ARCH 614. Study Guide for Quiz 7

This guide is not providing “answers” for the conceptual questions. It is a list of topical concepts and their application you should be familiar with. It is an aid to help prepare for the quiz.

Covers material of Lectures 21, 22, 23, 24, 25 & 26

- Constituents to make concrete
- Behavior in compression vs. tension of concrete
- Design methodology
- Load and Resistance Factor Design
- Working loads
- Factored loads
- Resistance Factors
- “Design” values vs. “Capacity”
- Density of materials and relation to weight
- Load types (and directions) (like D, L, S ...)
- Load combinations
- Minimum Design Loads & Requirements
- Serviceability and limits
- Creep
- “composite”
- Transformed section
- Depth of the Whitney stress
- Moment capacity (or ultimate strength) vs. nominal moment (or strength)
- Factored design moment (or shear or ....)
- Design stress in reinforcement
- Design stress in concrete
- Effective depth vs. depth of a beam
- Reinforcement grades
- Reinforcement ratio
- Under-reinforced vs. over-reinforced
- Purpose of minimum reinforcement area requirement
- Why development length is necessary
- Use of Strength Design Curves (Rn)
- Purpose of stirrup requirement when concrete capacity is available
- Stirrup strength
- Shrinkage
- Cracks
- Concrete cover and purpose
- Clear span / span length
- #3 bar (meaning of the numeral)
- Why bars need space between/around them
- Purpose of compression reinforcement
- T-section behavior and stresses in flange
- One-way slabs design and “unit” strip
- One-way vs. two-way slabs
- One-way vs. two-way shear (load & strength)
- Why torsional shear stirrups are “closed”
- Continuous beam analysis with coefficients
- Effective column length for sway or non-sway frames
- Columns with ties vs. spirals (stresses, factors, etc.)
- Location of maximum shear for design in beams
- Torsional (shear) stress (and where maximum occurs)
- Design vs. analysis