TECHNICAL DESCRIPTION OF ELECTRIC POWER INSTALLATIONS

Investor:	THE CITY OF NOVI PAZAR
Building:	HEATING INSTALLATION RECONSTRUCTION IN "STEFAN NEMANJA" PRIMARY SCHOOL NOVI PAZAR
Type of project:	EXECUTION PROJECT/ DETAILED DESIGN
Design part:	4 – DESIGN OF ELECTRIC POWER INSTALLATIONS
Work site:	NOVI PAZAR

TECHNICAL DESCRIPTION OF THE BUILDING

The subject of the design is the reconstruction of the boiler room & storage for pellets at "Stefan Nemanja" Primary School in Novi Pazar. Power supply is provided for consumers in the boiler room including heat substation from the special switch cabinet (RTK) placed in the boiler room. Power supply to the special switch cabinet (RTK) in boiler room is provided by the existing cable PP-Y 5x6 mm^2 laid from the main junction cabinet with the meters which is situated on the ground floor of the school.

SWITCH CABINET

The entire accessories for supply of electric power consumers is mounted in the switch cabinet which dimensions are 800x800x200 mm and protection degree is IP 54. The switch cabinet is made of twice pickled metal sheet, and built up on anchored profiled bars (L 50x5 mm) at a height of 1 m from the floor. Switch cabinet is twice protected from corrosion and then painted. In the switch cabinet remains 30% of free space for the eventual installation of additional accessories.

In the switch cabinet next to the main fuses and main power switch are provided protection elements against overloads and short circuits, as well as switches and controls. The cabinet must be made with the possibility of sealing the main terminal for calorimeter connectors. All the controlos (switches) and signaling elements (signaling lights presenting fidelity of electrical supply etc.) are placed at the door of the cabinet and on the inside they must be protected from direct contact with live parts.

For each motor consumers are provided: the main fuses, controls, contactor for operation indication, the cam switch (0-1) to command contactor, and for the whole system is planned power switch (manual-zero-automatic).

For the purpose of boilers connection the necessary equipment should be installed (fuses, contactors and switches). Accessories in the switch cabinet is determined by the relevant scheme, which is part of the design and it should be enclosed within the switch cabinet and must match the built state.

PUMP INSTALLATION

Installation of the pump power supply should be carried out with cable type PPOO-Y 3x2.5 mm^2 within PNK channels 50 racked on the wall by the spacer clips attached to the wall with plastic anchors and bolts. The types of electrical switchboard are "C" & "J". The degree of protection is IP 54. At places where mechanical damages are possible the cables should be laid in solid seamless steel pipes or flexible steel pipes. Before laying and cutting the cables, the location and characteristics of the installed equipment should be checked (strength, power, etc.), after that the cables should be stretched and cut.

Parts of conductors from the wall to the consumer are protected mechanically pulling in the armored metal hoses.

MEASUREMENT AND REGULATION

Measurement and control devices for temperature are located on panels placed on the boilers and on the walls in the boiler room where the pumps, servo motors and sensors are connected. Connection diagram is given in the drawings. Signal cables should be laid in corrugated pipes with diameter of 16 mm within PNK channels 50 racked on the wall by the spacer clips attached to the wall with plastic anchors and bolts.

LIGHTING INSTALLATION

In the boiler room, and storage the replacement of lamps is provided to achieve illumination with an average above 150 lx. Lighting should be made with waterproof fluorescent lamps with fluorescent tubes of 36 W. The degree of protection should be IP 54. The electrical installation for lighting will use the existing installation from the junction box in boiler room providing that the connector is taken before the main switch. The installation will be performed by cable PPOO-Y-3x1.5 mm^2 on the wall and ceiling by the spacer clips (the types of electrical switchboard are "C" & "J"), for external lighting in the front of storage the accessories with protection degree IP 54 should be used. The existing switches for lights in the boiler room and the storage will remain, they are located at the entrance to the rooms and switches are 10 A, 230 V, degree of protection IP 54, for connecting external and internal lamps for the storage two serial switches 10A, 230V, IP 54 will be added.

METALLIC MASS CONNECTIONS

For connecting of all metallic mass in boiler room will be performed strip Fe / Zn 25x4 mm on the supports type N.B4/925 attached on the wall at height of 0.5 m from the floor. Connecting of metal masses includes electrical connections of metal pipes, couplings (motors, valves, etc.), channels and their connection to a single-potential bar. In making all ground connections at joint places set lead washers with creating connections using two zinc-coated or cadmium-coated standard design screws where it is necessary to achieve the best possible connection. The bridges on the flanges should be made with copper braid of 16mm^2 or cable P/F 1x16mm^2, bolts should be welded on the flanges so that the bridge does not interfere any manipulation with device between flanges. All earthing of metal masses should be reduced to a bus for potential equalization. Equipotential bonding is directly connected to the grounding rail in the switch cabinet.

SCOOP-PROOF

As a protective measure against indirect voltage contact is applied TT system in the building, and this measure will also be applied in the boiler room. On the switch cabinet will be mounted table including the tag of this protection.
In the switch cabinet will be mounted a special earth bar which will be used for connections of all the protective cables and protective conductor of the main power cable.

INSTALLATION TESTINGS

Testing of electrical installations will be performed by measuring under *Rulebook for low voltage installations* in the following order:

1. the continuity of protective conductor and main and additional conductors for potential equalization;
2. insulation resistance of electrical installation;
3. checking the conditions for protection by automatic disconnection of the power supply, as a measure of protection against indirect contact performed accordingly Article 197 of the *Rulebook*
4. check the correctness of the galvanic connection between the metal parts, as evidence that there has been an additional potential equalization where it is required.

Basis on the conducted measurements, approval/certificate will be issued by the authorized organization.