CE 120 MATERIALS PRESENTATION

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Materials Engineering Concepts

- Materials Science
- Mechanics of Solids
- Construction (Construction) Materials
  - Selection
  - Specifications
  - Quality Control
Major Construction Materials

- Portland Cement Concrete
- Structural and Reinforcing Steel
- Precast Concrete
- Concrete and Clay Masonry
- Wood and Timber
- Asphalt (Bituminous)
Recent Innovations

Emphasis – meet certain criteria (performance)

• HP (High Performance) Concrete
• Fiber-Reinforced Composites
• High Strength/Lightweight
• Superpave Asphalt
• Perpetual Pavements
• Smart Materials
Questions

- How the **properties** of materials affect their **selection** and **performance** in CE applications?
- How to **measure** properties?
- How to **specify** materials?
- How to control **variability**?
- How to assure **quality**?
Major Factors and Properties to Consider

- Economic Factors
- Mechanical Properties
- Non-mechanical Properties
- Production/Construction Considerations
- Aesthetic Properties
Mineral Aggregates
Lime and Gypsum
Portland Cement
Portland Cement Concrete
Structural and Reinforcing Steel
Precast Concrete
Concrete Masonry Block and Pipe
Clay Brick Masonry
Wood / Lumber
Asphalt - Liquid
Asphalt Pavement
PVC Pipe