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## Secondary school I-III degrees #10, H-type

Svitlovods'k (Kirovohrads'k region, Ukraine')

### 1. General information.

The year of construction of the school No. 10 in Svitlovods'k city is 1971 (presumably built according to the standard 2c-02-8). The school building is an existing H-shaped brick building, interlocked from three buildings: a middle block - two-story building (cabinets, library, laboratories), a lower (South) block - three-story school building (classes), and an upper (North) block – two story + ground story + an unheated basement under a part of the block. Part of the two-story building (upper block), occupies a gym to its entire height. There are classes, training workshops, canteen, stair-cases and toilets in another part of the upper block. The heat distribution equipment is located in the ground floor rooms.

Currently, the building of the educational building of the school is operated for its intended purposes.

The purpose and goals of the PHPP-calculations are examinations of old school buildings in Ukraine built by standard projects and located in different climate zones of the country. The further development of the projects aims to conducting of a deep refurbishments of these school buildings using the Step-by-Step to EnerPHit methodologies which were develop by Passive House Institute and its EU partners during EuroPHit project.

### 2. Location. Climate

This document provides a short overview of the initial part of the project of energy-efficient improvement to EnerPHit standard, using Step-by-Step refurbishment technologies, to be undertaken for the secondary school I-III degrees #10, H-type, located in Svitlovods'k town (Kirovohrads'k region, Ukraine').

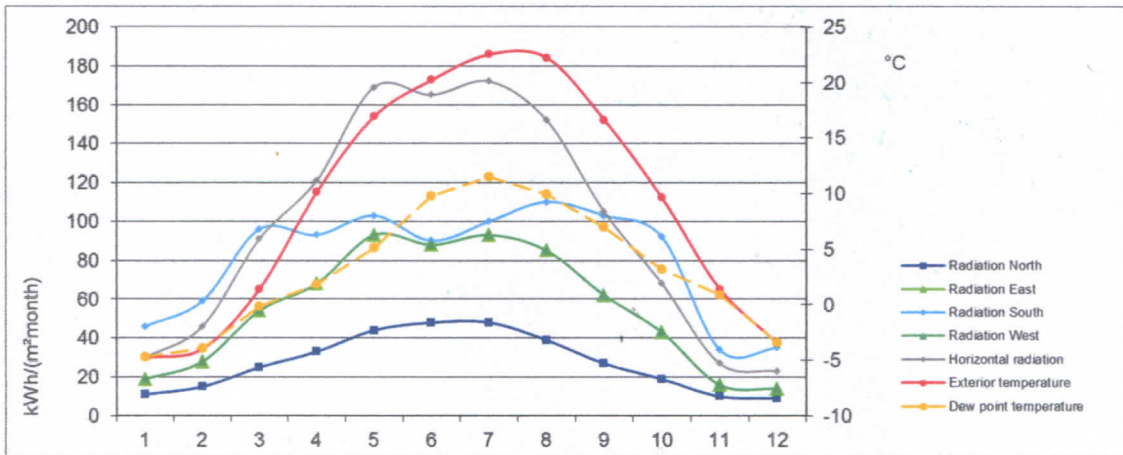
Svitlovods'k town is located on the right bank of the Kremenchuk reservoir of the Dnieper River, Ukraine. The reservoir was created in 1959 when the Kremenchuk Hydroelectric Power Plant was built. This is the largest reservoir in terms of area in Ukraine. The building site (altitude 134m) of the Secondary school #10 is located on the Northern slope of the hill in a distance of 320 m from the reservoir shore (altitude 77 m).

The climate is continental, moderate cool (according to PHI definition: cool-temperate climate), with high humidity, especially during cold seasons. The average January temperature is -5,4 °C

and in July +21,4 °C. Average annual precipitation is 450 mm. The climate offers considerable solar radiation even in the winter months.

For the PHPP preliminary calculations, set of Climate Data generated with Climate Data Tool for the school's location was used. This tool was developed by Passive House Institute (PHI, Germany). The generated Climate Data is permitted by PHI for the use on the preliminary stage of the projects. In case of the building certification by PHI, it's mandatory to use the Climate Data verified and approved by PHI.

### PHPP9 Climate Data Worksheet



### Data for heating Data from monthly balance Annual method Heating Cooling

	Annual	Heating	Cooling	
Heating / cooling	203	212	153	d/a
period Heating / cooling	93	97	-22	kKh/
degree hours	109	122	207	a
Radiation	215	228	407	kWh/(m²
North Radiation	418	454	506	a)
East Radiation	215	257	434	kWh/(m²
South Radiation	358	406	763	a)
West Horizontal radiation				kWh/(m²
				a)
				kWh/(m²
				a)
				kWh/(m²
				)

*abbreviated*

**List of Annexes**

**Annex 1 PHPP calculations for existing building, including Energy Performance Documentation.**

**Annex 2 PHPP calculations for EnerPHit refurbishment (5 variants with different sequences of steps).**