USF - Cottages at Hasty Place

Grove Park Yellow Jackets
Team Introduction

Tyler Pilet
PhD High Performance Building

Wen Yi Chang
MS High Performance Building

Raunak Tibrewala
MS High Performance Building

Warren Cambell
MS High Performance Building

Yuran Kong
MS High Performance Building

Yuhang Li
M. Architecture

Dan Lu
MS High Performance Building

Raj Shah
MS Building Construction

Jingxin Xu
MS Urban Design

Xinyi Zhang
MS Civil Engineering
Faculty and Partner Profiles

Team Advisor

Jason Britton Brown
Lecturer, School of Architecture
Georgia Tech

Community Partners

Habitat for Humanity

GROVE PARK
EST. 1920

GROVE PARK
FOUNDATION

Grove Park Yellow Jackets | Cottages at Hasty Place
Industry Partners

PERKINS + WILL

Pursuit Engineering

Southface

YKK AP

ACME Panel

America’s Cleaner More Efficient Panel
Location

3A – Urban Single-family Home
The Changing Landscape of Atlanta
Atlanta Beltline

Introduction

Atlanta Beltline

Grove Park

Grove Park Yellow Jackets | Cottages at Hasty Place
Introduction
The Reality of Change

Grove Park named highest in Atlanta energy burden by Georgia Tech policy study.

Local Area Population Trends

Grove Park Population (in Thousands)
Vacancies are 2x that of the Metro—Atlanta Area

The percentage of black residents is 3x higher in Grove Park than Metro-Atlanta
Grove Park Incomes

Median Income: $41,000
Resurgence in Grove Park

Fred Stevens of the Grove Park Foundation
Community-Driven Approach

In 10-20 years, Grove Park will be

- More diverse, multicultural, and economically stable

- Strong diverse community of working class people with families

- Gentrified if not prevented

Our team active in the community
Grove Park Housing Workshop

Craftsman Style – Option 1

Craftsman Style – Option 2

Craftsman Style – Option 3

Colonial Revival Style – Option 1

Colonial Revival Style – Option 2

Minimal Traditional Style

17.6% votes

32.4% votes

29.4% votes

0% votes

0% votes

20.5% votes
Site Location and Zoning

New K-8 School

New Mixed-Use Multi-Family

Cottages at Hasty Place

30' Wide Access Road
Design Statement

To design an efficient two bedroom single-family home that is affordable for Grove Park Residents, while promoting thoughtful design.
Project Design Goals

- Energy Efficiency
- Modularity
- Affordability
- Durability & Resiliency
- Positive Social Impact
Site and Climate

- **Site**
  - Buildable Lot Area: 4981 ft²
  - Shared Community green space between Single-Family and Multi-Family

  Climate Zone: 3A

**Site Section Profile**

- Tall Deciduous Trees

---

**Georgia Tech**
Massing Concepts

Space Optimization
- Separate Private and Public Spaces
- Minimize Transition Spaces
- Open Plan

Land Centered Design
- Integrating Mass with the natural slope on the site.

Design of Social Spaces
- Integrate and Maximize Outdoor Spaces

High Performance Building
- Minimize Thermal Loads and EUI
- Optimize Daylight Performance
- Efficient integration of building systems
Floor Layout

First Floor Level

- Private Spaces
- Public Spaces

Ground Floor Level

- Bedroom 1
- Bathrooms
- Bedroom 2
- Circulation
- Kitchen
- Living Space

Grove Park Yellow Jackets | Cottages at Hasty Place
Design Native Xeriscaping
Site Design

Legend

1. Driveway and Entrance
2. Ramp up to the Front Porch
3. Front Porch
4. Outdoor Family Activity Area
5. Shared Community Garden
6. Creek
Landscape Strategies

Gravel Rain Reserve System Detail

Rain Garden

Vegetable Garden

Rain Recycling System
Community Garden Design
Community Farming Space
SIPs Panel Construction

Ease of Construction
1) Panel Size- Easy to built with.
2) Fits into the construction process of our partner, Atlanta Habitat for Humanity.

Energy Efficient
1) Consistent R-value
2) Less Thermal Breaks
3) Air-Tight Envelope
### Construction Sequence

#### Improvements in Atlanta Habitat for Humanity Construction Timeline

<table>
<thead>
<tr>
<th>Current Process</th>
<th>Proposed Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1 Lift exterior walls</td>
<td>Lift panelized walls</td>
</tr>
<tr>
<td>Week 2 Build interior walls</td>
<td>Build interior walls</td>
</tr>
<tr>
<td>Week 3 Roof construction</td>
<td>Roof Construction</td>
</tr>
<tr>
<td>Week 4 Wall insulation and exterior cladding</td>
<td>Roofing and facade trimming</td>
</tr>
<tr>
<td>Week 5 Roofing and facade trimming</td>
<td>Cabinet installation and painting</td>
</tr>
<tr>
<td>Week 6 Cabinetry, crawl space MEP, and insulation</td>
<td>Landscaping</td>
</tr>
<tr>
<td>Week 7 Exterior and interior painting</td>
<td></td>
</tr>
<tr>
<td>Week 8 Landscaping</td>
<td></td>
</tr>
</tbody>
</table>

**Time Saved**
Envelop Durability

Effective R-51.2
Effective R-34.3

SIP Wall Durability

Ceiling Durability
Envelope Durability

Effective R-34.3
Effective R-24.3 with Warm Floor
Effective R-33.3

YKK Style-View Casement Windows
U-Factor = 0.3
SHGC = 0.3
VT = 0.56
Infiltration = 0.1
Envelope Durability

YKK Style-View Casement Windows

- U-Factor = 0.3
- SHGC = 0.3
- VT = 0.56
- Infiltration = 0.1

Effective R-33.3

Effective R-10.9

Stud Wall Durability

% RH

Temperature
Envelope Durability

Key Plan

Insulation

Weather Barrier

Attic Level
19' - 0"

First Floor Level
9' - 0"

Ground Level
0' - 0"

Foundation Level
-4' - 0"
Daylighting Performance

+21% Daylight
Bedroom Interior Design

Led Surface lighting

Led surface lighting

Led lightbulb

Master bedroom
Study Interior Design

Study Room

Grove Park Yellow Jackets | Cottages at Hasty Place 36
Public Space Interior Design

Living Area

Insignia

EnergyGuide

GE General Electric

EnergyGuide

Introduction

Architecture

Construction

Envelope

Interior Design

Thermal Comfort

Energy

Financials

Conclusion
Space Conditioning Summary
Multi-Split Combo

Energy Recovery Ventilator

Domestic Hot Water

Fresh Air System and Exhausts

Thermal Control System
Energy Recovery Water Heating

**FREE Summer Hot Water** and **50% More Efficient Winter Hot Water***

*Compared to Standalone Electric Resistance Water Heater*
Solar Power System

1507 Usable hours of sunlight per year on site

0.17 Acres of usable space with 70 kW maximum PV capacity

Panels: Canadian Solar CS6K-305MS
Inverters: Enphase IQ7-60-2-US
Energy Analysis

HERS Rating Index

Typical Grove Park Existing Home
Typical Existing American Home
Standard New Home
Energy Star Home
Cottage Before PV
Cottage With PV

Design Energy Use Reduction

Design Thermal Load Reduction

Base Energy Usage
Design Energy Usage

Base Heating Load
Designed Heating Load

Base Cooling Load
Designed Cooling Load
Financial Summary

Summary of Costs (With Additional Unit)

<table>
<thead>
<tr>
<th>Component</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction Cost</td>
<td>$111,205</td>
</tr>
<tr>
<td>Total Cost:</td>
<td>$111,205</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Financials</th>
<th>Net Income</th>
<th>Home Debt to Income Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unrented Unit</td>
<td>$41,000</td>
<td>30%</td>
</tr>
<tr>
<td>Rented Unit</td>
<td>$48,200</td>
<td>25%</td>
</tr>
</tbody>
</table>