6.6 Protocol for the thermal evaluation of the building envelope

Identification

Type of the object	Hotel
Address	Suvorovova 2888/9, 902 01 Pezinok
Cadastral area	Pezinok [846163], Stará hora, Plot n. 840/3, 840/24
Owner	Davidson John

Characteristics of the object

Volume of the object V – outer volume of the heated space, Does not include loggias , attics and foundations	5674.32 m^3
Total area A – sum of the areas limiting the volume of the object	1512.97 m^2
Volume factor of the object A/V	0.27
Interior temperature during winter θ_{im}	20 °C
Exterior temperature during winter θ_e	-15 °C

Characteristics of important cooled structures

			Assessed building		Reference building	
Cooled structure	Area A_i (m^2)	Temperature reduction factor b_i (-)	Heat transfer coef. U_i ($W . m^{-2}.K^{-1}$)	Nominal overall heat transfer loss $H_{Ti}= A_i*b_i*U_i$ (W/K)	Required heat transfer coef. $U_{N,20}$ ($W . m^{-2}.K^{-1}$)	Heat loos by heat transfer $H_{Ti,N} = A_i*U_{N,20}*b_i$ ($W.K^{-1}$)
External wall	1167.60	1	0.115	134.274	0.30	350.28
Floor	935.21	1	0.212	198.265	0.45	420.845
Window	65.00	1	0.610	39.65	1.5	97.5
Doors	22.22	2	0.680	30.219	1.7	75.548
Roof	935.21	0.61	0.131	74.733	0.24	136.915
Thermal bridges	ΣA_i 3125.24	ΔU_{tbm} 0.02		ΣH_{Ti} 477.141		$\Sigma H_{Ti,N}$ 1081.088
Thermal bridges ΔU			$\Sigma A_i*\Delta U$	62.505	$\Sigma A_i*\Delta U$	62.505
Total nominal overall heat transfer loss H_T			$\Sigma H_{Ti+}(\Sigma A_i*\Delta U)$	539.646	$\Sigma H_{Ti,N+}(\Sigma A_i*\Delta U)$	1143.593
Average heat transfer coefficient			$U_{em}=[\Sigma H_{Ti+}(\Sigma A_i*\Delta U)]/\Sigma A_i$	0.173	$U_{em,rqd}=[\Sigma H_{Ti,N+}(\Sigma A_i*\Delta U)]/\Sigma A_i$	0.366
The class of the building envelope			$U_{em}/ U_{em,rqd}$	0.473	CLASS	A

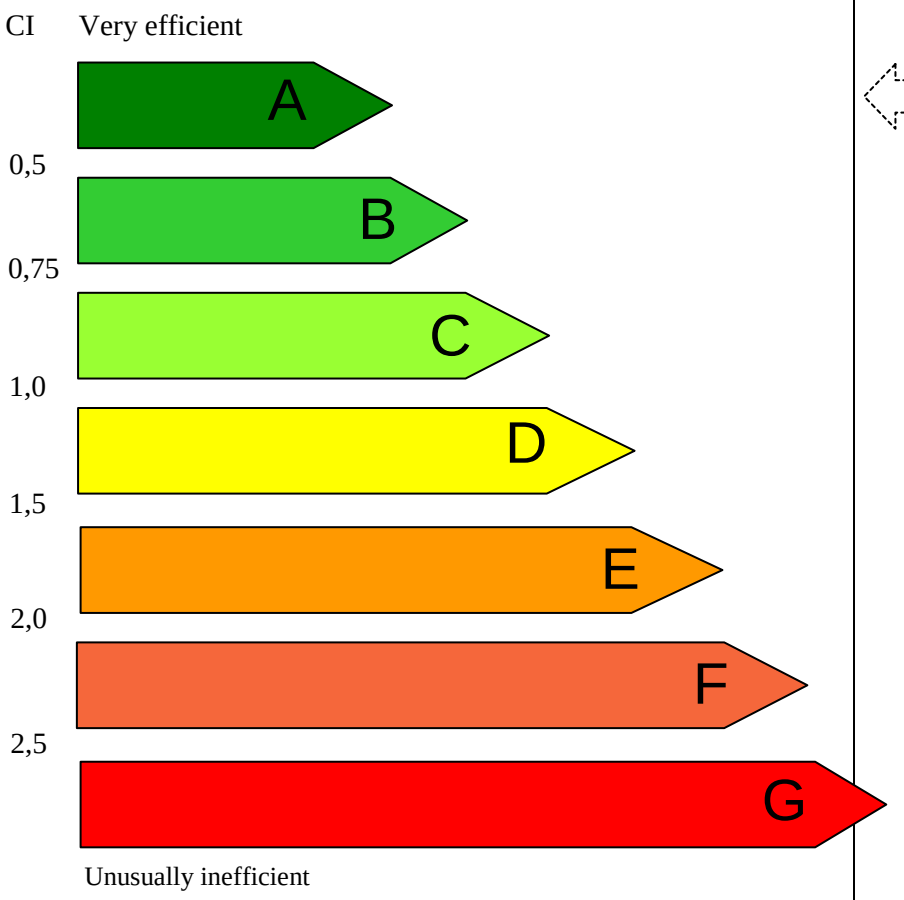
The structures fulfil the requirements stated in the ČSN 73 0540-2.

Classification classes of heat transfer through the building envelope

Classification classes	Average heat transfer coef. U_{em} [W/(m^2.K)]	Verbal statement	Classification letter
A	$U_{em} \leq 0,5. U_{em,N}$	Very efficient	⇐ 0,5
B	$0,5.U_{em,N} < U_{em} \leq 0,75. U_{em,N}$	Efficient	⇐ 0,57
C	$0,75.U_{em,N} < U_{em} \leq U_{em,N}$	Approvable	⇐ 1,0
D	$U_{em,N} < U_{em} \leq 1,5.U_{em,N}$	Not approvable	⇐ 1,5
E	$1,5.U_{em,N} < U_{em} \leq 2,0.U_{em,N}$	Not efficient	⇐ 2,0
F	$2,0.U_{em,N} < U_{em} \leq 2,5.U_{em,N}$	Inefficient	⇐ 2,5
G	$U_{em} > 2,5.U_{em,N}$	Unusually inefficient	

LABEL OF BUILDING ENVELOPE

Type: Hotel Address: Suvorovova 2888/9, 902 01 Pezinok	Evaluation	
Total area: 1512.97 m^2	present	recommended



CLASSIFICATION	A	
Average loss by heat transfer $U_{em,N}$ in W/(m^2.K) U_{em} =[ΣH_{Ti+}(ΣA_i*ΔU)]/ ΣA_i	0.173	
Required average loss by heat transfer of building envelope according the standard ČSN 73 0540-2 $U_{em,rqd}$ in W/(m^2.K)	0.366	

Classification factor CI and its corresponding values

CI	0,5	0,75	1,0	1,5	2,0	2,5
U_{em}	0,135	0,203	0,27	0,405	0,54	0,375

Expiration date:	Date 12.12.2018
Elaborated by:	Name and surname: RICHARD SASKO

Elaborated: Richard Sasko Signature:.....

This protocol and the thermal classification was elaborated according the European standard no. 2002/91/ES and EN 15217. Also, it was elaborated in accordance with ČSN 73 0540 and the project documentation which was given by the investor.