RESILIENCY RESEARCH

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HOW PERKINS+WILL IS USING RESEARCH & ARCHITECTURE TO CREATE RESILIENT CITIES
RESEARCH DRIVEN / VISUALIZATION LABS

INSIDE THE LABS

A BEHIND THE SCENES LOOK AT OUR CURRENT RESEARCH LABS

01 DESIGN PROCESS
02 HUMAN EXPERIENCE
03 MOBILITY
04 SUSTAINABLE COMMUNITIES
05 BUILDING TECHNOLOGY
06 MATERIAL PERFORMANCE
07 ENERGY
08 WATER
09 RESILIENCY
10 REGENERATIVE DESIGN

WHY DESIGN PROCESS MATTERS

Meeting Tenants’ Needs

The health and happiness of people in a built environment starts with the design process. Equipped from the get-go with the right tools and data sets, design teams can ensure that tenant needs are accounted for and that they get addressed throughout the design, construction, and post-occupancy phases of a project.
WHAT IS...

RESILIENT DESIGN /
pursues Building + Communities that can survive, recover, grow and thrive when facing acute shock events or long-term stressors, through a combination of diversity, foresight and the capacity for self-organized and learning.

A RESILIENT SOCIETY /
can withstand shocks and rebuild itself when necessary. It requires people to embrace their capacity to anticipate, plan and adapt for the future.
WHY RESILIENT DESIGN?

▲ INCREASED OCCURRENCE /

of extreme natural events, acute events and on-going chronic issues.

▲ INCREASED AWARENESS OF AND DEMAND /

for resilient solutions by residents, business owners, and leaders at all levels in areas recently affected by acute events and those most likely to be affected in the future.
INCREASED PRESSURE ON CITIES AND BUSINESSES /
to protect populations and investments.

INCREASED AWARENESS /
of the link between climate change and population health.

INCREASED KNOWLEDGE /
of risks to vulnerable populations.
UNDERSTANDING CHALLENGES:

ACUTE SHOCKS /
Quick impacts from extreme social, environmental, and economic events

SOCIAL /
- Bias crime
- Civil unrest
- Terrorism
- Infrastructure failure
- Disease outbreak
- Fuel supply disruption
- Blackout

ECONOMIC /
- Stock market crash
- War
- Cyber attack
- Business closure

ENVIRONMENTAL /
- Extreme rainfall
- Severe storm
- Fire
- Snow/blizzard
- Severe ice storm
- Freezing
- Mudslide or landslide
- Flood
- Extreme heat or cold
- Volcanic eruption
- Hurricane or tsunami
- Earthquake
UNDERSTANDING CHALLENGES:

CHRONIC STRESSORS /
Lingering impacts from repeated exposure to social, environmental, and economic problems

SOCIAL /
- Aging
- Disability
- Disease
- Homelessness
- Low education
- Language barrier

ECONOMIC /
- Debt
- Poverty
- Recession
- Unemployment

ENVIRONMENTAL /
- Air pollution
- Coastal erosion
- Deforestation
- Drought
- Species engagement
- Water scarcity
$55T / $43B
necessary investment / available

$35 TRILLION / 2070
infrastructure improvements needed to adapt port cities

$1 / $100 / 300
invested in establishing credit worthy-ness / return on investment / priority cities
PEOPLE ARE TALKING

2015 / Obama Administration issues federal mandate to integrate resiliency strategies into all capital projects.

Pope Francis issues his encyclical linking social justice and climate change.

The Lancet issues comprehensive reporting linking population health and climate change.

2016 / COP21 Paris Climate Conference sets out global action plan that is the first-ever universal, legally binding global climate deal adopted by 195 countries.

HUD: The National Disaster Resilience Competition (NDRC) will make nearly $1 billion available to communities that have been impacted by natural disasters.

The World Economic Forum named failure of climate change mitigation and adaptation as the risk with the greatest impact.
MAJOR ORGANIZATIONS HAVE MOBILIZED

**GROSVENOR**

Resilient Cities Research Report – Quantifying the resilience of 50 of the world’s most important cities.

**OCHA**

Office for the Coordination of Humanitarian Affairs at the United Nations. Working globally to create networks of organizations to help respond to climate crises and resulting humanitarian issues. The Disaster Resource Partnership is a construction network led by Hindustan Construction.

**WORLD BANK**

Urban Risk Assessment – Bringing a common approach to identifying people and infrastructure that are most vulnerable to natural hazards.

**ROCKEFELLER FOUNDATION**

100 Resilient Cities Project. $164 million to fund Chief Resilience Officers in 100 cities
While there are significant areas of overlap between resilience and sustainability, one does not replace the other.

They are two complementary areas of focus in the continuum of green and restorative design practices.
RESILIENCY PRINCIPLES

- DIVERSITY /
- ADAPTIVE CAPACITY /
- NESTED SCALES /
- REDUNDANCY /
- FORESIGHT /
- SELF ORGANIZATION /

A Whole System Must Include All Principles
3 CORE QUESTIONS
What are the climate projections in your project location?
What are its vulnerabilities as a result of those projections?
How does your design solution address those vulnerabilities?
RELi THE RESILIENCY ACTION LIST
RESILIENCY ACTION LIST (RELi)

UNIQUE AREAS /
- Hazards, extreme events, adaptation
- Strong ties to financing, regional economics
- Expanded social cohesion
- Expanded community + local self-reliance

COMPREHENSIVE /
- Designed for scale-jumping
- City + Region → Campus + Site → Organization + Building
- Facilitates Correlated Risk + Co-benefits

DESIGNED FOR RAPID UPTAKE /
Compatible with both New Construction and Existing Buildings
Unique RELi Credits: Hazard Preparedness, Social Cohesion, Regional Economics

ANSI Integrative Process: Standard (MTS Developed)

Integrative Living Design Planning Process: University of Minnesota

Red Cross: Ready Rating Program for disaster preparedness


U.S. Small Business Administration + Prepare My Business.Org

Fortified for Safer Business Standard V1.0

Urban Green Building Resiliency Task Force, June 2013 Proposals (NYC)

EPA Vulnerable Zone Indicator System + EnviroFacts

Nuclear Regulatory Commission: Academy Of Sciences

Envision Sustainable Infrastructure Rating System V2.0

Center for Active Design

Sustainable Sites Rating System V2

LEED V4 and V2009 / NC, ND + Schools
RESILIENCE ACTION LIST (RELi)
FINANCE STANDARD

THE GREEN BOND MARKET /

2013 $11 Billion

2014 $36 Billion

2015 $42 Billion

2016 Projected $50 Billion
# Resiliency Action List (RELi)

## 8 Categories

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RESILIENCY ACTION LIST (RELi)

RESILIENCY ACTION KIT

**ACTION LIST /**
Summary / 60+ Actions

**PROJECT TALLY /**
Tracking / Excel Spreadsheet

**CREDIT CATALOG /**
Comprehensive / 200+ Actions and How-to-Use
CANALS IN OUR CITIES
A GLOBAL PERSPECTIVE
RESILIENT DESIGN FROM AROUND THE GLOBE
RESILIENT DESIGN FROM AROUND THE GLOBE
LESSONS LEARNED FROM THE NETHERLANDS
The Netherlands is slightly less than twice the size of New Jersey.
The Netherlands is one of the most densely populated nations in Europe.
But there are actually more bicycles than people!
The Netherlands is considered third happiest nation in the world

1. Denmark
2. Norway
3. **Netherlands**
4. Switzerland
5. Sweden
6. Canada
7. Finland
8. Austria
9. Iceland
10. Australia
67% of the Netherlands requires protection of dykes + dams
26% of the land is below sea level
There are over 14,000km of dykes in Holland
That's equal to the distance between NL + South Pole
NORTH SEA FLOOD FEBRUARY 1953

South-west part of Holland and killed 1,836 people
There is a network of (13) dams, I visited (6) of them.

1960's awareness the environment

Major Ecological Concerns
- environmental protests
- ecological life decline
- scientific + fisherman protests

Economical + Recreational Opportunity

THE DELTA WORKS, 1958
“Living with Water / We are here to stay”
Oosterscheldekering - Storm Surge Barrier, 1986
There are over 100km of canals in Amsterdam
OVER 1500 BRIDGES
RECREATIONAL OPPORTUNITIES
THE WATER KING + THE WATER COUNTRY

Over 7 Billion Euros to keep the water out!

Over 20,000 jobs provided!

Over 4,000 working pump stations!

William Alexander - King of the Netherlands
Expert in Water Management
The Urban Implications of Living with Water
CANALS IN OUR CITIES
A COLLABORATIVE PROCESS
PEOPLE ARE ALWAYS DRAWN TO NEW CONCEPTS OF LIVING

45 PUBLIC MEDIA SOURCES

OVER 350 MILLION VIEWS

TRANSLATED INTO 10 DIFFERENT LANGUAGES
THANK YOU