

Sustaining Rural Communities



Samantha Parkinson
Thesis Presentation
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The practice of architecture is the most delightful of all pursuits. Also, next to agriculture, it is the most necessary to man. One must eat, one must have shelter.

- Philip Johnson, 1979



Problem Statement

**How might sustainable architecture
satisfy the socio-economic needs of a
rural community?**

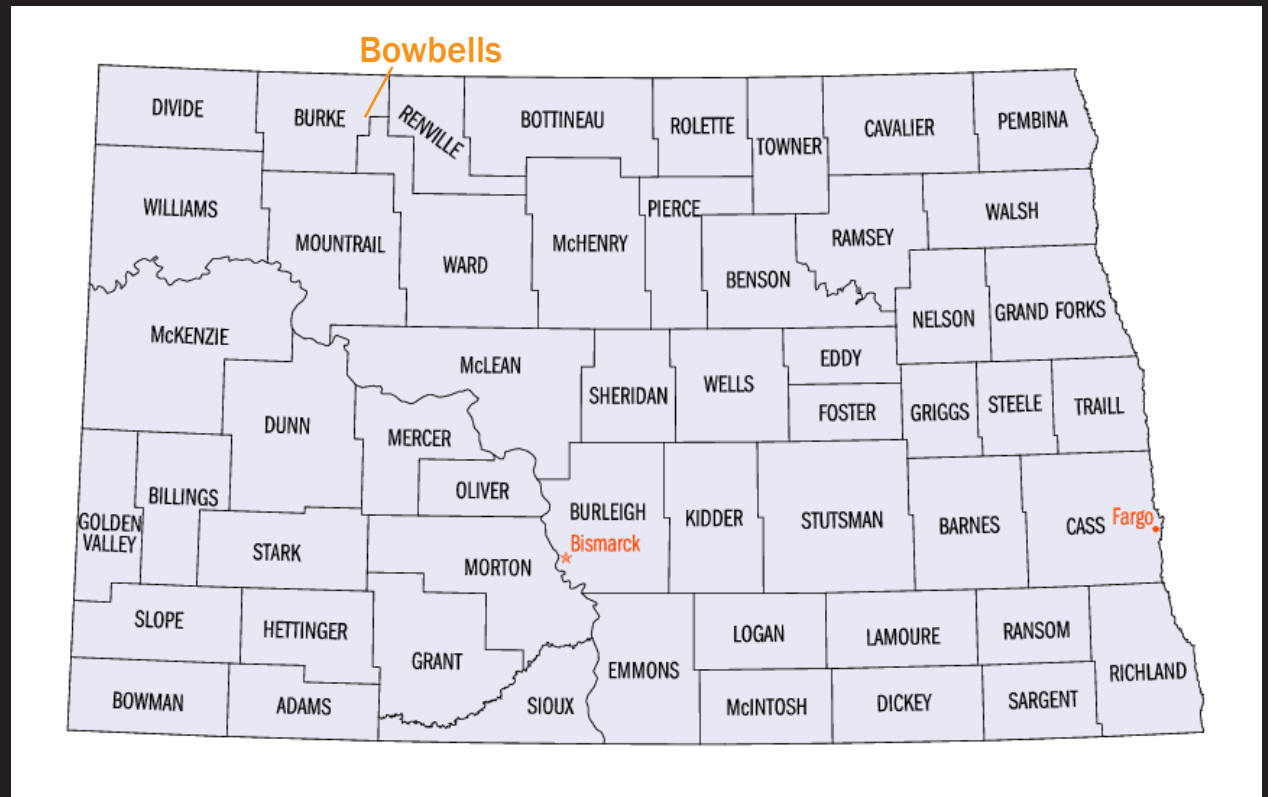
Theoretical Premise

A development that meets the socio-economic needs of a rural community and responds to the natural environment will bring people to the town for business, pleasure, and residence.

Bowbells, North Dakota



Burke County Seat
Population: 350



Socio-economic Needs



Bowbells' major sources of business are agriculture and oil.

Having both is putting a strain on the community's infrastructure.

Before oil activity hit the area, small businesses were lost, including a grocery store and an auto repair shop.



Those essential businesses are not the only establishments the community lost. Bowbells also lost a diner and swimming pool, which gave residents a place to gather.

Now, with oil activity at the back door, the population is rising but there is little to no housing available

Sustainable Architecture/Green Development

Green developments consider:

Environment

Local Environment

Resources

Social Impact

Connections:

People and Place

People and Nature

Buildings and Nature

Financial Goals

Reduced Capital Costs

Marketing Benefits

Why Green Developments are not used as often:

Lack of Understanding

Interview



Mayor Dan Linster

Future of Bowbells:

Oil development

New leaders

Preparing for Growth:

Improve Infrastructure

Provide Necessary Businesses

Grocery Store

Day Care

All Day Restaurant

Hardware/All-Purpose Store

Implementing Changes:

Land Use Plan and Zoning Regulations

Possibility of Sustainable Design:

Interested but not sure what it includes

Decisions Made

Typology: Mixed-use

- Grocery Store
- Deli/Coffee Shop
- Business Incubator
- Apartments

Site Location: Downtown Bowbells

Case Studies

I researched three small mixed-use buildings. Out of the three, Sweetbriar in Seattle appealed to me more because of its use of massing to breakdown the “big box” feeling and the careful attention to the relationship to the street.



Sweetbriar, Seattle, WA



Cherokee Studios,
Las Angeles, CA



DC Townhouse, Washington, D.C.

Site



Site Analysis



The southern building shows major signs of destruction and neglect.



Site Analysis



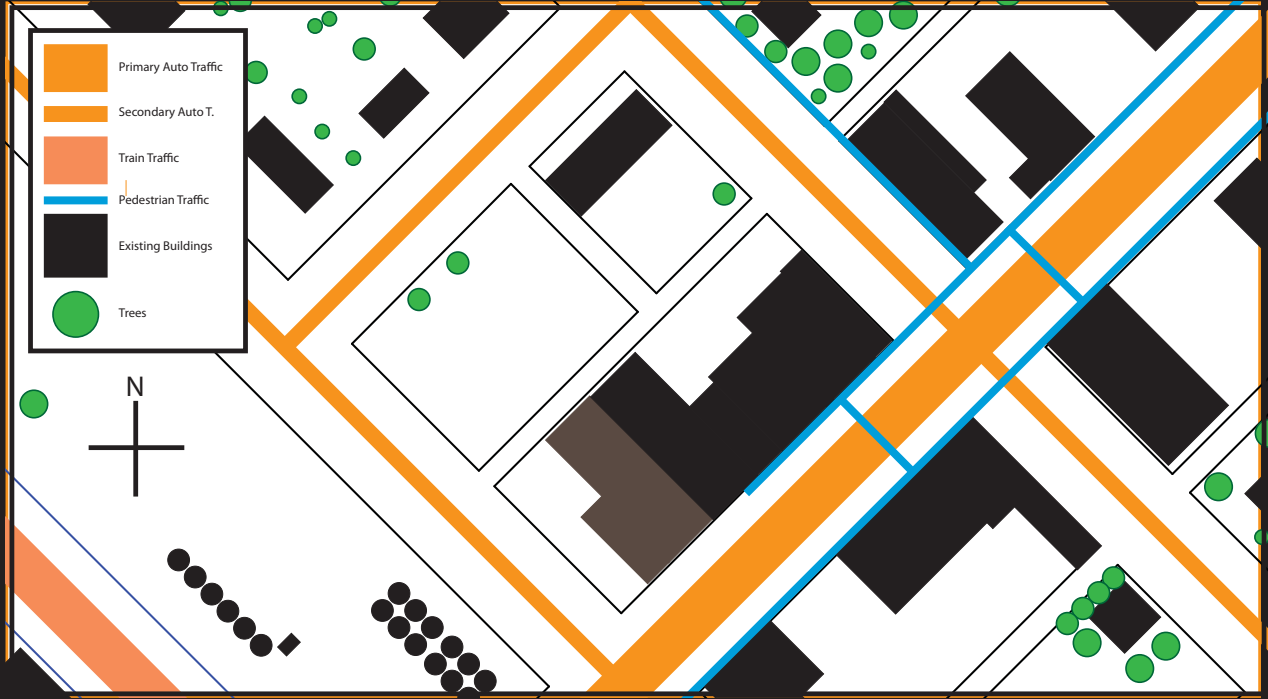
The northern building is in better shape but still has interior and roof damage.



Site Analysis



Site Analysis



Site Analysis

Soils

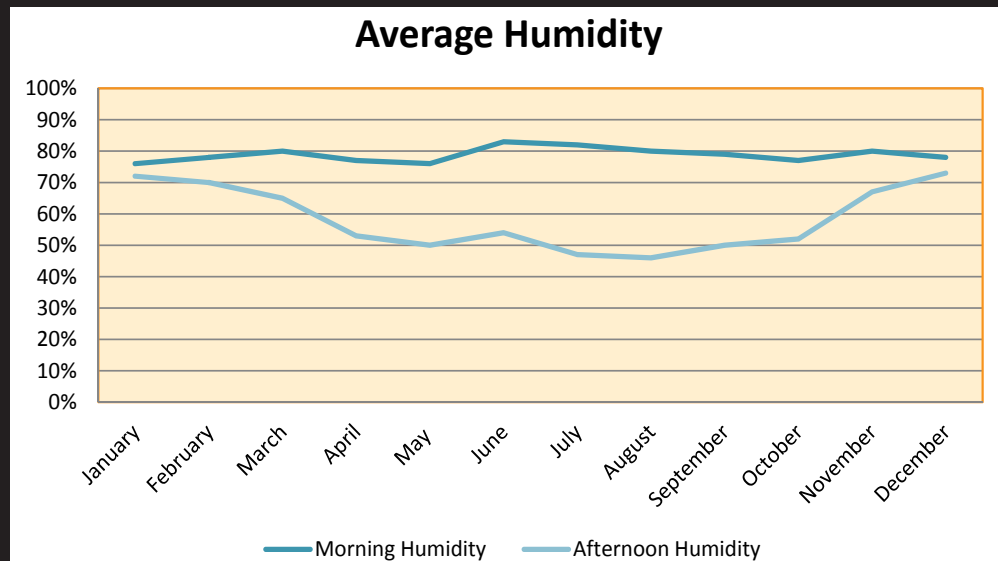
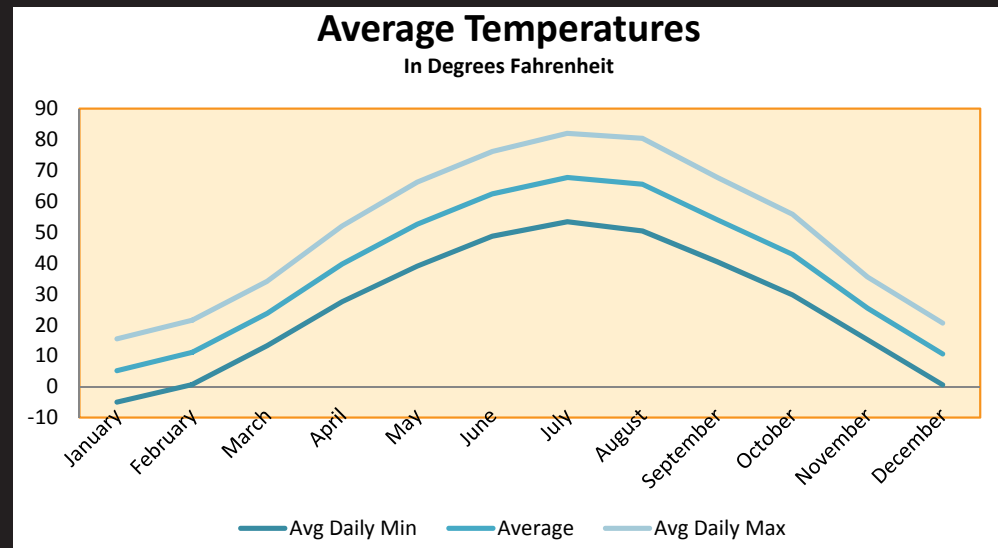
USDA Series 2023

- Mixture of Williams-Niobell loams.
- Occurs on a 0 to 3 percent slope
- Profile of loam or clay loam.

This soil will have some minor problems in building site development due to shrink-swell and freeze-thaw.

Water Table

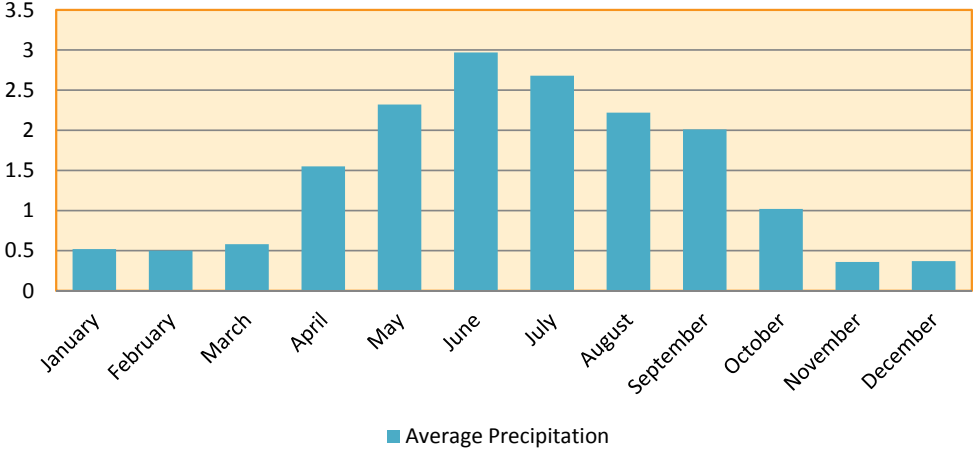
The water table fluctuates throughout the year and is usually seasonal.



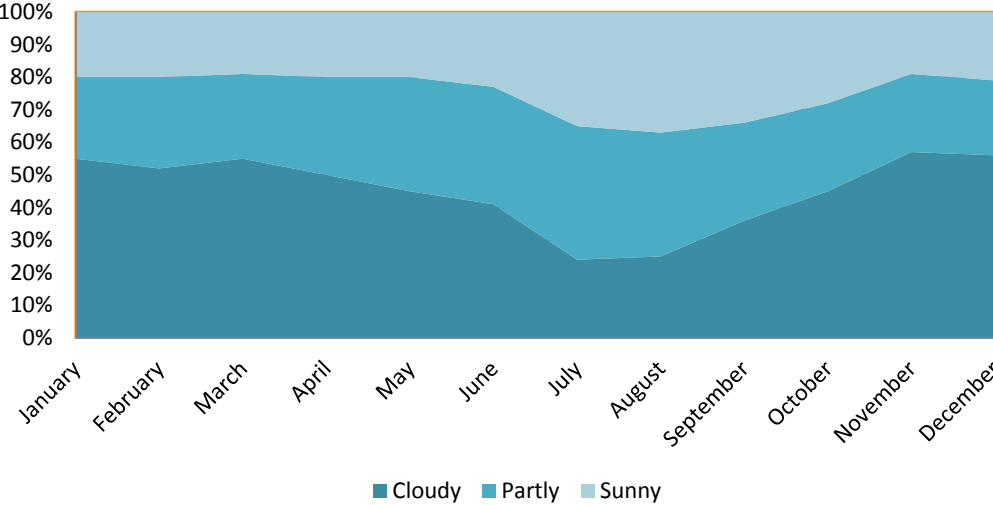
Site Analysis

Average Precipitation

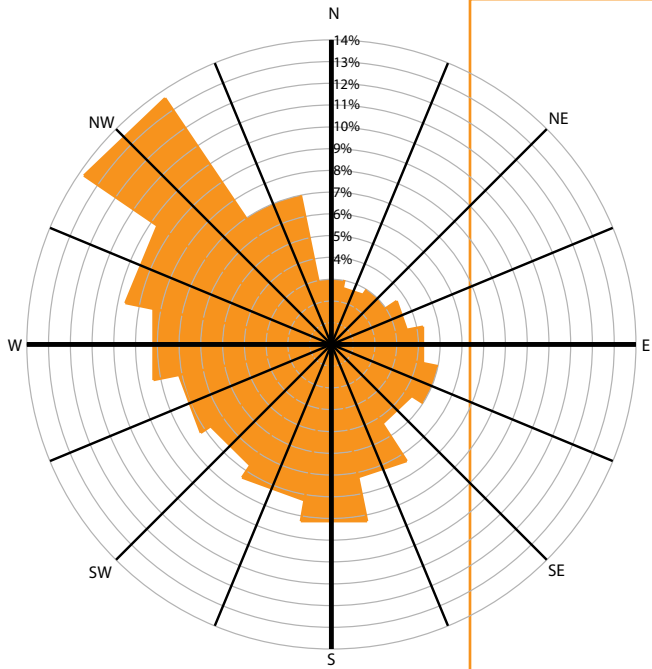
In Inches



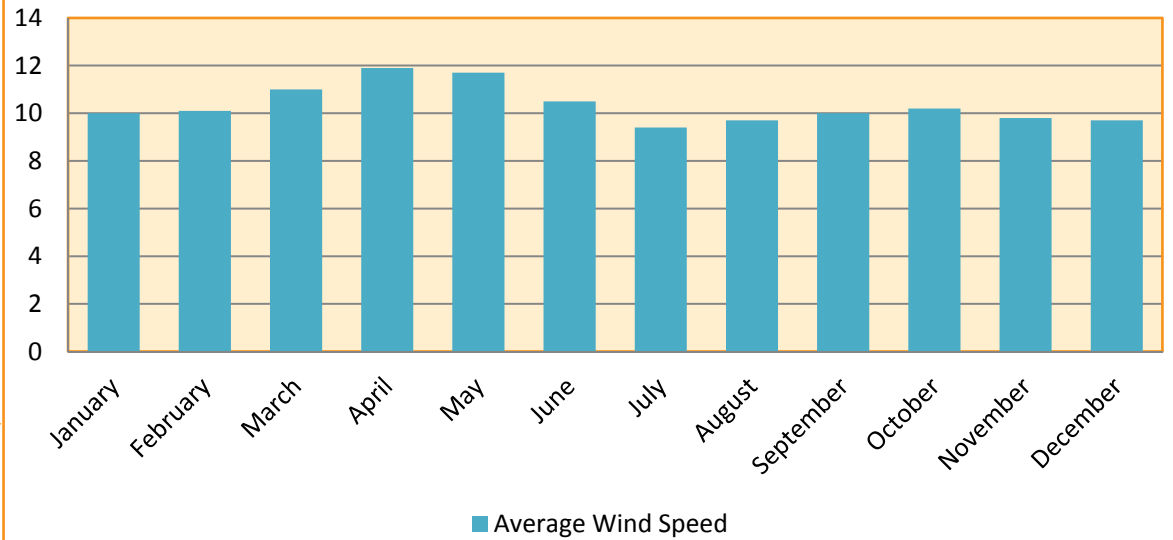
Days of Sunshine and Clouds



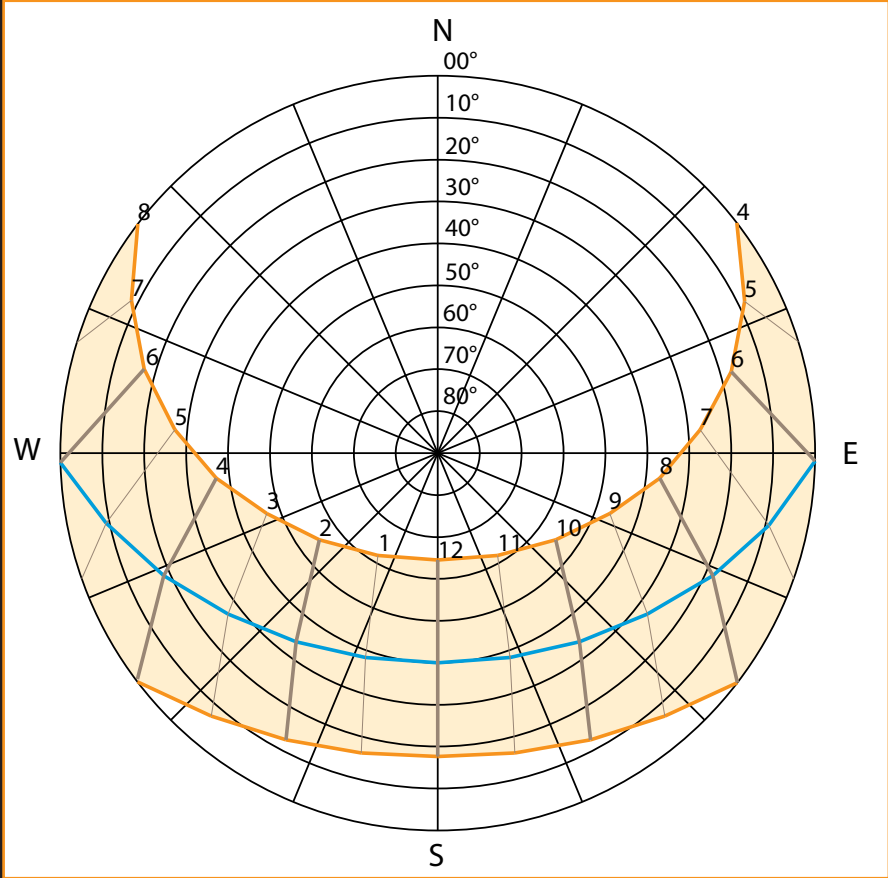
Site Analysis



Average Wind Speed In MPH



Site Analysis



Site Analysis

Shading:

The site is located on the southern corner of the block and across the street there is nothing that causes shadows to cross the site. The storage bins for SunPrairie Grain are not tall enough or close enough to cause shading on the site. Solar access is plentiful and will continue to serve as an opportunity for solar energy collection.

Noise:

There is a lot of noise pollution on the site which sits along Main Street or North Dakota Highway 8. This road is full of traffic throughout most of the day and is used by cars, grain trucks, and oil trucks. To the south of the site the elevator is another source of noise pollution. Trucks, augers, and other equipment can be heard on site. The tracks used to supply the elevator is quite busy and the trains can be heard not only on site but throughout town. Careful consideration towards acoustics and sound proofing will be made to minimize effects from within the building.



Zoning/Program

Lot Size: 14,000 sq feet
Lot Dimensions: 140 ft x 100 ft

Zoning

Min Lot Area: 10,000 sq ft
Min Lot Width: 80 ft
Min Lot Coverage: 35%

Setbacks:

- Front 10 ft
- Side Interior 10 ft
- Side Corner 10 ft
- Back 10-15 ft

** Decreasing setbacks available
in Compensating Public Benefits
and by review of City **

Max Density: 16-25 units/gross
acre

Min Common Open Space/Dwell-
ing Unit: 500 sq ft

Min Dwelling Unit Size: 900 sq ft
Maximum Building Height: 35 ft

Amount of Common Open Space
Required: 250 sq ft/ 1000 sq ft

Maximum Floors: 3

Maximum Sq Ft: 42,000 sq ft (3-sto-
ries)

Minimum Sq Ft: 4900 sq ft (1-story)

Program Based on Max Sq Ft:

Parking: 2000 sq ft

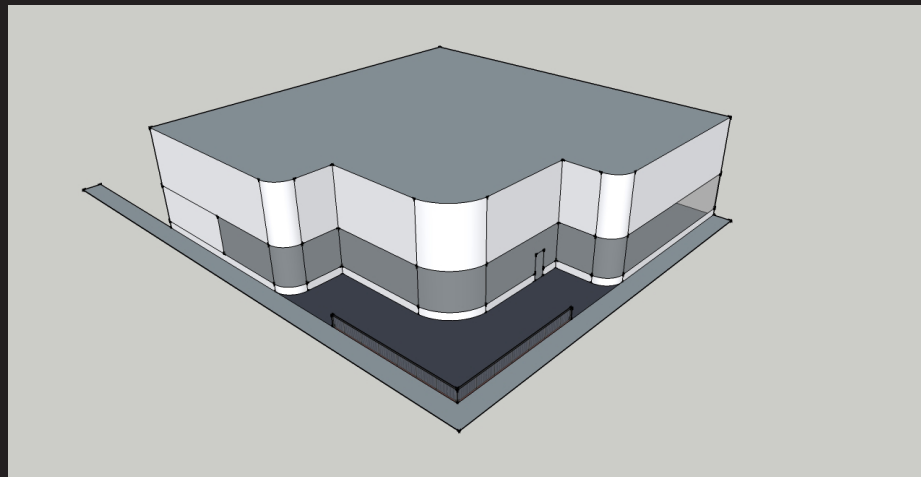
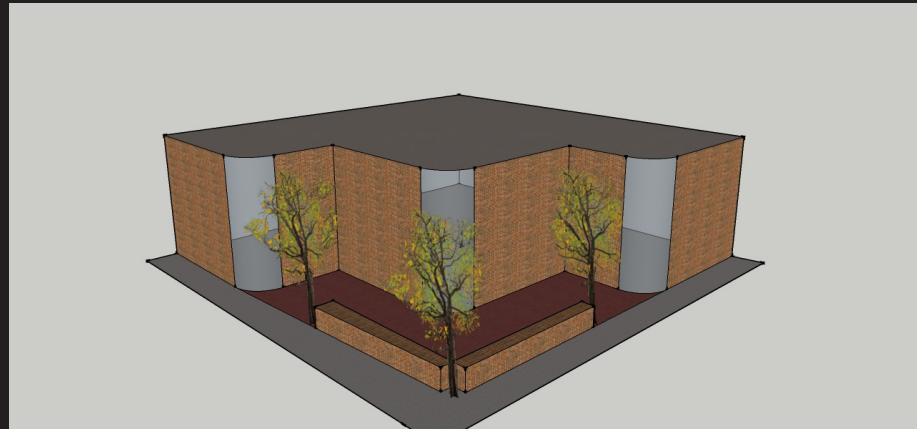
Retail: 12,000 sq ft

Residential: 24,000 sq ft

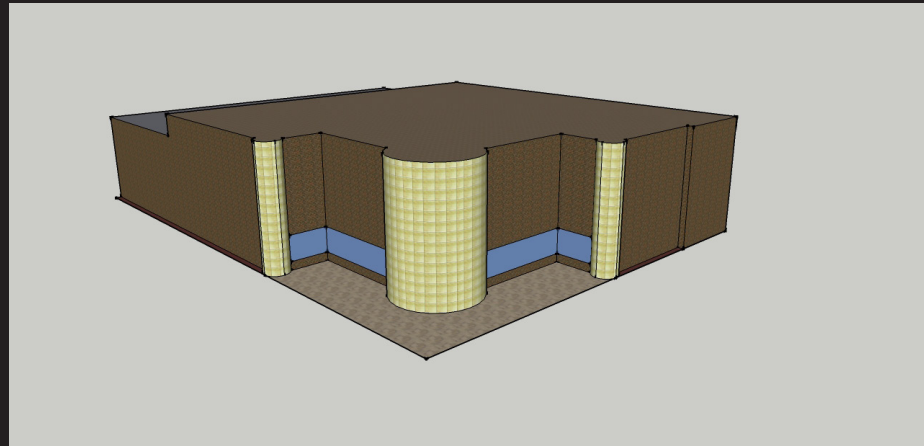
Process

Design Emphasis:

**Entry into town
Massing
Treating the Corner**



Process



Design



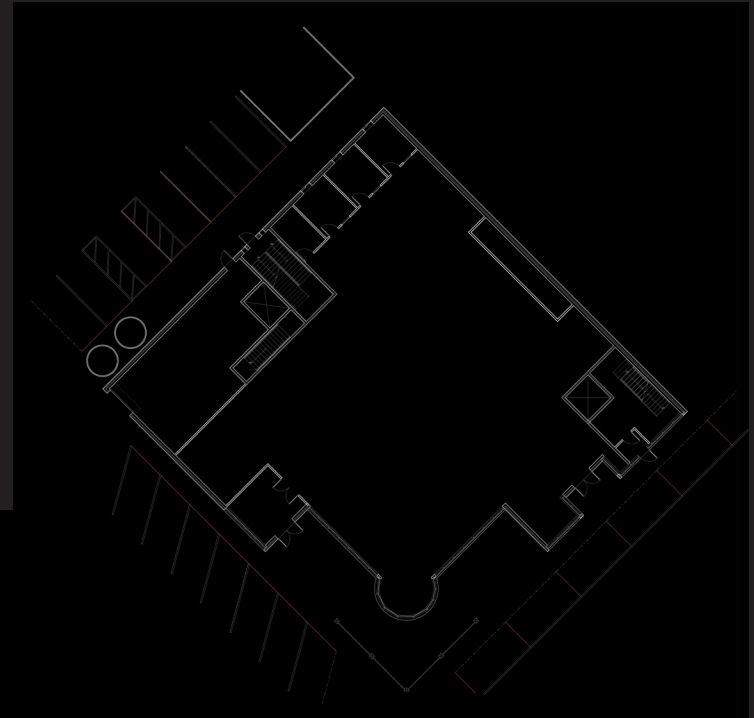
Design

Basement:

- Store Storage
- Resident Storage
- Mechanical

First Floor:

- Co-op Grocery
- Deli/Coffee Shop
- Business Incubator
- Store Loading
- Residential Entries



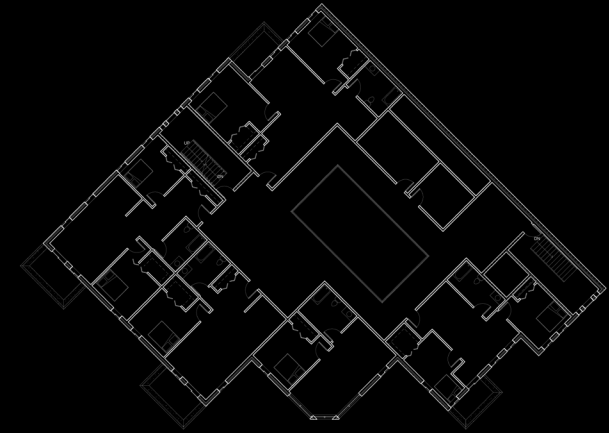
Design

Second Floor:

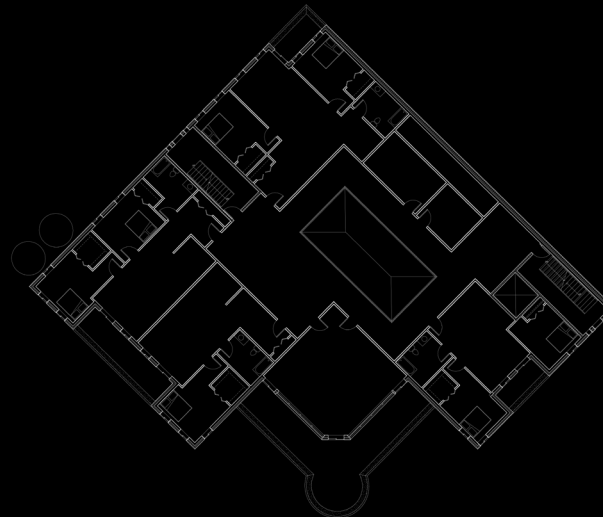
- Community Room
- Laundry
- Three 2-bedroom
- One 1-bedroom

Third Floor:

- Laundry
- Three 2-bedroom
- Two 1-bedroom



Third Floor Plan



Second Floor Plan

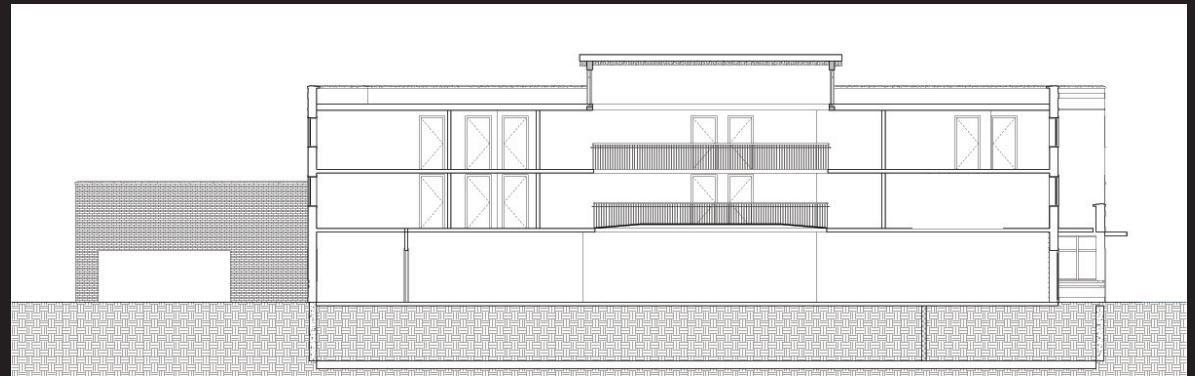
Design

Roof Plan:

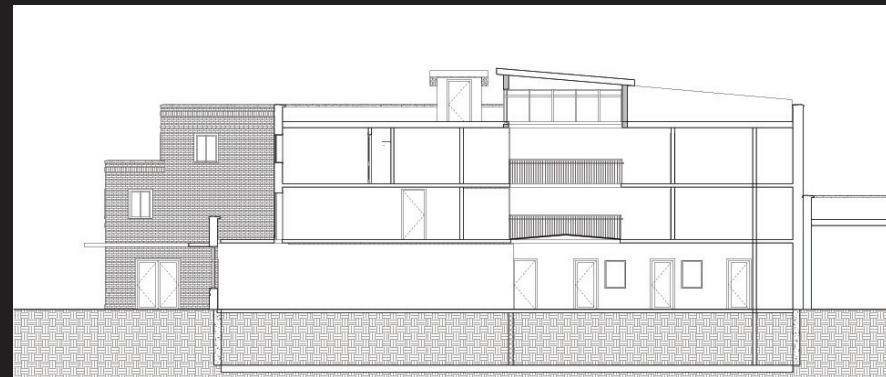
- Roof Access
- Clerestory
- Mechanical



Design



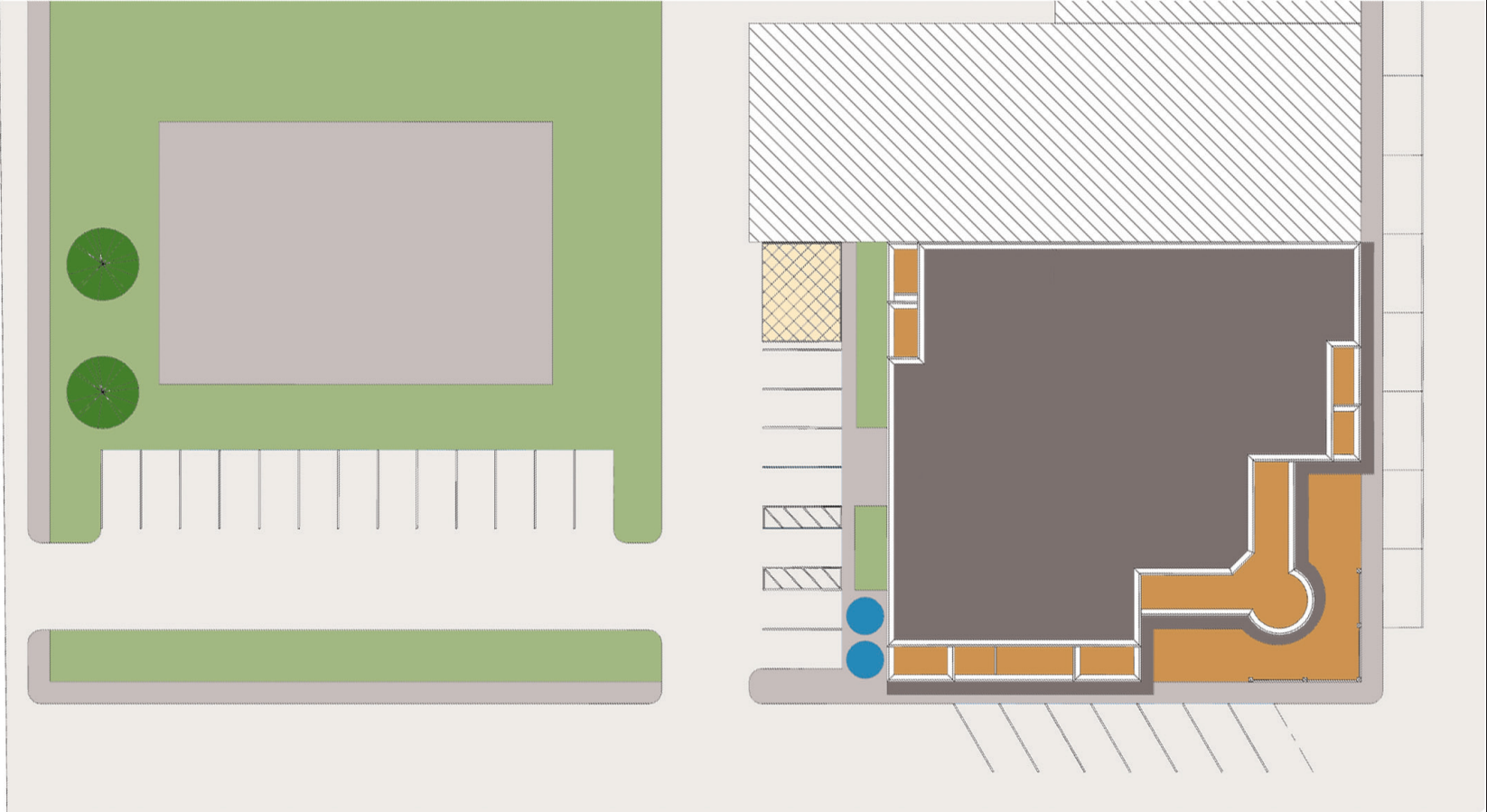
Interior Sections show the clerestory atrium.



Design



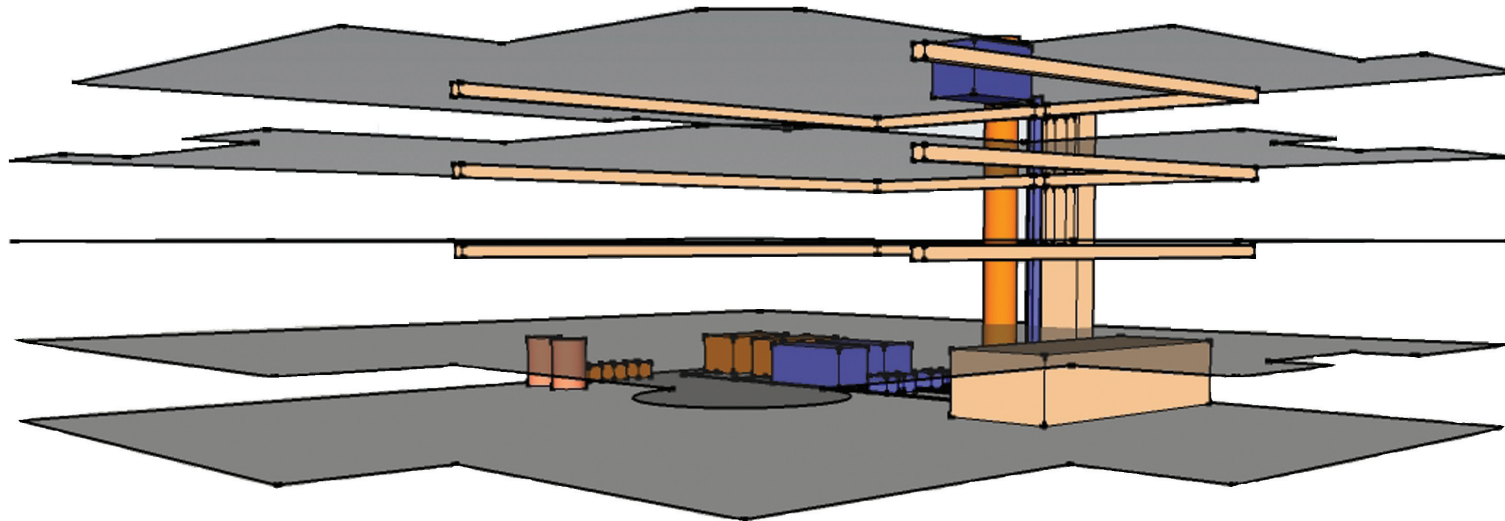
Design



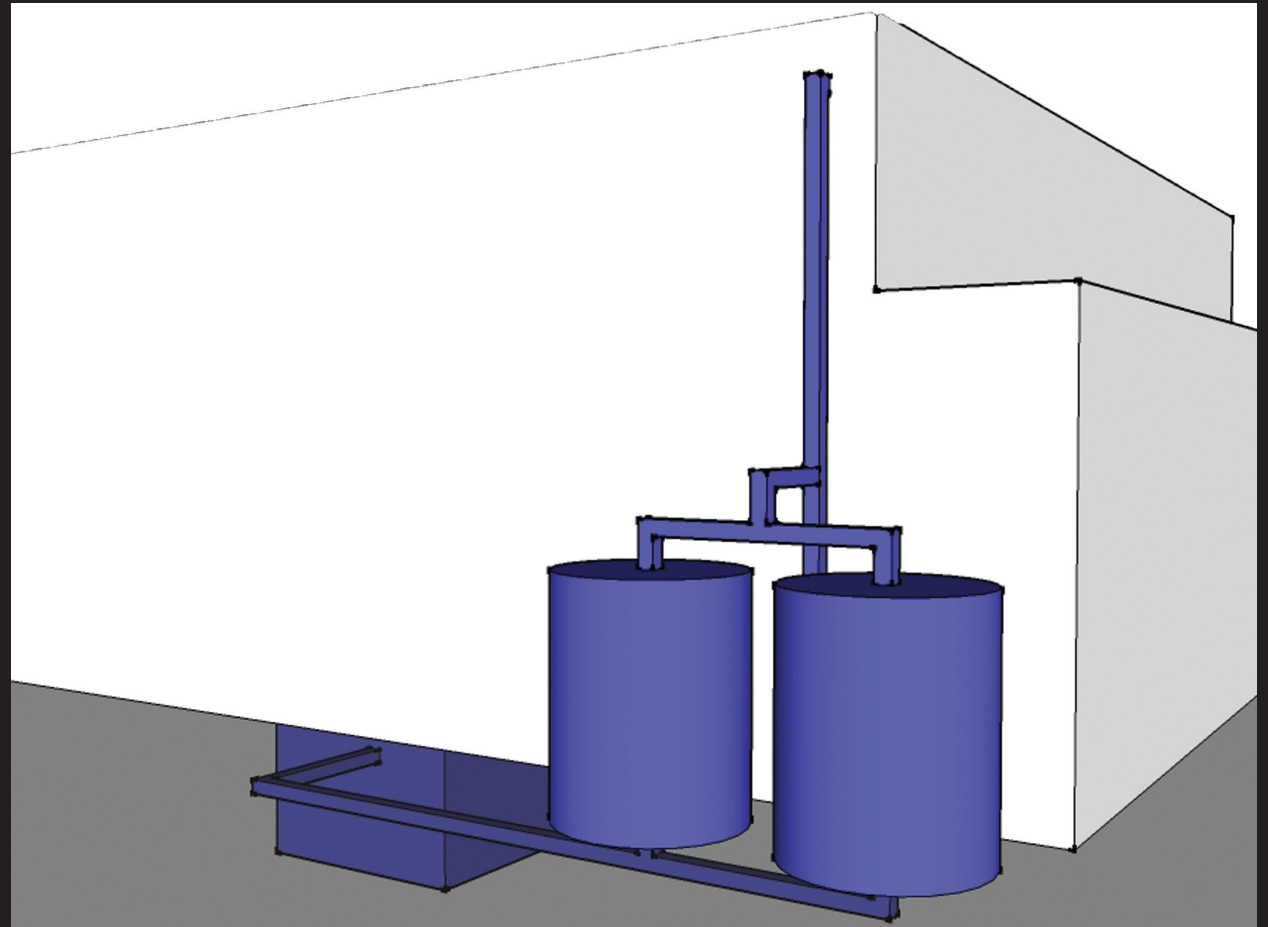
Design



Mechanical Systems



Rainwater Harvesting



How might sustainable architecture satisfy the socio-economic needs of a rural community?

Agriculture and oil activity

Poor and weak infrastructure

Loss of core businesses

No place to gather

Little to no housing available

Review

A mixed-use development such as this can satisfy more than one need.

Grocery Cooperative: Providing a sense of community and restoring a much needed supply service.

Business Incubator: Allowing small businesses and offices to be established.

Coffee Shop and Deli: Giving residents and workers a place to meet and enjoy a meal.

Apartments: Providing an opportunity for young families to establish roots in the community.

Courts: Renovating an existing amenity will provide new parking and a safe place for play.

Questions?





Thank You

