Senior Thesis Program
The Department of Architectural Engineering
The Pennsylvania State University
University Park, PA

Structural Technical Report 3
Lateral System Analysis and Confirmation Design

Prepare an analysis and confirmation design study of the lateral system in your building. Loads obtained from Technical Assignment 1, with any appropriate revisions should be used for this study. This assignment should be viewed as an extension of previous reports but appropriate background material, framing plans, sketches etc. from previous reports should be included.

Specifically, address the following:

1. Describe the lateral system used in the existing system.
2. Determine which lateral loads or combination of loads will control the design of your lateral resisting system.
3. Determine how the computed lateral loads should be distributed to the lateral resisting elements in a logical and rational method.
4. Confirm that a logical load path for distribution of the calculated loads exists in the real structure and note any weak links or areas of concern.
5. Include a check of strength, drift, story drift, overturning and impact on foundations as appropriate.
6. Strength check is to include spot checking of critical members.
7. Compare drift values to allowable code or industry accepted values and discuss results.
8. Incorporate overall building torsion issues as part of design check. Complicated buildings and lateral systems may approximate this if necessary for this assignment and go into more detail as part of the end of semester proposal.
9. Provide a discussion of any results that do not appear to match the existing results or that do not meet standard criteria for lateral systems.
10. Provide a summary and conclusions section in the report.

It is anticipated that a fairly detailed an accurate study will be necessary in most cases to confirm the design for such items as computed drift. Most students will find it worth while to incorporate computer modeling. Students with large (tall) or complicated buildings or loading conditions should discuss their approach with their consultant prior to starting the assignment. Your consultant may give you permission to simplify the models or to look at lateral loads in one direction only for these special case buildings.