"Net-Zero Shed"

Construction Team - Shed #3

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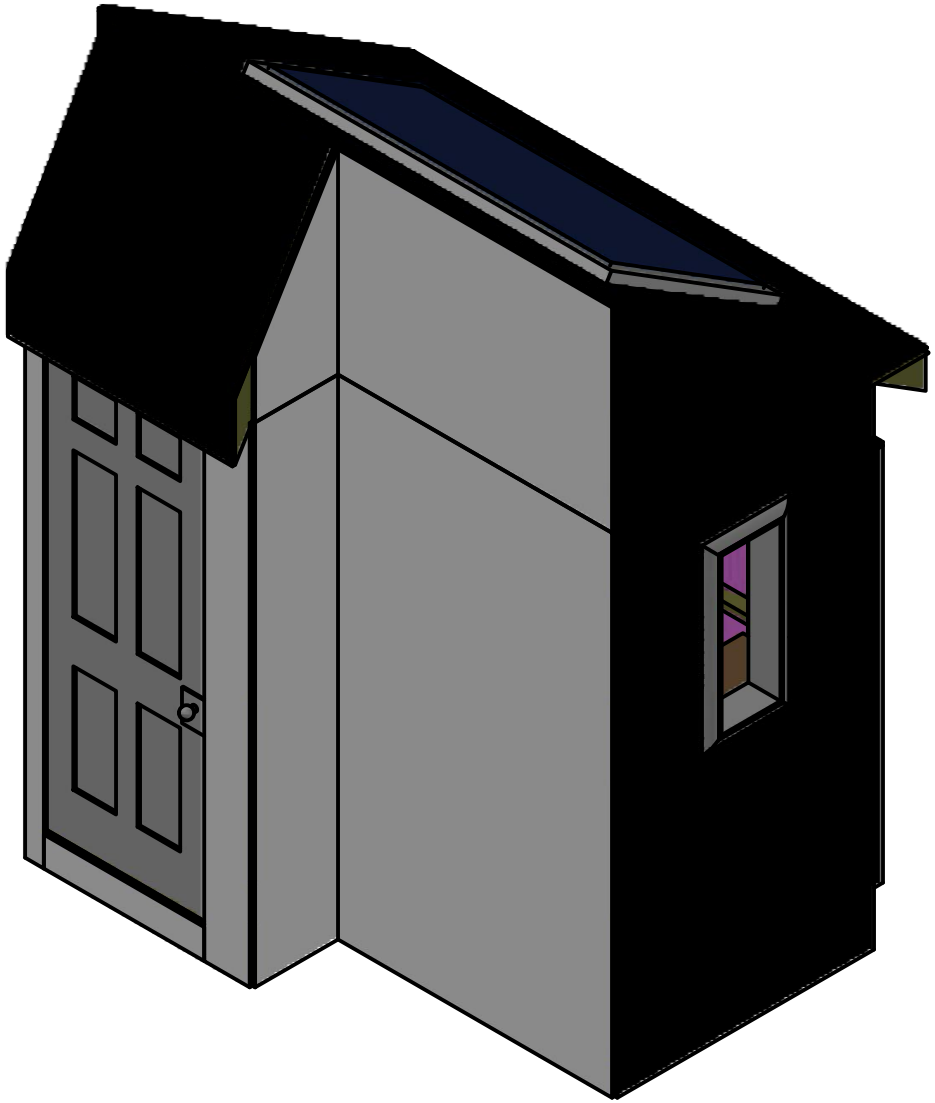


Background Project Information

This shed was designed for GNG1103 Engineering Design in the Winter 2017 session (January - April). It was assembled in the months of February - March and displayed at Design Day on March 29, 2017. Our team won 1st place in the shed category (competing against two other sheds) and 2nd place in the overall competition.

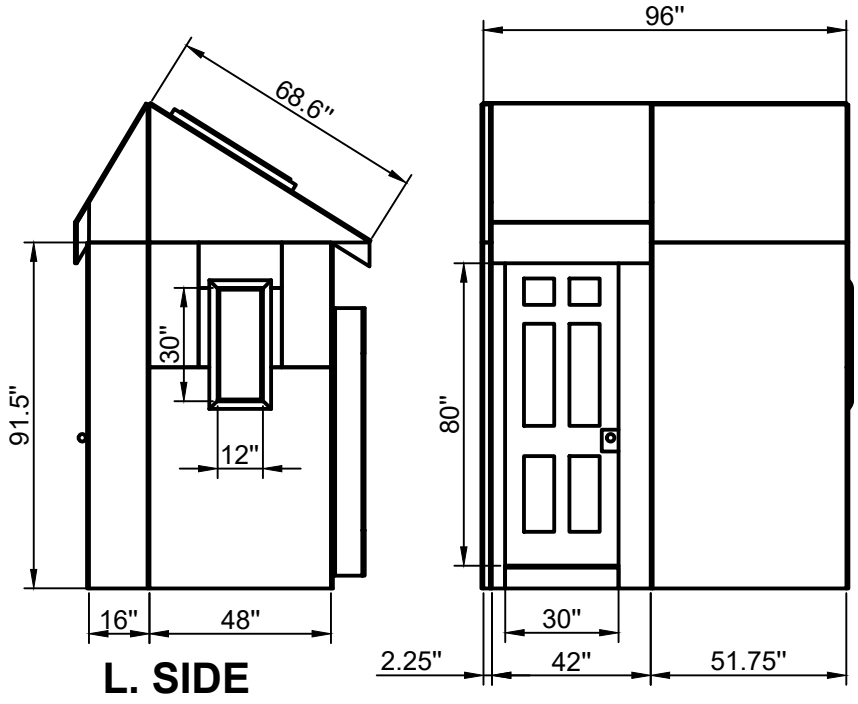
Our team was commissioned by Dr. Muslim Majeed of the uOttawa Civil Engineering structures laboratory to design and build a "net-zero" (carbon neutral) shed - a less ambitious version of a net-zero house. This shed was to be constructed using recycled materials, to be self-sustaining (solar collectors for heat, water heat, and electricity), and to be energy-efficient with automated light sensors, motion sensors, temperature sensors, etc.Our lab section of 14 people was split into three team; solar, automation, and construction. Our group, construction, was responsible for building the shed and then installing systems developed by the other teams.

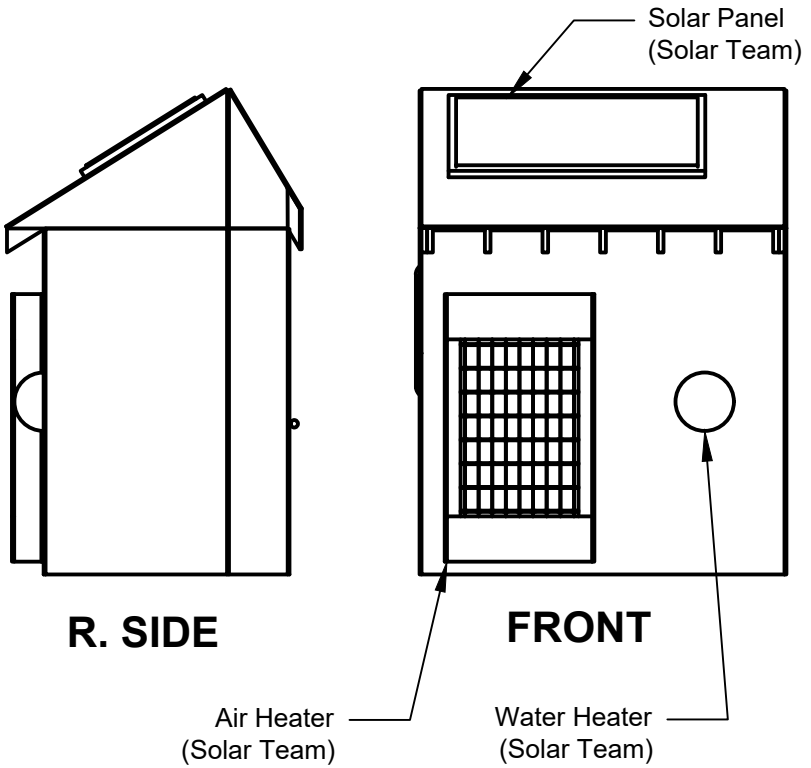
Almost all the wood used in this project was recycled from other projects found in the structures laboratory.

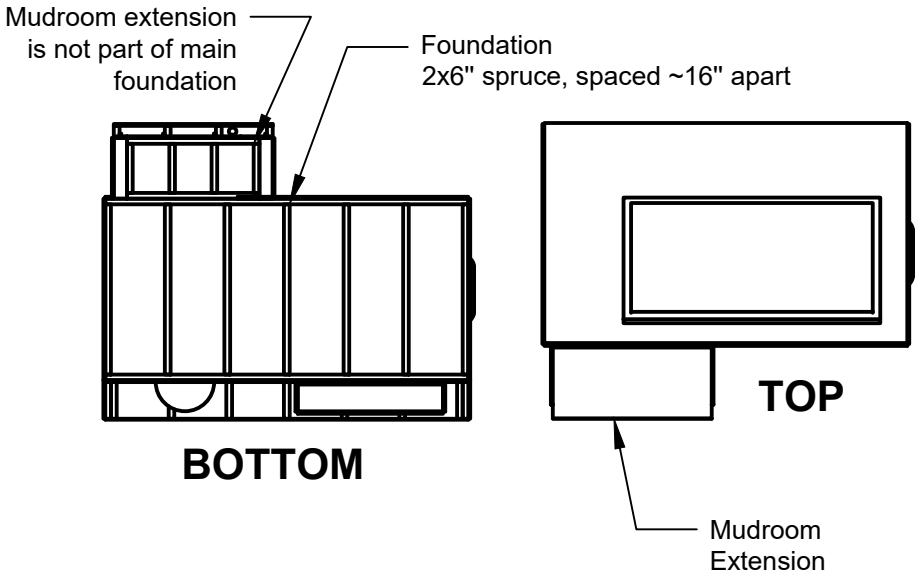
Technical Specifications

The shed's main portion was built to an 8'x4' base, and the door extension was built to attach to this; thus, it is not part of the main foundation. The framing in this CAD file is completely accurate to the basis, with 2"x4" spruce studs placed ~16" apart.The foundation and roof trusses are constructed out of 2"x6" inch spruce. The roof was shingled, and siding was installed on the door side (though it could easily have been installed on all sides if money allowed this). The remaining walls were painted black.

Our team is unique for having the door extension - the idea is that one would step into the extension, close the door behind them, and then step through a thermal curtain inside. This would minimize heat loss through the door.





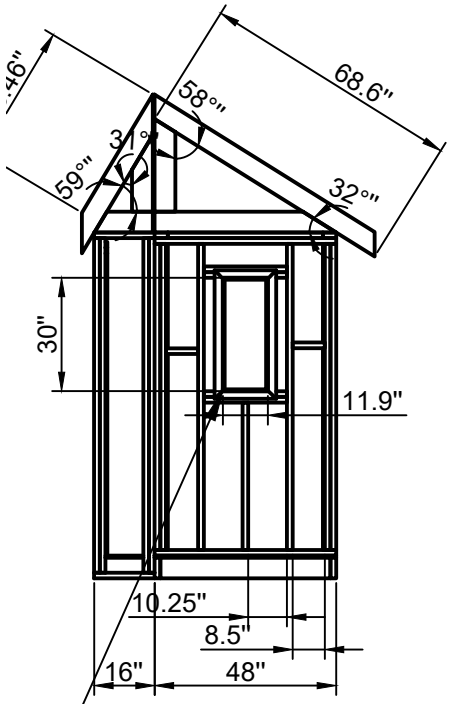


EXTERIOR ORTHOGRAPHIC PROJECTIONS

The exterior of the shed is covered in chipboard, excepting the BACK wall and a portion of the mudroom extension which is viewable on the LEFT SIDE. These are covered in plastic siding.

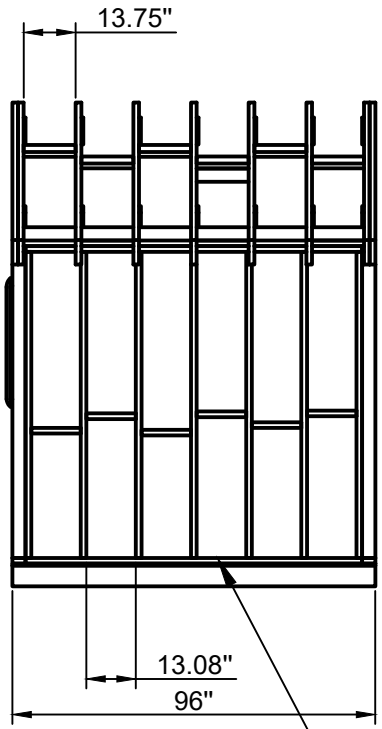
The entire roof is shingled, including both sides of the slant.

Rough approximations are given of the solar collectors attached to the outside of the shed. These are NOT scaled diagrams and are provided only for reference locations - please see solar team data for proper dimensions. Their air heater functions through use of aluminum cans and a small fan mounted on the inside, whereas the water heater is a glass bowl with a coil of copper piping through which water is pumped.



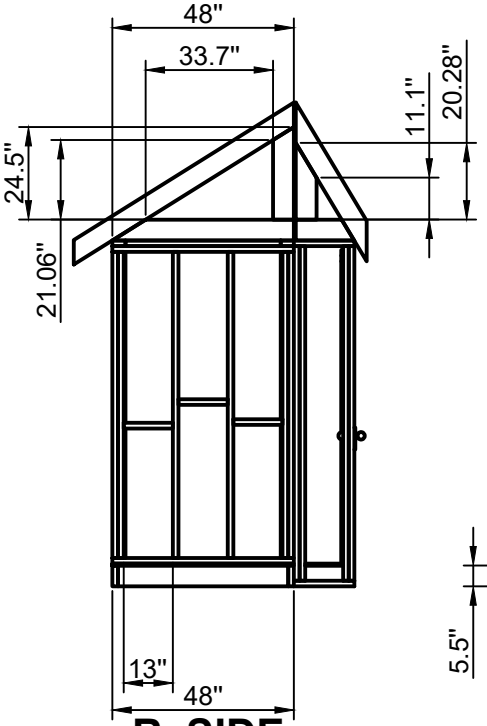
L. SIDE

Window frame was framed for a larger window and cut to fit a 30x12" afterwards

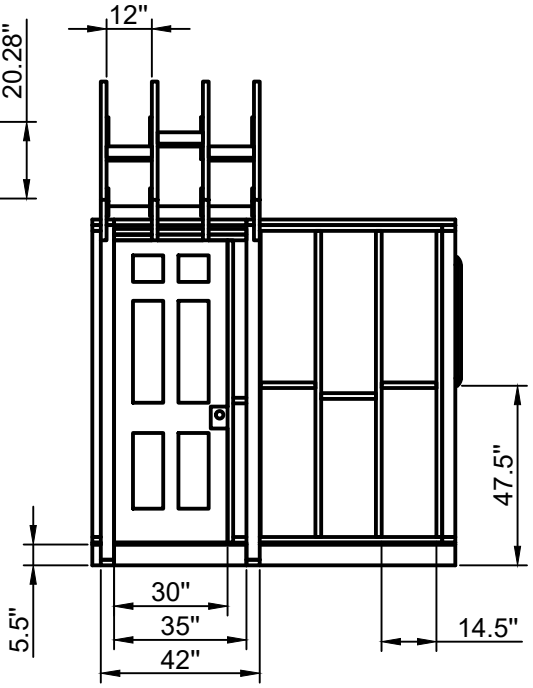


BACK

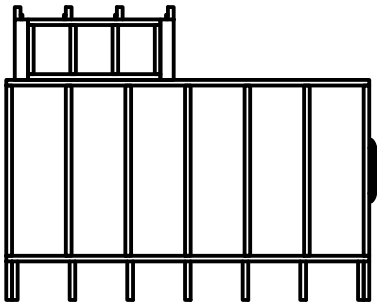
Studs are ~16" apart



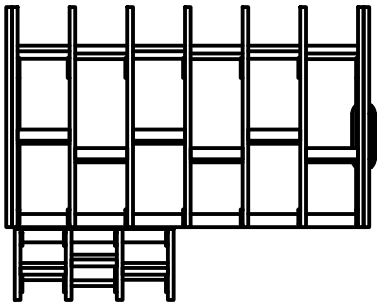
R. SIDE



FRONT



BOTTOM



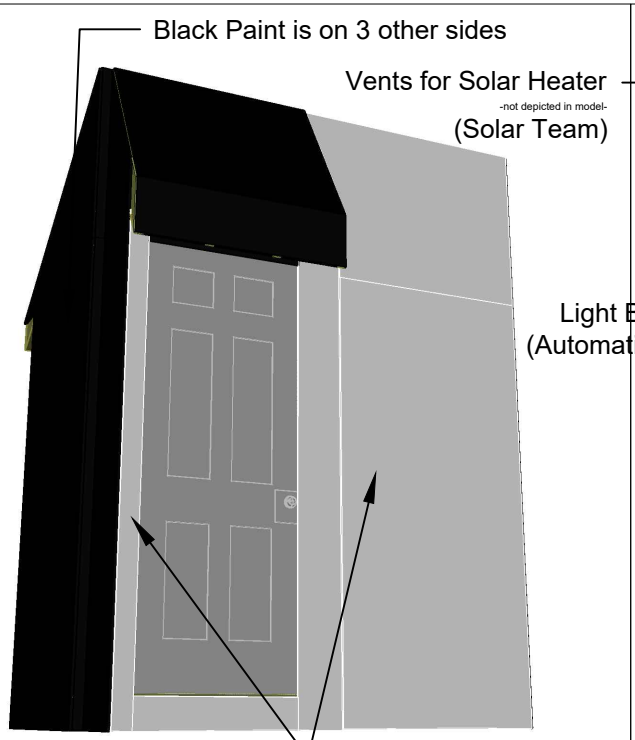
TOP

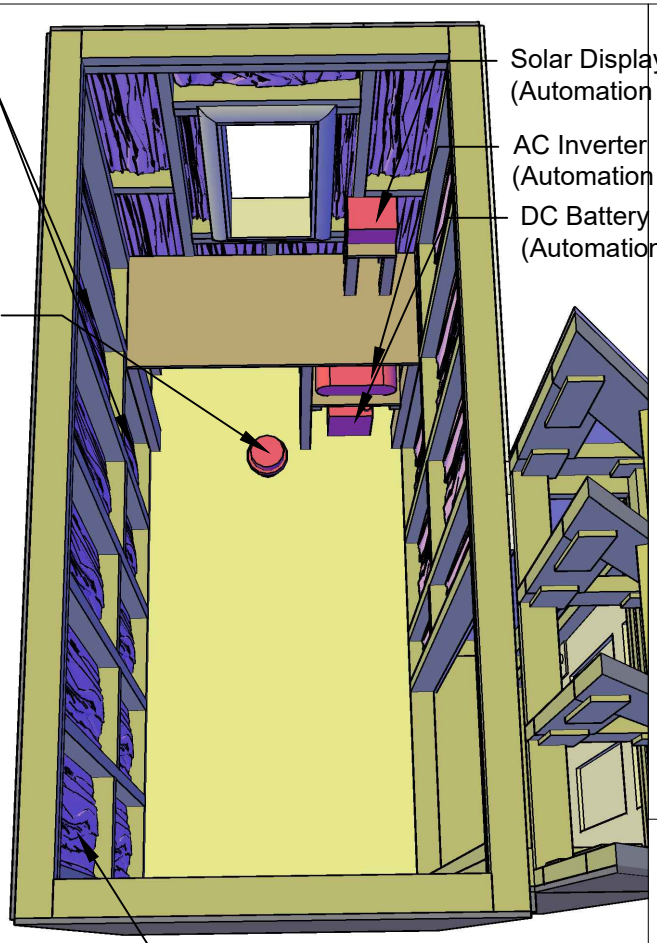
FRAME ORTHOGRAPHIC PROJECTION

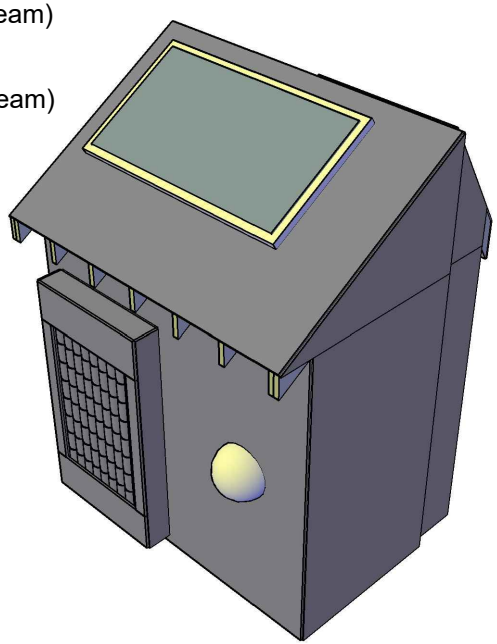
These views are provided to show the frame of the shed from each side. For convenience, opposing walls and objects behind the foreground frame are removed.

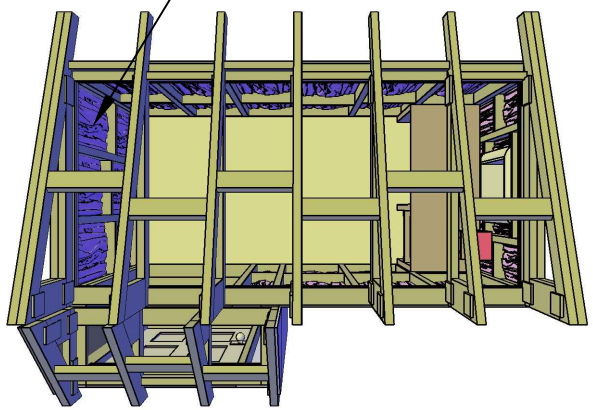
All studs are approximately 16" apart and are double studded at each end. Trusses follow the same rule.

Bracing is approximately halfway up the stud.









PERSPECTIVE RENDERS

These views are rendered in perspective (taking depth into account).

The open-roof view shows the table/desk built inside the shed. Red objects are automation systems (automation team).