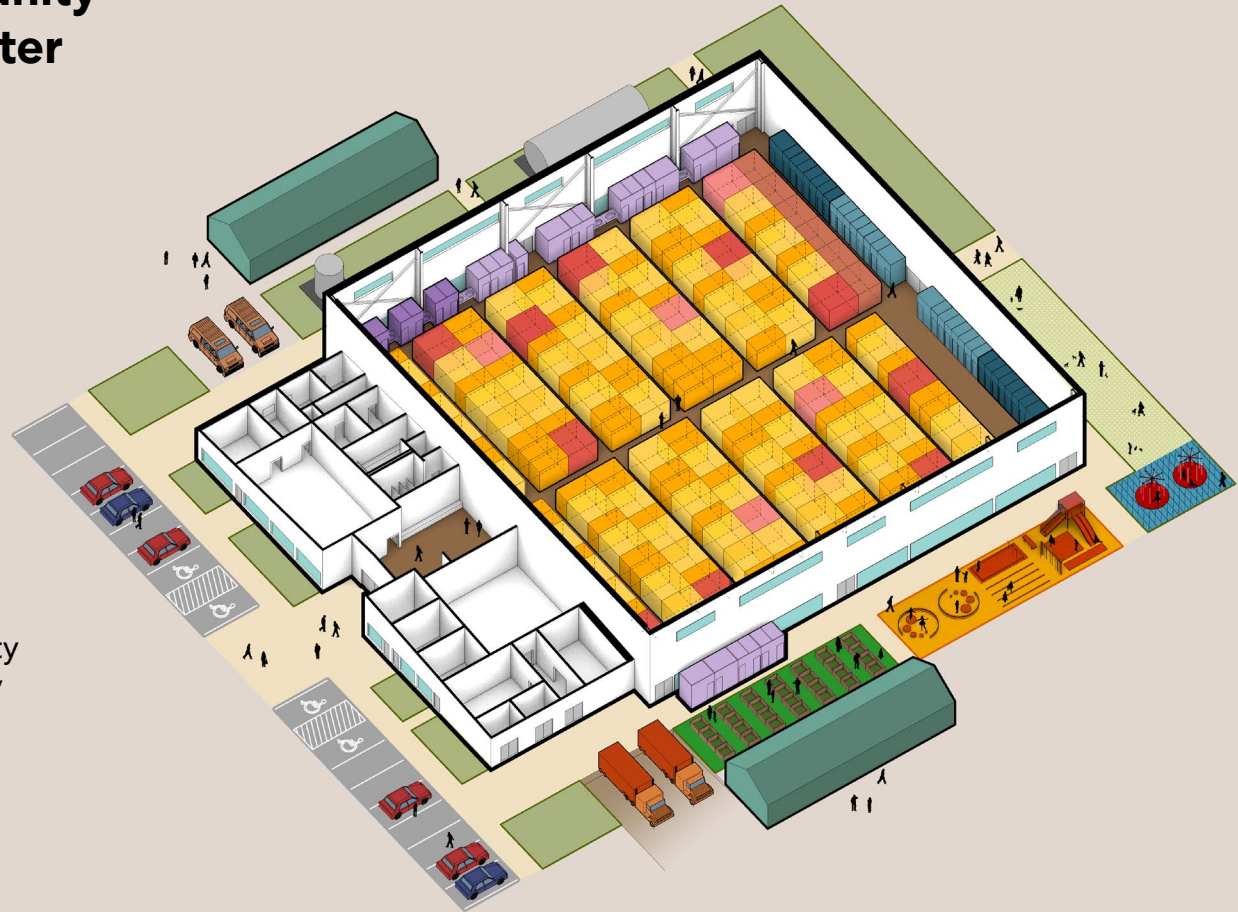


PHASE 1

Guánica Emergency Preparedness Plan & Shelter Design: Pre-During-Post Event



Guánica Resilient Community Center & Emergency Shelter



We designed three Resilient Community Centers that transform into emergency shelters during events such as earthquakes, hurricanes and extreme heat, to serve a maximum combined population of 2,550—18% of the total Municipal population.

Volunteering Team – Phase 1



Yanel de Angel

FAIA, Principal, Perkins and Will / Co-founder resilientSEE-PR



Danniely Staback

Designer, RISD and University of Illinois Design Critic in Architecture / resilientSEE-PR



Rania Karamallah

Designer, Perkins & Will



Shiyao Liu

Designer, Perkins & Will



Manuel Fontan

Engineer, PE, LEED AP, Resilient Equities / resilientSEE-PR



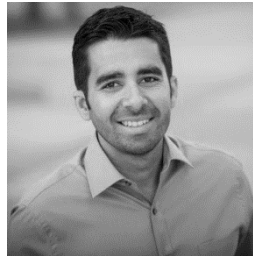
Christopher Lizewski

P.E., Life Safety, Code Red Consultants



Jesabel Rivera

MPH, CHES, Community Impact & Engagement Solutions, Co-founder Voluntariado de Ingenieros



José Sanchez

PE, Senior Structural Engineer, Co-founder Voluntariado de Ingenieros



Luiber Lugo

Contractor / Voluntariado de Ingenieros



Ruth Super

Prof. Boston Architectural College / Principal, Ruth Super Design



Ryan Downs

Student, Boston Architectural College / Architect



Ana Rios Sabater

Student, Boston Architectural College

Sites

Ensenada Neighborhood at El Batey Sector will be the first one built with funds secured from the FEMA Hazard Mitigation Grant.



Parque Centenario



Ensenada, Batey Sector

1st to be built



Oasis Sector



Community Center locations.



Objectives

Create a **Contextually Responsive Design** considering risks, susceptibilities, and vulnerabilities of the community

Design an **equitable and inclusive place** for all members of the community

Develop a **Community Center**, an asset for year-round capacity building, **that supports the community before-during-after an emergency**



January 2020 earthquake destruction.



Inclusive Design for a Vulnerable Population



Families



Elderly



Pets

Population Demographics in the 3 Shelter

Inclusive and integrative shelters that provides equal access for all.



Families

680



Individuals

183



Couples

20



Elderly / Assistance

20



Disabled & Companion

80



Pets

Yes



Families

812



Individuals

207



Couples

20



Elderly / Assistance

25



Disabled & Companion

94



Pets

Yes



2,402



150

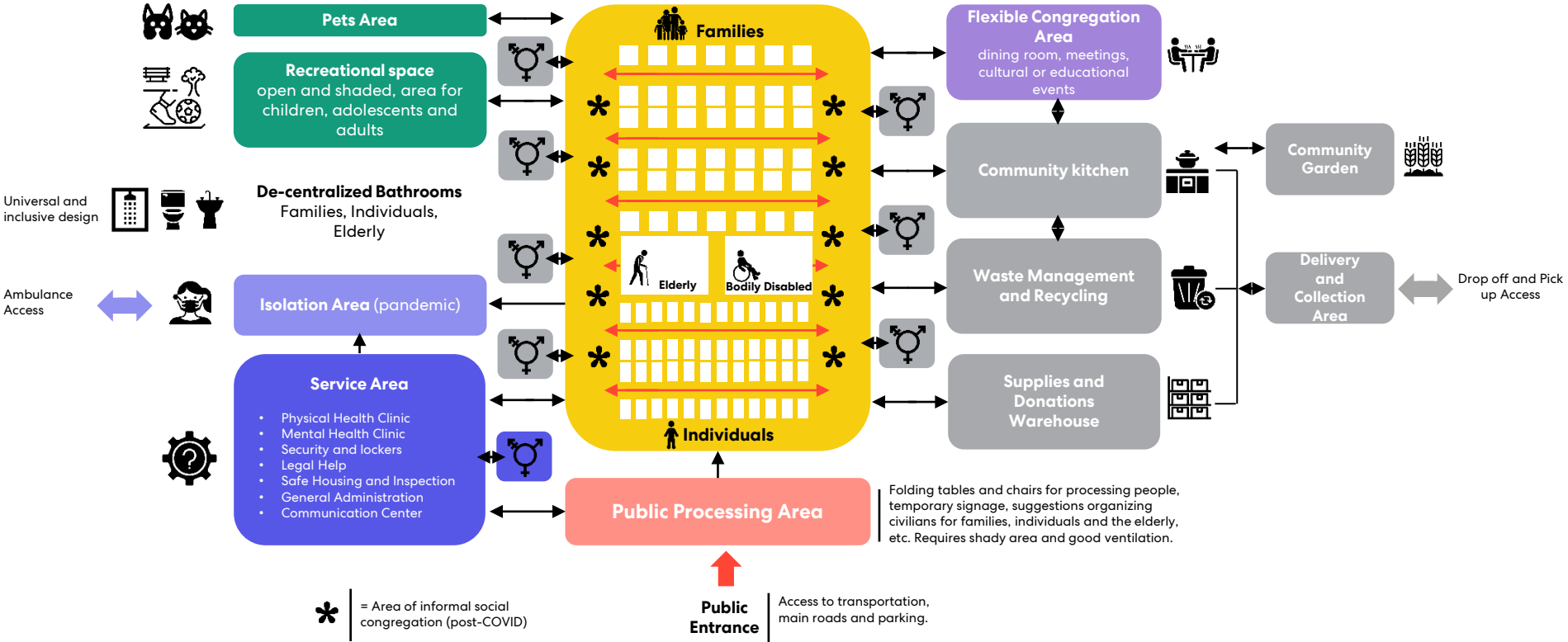
Hurricane
983 people

Earthquake
1,158 people

FEMA
2,552 people

Programming and Critical Adjacencies

Flexible, roofed and safe open space to establish booths or temporary divisions.





Cardboard Privacy Kit



Cardboard Privacy Kit

Transformation Depending on Use or Emergency

01.

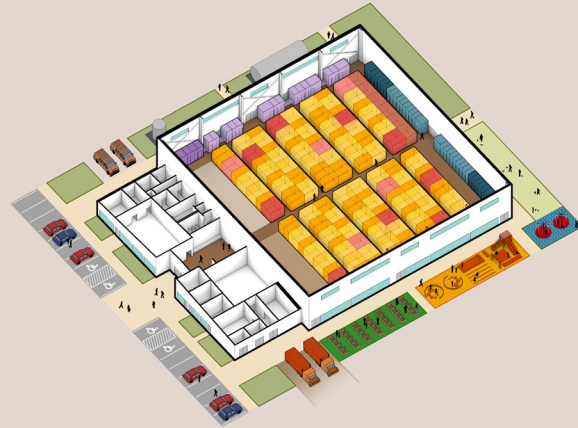


Regular Time / “Blue Skies”

Year-round capacity building

After a hurricane emergency, when shelters experience increased demand, services can be relocated outside to admit more people in need.

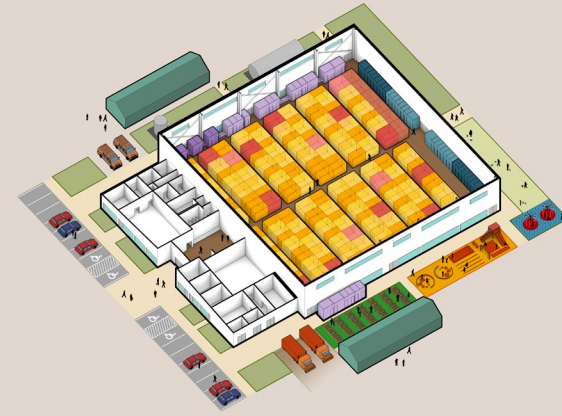
02.



Hurricane Emergency

All services provided inside
300 (18 ADA) Capacity

03.



Earthquake or Post-Hurricane Emergency

Services relocated to temporary tents
374 (23 ADA) Capacity
804 (50 ADA) Max FEMA Capacity



Floor Plan

- Staff Meeting
- Staff Kitchen
- Adult Changing/Inclusive WC
- Staff Locker/Shower
- Administration Suite

- Entry Hall

- Physical Health / Pharmacy
- Community Service Flex Office
- Community Laundry
- Community Kitchen
- Kitchen Support
- Storage
- Utility / Electrical



2-Court Shelter Concept

Insulated and white roofs to reflect heat gain

Emergency Cistern Water Tank, covers 3-days

Regular Use Rainwater Tank

Official vehicle area

Photovoltaic Solar Panels, 20% of Roof Area

Solar Tubes for Natural Light

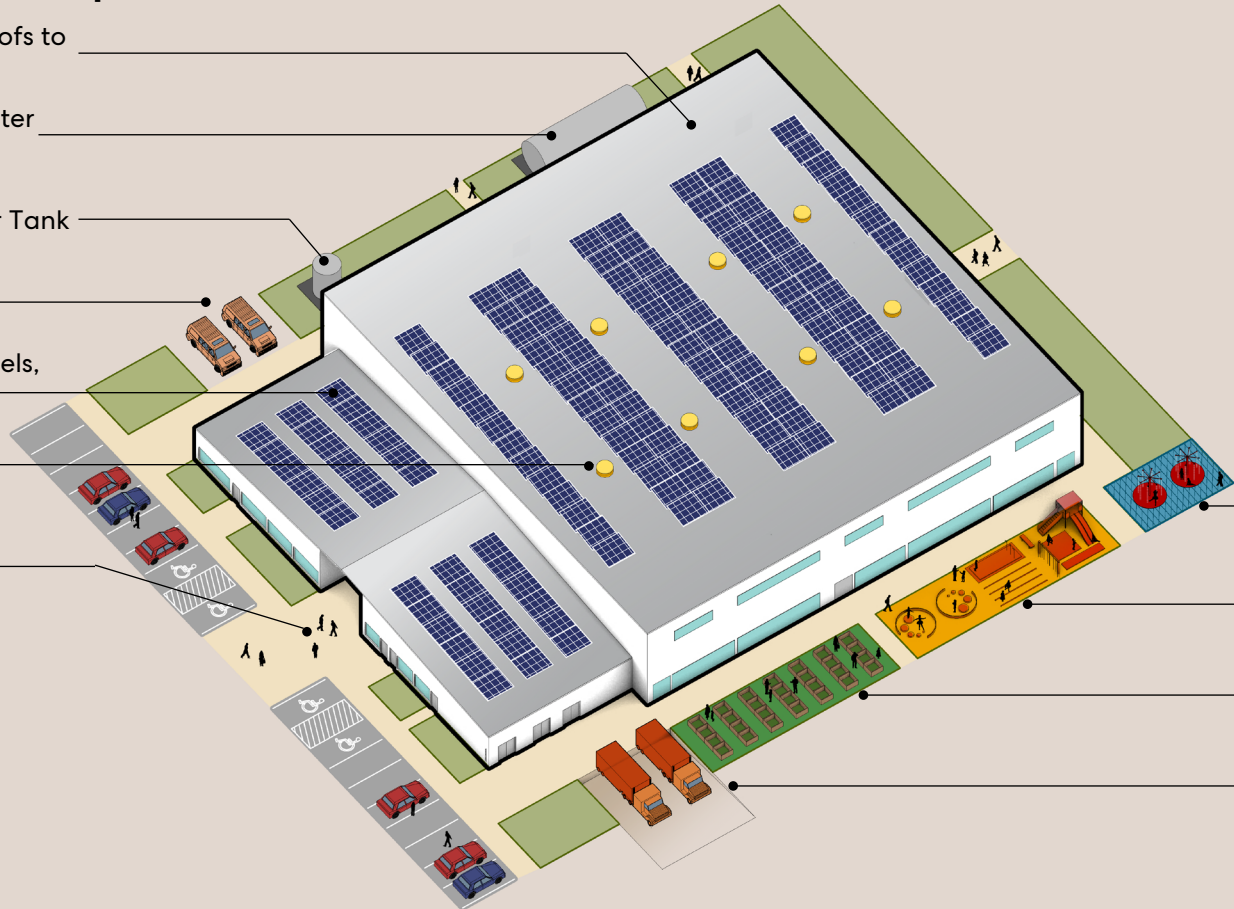
Main entrance

Water park

Games area

Community Edible Garden

Loading and unloading area



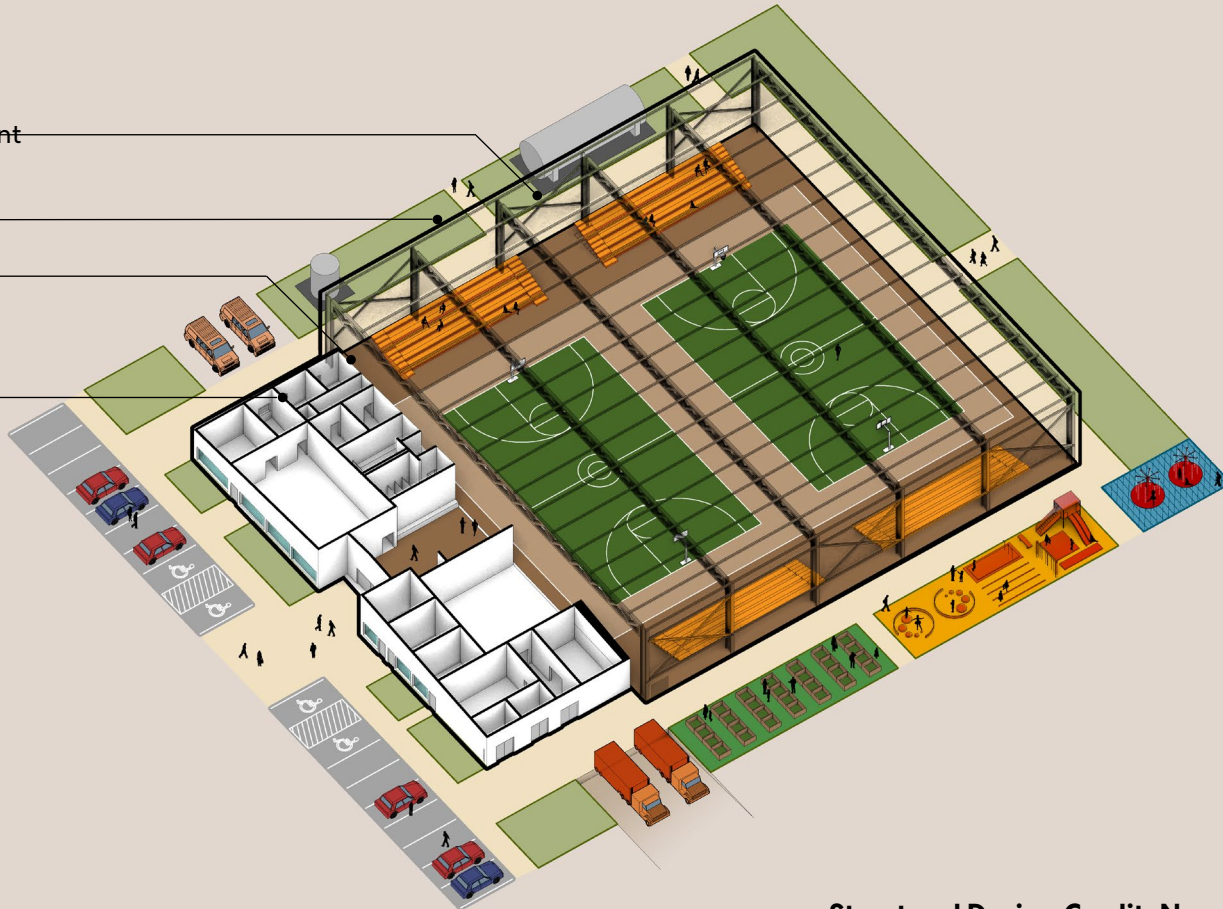
Structural Systems

Structural reinforcement

Steel Structure on
the Courts

4" movement
seismic control joint

Reinforced Concrete
Structure and
Reinforced Blocks



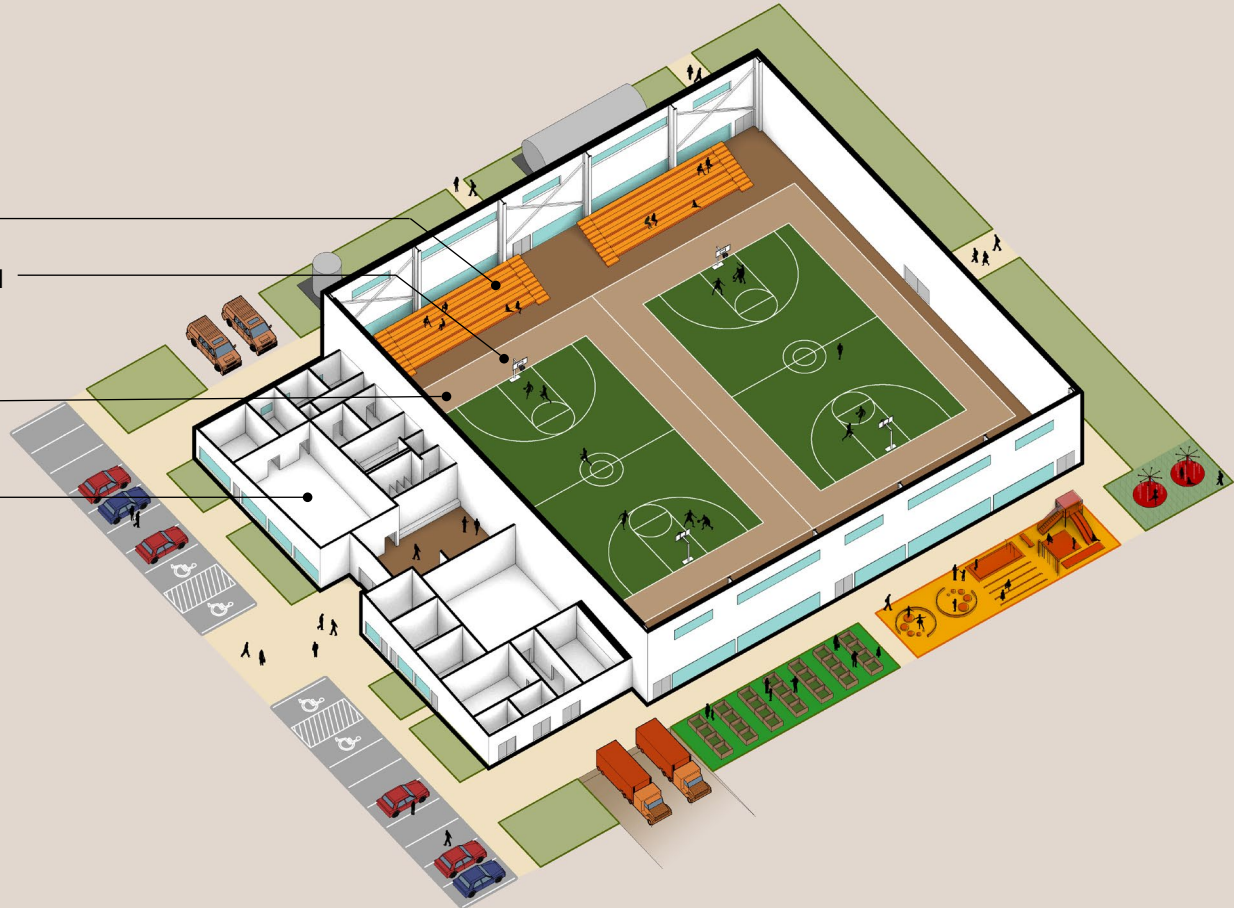
Regular Time Use

Retractable seats

Basketball Basket Held
from Roof Structure

Wood floor

Community Center:
Administration and
Services



Emergency Use During Hurricane

Temporary Showers :

Dark Blue = ICC 500 requires 1:25 ratio

Light Blue = 1:8 ratio pandemic recommendation

Toilet / Hand Wash :

Dark Violet = ICC 500 requires 1:20 ratio

Light Violet = 1:8 ratio pandemic recommendation

Temporary Sinks

Refugee Area

Temporary Services Area

Public Prosecution Area

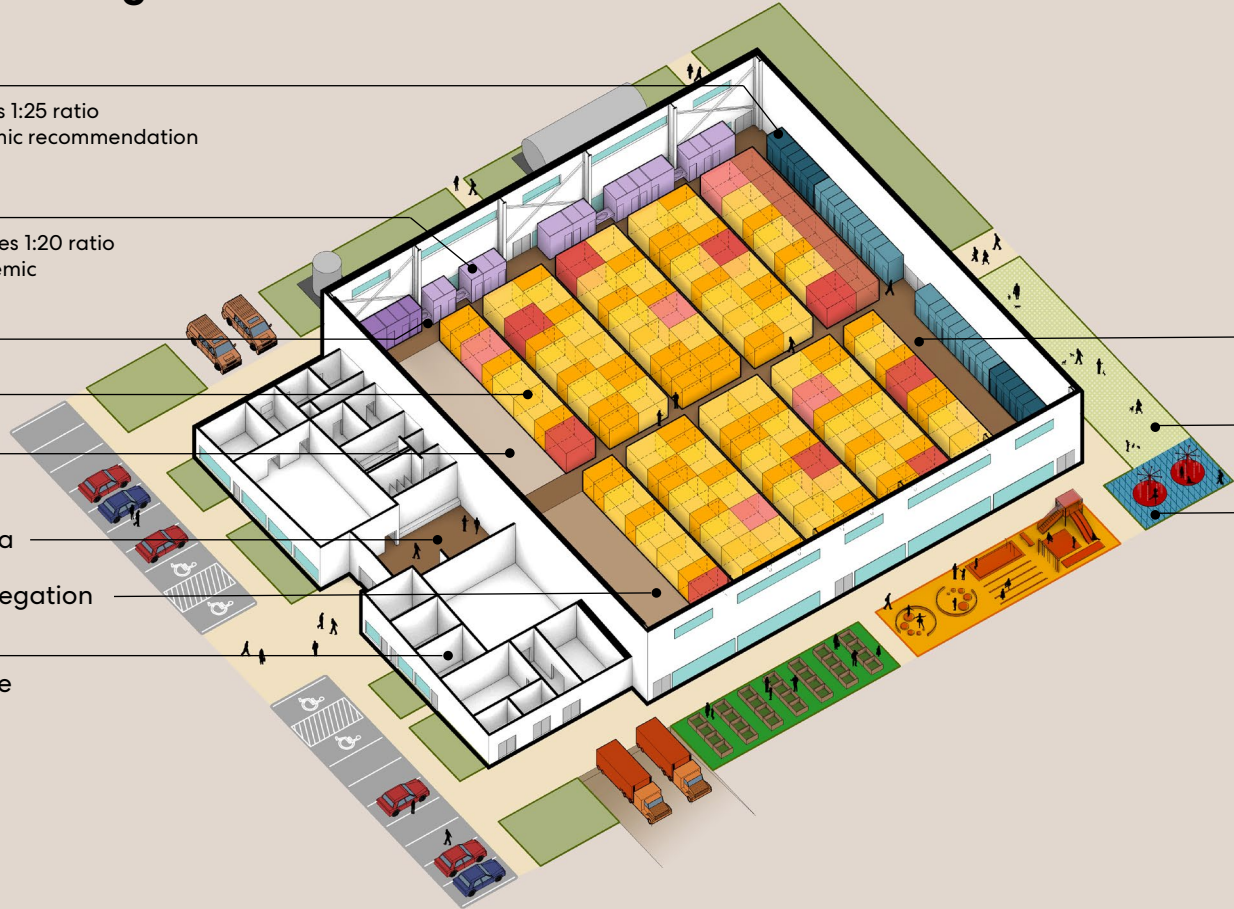
Flexible Area of Congregation

Community Center: Activated to Attend the Emergency

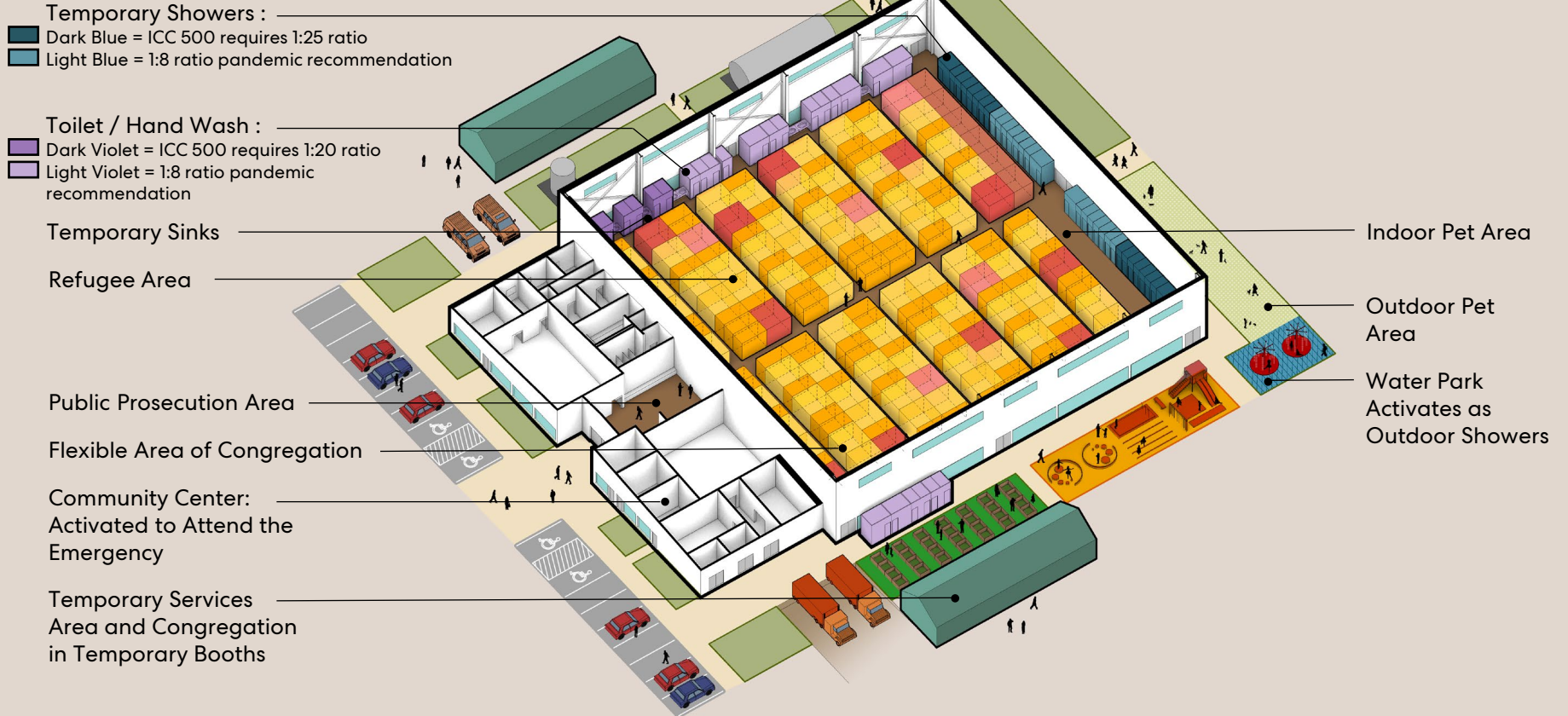
Indoor Pet Area

Outdoor Pet Area

Water Park Activates as Outdoor Showers

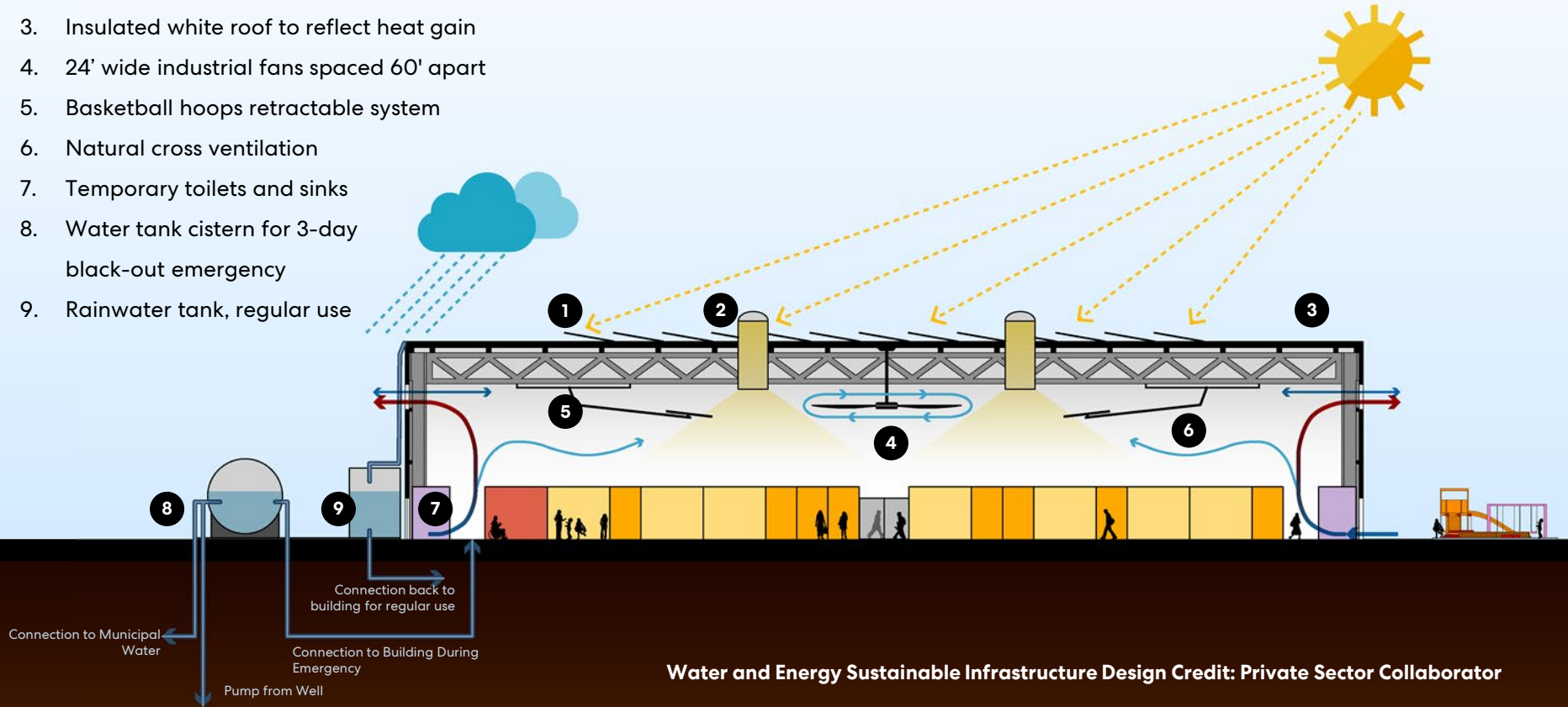


Emergency Use During Earthquake or Post-Hurricane



Cross Section

1. Photovoltaic solar panels tied to battery system
2. Solar tubes for natural light
3. Insulated white roof to reflect heat gain
4. 24' wide industrial fans spaced 60' apart
5. Basketball hoops retractable system
6. Natural cross ventilation
7. Temporary toilets and sinks
8. Water tank cistern for 3-day black-out emergency
9. Rainwater tank, regular use



Boston Architectural College

Studio Collaboration

Led by Professor Ruth Super, Professor at the Boston Architectural College

Course: DHH 3012: Universal / Inclusive Design

Students: Ana Rios Sabater and Ryan Downs

Prof. Ruth Super

Operational Policy

Sleeping Areas and Distribution

Toilets and Showers Use

Companion Animals

Pandemic Requirements

Lighting and Ventilation

Intake Forms / Health Questions

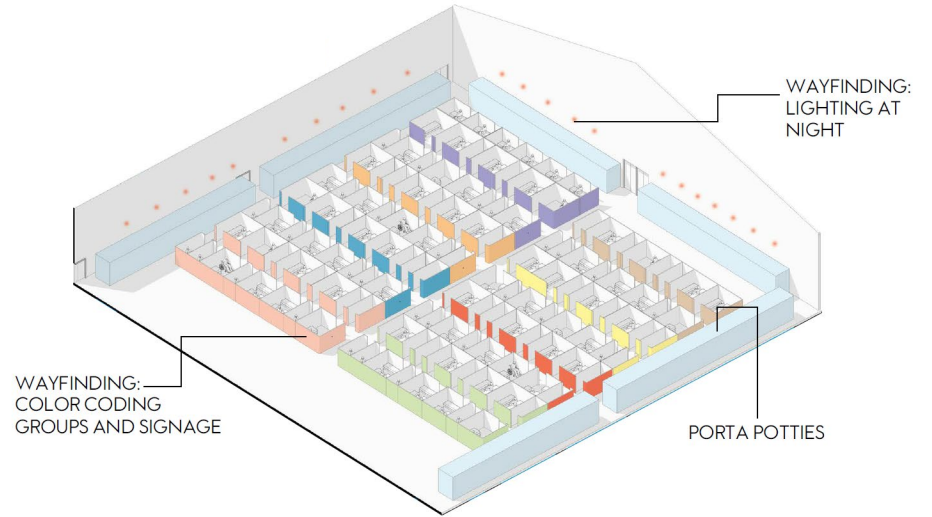
Shelter Rules

Shelter Questions

1. What is your name?
2. Is there someone in your family who speaks English?
3. (Ask only if the English-speaking family member is a child.)
Will you allow your child to translate for you?
4. Please fill out this registration form:
 - Head of household
 - Spouse
 - Children in home
 - Other non-family members in the home
 1. Where were you living when the disaster happened?
 2. What is your telephone number?
 3. Can we share this information with other agencies?
 4. Please let us know where you will be living when you move from the shelter.
 5. Health regulations forbid animals in shelters except working service animals who assist with disabilities.
Do you have any pets with you?
 6. Please sign in and out when leaving or re-entering shelter.

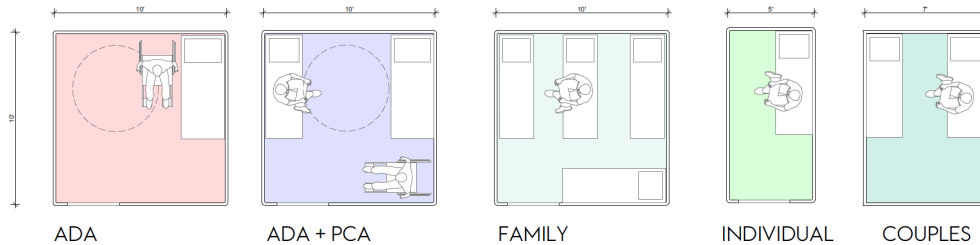
Shelter Questions

Shelter Community

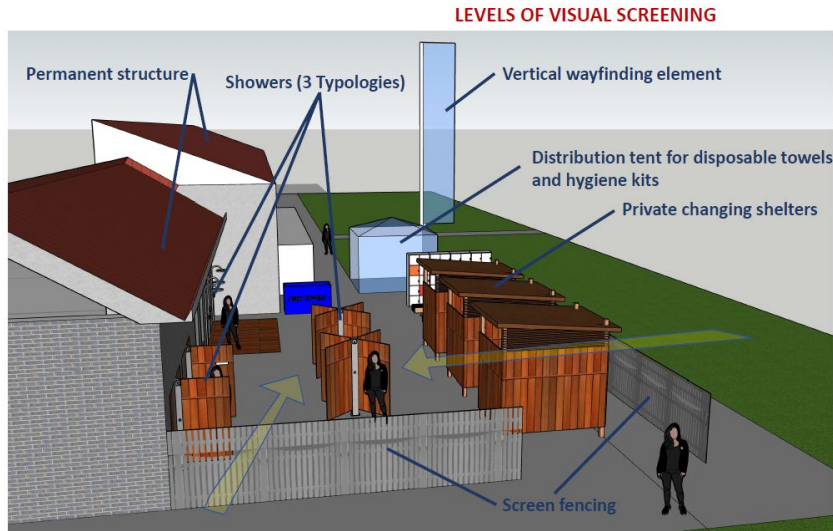


↓ Shelter modules for diverse population

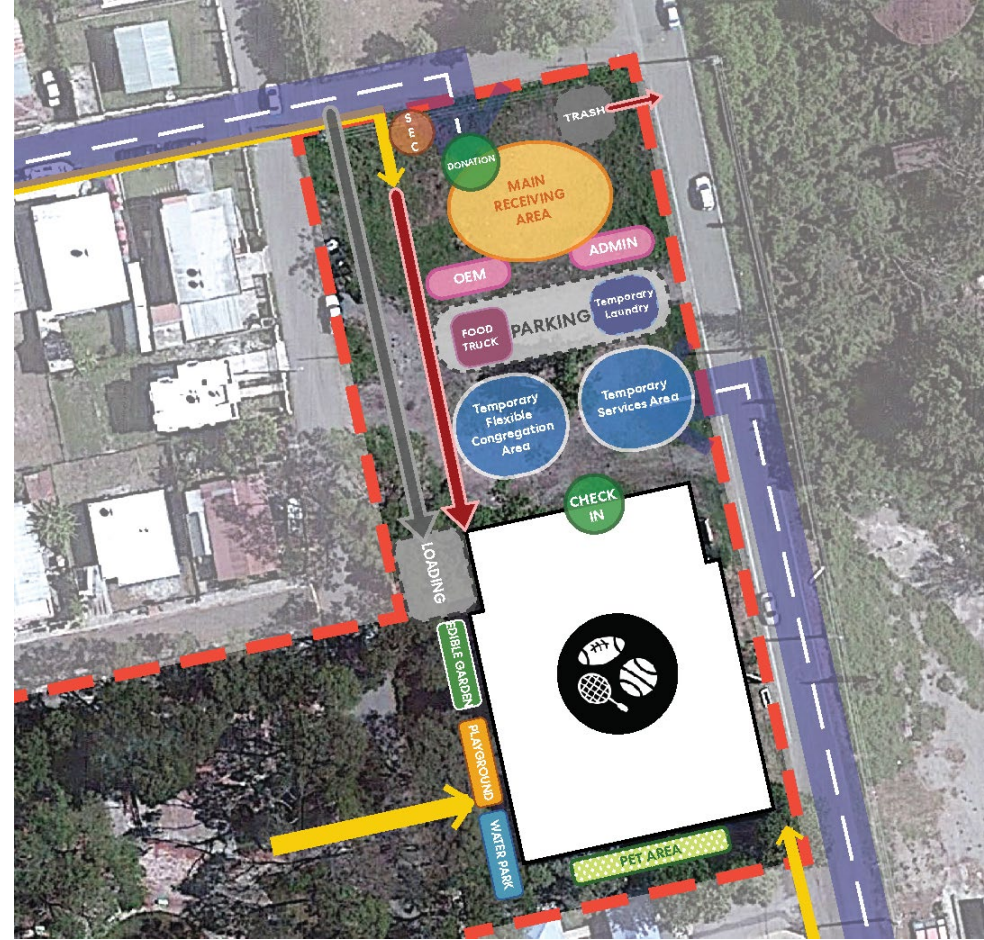
↖ Wayfinding Concept



Emergency Operations



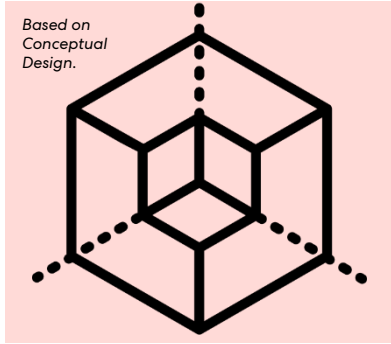
↑ Inclusive Exterior Shower Concept



↑ Site Emergency Operations Plan

Credit: Academic Collaborator, student: Ryan Downs

Design & Documentation – 12 months



Schematic Design

Activities / 3 months

Community Feedback Workshop

Geotech Study - soil conditions

Site Survey - topography

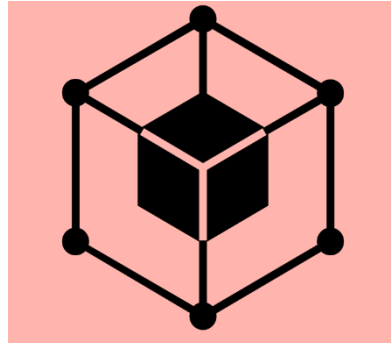
Civil – building siting & utilities

Architecture – base drawings developed

Structural – type feasibility

MEP/FP – systems type selection

Specialty Equipment – identify



Design Development

Activities / 3 months

Civil & Landscape – site plan development

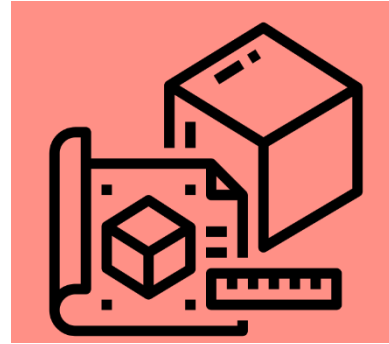
Architecture – develop building envelope and interiors, coordinate all disciplines

Structural – initial calculations and coordination

MEP/FP – systems sizing, energy and water models, coordination

IT/AV – equipment coordination

Specialty Equipment – shelter modality coordination equipment, signage



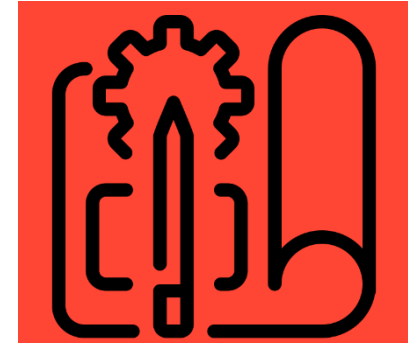
Construction Documents

Activities / 3 months

Coordinate integration of all disciplines and create construction documents

Authorities Having Jurisdiction Meetings

Begin Permits with Early Packages, as necessary



Bidding

Activities / 3 months

Contractor Qualifications

Contractor Selection

Bidding and Contract

Permits

Construction – 24 months



Construction Initiation

Activities / 6 months

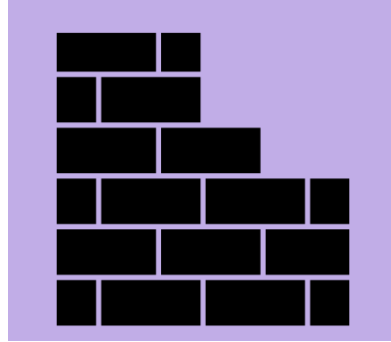
Contractor Mobilization

Site Clearing & Access

Foundations

Site Work

Utilities Infrastructure Connections



Core & Shell

Activities / 6 months

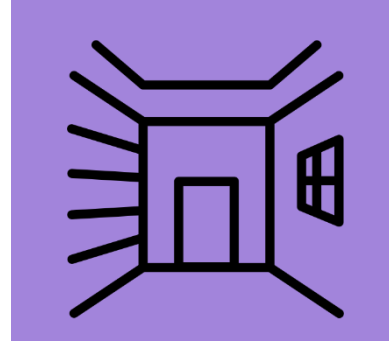
Structural System Erection

Framing & Core Elements

MEP/FP Rough Work

Envelope Construction & Installation

Parking and Exterior Surfaces Layout



Interior Fit Out

Activities / 6 months

Interior Finishes

Equipment & Lighting Installation

Specialties, Signage & AV/IT Systems Installation

Landscape Installation

Exterior Pavement & Sidewalks



Final Close Out

Activities / 6 months

Punch List

Systems Commissioning

Certificate of Substantial Completion

Agency & Municipal Endorsement

Operations Manual

Occupancy Permit

Lessons Learned

Successful remote collaboration connecting professionals in different parts of the World to contribute expertise

Partnership with an academic institution to educate the leaders of tomorrow

Dynamic engagement with community and government leaders

Recognition of obstacles in providing direct relief services to communities: access to funding for design and construction and gaps in the process

A Guánica as resilient as the mangroves of its coast.



PHASE 2:
**Guánica Emergency Preparedness
Plan & Shelter Design:**
Pre-During-Post Event



Volunteering Team – Phase 2



Yanel de Angel

FAIA, Principal, Perkins and Will / Co-founder resilientSEE-PR



Danniely Staback

Designer, RISD Critic in Architecture / resilientSEE-PR



Manuel Fontan

Engineer, PE, LEED AP, Resilient Equities / resilientSEE-PR



Giovanna Rodríguez

Mechanical Designer, Individual Collaborator



José (Ito) Fullana

Cost Estimator, FR Construction Group, Inc., consulting for resilientSEE-PR



Jesabel Rivera

MPH, CHES, Community Impact & Engagement Solutions, Co-founder Voluntariado de Ingenieros



Ariel Felipe Irizarry

PE, Structural Engineer, Moderno Engineering / Voluntariado de Ingenieros



Carmen Cosme

Executive Director, One Stop Career Center of Puerto Rico, Inc



Cesar E Torres-Vega

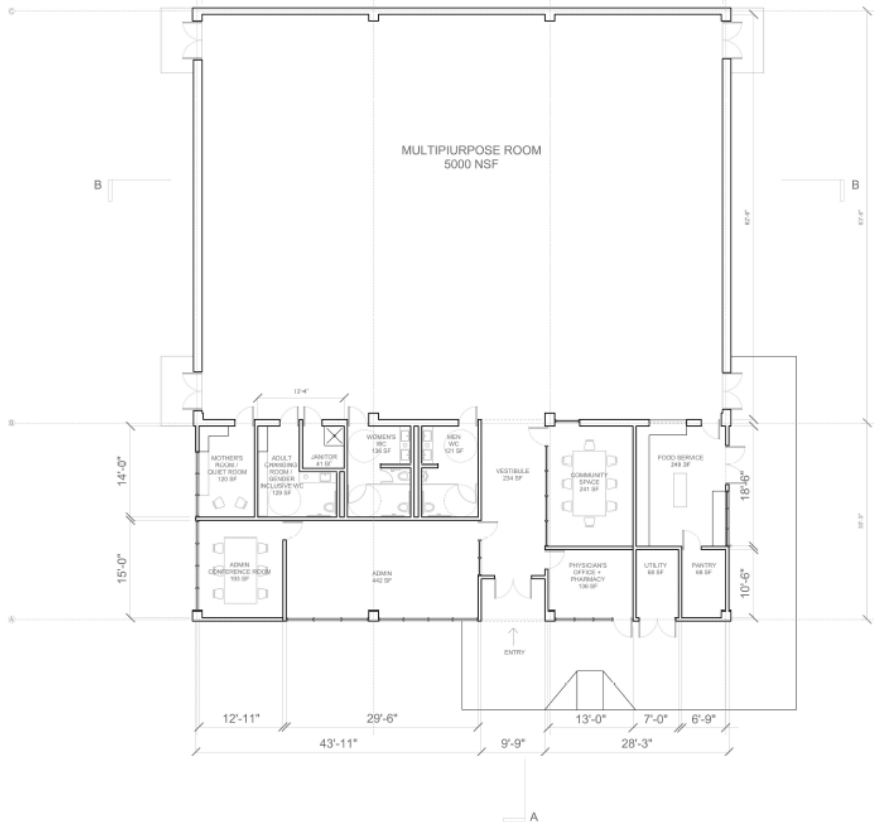
Compliance Officer, One Stop Career Center of Puerto Rico, Inc



Alberto Luis Perez Torres

Cost Estimator, consulting for One Stop Career Center of Puerto Rico, Inc

Final FEMA submission, program reduced size to meet \$8.7M budget.



PLANTA ARQUITECTÓNICA 1/16" = 1"

7,794 GSF



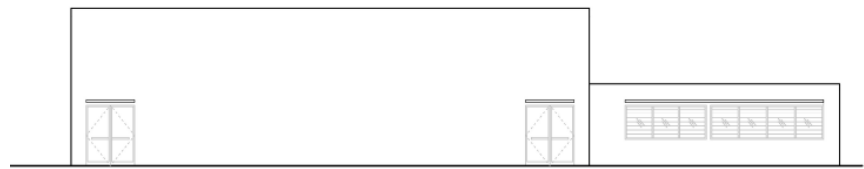
Proposed Resilient Center

Existing open air basketball court

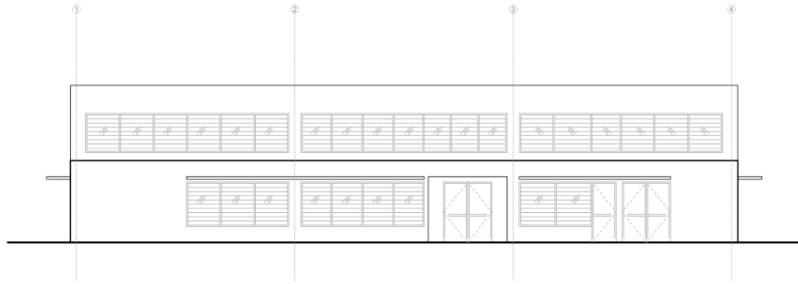


Site

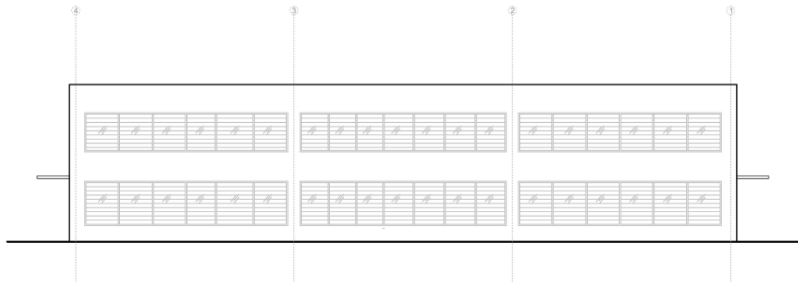
Elevations and Sections



ALZADO NORTE 1/16" = 1'



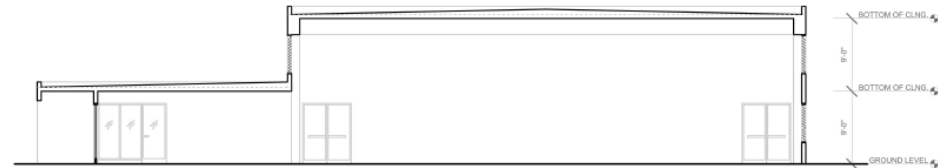
ALZADO OESTE 1/16" = 1'



ALZADO ESTE 1/16" = 1'



ALZADO SUR 1/16" = 1'



CORTE A-A 1/16" = 1'



BOTTOM OF CLING
8' 0"
BOTTOM OF CLING
8' 0"
GROUND LEVEL

Guanica, Oasis - Community Safe Room
PROGRAM

FEMA Safe Room Capacity Calculation														
Space / Espacio	Quantity / Cantidad	Net Square Feet	Comments / Comentarios	Safe Room	Safe Room	NSF	Area Reductions				Usable Floor Area			TOTAL Occupancy
							50% for safe rooms with concentrated furnishings or fixed	35% for safe rooms with unconcentrated furnishings and without fixed seating	15% for safe rooms with open plan and without fixed seating	10% for natural travel corridors	NFS after reductions	Non ADA occupant count / 20 SF per occupant	ADA occupant count / 40 SF per occupant in medical bed	
Multipurpose Room	1	5,000	Community Safe Room	X	Multipurpose Room	5,000			750	500	3750	188		188
Vestibule	1	234	Use for processing people pre-emergency.											
Administration														
Open Office Area	1	442	Community Safe Room	X	Open Office Area	442	221			44	177		4	4
Conference Room	1	193	Community Safe Room	X	Conference Room	193		68		19	106		3	3
Community Resource														
Community Space	1	241	Community Safe Room. Meeting space for community programs during 'Blue Skies.'	X	Community Space	241		84		24	133	7		7
Physicians Office & Pharmacy	1	136	Space for volunteering physician to see community members for scheduled visits. Includes secured pharmacy cabinet, medicine refrigeration, and medical disposal canister. Can be flexed use for other services such as those offered by volunteering organizations in mental health and legal help. Operational during emergency for those in Safe Room.											201
Food Service Area			Operational during emergency for those in Safe Room.											
Food Service	1	249												
Pantry	1	68	Dry Storage. Can be stocked pre-emergency.											
Mother's Room & Sensory Room	1	120	respite and de-escalation room for calming behavioral situations. Operational during emergency for those in Safe Room.											
Water Closets / Washrooms														
Adult Changing Room / Gender Inclus	1	129	Provide adult changing table and consider providing a ceiling mounted transfer system. Code Compliant.	Resources:	https://www.disabilityaccessconsultants.com.au/what-is-an-accessible-adult-change-facility/					https://www.changing-places.org/				
Men WC	1	121	Code compliant.											
Women WC	1	136	Code compliant.											
Support Spaces														
Janitor	1	41	Provide mop sink and utility faucet.											
Utility	1	68	Electrical Room for system and batteries.											
TOTAL NSF		7,178												
TOTAL GSF		7,794	outer wall of building dimension											
ADA Parking	2		1 car vehicle and 1 van parking space, paved for wheelchair accessibility											

Guanica, Oasis - Community Safe Room

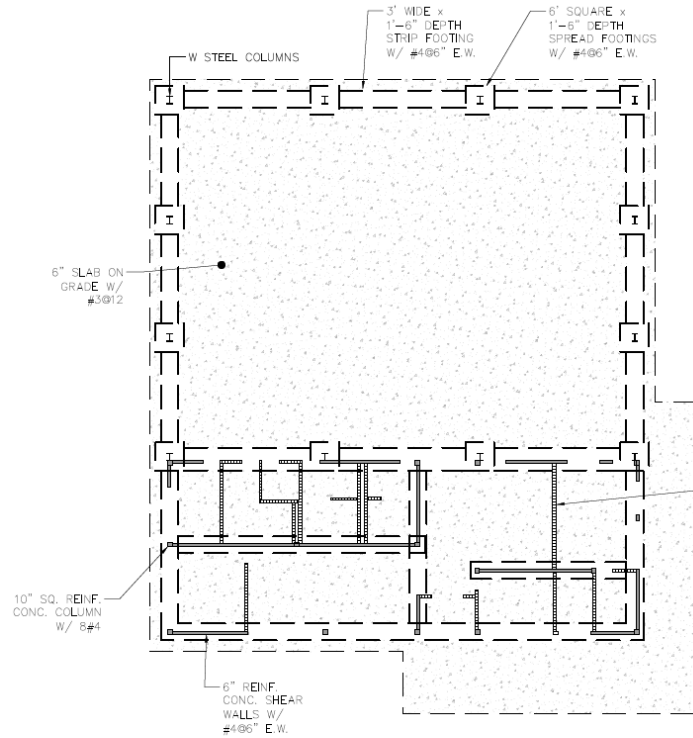
FINISHES

Room Name	Finishes		Ceiling	Comment
	Floor	Walls		
Multipurpose Room	expose concrete	Operable windows as indicated in elevations	open ceiling, surface mounted LED lighting	dimable lighting
Vestibule	expose concrete		open ceiling, surface mounted LED lighting	
Administration				
Open Office Area	Carpet		open ceiling, surface mounted LED lighting	
Conference Room	Carpet		open ceiling, surface mounted LED lighting	
Community Resource				
Community Space	expose concrete		open ceiling, surface mounted LED lighting	
Physicians Office & Pharmacy	Porcelain Tile		open ceiling, surface mounted LED lighting	Locable pharmacy cabinet
Food Service Area				
Food Service	Quarry Tile	wainscot height Porcelain tile at wet wall	open ceiling, surface mounted LED lighting	
Pantry	Quarry Tile		open ceiling, surface mounted LED lighting	
Mother's Room & Sensory Room	Carpet		open ceiling, surface mounted LED lighting	requires sink and dimable lighting
Water Closets / Washrooms				
Adult Changing Room / Gender Inclusive WC	Porcelain Tile	wainscot height Porcelain tile at wet wall	open ceiling, surface mounted LED lighting	
Men WC	Porcelain Tile	wainscot height Porcelain tile at wet wall	open ceiling, surface mounted LED lighting	
Women WC	Porcelain Tile	wainscot height Porcelain tile at wet wall	open ceiling, surface mounted LED lighting	
Support Spaces				
Janitor	expose concrete		open ceiling, surface mounted LED lighting	
Utility	expose concrete		open ceiling, surface mounted LED lighting	
		Note: paint is not cover by FEMA grant		

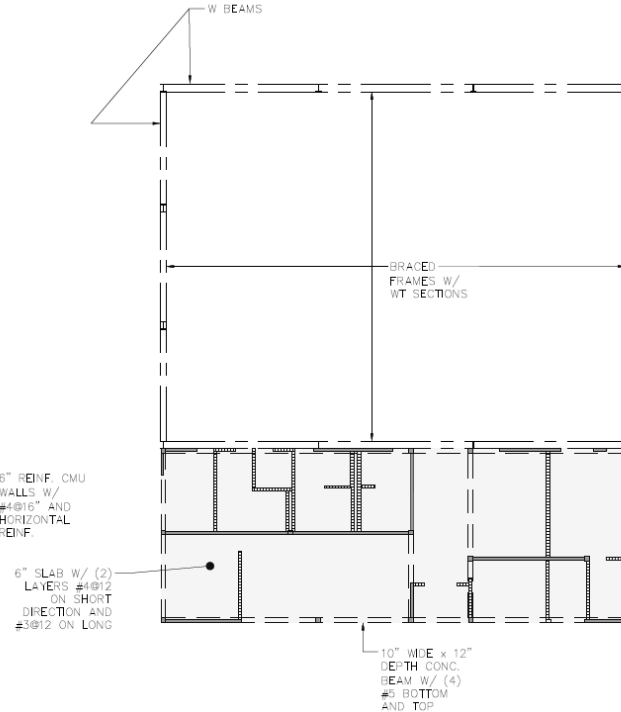
Location: Oasis Neighborhood



Structural Concept, courtesy of Voluntariado de Ingenieros



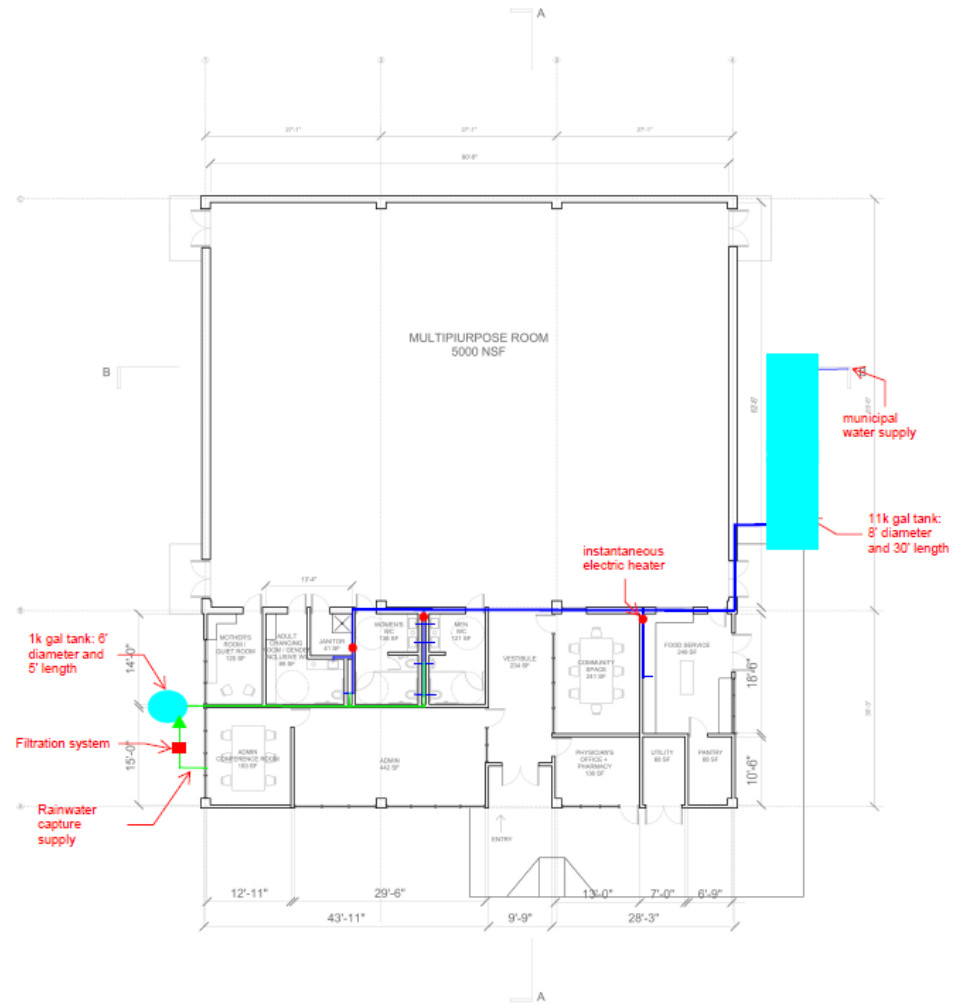
FOUNDATION PLAN
SCALE = 1/4" = 1'



FRAMING PLAN HEIGHT = 9'
SCALE = 1/4" = 1'

PRELIMINARY – NOT FOR CONSTRUCTION

Plumbing, courtesy of WSP



Solar, Alternative 1, courtesy of WSP



41.19 sf ← VRF

64.45 sf ← Exhaust fan

159.69 sf ← Fresh air unit

PLANTA ARQUITECTÓNICA 1/16" = 1'
 DIBUJO PRELIMINAR
 7,794 GSF



THANK YOU.