The building-restoration design of renovation of the former prayer house of Mennonites in Nowe Wymyśle Gąbin Commune, Mazovian Voivodship

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1. INITIAL DATA.

1.1. Basis of the study.

The basis of this study are inventory measuring results of the object and survey of itys particular structural elements, as well as specialist tests made and expert opinions obtained for the needs of this project.

1.2. Subject and objective of the study.

The subject of the study is the building of the former prayer house of Mennonites in Nowe Wymyśle, Gąbin Commune, Mazovian Voivodship, hereinafter referred to as the object.

The objective of the study is a building design of an overhaul of the object in the scope of external and internal walls, floors, window and door carpentry, roof structure and roofing. This project is being carried out in order to execute overhaul works on the object which is in a bad technical condition and is threatened with further destruction.

While preparing this documentation, the authors have carried out a survey of the structural elements which are important from the viewpoint of the study. Selected structural elements have been measured and an evaluation of their technical condition and the type and scope of damages, if any, has been made in order to determine the scope of the works and select the optimal design solutions.

2. DESCRIPTION OF THE OBJECT.

2.1. Basic technical data.

Length: 15.23 m.

Width: 10.14 m.

Aisle height (interior): 4.76 m.

Roof ridge height: 10.00 m.

Maximum height: 11.08 m.

Gross covered area (footprint): 154.43 m^2

Useable area: 119.84 m^2

Cubature: about 820 m^3

Building type: detached

Number of levels above ground: 1

Number of levels under ground: 0

2.2. History of the object.

The date of establishment of Nowe Wymyśle (which was initially called Olędry Czermińskie) is not clear. The available literature on the subject states two dated – 1762 and 1781. The settlement was founded by German evangelicals and as time passed, most of the farms were bought out by Mennonites. The process ended in the 1st half of the 19th century. Wymyśle became an alomst completely Mennonite village. The settlers mainly came from the Flemish communes of Przechówka and Montawy-Grupa (the first wave dated to the years 1762-64). In the years 1818-24, further settlers from Przechówka and Błotnica and Głęboczek on Noteć villages joined the first wave.

The time of building of the first prayer house is not unequivocal, either. According to the literature, the first chapel and the school were built between 1764 and 1770. The building is said to have burnt between 1860 and 1864. On the other hand, other sources inform that the first prayer house was erected in 1813. It was divided into two parts, where one served religious meetings and the other served as a school. The building burnt during the fire in Wymysle in 1845, and in its place, a school was erected in 1854.

What is certain, is the the history of the new, presently existing prayer house. It was erected in 1864, on the plot of and with material donated by Michael Loter. It suffered severely during World War I, when among other things, the roof of the object was destroyed. It was reconstructed in 1924, thanks to aid from Mennonites from the USA.

In the second half of the 19th century, reformatory movements connected with the baptist movement intensified. They resulted in creation of the Brotherhood Church (Mennoniten Bruder Gemeinde - MBG). About 1884, it commenced a very strong missionary activity in Wymyśle. As a result, most of the inhabitants of the village joined the Brotherhood Church by 1895, together with the leader of the Wymyśle Commune, who joined it in 1907. In that connection, the prayer house building was subjected to the rule of MBG. The few members of the old commune accepted the rule of the Kazuń Commune, and religious meetings took place in a specially adapted residential house.

In the post-war period, the building of the former prayer house was used as a library, and in the later period, it was used as a warehouse of herbs belonging to the firm Herbapol. Since the end of the 1990-ties of the 20th century it has been unused, devastated and looted, gradually collapsing into a ruin.

2.3. Description of the architecture and structure of the object.

The building is situated in the centre of Nowe Wymyśle, in an unfenced area adjacent to the dirt road running through the village. Its front façade is oriented towards the west, and the southern façade is parallel to the road. The church area is not delineated at present, fences of the naighbouring properties are adjacent to the building from the western and eastern side.

The object is a compact mass consisting of a cuboidal body without a separated chancel or any extensions, covered with a three hipped roof with the top on the front side and the third slope of the roof on the eastern side. The wall coping of the western gable is a small cast iron cross on a masonry basis.

The original entry to the object was only in the front façade, while at present, it is blinded and replaced with two additional entries in the southern side façade, directly from the side of the road.

The interior of the building is of a hall character, with a chancel not separated architecturally and a choir situated on the western side, under which there is a vestibule leading to the original main entry to the prayer hall and two rooms on its sides. In the smaller, southern room, there are stairs leading to the choir, and the bigger, northern room probably originally fulfilled the function of a vestry. The former prayer hall is of a one-space character, covered with a wooden, plastered ceiling. At present, in the hall, the original wooden floors are missing.

Foundation and base course:

The walls of the building are set on a stone foundation made of granite, erratic blocks bonded with a lime mortar with a depth of about 80-100 cm and width of 71 cm. Above the ground level, the foundation switches into a base course of a height of about 50 cm, which on the external side has a face of chopped erratic stones pointed smoothly, with small chops of dark granite melted in. The stone base course is crowned with a full-brick roll set upright, plastered, with a slope on the external side.

External and internal walls:

They have been made in a masonry structure, of a full brick bonded with lime mortar, where the external walls are 66 cm wide, internal walls 33 and 15 cm thick. All the walls are plastered on both sides with a lime plaster and painted. In the external and internal wall plasters there are elements of the

architectural decoration of the building: indirect cornices and the crowning one, architraves of windows, rustication lines and ceiling plaster coves.

Roof structure:

The original, wooden roof structure over the building has been well preserved. It comes from the time of erection of the building or the period of its renovation in the 1920-ties of the 20th century. Jt is a small standing stud structure, with two studs, consisting of 11 trusses, of which 4 trusses are full, with studs in the side frames and 7 which are not full. The two extreme trusses on the eastern side do not have full-length rafters, except of jack-rafters reaching the hip rafter on the break of the roof slope. The truss beams of the roof structure are at the same time the ceiling beams and are currently suspended on the steel double-tee bar based on the gable and back wall of the building.

Roofing:

The current roofing is steel sheet, galvanized, laid on an incomplete planking, in a very bad technical condition, destroyed to a significant extent.

Ceilings:

Both in the main hall and in the rooms under the choir there are wooden ceilings, based o beams with a planking and a plastered ceiling.

Choir:

The choir structure consists of six wooden beams based on a wooden cross-beam laid on a masonry partition wall between the main hall and the auxiliary rooms and directly on the front wall. The wooden stairs to the choir lead from the room on the southern side of the entry vestibule. The beams of the choir are covered with floor planks, where from the eastern side it was originally limited with a wooden balustrade, currently not existing.

Stairs:

The difference of the levels of the building floor and the terrain is realized by way of external stairs with two steps at the side doors and the main entrance. The stairs are made in brick, with a semi-circular shape.

Inside of the building there is only one flight of stairs leading to the choir, wooden, one-flight, originally having a wooden balustrade, currently non-existing. the structure of the stairs is partly based on the partition wall between the entry vestibule and the auxiliary room.

Window and door carpentry:

The building has a preserved window carpentry dating back to the time of its construction. Those are rectangular windows in the main hall and square windows in the front façade, with an arch-section-shaped header visible from the interior, having a frame structure with a fixed post, two-wing ones, with wings divided into smaller quarters with wooden muntins and mullions. On the external side, the windows had wooden, frame-and-panel shutters with a system of three panels, hung on steel hinges.

At present there is no preserved original door carpentry which consisted of the main entry door, the door between the vestibule and the main hall and two doors to auxiliary rooms. They were probably wooden frame-and-panel doors, one- and two-wing ones.

Floors:

The original plank floors on wooden joists are missing in the building, nowadays. Only in the entry vestibule and in the auxiliary rooms there are preserved secondary cement levelling screeds and remnants of also secondary plank floors.

Installations:

There are no installations, now. Originally the building had no installations. In the post-war period, only an electric and earthing installations were in place.

Interior decoration:

The original decoration of the interior of the object manifests itself with scarcely preserved remnants of the painting decoration of the walls and ceiling, located primarily in the main hall. There exists no iconography of the object from the period of the functioning of the Mennonites prayer house, which does not allow for determination of the original look of the building interior, its character and form of the appearing furnishings. The preserved traces and remnants of the decoration elements allow for concluding that the main prayer hall was of a one-room character with the floor elevated by one step in the eastern part, which constituted a podium for the leaders of the commune and the pastor, with seats and a pulpit.

The walls and the ceiling of the building were covered with a modest painting decoration, located primarily in the main prayer hall. Above the floor, up to the height of the windows there ran an oil paint strip imitating a rustic-type marbling. Above that, the walls and the ceiling were painted with a homogenous light glue colour, without a colouristic distinction of the architectural elements of the cornice and the bevel. Although directly under the cornice and on its profiles there was a painting decoration consisting of repeated elements of stylized plaques and lilies. A painting decoration could also be seen on the bevel of the ceiling and on the ceiling itself, in the form of a painted edge separating the bevel from the plain of the ceiling. Certain elements of a modest decoration in the form of an edge could also be seen above the oil painted strip and in the auxiliary rooms.

3. DESCRIPTION OF THE STATE OF PRESERVATION OF THE STRUCTURAL ELEMENTS OF THE BUILDING.

In the framework of preparation of this documentation, the authors carried out a survey of the structural elements important from the viewpoint of the prepared study. Selected structural elements were measured and their technical condition, type and scope of damages, if any, were verified in order to define the scope of the necessary works and select optimal design solutions. The survey was carried out

after making of local openings of some structural elements, mainly foundations, walls and some elements of the roof structure. Also, the remnants of the painting decoration of the main prayer hall.

Foundation and base course:

Based on the local openings, it can be concluded that the state of preservation of the foundation and the base course is satisfactory, as the structure does not show visible, significant cracks or losses which might affect the stability of the upper parts of the walls.

A big part of the original stone face of the base course was covered with plaster in the later period, and at present some parts of the plaster and the original pointing of the stones has been damaged or destroyed. Also the plasters of the base course on the side of the interior are locally destroyed.

The foundation has no vertical or horizontal insulation against moisture, although the height of the base course and the stone material of which it has been made are the reason why the walls themselves only are only insignificantly subjected to the process of capillary suction of moisture from the ground, which can only take place via the lime joint binding the stones of the foundation and the base course. Thus, the moisture level in the wall and base course within the basement does not deviate from standard values, and the wall does not show visible symptoms of destruction of the joints, plasters and bricks.

External and internal walls:

In spite of local damages, the state of preservation of the wall structure can be assessed as satisfactory, where the only more significant destructions can be found in the eaves zone in the western corner of the northern wall of the building, where the roofing and the upper fragments of the wall have been destroyed. In the remaining parts of the walls there are no significant losses of bricks or damages which might affect the structure. The existing scratches and cracks, visible particularly in the headers of the window openings are not of an active character and they have resulted primarily from the settling of the building, and the cracks visible on the preserved parts of the external and internal plaster work are of a thermal character, resulting from the lack of thermal insulation and cycling frost penetration of the walls.

On the other hand, the plaster work covering the external and part of the internal walls are significantly destroyed or damaged, especially in the places of seepage caused by the lack of or roofing or its leakage. The still existing parts of the external plaster work are loose and the lime joint washed out, which qualifies the whole plaster work for replacement.

Roof structure:

The state of preservation of the roof structure on the building is diversified, resulting from damages to the roofing and elements of the rafter framing. The wood, of which the framing has been constructed - both truss beams, rafters, collar beams, studs and angle braces show a lot of traces of insect feeding in the form of round and oval exit openings characteristic of beetles: a Cerambycid (*Hylotrupes bajulus*) and a death-watch (*Anobium pertinax*) and traces of destruction caused by fungi (brown fungus) and moss and lichen, which have appeared due to damage and leakage of the roofing. The rafter framing is also damaged as a result of dismantling of the reinforcement in the middle – bolts fixing the ceiling joists to the top plate, as a result of which, the middle part of truss beams has sunk-in, causing a tilt and falling down of a part of stud frames, as well as in result of destruction of a part of the roofing and regular flooding by rain water.

The state of preservation of particular elements is as follows:

Truss beams – in acceptable or bad state, deflexed in the middle, with damages on the ends in the northern part, being a result of the damage of the roofing.

Rafters – in various condition – generally good, except the rafters on the northern side, especially north-western side, where there is no roofing and the ends of the rafters which were not covered by the roof have been damaged.

Collar beams – in a good condition, except one destroyed collar beam at the gable wall on the western side.

Studs – in an acceptable condition, partly damaged is the southern stud, there is a visible loosening of the studs fixing in the whole structure, the south-western part of the stud structure has been dismantled – it rests loosely on the ceiling joists – as a result of a damage resulting from wobbling of the structure (removal of bolt fixings at the double-tee bar.

Causes of destruction:

The aging and destruction of wood in the object is caused by many factors which can be gathered in two groups:

1. The **abiotic** factors causing destruction of the wood include:
   - ✓ influence of high temperatures causing decomposition or charring of the wood tissue – resulting from exposure to the sun and attempts to set fire to the object (visible in some of the rooms of the basement),
   - ✓ influence of low temperatures which freeze water in the wood, causing it to crack,
   - ✓ solar radiation causing oxidation of the wood tissue,
   - ✓ mechanical loads of the object structure (static and dynamic) caused by external forces (both stretching and pressing).
2. The **biotic** factors include the influence of fungi, insects, bacteria, lichen and algae.

In the rafter frame of the historical prayer house of Mennonites at Nowe Wymyśle, we have to do with destruction caused by:

1. **Algae and lichen** appearing mainly on the ceiling joists and rafters in the northern slope of the roof on the north-western side and on the planking of the roof structure (part of scantlings on the north-western side).

2. **Brown decomposition fungus**, both a cellar type (Coniophora puteana) and sleeper type (Leutimus lepideus).

3. **Insects**: Cerambycid (Hylotrupes bajulus) and deatch-watch (Anobium punctatum).

a) Cerambycid has attacked mainly the ceiling joists and collar beams and part of the rafters, especially those on the northern side.

- ✓ destruction mostly affected the alburnous parts of the wood,
- ✓ the insect routes create a thick labyrinth of corridors in the shape of a flatenned oval with a diameter of 6-10 mm,
- ✓ the feeding places are filled with wood flour and faeces.

b) the damage caused by death-watch is smaller - it can be observed on the studs and scantlings.

- ✓ affected is both the deciduous and coniferous wood,
- ✓ the insect routes create a labyrinth of corridors with a round shape and a diameter of 2-3 mm.

4. **Mechanical damage** caused by the lack of current repairs, destruction of a part of the roof slope by an uncontrolled disassembly and dismantling of the reinforcement in the form of a steel double-tee rail running along the building, to which the ceiling joists had originally been fastened.

The basis for determination of the degree of destruction of particular affected elements:

The degree of destruction of the examined structural elements, taking into account their historical character, was determined on the basis of the *Technical instruction for impregnation of building timber and elimination of dry-rot in buildings,* issued by Arkady publishing company in Warsaw in 1963 and on the basis of literature on the subject.

The wood built into the object has been affected both by fungi and insects, but to different degrees. Therefore, two separate classifications have been applied in order to determine the degree of damage of the affected wood.

Two degrees of destruction have been adopted for the wood affected by **insects**.

I - THE FIRST DEGREE DESTRUCTION describes the wood affected on the surface layer only, to the depth of 3 cm, where the structure of deeper layers has remained untouched by the feeding insects.

II - THE SECOND DEGREE DESTRUCTION is connected with bigger devastations. On the wood surface there are visible numerous exit openings which constitute evidence of a thick network of corridors existing inside the wood, which principally or totally destroys the wood structure (the changes reach farther then 3 cm).

Damage caused by **fungi** is described by three degrees of destruction.

I - THE FIRST DEGREE describes the destruction of the wood on the surface (affected external layer to the depth of 3 cm.).

II - THE SECOND DEGREE DESTRUCTION describes deeper changes (from 3 to 8 cm) observed in the form of a brown colour of the external layer with numerous cracks in the wood layers.

III - THE THIRD DEGREE DESTRUCTION describes a destruction of more than a half of the section of wooden elements - one can see longitudinal and transverse cracks, the wood disintegrates on the surface, doesn't show cohesion and can be turned to powder by fingers.

In the cases where wood has been attacked both by fungi and insects, the degree of destruction is described by the factor which causes a bigger destruction.

Inventory of the devastations:

No.	Name of element, marking	Cause of destruction	Degree of destruction	Conservator's guidelines	Remarks
Truss I					
1.	Rafter K 1a	Insects, fungi, flooding	III	Replacement	Destruction as a result of regular flooding
2.	Rafter K 1b	Insects, fungi, flooding	III	Replacement	Destruction as a result of regular flooding
3.	Collar beam J1	Insects, fungi, flooding	III	Replacement	Destruction as a result of regular flooding
4.	Truss beam B1	Insects, fungi	III	Replacement	Destruction as a result of regular flooding
5.	Stud S1	Insects	I	Cleaning	
6.	Angle brace M1	Insects	I	Cleaning	
7.	Stud S2	Insects	I	Cleaning	
8.	Angle brace M2	Insects	I	Cleaning	
Truss II					
9.	Rafter K 2a	Insects, flooding	III	Partial replacement	On the length of 130 cm from the northern side
10.	Rafter K 2b	Insects	I	Cleaning	
11.	Collar beam J2	Insects	I	Cleaning	
12.	Truss beam B2	Insects, flooding	II	Partial replacement	On the length of 100 -130 cm from the northern side
Truss III					
13.	Rafter K 3a	Fungi, flooding	III	Partial replacement	On the length of 160 cm from the northern side
14.	Rafter K 3b	Insects	I	Cleaning	
15.	Collar beam J3	Insects	I	Cleaning	
16.	Truss beam B3	Insects, lichen, flooding	III	Partial replacement	On the length of 180 cm from the northern side

17.	Stud S3	Insects	I	Cleaning	
18.	Angle brace M3	Insects	I	Cleaning	
19.	Angle brace M4	Insects	I	Cleaning	
20.	Stud S4	Insects	I	Cleaning	
21.	Angle brace M5	Insects	I	Puttying	
22.	Angle brace M6	Insects	I	Cleaning	
Truss IV					
23.	Rafter K 4a	Insects, lichen, algae, flooding	III	Partial replacement	On the length of 60 cm from the northern side
24.	Rafter K 4b	Insects	I	Cleaning	
25.	Collar beam J4	Insects	I	Cleaning	
26.	Truss beam B4	Insects	III	Partial replacement	On the length of 140 cm from the northern side
Truss V					
27.	Rafter K5a	Insects, fungi, flooding	III	Partial replacement	On the length of 180 cm from the northern side
28.	Rafter K 5b	Insects	I	Cleaning	
29.	Collar beam J5	Insects	I	Cleaning	
30.	Truss beam B5	Insects, lichen, flooding	III	Partial replacement	On the length of 60 cm from the northern side
Truss VI					
31.	Rafter K 6a	Insects, fungi, flooding	III	Partial replacement	On the length of 80 cm from the northern side
32.	Rafter K 6b	Insects	I	Cleaning	
33.	Collar beam J6	Missing	I	Cleaning	
34.	Truss beam B6	Insects, fungi, flooding	III	Partial replacement	On the length of 160 cm from the northern side
35.	Stud S5		I	Cleaning	
36.	Angle brace M7	Missing	I	Cleaning	
37.	Angle brace M8	Missing	I	Cleaning	
38.	Stud S6	Missing	I	Cleaning	
39.	Angle brace M9	Missing	I	Cleaning	
40.	Angle brace M10	Insects	I	Filling-in	Damaged (broken) tenon of the connection with the top plate
Truss VII					
41.	Rafter K 7a	Fungi, flooding	III	Partial replacement	On the length of 200 cm from the northern side
42.	Rafter K 7b	Insects	I	Cleaning	
43.	Collar beam J7	Insects	I	Cleaning	
44.	Truss beam B7	Insects, flooding	III	Partial replacement	On the length of 240 cm from the northern side
Truss VIII					
45.	Rafter K 8a	Insects	I	Cleaning	
46.	Rafter K 8b	Insects	I	Cleaning	
47.	Collar beam J8	Insects	I	Cleaning	
48.	Truss beam B8	Insects	I	Cleaning	
Truss IX					
49.	Rafter K 9a	Insects, algae	I	Cleaning	
50.	Rafter K 9b	Insects	I	Cleaning	
51.	Collar beam J9	Insects	I	Cleaning	
52.	Truss beam B9	Insects, algae	I	Cleaning	
53.	Stud S7	Insects	I	Cleaning	
54.	Angle brace M11	Insects	I	Cleaning	
55.	Angle brace M12	Insects	I	Cleaning	
56.	Stud S8	Insects	I	Cleaning	Fallen down together with the angle braces, it rests on the ceiling joists, undamaged
57.	Angle brace M13	Insects	I	Cleaning	
58.	Angle brace M14	Insects	I	Cleaning	
Truss X					
59.	Rafter K 10a	Insects	I	Cleaning	
60.	Rafter K 10b	Insects	I	Cleaning	
61.	Collar beam J10	Insects	I	Cleaning	
62.	Beam Truss. B10	Insects	I	Cleaning	
Truss XI					
63.	Rafter K 11a	Insects	I	Cleaning	
64.	Rafter K 11b	Insects	I	Cleaning	
65.	Collar beam J11	Insects	I	Cleaning	
66.	Beam Truss. B11	Insects	I	Cleaning	
Truss XII					
67.	Rafter K 12a	Insects	I	Cleaning	
68.	Rafter K 12b	Insects	I	Cleaning	
69.	Beam Truss. B12	Insects	I	Cleaning	
Stud frame purlins					
70.	Northern	Insects	I	Cleaning	
71.	Southern	Insects	I	Cleaning, re-assembly	The connection of the two components of the purlin is damaged

Roofing:

The state of preservation of the currently existing roofing is very bad, many missing parts and leakages are visible, especially on the western part of the northern and southern slope. The roofing qualifies for replacement on the whole building. Also replaced should be most of the planking constituting a basis for the sheet metal roofing.

Ceilings:

The ceiling structure over the main hall is in similar state as the truss beams of the rafter framing. Due to a considerable span, weakening of the wood and dismantling of the structural hangers supporting the truss beams in the middle of their length, the beams have considerably warped in the central part. Also the planking of the ceiling is partly destroyed together with the plaster which covers it, especially on the north-western side, where the roofing is missing and the planking is often flooded with rain water. Hence, the planking of the ceiling and the plaster qualifies for a total replacement.

Also, the structure of the ceiling over the auxiliary rooms and the choir is totally destroyed. The still existing structural beams are significantly damaged biologically due to frequent flooding with rain water (in the northern part), and in the southern part, they are incised, probably with a view to prepare them for disassembly and removal. Also destroyed is the planking of the ceiling on the side of the auxiliary rooms and the entry vestibule, thus qualifying the whole ceiling for a total replacement.

Stairs:

The external stairs in the front façade are covered with debris, now, and hence not accessible for survey aiming at assessment of the state of preservation. That will only be possible in the phase of carrying out of the overhaul works.

The internal stairs leading to the choir are in a principally good condition, only one step and the balustrade are missing. The stairs qualify for repair and making-up for the missing elements.

Window and door carpentry:

The existing window carpentry has been preserved in a very bad state, only the architraves with the central post have been preserved in a big part, significant destructions of architraves only appear in the northern wall. The window wings and shutters have preserved in a residual state and need to be completely reconstructed on the basis of the remnants. The original, preserved hinges of the shutters can be used in the new windows.

At present, the building has no preserved door carpentry, only one door has survived, which probably led to the locker under the stairs.

Floors:

The floors have been preserved in a residual state, they need to be completely reconstructed.

Installations:

Currently there are no installations in the building.

Decoration of the interior:

Only part of the original painting decoration of the walls in the main hall has survived. The oil paint strip, imitating a marble, has been preserved in about 80%. Decorative elements of the upper parts of the walls, in the form of stylized plaques and lilies and the ceiling edges have been only partly preserved, but they offer a possibility of restoration of the original form. However, the decorations of the walls of the other, auxiliary rooms are completely illegible.

4. TECHNICAL DESCRIPTION OF EXECUTION OF THE OVERHAUL WORKS.

4.1. Scope of building works.

Phase I – demolition and disassembly works.

Phase II – building and overhaul works.

Phase III – finishing works.

4.2. Demolition and disassembly works.

Due to the scope of the planned works it is necessary to execute the preceding demolition and disassembly works of a part of the structural elements. Demolition works must be executed with an utmost care, while strictly abiding by the occupational health and safety regulations. A particular cautiousness is recommended with regard to the disassembly of the structural elements of the object, especially seeing to it that parts not destined for disassembly are not damaged.

Demolition and disassembly works will be carried out in the following scope:

Foundation and base course:

No disassembly works are foreseen with regard to the foundation structure and the base course, except shipping off the secondary plaster work from a part of the base course on the side of the interior. As regards the destroyed joints between the base course stones, they should be chipped off to the depth of 1-2 cm, and the surface of the stones should be cleaned.

External and internal walls:

Similarly as in the case of the base course, it is not assumed that the structure of the walls will be disassembled, except of chipping off the destroyed and loose external and internal plaster work. Due to the significant destructions, the plaster work on the external side should be chipped off in whole, and on the internal side, they should only be chipped off after making sure that they are loose. Joints in the wall should be removed to the depth of 1-2 cm, and the wall surface should be cleaned.

Roof structure:

The destroyed elements, destined for replacement, should be dismounted and removed. Disassembly of collar beams and rafters should be carried out section by section, 1-2 trusses at a time, in order not to cause a damage to the structure.

The destroyed ends of rafters and truss beams should be removed on the length of specified in the documentation. Before the execution of the works, the structure should be secured against destruction. Demolition materials should be stored in a selected place and then disposed of following the progress of the disassembly works.

Roofing:

The roofing is to be completely disassembled including the planking, after a prior securing of the roof structure and the building against flooding in case of raining.

Ceilings:

The scope of works on the ceiling over the main hall and under the choir will consist in disassembly of the existing, destroyed ceiling, and in the case of the choir, also the existing structural beams. The demolition debris should be stored in a selected place and then disposed of as the disassembly works are progressing.

Stairs:

No demolition works are foreseen as regards the stairs.

Window and door carpentry:

The elements of the window carpentry destined for replacement (elements of window wings, shutters and parts of architraves) and fully the windows destined for liquidation should be disassembled and stored in a selected place. Also the existing internal door frames are to be fully disassembled.

Floors:

The still preserved remnants of planks and floor joists should be disassembled and stored in a selected place. Also, the existing secondary cement floor leveling in the entry vestibule and in the auxiliary rooms should be completely chipped off.

4.3. Building and overhaul works.

A wide scope of building and overhaul works is foreseen in connection with the walls of the building, concerning primarily the execution of local reinforcements of the walls and liquidation of cracks and making of a new external and internal plaster work. In the scope of the roof structure it is assumed to replace the destroyed elements of the rafter framing and making of a new roofing of a zinc and titanium sheet. The scope of the works also includes reconstruction of the window and door carpentry, an overhaul of the choir structure, making of new floors and ceilings and restoration of the original painting decoration of the walls.

It is assumed that the building works will be executed by qualified, competent and trained working teams, possessing an appropriate professional knowledge and qualifications, the required building and conservator licences and provided with the necessary specialist equipment.

The building and assembly works should be carried out in accordance with respective ITB (*The Institute of Building Technique*) technical conditions of execution and acceptance of building works and the standards referred to in the above mentioned works, based on which the below described scope of works and recommendations have been prepared. The contractor will be obliged to know and abide by, during the works, all the regulations concerning environmental protection, fire safety and occupational health and safety.

The scope of the overhaul works which need to be executed has been determined on the basis of technical expert opinions obtained for the needs of the project and on the basis of the survey of the object carried out by the authors of the study. Also the conditions resulting from the historical character of the building, and the possession by the object of given artistic, historical and scientific values subject to the conservator's protection have been taken into account.

Description of execution of the works:

Foundation and base course:

It is assumed that the existing foundation and the stone base course will be repaired, including restoration of the original character on the external side, with visible chopped erratic stones and joints floated smoothly with small fragments of dark granite melted in. Because of the structure of the foundation and base course, it is not foreseen to make an anti-moisture insulation between the base course and the wall.

Detailed description of the execution of the works:

1. After removal of the secondary plaster work of the base course stones on the external side and chipping off the joints to the depth of 1-2 cm, new cement and lime joints smoothly finished should be made, and then small particles of dark granite or basalt should be melted into the joints between the stones.
2. The upper part of the base course in the scope of the brick reel should be covered with a cement-lime plaster with addition of sealing and adhesion improving agents, with slant of the base course protrusion equal to 2-3%.
3. On the internal side, the base course should be covered with a plaster work, just as the interior walls.

External and internal walls:

The overhaul works will consist in a repair of wall cracks with the use of steel rods set in the wall, repair of the destroyed parts of the walls in the zone of the crowning cornice in the north-western corner, in the place of destruction of the roofing and a total replacement of the external and internal plasters and restoration of the existing elements of the architectural decoration of the façade.

The project also assumes a restoration of the non-existing wall between the auxiliary room and the entry vestibule, liquidation of the blindings of the original door openings (the main door in the front façade and the door from the vestibule to the main hall) and blinding of the secondary door openings in

the southern façade and secondary window openings between the auxiliary rooms and the main prayer hall.

The proposed method of repairing of the wall cracks with the use of steel rods set in the wall will allow for liquidation of the existing cracks and will secure the walls and plasters against appearing thereof in the future.

NOTE:

The design drawings show schematically the existing cracks qualified for reinforcement, however the full scope of the works and the layout of rods will be only possible for assessment after chipping off the plaster works and cleaning of the wall. As a standard, rods are fixed on every two or three layers of bricks, and this also concerns at least 2-3 layers above and below the crack. The length of rods is minimum 100 cm, 50 cm on each side of the crack. In case of reinforcement of parallel cracks, one can apply one longer rod, but it should extend at least 50 cm on each side of the crack. In liquidation of cracks at corners of the building or next to windows, the rod should be bent to a minimum 10 cm and fixed in a slit in the adjacent wall or a reveal.

In case of horizontal cracks, one should make vertical furrows with a furrow making tool and fix the rods vertically in the furrows, and in case of arch headers - on the arch line.

Reinforcement of cracks in the wall should be made in the similar way, absolutely on both sides of the wall!

The decision concerning the number of cracks to be reinforced and the layout of rods should be taken by the site manager together with the supervising inspector after consulting the designer.

Detailed description of works to be executed in the framework of the overhaul of the walls:

1. After a complete removal of the remnants of old plasterwork, the wall should be cleaned of loose fragments of bricks and crushed joints. The joints should be cut off to the depth of 2 cm and cleaned.
2. The destroyed bricks in the top cornice should be removed, the cornice should be supplemented with new solid bricks in place of the missing ones, on a lime mortar in accordance with the existing state.
3. In places qualified for fixing of rods, furrows should be cut to the depth of minimum 10 cm (due to the lack of thermal insulation of the wall) and width corresponding with the length of the rod (min. 100 cm). Mortar should be removed from the whole thickness of the joint.
4. The furrows should be cleaned with vacuum cleaner and the joint and brick should be rinsed with plenty of water.
5. A cement mortar class M20 min. M5) about 2 cm thick should be inserted to the end of the furrow.
6. A rod ø 8 mm (max. ø 10 mm) made of steel class AIII should be pressed into the mortar in order to obtain an equal cleading.
7. A next layer of cement mortar should be inserted so as to cover the whole rod and filling the joint to the depth of 2 cm.
8. During drying, the mortar should be moistened with water. The remaining part of the joint should be filled with a mortar corresponding with the mortar applied in other joints of the wall.
9. The places where the rods have been fixed should be strengthened by way of sinking in the bottom layer of the plaster of a metal lath (Rabitz screed) or optimally a special glass fibre screed used for reinforcement of wall structures (Mapegrid G 220, produced by Mapei), which will also spread the tensions appearing in the wall.
10. After making of the reinforcement of the cracks in the walls and fixing of the new window carpentry, a new cement-lime plaster work should be made including restoration of the original architectural decorations of the façade.
11. After drying of the plaster work, the walls should be covered with silicate paints in colour S 3060-Y20R as per the NCS colour palette.

Roof structure:

The state of preservation of most of the components of the rafter framing is generally good, but nevertheless, many of them need conservation and some must be replaced - especially the ends of truss beams and rafters in the north-western part of the building, which have been irreversibly damaged. Overhaul of the roof structure will be realized by way of replacement of destroyed elements with new ones and repair of damaged elements which still can be repaired.

The evaluation of the state of preservation of the elements of the rafter framing has allowed for determination of the extent of destruction of particular examined elements and determination of the scope of the necessary repair. **71** elements constituting the rafter framing structure were examined with the following conclusions:

- ✓ **4** need to be completely replaced (5.7 %) – they make Truss I,
- ✓ **12** need to be partly replaced (16.9 %),
- ✓ **1** needs puttying (1.4 %),
- ✓ **1** needs filling-in (1.4 %),
- ✓ **53** need cleaning (74.6 %)

The first degree destruction affected **55** elements, the second degree **1**, the third degree **14**.

NOTE:

The detailed description and scope of the repairs has been specified in the tables titled "Inventory of destructions" in part 3 of the design. One should strictly abide by the recommendations contained in the table as regards the scope and method of repair of the given element.

The replacement and repair works on the elements should be executed with special care, section by section, after removal of the roofing and scantlings.

New elements and repair elements should be made of pine wood and have dimensions compliant with the design documentation and the original. The existing tenon connections of elements should be restored.

Replacement elements should be made of solid timber class at least C30, sorted for quality and strength, classified with strength methods. Qualification principles should be based on a visual and mechanical assessment and meet the requirements stated in PN-82/D-09421, PN-B-03150:2000 and PN-EN 518 or 519.

The timber should be seasoned, with maximum moisture content not bigger than 15%, before building it in, it should be secured against fire, fungi and insects by way of pressure and vacuum impregnation, or in case of big-size elements, the impregnation should be made manually or by way of spraying or painting. After an additional processing, the elements will have to be additionally impregnated on the surface in the processed places.

Impregnation agents which can cause corrosion on steel should not be used. The preparations should be compliant with the requirements of PN-C-04906:2000 and the requirements given in the product technical approvals.

Note:

While accepting the materials and wooden structural elements on the site, one should verify the conformity of the type, class, category and dimensions of the elements with the requirements stated in the design.

Wooden structural elements should be secured against a long-lasting moistness in all phases of their preparation.

Impregnation preparations should be applied in strict accordance with the producer's recommendations stated on the packaging or technical specifications, absolutely abiding by the "use before" dates.

Detailed description of execution of the works:

1. The suspension of the truss beams on the steel double-tee bar with steel hangers with bolts should be restored.
2. All the conservation works should be carried out under permanent conservation and building supervision. The joinery and carpentry works should be done, to the extent possible, with traditional tools and traditional technique.
3. Elements qualified for replacement, not suitable for re-mounting, should be copied on a new material before being burnt. Elements qualified for re-use (fully or after re-filling) should be cleaned of nails, added elements, dirt, pits and dust.
4. Wood used in conservation works should be properly assorted, seasoned, dry, with a similar layout of annual rings as those in the building, in order to reflect and maintain the authenticity of the object and historical faithfulness.
5. Depending on the extent of destruction of the elements, it will be necessary to carry out the following procedures - cleaning, roughing out, supplementation, filling-in, sealing, replacement.

A. Cleaning - in case of elements destroyed on the surface:

Elements destined for processing should be thoroughly cleaned of all the corroded parts with the use of a wire brush, ripping chisels, spokeshaves, etc.- fungicidal and insecticidal procedures should be carried out.

B. Roughing out - in case of elements destroyed not more deeply than 3 cm inside the wood structure:

This concerns the elements which have been affected by the first degree destruction. An element may be damaged on its fragment or on the whole length or width. Elements to be processed should be cleaned in the destroyed places with the use of a carpentry axe or (when it is destroyed on the whole length and width) should be whittled with a plane, edging machine - then, fungicidal and insecticidal procedures should be carried out.

C. Sealing - supplementation of sawdust and glue masses - in cased of elements characterized by local, narrow, deep destructions on planes:

This concerns the elements which have been affected by the second degree destruction. when sealing the wood, one should:

1. Clean the destroyed surface of the wasting in a ceiling joist, using a wire brush and a wood chisel and a hammer.
2. Disinfect the cleaned cavity by way of application of three layers of an insecticide and fungicide preparation and dried.
3. Make-up for the loss with a sawdust-resin mass.

The making of the sealing should include the following actions:

1. Drill openings in the effected part of the element.
2. Hammer-in wooden pegs with a sharp end into the openings.
3. Prepare a small quantity of glue and applying it once (grounding) on the surface of the loss and waiting for the glue to dry.
4. Prepare a sealing mass in accordance with the following recipes.

a) for big, deep losses three sets of sealing masses:

- ✓ the first one is a mixture of glue with woodchips,
- ✓ the second one is glue mixed with sawdust,
- ✓ the third one - external - is glue with wood flour and pigment stain or a natural dye (ground bark).

b) in case of smaller cavities, the sealing mass may be homogenous.

5. Apply the prepared mass on the cavities and press it in, e.g. with a small glass stick.
6. After the external surface of the sealing has completely dried, polish it with the use of a polishing disk with a corundum abrasive paper, held by a mechanical drill.

D. Tapping - supplementing with the wood-to-wood method - in case of elements with local destructions of the wood tissue reaching deeper than 3 cm.

This concerns the elements affected by the second and third degree destruction.

The making of the wooden element taps should include the following actions:

1. The taps should be made of wood of the same species, healthy, without defects, seasoned for at least 5 years (the best way would be to use an older wood, coming from demolition of another wooden structure).
2. The new and old wood should be matched from the viewpoint of similar run of the annual rings.
3. Moisture content in the new element should be the same as moisture content of the old element (air moisture free wood).
4. It is not allowed to use moist wood or wood dried in drying rooms.

The making of taps should include the following actions:

1. Rough out the affected wood, giving the wastage a geometric form - the destroyed fragment of the element should be cut out.
2. Clean the surface of the element.
3. Secure the whole filled element against further destruction with a fungicide and insecticide preparation.
4. Fill the wastage with the tap.
   a) make and adjust the tap - depending on the place and degree of destruction one should apply: head, tray or surface taps,
   b) apply the fungicide and insecticide preparation to the tap,
   c) prepare glue for bonding of the tap with the element - apply a layer of glue to both parts,
   d) connect the glue-covered surfaces and press both elements with a woodworker's vice and leave for 12 hours.

Roofing:

It is planned to make a new roofing of zinc and titanium plate metal with the thickness of 0.7 mm, connected by way of a standing seam. The sheet metal will be patinated by the producer.

The sheets will be assembled on a full planking with separation layers in the form of a steam-penetrable foil and an 8mm-thick spatial separating matt. Only system elements produced or recommended by the producer of the roofing should be used.

The timber for planking should be seasoned, with a maximum moisture content of 15%, secured against fire, fungi and insects by way of a pressure-vacuum impregnation before building it in. After an additional processing, the elements need to be additionally impregnated on the surface of the processed places.

Impregnation agents which can cause corrosion on steel should not be used. The preparations should be compliant with the requirements of PN-C-04906:2000 and those stated in the technical approvals of the products.

Description of the roofing works:

1. Lay a full planking on rafters, horizontally, the planks should be 3.2 cm thick, laid butt to butt.
2. Lay on the planking the separating layers of steam penetrable foil and an 8mm-thick spatial separating matt.
3. Cover the whole roof with a zinc and titanium metal sheets, connected by way of a standing seam.

Ceilings:

It is planned to completely replace the planking of the ceilings, both in the main hall and in the auxiliary rooms. New plastered and painted ceilings are foreseen, including a plaster cove made between the walls and the ceiling. The ceiling planking works should be carried out after or parallel to repair and replacement works on the roof structure elements.

Planks for planking of the ceilings should be 1.8 cm thick, butted to the bottom part of the joists, then plastered with a cement-lime mortar on a steel mesh and painted.

The timber for planking of ceilings should be seasoned, with a maximum moisture content of 15%, planed on both sides, secured against fire, fungi and insects by way of a pressure-vacuum impregnation before building-in. After an additional processing, the elements need to be additionally impregnated on the surface of the processed places.

Impregnation agents which can cause corrosion on steel should not be used. The preparations should be compliant with the requirements of PN-C-04906:2000 and those stated in the technical approvals of the products.

Choir:

The works on the choir will consists in restoration of the whole wooden structure of the choir, consisting of six pine wood joists with section dimensions 20x20 cm and length about 355 cm. The joists are to be based on the transverse partition wall via a wooden beam with sectional dimensions 20x20 cm and length about 886 cm.

NOTE:

The dimensions of the elements are approximate. Before ordering the elements, they should be thoroughly measured and the order should provide for an extra 20-30 cm.

The ends of the joists in the place of their basing on the western wall and the whole beam lying on the transverse partition wall should be insulated from the wall with the use of a bituminous roofing paper. On the bottom part of the joists in the auxiliary rooms, there should be made wooden ceilings, plastered. The floor of the choir should be made of 3.2 mm thick and 30-35 cm wide pine wood planks. On the side of the hall, the wooden balustrade should be restored in accordance with the design documentation.

The requirements regarding the class, quality and impregnation of wood are the same as in case of the roof structure.

Stairs:

The state of preservation of the external stairs at the main entrance to the building in the front façade is unknown. After removal, during the overhaul works, of the debris covering the stairs, one should evaluate their state of preservation, and in case of a good or satisfactory state of preservation, repair works should be carried out, and in case of a bad state of preservation, the stairs should be demolished and restored in accordance with the archetype. The stairs are made in brick, consist of two steps in a semicircular shape.

Because of the principally good state of preservation of the structure of the internal wooden stairs leading to the planned choir, the design only assumes a repair and restoration of the missing elements.

Description of execution of the works on the stairs:

1. Clean the existing structure of the stairs from the secondary painting, fill-in the losses, if any, with wooden taps.
2. Supplement the missing steps and the balustrade in the choir in accordance with the design documentation.
3. Reconstruct the casing of the locker under the stairs on the side of the entry vestibule together with the door carpentry.
4. Cover the whole structure with painting coats in the same colours as the wooden elements of the interior and the door and window carpentry.

The requirements concerning the class, quality and impregnation of wood are the same as in case of the roof structure.

Window and door carpentry:

Due to the bad state of preservation, the whole existing window carpentry will be replaced, with maintenance of the existing and being well preserved wooden architraves and posts. The architraves should be subjected to a conservator works, and the destroyed or damaged elements, if any, should be replaced.

New windows should be made in accordance with the design documentation, on the basis of the profiles of existing remainders of the stiles. Window wings are not separable, fixed permanently with hooks. Panel panes, rolled or so called "bubbled". The window carpentry is to be painted with the same colour as the door carpentry and wooden elements of the interior, the styles are of pine wood, free of knots, impregnated.

All the windows have similar dimensions, differing by 1-2 cm on the length and width. Because only window wings will be replaced and the architraves will be left, it is necessary to verify the compliance of dimensions in the design documentation and the actual dimensions.

As regards shutters, the preserved hinges and fittings should be transferred, after cleaning and conservation, to the new windows. Internal window sills are made of wood and will have to be restored in full.

All the door carpentry has to be replaced with a new one made in accordance with the design documentation. The doors are to be painted in the same colours as the window carpentry and the wooden elements of the interior, made of pine wood, free of knots, impregnated. Painting coats are to be made with environmentally friendly, water-soluble paints. Fittings made of brass, stylized to look like historical ones.

Floors:

It is planned to completely replace the floors in all the rooms and in the choir. Because of the historical character of the building, it is proposed to use traditional solutions in the form of a plank floor on joists.

The floor joists will be made of pine wood with section dimensions 10 x 12 cm laid on posts made of solid brick. Between the posts and joists there will be an insulation made of two layers of bituminous paper. The posts with section dimensions 25 x 25 cm (the width of one brick) and height equal to three bricks. The posts will be put on a 15 cm thick base made of a stabilized gravel or broken stone, between the posts there will be a 3-5 cm layer of sand mixed with hydrated lime. The posts will be situated in accordance with the layout shown in the design drawing.

The floor planks will be made of pine wood, laid longitudinally (parallel to the longer walls of the building) with a width of 30 to 35 cm (arranged alternately), thickness 3.2 cm. Approximate lengths of the floor planks: 5.17 m in the main hall and 3.28 m in the auxiliary rooms and the vestibule. Planks planed, laid butt-to-butt, with own feather and key and fastened to the joists with wooden pegs.

The requirements concerning the class and quality of the wood are the same as in case of the roof structure. The new floor planks should be impregnated and their surface should be secured against destruction. The recommended method of securing – oiling, which secures the planks in the best way and creates a characteristic look of the surface, adjusted to the historical character of the interior of the building.

4.4. Finishing works.

<u>Interior decoration:</u>

Due to the lack of archival iconographic documentation showing the interior of the Mennonites' prayer house and still undecided purpose which the building will serve, the present phase only includes the designing of the painting decoration of the walls, while the issues concerning the furnishing of the rooms, especially the former main prayer hall has been left for elaboration in the future.

The design assumes a restoration of the original painting decoration, in accordance with the preserved patterns. Only the original oil-paint strip on the wall can be lefty after cleaning and conservation and adding the missing fragments.

Due to a significant fading away of the decorations on the walls in the auxiliary rooms, which give no possibility of restoration of the original decorations, it has been planned to leave those rooms without decorations, except giving them a uniform, light colours of the walls and ceilings.

The detailed design of the colours of the internal walls has been shown on the design drawings. It assumes execution of the following decorative elements of the main hall:

1. Oil paint wainscot having a character of a rustic marbling on the internal walls of the main prayer hall up to the level of the window sills (conservation of the original and filling in of the missing fragments). The wainscot is both on the perimeter walls of the building and on the internal wall between the main hall and the auxiliary rooms.

   The wainscot made in oil paint, with colours matching the original, the background grey and green S 0500 N, elements of marbling are darker: S 3060-Y20R and S 3063-Y10R in accordance with the NCS palette of colours.
2. Under the cornice on top of the wall - the frieze consisting of a strip of stylized plaques in the kidney-shaped volutes and interior alternately in blue and red colour.

   The decoration is to be made with wall paints in colours matching the original, the volute in brown colour M 05680 Y4J, the interiors in blue and red colours at various tonal degrees: T 5020-Y70K, T 5030-Y70K, T 5040-Y70K and M 9850-G2L, M 9851-G2L, M 9852-G2L in accordance with the NCS palette of colours.
3. Between the plaques there is background in pink colours, at the bottom with a motive of stylized, geometrized ending of a lily, with a lighter interior.

   Decoration made in wall paints in colours matching the original, pink colour with a diversified tonal degree M 09870 M0J and M 09871 M0J in accordance with the NCS palette of colours.
4. On the cornice profiles, a strip of stylized, geometrized lilies with a background in the shape of arcades.

   Decoration made in wall paints in colours matching the original, green colour with brown and blue inserts, a pink arcade background. Colours of the lilies: T 5020-Y70K, T 5030-Y70K and M 9850-G20L, background: M 09871 M0J in accordance with the NCS palette of colours.
5. Above the cornice, a plaster cove in the forms of strongly re-stylized and geometrized arabesque, limited on the ceiling with an undulated edge and a motive of lilies in the corners.

   Decoration made in wall paints in colours matching the original, decoration on the plaster cove in colour T 5020-Y70K, the edge in S 3060-Y20R J, lilies M 9851-G20L in accordance with the NCS palette of colours.
6. The colours of the wall and ceiling surfaces in all the rooms, both in the main hall and in the auxiliary rooms will be uniform, with imposed decorative elements as above. The walls painted with wall paints in light cream colour, colour No. M 09871 M0J in accordance with the NCS palette of colours.

   NOTE!

All the colours defined on the basis of the palette of colours are of an approximate character. In case of all the elements it is necessary to make trial paintings on a smaller surface, and only based on that, the appropriate shade and intensity of the colour should be selected.