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Associated Schools of Construction

Student Competition - Sparks, NV
February 6 - 9, 2013

National Problem Statement:

Sustainable Building & LEED

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Introduction

Welcome to the 2013 ASC National Problem Statement focusing on Sustainable Building and Leadership in Energy and Environmental Design (LEED®) projects.

As one of the top Contractors of sustainable construction projects, Skanska USA Building has strived to create projects that have minimal, if any, impacts on the environment throughout their construction and lifecycle. Utilizing the programs set forth by the U.S. Green Building Council, the International Living Future Institute, and other green certification agencies, along with forward-thinking project teams and design partners, we have sought to move farther down the path of "green building" using any and all methods available. With your help and participation in this problem statement, we hope that you will gain understanding and appreciation of the green building methods that the construction industry can employ in our day-to-day operations. More than that, we hope that you will look to implement these ideas into your daily lives outside the workplace.

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Project Description

The 3400 Stone project is a new construction of a five (5) story concrete building with three (3) stories of below grade parking in the Fremont neighborhood of Seattle, WA. The top four (4) floors will be approximately 110,000 sf of new office space. The first floor will house approximately 15,000 sf of street level retail space. Parking capacity of the below grade floors will be approximately 200 vehicles. The structure is post-tensioned concrete and the exterior skin is a combination of precast, curtain wall, and storefront. The building is designed to achieve LEED Platinum as well as to meet components of the Living Building program.

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Scoring

The judging panel will be made up of four or more members from the project architect, engineers and general contractor. Point scales will be assigned to several elements of the written and oral presentations.

	Available Points
• **Prequalification**: Your team's; actual resumes personnel, experience and commitments to sustainable design and green building, presented as a pre-conference submittal.	5
• **Problem Statement 1** – Sustainable Wood.	15
• **Problem Statement 2 –** Water Efficiency and Re-use.	20
• **Problem Statement 3 –** Alternative Transportation.	10
• **Problem Statement 4 –** Sustainable Sites Selection.	15
• **Problem Statement 5 –** Indoor Environmental Quality – Low Emitting Materials.	15
• **Oral Evaluation:** - Prepare and present a persuasive argument and recommendation for a problem unrelated to the written problems.	20
Total Possible Points	**100**

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Schedule

The problem statement schedule is as follows:

- **Monday, January 16th, 2013**
  - 5:00 p.m. – Pre-qualification submittal delivered to Skanska USA Building Inc.

- **Thursday, February 7th, 2013**
  - 6:30 - 6:45 a.m. - Teams will attend a LEED Problem Overview for the selected project and distribution of problem instructions and materials.

  - 6:45 a.m. - 8:59 p.m. - Preparation of written Problem Statement responses.
    - 9:00 a.m. – RFI Session #1
    - 2:00 p.m. – RFI Session #2
    - 5:00 p.m. – Final RFI's due, no RFI's will be accepted after this time.

  - 9:00 p.m. – Written responses to Problem Statement and documentation due.

- **Friday, February 8th, 2013**
  - 7:30 a.m. - Turn in all oral presentation materials including handouts, electronic presentation media and other materials to specified room.

  - 7:35 a.m. - Lottery for Oral Presentation Schedule.

  - 9:00 a.m. - 4:00 p.m. - Oral presentations. 5 minutes setup, 15 minute presentation, 5 minute questions and answer period and 5 minute breakdown period.

  - 6:30 p.m. - Debriefing of project Problem Statement.
  - 7:00 p.m. to 8:00 p.m. – Hospitality Event

- **Saturday, February 9th, 2013**
  - 12:15 p.m. - Awards Presentation

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Required Materials for Problem Statement

Submission Guidelines:

In keeping with sustainable practices, all proposers will provide a "Paperless" submission. Email attachments, flash drive and/or Compact Disks (CD) are the only acceptable means of submission materials. All electronic submissions must be in the form of a PDF, MS Imaging file, JPG, TIF or other electronic format. PDF is the preferred file format for submission.

Requests for Information:

A blank form for Requests for Information (RFI) is included as an attachment for use in submitting questions. Two question and answer periods will be scheduled during the day for informal questions, but all teams must submit written RFI's if a formal response is requested. All RFI requests received will be provided as a response to all teams.

Format of Submission:

In addition to the requirements for electronic submission noted above, the following proposal formats must be adhered to:

1. 12-point Times New Roman font
2. 1-1/4" border around all documents, left justified
3. All text single spaced
4. Maximum submission of 25 pages, including cover page, cover letter, schedules or other documentation necessary to support your submission.
5. If CD submission is utilized, 4 copies are required clearly indicating your team's name, problem statement and submission date.
6. Internet accessibility is allowed and required for your research and submission assistance.

A ten (10) point deduction from the overall team score will be assessed for pages in excess of the page limit described above.

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Problem Statement 1: Sustainable Wood Problem Statement

15 Possible Points

Part 1: Evaluate FSC Wood Credit MRc7 - 7 Points

Reference the submittal documents in Attachment #4 and evaluate how each product contributes to the FSC wood requirements for the project (see products listed below). Input data into the spreadsheet provided in Attachment #5 and identify if your proposed products will allow you to achieve LEED credit MRc7. (Show your answers in the table provided and clearly state any formulas used for this analysis. Denote any formulas used within the table at the column/row headers. Provide reasoning for your analysis of MRc7.)

- GluLam Beams
- Interior Carpentry & Millwork
- Wood Paneling
- Hardwood Flooring
- Wood Doors
- Custom Casework
- Wall Backing

Part 2: Identify Qualifying Subcontractors - 7 Points

As the general contractor for the Stone 34 project, you are bidding out the finish carpentry scope of work to several subcontractors. Evaluate and respond to the following scenario and questions.

A. Three subcontractors have submitted a bid for the finish carpentry scope of work. Each subcontractor has provided cut sheets and pricing (per linear foot) for their proposed products. Evaluate the cut sheets provided in Attachment #4 and identify which, if any, subcontractors have submitted a product which complies with the project specifications for finish carpentry as it applies to the entry canopy. State your reasons for compliance or non-compliance.

a) A + B = C Contractors:
   - See product information for Wahoo Decks

b) Best Ever, Inc.:
   - See product information for Everwood Decking

c) Don't Pick Me & Son, Inc.:
   - See product information for East Teak Fine Hardwoods, Inc.

B. Using the information provided from the three contractors listed above, evaluate what impact the finish carpentry products will have on achieving LEED credit MRc7. Note that the submitted product is intended for use at the entry canopy.

C. Based on your responses to parts "A" and "B" above, provide a recommendation for contract award for the finish carpentry scope. Provide reasoning for your recommendation.

Part 3: Living Building Challenge - 1 Point

A. What section(s) of the Living Building Challenge relate to LEED credit MRc7?

B. Based on your contractor evaluations in Part II, describe which contractor you believe best exemplifies the Living Building Challenge for materials. Provide reasons for your selection.

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Problem Statement 2: Water Efficiency & Re-use Problem Statement

20 Possible Points

Intent: Capture rainwater in the building's cistern to minimize the use of potable water for irrigation and toilet flushing.

Part 1: Water Re-use – 10 Points

Calculate the design and baseline cases for potable water usage based on the landscaping data provided in Attachment #6 and the landscape drawings (L004 and L005). How much reuse water must be available in the cistern to achieve LEED WE Credit 1 Option 2 Path 1?

Part 2: Cistern Design – 10 points

Using the occupancy information provided in Attachment #7, information provided in WE Prerequisite 1, and the fixture schedule in Attachment #10, calculate the minimum size the rainwater cistern needs to be to achieve LEED WE Credit 2 Option 1. Upsize the cistern by 20% to account for extreme conditions. Assume the collection area includes all roof surfaces with drains and use a runoff coefficient of 0.82. Assume the cistern is full on January 1, the day the building is open for occupancy, and is only used for toilet flushing.

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Problem Statement 3: SS Credit 4.1 & 4.2 Alternative Transportation

10 Possible Points

Intent: To reduce pollution and land development impacts from automobile use.

Part 1: SS Credit 4.1 Public Transportation Access – 4.5 points

A. The project is attempting to attain SS Credit 4.1 – Alternative Transportation – Public Transportation Access. Proximity to public transportation access will need to be verified. The solution shall be provided by one of two ways:

   Option 1: Rail Station Proximity
   Use an area drawing, aerial photograph, or map to calculate the walking distance to rail stations. Planned and funded commuter rail, light rail or subway stations shall be considered.

   Option 2: Bus Stop Proximity
   Use an area drawing, aerial photograph, or map to calculate the walking distance to bus stops.

B. The Owner is interested in earning an Innovation in Design credit for exemplary performance by achieving Option 2 under SSc4.1 section 9, Exemplary Performance. Using the City of Seattle Department of Transportation Transit Master Plan as reference, prove how this can be accomplished. If not achievable provide explanation as to why.

Part 2: SS Credit 4.2 Bicycle Storage and Changing Rooms – 4.5 points

A. Using the information provided regarding building occupancy in Attachment #7, calculate the number of Bicycle Storage Spaces/Racks and Changing Rooms required to achieve SS Credit 4.2 for New Construction. Show all of your work clearly; partial credit will be awarded.

B. Confirm if the number of bicycle spaces shown on the architectural drawings provided in Attachment #1 will achieve SS Credit 4.2 and justify your answer.

Part 3: Living Building Challenge (LBC), Imperative 4, Car Free Living – 1 point

Provide a short written answer for each of the following, using the LBC provided in Attachment #8 as reference:

A. What is the primary goal of the LBC Imperative 4?

B. How is “Car Free Living” different than mandating the elimination of cars from a development?

C. What is the “catchment area” as related to the LBC Imperative 4?

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Problem Statement 4: Sustainable Sites & Site Selection

15 Possible Points

Part 1: SS Credit 2 Development Density and Community Connectivity – 4 Points

Determine if the project meets the LEED Sustainable Sites Credit 2 requirements. Provide supporting documentation similar to documentation required for the LEED submittal

Part 2: Living Transect Category – 1 Point

Calculate the Floor Area Ratio (FAR), as defined by LBC. Identify what Transect this project falls into and whether or not this project requires any agricultural allowances.

Part 3: Living Building Site – 4 Points

The LBC states that construction may only take place in specific, approved locations. For this project please answer the following questions:

A. Is this project on a previously developed site, greyfield and/or brownfield? If so, which one?
B. Is this project set to be developed on a sensitive ecological habitat, prime farmland, or within the 100-year flood plain?
C. Provide documentation/list of resources supporting your claims.

Part 4: Effects of Living Building Site – 3 Points

What other imperatives are affected by where the building is sited and does this building comply? Please list and explain your reasoning.

Part 5: Site Selection – 3 Points

A. Determine what LEED site credits can also support LBC certification.
B. Would you recommend the project team pursue LEED or the LBC site petal? Provide support for your recommendation.

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Problem Statement 5: LEED IEQc4.2 – Low Emitting Materials – Paints and Coatings

15 Possible Points

Intent: To reduce the quantity of indoor air contaminants that are odorous, irritating and/or harmful to the comfort and well-being or installers and occupants.

Scenario: You have been tasked with evaluating your painting subcontractor's submittals and approach to the project. In Attachment #9 you will find their painting and coating submittal. Assume the chart shown below includes all the building areas that need to be painted and the attached submittals represent paints and coatings for all the areas included on the chart.

Product to be coated	Quantity
Interior Wood Trim & Paneling	18,000 s.f.
Exterior Wood Soffits	11,256 s.f.
Exterior Metal Railing	2,200 s.f.
GWB Walls	37,000 s.f.
GWB Ceilings	15,000 s.f.
Interior Metal Railings	2,000 s.f.
Wood Benches	850 s.f.

Part 1: Submittal Evaluation - 2 Points

Evaluate the submittal for compliance or non-compliance with LEED IEQ4.2. You must answer the following question.

A. Do all products meet the LEED IEQ4.2 VOC limit requirements? You must have a definitive answer (Yes/No).

Part 2: Spreadsheet Analysis – 10 points

It is imperative that you achieve this LEED point to achieve the buildings LEED Platinum rating. Use your LEED knowledge to assure that you do achieve this point and show the owner through spreadsheet analysis how you can achieve it using the product data submitted.

Part 3 – Subcontractor Means and Methods – 3 Points

What other means and methods could you recommend the subcontractor employ to achieve this LEED point, if for argument sake; the products could not be changed. Describe what actions you would recommend that the subcontractor take regarding how his products are finished that could affect the Low Emitting LEED points.

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Oral Evaluation

Oral Group Presentation

20 Possible Points

Intent: Prepare and present a persuasive argument and recommendations.

Required:

The project developer has asked for assistance in achieving LBC Imperative 11 "Red List" and Imperative 14 Appropriate Sourcing, your team has been asked to provide a presentation which will inform the owners design and construction team about Imperative 11 "Red List" and Imperative 14 Appropriate Sourcing. Key points to focus on would be:

- What are the reasons the LBCI created the Red List and Appropriate Sourcing?
- Describe five key benefits to sustainable building of focusing on materials and sourcing.
- Give five examples of chemicals on the Red List and describe what building material products commonly contain the chemical. What are possible alternate products and what are the potential impacts to the project of using the alternate material?
- What challenges does your team foresee in gathering the building material product data? How and when would you propose to gather and track this information?
- In an effort to grow the implementation of these imperatives what should be done with the information after it is collected?

Presentation Timeline:

- Teams will be allowed a five (5) minute set-up period.
- Teams will be allotted fifteen (15) minutes in which to; introduce their team, present their information, and explain the expected challenges.
- A five (5) minute question and answer period will follow the presentation.
- Five (5) minutes will be allowed for breakdown.
- A computer with MS PowerPoint, a projector, and screen will be provided for presentation to the committee.
- Any other presentation materials required are to be provided by the team.

ALL ELECTRONIC AND HARDCOPY PRESENTATION MATERIALS ARE TO BE DELIVERED AT 07:30 AM PST TO THE PRESENTATION ROOM ON THE MORNING OF FEBRUARY 8, 2013.

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Required Materials for Problem Statement

1. Stone 34 Architectural Drawings (102 Drawings)
2. Stone 34 Structural Drawings (63 Drawings)
3. Blank RFI Form (1 File)
4. FSC Wood – Product Information (112 Pages)
5. FSC Wood Tracking Sheet (1 File)
6. Landscaping Data (1 Page)
7. Building Occupancy Data (1 Page)
8. Living Building Challenge 2.0 (49 Pages)
9. Paints and Coatings Product Data (10 Pages)
10. Plumbing Fixture Schedule (2 Pages)
11. Stone 34 Specifications (117 Files)