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The history of brick masonry constructions in the BSR

Climate protection goals

Jūratė Jurevičienė, VGTU

Historic development of brick construction in the BSR

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Initial areas of brick masonry technologies in the BSR:

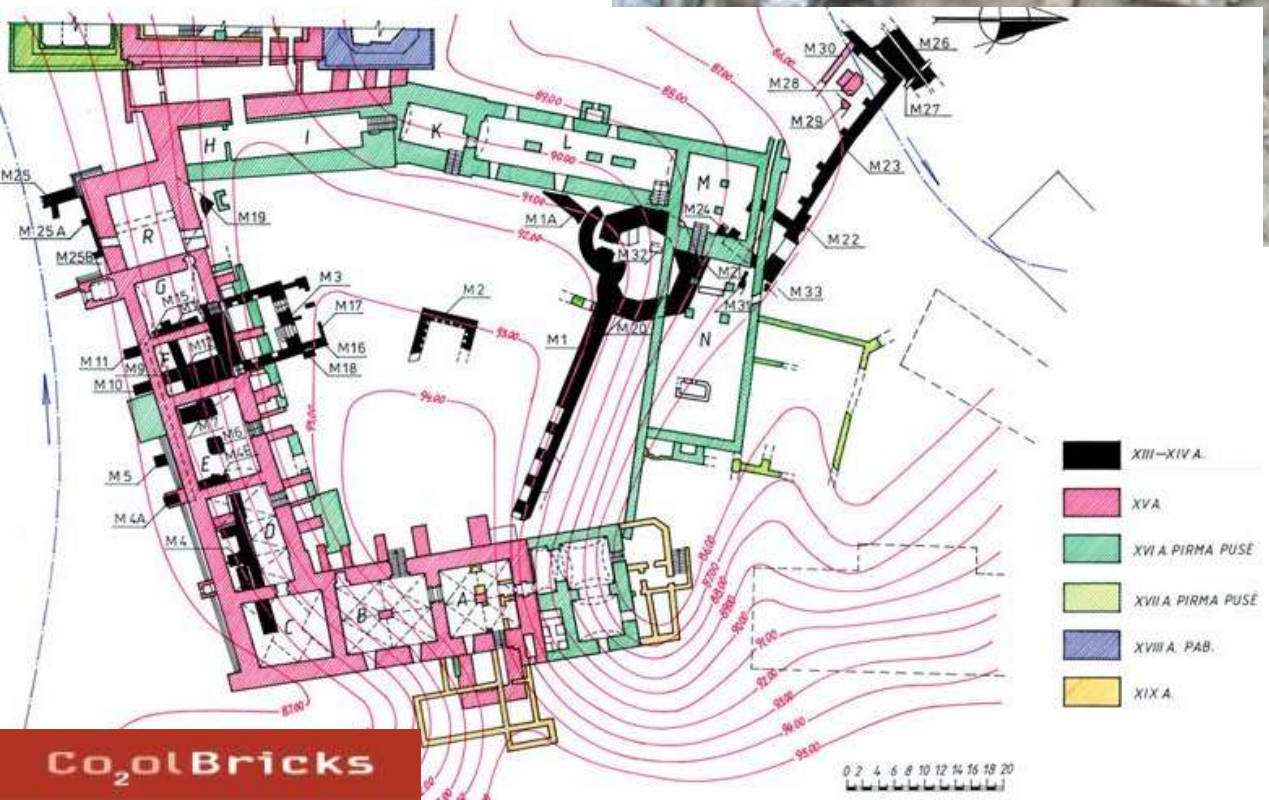
- **Gotland** as regional center of brickwork technologies;
- **Malbork** (Marienburg) castle (ordensburg);
- **Kievan Rus** (sacred sites building).

The knowledge about clay brick was developed by the Romans and reached the BSR with the **monasteries**.

The manufacturers of brick were developed near areas with easy reachable clay and lime. Initial location – at the construction sites and at the rivers (big manufacturers), from the 19th c. – at the railroad.

Lower Castle, Vilnius (excavation site at 2007)

Excavated foundations of stone masonry and clay-lime mortar, 1998.



Stratification of the masonry layers from 6 historic periods of reconstruction of the Lower Castle in 13th - 19th c.

Historic periods of brickwork construction in the BSR

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Brickwork construction in the BSR was introduced in:

- **Denmark, Sweden, Germany** - late 11th – 12th c.;
- **Estonia, Finland, Latvia, Lithuania, Poland, Kaliningrad district (Russia)** - 13th c. – early 14th c.;

The main **architectural periods** of brickwork development:

- Pre-Gothic (Romanesque, Wendic, Baltic);
- Gothic;
- Renaissance;
- Baroque;
- Classicism (Neo-Classicism),
- Historicism (Romanticism),
- Modernism.

Pre-Gothic period

Lower Castle, Vilnius,
archaeological research and reinforcement

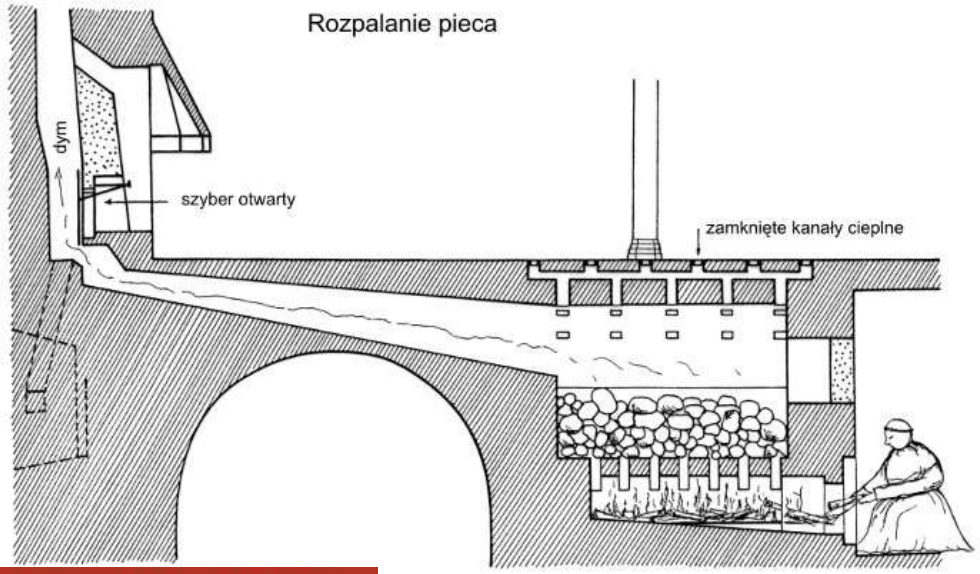
Wendic (Baltic) bond masonry from the13th – 14th c. after conservation

The remains of ground floor masonry and brick pavement

Gothic

Malbork (Marienburg) castle

- Heating innovations: hypocaust system, water supply
- High quality standarts of bricks and masonry



rys. J. Kacperska

Orden's Councill Hall

Hypocaust stove

The Middle Ages in the development of brick building in the BSR

- In the **Early Middle ages** development of brick construction in Poland, Lithuania, Latvia, Estonia and Kaliningrad district of Russia was mostly influenced by Teutonic Order, in Scandinavia – by other monastic orders.

- In the periods of **High and Late Middle Ages** the centers of brick building were also created by the towns and manors.

- Bricks used for building the Teutonic castles were produced in brickyards close to the castles. Limestone was imported, mainly from the island Gotland.

- Gothic period could be evaluated as the first wave of globalization – the same standards of brick masonry were aplied almost in all countries of the BSR.

Renaissance

The quater between Sv. Ignoto and Totorių str., Vilnius

The hypocaust stove (the view through the floor)

Renaissance

Rūdninkų str. 16,
Vilnius

Mural painting in the main hall

Gothic bond masonry and Renaissance architecture of the facades

Baroque

The Technical Library (former Jesuit noviciate), Vilnius

Mural painting

The gallery and courtyard after restoration (completed in 1986)

Baroque

The Basilian Gate, Vilnius

Vilnius city defence wall

Reused masonry of earlier periods

Use of lower quality bricks

Classicism

Vilnius University complex,

the Faculty of History

Mural painting after restoration in 2005

The facade after few reconstructions

Historicism

- High quality bricks
- Mural painting

Vanagai church, Klaipėda district, 1909

Functionalism

Gedimino av. 35, Vilnius, 1936

Use of brickwork with reinforced concrete frame

Facing with imported sandstone slabs

Soviet period

- Continuation of masonry traditions in Stalinistic period

The dwelling houses in Gedimino av., Vilnius, 1959

The dwelling houses in Klinikų str., Vilnius, 1965

Conclusions

Historic features of brick masonry constructions in the BSR:

- Efficient use of local building materials: clay, lime, water, wood, and skills from the Middle Ages;
- Durability and reuse of bricks and masonry during different historic periods;
- Continuation of architectural and engineering traditions untill industrialization period in the mid 19th - 20th c.;
- Increasing interest in brickwork heritage together with traditional use of building materials, authenticity, traditional way of life, cultural identity from the late 20th c.

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Preserving brick masonry heritage in the BSR: problems and lessons learned

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Physical characteristics of historic brick masonry in the BSR:

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- Remarkable strenght along centuries of rain storms, snow, thaw-freezing cycles, temperature changes and human included deterioration;
- Variety of colors, porosity, textures, water absorbtion, size and forms;
- Ability to embody different architectural styles (plasticity) and various finishing materials: painting, plaster (mostly from the Renaissance period), limestone and sandstone slabs;
- Adequacy to the requirements of healthy microclimate inside (sufficient level of humidity and heat conservation).

Preservation with respect to authenticity

Koldinghus, Danmark,
13th – 19t c., restoration
1970's - 1991

Use of new brickwork, floors, and their supports of different color, texture, form

Replacements of missing parts must integrate harmoniously with the whole, but at the same time must be distinguishable from the original so that restoration does not falsify the artistic or historic evidence.

Article 12. International Charter for the Conservation and Restoration of Monuments and Sites (Venice Charter 1964)

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Basic methods of treatment of historic brick structures in the BSR:

- Rebuilding;
- Restoration;
- Conservation;
- Provisional conservation (reinforcement);
- Preventive maintenance.

1.3. The value of architectural heritage is not only in its appearance, but also in the **integrity of all its components** as a unique product of the specific building technology of its time.

3.14 The **removal** or **alteration** of any historic material or distinctive architectural features should be avoided whenever possible.

ICOMOS CHARTER - PRINCIPLES FOR THE ANALYSIS, CONSERVATION AND STRUCTURAL RESTORATION OF ARCHITECTURAL HERITAGE (2003) PRINCIPLES

Rebuilding

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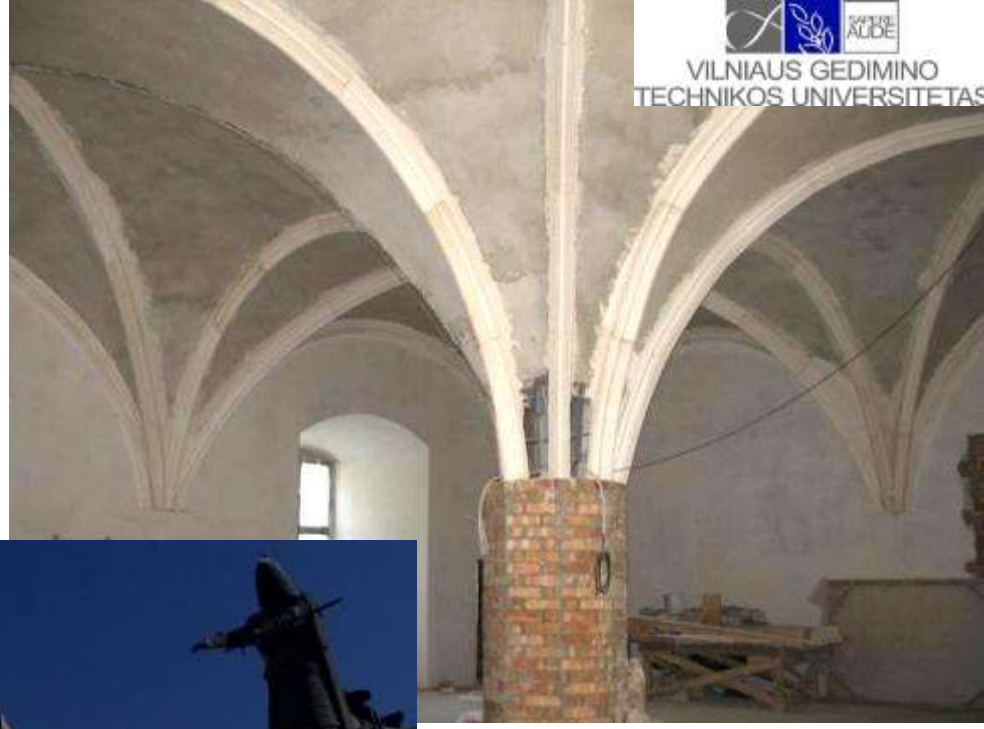


Vilnius Lower Castle

Rebuilding

Inclusion of the facade of the 19th c. house into rebuild volume of the palace

Rebuilding

Defence Ministry, Vilnius.

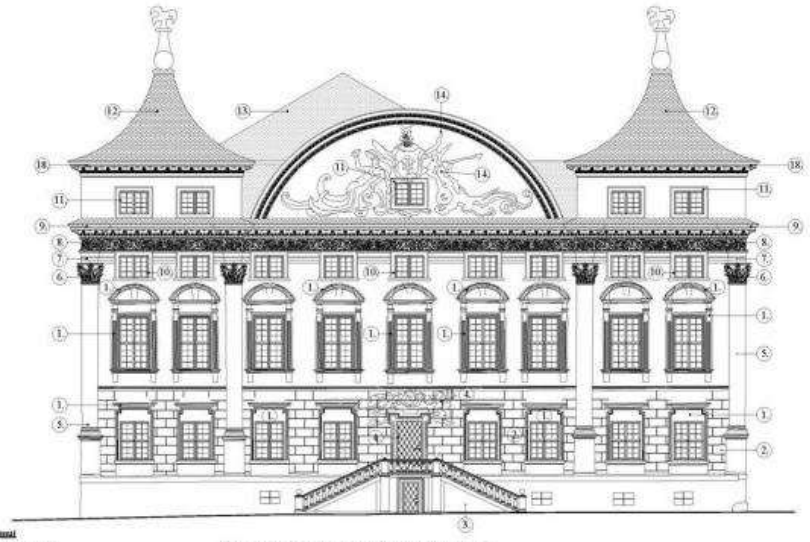
Gothic cellars after restoration

Post –modern interpretation of destroyed Gothic buildings

Restoration

Sapiegos palace, Vilnius

The palace after Neo-Classicistic reconstruction



Proposals of restoration of original architecture, 2012

Restoration

St. Stephen church, Vilnius

1. The interior in 2007

2. The facades in 2009

Restoration

Siesikai manor, 16th c.

1, 2. Plastering of the stoves, 2011

3. The facades under conservation, 2011

Conservation

Vilnius Castle

The crypt of the Cathedral

The remains of the defence wall

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Conservation

Dried and cracked brickwork inside the New Arsenal in Vilnius Castle (chemical conservation of 1987)

Provisional conservation

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The Synagogue in Švėkšna, 2011 (built in 1928)

3.18. **Provisional safeguard** systems used during the intervention should show their purpose and function without creating any harm to heritage values

3.9. Where possible, any measures adopted should be "**reversible**" so that they can be removed and replaced with more suitable measures when new knowledge is acquired.

ICOMOS CHARTER - PRINCIPLES FOR THE ANALYSIS, CONSERVATION AND STRUCTURAL RESTORATION OF ARCHITECTURAL HERITAGE (2003) PRINCIPLES

Need of conservation

Decorated ceilings in the staircases:

Šaltinių str. 11, Vilnius

A. Jakšto str. 5, Vilnius

Need of conservation

J. Basanavičiaus str. 16, Vilnius

Poor physical condition of the facade decoration

Valuable floor in the staircase

Need of conservation

Aguonų str. 5, Vilnius

Painting of early 20th c.

Need of conservation

Kalvarijų g. str., Vilnius

Stove of the late 19th c. in the staircase

Conclusions

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- Treatment of historic brick structures value during last decades pays more respect to authenticity of their architecture and materials
- Preservation of historic brick masonry structures is apparently increasing from the sixties of the 20th c.
- Methods of preservation of historic brick structures during the last decades in the BSR vary from rebuilding to conservation
- Many historic brick buildings of high cultural value still are in bad physical condition and in need of conservation