ASC Student Competition

Virtual Design and Construction Problem

February 7th-10th, 2013

Webcor Builders

INTRODUCTION

Summary:
Virtual design and construction is leading the way in the construction industry to be the most efficient and most effective means of building. This problem is intended to allow your team to demonstrate your skills in creating, analyzing, and implementing multidimensional Building Information Models (BIMs) to solve construction problems in both the preconstruction and construction phases.

Models have evolved beyond the typical 2D plans and 3D geometries. While it is still critical to be able to read 2D plans and generate accurate and functional 3D models, Building Information Models (BIMs) allow the project team to extract information for 4D (schedule) and 5D (estimate) components. Tasks can be generated and linked to every element in the 3D model in order to build an integrated schedule. 4D BIM allows for easy sequencing of the 3D model using quantity takeoffs, resources, productivity rates, and labor costs. Furthermore, 5D BIM allows for integration of cost and productivity data from the project's Subcontractor in order to accurately provide a cost estimate that reflects what truly happens in the field. With consumption factors, waste factors, unit costs, and appropriate units, every element in the 3D model would be accounted for in a model-based cost estimate. The next step of the integrated process is to provide production control of construction in the field to forecast future costs and schedule with the budgeted allowances. By using an integrated approach with virtual design and construction, project teams are able to reduce risks, manage costs, and optimize schedules on complex building projects.

In this problem statement, you are provided with design documents, models, and subcontractor data related to a new high rise building in busy downtown San Francisco. With the increased housing demand, the Owner of One Rincon Hill has decided to build a sister building that sits right next to its finished counterpart. Activities related to modeling, model quality control, model-based estimating & scheduling, and presentation skills are required.

Disclaimer: The information contained in this problem (including any documents, models and/or data) are only representative in nature and are to be used for educational purposes during the 2013 ASC Student Competition Virtual Design and Construction Problem **ONLY**. Any unauthorized use of this information without Webcor Builders written approval is prohibited.

General Information:

1. **Premise:** Teams will prepare their answers as a general contractor project team. Judging will be Webcor Builders Virtual Building team.

2. **Communication:**
   a. Each team will provide a single e-mail address to the judges as the contact for the team and a cell phone number for text messages.

3. **Question and Answer Period:** Q&A sessions will be held at 1:00 PM and 5:00 PM. At least one person from each team must attend.

4. **Problem Deadlines**:
Problem deadlines are due at the times specified in the table below.

5. **RFI's:** All questions must be submitted via e-mail. Answers to those questions the judges feel are valid will be sent to all designated team contacts.
   a. RFIs will be accepted during the following time periods **only:**
      i. 9:30 AM – 10:00 AM
      ii. 2:30 PM – 3:00 PM
      iii. 8:00 PM – 8:30 PM
   b. All questions to the judges will be directed to Ty McConnell via email at tmcconnell@webcor.com and Matt Larson via email at mlarson@webcor.com. Only questions sent during the defined time periods will be evaluated for validity and responded to if valid.
   c. The Judges will respond as appropriate to the team contact person.
   d. All teams will receive any responses provided.

6. **Problem Solutions:** Solutions will be submitted to the judges on the provided flash drives at 1:00 PM, 5:00 PM, and 10:00 PM Thursday, 2/7 in the problem room, Genoa Suite. Actual deliverables are listed in the respective problem statement handouts. Late submittals will be considered unresponsive and will not be accepted.

Please **do not revise** any parts of the solutions template provided. Only fill out the cells highlighted in green.

7. **Presentations:** All materials to be used in the presentation will be submitted to the judges on one of the provided flash drives at 7:30 AM Friday 2/10.
   a. Teams will draw for presentation position at that time.
   b. Team presentations will begin at 8:00 AM, with the order being selected at random.
   c. Teams will be given 5 minutes for setup and 5 minutes to break down.

d. Arrive 10 minutes prior to presentation. Wait outside the meeting room. Webcor will let you know the appropriate time to enter.
e. Points will be deducted for lateness and additional time will not be granted.

8. **Room Visits:** Judges will be performing random visits to the teams.

PROBLEM DESCRIPTION

General Information:

1. The project is a 53-story apartment high-rise located at First and Harrison Streets in San Francisco, California.

2. The problem assesses knowledge and skills in five (5) areas: Modeling, Construction Document Quality Control, Model Quality Control (QC), Estimating, and Scheduling. Each phase will require different tasks and address different portions of the project. Please read instructions carefully and provide all requested information in the proper format.

3. As indicated in the pre-problem statement, teams may use any software available, but the deliverables need to be in the format indicated.

4. The presentations will be the time to demonstrate how teams arrived at their solutions and explain the integrated approach taken to solve the problems presented.

PRESENTATIONS

1. Teams will be allowed 5 minutes for set-up, no longer than 10 minutes for presentation, and 15 minute for questions and answers.
2. Presentation order will be determined by random draw at 7:30 AM. All teams must be prepared to present at this time.
3. At this time, teams will submit their presentations to the judges on a provided flash drive. Teams will return at time of presentation.
   Only team developed deliverables should be used for presentations. Do not use Webcor provided materials for presentation (models, database information, design documents, etc.)
4. Teams may stay for other team presentations after presenting, but teams may not view presentations prior to their designated time.
5. Teams must provide their own computers and projectors
6. During the presentation portion teams should focus their time on explaining the team's **approach** to the problem. Keep the presentation brief and poignant. Some of the questions that your team should address are:
   a. How was the work divided?

b. What was your general approach to each phase of the problem?
c. Highlight significant challenges and your approach to solving the problem.
d. Discuss how the problem was approached using an integrated approach to modeling, estimating, and scheduling.

JUDGING CRITERIA

Pre-Problem Deliverable	Time Issued	Time Due	Weight
Student Resume Packet	N/A	N/A	5%
Modeling Problems			
Structural Modeling	8:00 AM	1:00 PM	10%
Drawing QC	8:00 AM	1:00 PM	5%
Model QC	1:00 PM	5:00 PM	5%
Shop Drawings	5:00 PM	10:00 PM	5%
Estimating Problems			
Estimating 1	8:00 AM	5:00 PM	12.5%
Estimating 2	5:00 PM	10:00 PM	12.5%
Scheduling Problems			
Schedule 1	1:00 PM	5:00 PM	7.5%
Schedule 2	5:00 PM	10:00 PM	17.5%
Presentation and Q&A Session			
Presentation and Q&A			20%
		Total	**100%**

PROBLEM RECAP

Webcor Builders will present a 30 minute solution and problem recap in problem room, Genoa Suite, on Friday at 4:30 PM. All students, coaches, alternates, etc are welcome to attend. The recap will be followed by Hospitality Suite in Genoa Suite, starting at 7pm. There will be food and beverage provided with lots of prizes including an iPad Mini.