# The Greenhouse Update

Construction Group 3

# Meet the team

## Construction 3

Electrical engineering group


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# Let's Jump Into It...

# Client Needs + Problem Statement

## Needs (Importance)

- **Run through at least 3 seasons (5)**
- **Self-sustainable (5)**
- **Safe from wild animals (3)**
- **Low cost/ affordable (3)**
- **Easy to maintain and use (4)**
- **Modular {max 6x8} (4)**

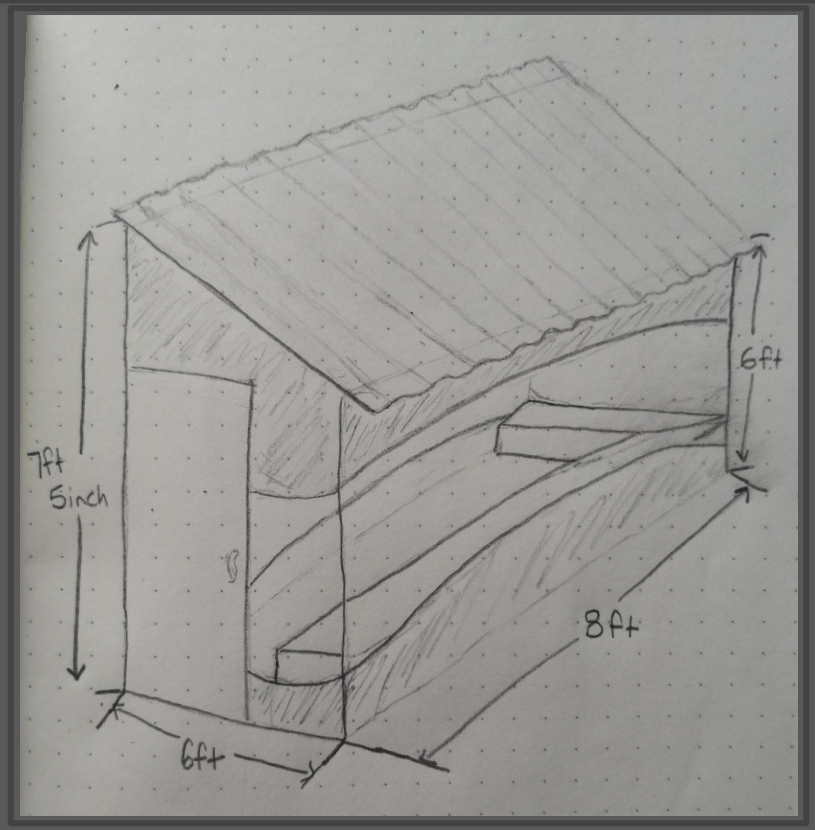
## Problem Statement

The community of the Algonquins of Barriere Lake are in need of a ***safe***, ***self-sustaining*** and ***affordable*** greenhouse that can provide produce for an extended amount of time, ***throughout the year***.

# Concept Design

## Features

- 6x8 ft Base
- 324 cu ft
- Bench storage
- Optimized sun access
- High siding for animal proofing
- Water and snow easily slides off roof



# Bill Of Materials

| | A | B | C | D |
|---|---|---|---|---|
| 1 | **Material** | **Amount** | **size** | **Cost** |
| 2 | **Wood** | | | |
| 3 | | 7 | 2x4x96 | $15.12 |
| 4 | | 45 | 2x3x96 | $108.90 |
| 5 | Total | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | **Plywood** | 5 | 1/2x48x96 | $87.75 |
| 9 | | | | |
| 10 | **Corrigated plastic sheets** | 4 | 16x96 | $63.92 |
| 11 | | | | |
| 12 | **vinyl Siding** | 25.5 | 8.5x1 | $71.66 |
| 13 | | | | |
| 14 | **Hurrican Clips** | 10 | | $11.00 |
| 15 | | | | |
| 16 | **Hinges** | 3 | bench | $9.66 |
| 17 | | 2 | door | $4.11 |

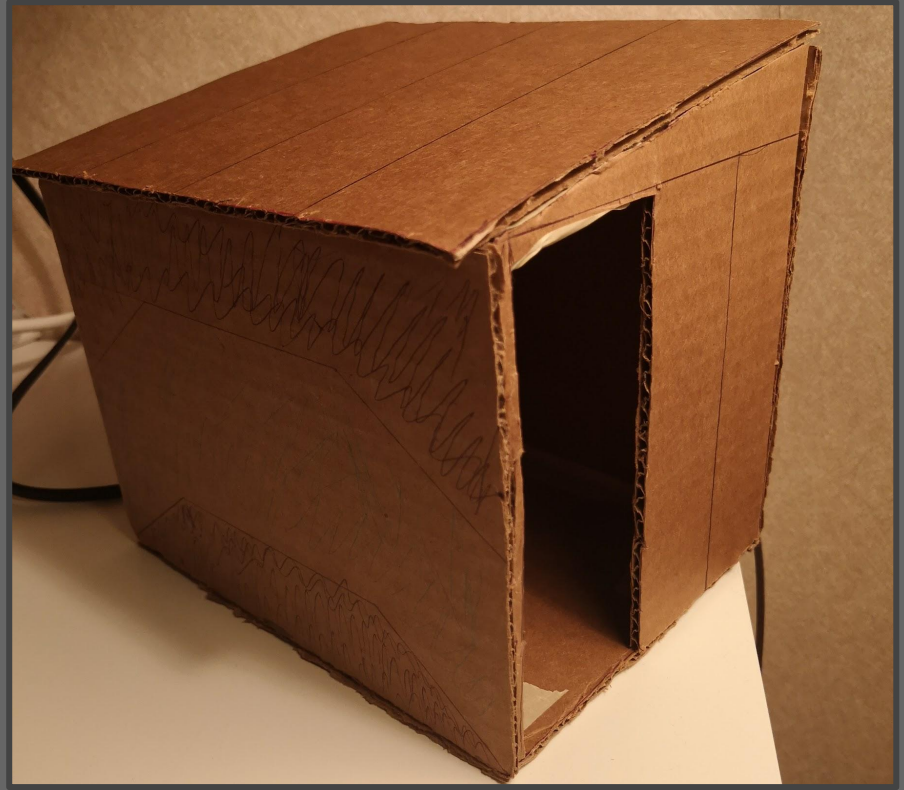
# The Final Cost

# $372.12

# Prototype I

## Features

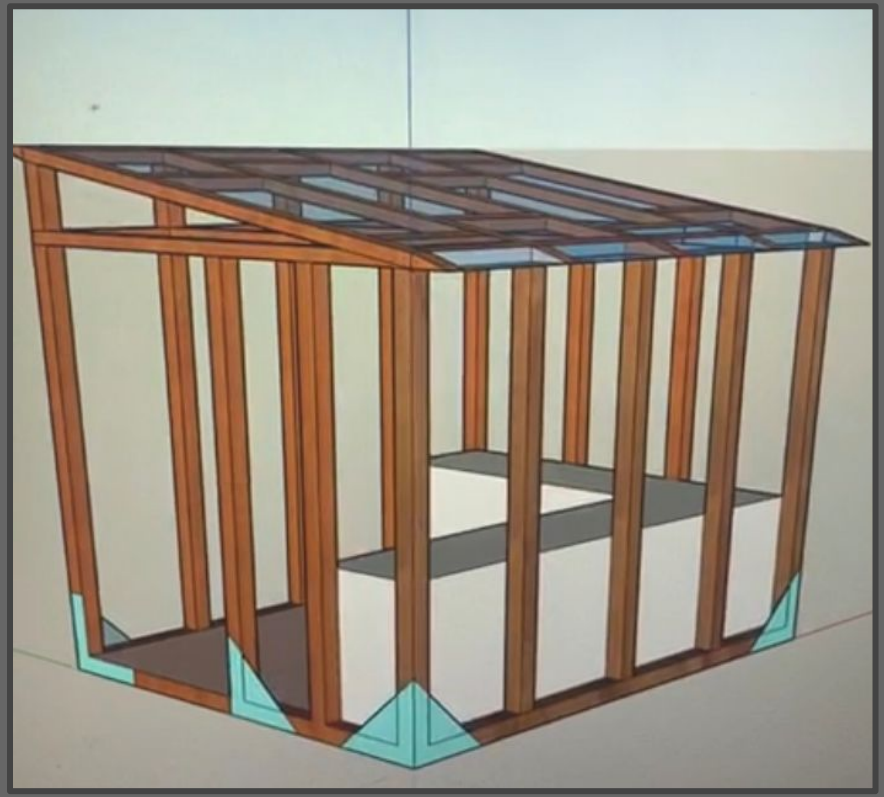
- Scale 1 ft : 1 inch
- 324 cu inches
- Features our siding design
- Mainly a visual aid for first design



# Prototype II

## Features

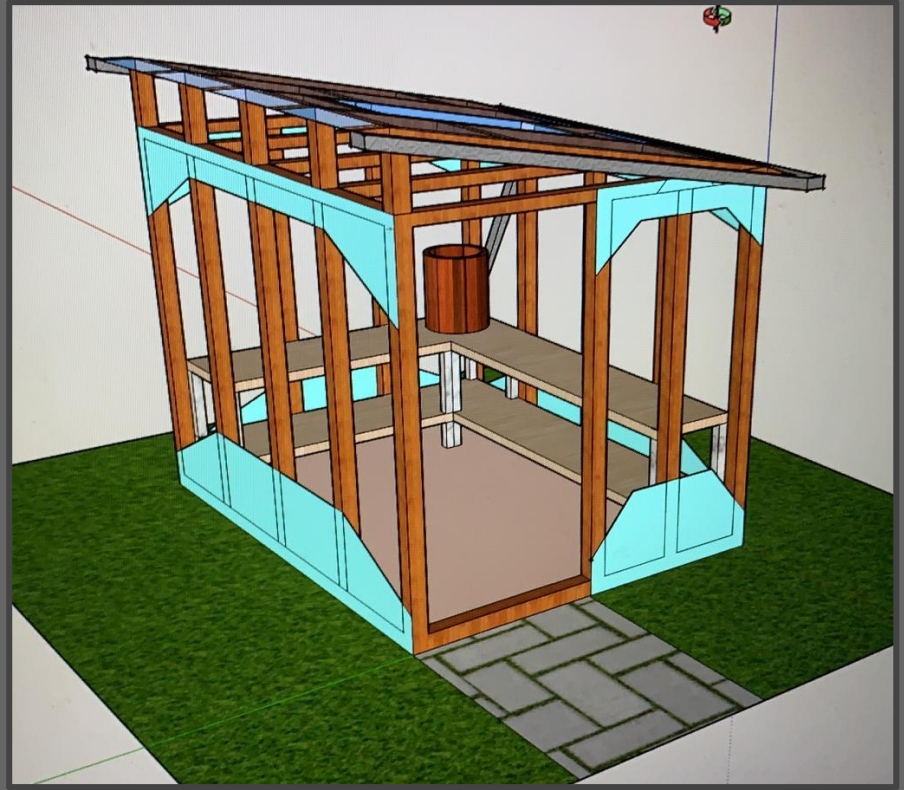
- CAD design
- Bench storage
  - Tools
  - Hydroponic system (Water Tank)
- Corrugated plastic roof



# Final Prototype

## Features

- CAD design
- Bench storage
- Extended supports
- Original siding design



# Final Product

## Features

- All walls assembled
- Roof assembled
- Corrugated plastic installed
- Supports put in place
- Floor and supports painted

# The Building Process...

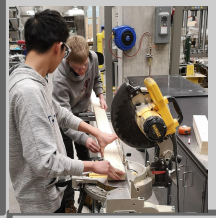
## Brainstorming

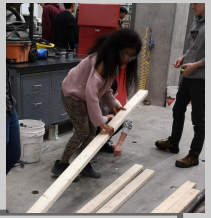
- Each member came up with designs
- Discussed pros and cons

Beginning

## Prototype I and Client meeting

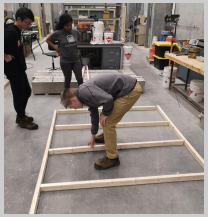
- Based on our picked design
- Visual testing
- Customer feedback





## Build Day 1

- Cut all the required pieces for the base
- Assembled the base with the new dimensions

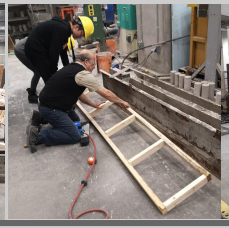


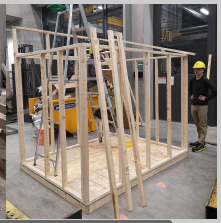
## Build Day 2

- Cut all pieces for walls
- Assemble 2 walls

## Prototype II and Client meeting

- CAD design + build update
- Visual testing
- Customer feedback



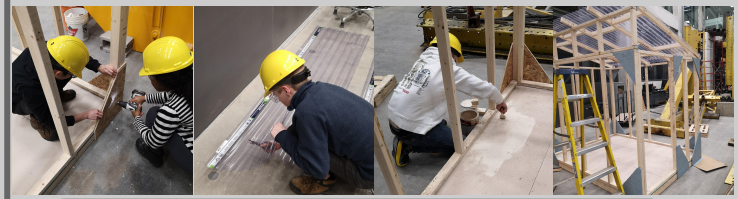


## Build Day 3

- All walls assembled
- Walls connected to base
- Roof attached

# Build Day 4

- Complete the assembly of the walls
- Add supports to the corners
- Paint the base



# Build Day 5

- Cut the corrugated plastic for roof
- Attach roof
- Paint supports
- Touch up base paint job

# Final Product

- What we finished in the labs
- Add anything we couldn't using CAD software
  - Bench
  - Siding

# Testing Process...

# Testing

- Conceptual design testing
- Roof design
- Strength testing
  - Structure
  - Bench system
- Hydroponic Fitting

# A Look to the Future...

# Our next steps...

- Add vinyl siding to walls
- Add our storage bench
- Add our animal proof siding
- Install door
- Install hydroponics
- More testing

# In Conclusion...

# Conclusion Statement

We have answered the needs of the customer to the best of our abilities. We have creating an affordable, modular and low maintenance greenhouse design, that will produce vegetables through the different seasons in Barriere Lake. At a cost of $372.12, this greenhouse is ideal for feeding the residence of this Algonquin community.

As always, we will continue to...

# Work hard!

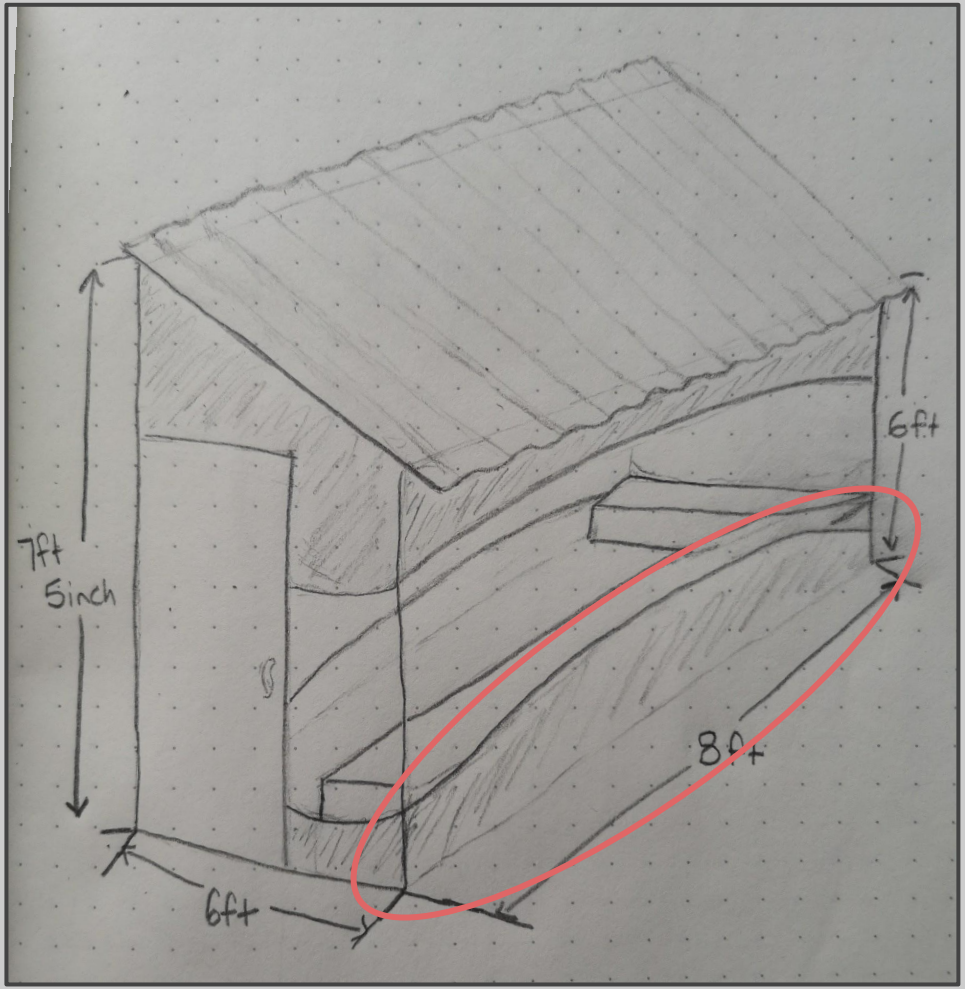
# Work Safe!

# Keep you informed!

# Thank you for your time,
# Any questions?

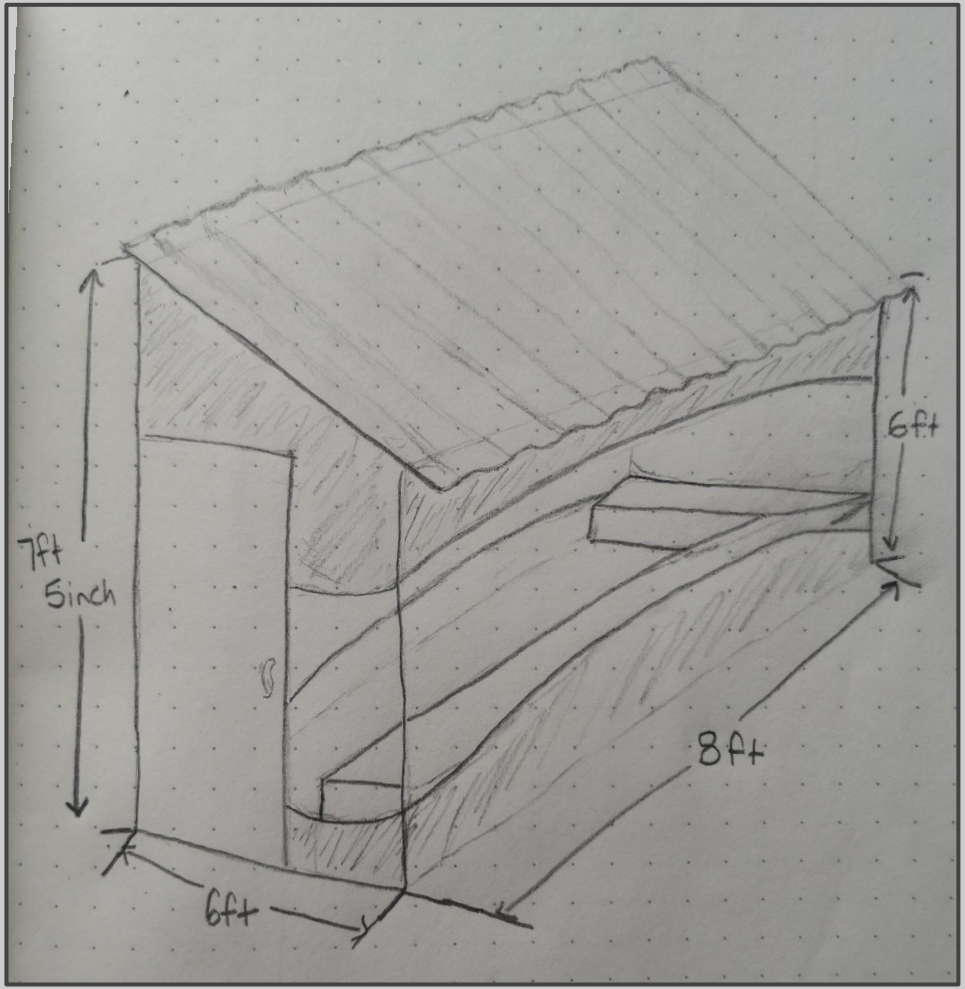
# Animal Proofing

- 1ft if not more of siding to the bottom of the greenhouse to ensure no animals enter through the siding into the greenhouse
- Door requires the handle to be turned to open



# Water Collection

- Room in budget for a water tank and gutters if required
- Space on the bench can be used to store the water if needed for hydroponics



# Modularity

- This design is easy enough to make it modular
- By taking off the back wall and duplicating the design, we would be able to create a 12x8 greenhouse