

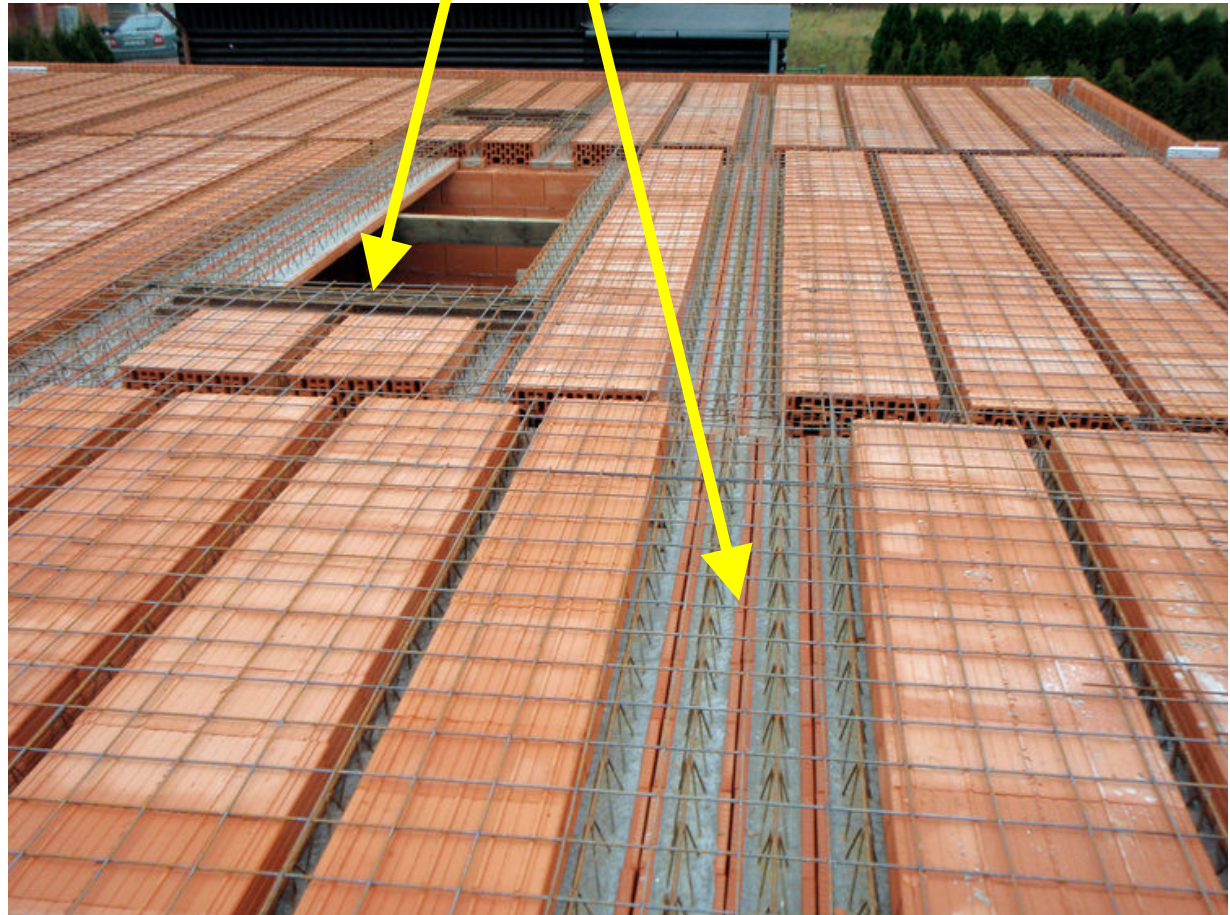


# **„Atypical Masonry“:** **Examples of Non-standard Details, Elements and Applications**

*This presentation was created thanks to the support of FRVŠ  
project 915/2013 B1d „Tools for teaching design of concrete  
and masonry structures in English“*

# Ceramic Slabs: Openings and Reinforced Areas

- In the area of opening, additional RC beam is created
- Where higher load is expected, several joists are used to act together

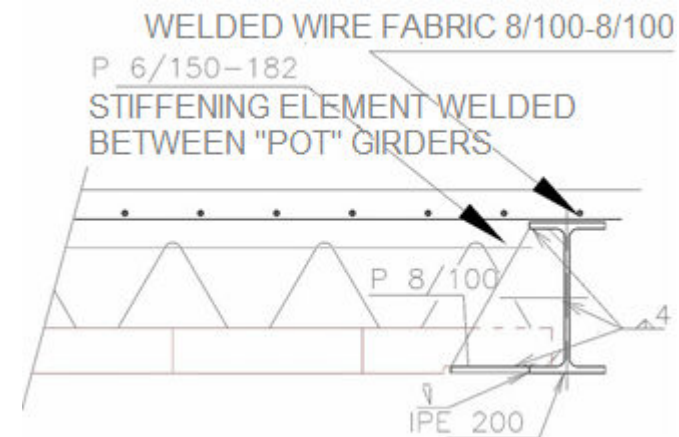
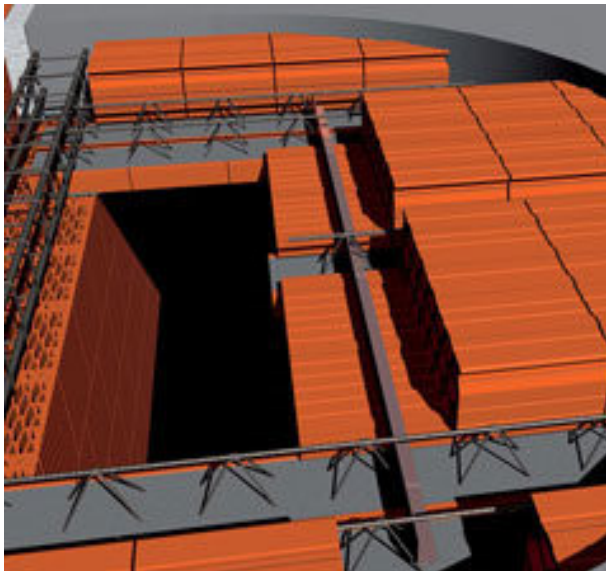


Source: [www.heluz.cz](http://www.heluz.cz)

concrete.fsv.cvut.cz/~bily

# Ceramic Slabs: Openings

- Instead of RC beam, various steel girders can be used



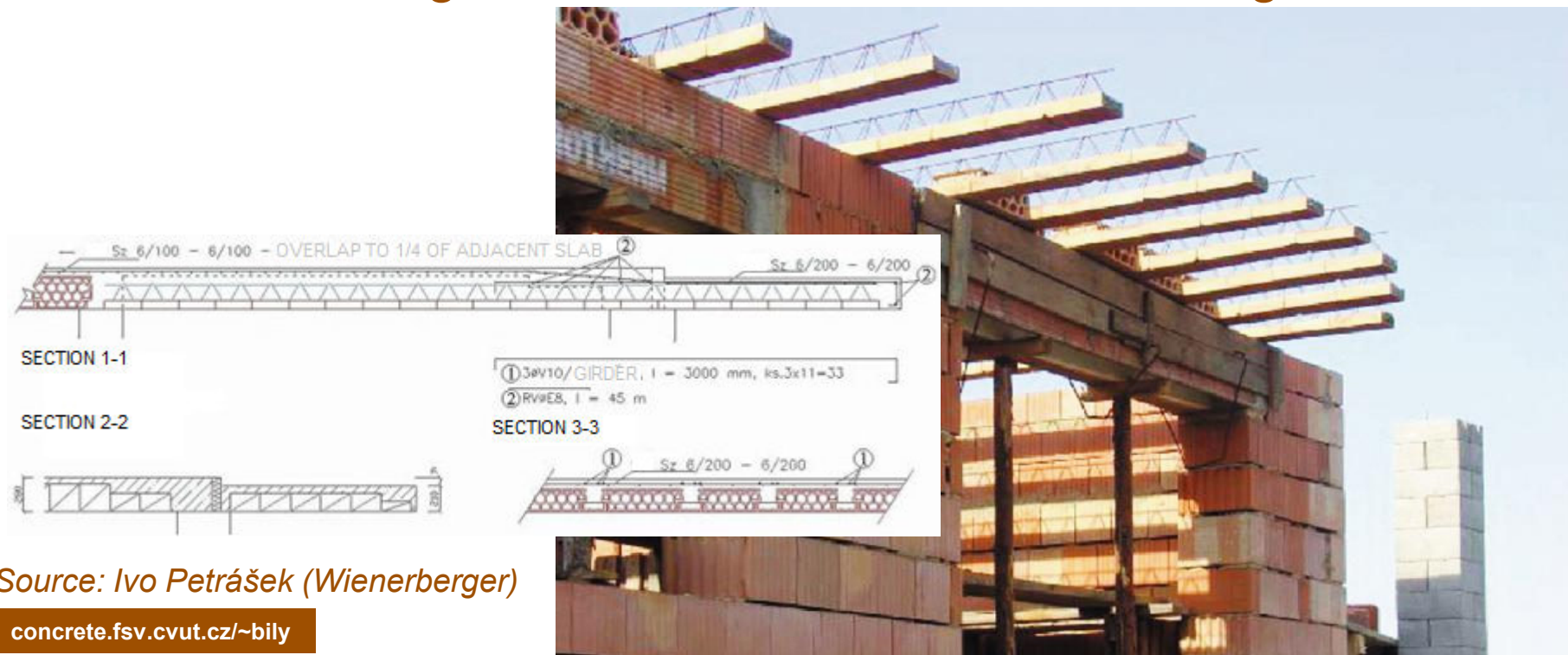
Source: Ivo Petrášek (Wienerberger)

concrete.fsv.cvut.cz/~bily



# Cantilevers in Ceramic Slabs

- Joists are used as supports for brick inserts
- Bending moment is carried by additional reinforcement in concrete layer
- Lower self-weight than RC slab => lower bending moment



Source: Ivo Petrášek (Wienerberger)

concrete.fsv.cvut.cz/~bily

# Precast Ceramic Panels

- To speed up the construction process, precast ceramic panels can be used



Source: Tereza Mokořová

[concrete.fsv.cvut.cz/~bily](http://concrete.fsv.cvut.cz/~bily)



# Precast Ceramic Panels

- Panels with openings or atypical panels can be ordered



Source: Tereza Mokořová

[concrete.fsv.cvut.cz/~bily](http://concrete.fsv.cvut.cz/~bily)



# Lintels for Rolling Blinds

- Rolling blind is hidden in the lintel



Source: [www.heluz.cz](http://www.heluz.cz)

concrete.fsv.cvut.cz/~bily

# Vaults

- Rarely used in modern structures
- Special formwork is used to support the structure during construction



Source: Tereza Mokořová

[concrete.fsv.cvut.cz/~bily](http://concrete.fsv.cvut.cz/~bily)





# Vaults



EXTRADOS    KEYSTONE



Source: Tereza Mokošová

[concrete.fsv.cvut.cz/~bily](http://concrete.fsv.cvut.cz/~bily)



# Vaults

- Straight arches supported by steel girders can be an alternative to ceramic or reinforced concrete slabs

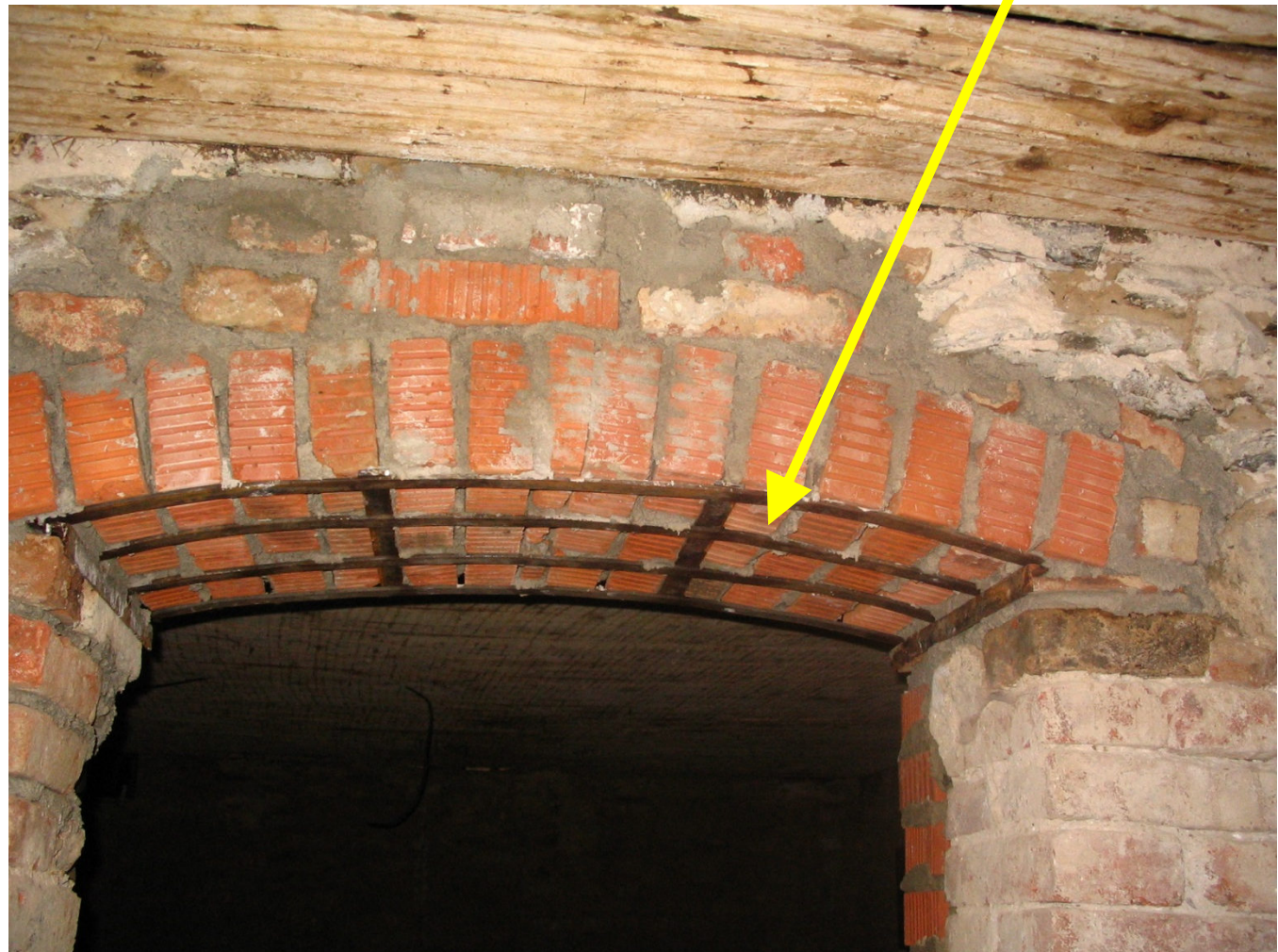


Source: Tereza Mokrošová

[concrete.fsv.cvut.cz/~bily](http://concrete.fsv.cvut.cz/~bily)

# Vaults

- During reconstruction, vault can be reinforced by steel strips



Source: Tereza Mokrošová

[concrete.fsv.cvut.cz/~bily](http://concrete.fsv.cvut.cz/~bily)

# Blocks with Embedded Insulation

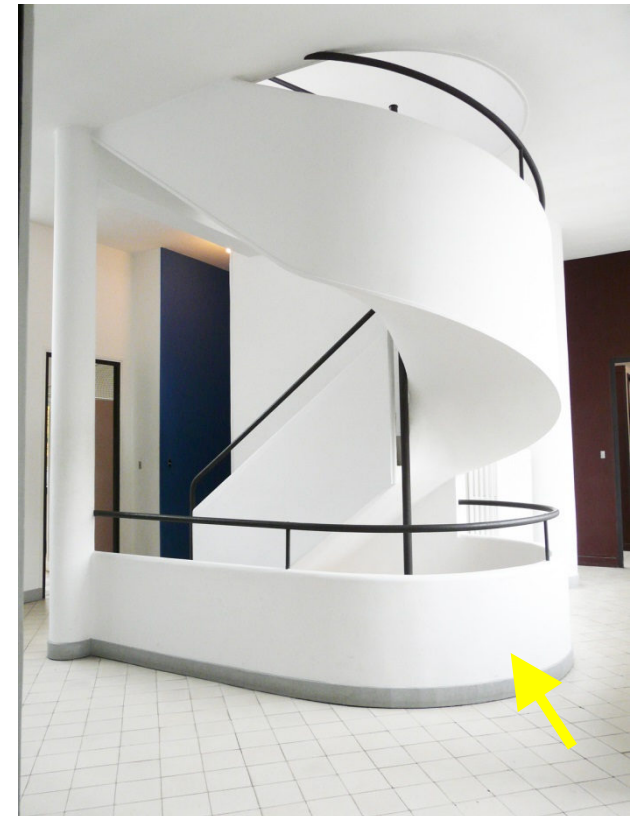
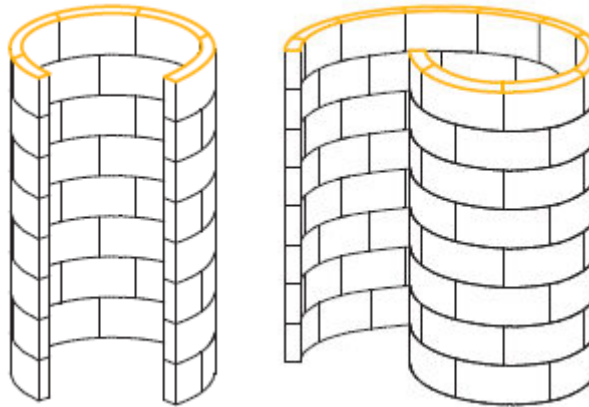
- Hollow masonry blocks can be filled with insulation material (polystyrene, mineral wool)
- To further reduce thermal bridges, polyurethane foam is used instead of thin layer mortar
- U-value can be as low as  $0,15 \text{ W/m}^2\text{K}$



Source: [www.heluz.cz](http://www.heluz.cz); [www.wienerberger.cz](http://www.wienerberger.cz)

# Arch segments

- Corners, shower enclosures, staircases



Source: [www.ytong.cz](http://www.ytong.cz);

[www.tyden.cz](http://www.tyden.cz)

[concrete.fsv.cvut.cz/~bily](http://concrete.fsv.cvut.cz/~bily)



# Chimneys

- Producers of hollow ceramic blocks offer wide range of special bricks for chimneys



HELUZ KLASIK



HELUZ MULTI



HELUZ PLYN



HELUZ METAL



HELUZ IZOSTAT



HELUZ MINI - PLAST



HELUZ MINI - METAL



HELUZ MINI - IZOSTAT



High precision  
flue block HT



High precision  
flue block HU



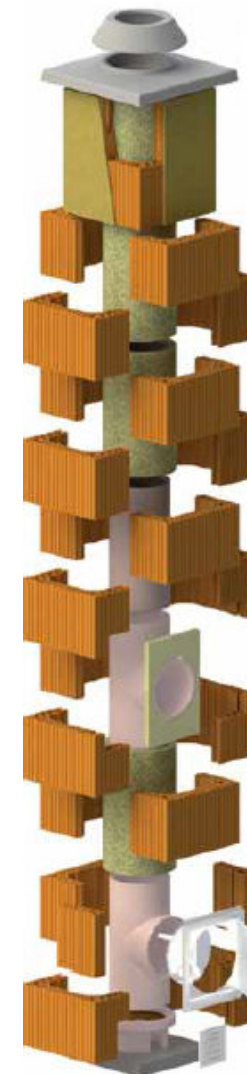
High precision  
flue block filled  
by perlit



Ventilation block  
H2-double



Flue block  
HM-MINI



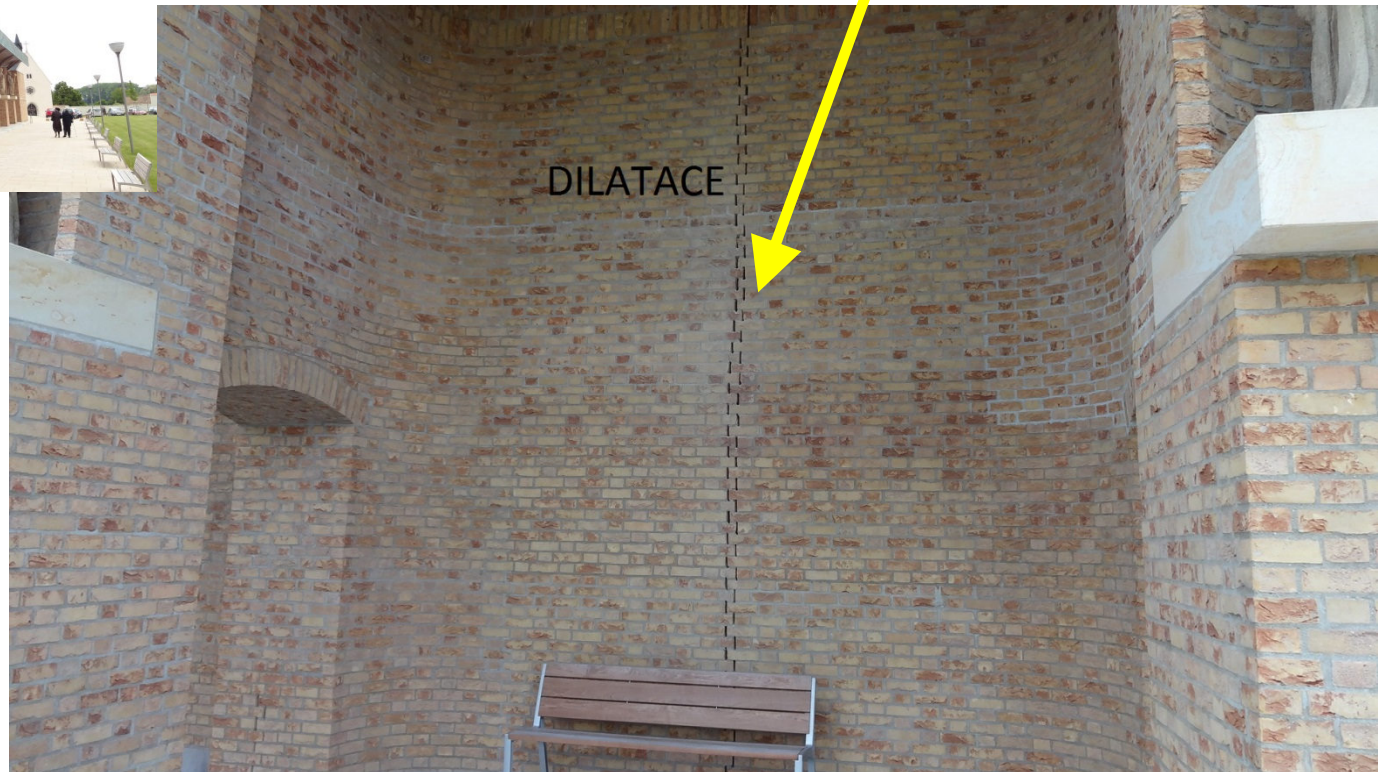
Source: [www.heluz.cz](http://www.heluz.cz)

[concrete.fsv.cvut.cz/~bily](http://concrete.fsv.cvut.cz/~bily)



# Expansion Joints in Masonry

- Large exterior structures must contain expansion joints to avoid cracking and deformations

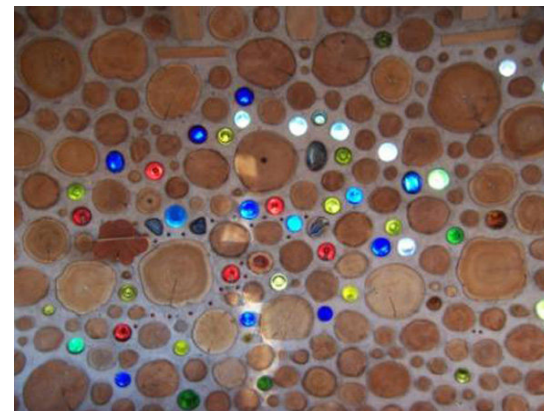


Source: Tereza Mokořová

[concrete.fsv.cvut.cz/~bily](http://concrete.fsv.cvut.cz/~bily)

# Cordwood Masonry

- Alternative architecture, poor U-value due to mortar



Source: [www.rainharvest.co.za](http://www.rainharvest.co.za); [www.naturalbuildingblog.com](http://www.naturalbuildingblog.com)

concrete.fsv.cvut.cz/~bily





# Cordwood Masonry

- U-value can be improved by creating cavity wall with or without insulation (EPS foam balls, sawdust...)



Source: [www.renaupitis.com](http://www.renaupitis.com) [bennetthouseproject.blogspot.com](http://bennetthouseproject.blogspot.com)

concrete.fsv.cvut.cz/~bily

