

Potato Storage in Baretí, Georgia

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Project Goals

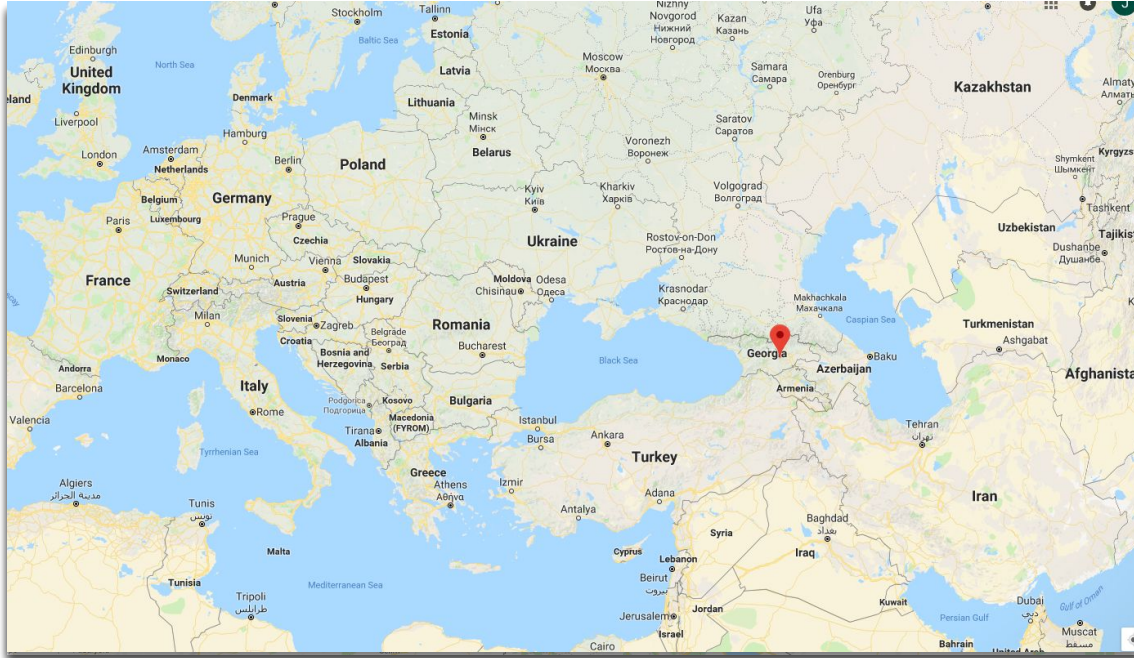
Increasing local economic opportunity by creating a **potato storage facility** to decrease seed degeneration and prevent postharvest losses, while providing the village with a space for **agricultural education**.

Project Statement

Our group has evaluated the sectors of **building structures, HVAC systems, layout, and maintenance** that is needed to efficiently store and protect potatoes in **Bareti, Georgia**.



Bareti, Georgia



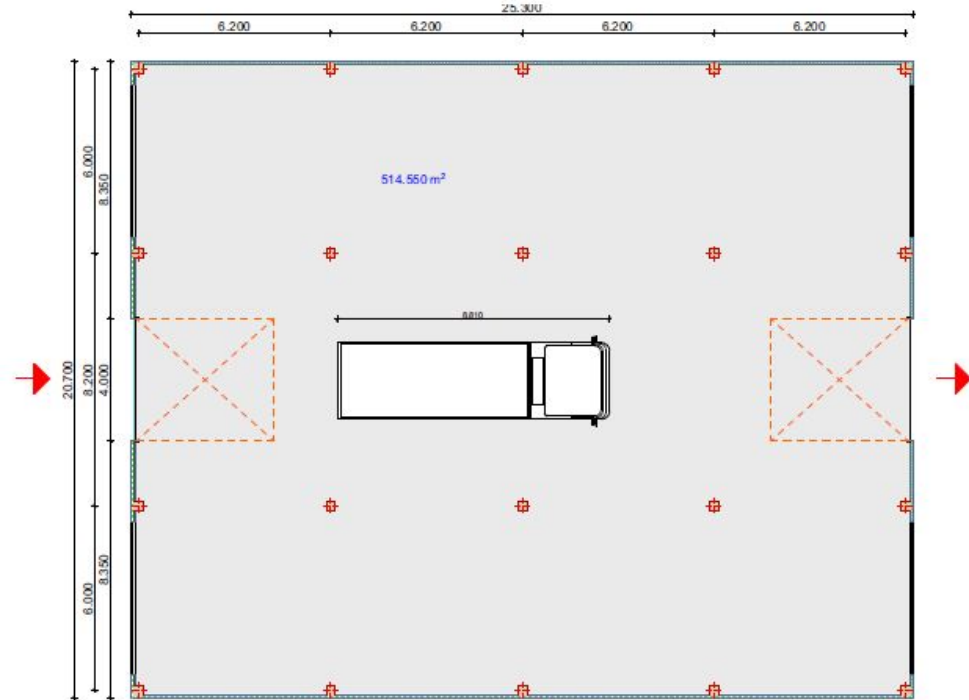
Maps from Google Maps



Project Background

Prospective Facility:

- Facility Size: 500+ square m
 - This prospective facility has only 300 square meters of usable space
- Desired Tonnage: 900 tons of stored potatoes
 - This facility does not have the floor plan or necessary height to meet needs
- Educational Workspace
 - No distinctive educational workspace in this facility



Background - cont.

- **Timeline**

- Construction will start in early summer
- Facility needs to be operational by fall harvest
- Classes will be held over summer months

- **Budget**

- Grant of 90,000 USD from the Japanese Embassy in Georgia
- Must be used during 2019 Calendar Year

How Potatoes Go Bad...



Bruising



Mechanical damage



Blackheart



Growth cracks

Research Findings

01

Architecture

02

HVAC

03

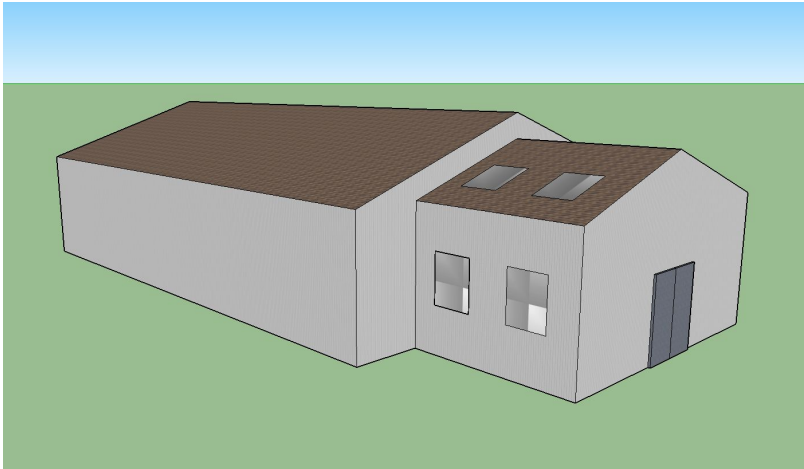
Layout &
Maintenance

Research Findings

01

Architecture

- Importance of drop-down ceiling to more easily maintain temperature
- Need for interior **Vapor Barrier** in high humidity environment
- No windows in Potato Storage Structure
- Double-Sliding doors to minimize loss of heat/controlled environment
- Value of **Anteroom** in maintaining climate control, additionally:



Research Findings

02

HVAC

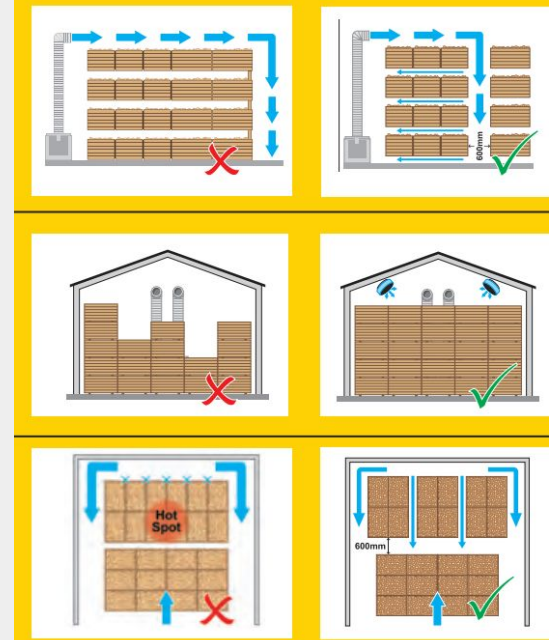
- **Temperature** for seed potatoes is recommended to be between 3 and 4 °C
- **Insulation** is best at an RSI of 6.1. This is 250mm of fiberglass or 150mm of polyurethane
- **Circulation** is recommended for storing above 160 tons of potatoes

Research Findings

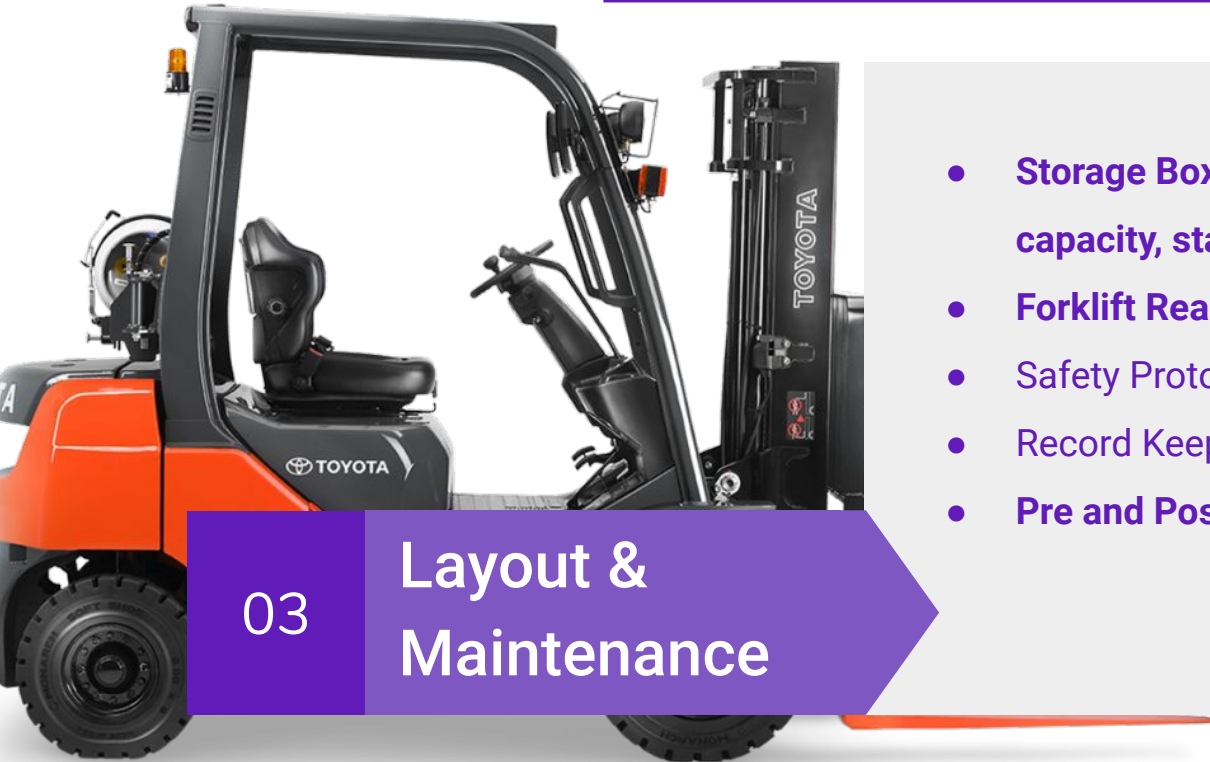
02

HVAC

- There should be a **600 mm gap for ventilation** at the end of the stack of boxes
- Stacks should be a **uniform height**
- Stacks should be **alternated** to promote airflow and discourage hot spots



Research Findings

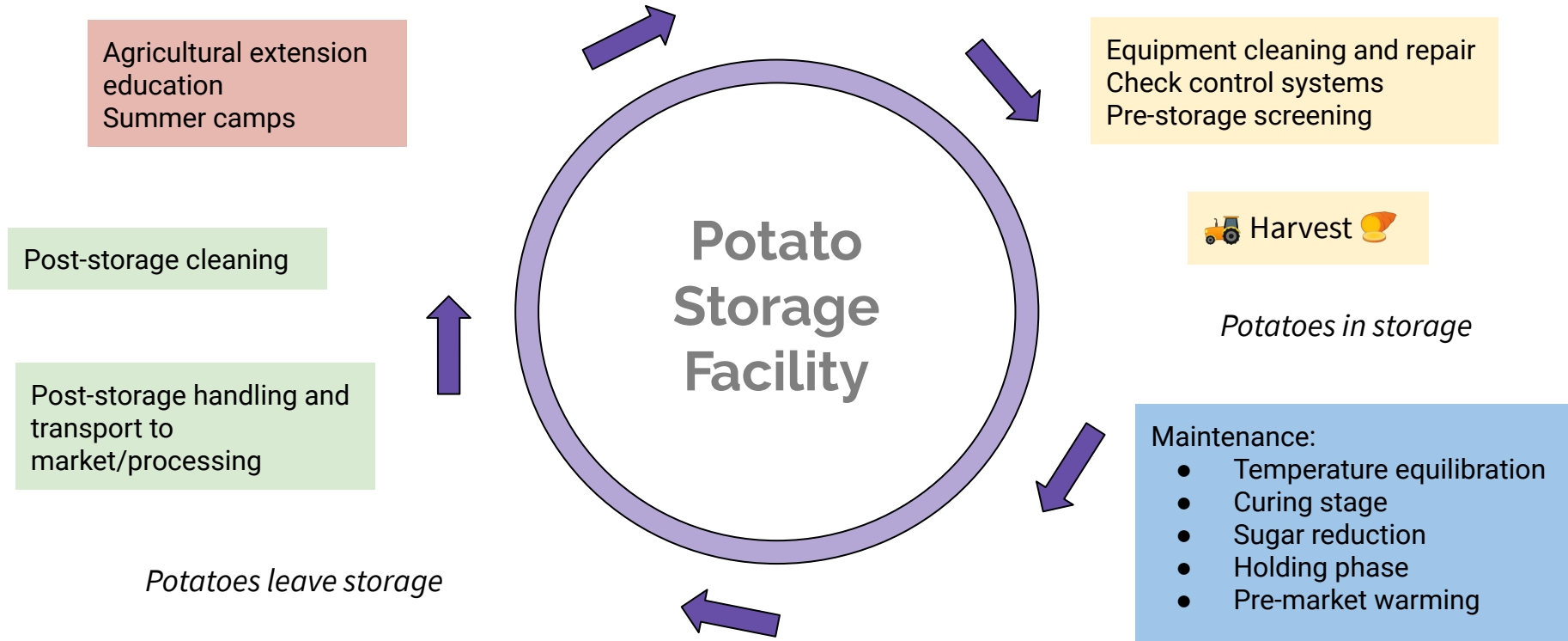


- **Storage Boxes: sizes, carrying capacity, stack height, construction**
- **Forklift Reach and Maneuverability**
- Safety Protocol
- Record Keeping
- **Pre and Post Storage Activities**

03

**Layout &
Maintenance**

Life Cycle Analysis



SWOT Analysis

Strengths:

- Funding
- New/Advanced
- Backing of Community Organization
- Well connected Client

Opportunities:

- Scalability
- Collaboration with other Organizations (CIP)
- Educational Opportunities

Weaknesses:

- Knowledge of Best Practices
- Buy-In from Farmers
- New/Unproven
- Rushed Time Frame

Threats:

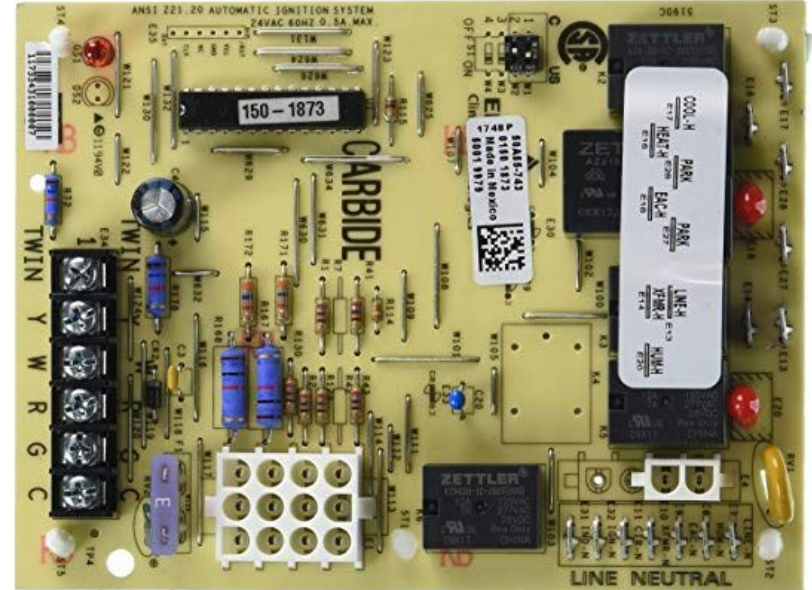
- Winter
- Government Bureaucracy
- Road Infrastructure
- Drop in Potato Prices

Recommendations for D-Lab II

Potato Box System



HVAC control system



Thank You!

