

Part I: Masonry in Architecture

- Introduction
- Material Properties and Structural Morphology
 - i. Wood
 - ii. Masonry**
 - iii. Steel
 - iv. Fabric
 - v. Composites

Part II: Masonry Systems and Architecture

- Details and systems

Part III: New Materials and Systems

Part IV: Resource Efficiency

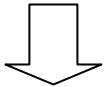
MASONRY

Part I: Masonry in Architecture

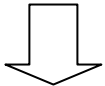
- Introduction

Evolution of masonry

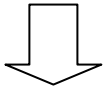
1. **Load-bearing**



2. **Layered**



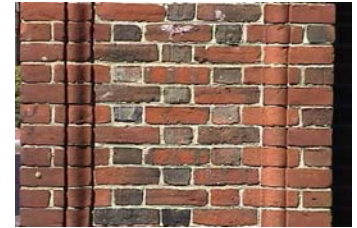
3. **Veneer (non L-B)**



4. **? (Load-bearing, thermal mass)**



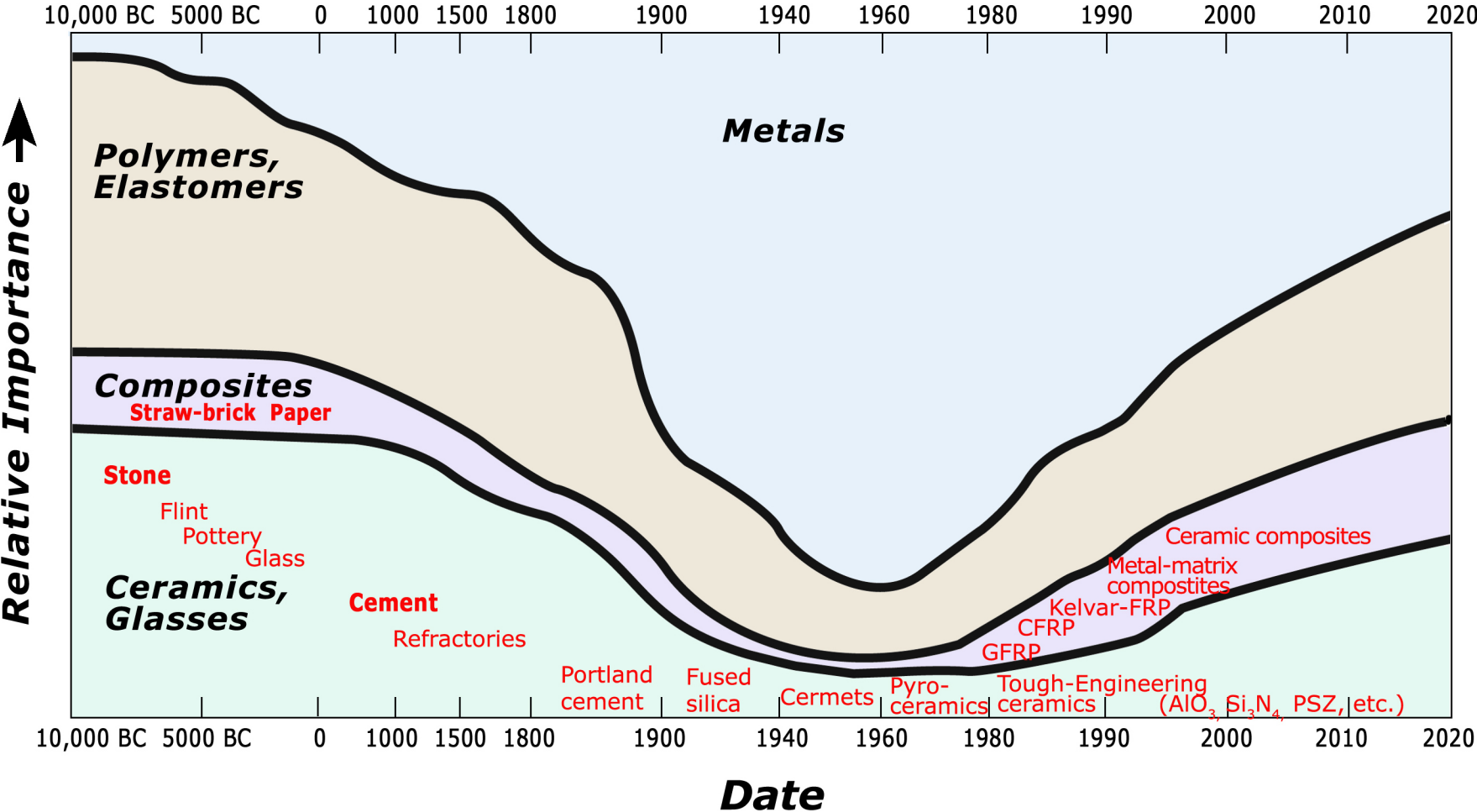
Ramparts, Turkey
Photo courtesy of ArchNet



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Part I: Masonry in Architecture

- Introduction
 - i. Historical trajectory



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- i. Historical context

Landmark developments

14 000 BC	Hand-molded clay bricks in Egypt (straw reinforced)
5000 BC	Fired clay bricks
3000 BC	fired and sun-dried bricks of different colors in Mesopotamia
2500 BC	Discovery of bronze made precision cutting of ashlar stone possible
1st c. AD	Vitruvius writes of brick.
100 AD	Aqueduct at Segovia, part of a 17 km long water circuit
120-125 AD	Pantheon constructed using opus caementitium (cement infilling of brick walls)
532-537 AD	35m masonry cupola of the Hagia Sophia built
Through 13thc.	Cathedrals became place of masonry innovation
13thc.	Standardization of process and sizes established in much of Europe
1854	Carl Schlikeyesen invents extrusion press. Revolutionized the manufacturing of bricks from individual molded units to a continuous process
1858	Friedrich Hoffman invents the ring kiln that allows for a continuous process of firing bricks
1890-91	Tall bearing wall brick buildings – Monadnock Building in Chicago

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- Material Properties

Composite material system
composed of:

Unit

Mortar

Earth (loam)

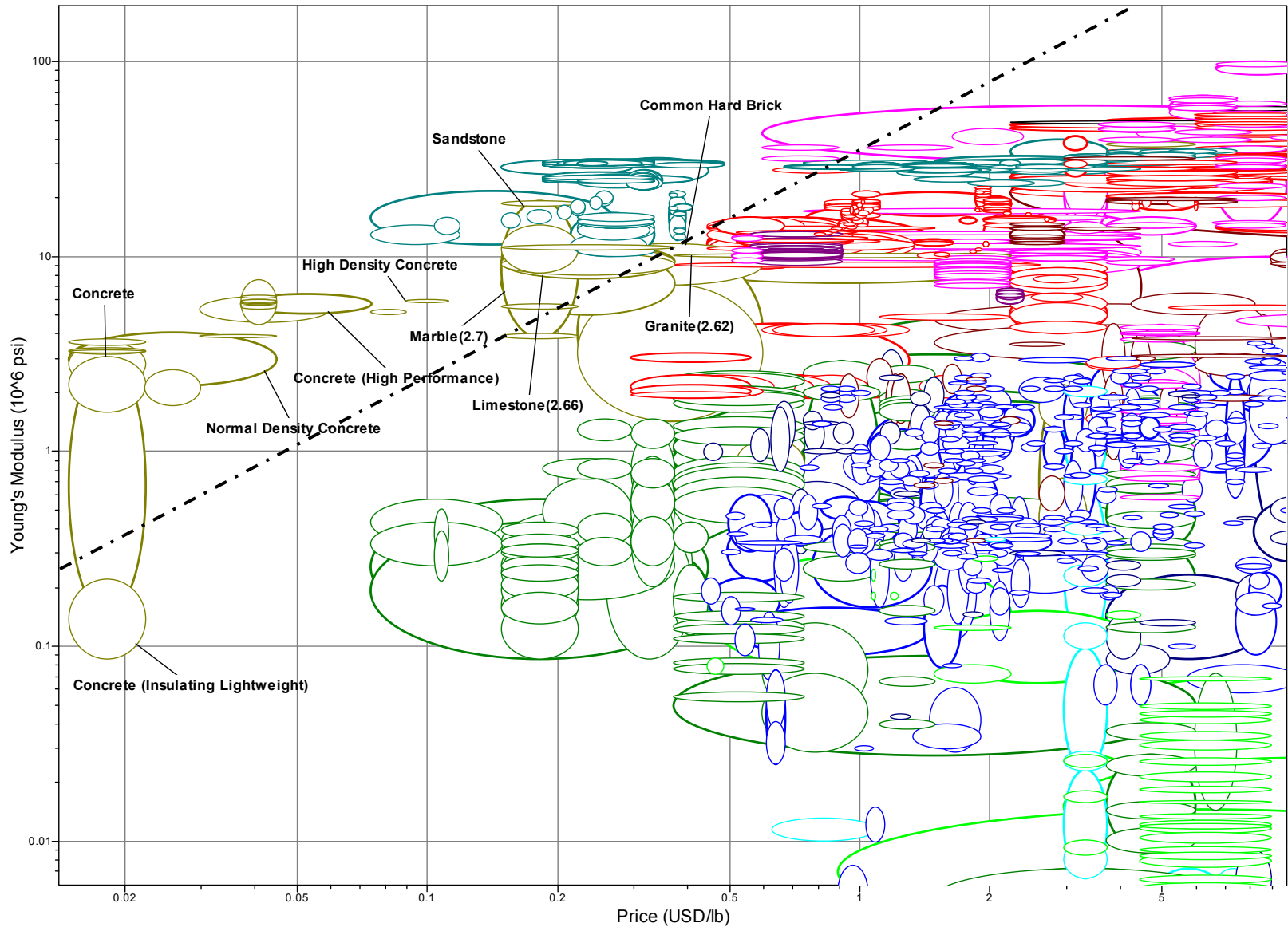
Clay (fired and sun dried)

Cement

Glass



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Mud Mosques, Mali

Photos courtesy of ArchNet and
the Aga Khan Trust for Culture

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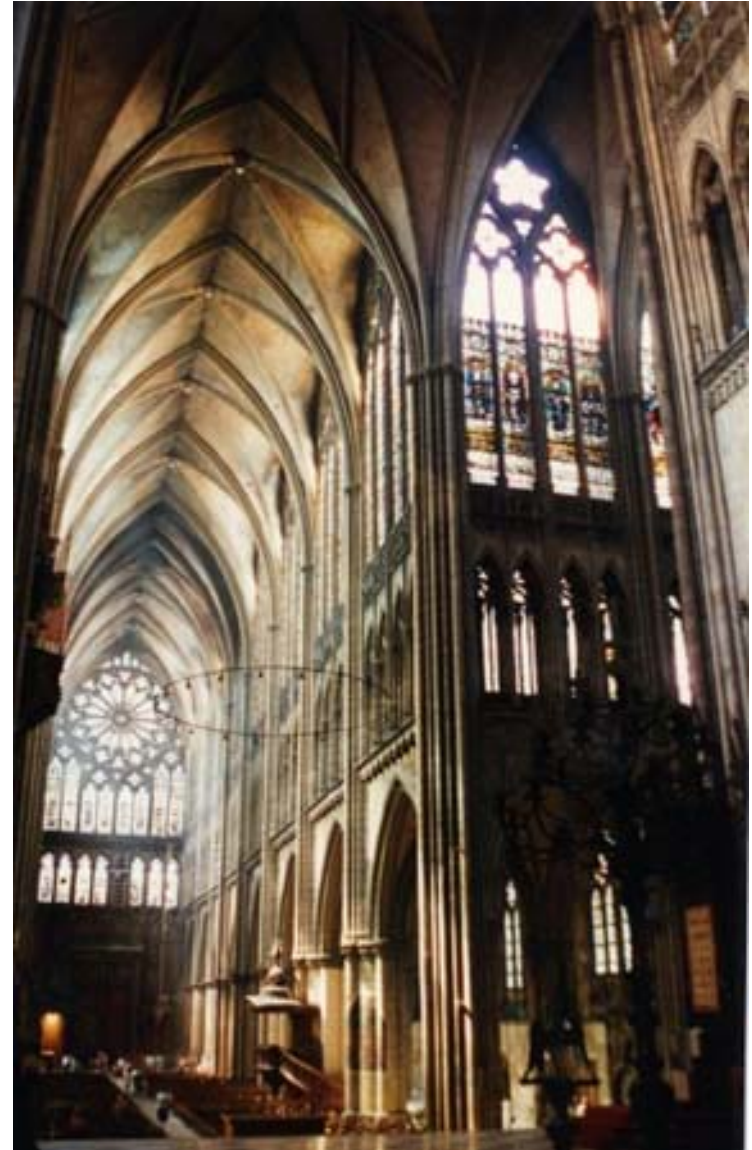


Nassau Hall, Princeton University
Princeton, NJ
Photo courtesy of Structurae

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Metz Cathedral,
France.

Image courtesy of Jacques
Mossot, photographer, and
Structurae.