ARCH 331. Study Guide for Quiz 4

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 11, 12, 13 & 14

- ☐ Allowable Stress Design
- ☐ Load and Resistance Factor Design
- ☐ Working loads
- ☐ Factored loads
- ☐ Resistance Factors
- ☐ "Design" values vs. "Capacity"
- ☐ Factor of Safety
- ☐ Density of materials and relation to weight
- ☐ Static vs. dynamic loads
- ☐ Wind and dynamic response terms & behavior
- ☐ Load types (and directions) *(like D, L, S ...)*
- ☐ Load combinations for ASD, LRFD
- ☐ Load patterns
- ☐ Building codes vs. structural design codes vs. material standards
- ☐ Minimum Design Loads & Requirements
- ☐ Serviceability and limits
- ☐ Design vs. analysis
- ☐ Actions vs. reactions
- ☐ Load tracing & tributary width (vs. area)
- ☐ Concentrated loads
- ☐ Distributed loads – uniform / non-uniform
- ☐ w vs. W
- ☐ Equivalent center of load area
- ☐ Equivalent Force Systems
- ☐ Rafter, joist, girder, decking, pilasters, bearing walls, shear walls

- ☐ Shallow foundations: spread, wall, mat
- ☐ Deep foundations: piles, pile caps, grade beams
- ☐ Horizontal spanning levels and collectors
- ☐ Load distribution for slab supports
- ☐ Parts of retaining walls & types
- ☐ Loads on retaining walls (gravity, friction, equivalent fluid pressure, bearing pressure)
- ☐ Factor of safety of sliding and overturning
- ☐ Triangular or trapezoid shape of bearing pressure & relation to location of centroid of load
- ☐ Wind load tracing and bracing configurations
- ☐ Lumber vs. engineered timber characteristics
- ☐ Various strengths (directionality, wood type, etc.)
- ☐ Timber design methodologies and obtaining allowed stresses (duration, multiple member use....)
- ☐ Creep
- ☐ Nominal dimensions of timber
- ☐ Maximum bending stress (& location along length and in cross section)
- ☐ Maximum shear stress (& location along length and in cross section)
- ☐ Maximum shear stress by beam shape (proper equations)
- ☐ Stress types in beams
- ☐ Self-weight

- ☐ Deflections & superpositioning (+ *units)*
- ☐ Use of Beam Diagrams and Formulas
- ☐ Lateral buckling (and bracing)
- ☐ Equivalent distributed load based on a maximum moment
- ☐ Use of Load Tables
- ☐ Decking, joist types, laminated arches, stressed-skin panels, box sections, trusses, lamellas
- ☐ Depth with respect to span length and shape
- ☐ Timber construction types
- ☐ Column stability factor, F_{CE} & l/d
- ☐ l/d limit for timber
- ☐ Effective length, K & bracing
- ☐ Beam-Columns

- ☐ Combined bending and compression – *interaction*
- ☐ P-Δ effect
- ☐ Eccentricity
- ☐ Connection stresses
- ☐ Design vs. analysis
- ☐ Bolt designations
- ☐ Effective net area
- ☐ Connection types
- ☐ Nail load capacity charts
- ☐ Bolt capacity charts and relation to wood strengths
- ☐ Single vs. double shear
- ☐ Stresses in built-up beam sections and the connectors