

BUILDING GOOD PRACTICE

Music School Complex – Tychy, Upper Silesia

GENERAL INFORMATIONS	
Name of the public building renovation:	Music School Complex in Tychy
Index of Building Good Practice (ex. BGP n°1 – IT)	BGP n°3 – PL
Sub-group	Schools
Description	Photo
	 
Address	53 Niepodległości Street, 43 – 100 Tychy

Public sector contractor	Service and production Enterprise Concret Zbigniew Boczkowski and Jan Góra, ul. Fabryczna 10, 43 – 100 Tychy
Architect Engineering consulting	Architectural Design Studio „ARCUS” Damian Kulisz, Andrzej Szymon, 12 Piłsudskiego Street Ap. 312, 43 – 100 Tychy
Building Characteristics (surface, number of users, orientation etc.)	Net surface volume – 3021 m ² (heated), Number of users – 370 number of floors – 3, footprint – 1121 m ² ,
Date of construction	1965 - 1970
Legal aspects (e.g.: protected property)	Does not concern.
Date of renovation	2009 - 2010
Nature of the work (short description)	<p>Within the framework of accepted project of thermal modernization the following work was finalized:</p> <ul style="list-style-type: none"> – thermal insulation of walls and roofs with necessary building finishing, – replacement of external windows and door, – modernization of central heating system, – installation of mechanical air-to-air handling unit in concert hall, installation of air-conditioning, – additional works connected with insulation (e.g. bands, the installation of lightning rod, bars, gutters etc.). <p>Additional works concerning the modernization of school building:</p> <ul style="list-style-type: none"> – general repair of the building: floors, tiles, internal partition system, – rebuilding of construction and communication inside the building in order to set off additional rooms (including the audiovisual room, recording studio) and enlargement of classroom system, – acoustical isolation of rooms and repair (eurhythmic class, staff room, reception near concert hall, basement),

		<ul style="list-style-type: none"> – replacement of electric and lighting installations (energy-saving materials), – drainage of foundations and cellars, – adaptation of cellars into percussion rooms, – reconstruction of the installation of natural gas, together with the installation of the detection of gas, – reconstruction of fire installation and hydrant, – partial reconstruction of water-supply and sewage installation.
	Budget and source of financing	<p>Total cost of the task: 4 200 885 PLN, including:</p> <ul style="list-style-type: none"> – city budget: 2 103 208,25 PLN, – Regional Development European Fund: 2 097 676,75 PLN.
AVAILABLE RESULTS		
What were the big problems (in terms of energy efficiency) to tackle?	<p>The object was built in seventies, when construction standards were considerably lower. The building was not the subject of general repair or improvement and this is why significant losses of heat were observed due to low thermal insulation of internal partitions, but also the lack of control and management of energy in the building, especially heat energy – the most significant factor in heat consumption in music school complex.</p>	
Has this building been already analysed and certified?	<p>Energy audit of the building does not include data about consumption of electric energy itself.</p> <p>According to the summary of the audit the demand of energy gross before was 3 611,3 GJ/year, and now it comes up to 171,4 GJ/year. Annual savings in exploitation is about 84 272 PLN.</p>	
What are the key innovative energy efficiency measures undertaken through the renovation?	<p>Within the framework of this investment the renovation work included: thermal modernization of the building with the replacement of external windows and door, central heating system, recuperation system installation for ventilation and heating. The modernization resulted in:</p> <ul style="list-style-type: none"> – expected thermal comfort for users, – large savings in heating expenses, – achievement of the greater efficiency of the entire installation including the hot-spot, – achievement of measurable ecological effects. 	
What are the measurable improvements in terms of	<p>Before the thermal modernization the consumption of energy was 52 161 kWh/year, after the investment it comes up to 41 864</p>	

energy efficiency (kWh saved)?	kWh/year. The energy savings are at the level of 10 297 kWh/year.
Ecological Effect	
ENERGY EFFICIENT MEASURES	
Energy efficient measures of the building envelope	<ul style="list-style-type: none"> – thermal insulation of walls, roofs including building finishing and necessary flashing (before the thermal modernization: external walls built in traditional technology, made of brick and air-brick with heat transfer coefficient of 0,784 W/m²K over part A of the building and 1,382 W/m²K in the remaining part (the harmonized standards failed); – replacement of external window frames for new ones with the heat transfer coefficient of 1,6 W/m²K including underpinnings (before thermal modernization: old aluminium windows in bad condition with heat transfer coefficient of 3,2 W/m²K); – replacement of old door for new with heat transfer coefficient of 2,0 W/m²K (before the thermal modernization old, cracked external door, poor technical condition with the heat transfer coefficient of 5,1 W/m²K).
Energy efficient measures of the heating system	<ul style="list-style-type: none"> – modernization of central heating system including: replacement of pipes and radiators, new thermostatic valves installation, distribution of central heating within the building (before the modernization two-pipe system made of steel welded wires in bad technical condition, cast-iron radiators, partially exposed, made of finned tubes and few steel plates); – installation of mechanical air-to-air handling unit in concert hall.
Energy efficient measures of monitoring energy	Complete modernization of heat exchanger centre in 2004. Automatic Timing- Weather System controlling and monitoring the operation of heat exchanger centre and heating circuits in order to adjust the inside temperature to outside conditions.
Energy efficient measures regarding behaviour	All employees and pupils were instructed on subject connected with energy saving – opening windows during low temperatures periods, other energy saving issues).
Parties engaged	The City Hall of Tychy – the unit of local government responsible for the preparation and realization of investment.
SUSTAINABILITY OF THE RENOVATION	
Design and choice of	The following materials were used:

<p>sustainable materials?</p>	<ul style="list-style-type: none"> – façade Styrofoam , – silicon thin-layer plaster, – plasterboards, – rubber floor finish , – suspended ceiling system, raster, – interior doors with improved sound insulation, – aluminium windows with improved acoustic performance. <p>The right type of materials necessary to carry out construction work and receive certificates and approvals was chosen by the designer in the design documentation of the investment. However accordingly to Public Procurement Law provisions the public entity is not allowed to define the manufacturer of product in the specification of essential terms, but is obliged to describe the technical parameters of products, including certificates and quality tests. This is why the specification of essential terms provisions admits using materials of equivalent parameters than specified in documentation.</p>
<p>Sustainable building site management? (sorting waste, water...)</p>	<p>In order to implement the project in accordance with applicable law modernization work was carried out according to "information on safety and health protection", which is part of the construction project. The above-mentioned documentation contains instructions on how to carry out the works in respect of:</p> <ul style="list-style-type: none"> – development of building site (including fencing and destination of danger areas, construction of streets, entrances and exits for pedestrians, electric energy and water supply, sewage system and utilization, arrangement of social and sanitary rooms, natural and artificial lighting, storages for materials and products etc.); – earthworks (including: conducting work on a project basis specifying the location of installations and groundwater devices that may be in the range of work carried out, setting the light barrier for the dusk around the earthworks etc.); – construction works (including: weather conditions for large size element installation, light distribution around construction sites, work area at height – special bars for people working more than 1 m above ground level etc.); – building completion (including: adequate powers of staff engaged in assembling and dismantling of scaffolds, the use of devices to prevent falls from scaffolds, danger zones

	arrangement during the works, etc.), machinery and technical equipment used during construction (including installation and operation of machinery accordingly to operating instructions etc.).
Application of a valuation method (BREAM? HQE? Others?)	No
BUILDING MAINTENANCE: life of the building after the renovation	
Is the building object of an energy monitoring? Is there a responsible manager?	<p>The building is not the subject of energy monitoring process.</p> <p>On the other hand installed automatic Timing- Weather System controls the work of heating system and heat exchanger centre in order to adjust programmed temperature to inside and outside weather conditions.</p>
Who is in charge of the maintenance of the heating system of the building?	Building administrator – The Management of Music School Complex in Tychy.
Who is in charge of the day to day energy management?	Building administrator– The Management of Music School Complex in Tychy.
Are there some specific measures to raise energy awareness and to implicate users in energy efficiency?	The decrease of maintaining expenses through additional insulation of the building and the proper number of radiators. All employees and pupils were instructed on subject connected with energy saving – opening windows during low temperatures periods, other energy saving issues).
TRANSFERABILITY	
Transferable aspects according to the partner in charge of this example of good practice	<p>Transferability of planning (forming a partnership, choosing priorities, setting up a renovation building teams, etc.)?</p> <p>The process of preparation and realization of the investment is always carried out by the City Hall Departments. That is why thermal modernization of the public buildings is also conducted by Department staff in the City Hall of Tychy.</p>
	<p>Transferability of the process of renovation (management structure, monitoring system, implication of end users, participation, etc.)?</p> <p>The City of Tychy is a local government unit and in order to prepare the project documentation and realization of the task the provisions of Public Procurement Law are binding. That is why there is a possibility to transfer the process of preparation and</p>

	<p>realization of the investment to other institutions obliged to adopt the regulation of public procurement law.</p>
	<p>Transferability of results (good solutions, adaptability, change of behaviour, etc.)?</p>
<p>Transferable aspects according to all the partners of Serpente project</p>	<p>The other partners will analyse and validate these good practices. During the process of validation the partners will take on the role of auditors because they will assess and improve the effectiveness and portability of good practices in their context.</p>
	<p>The validation process will promote a systemic approach in local competent public administrations. Moreover, this process of selection and validation is a peer review and entails the mutual role of experts and auditors depending on typology of buildings and partner's expertise.</p>
<p>SOURCES</p>	
<p>Publications</p>	<p>Energy Audit, construction documentation, the specification of essential terms for all construction work.</p>
<p>Website</p>	<p>www.bip.umtychy.pl</p>
<p>Interviews</p>	<p>The information received from the authors of energy audit and construction documentation.</p>