

Restoration Of Quebec City's Stone Masonry Walls and Canada's Parliament Building in Ottawa

Presented by :

Luc Genest

Sales Manager

Masonry Markets

KING ***Mixing Strength With Satisfaction***

Summary

- Properties of a good mortar
- Types of binder
- Which binder should be used
- Stone masonry restoration
- Different types of grout
- Review of some projects

Mortar vs Concrete



Properties of a good mortar

- Adherence.
- Sufficiently resilient to accommodate slight movements –shrinkage or expansion of the construction – once hardened.
- Weaker than the masonry unit to be installed.
- Better vapor transmission rate than the masonry unit to be installed.
- Durable.
- Aesthetically pleasing.

Types of binder



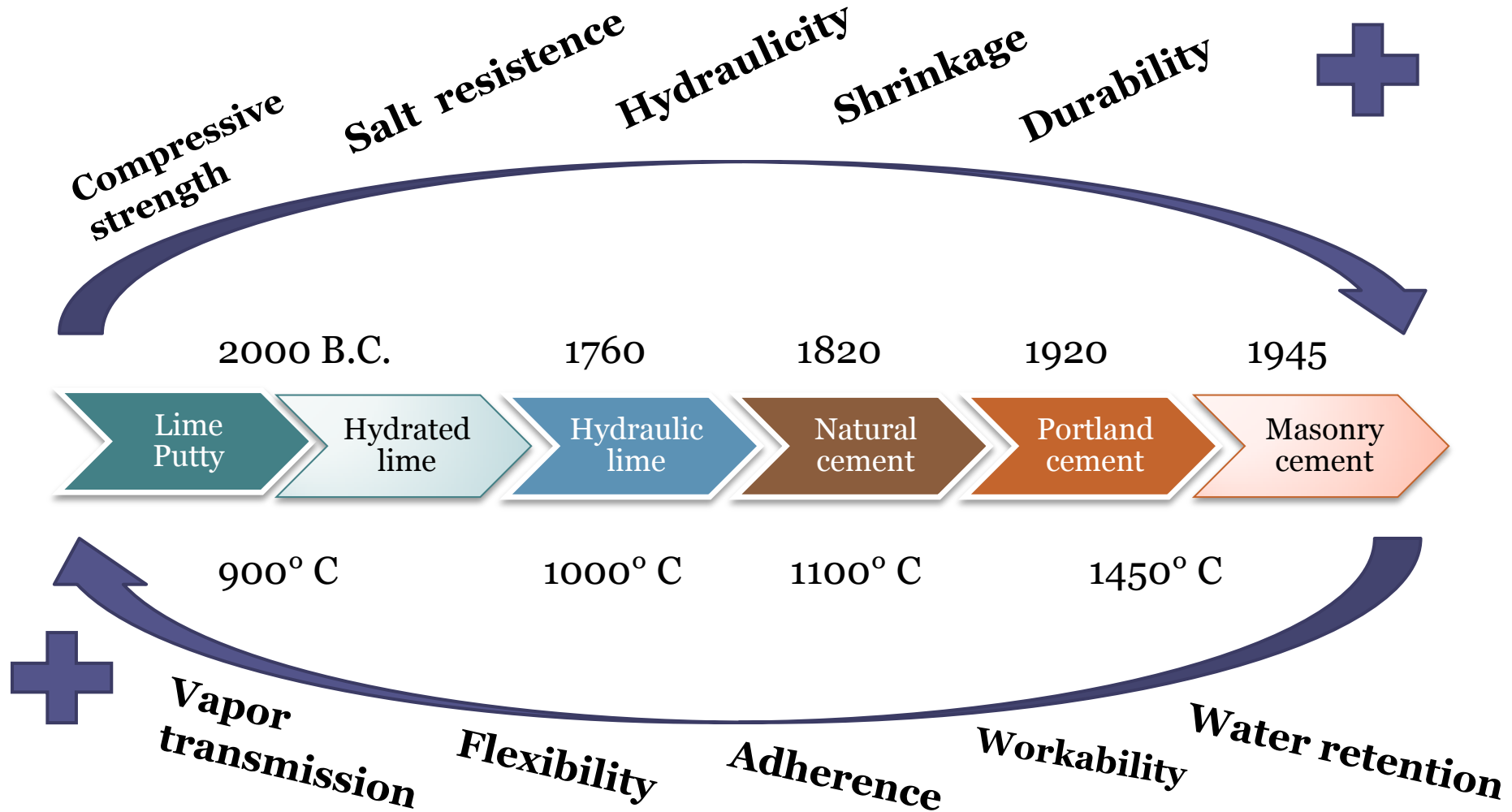
Types of binder

- Lime putty
- Hydrated lime
- Hydraulic lime
- Natural cement
- Portland cement
- Masonry cement
- Mix of hydrated lime and Portland cement

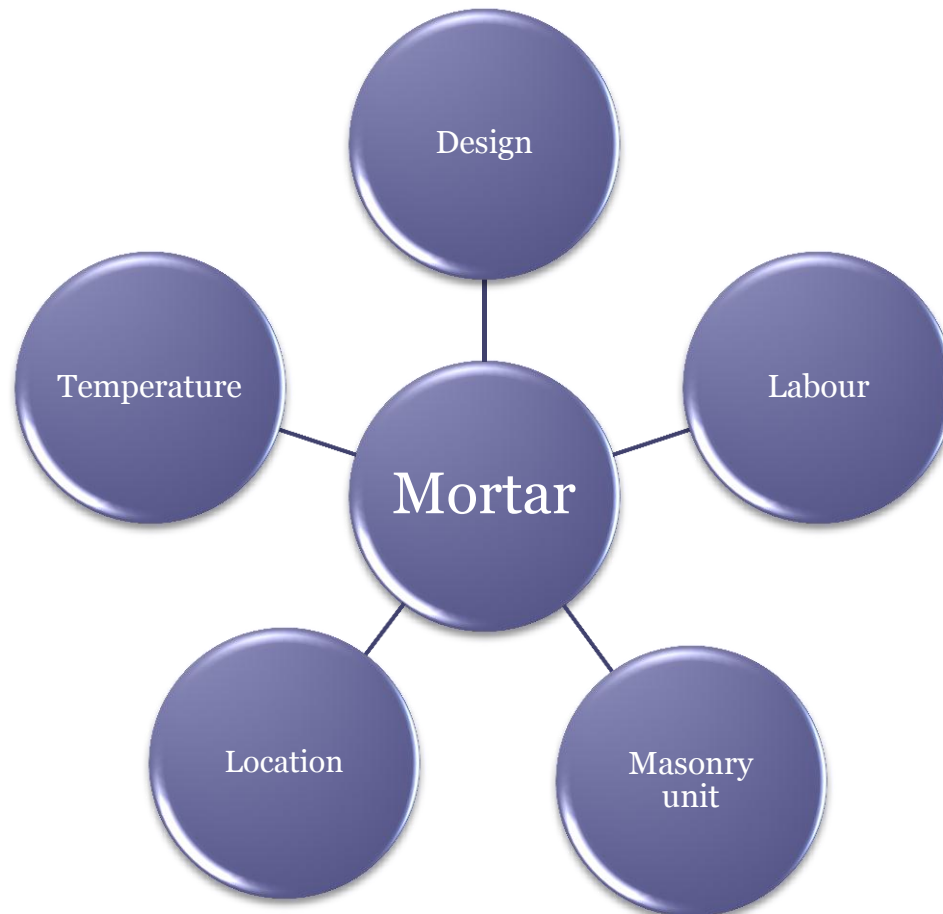
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BINDERS



Mortar = System

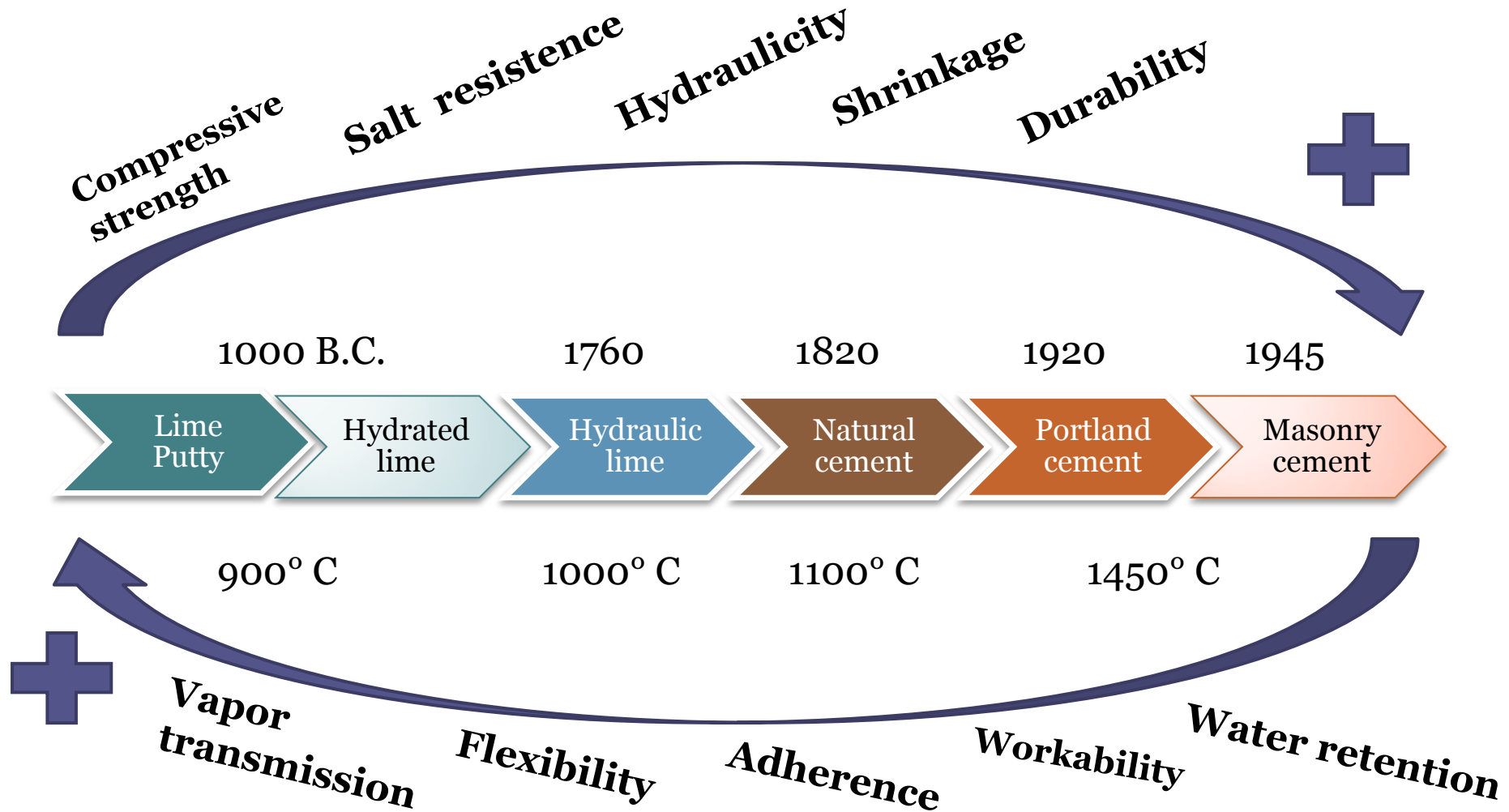


The theory in masonry restoration

- Never introduce a material that was not in the original construction.
- The new mortar should not be stronger (in compressive strength) than the masonry unit and not stronger than the original mortar.
- The new mortar should have the same – or have a better – vapor transmissison rate than the old mortar.

WHICH BINDER
SHOULD BE
USED???

BINDERS



Stone restoration



Replace the stone



Flipo



Repair with a mortar



Repair with mortar

- There is a large variety of stones (Limestone. Sandstone, Granite, Etc.).
- Each type of stone has its own coefficient of thermal expansion.
- Beware of “one-size-fits-all” products.
- Make sure that you won’t use a product that will act as a vapor transmission barrier.

Grouts

- Grouts are often related to the structural design. Make sure you work with a structural engineer before using any grout.
- Just like mortars, grouts can be made from different binders.
 - Portland cement
 - Hydraulic lime
 - Natural cement

Quebec City

Review of some projects

Porte Kent

Porte St-Jean



Batterie Royale



André Laurendeau Building



Pierre Laporte Bridge



Quebec Citadelle



Canada's Parliament (1865-76)



Canada's Parliament



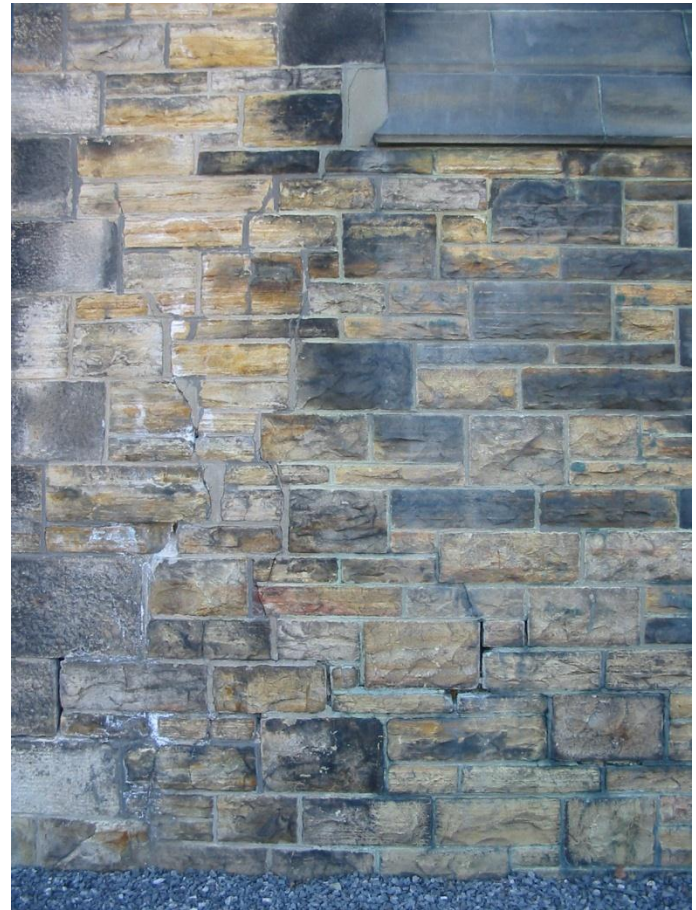
Canada's Parliament



Canada's Parliament



Canada's Parliament



Merci!

Enjoy your stay in
the most beautiful
city in the world!