

1. Built Pedagogy

Faculty of Architecture Building and Planning, The University of Melbourne
 Kazuhiro Kojima + Kazuko Akamatsu / CAat

PROFILE

The architectural practice Kazuhiro Kojima + Kazuko Akamatsu / CAat is based in Tokyo, Japan, and has designed and completed numerous projects in Asia, Central Asia and the Middle East. Our projects were awarded with various prizes both for appearance and performance, and displayed in major galleries and international exhibitions.

Our portfolio shows the profound experience we have with educational buildings, such as the Liberal Art & Science College in Doha (see p. 2) and the Research Centre for Advanced Science and Technology in central Tokyo (see p. 3). Our many school buildings, in particular Hakuo High School (see p. 3) and Mihama-Utase Elementary School, have contributed to the modernisation of the Japanese educational system. Another key aspect of our work are university master plans, e.g. for the Naryn Campus of the University of Central Asia (see image below) and the Ho Chi Minh University of Architecture in Vietnam (see images top right). Both were designed with a focus on connectivity and activity, and integrate both natural and built landscape.

We are constantly searching for advanced design methods and collaborate with excellent consultants and university research laboratories. As an example, the diagrammatic analysis by Jun Sato Structural Engineers (bottom right corner) shows the sheet-steel structure of Tsuda Veterinary Clinic as clusters of arrows. Unlike conventional design methods, the ultimate design could be determined by synchronising the structural analysis and the overall shape on a micro level. As activity is one of our key design parameters, our educational buildings provide a great diversity of spaces, including high quality studio spaces and vibrant public spaces with high degrees of visibility, promoting display, discussion and social interaction.

CONTACT

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Liberal Arts & Science College, Qatar



Liberal Arts & Science College, Doha, Qatar

KAZUHIRO KOJIMA

Born 1958 in Osaka, Japan, Kazuhiro Kojima graduated from Kyoto University in 1982 and from University of Tokyo in 1984. In 1986, Kazuhiro Kojima established COELACANTH Architects, which he reorganized as CAat in 2005. Kazuhiro Kojima is professor at Tokyo University of Science and visiting professor at Kyoto Institute of Technology.

KAZUKO AKAMATSU

Born 1968 in Tokyo, Japan, Kazuko Akamatsu graduated from Japan Women's University, Tokyo, and joined COELACANTH in 1990. Since 2002, Kazuko Akamatsu is a partner. Kazuko Akamatsu is a lecturer at Hosei University, Nippon Institute of Technology, Kobe Design University and Nara Women's University.



Ho Chi Minh University of Architecture, Vietnam



Ho Chi Minh University of Architecture, Vietnam

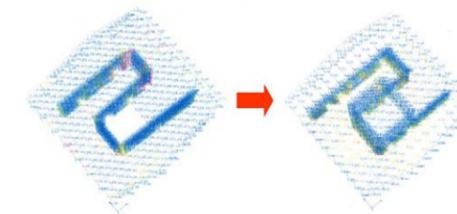


University of Central Asia, Naryn Campus, Kyrgyzstan

WHAT OTHERS SAY ABOUT OUR WORK

Toyo Ito (2G no. 43, 2007): "I feel that he (Kojima) perceives the school as a realm for life rather than that what a school is typically taken to be. (...) how pupils develop a rapport with space and place. Kojima is an architect who is constantly thinking about these things, and translating them into architecture. It seems that pupils are happy to learn there."

Kazuyo Sejima, SANAA (JA no. 61, 2006): "Undoubtedly, CAat's thinking is close to ours, yet it includes aspects we are unable to achieve. We cannot readily produce scenes like CAat does. I feel that our abstraction is somehow a process of constantly stripping away the excess, but the abstraction of CAat seems to be a process of incorporating various things. (...) Looking at the series of school buildings, I think they are very skillfully done. I also think they are great in the way various answers are drawn out in developing the plan of the school."



Structural analysis for Tsuda Veterinary Clinic by Jun Sato Structural Engineers



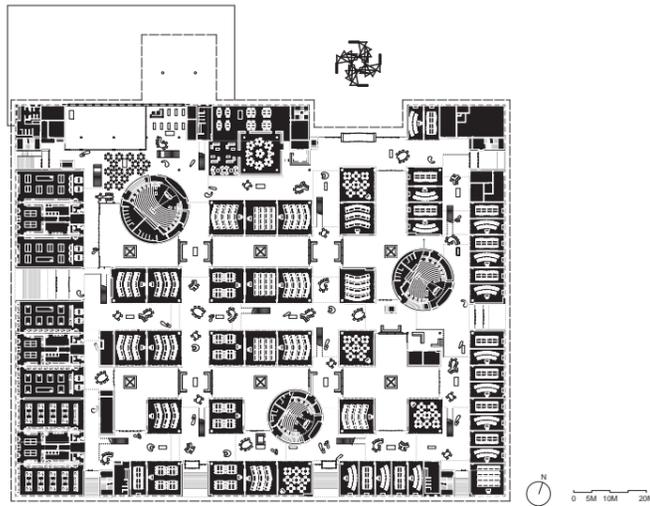
Tsuda Veterinary Clinic, Hirakata, Japan

2. Academic Environment & Design Studio

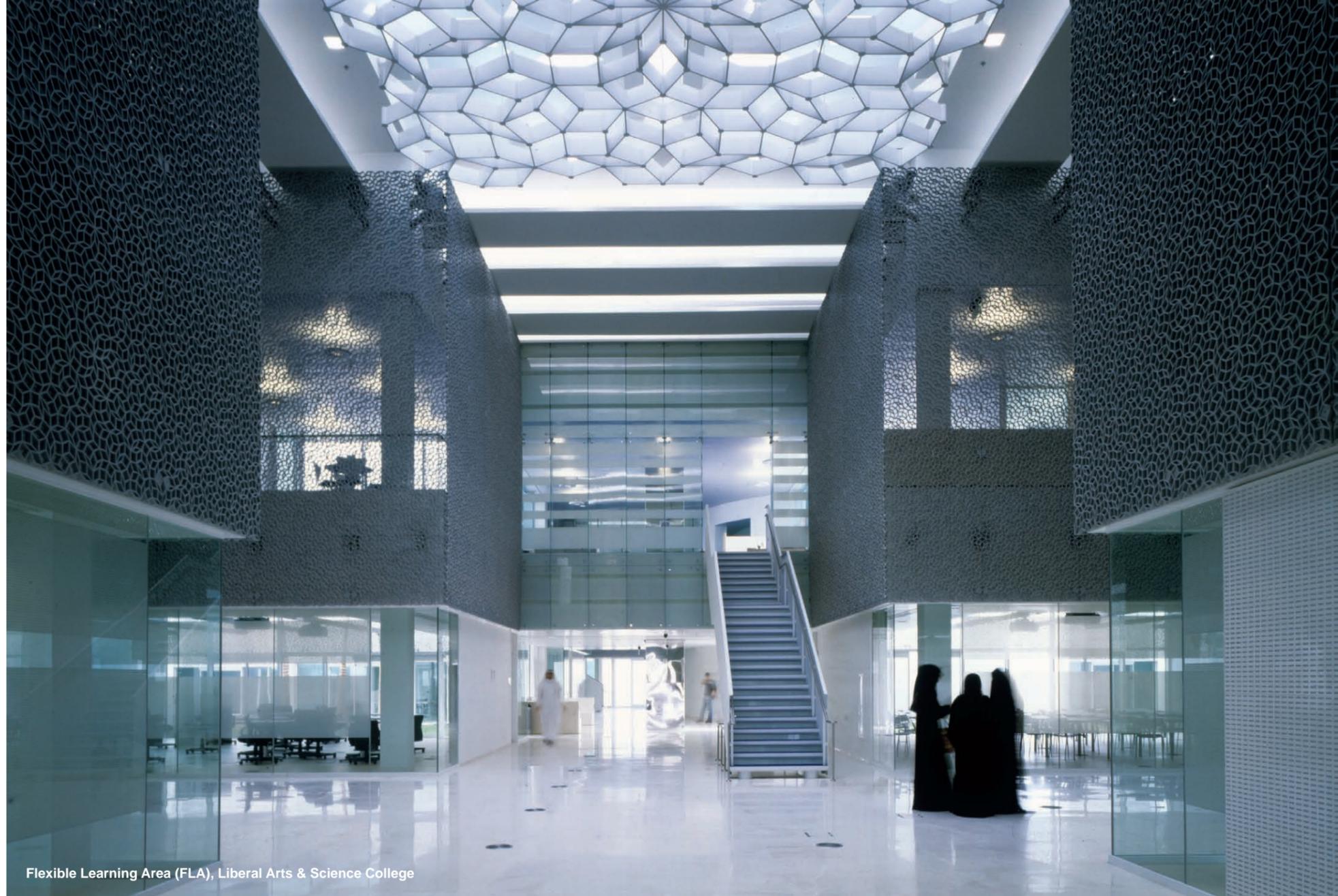
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LIBERAL ARTS & SCIENCE COLLEGE

This building, located on the shores of the Persian Gulf in the suburb of Doha, the Qatar capital, is a newly built project in line with the expansion of the Education City (master plan design by Arata Isozaki + I net). As there are no existing buildings on the site, the context comes from the strength of light in the vast desert and the geometry of the Islamic design. Both aspects possess a high degree of abstraction. The project responds to this context by an extensive use of natural light reflections and by applying the quasi-crystal pattern. The double roof and double skin provide protection against the heat load. The outer skin is made of glassfiber reinforced concrete panels suspended one meter away from the main volume. By painting the back of the panels yellow, the color reflects onto the white walls of the main volume, which have a yellow glow by day and night. The interior space is filled with diffuse natural light reflected towards the ceiling by reflectors that are set in place right under the top lights. The wind-catcher tower, a traditional motif in the Persian Gulf, is used as a both economically and ecologically sustainable ventilation system.



Ground floor plan, Liberal Arts & Science College



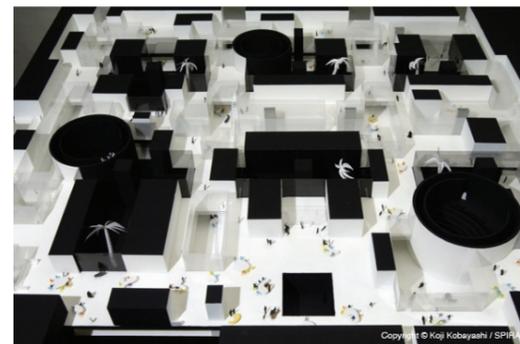
Flexible Learning Area (FLA), Liberal Arts & Science College



Double skin, Liberal Arts & Science College

A method we often use to develop and explain our design is the distinction between *black space* and *white space*. *Black space* is space with one single function, eg. studios, workshops, lecture theater and seminar rooms. *White space* is space with no assigned program; instead the users can define its function by choosing their own activities. In our educational buildings we introduced the so called *Flexible Learning Area (FLA)*, which replaces conventional corridors with large flexible zones offering a wide range of informal learning and teaching areas that encourage interaction.

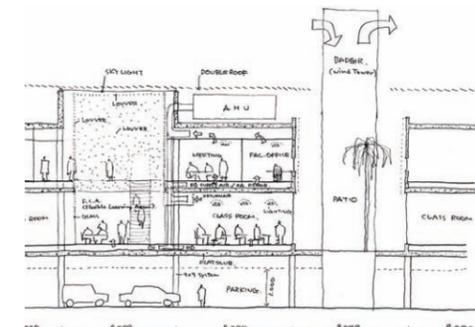
To create spatial diversity, the ground floor accommodates spaces for mass activities like classrooms, and the first floor consists of silent places for personal activities. Round lecture halls are placed as landmarks for the interior space where the FLA intersects. Considering that this is the first co-education college in the country, views into the seminar rooms are controlled by 30mm thickness aluminum casting shades. As a result, students can choose their own study spaces in a range of spaces with different degrees of visual privacy.



Black space / white space model



FLA, informal meeting area



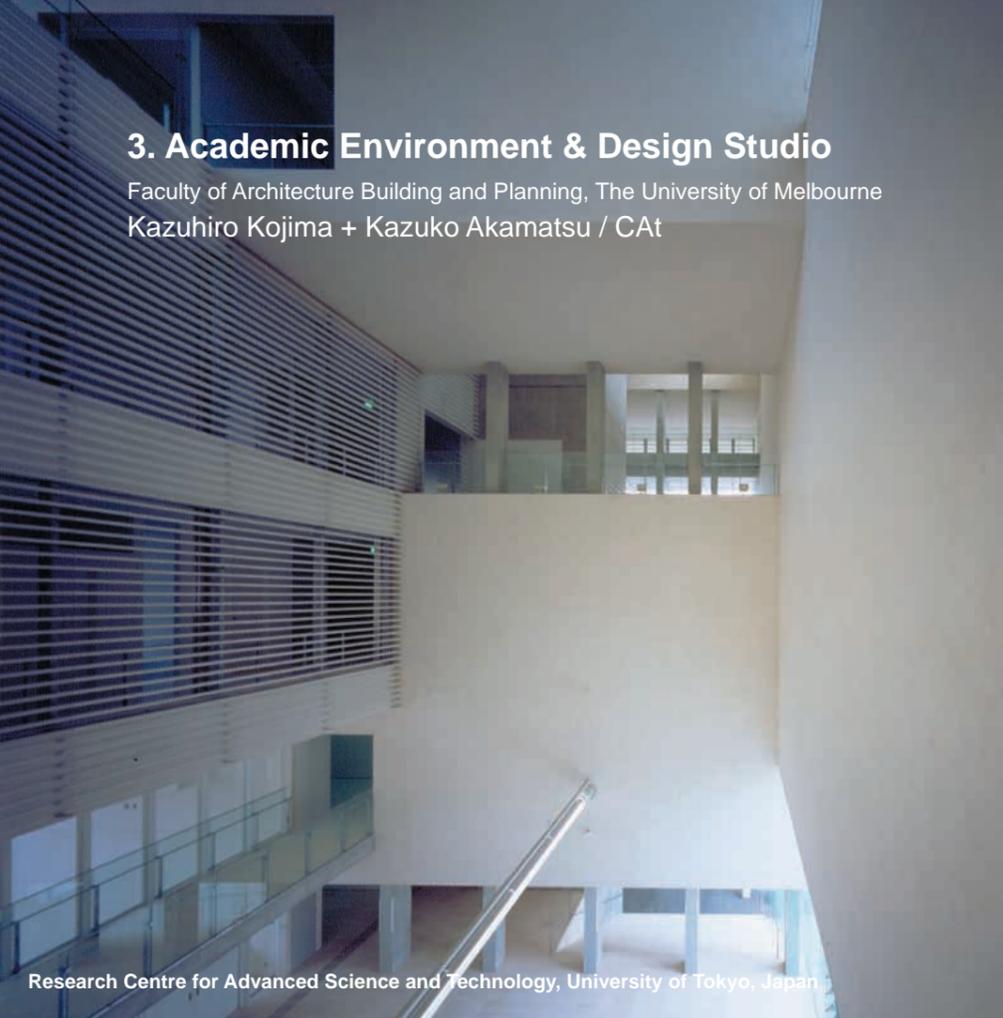
Concept section



Quiet study space

3. Academic Environment & Design Studio

Faculty of Architecture Building and Planning, The University of Melbourne
Kazuhiro Kojima + Kazuko Akamatsu / CAI



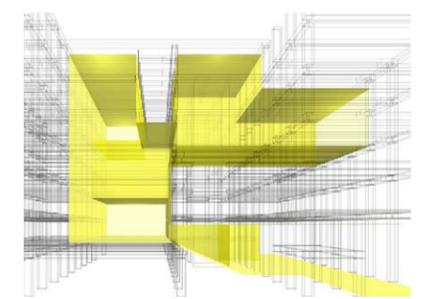
Komaba Campus, Masterplan



Research Centre, University of Tokyo



High quality work environment for researchers



Three-dimensional atrium

RESEARCH CENTRE FOR ADVANCED SCIENCE AND TECHNOLOGY

This building consists of various types of state-of-the-art research rooms and laboratories for academic and graduate researchers and is situated in the University of Tokyo's Komaba campus in central Tokyo.

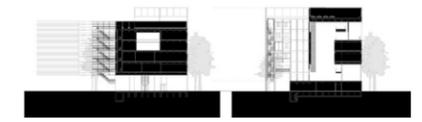
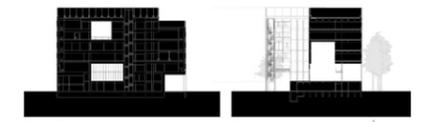
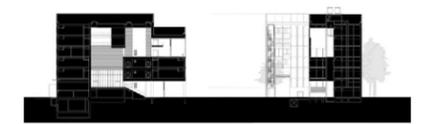
The volumetric layout of the building and the front pilotis correspond to the inner courtyard building-type, in accordance with the campus renovation plan by architect Hiroshi Hara.

The key feature we designed in this project is the three-dimensional atrium that extends seven storeys up, with protruding arms into the garden courtyard. The atrium acts as an air chamber with computer-controlled windows that are synchronized with the climatic conditions. This air chamber is not air-cooled or heated in order to provide fresh air ventilation to the adjoining laboratories.

The structural system was another key element in the design process in order to allow the laboratories to have open plan typology and provide flexibility for the necessary high-tech research equipment. Thus the main structure was built using pre-cast prestressed concrete slabs, which also allow for shallow beam heights.

In order to simplify the complex program of the project and create a space that will allow many activities to occur simultaneously and efficiently, the project was tackled using the *black space / white space* method.

Using this method allowed us to generate a non-conventional university building that does not possess a typical homogeneous space. Instead, the building allows several hundred people, each having varying intentions to act concurrently in a fluid and expansive space. Our intention was to provide a space within the building that is almost like a park or a city in typology.



Diversity of space

HAKUO HIGH SCHOOL

The site is in a rural area situated two hours from Tokyo, Japan. The project's aim was to build a new high school with a new educational curriculum to replace two former existing schools within the city. This new curriculum was to allow for a more flexible learning methodology, since it would enable students to choose a lot of their courses. In such a learning system, diverse spaces are required in addition to conventional classrooms. Students frequently move from one classroom to another and also have free time in between classes. This educational environment does not correspond to the traditional Japanese educational system and allowed for a new school typology to be developed in Japan. Unlike conventional school planning methods, that only use *black space*, and restrict their users to systematic patterns of behavior, Hakuo High School promotes "spontaneous learning" and provides pockets of self study spaces. Within the self-study spaces (*white space*) furniture becomes a key design feature that propagates interaction. It is important to provide many pieces of furniture of different types to accommodate for different uses. This diversity will allow students to choose their own space depending on what they want to do. Another focus of our design are the studios and classrooms in educational buildings, that provide both advanced equipment and layout.



Studios allowing for flexible & experimental learning methods, Hakuo High School



Flexibility and choice in work styles, Hakuo High School



Hakuo High School, Miyagi, Japan

4. The Living Building

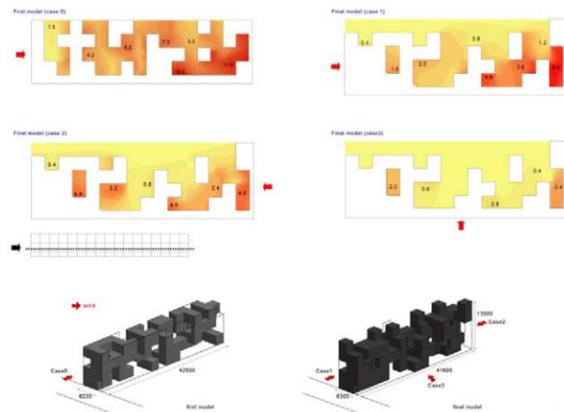
Faculty of Architecture Building and Planning, The University of Melbourne
Kazuhiro Kojima + Kazuko Akamatsu / CAT

"FLUID DIRECTION"

Kazuhiro Kojima's concept of *directing fluids* has shaped our designs for numerous buildings in Asia, Central Asia and the Middle East.

So called *fluids* like wind, light, sound, structure, water and human activity are essential design parameters in all of CAT's projects. Relevant *fluids* are being simulated by computer programs or physical models and in collaboration with engineers and universities, and thus have a direct influence on the building design. At this point in the 21st century, technological advances continue to be made which can be applied to architectural design. As a result, elements that were never possible to simulate in the past are now made viable through computer simulations, taking the precision of design to new heights.

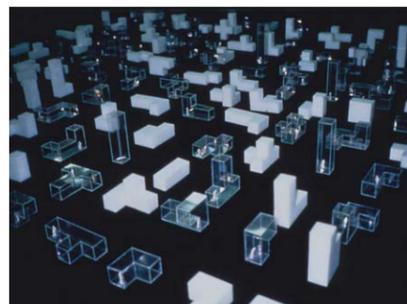
By this approach, the resulting buildings take advantage of local climate conditions, are sustainable both economically and ecologically and provide a comfortable and delightful environment for their users.



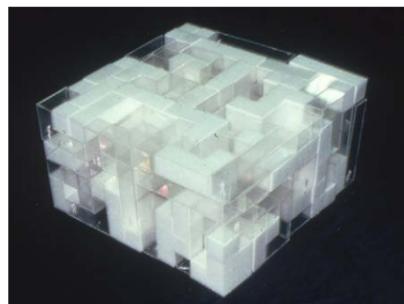
Computer fluid dynamics analysis for porous space, Space Block Hanoi model

WIND

The flow of wind in a space is the easiest factor to understand. The illustration below, a computer fluid dynamics analysis, shows the movement of air in a sectional view of our Space Block housing project in Hanoi. The redder an area, the more stagnant the air there. Then, after repeatedly changing the position of the openings through trial and error by restacking the basic space blocks, the red areas disappear from the overall space. The building, which encloses a three-dimensional courtyard, might at first appear strange and defy the imagination in terms of how it was designed. However, the design was actually based entirely on the variables of airflow and maintaining privacy, as determined by the computer fluid analysis.



Basic Space Blocks



Basic Space Blocks grouping



Izumo Art Complex



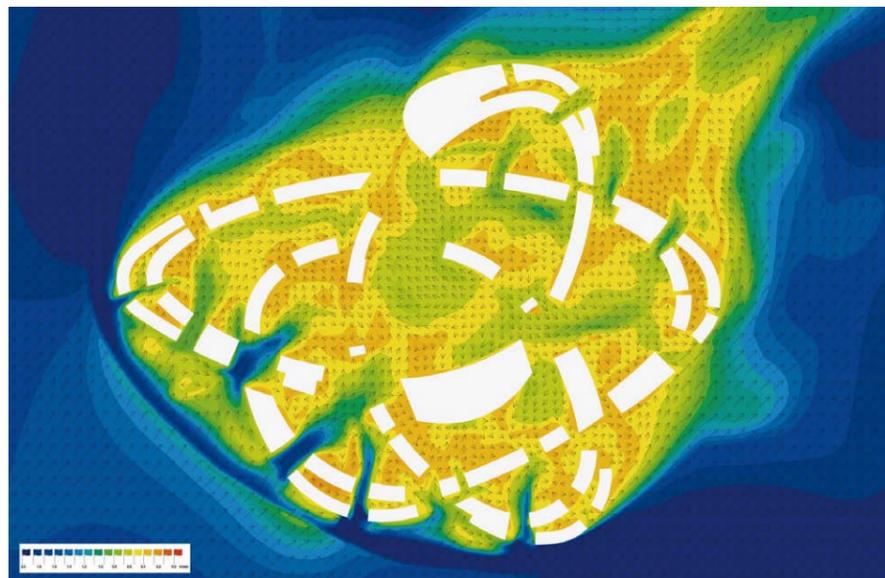
Glass louver closed, Izumo Art Complex



Glass louver opened, Izumo Art Complex

In the buildings we are designing, we have adhered closely to the idea that windows should be able to open. Thus, fixed glass, which looks so appealing in photographs, is almost entirely absent from our work.

The photographs above show the facade of the Izumo Art Complex, a project we completed in 1999. Equipped with sensors to sense the microclimate in the space in real time, more than 2000 computer-controlled double-glazed, louvered windows open and close automatically as if they were breathing.



Wind computer fluid dynamics analysis, Ho Chi Minh University of Architecture

The computer fluid dynamics analysis diagram above is for the University of Architecture in Ho Chi Minh. This project won the 1st prize in an international competition and is currently being nominated for the Global Holcim Award 2009.

The Holcim jury summarizes our project as follows: "The proposed solution strives for a maximum integration of the new campus into the natural environment, an extensive application of passive design in order to reduce air conditioning use and to create as much outside shaded space as possible.

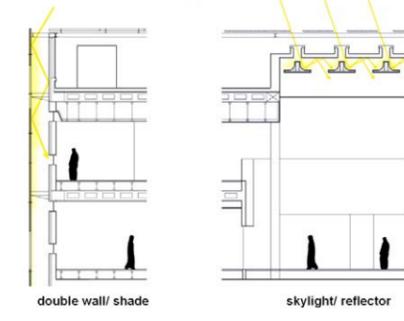
The general layout of the site is driven by the idea of using the strong winds for natural ventilation of buildings and open circulation areas. The heavy rainfalls will be collected and stored in order to meet potable and grey water requirements. Energy consumption will be reduced by passive design and a maximum use of daylight. (...) the new campus design is an entire response to the environment based on a surprisingly simple idea which produces unexpected aesthetic and spatial experiences. Its striking design strategy makes it a robust system amenable to adaptation and change responding to the evolving needs of the user community."

LIGHT

Natural light can be considered as a fluid. The lot for the Qatar project is located in a desert area. The context for the site was an element of natural light that is so strong that cloudy days are practically unknown in the area. Through the extensive use of "reflection" both in the facade and the interior, the overwhelming light and heat can be tamed and the changing light incorporated into the building as something visual.



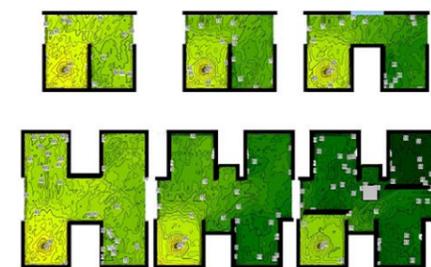
Facade model of the Liberal Arts & Science College in Doha



Control of the strong sunlight, Liberal Arts & Science College in Doha

SOUND

Sound has an extremely strong influence on one's understanding of a space. The acoustic engineering of buildings in the past was based on the idea of "closed spaces", but this is another area in which advances in computer technology now allow us to create simulations of "open spaces". In Mihama Utase Elementary School we were able to reduce the noise to such a degree that when 1,000 children were moving freely within a series of connected spaces, the gap between what was occurring visually and what was occurring aurally was so great as to be truly astounding. This method can be used to create different levels of acoustic privacy depending on the requirement of each space in the new Faculty building.



Sound simulation Mihama-Utase Elementary School, Kanako Ueno + I.I.T., University of Tokyo



Sound simulation Mihama-Utase Elementary School, Kanako Ueno + I.I.T., University of Tokyo

ACTIVITY

In addition to the flow of energy and environmental factors like wind, light and sound, it is also possible to determine the flow of activity for a given number of people.

The black dots above represent the pupils in Mihama Utase Elementary School. The image was originally part of a movie, which unfortunately you can't see in motion. Here we tried to simulate the collection, dispersion, and overall movement of 300 pupils. Rather than trying to order the movement, we considered ways of responding to the space and activity in order to stimulate individual, spontaneous movements by each of the pupils. It is our hope that people visiting the site will come away with an impression of the space as "activity" rather than architecture.

Analyzing and simulating activity has likewise lead us to new spacial concepts for university buildings. As students and teachers want to pursue various activities at the same time, a wide range of opportunities are required, such as spaces with high levels of acoustic and visual privacy for individual work and spaces for informal learning that encourage collaboration and social interaction.

Naturally, designing by activity also results in highly accessible and inclusive buildings.

5. Capability and Process

Faculty of Architecture Building and Planning, The University of Melbourne
Kazuhiro Kojima + Kazuko Akamatsu / CA

CAPABILITY & STRATEGY FOR REALISATION

The selected projects below show our clear capability of completing projects of this size, type and budget including registration with the respective local authorities, not only in Japan, but also in Asia, Central Asia and the Middle East. Especially our involvement in designing the University of Central Asia with its campuses in Kyrgyzstan, Tajikistan and Kazakhstan displays our experience with large-scale projects, that can only be realised in collaboration with large international and interdisciplinary teams, and in engagement with future users and locals.

To understand the complex requirements for the faculty and the campus and to make the design and construction process as effective and transparent as possible, we propose to rethink and redesign the Faculty in an *integrated design* process, together with University, Faculty, students and the design team, which will incorporate various disciplines. We would like to find out how teachers and students are currently using the existing campus and how they want to use it in future, and design the new Faculty building accordingly. *Integrated design* can for example begin with an intensive design workshop, in which all involved parties collaborate to set clear goals and identify successful strategies. One of the discussion tools we often use to develop the design together with our clients is the distinction between *black space* and *white space* (see p. 2).

DESIGN TEAM

From detail design phase onward, we also intend to collaborate both with local consultants and a local executive architect. At competition stage, our team typically includes several of the following consultants:

Structure: Jun Sato Structural Engineers, Oak Structural Design Office, T.I.S. & Partners, Plus One Structural Des. & Engineering Firm
Mechanical: Arup London/ Japan, Setsubi Keikaku, So Setsubi Sekkei, Scientific Air-Conditioning Institute, Gear Sekkei, Setsubi, Katsuo Nakata & Associates
Sound: Hideki Tachibana & Kanako Ueno, Tachibana Laboratory, Applied Acoustics Engineering Department, University of Tokyo
Light: Lighting Planners Associates, Light Design
Wind: Environment Simulation Ltd.
Landscape: On-Sight, Atelier Haru
Botanical: Ga Yamazaki

CLIENT REFERENCE

Project: Research Centre for Advanced Science and Technology, University of Tokyo
Client: University of Tokyo
Mr. Kotaro Imai, Department of Human and Social Systems
Email: kotaro@iis.u-tokyo.ac.jp
Telephone: +81 (0)3 5452 6377

SELECTED PROJECTS



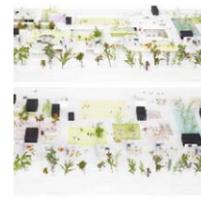
Makuhari International School
Tokyo, Japan
Area: 3,906 m²
2009



Japan Foundation Information Centre
Tokyo, Japan
2008



K Library
Kanazawa, Japan
2008



Elementary School Uto, Japan
Area: 7,500 m²
Costs in AUD: 33.6M
2008-



Ginza 5 chome Building
Tokyo, Japan
Area: 1,046 m²
2007



Mihama-Utase Elementary School
Tokyo, Japan
Area: 9,205 m²
2006



Akasaki Research Memorial Hall
Nagoya University
Nagoya, Japan
2006



University of Architecture
Ho Chi Minh, Vietnam
Area: 117,008 m²
2005-



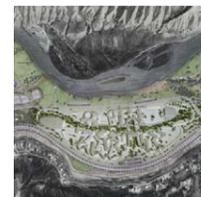
Space Block Nozawa
Tokyo, Japan
Area: 693 m²
2005



Gunma Kokusai Academy
Ota, Japan
Area: 7,935 m²
2005



Ota House Museum
Ota, Japan
Area: 219 m²
2004



University of Central Asia
Naryn, Kyrgyzstan
Area: 122,000 m²
Principal Architect:
Arata Isozaki
2004-



Liberal Arts & Science College
Doha, Qatar
Area: 36,363 m²
Costs in AUD: 117.4M
2004



Aichi Shukutoku University Language Education Centre
Aichi, Japan
2004



Murayama
Tokyo, Japan
Area: 1,060,000 m²
2003-



Housing
Tianjin, China
Area: 25,408m²
2003



Soho Villas
Beijing, China
Area: 2,191 m²
2003



Space Block Hanoi Model
Hanoi, Vietnam
Area: 466 m²
2003



Tsuda Veterinary Clinic
Hirakata, Japan
Area: 104 m²
2003



Research Centre for Advanced Science and Technology
Tokyo, Japan
Area: 7,049 m²
Costs in AUD: 38.4 M
2003



Hakuo High School
Kurihara, Japan
Area: 18,119 m²
2001



Campus 21
Chukyo Women's University
Nagoya, Japan
2001



Aichi Shukutoku University
Aichi, Japan
2000



Big Heart Izumo Art Complex
Izumo, Japan
Area: 4,875 m²
Costs in AUD: 49.9M
1999

6. Merit

Faculty of Architecture Building and Planning, The University of Melbourne
Kazuhiro Kojima + Kazuko Akamatsu / CA

SELECTED AWARDS

2009 Nominated for Global Holcim Award
2009 Selected Architectural Designs, Architectural Institute of Japan (Mihama-Utase Elementary School)
2008 Regional Holcim Award Asia Pacific Silver
2007 Selected Architectural Designs, Architectural Institute of Japan (Gunma International Academy and Tsuda Veterinary Clinic)
2006 1st Prize, TEPCO Housing Competition (House YK)
2005 Good Design Award 2005 (Space Block Nozawa)
2004 Award by Public Building Association (Kibikougen Elementary School)
2004 Selected Architectural Designs, Architectural Institute of Japan (Big Heart Izumo Art Complex)
2004 Award, Design Contest for Xyloid-Architectural Space (Himoru House)
2003 Selected Architectural Designs, Architectural Institute of Japan (Hakuo High School)

2003 Award for Excellent Architecture 2003, Japan Federation of Architects & Building Engineers Associations (Himuro House)
2002 Arcasia Award for Architectural Excellence Category A-2 Multiple Family Residential (Space Blocks Kamishinjo)
2001 Ar+d Award (Denmark) (Space Blocks Kamishinjo)
2000 New Office Promotion Award (Asahi Shimbun, Akita Branch)
2000 Inter Intra Space Design Selection - 9 Excellent Awards (Art Complex Izumo)
2000 American Wood Design Awards Merit Awards (Kibikougen Elementary School)
1998 Grand Prix, Japan Interior Design Award (Kibikougen Elementary School)
1997 Grand Prize, the Architectural Institute of Japan for Design (Utase Elementary School)
1995 Housing Prize, Tokyo Architects Society (House TM)
1990 Yoshioka Prize (Sakuradai Apartment)
1985 2nd Asakura Prize, SD Review 1985 (Himuro Apartment)

SELECTED EXHIBITIONS

2007 "-Cultivate- Kazuhiro Kojima+Kazuko Akamatsu/CA" (Gallery MA, Tokyo)
2006 Parallel NIPPON "Contemporary Japanese Architecture 1996-2006", travelling Japan, Iran, Luxemburg, Italy and other countries
2006 Archilab 2006 "Nested in the city"(Orleans, France)
2002 Japanese Pavilion, "La Biennale de Venezia"(Venice, Italy)
2002 Exhibition "Kazuhiro Kojima"(GA Gallery, Tokyo)
2002 "EU/JAPAN New Trend of Architecture", travelling Japan, Spain, Belgium and other countries
2002 "45 under 45"(Wien, Austria)
1997 "Activity in the Office: Architecture of COELACANTH"(Gallery MA, Tokyo)
1994 "Architecture of Coelacanth"(Architects' Club, Tokyo)
1991 "Deepening Architecture - COELACANTH ARCHITECTS" (HALS Gallery, Tokyo and Osaka)

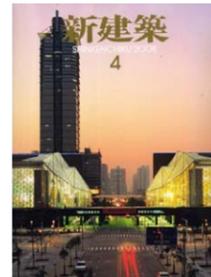
SELECTED PRESS



Cultivate CAT
Toto
September 2007



Architectural
Institute of Japan
March 2009



Shinkenchiku
April 2008



2G No. 43
Kazuhiro Kojima /CA
December 2007
CA



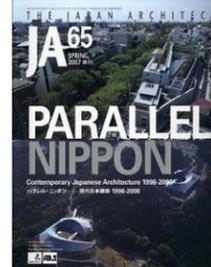
Costruire
November 2007



GA Japan No. 89
November 2007



GA Houses No. 98
March 2007



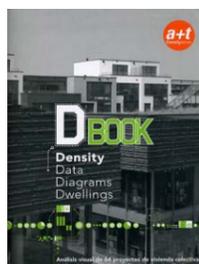
JA No. 65
April 2007



Casa Brutus
April 2007



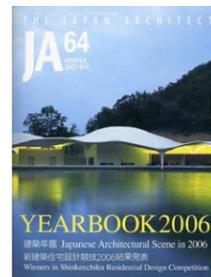
Architectural
Institute of Japan
March 2007



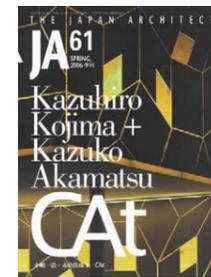
a+t Density Series
March 2007



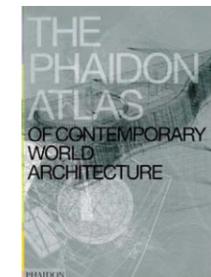
egg
February 2007



JA No. 64
January 2007



JA No. 61
April 2006



The Phaidon Atlas of
Contemporary World
Architecture
Mai 2004