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 13-16, 2008

Answer Package

Central Service Yard

San Jose, CA

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Hensel Phelps Construction Co.

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

Proposals should be neatly assembled in a binder of adequate size. Your team name (school) should be easily found on the cover, spine and front sheet. Tabs should be neatly labeled in the order as indicated in the Problem Outline. Formats of work product from tab to tab should be relatively consistent. Utilizing the Owner's logo or graphics on the proposal is always a nice touch to show you understand who your client is and are preparing your submission for them.

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 and drywall estimates, and estimating your General Conditions. You must plug the values for these last items into the General Summary, and determine what the bid price of the project should be. Given the design-build nature of this project it is appropriate to carry a contingency budget to cover unforeseen conditions which will develop as the construction documents evolve and are finalized. Due to a robust economy in San Jose, many of your competitors are too busy to bid, leaving only your company and two (2) other firms to bid on the project. This market condition should be taken into consideration as you review your approach to margin on the project.

Please reference the attached 'General Summary' spreadsheet. The "hard" values that were left to include in the spreadsheet come from the General Conditions exercise, Estimate exercise and Tab Analysis exercise and as such are subject to how you approached those sections. The Contingency line item is based on your comfort level of the estimate and the

quality/completeness of the Construction Documents. Most General Contractors will apply a contingency to design-build projects in the range of 2% to 6%. The Margin line item is quite subjective, with no right or wrong answer within a range. Given the current market conditions, the range that most General Contractors bid work of this type would be in the 6% to 10% range.

2. ESTIMATE

Concrete Estimate

Your company has an outstanding reputation for performing concrete work on their projects, and this is an opportunity to perform some self work and keep some valuable craft employed. The total cost of all the concrete work will have a direct impact on your final bid. Use the bridging documents to quantify all of the project's concrete, specifically:

- Foundations (Footings and concrete wall footings)
- Slab on grade (Building slabs, thickened slabs and depressions)
- Mechanical Pads/Curbs
- Car Wash Slab (Building H)
- Bunker Enclosures
- Site Concrete including: Vertical Curb, Curb & Gutter, Valley Gutters and the driveway at the Parking Lot

Each area shall include costs for concrete material, forming, placing, finishing and curing. All asphalt paving, excavation, removal of spoils, reinforcing steel, concrete accessories, site specialties including wheel stops, and saw cutting shall be subcontracted and therefore not included in your estimate. General Conditions for the concrete scope of work are including in your overall estimate on the General Summary.

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. Because the delivery method of this project is modified design-build, the fee for the concrete will also include all contingency money to cover the risk of added scope incurred between the bridging documents which are the basis of the quantity takeoff and the final construction documents. DO NOT add items of work to the Concrete Estimate Spreadsheet. In addition, use the attached COST DATA SHEET as the source for labor, material, and equipment. Discuss internally with your project team and decide the percentage of fee to be included in this estimate which will include contingency money to cover additional scope added during the design period. Attach a written justification for the chosen percentage applied to your 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 concrete line items for labor, material and equipment on the General Summary. Be sure to round your numbers to the nearest $1,000.

Please refer to attached answer spreadsheet for concrete estimate. A typical range for fee including contingency for this scope of work would be between 7% and 15% of the total cost. It would fluctuate in this range depending on a number of variables including: confidence in bridging document drawings and quality of the quantity takeoff for the estimate, the amount of labor risk, and how your concrete estimate compares to any quotes you may have received from subcontractors. A 10% fee was assigned in the answer for this portion of the project based on the fact that the takeoff was performed off of the bridging documents. It could be assumed that the bridging documents do not include all of the details that will be required to place all of the concrete, but the added work would be assumed minimal as the work consists of footings, slab on grade and site concrete. Also, there is high risk associated with managing your own labor force, especially on a design-build project in which the scope is not finalized until after prime contracts have been signed. The percentage was chosen to cover the risks while remaining competitive. The importance of self-performing this work was also influential, since it would provide work for Hensel Phelps craft labor in the area which is always important to Hensel Phelps.

Drywall Estimate

There has been little interest shown by bidders regarding the drywall scope of this project. One of the subcontractors that your company works with frequently has expressed interest in the project but has told you that they do not have the resources to perform a takeoff. They tell you that they will give you their unit costs which you can use to determine an estimate. Therefore, your team will need to perform a quantity takeoff of the drywall scope of the project. The drywall scope includes:

- framing and gypsum board for partitions
- framing and gypsum board for ceilings
- plywood wall coverings

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 complete the Gypsum Board Assembly Spreadsheet by filling in the appropriate wall types, quantities and unit costs (make sure to reference the Cost Data Sheet from the subcontractor) needed to calculate the total cost. When all costs have been determined, the total cost will need to be carried over to the Drywall line item on the General Summary.

Please refer to attached answer spreadsheet for drywall estimate.

3. GENERAL CONDITIONS

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

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

Please prepare the following documents:

1. Prepare a detailed General Conditions budget for the project using the form provided (Section XI.3.1) As you breakdown the costs and units for each budget item provided in Section XI.3.3, be mindful that items may be comprised of labor, material, equipment or any combination of all three. Use your best judgement, team experience or available resources to determine these break-downs and load your budget.

See attached General Conditions Budget Sheet

2. Prepare a Staffing Matrix showing the duration and period each staff member is on the project on the form provided.

See attached Staffing Matrix Sheet

Comments on the staffing matrix answer: There is no right or wrong answer when it comes to planning your project staffing. However, it should be well planned & thought out. It should also include input from other team members. Overall, you will note that the general staffing concludes a month or two after project completion. This is because a significant close-out effort with subcontractors will be required. The following breaks down the staffing strategy for this particular project by title:

Project Manager:
The PM typically is the first dedicated staff member to be assigned to a project as well as one of the last to close it out. His/her time should be planned accordingly.

Superintendent:
The Super will start the project on time and serve through the bulk of construction. However as the project nears completion and trades complete their work, he/she will be able to be moved on to other projects.

Estimator:
The Estimator will be required for this particular design build project. His/her duration on the project will follow closely with the 5 month design

portion of the project. Once design is complete, the Project Manager can execute the remaining subcontracts like any build-only project.

Project Engineer/Office Engineer/Office Manager
Like the PM, the PE, OE & Office Manager are responsible for the administrative aspects of the project. The paperwork associated with a construction project really does not taper off until after contract closeout. Therefore all of these staff members should be available through this time.

Field Engineers
FE's play more of a hands-on role during the construction of the project and less of a planning role. Therefore, 2 FE's will be brought on as a team to execute the layout of the project right about the time construction commences. As the project progresses, one FE will be sufficient to serve in more of a day-to-day problem solving, QC and punchlist management role.

Interns
An intern should be expected for any summers the project is significantly operating. Therefore one has been assigned for the summer of 2008 & 2009.

3. Upon completion of the General Conditions budget, identify the three (3) individual items in your budget that your team feels are at the highest risk of overrun if left unchecked as the job progresses. For each of these items, provide a short narrative of why you feel they are so risky and how your team plans to manage this risk.

Document Printing – Over the course of the job, managing printing & copying expenses can be a big challenge. A design-build job adds to the challenge, as we are responsible for the document development. Also, Subcontractors will make requests for documents and additional plans. As we establish relationships with these subs, it can be tough to say no… "Order the additional documents yourself." Solutions:

- ***i. Establishing a firm stance early on that subs are responsible for additional prints.***
- ***ii. Make 1 person on the staff (either the PE or senior OE) a clearinghouse for printing charges.***

Postage & Shipping – Much like document printing, allowing the staff free reign to ship as they please can run up bills fast. Solutions:

- ***i. Establish subcontractor pickup boxes on site. This will allow subs that are frequently on site to pick up materials, thus eliminating the need for shipping.***
- ***ii. Have office manager / secretary handle all shipping requests.***

iii. ***Achieve on-time submittal reviews to minimize the need for overnight shipping or couriers.***
iv. ***Keep postage machine on a code that only a select few know.***

Temp Facilities – The subcontractor trades will be very vocal about jobsite wash & toilet conditions. Many times we have no choice but to order additional toilets to keep them satisfied and/or keep the job in OSHA compliance. Solutions:

i. ***Ensure that the toilets are budgeted for the MAXIMUM manpower of the job.***
ii. ***Establish an aggressive service schedule to keep facilities clean.***
iii. ***Hold the wash / toilet service company accountable for keeping service commitments***

Dumpster Rental – Knowing how much material to be discarded on a job is an inexact science. Estimating dumpster rental relies on performance from previous jobs and management's experience. Solutions:

i. ***Get the input of the dumpster rental company to firmly establish the expectations of their services.***
ii. ***Purchase subcontractors, especially larger subs like the drywaller, accordingly to keep them liable for their own waste removal.***
iii. ***Utilize site separation of materials. For example, scrap steel recycling may allow some recoup of costs.***
iv. ***Ensure that labor force is maximizing dumpster space usage before pickups are ordered. A compaction device may be viable.***

4. (TIME WARP TO 6 MONTHS PRIOR TO PROJECT COMPLETION). The project is on schedule and The City has approached management about possibly changing Paint Booth equipment manufacturers. The new equipment would arrive 3 months later than anticipated, thus delaying turnover of Building B by 3 months. Assuming Building B will be the only structure affected by this delay, develop a General Conditions budget proposal and Staffing Matrix for this condition on separate forms. Justify your reasoning with a written narrative. The owner will review your GC budget, staffing matrix and narrative to decide whether the expense can be justified.

See modified Staffing matrix, GC's matrix & Owner letter.

4. PROPOSAL SUMMARY (TAB ANALYSIS)

During today's bid, you are assigned the responsibility of closing the proposal summaries for the following trades: Concrete Reinforcing, Masonry, Flooring, Ceramic Tile, and Pre-Engineered Buildings. 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. An example tab has been included in your packet for reference.

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.

Please reference the attached Proposal Summary spreadsheets. Items on the "tabs" which are bordered in heavy line are items which are not discernable from review of the proposer's quote only, but required questioning the proposer further, or making certain assumptions / estimates yourself.

5. 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 HOW you are planning to build it. As part of your review with management, you will be required to present a complete, workable Critical Path Schedule (CPM) that effectively communicates your plan. The project consists of multiple buildings and has a phased turnover where specific elements of the project are required to be turned over to the Owner prior to other elements beginning. Management is concerned with the "phasing" of the project and wants to know how the different phases will impact the overall construction schedule. In turn, your schedule presentation, written and oral, will be comprised of (1) building a CPM, (2) presenting an overall site "phasing" plan, and (3) a detailed schedule/plan showing the interior construction of Building G. Project Specification Section 01110 found in the Supplemental Information and the following criteria explain the background information and requirements of the CPM schedule your team will present.

1. General CPM Schedule Criteria:
    a. Presentation Criteria:
        i. Format:
            1. At a minimum, show Activity ID, Activity Description, Original Duration (OD), Early Start (ES), Early Finish (EF), Total Float (TF) per activity.
        ii. Activity count: 1 – 1,000

iii. Show the logic from Notice to Proceed to submittals to fabrication and delivery activities to execution of the required scope including Owner move-in.
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. Your logic should follow the site phasing plan and Building G interior construction plan you will be preparing.

b. Contractual Criteria:
   i. Project Start Date (Notice-to-Proceed or NTP): 3/3/08
   ii. Design Review for Permit Drawings: 2 weeks per submission
   iii. Owner turnover of Hazardous Materials Site: 3/2/09
   iv. Project Completion: 7/31/09

c. Design Durations:
   i. Site Grading and Demolition: 4 weeks from NTP
   ii. Structural Foundation and Metal Buildings: 6 weeks from NTP
   iii. Underground Utility: 8 weeks from NTP
   iv. Building Interior and Life Safety: 12 weeks from NTP

d. Other Requirements:
   i. Metal Building Duration: 10 weeks per building
   ii. Installation of 2nd Metal Building can begin 5 weeks after start of the 1st Metal Building.
   iii. Minimum Milestones to be presented on CPM Schedule:

Building B Complete	Notice To Proceed
Building F Complete	Start Construction
Building G Complete	Final Completion
Sitework Complete	

Why do we build a CPM schedule? Administratively, it is usually a required deliverable of the specifications. Legally, it documents time impacts to the project. Constructively, it communicates your "Plan" of how you intend to build your project to all that are involved with the project. Your "Plan" needs to be specific enough so everybody understands when their scope of work will be installed, and how much time they have to perform their scope of work. With this being a Design-Build project, you will have very little input on the schedule from subcontractors due to the fact that the schedule must be prepared while bid package drawings are still being completed to allow subcontractor solicitations. Because of this, the schedule will probably be less detailed than what you would expect to see on a hard bid project.

There is no right answer when creating a schedule. There is, however, bad or poorly communicated "Plan". The schedule needs to be easy to follow, quickly identifies when a course correction is needed, and highlights the areas that are potential problems for the project. Some of things that should have been identified are:

Design & Preconstruction:
Since this project is Deign-Build, there should be a portion of the schedule tied to completing the design. The durations of the design components were given in the problem statement. However, time must be allotted for an internal review of the drawings prior to submission, the Authority Having Jurisdiction must have time for review, and there must be time to bid out the drawings after approval. In some cases the schedule does not allow for all of these activities to have a Finish-to-Start relationship and the bidding process must happen concurrently with the review process, such as with the grading and demo package. While this is not an ideal situation, your schedule will help identify the risks of the project so they can be managed appropriately.

Administration:
The brick and mortar part of a project cannot begin until the proper submittals have been approved. Some items have very long lead times and the schedule should identify which items will demand the higher priority for submission and review. Certain items will have such a long lead time that it will impact the schedule (i.e. metal buildings). The schedule must be built in a manner to reflect when these deliveries can be received rather than when a project could be ready for them. Buyout is another administrative item that needs to be accounted for in the schedule. A buyout issue identified in another section of this problem was a subcontractor with the lowest price had a much longer fabrication and delivery time. From a scheduling perspective, either subcontractor is acceptable to use as long as the schedule reflects the appropriate time frame of when the buildings will arrive, and the project is completed on-time without any unrealistic durations or logic ties.

Site Work (Phase A):
For the most part the site work was pretty straight forward. The only problem is that the entire storm drain system for the 30 acre complex drained through a line that ran through Building G, and the permits for the new storm drain would not be issued until two months after you need the building pad completed. From a scheduling perspective it is not as important to solve this problem now, but to ensure that an appropriate amount of time has been allotted for implementing your plan of action. Using the schedule we identified the time of year that this was going to take place and felt that there was a low risk of having a significant amount of rain. We capped the storm drain lines and pumped any rain water

around our building pad and tied back into the existing storm drain line until the permanent lines were installed.

Buildings:
The specifications require that Building G is completed first. With the staggered start of the steel, the schedule should have a smooth flow for all trades from Building G into Building F. Building B could not start until the occupants of Building B had moved into the new Buildings F & G. The schedule must allow for a period of time after the completion of F & G to relocate the furniture and equipment out of B.

See attached CPM schedule network.

2. Overall Site Phasing Plan Criteria:
    a. Due to the fact that this project has a "phased" turnover, management is requiring a detailed "phasing" plan. The site phasing plan will define the planned sequence of construction through the project site.
    b. The phasing plan should visually represent your plan so it can be communicated to others.
    c. A brief narrative of the phasing plan is required to be submitted with the visual representation. The written description should explain the logic/reasoning behind how you "phased" the sitework.

Every inch of the construction site was required to be modified in this project. Our goal was to phase the sitework to allow for minimal disruption to the construction trades and the City who used part of the construction site as a drive lane. Some of the items we considered in determining how we phased the work are as follows:

(1) The specifications require that the "main travel corridors" be turned over first. The main travel corridor runs thru the east side of the site from the gate on Phelan Ave. to the north side of Building C. See Zone 1.

(2) The first building that was specified to be turned over was Building G. Completing the sitework around Building G allowed us to provide stable access to the building. See Zone 1.

(3) The west side of Building F was to be used for construction parking and material staging while the sitework on the east side was being done. Access to the site was through the 10th Street gate. Access to Buildings F & G was through the west entrances. See Zone 1.

(4) The asphalt in Zone 1 was to be used for construction parking and material staging/storage while the site work on the west side was being done. Access to the site was through the Phelan gate. Access to Buildings F & G was through the east entrances. See Zone 2.

(5) Building H and its associated sitework was not required until after Buildings G and F were complete. However, it was required for us to include the Building H sitework with Zone 2 due to the new 10th Street gate.
(6) The entry gate from 10th Street needed to be operational when Buildings F and G were occupied. See Zone 2.
(7) The specifications stated that the Hazardous Material Storage Area would not be available for demolition until January 1, 2007 (March 2, 2009 in problem). This meant that we could not complete the Covered Parking Areas until after this area was turned over by the Owner. In order to be more efficient, we elected to do all of Zone 3 after the Hazardous Material site was turned over by the Owner. See Zone 3.

In order to help everyone understand how we were going to move through the sitework, a full size drawing showing the different zones was posted in our conference room. This allowed us to effectively communicate our plan to the Owner and subcontractors which helped minimize confusion and disruptions in productivity.
One other item to consider when scheduling sitework is weather. Installing baserock and asphalt greatly reduces the amount of costly winterization that needs to be done to the site. We succeeded in completing the asphalt work in Zones 1 and 2 by the Fall of 2006 in preparation for the rainy season and Owner move-in.

See the attached drawing.

3. Building G Interior Schedule:
    a. As management has reviewed the construction documents, it has been realized that the path of construction through the interior of Building G will be challenging. In an effort to help clearly represent how the different trades are to move through the interior space of this building, you are required to submit a detailed schedule that shows how and when the different construction trades will move through the building from framing through paint.
    b. Your schedule should identify which trades will be in a specific area and the dates they will be there.
    c. Be creative (visual aids often help!). Remember that a detailed schedule is a tool you will be using to help you clearly explain the construction sequence to your staff, subcontractors, and Owner.

As the project progressed, it was realized that the interior construction in Building G was going to be a challenge. As part of the design, the architect included high walls in the main corridor with low walled offices below. The high walls had glazing to allow the natural light from the skylights to flow into the interior spaces of the

building. The challenge was that the high walls had to be 100% complete (including paint) prior to the framing of the low walled offices. If not, we would have had to come up with a safe way to access the high walls to finish them. This could have delayed our construction schedule and would have been very expensive.

In order to complete the high walls prior to framing of the low walls, we had to get "buy in" from our subcontractors that were performing the work. To accomplish this, a drawing was used to identify the different areas that needed to be worked and the timeframe in which they needed to be completed.

See the attached drawing.

4. All Other Work Criteria:
    a. The majority of the work will be handled by subcontractors. Your team will coordinate and manage the subs.
    b. As part of the construction contract, your company is required to move the Owner into their new buildings.
    c. Scheduling of all work and the phasing plans should support the assumptions made by the Site Utilization Plans drafted in Section 9.
    d. 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.
    e. Your team may begin construction anytime, provided you have achieved at least 1 approved submittal before you begin work. Therefore, based on your scheduling, determine which of the submittal 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 Final Completion.

6. COORDINATION OF WORK

(TIME WARP TO LATER IN THE PROJECT DURING CONSTRUCTION)

The owner has informed you that they will be performing the painting scope of work for this project. As the general contractor you are very concerned with having to manage the owner as a subcontractor.

Prior to work beginning:

1) Please generate a list of potential benefits and/or problems that you feel apply to this situation.

Possible benefits – One less contract to write, smoother / faster / easier punchlist.

Possible problems – Safety, work hours, material storage, quality of work, clean-up, man-power, schedule, back-charges, submittals and timely submittal review (or lack thereof).

2) A pre-construction meeting has been set up with the owner to discuss the future scope of work to be performed. Please provide an agenda for this meeting, addressing the possible problems listed in question #1.

See attached agenda.

3) Time Warp (Not long after painting has begun): As the painting is proceeding, your drywall sub comes to you complaining that the painter is not sanding after priming, and is applying paint too thick. The result is swelling of taped seams, and a bad finish. This makes the drywall subcontractors work appear sub-par. After expressing your quality concerns with the painting foreman at the weekly foreman's meeting, it is obvious that the foreman plans on making no changes to the way he is running his painting operations. Provide an explanation of how you plan to deal with the non-responsive foreman on his poor quality of work. Keep in mind that you have a good working relationship with the City of San Jose, and do not want to do anything that would compromise future work with the City.

Schedule an informal sit-down or lunch with the foreman, or foreman's boss. The idea is to handle this issue at the field level and not bring upper management in on this. We're not trying to get anyone fired, or disciplined, just trying to improve on the quality of painting, and overall appearance. If this informal approach does not produce the desired results, you will have no alternative but to elevate this issue to the Owner's Project Manager for resolution. The Owner has the prerogative to accept from his painters this lesser quality if he so chooses; however Hensel Phelps prides itself on turning over quality projects and we have a duty to the Owner to point out this problem.

7. PERSONNEL ISSUES

(TIME WARP TO AFTER CONTRACT AWARD)

You are the Project Engineer for the project and responsible for three Office Engineers. One of your Office Engineers, Tom Johnson, came into your office on Monday morning and told you that he saw Jerry Peterson, the most senior Office Engineer on the project, using illegal drugs the past two weekends. You are confused. You would never assume that Jerry would be using illegal drugs, nor have you noticed any changes in his job performance. In addition, Jerry is on the verge of a big promotion to Project Engineer; which will allow you to move into an Area Superintendent role. As an Area Superintendent you will receive a company

truck and a handsome raise. You want to do the right thing for the company, the project, and your future. What do you do?

Attached is the Company Substance Abuse Policy. Please answer the following questions.

1. Describe four possible courses of action.

Possible courses of action include:

a. A Project Engineer should never take on the responsibility of dealing with drug use issues without the assistance of the Project Manager and the Operations Manager. In this scenario, the Project Engineer should report the situation to the Project Manager immediately. Hensel Phelps does not want to jeopardize other employees if these drug allegations are true. Action must be taken immediately.

More information needs to be gathered on the accusation that Jerry is using illegal drugs. Tom needs to be queried and made accountable for his story and discussion needs to take place with Jerry personally to get his side of the story. Upon review of the information at hand, the Operations and Project Manager can then decide what further action needs to be taken.

If further discipline action is necessary, Jerry Peterson will be tested in accordance with Hensel Phelps Substance Abuse policy.

Per section E.4, "Reasonable Cause Testing" contact the district manager and request drug testing.

Follow section F, "Procedure for Pre-Employment, Jobsite, and Reasonable cause testing".

Follow section H, "Test Results".

Follow section J "Consequences of Positive Test Results".

b. Do nothing. Your promotion is on the line. (This is not a possible course of action. Points will not be awarded for this solution.)

***c.* Give him the Substance Abuse Policy and tell him to read it thoroughly.**

d. **There is reasonable evidence that Jerry is using drugs. Contact your district manager and request for a "Reasonable Cause Testing".**

e. **Request a job site testing**

2. What course of action would you take? Fully describe the course of action and why it is the best possible course of action for the company. If you referenced the Substance Abuse Policy, please identify all of the sections that were referenced.

See answer (a) to question 1 above.

8. SAFETY

(TIME WARP TO AFTER CONTRACT AWARD)

You are a newly promoted Area Superintendent that has just been assigned to the Central Service Yard project. Your project Superintendent has assigned you with the task of completing a Job Hazard Analysis for the erection of the pre-engineered buildings.

Prior to sending you on your way to execute this task he informs you that the correct way to execute the JHA is to use the Hensel Phelps Construction Co. form no. C04.01. Once the form is complete; a meeting will be scheduled with the subcontractor to review the hazards that will be encountered.

1. Using the attached form C04.01 complete the columns labeled "Unsafe Condition, Action, or Other Hazards" & "Prevention or Correction Action That Will Be Taken" for the following "Activities/Operations":

a. Personnel
b. MSDS (Material Safety Data Sheet) MSDS
c. Lifting
d. Drinking Water
e. First Aid Kit
f. Hand and Power Tools
g. Ladders
h. Equipment Operations
i. Rigging Equipment
j. Hoisting Heavy Loads
k. Excavations
l. Rebar
m. Welding and Burning
n. Gas, Oil, Chemicals
o. Barricades and Hole Covers
p. Scaffolds
q. Housekeeping
r. Tool-Box Meeting (Daily)

s. Fall Protection

See attached completed Job Hazard Analysis

2. What are the fall protection requirements for Iron Workers while connecting on a job this size? (Hint use calosha requirements, www.dir.ca.gov)

Using the Cal/OSHA website or a hard copy of the Cal/OSHA Construction Safety Orders:

Subchapter 4. Construction Safety Orders
Article 29. Erection and Construction §1710. Erection of Structures.
Subsection (m) (1) (A)

(m) Working and Traveling on the Skeleton Steel of Multistory Buildings or Structures.

(1) Connecting.

(A) When connecting beams or other structural members at the periphery or interior of a building or structure where the fall distance is greater than two stories or 30 feet, whichever is less, iron workers shall be provided with and use a personal fall protection system as described in Article 24 tied-off to either columns, pendant lines secured at the tops of columns, catenary lines, or other secure anchorage points.

9. SITE UTILIZATION

Currently, the City occupies five (5) buildings on the site which was formerly the Beechnut Baby Food Factory. The actual 6.5 acre construction site (shown on page C5.0) is presently vacant except for the storage of used city vehicles/equipment and occasionally being used by police-canine units to train. The Site Utilization Plan should show how the site is organized from where the trailers and laydown areas are located to the mundane circulation of the site. For this project, the construction trailers can be staged within the new construction area or the client may allow for the trailers to be staged outside of the construction area if they do not impact the City's current daily activities and if a rental fee is paid.

Each team will design a Site Utilization Plan that takes a snapshot in time. Instead of asking for a generic plan for any time period during the 17 month project, we are asking each team to consider their schedules and design a plan that is applicable from June 15 to August 15, 2008. This will allow for all the plans to be some what uniform but at the same time still giving each team enough latitude to be innovative and resourceful.

Though any of the permit drawings may be used to develop and explain your site utilization plan, civil sheet C5.0 shows the entire construction area and boundaries. Below is a minimum set of points we would like for each team to address, but feel free to add more line items to fully explain your position as your project evolves or changes. Also, make sure your plan follows a logical coordinated progression and does not contradict any code requirements, but shows foresight of future work activities.

Points to address:

1. Location of the project office
2. Location of the jobsite information/bulletin boards
3. Location of the Mechanical, Electrical and Plumbing subcontractor trailers
4. Location of the temporary fencing and access gates
5. Required signage
6. Circulation and access routes for material deliveries
7. Temporary storage and laydown areas for trades on site
8. Location of toilets and wash stations (assume a max. of 75 craft personnel on site, 1 toilet for every 20 workers/1 wash station at each location)
9. Emergency Evacuation Gathering Area(s)
10. Location of temporary utilities for construction use (i.e., metered water and power)
11. Garbage/location of dumpster(s)

See attached site utilization plan.

Phased Site Utilization Plan:
There are two important phases of work that may impact the turnover and schedule of the entire project if not diligently addressed. The first is the Hazardous Waste turnover and the second is the work in Bldg B. Due to the proximity of both of these areas to adjacent buildings, they could affect the new or existing work activities taking place. Show a site utilization plan for one of the two areas addressing points 4, 5, 6, 8, 9 and 11 above.

See attached phased site utilization plans.

10. UNFORESEEN SITE CONDITIONS

(TIME WARP TO LATER IN THE PROJECT DURING CONSTRUCTION)

In this scenario your team is near the completion of Building F. There is only one thing standing in your path to turning over Building F to the Owner – the State Health Department permit. Your team has worked feverously over the last few months to obtain the Health Department permit. The Municipal Water Department, whom is responsible for submitting your plans to the State Health

Department, has rejected your plans for the third time based on minor descriptive wording, labels, etc.

The Health Department permit is vital because without it you cannot make the final connections to your reclaimed water loop. The reclaimed water loop happens to supply water to both the toilets inside Building F & G and the surrounding landscape irrigation system. The City of San Jose requires the reclaimed water system to remain an integral part of the project to earn points towards the LEED Silver certification. So ultimately the system needs to remain and function as designed.

While the Owner will probably agree to occupy the building without landscape water, they will certainly require operable restrooms for their staff. Faced with the dilemma of not having functional toilets and a looming completion date waiving over your head, your team has to make a decision to solve this problem. And make it Fast!!!

1. As a team decide on three options to solve this problem.

    a. ***Use an alternative method to temporarily feed the toilets - backfeed the reclaimed water lines with domestic water.***
    b. ***Rent portable toilets for Owner's Staff until the final connection between the toilet water lines can be made with the reclaimed water loop.***
    c. ***Do nothing – wait until the Health Department permit is obtained and final connections are made between the toilet water lines and reclaimed water loop.***

2. Evaluate the pros and cons with each of the options. Identify whether the options have potential cost or schedule impacts.

Options	***Pros***	***Cons***
Use alternative method – backfeed reclaimed water lines w/ domestic water	***1.) Provides a temporary solution. 2.) Owners can both occupy building and use toilets. 3.) Minor, if any, schedule impact. 4.) Owner is satisfied with our proactive approach to resolving problem.***	***1.) You'll have to reconnect to the reclaimed water loop once the Health Dept permit is obtained. 2.) Some cost will be incurred to connect to the domestic system.***

Options	*Pros*	*Cons*
Rent portable toilets for Owners Staff	***1.) Temporary solution to problem. 2.) Owner can occupy building. 3.) No impact to schedule.***	***1.) Owner may potentially complain about using portable toilets when they have a new facility. 2.) Could be costly – especially since the duration for rental is unknown. 3.) Ultimately the Health Department may not allow the use portable toilets.***
Do nothing		***1.) Owner will not be able to occupy Bldg F on schedule. 2.) Major impacts to schedule – delay in starting Bldg B & out-of-sequence work. 3.) Not good practice, especially if you anticipate future work with Owner. 4.) Potential to have Owner assess liquidated damages for not completing building on time.***

3. Which option has your team decided to pursue? Explain your reasoning.

   Our team chose to pursue Option "A". The team felt the most feasible solution was to backfeed the reclaimed water lines with the domestic water loop. We were able to make this change with very little impact (schedule/cost), and it allowed us to turn the building over to the Owner. When we first approached this problem we identified two goals – keep the project on schedule and keep the Owner satisfied. This option allowed us to achieve both goals.

4. Based on your response to #3, how does your decision impact the relationship between Hensel Phelps and the City of San Jose (Owner)? Keep in mind you still have to complete the remaining buildings on the project.

   Our decision to backfeed the reclaimed water lines with the domestic system was well received by the Owner. They were impressed with our ability to resolve this issue with virtually no impact to their staff or facility operations. The manner in which we handled this situation reinforced the trust the Owner had placed in us and made for a successful completion of the remaining buildings.

11. QUALITY CONTROL

(TIME WARP TO LATER IN THE PROJECT DURING CONSTRUCTION)

You are the Project Manager on-site. The project has been going on for approximately 10 months. You are pleased with the relationship you and the owner have had. On your monthly partnering jobsite walk with the owner, the owner's representative points to the pre-engineered building you have provided for him and says," Hey Mr. HPCC project manager, why are these exterior panels a different color than what I requested?" Calmly you respond; "Well let me look into it and I will get back to you."

You head back to the jobsite trailers and sit your Project Engineer and Office Engineer down to determine what happened. You find out that during the submittal process the shop drawings and product data have been approved as noted. You review the submittal notes and find only structural and other architectural comments and nothing relating to the color of the exterior panels. In further discussion with your Project Engineer, you find out of an Owner Change Directive which involved multiple changes including upgrades to the interior finishes, mechanical and electrical upgrades and a clearly defined color change to the exterior panels of the buildings in question.

Your Project Engineer tells you that the Change Directive in question has been negotiated with the owner and change orders have been issued to all subcontractors involved; including the pre-engineered building subcontractor. Further research reveals that the pre-engineered subcontractor provided a zero cost to change the color of the panels under the condition that written direction is issued prior to fabrication. In the correspondence issued to the pre-engineered building subcontractor you find clear direction from HPCC and the Owner to proceed with the change.

It appears that a lot has transpired to where the current field condition stands. The pre-engineered subcontractor is currently notifying you that if the color of the panels needs to be changed from what has been erected; the cost of the replacement would total roughly $60,000.

Please respond to the following questions:

1. Where did the quality control system fail?

In general Quality Control is a team effort; therefore the team failed.

The Office Engineer and / or Project Engineer should have followed-up at execution of the change order and during fabrication to ensure that the revision was reflected in the product order.

The subcontractor should have coordinated with their fabrication schedule as to when direction was received from HPCC to incorporate the color change.

Material checklist is part of the HPCC quality control. This step was skipped and therefore impacted the job quality.

2. What could have been done different to avoid the current exposure of added cost?

Follow-up and closing the loop on the risk.

3. Who is responsible for any cost required to correct the current condition ($ 60,000 + overhead)?

CHOOSE ONE AND EXPLAIN:

a. Owner
b. Hensel Phelps Construction Co.
c. Subcontractor
d. All of the above

Answer: c – the Subcontractor. The Owner clearly directed the change and allowed the Subcontractor an opportunity to price and implement the change.

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

12. BONUS - LEGAL

(TIME WARP TO AFTER PROJECT COMPLETION)
Your company has completed the Central Services Yard for the City of San Jose, which is now in full time use by the city workers (95% male / 5% female). The worker's union filed a grievance under Title 8 (Workforce Safety Code) with the City of San Jose because there were not sufficient male bathroom facilities designed and constructed. The City of San Jose has taken the stance this is your companies issue and has requested your immediate action to resolve the lack of male bathroom facilities.

The Central Services Yard is a design build project. The Contract includes a set of bridging documents from which your company used for the basis of design. These documents showed the bathroom facilities being a 50/50 male to female ratio which is per the plumbing code.

State your company's position in a letter on how to resolve this issue and if bathroom facilities need to be added, who will incur the costs.

See attached letter addressed to the Owner.

13. BONUS - GREEN BUILDING

For the purpose of this question time wrap several months into the project. The structure and MEP trades have been bought out. You are working on finishing buyout for the project and are now focusing on the finish trades. The contract with the Owner requires that the project be LEED Silver under LEED v2.1. The Owner has now asked you what it would take to achieve LEED Gold on the project.

The LEED Scorecard provided on the Reference CD shows the current status of the LEED points considered to have been achieved, still possible, and not achievable. Currently the project has documented 29 credits toward achieving LEED Silver. Several more credits are needed to achieve LEED Silver as required.

The LEED Scorecard has three columns next to each credit. All credits with a "1" in the green column are considered achieved. All credits with a "1" in the yellow column are considered possible. All credits with a "1" in the red column are considered not achievable.

Update the LEED Scorecard so that you know what credits are needed to fulfill your contractual requirement of LEED Silver. In one paragraph state why you selected those credits to fulfill your contractual requirement.

See attached LEED Scorecard with the goal of Silver.

The credits were selected based on the criteria of what can be achieved for the least amount of money and effort. Waste management and recycling are documentation credits which are achievable for this project based on the building's prefabricated metal structure and low level of finishes. Using low-emitting materials on a project of this type and size would have a minimal cost impact. The low-emitting materials credits can then be achieved via the buyout process and will just need to be documented. The daylight and views credit was achieved by the design and at this point is also just a credit that needs to be documented.

Now update the LEED Scorecard to show the Owner what credits you would achieve to obtain LEED Gold for the project. Draft a short letter to the Owner explaining why these credits were selected. If you feel this will result in added costs to the project please state this in your letter and briefly explain your position. Do not attempt a takeoff to provide an estimate or rough order of magnitude.

See attached LEED Scorecard with the goal of Gold.

See attached letter addressed to the Owner.

VII. COMPETITION SCORING SYSTEM

Item	Description	POINTS
0.	Quality of Submitted Proposal	2
1.	General Summary	4
2.	Estimate	20
3.	General Conditions	14
4.	Proposal Summary	18
5.	Schedule	22
6.	Coordination of Work	6
7.	Personnel Issues	6
8.	Safety	6
9.	Site Utilization Plan	10
10.	Unforeseen Site Conditions	6
11.	Quality Control	6
Subtotal		120
Oral Presentation		80
GRAND TOTAL		200 POINTS
Bonus Questions:		
12.	Legal	6
13.	Green Building	6

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

VIII. LIST OF JUDGES

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XI. SUPPLEMENTAL INFORMATION

Answer Package:

1.a General Summary Spreadsheet
2.a Concrete Estimate Spreadsheet
2.b Drywall Estimate Spreadsheet
3.a General Conditions Spreadsheet
3.b Staffing Matrix Spreadsheet
3.c Extended GC's Letter to Owner
3.d Extended General Conditions Spreadsheet
3.e Extended Staffing Matrix Spreadsheet
4.a Proposal Summary Forms
5.a CPM Schedule Network
5.b CPM Site Phasing Drawing
5.c CPM Building G Phasing Drawing
6.a Preconstruction Meeting Agenda
8.a Job Hazard Analysis Form
9.a Site Utilization Plan
9.b Phased Site Utilization Plan for Building B
9.c Phased Site Utilization Plan for Hazardous Waste Site
12.a Restroom Issues Letter to Owner
13.a LEED Silver Score Card
13.b LEED Gold Letter to Owner
13.c LEED Gold Score Card