Executive Summary of the UIA Seminar
by the Japan Institute of Architects (JIA)

6 September 2017, 15:00~17:30 @COEX 318A, Seoul

Theme:

Integrated Resilience of the Built-Environment

Chair & Moderator: Kazuo IWAMURA, FJIA

UIA Seminar by the Japan Institute of Architects (JIA)

Theme:

Integrated Resilience of the Built-Environment

6 September 2017, 15:00-17:30 @COEX 318A, Seoul

SPEAKERS			
Chair: Kazuo IWAMURA (Japan)			
1	Presentation of the seminar issues (30m)	Kazuo IWAMURA	JIA, Japan
2	From the European viewpoints (30m)	Cuno BRULLMANN	SIA, Switzerland
3	From the American viewpoints (20m)	George KUNIHIRO	JIA/AIA, Japan/USA
4	From the Asian viewpoints (20m)	Sathirut TANDANAD	ASA, Thailand
5	Discussion (40m)	Moderator: K. IWAMURA	JIA, Japan
6	Wrap-up of the seminar (10m)	Joseph KWAN	HKIA, Hong Kong

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3. American view by *George*..... 30
4. Asian view by *Nui*..... 34
5. Wrap-up by *Jo*..... 36

Sparkers & Participants

UIA Seminar
By JIA
in COEX,
Seoul

6/9/2017
15:00-17:30

Kazuo IWAMURA

Kazuo IWAMURA, M.Eng., right after having studied at Waseda University in Tokyo, Japan, began his professional career at Agence Candilis in Paris (1973) as a French Government Scholarship Intern, and co-founded a joint architectural design office "*AG5 (Arbeitsgemeinschaft für Architektur und Städtebau)"* in Darmstadt, Germany (1977) with his four German colleagues.

After having returned home in 1999, Kazuo founded his own architectural studio "IWAMURA Atelier Inc." in Tokyo (1980), specialized in the holistic sustainability of architectural and urban design.

Kazuo has been serving as Professor at Tokyo City University since 1998, and became Professor Emeritus in 2014, contributing in-between to numerous other universities and professional organizations world-wide including;

"Union Internationale des Architectes (UIA: International Union of Architects)"
Vice-president, representing the Region IV (2008~2011)
"World Green Building Council (WGBC)": Member of the Board of Directors (2007~2012)
"The Japan Institute of Architects (JIA)"
Vice-President (2005~2006), Councilor (2002~2006, 2012~)
Chair of the Committee of International Affairs (2002~2006, 2012~2017)
"Architectural Institute of Japan (AIJ)": Council member (2006~2008)
"Association for Environmentally Symbiotic Housing": General Technical Consultant (1997~)
"Japan Sustainable Built Environment Consortium" (The mother of CASBEE)
Member of the Board of Directors (2010~)

Kazuo received many awards for his architectural practices to date, including UN World Habitat Award in 2001, most prestigious Architectural Institute of Japan Prize in 2003 and JIA Environmental Architecture Prize in 2003 and 2014.

Also he wrote 17 books of related themes so far, including "Natürliche Konstruction" by Frei Otto (Translation),1986, "Architectural Environment,"1990, "Symbiotic Housing A-Z,"1998, "Architecture of the Future (in English),"1999, "Glocal Document 2000, Forefront of Sustainable Architecture,"2000, "Building, Culture & Environment (in English)",2003, "asian breezes (in English)",2005, "Architecture for a Sustainable Future (in English),"2005, "Urban Design in the Era of Global Environment,"2007, "Housing for Human Security,"2012, "CASBEE (in English),"2014, "Kaleidoscopic Review of Housing and Communities from around the Globe,"2015.

Currently Kazuo is CEO of IWAMURA Atelier Inc., and Visiting Professor at Chu Hai College of Higher Education in Hong Kong. Contact: iwamura@iwamura-at.com

Abstract

Integrated Resilience of the Built-Environment

In the 21st century most of population on the globe live and work in cities, where uncertain risks are increasing, such as climate change, global warming, multiple natural disasters, income gap-widening, aging, health problems, political conflicts, terrorism, vulnerable infrastructure, etc.

"Resilience" is a term that emerged from the field of ecology in the 1970's to describe the capacity of a system to maintain or recover functionality in the event of disruption or disturbance. It is then applicable to cities & buildings (built-environment) because they are complex systems that are constantly adapting to risky and changing circumstances.

The notion of a "resilient built-environment" becomes, therefore, conceptually relevant when chronic stresses or sudden shocks threaten widespread disruption or the collapse of physical or social systems. "Integrated resilience of the Built-Environment" describes, consequently, the capacity of those to function, so that the people living and working there survive and thrive no matter what stresses or shocks they encounter.

This seminar will be an opportunity to discuss about the above accordingly as follows;

1) Japan has been always experiencing frequent difficulties physically, environmentally, economically and socially, due to a variety of occasional natural disasters as well as daily indoor disasters.

2) Accordingly, short-, mid- and long term effective relief measures should be taken to cope with them, especially the relevant preparedness measures for predicted future disasters.

3) In this regard, a cyclical design process for the human security must be taken into consideration involving all the stakeholders beyond simply being "Green" or "Smart."

4) To this end, our collective efforts through communal and local solidarity will be the very base towards; Integrated Resilience of the Built Environment for Human Security.

Such a goal towards human security must be the top priority that formulates the social responsibility of our profession worldwide;

Beyond Disasters, Through Solidarity, and Towards Resilient Sustainability.

INTRODUCTION

01

UIA Seminar
by the Japan Institute of Architects:

Integrated Resilience of Built-Environment

6 September 2017, 15:00-18:00 @Room 318A

by Kazuo IWAMURA

Professor Emeritus, Tokyo City University
Visiting Professor, Chu Hai College of Higher Education
CEO, IWAMURA Atelier Inc.
FJIA, Japan Institute of Architects

02

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0. Introduction: Notion of resilience

1) In the 21st century, most of population on the globe live and work in cities, where uncertain future risks are increasing such as global warming, multiple natural disasters, income gap-widening, aging, health problems, political conflicts, terrorism, vulnerable infrastructure, etc.

2) In 1961, Jane Jacobs, a community activist, already published "The Death and Life of Great American Cities," referring to the roots of similar risk issues of the city resilience.

3) "Resilience" is a term that emerged from the field of ecology in the 1970s to describe the capacity of a system to maintain or recover functionality in the event of disruption or disturbance. It is applicable to cities and buildings because they are complex systems that are constantly adapting to changing circumstances.

03 *(Ref.: "City Resilience Framework," 2015, Rockefeller Foundation + ARUP)*

0. Introduction (cont'd)

4) The notion of a "resilient city and building (built environment)" becomes, therefore, conceptually relevant when chronic stresses or sudden shocks threaten widespread disruption or the collapse of physical or social systems.

5) "*Integrated Resilience of Built Environment*" describes, consequently, the capacity of those to function, so that the people living and working there, particularly the poor and vulnerable, survive and thrive no matter what stresses or shocks they encounter.

Such a goal towards human security must be the top priority that formulates the social responsibility of our profession worldwide.

04 *(Ref.: "City Resilience Framework," 2015, Rockefeller Foundation + ARUP)*

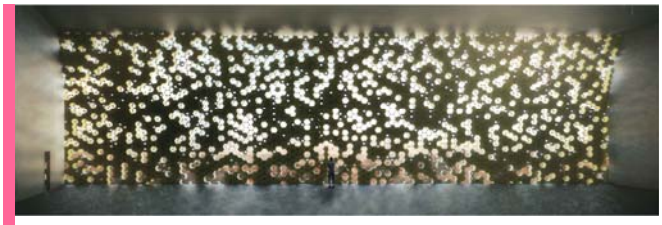
05

1. Recent Proposal

"Meta-Sand Spiral City", Cairo

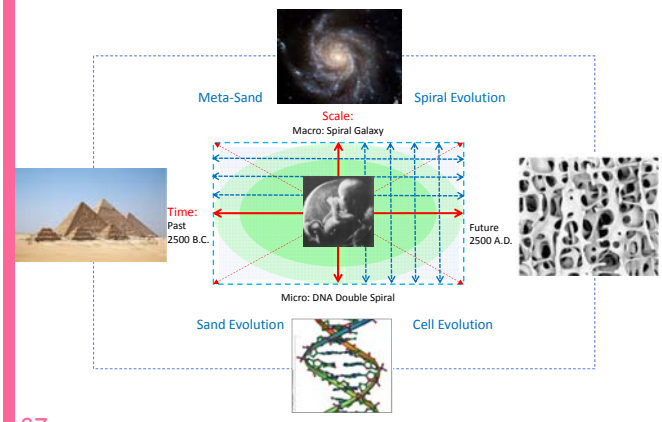
Innovative resilience
across time and scale

by
YASUI Architects & Engineers Inc. + IWAMURA Atelier Inc. JV
August 2016



06 "Meta-Sand Spiral City," Cairo

Conceptual Coordinate across Time & Scale



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"Meta-Sand Spiral City"

The innovative incubator of scientific culture, integrating Nature, Civilization and Life, on the basis of "Meta-Sand" and "Spiral Evolution"

Site area: 125,000m², Built-up area: 32,000m², Total floor area: 114,500m²

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Site Location

From Cairo to the Site:
The site is located 38km away from and to the west-southwest of the city-center of Cairo, connected by the major road 27 July Axis and Al Fauern-Al Wahat Road.

Main access to the site is given only through the northern residential areas, which is not favorable from the traffic point of view.

Although the southern buffer zone currently allows no access from Al Wahat Road, it is strongly advised to provide one to avoid any traffic inconvenience in the adjacent residential areas.

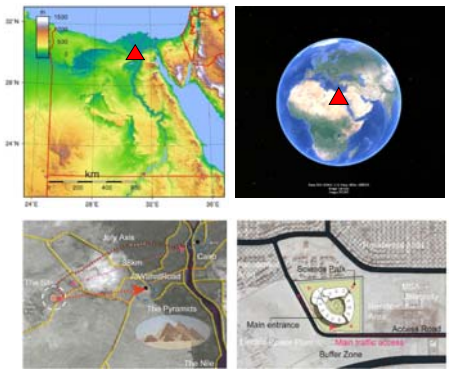
Also the southern buffer zone may be used for additional visitors parking place, as is the case of the Modern Science & Art University.

Local Consideration:
The northern residential areas, closely developed to the site, require a buffer line along the boundary.

The site plan, therefore, requires to keep a distance with buildings that embraces a courtyard, which creates tranquil and attractive urban asset with a well-tempered human environment for both the users and the neighbors.

Homage to the Pyramids:
Symbolizing the time evolution, the Observatory Tower allows to appreciate the Giza Pyramids, the jewel of Egypt, over the entire view of the Science City.

Site Planning:
The cell-like buildings are located at the center of site, surrounding a courtyard. They consist of four cells, connected with each other by spiral slopes in the courtyard. They are integrated into the site topography slightly rising toward the north and also partially connected with the landscaping.



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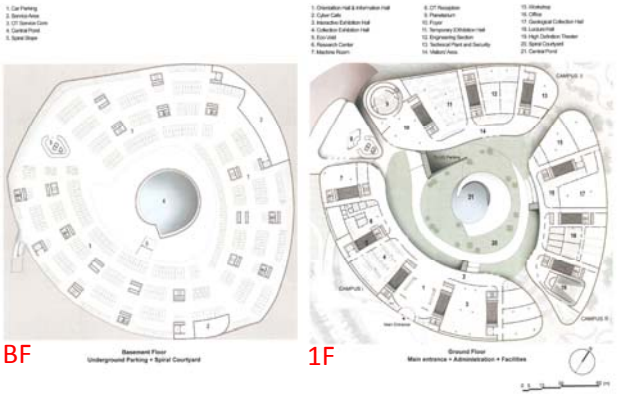
Floor Plans



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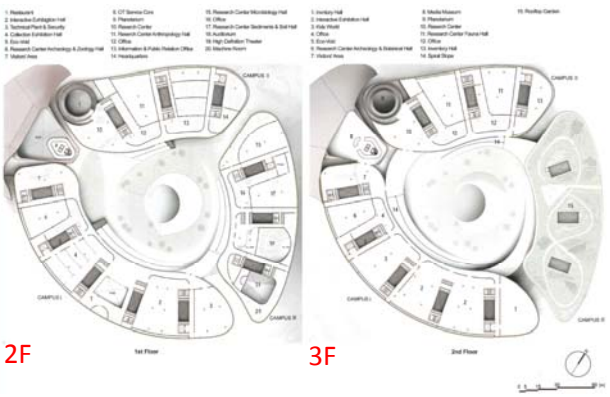
Floor Plans



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Landscaping-1

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Landscaping-2

1) Organically integrated landscaping through;
Site specific topography and geography

2) Impressive surroundings along the site boundary by;
Moats, mounds and rampart for security
using similar material to the façade for harmony

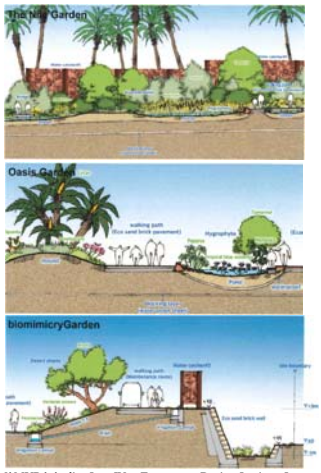
3) Memorable approach & entrance by;
welcome water basin reflecting the unique façade and the stardust lighting

4) Region specific outer-gardens constituted of:
Desert, Rock, The Nile, Oasis, Grass and etc.
Roof-top garden on the Campus III linked to Grass Garden

5) Peaceful unique inner-garden as the courtyard characterized by;
lawn and pond at the middle surrounded by the three organic buildings and the tower
spiral pedestrian slopes connecting each floor

6) Natural irrigation water provision by means of;
air-water catcher devices taking advantage of the hourly fluctuation of temperature & humidity

7) Consideration for maintenance and security by;
the maintenance road beside the mound and rampart along the site boundary



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Elevation (South)

South Elevation

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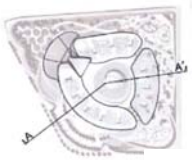
Section (A-A')



A-A' Section

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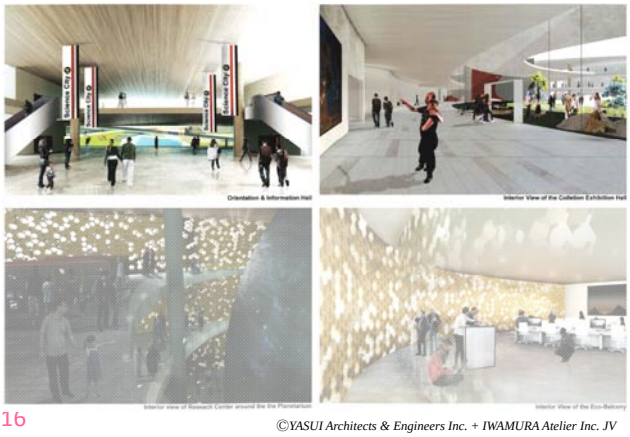
Interior images



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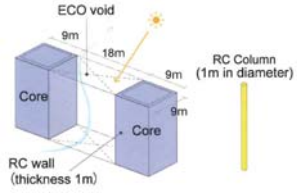
Innovative Structural Design

Main Structure

Main Structure is composed of RC 9m x 9m core system to support normal force, while random RC columns are set to support horizontal force to allow free and flexible space provision by means of:

1) Column-less space through long span PC beams

2) Full usage of the story height between the voided flat slabs

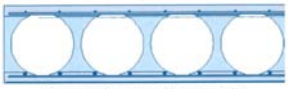


<Core > **<Column>**

	Number of Core Units	Number of Columns
1. Campus I	5	28
2. Campus II	3	22
3. Campus III	3	18
Total (1+2+3)	11	68

Voided flat slab system:

Voids contribute to reducing the weight and can be used for utility piping & wiring



Cross section of a voided flat slab

Voided flat slab under construction

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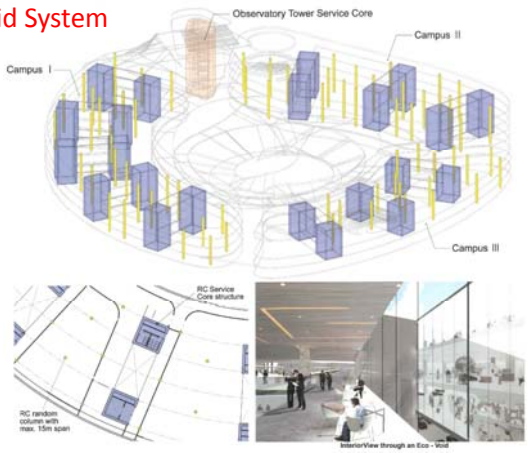
Eco-Void System



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Interior images




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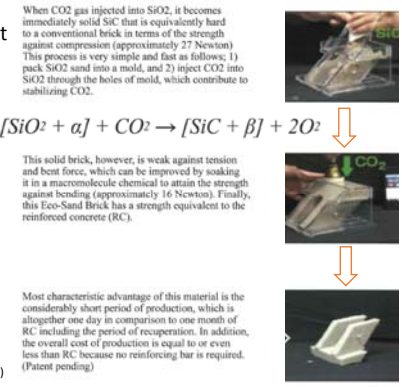
Meta-Sand Brick

is a state-of-the-art structural material that can be easily made injecting CO_2 gas into SiO_2 and soak in urethane liquid afterward.

SiO_2 is abundantly available in the adjacent desert and therefore very affordable.

(Courtesy of Prof. Norihide IMAGAWA)



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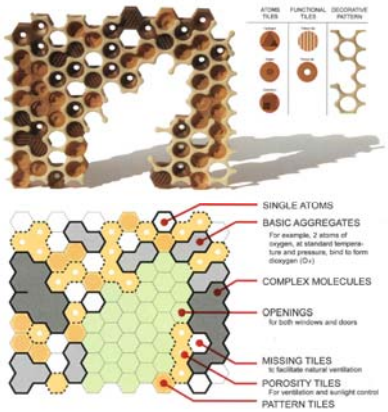
Abacus of Meta-Sand Brick Elements

The elements of the Meta-Sand Façade represent a variety of molecules and compose diverse patterns according to the requirement of the related interior space.

This pattern characterizes the whole façade of the Meta-Sand Spiral.



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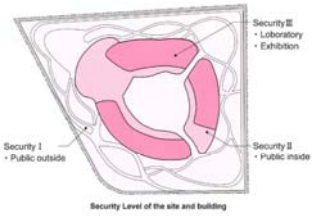
Design for Resilience -1: Security System



Security

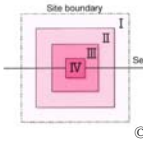
1)Security zoning

Comprehensive security system is indispensable element to realize resilient operation of the Science City.

The security zoning is herewith proposed to be divided into the Level I to VI according to the functional importance, and the security check-points are set in every zone.

2)Security level

The level of security is systematically established from I to IV covering the site, the buildings, general rooms and a special room respectively. Also a personal authentication system through a chip card and fingerprint is introduced for security operation and management.



Area	Security Intensity Level I	II	III	IV
1. The whole site				
2. The whole building				
3. Interior security zone				
4. High security room				

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Design for Resilience -2: BCP System

BCP (Business Continuity Plan)

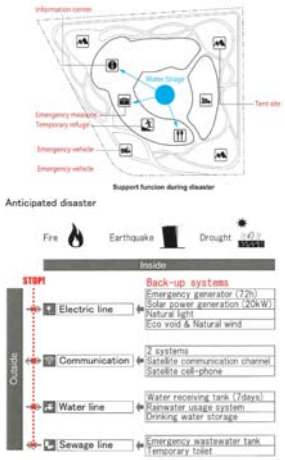
Disaster preparedness

Facing unexpected risks including natural disasters and/or terrorism, BCP is indispensable for both public and private business entities to support the stakeholders as well as the relevant company to survive beyond the prospective risks and dangers.

The figure on the right show an image of BCP framework simply customized in the Science City in case of the infrastructure shutdown.

Recovery during the aftermath

Simulation of recovery is the core of BCP in view of the survival with ever changing requirements during the aftermath. The Science City could be used as an evacuation venue for the employee, the visitors and the neighbors.



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Nightscaping

According to the daily and seasonal change of natural lights, the Meta-Sand Spiral City is designed to appreciate the ecological lighting effects through the porous façade and the Tower.

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2. Disasters

2.1 Occasional Disasters

Japan has been experiencing the frequent difficulties physically, environmentally, economically and socially, due to a variety of temporary & natural disasters including typhoons, floods, earthquakes, tsunamis, volcanic eruptions and the like.

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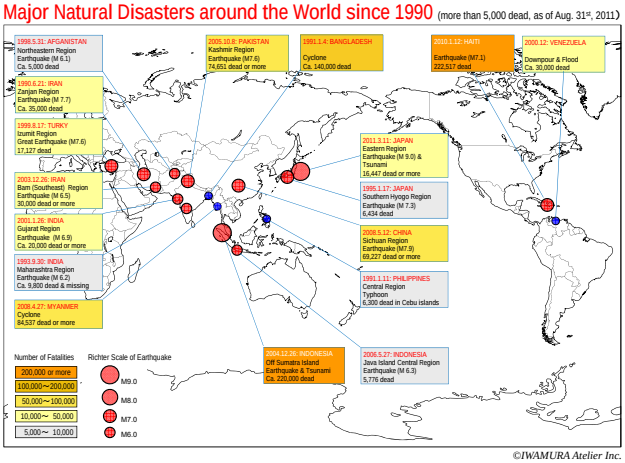
26 Major Natural Disasters around the World since 1990 (more than 5,000 dead, as of Aug. 31st, 2011)



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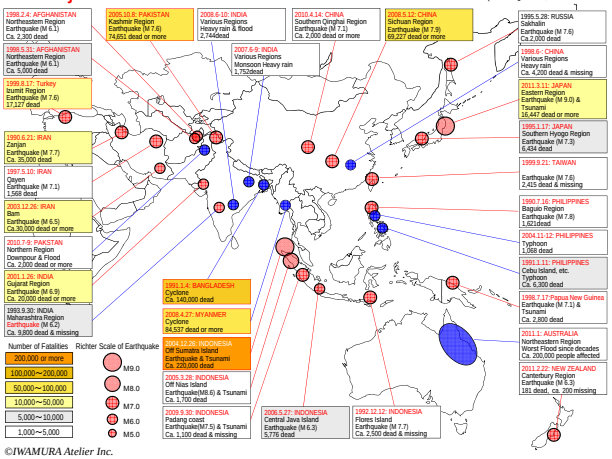
27 Major Natural Disasters in Asia & Oceania since 1990 (as of August 30th, 2011)



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28 Record of Major Natural Disasters in Japan since 2011

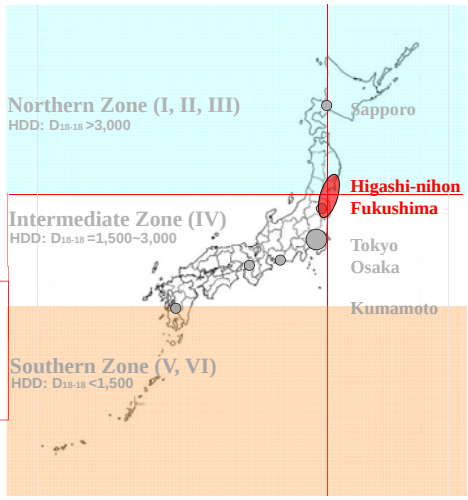
Date	Location	Category	Note
2011			
Jan.-	Kyushu	E. Eruptions	Since 0.5 century
Mar.9	Miyagi	EQ:M7.3	
Mar.11	East Japan	EQ:M9.0 & Tsunami	15,900D, 2,500M
Mar.12	Nagano	EQ:M6.7	
Mar.15	Shizuoka	EQ:M6.4	
Apr.11	Fukushima	EQ:M7.1	
May.-	West Japan	Typhoon & Floods	Heavy rain
Jun.-	All Japan	Intense Heat	Heatstroke Deaths
Jul.-	Shikoku + α	Typhoon & Floods	Heavy rain
Jul.28-	Hokuriku	Floods	Heavy rain
Aug.30-	East to Kyushu	Typhoon & Floods	20,000-Flooded Houses
Sep.-	All Japan	Typhoon & Floods	7,800-Flooded Houses
Nov.-	Amami	Tornado	
Dec.3	Okinawa	EQ:M7.0	
Dec.3	All Japan	Cold Wave	Heavy snow
2012			
Jan.	Torishima	EQ:M7.0	
Apr.3	All Japan	Windstorm	
May.6	Ibaragi	Tornado:F3	1,000-Collapsed Houses
Jun.	All Japan	Typhoon & Floods	
Jul.-	West Japan	Heavy rains & Floods	12,000-Flooded Houses
Aug.	Kinki + α	Heavy rains & Floods	
Aug.25	Hokkaido	EQ:6.1	
Sep.-	All Japan	Typhoon & Floods	
Dec.-	All Japan	Cold wave	Snow storm & Snowfalls
2013			
Feb.2	Tokachi	EQ:M6.5	
Feb.25	Tochigi	EQ:M6.2	2,000-Collapsed Houses
Apr.14	South Hyogo	EQ:M6.3	2,000-Collapsed Houses
Apr.17	Miyake Isl.	EQ:M6.2	
May.18	Fukushima	EQ:M6.0	Offshore
Jul.-	Chugoku Region	Heavy rains & Floods	+Tornado
Aug-	West Japan	Intense heat	Heatstroke Deaths
Aug.4	Miyagi	EQ:M6.0	Offshore
Sep.-	All Japan	Typhoon & Floods	10,000-Flooded Houses
Oct.-	East Japan	Typhoon & Floods	
Oct.26	Fukushima	EQ:M7.1	Offshore

Date	Location	Category	Note
Nov.-	Ogasawara	E. Eruptions	New island
2014			
Jan.-	All Japan	Influenza epidemic	1.5mil. Affected people
Feb.-	East of Kinki	Heavy snow +storm	Snowfall records
Mar.14	Iyo-nada	EQ:M6.2	Offshore
May.5	Izu-oshima	EQ:M6.0	Offshore
Jun.-	West Japan	Torrential rain	Record rains
Jul.-	All Japan	Typhoon & Floods	Heavy rain & Landslide
Aug.-	All Japan	Typhoon & Floods	Heavy rain
Aug.10	Aomori	EQ:MM6.1	Offshore
Aug.-	West Japan	Torrential rains	Thousands of Flooded Hs.
Sep.-	E & N Japan	Torrential rains	Recorded 120mm & more
Sep.27	Gifu & Nagano	E. Eruptions	Postwar worst E. disaster
Oct.-	Mid Honshu	Typhoons & Floods	Heavy rains & Landslides
Nov.22	North Nagano	EQ:M6.7	
Dec.16	All Japan	Snow storms	Heavy snow & Cold wave
2015			
Feb.6	South Tokushima	EQ:M6.0	
Feb.17	Iwate	EQ:M6.9	Offshore
May.13	Miyagi & Iwate	EQ:M6.8	Offshore
May.29-	Kuchinoerabu	E. Eruptions	Pyroclastic flow
May.30	Ogasawara	EQ:M8.1	Offshore
Jun.29-	Hakone	Phreatic eruptions	Since few centuries
Jul.15-	West Japan	Typhoon & Floods	Heavy rains
Aug.-	S & W Japan	Typhoon & Floods	Windstorm & Heavy rains
Sep.-	Shikoku & East	Typhoon & Floods	Torrential rains
Sep.14	Mt. Aso	Phreatic eruptions	
2016			
Jan.14	South Hokkaido	EQ:M6.7	
Jan-	All Japan	Record cold wave	Heavy snow & Storm
Feb.-	Sakurajima	E. Eruptions	Volcanic smoke: 4,000m
Apr.14-	Mid Kumamoto	EQ:M6.5	Thousands of DH Frequent aftershocks
Jun.-	Kinki & East	Torrential rains	Floods & landslides
Aug.-	Chubu & East	4 Typhoons	Windstorms & heavy rains
	West Japan	Record hot days	Heatstroke sufferers
Sep.-	West Japan	Typhoon & Floods	Windstorms & heavy rains
Oct.-	South Japan	Typhoon & Floods	Windstorms & heavy rains

Note) EQ: Earth Quake (only M=6.0 or more), E. Eruptions: Explosive Eruptions

The Great Japan East Earthquake & Tsunami

March 11, 2011



Casualties:
（as of Mar. 10, 2016）

Deaths ： 15,894p
Missing ： 2,561p
Injured ： 6,152p

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Tsunami attacking the Sendai Airport and its vicinity after the 3.11 Earthquake

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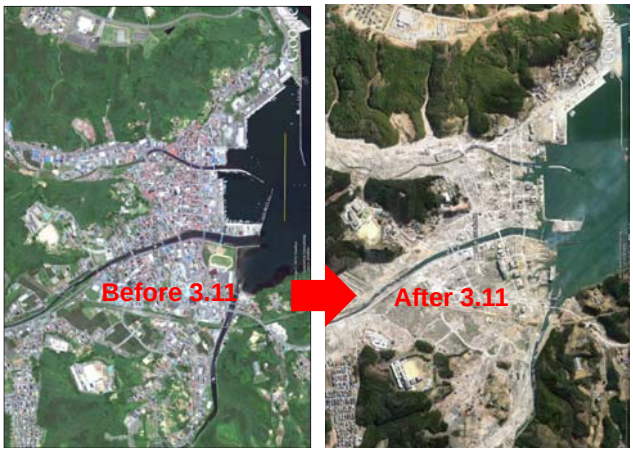
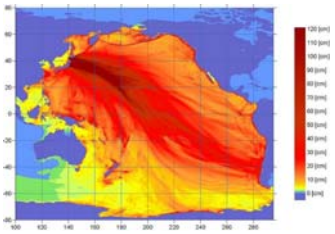
31

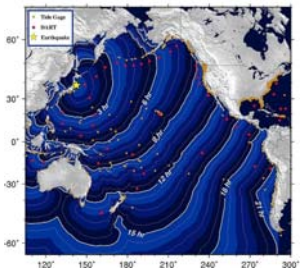
32 Minami-Sanrikucho totally devastated by the 3.11 Tsunami



Local disaster ⇒ Global disaster

Energy Transmission of the Tsunami triggered by 3.11 Earthquake





Arrival Time of the Tsunami to the Pacific Coasts after 3.11 Earthquake

(Source: 2011Sendai-NOAA-Energylhvpd9-05.jpg
NOAA: National Oceanic and Atmospheric Administration, US Department of Commerce)

33

SHIGERU BAN ARCHITECTS
Voluntary Architects Network (VAN)

Paper Partition System designed and provided by Shigeru BAN for human dignity at Ohtsuchi High-School's gymnasium as an aftermath refuge, set up by the refugees themselves

(2015 Pritzker Prize-Winner)

Before

After

34 © SHIGERU BAN ARCHITECTS

TOYO ITO (2013 Pritzker Prize-Winner)
& ASSOCIATES, ARCHITECTS
Initiatives of "Home-for-All" Networking

The 1st Home-for-All (Oct. 2011), built within a temporary housing site in Sendai

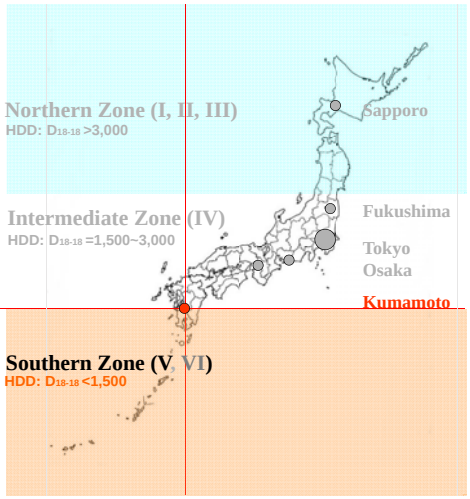
35 ©TOYO ITO & ASSOCIATES, ARCHITECTS

Kumamoto Earthquake

April 14~, 2016

Casualties:
(as of Apr. 28, 2016)

Deaths : 49p
Missing : 1p
Injured : 1,496p

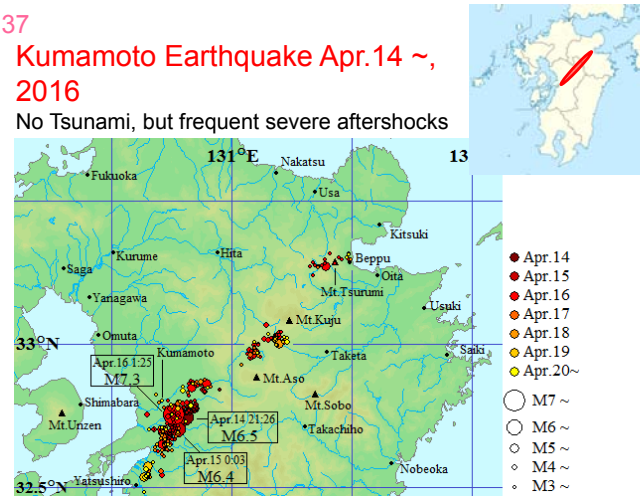


36

37

Kumamoto Earthquake Apr.14 ~, 2016

No Tsunami, but frequent severe aftershocks

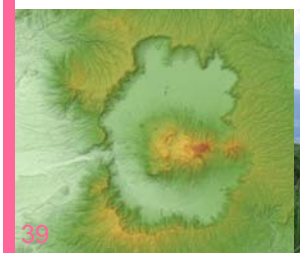


38

Kumamoto Earthquake Apr.14 ~, 2016

Mt. ASO 32.884° N / 131.104° E, Summit: 1,592 m

Primary volcano type: Caldera



39

Mt. ASO's explosive eruptions

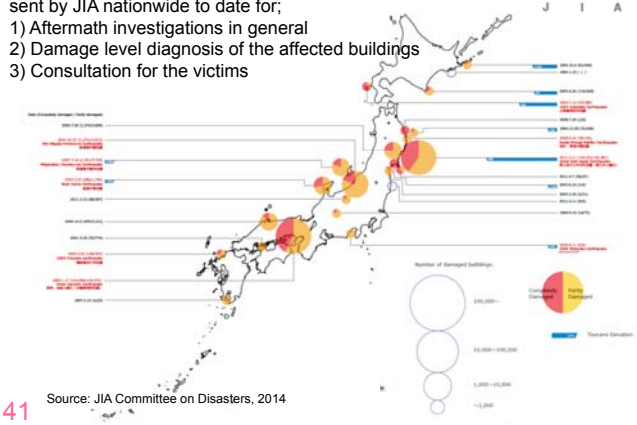
A series of explosive eruptions at Mt. Aso's Nakadake Crater occurred at 21:52 on 7 October and 01:46 on 8 October, 2016, after a period of deformation was detected. The last similar eruption was recorded 36 years ago.

The volcanic ash fell as far as 320km away from the crater (see below the Aso City covered by ash).

40

Emergency Architects for disaster relief

sent by JIA nationwide to date for;
1) Aftermath investigations in general
2) Damage level diagnosis of the affected buildings
3) Consultation for the victims



Source: JIA Committee on Disasters, 2014

41

International Workshops about seismic-proof design

February 2016: The Earthquake Resistance Design Workshop in Tokyo for Thai architects.

March 2016: The first Iran-Japan International Workshop in Tokyo on Architectural and Urban Design for erthquaque.

42

Organized and moderated by Kazuo IWAMURA, FJIA

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2.2 Daily Disasters

In Japan, domestic accidental death toll amounts more than three times as much of traffic accident.

↓

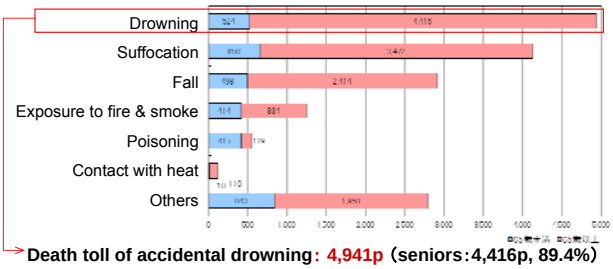
This should be called “Daily Disaster.”

↓

The key architectural solution is providing a whole house with high thermal insulation to relax the Indoor Heat Shock in existing old houses.

Annual death toll of domestic accidents in Japan (2011)

Total：16,722p, of which 13,325p（79.7%）are seniors (>65)



Death toll of accidental drowning：4,941p（seniors：4,416p, 89.4%）

＜Reference＞ Annual death toll of traffic accidents in 2011: 4,664p (seniors: 2,291p, 49.1%)

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Death toll of drowning in bathtub has been rapidly increasing in existing old houses, while that of traffic accident became a half during 1995～2012.

The major cause of this accident is considered:

Indoor Heat Shock,

due to the intense temperature difference between

①living room (24℃),

②undressing room (14℃) and

③bathtub (42℃),

which causes sudden change of blood pressure, and consequently stroke or cardiac failure.

High thermal insulation of the whole house is proved very effective to prevent such accidents.

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3. Methodological Approach towards Resilient Built-Environment

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3.1 Trigger

Iwamura et al. started developing so entitled “Environmentally Symbiotic Housing” as a national initiative of Japan in collaboration with governments, academia and industry in the year of 1990. The trigger was the Japanese cabinet’s project in view of coping with the Global Warming (1990). Since then as ever, Japan has experienced a number of tragic natural disasters.

Learning from those experiences, it should be recognized that the sustainability of housing and community be holistically elaborated along a cyclic sequence of time,

1) In ordinary time,
2) At the disaster and
3) In the aftermath.

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3.2 Life Continuity Plan (LCP)

Given the above, it must be recognized that we are always confronted with disasters both “Occasional” and “Daily.” Taking this into consideration, how should we plan and design sustainable housing and community?

Related to this query, Business Continuity Plan (BCP) gives us a hint, which means as follows;

“When business is disrupted, it can cost money. Lost revenues plus extra expenses means reduced profits. Insurance does not cover all costs and cannot replace customers that defect to the competition. A business continuity plan to continue business is essential”.

The author proposed a similar initiative, replacing “Business” by “Life,” namely “Life Continuity Plan (LCP)” to take care of the holistic planning and design of resiliently sustainable housing and community.

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Life Continuity Plan (LCP)

Basic Frame of Housing for Human Security

Phase	Items	Housing Level		Community Level	
		Detached	Collective	Neighborhood	Region
1. Ordinary Time	Physical Health				
	Physical Security				
	Mental Health				
	Peace of mind				
	Crime Prevention				
	Maintenance				
	Periodic Inspection				
2. At the Disaster	Place of Refuge				
	Energy Sources				
	Energy Supply				
	Tap Water				
	Sewerage System				
	Toilet				
	Traffic				
3. In the Aftermath	Place of Refuge				
	Energy Sources				
	Energy Supply				
	Tap Water				
	Sewerage System				
	Toilet				
	Traffic				
	ICT				
	Provisions				

First, a basic frame has been developed to grasp at a glance overall relevant engagements in terms of the time-line and scale.

The objects of measures are sorted horizontally according to the scale (from a detached-house, an apartment, a neighborhood, to a region), and vertically to the time-line (from ordinary time, at the disaster, and in the aftermath, which are always cyclically repeated).

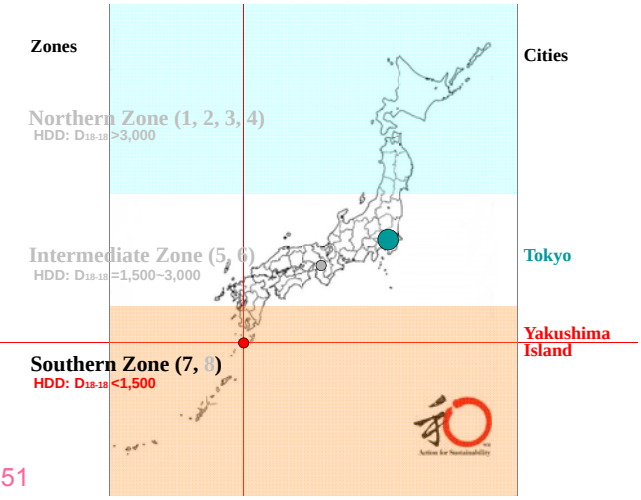
© Kazuo IWAMURA, 2011

4. Implemented Practice

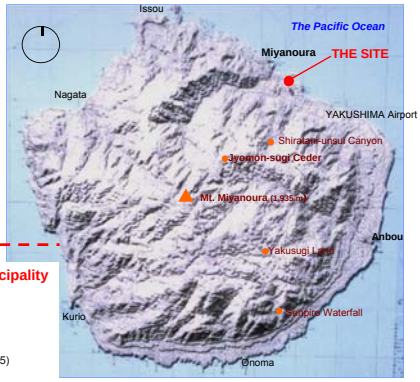
Yakushima Symbiotic Housing

designed for
passive & indigenous resilience

by
IWAMURA Atelier Inc.
2001-2006



Location



Yakushima Island Municipality

Location:
Long. 130° 34'E
Lat. 30° 25'N

Area: ca. 503km²

Population: 13,761 (as of 2005)

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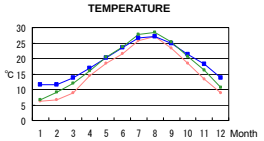
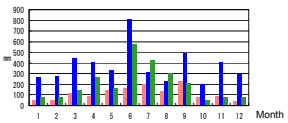
Nature of Yakushima: *World Natural Heritage*

Local climate

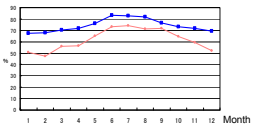


Annual Mean Temperature:
19.14℃

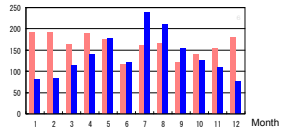


Annual Mean Precipitation:
4,488 mm

YAKUSHIMA TOKYO KAGOSHIMA



Annual Mean Humidity:
74.35%



Annual Mean Hours of Sunshine:
1,627 hr

Source : AMEDAS Data by the Meteorological Agency (1993~97)

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Existing vernacular settlement in Nagata on the western shore






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Conceptual design guidelines

1. 太陽と暮らす
Live with the sun
・太陽エネルギーを利用する
・適切な断熱と日射遮蔽を行う
・適切な蓄熱を行う
・内外に変化をつくる
・土間を確保し、しつらえを工夫する
・北側空間を有効利用する

2. 水と暮らす
Live with water
・排水する
・雨を避ける
・雨水を利用する
・積水力を高める
・節水・水質浄化に寄与する

3. 風と暮らす
Live with wind
・空気の流れをつくる
・風力エネルギーを利用する
・強風・塩風害に対応する

4. 資源と暮らす
Live with resources
・省エネルギー設備機器を採用する
・維持構造を長持ちさせる
・ライフスタイルの変化に対応する
・リサイクル資材・建材を用いる
・廃棄物を削減する
・地場産材を積極的に採用する

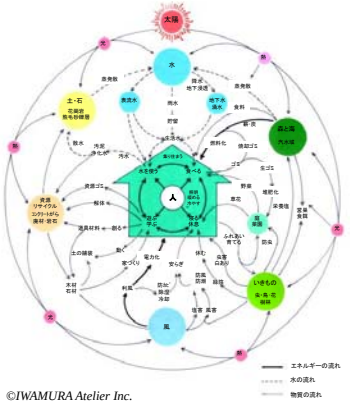
5. 生き物と暮らす
Live with creatures
・表土の流出を防止する
・薬剤を過剰に利用しない
・水と緑の融をつくる
・多様性を確保する
・貴重種・希少種の保護に配慮する
・多孔質な空間を確保する

6. 地域社会と暮らす
Live with local community
・界隈を引き継ぐ
・伝統的住いに学ぶ
・伝統的暮らしに学ぶ
・人と人の交流を進める
・家づくりに参加する
・まちづくりに参加する
・リサイクルマーケットを設置する

7. 自然と暮らす
Live with the nature
・生き物とふれあう
・音・香り・感触を楽しむ
・緑化によって、熱環境の質を向上する
・景観豊かな計画

8. 安心して暮らす
Live safe
・利用者の特性に配慮する
・自然の被害に対応する
・安全な材料を用いる
・カビ・病原を防ぐ
・非常時に備える

■屋久島環境共生住宅の流れと循環モデル図



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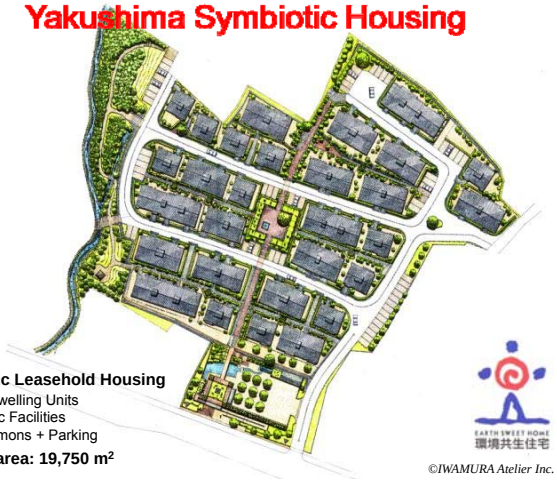
Yakushima Symbiotic Housing



- **Public Leasehold Housing**
  - 50 Dwelling Units
  - Public Facilities
  - Commons + Parking
- **Site area: 19,750 m²**

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Major strategies of Yakushima Symbiotic Housing -1

1) Provision of safe and long-life basis and housing, resisting typhoons, heavy rains, salt damage and termites
2) Creation of safe and beautiful town-and land scape, respecting the original topography of the site as well as the local life-style
3) Provision of a greening base to be networked for the restoration of the local forests that disappeared through exploitation to date

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Major strategies of Yakushima Symbiotic Housing -2

4) Housing development using the indigenous resources of the Yakushima island
5) Provision of a variety of housing types based upon the simple and flexible timber structure
6) Consideration of the property maintenance through participatory initiatives of the residents

for Human Security and Resilient Sustainability

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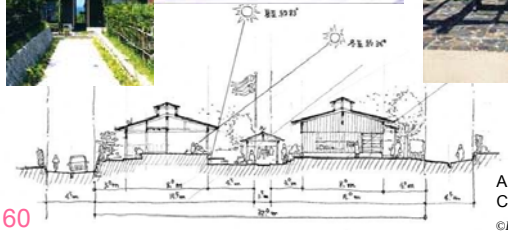
Townscape for the Human Security

A Typical Cross Section

60

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Common paths for the residents

as of August 2004

For the neighborhood exchange as well as evacuation route at disasters

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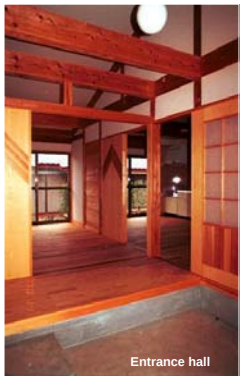
Indoor and outdoor relationship

A typical block (model)

-Traditional closed housing layout to protect each other against typhoon's strong wind

-Open interior for providing flexibility and natural ventilation



62

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Interior solutions of passive design

As of October 2000

■Upward View toward the Upper Roof

■Tatami, Cedar Flooring and Recycled Charcoal for Humidity Control

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Central Square for provisional refuge

as of August 2004

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Neighborhood's Meeting Hall as an indoor refuge

65

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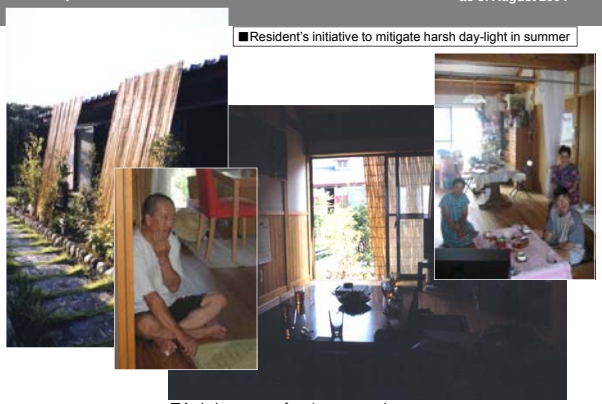
Occupants' intervention

as of August 2004

■Resident's initiative to mitigate harsh day-light in summer



■An indoor scene of post-occupancy in summer

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New resilient village, learned from the heritage

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5. Conclusion

1) Japan, similar to other Asian countries, has been experiencing the frequent difficulties physically, environmentally, economically and socially, due to a variety of natural and occasional disasters including typhoons & earthquakes, as well as the daily indoor disasters.

2) Accordingly, short-, mid- and long term effective relief measures should be taken to cope with them, especially the relevant preparedness measures for predicted future disasters.

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5. Conclusion (cont'd)

3) In this regard, a cyclical design process for the human security must be taken into consideration as the highest priority involving all the stakeholders beyond simply being "Green" or "Smart."

4) To this end, our collective efforts through communal and local solidarity will be the very base towards; Integrated Resilience of Built Environment for Human Security.

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5. Conclusion (cont'd)

5) Consequently, it describes the capacity of those to function, so that the people living and working there, particularly the poor and vulnerable, survive and thrive no matter what stresses or shocks they encounter.

6) Such a goal towards human security must be the top priority that formulates the social responsibility of our profession worldwide;

Beyond Disasters
Through Solidarity
Towards Resilient Sustainability

風 内 外 内
水 外 気 気
自 相 成 萌
生 乗 形 生

Thanks for your attention.

Prof. Kazuo IWAMURA
iwamura@iwamura-at.com

Appendix

1) Gigantic road subsidence in Hakata, Japan on 8 November 2016 & 6 days' restoration
https://www.youtube.com/watch?v=h2p5FVrh_3U&sns=ern

2) E-Defence (Floating Building & City), State-of-the-art seismic-isolation technology, by means of compressed air for floating B & C, reported by NHK News on 2 September 2017
http://www3.nhk.or.jp/news/html/20170902/k10011123781000.html

Cuno BRULLMANN

Swiss origin, now lives in France and Austria.

Graduate Architect of the 'Swiss Federal Institute of Technology in Zurich (ETH).

Professional experience with Van der Erve in Den Haag (Holland).
Assistant to Kisaburo Ito, architect in Tokyo (Japan).
Team Architect with Ove Arup Associates, architects and engineers in London
Architect representing the Agency of Renzo Piano on several projects in Genova and in Milano (Italy) from 1972 to 1974. www.rpbw.com
Senior member in the Piano & Rogers team in Paris on the Georges Pompidou Centre Project from 1974 to 1976. www.rsh-p.com
Personal agency in Paris since 1977.
in 1983, founds the B+FL S.A. company with Arnaud Fougeras Lavergnolle.
in 1998 this company becomes: Cuno Brullmann SA
in 1998 founds the Cuno Brullmann & associés sarl. company.
in 2003 this company becomes: Cuno Brullmann, Jean-Luc Crochon & associates. www.crochon-brullmann.com

Professional Titles

Full Professorship at the Vienna University of Techonoly, TU Wien, since 1995
Professeur de l'Ecole Spéciale d'Architecture in Paris from 1980 to 1995 www.esa-paris.fr
Diplôme d'Architecture de l'ETH, Zurich Suisse.
Member of the Société Suisse des Ingénieurs et Architectes (SIA). www.sia.ch
Member of the Ordre des Architectes en France No 00242. www.architectes.org
Member of the Fédération Suisse des Architectes (BSA). www.architects-fsa.ch

Awards and Nominations (extracts after 2000)

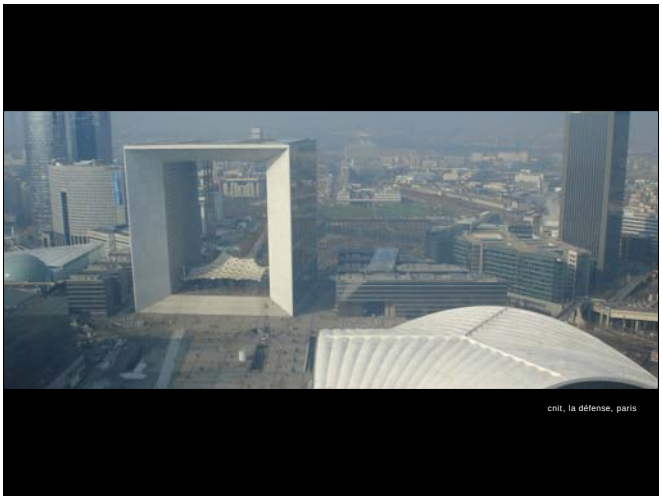
Prix ACIER 2010
1er prix concours pour l’extension et restructuration de l’Université STABS à Nice, 2005
1er prix concours pour la construction du centre paléontologique à Gannat (France) 2005
Mention spéciale Prix AMO, "Architecture et lieu de travail", construction d'une usine en Suisse, 2002
1er prix concours pour l’extension et la réhabilitation de l’Hôpital Foch à Suresnes, 2001
1er prix concours Centre de Petite enfance Jeanne d’Arc et parking public à Nice, 2001
1er prix concours boulevard-piéton et parking, ceinture de la vielle ville de Montauban, 2000
Many others

UTOPIA REAL LIVING IN 100 YEARS

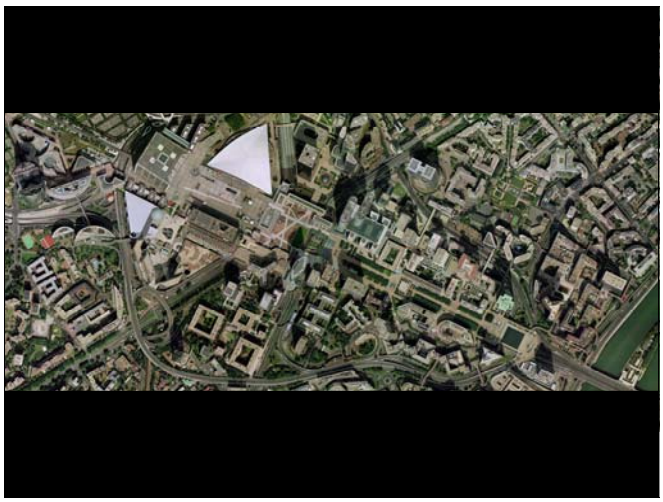
cuno brullmann

pompidou center paris

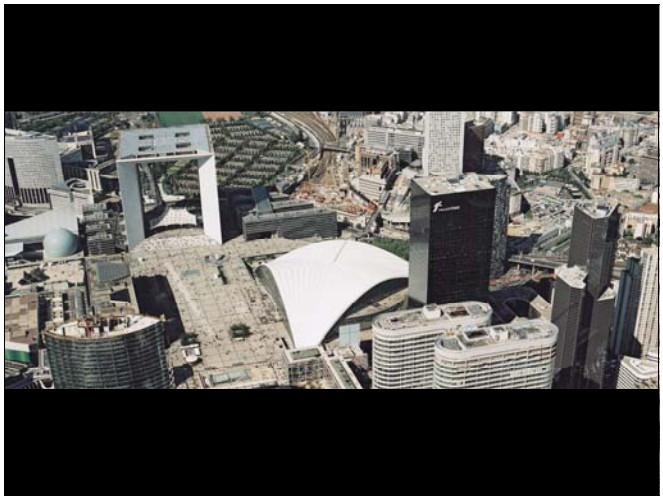
evolution

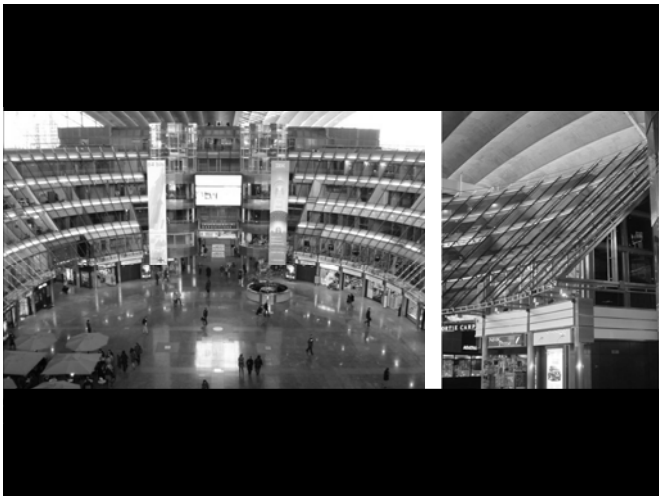


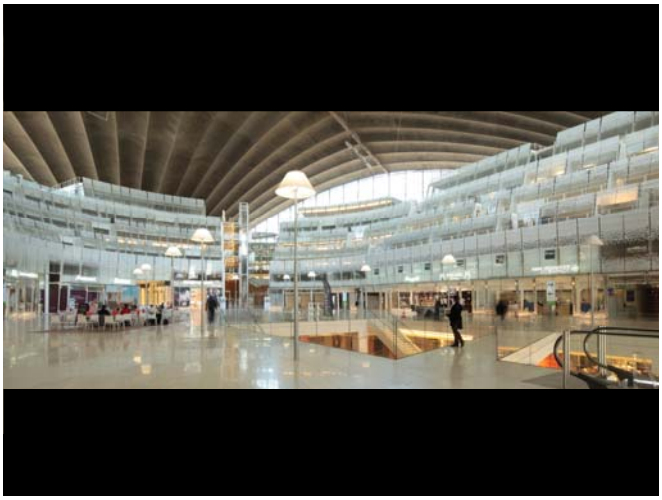
cnit, la défense, paris



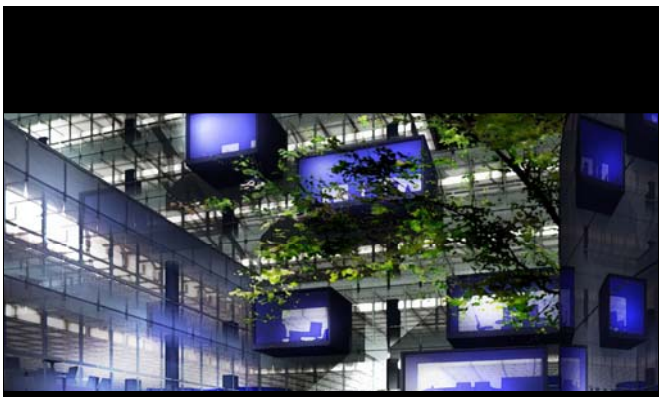
rappel historique
photo 1958



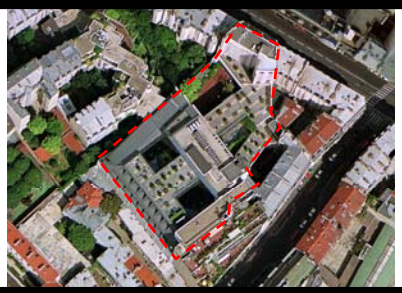


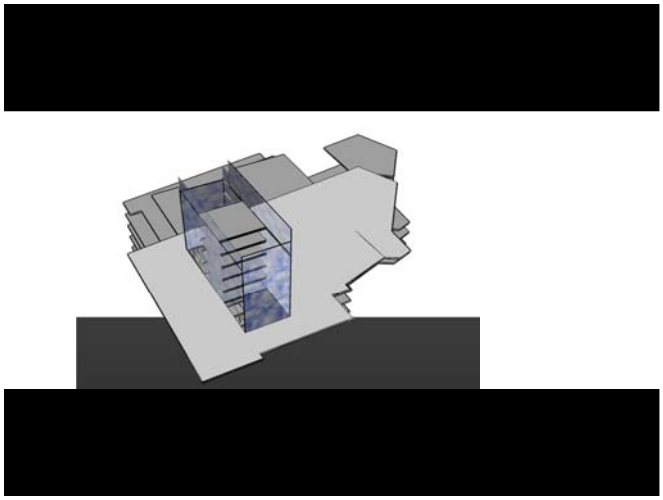


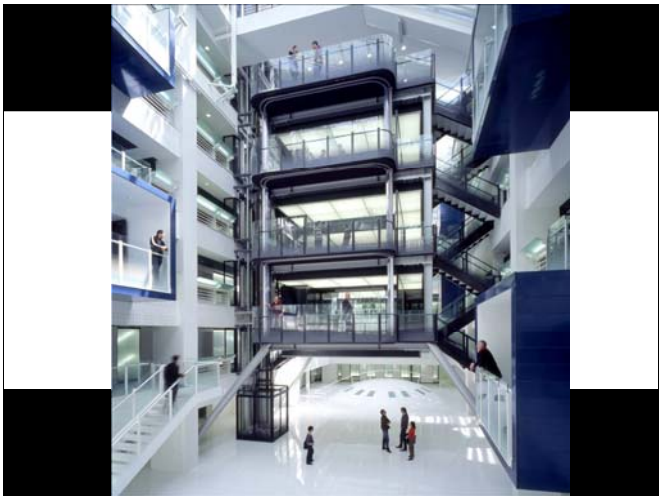
trinity tower la défense, paris, france

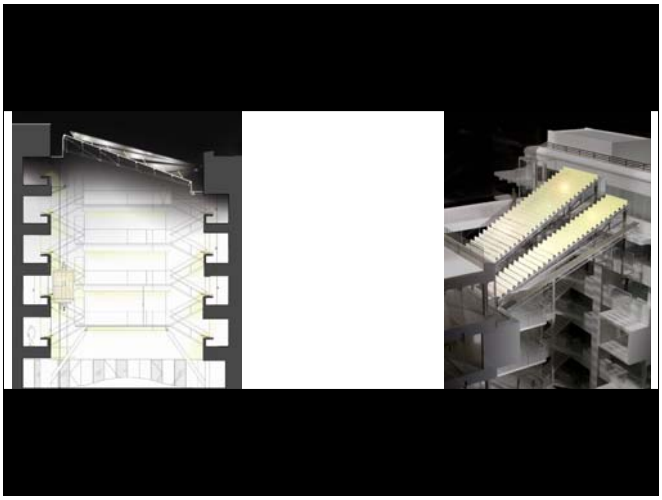


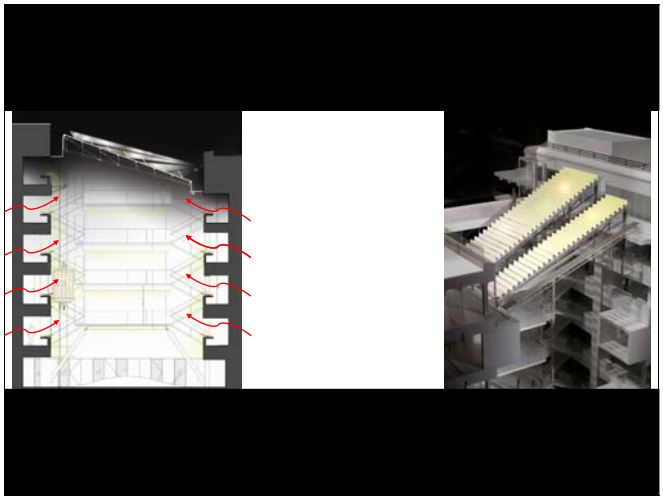
opac headquarters, paris

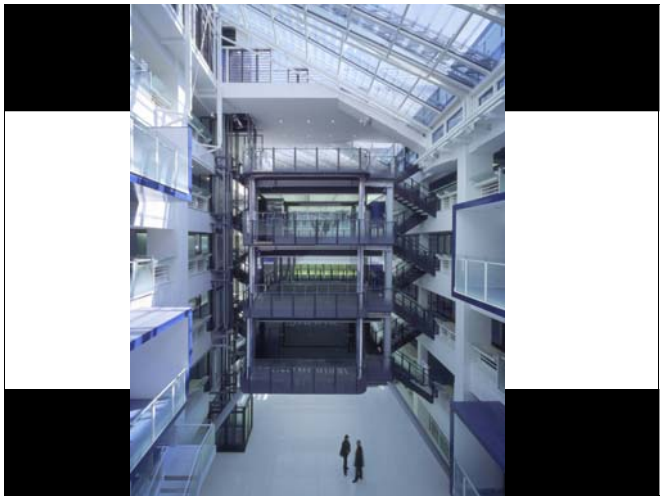






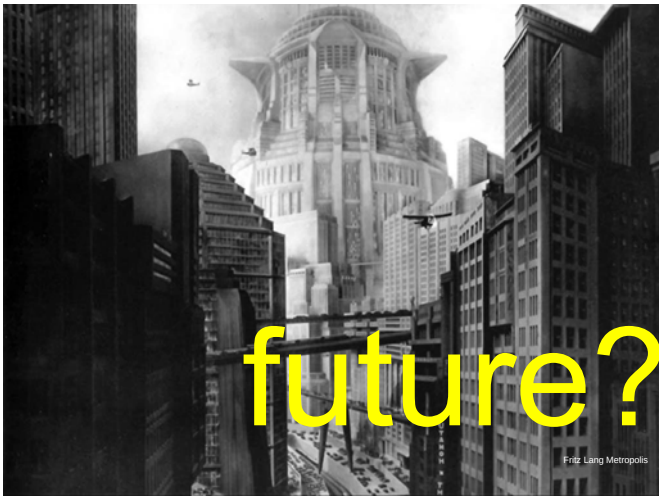






utopia real living in 100 years

cuno brullmann



conventual community

TU Vienna Architecture and Design

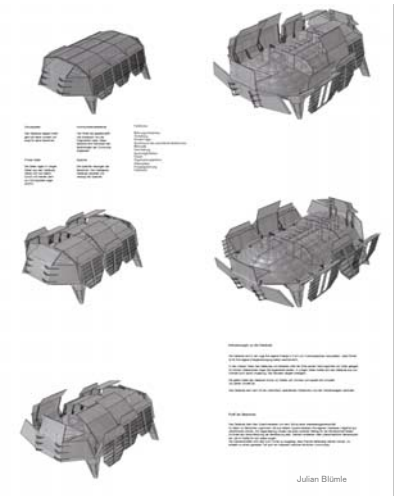
CONVENTUAL COMMUNITY 2110






Julian Blümle

Julian Blümle



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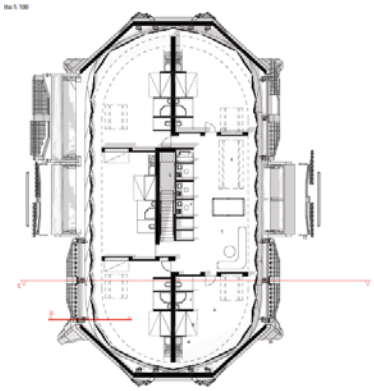
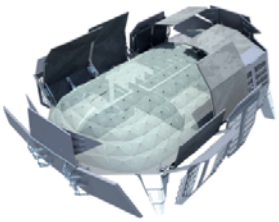
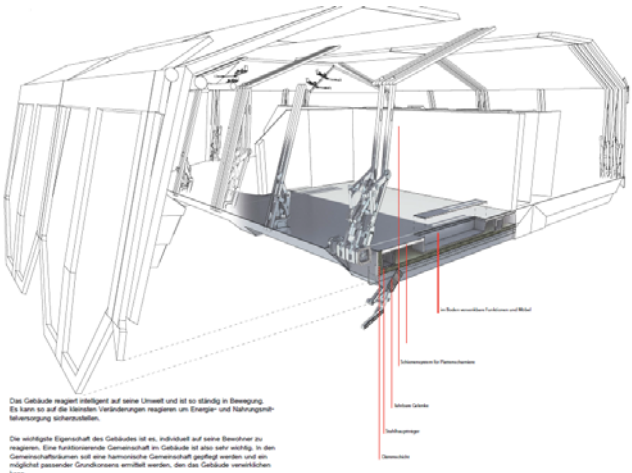
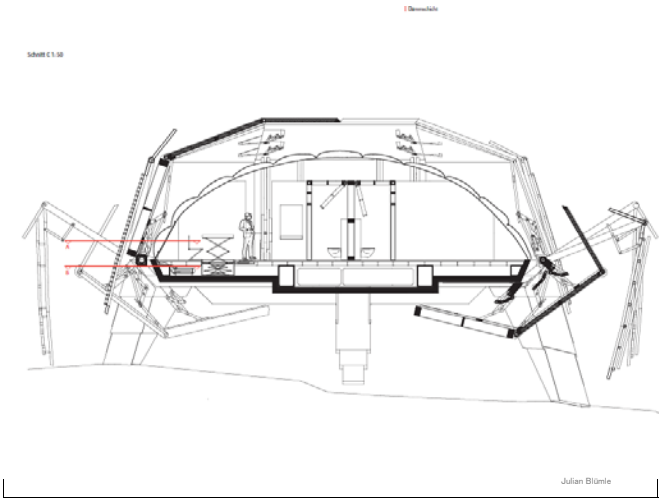



Julian Blümle



Julian Blümle

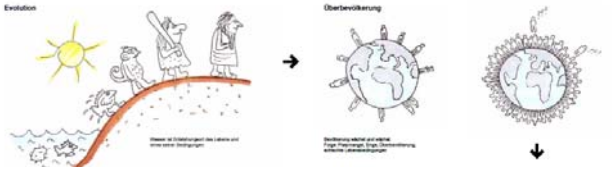


Julian Blümle

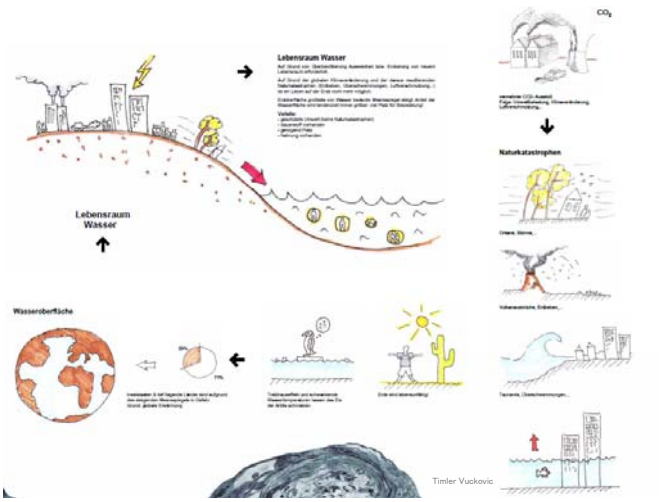
Hydro – Sphere

TU Vienna Architecture and Design

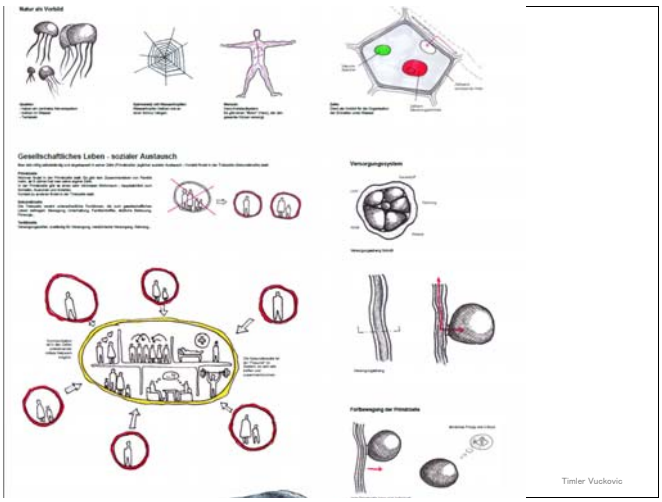
ideen.konzept lebensraum im jahr 2110



Timler Vuckovic



Timler Vuckovic



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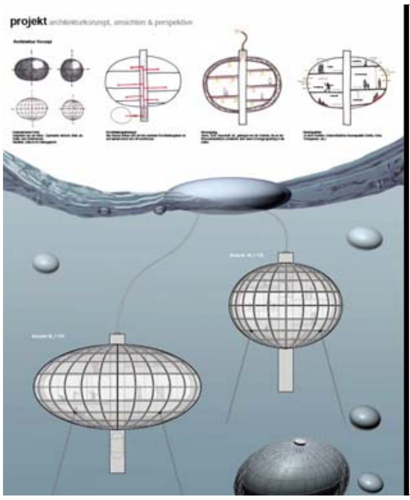

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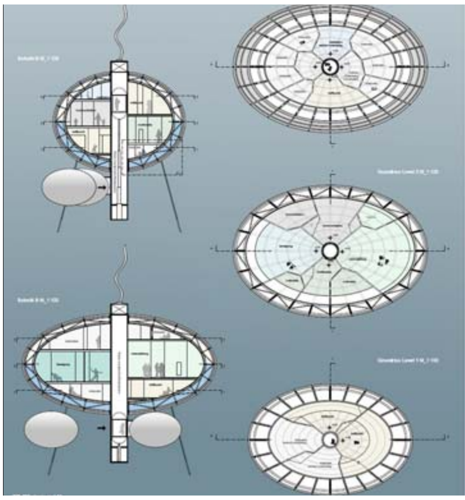


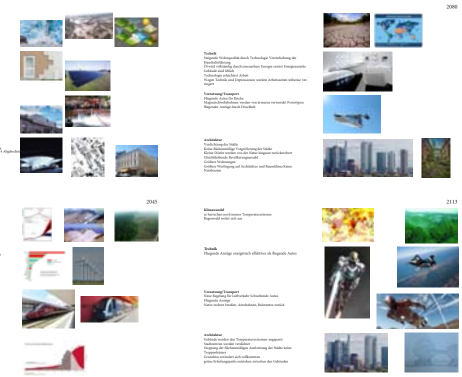
Timler Vuckovic

nature reloaded TU Vienna Architecture and Design

Szenario

Nature Reloaded

2013



2080

2045

2113

Pläne

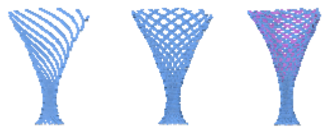
Modellfoto

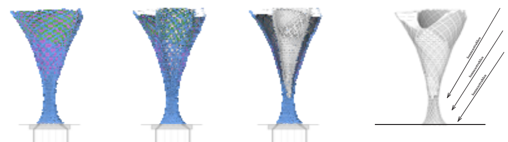
Schnitt 1/500

Konstruktion

Konstruktion Grafik

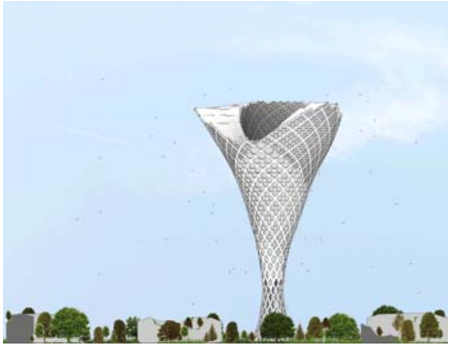
Beschreibung Konstruktion



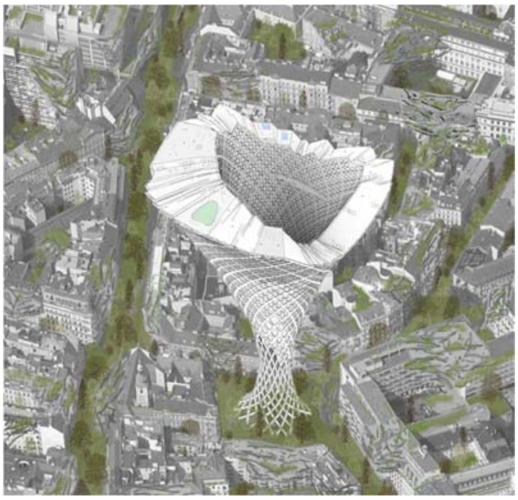


Hier dargestellt ist die Ansicht des Gebäudes mit dem tiefen Einschnitt im Süden, sodass der Lichthof im Inneren noch besser belichtet wird.

Modellfoto



Ansicht 1/500



BuiltBoard

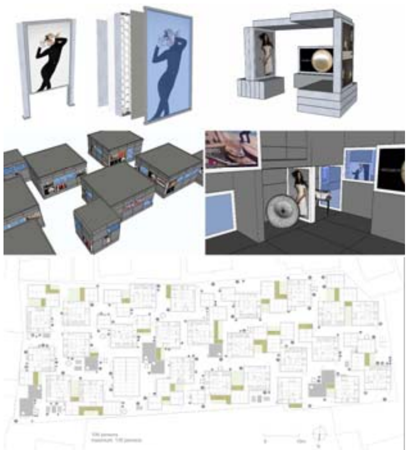
Tokyo Institute of Technology TU Vienna Architecture and Design

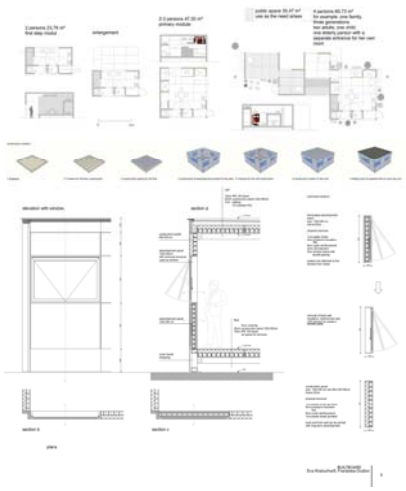
BUILTBOARD

Eva Kratochwill, Franziska Oczlon

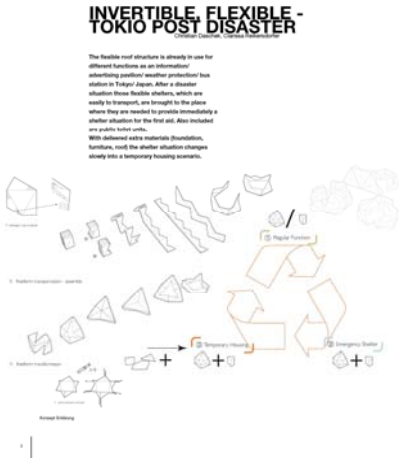
To be prepared for the great demand for cheap and easy-to-build temporary houses after a natural disaster, we developed a system that is financed and has a use before the catastrophe occurs. We created panels for less vulnerable, smaller structures that contain all necessary materials for the housing. In fact, we provide two different types of panels: a cost- saving variation and the advertisement panel, with lights and plexiglass, that is optimal for billboards and functions in the houses as an out- and indoor illumination or as a window.

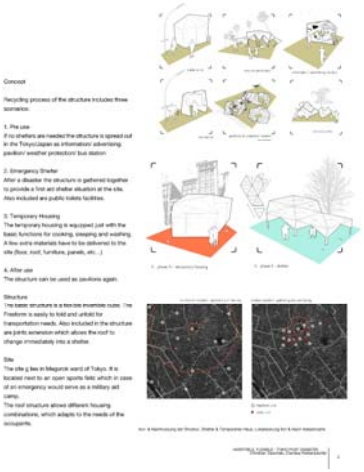
The advertisement panels, their size is adapted to common poster sizes, should finance the project, as companies pay for these panels in advance, so the building components are already paid, built and stored all around the city. Additionally the cost-saving variations of these panels are used as fences and sound barriers or, in combination with the advertisement panels, as bus stops and waiting accommodations. However they are always fixed with screws and beams that are necessary for the houses.
As Japanese houses often have one or two steps between the street and the living level, we rise the inner floor 0,8 m and use this elevated floor for plumbing, power installations and the deep bath tubs. Furthermore each house has a semi-private patio.
Another aspect is the closets and alcove parts in Japanese houses. We developed a kind of living double-wall that builds the outer wall and is a 1,20m deep service zone containing, toilet, bath, beds, working place, relaxation spaces and storage. These spaces between the double walls can be adapted by the needs of the inhabitants.

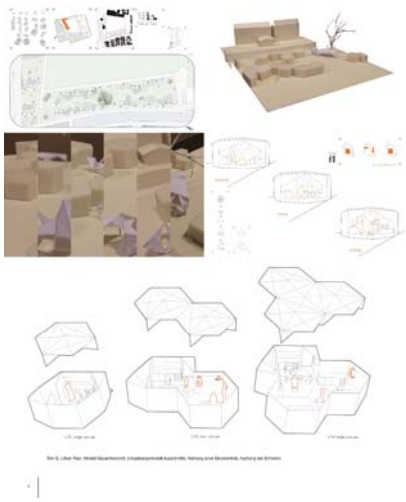




Invertible Tokyo Institute of Technology TU Vienna Architecture and Design







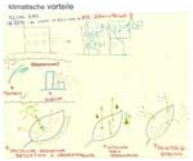
Growing buildings TU Vienna Architecture and Design

die baubotanik der NHP

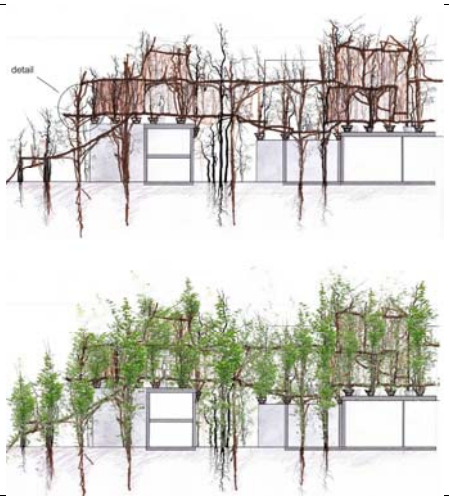
+ selbsbildent
+ selbstreparaturprozesse
+ selbsoptimierungsprozesse

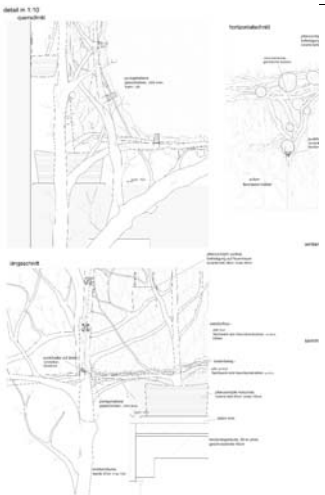
grundidee - bäume sind in der lage, ihre gestalt an auftretende belastungen u. umweltbedingungen anzupassen

NHP - der ursprung der architektur...
+ neue architektur - durch wachstumsprozesse, jahreszeiten, neue rolle des architekten



LIVE IN 2113
BAUBOTANIK

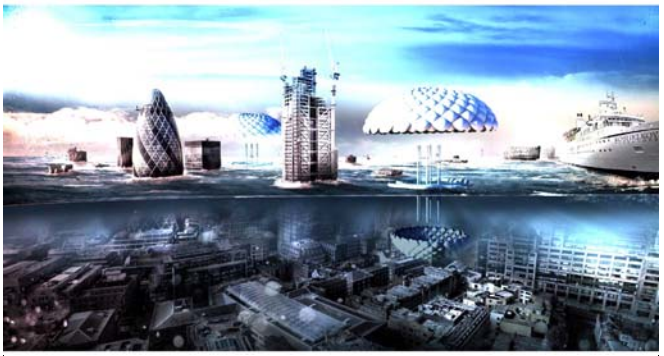


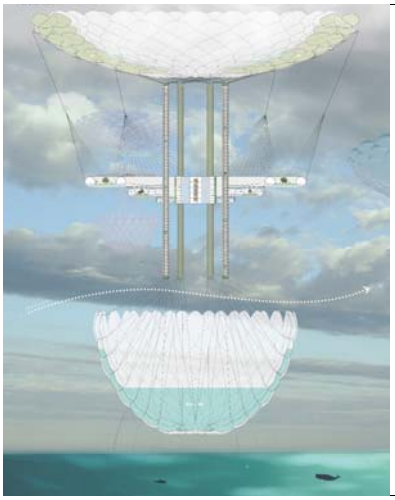


Phytoplankton Farm

TU Vienna Architecture and Design

PHYNTOPLANKTON
FARM / AIR PURIFIER
WATER COOLER





George KUNIHIRO

George Kunihiro, FAIA, is a noted architect/educator.
He is a Professor of Architecture at the Kokushikan University in Tokyo, Japan.
He received his Master of Architecture from Harvard University Graduate School of Design and his Bachelor of Arts from the University of California/Berkeley.

As an architect, in 1980, George began his private practice in San Francisco. Subsequently, he opened his office in Los Angeles and New York and designed numerous projects in the United States and in Japan. In 1997, George moved his base to Asia. For twenty years, he has been focusing his practice and research on the modern Asian heritage in contemporary society.

George has received much international recognition, including the Presidential Medals from the American Institute of Architects (AIA) and from Federacion de Colegios de Arquitectos de Mexico in recognition of significant contributions to the field of architecture. He was also selected to the 11th Annual Space Design Review in 1992, and received the Japan Commercial Environmental Design Award in 1993.

Furthermore, George has been active in promoting the profession and research in Asia. From 2011 to 2012, he served as the President of the Architects Regional Council Asia (ARCASIA), an organization of 21 national institutes of architects in Asia.

From 2002 to 2016, George has served as the Vice Chairman of mAAN (modern Asian Architecture Network), an organization working to conserve and revitalize the 20th Century Asian heritage. With mAAN, he has organized international workshops on cultural and industrial heritage in China, Indonesia and Turkey. In 2009, Ar. George Kunihiro was elevated to the College of Fellows of the AIA.
In 2011, George was appointed as Visiting Professor at the prestigious Tsinghua University in Beijing, where continues to teach today.

George has served as the International Director on the National Board of the AIA, was a member of the Strategic Council and the Director of the International Region.
He has also been a member on various international juries and has lectured widely on the subject of modern architecture and urban design.

RESILIENCE + ADAPTATION

THE AMERICAN INSTITUTE OF ARCHITECTS
SUSTAINABILITY:

RESILIENCE + ADAPTATION

AIA

George Kunihiro, FAIA
September 2017

Historic Flooding

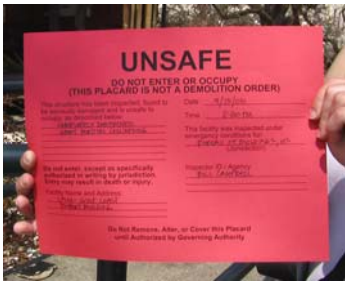
The equivalent annual rainfall in 4 days

AIA Disaster Assistance Program

ROLE OF THE ARCHITECT In 1972, the AIA formally recognized the role of architects in emergency response

PUBLIC SAFETY Damaged buildings can pose a lingering public threat for days or weeks following a disaster

SAFETY ASSESSMENT EVALUATIONS Hundreds of architects have volunteered to provide thousands of assessments since 2011 alone



AIA Alabama – 2011 Tornado Response

"Words cannot express my deepest gratitude for the assistance you sent the City of Tuscaloosa in the wake of the April 2011 tornado disaster. Thank you for your willingness to aid our city in its rebuilding process"
---Walter Maddox, Mayor of Tuscaloosa, July 2011

- 2 training sessions by AIA
- 6 volunteer days
- 5,000 structures
- $300,000 value in volunteer hours
- Residents return to their homes, reducing spending and resources

Disaster Assistance Resources

Disaster Assistance Handbook

- Published March 2017
- Case studies, examples
- Resilience and mitigation

*Free to download on AIA.org

**Look for the Spanish-language version in 2018

Disaster Assistance Training

Safety Assessment Program

- One of two national standards of training
- AIA instructors available to teach courses

AIA DIRECTORY OF PUBLIC POLICIES AND POSITION STATEMENTS, 2014

"Buildings and communities are subjected to destructive forces from fire, storms, earthquakes, flooding, and even intentional attack. The challenges facing the built environment are evolving with climate change, environmental degradation, and population growth. **Architects have a responsibility to design a resilient environment that can more successfully adapt to natural conditions and that can more readily absorb and recover from adverse events.**
The AIA supports policies, programs, and practices that promote adaptable and resilient buildings and communities."

Shocks

- Infrastructure failure
- Hurricanes
- Earthquakes
- Wildfires
- Heat waves
- Blizzard
- Health epidemics
- Flooding
- Tornadoes
- Acts of terrorism
- Civil unrest
- Dam failure
- Subsidence
- Liquefaction

Stresses

- Affordable housing
- Aging population
- Environmental degradation
- Sea level rise
- Growing wealth gap
- Drought
- Species extinction
- Aging infrastructure
- Population growth
- Unemployment
- Melting polar ice caps
- Global warming
- Food scarcity
- Increasing pollution

Three Aspects of Resilience

Clients, Firms and Architects agree:

65% of owners reported that they ***will*** include resilient design in their projects over the next three years and **81%** reported that they ***may or will*** include resilient design in their projects over the next three years.

72% of firms see resilient design effecting trends and business, citing climate change and America's aging population

Resilience + Adaptation Program Goal

It is the goal of the AIA program to enable all members to be architects of resilience. The program's goals: empower members with awareness of emerging issues, **provide resources and education to equip members with the knowledge and skills needed** to address shocks and stresses and to **advocate for policies** to support new practices, to therefore **provide greater value to clients and communities.**

Framework for Resilience

AIA Resilience Activities: Snapshot

AIA'S SAFETY ASSESSMENT PROGRAM and HURRIPLAN TRAINING
- Post-disaster safety assessments
- Resilient Coastal Design

2015 RESILIENCE SUMMIT
- Member case studies shared
- Member working groups strategized resilience education, policy and advocacy

RESILIENCE BUILDING COALITION
- Led by AIA with NIBS
- Coalition of 43 organizations

100 RESILIENT CITIES PLATFORM PARTNER
- Supports 24 AIA chapters

RESILIENCE NETWORK
- Knowledge-sharing etwork of members
- Engaged for specific objectives/tasks

NATIONAL RESILIENCE INITIATIVE (NRI)
- Six university-based studios
- A nationwide academic network to increase resilience in the built environment

AIA CONVENTION CURRATED TRACK
- At AIA Convention 2015, 2016, 2017. 2018
- Many captured on AIAU.

RESLIENCE and ADAPTATION EDUCATION
- Creating a 10-course curriculum for mid-career architects

Industry Statement on Resilience

RESEARCH › EDUCATE › RESPOND › ADVOCATE › PLAN

Key Policy Issues

Government Accountability Office

Improved Federal Coordination Could Facilitate Use of Forward-Looking Climate Information in Design Standards, Building Codes, and Certifications


GAO

Report to the Honorable Matthew Cartwright, House of Representatives

CLIMATE CHANGE

Improved Federal Coordination Could Facilitate Use of Forward-Looking Climate Information in Design Standards, Building Codes, and Certifications

FEMA Recovery Policy:

Requires states accessing disaster funds to rebuild to the current building code


FEMA

Public Assistance Required Minimum Standards

FEMA Recovery Policy FP-104-008-4

A Resilient Building is:

- Adaptable
- Redundant
- Flexible
- Recognize inherent interdependencies
- Pride of Place
- Prepared
- Designed for full life cycle
- Addresses risk
- Smart Site Selection
- Of local place
- Strive for self-sufficiency
- Safe & secure
- Durable & accessible
- Minimum Negative impact
- Maintainable/serviceable
- Low carbon
- Maximizes daylighting
- Uses quality Materials
- Cradle to cradle
- Regenerative

THE AMERICAN INSTITUTE OF ARCHITECTS SUSTAINABILITY:

RESILIENCE + ADAPTATION

AIA

resilience@aia.org

NAME **SATHIRUT TANDANAND**

NATIONALITY Thai

BORN 1953

EDUCATION

Master of Science, Architecture & Urban Design, COLUMBIA UNIVERSITY, U.S.A., 1983

Bachelor of Architecture, UNIVERSITY OF MINNESOTA, U.S.A., 1979

Bachelor of Environmental Design, UNIVERSITY OF MINNESOTA, U.S.A., 1979

PROFESSIONAL REGISTRATION

Registered Chartered Architect, Thailand, Category No. 430, Architect Council of Thailand (ACT)

Member – Architect Council of Thailand (ACT)

Member – The Association of Siamese Architects under Royal Patronage, Bangkok, Thailand (ASA)

Honorary Member – **The American Institute of Architects (AIA)**

Honorary Member – **Korean Institute of Registered Architects (KIRA)**

Member – Singapore - Thai Chamber of Commerce

HONORARY APPOINTMENT

2015 – 2016	**Architects Regional Council Asia (ARCASIA), President**
2013 – Present	Architect Council of Thailand, **ASEAN Architect Monitoring Committee**
2013 – 2014	**ARCASIA Fellowship Chairman**
2010 – 2014	Architect Council of Thailand, **Architects Board of Registration**
2011 - 2012	**ARCASIA, Vice President Zone B**
2010 - 2011	**Advisor to The President of Thai Trade Representative Office**
2009 - 2012	The Association of Siamese Architects under Royal Patronage, **Vice President for Foreign Affair**
2007- 2008	The Association of Siamese Architects under Royal Patronage, **Foreign Affair Committee**
2006	The Association of Siamese Architects under Royal Patronage, **Executive Committee**
2005 - 2006	The Association of Siamese Architects **Representative to Union of International Architects (U.I.A.)**
1999 -2001	Singapore-Thai Chamber of Commerce, Director
1997	**Guest Speaker at The 1997 Harvard University** Asia Pacific Design Conference, Cambridge, U.S.A.
1992 - 1994	The Association of Siamese Architects under Royal Patronage, **Vice President for Foreign Affair**

Observation by Sathirut Nui TANDANAND (ASA)

In my view, Integrated Resilience of Built-Environment (focused on natural disasters) should consist of 4 main elements as follows:

1. Proper urban and community planning to minimize the impact of natural disaster

In the past, communities and cities in many instances, were built on fertile land for livelihood or simply just available land. Communities built on flood plains, along the foothills, along the shores unaware any of natural disaster that may occur. These are the places most devastated by flooding, tsunami, and landslides. Opportunities for architects to assist government to help relocate some of these affected villages to safer area. Example: tsunami in Thailand, architects help assist the government in the planning of post disaster reconstruction of villages and homes. As well as in New York after Hurricane Sandy, architects were selected to re-plan communities along the East River.

2. Proper architecture and structural design for homes and public buildings

Traditional construction techniques sometimes are born out of convenience and available materials close by. Examples in Nepal where stones and mud were used to construct walls of homes and buildings without reinforcements. When earthquake struck, these walls would collapse. And in the Philippines, homes were built using light weight natural materials such as thatch roof could not withstand typhoon winds. It is necessary for architects and engineers to help educate the local communities to build with better construction technique to withstand the forces of nature.

3. Proper training for post disaster mitigation and management by the Institutes and ARCASIA

Because there are many natural disasters happening in Asia. In 2015, ARCASIA signed MOU with Asian Disaster Preparedness Center (ADPC) to help train architects in Post Disaster Mitigation and Management. Last year, we launched ARCASIA Emergency Architects. Together we will have the first fully organized training program with ADPC in Bangkok this coming November.

And the Japan Institute of Architects (JIA) has also been instrumental in providing knowledge in earthquake designs for our member institutes.

4. The importance for Retention of cultural identity to help in the post disaster rehabilitation and reconstruction

Retaining Cultural identity. It's is of utmost critical that in the post disaster reconstruction, cultural identity of the place is retained. For example, in Nepal, the Society of Nepalese Architects and ARCASIA recommended that the character of all reconstruction of homes and buildings retain the traditional character but using proper structural reinforcements. The villagers themselves help do the reconstruction so they can also develop proper construction skills and techniques.

AIA ARCHITECTS Foundation assistant to help raise over 2.5 million USD for the Nepal post-earthquake reconstruction.

Joseph KWAN

Managing Director - UDA Consultants Ltd.
Dip.Arch.(QIT); M.Sc (Surrey)
Registered Architect (QLD & HK)
FRAIA, RIBA, FHKIA, Assoc.AIA, IFMA, Aff.ACAA, APEC Architect, BEAM Pro

Joseph Kwan has practiced architecture in Australia, United Kingdom and France; and was the Director of an access advisory service in Hong Kong from 1987 to 2005. He founded the practice ***UDA Consultants Ltd***., a specialist consultancy on ***U****niversal* ***D****esign and* ***A****ccessibility* in 2005.

He has over 40 years' experience in architecture, of which 30 years has been focused entirely on projects in universal accessibility design.

Joseph Kwan is Director of ***UIA Region IV Work Programme "Architecture for All"*** since 1999, and is currently serving as Deputy Vice-President of ***Rehabilitation International*** for Asia Pacific***.*** He was the inaugural Chair of the ***ARCASIA Committee on Social Responsibility*** in 2011.

He is the current Vice-Chair of ***Architects Registration Board Hong Kong*** and was Vice-President of the ***Hong Kong Institute of Architects***. He has been invited by the Hong Kong Government as a member for the ***Housing Authority, Buildings Department, RAC-Subcommittee for Access*** and the ***Equal Opportunities Commission*** Hong Kong.

He was engaged as Consultant to prepare universal access strategy for Kuwait, Qatar and Saudi Arabia and is the access advisor to ***United Nations - Economic and Social Commission for Asia and The Pacific*** and the ***Asian Development Bank***. He has lectured globally in 33 countries on universal access and inclusive design, and has been an External Reviewer for the Universities' Schools of Architecture and Design in Hong Kong. He was an Assistant Professor of the ***Department of Architecture*** at the University of Hong Kong in 2005.

He is a Recipient of ***The American Institute of Architects (AIA) Hong Kong Citation*** and was awarded the ***Medal of Honour*** (MH) by the Hong Kong SAR Government for his valuable contributions in improving a built environment that caters for the needs of people with disabilities.

Seminar Wrap-up by Joseph KWAN (HKIA)

Kazuo IWAMURA

The Seminar opened with a presentation by Ar. Kazuo Iwamura explaining that resilience is the capacity of system to maintain or recover functionality, and that people living and working within the built-environment must be able to survive and to continue to thrive no matter what stress or shocks are encountered….that is the notion of resilient built-environment.

He continued with a recent project proposal such as the “Meta-Sand Spiral City” in Cairo to illustrate innovative resilience across time and scale. Planning, landscaping, innovative structural design, eco-void system and an abacus of meta-sand brick elements were explored in the design of the Meta City. Design for resilience in terms of security system and BCP (Business Continuity Plan) was introduced within resilience framework.

The second topic presented was Occasional and Daily Disasters in Japan. Major natural disasters in Asia and Oceania have been more prevalent since 1990 with the death and injury of victims and destruction of cities becoming more severe. Earthquakes and tsunamis are uncontrollable and unpredictable, with man’s intervention only in the aftermaths of devastation, at the foremost stage of temporary shelters by architects such as Shigeru Ban and Toyo Ito. JIA has deployed emergency architects for disaster relief and conducted international workshops on seismic-proof designs.

In Japan, domestic accidental death toll is more than three times that of traffic accidents. These daily disasters include drowning in bathtub, suffocation, falls and indoor heat shock.

Kazuo proposes a methodological approach towards resilient built-environment with the notion of Environmentally Symbiotic Housing along with LCP (Life Continuity Plan). He implements this concept through the Yakushime Symbiotic Housing project which is designed for passive and indigenous resilience.

He concludes by stating a cyclical design process for the human security must be taken into consideration as the highest priority involving all the stakeholders beyond simply being “Green” or “Smart.” To this end, our collective efforts through communal and local solidarity will be the very base towards; Integrated Resilience of Built Environment for Human Security, the ultimate outcome being people living and working, particularly the poor and vulnerable, survive and thrive no matter what stresses or shocks they encounter.

Our goal towards human security must take top priority to formulate a social responsibility of our profession worldwide, Beyond Disasters through Solidarity, Towards Resilient Sustainability.

Cuno BRULLMANN

Ar. Cuno Brullmann began with the evolution of buildings illustrating with the CNIT Complex in La Défense and the OPAC Headquarters in Paris. Through careful manipulation of space and volume, he was able to transform the ageing CNIT into a contemporary structure with renewed functions. Similarly, the OPAC HQ was the result of adaptation into new office environments that stimulate occupants with a sense of openness, light and vitality. Active and passive designs were deployed to minimise energy consumption. The reuse of ageing buildings is considered more appropriate and sustainable than complete demolition and rebuild.

Cuno then shared projects by his students from “Utopia real living in 100 years”.

As the future is more and more depicted as approaching Armageddon with floods and rise in sea levels reaching uncontrollable heights, cities are likely to be submerged. The conventional communities will no longer exist. The TU Vienna Architecture and Design students proposed a new “conventual community 2110” that survives in amphibious crafts/dwellings which open and close, travel and adapt in places of safety and security.

The second example is a “Hydro-Sphere” where man in reverse evolution returns to dwell in the ocean. Floating pods submerged in the ocean will drift at will to maintain survival of the human species.

Other projects explored the notion of “nature reloaded” with an inverted community, “BuiltBoard” facades, “Invertible, Flexible – Tokio Post Disaster” building systems, organic “Growing buildings” with vines and tree branches that grow to become liveable spaces and elements , “Phytoplankton Farm” with air purifier water cooler that submerge and then rise, glide and drift in search of the new world…..post disaster.

Through these example, Cuno suggests that resilience can be viewed as relying less on new resources which are rapidly depleting, by adaptive reuse of existing infrastructures; and as his students demonstrated, by establishing a utopia that flourishes on remnants of a post-disaster age.

George KUNIHIRO

Ar. George Kunihiro in his capacity as the former International Director on the National Board of the AIA, former member of the Strategic Council and the Director of the International Region of AIA presented under AIA’s Sustainability program: Resilience + Adaptation.

AIA Disaster Assistance Program focused on the role of the architect, public safety and safety assessment evaluations to guide volunteer architects in providing thousands of assessments since 2011, in addressing disasters such as the Alabama tornado response.

Disaster Assistance Resources and Disaster Assistance Training are readily available to members, including the AIA DIRECTORY OF PUBLIC POLICIES AND POSITION STATEMENTS, 2014 that states: *Architects have a responsibility to design a resilient environment that can more successfully adapt to natural conditions and that can more readily absorb and recover from adverse events.*

He suggests the three key aspects of resilience: Climate Adaptation, Community Resilience, and Hazard Mitigation.

The AIA Resilience + Adaptation Program Goal is to enable all members to be ***architects of resilience***, to empower them with awareness of emerging issues, to provide resources and education to equip them with knowledge and basic skills needed to address shocks and stresses, and to advocate for policies that support new practices, to therefore ***provide greater value to clients and communities.***

AIA Resilience Activities include Resilience Network, Resilience Summit, National Resilience Initiative (NRI), Resilience Building Coalition, over 100 Resilient Cities Platform Partners supported by 24 Chapters, and Resilience and Adaptation Education.

Finally, he states that a resilience building should be adaptable, redundant, flexible, safe & secure, durable & accessible, designed for full life cycle, strive for self-sufficiency, maintainable & serviceable, low carbon yet maximise natural daylighting, be regenerative, address risk and prepared, and a place of pride from cradle to cradle.

Sathirut Nui TANDANAND

Ar. Sathirut Nui Tandanand focused his presentation on natural disasters and stated four main elements:

- Proper urban and community planning
- Proper architecture and structural design
- Proper training for post-disaster mitigation and management
- Importance for Retention of cultural identity

He further elaborated in detail that:

1. Opportunities for architects to assist government to help relocate affected villages to safer areas; as in the past, communities were built on fertile land for basic reason of livelihood or simply on available land, which are flood plains, foothills, or along the shorelines, unaware these locations are most vulnerable to natural disasters such as flooding, tsunami, and landslides. Architects for example in Thailand and in New York assisted the government in the planning of post-disaster reconstruction of villages and homes and to replan communities along the East River respectively.

2. Architects and engineers to help educate local communities to rebuild with modern construction techniques to withstand the forces of nature. Traditional constructions sometimes borne out of convenience or readily available materials, built without incorporating proper structural reinforcements would collapse under typhoon or earthquake conditions.

3. To respond to the increasing number of natural disasters occurring in Asia, ARCASIA in 2015 signed a MOU with Asian Disaster Preparedness Center (ADPC) based in Bangkok to provide training for architects in Post-Disaster Mitigation and Management. In 2016 ARCASIA Emergency Architects (AEA) was launched. In addition, Japan Institute of Architects (JIA) has also been instrumental in providing knowledge transfer in earthquake designs for ARCASIA member institutes.

4. Finally, he stressed the importance of retaining cultural identity in all post- disaster reconstruction, so that the traditional and cultural identity of the people and place are not lost in the translation of modern rebuilding techniques. After the Nepal earthquake, the Society of Nepalese Architects (SONA) and ARCASIA recommended that the character of all reconstructed homes and buildings retain the traditional quality and appeal without sacrificing structural integrity. Villagers were taught safe and resilient construction so they may develop proper construction skills and techniques.

In conclusion, he added that AIA ARCHITECTS Foundation assisted to raise over UD$2.5 million for the Nepal post-earthquake reconstruction.

Joseph KWAN

In wrapping-up, Ar. Joseph Kwan thanked all the Speakers for sharing their valuable expertise and experiences at this JIA Seminar. Heartfelt appreciation to Ar. Iwamura for initiating the theme of "Integrated Resilience of the Built-Environment" at this UIA World Congress in Seoul 2017; to Ar. Brullmann for introducing the notion of adaptive reuse and designs for Utopia real living to meet fatalistic disasters yet to come; to Ar. Kunihiro for his optimistic outlook in our preparedness to meet disastrous situations through comprehensive programs such as the AIA's Sustainability program: Resilience + Adaptation; to Ar. Tandanand for his practical suggestions on training for architects and to rebuilt with traditional and cultural identity of the people and place in mind.

The Rapporteur Ar. Kwan impelled that to achieve **"Integrated"** Resilience of the Built-Environment, the human element should not be overlooked. The most vulnerable stakeholders in any disaster are the weak, the frail and elderly, and people with disabilities, which amount to over 15% or one billion of the world's population, of which an estimated 80% are living in developing countries.

He concluded by recognising and encouraging that:

- Architects should be ***socially responsible*** and be embedded with ***an obligation to act to benefit society at large*** (ISO 26000).

- Architects should ***make cities and human settlements inclusive, safe, resilient and sustainable*** (Goal 11, SDG 2030)

- Architects should take up core responsibilities and ***"Leave No One Behind".*** (#3 Agenda for Humanity 2016)

- Architects should be reinvigorate with the global commitment to sustainable urbanization, to focus on the implementation of a ***"New Urban Agenda"*** (UN-Habitat 2016).

- Architects should take action towards a Disability-inclusive Disaster Risk Reduction framework and in its implementation; and to ***Build Back Better*** for our future generations (Sendai DiDRR 2015).

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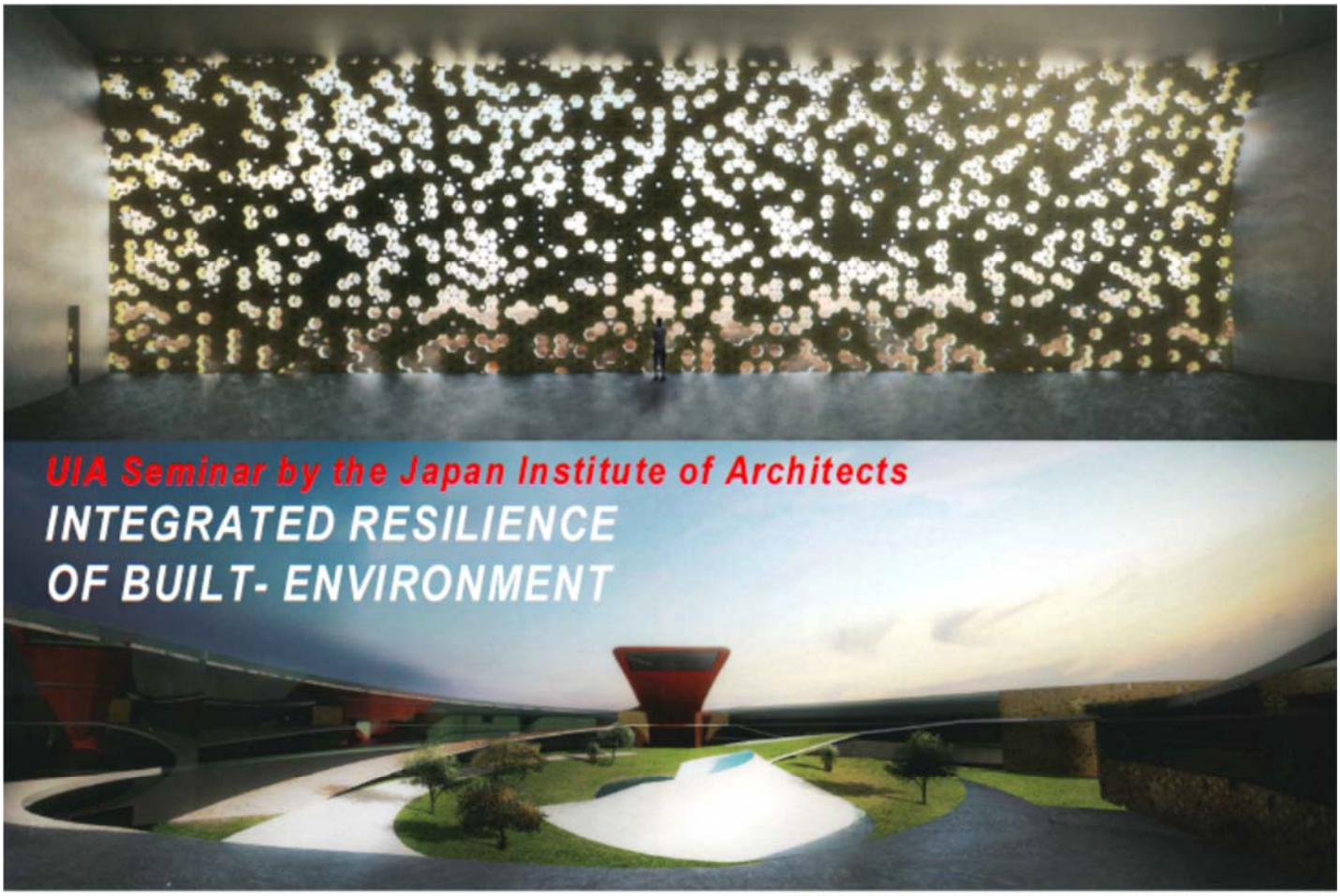

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In the 21st century, most of population on the globe live and work in cities, where uncertain future risks are increasing such as global warming, multiple natural disasters, income gap-widening, aging, health problems, political conflicts, terrorism, vulnerable infrastructure, etc.

"Integrated Resilience of Built-Environment" describes, consequently, the capacity of those to function, so that the people living and working there, particularly the poor and vulnerable, survive and thrive no matter what stresses or shocks they encounter. Such a goal towards human security must be the top priority that formulates the social responsibility of our profession worldwide

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Speakers: Cuno Brullmann (SIA, Switzerland), Nui Tandanand (ASA, Thailand), Joseph Kwan (HKIA, Hong Kong), Geroge Kunihiro (JIA/AIA, Japan/USA), Kazuo Iwamura (JIA, Japan: Moderator)

3:00pm-6:00pm
6 September 2017 (Wed)
Session Code: MS11, Room: 318A

<Poster of the Seminar>