



Student
Chapters

NAHB Student Competition
Held in conjunction with the 2024 NAHB International Builders' Show
Problem Description Associate Degree Programs

Welcome to the 2024 NAHB Student Competition. Developed by the NAHB Student Chapters Advisory Board, the NAHB Student Competition is the highlight of the International Builders' Show (IBS) for student members. This year's problem will make for an exciting and challenging 2024 NAHB Student Competition.

The information that you will use to develop your project and presentation is listed below and can be accessed through the NAHB Student Chapters web page [Associate Problem](#). The Rules and Guidelines document includes the sample grading summary that the judges will use to score your project and presentation. *Please read all documents thoroughly.* If you have problems viewing any of the provided items, **please contact StudentChapters@nahb.org**:

- Rules and Guidelines
- Problem Description (included in this document)
- Plans
- Specifications for the Cabin B, Finish Package B, at Velvaere
- Estimate Template
- [Sponsor website](#)

Read and follow the instructions carefully and fulfill all the required elements of the exercise. Going beyond the required elements of the exercise, while it may show initiative, may hurt the overall team score if the basic exercise is not executed well. After registering, teams will have copies of the additional drawings sent to them.

I. Problem

The project is in Park City, Utah, in Velvaere, a Magleby Development community. Your team is an outside construction management contractor making a proposal to Magleby Development to build the assigned plan "Cabin B" on a pre-graded lot located at 10226 N LIV PL (lot C-07) within Velvaere. You must develop a partial set of drawings and details, a detailed cost estimate, a complete construction schedule, and a construction management plan for the two-story floor plan (basement + main level) provided.

II. Design Criteria

The plan must allow for all items in the Specifications for the Cabin B at Velvaere, a Magleby Development community. Easements and setbacks are shown on the plot plan. The building has a basement and foundation is a 4" slab on grade with a typical 12" deep by 42" wide footing. utilities are stubbed 5' into the lot location for connection. Window schedule is provided below

WINDOW SCHEDULE											WINDOWS ARE TYPICAL ON SCHEDULE. FOR SPECIFIC DETAIL REFERENCES, HEIGHTS, NOTES, ETC. SEE WINDOW GROUPS, ELEVATIONS AND DETAILS 4 & 5(A&B) FOR APPLICABLE DETAIL REFERENCES.	
MARK	UNIT SIZE		HEAD HEIGHT	OPERATION	MATERIAL	FINISH	DETAIL			GLAZING		COMMENTS
	WIDTH	HEIGHT					HEAD	JAMB	SILL	THICKNESS	TYPE	
W003	3'-0"	2'-6"	10'-0"	FIXED	ALUMINUM	PAINT	21/A603	16/A603	22/A603	PER MANUFACTURER	CARDINAL 366 LOWe	TEMPERED
W004	9'-0"	9'-0"	8'-11"	DOOR SLIDER DOUBLE	ALUMINUM	PAINT	24/A504	22/A602	14/A602	PER MANUFACTURER	CARDINAL 366 LOWe	TEMPERED
W005	6'-0"	9'-0"	8'-11"	DOOR SLIDER DOUBLE	ALUMINUM	PAINT	11/A603	22/A602	14/A602	PER MANUFACTURER	CARDINAL 366 LOWe	TEMPERED
W006	9'-0"	9'-0"	8'-11"	DOOR SLIDER DOUBLE	ALUMINUM	PAINT	11/A603	22/A602	14/A602	PER MANUFACTURER	CARDINAL 366 LOWe	TEMPERED
W100	4'-6"	2'-6"	10'-0"	FIXED	ALUMINUM	PAINT	10/A603	16/A603	22/A603	PER MANUFACTURER	CARDINAL 366 LOWe	
W101	3'-0"	5'-0"	8'-0"	FIXED	ALUMINUM	PAINT	28/A603	16/A603	22/A603	PER MANUFACTURER	CARDINAL 366 LOWe	
W102	3'-0"	2'-0"	11'-0"	FIXED	ALUMINUM	PAINT	10/A603	16/A603	28/A603	PER MANUFACTURER	CARDINAL 366 LOWe	
W103	4'-0"	2'-0"	11'-0"	FIXED	ALUMINUM	PAINT	10/A603	16/A603	28/A603	PER MANUFACTURER	CARDINAL 366 LOWe	
W104	11'-10"	7'-11"	7'-11"	DOOR SLIDER TRIPLE	ALUMINUM	PAINT	28/A603	15/A603	24/A602	PER MANUFACTURER	CARDINAL 366 LOWe	TEMPERED
W105	4'-0"	6'-0"	9'-0"	CORNER WINDOW	ALUMINUM	PAINT	10/A603	17/A603	23/A603	PER MANUFACTURER	CARDINAL 366 LOWe	
W106	5'-0"	2'-0"	9'-0"	FIXED	ALUMINUM	PAINT	10/A603	16/A603	22/A603	PER MANUFACTURER	CARDINAL 366 LOWe	
W107	3'-0"	5'-0"	15'-0"	FIXED	ALUMINUM	PAINT	27/A603	16/A603	27/A603	PER MANUFACTURER	CARDINAL 366 LOWe	
W112	7'-10"	8'-0"	7'-11"	DOOR SLIDER DOUBLE	ALUMINUM	PAINT	28/A603	28/A602	24/A602	PER MANUFACTURER	CARDINAL 366 LOWe	TEMPERED

III. Problem Location

The project address is 10226 N LIV PL, Park City, Utah (lot C-07). The lot is graded, and the improvements are complete (streets, curb and gutter, and utilities to the lot).

IV. Applicable Building Codes

The plans shall be prepared to meet applicable building codes for Wasatch County and the State of Utah.

V. Specifications and Finish Schedules (See Specifications provided). Use Finish Package B for the Cabin B plan.

VI. Deliverables

A. Drawings

Each team must produce drawings and sketches to assist in developing the estimate, documenting the quantities, and showcasing your knowledge of the constructability of the home. **Your team should not change the shape or room configuration of the floorplan. Points will be deducted if these are altered.**

Drawings shall include the following:

- Site Plan showing location of the home and utilities
- Foundation Plan(s) and Details
 - Replicate the Footing and Foundation Plan found on S201
 - Draw a Footing and Foundation Wall Detail for a "CW2" wall with a "FC33"

- Footing with a slab on grade. Example detail provided. Your detail should be dimensioned correctly as indicated by the wall and footing callout.
- Exterior Wall Details showing: (1) Wood Frame + Stone Masonry, (2) Wood Frame + Wood Siding, (3) Wood Frame + Metal Paneling
 - Wall sections should include the use of a continuous exterior insulation product (e.g. Rockwool)
 - Wood Frame + Stone Masonry wall section should include a window intersection
 - Provide R Values of each material for the Wood Frame + Stone Masonry wall section
 - Framing to Foundation Detail
 - Provide a Foundation Wall to I-Joist Floor Detail. Sample provided.
 - Roof Edge detail
 - Flashing window detail
 - Provide a typical window flashing detail. Example provided.
 - For more instruction see: [Window Flashing Best Practices Installation - Construction Instruction](#)
 - Other drawings to assist in developing and documenting the estimate, as required
 - Drawings must be well organized, neat and legible. They may be drawn using a CAD program, other drawing software or by hand. Hand-drawn sketches should be created using a straight-edge and appropriate tools to ensure lines are perpendicular. Sketches should be drawn to scale with the scale indicated on the drawing.
 - Consider 1"-1'-0" a minimum scale
 - Do not dimension in increments less than 1/4" (except diagonal or squaring dimensions)

B. Material and Labor Estimate

Each team must complete a detailed estimate of the required material and labor for their plan.

- The estimate must be market-based, i.e., adjusted to the market area.
- All estimates should reflect the Finish Package B design option.
- The estimate will be judged on clarity, accuracy, and overall conclusion. Provide sufficient detail so that judges can check your calculations. List assumptions in the notes section of the estimate template.
- The estimate must be completed using sheets from the file *2024 NAHB Estimating Template.xlsx*. This is just a template and teams are expected to edit it as they see fit. Teams enter the takeoff quantity, unit cost, and amount total for each item based on the unit of measure provided. Format the sheets with page breaks or blank rows before printing to provide a well-organized copy for the judges. All columns must print on one sheet. Each sheet MUST include the team/school name and page number.
- Format the sheets with page breaks or blank rows before printing to provide a well-organized copy for the judges. All columns must print on one sheet. Each sheet MUST include the team/school name and page number.
- Each team must justify that the quantities and pricing are reasonable for the problem.

Document the sources used for this justification

C. Construction Schedule

Each team must produce a complete construction time schedule for the project showing a logical construction sequence (i.e., footings before trusses).

- The schedule shall include activity durations and dependencies.
- The schedule will be judged on clarity in the construction process and understanding of lead times. Teams should focus primarily on process (dependencies) and less on durations.
- The schedule should include the procurement of the following long lead time items: Windows and Doors, Cabinets, HVAC, Fireplaces, Electrical Fixtures, Plumbing Trims, Flooring, and Countertops.
- Each team must justify that the schedule is reasonable for the solution to the problem. Justification sources must also be documented.
- Plan for construction to begin 4/1/2024

D. Construction Management Plan

Each team will create a construction management plan that showcases your teams' approach for managing the project. This plan includes but is not limited to:

- Identify the local HBA and other local resources to develop your criteria for trade partner selection.
- Description of materials procurement and management.
- Describe how building inspections will be handled along with a list of building inspections required.
- SWPPP best management practices.
- Site logistics plan
- Implementation of sustainable features
- Develop a safety plan

E. Presentation

February 26 - February 27, 2024: The 2024 competition presentations resume to an in-person format at IBS. **There will not be a virtual presentation option.** The schedule of presentations will consider team preferences that were selected through your Competition Entry application at the time of team registration. Every effort will be made to schedule presentations according to the stated preference, but NAHB Student Chapters cannot guarantee a particular time slot. Teams will be notified of the preliminary schedule after the competition entry deadline.

Each presentation should include a description and explanation of their drawings, estimate and schedule. The presentation will be made to a panel of industry professionals, including the project sponsor, Shea Homes. The format will be a 10-minute presentation followed by questions.

The following elements shall be included in the presentation to the judges:

- Introduction of your team members and the school's name

- Overview of the drawing details
- Overview of the cost estimate
- Overview of the construction management plan
- Overview of the schedule and possible issues or problems that may come up during this project

It is highly recommended that all team members participate in the presentation and answer the judge's questions.