The Millennial Village Team is made up of 5 architecture students and one electrical engineering student from the School of Engineering and Technology. Both programs are small:

- Lead advisor: Prof. Laura Battaglia
- Co-advisor: Prof. Jeehwan Lee

4th year Architecture (Lead) Kobi Henson

5th year Architecture Ty Champion

4th year Architecture Amir Amzajerdian

4th year Architecture Michael Poarch

4th year Architecture Trayquan Walton

3rd year Architecture Jai Huntley

MILLENNIAL VILLAGE  Hampton
Hampton University is a private historically black university in Hampton, Virginia. It was founded in 1868 by black and white leaders of the American Missionary Association after the American Civil War to provide education to freedmen.

Architecture:
13 in its 2019 graduating class

Electrical Engineering:
3 in its 2019 graduating class
MILLENNIAL VILLAGE

Hampton

Zero Energy Ready
Campus in a Box: Hampton Roads resiliency
Adaptation to Sea Level Rise

work + live
Port of Virginia
Hampton University is a private historically black university in Hampton, Virginia. It was founded in 1868 by black and white leaders of the American Missionary Association after the American Civil War to provide education to freedmen.

To design a zero ready home, you do not need to overbuild.

Altruistic Design is a client-centered, socially responsible architecture firm.

Create. Support. Promote. Let’s join forces and revitalize the ViBe.

Net-Zero Home Builder
Mr. Jay Epstein

ViBe creative District Executive Director:
Ms. Kate Pittman

Mr. Jeremy Maloney

Altruistic Design Architect:
Mr. Jeremy Maloney

Mr. Brian Turner

Clark Nexsen Mechanical engineer:
Mr. Brian Turner

MILLENNIAL VILLAGE  . Our Vision

STAKEHOLDER ENGAGEMENT
MARKETABILITY: the ViBe Creative District
“The Virginia Beach MSA has the highest percentage of millennials of any metro area in the country, according to Forbes”
VILLAGE CONCEPT

- 17TH STREET ENTRANCE (FUTURE PEDESTRIAN CORRIDOR)
- CENTRAL GATHERING SPACE
- RAISED COMMUNITY GARDEN BEDS
- RAIN GARDEN AND BOARDWALK BRIDGE
- COMPOST
- ELECTRIC CAR CHARGING

MILLENNIAL VILLAGE . Architecture
5 HIGH CUBE CONTAINERS
EXTERIOR FEATURES

- COVERED DECK
- SHADING DEVICES
- PROTECTION OVER EVERY WINDOW & DOOR
- PRIVATE ENTRY
- ADJUSTABLE CANVAS SHADE
- OUTDOOR DECK
- PUBLIC ENTRY
Climate zone 4A (mild and humid)
“As all Canadian children do, when it gets cold, we pull the sweaters over the outside of us. We don’t eat them, shove them into our ribs. So you have to decide you want to be a sweater wearer rather than a sweater eater”.

Joe Lstiburek, Building Science Corp.
Humans use clothes to keep themselves warm—and they need even more layers of clothing the colder it is. Clothes form a thermal barrier between our warm bodies and the cold weather, preventing heat from escaping. Other mammals have developed natural barriers to trap body heat, allowing them to survive in cold climates.

WALL SECTION DETAILS

MILLENNIAL VILLAGE: Energy Performance

INSULATION R-VALUES

- 2x4 STUD
- CELLULOSE INSULATION
- POST BAR
- CORRUGATION
- 2x6 WOOD STUD
- 6" CLOSED CELL SPRAY FOAM
- U-.28
- CORRUGATION
- 6" METAL STUD
- 6" CELLULOSE INSULATION
- 5" PLUNEM
- BAMBOO FLOORING
- 6" METAL STUD
- 6" CLOSED CELL SPRAY FOAM
- 3" ROCKWOOL INSULATION
- CLOSED CELL SPRAY FOAM
- R-48
- R-24
- R-47
NEW PLYWOOD SUBFLOOR CUT BACK FROM PERIMETER TO ALLOW FOR 2” OF CONTINUOUS INSULATION

SHEET METAL WINDOW BOX TO SHIELD WELDED INTO EXTERIOR STEL CORRUGATION

CONSTRUCTABILITY
CONSTRUCTABILITY
SIMULATION OUTCOMES

MILLENNIAL VILLAGE: Energy Performance

BEoptim

HOT WATER: 4.6 MMBTU
HEATING: 1.3 KBU
COOLING: 9.4 MMBTU
FAN: 0.8
LIGHTING: 2.7 MMBTU
LIGHTING APPLIANCES: 5.8 MMBTU
VENT FAN: 1.7
MISC: 7.3 MMBTU

SITE ENERGY: 33.6 MMBTU or 21 kBTU/SF/YR

TARGET SITE ENERGY: 35.0 MMBTU or 22 kBTU/SF/YRZ

TRANE TRACE

HEATING: 10.2 KBU OR 10.7 MBH (SEE APPENDIX)
COOLING: 15.6 KBU OR 1.3 TON (SEE APPENDIX)

REM/Rate™

1.4 MMBTU
HERS INDEX w/o PV: 51
HERS INDEX w PV: 0

TARGETED SITE ENERGY:
35.0 MMBTU or
22 kBTU/SF/YR

32.5 MMBTU/YR

HEATING: 11.7 kBTU
COOLING: 14.3 kBTU

ACHIEVED SITE ENERGY:
32.5 MMBTU or
20.3 kBTU/SF/YR

REM/RATE ENERGY SIMULATION
PV SYSTEM AND GRID INTEGRATION
PV ARRAY AND ENERGY GENERATION
HEATING, COOLING & VENTILATING
PLUMBING

TANKLESS HOT WATER HEATER

WASHER & DRYER

WASHER

WATERSENSE TOILET

GREY WATER FOR FLUSH

4” SEWAGE LINE

GREY WATER IN
Population Estimates from the United States Census Bureau

- Population: 450,435 (July 1, 2017)
- Mean price for detached: $360,600 (According to City-Data website)
- Education (high school graduate or higher): 93.4%
- Bachelor’s degree or higher: 34.8%
- Median household income (in 2017 dollars): $70,500
- Mean household income: $89,528
- Family income: $81,730
- Married families: $97,985

FINAL COST ESTIMATE (after review with advisors) = $246,257

COST ESTIMATE
FINAL COST ESTIMATE = **$246,257**

$246,257 @ 1600 SF = $154 per sq. ft.
(lower than median list price per sq. ft. in Virginia Beach = almost 10% lower)

COST SAVINGS OVER 10 YEARS
$28,080 (estimated)

<table>
<thead>
<tr>
<th>Typical</th>
<th>Millennial Village Home</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas</td>
<td>$80</td>
</tr>
<tr>
<td>Electrical</td>
<td>$124</td>
</tr>
<tr>
<td>Sewage</td>
<td>$34</td>
</tr>
<tr>
<td>Water + Storm Water</td>
<td>$100</td>
</tr>
<tr>
<td>Monthly Total</td>
<td>$338</td>
</tr>
<tr>
<td>Annual Total</td>
<td>$4,656</td>
</tr>
</tbody>
</table>

Difference per year
Save $2,808
Tidewater

THE HAMPTON ROADS AREA OF VIRGINIA IS RELATIVELY UNKNOWN NATIONWIDE, BUT IT IS THE REGION WHOSE VULNERABILITY TO SEA LEVEL RISE MOST AFFECTS MILITARY READINESS AND OUR OVERALL NATIONAL SECURITY.

RESILIENCE
Adaptation to Sea Level Rise

The Hampton University Department of Architecture has established one of the first programs devoted to design solutions adapting coastal urban communities to the challenges posed by Sea Level Rise.

An emerging field of inquiry, a knowledge base in and completion of the requirements for a concentration in the field should provide an advantage to graduates seeking employment. Further, as the program is rooted in an active collaborative process with policy makers, area professionals, and engineering students from other state universities, potentially employers will recognize the special skills required for successful collaboration.

Since its Inception, students engaged in the program have been active in community engagement processes, have been invited participants in an international design program, have been speakers before municipal and state officials, and at regional and national conferences.

The Department of Architecture has been named one of six programs nationally to form the National Resilience Initiative, formed by the Clinton Global Initiative and the Rockefeller Foundation’s 100 Resilient Cities program and overseen by the American Institute of Architects.

The concentration is an available addition to the Master of Architecture degree, requiring completion of two courses offered in the Department, one offered by the university’s Marine Science Program, and one offered online by Old Dominion University’s Department of Civil and Environmental Engineering.
**Creative: work + live**

**MILLENNIAL VILLAGE** . Resilience

**Category 1**
- Winds 74-95 mph (119-153 km/h)
- Some damage and power cuts

**Category 2**
- Winds 96-110 mph (154-177 km/h)
- Extensive damage

**Category 3**
- Winds 111-129 mph (178-208 km/h)
- Well-built homes suffer major damage

**Category 4**
- Winds 130-156 mph (209-251 km/h)
- Severe damage to well-built homes, trees blown over

**Category 5**
- Winds 157+ mph (252+ km/h)
- Many buildings destroyed, major roads cut off

**RESILIENCE**
INNOVATION CYCLE

Client
ViBe Creative District
Millennial Site Owners

Port of Virginia

Location

Energy Performance
Net-Zero Container House

INNOVATION

MILLENNIAL VILLAGE . Innovation
DRST motto: “Where dreams and reality sometimes touch” Jay Epstein