 630A, 3-phase	1
Load switch 3x80A	10
Load switch 1x40A	65

Fuses and circuit breakers:

Fuse disconnecter RBK1	10
Knife fuse gG_50A, size "1"	30
Circuit breaker C32 3-phase	2
Circuit breaker C32 1-phase	42
Circuit breaker D25 3-phase	1
Circuit breaker K25 3-phase	1
Circuit breaker C25 1-phase	42
Circuit breaker C20 3-phase	1
Circuit breaker C16 3-phase	5
Circuit breaker C16 1-phase	3
Circuit breaker C13 1-phase	42
Circuit breaker C10 1-phase	85
Fuse disconnecter RBK000	1
Knife fuse aM_10A, size "000"	3
Circuit breaker C4 1-phase	35
Circuit breaker C3 1-phase	3
RCBO C16/30mA	103
RCBO C10/30mA	14
RCD 25A/30mA 4-pole	7

Relays:

Photorelay for DIN rail 16A	3
Relay 2P 20A 2NO+2NC for DIN rail	3
Contactora 3-phase 20A for DIN-rail	1

Other panel products:

Terminal PM5X	40
Control lamps for DIN rail, 2W	3
Electricity meter 3-phase 5-85A	1
Electricity meter 1-phase 40A	63

Cables and wires:

Cable NYM 5G25	500 meters
Cable NYM 5G10	150 meters
Cable NYM 5G6	500 meters
Cable NYM 5G2.5	35 meters
Cable NYM 3G2.5	1600 meters
Cable NYM 3G1.5	2800 meters
Cable NYM 3G1.0	1300 meters
Copper wire S=16mm, black	2000 meters
Copper wire S=16mm, blue	2000 meters
Copper wire S=16mm, yellow-green	2000 meters
Copper wire S=10mm, black	2100 meters
Copper wire S=10mm, blue	2100 meters
Copper wire S=16mm, yellow-green	2100 meters
Copper wire S=120mm, yellow-green	20 meters
Copper wire S=50mm, yellow-green	30 meters
Copper wire S=25mm, yellow-green	450 meters

Ground and lightning safety:

Steel tape 50cm	305 meters
Galvanized rods, L=10 meters, D=30cm	5
Clay	5400 kilograms
Grounding collars	~40
Welding	*employ the welder to join steel tape with rods

Installation appliances:

Light fixtures	*ask lighting schemes from photodesigner
Sockets 3-phase 32A	2
Sockets 3-phase 16A	5
Schuko sockets 16A	1690
Light switches IP20 10A 250VAC	150
Junction boxes	~2400
Cable trays	*by installation process
Cable channels	*by installation process
Flexible conduit	*by installation process
Other (nails, screws)	1

Work *will be calculated by construction company