



Make wellness standard.
Make resilience standard.
Make sustainability standard.
Let's make a new living standard.

> *Retrofitting the Built World of Today for Tomorrow's Climate*

NELSON



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Using real-world building scenarios, we will charrette four specific geographic locations in the US using critical thinking and technical evaluation about how existing buildings need to be adapted to withstand new climate norms. Each scenario will consider building material selection and furniture/finish selection to withstand new patterns in humidity shifts; realistic budgets and logistics; and the double utilization of space for disaster sheltering while maintaining security, dignity, and safety.

Teams will present and discuss an approach to retrofit existing buildings for climates they were not design to withstand.

> *Learning Objectives & Learning Level*

- > Identify the key components of existing building conditions that must be addressed based on projected changes in climate by geography
- > Work to identify realistic solutions that can be employed to retrofit existing buildings to withstand changes in climate
- > Identify roadblocks/limitations to this as a best practice/approach
- > Discuss strategies and ways to make retrofit solutions accessible in real-world scenarios
- > Learning Level: 200

> Resilience

Resilience **is the capacity to adapt to changing conditions and to maintain or regain functionality and vitality in the face of stress or disturbance. It is the capacity to bounce back after a disturbance or interruption.**

Through maintain livable conditions in the event of natural disasters, loss of power, or other interruptions in normally available services.

Resilient design **is the intentional design of buildings, landscapes, communities, and regions in response to these vulnerabilities.**

*<https://www.resilientdesign.org/what-is-resilience/>

1.5 MILLION

PEOPLE WILL BE ADDED
TO CITIES EVERY WEEK

66%

OF THE WORLD'S
POPULATION IS
EXPECTED TO LIVE
IN CITIES BY 2060

2.5 TRILLION

SQUARE FEET OF
BUILDINGS WILL BE WILL
BE CONSTRUCTED OR
RENOVATED IN CITIES
OVER THE NEXT 35 YEARS

DATA COMES FROM THE ARCHITECTURE 2030 WEBSITE

75%

BUILDINGS ARE
RESPONSIBLE FOR UP
TO 75% OF CARBON
EMITTED IN CITIES

580

ZERO ENERGY
BUILDINGS

60%

ZE-VERIFIED
BUILDINGS ON
AVERAGE USE
60% LESS ENERGY

DATA COMES FROM THE NEW BUILDING INSTITUTE WEBSITE



FISHERMEN'S COMMUNITY HOSPITAL, MIAMI









> Climate Comparisons

ELEMENTS	NORTHEAST / MID-ATLANTIC		SOUTHEAST		UPPER MIDWEST		WEST	
	NOW	FUTURE	NOW	FUTURE	NOW	FUTURE	NOW	FUTURE
Sea Level	●		●			●	●	
Temperature Ranges	●		●		●		●	
Humidity Ranges	●		●		●		●	
Air Quality	●		●		●		●	
Frequent Flash Floods	●		●		●		●	
Mudslides	●			●			●	
Standing Flood Waters	●		●		●		●	
Hail	●		●		●			●
Tornadoes	●		●		●			●
Hurricanes	●		●			●	●	
Severe Drought		●	●			●	●	
Wild Fires		●	●			●	●	
Depleted Farm Soils	●		●		●		●	
Reduced Biodiversity	●		●		●		●	
Depleted Forest		●		●		●	●	
Eutrophication of Water Bodies	●		●		●		●	

THOUGHT STARTERS FOR IMPACT ON BUILDINGS, INFRASTRUCTURE, COMMUNITIES

- > Extended grid blackouts
- > Public transit shut down
- > Limited or no fuel supply
- > Food sourcing
- > Prescription sourcing
- > Stay-in-place evacuation
- > Electrical fires
- > Commerce impairments
- > Paralyzed workforce
- > Uninsured losses beget permanent losses
- > Preservation of historic buildings limited
- > Affordable housing lacks resiliency, therefore lower income households suffer greater losses
- > Migrant species

> Miami, Florida



BUILDING DESCRIPTION:

- > Concrete frame structure, interior stair tower
- > Roof mechanical penthouse
- > Five stories, 70' height
- > Street level retail spaces
- > First floor elevation at 1 foot above street level, (2 feet below FEMA 100 year flood)
- > Landscaped entrance plaza with 12-foot landscaped perimeter

SITE:

- > Near Bay, in light urban center
- > Heavy vehicular use

> Chicago, Illinois



BUILDING DESCRIPTION:

- > Steel frame structure, stone façade
- > Five stories, 70' height
- > Historic designation
- > All retail use
- > First floor elevation at street level

SITE:

- > One block from river, in inner loop
- > No lot line restrictions

> New York City



BUILDING DESCRIPTION:

- > Wood frame structure on transfer slab
- > Five stories, 70' height
- > Industrial material sheathing to reflect neighborhood
- > Street level retail/hospitality spaces; Floors 2&3—Office; Floor 4&5—Residential
- > First floor elevation at street level

SITE:

- > Red Hook, Brooklyn
- > Waterfront site
- > No lot line restrictions
- > Legacy industrial site

> San Diego, California



BUILDING DESCRIPTION:

- > Underground and first level—concrete frame;
Floors 2 through 5—Steel frame
- > Five stories, 80' height above street level;
Two Underground parking levels—10 feet high each
- > Street level retail/fitness spaces;
Floor 2—Co-working spaces;
Floors 3 through 5—Residential
- > Seismic zone: Downtown Special Fault Zone:
Geologic Hazard Category 13

SITE:

- > No lot line restrictions
- > Two levels of underground parking

> *Ideation Groups*

REVIEW YOUR ASSIGNED BUILDING

1. BUILDING DESCRIPTION AND LOCATION
 2. CLIMATE COMPARISON CHART
 3. NEW CODE REQUIREMENTS
-

HOW WOULD YOU RETROFIT THE BUILDING?

PRESENT YOUR PLAN



SAFE
HEALTHFUL
RELIABLE

CONCLUSIONS AND QUESTIONS

THANK
YOU!

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