Timber-Strong Design Build Competition Colton Davis, Allison Harris, Giselle Mata, Jesa'Lyn Waggoner Department of Civil Engineering, Construction Management and Environmental Engineering

PROJECT DESCRIPTION

Design-Build Project

- •Design, Plan, and Construct
- •Two-story wood light-framed structure
- •Designed for durability, sustainability, and aesthetic appeal



DESIGN

•The roof imitates the San Francisco Peaks in Flagstaff, Arizona.

Des	ign 1 D	esign 2	Design 3		1	
	Diaphragm Fa	У				
	Type Factor of S		afety			
	Roof	2.05				
	Floor	2.33		•		
	Average	2.12				
	Shear Wall Factor of Safety		y		1	
	Туре	Factor of S	afety			
	First Story	1.91				
	Second Story	1.57				
	Average	1.77				

COST TO IMPLEMENT

Description		Purchased		Donated		Total	
Wall Framing (1st Floor)	\$	162.69	\$	-	\$	162.69	
Wall Framing (2nd Floor)	\$	195.67	\$	-	\$	195.67	
Floor System	\$	137.94	\$	-	\$	137.94	
Roof System	\$	193.24	\$	-	\$	193.24	
Connectors and Fasteners	\$	_	\$	306.58	\$	306.58	
Aesthetic Materials	\$	149.90	\$	-	\$	149.90	
Total Cost of Materials					\$	1,146.02	

TRIPLE BOTTOM LINE: IMPACTS

Environmental Impact:

Using wood stores 304 metric tons of CO₂—equal to removing 64 cars from the road for a year. Locally sourced and recycled wood lowers embodied carbon and waste, supporting sustainable forestry.

Social Impact:

Wood's natural look creates a warm, inviting space. Local sourcing builds community ties and promotes sustainability.

Economic Impact:

Wood is affordable due to lower material and construction costs. While maintenance may be higher, its low embodied energy and upfront savings make it cost-effective.

MODELING

2D Modeling: Full set of construction plans and supporting calculations **3D Modeling**: Building Information Modeling (BIM) in REVIT















D2: STRAPPING DETAIL - EAST FACE

CONSTRUCTION





COMPETITION

2025 ASCE Timber-Strong Design Build competition during the Intermountain Southwest Student Symposium hosted by the University of Arizona: 1st Place Overall in ASCE 2025 Design Build Competition 1st Place Overall in BIM Modeling Our team became the 6th university to achieve a dual victory in the history of the competition across all regions of the nation, joining UCLA, LeTourneau University, University of Alabama, FAMU-FSU, and Colorado School of Mines.

Criteria	Re
	0
0.5 - 1 inch	ind
Less than 90 minutes	mir
creativity and	
aesthetically pleasing	
structure	
structural analysis,	
completeness, and	
correctness	
	Criteria 0.5 - 1 inch Less than 90 minutes creativity and aesthetically pleasing structure structure

Sponsors









of Engineering















