



SUSTAINABLE DESIGN COLLABORATIVE ATLANTA 2014  
JOLLY AVENUE DEVELOPMENT CENTER



Friends *of* Refugees

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## PARTICIPATING PROFESSIONAL ORGANIZATIONS

American Institute of Architects (AIA) Atlanta Chapter

American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) Atlanta Chapter

American Society of Interior Designers (ASID) Georgia Chapter

Construction Management Association of America (CMAA) South Atlantic Chapter

Construction Specifications Institute (CSI) Atlanta Chapter

International Interior Design Association (IIDA) Georgia Chapter

U.S. Green Building Council (USGBC) Georgia Chapter

PREPARED FOR:

**FRIENDS OF REFUGEES**

DEVELOPED BY:

**SUSTAINABLE DESIGN COLLABORATIVE ATLANTA**



RECEPTION

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# SDCA INTRODUCTION

## Our Vision

In its fourth year as a collaborative effort, Sustainable Design Collaborative Atlanta, formerly Red and Green Scene (R+GS) Community Outreach Committee, continues to follow its vision to enhance communities by providing equal access to cross-disciplinary sustainable design solutions.

## Our Mission

To provide a means for pooling talent, sharing ideas, and developing programs for the betterment of the community.

## Who We Are

We are a non-profit volunteer driven organization with our members representing eight diverse building community organizations. Each member is a sustainable-minded professional. We are connected by our desire to provide professional design services to the 99% of the human race that does not normally have the opportunity to fund these types of services. We began in 2010 and complete one pro-bono project each year. Each of our organizations are represented at the annual Red and Green Scene Holiday Fundraising event. Currently, this event provides all of our funding.

## What We Do

Our cross-disciplinary approach focuses on bringing holistically integrated design solutions to organizations with sustainability and community enhancement driven missions.



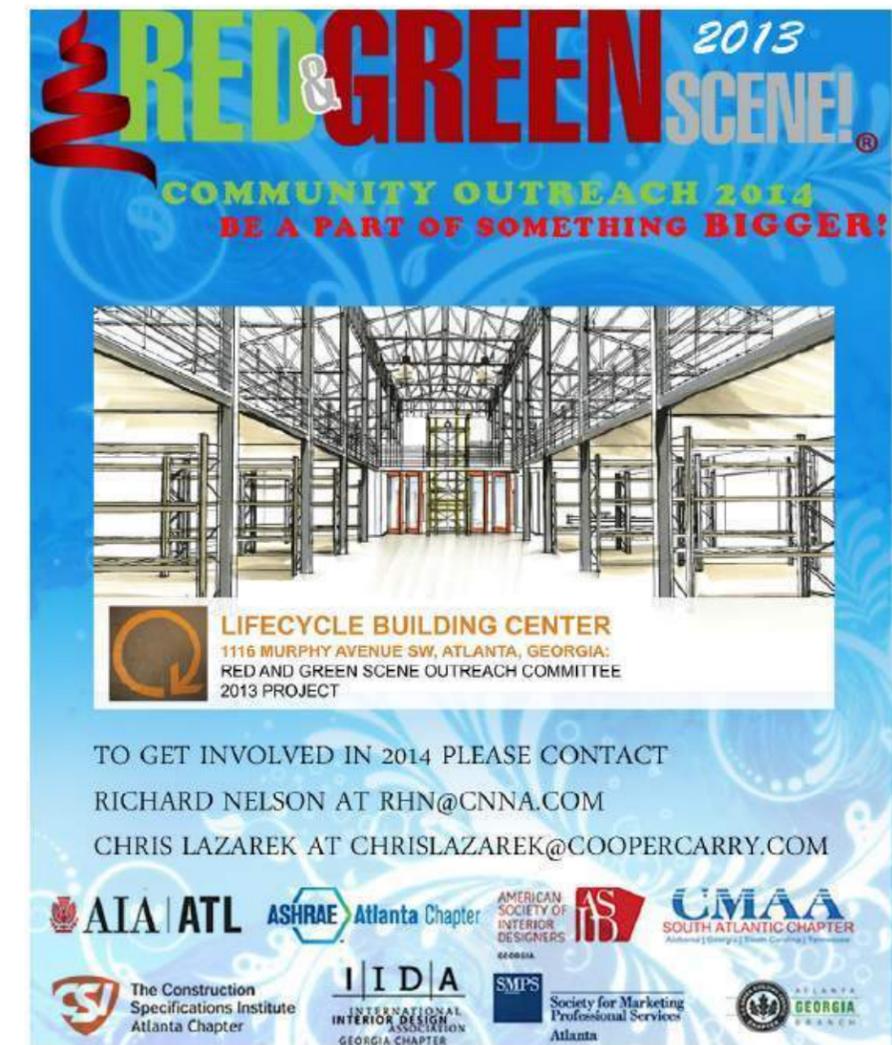
## From Celebration to Service

Red and Green Scene Holiday Party 2014 gathered participants of seven organizations from Atlanta's sustainable and design community, including members of the American Institute of Architects (AIA | Atlanta), Atlanta Chapter of the American Society of Heating Refrigeration and Air Conditioning Engineers (ASHRAE), Georgia Chapter of the American Society of Interior Designers (ASID), South Atlantic Chapter of the Construction Management Association of America (CMAA), Atlanta Chapter of the Construction Specifications Institute (CSI), Georgia Chapter of the International Interior Design Association (IIDA Georgia), and the Georgia Chapter of the United States Green Building Council (USGBC). While the celebration takes place in one night, the service has just begun. An annual service project is supported by proceeds from the industry's annual Red and Green Scene (R&GS) end of the year holiday celebration, in addition to volunteered professional services from R&GS member organizations.

This year, Sustainable Design Collaborative Atlanta gathered once again to give back to the community. The organization elected to work on a project for the good of the city of Atlanta, it's refugees, and the Clarkston community located near the Atlanta Metro Area, by adopting the Jolly Avenue Development Center (JADC) as its 2013-2014 service project.

JADC is the brainchild of the non-profit organization called Friends of Refugees (F.O.R.) to provide critical, programmatic, and support service spaces for the refugees who settle in this area.

This project includes an evaluation of the building/site and the development of a report that will indicate recommendations, through design development phase of the building, for sustainable use as well as plans to make it the first building in Georgia to meet the Passive House commercial green building certification. Recommendations and plans have been proposed for the site and building to provide connectivity to the surrounding community, and to make it a thriving center for refugees to learn, work, and grow together to thus become flourishing, contributing members of the community.



## F.O.R. HISTORY



CLARKSTON, GA

Every year, thousands of refugees are formally welcomed to the United States, carrying dreams of a better life and the desire to escape political, religious and ethnic persecution, or the violence of war within their home country. In the early 1990's, refugees began to be resettled in the community of Clarkston, GA, a small town located near metro Atlanta. During this time, the population of Clarkston grew 34% as refugee families from over 150 different ethnic groups found a supportive urban environment for development and growth. Since this process began, some 60,000 refugees have begun their journeys as New Americans in this area. With so many ethnic groups represented within and around the city, Clarkston has been called "the most diverse square mile in America" by *The New York Times*. As the refugee population in Clarkston grew, the need for specialized human support service organizations became apparent. Friends of Refugees (F.O.R.) was founded in 1995 for this purpose by Pat Maddox, a resident of Clarkston, full-time volunteer and current active Board member. In 2005, FOR became an official non-profit organization whose mission is "to empower refugees through opportunities that provide for their well-being, education and employment." The program areas are designed to serve the needs of refugees through its workers, volunteers, and support services.

**"Refugees experiencing Abundant life in Flourishing Communities"**

These programs include: After School Tutoring, Café Clarkston (employment assistance and job training), The Jolly Avenue Community Gardens, Embrace (pregnancy care for expectant mothers), Children's Summer Camp, Food and Clothing Distribution, Mommy & Me Family Literacy, and the Refugee Sewing Society.

In 2013, FOR's supporters gave more than 50,000 volunteer hours to serve over 2,000 individuals across the program areas. These program support services have provided hundreds of job placements, over 7,000 meals served in our kids' summer camp, hundreds of moms and kids learning English together, dozens of babies born to healthy moms and over 70 family kitchen tables filled with fresh produce from their plots in our community gardens. The Atlanta Magazine has featured FOR and our founder Pat Maddox (the "Mother Teresa of Clarkston") for such work, but much still needs to be done to empower the refugees who are welcomed each year to our local community.



## CLIENT FACILITY GOALS

After over a decade of strong growth for Friends of Refugees and a desire to better serve the community in Clarkston, the idea for the Jolly Avenue Development Center (JADC) arose as a way to more sustainably provide space for critical programmatic and community development services. The JADC is located just outside the City of Clarkston in unincorporated DeKalb County, at the site of Friends of Refugees' (FOR) existing family community gardens, which will be a part of the new site.

The JADC will benefit the entire neighborhood, but with more than 100 ethnicities within a few minutes' walk of the site, it predominantly serves refugees resettled in the USA from areas of the world where they have endured abject poverty, religious or political persecution, violence and war. These refugees now have an opportunity to build a better life in America, but they have significant opportunity and empowerment needs. Language and cultural barriers leave them vulnerable to isolation from mainstream American culture and safety nets.

Through multiple years of community research, the JADC's uses have been carefully designed not to replicate existing resources in the neighborhood of South Jolly Avenue. The JADC focuses primarily on functions that emphasize economic uplift, opportunity, innovation and well-being; it does not endeavor to host major events, weddings, or arts and recreation, among other things. Rather, it hopes to form an integral part of the community development keys that are unlocking the potential already present in the community.



The objectives of the JADC are first and foremost to support FOR in its charitable mission. The JADC will be a place that is inviting and welcoming to the immediate area's residents. With abundant outdoor spaces, family community gardens, shaded porches, an accessible streetscape of edible landscaping and public benches, the JADC will create space in which the residents of this diverse neighborhood can safely share life together. The center features groundbreaking innovation in affordable environmental design and construction. The building itself will be Georgia's first Passive House Institute of the United States (PHIUS) certified commercial green building, in addition to possible LEED certification, with annual operating costs up to 90% lower than a standard building, without added cost over standard construction. This kind of building will allow FOR to focus donors' resources on community impacts, not capital upkeep, and provide a building that is readily self-sustaining. This is a significant and important investment in the local community that also will serve as a national model for innovative environmental design, construction and mixed-use private sector development opportunities. While recently popular in some residential applications in the South, Passive House has only become affordably viable in high latent humidity environments for commercial buildings in the past 5-10 years. The JADC seeks to promote well-being, education and employment by being a space where residents can find what they need to become flourishing, contributing members of the community. There will be offices which can be rented by emerging social businesses that support the mission of FOR. Some likely tenants include:

- A local housekeeping service that employs neighborhood residents
- A speech pathology practice that specializes in accent-reduction classes for New Americans
- A remodeling service that grows a skilled workforce while helping properties get grants to perform cost-of-living reducing and quality-of-life enhancing 'green' renovations
- Office space for refugee entrepreneurs in partnership with business development programs

The community gardens will remain on the site, enhanced by rainwater collection from the rooftop and by the availability of a catering kitchen for processing fresh produce into several community markets.

Onsite hospitality services and temporary accommodations (14-day max) will be provided by the full-time caretaker-in-residence. Populations served include:

- Refugee families in the process of "out-migration" with their initial resettlement agency
- Volunteer teams from universities and other organizations around the country, who currently must commute here from distant housing

The JADC will also provide much-needed additional space for small meetings and gatherings, including:

- Family literacy and afterschool programs
- Trauma counseling and marriage/family therapy
- Healthy pregnancy and birthing classes
- Office and meeting space for non-profit organizations
- Small religious services and cultural gatherings
- A catering kitchen for growing catering services and for the community gardeners

Because of its uniqueness in environmental design and construction, the Center will serve as a Science, Technology, Environment, and Math (STEM) fieldtrip site for the neighborhood's schools, and as a technology research site for partnering universities and organizations. This showcasing of the Center will foster interest in the sciences, appropriate technology, design, construction and ecology, giving the community's children opportunities to build their own futures in these vocations. The Center will be a place where both students and teachers can enjoy year-round field trips that enrich such learning and bring them into creative contact with other communities that can fuel their interest, including companies that make possible vibrant careers right here in DeKalb county.

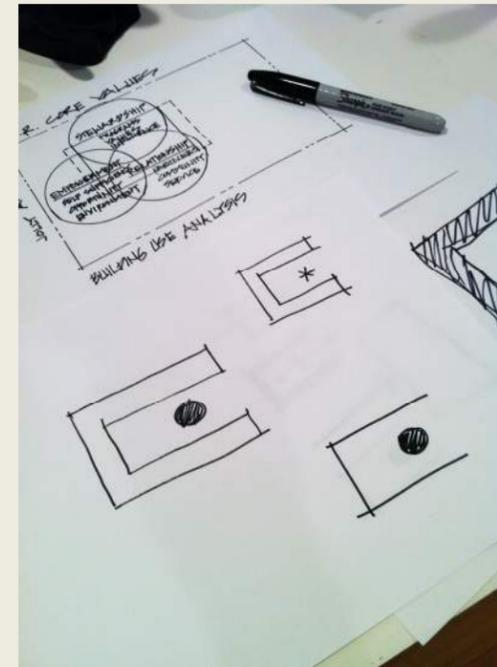
# PROCESS: CLIENT SELECTION & CLIENT MEETING

## The Client Selection

2014's collaborative effort began with four strong project candidates. This can be attributed to the strong finish and sustained growth from last year's association with the Lifecycle Building Center. This year's prospective clients ranged from groups associated with the Atlanta Beltline, to urban agriculture, to a well-established group serving the under-privileged in the wake of the Stadium changes. However, it was the Friends Of Refugees (F.O.R.) that captured Sustainable Design Collaborative Atlanta's (SDCA) attention due to their spirit and attitude. The fact that they were highly organized and well prepared, provided a complete picture of the project at hand, owned the site and had received their zoning permit, and were extremely interested in using the Passive House Institute guidelines set them apart. The Friends Of Refugees offered SDCA an opportunity to serve the community with immediate impact.

## Client Meeting & Site Visit

The initial meeting with Executive Director Brian Bollinger and his team was almost as exciting as reading their proposal. His board of a wide range of community invested players drove home the ever growing need and the groundswell of optimism that was energizing for our team. Brian shared their story, their history, their challenges, and their goals. These culminated in hard work that paid off in good fortune with local vendors and favorable zoning considerations from the local agencies. Most importantly, SDCA heard from the Architect and Engineering team about their design guidelines for the property as well as the consultants who advised us on Passive House and its associated characteristics.





## PRE-CHARETTE

### F.O.R. Mission Statement

To empower refugees through opportunities that provide for their well-being, education and employment

### Vision Statement

Refugees Experiencing Abundant Life in Flourishing Communities

### Core Values

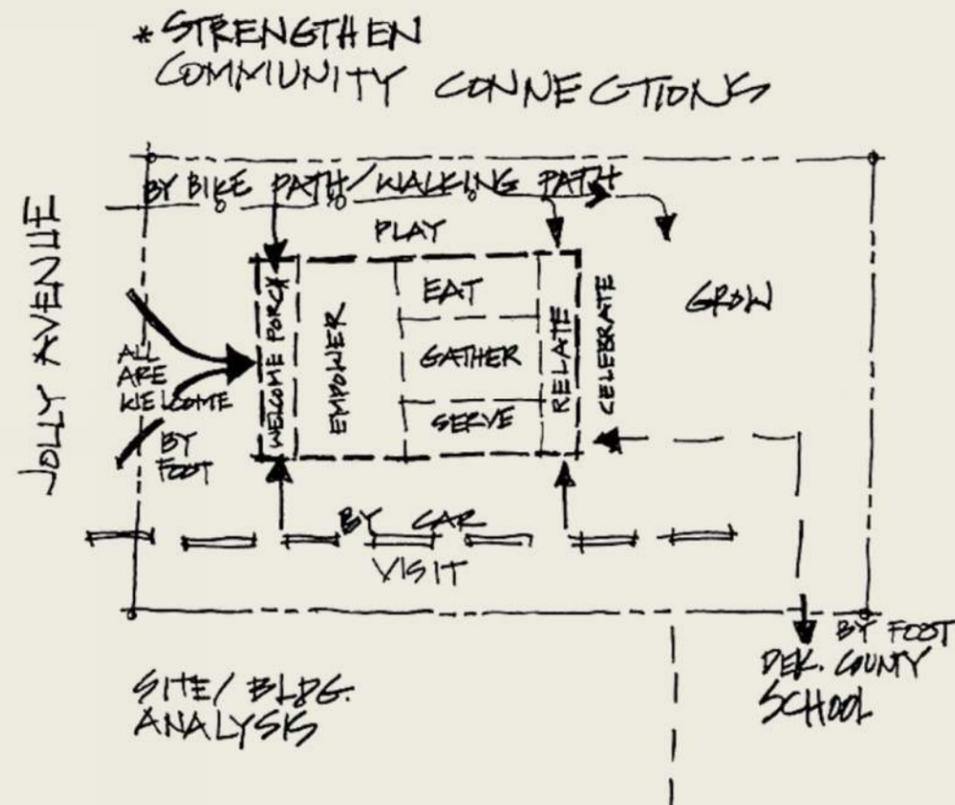
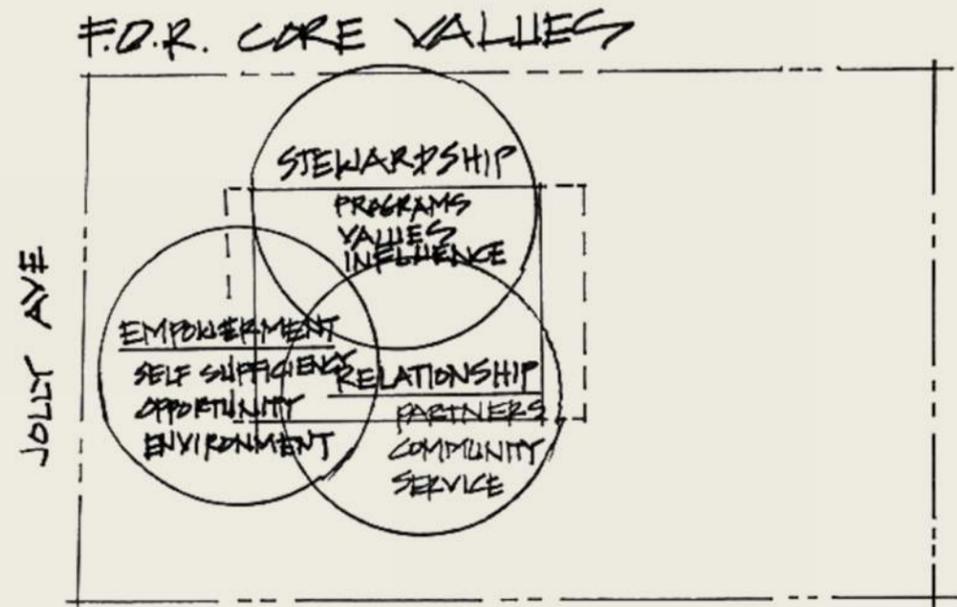
Partnership, Empowerment and Stewardship

### Project Goals

- Design system to produce a zero water runoff on site in a 100 year storm. Design to provide irrigation for onsite gardens.
- Provide a design that utilizes an onsite septic tank to handle all sanitary waste using a permeable site drainage.
- Solve the interior design puzzle of proving the material re-use stream of Life Cycle Building Center.
- Design both the interior and exterior of the JADC to be a walkable STEM field trip site and support a pedestrian-friendly neighborhood.
- Provide a design for the envelope that marries with the open format to host multiple occupancy classifications at widely varied usage levels.
- Build a network and case for support by Georgia/Regional industry partners who manufacture and install the products necessary to complete the project.
- Design roof and DC electrical systems to optimize solar PV for the building's power.
- Build a network and case for charitable support by Georgia/ Regional industry partners who manufacture and install the products necessary to complete the project.
- At the confluence of all these factors, create a readily scalable and marketable building process and an industry team that can deliver PHIUS commercial buildings at less than or parity with code-built construction costs.

**T**his year's Pre-Charette had a different flow to it than in years past. It was good in that, a project with different constraints will sometimes bring a different creativity to the forefront. We had a strong participation from our partner organizations as well as SCAD students. This led to good collaborative discussion and real problem solving. What we did not have to do is develop a new mission and vision statement or project goals. Friends Of Refugees did all of that for us on the front end and we found their effort to be direct, complete, concise, and well thought out.

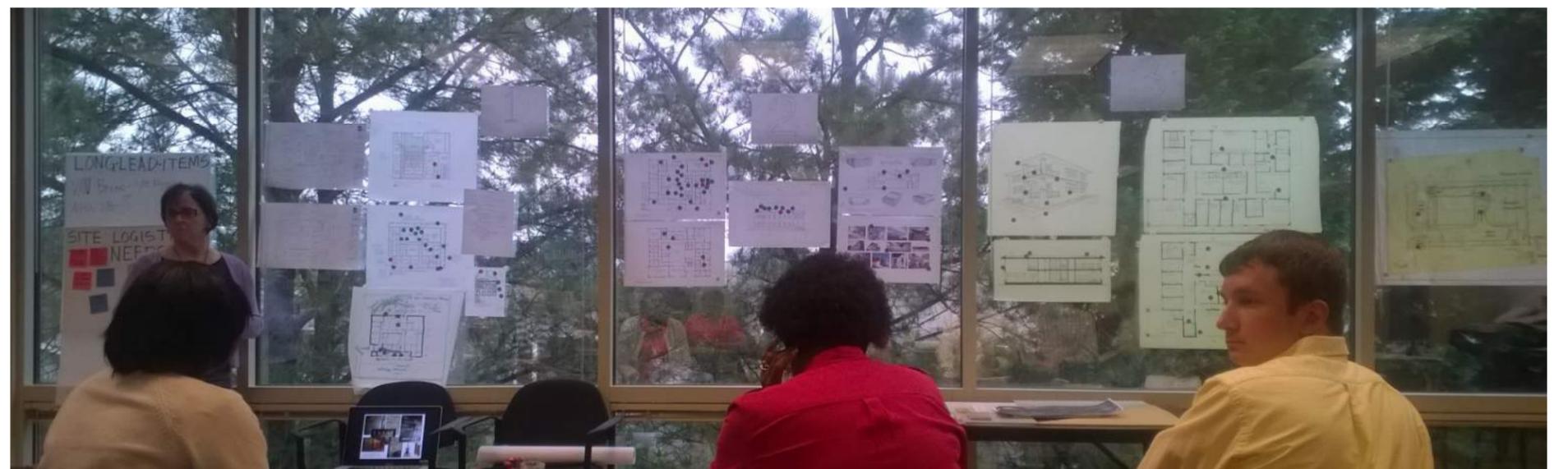
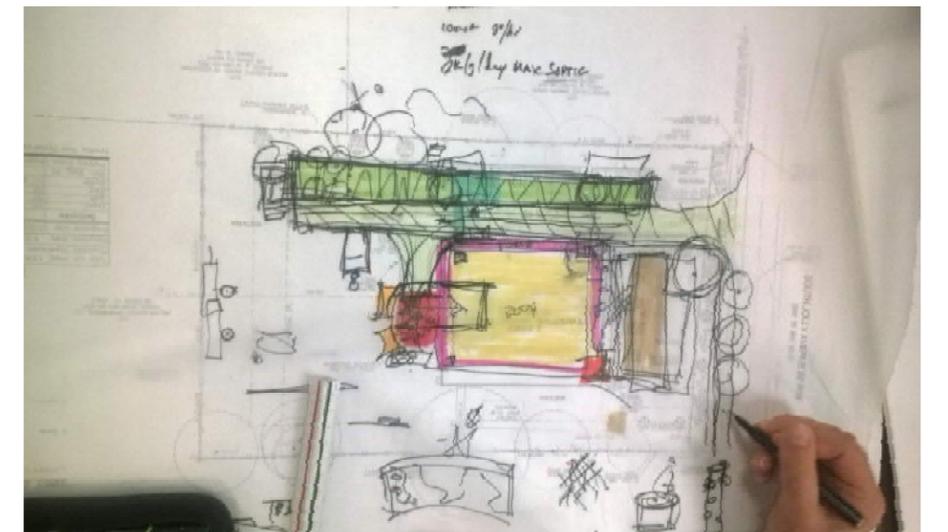
## CHARETTE AND THE CONCEPT



This year's Charette was held at the offices of J.E. Dunn Construction. A nine-hour design effort, the group worked in three teams to break down and solve the eight project goals while working under the mission and vision statements. We leaned on our strongest fields of expertise and broke out into three teams: Building systems and design, Interiors, and Site Development. The building systems team had the task of incorporating all of the Passive House Institute requirements and how to do that with efficiency and economy. The Interiors team had to develop that space into something functional, flexible, warm and inviting, yet professional and secure. The Site development team had to make the most of a small site while maximizing sustainable practices and features.

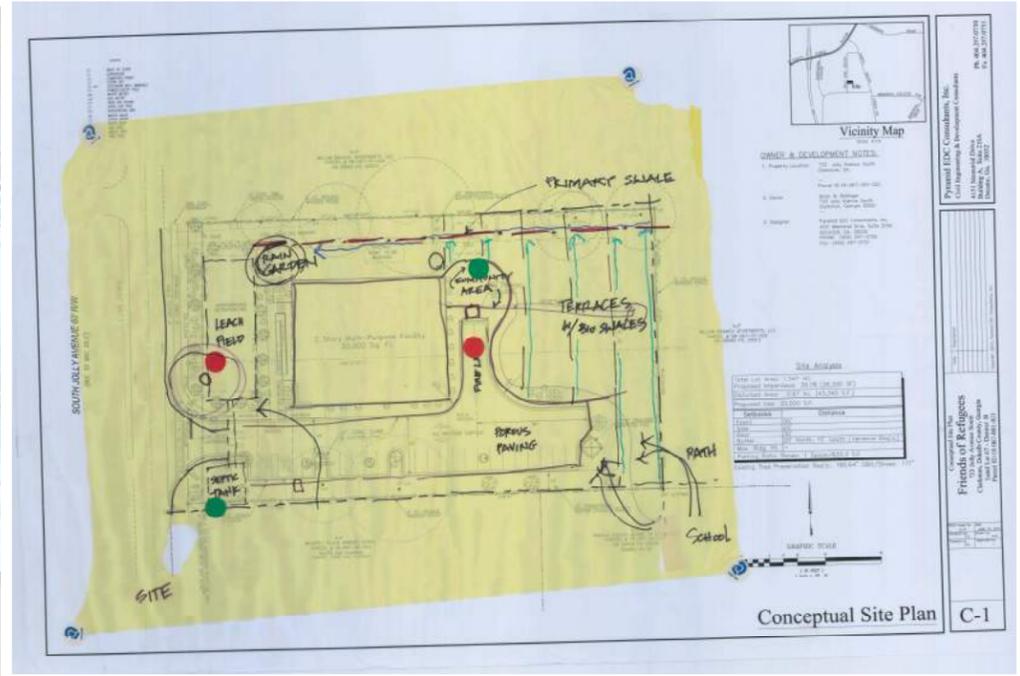
Starting with the F.O.R. values, the analysis process began by overlaying these with the building floor-plate, emphasizing the key words for each value of empowerment, stewardship, and relationship. The three circles overlap where the multi-purpose space will be located. The functional spaces create a U around this focal area, which opens to the gardens at the rear of the site. In order to strengthen community connections, a long front porch and rear porch are added, with business areas towards the front of the building, and community areas near the gardens. The care-taker is strategically located at the south-east side of the building, providing "eyes" over the parking lot and gardens while giving the residents warm eastern light in their home. The care-taker's space is designed with an accessible bedroom on the first floor. Business areas located along the front and parking areas help to empower residents, while multi-purpose areas can be joined for gatherings, community meetings, and celebrations.

The outcome is a building that will be a true community addition, putting in place of the old drug house a new space that can serve multiple needs and various groups at the same time. The open floor plan will allow flexibility end to end and the colors and materials selected will allow future partnering with the Lifecycle Building Center as their needs grow and change. The building systems will be almost self-sustaining and set the example as they work to accomplish the goal of being certified as a Passive House. The site will offer the same types of amenities, from access by the public to the gardens to the use of water detention, storage and reuse techniques. This will truly be a place everyone in the community can be proud of.



# SPACE REQUIREMENTS

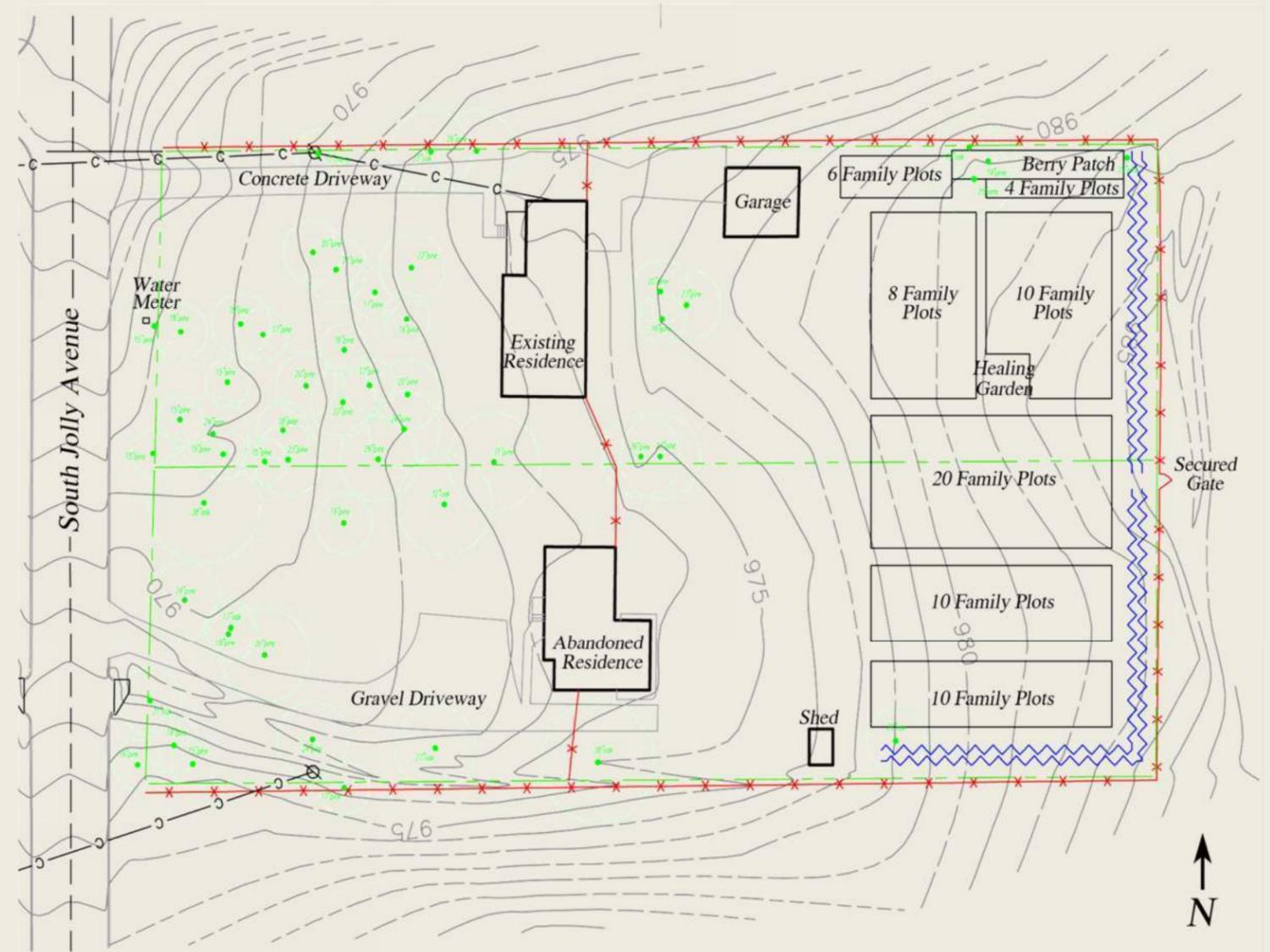
COMPANY NAME:							
CURRENT SPACE REQUIREMENT						GENERAL NOTES	
Ref	Room Name	Space Type	Size/SF	Occupants	Quantity	NET SF	
<b>1. Reception, Office, Counseling &amp; Programs</b>							
	Covered Entry (Canopy)		100	0	1	100	
	Entry Vestibule		64	0	1	64	
	Reception & Waiting		200	8	1	200	Reception counter and seating for 8
	Office for Rent	Private Office	160	1	2	320	Desk, Credenza and Shelving
	Speech Therapy	Private Office	160	2	1	160	Office with small sitting area
	Wellness Clinic	Private Office	160	2	1	160	
	Flexible Work Area/Board Mtg Room	Work Stations	350	16	1	350	Modular moveable tables and chairs
	Friends of Refugees Office	Private Office	225	2	1	225	2 work stations
	Personal Counseling	Private Office	176	2	2	352	Office with small sitting area
	Counseling Center Group	Shared Office	350	4	1	350	4 work stations
	Intern Office / Adult ESL	Shared Office	330	4	1	330	4 work stations
	Adult ESL / Afterschool Prgm	Seminar Room	160	6	2	320	Conference table with seating
	Large Adult ESL / Afterschool Prgm	Seminar Room	240	10	1	240	Conference table with seating
						<b>NET SF Subtotal</b>	<b>3171</b>
						<b>Circulation/Walls (45%)</b>	<b>1427</b>
						<b>Gross SF</b>	<b>4598</b>
<b>2. Group Training Area</b>							
	Multi-purpose Room	Moveable Seats	1485	99	1	1485	
	Pregnancy/Newborn Class Area	Moveable Seats	725	48	1	725	Group mtgs and multi-purpose overflow
	Group Meeting	Moveable Seats	440	29	1	440	Group mtgs with break counter, sink, refrig.
	Outdoor Small Group Meeting		330	22	1	330	Balcony or Terrace
						<b>NET SF Subtotal</b>	<b>2980</b>
						<b>Circulation/Walls (45%)</b>	<b>1341</b>
						<b>Gross SF</b>	<b>4321</b>
<b>3. Food Prep and Service</b>							
	Serving Kitchen		225	0	1	225	
	Lunch Room		550	36	1	550	
	Garden Processing		225	0	1	225	
						<b>NET SF Subtotal</b>	<b>1000</b>
						<b>Circulation/Walls (45%)</b>	<b>450</b>
						<b>Gross SF</b>	<b>1450</b>
<b>4. Residential</b>							
Caretaker Residence							
	Living/Dining Combination		375	6	1	375	
	Kitchen		200	0	1	200	
	Laundry Closet		20	0	0	0	
	Bedroom		150	0	3	450	Clothes closet in each bedroom
	Bathroom		60	0	0	0	One accessible from living area
	Storage Closet		50	0	0	0	
	Loft		290	0	1	290	
	Volunteer/Refugee Overnight Stay		160	6	3	480	Clothes closet in each bedroom
	Mens Toilet & Shower Room		250	0	1	250	
	Womens Toilet & Shower Room		250	0	1	250	
						<b>NET SF Subtotal</b>	<b>2295</b>
						<b>Circulation/Walls (45%)</b>	<b>1033</b>
						<b>Gross SF</b>	<b>3328</b>
<b>5. Building Support</b>							
	Mens Toilet		200	0	1	200	
	Womens Toilet		200	0	1	200	
	General Storage		200	0	1	200	
	Audio Visual Storage		120	0	1	120	
	Bike Storage		100	0	1	100	
	Custodial Rooms		50	0	2	100	
	Telecom and Data		50	0	1	50	
	Elevator		60	0	2	120	
	Mechanical		500	1	2	1000	
	Electrical		150	1	1	150	
						<b>NET SF Subtotal</b>	<b>2240</b>
						<b>Circulation/Walls (45%)</b>	<b>1008</b>
						<b>Gross SF</b>	<b>3248</b>
						<b>Total Net Area</b>	<b>11686</b> 69%
						<b>Total Circulation Area</b>	<b>5259</b>
						<b>Total Gross Area</b>	<b>16945</b>



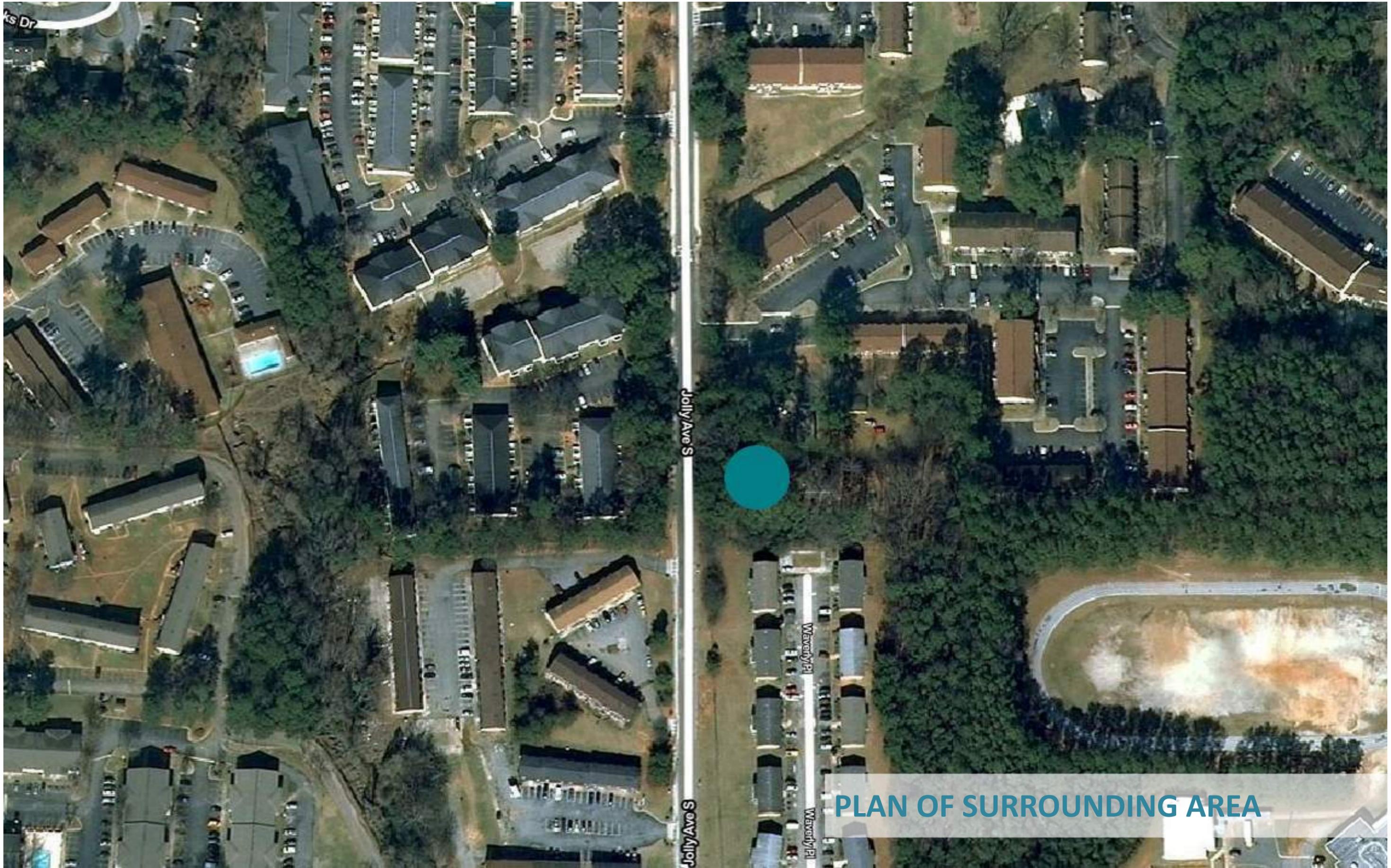
# SITE PROPOSAL

In keeping with Friends of Refugees' (FOR) core values of Partnership, Empowerment and Stewardship, our plans to construct a sustainable center (the Jolly Avenue Development Center) epitomizes FOR's conviction that we should design and build in a way that lowers operating costs; dramatically reduces the waste sent to our landfills; enhances and protects biodiversity and the ecosystem; conserves our energy and water; provides environmental education and training opportunities; helps the local economy through job upgrading and entrepreneurship; comprehensively increases the value of our neighborhood; and creates the healthiest possible environment for visitors and guests to the JADC.

The site development team particularly embraces these values and goals in developing our ideas for the JADC site development. Three of the eight JADC goals have been incorporated in this design along with other sustainable ideas and suggestions. Due to our analysis of the site we determined the locations for the parking lot, handicap parking, location of the playground and the leach fields. The viaduct and bog swales were previously detailed per the Dekalb County approved site layout for the building and the gardens. The handicap parking was located to avoid crossing traffic and creating extensive ramps to access the entrance to the building.



## EXISTING SITE PLAN



# SITE GOALS

## Goal #1

Solve the landscape architecture and civil engineering puzzle of how to affordably infiltrate a 100-year rainfall event on-site (approx. 48Kgal) and achieve a zero-runoff, low-impact site plan, allowing us to seek a full waiver of storm water impact fees from the county, while also providing the irrigation for our 70 family community garden plots (already in their 6th growing season) and achieving a reduction in net site impermeability upon completion.

In collaboration with the exterior team design for the roof and the existing site topography, a collection viaduct extends from the building to a cistern located along the east and southern ends of the site and then through the a series of bog swales. As the water travels through the bog swales the water collects nutrients from the decaying wood and organic matter. The water from the roof mainly will feed the collection system which feeds a large capacity underground storage tank that will serve as the water for gardens. The other potential pervious surface will be the drive way utilizing concrete grass pavers.

The plan utilizes grass pavers for the car parking. The driveway entrance, the handicap parking spaces, the remaining areas of the drive and fire truck turnaround will be concrete grass pavers allowing the water to soak into the ground and remain on site and provide support for vehicles. The dumpster is located in the corner of the drive with a fruit tree bosque on one side and pallet racks with vegetable plants growing inside the pallets.

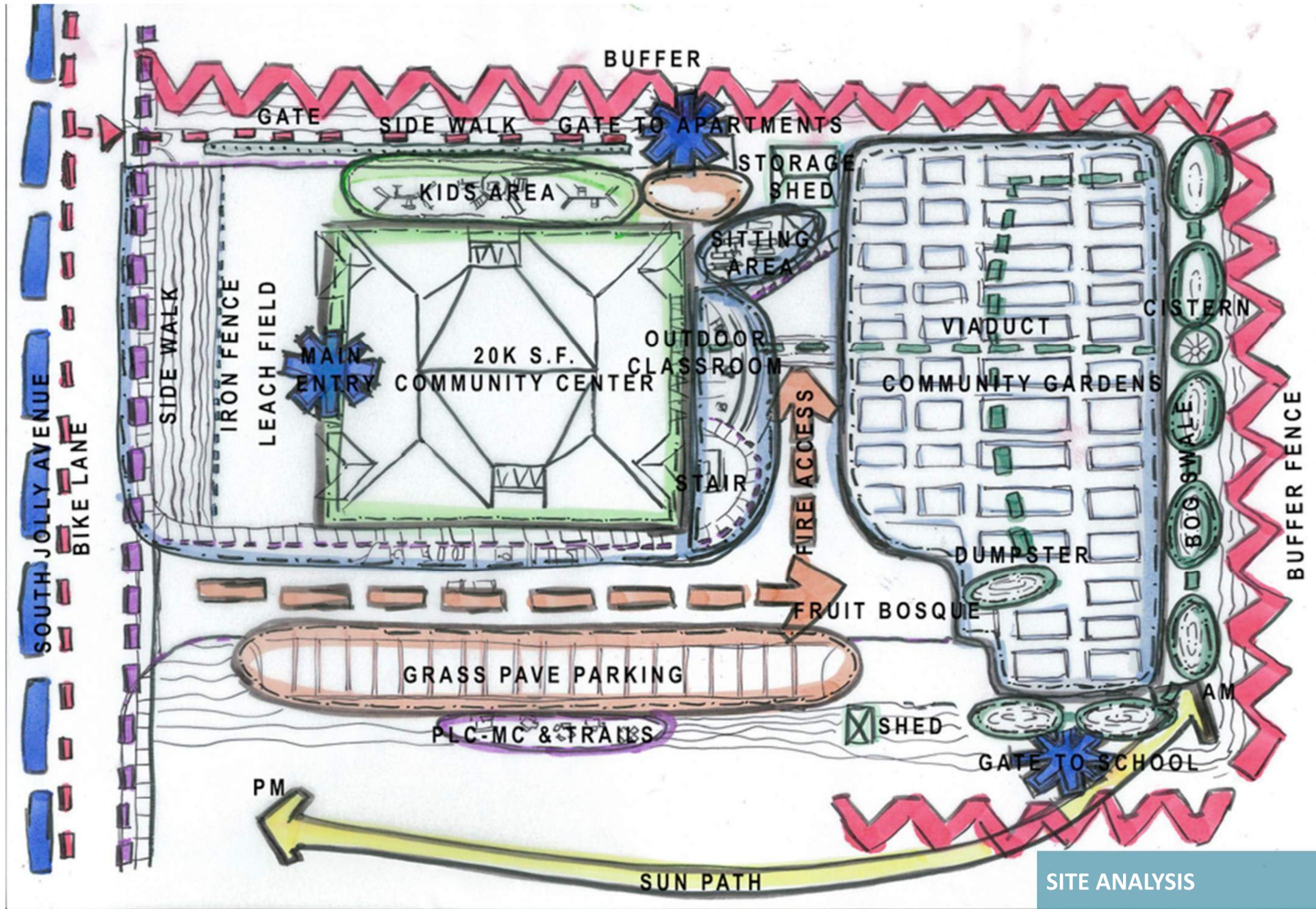
## Goal #2

Provide a design that utilizes an onsite septic tank to handle all sanitary waste using a permeable site drainage. Because the distance to the nearest sewer line is cost prohibitive to connect the JADC, a properly sized septic tank with a leach field will be utilized. This will aid in the reaching the goal of handling all sanitary waste onsite and utilizing a permeable site drainage.

## Goal #3

Design both the interior and exterior of the JADC to be a walkable STEM field trip site and support a pedestrian-friendly neighborhood. In an effort to create a tie with the interior multipurpose room and the outside, an outside classroom is created with logs cut as seats in an area outside of the multipurpose room that will allow a meeting, class or conference to extend outside weather permitting. On the North side of the site areas have been designated as the playground areas for the kids. This area was selected because of the close proximity to the multipurpose room and the classrooms to allow the parents to stay in visual contact with the children as they play and also keeps them at a safe distance from the gardens. Entrances in the fences will be strategically placed to allow access to the site for STEM trips and neighborhood interaction but provide protection to the gardens and the occupants of the JADC.





SITE ANALYSIS

# RENDERED SITE VIEWS



RENDERED ENTRY AXON



RENDERED PEDESTRIAN ENTRANCE



RENDERED SITE AXON



RENDERED GARDEN AXON



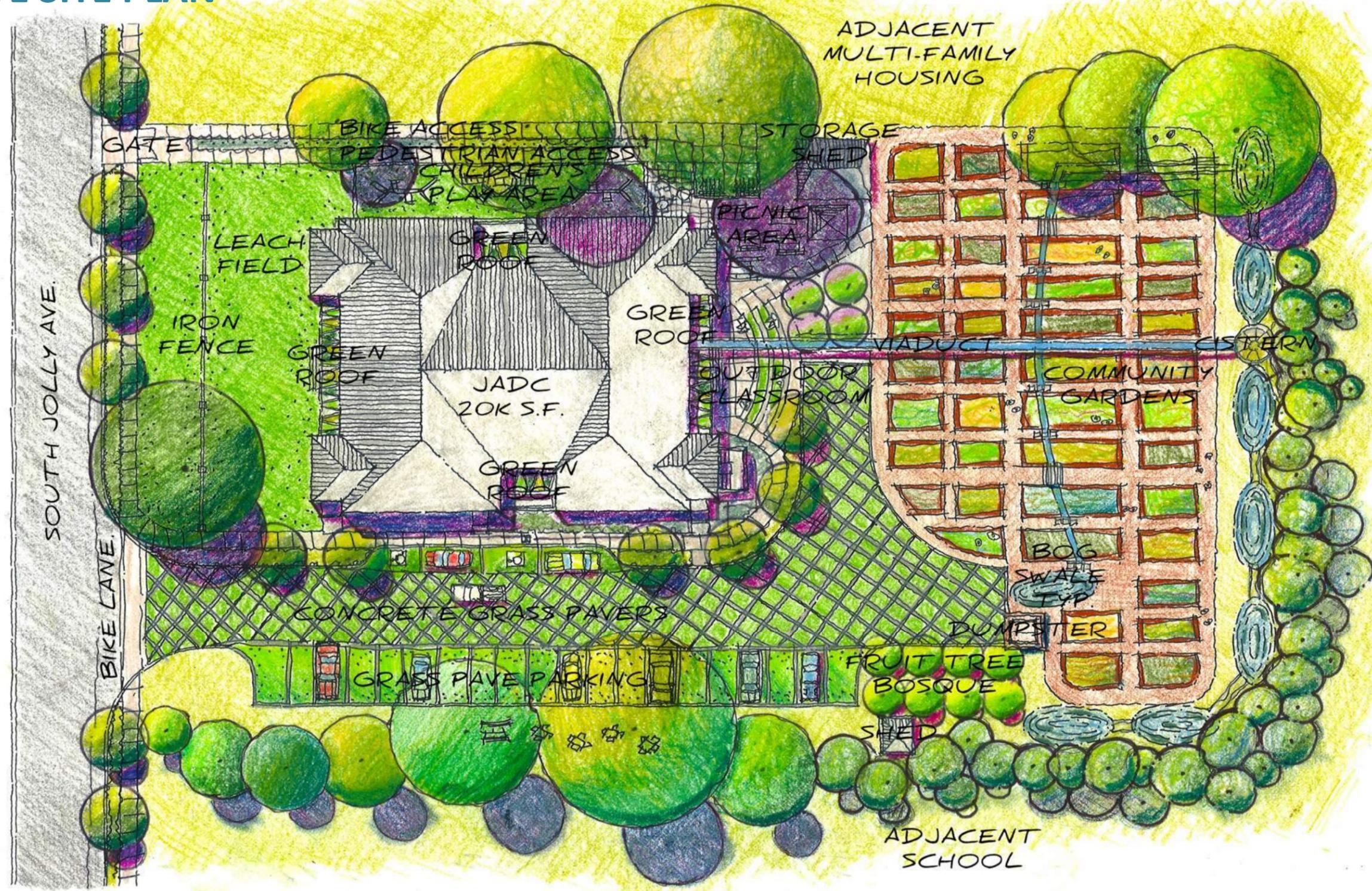
RENDERED SITE AXON



"A Brighter Future Together!"



# ILLUSTRATIVE SITE PLAN



# BUILDING ENVELOPE





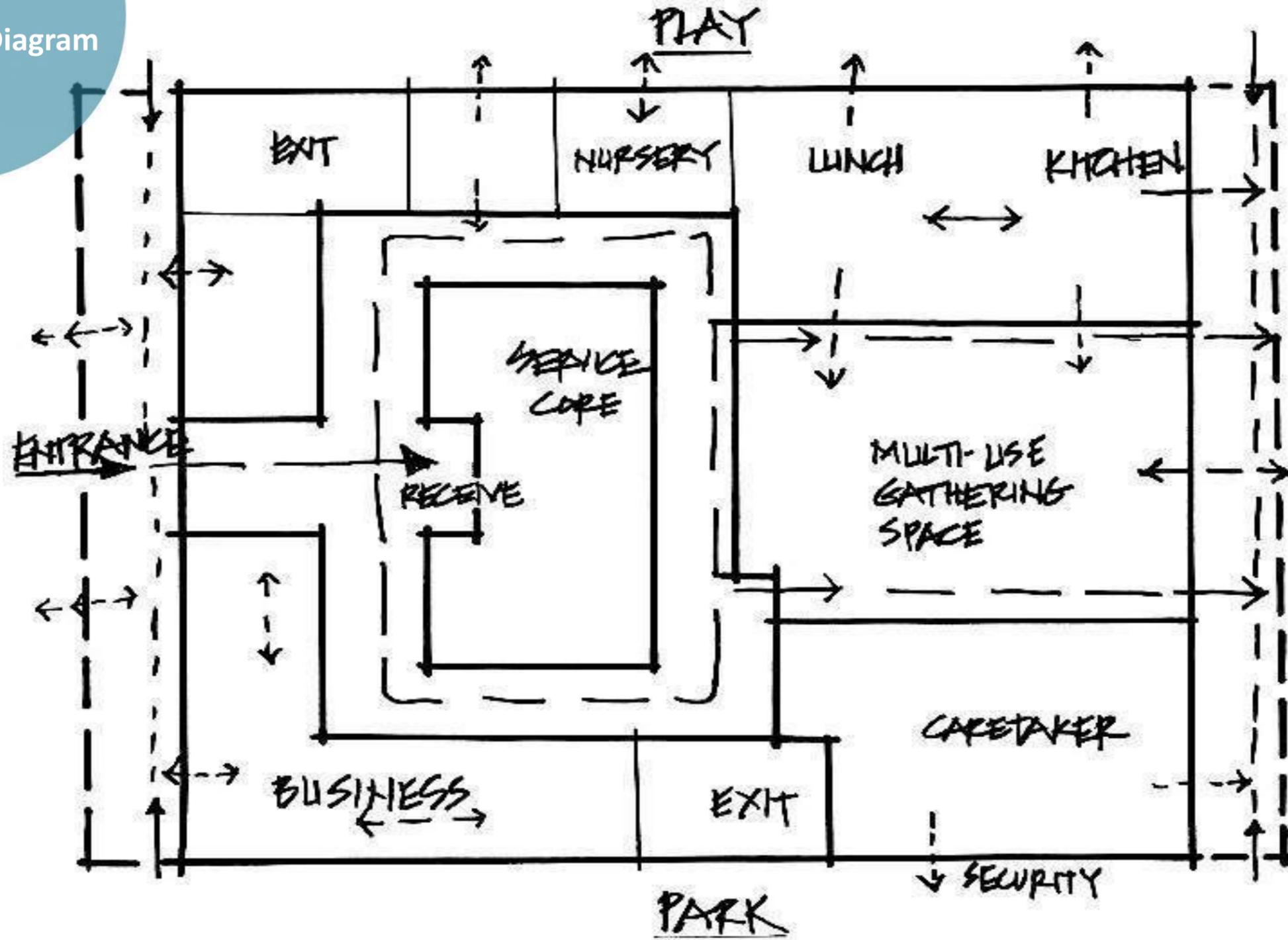
## INTERIOR PROPOSAL

The challenge of the interiors team was to create a two story multi-functional space for Friends of Refugees (F.O.R.) which could support a variety of users and functions of the Jolly Avenue Development Center (JADC). The scope of the program for the interiors of the facility evolved to include a reception area, a caretaker's residential apartment, offices for Friends of Refugees administrative staff and offices for rental, a board room, a nursery, classrooms for adults and children learning English as a second language, pregnancy classes, a wellness clinic, personal and group counseling rooms a multi-purpose space for events, meetings, and gathering, a functional warming kitchen, garden processing area, volunteer overnight stay areas, bike storage and restrooms. Access to daylighting, gardens and outside activities was a primary concern.



# First Floor

## Block Plan Diagram

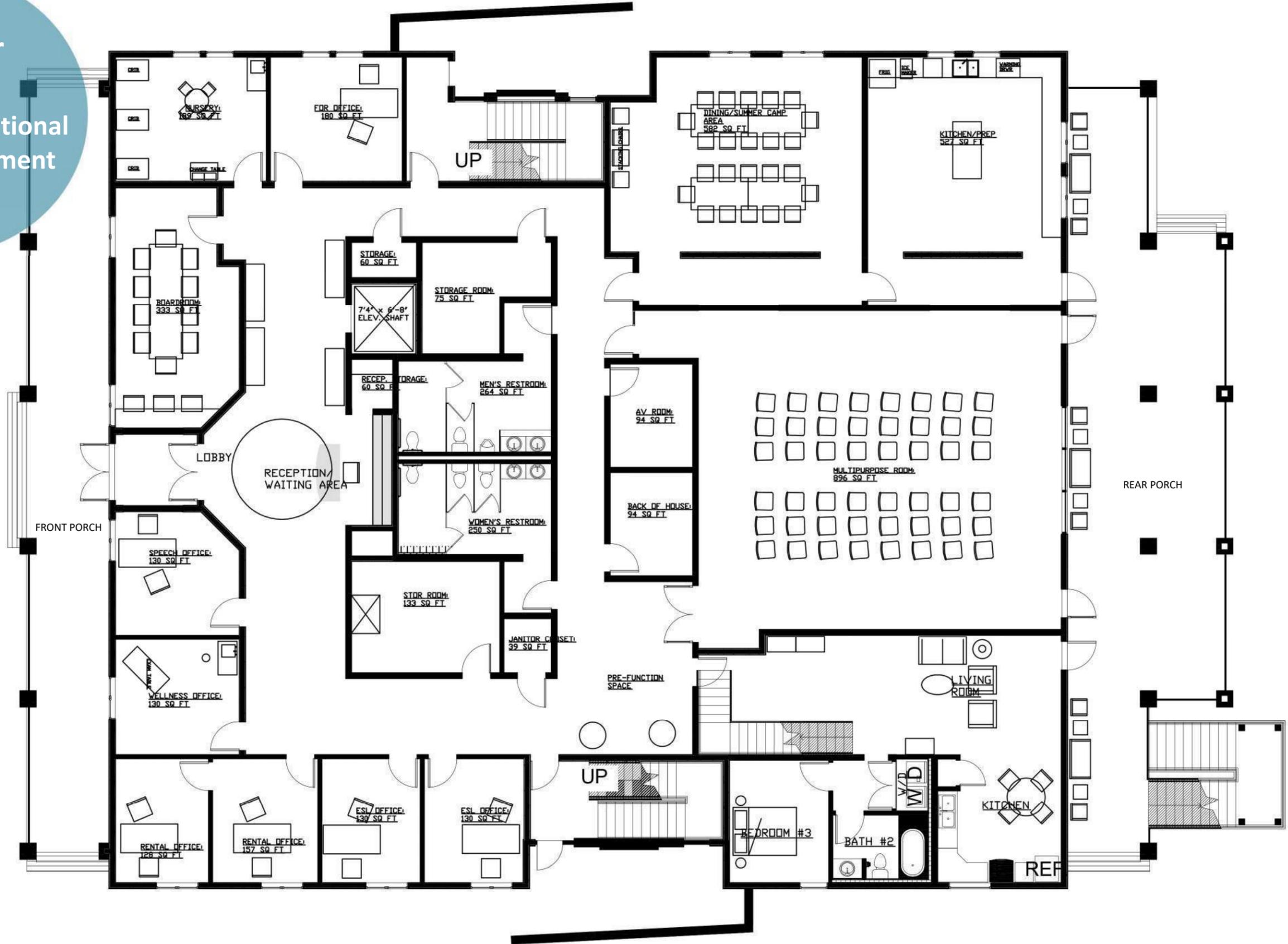


### Legend:

-  Circulation
-  Visual Connection
-  Walls/Zones

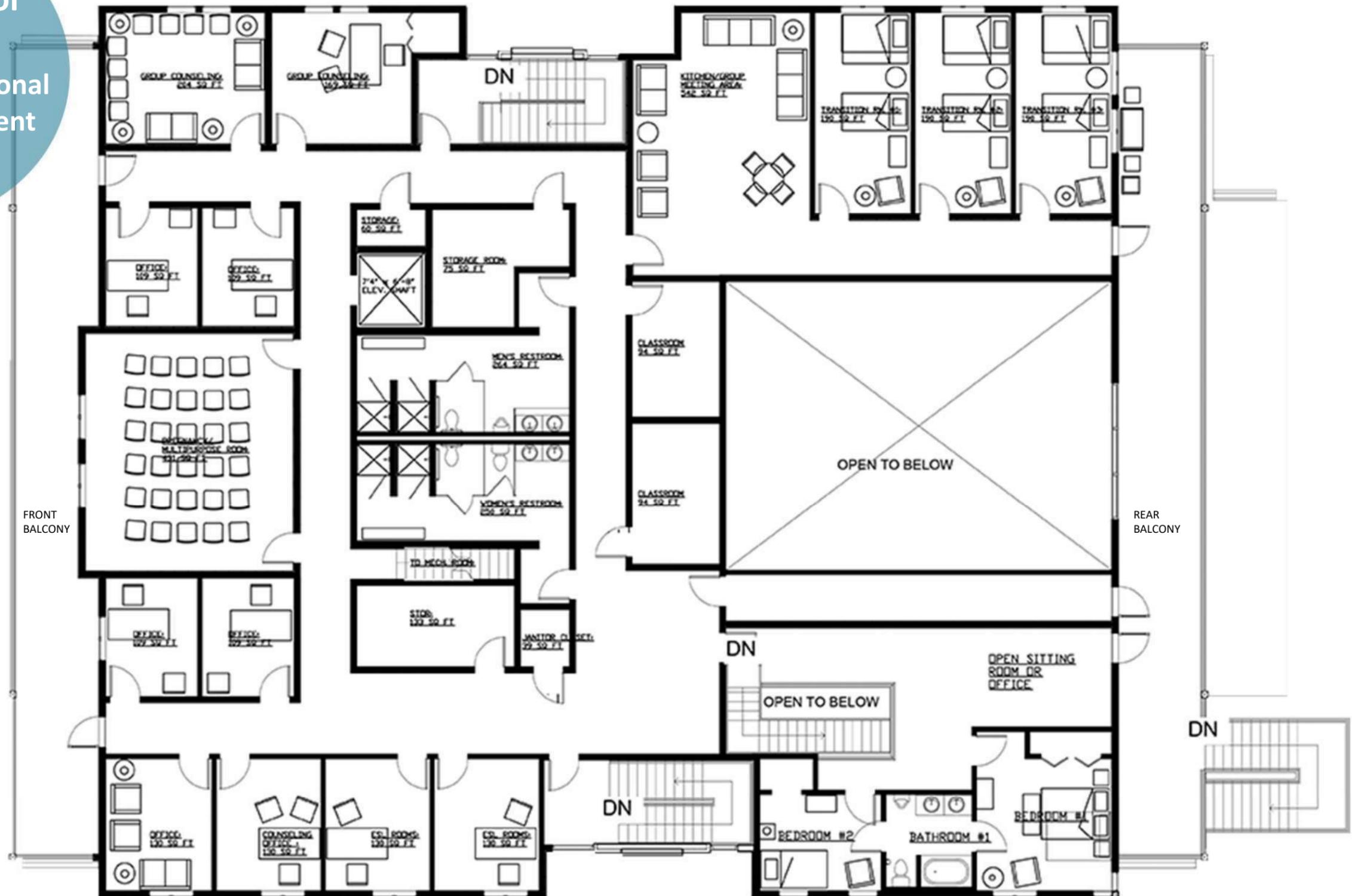
# First Floor

## Floor Plan & Optional Furniture Placement



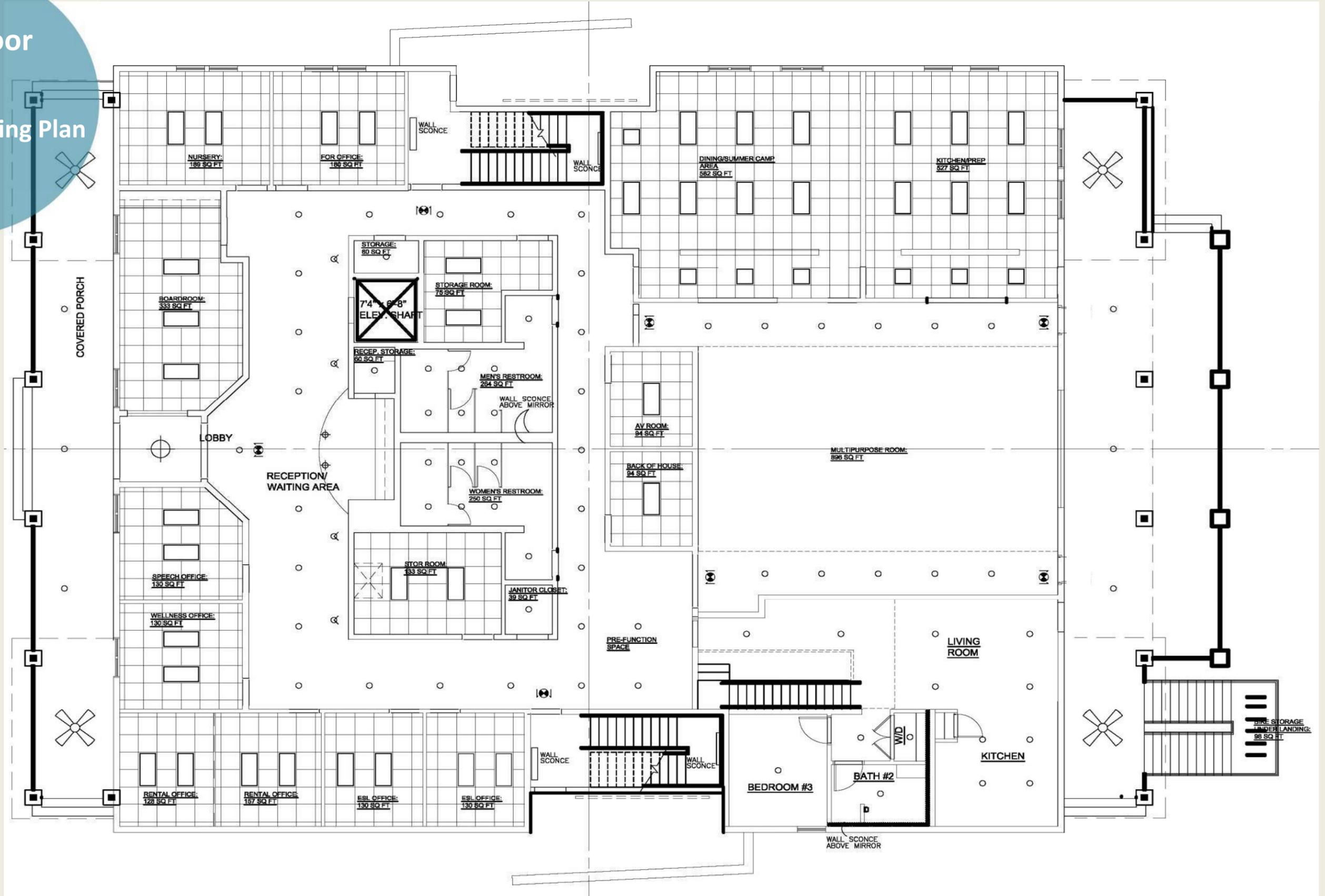
# Second Floor

## Floor Plan & Optional Furniture Placement



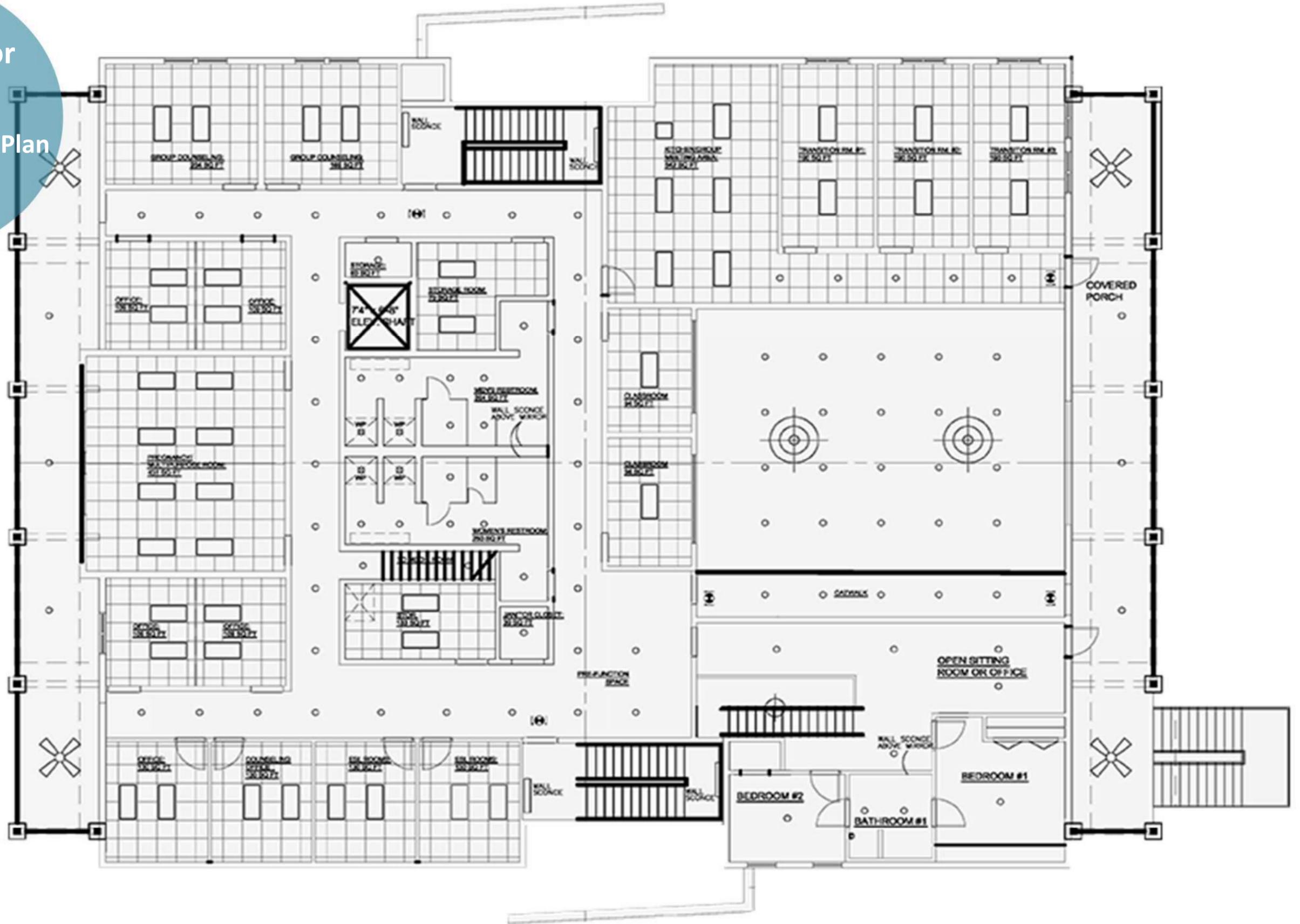
# First Floor

## Reflected Ceiling Plan



# Second Floor

## Reflected Ceiling Plan



The interiors team will develop the following areas:

## Reception

The reception area serves as the first point of entry for all guests and users. The reception area will be a spacious entry point which includes a porch that will provide inviting seating such as rocking chairs, benches and side tables for overflow waiting. A memorial wall is incorporated into the reception area which details partners who helped to create the JADC. This area will also serve as informal security for the JADC.

## Wellness Clinic

A private Wellness clinic will be created that offers natural lighting and is a short distance from the reception area. The Clinic will be staffed by volunteers in the medical profession to provide basic health services such as health checkups, dental services, and pre-natal services.

## Overnight Stay Rooms

In order to meet the sleeping needs of volunteers and “out-migration” refugees who need temporary housing prior to arriving at their final destination, overnight stay rooms are planned for the facility. This area will house double and bunk beds and allow the refugee families to remain together while in transition.

With the current planned layout of the interior space of the JADC, the Friends of Refugees will be able to serve as a resource for refugees, the neighboring community and nearby schools under one roof.

## Caretaker Residence

A two story caretaker residence was added with accessibility on the first level for elder parents or a disabled minor child that may be staying with the caretaker. It consists of an accessible bathroom, kitchen and bedroom on the first floor. An additional bathroom and two bedrooms are located on the second floor. Access to the porch will be provided along with access to the play area on the first level.

## On Site Nursery

In order to allow users to take full advantage of the multitude of programs at JADC, a nursery is planned in close proximity to the reception area.

## Food Service and Dining

The food preparation will be done in a light, warming commercial kitchen that is adjacent to an open dining hall that features an outside dining porch. The kitchen will have food prep tables, warming drawers, a refrigerator and commercial sinks.

## Offices

Offices conveniently located near the reception area, as well as the second floor will feature natural and eco friendly lighting and furnishings that will be used to provide services such as speech therapy, group and individual counseling, after school programs, and adult education programs. In addition to the services, there will also be rental offices designed for shared space and secure storage.

## Multi Purpose Room

There is a multi-purpose room that will be used as a combination auditorium and children’s learning center. This flexible meeting space will be used as a training space during the day and will be available for booking events on some evenings and weekends. The design will incorporate flexible partitions to help subdivide the area into smaller spaces when needed.

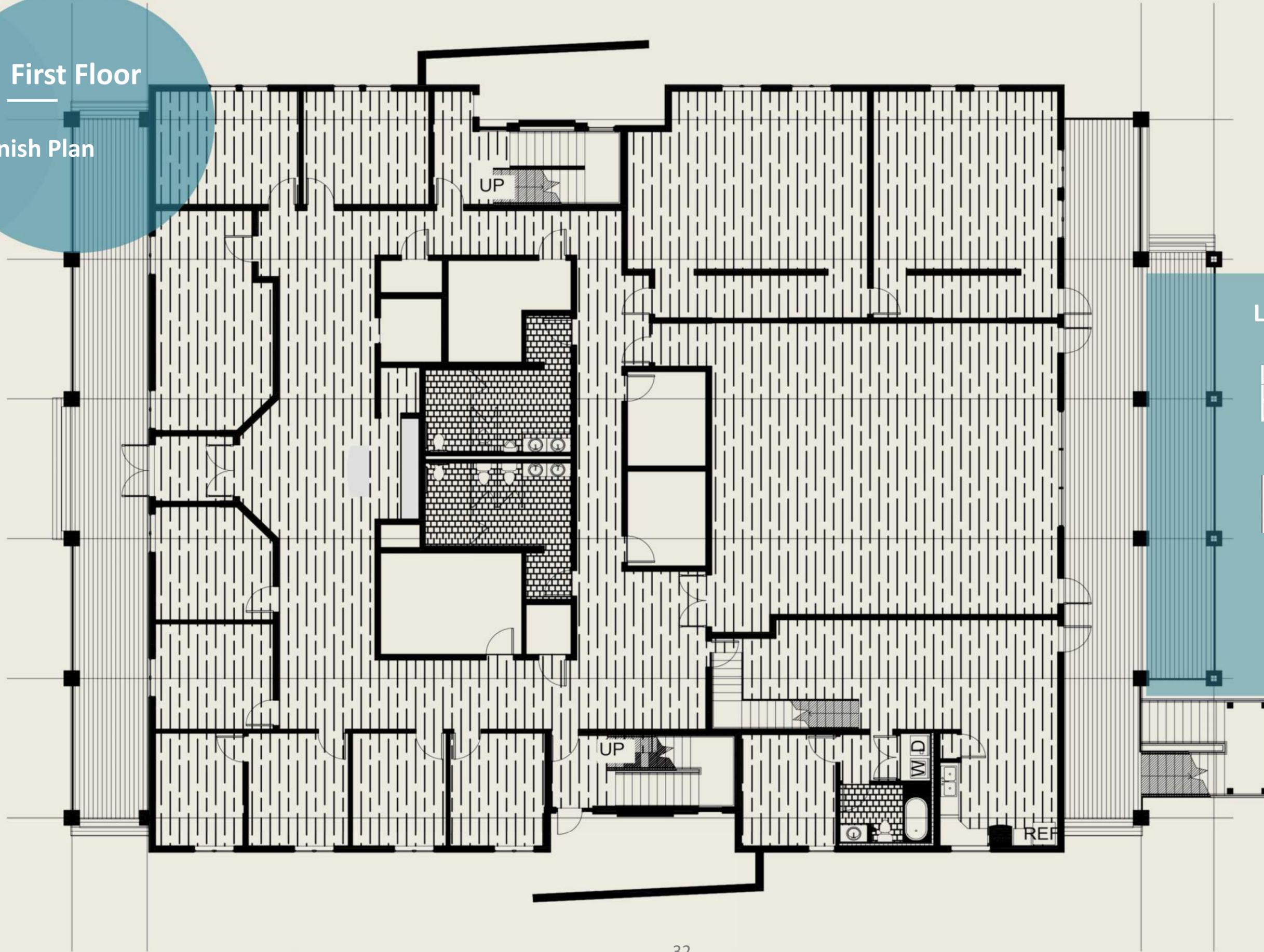
## Boardroom

A flexible board room is planned, which will serve as a work area for interns and conference meeting room.

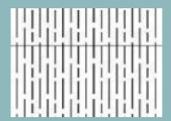


**MULTI-PURPOSE ROOM**

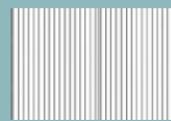
First Floor  
Finish Plan



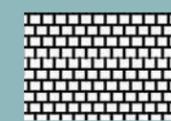
Legend:



Concrete



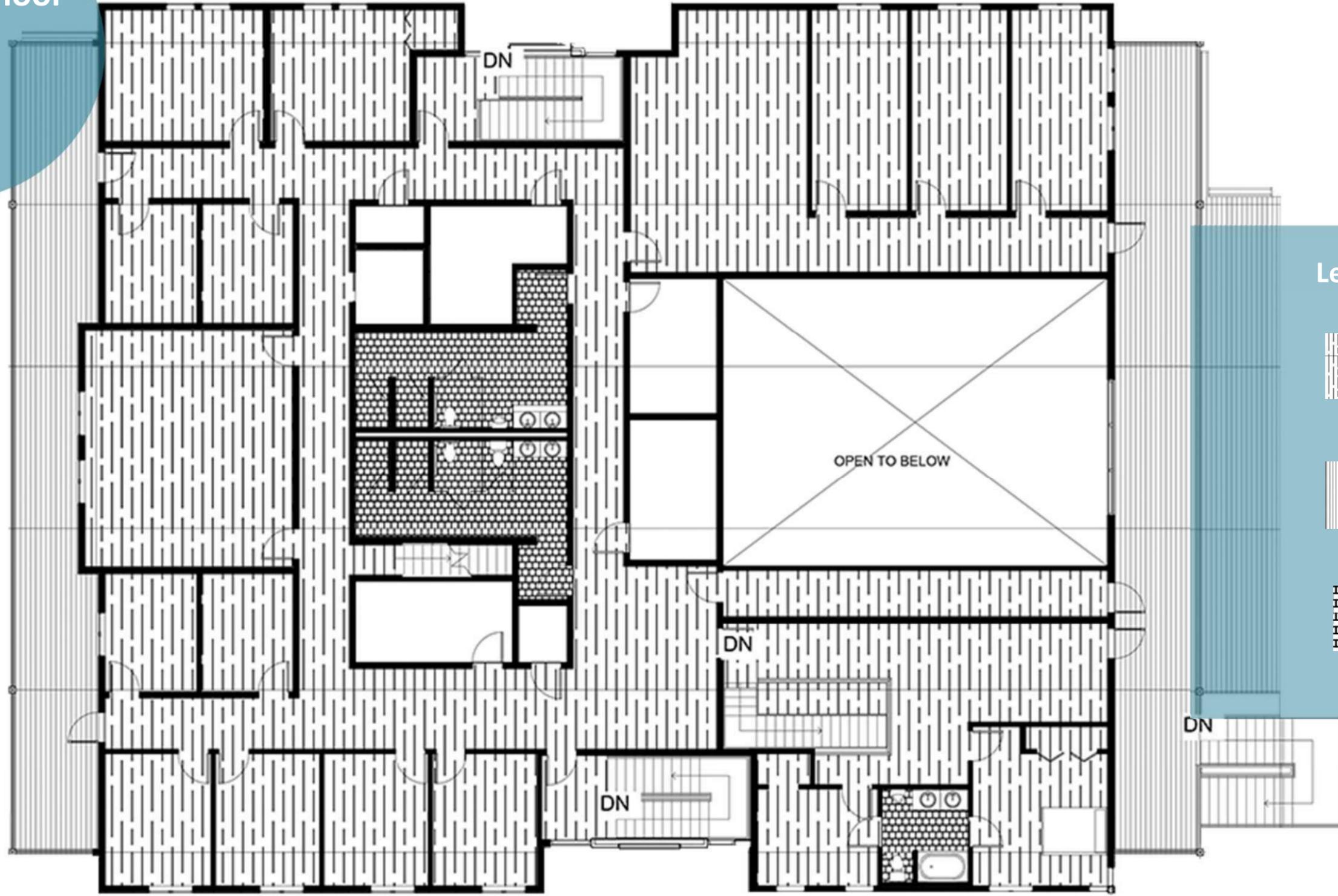
Wood



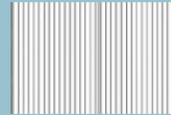
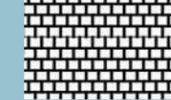
Tile

# Second Floor

## Finish Plan



### Legend:

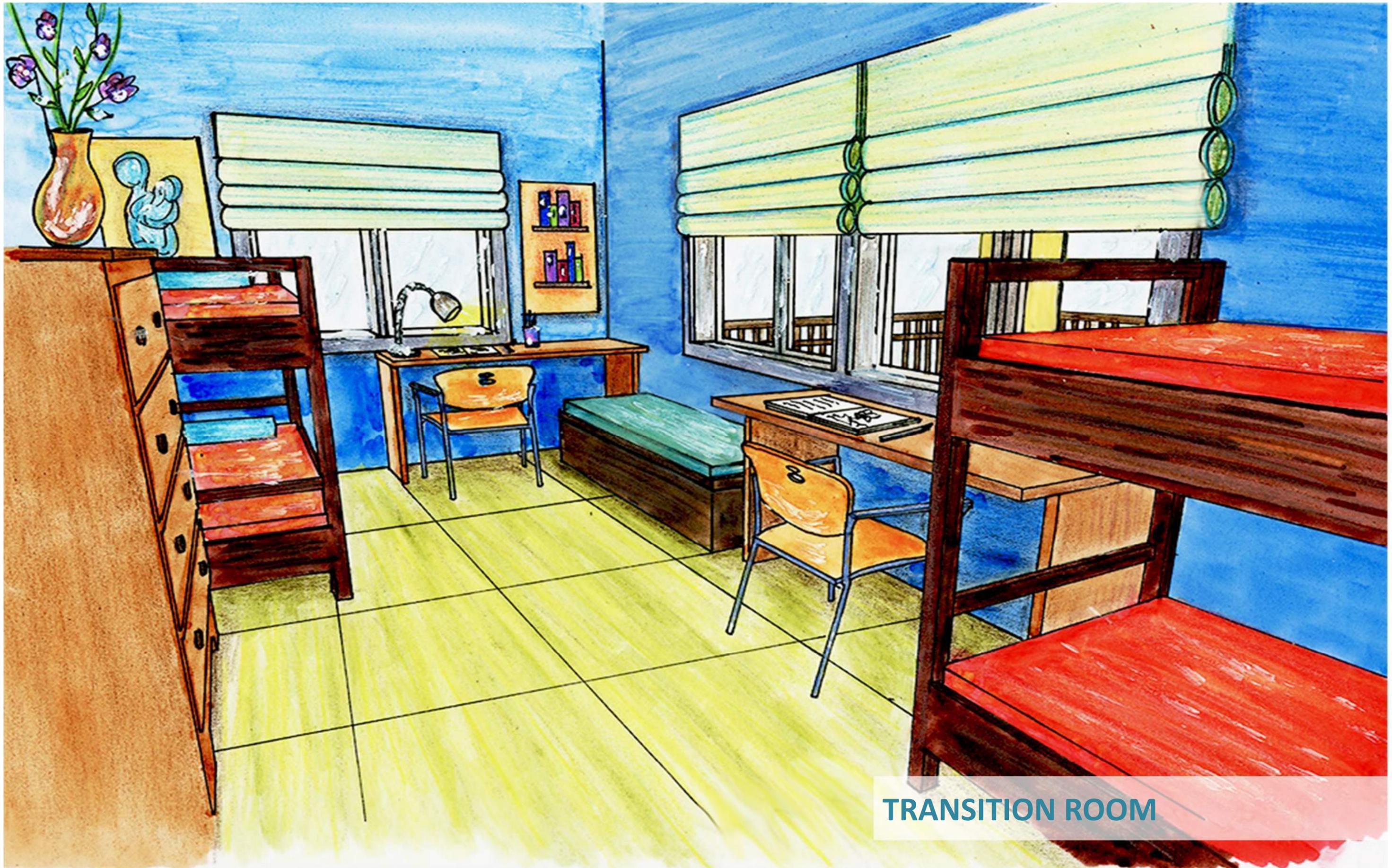
-  Concrete
-  Wood
-  Tile

# MATERIAL OPTIONS



CARETAKER SUITE





TRANSITION ROOM

# SUSTAINABILITY

Spreadsheet sample developed in collaboration with Lifecycle Building Center

Jolly Avenue Development Center, Building Materials Inventory List								
ID #	Item Name	Description	Unit Quantity	Donation Value (50% retail)	Source Through LBC?	Source Option #1	Comments	SDCA_LBC FF&E Recommendations (use below images or similar to maintain design intent)
	Metal siding/roofing material				Unlikely			
	Low maintenance point of use hot water devices		8		Maybe			
	6' perimeter fencing with pedestrian and vehicle gates	Heatworks may be a good choice 4 pedestrian, 1 vehicle gate, 100' presently absent fence required, 873' "opaque" 6' fence desirable to cover all existing linear boundaries (existing fence there is serviceable)	100-873		Maybe		Unit = linear feet	
	Commercial and Residential bathroom sinks	.5 gpm heads, time release, don't have to match	12	\$3,000.00	Likely	LBC	Frequent inventory item	
	ADA bathroom grab bars	10 bathroom railings, 50' outdoor railings, reception & kitchen service counter segment	10	\$150.00	Likely	LBC	Possibly at Druid Hills Baptist	
	Outdoor railings		50		Maybe		Possibly at Druid Hills Baptist	
	ADA accessible kitchen service counter		1		Maybe		Possibly at Druid Hills Baptist	
	ADA assist motors for doors		3		Unlikely			
	Wheelchair lift or wheelchair elevator		1	\$5,000.00	Likely	LBC	May have access to lift through Sandy Springs church project	
	Commercial furnishings (seats, couches, waiting room tables)	Focus on low lifetime operating cost product lobby seating for 8, 1 coffee & 2 end tables, reception desk, 2 lobby chairs; for offices: 1 conference table, 17 office desks & chairs; transitional meeting room meeting area: 1 coffee & 2 end tables, 2 couches, 12 other chairs (any kind).	see description		Likely	LBC		
	Commercial countertops/service islands	25' commercial kitchen surfaces, 12' reception countertop, 15' residential kitchen counters, 30' classroom counters in program offices 11-14, Casters on all counters and cabinets preferred	see description		Maybe		Druid Hills Baptist project may have 2 counters and cabinets and commercial kitchen prep surfaces	
	Bathroom Faucets	time-compression handles preferred	13		Maybe		Druid Hill Baptist Project may have several faucets and sinks	
	Toilets	10 toilets, .2 gpf vacuum assisted EcoJohn toilets preferred	10	\$2,000.00	Likely	LBC	LBC has 5 High-Efficiency Toto toilets in stock now; FOR would like to reserve	
	Waterless urinals	4 urinals (4 ADA); lowest maintenance urinals	4		Unlikely		Waterless urinals hard to find used	
	Water fountains	electricity free models	2	\$1,000.00	Likely	LBC	Druid Hills Baptist has several water fountains	
	Changing Table units for bathrooms		4	\$400.00	Likely	LBC	Just recently sold two of these	
	Bathroom Stalls	Don't have to match, 4 ADA, 4 standard	8	\$8,000.00	Likely	LBC		
	Hand drying solutions for restrooms		4		Unlikely			
	Carpet Tile		5000	\$7,500.00	Likely	LBC	Unit = square feet; being offered 20,000SF from Buckhead project	Use Low VOC Carpet Tiles and natural adhesives, use tiles with at least 10% pre-consumer recycled content



Use materials and finishes with Low/NO VOC whenever possible

Utilize reclaimed Furniture Fixtures and Equipment from sources such as Life Cycle Building Center

For materials not able to obtain through donation strive to only purchase materials within a 500 mile radius to the site

Utilize low flow plumbing fixtures as required by county or Passive House

Integrate educational recycling opportunities throughout building

Prohibit on-property smoking within 25 feet of entries, outdoor air intakes, and operable windows

All carpet adhesive must have less than 50 g/L VOC

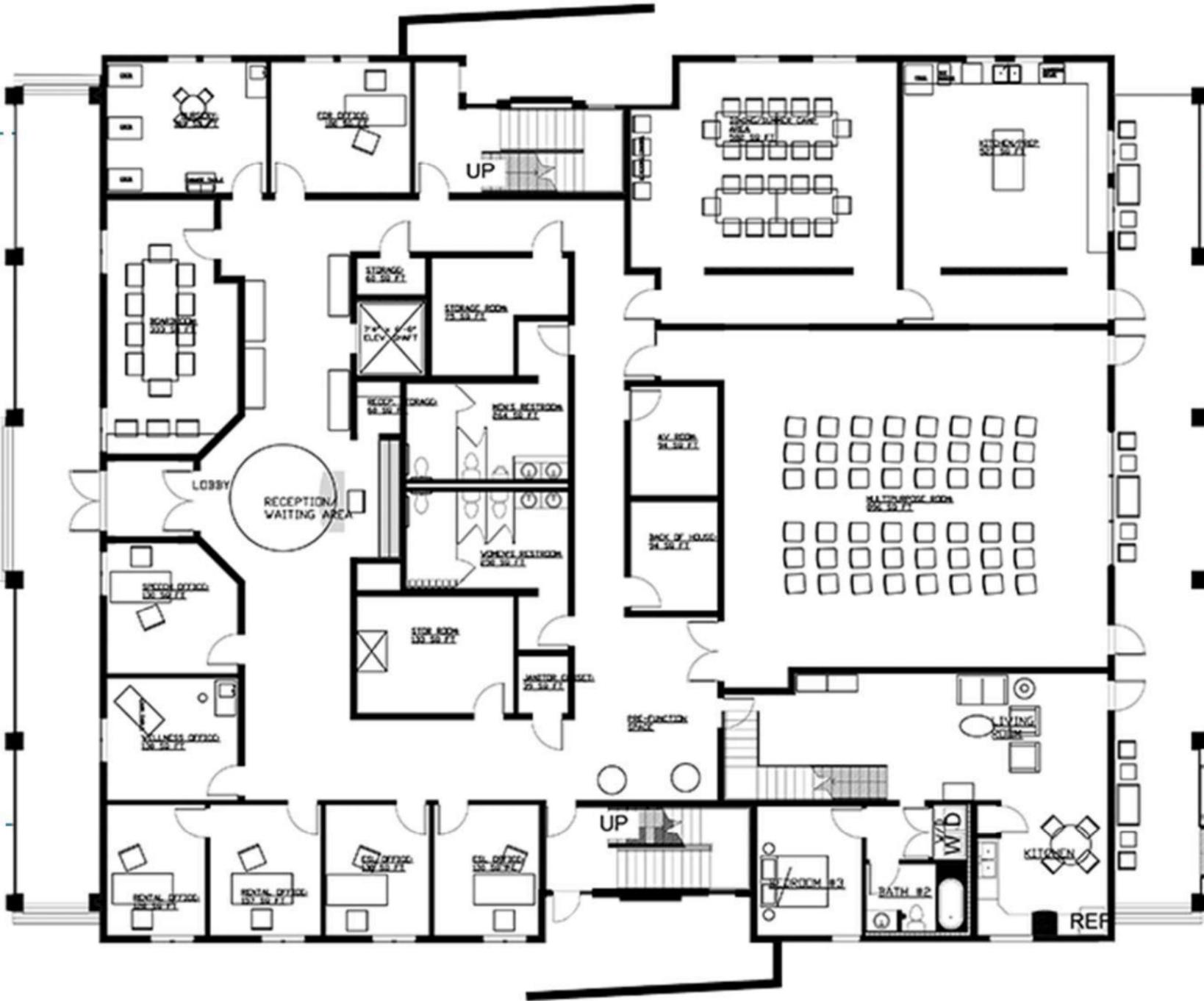
Meet ASHRAE Standard 62.1-2007 Indoor Air Quality Performance or greater as outlined by Passive House Requirements

# SUSTAINABILITY MAP

Utilizes low flow plumbing fixtures

Optimizes the building orientation and window placement to maximize use of day lighting and minimize the need for artificial lighting

Utilizing Finishes, Fixtures and equipment from Atlanta's Lifecycle Building Center



Integrates materials with low to no VOCs and high recycled content

Interior furniture is being donated by various partners keeping items out of the landfill

Design strives to meet Passive House Certification

Utilizing concrete floor reduces use of materials.

# BUILDING SYSTEMS PROPOSAL

## JOLLY AVENUE DEVELOPMENT CENTER PRELIMINARY ENVELOPE DESIGN

During the preliminary design phase of the Jolly Avenue development Center (JADC), several envelope options were developed for possible use in the project. The basic building “envelope” consists of the floor/slab, wall and roof assemblies, which can be represented in a “wall section” as illustrated in the accompanying documents. The final envelope design must of course respond to the general requirements of being aesthetically pleasing, cost effective and durable in the context of the specific application and environment in which it will be used. Additionally, in order to meet the stringent Passive House performance criteria, the envelope must address a number of considerations, some of which are listed as follows:

1. Adequate and continuous insulation to control heat loss/gain (like your nice wool coat for a cold day).
2. A continuous barrier to control air infiltration (like your wind breaker for that gusty day).
3. Proper detailing to eliminate “thermal bridges” through the envelope (imagine that hot skillet handle without a pot holder).
4. Proper material selection to help control the unwanted effects of moisture/water within the building assembly (like cotton socks vs. acrylic on a hot summer day).
5. The proper assembly of the various materials and components into floor, wall and roof systems so the whole building performs as intended (wearing your wind breaker inside of your nice wool coat is not the best idea).

The two “preliminary” wall sections (labeled Option 1 and Option 2) shown on page generally respond to above considerations although verification that they quantifiably satisfy the specific Passive House performance requirements will necessarily occur later in the process after the project design and its associated details are more further developed.

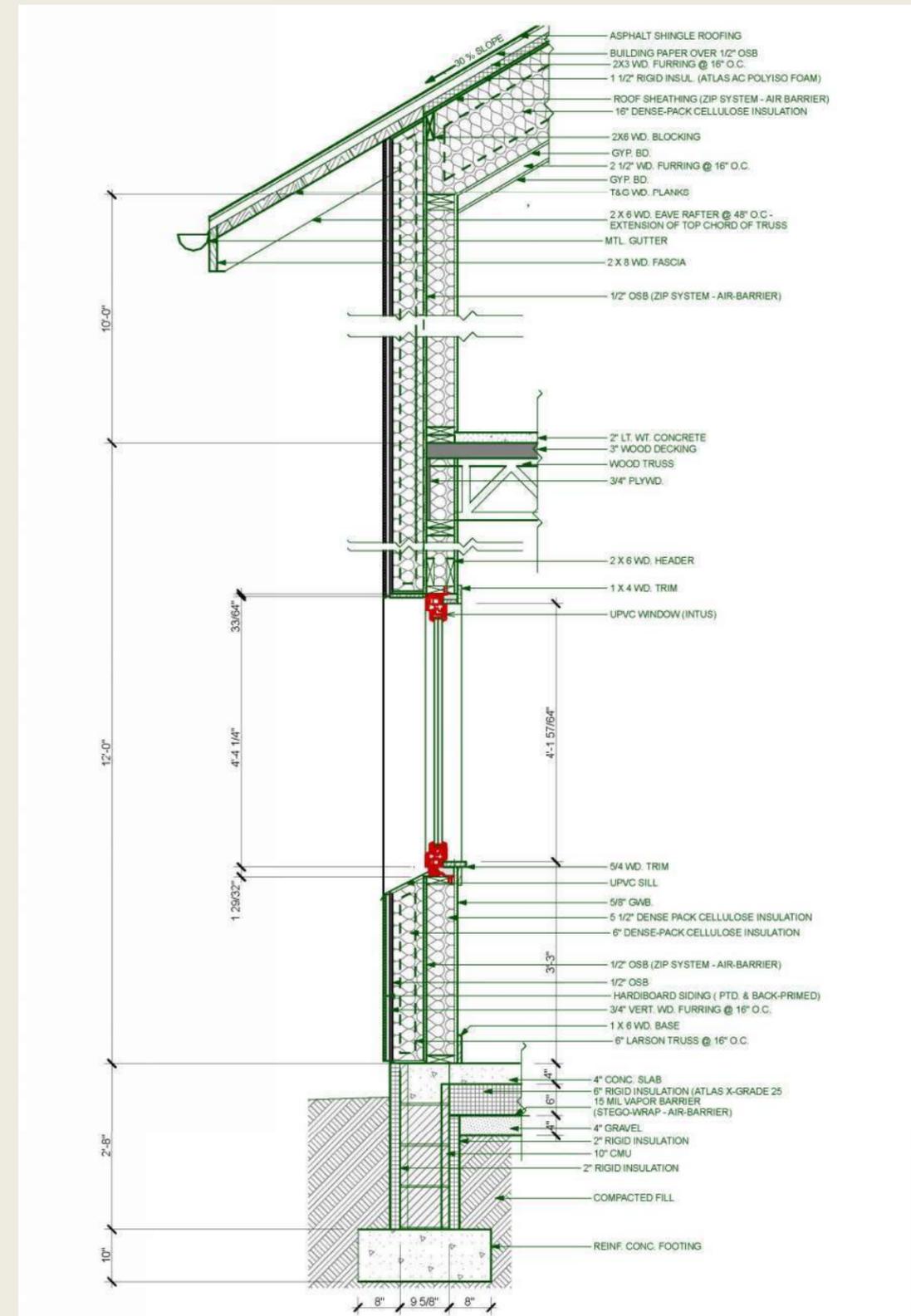
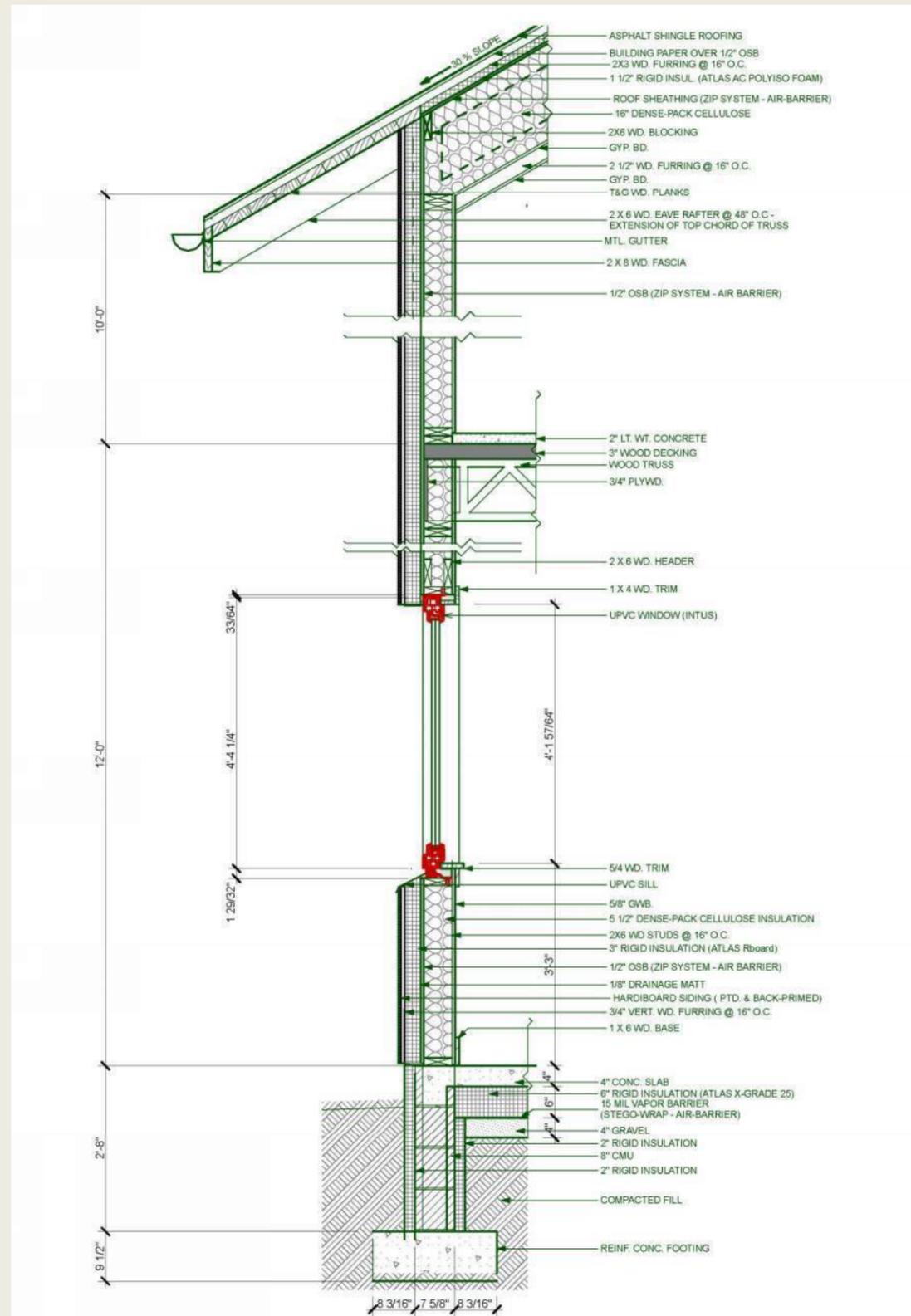
As a starting point, the amount of insulation to be used in the envelope (as reflected in the R-values for the assemblies) was based on a Passive House project designed elsewhere in a similar climate zone. The accompanying document titled “R-Values of Envelope Assemblies” indicates the components the preliminary floor, wall and roof assemblies and calculates their associated R-values; this document is part of the Passive House Planning Package (PHPP), which is used for energy modeling of projects seeking Passive House certification. Both of the wall section options should be developable into systems that meet Passive House requirements. For preliminary planning purposes, the team is currently proceeding on the assumption that option 1 will be used although option 2 may be considered later, subject to additional information relative to the constructability, cost and environmental impact issues associated with each option.

Later in the design process the wall sections will be further developed in concert with larger scale details showing the additional critical components (sealant joints, flashings, and etc.) necessary for a high performance building system; one that we also expect to be the “best dressed” building in the neighborhood.



PERSPECTIVE VIEW AT NORTH SIDE

# WALL SECTION OPTIONS



## PASSIVE HOUSE DESIGN

The Jolly Avenue Development Center (JADC) will be the first *commercial* building in Georgia built to Passive House standards. This construction method is revolutionary in its affordable approach and low operating cost, but it is as much an approach of the past as the future. In fact, before the advent of air conditioning and central heating, all houses were “passive” houses— in that they relied on natural processes to heat and cool their interiors, as well as using fans, cross ventilation and elevated living space. The “house” part of “passive house” is a misnomer leftover from the German name. In fact, all kinds of buildings – single-family, multifamily, schools, high-rises, and others can be designed and built to passive house standards. The “passive” in “passive house” refers to achieving extreme energy savings *before* applying "active" technologies. Energy losses are minimized and gains are maximized. Superinsulation and air-tight construction minimize losses. The energy recovery ventilator helps keep energy that has already been generated, inside the building instead of venting it out. By modeling the thermal storage capacity of building materials and their "passive" effects on the indoor temperature, the architect/designer can plan for thermal storage mass in a structure by specifying the floors, finished concrete slabs, etc. to balance the loads year-round and minimize active heating, cooling and dehumidification loads. Of course, photovoltaics, solar, point, and heat pump hot water, grey water heat recovery, ground coupled cooling and other technologies can still be implemented. In fact, Passive House has been recognized by the U.S. Department of Energy’s Challenge Home program as the best path toward Net Zero or Net Positive construction. Within the past 5 years, the cost premium for building this way has fallen to 8-11% for homes and parity or even up-front savings on commercial buildings, where added envelope expenses are recovered in major mechanical system size reductions.



Passive House Institute US

# PASSIVE HOUSE

## The 3 Metrics for Achieving the Standard



### Air infiltration

The Passive House standard for air infiltration can be no greater than **0.6 air changes per hour (ACH) at 50 pascals (Pa)**, which means the house is virtually airtight when blower-door tested. The IRC's 2012 code (the most recent adopted for Georgia) has significantly reduced allowable air infiltration, but still only limits it to 3 ACH at 50Pa, which is 5 times greater than allowed per the Passive House standard.



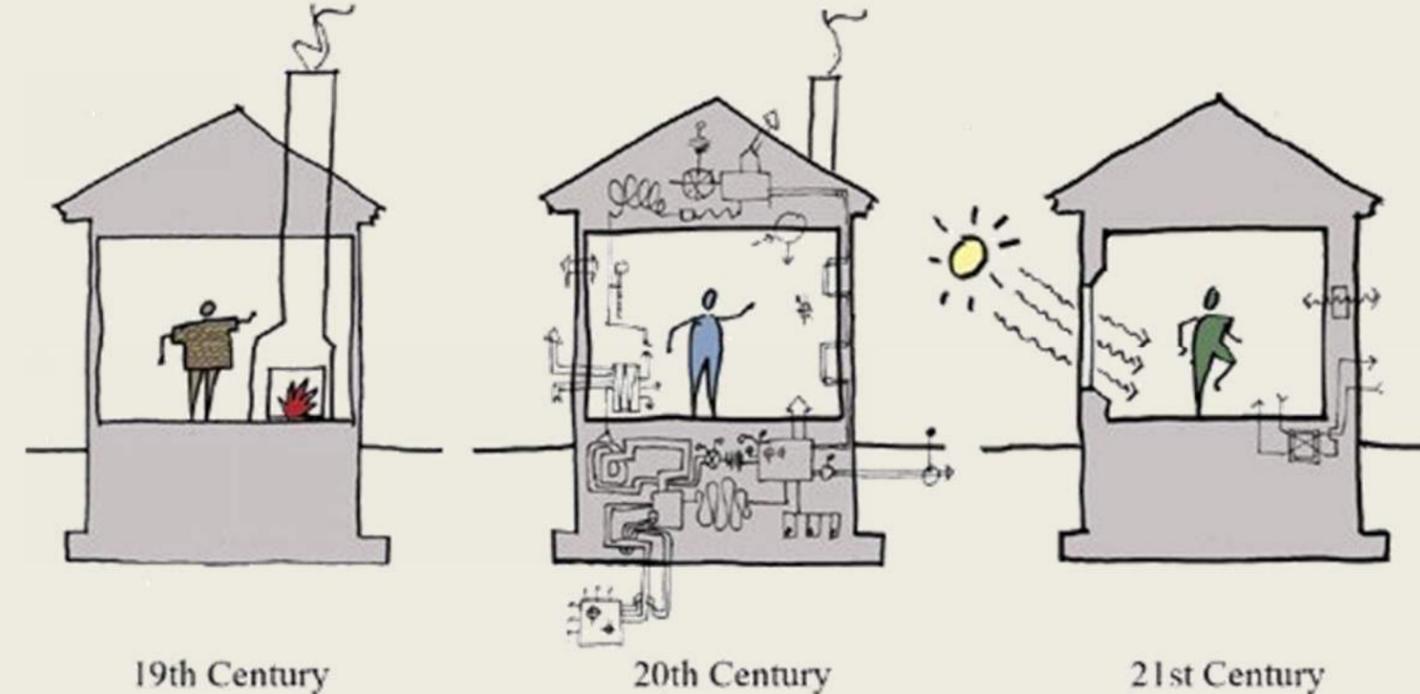
### Btu consumption

The annual energy use for heating and cooling cannot exceed **4.8KBtu per sq. ft. annually**. The average new home built to current code consumes nearly 10 times that amount. Energy Star has requirements for appliances and mechanical systems that can still amount to nearly eight times the Passive House requisite.

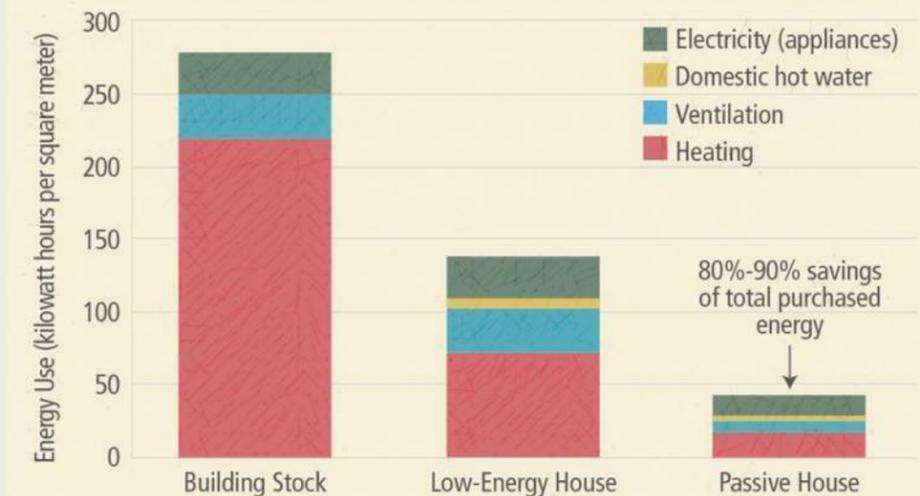


### Total Energy usage

The maximum total energy use of the house, which includes heating, cooling, dehumidification and electricity, cannot exceed **11.1 kWh per sq. ft.** While there are no specific energy use standards for code-built and Energy Star homes, estimates put their usage around 30 kWh and 20 kWh, respectively.



### Passive House Reduces Energy Used by 80-90%



# I want details! How will the JADC get it done?

## STRUCTURAL



Super-insulated building envelope with R-47 walls, R-60 high SRI cool roof, thermal bridge-free detailing, air-tight envelope with open diffusion and rain screens, advanced windows and doors, active and passive control of year-round solar heat gains.

## SITE PLANNING



Full on-site storm water infiltration, pervious grass paver parking lot, rainwater irrigated landscape architecture, edible perennial plants and abundant outdoor gathering spaces.

## ELECTRICAL



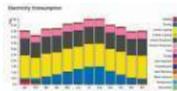
High efficiency electronics and appliances, 50 KW Solar Photovoltaic array with DC-direct tie to 100 KWH of battery storage, 380 Volt DC micro grid backbone for DC-powered 24 Volt LED lighting, PCs, ECM mechanicals and ceiling fans, a Single mode optical fiber backbone enabling centralized management of network, communications, energy, security and lighting.

## MECHANICAL



Active air quality monitoring with MERV 12 filtration, ultra-high efficiency energy recovery ventilators, solar condensing dehumidification, dedicated micro-ERVs for bathrooms and kitchens, ultra-high SEER heat pumps in micro-zones, low energy ceiling fans, elevated ceilings and cross-ventilated rooms.

## ENERGY MODELING



Climate-based siting, Solar path finding, and continuous computed energy modeling and air tightness testing throughout build process.

## FINISH AND FIXTURE



>90% day-lit spaces, light shelves, interior glazing, low maintenance finishes, ULF plumbing fixtures, high efficiency hot water, Lifecycle Building Center unprecedented incorporation of reclaimed building materials: furnishings, finishes and fixtures.

## EXPERT VOLUNTEERS



## USAGE/BEHAVIOR



Room level sub-metering and plug load monitoring, open source Building Automation Systems and sensors, simplified recycling and composting.

## PRELIMINARY BUILDING ENERGY SIMULATION

Passive House is a rigorous, yet elegantly simple, performance-based building certification program. Unlike, many building certification programs, Passive House requires that the building meet stringent performance standards both before and *after* its construction and occupation. Achieving the performance metrics requires extensive project planning, cross-team integrated design, and thorough execution of the design details. The Passive House concept and certification process was developed in a heating-dominated climate zone, and its adoption in the United States is a fairly recent phenomenon, with few examples in warm-humid climate zones, providing a unique opportunity for innovation. The core concept of Passive House is to tackle one of the largest sources of building energy usage, heating and cooling, by aggressively mitigating heating and cooling loads produced by the building envelope.

Through super-insulation and superior air-tightness, Passive House structures deliver levels of efficiency that are simply not possible in conventional building designs. Preventing heating and cooling loads is far simpler than designing systems of contraptions to efficiently—and nearly continuously—move heat between the interior and exterior of the building. Improving the building envelope decreases the required heating and cooling capacity for a building’s HVAC design. However, the type of heat that must be removed in the cooling season (cooling load) differs not only in magnitude—but also in composition. A building’s heating/cooling loads are comprised of three components:

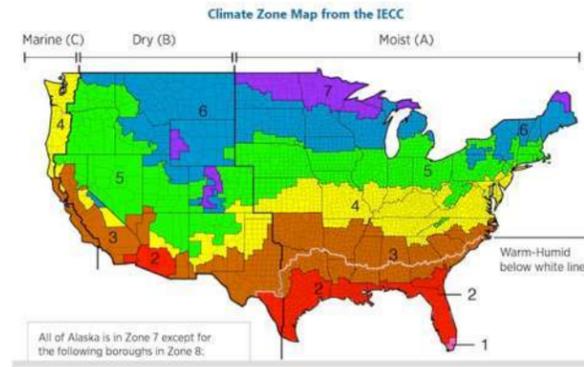
Sensible heat: The heat that makes a thermometer change its reading

Latent heat: The heat contributed by the addition of water molecules to the air

Radiant heat: The heat from electromagnetic waves, such as sunlight

The sum of these three components of heat make up the building’s heating/cooling loads. Reducing the thermal conductance of the building envelope shifts the primary source of cooling loads from the external environment to internal sources of heat gain. The largest contributors to internal cooling loads (heat gain) are occupants, along with their need for contaminant-free air.

Currently, the best way to maintain vital indoor air quality is to throw out the contaminated “stale” air from inside a building and replace it with “fresh” outside air. Maintaining healthy indoor air quality is essential for building occupants, but it carries a high thermal price during hot or cold weather. This is especially true during the cooling season in a humid climate, where the air is moist and filled with invisible latent heat. Most cooling systems are designed primarily to remove sensible heat, and only remove latent heat as a by-product of passing moist air over a cold coil. In a Passive House design, drying the moisture from the air is every bit as important as removing sensible heat to drop the temperature.



<b>Project Overview</b>	
<b>Organization</b>	Friends of Refugees
<b>Location</b>	Clarkston, GA
<b>Building Size</b>	20,000 Sq-Ft
<b>Building Use</b>	Mixed Use (Office, Education, Residential)
<b>Climate</b>	ASHRAE Climate Zone 3A
<b>Target Completion Date</b>	December 2014
<b>Preliminary Budget</b>	\$1,800,000.00

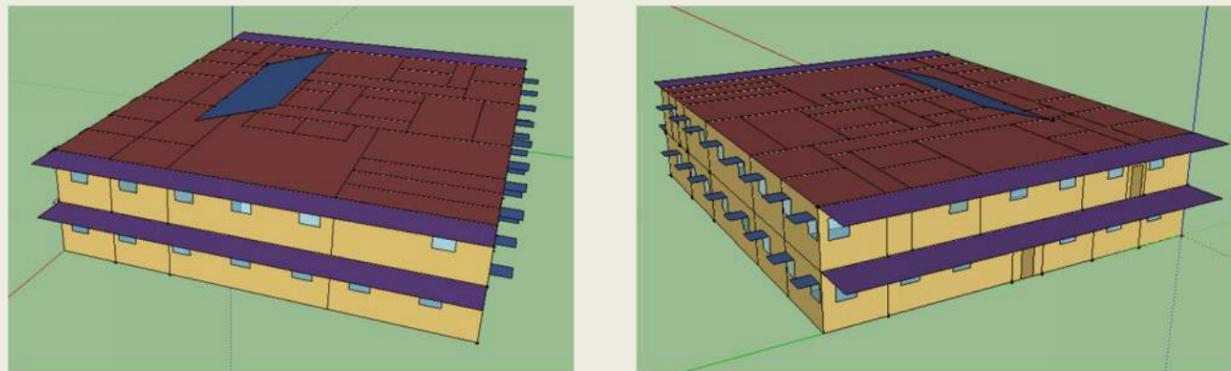
<b>Passive House Requirements</b>		
<b>Objective</b>	<b>Metric</b>	<b>Criteria</b>
Minimize Primary Energy Demand	Source Energy Use Intensity	< 38.1 kBtu/Sq-Ft/Yr
Minimize Primary Heating Demand	Heating Source Energy Use Intensity	< 4.75 kBtu/Sq-Ft/Yr
Minimize Primary Cooling Demand	Cooling Source Energy Use Intensity	< 4.75 kBtu/Sq-Ft/Yr
Mitigate Air Infiltration	Air Changes per Hour @ 50 Pa	< 0.6 ACH50

## Preliminary Feasibility Study

A major goal of the preliminary energy modeling was to understand the way that an air-tight, super-insulated building envelope interacted with available HVAC systems to assess project feasibility and better understand design constraints/necessities.

## Building Geometry

The architectural floor plans and envelope sections were used to construct a simplified three-dimensional model of the proposed building design. Floor-to-ceiling heights of 12 feet were assumed for the first and second floor of the building. Complex interior space layouts were approximated with roughly equivalent rectangular spaces.



### **FOR Energy Model Envelope Summary**

<b>Component</b>	<b>Approximate Assembly R-Value</b>	<b>Area (Sq-Ft)</b>
<b>Wall</b>	<b>39</b>	<b>9,023</b>
<b>Roof</b>	<b>111</b>	<b>8,800</b>
<b>Windows</b>	<b>3.2</b>	<b>914</b>

The window-to-wall ratio in the preliminary design is only 10%. The amount of glazing necessary to deliver adequate natural daylight will likely need to be increased, but this seemed to be a good minimum threshold to start from. Positioning of building glazing, shading, and light distribution systems will need to be designed to maximize effectiveness.

## Comparison to Other Building Code/Design Standards

Passive House certification is performance based; hence, there are no prescriptive criteria that must be met by building components and systems. The building must meet the Passive House performance criteria after it has been occupied. This method of rating/certifying a building is very different from standard construction practice.

Conventional construction practices strive to meet the minimum criteria that are legally permissible, which are set by the currently adopted energy code, ASHRAE 90.1-2007. Meeting the minimum standard reduces construction cost for the builder and the owner, but low-quality construction has lasting negative effects that are challenging or impossible to remedy after construction for a reasonable price. These lingering negative effects include higher utility costs, more frequent and higher cost building maintenance, lower building valuation and lease rates, shorter useful life, comfort problems, and greater environmental impact.

Building design and construction programs that seek to exceed the minimum standard are becoming increasingly popular. Such beyond-code programs include LEED, ENERGY STAR, EarthCraft, Living Building Challenge, Green Globes, Passive House, and many others.

The Friends of Refugees project was compared by designing the building according to three separate criteria:

Minimum standards of the American Society of Heating Refrigeration and Air Conditioning Engineers, ASHRAE 90.1-2007 for Climate Zone 3A  
 Prescriptive recommendations from the Advanced Energy Design Guide (AEDG) for Small to Medium Offices- 50% reduction over ASHRAE 90.1-2007

Passive House

The key system performance criteria for each tier of building efficiency are listed in the table below. The values for each component are guidelines only (except for 90.1).

<b>Key System Performance Criteria</b>			
<b>Component/System</b>	<b>ASHRAE 90.1-2007</b>	<b>AEDG- 50%</b>	<b>Passive House</b>
<b>Roof R-Value (Flat Roof)</b>	R-20 C.I.	R-25 C.I.	R-75 + R-9 C.I.
<b>Wall R-Value (Wood-framed)</b>	R-13	R-13 + R-3.8 C.I.	R-26 + R-18.5 C.I.
<b>Window U-Value</b>	0.65	0.6	0.3125
<b>Window SHGC</b>	0.25	0.25	0.25
<b>HVAC System Type</b>	Air Source Heat Pump	Air Source Heat Pump + DOAS	VRF + DOAS
<b>Cooling Efficiency (SEER)</b>	13	15	16+
<b>Heating Efficiency (HSPF)</b>	7.7	9	10+
<b>Lighting Power Density (W/Ft<sup>2</sup>)</b>	1.0	0.75	0.5

The operating costs for each of the three design criteria were assessed by simulating the common Georgia Power and AGL utility tariffs using EnergyPlus. In each of the three design scenarios, the optimal electricity rate structure was Time of Use – Energy Only.

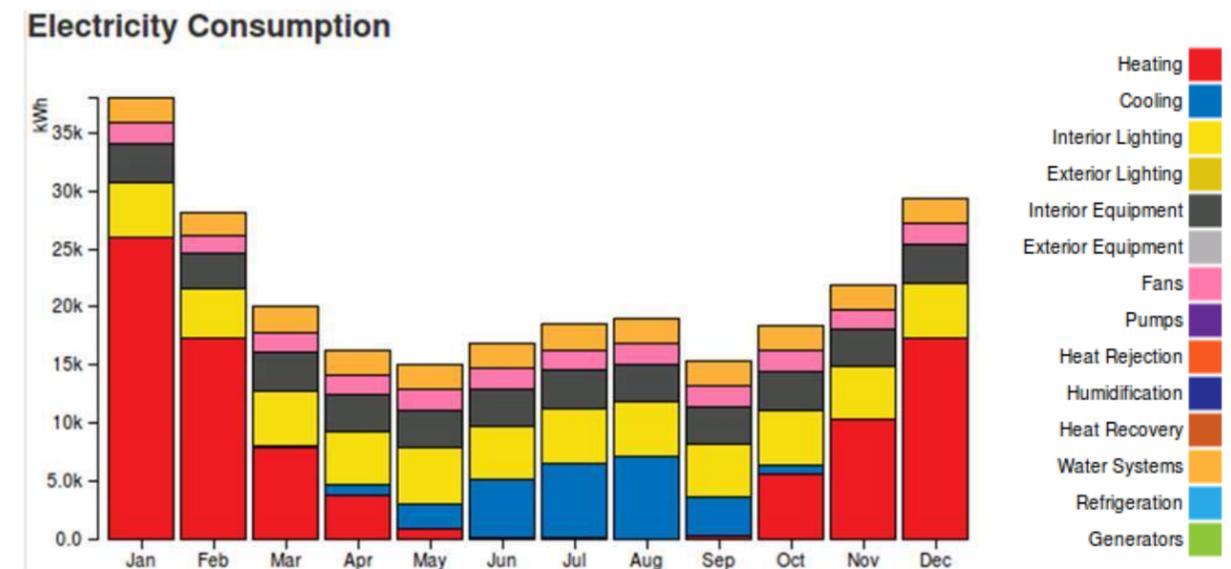
<b>Operating Cost</b>				
<b>Rate Structure</b>	<b>ASHRAE 90.1-2007</b>	<b>AEDG- 50%</b>	<b>Passive House</b>	<b>Passive House w/ PV</b>
GPC-GS-8	\$ 27,549	\$ 10,883	\$ 10,382	\$ 5,636
GPC-PLL-9	\$ 31,138	\$ 13,367	\$ 12,781	\$ 7,041
GPC-PLM-9	\$ 27,582	\$ 11,759	\$ 11,243	\$ 6,179
GPC-PLS-9	\$ 27,691	\$ 11,671	\$ 11,150	\$ 6,069
GPC-SCH-16	\$ 28,408	\$ 12,129	\$ 11,596	\$ 6,375
GPC-SLM-12	\$ 32,660	\$ 14,879	\$ 14,270	\$ 8,234
GPC-G-17	\$ 22,428	\$ 9,476	\$ 9,062	\$ 5,323
GPC-TOU-EO-8	\$ 19,253	\$ 8,430	\$ 8,302	\$ 4,842
GPC-TOU-GSD-8	\$ 25,714	\$ 10,706	\$ 10,335	\$ 7,285
Gas AGL-G	N/A	\$ 223	N/A	N/A
<b>Total Annual Utility Cost</b>	<b>\$ 19,253</b>	<b>\$ 8,653</b>	<b>\$ 8,302</b>	<b>\$ 4,842</b>

Another key criterion for assessing the three design scenarios is size, cost, and complexity of the building’s HVAC system. Minimizing the size and complexity of the HVAC system will be beneficial in reducing the first cost of construction, delivering a system that can be more easily maintained, and mitigating the eventual HVAC system replacement costs—since the building will outlast the best mechanical equipment several times over.

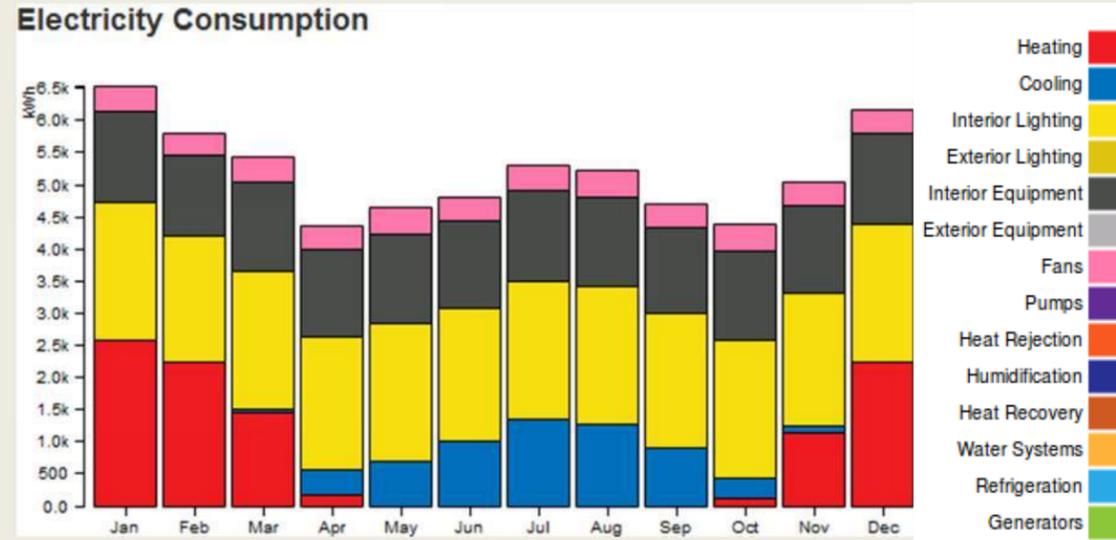
<b>HVAC System Size Based on Cooling Load</b>			
	<b>ASHRAE 90.1-2007</b>	<b>AEDG- 50%</b>	<b>Passive House</b>
<b>Cooling Capacity (tons)</b>	21.9	17.9	8.7

The energy consumption profile for each of the design scenarios are indicated below.

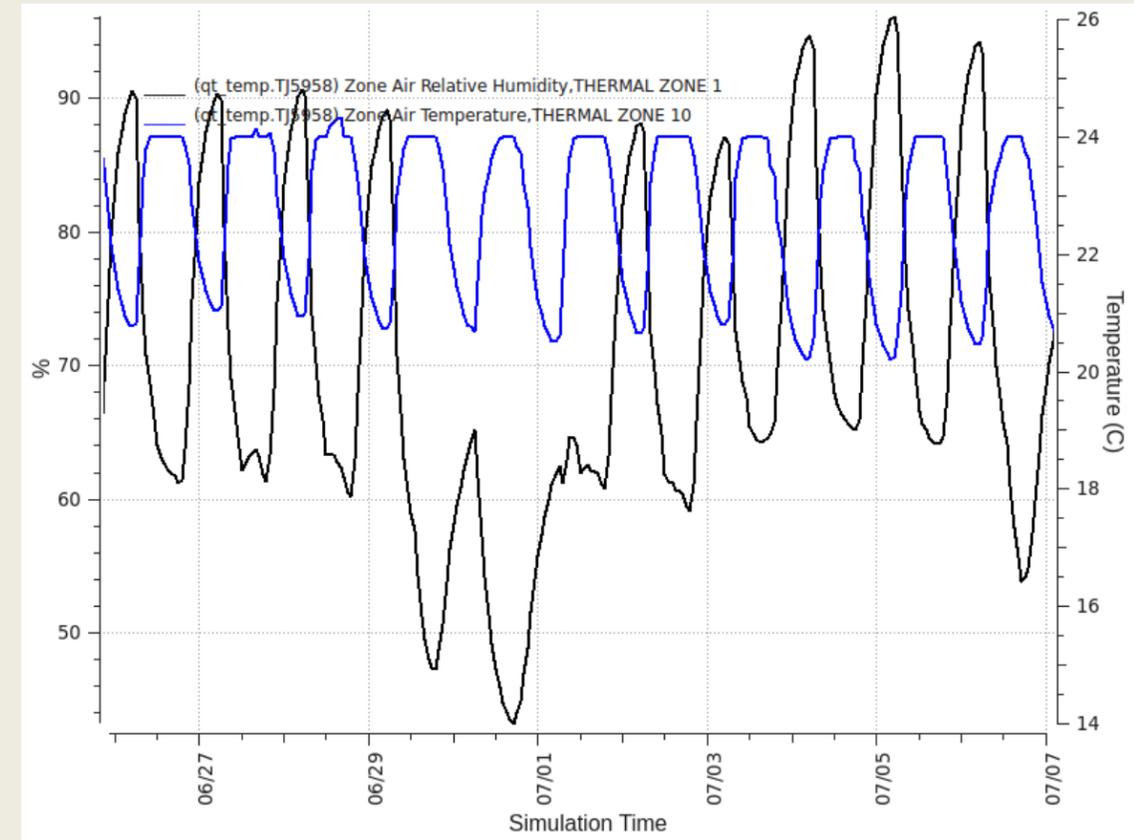
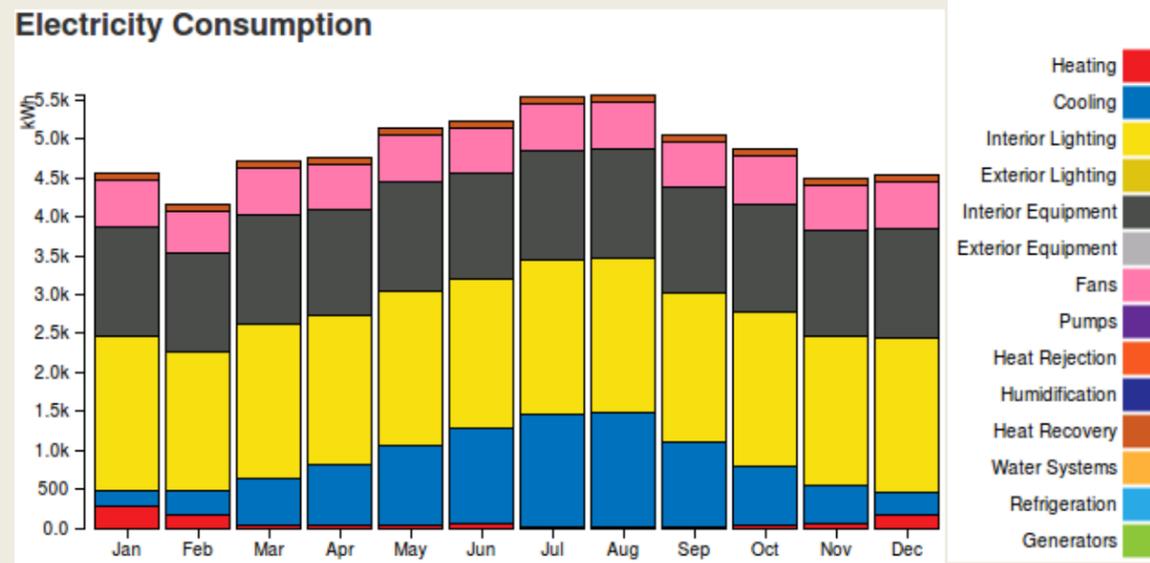
### ASHRAE 90.1-2007 DATA



# Advanced Energy Design Guide - 50% DATA



## Passive House Data



Early modeling of heating and cooling systems demonstrated that excessive humidity would potentially be a major issue.

# HVAC/CONTROLS/LIGHTING/FIRE PROTECTION/FIRE ALARM/ PLUMBING/SECURITY/ACCESS CONTROL/CCTV/MUSIC/LIFE SAFETY & MISC

## Air Conditioning System Recommendations:

### **I. VARIABLE REFRIGERANT VOLUME (VRV)/VARIABLE REFRIGERANT FLOW (VRF) SYSTEM with HEAT RECOVERY – with HEAT RECOVERY VENTILATOR**

VRV or VRF is a commercially applied heating and cooling system that distributes refrigerant rather than water, to multiple ducted or un-ducted indoor units serving the conditioned space.

#### **Advantages:**

1. Energy efficient utilizing variable speed compressors
2. 10 to 20 percent energy savings compared to conventional systems
3. Individual control of multiple zones on one piping network
4. Centralized piping network
5. Heating and cooling simultaneously
6. Tight temperature control, quiet indoor operation
7. Control using multiple protocols
8. High EER and COP values
9. Lower maintenance cost
10. Possible tax credit

#### **Disadvantages:**

1. Installation cost may be higher when compared to a conventional VAV system

### **II. SPLIT SYSTEM HEAT PUMP with Supplemental Heat - with HEAT RECOVERY VENTILATOR**

The split air conditioning means that the condenser or “outdoor unit” is separated from the “indoor unit”. Some models come with multiple indoor units that will use one single compressor; this is known as the multisplit air conditioning system. The heat pump may require additional electric heat to meet heating demand. For those systems where individual or simultaneous heating and cooling is required, separate split systems should be considered.

#### **Advantages:**

- Heat pump produces 3kW of heat to 1 kW of electricity spent (an electric heater gives you a 1 to 1 ratio)
- Easy installation
- Easy maintenance
- Quiet operation
- Heating
- Cost effective
- Simple control
- Commercially available in many sizes

#### **Disadvantages:**

1. Multiple units required (interior and exterior)

### **III. DEDICATED OUTDOOR AIR SYSTEM (for use with VRF system)**

A dedicated outdoor air system (DOAS) is a type of heating, ventilation and air-conditioning (HVAC) system that consists of two parallel systems: a dedicated outdoor air ventilation system that handles latent loads and a parallel system to handle sensible loads. The main point of a DOAS system is to provide dedicated ventilation (outdoor air) to the building rather than ventilation as part of conditioned air. Published simulation results indicated that the full DOAS resulted in the annual HVAC energy cost savings ranging from 21% to 38%.

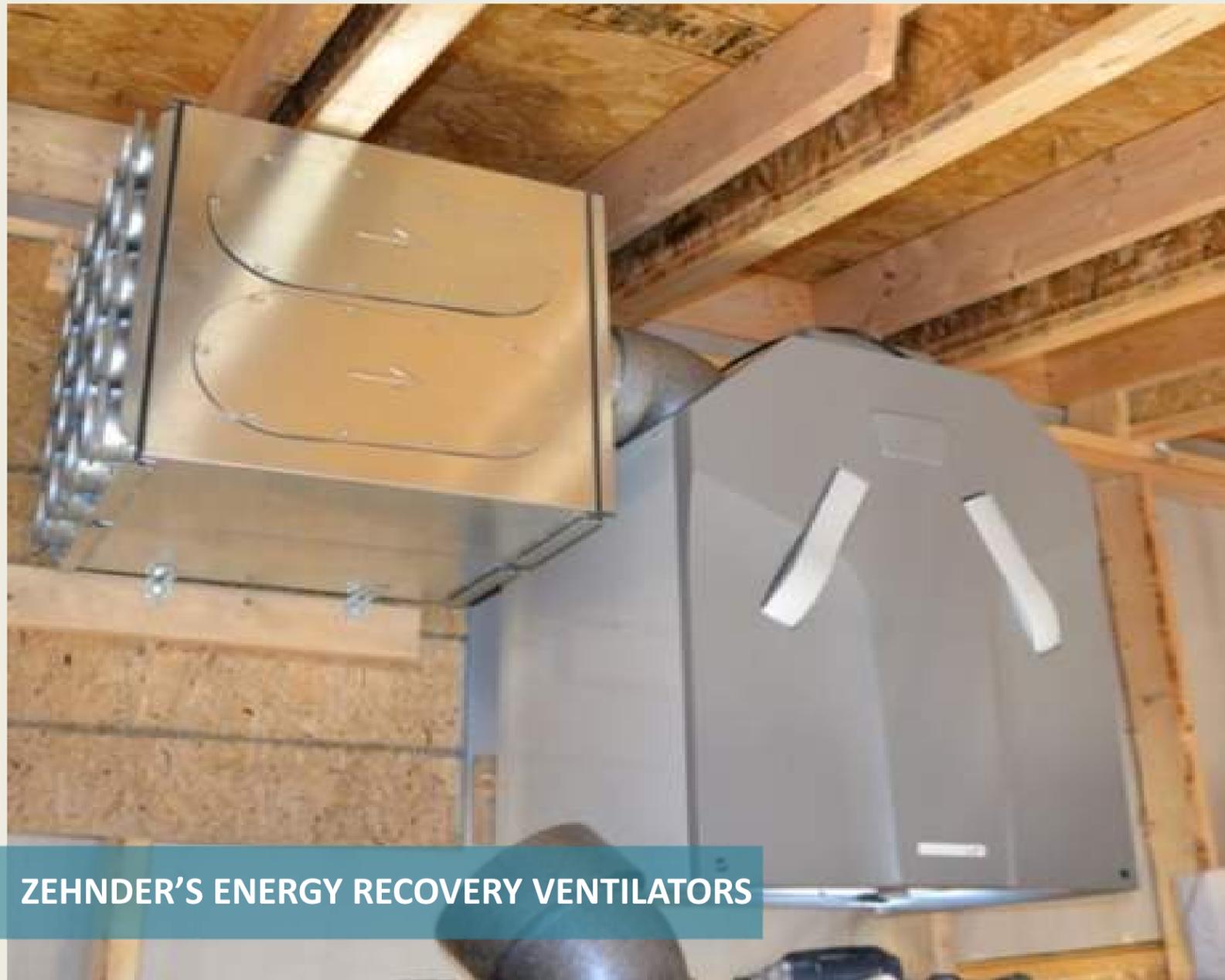
#### **Advantages:**

- Simpler design
- Better humidity control and air distribution
- LEED Certification
- Better Filtration characteristics than conventional systems
- Better heat exchanger construction and operation
- Better temperature control over a wide range of outside air temperature
- Energy saving more economical operation
- LEED Certification
- Easy installation

#### **Disadvantages:**

1. More ductwork required to get ventilation air to each zone
2. Supply and return ductwork must be routed to DOA unit.

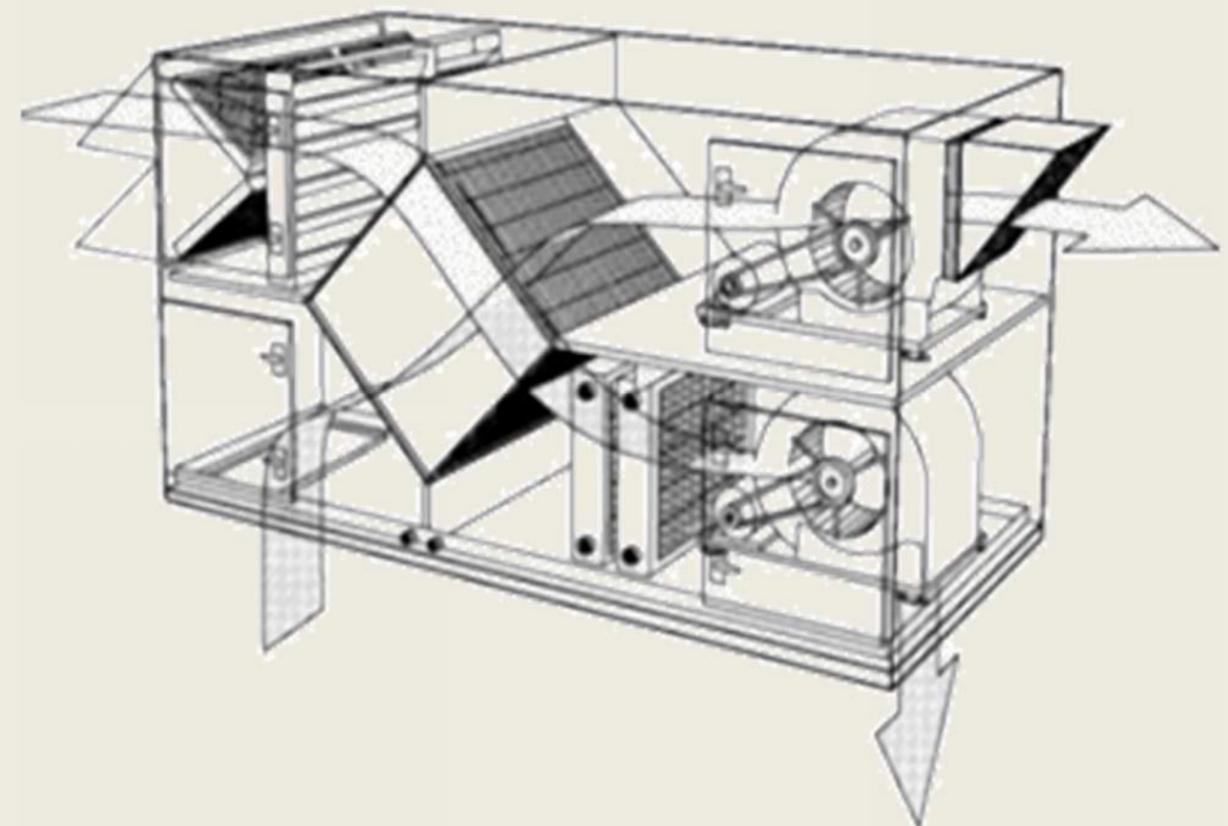
# BUILDING CONTROL SYSTEMS



ZEHNDER'S ENERGY RECOVERY VENTILATORS



DEDICATED OUTDOOR AIR SYSTEM



# Building Controls System

## I. INTRODUCTION

Building Controls is always the most misunderstood and mistreated application of those included into the Building Systems discipline, which typically includes Mechanical-HVAC, Electricity, Plumbing, & Communications. This industry is geared to provide an “all inclusive” stream of technologies and information for which the potential Owner/User tends to acquire a certain level of automated advantages that include a myriad of little conveniences. In short the Friends for Refugees Center needs a “smart” controls system configured to be “User Friendly” in terms of the non-technical staff that will administer or run the facility. The HVAC system shall incorporate a single t-stat per room to increase the system controllability while ensuring expected comfort.

## II. OPERATION

This system should offer a web-interface, dedicated interface screen or dedicated button-switch panel that allows Administrative Users to set areas of the building as Occupied, Unoccupied, or off via schedules or time-based overrides to allow usage for random events.

Upon setting systems to Occupied Mode the Controls system shall be “smart” enough to index to On and Occupied those mechanical systems (such as air handling component(s) and exhaust fan(s) associated with the area to be used. This system shall be a User adjustable “time of use” setting. Once indexed to Occupied Mode all associated systems shall run continuously until the typical time of use duration is completed. It is anticipated that the Dedicated Outdoor Air System will operate 24/7. Occupancy sensors shall confirm that no occupant is present in monitored spaces prior to setting the systems back to either Unoccupied Mode or simply Off. This pre-configuration will ease the system utilization on behalf of the typical Users who usually are not aquatinted with the technical details to operate it. All systems should be configured to operate as described in order to deliver a functional system to the Administrator.

## III. COMFORT

This system should include a built-in “Pre-Occupancy Mode” function that will use internal algorithms to determine the best earliest time to index pre-selected systems to On or Occupied Mode so the space(s) are at set point at the beginning of the scheduled occupancy. Also the local screen shall include a pop-up window to flash whenever the systems are indexed to Occupied manually to advise the User(s) that it will take some time to achieve the desired set point(s). Said screen shall flash intermittently until said set point(s) are achieved. This feature will avoid the usual service calls generated due to this scenario.

## IV. INTEGRATION

This system should include integration and monitoring of the lighting control system, fire alarm system, plumbing system, photo-voltaic solar system, building alarm/security system and additional systems listed below and as required by owner.

## LIGHTING AND LIGHTING CONTROL SYSTEMS

The Friends of Refugee facility shall have an intelligent network based lighting control system that incorporates communication between various system inputs and outputs related to lighting control with the use of one or more central computing devices. The lighting control system shall monitor and control both indoor and outdoor lighting of commercial and residential spaces. The lighting control systems will serve to provide the right amount of light where and when it is needed.

Smart lighting operations will include dimming controls, occupancy sensors, LED monitoring and photo cell/timer control for the exterior lighting in order to maximize the energy savings from the lighting control system. The lighting control system shall be integrated and monitored by the building automation system.

LED monitoring to control multiple LED's in remote locations and to detect power consumption of the system. The system should not only adjust the three-color LED light group brightness of each node, but also get the energy consumption data of each node in time.

LED exit signs should be installed throughout the facility

A combination of Solar PV tied DC direct LED lighting fixtures, as well as standard AC socket LED bulbs, shall be used for energy efficiency and to ensure future compatibility with new lighting technology which is likely to always be available in standard socket format.

LED lighting throughout the exterior of the facility shall be considered for energy efficiency operation.

Motion sensed lighting shall be installed on the exterior of the facility for security purposes.

High efficiency electronics and appliances, 50 KW Solar Photovoltaic array with DC-direct tie to 100 KWH of battery storage, 380 Volt DC micro grid backbone for DC-powered 24 Volt LED lighting, PCs, ECM mechanicals and ceiling fans, a Single mode optical fiber backbone enabling centralized management of network, communications, energy, security and lighting.

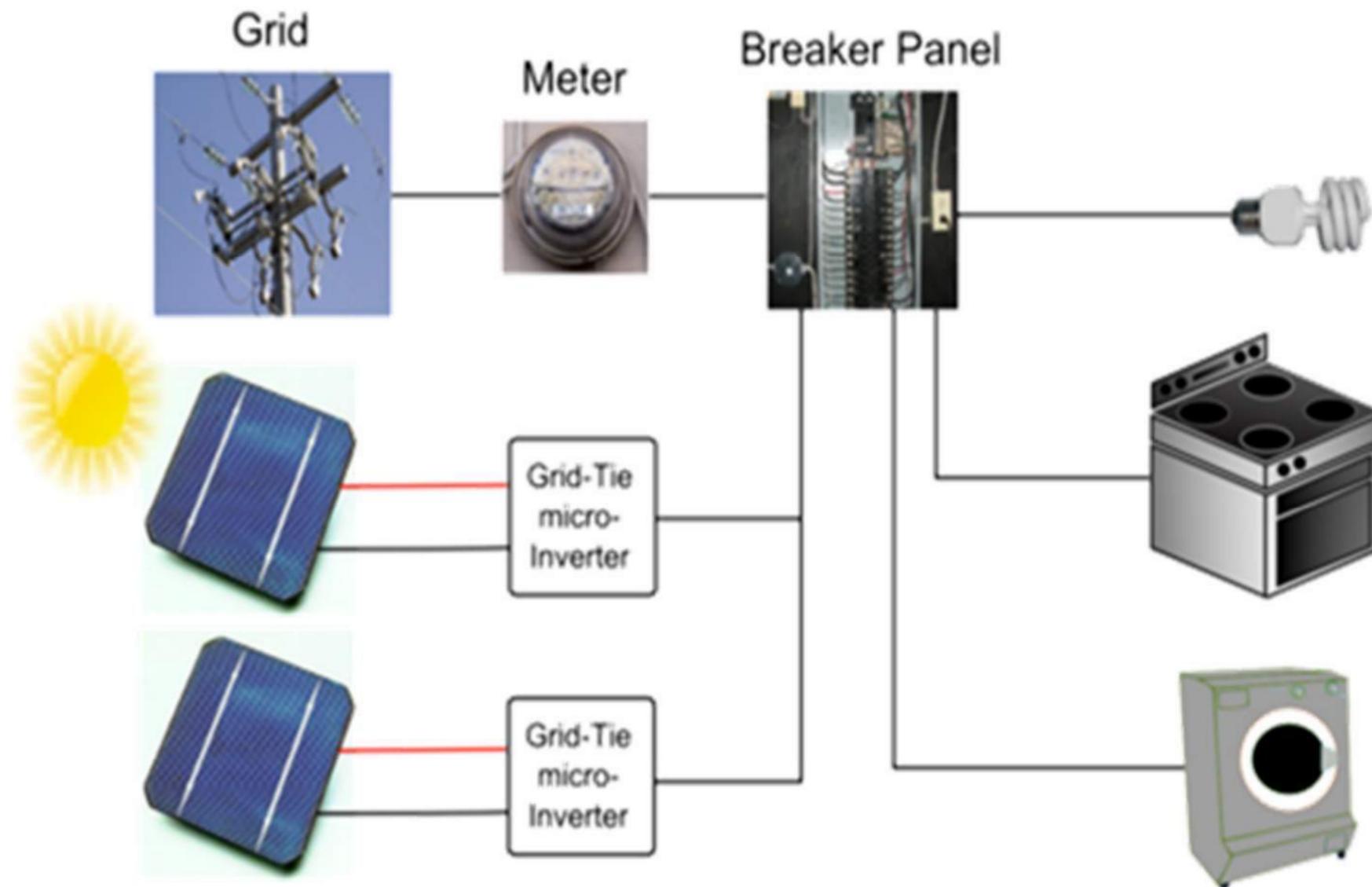


DIAGRAM OF A RESIDENTIAL PHOTOVOLTAIC GRID SYSTEM



INVERTER FOR PHOTOVOLTAIC



PHOTOVOLTAIC ON ROOF

# PLUMBING SYSTEM

## I. LOW FLOW or ULTRA LOW FLOW URINALS with SOLAR POWERED BATTERY OPERATED SENSOR

Low Flow (ultra low flow), 1/8 gallon per flush models with a battery powered flush sensor is the unit recommend for all new construction and retrofits. These low flow units provide 85% of the water savings associated with waterless units without the cartridge changing costs.

### Advantages:

1. Low flow equals water savings
2. Qualify for USGBC LEED point
3. Low maintenance
4. Installation in new and retrofit situations
5. First cost is coming down

### Disadvantages:

1. High up front cost in \$ per unit

## II. WATERLESS URINALS

The waterless urinal with wall outlet saves you water and money. The unit eliminates water and sewer costs from urinals; reduces maintenance and repair bills; and is designed to create hygienic, odor-free restrooms. Implementation and maintenance guidelines must be understood prior to specifying this product.

### Advantages:

1. Reduced water and sewer cost
2. Qualify for USGBC LEED point
3. Installation in new and retrofit situations
4. Payback around 1 ½ to 3 years
5. Does not require freeze protection
6. Does not require flush valve maintenance
7. Does not require batteries, transformers or electronics
8. Environmentally friendly

### Disadvantages:

1. Educating janitorial staff on what products to use for cleaning
2. Odor or perceived odor related to decreased cleanliness
3. Splashing of urine on men's trousers during use (may not apply here)
4. Reduced flow in waste water piping leading to deterioration of piping
5. Cartridge changing costs
  - Material expenses and stocking
  - Labor expenses and when to replace
  - Who does the change out? FMS or janitorial?
  - Cartridge disposal. HazMat or not?



### III. LOW FLOW WATER CLOSET with SOLAR POWERED BATTERY OPERATED SENSOR

A pre 1994 flush-toilet or *gravity-fed* toilet uses 3.4 US gallons or 2.8 imperial gallons or more per flush. In 1992, the United States Congress passed the Energy Policy Act of 1992, which mandated that, from 1994, the common flush-toilet use only 1.6 US gallons of water per flush. Low flow water closets possess an effective flush volume of 1.28 US gallons or less. Low flow water closets may be *single-flush* or *dual-flush*. A dual-flush toilet permits its user to choose between two amounts of water. Some Low flow water closets are *pressure-assisted* (or *power-assisted* or *pump-assisted* or *vacuum-assisted*).

The performance of a flush-toilet may be rated by a Maximum Performance (MaP) score. The low end of MaP scores is 250. The high end of MaP scores is 1000. A toilet with a MaP score of 1000 should provide trouble-free service. It should remove all waste with a single flush; it should not plug; it should not harbor any odor; it should be easy to keep clean. The United States Environmental Protection Agency uses a MaP score of 350 as the minimum performance threshold for Low flow water closets.

#### Advantages:

- Reduced water and sewer cost
- Qualify for USGBC LEED point
- Installation in new and retrofit situations
- Payback around 1 ½ to 3 years
- Environmentally friendly

#### Disadvantages:

- Specifying the right manufacturer

### IV. Faucet's with LOW FLOW AERATOR and SOLAR POWERED BATTERY OPERATED SENSOR

The installation of faucets with solar powered battery operated sensors and low flow aerators' (0.5 gpm), will save the owner money and water usage.

#### Advantages:

- Reduced water and sewer cost
- Qualify for USGBC LEED point
- Installation in new and retrofit situations
- Environmentally friendly

#### Disadvantages:

- Educating janitorial staff on who replaces batteries



## V. LOW FLOW SHOWER HEADS

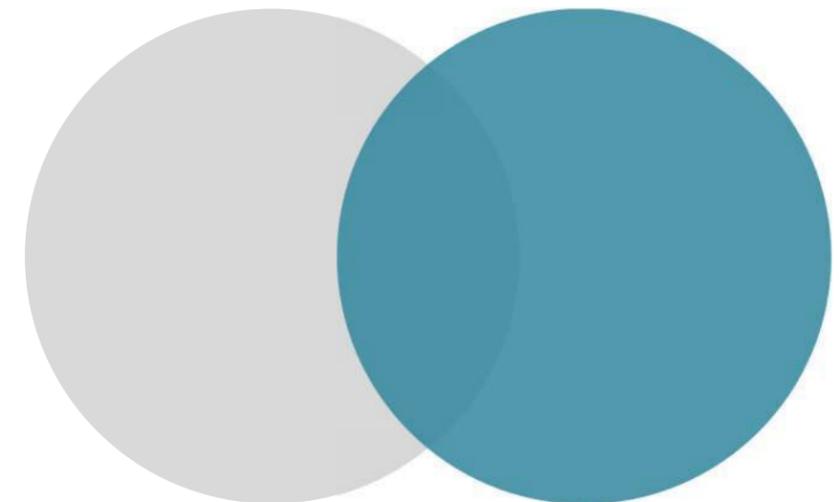
According to the Environmental Protection Agency, water use during showering or bathing represents 17 percent of all indoor household water use. Water flow and water pressure measurements determine the flow rate of a showerhead. Low flow showerheads (less than 2.5 gpm and 80 psi) restrict the flow of water and reduce the amount of water used during a shower. Low flow showerheads benefit the environment while lowering the owner's utility bills. The JADC's showers will deploy affordable and effective 1.0 gpm showerheads from brands such as Niagara Conservation.

### Advantages:

- Reduced water and sewer cost
- Qualify for USGBC LEED point
- Installation in new and retrofit situations
- Environmentally friendly
- Easy to install
- Inexpensive

### Disadvantages:

None



## FIRE AND SAFETY

### Fire Sprinkler System

The Friends of Refugee facility shall be a fully sprinkled facility per current NFPA, State and local code requirements.

### Fire Alarm System

The Friends of Refugee facility shall have a state-of-the-art fully addressable fire alarm system per current NFPA, State and local code requirements.

### Security /Access Control / CCTV / Music

The Friends of Refugee facility may have a monitored security/access control system installed. Access control can be installed on selected exterior entrance doors and on selected private quarters and common spaces such as mechanical spaces.

## VI. SOLAR POWERED WATER HEATER

Solar water heating systems include storage tanks and solar collectors. There are two types of solar water heating systems: active, which have circulating pumps and controls, and passive, which don't.

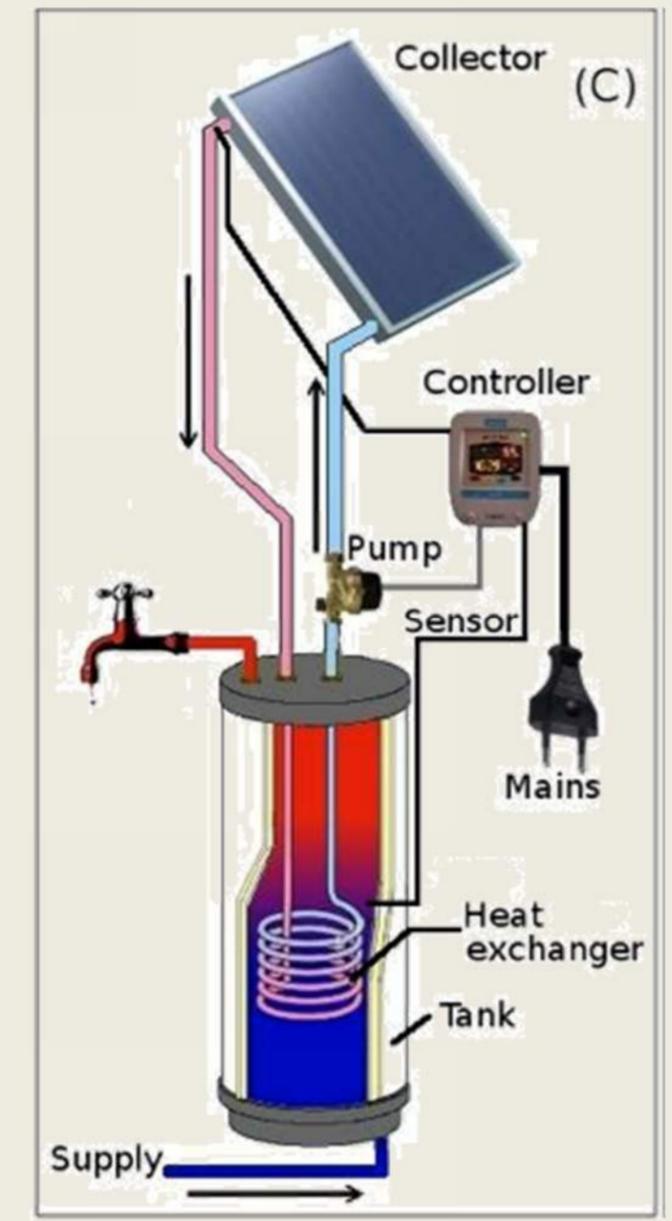
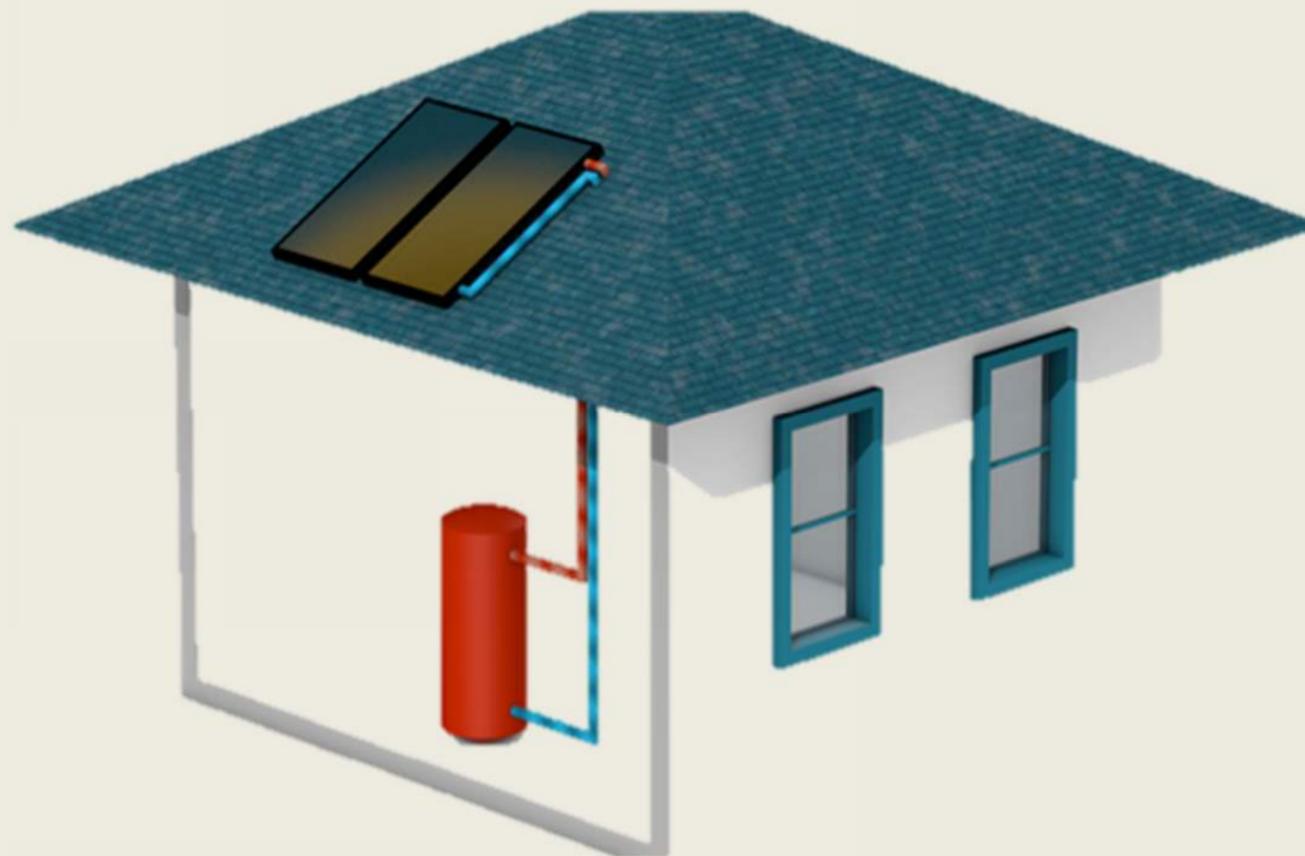
Most solar water heaters require a well-insulated storage tank. Solar storage tanks have an additional outlet and inlet connected to and from the collector. In two-tank systems, the solar water heater preheats water before it enters the conventional water heater. In one-tank systems, the back-up heater is combined with the solar storage in one tank.

### Advantages:

- Reduced energy usage
- Qualify for USGBC LEED point
- Installation in new and retrofit situations
- Environmentally friendly
- Easy to install by experienced installer

### Disadvantages:

- New technology for the user - requires training



## VII. RAINWATER HARVESTING COLLECTION SYSTEM

**Rainwater harvesting** is the accumulating and storing, of rainwater. Rainwater harvesting systems channel rainwater that falls on to a roof into storage via a system of gutters and pipes. The collected rainwater can be reused to irrigate vegetation or to water the local golf course. Additional uses of the collected water could be to flush toilets. Local codes must be understood in order to follow rainwater requirements.

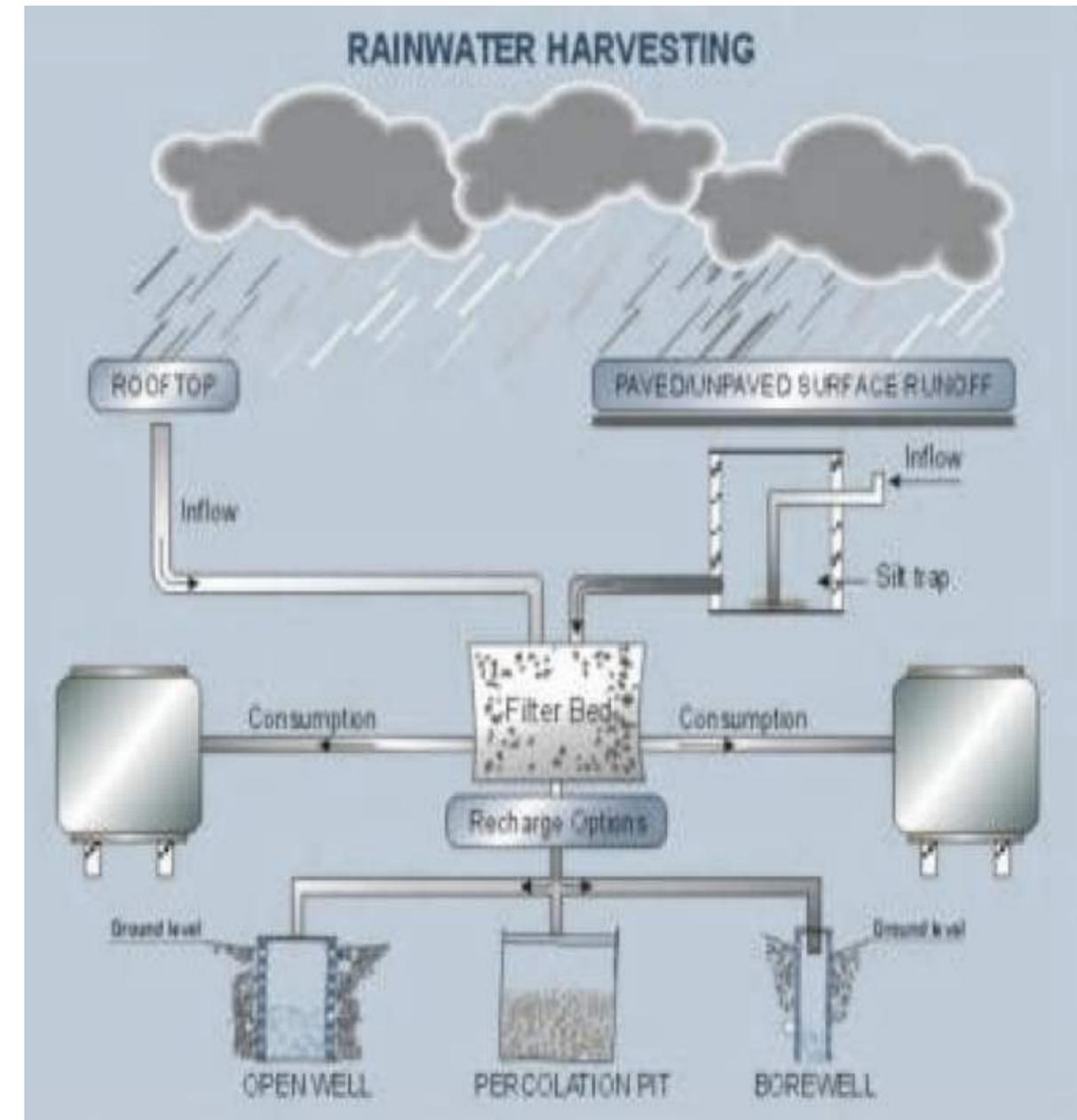


### Advantages:

- Reduced water usage
- Qualify for USGBC LEED point
- Installation in new and retrofit situations
- Environmentally friendly

### Disadvantages:

- May lead to less water returned to the lake
- Underground tank may be required
- Energy used to pump water to final destination



## NETWORKING

Video monitoring systems shall be installed to monitor the exterior grounds and selected common spaces on the interior.

A wireless intercom/paging system shall be installed to allow facility operators to communicate to the exterior and interior facility operators and users.

The F.O.R. facility shall have a facility-wide state-of-the-art music system installed in the common interior areas and on the exterior.

### **Life Safety and Misc.**

I. A/E shall perform a formal code review of the project during the design documents phase.

II. Facility shall have a tornado safety alarm system and tornado safety plan.

III. Facility shall have a fire evacuation safety plan.

IV. Facility shall have automatic deliberators located in accessible locations throughout the facility. Staff training for the deliberators shall be required.

V. Facility shall have staff personnel trained in First Aid and CPR.

## Networking Building Systems

### Internet Connectivity:

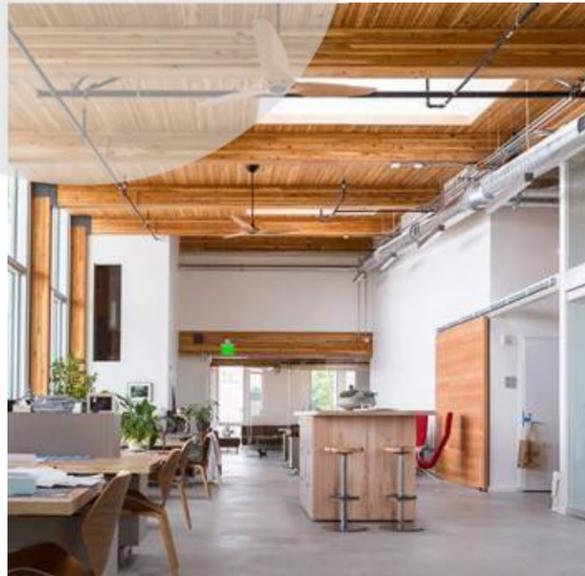
Internet connectivity is an important feature of modern buildings that ensure that both occupants and building systems can receive and transmit vital information. Network connectivity can be achieved through the following means:

- I. Dedicated conductive wiring
  - a. Very reliable
  - b. Very fast: 10-gigabit (10 billion bit) transfer rates with current protocols, which are 10 times faster than Gigabit and 100 times faster than 100 c. Megabit connections that are commonly used today
  - d. Inexpensive material cost, and trivial labor cost when also pulling wiring for other purposes
- II. Shared wiring that transmits electricity for energizing equipment and communication signals
  - a. A compromise
  - b. Unreliable
  - c. Slow
  - d. Do not use if other choices are available
- III. Optical wiring
  - a. Very reliable
  - b. Incomprehensibly fast: light speed
  - c. Expensive to install
  - d. Not particularly useful if the Internet Service Provider does not also provide an internet connection of the same speed/bandwidth
- IV. Wireless protocols
  - a. Signals are transmitted via electromagnetic waves without the need for wires with protocols that include:
    - i. Wi-Fi
    - ii. Radio frequency- mesh networks
    - iii. Light (experimental)
  - b. Less reliable than a physical wire
  - c. Fast and approaching Gigabit speeds
  - d. Minimal design or installation cost.

### Recommendations:

It is recommended that conductive, dedicated wiring (Cat6) is installed throughout the building. A hard-wired connection is extremely reliable, fast, and inexpensive when installed during construction. A hard-wired connection provides flexibility for locating routers to transmit/receive wireless signals, and ensures that a dependable internet connection is available for special purposes, such as control systems. Every envelope penetration must be meticulously sealed to meet the Passive House Certification criteria. Making only one penetration, at a single instance will make air sealing much easier.

# INSPIRATION





# Conclusion and Project Participants

## From the Chair of the Executive Board of SDCA

Members of seven organizations that are invested in sustainable design came together to sit at the same table and work on a solution, each member respected for their offering of knowledge and their volunteer spirit. These weekend warriors offer a solution that is documented through this booklet and several presentations.

This was the fourth year in a row that a foundation of professionals, along with some wonderful “new blood” in the way of volunteers, have collaborated together utilizing the “charette” methodology to provide design services to the underprivileged. This hands on approach, including on-ground face-to-face gatherings, pre-charette meeting, charett, and post-charette meetings along with online communication over several months, provides the glue that keeps everyone on the same page, at least most of the time. The energy provided by volunteer professionals, students, client, and others, is what makes it work. All of this is accomplished while volunteers maintain regular work/school hours and loads. This is a testament to the volunteer spirit within the building and design community that can truly make a difference.

Through this effort, we have expanded our services to the design of a building from the ground up, rather than adaptive re-use of an existing building, through design development phase. We realize that the design needs to continue to be developed during construction documentation phase, but we hope that we have laid the foundation to meet the immediate needs of F.O.R., to help provide a vision for the future of this community, and to serve as a catalyst for change in the immediate surroundings.

We trust that you will find this booklet useful and that it will provide guidance in the years to come. We thank Brian Bollinger, Executive Director of F.O.R., for his expert guidance along the way. It has been a pleasure to work with you and your volunteer staff of believers. Our sincere hope is that this building will be under construction very soon.

Liset Robinson, Chair SDCA 2011 - 2014

# Past Projects of SDCA

**2013 - 2014**, Jolly Avenue Refugee Development Center, Clarkston Georgia Friends of Refugees Website:

<http://friendsofrefugees.com/>

**2012 - 2013**, LifeCycle Building Center, Atlanta, Georgia

Project Book:

<http://issuu.com/redandgreenscenecommunityservice/docs/redandgreenscenecommuntayoutre>

Lifecycle Building Center's Webpage:

<http://www.lifecyclebuildingcenter.org/>

**2011 - 2012** : Lithonia Woman's Club, Lithonia, Georgia

Project Book: <http://issuu.com/redandgreenscene/docs/rags2012bookfinalsinglepages>

**2010 - 2011** : Adams Park: Conceptual Sustainability Study, Atlanta Georgia

Prepared for: The City of Atlanta Department of Parks, Recreation & Cultural Affairs and the Mayor's Office – Division of Sustainability



# Participating Organizations

## R+GS Partners

American Institute of Architects

US Green Building Council

International Interior Design Association

American Society of Heating Refrigeration and Air Conditioning Engineers

Construction Management Association of America

Construction Specification Institute

American Society of Interior Designers

## SDCA Partners

Friends Of Refugees

Savannah College of Art and Design – Atlanta Interior Design students

Geheber Lewis Architects

Southface Energy Institute

Passive House Institute

Lifecycle Building Center

SPECIAL THANKS to J E Dunn Construction for all of the hosting duties for the 2014 project

## SDCA Executive Board Members 2014

<b>Chair</b>	Liset Robinson
<b>Co-Chair</b>	Richard Nelson
<b>Secretary</b>	Brent Redmon
<b>Treasurer</b>	Michael Dudley
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