

## ARCH 631. Case Study Project

**Date:** 9/19/13

*Report to be submitted to Turnitin.com;  
Report and files due 12/3/13; Presentations 11/21/13 & 11/26/13*

### **Problem Statement:**

A case study of an architectural structure is to be undertaken by a team of 4-5 class members. The structure being investigated can be new or old, still standing or torn down, but must have sufficient documentation to prove it existed and can be investigated.

The subject for the case, determined by the team, must be approved by the instructor. It is strongly recommended that the group obtain feedback on the approach to the structural system evaluation with respect to complexity and content.

A hardcopy report (8-12 pgs.) is to be submitted which contains documentation of the case, examples and illustrations of the structural system(s) or members, computer analysis (with animation if appropriate) with Multiframe for the system or an assemblage. If there are no appropriate systems or assemblages that can be modeled in 2 or 3D with the software, a 2D representation for non-planar systems such as domes must be analyzed with Multiframe. The report will include any other supporting evidence showing the application of the subject matter of ARCH 631 in the qualitative and quantitative analysis.

A Microsoft PowerPoint file must be created to present the content of the report visually and submitted for posting on the course web site. The presentation *will not* be graded; only the report.

In addition the report must be submitted in electronic format, either in Microsoft Word, WordPerfect, RTF, PDF, PostScript, HTML, or plain text format. It should also have been submitted for evaluation by Turnitin.com. Any Multiframe model files must also be submitted.

### **Objective:**

The objective of the study is to synthesize the material of the course, and apply it to a structure that is of particular interest to the group. The application of structures to architecture is as varied as there are architects. The presentation file is to impart your knowledge and demonstrate the variety of structural applications. The presentation should also show the force analysis, stress criteria and validity of the selected structural members with respect to their material and applicable code requirements. The reports are to be informative as well as interesting.

### **Grading Criteria:** (also provided in the Case Project Evaluation Form)

The project report and presentation are a TEAM effort, and will be graded as such. Overall quality and breadth will be reflected in the reports and presentation. Teams should clarify goals and outcome together, but all work will not necessarily be conducted together. Teams should delegate research assignments or tasks so as to work productively. Input on the effort of individual team members will be solicited from the teams themselves and used to assess the overall grade. The Self/Peer/Team assessment must be completed and submitted by every member for the report to be graded.

The report and presentation must have the minimum content (C level):

Introduction: This is the section that sets up the story and says why the project is of particular interest. It is usually a brief description of what you are going to tell the reader/viewer.

Background: It must provide background on the structure, architect (if appropriate), program & function, political/funding background, etc. It should also go into sufficient detail as to why the project is of particular interest or the unique aspects of it. It could include the designer's intent.

Main Body: This section can have any relevant title and multiple subsections. It should include a description of the main structural system. The relevant components should also be identified. For example, if the structure is a pinned frame, describing the beam and column elements is NOT necessary. Describing the connections and lateral resisting system IS necessary. The discussion must include identification of the lateral resisting components or system. Within or separately from this identification, the loads on the structure must be identified. Loads on representative structural components, such as beams & columns, **must be quantified** even if that information is unavailable in the literature. Current design code quantities for loads based on usage must be referred to in this case. Results must be presented from a Multiframe analysis. A qualitative or quantitative description must be provided to show how the system or elements transfer the primary loads and how lateral loads are transferred. Simplified analysis is acceptable. If the structural system was subjected to any extreme loads during construction, these must be identified and related to the choice of the structural system.

A description of how the system would respond to lateral loads must be included. For example, the structure could respond by twisting, or side-sway with rotation of joints.

A description of the foundation system must be provided and a discussion of the choice with respect to the known soil conditions or the possible soil conditions that the foundation type can be used with. If no foundation information is available, a description of what could be used can be substituted. Qualitative analysis must be provided for a typical foundation component which includes a diagram of resulting pressure and typical allowable soil pressure for the type of soil involved. If a spread footing is used, the maximum column load should be calculated from the soil pressure and footing area.

Conclusion or Summary: This section must summarize the key points from the story. It is usually a brief description of what you just told the reader/viewer.

References: This section MUST include the reference material used or cited from books, web pages, or other sources. If photographs or images of the structure are copy righted or include analysis figures not performed by the team they must be referenced, otherwise it is not necessary. See the reference **Student Guide to Academic Integrity when Writing Papers**. Failure to comply will result in a failing grade for the assignment, and will be reported to the Office of the Aggie Honor System.

The reference list may be alphabetical with reference to year and author in the text, or indicated numerically by order in the text or alphabetically. The Chicago Manual of Style is a good source for examples by reference type and also has reference style listing for internet sources. A web site based on the text can be found at: <http://library.osu.edu/sites/guides/chicagogd.html>