Design for Economy

Presented by Illya Azaroff, AIA
Define resilient design and how it benefits communities, and the economy in several different locales.

Describe how material selection - from local sources, using recycled content, and designed for resiliency - can also have a positive impact on not only the project budget, but the lifecycle costs of a building.

Understand how design solutions provide a return on investment through energy savings, maintenance savings, and lower insurance rates.

Understand how to maximize local, state, and national incentives; grants; and financing options to improve performance.
Questions?

Click on the Q&A button located on the black menu bar either on the top of bottom of your computer screen. Type in any questions you might have.
Design for Economy

AIA Framework for Design Excellence:

Focus Topics:
• Building Size
• Material Use
• Operation Requirements
• Financing and Incentives
• Community Links
Illya Azaroff, AIA

AIA New York State Disaster Coordinator
Founding Co-chair Design for Risk and Reconstruction
Professor in Practice NYCCT CUNY
R.A.R.E. Practice
Resilience Architecture Regeneration Equity

Economy? What is your currency?

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Working with islands across the world
WE ALL LIVE ON ISLANDS......
A few of our Stories
RESILIENT COMMUNITIES = ADAPTIVE COMMUNITIES

RESILIENCE IS NOT RESILIENCY

THINK OF RESILIENCE AS AN ACTION!
4 DIMENSIONS for R.A.R.E. Model

**SCALE** adaptation is not just buildings it is complex Networks

**LOCATION** is always in a state of becoming

**ALL HAZARDS**

**TIME** project forward +100.......+200....
Story close to home

How do we lead change?

ADAPTATION Coastal Zone
New Construction- Breezy Point

#Hurricanestrong
NEW CONSTRUCTION: BREEZY POINT
DEMONSTRATION HOME All Hazard #Hurricanestrong
Typical Resources

Prepare for All Hazards
Fortified is a program and beyond Code Guide to increase resilience and reduce the cost of insurance for the building and owner.

Material and assembly testing is behind this essential guide to build better structures.
Coastal Construction Manual
FEMA P-55 / Volume I / August 2011

FEMA P-55
A 2 volume publication that provides a comprehensive approach to planning, siting, designing, constructing, and maintaining homes in the coastal environment.

Vol.II is tailored for the design professional who is familiar with building codes and standards and has a basic understanding of engineering principles.
Home Builder’s Guide to Coastal Construction

Technical Fact Sheet Series

FEMA P-499 / December 2010

FEMA P-499
Series of 37 fact sheets to provide technical guidance and recommendations concerning the construction of coastal residential buildings. The fact sheets present information aimed at improving the performance of buildings subject to flood and wind forces in coastal environments.
NYC Department of City Planning, *Retrofitting Buildings for Flood Risk*, is a comprehensive analysis of retrofit options available for buildings in the New York City floodplain.
ILLUSTRATIVE RETROFIT STRATEGY

BUNGALOW

RETROFITTING BUILDINGS FOR FLOOD PROOF

RETOFIT FLOOR PLAN

CHANGE OF USE

EXISTING Ground Level

PROPOSED Ground Level

Ground Level
- Parking, access and storage.
- Two requiredpersona mitigation: plantings and shelf turn.

Level One
- This upsizes the lowest non-potential floor.
- The critical systems are relocated within an addition structure.
- Additional outdoor space for gardening.
- In order to drive piles or rebuild a foundation, typically the building must be moved out of the way and then basic excavation work will need to be performed. Special conditions make elevation difficult due to restricted access to the building, consider elevating several buildings at once in order to accommodate the project's equipment requirements.

ADAPTATION CONSIDERATIONS

ACCESS

WET FLOODPROOFING

When wet floodproofing, openings for water penetration and exit must be engineered according to ASCE 24 requirements. A minimum of two openings is required for each flooded area below the DEI, ticke for each flooded area above the DEI. The opening should be located no higher than 1 foot above the grade immediately under each opening.

STRENGTHS

The building entrance is relocated to 10’ above the new property line to accommodate the stair run and porch depth.

As per the Zoning Resolution, homes elevated over 5’ above the sidewalk must require a stair entrance to be connected to the interior. These requirements can be amended from a list of options specified in the Zoning Resolution, such as a ramp, an accessible entrance using a standard pavilion, or an accessible entrance using a standard ramp. The opening should be located no higher than 1 foot above the grade immediately under each opening.

STREETSCAPE

The critical systems are relocated within an addition structure.
- Additional outdoor space for gardening.
NYC – ORR
Climate Resiliency Design Guidelines 4.0

Figure 3 – Schematic elements of the NYC drainage system (illustrative), GI = green infrastructure
## A-Typical Resources

### Breezy Point Partners

<table>
<thead>
<tr>
<th>Partners</th>
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<tr>
<td>Presenting Partners</td>
<td>Contributing Partners</td>
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<tr>
<td>• Portland Cement Association</td>
<td>• Breezy Point Cooperative</td>
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<tr>
<td>• Federal Alliance for Safe Homes</td>
<td>• Energy &amp; Environmental Building Alliance</td>
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<tr>
<td>• + LAB architect PLLC</td>
<td>• Insurance Information Institute</td>
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<td></td>
<td>• Malbro Construction Services, INC.</td>
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<td></td>
<td>• New Jersey Institute of Technology</td>
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<td></td>
<td>• Queens Borough President’s Office</td>
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</tbody>
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### Material Donors/Partners

- BASF
- Dupont
- Eagle Roofing
- Huber Engineered Woods
- James Hardie
- Kohler Generators
- Lightning Protection Institute
- Logix
- Quadlock
- Rinnai
- Simpson Strong-Tie
Get started and make a plan today!
FOUR DIMENSIONAL RESILIENCE
• PASSIVE (TEMPERATURE + POWER)
• WIND
• WATER
• TIME (+100 YEARS)

LOCAL + SOCIAL (Currency)
• SOCIAL PLANNING
• CONTEXT (FITTING IN)
FOUR DIMENSIONAL RESILIENCE

- PASSIVE (TEMPERATURE + POWER)
- WIND
- WATER
- TIME (+100 YEARS)

Breezy Build #Hurricanestrong Resilient + Sustainable
IMPACT:
WIND AND WATER
WINDOWS, DOORS, SKYLIGHTS, ROOF, SIDING

BACKUP POWER GENERATION

Breezy Build #Hurricanestrong Resilient + Sustainable
THERMAL: ENVELOPE, SPRAY FOAM INSULATION, ICF, RADIANT FLOORS

FIRE PROTECTION: NON-COMBUSTABLE CONCRETE CONSTRUCTION, SPRINKLER SYSTEM, LIGHTNING PROTECTION

FLOODING: BFE +3’, SMART VENT, MATERIALS

Breezy Build  #Hurricanestrong  Resilient +Sustainable
"Illya is an important partner with the City of New York, helping us think through policies that support resilient construction". - Eric Wilson, Deputy Director of Land-use Buildings, Mayors office of Resilience

Using existing federally funded “Build-it Back” program (+lab) changed the rules and the future. - FEMA
Illya created a new precedent for balancing climate mitigation and climate adaptation with his design of the HurricaneStrong House in Breezy Point.

- Eric Wilson, Deputy Director of Land-use Buildings, Mayor's Office of Resilience

“Illya has proven to be a collaborative cross cutting leader for hazard mitigation design in the New York City area proven by his leadership for the all hazard hurricane home in Breezy Point”

- Heather Roiter, Executive Director, Hazard Mitigation Recovery, NYC Emergency Management
FOUR DIMENSIONAL RESILIENCE
• PASSIVE (TEMPERATURE + POWER)
• WIND
• WATER
• TIME (+100 YEARS)

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Breezy Build #Hurricanestrong Resilient +Sustainable
Resilient buildings do not need to look different. They need to perform differently.

ROI Operations

43.1°F

(10yr savings) $28,560

$42/month (New House)

$280/month (Old house)
Currently this home is located in the low risk flood zone X. The flood insurance premium is $532 for the year. Preliminary FEMA flood maps for the area have the flood zone changing to higher risk AE zone, and the Base Flood Elevation of 12’. The upper living floor will be at 15’ when converting the Datum correctly. When this map was officially adopted by the town:

- The AS is flood premium would be $4,086.
- The after F.R.E. premium would be $576.

Based on the enclosure below the home being both, over 5 feet in height and sub-grade on all four sides, it is considered a basement by NFIP standards. Bringing the floor level of the enclosure up to or above the lowest outside ground level will change the basement status and therefore reduce the flood insurance premium dramatically. (As detailed above)
ELEMENTS SHOWN

• PASSIVE LIGHTING
  • HIGH CEILING WITH FANS
  • IMPACT RATED SKYLIGHTS
• SPRINKLERS
• IMPACT RATED WINDOWS
ELEMENTS SHOWN

- BACKUP GENERATOR
- CRAWL SPACE ACCESS
- FLOOD VENTS
- AC UNIT
- VENTILATION EXCHANGE
- LIGHTING PROTECTION
FOUR DIMENSIONAL RESILIENCE

• PASSIVE
• (TEMPERATURE + POWER)
• WIND
• WATER
• TIME (+100 YEARS)
1. RESILIENCE IS RECOGNIZABLE
2. COST EFFECTIVE
3. ACCESSIBLE FOR EVERYONE.
DID WE REGENERATE THE COMMUNITY?

NO OTHER HOME IS COMPLIANT. IS THIS RESILIENCE?

ROI Social Currency?

We have a power outage guess who’s only house is lit on the block mine thank you for the generator

Diane that’s great news! It’s going to get cold out there stay warm! Great to hear Kohler came through
Leadership

• FEMA recovery
  City of New York
  - Adopted as next generation of housing
  - BE EX Advisory
  New York State
  - NYCERDA
  Federal
  - Changed federal policy
  - HUD new Housing regulations
Story close to the heart

How do we regenerate culture?

Kudma’ - Regeneration

#KIGRR
Kalinago Institute for Global Resilience and Regeneration

REPLACE housing or REGENERATE community?

THINK OF RESILIENCE AS AN ACTION!
Housing policy aimed to fail
Common building practice

- Encouraged to abandon knowledge

• Yet everyone knows how to build
Recognize the current model

• Is a maintenance economy model
• LINEAR
• REACTIVE

• Based on REPLACEMENT
  • Shock or stress = repair
    • Goal is to return to life before the disaster
  • Did anyone ask was life sustainable & equitable before the disaster

• Conclusion this is a FLAWED model
Lost 80% of housing
Subsistence farming devastated
Local needs.
- Listen and Learn
- Understand the needs

Kudma’
Best building practice
- One step beyond
- Proven by history – DNA of Success

- Mouina (top right) - a traditional triangular shaped shelter built by Kalinago people. To cover the roof ‘roseaux’ plant stems or balizier leaves were used. Kabay or Tabou (on the back) - main structures for sleeping, eating and lounging.
Responding
Listening to Culture
Learn from Culture of Place
Surgical
• Continuous Load Paths
• Loft Space/Storage
• Living Space and Kitchen
• Biogas

• 2-3 Bedrooms
• Cross Ventilation
• Hurricane Strong Framing

Overhang Provides Shade

Rain Capture Cistern

PV Panels
Storm Shutters
Hammocks
Fortified Anchor

Site Transition Rain Flow Away From Building
Dominica rebuilding locally
- Local Knowledge
- Community Hands
  Kudma’
EU – Funding 50 new homes
Listen and Learn
Uniqueness of Kalinago and Dominica
Mythology + History + Building practice
New Model
Kalinago Institute for Global Resilience and Regeneration

Regeneration economy or Healing economy
• Circular and expanding
• PROACTIVE
  • Shock or stress = repair + REGENERATE
    • Goal is to SURGICALLY invest in high impact initiators that jumpstart regeneration that is expansive
    • Goal to express the uniqueness of people and place (for each island)
    • Repair the earth and regenerate bio capacity while expanding equity within the culture

• Conclusion this is a NEW model
New Model
Kalinago Institute for Global Resilience and Regeneration

• Identified the DNA of resilience cultural practice already in the Kalinago People
• Cultural regeneration is key
  • Building practice
  • Agro forestry
  • Agro Pharma
  • Fishing and reef restoration
  • Green energy production and transportation
  • Banking finance and mesh networks
Dominica rebuilding locally
- Local Knowledge
- Community Hands

Global support
- CGI
- Commonwealth

Kudma’
Our newest story

Making the invisible VISABLE

Ohana - Family

#KCRH
54-256 HAU’ULA HOMESTEAD RD - SITE PROPOSAL

ELEV. 225’

FOREST ZONE
(NATIVE TREES,
ETC.)

STREAMS

AHUPU’A SYSTEM
AS CONTEXT

ELEV. 110’

COMMUNITY CENTER,
RESILIENCE HUB

ELEV. 25’

WATER CATCHMENT
PONDS

AGRICULTURE
ZONE, FOOD SECURITY
(BREADFRUIT, Taro,
ETC.)

NATIVE PLANT
PROPAGATION
(MEDICINAL PLANTS)

LIVING ZONE

APROX. SEA LEVEL

RESILENT O'AHU

[Diagram of proposed site with labeled zones and elevations]
- Koolauloa Community resilience hub
- 100 RC Action plan for Hawaii’
- Achieved State Funding
- AGRR 400 community
More stories? Ask me about ........

- Japan, Houston, South Florida, North Carolina, Saipan, Guam, Singapore, Nepal, Costa Rica, USVI, Puerto Rico, Omaha, New Orleans, Bangladesh, Delaware, China, Bahamas, New Jersey, Washington DC.............
Next steps....Define your currency.