ARCH 614. Study Guide for Quiz 6

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 16, 17, 18, 19 & 20

- Design methodologies
- Steel grades (standard properties)
- Yield strength vs. ultimate strength
- Local buckling in web & flange
- Bearing on flange
- Plastic section modulus
- Plastic moment & plastic hinges
- Braced vs. unbraced length
- W (first number meaning) x (second number meaning)
- Area of web
- Load tracing & tributary width (vs. area)
- Self-weight
- Neutral axis, section modulus, Q, extreme fiber
- Use of Beam Diagrams and Formulas
- Deflections & superpositioning (+ units)
- Lateral buckling (and bracing)
- Allowable Stress Design
- Load and Resistance Factor Design
- Unified Design Method
- Factored loads
- Resistance Factors
- “Design” values vs. “Capacity”
- Factor of Safety
- Load types (and directions) (like D, L, S ...)
- Load combinations
- Minimum Design Loads & Requirements
- Serviceability and limits
- Economical selection by Z charts
- Design vs. analysis
- Use of beam moment capacity charts
- Equivalent distributed load based on a maximum moment
- Use of Load Tables
- Joist vs. beam vs. girder
- Plate girder
- Web stiffener plates
- Decking (composite vs. non)
- Open web joist
- Gusset plate
- Method of Sections
- “Best” location for summation of moment
- Truss configurations and assumptions for analysis
- Zero-force member
- Special truss member configurations at joints and conditions
- Compound truss
- Diagonal tension counters and solution method
- Design vs. analysis
- Slenderness criteria & l/r
- k/r limit for steel
- with respect to least radius of gyration
- Compact section criteria
- Use of column load capacity charts
- Bolt designations
- Gross area
- Effective net area
- Area of web
- Connection types
- Weld strengths
- Throat thickness
- Fillet, butt, plug, slot
- Coping
- Tension member
- Simple shear connector
- Framed beam connection
- Sheet metal shapes and spans, i.e. decking
- Use of decking capacity tables
- Composite vs. Noncomposite deck

- Single vs. double shear
- Capacity of a connection
- Block Shear Rupture
- Effective length, K & bracing
- Beam-Columns
- Combined bending and compression – interaction
- P-Δ effect
- Eccentricity