



**ASSOCIATED SCHOOLS OF CONSTRUCTION**

ROCKY MOUNTAIN REGION  
REGION VI  
AK, AZ, CO, ID, MT, NV, NM, UT, WY

FAR WEST REGION  
REGION VII  
CA, HI, OR, WA

**Region VII- Commercial Building Division**  
**February 7-10, 2007**

# Problem Statement



**UC Irvine Bren Hall**  
**Irvine, CA**

Problem Sponsor:



**Hensel Phelps**  
**Construction Co.**

Competing Teams:



Chico State



San Luis Obispo



Long Beach State



Washington State



**SAN DIEGO STATE**  
**UNIVERSITY**



University of  
Washington



University of  
Southern California

**Associated Schools of Construction Competition  
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**PROBLEM SPONSOR**



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**I. COMMERCIAL DIVISION TIME TABLE**

**THURSDAY, FEBRUARY 8TH**

Pick-up Problem Statement ..... 6:00 AM  
Written Questions (RFI's) Due ..... 10:00 AM  
First Progress Meeting ..... 10:00 AM  
Second Progress Meeting / Question Session ..... 2:00 PM  
Subcontractor Interviews (10 min. / team) ..... 5:00 – 7:00 PM

**FRIDAY, FEBRUARY 9TH**

Proposals Due ..... 12:00 AM (Midnight)  
Interview Start Times Posted..... 9:00 AM  
Interview Material Due (all teams) ..... 9:45 AM  
Interviews Start..... 10:00 AM  
Project Debriefing..... 6:30 PM

**SATURDAY, FEBRUARY 10TH**

Career Fair ..... 8:00 AM -12:00 PM  
Awards Banquet / Luncheon..... 12:15 PM



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## **II. PREFACE**

WELCOME to the 2007 ASC Student Competition. All participants are to be commended for the personal time and financial commitment made in attending this competition. The construction industry has noted these sacrifices and the premier student population that is competing here. This is evident in the quantity of companies attending the “Job Fair” (see Saturday schedule).

The student competition is designed to enhance and expose every team member to different facets of the construction industry. Each team’s estimating, scheduling, organizational, leadership, productivity, and communication skills will be tested **and enhanced** while participating in this competition.

The competition will present each participant with construction industry exposure that may not otherwise be experienced until after several years of work in the industry. This experience should, therefore, be considered priceless. It is Hensel Phelps Construction Co.’s desire to present each team member with real life situations through this competition. Some of these “experiences” may seem uncomfortable and/or appear to contain no logic. Be aware the real world is not always fair and not always logical!!! The construction industry will present situations where people are less than pleasant and some that know it all. Some real life questions may have two answers and some questions may have no correct answer. These situations are presented to the teams to expand their real life experiences. The superior level of the student competitors attending the 2007 competition should embrace these challenges and recognize the value of these situations. Although it is human nature to “take it personal”, please understand your development process is in action. At the end of the competition each team member should reflect on the knowledge and experience gained.

As a driven team member, realize that all teams have come to the competition with the main goal of WINNING! However, with so many competitors, also realize that there can only be one winner announced. As an intelligent, driven and committed individual recognize the vast knowledge, industry exposure, and experience gained in competing and finishing this competition. This is the real reason all teams and individuals are competing. Yes, it is true; every person competing is a winner regardless of the final overall placement. Make sure you, and your team, understand this; it does make a difference.

Determination of the Winner is based on a **uniform grading scale** for the written portion of the competition. The oral presentation is judged via a **multi-member judge panel**. The combination of these two components, in the scoring ratios listed, determines the overall team placement. Overall team placements will not be posted. The first place winner will be asked to represent our region by attending the National competition. Congratulations for participating and Good Luck!



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### **III. PROBLEM SCENARIO**

(Competing schools will represent a Project Team that must evaluate the following project.)

Your company is responding to a Request for Proposal issued by the University of California, Irvine. The project is named Computer Sciences Unit 3-Bren Hall. This is a modified design build project and the bridging documents, completed by an architect under a separate contract with the University, have been issued. Your team is to develop a lump sum bid proposal to submit to the University. For the purposes of this Student Competition, the drawings included are the final construction documents produced by the actual design-build team, but should be considered as the pre-proposal bridging documents.

Upper management has asked your team to establish the budgets based on the current design and validate the schedule of the project as you prepare to submit the proposal. You must submit documentation to them by midnight tonight and you will be asked to present your findings in a meeting with your upper management tomorrow. Interim progress meetings are scheduled for 10:00 AM and 2:00 PM today (Thursday, February 8, 2007). Any questions should be delivered, in writing on the Request for Information form (RFI), to the management team at the 10:00 AM meeting. Response to these RFI's will be provided at or before the 2:00 PM meeting. The RFI form is provided in Section XI. The 2:00 PM meeting will be for verbal questions and answers only.

Please note that some of the written questions do not fit into the "pre-construction" scenario (i.e.-they occur later during construction), consider these "time warp" and answer them with that understanding. This is to challenge your team on the full realm of construction issues.

For the oral presentation on Friday, all teams shall include students representing the company's Project Manager, Project Superintendent, Project Estimator, Project Engineer, Office/Field Engineer and Safety Director. The 30 minute presentation should allow for 20 minutes of team presentation and 10 minutes of questions and answers.

Your presentation should at least touch on the following topics;

- Cost
- Schedule
- Site Utilization
- Quality
- Safety



## **IV. PROJECT INFORMATION**

Your firm has successfully completed 5 projects on campus and the University is one of your district's most important clients.

Your team is proposing on a 125,000 square foot building for the University of California Irvine which will house offices and research space for the faculty and graduate students. The project site is approximately 2 acres including the buildings, the new entry plaza and the landscape area. The overall site area is part of the Engineering quad. The building will be constructed adjacent to the main ring mall student pedestrian walkway. The building site is mostly an existing surface parking lot. The first level includes a 250 seat lecture room, a 125 seat lecture room, two 50 seat seminar rooms and classrooms. Two levels are for the School of Engineering and four levels are for the School of Information and Computer Sciences. Site work includes reworking the existing grades and pathways, a new arcade and landscaping.

The building is cast in place with exposed integral color concrete. The building expresses the building layers: a base of darker textured CMU, precast and brick veneer; body of integral color concrete; and top of glazed ribbon windows and sunshades at the offices. The mechanical equipment is in a mechanical penthouse above the top floor.

The project is to be complete within 910 calendar days upon the receipt of Notice to Proceed including the design and construction.



## V. PROBLEM OUTLINE

Structure and tab your documentation according to the following outline. Include only the information requested in **Section VI. Submission Requirements.**

1. **General Summary**
2. **Technical Proposal**
3. **Concrete Estimate**
4. **General Conditions**
5. **Proposal Summary (Tab Analysis)**
6. **Schedule**
7. **Coordination of Work**
8. **Personnel Issues**
9. **Safety**
10. **Site Utilization**
11. **Unforeseen Site Condition**
12. **Quality Control**
13. **Bonus - Legal**
14. **Bonus - Green Building**

**Team Member Resumes**



## **VI. SUBMISSION REQUIREMENTS:**

*Please note that some of the following questions do not fit into the time frame of the Problem Scenario described earlier (i.e.-they occur later in the construction phase), consider these a “time warp” and answer them with that understanding.*

### **0. QUALITY OF SUBMITTED PROPOSAL**

The appearance and organization of proposals is important in the construction industry as it is often our first opportunity to interact with a new Owner and / or impress the upper management in our company. We want them to see the professional image we are trying to portray and be able to find and understand the information we are presenting. Points will be awarded in this section based upon the appearance and organization of your team's submitted response to the following problems.

#### **1. GENERAL SUMMARY**

You are finalizing the estimate to determine the bid price that you will recommend to your upper management. The General Summary form has been filled out with values for the items that have already been analyzed and summarized, but you are taking bids on a few of the remaining trades, finalizing your concrete estimate, and estimating your General Conditions. You must plug the values for these last items into the General Summary, review your approach to fee, and determine what the bid price of the project should be.

#### **2. TECHNICAL PROPOSAL**

The award of this project by the University is based upon a Best Value criteria. This is established based upon the combination of bid price and technical qualifications, therefore it is very important that we convey to the University what sets us apart from the competition. The technical submission requirements include detailed backup for design-build approach, project schedule, quality control plan, site utilization / coordination with operating facilities and students, staffing, safety and sustainable design. The technical submission also requires an Executive Summary of the proposer's approach to this project. This Executive Summary is to be not more than 1 page in length and should summarize the technical submissions and include any other information necessary to convey to the University why the proposer should be selected for this project.

Much of the information requested for the technical proposal will be included in the answers to other sections of this problem. For this task you are to write the Executive Summary statement. Include references to other areas within your submission where the expanded backup information can be found. Some of your references will be to backup which you are not including for the student





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competition, but are referencing with the assumption that it has been written, such as design-build approach, etc.

### **3. CONCRETE ESTIMATE**

Your company has an outstanding reputation for performing the concrete work on their projects, and this is an opportunity to perform some self work and keep some valuable craft people employed. The total cost of all the concrete will have a direct impact on your final bid. The concrete to be included in your price should include:

- Foundations (Footings and concrete wall footings)
- Slab on grade (Building slabs, elevator pits, lecture room stepped seating, depressions)
- Columns
- Exterior Concrete walls
- Concrete Shear walls
- Concrete beams
- Cast in place decks
- Metal Pan Stairs
- Mechanical Pads/Curbs
- Slab on deck at roof

Each area shall include costs for forming, placing, finishing and curing. All excavation, removal of spoils, reinforcing steel (including Post Tension Tendons), concrete accessories, saw cutting, exterior sandblasting and site concrete shall be subcontracted and therefore not included in your estimate.

Typically, your company self performs concrete work on most of its projects; however, management will consider “selling” the concrete work if it makes the overall project bid more competitive. You know that none of the other general contractors bidding this project self perform their concrete. Even though no subcontractor quotes are expected, the concrete scope of work should be quantified and bid so that it can be evaluated against subcontractor bids, if received, for this same scope; therefore, the concrete general conditions and fee in this estimate are in addition to the Project General Conditions. Supervision for the concrete work is separate from the overall project and should be priced accordingly. Therefore, the concrete spreadsheet contains line items for supervision, field engineering, surveying, storage bins, and miscellaneous items. These line items should be priced for the duration of concrete activities used in the project’s CPM schedule in conjunction with the unit prices provided from historical data. Be sure to include the concrete Area Superintendent and Field Engineer in the staff matrix required in section 3, General Conditions.

The Supplemental Information, Section XI, contains an Excel spreadsheet that has been formulated for your use in compiling this data in the same format as the other teams. You are to fill in the quantity, unit costs, and the Fee % on the attached Concrete Estimate Spreadsheet. The quantities in **Bold Type** were



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provided by your extremely experienced Chief Estimator, who should never be questioned on quantity accuracy. DO NOT add items of work on the Concrete Estimate Spreadsheet. In addition, use the attached COST DATA SHEET as the source for labor costs, material costs, equipment costs, and concrete general conditions. Discuss internally with your project team and decide the percentage of fee to be included in this estimate. Attach a written justification for the chosen percentage to you concrete estimate and be prepared to discuss your team's reasoning in the presentation of this project. Upon completion of this work and when all blank spaces have been filled in, the costs will need to be totaled and carried over to the Total Cost of Work concrete line item on the General Summary.

Clarifications:

- Assume walls and columns on floors two through five are typical. Your quantity survey should be based on level two. Window sill walls as shown in detail 15/S511 and 17/S510 are to be quantified as graphically shown on structural elevations.
- Assume floor slabs on level two through six are typical. Your quantity survey should be based on level two.
- Assume columns located within walls as pilasters that are poured monolithically with the walls when quantifying square foot contact area (sfca) of formwork.

#### **4. GENERAL CONDITIONS**

General Conditions are the on-site project management and supervision costs incurred throughout the duration of the project.

You are assigned to prepare a detailed breakdown for the project's General Conditions. This breakdown will allow for upper management to confirm your staffing plan, mobilization, operating, and other resource costs that will be spent during the project.

The Supplemental Information is attached in Section XI depicting descriptions of staff responsibilities and a list of company historic billing rates and typical job costs.

Please note the following:

- A. General Conditions, with exception to concrete supervision, include salaried on site and off site personnel that are assigned to the project. Included are all operating costs and expenses that are a function of on site job supervision. These expenses include but are not limited to office documentation support, networking service and fees, utilities, cellular phones, computers, etc.



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- B. Home-office overhead (G&A) is not included in the General Conditions of the project; however this does not include estimating costs. Due to this job being a design-complete project, your team will need the assistance of the estimating department. The estimating staff that will be dedicated to the project will assist the design team and owner with design completion, and directly assist the project manager with subcontractor bid packaging, scope breakdown, purchasing, and contract issuance.
- C. Due to the repeat client, it may prove beneficial that previous projects completed, or soon to be completed, at the University will serve as a 'furniture bone yard' for this project. Some office materials, furniture, computers, etc., may be obtained and should be considered during this exercise. Please take into account that all office setups and staffing are dynamic and must be tailored to the project. This may or may not account for additional equipment to be purchased.
- D. Many, but not all of your employees are coming from jobs in the same general area and will not need to be relocated when starting on this project.
- E. Supervisory staff positions should be allocated to the project as the team sees fit.
- F. This project will be assigned a summer intern. All costs associated with moving and housing are provided by the jobsite.
- G. The University will require onsite trailer (10'x30') facility for their inspection staff.

Please prepare the following documents:

1. Prepare a detailed General Conditions budget for the project using the form provided.
2. Prepare a Staffing Matrix showing the duration and period each staff member is on the project on the form provided.
3. Provide three (3) project conditions that can impact the General Conditions and give a brief explanation for each.
4. (TIME WARP TO 6 MONTHS PRIOR TO PROJECT COMPLETION). The Owner has requested a 3 month early turnover of the project, and subsequently, has requested a cost proposal for providing the substantial completion of the project early. They have indicated that they believe a substantial credit is in order. The University has authorized that typical work days can be extended to 10 hours (2 hours overtime) and Saturday work is acceptable (8 hours overtime).



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Assuming that all critical path activities allow for this 3 month early completion if accelerated, this option can be achieved (CPM schedule analysis not required for this exercise). Provide cost analysis for this change, justifying your reasoning. The project Superintendent has provided you with the manpower breakdown on the included memo. Your Operations Manager has provided you the attached chart showing the effects of overtime on crew efficiency.

**5. PROPOSAL SUMMARY (TAB ANALYSIS)**

During today's bid, you are assigned the responsibility of closing the proposal summaries for the following trades: Steel, Drywall & Plaster, Acoustical, Building Specialties and Elevators. In order to arrive at the value to be plugged into the General Summary for these trades, you must "tab up" the quotes of the subcontractors for each trade to determine the most advantageous price to use. The Proposal Summary sheets have been created and "check questions" written on them to determine if the subcontractors have the correct scope per plans and specifications (you may find that additional "check questions" are necessary to define the complete scope or differentiate between bidders; you are free to add "check questions" as you see fit). Choose your subcontractors carefully to ensure that they will perform the correct scope, staff the project adequately, and that they are financially stable. The company policy is to require bonds on all subcontractors with subcontract values over \$50,000, unless the District Manager approves to not bond them. You will be able to speak to representatives of each subcontractor briefly to ask scope questions not included in their proposals (total 10 minutes per team) when they visit your room between 5pm and 7pm.

Note: We encourage teams to tabulate quote items by rounding to the nearest \$1,000 for each entry; this allows quick summation of the proposal summaries.

**6. SCHEDULE**

Just as complete and concise Construction Documents serve as the "road map" as to WHAT you are contracted to build, a complete and concise schedule serves as the "road map" as to WHEN you are contracted to build it. As part of your review with management, you will be required to present a complete, workable Critical Path Schedule (CPM) to plan the work within the guidelines prescribed by the specifications. As you know, the Computer Sciences Unit 3-Bren Hall project is Design/Build and your company may perform its own concrete. Therefore, management will be just as concerned, if not more so, about the risks in Design & Concrete as they will be about the rest of the work. In turn, your schedule presentation, written and oral, will be comprised of these 3 major phases of work. The following criteria explain the background information and requirements of the CPM schedule your team will present.

1. General Schedule Criteria:
  - a. Presentation Criteria:



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i. Format:

1. At minimum, Show Activity ID, Activity Description, Original Duration (OD), Early Start (ES), Early Finish (EF), Total Float (TF) per activity (see Figure “A” below):

Figure A

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	Total Float	FEB	MAR	APR	M
<b>Reno Competition - UCI Bren Hall</b>									
<b>Design Development</b>									
<b>Civil</b>									
01010	Notice to Proceed	0	02/19/07		0	◆			

- ii. Activity count: 150-200
- iii. Show the logic from Design Documents to submittals to fabrication and delivery activities to execution of the required scope.
- iv. Clearly identify the critical path of the schedule.
- v. Organize your activities so they are easy to read, activities are grouped intuitively and the schedule “flows” well.

b. Contractual Criteria:

- i. Project Start Date (Notice-to-Proceed or NTP): February 19, 2007
- ii. Project Duration: 910 Calendar days (including design)
- iii. Weather Allowance: 27 Calendar Days
- iv. Minimum Milestones to be presented on CPM Schedule:

Building Dry-in	Notice To Proceed
Design Complete	Punchlist Begins
Final Completion	Rough-ins Begin
Finishes Begin	Structure Complete

2. Design Development Phase Criteria:

- a. UCI calls for a maximum 365 Calendar day design phase after NTP. Therefore, your team must have achieve 100% construction documents by the end of that phase. UCI calls for 3 design packages completed during this phase:
  - i. Site/Civil
  - ii. Foundation/Structural
  - iii. Architectural/MEP/Landscape
- b. UCI calls for 6 weeks of review time for each initial package and 3 weeks for possible backchecks, if required.
- c. Target this phase to account for approximately 10% of your CPM's total activities.

3. Concrete - Foundation & Superstructure Phase Criteria:

- a. The management team sees an excellent opportunity by self performing concrete. Naturally, this responsibility assumes more



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risk. Management will want to be reassured that this risk is minimized and that careful thought has been placed into the plan for concrete work execution.

- b. Phase 2 of your CPM should accurately represent the schedule of the concrete work your team estimated in “Section 2 – Concrete Estimate”.
  - c. Target this phase to account for approximately 25% of your CPM’s total activities.
4. All Other Work Criteria:
- a. The remainder of the work will be handled by subcontractors your team will manage.
  - b. Scheduling of all work should support the assumptions made by the Site Utilization Plans drafted in Section 10.
  - c. Review the plans thoroughly. Ensure that your schedule encompasses as much of the work as possible in the limited activities you are required. This will take some creative thought and a little finesse.
  - d. Target this phase to account for approximately 65% of your CPM’s total activities.
  - e. Your team may begin construction anytime, provided you have achieved at least 1 approved design package and submittals before you begin work. Therefore, based on your scheduling, determine which of the packages should be prioritized to begin work as soon as possible. Also, identify your office setup & mobilization on site.
  - f. The last activity in your schedule should be Contract Completion.

General comments:

1. Do not resource load or cost load your schedule.
2. With the exception of the design development, all phasing of construction work is arbitrary. “Phases” as described above are more of an organizational tool, than a hard and fast rule. As the Design/Builder, your team has the power to phase work in any way that you see fit. Construction phases may overlap, and concurrent work may take place. However, any such decisions must keep in mind safety, productivity, potential conflicts and “common sense” work sequencing.
3. When it comes to scheduling, there are no right or wrong answers. However, the schedules that are taken seriously by your staff, owner and subcontractors and end up succeeding are the ones that make sense. Ensure that your team can substantiate and explain all the assumptions and decisions made in the process of drafting your schedule.

**7. COORDINATION OF WORK**

(TIME WARP TO LATER IN THE PROJECT DURING CONSTRUCTION)



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Concrete work is completed. Wall framing is commencing in corridors and elevator door frames and sills are being installed when the field foreman from the elevator subcontractor storms into your office.

“*You* have a problem. The shaft walls don’t align with *my* elevator rails, which were approved through submittal. I have to stop work until you fix the problem or direct me to tear out all my guiderails and start all over after you move the support steel.”

You quickly pull the approved elevator submittal (see attachment) and perform a quick as-built of the elevator shaft and tube steel layout (see attachment) before identifying that there is a conflict between the Architect’s wall type designation and the guiderail support location for the elevator’s needs. The concrete shaft clear openings and locations are verified to be perfect, of course.

1. Although the field foreman has exaggerated the problem, a problem still exists. Detail a solution that will get the elevators back on track.
2. Better double check other trade coordination with the elevators while you have the shop drawings out. Besides the drywall and structural concrete operations, list five other trades that require coordination with the elevator requirements and the elements that each of these trades is to provide for the elevator per the shop drawings and the plans.

## **8. PERSONNEL ISSUES**

You are the Project Engineer and therefore responsible for reviewing subcontractor insurance certificates for compliance with contractual requirements. You have delegated some of the review to the Office Engineers. As you review the certificates there are a few subcontractors missing an item or two off of the insurance checklist. They happen to be subcontractors that have been working on the project for at least 6 months. Records show that they have had at least 3 notices sent regarding the inadequacies of the insurance certificate provided.

1. Explain your immediate course of action.
2. What course of action would you take to insure that the Office Engineers do not allow inadequate subcontractor insurance to remain outstanding?
3. Do you explain what happened to your Project Manager?

## **9. SAFETY**

(TIME WARP TO AFTER CONTRACT AWARD)



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You are a newly promoted Area Superintendent that has just been assigned to the UC Irvine Bren Hall project. Your project Superintendent has just tasked you with completing the outline for the Project Safety Orientation that ALL employees will be required to attend before they will be allowed to work on-site.

Before sending you off to complete this very important task he explains that safety must start at the planning stage and that no effective work has ever been accomplished without some degree of planning, and the more thorough planning, the better the result. Additionally, the Project Safety Orientation will help convey our occupational health goals and increase awareness to things such as but not limited to emergency procedures, personal protective equipment, fall protection, electrical, equipment, cranes, parking, training, housekeeping, hot work permits, accidents/nears misses, etc ...

The safety and health of all employees on this construction site is a primary concern of the company. Each supervisor must insure compliance with established occupational health practices to reduce potential exposure. All employees must be fully aware of their responsibilities to achieve an accident free environment.

You are to utilize the attached partially completed outline to help you develop your entire Project Safety Orientation Outline. You should not plan on presenting this at your team's interview; just include a copy in your answer packet.

## **10. SITE UTILIZATION**

The Computer Science Unit 3 – Bren Hall project is located on a 2 acre site on the University of California, Irvine campus in Irvine, California. The site is currently utilized as a parking lot for the University. The University Club is located to the East. The University Club is the campus restaurant where prospective professors and other important guests are taken. The facility is also rented out on most weekends for weddings. To the west is the existing Computer Science building and the Information Computer Science (ICS) building. To the south is a fire lane that must remain open at all times. The Ring Mall is to the north. The Ring Mall is also a fire lane and is also the main pedestrian route on campus. The Ring Mall is a circular path that goes around the entire campus. The Ring Mall has two lanes and one lane must remain open at all times.

The University has provided parking for the craft at the dirt lot on the corner of East Peltason Drive and Bison as indicated on Sheet C-000. This is approximately four tenths of a mile from the project site. The project has been given the portion of the laydown yard indicated on Sheet C-000. The laydown area can be used however you see fit. The Hensel Phelps Construction Co. project trailers can be located on the project site, the laydown yard, or next to the owner's field office. The owner's field office location is shown on Sheet C-000. The site utilization plan is to be based on the criteria that all demolition, earthwork, and site utilities have been completed and are now digging footings.





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1. Site Utilization Plan

Use any of the full size drawings to creating your site utilization plan (Sheets A-100, C-000, and C-020). Other drawings may be used if you determine them necessary to fully explain your plan. Your plan can add or omit items from the basic list below, as long as a valid reason is presented and that your logic does not contradict code requirements. Ensure that all locations for the items listed below are coordinated with future work activities, so they do not impede the project construction. In addition, if your site utilization changes / evolves throughout the project (as may be necessary) describe the flow of the changes. Include but do not limit yourself to the following information on your plan:

- Location of your project office
- Location of Mechanical, Electrical, and Plumbing subcontractor trailers
- Locations for the temporary fence and access gates
- Required signage
- Material deliveries and temporary storage
- Location of Toilets and Wash stations (Assume a max. of 90 craft personnel on site)
- Location(s) of crane(s) for formwork, reinforcing, structural steel, etc.
- Emergency evacuation location
- Location of temporary utilities for construction use
- Any other items that your team deems necessary

2. Phased Site Utilization Plan

On this project there will be a few phases of work that will possibly impact the site-utilization plan. The utility tunnel tie-in and the domestic water tie-in will require blocking off access to each lane of the Ring Mall at some point. In addition, at the end of the project, landscaping and various hardscape finishes will occur that will also need to be taken into consideration.

A. Briefly describe how one lane of the Ring Mall will remain open for fire and pedestrian access at all times. If necessary, prepare a 'Phased' site utilization plan that will show how the utility tie-in will be completed and maintain Ring Mall access.

B. With site work taking place, briefly describe any conflicts that might occur with locations of trailers, etc. and completing all of the landscaping and site work. Provide a brief explanation on how these conflicts will be resolved or coordinated. If there are no foreseen conflicts, briefly explain how the site utilization plan was coordinated with the final site work.



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Note: A separate site plan does not need to be created for the Phased Site Utilization Plan portion of the problem as long as your answer clearly describes your solution.

## **11. UNFORESEEN SITE CONDITIONS**

(THIS IS A TIME WARP. Fast forward to after completion of Civil and Structural Construction Documents)

Sheet C-003 shows existing site electrical and communications conduits extending North and then East from the electrical room of the existing Cal IT Building. The location of the conduits as shown on sheet C-003 was based on as-built drawings provided by the University prior to the original bid date. As located by the University's as-built drawings, the conduits lie outside of the footprint of Bren Hall, and therefore are not expected to interfere with the building's foundation.

Your Design-Build Electrical and Communications Contractor also performed the Electrical and Communications work for the Cal IT Building several years ago, including the site utilities referenced above. After receiving approval of 100% Civil/Structural Construction Documents, but just prior to breaking ground on Bren Hall, your Electrical Contractor mentions to you that he seems to recall that the existing electrical and communications conduits shown on sheet C-003 extend farther North than indicated on the drawings.

Immediately, you decide to have the Electrical Subcontractor pothole to identify the exact location of the existing conduits. It is determined that the communications conduits (but not the electrical conduits) do, indeed, conflict with the planned foundation for Bren Hall. Attachments 1 and 2 show the actual location of the telecommunications and electrical conduits. Attachment 3 is a photo of the exposed conduits—the orange layout line denotes the edge of the Bren Hall foundation.

After several discussions with the Structural Engineer and the Electrical Contractor, you determine that there are three options:

- A. Redesign the foundation for the Southeast corner of Bren Hall to accommodate the existing location of the communications conduits.
  - B. Shift the entire footprint of Bren Hall three feet to the North.
  - C. Excavate and relocate the existing communications conduits.
1. Evaluate and discuss the pros and cons of the three options. Identify issues that have potential cost or schedule impacts for each option.
  2. Determine how you are going to proceed and explain your reasoning.



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3. Given the facts as stated above, do you believe that the Owner should be held responsible for any cost and schedule impacts? Explain why or why not.

4. If you decide that impacts resulting from these unforeseen conditions should be the responsibility of the Owner, you must notify the University in writing immediately. Write a Notification of Impact to the University. Explain the situation, how you propose to proceed, and why your company should be compensated for the changes.

5. If you decide not to request additional time or money from the Owner, you must notify your electrical subcontractor of the situation and explain why you are holding them accountable for costs and schedule impacts resulting from the condition. Write a letter to your electrical subcontractor explaining how you wish to proceed and why they are responsible for the changes.

- Note: Your team should answer either Question #4 or Question #5, but NOT BOTH.

## **12. QUALITY CONTROL**

(TIME WARP TO LATER IN THE PROJECT DURING CONSTRUCTION)

Back when you were buying out the various scopes of the project, the Owner mandated that you use some specific vendors for minor scopes of work, as they had already made some finish selections and “pre-negotiated” a purchase agreement scope and dollar amount, but left the actual subcontracting to you, the General Contractor. With every intent to please the Owner, you agreed to use these pre-negotiated suppliers (i.e. forgo competitive bidding), but required the vendors to sign up under your purchase agreement terms so that you could have control over aspects of their work, such as scheduling, billing, etc. Everyone was happy: the pre-agreed dollar amounts fit your Contract budgets and the Owner was going to get the products that they had pre-selected. The pre-cast concrete elements were one such “pre-negotiated” scope.

The pre-cast elements that trim the exterior face of the building arrived on schedule, much to your amazement, since the supplier had turned out to be very difficult to deal with in the submittal and mock-up phase of pre-construction. The mason has installed a bulk of the pre-cast items. Life is good until the Owner’s representative visits the site and brings up their dissatisfaction with the pre-cast color—or rather, the variation in color. The pre-cast color is consistent on each piece, but not from piece to piece; such that only a few of the pre-cast pieces actually match the color of the Architectural cast-in-place concrete walls as was intended.

Revisiting the mock-ups, you find that the submitted colors did match the Architectural concrete, and the product data does not mention anything about



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color variations. The supplier explains that it is natural for any batched item (like brick or pre-cast) to have some amount of variation from batch to batch, as the environmental temperature during mixing/curing may slightly vary, or the batch mix may slightly vary, or the curing process may slightly vary, etc. Regardless, it is too late in the schedule to re-order replacement pre-cast elements and still install them before building turns over to Ownership.

1. Whose problem is this?
2. How could it have been predicted or prevented?
3. How can this issue be remedied to the Owner's satisfaction? What are some cons to the proposed solution?
4. How should the costs of your proposed solution be conveyed to the responsible party?

**BONUS QUESTIONS**

Bonus points will be awarded for responses to the following questions.

**13. BONUS - LEGAL**

The University of California has been involved in several contract disputes on large construction projects. In order to protect the University of California, the University's Standard Contract General Conditions have become more and more onerous and difficult to fully comply with, ultimately, increasing the Contractor's and Subcontractor's risks during the completion of a construction Project.

In an effort to attract more Contractors and Subcontractor's to participate on University of California construction projects the University System has made some modifications to the Standard Contract General Conditions.

Review the attached University of California Irvine Standard General Conditions, dated March 1, 2006, and compare them to the revised University of California Irvine General Conditions issued in an addendum, dated September 1, 2006.

Provide a list of modifications that would be considered more desirable to the Construction Community, utilizing the included matrix.

**14. BONUS - GREEN BUILDING**

LEED is a system developed by the United States Green Building Council (USGBC) to promote a voluntary 'Green' approach to designing and constructing new and existing buildings. LEED is changing the way projects are being built throughout the construction industry. Owners and developers are recognizing the many benefits Green Building has to offer. The benefits are reducing the operating costs in buildings, which reduces negative environmental impacts.



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Other benefits include; increased occupant productivity, reducing occupant absenteeism, adds a marketing advantage, and adds an increase the building value and return on investment. Therefore, University of California Irvine has acknowledged some of these benefits and is requiring the Computer Sciences Unit 3-Bren Hall Project to be LEED Certified.

1. Indoor Environmental Quality Credit 1 – Carbon Dioxide (CO<sub>2</sub>) Monitoring requires CO<sub>2</sub> sensors located within all densely occupied spaces (those with a design occupant density greater than or equal to 25 people per 1000 SF) and located between 3 feet and 6 feet above the floor. How many CO<sub>2</sub> sensors are located on the 1<sup>st</sup> floor? Are there enough CO<sub>2</sub> sensors on the 1<sup>st</sup> floor to obtain EQ Credit 1?
2. Develop an Indoor Air Quality (IAQ) Management Plan to follow for the construction phase of the building.
3. Prior to occupancy, it is possible to conduct an indoor air quality test in lieu of the 2-week flush out. What measures shall be taken prior to testing to ensure in having a successful air quality test?

**TEAM MEMBERS RESUMES**

Provide each team members personal resume (**not** a resume tailored to this problem).



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## VII. COMPETITION SCORING SYSTEM

Item	Description	POINTS
0.	Quality of Submitted Proposal	2
1.	General Summary	4
2.	Technical Proposal	4
3.	Concrete Estimate	20
4.	General Conditions	14
5.	Proposal Summary	14
6.	Schedule	18
7.	Coordination of Work	6
8.	Personnel Issues	4
9.	Safety	6
10.	Site Utilization Plan	12
11.	Unforeseen Site Conditions	10
12.	Quality Control	<u>6</u>
	Subtotal	120
	Oral Presentation	<u>80</u>
	GRAND TOTAL	200 POINTS
	Bonus Questions:	
	13. Legal	6
	14. Green Building	6

**Note: 1 Point will be deducted from the total score for every minute past the deadline time.**



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## **VIII. LIST OF JUDGES**

### **Oral Presentation Judges:**

Ron Mitchell, General Superintendent  
(408) 452-1800  
rmitchell@henselphelps.com

Hensel Phelps Construction Co.  
226 Airport Parkway, Suite 150  
San Jose, CA 95110

Sean Carolan, Project Manager  
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### **Alternates:**

Jeff Wellenstein, Area Superintendent  
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Roger Henry, Area Superintendent  
(949) 852-0111  
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Hensel Phelps Construction Co.  
18850 Von Karman Ave., Suite 100  
Irvine, CA 92612

### **Administrator / Timekeeper:**

Rod Hammett, Project Manager  
(949) 852-0111  
rhammett@henselphelps.com

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## **IX. THE RULES**

The rules for the competition are designed to provide each team with an equal opportunity to apply their knowledge in developing their respective solutions and an equal opportunity to present their solutions to the panel of judges. The following rules apply to the Commercial Division and serve to supplement the ASC Competition Rules.

- Rule No. 1 While the competition is in progress, only the six students identified as being team members shall be present in the teams' room(s). **Faculty advisor(s) may not interface with their team once the competition has begun.**
- Rule No. 2 Six (6) Copies of the proposal must be turned into the judges. **No proposals will be formally returned.** Some proposal binders may be available after the conclusion of debriefing; you are welcome to these as available. If you need a copy for preparation or use in your oral presentation, please make copies prior to the submission of the proposal.
- Rule No. 3 The number of computers per team and use of internet is to be as outlined in the ASC Competition Rules.
- Rule No. 4 Once the presentations begin, only the teams who have presented their solutions may be present at the presentations of the other teams solutions. This will mean that the first team up gets to see them all, while the last team up doesn't get to see any. That's the luck of the draw. Owners in real life do not let you know who goes first and why. The purpose is to prevent those participating later in the day from benefiting from the presentation of others. This rule extends to all students from the participating school, whether team members or not.
- Rule No. 5 The problems that are used for the competition are drawn from actual construction projects. In the past there have been situations where student team members have worked on, or have knowledge of, the project that is the subject of the problem. This can be perceived as giving the team an unfair advantage in developing a solution. If, upon receiving the problem, any student recognizes the project that is the subject of the problem statement, the student shall notify the problem sponsor's Administrator to discuss the student's project or problem knowledge. Alternates may be considered should there be an identified conflict. The problem sponsor will have the final decision. Failure to notify the problem sponsor makes the team subject to disqualification.
- Rule No. 6 All decisions of the judges are final.





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- Rule No. 7 A one point deduction will be taken for each minute the proposal is turned in past the time it is due. Written proposals are due February 9th, 12:00AM (Midnight Thursday night / Friday morning). Location of Bid Delivery will be announced at pre-bid conference. Other deliverables items will be due as specified elsewhere here in.
- Rule No. 8 Any team with graduate students can participate in the regional competition. However, the national level prohibits graduate students to participate on the team. The invitation from Region VII for the national competition will be from the highest placed team NOT containing any graduate students. If it is your team or school goal to go to the National competition please do not include graduate students on the team.
- Rule No. 9 Presentation materials for all teams are to be turned in to the judges prior to the first interview, by 9:45 AM on Friday, February 9<sup>th</sup>. No other presentation material will be allowed into the presentation that is not turned into the judges by this time. NO EXCEPTIONS WILL BE ALLOWED.
- Rule No. 10 NO Phone calls or emails may be made to the Owner, Construction Manager, Architect, Civil, or Structural Engineer, or any other design consultants listed on the Drawings. They are aware no team is to contact them and have been directed to alert the judges; a FIFTY (50) point score deduction for each such contact will be made.
- Rule No. 11 The judging panel has worked with your company for many years. You are therefore asked to not include extra peripheral information about your company such as safety plans, company profiles or other marketing materials. Please limit your response to the information requested and resumes of each team member. Failure to do so may decrease your score.

**Any team observed violating these rules might be asked to withdraw from the competition.**



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## **X. COMPETITION EVALUATION FORM**

Please have each team member complete this evaluation form and return it to the judges prior to the Debriefing on Friday @ 6:30 PM. Your comments are important and past participant's comments and evaluations have been incorporated into the continuing development of the Commercial Building competition. **The ticket to gain access to the debriefing is this evaluation form. Each team member MUST fill this out and return it.** This evaluation form is intended to better this competition in the years to come. Use the backside of the evaluation form for more space / comments.

Rate each category using the following evaluation scoring system:  
Include any comments below the line item.

1. Poor
2. Needs Improvement
3. Average
4. Good
5. Excellent

Location of facilities. \_\_\_\_\_

Applicability to school course work \_\_\_\_\_

Format of the problem statement. \_\_\_\_\_

Quality of the problem statement. \_\_\_\_\_

Question and Answer session. \_\_\_\_\_

1. How much of the financial burden of this trip was paid by the students (not including entertainment and gambling) on a percentage basis?
  
2. What was the most difficult component of the problem statement?
  
3. List any recommended changes to the competition rules. Include how to implement your recommendation.



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4. Was there enough time to complete the package?
  
5. What time did your team complete the written portion of this package?
  
6. List three positive things about this years' competition. Does not have to be Commercial team specific.
  - a). \_\_\_\_\_
  - b). \_\_\_\_\_
  - c). \_\_\_\_\_
  
7. List three negative things about this years' competition. Does not have to be commercial team specific
  - a). \_\_\_\_\_
  - b). \_\_\_\_\_
  - c). \_\_\_\_\_
  
8. On a scale of 1-10, (ten being the best) how would you rate this year's competition?

Use backside of form for additional comments. THANK YOU! – THE JUDGES and HENSEL PHELPS CONSTRUCTION CO.



## **XI. SUPPLEMENTAL INFORMATION**

- 0.1 Bridging Document Drawings (hard copies only)
- 0.2 Request for Information (RFI) Form
- 1.1 General Summary Spreadsheet
- 3.1 Concrete Cost per Unit Data Sheet
- 3.2 Concrete Estimate Spreadsheet
- 4.1 General Conditions Spreadsheet
- 4.2 Staffing Matrix Spreadsheet
- 4.3 Company Historical General Conditions Rates
- 4.4 Staff Position Duties
- 4.5 Memo from Superintendent
- 4.6 Memo from Safety Engineer
- 4.7 Overtime Efficiency Chart
- 5.1 Proposal Summary Forms
- 5.2 Subcontractor Proposals
- 7.1 Elevator Shop Drawings
- 7.2 Elevator Shaft Sketch
- 9.1 Safety Orientation Outline
- 11.1 Unforeseen Site Conditions Sketches & Photos
- 13.1 Contract Comparison Matrix
- 13.2 UCI General Conditions dated 3/1/06 (electronic only)
- 13.3 UCI General Conditions Revised dated 9/1/06 (electronic only)
- 14.1 LEED Score Card
- 14.2 US Green Building Council LEED Manual (electronic only)
- 14.3 Equipment Credit 1 Criteria
- 14.4 SMACNA Guidelines (electronic only)

