PROJECT SUMMARY & DESIGN FEATURES

Through our process and with respect to the surrounding neighbors, we adapted the building's geometry for **passive heating and cooling, developed an airtight and high thermal performative envelope, designed an efficient air conditioning strategy, and facilitated renewable energy generation.** Our design team aimed to achieve an EUI of 30 kBtu before renewables.

High priority is placed on natural daylighting throughout the design, recognizing its effect on both human comfort and well-being as well as reducing lighting loads. Optimal window to wall ratios and shading strategies were determined **through digital design tools** and customized to the building based on relationships to individual spaces.

Our mechanical strategy organizes the building into a series of zones, serviced through a variable refrigerant flow (VRF) system connected to energy recovery ventilators (ERV) and monitored through a smart system. The VRF system will allow for full customization of temperatures per space to accommodate our diverse programmatic needs and offer maximum efficiency, balancing internal loads with the need for conditioning. This system can be used to alternate scheduling for heating and cooling loads, **benefiting the building through energy savings at set times and making up differences in temperature** depending on usage patterns in each space. Additionally, an ERV units will be located in spaces with maximum passive conditioning potential (south side – shaded in summer, exposed in winter), reducing the amount of energy needed to condition recirculating air.

The project takes intentional steps towards respecting the existing community while working towards its overall economic improvement. **The office building aims at meeting the scale of the neighborhood, forming a relationship to the streetscape, a dialouge with the neighboring school and residential homes.**

We recognize that as a model for creating resilient designs we must always be looking at the big picture and considering our building as part of a greater whole; it is simply a single piece in the puzzle. By examining our goals for energy performance, socio-economic impact, and environmental well-being as being intricately tied to one another and to a greater network of systems, **we can design ways in which all aspects function in service of one another rather than at odds.**

GREENHOUSE PERSPECTIVE

TECHNICAL INFORMATION

	INSULATION VALUE	
WALLS	R-52	Prefab strawbale w/ cont. rigid wood fiber ext. insul.
EXT. FLOORS	R-18	4" Rigid stone wool insul R-16
FOUNDATION	R-38	Insulated Concrete Form
ROOF	R-45	8" Stone wool insul. + 3" Rigid wood fiber insul
WINDOWS	U-VALUE .15	Triple pane windows SHGC: Visible light transmitance

RENEWABLES	WATER SOURCED VRF W/ GEOTHERMAL
	ROOFTOP SOLAR PV ARRAY

PROJECT INTRO

Sharswood/Brewerytown

In Philadelphia, just 3 miles north of the city's commercial & civic center, the Sharswood/ Brewerytown neighborhood seems to have been neglected in the booms that have brought vibrant economic renewal to many of the city's struggling districts. The area has long stood as one of the most distressed in the city. Historically plagued by the process of "redlining," in which banks withheld access to mortgages, loans, and ratings from specific neighborhoods based on race and ethnicity.

Today Sharswood is characterized by its massive stock of vacant lots, abandoned commercial corridor, closed schools, and neglected buildings. **With a staggering unemployment rate of 80%, and more than 52.5% of the population living below the poverty line** (double the city average of 26%) it has become increasingly apparent citywide that the community is in desperate need of assistance. [Figure 3]

In response, the Philadelphia Housing Authority (PHA) released a neighborhood transformation plan in 2015 outlining its vision for revitalizing the area, introducing a large amount of affordably rentable building stock. **As PHA moves its plan into action, the strategy has become more and more visible:** take control of all vacant property, and enact eminent domain to gather the remaining "missing teeth", displacing families when necessary to create lot bundles that fit with their prescribed approaches. This strategy, while well intentioned, has since ousted many generational residents and made it increasingly harder for private development in the area. The remaining residents will likely fall victim to property tax increases over the coming years and be forced to relocate or rent.

A NEW DIRECTION

As development and gentrification continue to displace struggling residents within the community, our project focuses on addressing the community's largest and most prevalent needs: **education, engagement, and employment.** Our program proposal looks to facilitate a variety of non-profit organizations in a community sensitive building, transforming the typical office building typology from private work space, to vibrant community hub and resource center.

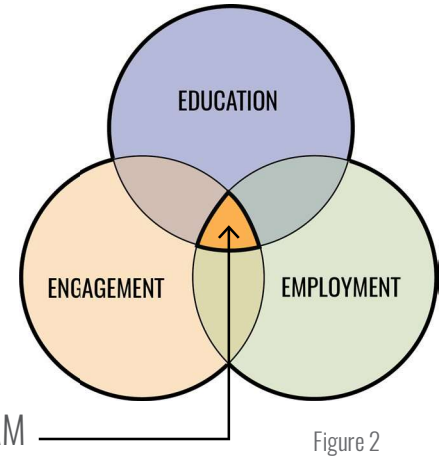
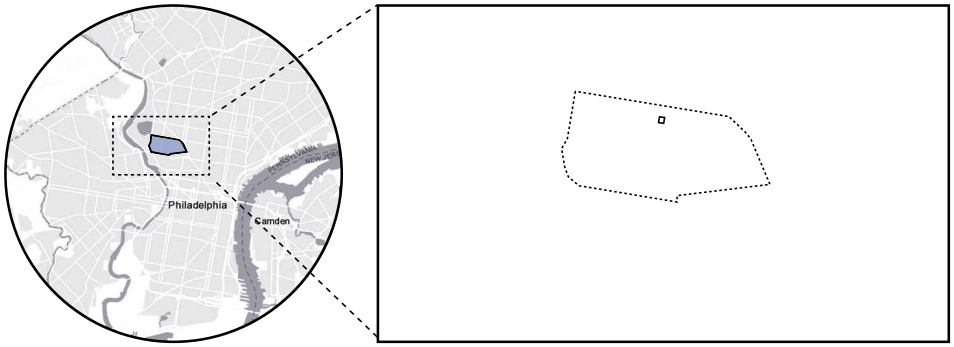


Figure 2

SOURCE: https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF



SITE PLAN

Figure 1

Sharswood is a historic neighborhood within Philadelphia, with over 51% of the current housing built before 1939. **Only 1/4 of the housing is occupied by the property owners, with an addtional 60% considered rental property for tenants.** 80% of occupants live in the same house that they lived in last year, but there are large gaps in price between newer and older rented housing.

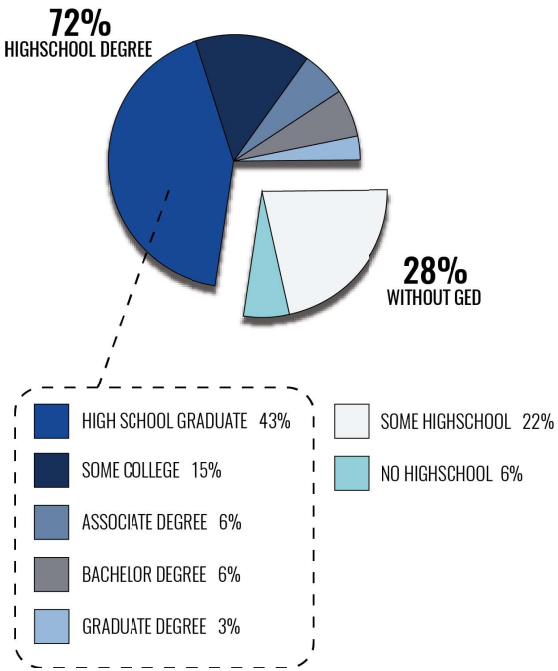


Figure 3 - EDUCATION DEMOGRAPHIC