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

These notes are a test.
Part I: Masonry in Architecture

- Introduction

Evolution of masonry

1. Load-bearing
2. Layered
3. Veneer (non L-B)
4. ? (Load-bearing, thermal mass)
Part I: Masonry in Architecture

• Introduction
  i. Historical trajectory
Part I: Masonry in Architecture

• Introduction
  
  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 Schlikeysen 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
Part I: Masonry in Architecture

- Material Properties

Composite material system composed of:

Unit
Mortar

Earth (loam)
Clay (fired and sun dried)
Cement
Glass
Part I: Masonry in Architecture

• Structural Morphology
  
i. Load Bearing
  
ii. Non-load Bearing
Part I: Masonry in Architecture

• Structural Morphology
  
  i. Load Bearing
  
  ii. Non-load Bearing
Part I: Masonry in Architecture

- Structural Morphology

  i. Load Bearing
  
  ii. Non-load Bearing

Mud Mosques, Mali
Photos courtesy of ArchNet and the Aga Khan Trust for Culture
Part I: Masonry in Architecture

• Structural Morphology

  i. Load Bearing

  ii. Non-load Bearing

Nassau Hall, Princeton University
Princeton, NJ
Photo courtesy of Structurae
Part I: Masonry in Architecture

- Structural Morphology
  
  i. Load Bearing
  
  ii. Non-load Bearing

Metz Cathedral, France.
Image courtesy of Jacques Mossot, photographer, and Structurae.