

Concrete

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Goals

- The biggest Concrete Building
- Concrete Principles
- Conclusion

The biggest Concrete Building

The Petronas



- Facts:

Location: Kuala Lumpur, Malaysia

Architect: Cesar Pelli

Date of completion: 1998

Building Type: skyscraper, commercial office tower

Construction: System glass, steel, and concrete

Height: 452 meters(1483 feet) above street level - 88 stories

Total built-up area: 341,760 sq.meters (3.7 million sq. feet)

Location of skybridge: Levels 41 and 42

Length of skybridge: 58.4 meters(192 feet)

Height of skybridge: 170 meters(558 feet) above street level

Vertical transportation: 29 high speed passenger lifts in each tower

Concrete: 60,000 cubic metres(78,477 cubic yards)

Glass: 77,000 square meters (The towers have 32,000 windows.)

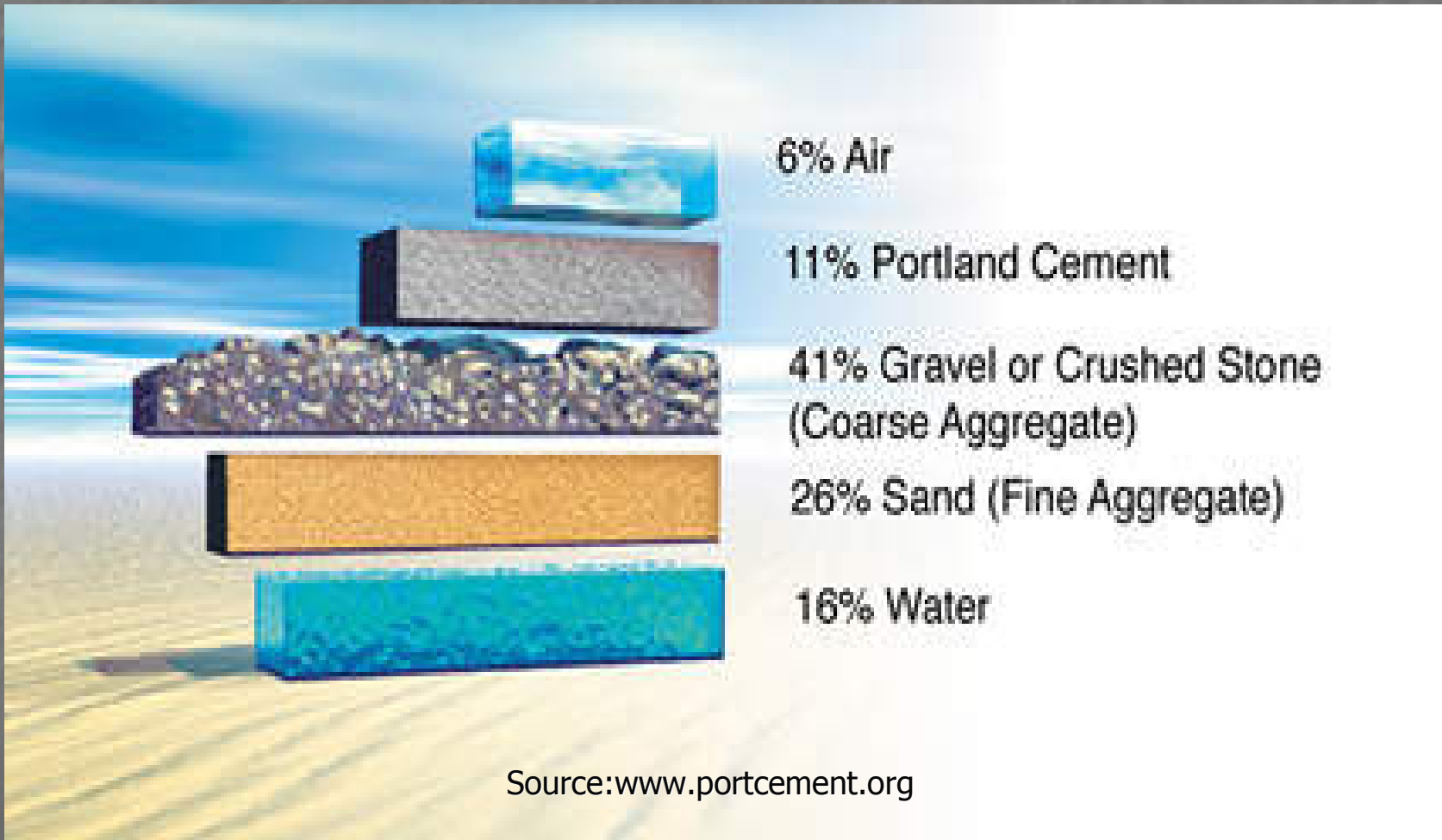
Cost: \$1.2 billion (US)

Source: www.concrete.com

Introduction

- The basic composition of Concrete is principally of aggregates, Portland cement, and water. Others may contain cementitious materials and/or chemical admixtures.
- *Aggregates* are crushed stone and sand.
- *Portland Cement* is compound of calcium, silica, alumina and iron oxide.
- *Cementitious materials*, i.e. Fly Ash, which fills in spaces in the cement paste that are left open.
- *Chemical admixtures* are frequently used to accelerate, retard, improve workability, reduce water, increase strength, or alter other properties of the concrete.
- The selection of concrete proportions involves a balance between economy and requirements of place ability, strength, durability, density, and appearance.

Concrete Basics



Basic Properties

- Workability: capacity to be placed and finish.
- Consistency: mobility of the concrete.
- Strength: resistance in compression @ 28 days.
- Water-cement ratio: ratio of Water/cement (0.25 - 0.55).
- Durability: must be able to endure severe weather conditions. i.e. heating and cooling.
- Density: weight/volume (130-150)pcf.
- Generation of Heat: A severe change in temperature produces cracks.

Conclusion

Concrete is one of the most manageable materials with it we can make buildings, towers, bridges, and even boats. The procedure for selection of mix proportions is applicable to normal weight concrete. Estimating the required batch weights for the concrete involves a sequence of logical straightforward steps. Finally, cement is the most expensive material, and in order to reduce costs we have to use smaller quantities of it.

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