Villa Pesquera Punta Santiago:
Building and Systems Renovation

Villa Pesquera Punta Santiago, Humacao

Building community capacity through resilient physical assets.

Roof Repair: Lexington United for Puerto Rico

Electric System Upgrade: P.E.C.E.S.

Solar System: Resilient Power P.R. with funding from ComPRometidos

Storage Doors: resilientSEE-PR

Project Management: P.E.C.E.S. & resilientSEE-PR

Guánica Emergency Preparedness Plan & Shelter Design:

Pre-During-Post Event

resilientSEE™

VOLUNTARIADO
DE INGENIEROS Y PROFESIONALES DE PUERTO RICO

BOSTON ARCHITECTURAL COLLEGE

Community Centers / Shelters

This project is a collaboration between resilientSEE-PR and Voluntariado de Ingenieros to provide the Guánica Municipality with site analysis, program and concepts for three Community Centers that transform into shelters during earthquake and hurricane events.

→

Guánica Municipality, Puerto Rico

Team

Yanel de Angel

FAIA, Principal, Perkins and Will / Co-funder 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, WSP USA / resilientSEE-PR

Christopher Lizewski

P.E., Life Safety, Code Red Consultants

Jesabel Rivera

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

José Sanchez

PE, Senior Structural Engineer, Co-funder 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

What is the project?

Three (3) year-round Community Centers that transform into shelters during an emergency.

Year-round permanent asset

Emergency temporary capacity

Objectives

Understand the context, risks, susceptibilities and vulnerabilities of the community.

Design an inclusive place for all members of the community.

Develop a conceptual program of spaces to support the community **before-during-after the emergency**.

→

Destruction of the January 2020 earthquake

Locations

Location 1

Parque Centenario

Location 2

Sector Oasis

Location 3

Barrio Ensenada

Sector El Batey

Escuela Agripina Seda, a middle school in Guánica, collapsed after the magnitude-6.4 earthquake.

Vulnerable structures collapsed during the earthquake.

Inclusive Design for a Vulnerable Population

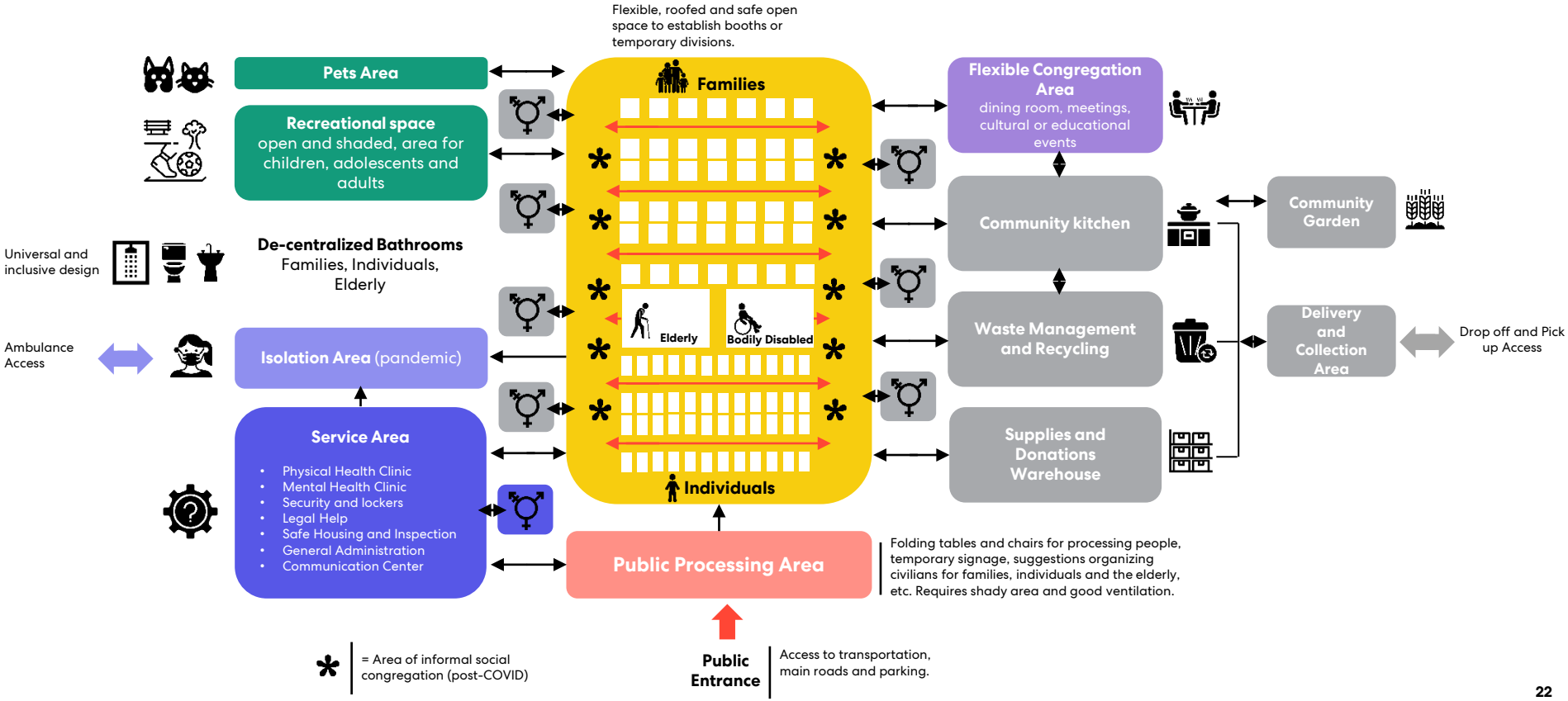
Families

Elderly

Pets

Diagram of Critical Adjacencies

de-centralized bathrooms



Cardboard Privacy Kit

Cardboard Privacy Kit

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

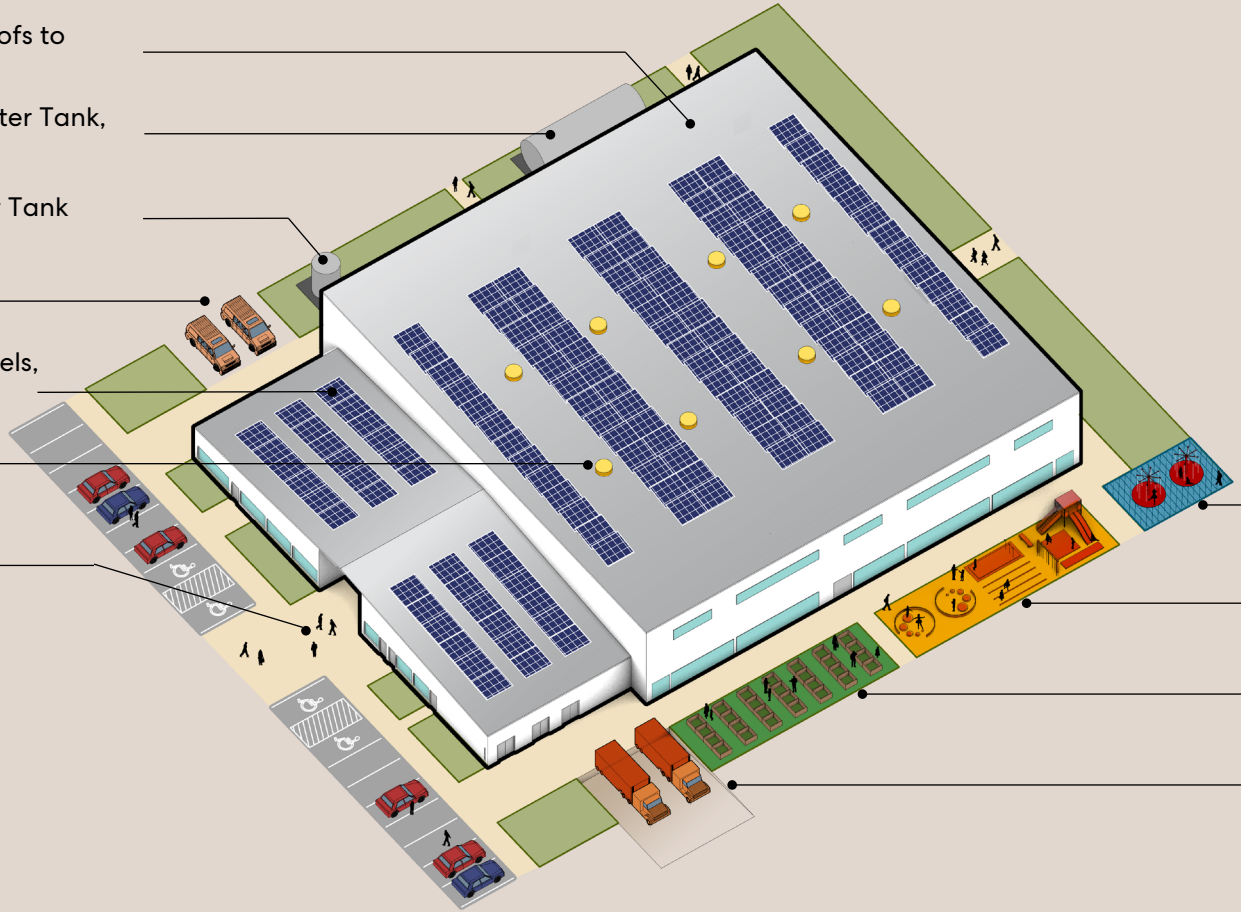
Earthquake
1,158 people

FEMA
2,552 people

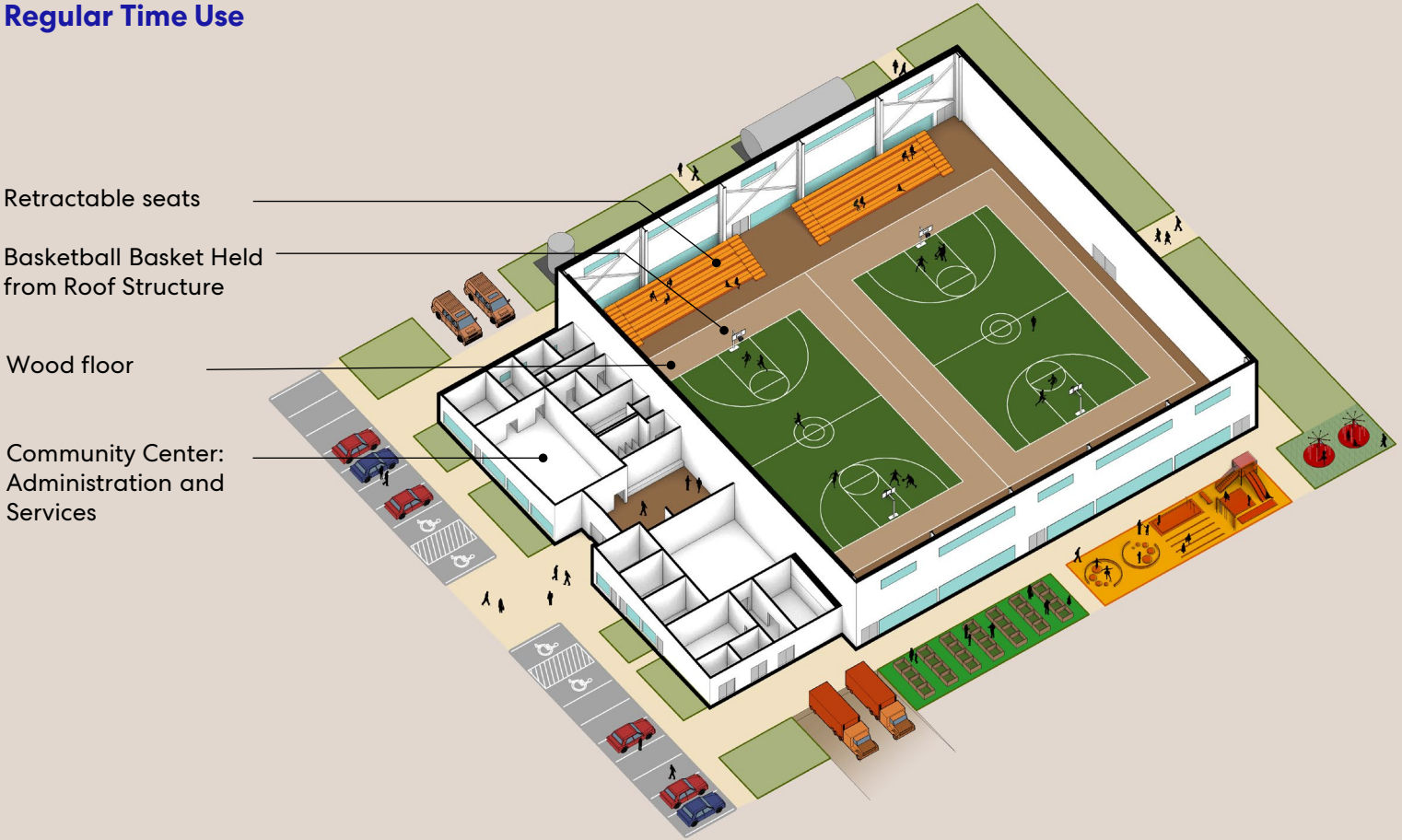
Shelter Module & Capacity / Módulos del Refugio & Capacidad

	Parque Centenario	Ensenada	Sector Oasis
Hurricane entry capacity *Capacidad de refugio durante un huracán*			
People Quantity / Cantidad de Gente	488 (30 ADA)	300 (18 ADA)	195 (12 ADA)
Earthquake or post event capacity *Capacidad de refugio post terremoto o huracán*			
People Quantity / Cantidad de Gente	562 (35 ADA)	374 (23 ADA)	222 (14 ADA)
FEMA Community Safe Room			
People Quantity / Cantidad de Gente	1188 (70 ADA)	804 (50 ADA)	560 (30 ADA)

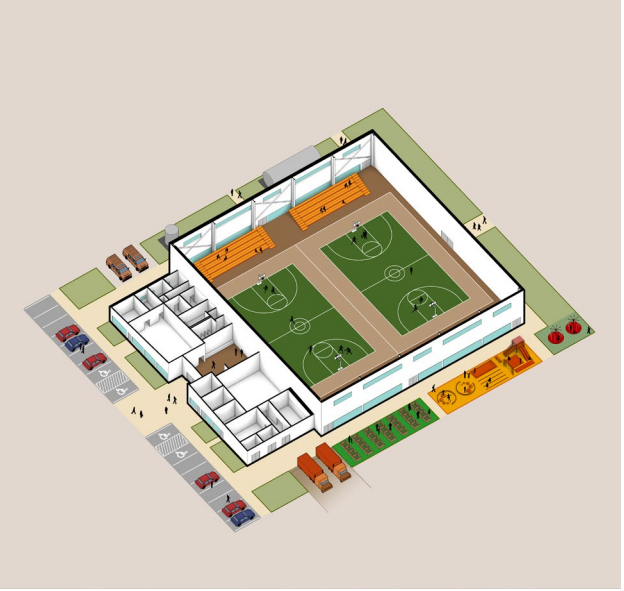
Concept for 2-court shelter



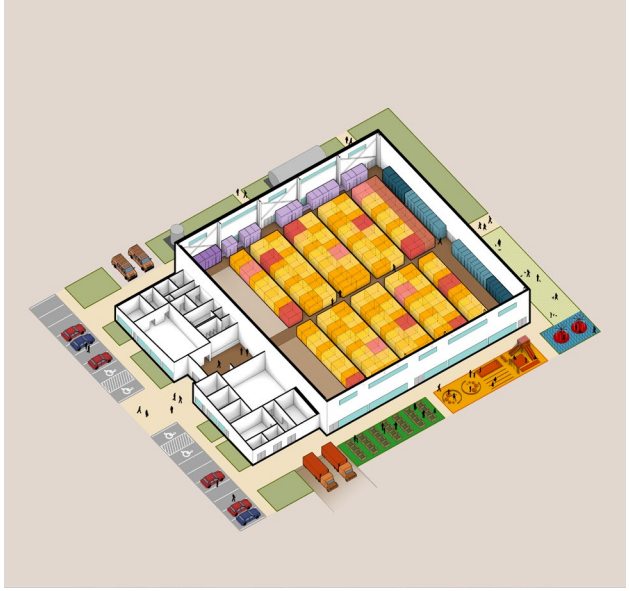
2-court Shelter Concept
Regular Time Use



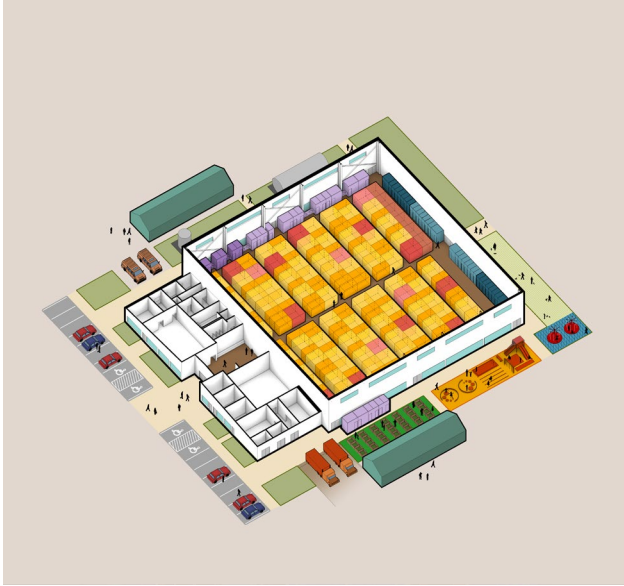

Official Vehicles Parking
Mother's Rm
Quiet / Sensory Rm
Staff Meeting
Staff Kitchen
Adult Changing/Inclusive WC
Staff Locker/Shower
Administration Suite
Bench
Entry Hall
Vending
Bench
Physical Health / Pharmacy
Community Service Flex Office
Serving Counter
Community Laundry
Community Kitchen
Kitchen Support
Storage
Utility / Electrical
Loading Area
Green Areas
Edible Garden
Playground
Water Park
Loading Vehicles
EDIBLE GARDEN
PLAY GROUND
WATER PARK



Regular Time / “Blue Skies”



Hurricane Emergency



Earthquake or Post-Hurricane Emergency

Year-round Community Center transforms into a Shelter during Emergency.

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

Concept for 2-court Shelter

Use in Emergency 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

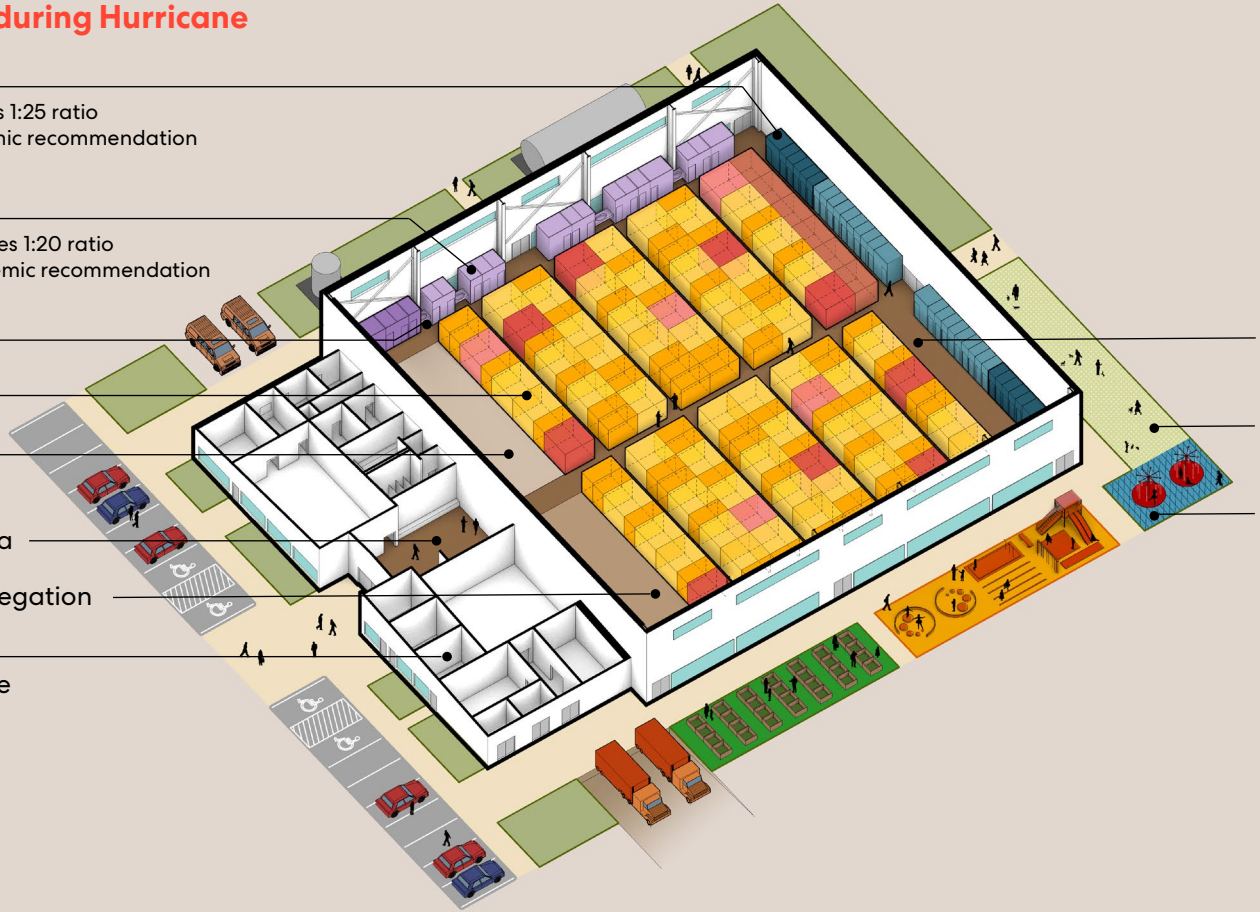
Refugee Area

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

2-Court Shelter Concept

Use in Emergency During Earthquake or Post-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

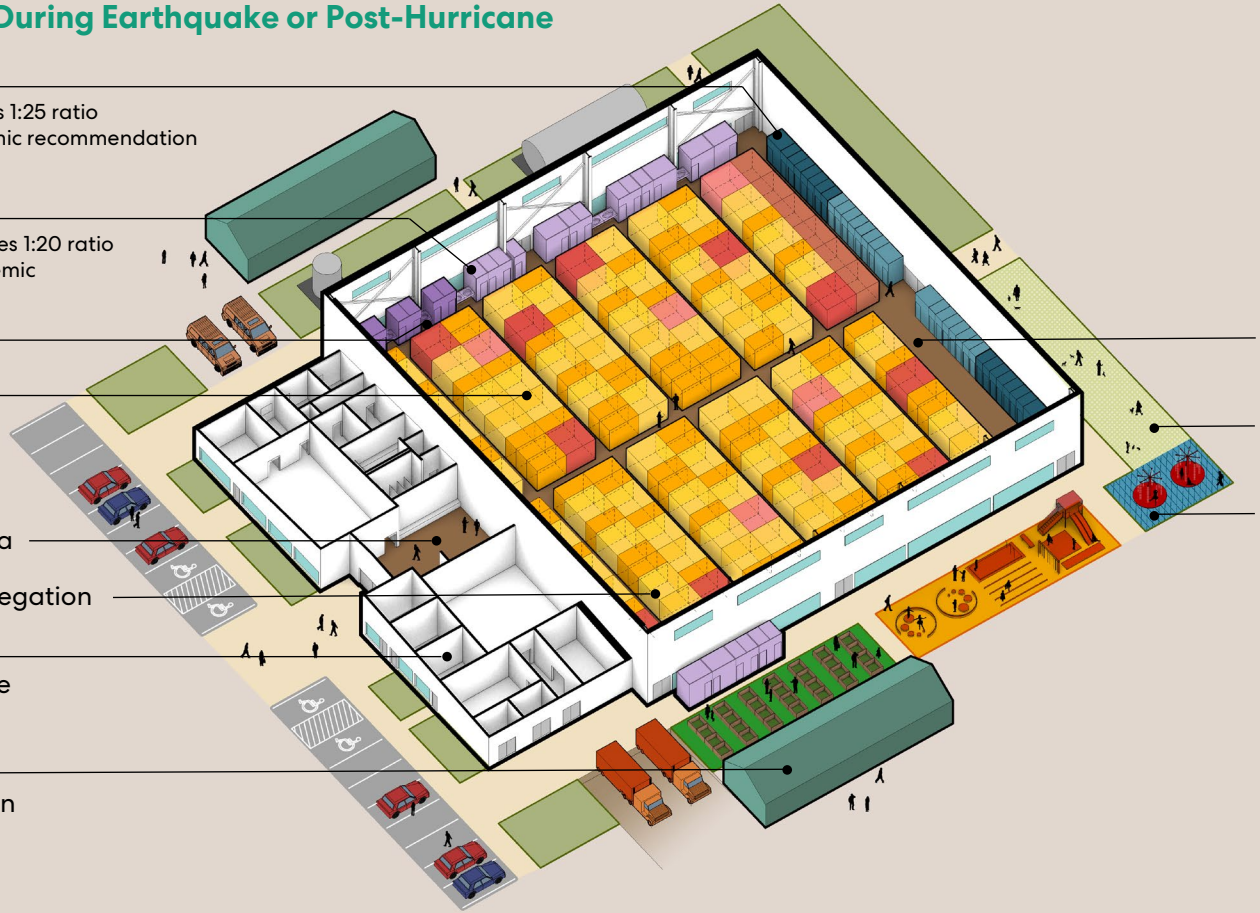
Refugee Area

Public Prosecution Area

Flexible Area of Congregation

Community Center:
Activated to Attend the Emergency

Temporary Services Area and Congregation in Temporary Booths



Indoor Pet Area

Outdoor Pet Area

Water Park Activates as Outdoor Showers

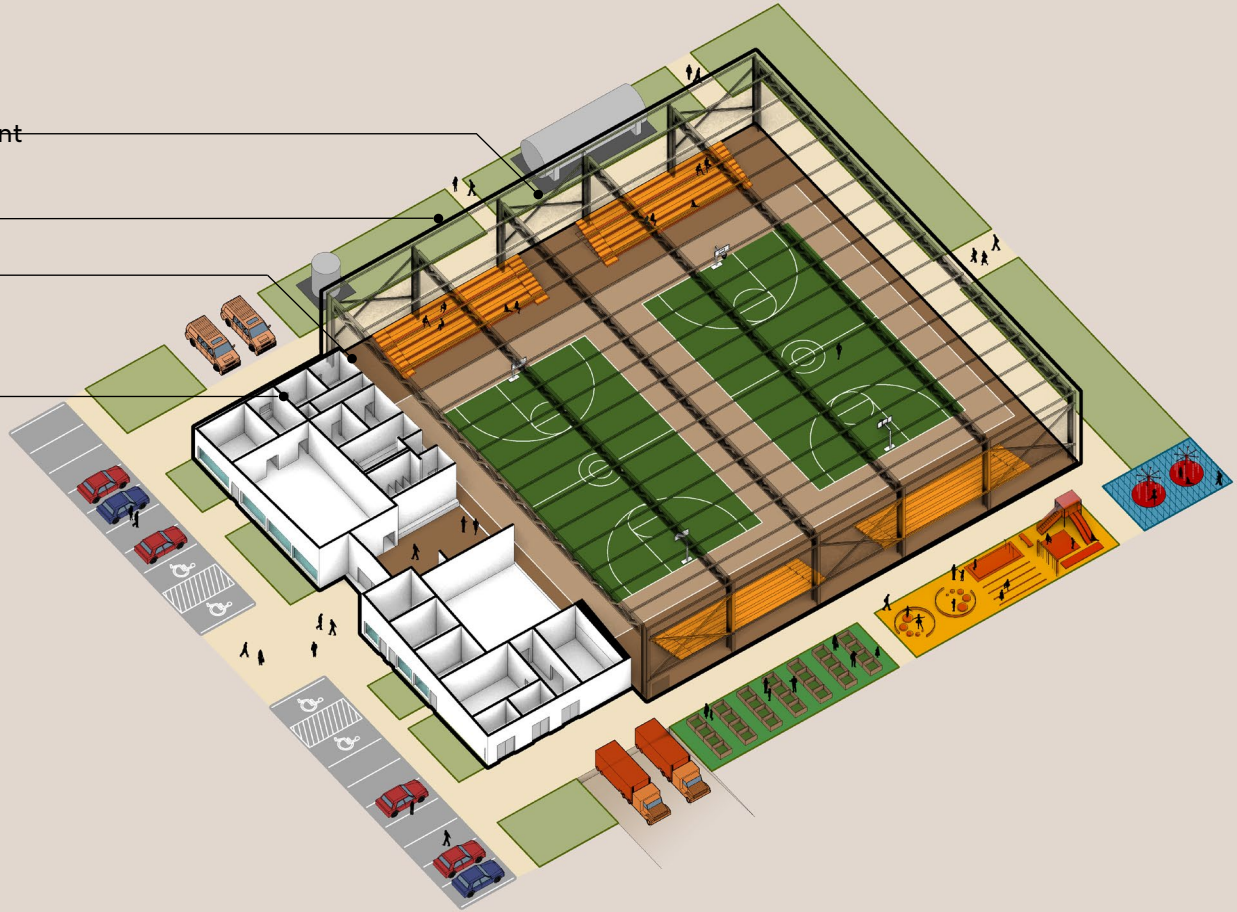
Concept for 2-court shelter

Structural reinforcement

Steel Structure on the Courts

4 ”movement control joint

Reinforced Concrete Structure and Reinforced Blocks



Cross Section

1. Photovoltaic Solar Panels

2. Solar Tubes for Natural Light

3. Insulated and white roof to reflect heat gain

4. 24 'wide industrial fans spaced 60' apart

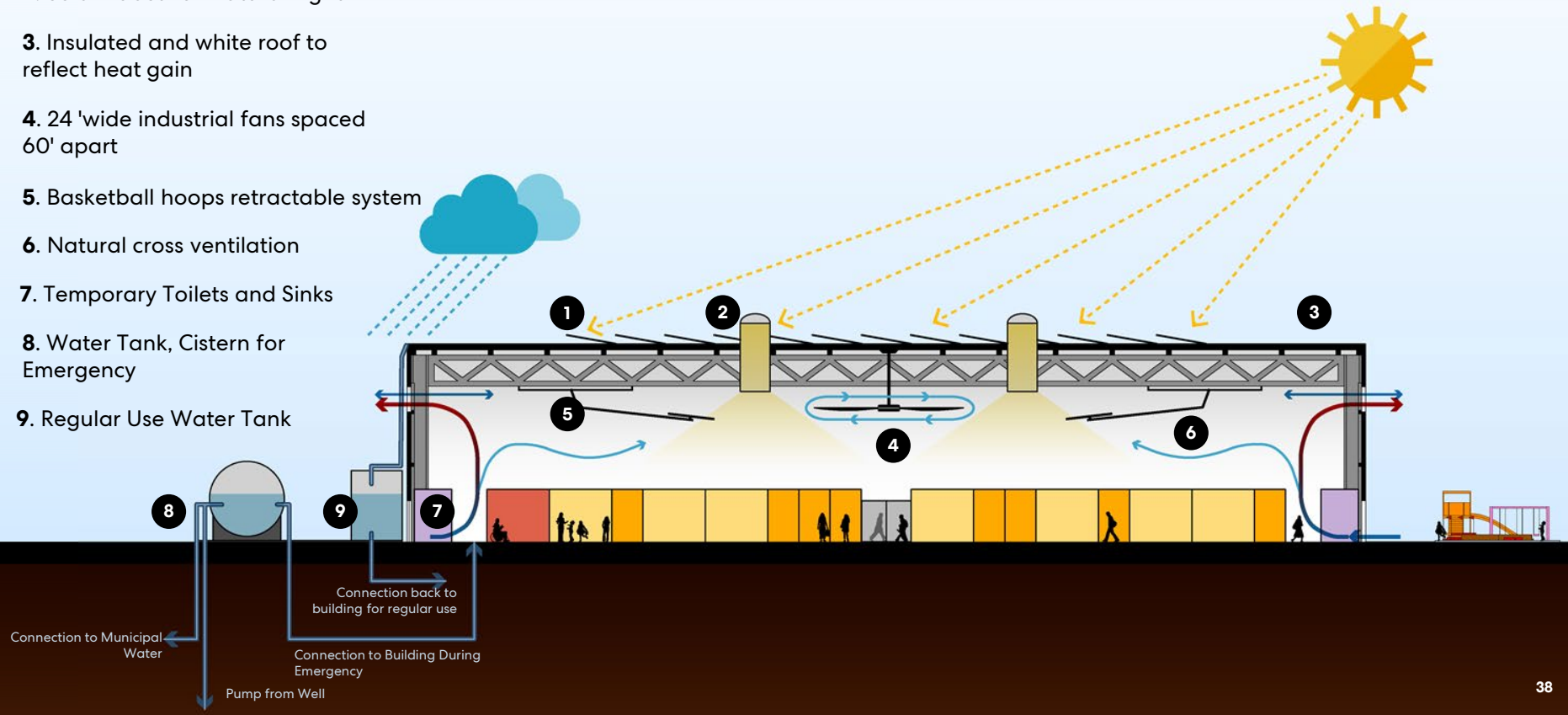
5. Basketball hoops retractable system

6. Natural cross ventilation

7. Temporary Toilets and Sinks

8. Water Tank, Cistern for Emergency

9. Regular Use Water Tank



Water and Energy

Parque Centenario

Ensenada

Sector Oasis

Water	people	3-day blackout Storage tank (kGal)	rainwater tank (kGal)
1-court	560	30	3500
2-court	804	45	4000
3-court	1188	65	5000

Energy	# of industrial fans needed	Emergency Energy Demand (kW)	PV array size	Battery size (kWh)	# of batteries	battery space req. (sq ft)
1-court	1	11	5,589	185	14	16
2-court	2	16.5	9,371	318	24	28
3-court	3	22	13,153	451	33	40

note: PV array size assumes conservative 100 sq ft per kW
note 2: industrials fan assumed as 24' diameter powerfoil x3.0, 1.5kW motor each
note 3: batteries assumed 13.5kWh Tesla PowerWall, 1.2 sq ft each

FEMA Community Safe Room			
People Quantity / Cantidad de Gente	1188 (70 ADA)	368 (18 ADA)	560 (30 ADA)

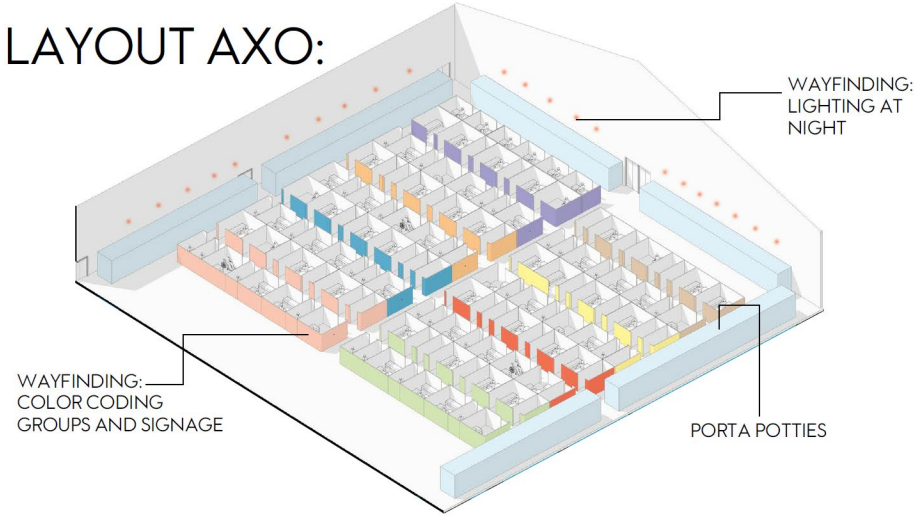
Boston Architectural College Studio Collaboration

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

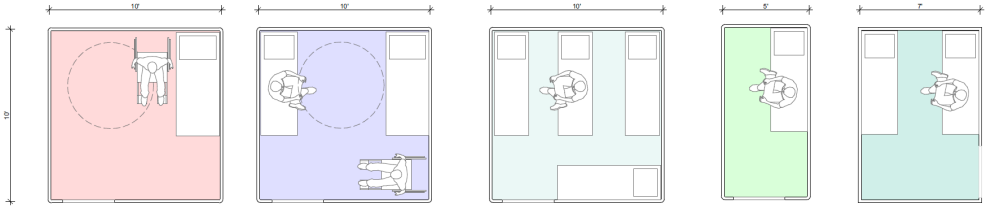
Course: DHH 3012: Universal / Inclusive Design

Students: Ana Rios Sabater and Ryan Downs

Ana Rios Sabater

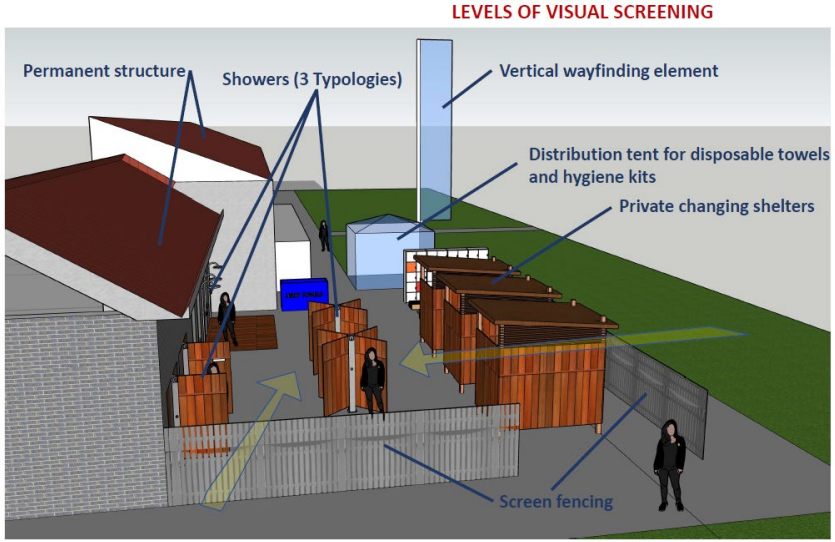


Shelter modules for diverse population

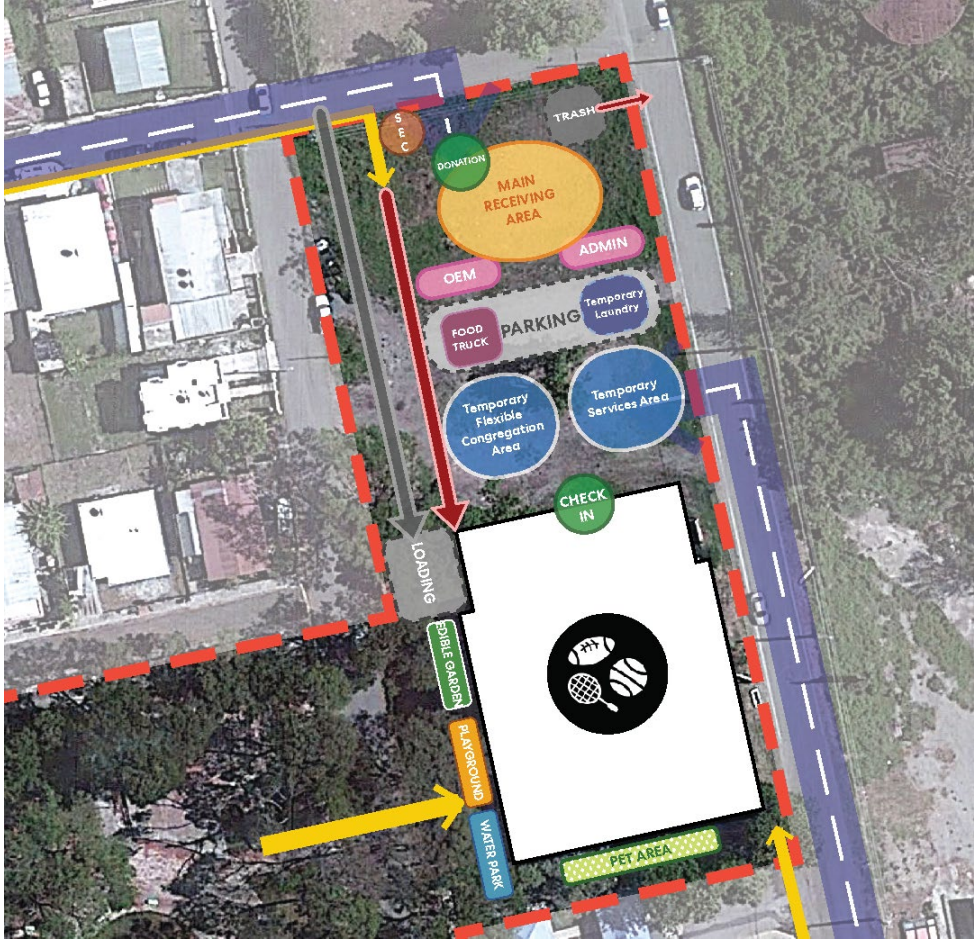


Wayfinding Concept

Ryan Downs



Exterior Shower Concept



Site Emergency Operations

Prof. Ruth Super

Operational Policy

Sleeping Areas and Distribution

Toilets and Showers Use

Companion Animals

Pandemic Requirements

Lighting and Ventilation

Intake Forms / Health Questions

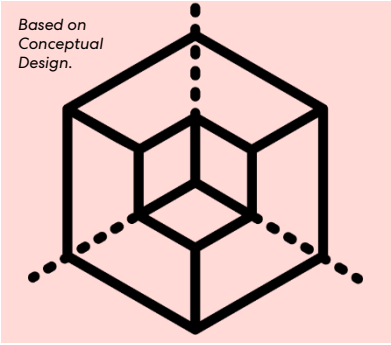
Shelter Rules

Shelter Questions

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.

Design & Documentation – 12 months



Schematic Design

Activities / 4 months

Community Feedback Workshop

Geotech Study - soil conditions

Site Survey - topography

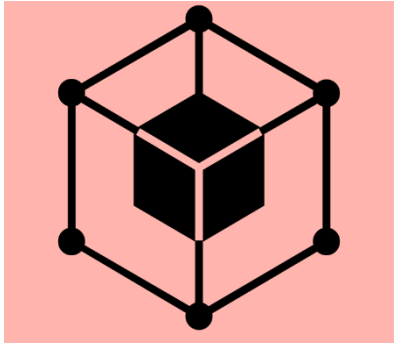
Civil – building siting & utilities

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

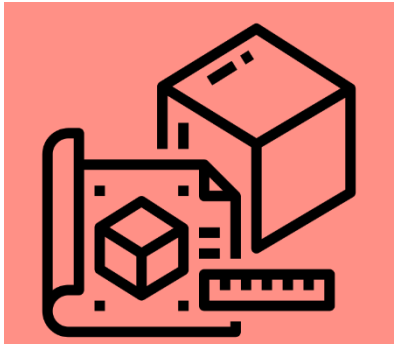
Architecture – develop building envelope and interiors, coordinate all disciplines

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



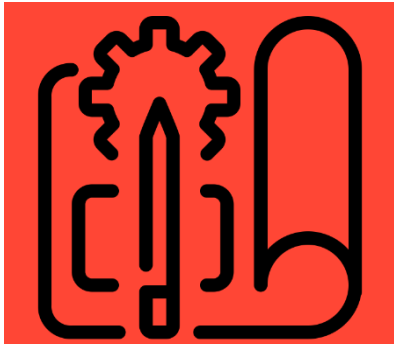
Construction Documents

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 / 2 months

Contractor Qualifications

Contractor Selection

Bidding and Contract

Permits

Construction – 24 months

Construction Initiation

Activities / 7 months

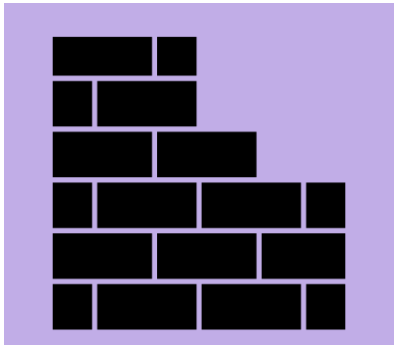
Contractor Mobilization

Site Clearing & Access

Foundations

Site Work

Utilities Infrastructure Connections



Core & Shell

Activities / 7 months

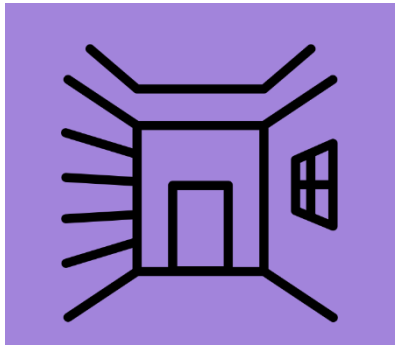
Structural System Erection

Framing & Core Elements

MEP/FP Rough Work

Envelope Construction & Installation

Parking and Exterior Surfaces Layout



Interior Fit Out

Activities / 7 months

Interior Finishes

Equipment & Lighting Installation

Specialties, Signage & AV/IT Systems Installation

Landscape Installation

Exterior Pavement & Sidewalks

Final Close Out

Activities / 3 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

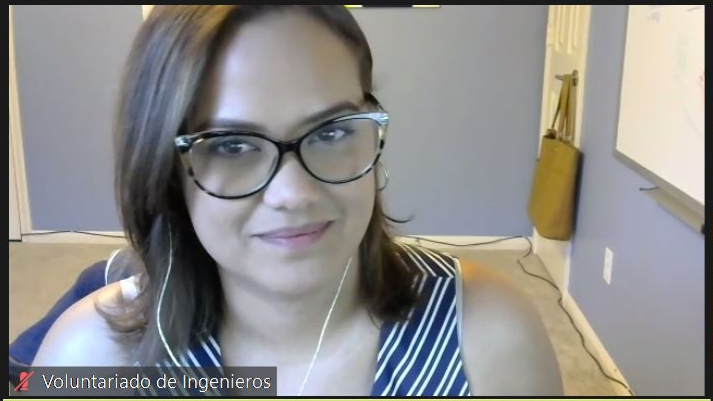
Partnership with an academic institution to educate the leaders of tomorrow

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.

Zoom Meeting



Participants (6)

- YD Yanel de Angel (Me)
- Voluntariado de Ingenieros (Host)
- JD Jackeline Del Toro
- 17875024617
- R Ruben
- S shiyao

Invite | Mute Me | Raise Hand

10:14 AM
10/15/2020

Arenas Community Center, Guánica
Emergency Center

Equipo de Voluntarios

Yanel de Angel

FAIA, Principal, Perkin&Will / Co-founder resilientSEE-PR

Tamara Perez

Designer, AiT, AIA Associate / resilientSEE-PR

Gaston Saboulard

Designer, Toro Arquitectos / resilientSEE-PR

Nicole Ferrer

Designer, Perkins&Will / resilientSEE-PR

Manuel Fontan

Engineer, PE, LEED AP, WSP USA / resilientSEE-PR

Bryan Markkanen

Architect, AIA, Elliott Workgroup / resilientSEE-PR

Marc Wouters

Architect & Urban Planner, RA, Marc Wouters Studio

/ resilientSEE-PR

Jesabel Rivera

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

Ruben Velez

PE, Senior Engineer, Voluntariado de Ingenieros

ARUP

- Leah Morales
- Kyle Cepeda

Unidos por Arenas, Inc.

- Luis Omar García-Mercado
- Sofia Ramos, secretaria
- Luz
- Virgen Rosado
- Juana Santiago Matos
- Sofia Ramos Bonilla
- Heidi Lopez
- Lillian

Nuestra Escuela

- Angel Perez Soler

Project Objectives

Transform the school into a resilient community center.

Evaluate existing building systems.

Develop an implementable concept.

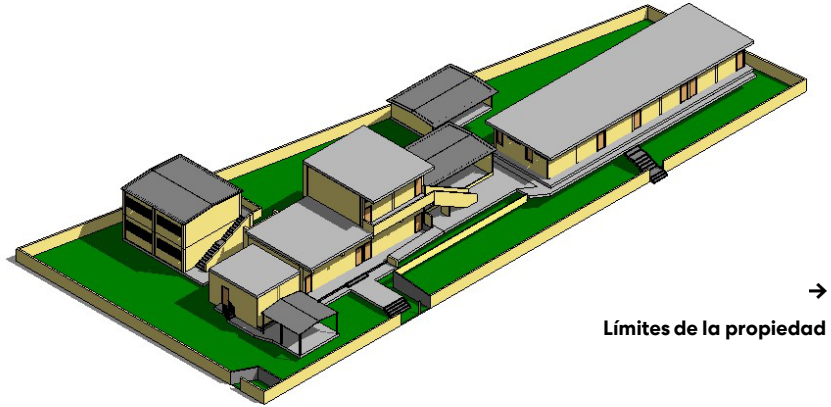
Recommend strategies to transform the building and equip it.

Help the community raise funds by providing technical assistance and drawing illustrations.

→

Escuela María del Rosario C. Claudio

The María del Rosario C. Claudio School is located on Main Street - route 332 - Comunidad Arenas, Guánica, P.R.



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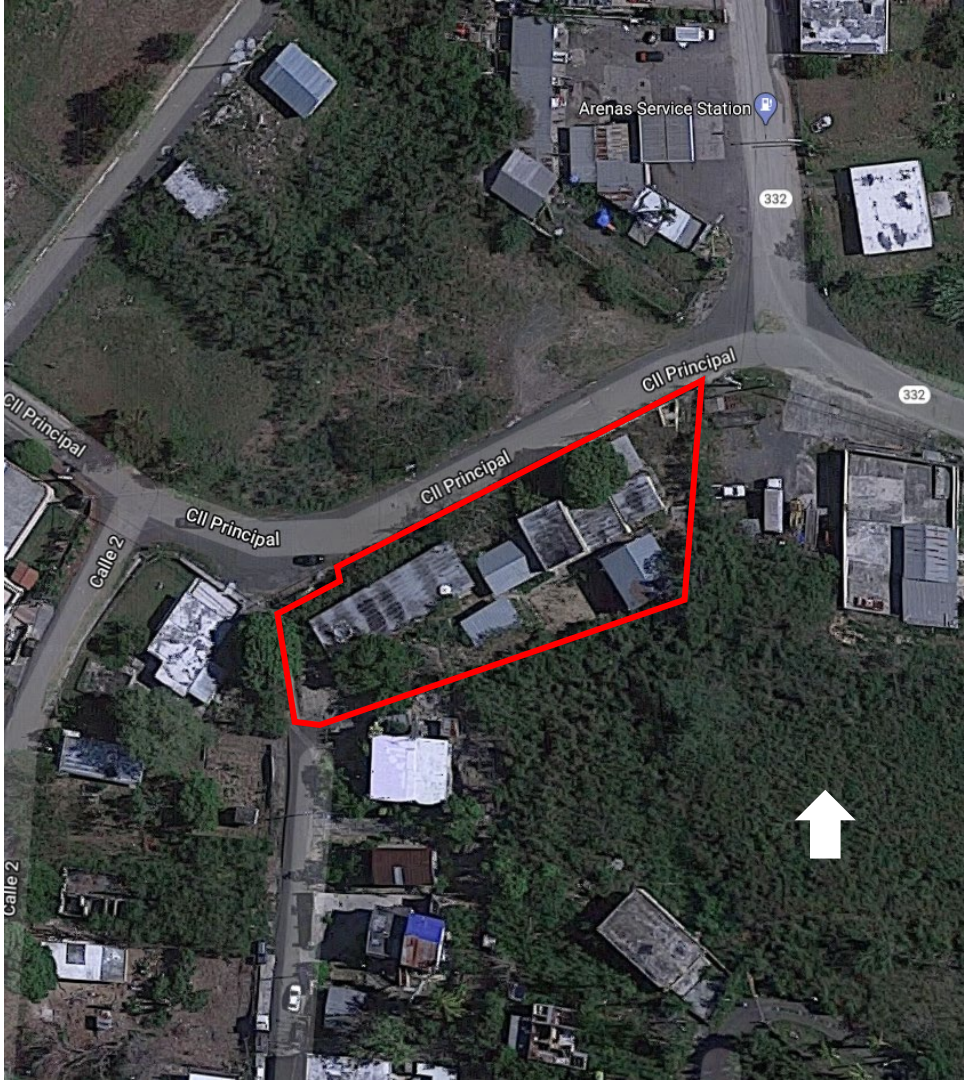
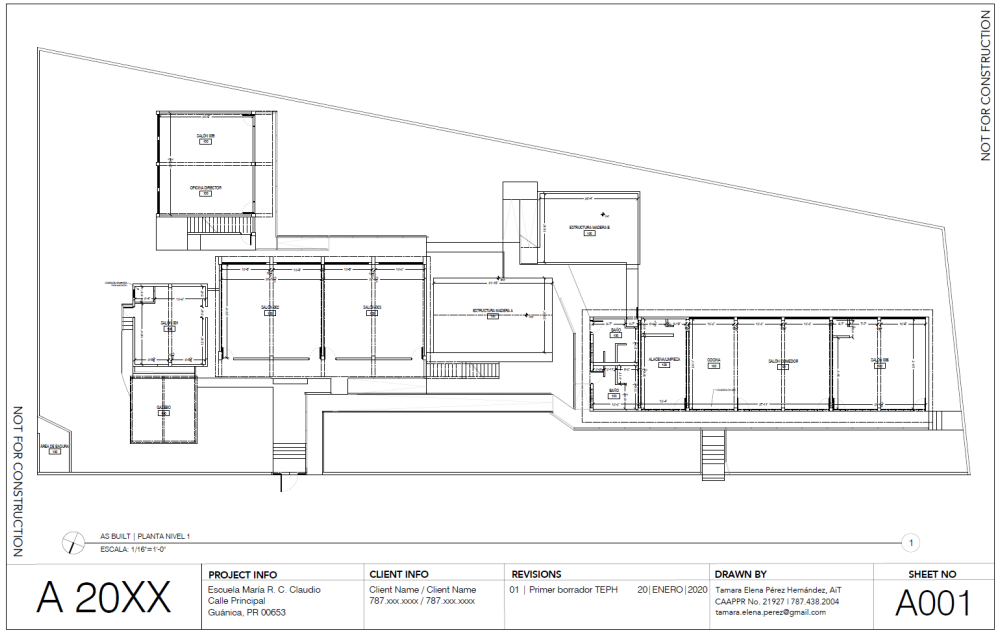
Límites de la propiedad



Project Activities

- ✓ Site Visits
- ✓ As-Built Documentation
- ✓ Existing Conditions Assessment
- ✓ Structural Certification
- ✓ Solar Panel System Peer Review
- ✓ Program & Adjacencies
- Architectural Room Layouts & Equipment List
- Implementation Grants / Donations



→ View from Main Street

Existing ramp system and existing stairs.

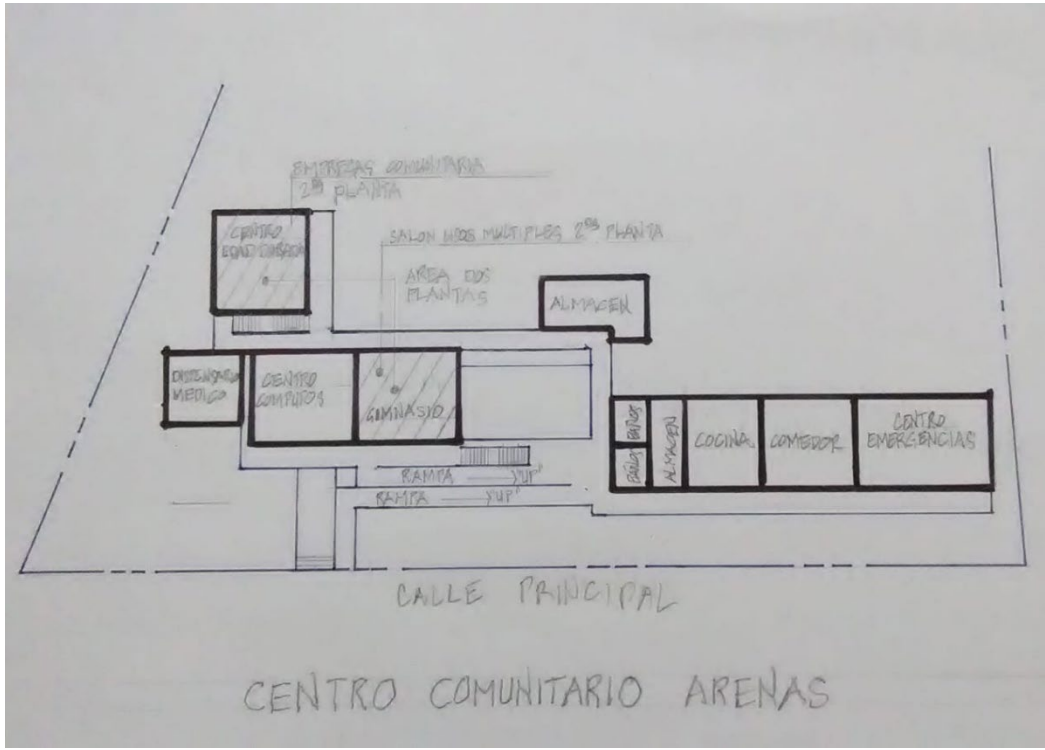
Spaces Program

First floor

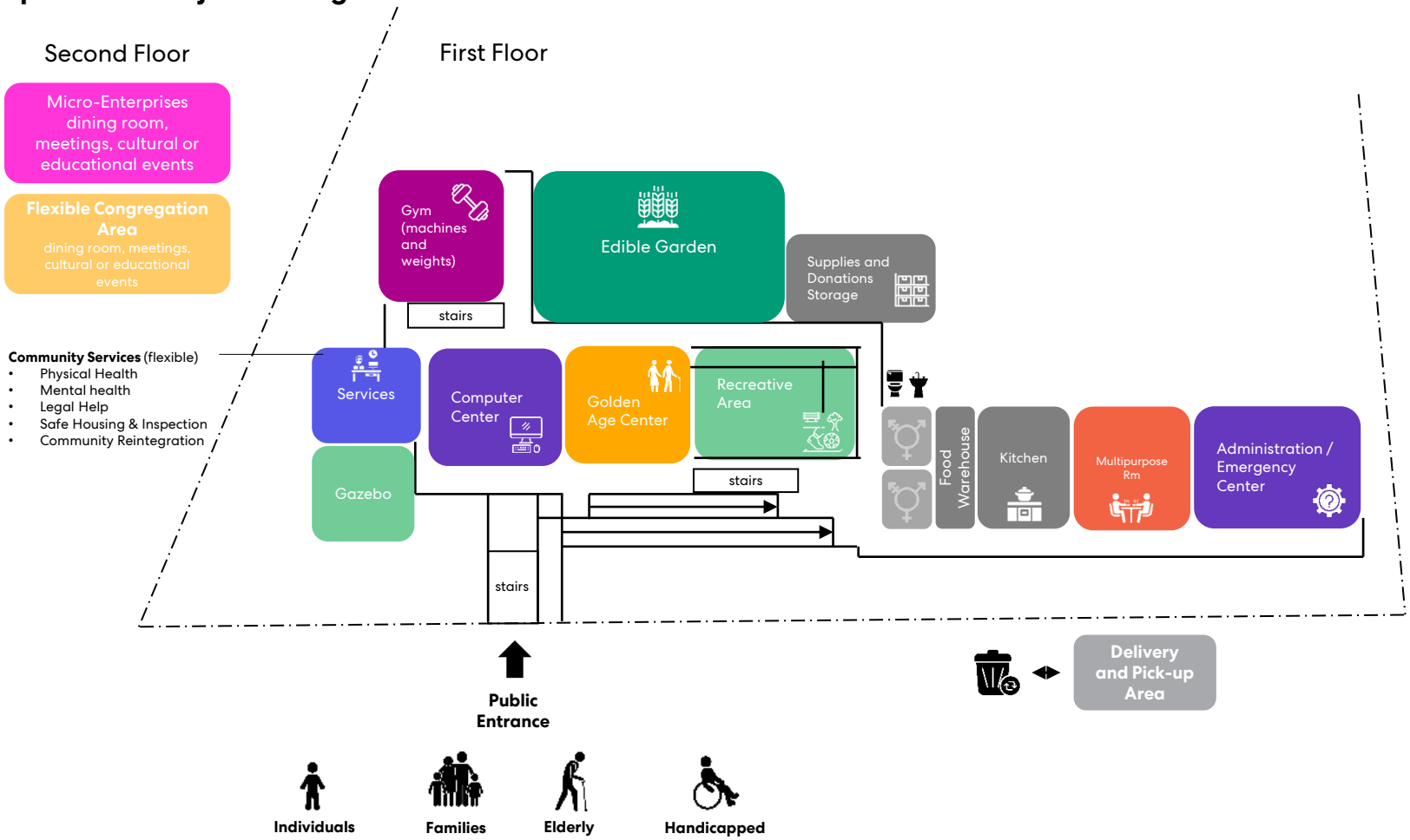
- Golden Age Center
- Medical Dispensary → **Community Services (flexible)**
  - Physical Health
  - Mental health
  - Legal Help
  - Safe Housing and Inspection
  - Community Reintegration
- Computer center → **Training / Tutorials / Studies**
- Gym → **Machines & Weights**
- Warehouse (2) → **Food vs Equipment**
- Toilets → **Gender Inclusive**
- Kitchen
- Dining room → **Multipurpose room**
- Emergency Center → **Administration & Communication**
- Community Garden → **Food Bank**

Second Floor / Require elevator to comply with ADA regulation

- Community Micro-Enterprises
- Multiple uses



Spaces and Adjacent Programs



Alternate 1. Basic Rampa Alternative
Estimated Rampa Rise 7'-6"
Estimated Rampa Run: 99' including required landings
NOT FOR CONSTRUCTION

Aerial View

View From Street Entrance

Conceptual Proposal March 5, 2021

Alternate 2. Rampa with Outdoor Classroom
Estimated Rampa Rise 7'-6"
Estimated Rampa Run: 99' including required landings
NOT FOR CONSTRUCTION

Aerial View

View From Street Entrance

Outdoor Stepped Area for Classroom / Meetings

Conceptual Proposal March 5, 2021