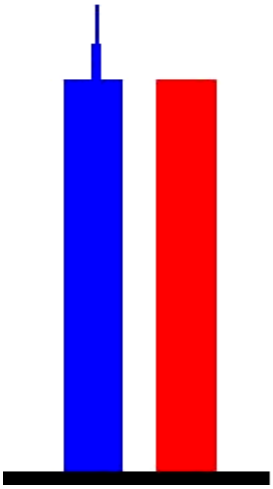
UNIVERSITY OF CALIFORNIA - BERKELEY
Department of Civil and Environmental Engineering
Fall Semester 2005
CE24- Freshman Seminar
Skyscrapers and the World Trade Center



This course is dedicated to the memories of the firefighters and rescue workers who heroically sacrificed their lives on September 11, 2001 to save others and to the memories of all victims of this horrifying act of violence against innocents.

Abolhassan Astaneh-Asl

Shanghai World Financial Center
(Currently under construction)
Digital Rendering Courtesy of Mori Corporation

World Trade Center prior to its destruction by terrorists on 9/11/2001
(Photo: LERA)

Proposed replacement for the World Trade Center as of July 2005
(Digital Image: Lower Manhattan Development Commission and SOM)

Faculty: Professor Abolhassan Astaneh-Asl
Lectures: Wednesdays 11:00-12:00 at 72 Evan Hall
Faculty Office Hours: See http://www.ce.berkeley.edu/~astaneh
Professor Astaneh's Office: Room 781 Davis Hall
E-mail: astaneh@ce.berkeley.edu (Expect a response to e-mails within 48 hours).

General Information:

Description: This seminar discusses skyscrapers first: how they are designed and constructed; what motivates us to build them; and who designs and constructs them. Then for the remainder of the semester we will focus on the World Trade Center. Topics will include the initial design and construction of the World Trade Center, the 1993 unsuccessful terrorist attacks on it, and the attacks in 2001 that resulted in the tragic collapse of the towers and the loss of lives of more than 3000 innocent people. Finally, the plans for rebuilding the World Trade Center will be presented. Although the focus of the course is on design and construction aspects of skyscrapers and the World Trade Center, other aspects such as economical, political, social and historical issues will not be excluded from the discussion. The students are expected to participate in classroom discussions and select a topic related to the course title and prepare and submit a three-to-five-page term report on the subject.

Professor Astaneh is a member of the faculty in the Department of Civil and Environmental Engineering. His area of specialty is behavior and design of structures to withstand gravity, seismic and blast loads. He has conducted several major research and design projects on long span bridges and tall buildings. He teaches graduate and undergraduate courses in structural engineering. A few days after the September 11th tragedies, armed with a grant from the federal National Science Foundation, he traveled to New York and for several weeks conducted field investigation of the collapsed towers of the World Trade Center. He is currently continuing his studies of the World Trade Center collapse to learn from this tragedy as much as possible. It is hoped that the lessons learned can be applied in design of other skyscrapers to prevent their catastrophic collapse in the event of future attack and to save lives.

Grading System: The final grade in the course will be Pass or Fail. In order to receive a passing grade the student should receive a final grade of 70 or more out of 100. The following weights will be used in calculating the final grade: 60% to attending seminars and actively participating in the discussions and 40% to the Term Report and presenting it to the class. During second week of semester, each student will select a topic related to skyscrapers or the World Trade Center (please see below for a list of some suggested topics). Students can select other topics as well. During the semester, each student will do the research on her/his selected topic and prepare a Term Report. In addition to working on their own topic, the students are expected to participate in the discussion of all other aspects of the WTC during the semester. The due date for the Term Report is the last lecture where each student will have 3 minutes to give a brief summary of her/his report to class.

Suggested Topics for the Report: (listed in random order)

1. Student's personal experiences and feelings about the 9/11 tragedy and the WTC.
2. History of the WTC, planning, early proposals, politics, financing the project, ..
3. Social, political and urban effects of the World Trade Center
4. The life and professional activities of M. Yamasaki, architect of the WTC .
5. Life and professional activities of L.E. Robertson (UC-Berkeley Alumnus) and structural designer of the WTC.
6. Wind design aspects, the vibration dampers and wind tunnel tests of models of WTC.
7. Geological and geotechnical aspects, the condition of supporting rock, ..
8. Foundations and retaining walls design, construction, problems and innovations

9. Material used in the towers, steel, concrete, bolts, fireproofing etc….
10. Superstructure of the towers, floor trusses, outside tubes, inner core
11. Fire engineering and fireproofing
12. The railroad system within the site (PATH Trains).
13. The 1993 terrorist attack.
14. The 9/11 attack.
15. Survivors and Families of the victims.
16. The news media coverage of the 9/11 attacks.
17. The "Skyscraper Safety Campaign"
18. The Congressional Hearings on the investigation of the World Trade Center
19. Ongoing investigation to find out what happened?
20. Proposed new designs for the site of WTC.
21. Any other topic related to WTC.
22. Future of skyscrapers.
23. Developing technologies to protect buildings against terrorist attacks.
24. History of skyscrapers.
25. Types of skyscrapers.
26. Architectural aspects of design of skyscrapers.
27. Social and political aspects of skyscrapers.
28. Why do we build skyscrapers?
29. Ten tallest skyscrapers in the world.
30. Any other topic that relates to skyscrapers or WTC.