

Case story: New storage facility at ASTRA Museum, Sibiu, Romania

Workshop on low energy climate control
in museum and archives

Copenhagen, 7 October 2010

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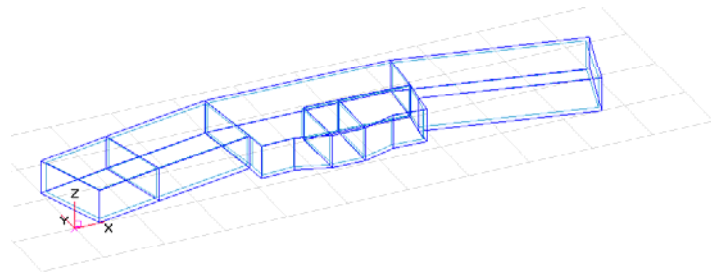
Sibiu, Romania



ASTRA National Museum Complex



The new storage building



Ground floor

Layer 1: Concrete reinforced v/c 0.4 C420, 0.20m thick

Layer 2: Stone, fill, 0.15m thick

Total thickness: 0.35m, Total R-value $0.310\text{m}^2\text{K/W}$.

Ceiling

Layer 1: Concrete reinforced v/c 0.4 C420, 0.15m thick

Layer 2: Styrodyr 25, 0.05m thick

Layer 3: Concrete reinforced v/c 0.4 C420, 0.06m thick

Layer 4: Rubber, 0.01m thick

Total thickness: 0.27m, Total R-value $1.39\text{m}^2\text{K/W}$.

Exterior walls section 1 and 3

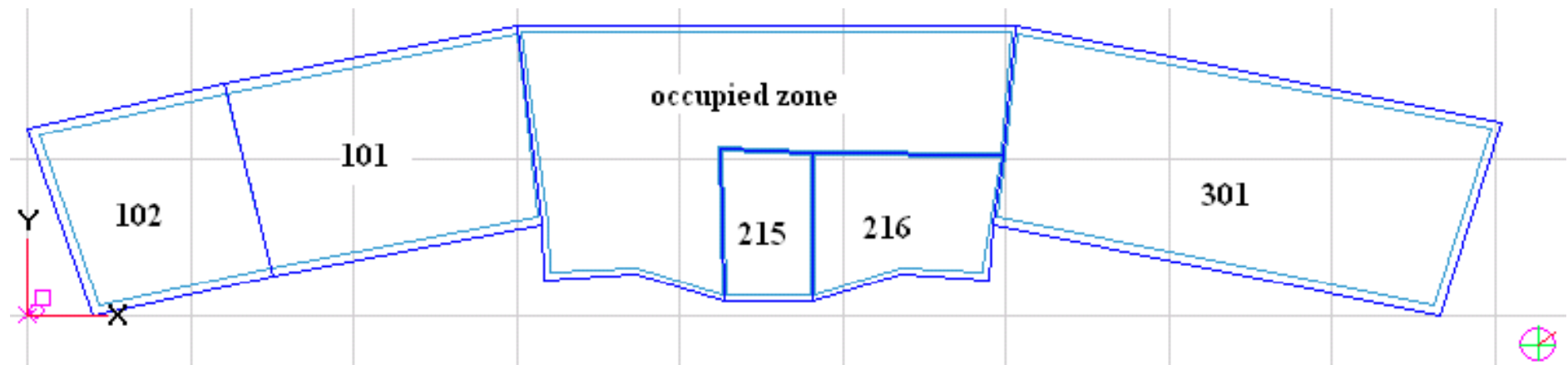
Layer 1: Ytong Cellular concrete, 0.30m thick

Layer 2: Isover 35, 0.20m thick

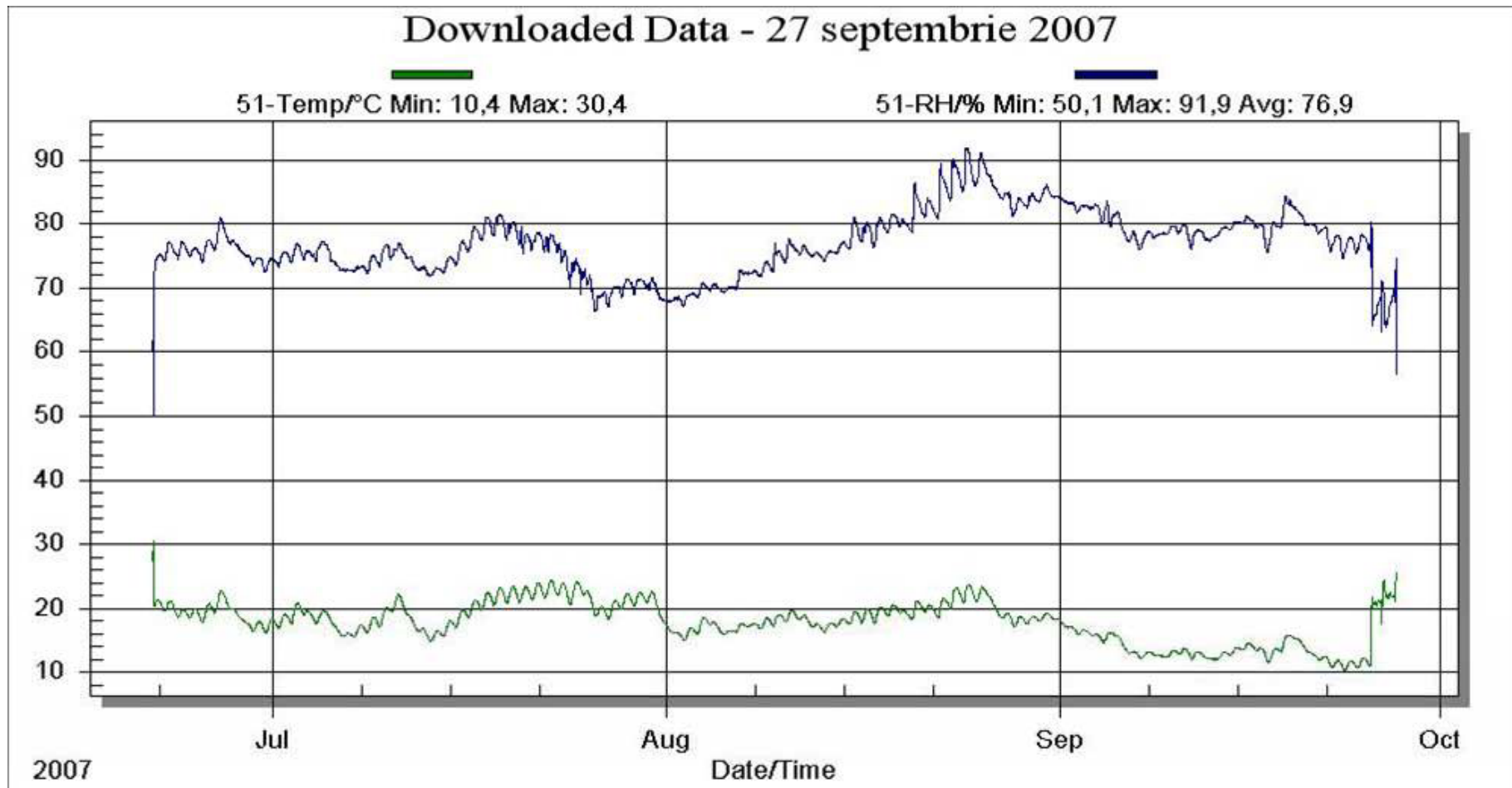
Layer 3: Ventilated air gap, 0.02m thick

Layer 4: Wood fiber board, 0.03m thick

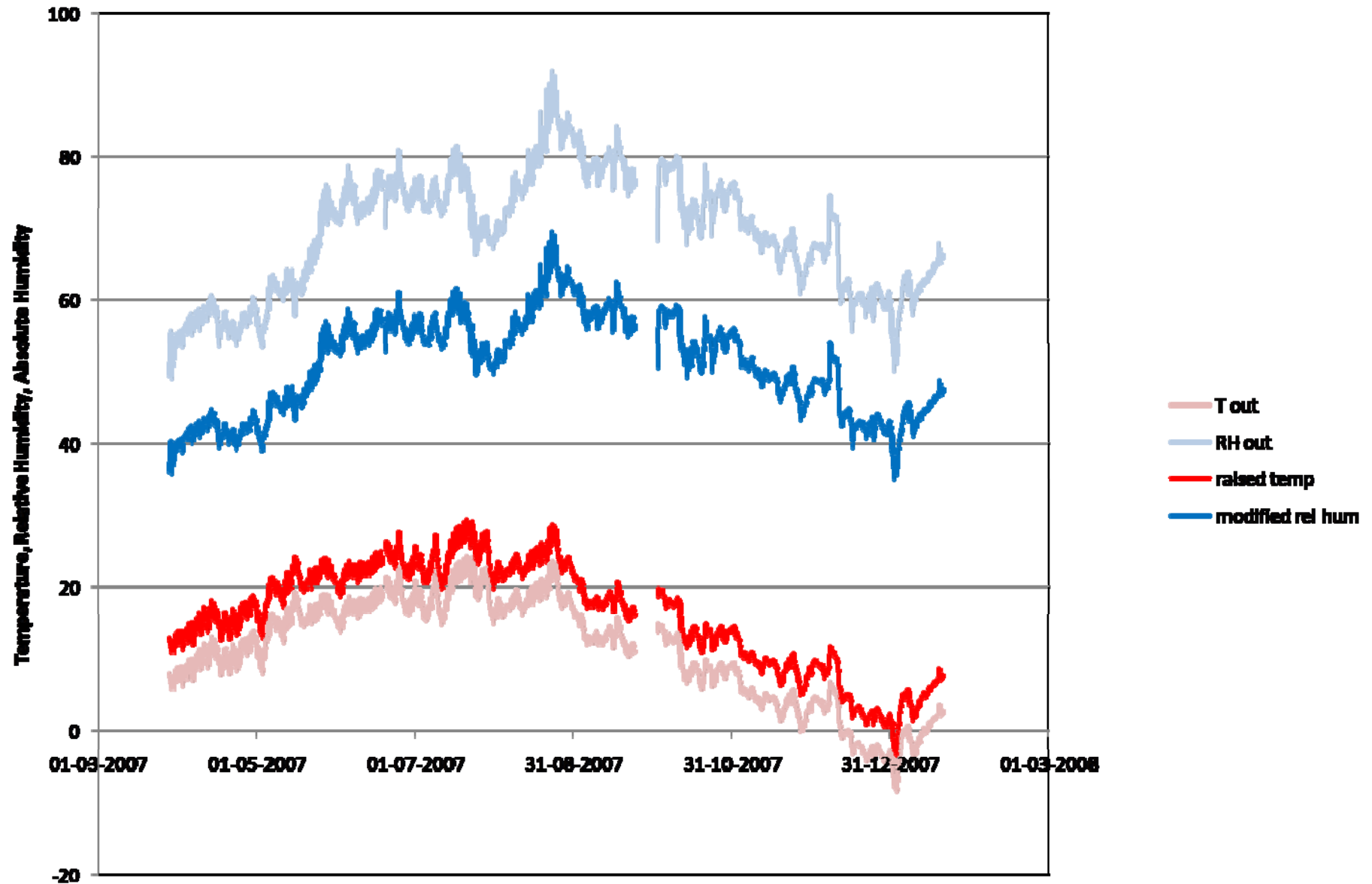
Total thickness: 0.55m, Total R-value $8.44\text{m}^2\text{K/W}$.

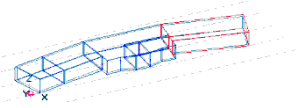


Local climate



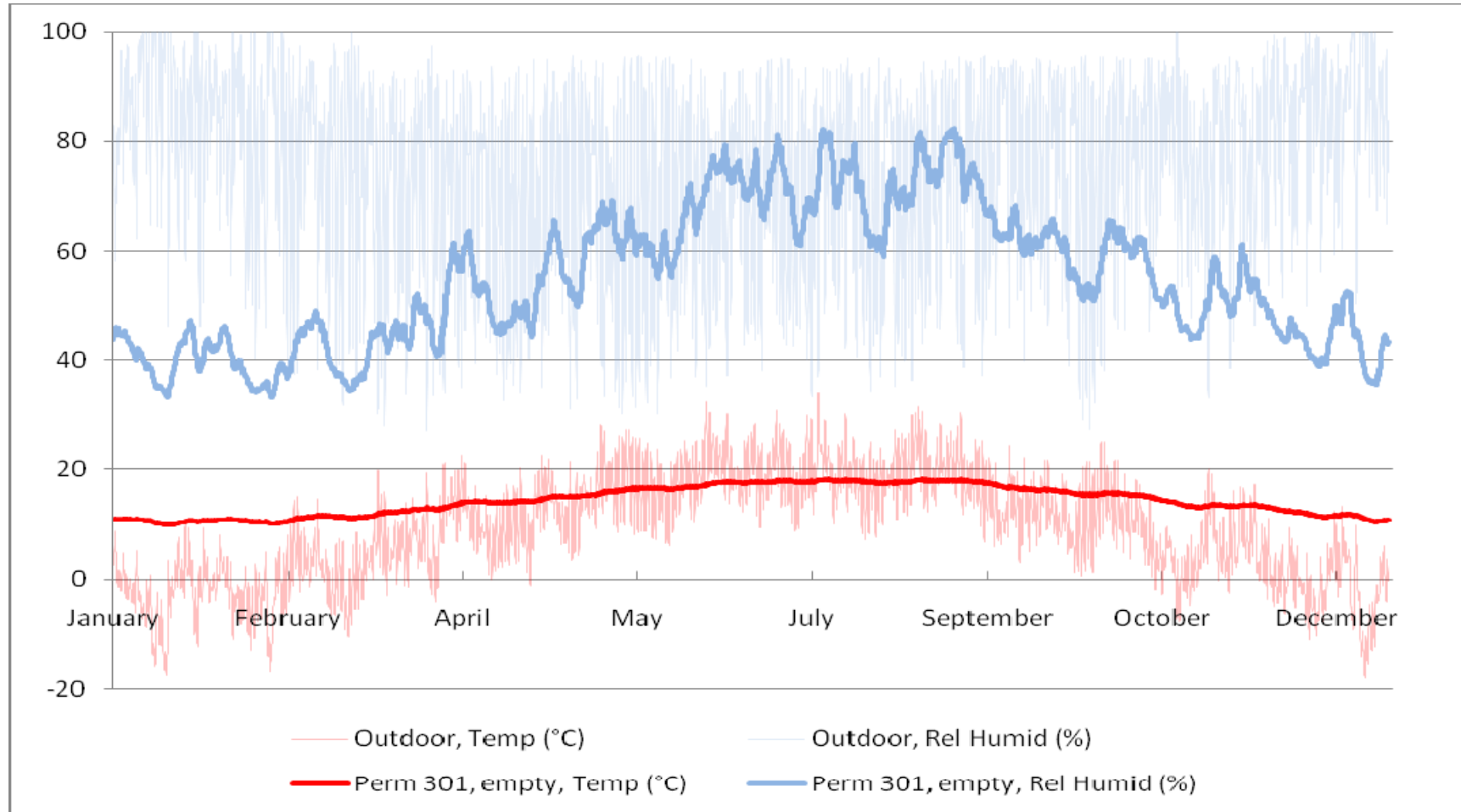
What if we raise the temperature 5C?



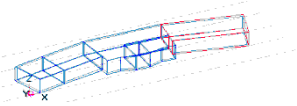


Simulation, empty building

AER 0.05 h⁻¹

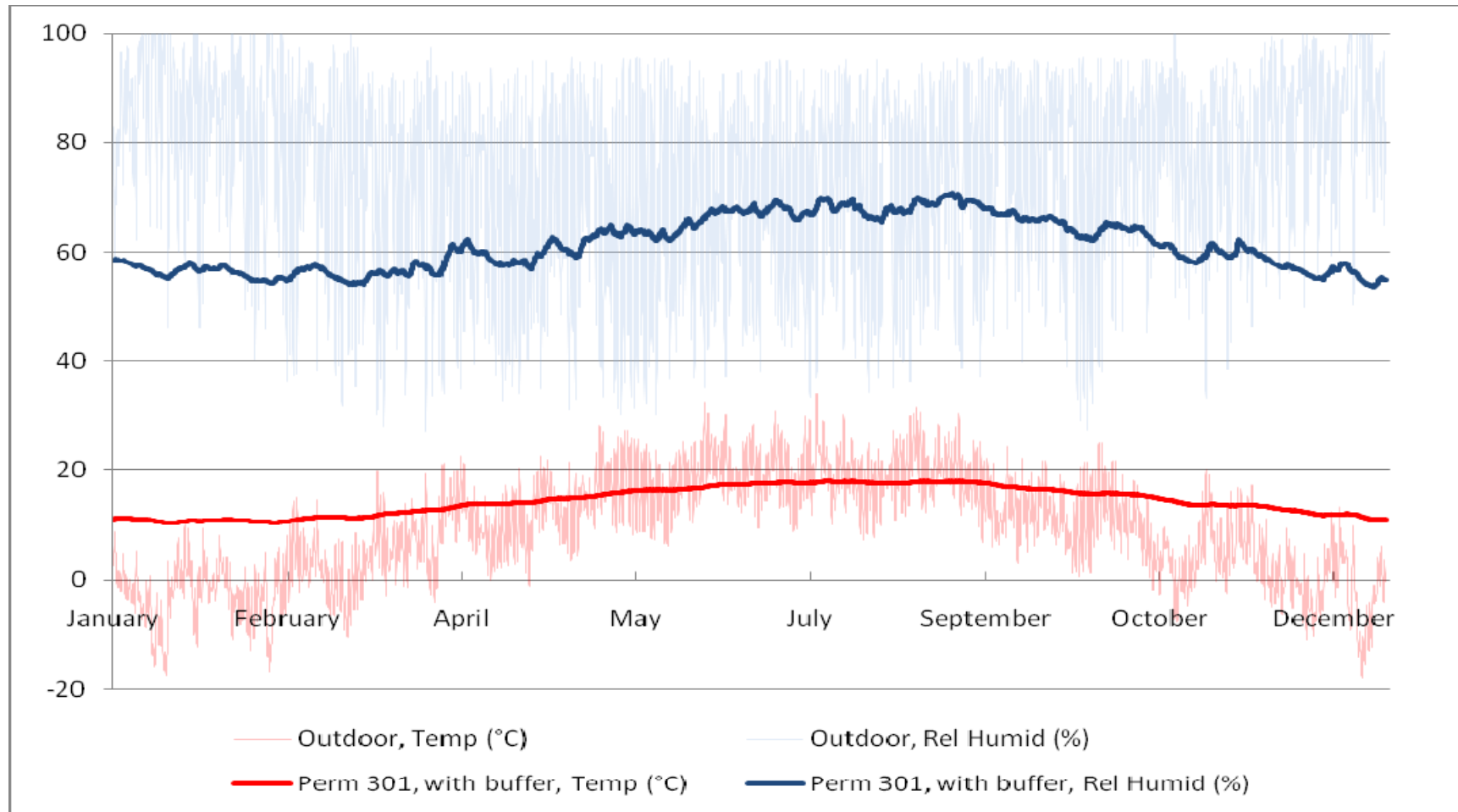


The temperature inertia is satisfying, however, the relative humidity is highly influenced by changes in weather

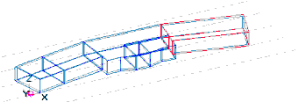


Simulation, with collection

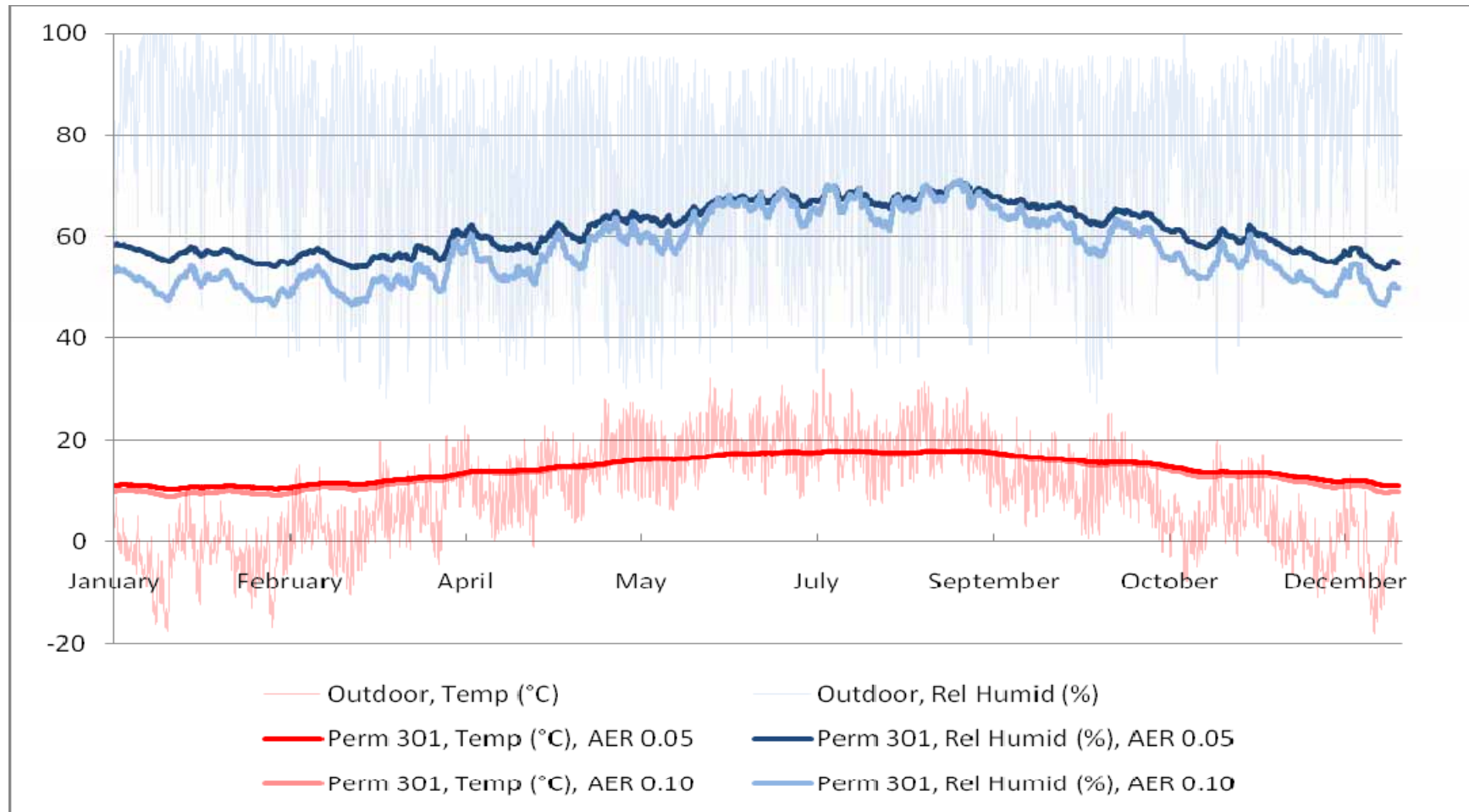
AER 0.05 h⁻¹



Adding humidity buffer: wood boards, 3 m² / m³



Simulation, with collection AER 0.05 and 0.1 h⁻¹



The simulated climate in the fully loaded permanent storage room 301 at the air exchange rate 0.05 per hour (dark color) and 0.1 per hour (light color).

Construction began September 2009



















http://www.conservareapatrimoniului.ro/noutati_si_foto_en.php

