Moynihan Train Hall, New York

SKANSKA

ASC Student Competition

Sparks, NV

February 8-9, 2024

Open Competition

Sustainable Building

Welcome to the 2024 ASC Open Competition Sustainable Building Problem Statement

We are excited that you've chosen to compete in this problem category. Skanska continues to be an industry leader in sustainable construction. We strive to create projects that have minimal impact on the environment throughout their construction and lifecycle. Sustainable construction continues to expand and encompasses a wide reach of topics including reducing waste, resiliency, carbon neutral practices, and occupant well-being. In participating in this problem statement, we hope that you will gain a better 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 careers and daily lives outside the workplace.

Like last year, we've organized the problem statement into three major categories – People, Planet, and Profit. We hope you enjoy this problem statement we have assembled for you.

The Kendeda Building, Georgia

Sustainable Building Problem Statement Schedule

Thursday, February 08, 2024

6:30am	Introduction in Southern Pacific EF, and Issue RFP via Procore
11:00am	Early Deliverable due via Procore
1:00pm	Breakout Session in Southern Pacific EF
2:00pm	Early Deliverable due via Procore
5:00pm	RFI Deadline for Proposals
9:00pm	Proposals due via Procore
9:00pm	Oral Presentation Order Assignment in Southern Pacific EF
9:30pm	Issue Oral Presentation Notice via Procore
11:00pm	RFI Deadline for Oral Presentations

Friday, February 09, 2024

6:00am	Presentation materials due via Procore
7:00am	Presentations start in Southern Pacific EF
5:00pm	Presentations End
6:00pm	Problem Statement Recap in Southern Pacific EF
7:00pm	Skanska Hospitality Event in Southern Pacific EF

Saturday, February 10, 2024

9:00am	Skanska Career Fair
12:15pm	Awards Ceremony

ASC Competition Rules

- Student teams must comply with ASC Competition Rules (revised for 2024). These are linked in Procore for reference and can also be found at: https://asc67.org/rules.html

- Once the kick-off meeting concludes, and until a team's oral presentation is completed, only the students identified as being team members shall be present in the team's room(s) or shall collaborate on the team's response to the problem statement. No additional person(s) may perform as a helper, runner, or assistant for any team for either the regional or open competitions. Teams will be disqualified if any team has more than 6 members participating in the process of creating a competition solution in any way. This includes food and supply runs! The use of cell phones to contact outside persons is not permitted except in an emergency or as deemed appropriate by the problem sponsor. Faculty advisor(s) may not interact with their teams once the competition has begun.

- Use of the internet is allowable and may be necessary for certain components of the problem.

- At the discretion of Skanska, the use of AI tools such as ChatGPT are **not allowed** for this competition. Any teams found to be using such tools will be disqualified.

- 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. Similarly, no components of the problem may be sent to others outside the team for assistance in completing the problem.

- A one-half (1/2) point deduction will be taken for each minute that the solution statement is turned in past the time that it is due. **Solution statements are due Thursday at 9:00pm PST via Submittals in Procore.** If internet issues arise, solutions can be submitted on a USB drive in the Southern Pacific EF room. The 9:00 pm deadline and point penalties listed above apply to USB submission as well. Other deliverable items, if applicable, will be due as specified.

- The Oral Presentation will be released by 9:30pm Thursday night. Presentation times will be determined Thursday evening. Presentation materials must be uploaded to Procore by 6:00am Friday morning. Skanska will provide the computer with all presentation materials for each team. No additional materials are allowed to be distributed or presented. Any additional equipment required for a presentation will be the responsibility of each team.

- Only registered participants accepted by ASC are allowed in a school's presentation room per ASC 2024 rules. Violation of this rule shall be cause for immediate disqualification from the competition.

- While the judges will endeavor to administer the problem with all fairness and appreciation for the teams' perspectives, the decisions of the judges shall be final when deciding conflicts and scoring.

Request for Proposal Guidelines

Requests for Information:
RFIs will be asked and answered using the RFI tool in Procore. All RFIs submitted and answered will be viewable by the Skanska project team and all students participating in the sustainability competition.

Supplemental Information:
Some of the problems have additional supplemental information, reference materials, drawings, etc. They can be found in the Documents tool on Procore.

Supplemental Problems:
Supplemental Problems may be provided during the problem statement competition. Supplemental Problems may be additional information about a changing condition that needs to be incorporated into a team's final solution statement. A Supplemental Problem may also be requiring a response and/or solution to accompany the solution statement or may have an earlier deadline during the day. Student teams will need to make note of the conditions and requirements set forth in the individual supplemental problems issued and provide an appropriate response. Note: Supplemental Problems are not 'extra credit' and are accounted for in the total possible points related to their respective category.

Solution Submission Guidelines:
Solutions will be submitted as a submittal via Procore. Each team must create their own submittal via the instructions provided in the Documents section of Procore. All electronic submissions must be in the form of a PDF or other electronic format as stipulated in the problem statement. Other formats may be accepted on a case-by-case basis. Requests for an alternate format should be made before the RFI deadline.

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

1. 11-point Arial font
2. 1-1/4" border around all documents, left justified
3. Maximum submission of 25 pages, including cover page, cover letter, schedules, or other documentation necessary to support your submission. All pages submitted will count unless specifically excluded in the written problem statement or via RFI acceptance.

A two (2) point deduction from the overall team score will be assessed for each page over the page limit described above.

Judging Team Profiles

Name: Marie Roza
Title: Senior Emerging Technology Engineer
Years with Skanska: 4
Office: Portland, OR
Business Unit: Building
Role/Responsibilities: I collaborate with our construction project teams and clients in Oregon to develop regional and national solutions that make our teams more efficient and drive innovation within Skanska. My key focus areas are implementing construction technology on our projects (like flying drones!), building apps and automations in low-code/no-code platforms, and providing key insights through data analytics.
Skanska Extracurriculars: Skanska Women's Network, SYP

Name: Tarah Driver
Title: Senior Project Engineer
Years with Skanska: 3
Office: New York, NY
Business Unit: Building
Current Project: South Brooklyn Marine Terminal Port Upgrade

Responsibilities: Quality Manager – Ensures contract document and code compliance for marine, civil, and building trade scopes of work totaling almost $1B
Skanska Extracurriculars: Skanska Women's Network, Skanska Young Professionals, ASC Region 1 (east coast), ACE Mentorship

Name: Frankie Alvis
Title: Senior Project Engineer
Years with Skanska: 5
Office: Portland, OR
Business Unit: Building
Current Project: Portland Airport, Ground Source Heat Pump System
Responsibilities: Out at the PDX Airport, I work with subcontractors from contract development to close out. From Contracts, Change Orders, RFIs and Submittals, to coordinating operational impacts with the airport, I spend my days ensuring the success of our Well Drilling, Horizontal Boring, Civil, and MEP Contractors.
Skanska Extracurriculars: Skanska Young Professionals – Portland Chapter Head, ASC Open Competition Problem Coordinator

Name: Tyler Martens
Title: Senior Project Engineer
Years with Skanska: 5.5
Office: Portland, OR
Business Unit: Building
Current Project: University of Portland Shiley TI
Responsibilities: Managing the UP Project, I'm responsible for our owner/client interface, document control, cost management and writing and executing subcontracts.
Extracurriculars: I was born and raised in Portland, OR. My favorite activities are backpacking/camping and hitting the gym. Between these activities and working, most of my time is spent looking after my golden retriever named Maverick and hanging out with my wife. I look forward to meeting you all!

Name: Jordyn Osborn
Title: Senior Project Engineer
Years with Skanska: 3.5
Office: Portland, OR
Business Unit: Building
Current Project: Portland Airport Terminal Core Expansion (PDX TCORE)
Responsibilities: At PDX, I've been on multiple teams; structure, enabling work, demo and I am currently working on the interior finishes team. I am the Skanska LEED point of contact for the project as well and work hand in hand with the design team and LEED consultants.
Extracurriculars: I am originally from Phoenix, Arizona and went to school at Northern Arizona University. I spend my time outside of work backpacking, snowboarding, biking, traveling and loving the outdoors! My favorite place in the US is Northern Cascades National Park. Fun fact: I did a volunteer trip in Laos in 2023!

Name: Robin Clarke
Title: Project Engineer
Years with Skanska: 4
Office: Seattle, WA
Business Unit: Civil
Current Project: L300 Lynwood Link Extension
Responsibilities: As a Project Engineer with our Civil Business Unit, my focus is on site operations, enabling the success of our earthwork and utility efforts.
Skanska Extracurriculars: Co-Chair Skanska Women's Network – California Chapter

Name: Sunny Lewis
Title: Senior Project Engineer
Years with Skanska: 5
Office: Portland, OR
Business Unit: Building
Current Project: Portland Airport Terminal Core Expansion (PDX TCORE)
Responsibilities: After completing my stint with the structures team here at TCORE where we pre-built and moved a 9-acre wood/steel roof, I've joined the interiors team. I help manage the build out of the concessions spaces (tenant-occupied areas including restaurants, coffee shops, retail spaces, etc.) on the enplaning level as well as the framing on the deplaning level.
Skanska Extracurriculars: ACE Mentorship, 6th year at the ASC Competition

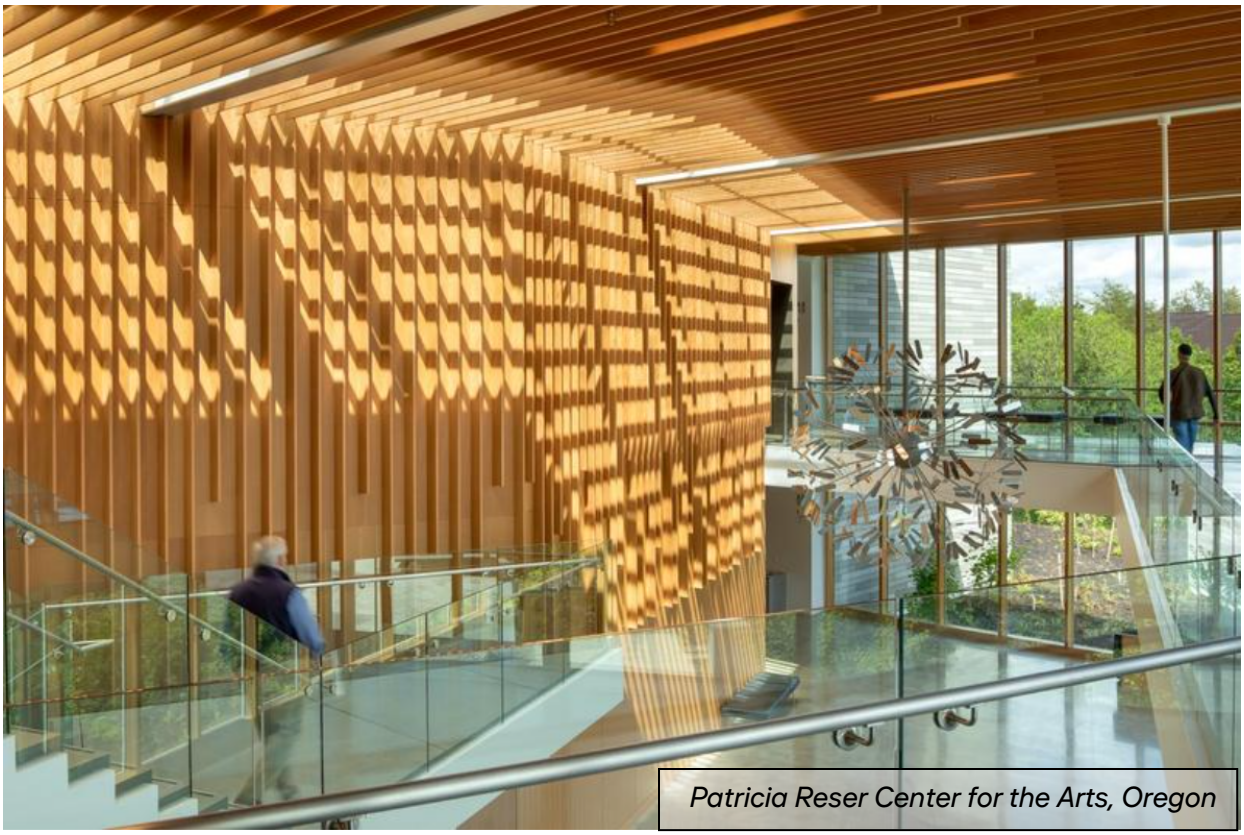
Name: Jeannie Yang
Title: Field Engineer II
Years with Skanska: 2.5
Office: Los Angeles, CA
Business Unit: Building
Current Project: LAWA RUE (LAX)
Responsibilities: I am a field engineer and the assistant design manager. I help coordinate and oversee our field operations for some of our scope ranging from signage to utilities to roadways. I also work closely with our designers and city agencies to acquire permits for our remaining work.
Extracurriculars: Skanska Women's Network – California Chapter. Outside of work, I really enjoy traveling and spending time outdoors, but if I'm not doing that, I really like sleeping. I also have fun trying new recipes and trying to catch up on TV.

Name: William Johnson
Title: Senior Project Engineer
Years with Skanska: 3.5
Office: Portland, OR
Business Unit: Building
Current Project: University of Portland Shiley TI
Responsibilities: I'm currently working with a confidential client on their Chandler, AZ site, assisting them with multiple tenant improvement (TI) related projects.
Extracurriculars: Outside of ASC, I'm part of the Skanska Young Professionals – Leadership Team. When I'm not at work, most of my time is spent looking after my golden retriever named Goose and coaching our Local High School Ski Team.

Scoring

Point Scales will be assigned to several elements of the written and oral problem statements. Awards will be provided to the three teams scoring the most overall points; 1st place, 2nd place, and 3rd place. Additionally, the judges may award a Judge's Selection award to a fourth team at their discretion.

Category	**Points Possible**
Prequalification Statement	5
Planet	33
People	33
Profit	34
Oral Presentation	20
Maximum Points Possible	125



Patricia Reser Center for the Arts, Oregon

Project Information

This year's problem statement focuses on two Skanska projects. More information about 1550 on the Green is provided below:

1550 on the Green
1550 on the Green is located directly adjacent to one of Houston's most celebrated and iconic parks in downtown Houston, Discovery Green. Part of the three- block master plan, all owned by Skanska, this building is designed by world renowned architect, Bjarke Ingels Group (BIG). The site will soon become a 370,000 SF office tower complete with market changing amenities including multiple terraces that pull the park up into the building. With a unique side-core design, expansive floor plate and LEED Platinum mechanical system, 1550 on the Green will set a new standard for Houston architect and office life.

1550 on the Green, Texas

Project Information

This year's problem statement focuses on two Skanska projects. More information about Moynihan Train Hall is provided below:

Moynihan Train Hall
This project is a rehabilitation to enhance the James A. Farley Post Office Building to connect the Farley Building with the adjacent Pennsylvania Station. The renovated Farley Building includes the new Moynihan Train Hall, retail, and commercial office spaces. The renovation covers all new aspects of civil, structural, architectural, mechanical, electrical, and plumbing, as well as demolition of existing structural and architectural elements, including abatement. Historic restoration of the entire exterior of the Farley Building and adjacent Annex building was also included. The new train hall improves access for Penn Station's 650,000 estimated daily rail customers.

Moynihan Train Hall, New York

Profit Portion

Profit Question 1 – Person-hours Tracking

1. The owner intends to provide payment to bidders for the time spent compiling the pursuit materials for this RFP. Please have each member of your team complete this provided form to log the number of person-hours spent on each of the RFP requested deliverables. ***This includes all portions of the problem statement***

Profit Question 2 – Leasing 1550 on the Green

1. The owner will lease ten floors of the building for varying uses charged at various costs, depending on the occupancy use. Using the provided typical floor plan located in the Procore Drawings Tool, calculate the requested values below to determine owner revenue and profit using the provided table. Provide each numerical answer, as well as your calculations for each value, to receive full points for the deliverable. Note that per the last row of the provided table, 10% of the office space shall be leased at a lower cost per square foot for the exclusive use of non-profit organizations and small businesses.
    a. Using the provided plans, create a marked up set of drawings confirming the lease area locations.
    b. Calculate the projected monthly earnings for rent collected from tenants, assuming full building occupancy.
    c. If the construction cost for these 10 floors was $102,000,000, the monthly building operating costs are $46,000 and the annual revenue is the value you calculated above, how many years will it take for the owner to be 'out of the red'? Assume that no other costs are incurred by the owner, provided relevant maintenance and property taxes are to be billed to the tenants as a separate cost. The rent shall not increase until the owner is 'out of the red' and assume no interest is accrued on collected rent.

Proposed Use	***Percent of Building SF***	***Cost per SF ($/sf)***
Retail Space	30%	$3
Restaurant Space	10%	$5
Office Space	60%	$4
** Non-profits & small businesses	10% of the office space SF	$2

Profit Question 3 – Biochar

1. Recently, there has been research done on the implementation of biochar as an admixture in concrete to create carbon-neutral or carbon-negative concrete. Producing biochar involves the process of taking biomass (molded wood, stumps, debris) and burning it in a pyrolysis machine to create biochar product. Reference the biochar presentation located in the Procore Documents tab for more information on the process. The owner has decided to use biochar in some of the concrete elements of 1550 on the Green. They have asked that you evaluate the feasibility of potentially (1) producing biochar concrete onsite or (2) purchasing from an offsite production facility. Using the template located in the Procore Documents tab, complete a risk assessment for the provided areas of concern to guide the

feasibility study. Upon completing the risk assessment worksheet, provide your formal recommendation and reasoning behind your selection to the owner based on your findings. Be sure to include both the risk assessment and formal recommendation within your final problem statement submission.

Profit Question 4 – Diesel-Fueled Equipment

1. For both 1550 on the Green and Moynihan Train Hall, subcontractors assumed within their bids that diesel-fueled equipment would be allowed to perform work and their subcontracts are qualified accordingly. While diesel-fueled equipment is often cheaper to use for projects that already require supervision by a master mechanic, it introduces environmental hazards and is therefore less favorable than their electric alternatives. The owners for both megaprojects have directed Skanska to use electric equipment for the carpentry trades in a post-contract award sustainability initiative. The owners will pick up the cost difference for the operation, labor, and cost of equipment rentals on their respective projects but need a ROM (rough order of magnitude) before Skanska will direct their subcontractors to execute the change. Using the information within the tables below, provide the cost differential for the electric vehicles with the following information. Consider not only the cost of rental equipment, but also costs due to changed productivity rates and additional labor. The final deliverable should include your calculations, work approach, and any assumptions or cost information found online. No additional cost information will be provided and assumed/researched values should be cited within your submitted deliverable. Use the following information in your calculation:

    a. *Equipment Considerations:* The carpenters for both projects assumed they would use the diesel-fueled Skyjack SJ 6832RT, but shall now switch to the JLG ERT 4069 which is the closest equivalent and most commercially available scissor lift. Specifications provided below for each piece of equipment:

        i. Diesel – Skyjack SJ 6832RT:
            1. National average to rent (cost per day): $500 (includes average fuel consumption for a typical workday)
            2. Working hours available for a full tank of fuel: 16
        ii. Electric Alternative – JLG ERT 4069:
            1. National average to rent (cost per day): $495 (includes rental cost for 1 spare battery)
            2. Battery charge time (from 0% to 100%): 6 hours
            3. Battery life (from 100% to 0%): 4 hours
            4. Downtime associated with battery swap and interrupted work: 1 hour

    b. *Location considerations:* The lost productivity cost for each location will be different due to varying labor market conditions between Houston and New York City.

        i. Houston - 1550 on the Green:
            1. Labor type: Open shop per prevailing wage in Texas, journeyman

2. Estimated production person-hours by carpenters in lifts: 1000
3. Hours spent per shift: 8
4. Shifts worked per day: 1
5. Minimum number of carpenters per crew: 2 journeymen

ii. Moynihan:
1. Labor type: Union only per New York City wages, journeyman
2. Estimated production person-hours by carpenters in lifts: 2500
3. Hours per shift: 7
4. Shifts worked per day: 1
5. Minimum number of carpenters per crew: 2 journeymen

Moving forward, Skanska would like subcontractors to price their bids including electric equipment only, based on the findings of this ROM exercise. Consider two building trades that would be especially difficult to make this transition and provide mitigation strategies for each of these trades that Skanska can implement to facilitate a smoother transition for them into this sustainable building practice.

Profit Question 5 – QAQC

1. Quality assurance (QA) and quality control (QC) protocols are critical to ensure that projects are completed on time and on budget, through their strategic prevention of rework. Typical Skanska subcontracts are broken into "Exhibits" that each detail subcontractor's requirements for elements like cost, schedule, insurance, liquidated damages, quality, and more. A draft contract exhibit for quality (referred to as "Exhibit A") to be used on both 1550 on the Green and Moynihan has been provided for bidder review and is located in the Procore Documents Folder. Staying consistent with the language and requirements within the draft Exhibit A provided, write the Material Receiving Procedures section of the Exhibit A. The entire Exhibit A document **shall not** be submitted with the final deliverable; submit only the Material Receiving Procedures section which shall not exceed 500 words. The owner voiced the following concerns that must be addressed within this Exhibit A section.

    a. Who is responsible for coordinating and approving material delivery and ensuring it arrives onsite in a timely manner?
    b. How will received materials be verified for conformance to contract requirements?
    c. What will happen to non-conforming material if delivered?
    d. Who is responsible if non-conforming materials are installed without verification and testing prior to commissioning? How can the potential of an issue like this occurring be reduced?
    e. What will happen if material is installed incorrectly or if the wrong material is installed? What are potential solutions to solve these problems, and which one would you choose?

People Portion

People Question 1 - Rating System Certifications

1. WELL vs. LEED
    a. 1550 on the Green is slated to earn WELL Building Platinum, and the Moynihan Train Hall is enroute to be LEED Silver rated. Both projects have a myriad of sustainable features, many of which benefit the health of the occupants in addition to the natural environment. Provide a brief summary of the WELL rating system and identify three (3) WELL Building categories that Moynihan Train Hall can satisfy with its existing LEED features.

2. WELL vs. Fitwel
    a. Both WELL and Fitwel rating systems focus on human health. The owner is aiming for 1550 on the Green to be both WELL and Fitwel certified. Evaluate the similarities and differences of both rating systems. Explain the differences, if any.

    b. Using your resources, determine how many square feet (SF) 1550 on the Green is. What is the price of each certification, WELL and Fitwel? Is it cost effective to acquire both certifications, or just one? If one, which? Provide a cost benefit analysis.

3. Social Equity
    a. One of Fitwel's health impact categories is "Support Social Equity for Vulnerable Populations". While social equity is not commonly considered in the construction process, the owner wants to be proactive and incorporate social equity into 1550 on the Green, both during and after construction. Define social equity and suggest four (4) strategies or programs to the owner that support social equity.

People Question 2 – Constructability and Public Interface

During the conceptual stages of project coordination, the owner held several meetings with the local municipalities to discuss several concerns regarding the impact of your construction operations on the general public. The owner has conveyed to you that in order to proceed with construction, you will need to provide a series of deliverables assuring them and the local municipalities that you will consider all elements of public impact throughout the duration of your project. For this question and your responses (People #2 - 2.1 to 2.3), please select <u>one</u> project: either 1550 on the Green *or* Moynihan.

1. Permitting Application
    a. **EARLY DELIVERABLE:** The owner anticipates your schedule will require some night shift or weekend operations. In order to be eligible for off-hours construction in the area, you will be required to apply for a Noise Variance. Please fill out the appropriate form for project's municipality (Procore Documents > Project Supplemental > People) and submit this form via Procore Submittal by 2:00 PM.

2. Public Impacts
    a. The owner has raised concerns about the impact of construction operations interfacing with the public. They have asked you to provide a logistics plan to address several areas of potential impact to the public during the project phasing. Utilize a Site Overview plan sheet (Procore Documents > Drawings) to provide a visual logistics plan showing the following details:
        i. Legend

ii. Key Notes (Including) -
- Proposed delivery hours
- Proposed regular working hours and potential night shift hours
- Reference MUTCD Typical detail for at least one temporary traffic control configuration that will be utilized for deliveries. This information can be found in (Procore Documents > Project Supplemental > People). List the Chapter, Section, Figure #, and Name of Typical Application for the proposed detail.

iii. Location of safety delineation to prevent interface between the public and the work zone

iv. Location for short-term material deliveries via long bed truck
- Pedestrian detour route and signage locations to temporarily detour the public around the delivery location

v. At least four (4) Best Management Practices (BMPs) for erosion control

vi. Muster Point (Location where all employees will meet in the event of emergency)

vii. Location for construction activities
- Material storage
- Jobsite trailers/connexes

3. Noise Impacts
   a. In addition to your application for a noise permit, the owner has requested a written explanation of how your team intends to mitigate noise during night and weekend operations. They are particularly interested in any innovative solutions your team may have to limit the overall noise impacts.

      i. Identify three (3) scopes of work that you anticipate may cause excessive construction noise and briefly detail your reasoning behind the selections.

      ii. Provide at least two (2) methods (generally, not per scope) that will be implemented on your project to reduce noise emitted during the operations identified in the previous question. Briefly describe how these methods will benefit the surrounding community and, if applicable, the surrounding environment. Explain how your team will measure or analyze the mitigation efforts to determine their levels of success.

People Question 3 – Usable Technology

Technology is becoming more prominent in the built environment, from digital art installations to automated processes that track paperwork to advanced equipment that keep workers safe. Building materials are also making leaps into the technological world. Walkable energy systems are making their way into the news, showcasing the positive impact of energy generation via footsteps. Piezoelectric tiles are an example of such a system, converting mechanical energy to electrical energy.

1. Locate the floor plans for Moynihan in the Drawings tab in Procore.
2. Perform a take-off of the public interior walkable space for the concourse level and first level of Moynihan.
3. Perform a cost analysis of using piezoelectric tiles in the walkable spaces of the train station. Make the following assumptions:
   a. Piezoelectric tile cost: $100 / sqft
   b. Piezoelectric energy generation: 3 joules per step

   Determine what types of specified flooring materials could be replaced with piezoelectric tiles. Does it make sense to use piezoelectric tiles in lieu of the specified materials? If so,

explain why and in which locations. What could the kinetic energy system power? What benefits would the passengers that travel through the train station experience?

Another technological advancement that has been making its way into the built environment is transparent solar panels. This invention has taken a renewable energy system that has proven useful and put a twist on it.

4. There are two types of transparent solar panels – partial and full. Partially transparent solar panels provide 60% transparency, while fully transparent panels provide 100% transparency. Additional stats for each type are listed below.
    a. Partially transparent solar panel cost: $80 / sqm
    b. Partially transparent solar panel energy efficiency: 7.2%
    c. Fully transparent solar panel cost: $400 / sqm
    d. Fully transparent solar panel energy efficiency: 5%

    1550 on the Green is 28 stories high with a glass curtain wall that faces east. Determine whether partially or fully transparent solar panels, or a combination of both, would be the best use of this material for the curtain wall. If a combination of both, explain where each type would be most impactful (tower, level, placement, etc.)

5. (2 points) Locate the roof plans for 1550 on the Green in Procore. Using your answer above, compare the use of a partially transparent solar panel curtainwall façade to traditional solar panels installed on the roof. Keep in mind the other sustainable aspects of the roof that have already been implemented in the original design. Which type of solar panel system is most practical in terms of cost, efficiency, installation, and maintenance? What benefits would the users of the office spaces see with the better of the two systems?

6. **EARLY DELIVERABLE** – submit via Procore by 11am
    Moynihan has several concession spaces (areas the food/beverage and retail vendors occupy) built out by multiple different contractors. The general contractor is responsible for building out the core and shell, while the tenant contractor is responsible for completing the interior build out. Your company has been awarded the contract to design the interior space of one of the restaurant/bar concessions. Using the Moynihan floor plans as a guide, put together your design using the Food & Beverage space EC1-125. Note your design should include a floor plan and at least one elevation view. Please label each aspect of your design and include both plan view and elevation on one page (this will not count toward your overall page count). Your design should include the following at a minimum:
        - Kitchen Space
        - Bar Space
        - Dining Space
        - Framing (if applicable)
        - Lighting
        - Fire Sprinklers
        - Fire Alarm
        - Signage
        - Finishes

BREAKOUT SESSION at 1pm– Send one representative from your team to the conference room at 1pm. Please bring a device with access to the internet.

Planet Portion

Planet Question 1 – Horizontal vs. Vertical Construction

1. Compare and contrast the impacts of vertical construction (1550 On the Green) and horizontal construction (Moynihan). Create a chart and focus on the following topics:

- Resource / Material Usage
- Development / Land Use
- Heat Island Effect
- Energy
- Sewage Management
- Safety
- Cost of Construction
- Construction Schedule Impacts
- Resiliency
- *Topic of your choice*

Topic	Vertical Construction	Horizontal Construction
Resource / Material Usage		
Development / Land Use		
Heat Island Effect		
Energy		
Sewage Management		
Safety		
Cost of Construction		
Construction Schedule		
Resiliency		
Topic of your choice		

2. In your team's opinion, which type of construction has the least impact on the environment? Provide a paragraph explaining your reasoning.

Planet Question 2 – Green Spaces

You are the lead landscape architect for the 1550 on the Green project in Houston, Texas. The Owner is looking to enhance the building's sustainability qualities by adding another green space on another level. Looking at the overall plans, you identify the exterior patio on Level 09 as being a good candidate for another green space. Your task is to create comprehensive plans for the new green space and provide design summaries to the client on your design. Please see the following questions:

1. Green Space Plans: Using the "2024 SK ASC – PLANET – QUESTION 2" PDF in Procore Documents, develop and propose the following drawing plans for the new Level 09 green space. Incorporate colors as necessary and provide legends:
    a. Materials & layout – Develop the layout of the green space, considering placement of any planters, vegetation, seating areas, walking paths, etc. Make sure to identify materials and create a legend.
    b. Planting – Develop your planting plan based upon your layout. Create a legend to indicate planting types and quantities. Identify and choose plants native to Texas with sustainability in mind.

c. Drainage & Irrigation – Develop a drainage and irrigation plan considering the needs of the specific plants and overall area of greenspace. Detail the irrigation system design, considering efficiency and water conservation.

Use the 1550 on the Green drawings under drawing set “PLANET QUESTION – QUESTION #2 REFERENCE DRAWINGS” under the Drawings tool in Procore as reference while developing your plans.

2. Plant selection and souring summary: Provide a detailed summary of the plants you have chosen for the green space expansion and explain why each plant was selected. Include information about their adaptability to the local climate, water consumption, and any additional benefits they bring to the environment and green space. Additionally, describe where you plan to source these plants, emphasizing sustainable and ethical practices in your selection.

3. Water Reuse for Green Space Irrigation: The owner is keen on implementing water reuse for irrigating the green spaces. Using your drainage and irrigation plan as a reference point, develop a comprehensive written plan on how you would achieve this goal while maintaining sustainability. Please make sure to include the following items in your plan:

    a. Outline the sources of water for reuse. and how it would integrate with the building and your plan, as well as identify any systems you would need in place to achieve this.
    b. Specify the water treatment processes involved in making reused water suitable for irrigation.
    c. Detail the irrigation system design, considering efficiency, water conservation, and automation.
    d. Highlight any smart irrigation, innovative technologies or practices you would incorporate to maximize water reuse in the green spaces as well as maximizing water irrigation efficiency.
    e. Ensure your plan addresses the owner's commitment to sustainability and considers long-term maintenance and operational aspects.

Planet Question #3 – Resiliency, Natural Disasters in Houston vs. New York

Both projects (1550 on the Green / Moynihan) lie in similar climates despite being nearly 1500 miles apart. Regardless of this, each building had to have a set of unique characteristics employed by the design team to make them both mesh architecturally with their cityscape, but also provide resiliency to the climate they reside in.

1. Compare and Contrast:
    a. Create a Venn Diagram that compares the climates of New York and Houston. Take special consideration to make each point unique to the city. Provide a minimum of 4 unique contrasts for each city and 5 similarities.

2. Exterior Makeup:
    a. Using the exterior details “1/A0.100” on Procore for 1550 on the Green mockup list out the materials that were selected for the exterior façade for this project.

b. Using the specifications for sustainable design requirements – LEEDv4, select one material for building from your list above and provide LEED product data from a manufacturer for that material. Specify what parts of the specifications are met and how this product meets the specifications.

c. Review each set of drawings carefully, taking note of the specific materials and design considerations made. In a few sentences, what considerations do you think the designers considered when selecting the materials for the façade? Do you see any opportunity to find a more sustainable for unique materials to utilize?

3. Extreme Weather Impacts:
    a. What extreme weather impacts each of our buildings? Create two lists (one for each project in T-chart format) to display the information.

4. Risk Assessment:
    a. Using the inspection tab on the problem statement Procore, complete a "Natural Disaster Risk Assessment" using one of the items from the list you created above in question 3. Extreme Weather Impacts. Risk Assessment must include the following:
        - Risk:
        - Areas of Building Impacted:
        - Worst Case Scenario:
        - Mitigation / Proposed Solutions:

Planet Question 4 – Green Roof & Storm Water Runoff

1. With the rise in popularity of green roofs, the owner is interested in increasing the square footage of green roof space on the 1550 On the Green project. Please address the following questions from the Owner:
    a. In a paragraph, describe the negative effects of stormwater runoff and the impact on the surrounding environment. Explain the pros and cons of a standard roofing system vs. green roofs.
    b. Using the provided roofing plans (A3.031) and sections (A5.003) for the 1550 On the Green project, complete the following Area takeoffs **(do not include terrace spaces)**:
        1. Green roof space that is already included in the design.
        2. Roof space that is not designed as a green roof.
    c. Estimate the annual rainfall amounts (in gallons) at the project location, reference the National Weather Service website.
    d. Calculate the amount of storm water runoff (in gallons) that would occur with a standard roofing system.
    e. Reference the planting schedule on landscaping sheet, L6.029, and the following link for the green roof run-off co-efficient chart: https://livingroofs.org/storm-water-run-off/ determine if the green roof system is intensive or extensive.
    f. Using the water retention percentage for the type of green roof you determine, calculate the amount of storm water runoff that would occur in a year with the green roof system currently designed.