



# AIA Los Angeles

A Chapter of the American Institute of Architects

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# Learning Objectives

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1) Participants will be encouraged to think outside the box as we consider the application of photovoltaics, wind turbines and other energy and sustainable systems as embedded elements in architecturally expressive green design.

2) Participants will learn about the latest sustainable building tools including Building Integrated Photovoltaics (BIPV), bi-facial PV modules and wind-sourced energy systems for inclusion in upcoming projects.

# Learning Objectives

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3) Participants will learn cost/benefit analysis methodologies for determining optimal solar array size and orientation as a means of proving to potential clients the short and long term financial benefits of incorporating solar into their projects.

4) Presenters will demonstrate, through example, how in addition to their primary function of generating electricity, solar modules can serve as a shading device, roofing system, skylight, rain jacket and screening device.

# 3<sup>rd</sup> Annual MOBIUS LA 2009 @ Dwell on Design



Sustainable Architectural Expression:  
Solar Design for the 21<sup>st</sup> Century

# Presented by

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Jesse Bornstein Architecture  
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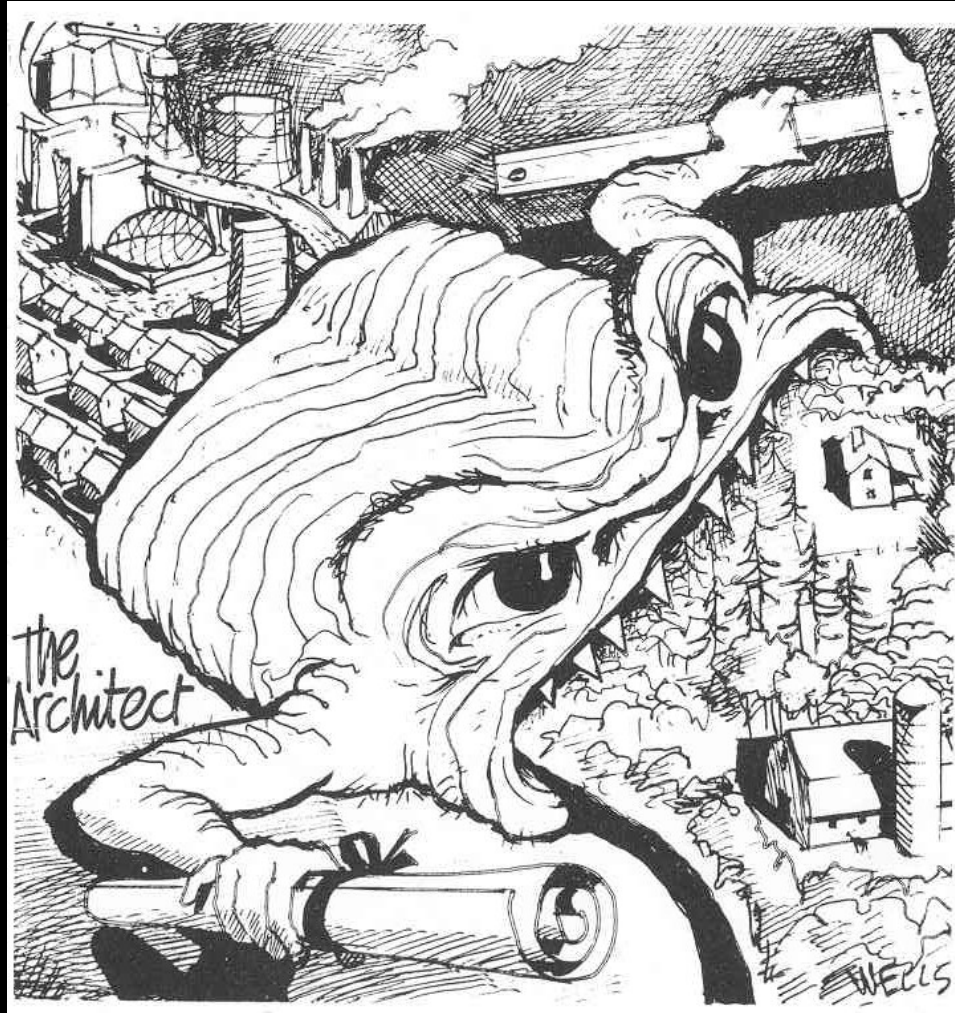
jesse bornstein architecture

Guillermo Honles, AIA  
LADWP Architect & Adjunct Professor,  
Woodbury University

Noah Golden  
Golden Energy  
[www.goldenenergy.com](http://www.goldenenergy.com)



# The Problem or the Solution?



# METROPOLIS

GEHRY · HERZOG + DE MUERON

ARCHITECTURE < CULTURE > DESIGN

October 2003



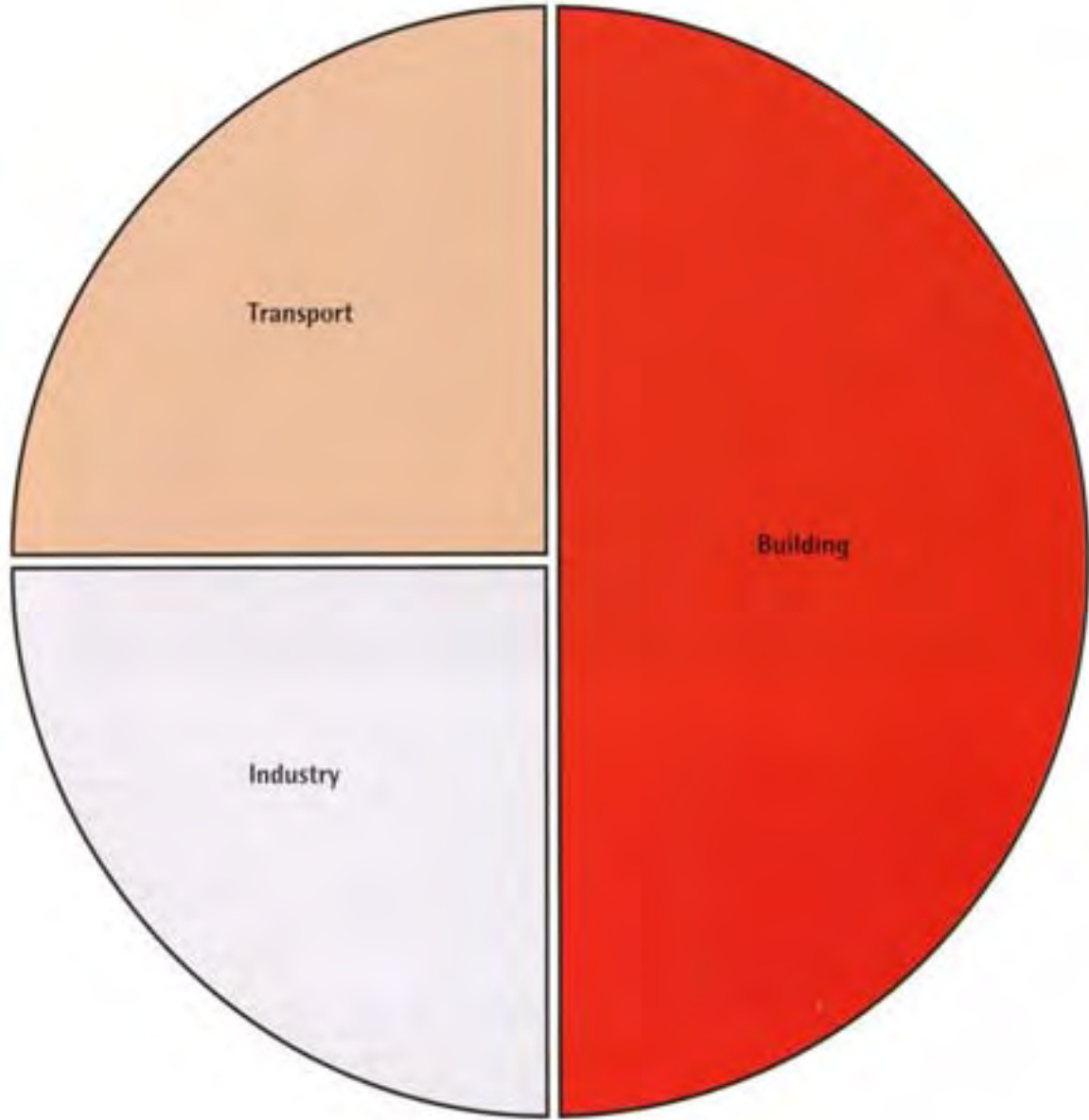
**ARCHITECTS**

**POLLUTE**

*Los Arquitectos Contaminan*

An alarming new analysis of global warming says architects are the problem — and our best solution





Incompetence or  
Negligence?



# Modern vs. Nature







Brasilia

Architect: Oscar Niemeyer

# Missed Sustainable Opportunities?



Centre Pompidou

Architect: Richard Rogers & Renzo Piano

Location: Paris, France



Walt Disney Concert Hall  
Architect: Gehry Partners  
Location: Los Angeles, California





High School #9

Architect: Coop Himmelb(l)au

Location: Los Angeles, California

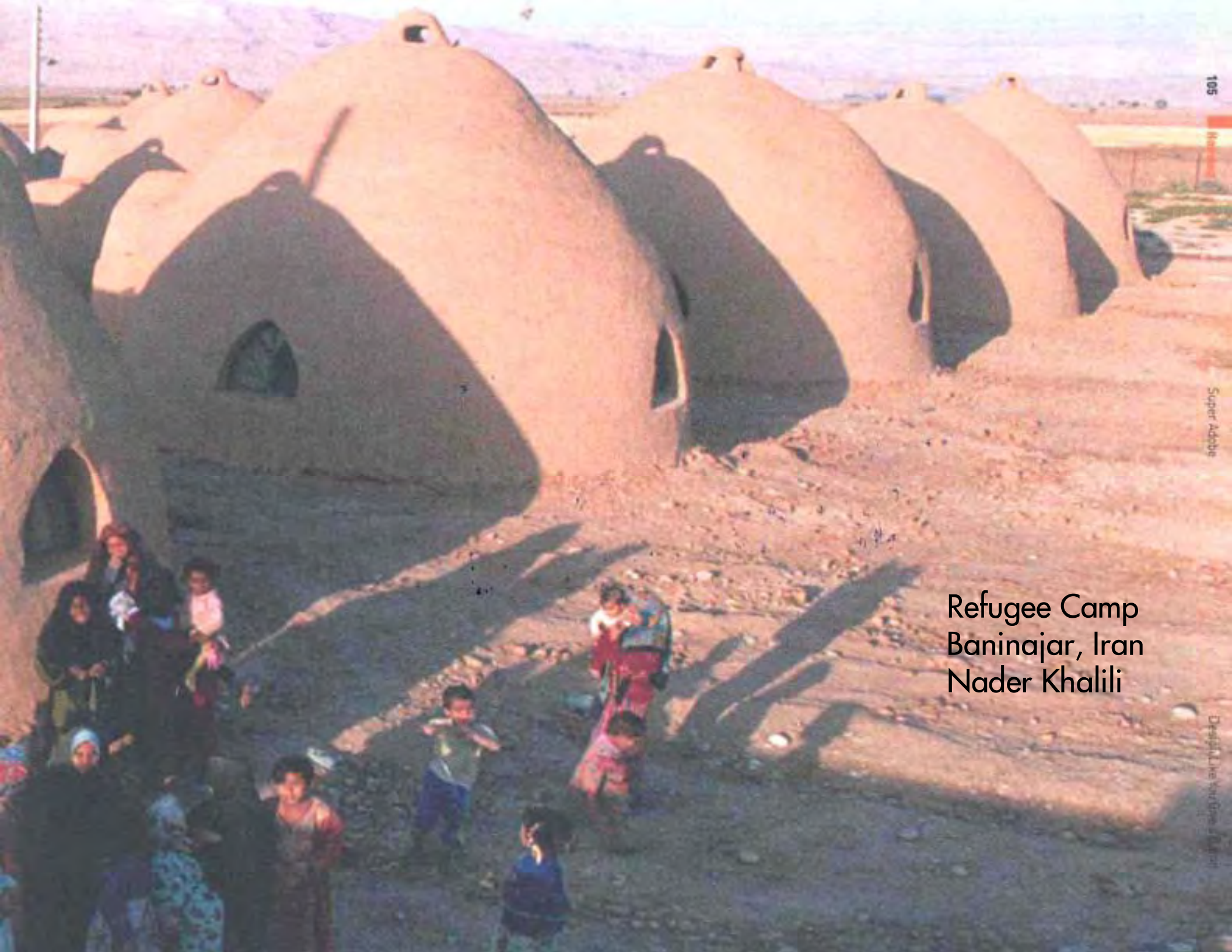


# Regional Vernacular









Refugee Camp  
Baninajar, Iran  
Nader Khalili





Primary School GANDO  
Architect: Diebedo Francis Kere  
Location: Gando, Burkina Faso









Vendredi le 20 février 2006

Objectifs

Apprendre à lire et à écrire les chiffres de 1 à 10  
Apprendre à compter les objets

Cibler

1 + 1 = 2  
2 + 1 = 3  
3 + 1 = 4  
4 + 1 = 5

Questions à poser

Quels sont les chiffres de 1 à 10?  
Combien y a-t-il de chiffres de 1 à 10?  
Quels sont les chiffres de 1 à 10?  
Combien y a-t-il de chiffres de 1 à 10?  
Quels sont les chiffres de 1 à 10?  
Combien y a-t-il de chiffres de 1 à 10?



Shelters in Kobe, Japan and Gujarat, India Architect: Shigeru Ban





Bamboo School  
Jang Song, Viet Nam



Central African Foundation for Health and Population Studies  
Architect: East Coast Architects  
Location: Somkhele, South Africa







# Cargo Palettes



Concrete



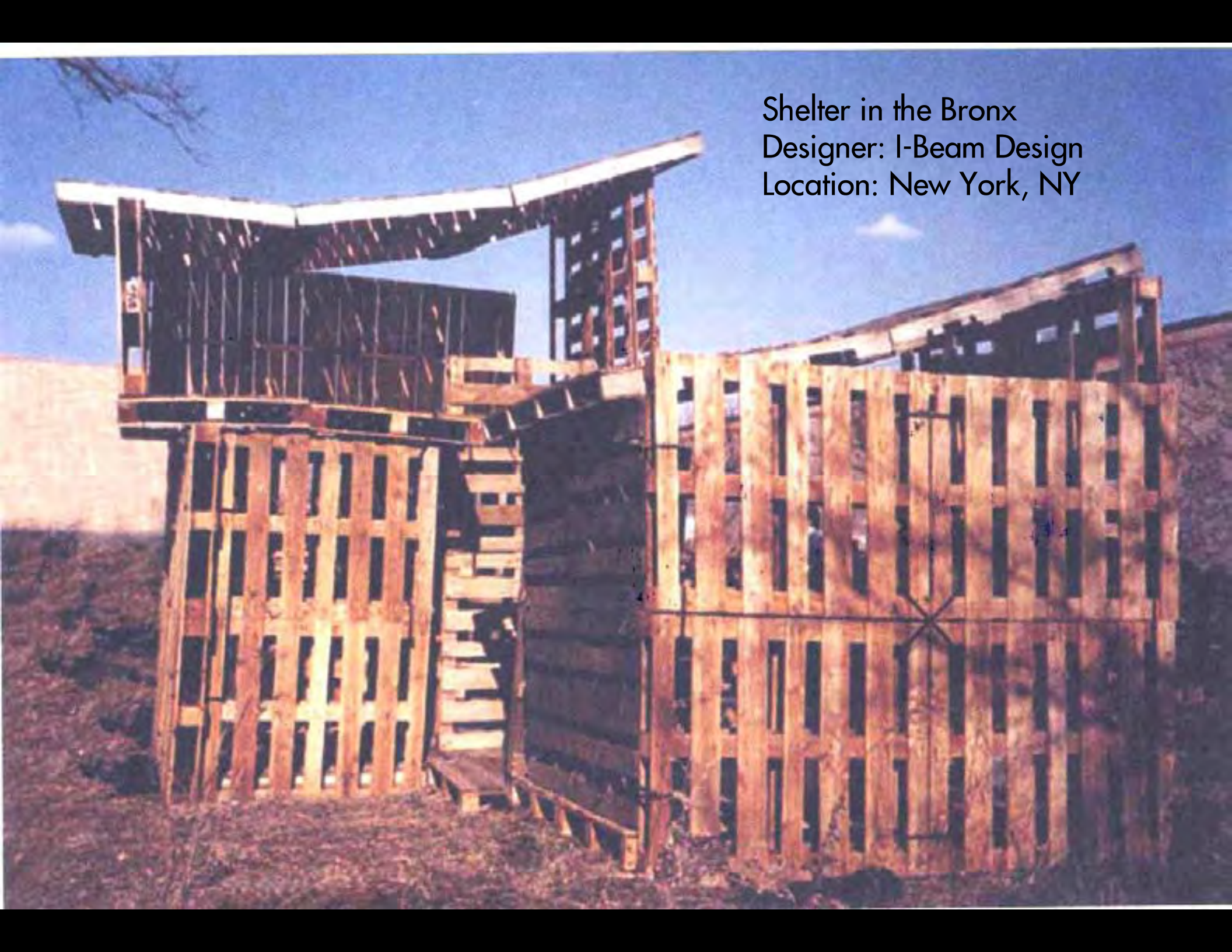
Straw



Stone

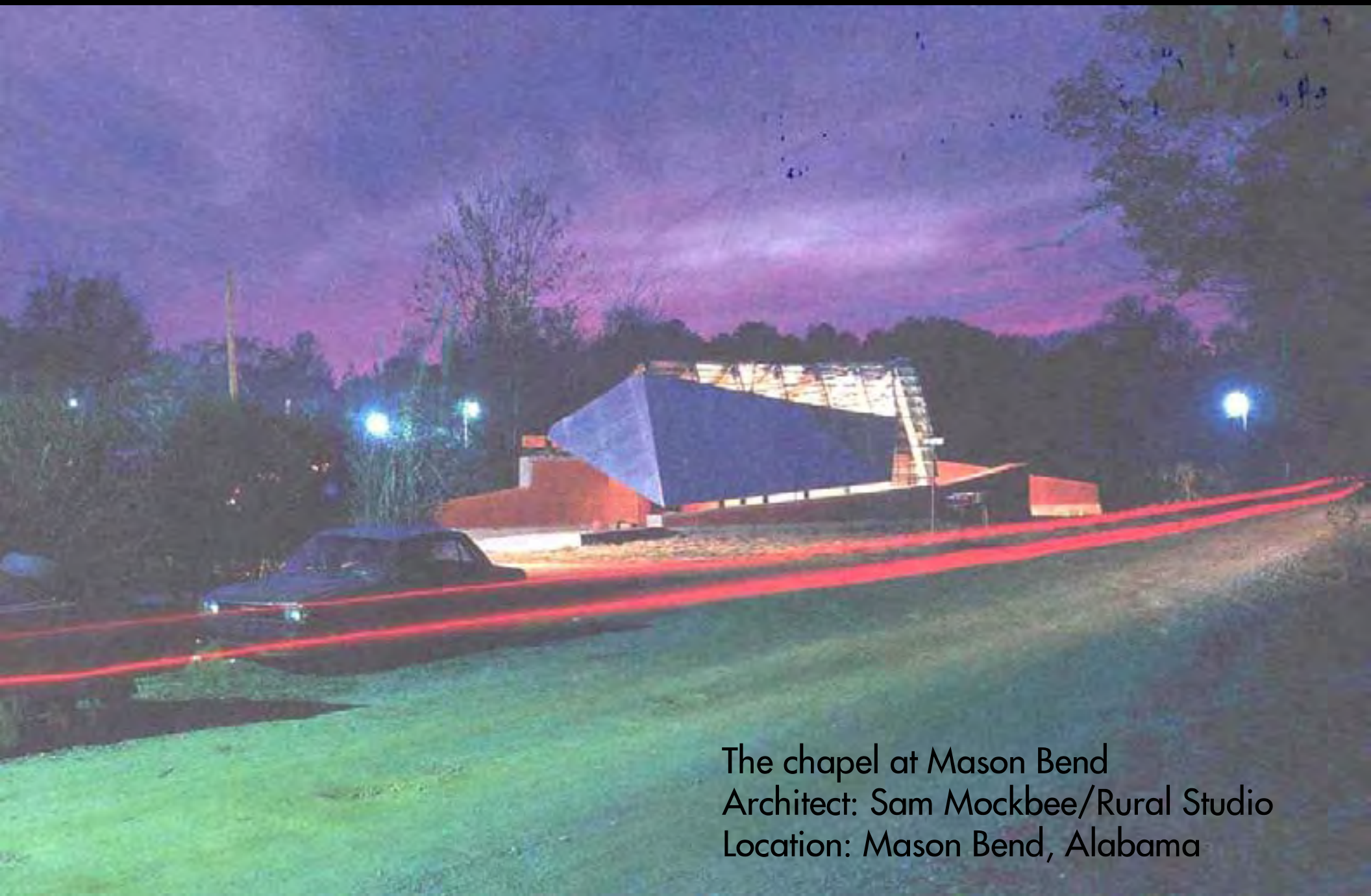


Shelter in the Bronx  
Designer: I-Beam Design  
Location: New York, NY









The chapel at Mason Bend  
Architect: Sam Mockbee/Rural Studio  
Location: Mason Bend, Alabama







# Modern with Nature



Taliesin West

Architect: Frank Lloyd Wright

Location: Scottsdale, Arizona







Falling Water House

Architect: Frank Lloyd Wright

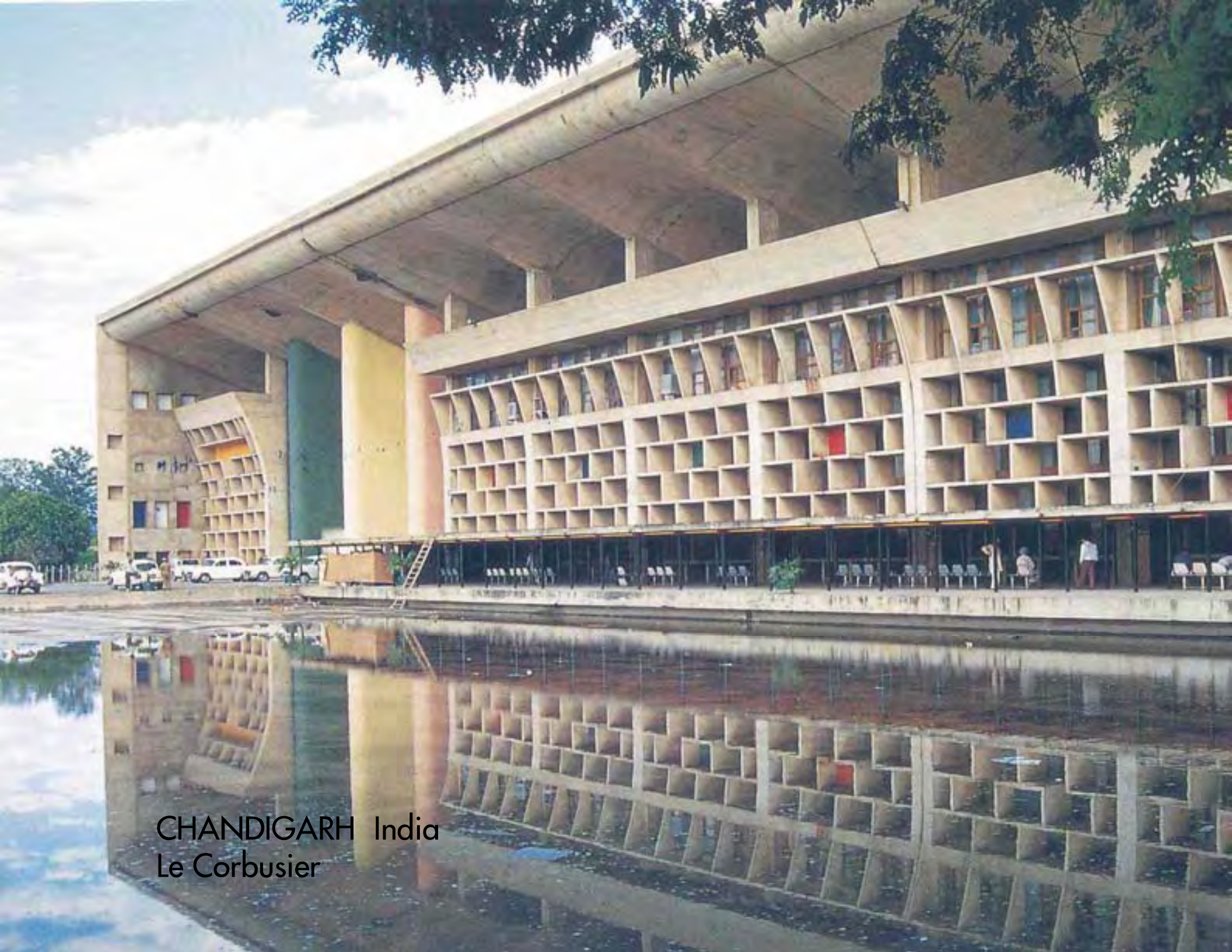
Location: Mill Run, Pennsylvania





The Schindler House, Rudolph Schindler, Los Angeles





CHANDIGARH India  
Le Corbusier









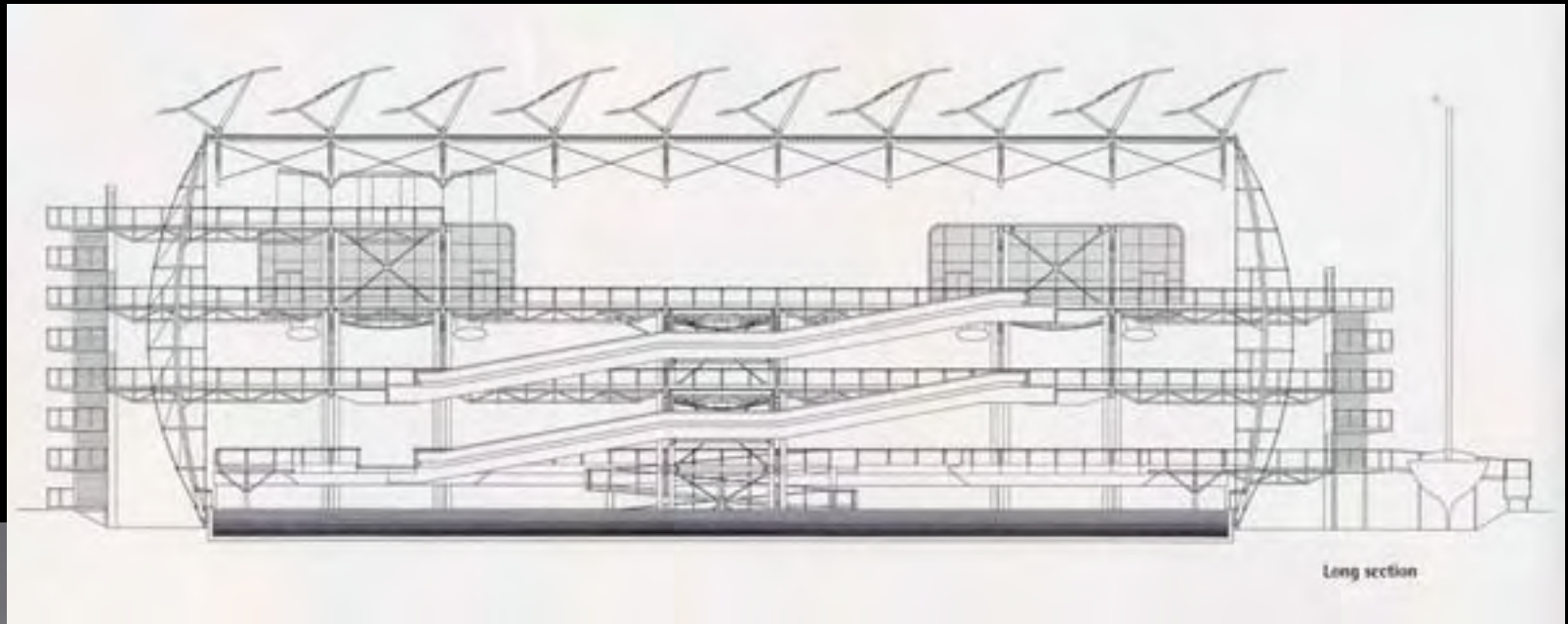


Wood Chapel

E. Fay Jones

Commercial Center  
Architect: Emilio Ambasz  
Location: Fukuoka, Japan





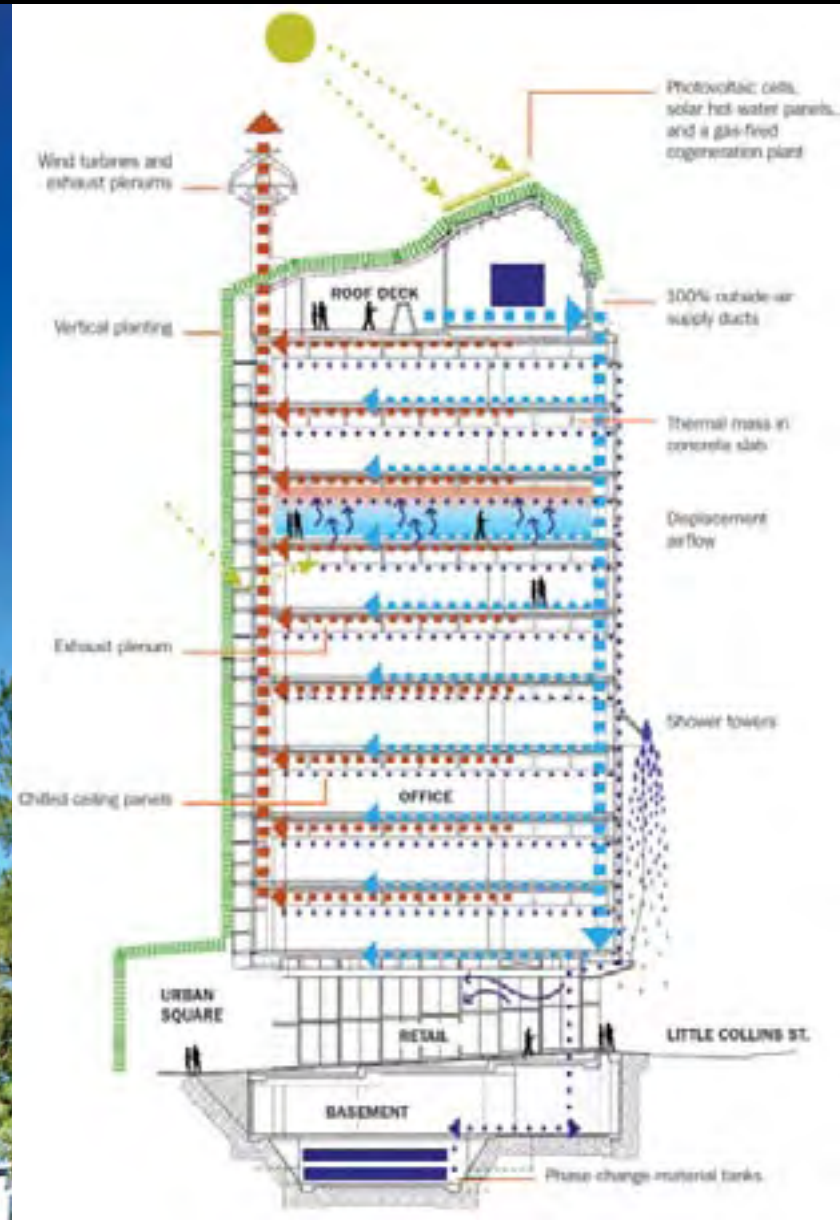
British Pavilion  
Seville Expo 92  
Nicholas  
Grimshaw





Newcastle University Solar Hall

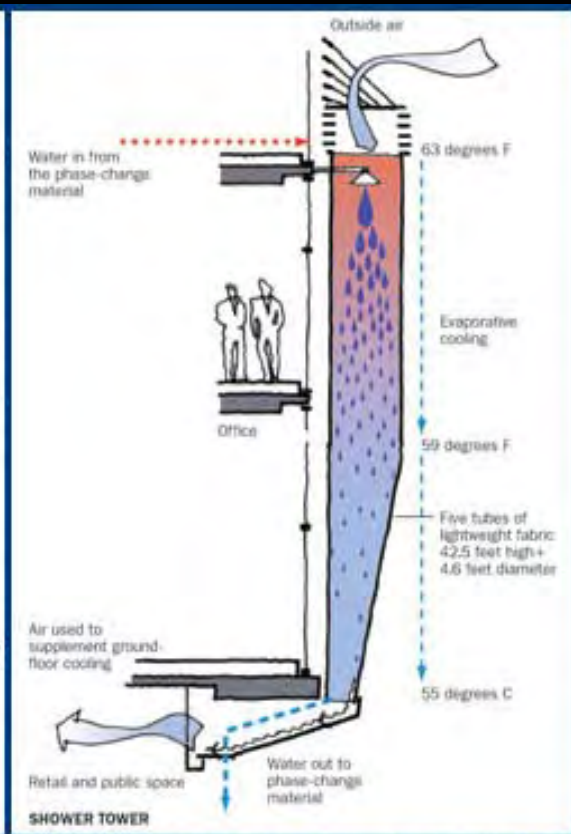
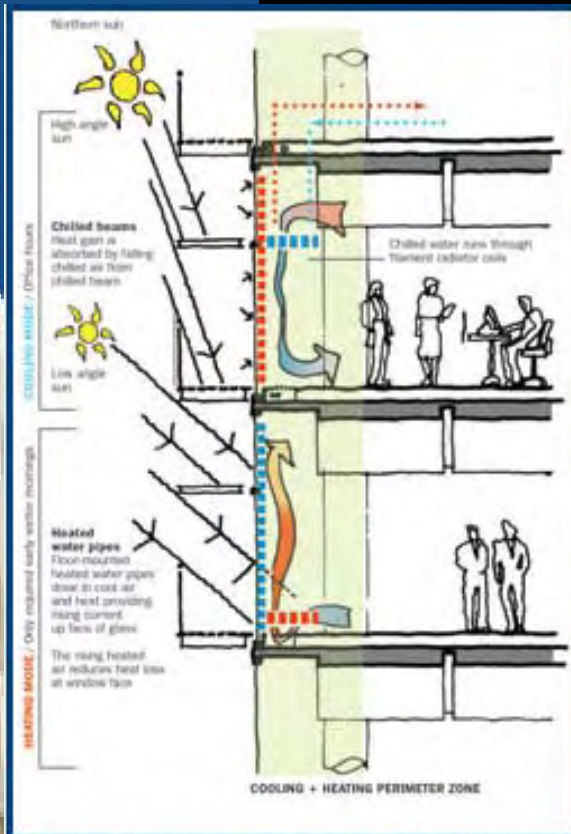
Architect: Nicholas Grimshaw



Council House 2

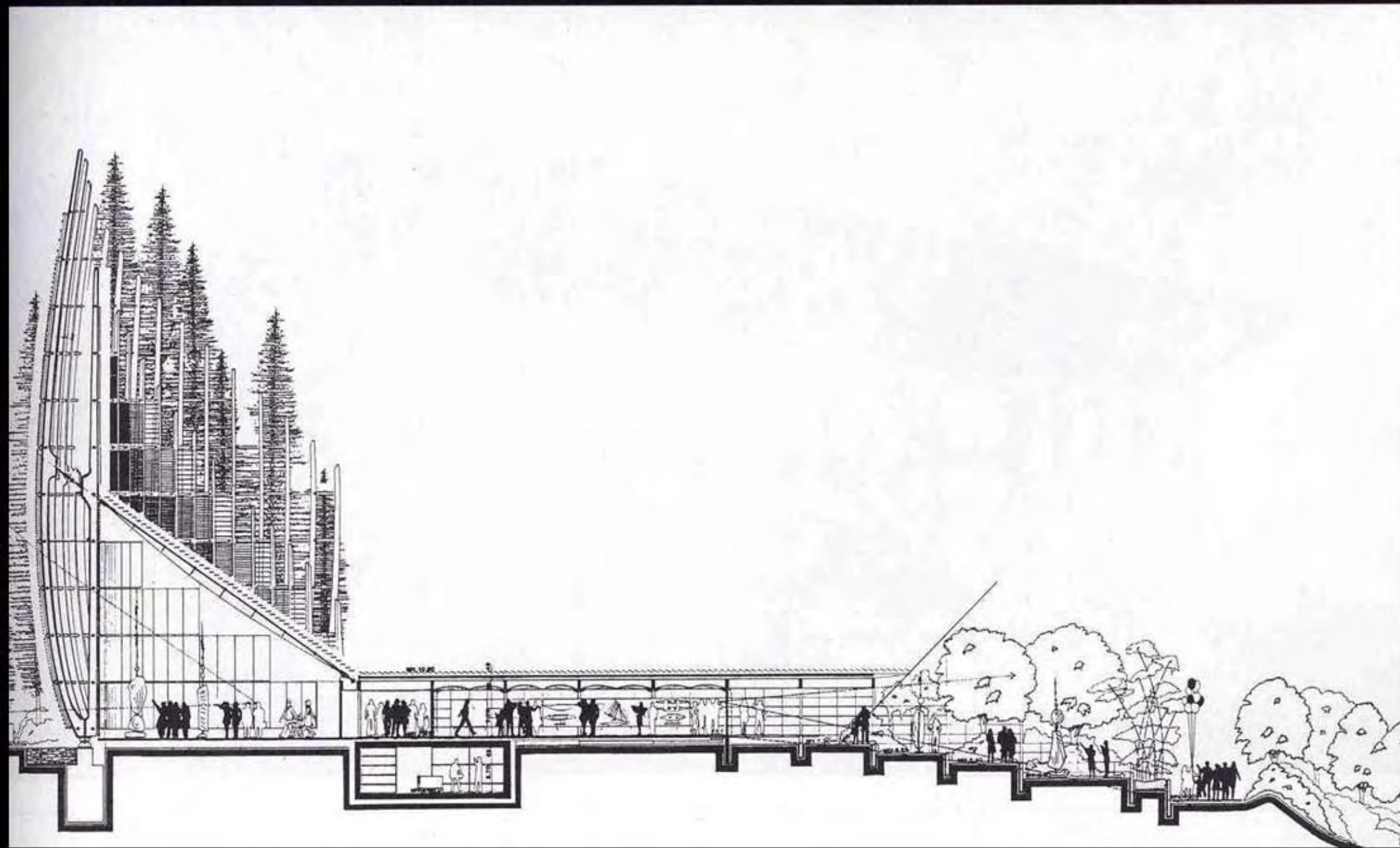
Architect: Mick Pearce/City of Melbourne/DesignInc

Location: Melbourne, Australia



In the winter, rooftop solar water heaters contribute hot water to the mechanical system's perimeter heating units (bottom of left image). During warmer months, chilled beams integrated into perimeter light shelves cut down on heat gain from sunlight (top of left image). On the south side of the building, five shower towers provide additional cooling to water for the mechanical system (right).  
 Photos © Russell Fortmeyer





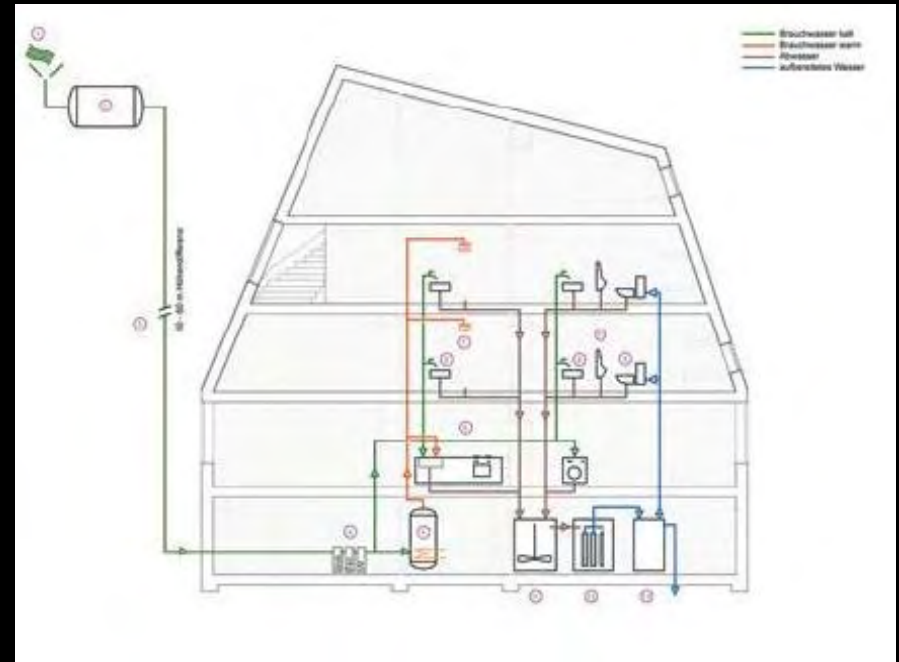
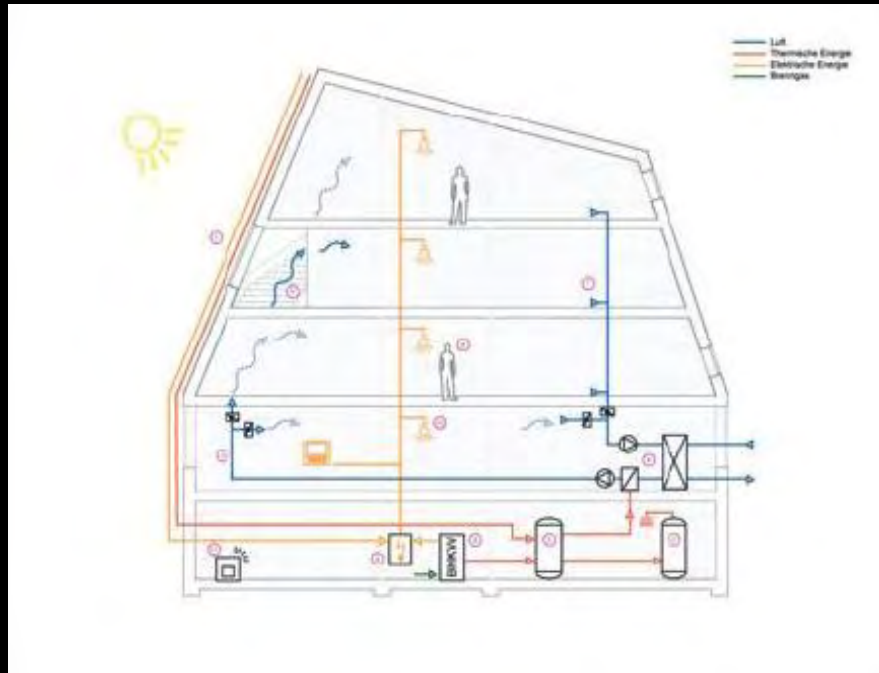
Jean-Marie Tjibaou Cultural Center  
Architect: Renzo Piano  
Location: New Caledonia









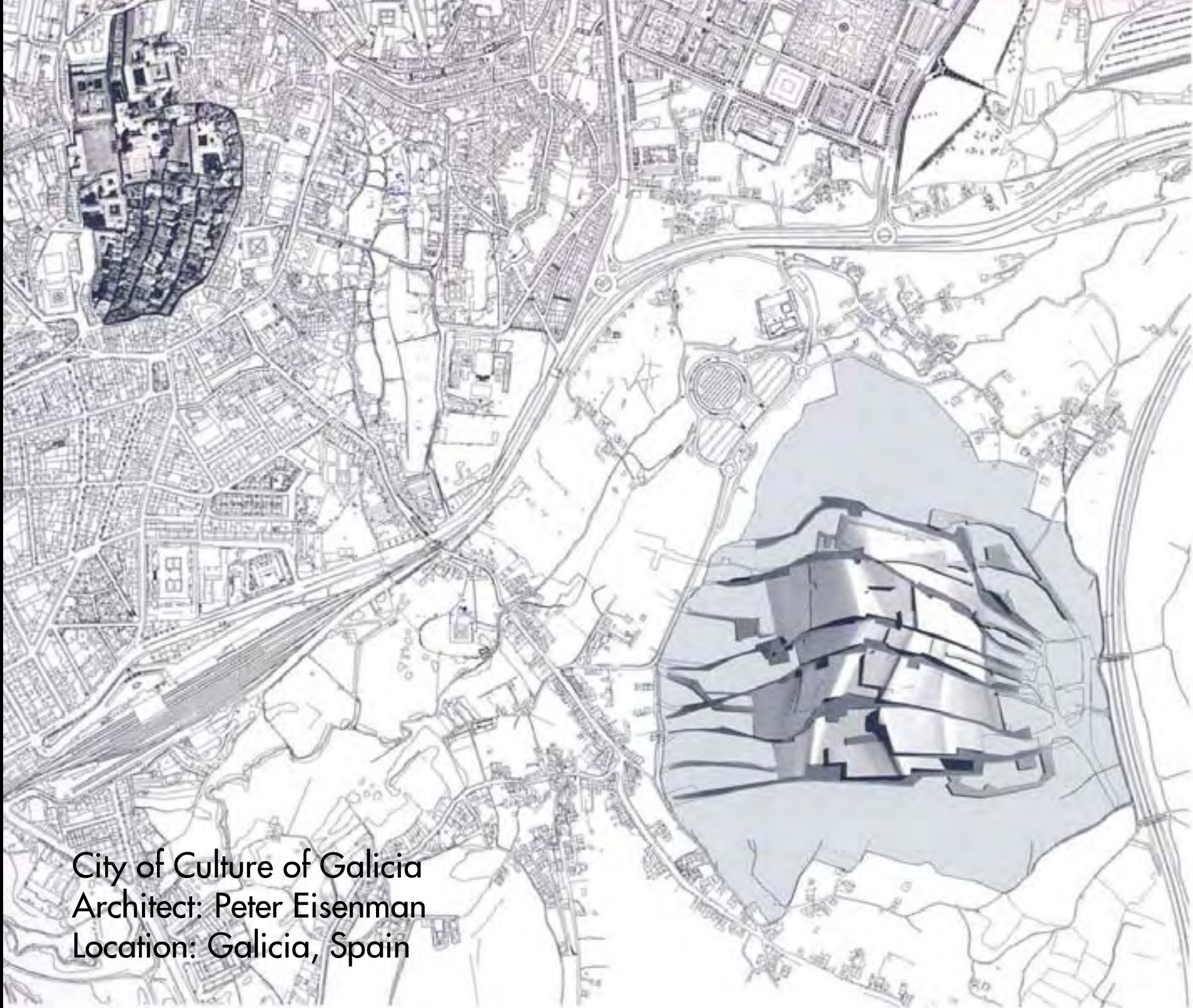


Architect: Department of Architecture – Swiss Federal Technical Institute

Location: Monte Rosa Glacier, Switzerland

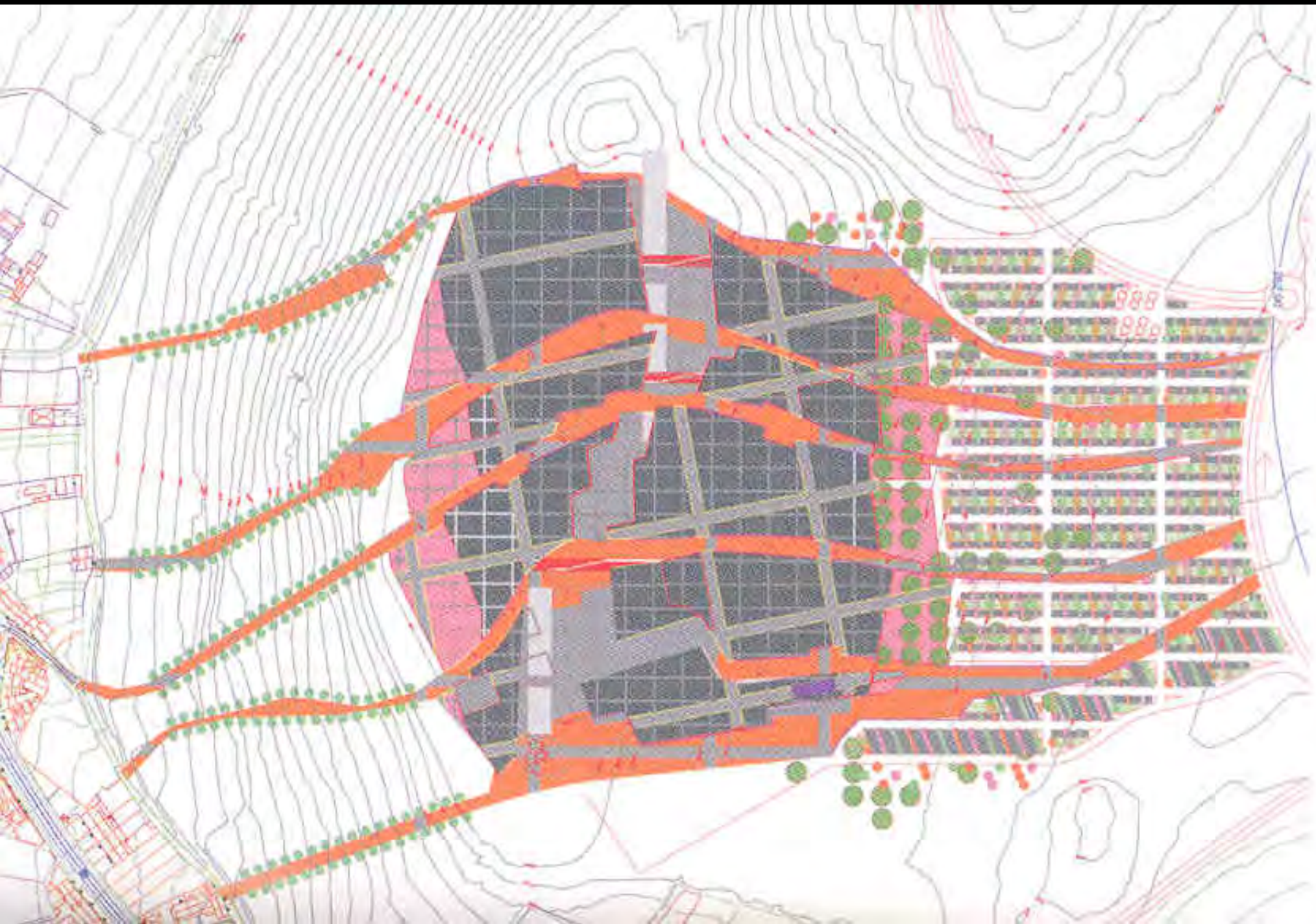
Year Completed: 2008

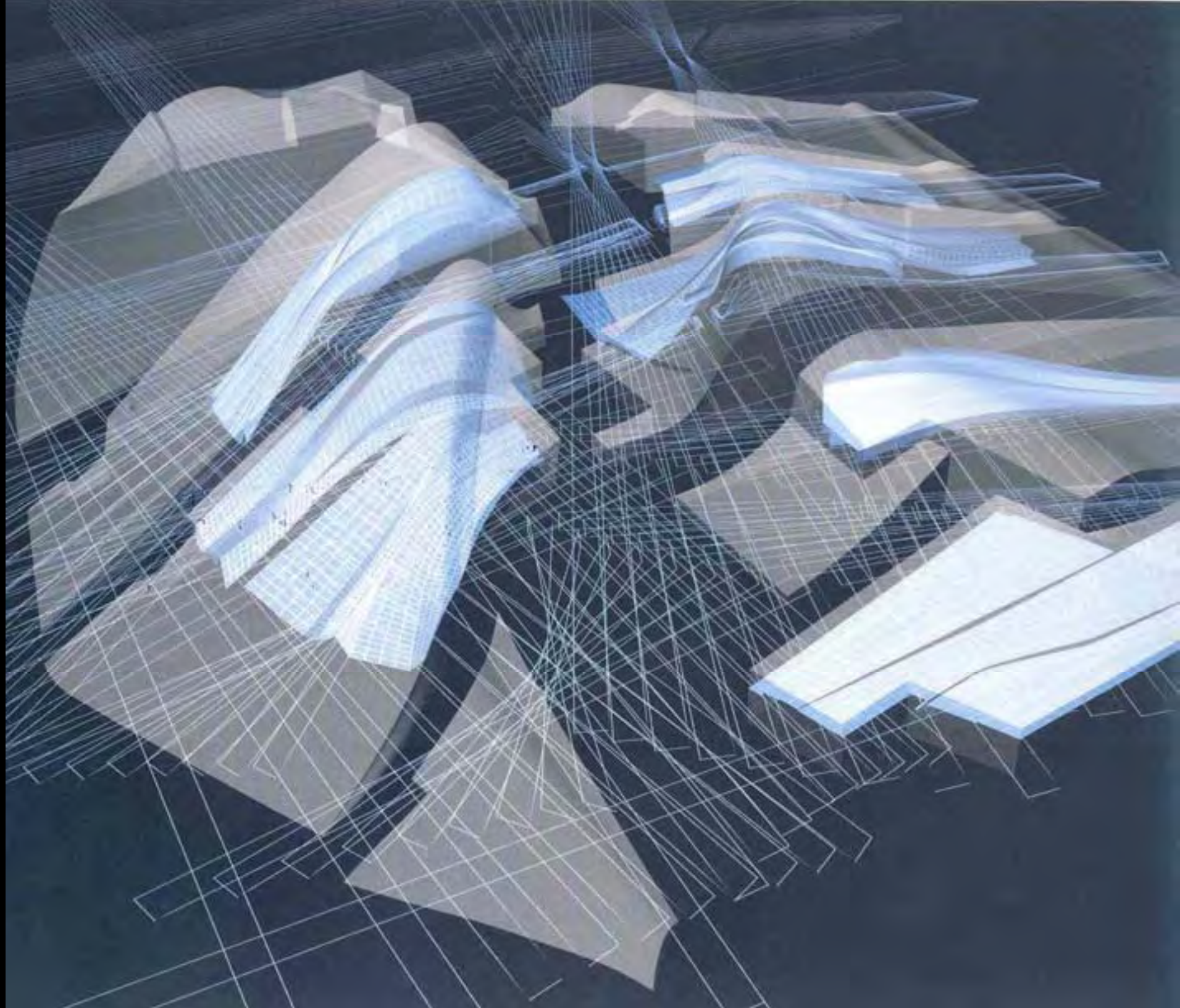


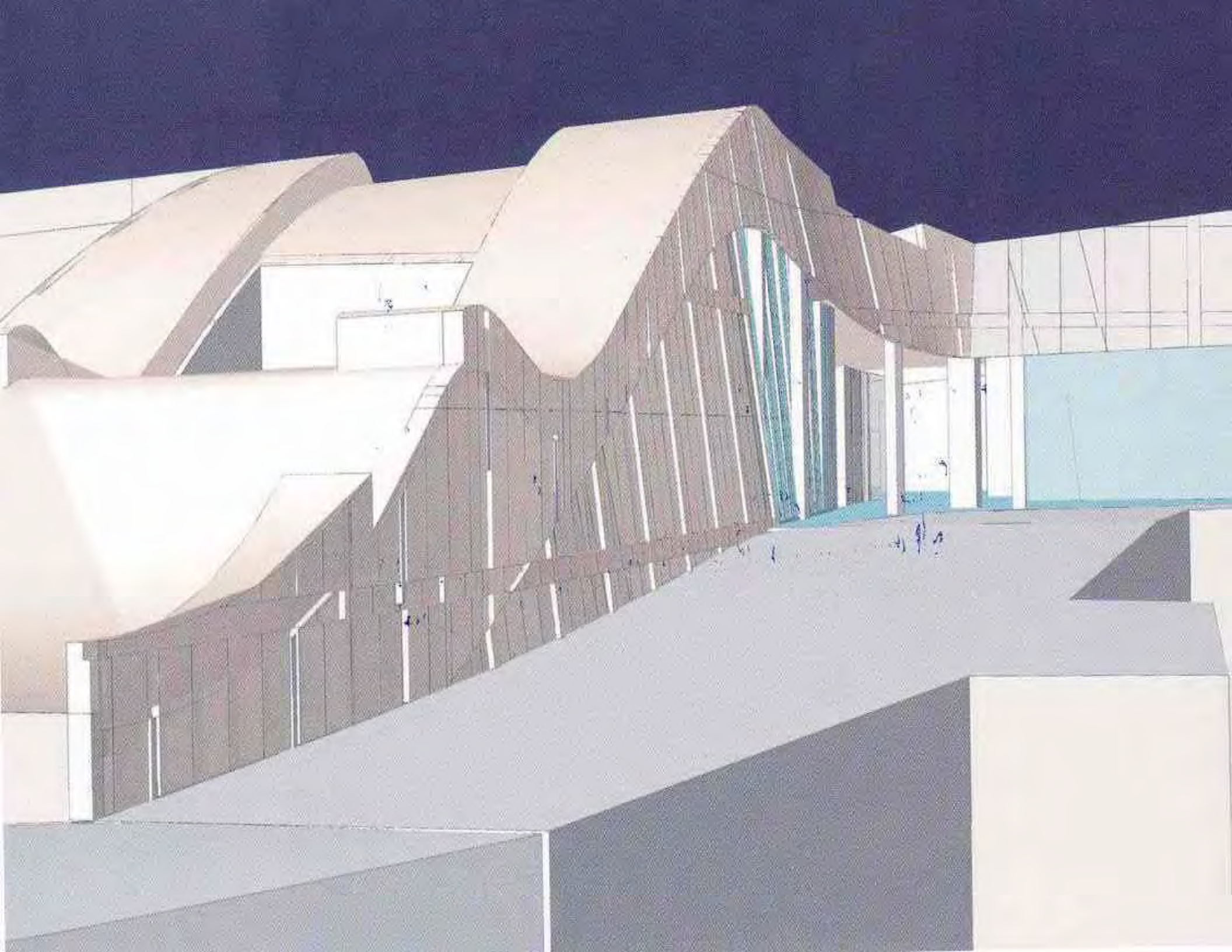


City of Culture of Galicia  
Architect: Peter Eisenman  
Location: Galicia, Spain



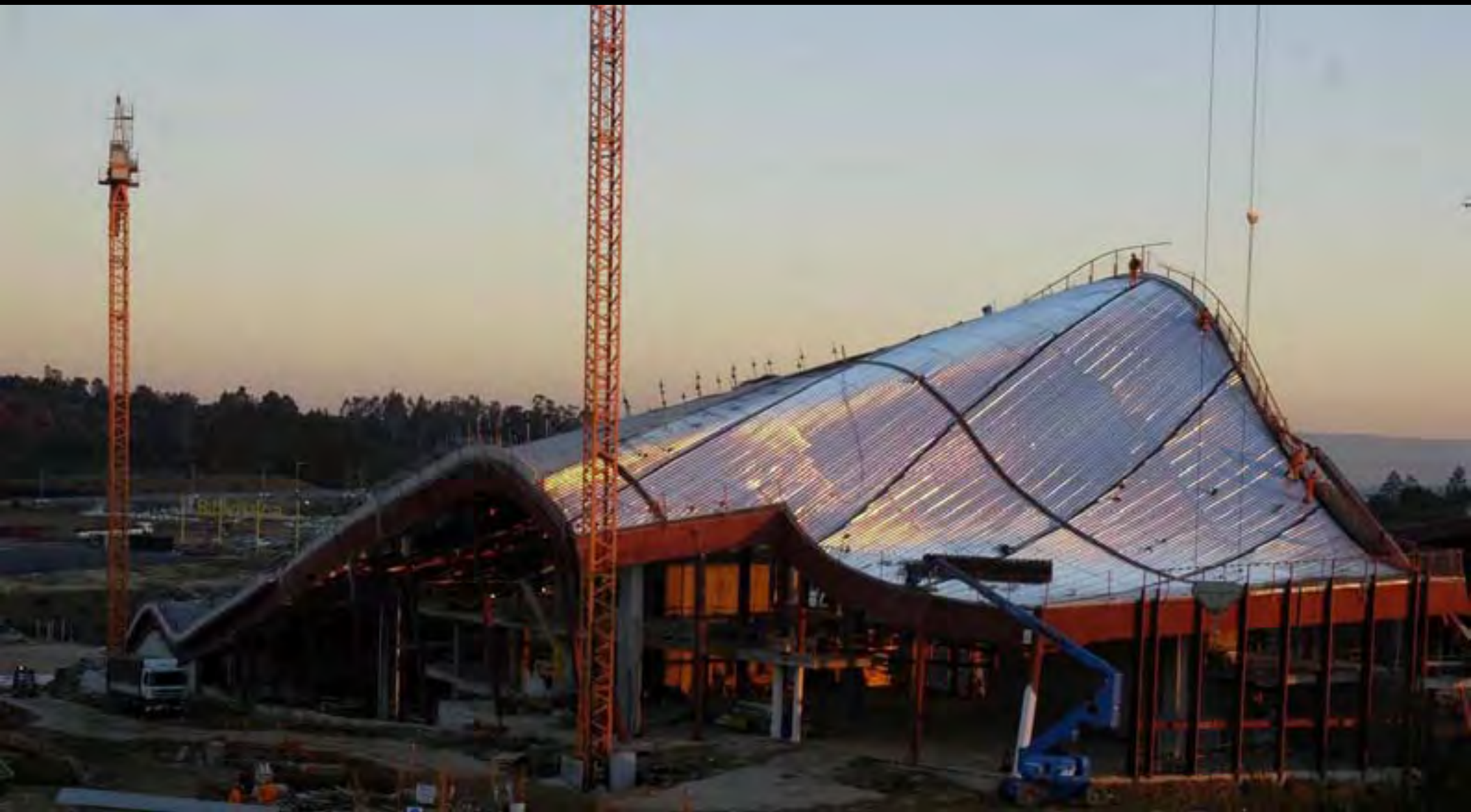














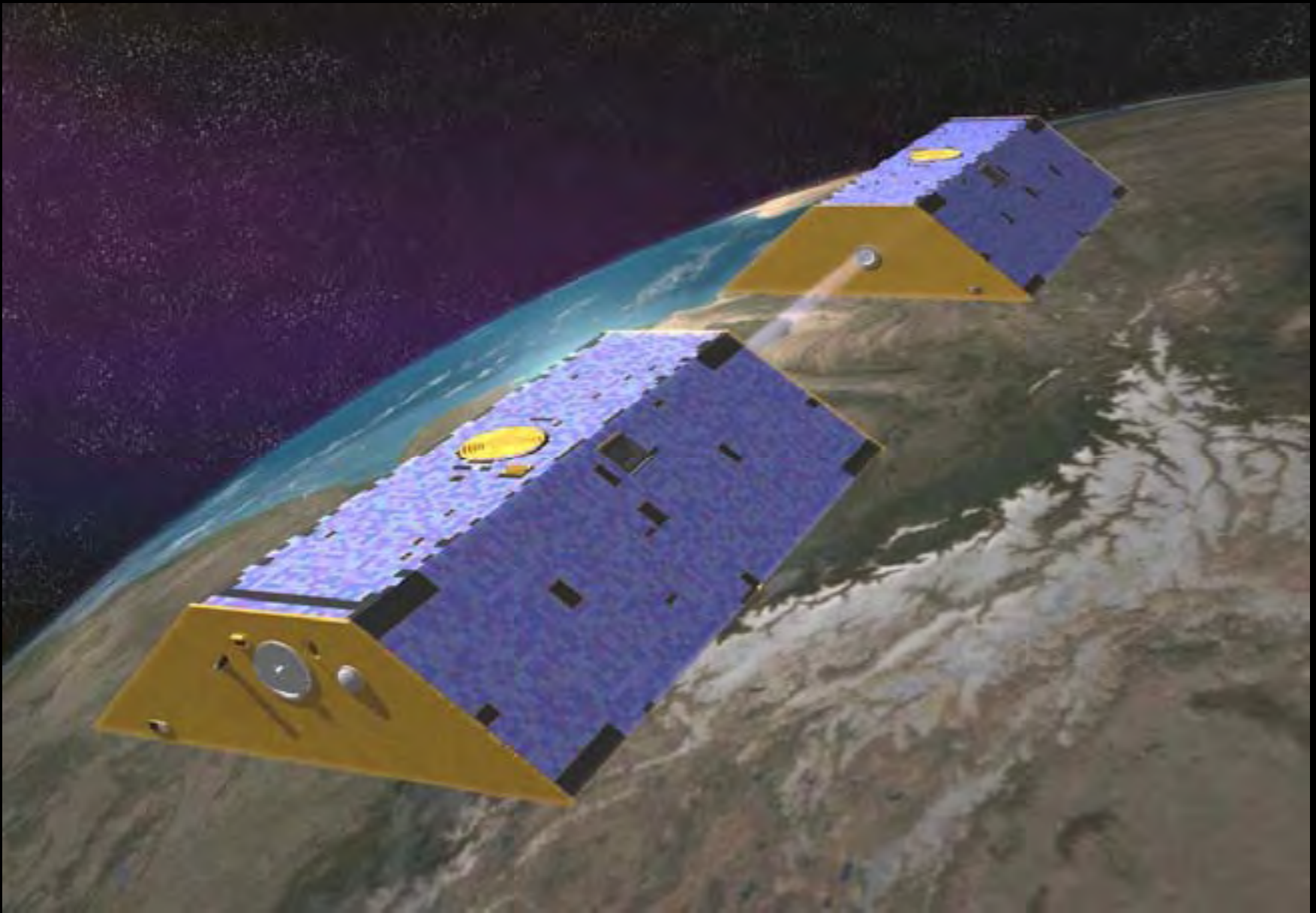






# Origins and Future of Photovoltaics





Gravity Recovery and Climate Experiment

NASA-JPL



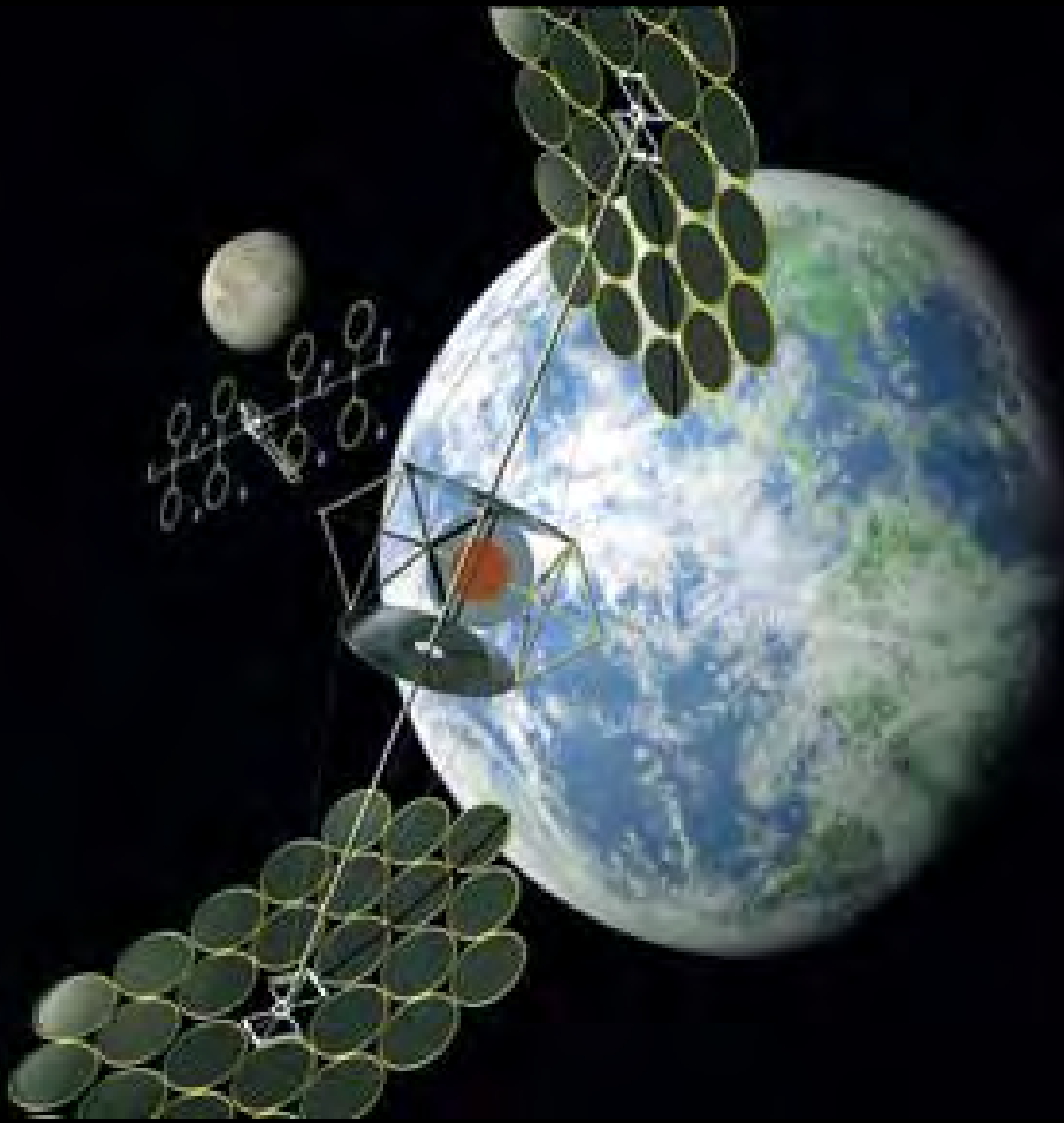
Terrestrial Planet Finder

NASA-JPL



Mars Reconnaissance Orbiter

NASA-JPL



Space Solar Power (SSP) Satellite

NASA-JPL

# Conventional Solar













# Solar Skin



Commercial Application

Manufacturer: Sapa Solar



## CIS Tower Solar Retrofit

Designer: Solar Century Holdings, Limited

Location: Manchester, England



Residential Application

Manufacturer: Sapa Solar



20 River Terrace - The Solaire

Architect: Cesar Pelli & Associates

Location: New York City, New York







# Solar Roofs



Stillwell Avenue Terminal Train Shed

Architect: Kiss + Cathcart Architects

Location: New York City, New York





Floriade Hall

Designer: Schuecco Solar

Location: Holland









Institutional Application

Manufacturer: Sapa Solar



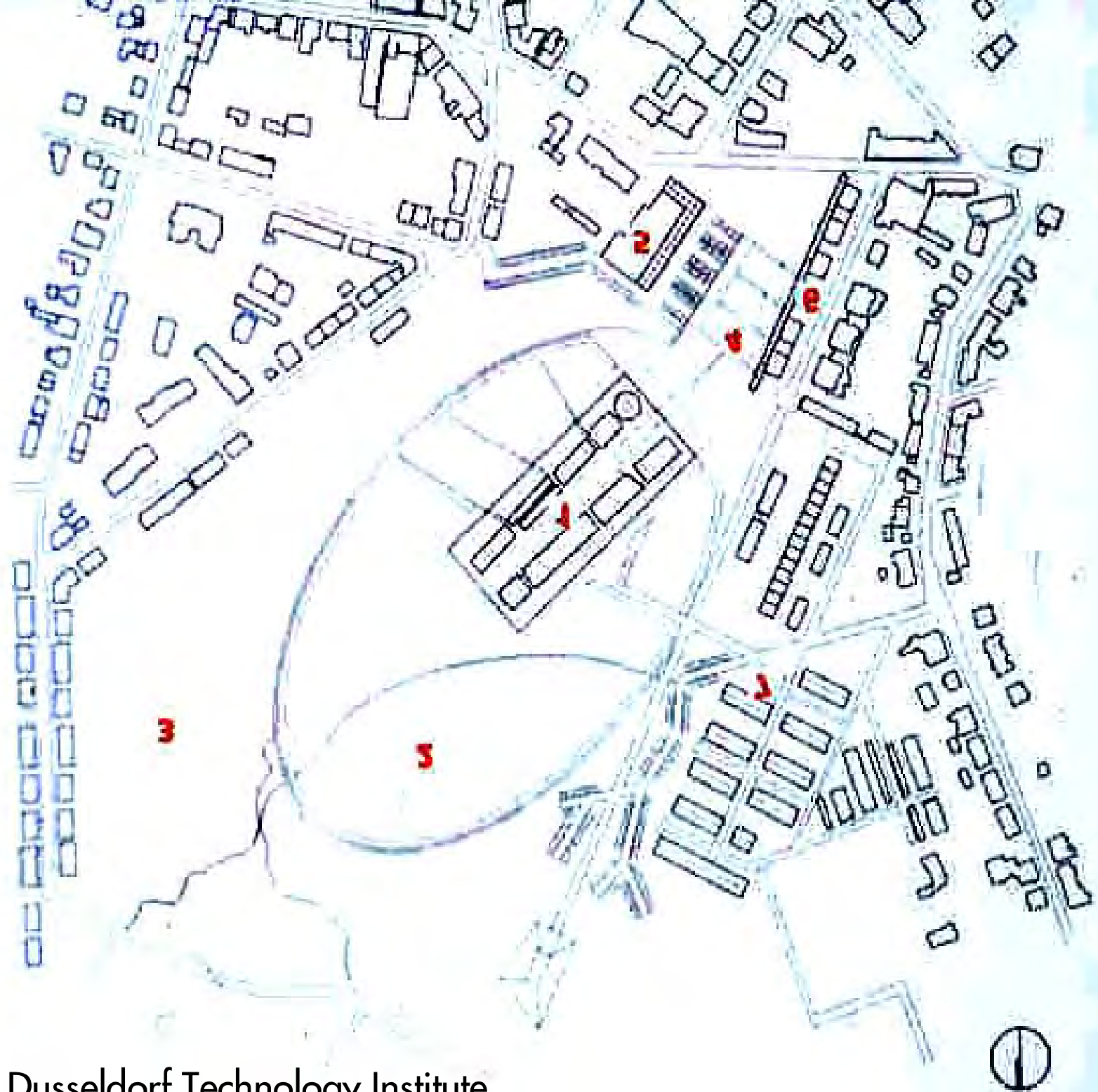


Agricultural Application  
Sapa Solar



Commercial Application

Manufacturer: Sapa Solar



Dusseldorf Technology Institute















BP Solar Showcase Pavilion

Designer: Ove Arup & Partners

Location: Birmingham, England

# Large Scale Projects



Solar Stadium

Architect: Toyo Ito

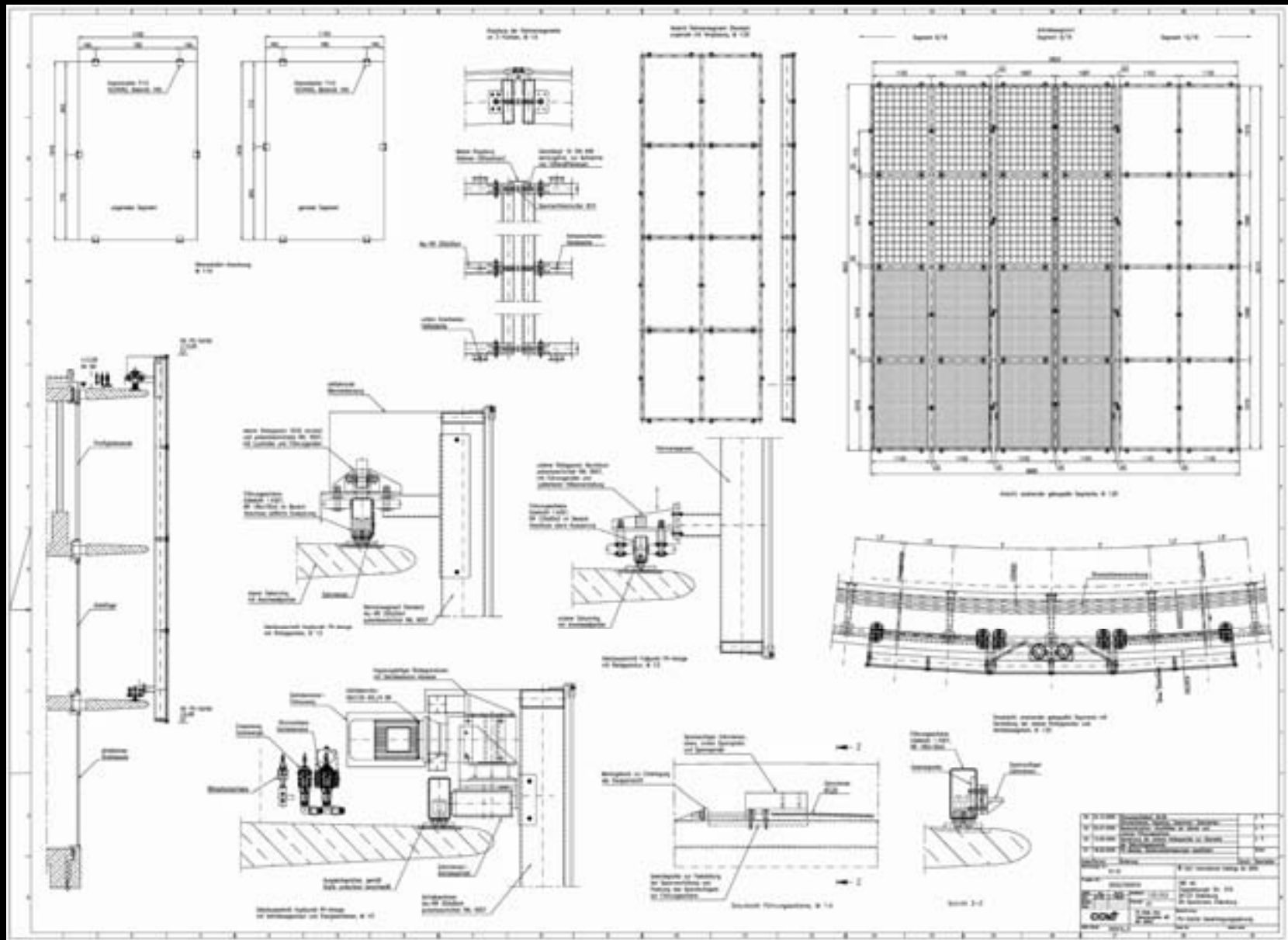
Location: Kaohsiung, Taiwan











EWE Arena

Architect: ASP Architekten

Location: Oldenburg, Germany





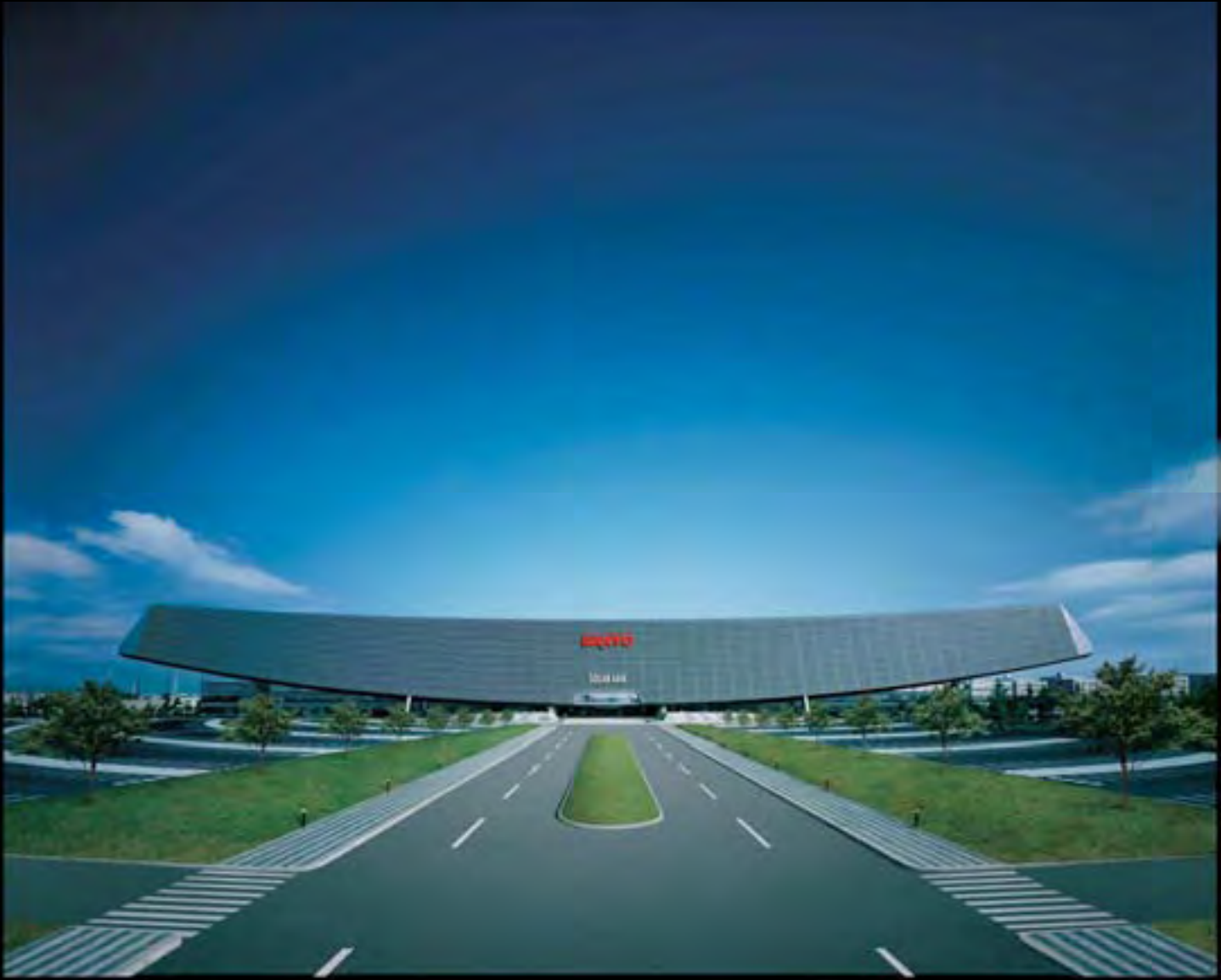




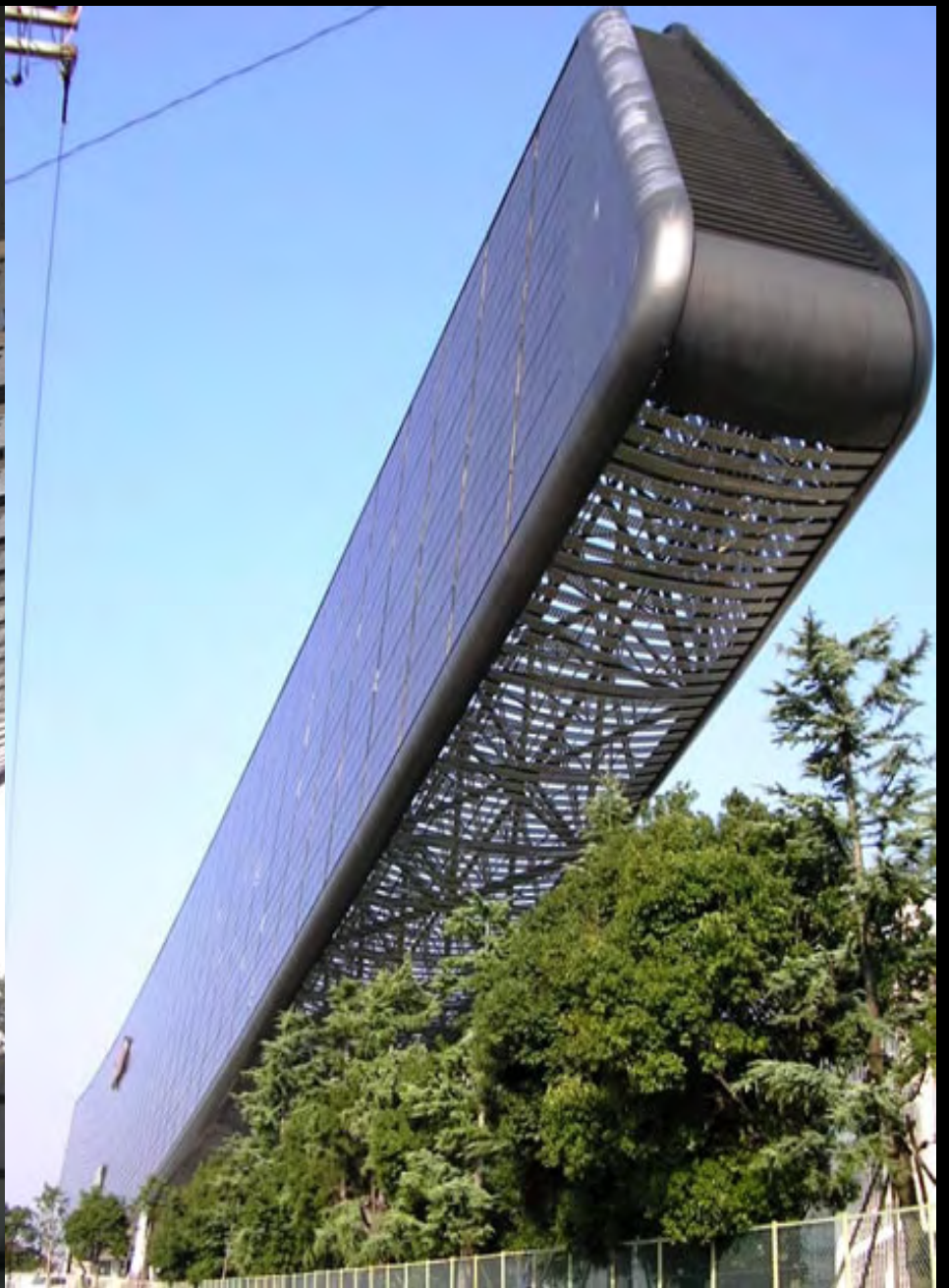
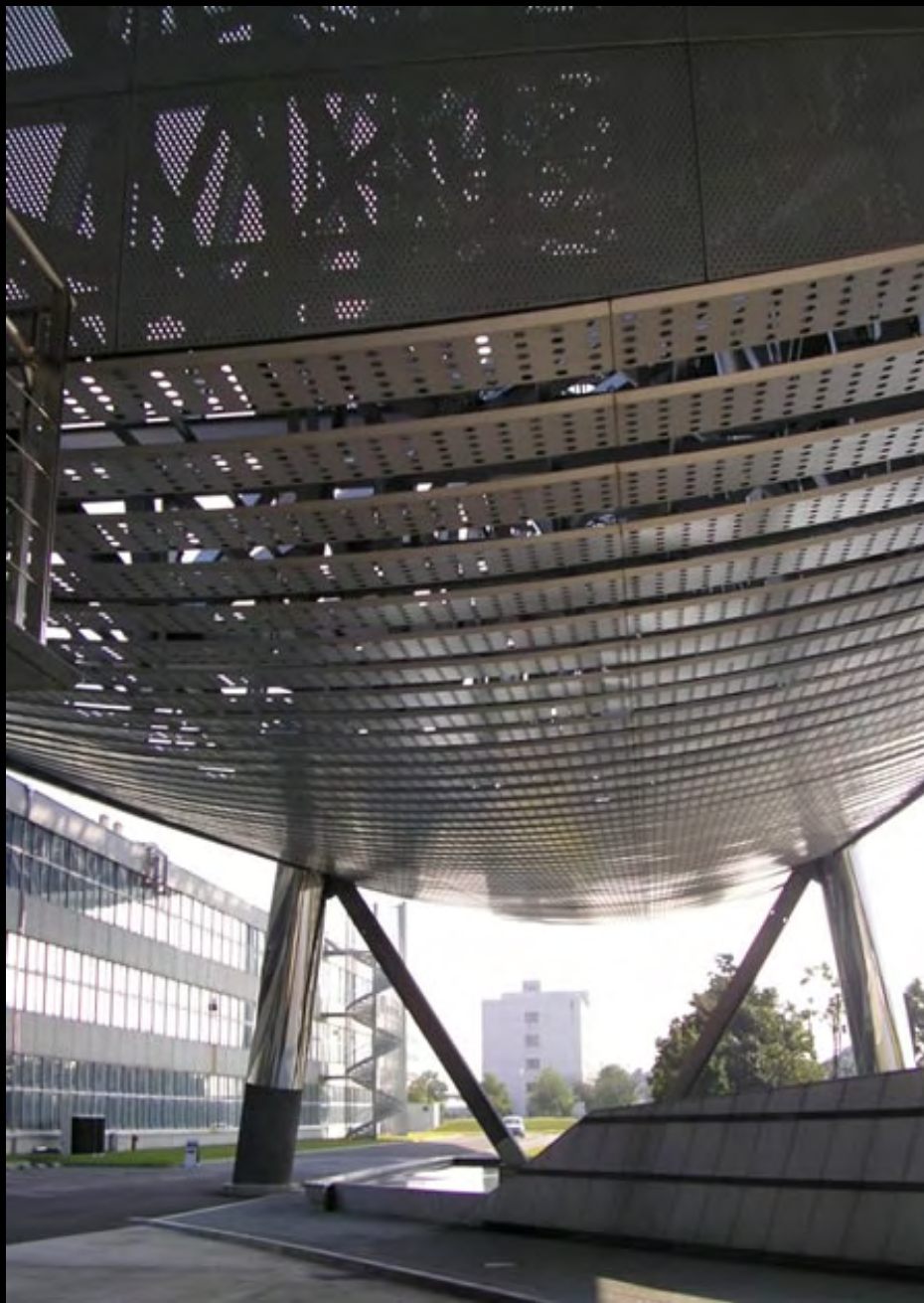


Sanyo Solar Ark

Location: Gifu, Japan







# Utilitarian Projects



Santa Monica Civic Center Parking Garage

Architect: Moore Ruble Yudell Architects and Planners

Location: Santa Monica, California