Located at 8005 North Broadway in St. Louis as a “Food Desert” in the Baden Neighborhood

A formerly Auto Repair Shop with a Garden Area of 30,000 square feet
- **Energy Audit on Yours Market Building**
  - Lighting
  - HVAC
  - Refrigeration
  - Cost and Return on Investment

- **Feasibility Study of Rainwater Harvesting System, including**
  - Estimation of Potential Rainfall
  - Estimation of Water Needs
  - Conceptual Design
  - Installation Cost Estimate
<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building SF</td>
<td>4,392</td>
</tr>
<tr>
<td>kWh Total</td>
<td>158,415</td>
</tr>
<tr>
<td>kWh/SF</td>
<td>36.1</td>
</tr>
</tbody>
</table>

![Pie chart showing energy usage breakdown: Refrigerator 65%, Cooking 7%, HVAC 12%, Lighting 9%, Other 7%]
1. Clean Coils and Filters Monthly
2. Turn off all equipment not in use: Lights, Hood Fan, Refrigerator, Cooking equipment
3. Install programmable thermostats: Set Different Temp After Work
4. Verify proper Temp set-points on all Old and New refrigeration and freezer units
5. Install a Hood Controller: Cycle Down the Hood Fan When No Activity
6. Install Electronically Commutated Motors (EMC) in all Evaporators and Condensers: Less energy, less heat.

7. Install Econofrost Modules over Produce Display Case: Retractable Curtains.

8. Install anti-sweat heater controls on all freezers: Reduce the Heater Runtimes.

9. Install insulated garage doors.

10. Install insulation on the roof of the market: Min. 2-inches Polystyrene.
Continuous Guttering
Rainwater Filter
Rainwater Storage Tank
Water usage: irrigation of the back garden

Operational Principle:

http://www.youtube.com/watch?v=Mw0EllKIOVY

1. Collection Area: Roof
2. Conveyance System: Gutters
3. Vortex Filtration
4. Storage Tank: Approx. 3,000 gal in the basement
5. Delivery System: Drip Irrigation
• Used 1999 – 2012 Precipitation Data from St. Louis Area
• Used model developed by Cincinnati Metro Sewer District
• Predicts capture volume based on roof area
Growing Mar thru Oct

- 50% of Roof Area Capture
- 100% of Roof Area Capture

Growing Feb thru Nov (w/Greenhouses)

- 50% of Roof Area Capture
- 100% of Roof Area Capture
Volume collected water changes throughout growing season as water is consumed

Use based on vegetables grown & area cultivated
  - tomatoes, lettuce, cucumbers, peppers

Assumed drip irrigation, most efficient

3,000 gallons selected

Modular system, additional storage added as needed
Rainwater Harvesting Feasibility Analysis

A total list of supplies and estimated costs are listed below:

- 3000 gallon tank $1,800
- 1 Pump $600
- Valves/Regulators $250
- Piping $500
- 1000 ft drip irrigation tubing $250
- 500 bubblers $300
- Electric Line to Pump $1,300
RAINWATER HARVESTING FEASIBILITY ANALYSIS

ADVANTAGES:
- Provide a source of water when needed
- Relatively clean and free
- Promote self-sufficiency and conserves water resources
- Offer cost savings
- Owner operated and managed

DISADVANTAGES:
- Initial Capital Cost and Minor Maintenance
- Limited and uncertainty of rainfall.
FUTURE PLANS

- Continue collaboration with students & YOURS Market
- Solicit funding for rainwater harvesting system
- Develop plans and specifications for rainwater harvesting & drip irrigation
- Implement energy savings measures
- Assess electric bill
- Assess potential savings from gas energy
- Assist in installing greenhouse hoops