

## PELLET STORAGE BUILDING

Primary School Stefan Nemanja, Novi Pazar

Cad. Lot No. 3332 C.M. Novi Pazar

### TECHNICAL DESCRIPTION

#### SEPARATE DESIGN TO AMEND THE AMENDED DESIGN FOR BUILDING PERMIT

According to Decision on Amended Building Permit, registered under No. ROP-NPA-29119-CPA-1/2016, dated 04 November 2016, the development of the Separate Design to amend the amended design for building permit has been performed for the metal roof shed in function of storage for pellet.

Namely, due to planned reconstruction of the central heating system for the Primary School Stefan Nemanja and switch to pellet as modern and clean fuel, the issue of its storage during winter time of exploitation has arisen, and possible off-heating season storage. The focus of this Separate Design for the amended design is solely on the solution for the pellet storage building.

The Separate Design to amend the amended design does not include any changes to existing connections of the building to the electric grid, water supply network, sewerage system, or any other.

#### 1. LOCATION

The pellet storage construction is planned on the North-West of the Primary School Stefan Nemanja building, located on cad. lot no. 3332 C.M. Novi Pazar, placed in the cut between the ground floor section of the building housing the boiler room, and the section housing the power substation, leaning along its entire length on the wall of the sports hall. (Fig. 1)

Fig. 1



## 2. DIMENSIONS, LAYOUT, FUNCTIONAL AND TECHNICAL ORGANISATION

Pellet storage construction is essentially a ground level shed, of metal structure, located in such a way that it is closed in on three sides by the school building, and the floor level of the storage building is levelled with the ground floor level of the school building, for easier communication, primarily towards the boiler room.

The roof is single-pitch, with 8° slope towards the only free side. The roof cover is a trapezoidal sheet metal TR-40/240 d=0.5mm. Rainwater drainage is conducted over a horizontal hanging gutter made of plastic coated galvanized steel sheet metal, d=0.5mm and dim. 15x15cm, connected to the existing/planned gutter vertical with connection to rainwater sewerage.

Storage building dimensions: 15.75m' x 5.0m' for pellet storage building alone and 17.20m' x 2.75m' for the part of the plateau – corridor along the open side of the storage building, which is the connection to the boiler room.

An opening shall be made in the wall of the existing boiler room, toward the storage building, and double metal door, dim. 180x200cm, which shall serve to move the pellet from the new storage room to the boiler room. The storage building is divided with a wall made of clay blocks, mortared on both sides, into two storage rooms, surfaces around 35m<sup>2</sup> and 38 m<sup>2</sup>, with separate entrances. The wall also serves as safety against fire by preventing any fires to spread to the other part of the storage room (fire resistance F90min).

The open side of the warehouse shall be fenced using reinforcing mesh Q-238, welded to the front row of pillars, and then coated over with anti-corrosion coating and painted brown. Simultaneously, openings shall be made in the fence, with double doors using HOP metal profiles, with welded wire mesh Q-238, for both storage rooms.

The existing windows in the lower level towards the sports hall, dim. 360x190cm shall be removed, as well as window dim. 80x100cm on the power substation, and the openings shall be closed using bricks and mortared on both sides with finishing. Inner side of the walls shall be puttied and coated with semi-dispersion, while on the outside the façade shall be made, using façade acrylic mortar, of Bavalit type.

All the joints and ends of the roof cover towards the walls shall be made according to manufacturer standards and manual, with finishing elements from the production programme of the same type of product and manufacturer. Also, line snow barriers shall be installed L=125cm RŠ=25cm, in two rows, in zig-zag.

The bottom side of the loadbearing roof structure, i.e. the storage building ceiling, shall be lined with gypsum boards d=1.25cm, fire resistance class F90min, as a fire safety measure.

## 3. STRUCTURE

### ROOF COVER

For the roof cover, considering the indoor space shall not be heated, a single-layer profiled steel sheet is planned, 0.5mm thick. Having in mind the slope of the roof plane, the minimum folding length of the profiled sheet boards shall be 20.0cm.

The roof shall be single and slope at 8°. Profiled steel sheet shall lean on binding rafters of the continuous beam static system, with a 4.0m span. The binding rafters shall be made of box profiles HOP60x100x5.0mm, spaced at 1.75m (horizontal projection).

## MAIN BEARER AND FOUNDATION STRUCTURE

The main bearer is a three pinned frame of 4.85m span, with sheeting rails on a single slope of 8°, ridge system height 3.80m. The spacing between the main binders is 4.0m. The headers shall be made of HOP profiles of constant cross-section. The sheeting rails are planned as HOP100x160x5.0mm. The header column shall be 3.0m of total height, planned as HOP100x100x5.0mm profiles.

The three pinned frame shall on one side lean on the foundation structure, and on the other the sheeting rails shall be anchored to the existing AB structure column. There are two types of foundations for the main header to lean on. The first type shall be pad foundations, dimensions 40x40x40cm (Item TS) and 60x60x40.0cm (Item TS1). The second type shall be foundation strip, planned below the wall dividing the storage building into two parts. The dimensions of the foundation strip shall be 40x40x510cm (Item TT). Both the pad foundations and foundation strips shall be connected to a floor slab (Item PP), planned to be 15.0cm thick and reinforced on both sides.

## LONGITUDINAL WALL STRUCTURE

The longitudinal wall shall be made in the axis across from existing AB walls. It shall be made of main bearer columns and sheeting rails in the longitudinal wall. Façade sheeting rails shall be made of HOP80x60x4.0mm, and there shall be two of them: one in the top of the column (cope) and another around 90.0cm below it, axially. A door is planned in the longitudinal wall, for loading in fuel (pellet). Door dimensions shall be 200x200cm

As the subject structure to this Design, is longitudinally completely covered by the existing structure, the bracings, having the role to take horizontal impacts in this direction, shall have a structural role, ensuring that the main bearers are in the planned position. There shall be two types of bracings on the structure:

## HORIZONTAL ROOF BRACING

At the location where this storage building is planned, there is a chimney for the existing boiler room. This has dictated the partially irregular form of the storage building base. As a result, on the side where the chimney is located, it is not possible to form the bracing in the first span, so it has been done in the second one. On the other side, the bracing shall be formed in the first span. This shall be truss bracing with crossed diagonals. Booms shall be sheeting rails of the main bearer, the verticals shall be binding rafters and only the diagonals shall be added. These diagonals shall be made of round steel, diameter  $d=1.0\text{cm}$ . these elements shall only be able to take tensile stress.

## VERTICAL BRACING IN THE LOGITUDINAL WALL

The static system of the vertical bracing shall be a truss with crossed diagonals. Booms shall be header columns, verticals shall be the cope and sheeting rails in the longitudinal wall, with only the diagonals added. The diagonals of this bracing shall be made of round steel, diameter  $d=1.0\text{cm}$ .

## BEARINGS

for the steel structure header are planned on both sides as pins. This bearing shall be made by welding the columns and the sheeting rails to the end plate at an angle. Thus prepared elements shall be mounted on a pre-made end plate, which shall, together with anchors, be connected to the columns and the reinforced concrete substructure using concrete, and connected to the beams by drilling it into the existing AB pillars.

## MATERIALS

used for all the elements of the structure shall be steel S235 (Č0361). The bonds with the structure elements shall be made using unfinished bolts, welded at an angle, using I quality butts. All the materials transported to the building site shall have appropriate manufacturer compliance certificates.

## 4. FIRE SAFETY

Fire safety measures are planned for in detail in the Fire Safety Study, which is an integral part of this Design. In order to improve the level of fire safety, it is necessary to:

- Line the ceiling using fire resistant gypsum boards d=1.25cm, fire resistance class F90min.
- Coat all the loadbearing pillars of HOP100x100x5mm profiles, using fire resistant coatings in accordance with SRPS U.J1.042/2000 and SRPS U.J1.043/2000, ensuring fire resistance class F90min.
- All anchor plates/profiles for anchoring the main bearer profiles HOP 100x160x5mm that remain unhidden, or unprotected, after lining with fire resistant gypsum boards has also to be coated using fire resistant coatings in accordance with SRPS U.J1.042/2000 and SRPS U.J1.043/2000, ensuring fire resistance class F90min.

NOTE: All measures must be verified on the spot.

Expert supervision over the works is mandatory.