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## PRECEDENTS STUDIES

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LAB PRECEDENTS 5.1

SURFACE PRECEDENTS 5.2

## 5.1 Laboratory Precedents

### 5.1.1 Life Sciences Building, The University of Newcastle

Figure 5.1: Circulation Void



The building provides the physical link between the biological and Medical sciences faculties, in order to facilitate interdisciplinary research and communication.

Project: Life Sciences research facility

Location: Newcastle, New South Wales, Australia

Architects: Suters architects with stutchbury and Pape

Completed : 2000

#### Introduction

The Life Sciences Building on the University of Newcastle campus has been constructed to house research and teaching laboratories together with lecture theatres and other specialist operations within the faculty schools of medical and biological sciences. The environmental demands required the natural landscape of a very steep site beneath the building to be retained. The design and construction of the building therefore necessitated innovative architecture. (Structural Concrete Industries, 2002)

The architectural concept provides for the building to cantilever over the site in two directions - twenty-one metres out to the north on the longitudinal axis and six metres to the west on the transverse axis. Two large inclined hinged struts support the main longitudinal cantilever. (Structural Concrete Industries, 2002)

#### Considerations

The facility is implemented to facilitate interaction between research disciplines in a physical and spatial sense. It accomplishes this by becoming the connecting bridge between two worlds. While achieving this most important of research facility design it also tackles the contemporary laboratory design issue in the following manner:

**Accommodation** - The facility provides for all of the possible occupants by providing teaching and research labs, staff offices, tutorial and post graduate student offices.

**Programming** - The programming is consciously designed with clustering of related function and the offset of open versus closed research labs. The design also employs a simple sectional design, moving from east to west the implementation of zones ( Office - Circulation void - Lab Support - Lab - External Services) to structure the facility.

**Sustainability** - Further the architects employed a passive ventilation strategy in all non-controlled environments.



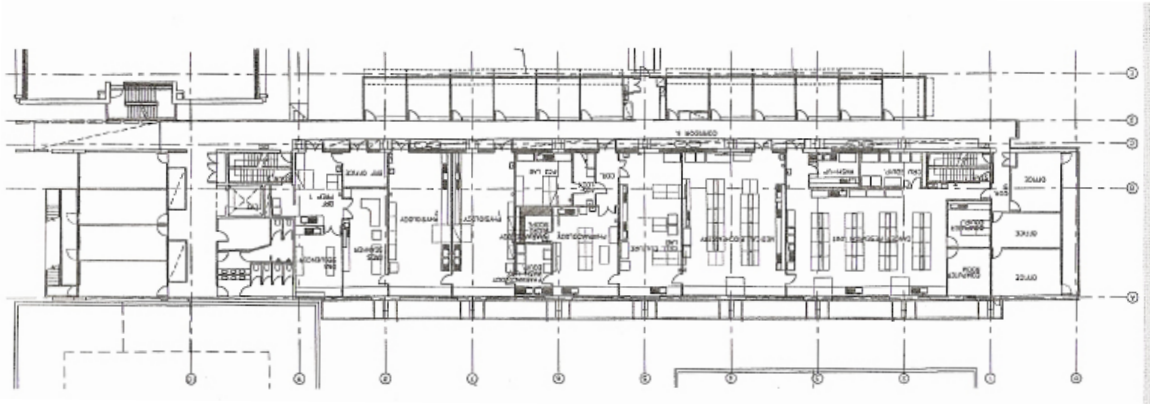


Figure 5.2,3: External views of facade

Figure 5.4-6: Interior and exterior views of building



Figure 5.7: Facilities plan



## 5.1.2 Boeringer Ingleheim Pharmasuetical Research Lab

Figure 5.8: Glass Louvre Facade



A long seven story exploits the predetermined building envelope to the full, facilitating a direct connection to the exiting adjacent building. Its spacious ground floor foyer provides the unifying element which focuses various views on the surrounding campus

Project: Boeringer Ingleheim Pharmasuetical Research Lab

Location: Biberach Germany

Architects: Sauerbruch Hutton Architects

Completed : 2002

### Introduction

The building consists of two parts: A naturally ventilated office area to the west and a laboratory zone to the east. The atrium that lies in between allows the two parts to communicate, natural daylight to penetrate and passive ventilation to take place.

The colourful glass louver skin unites the various diverse parts in to a whole. It serves as a layer of adjustable sun shades and generates a striking and contemporary image which is intended to symbolize the world of research and to set off Bibreach as a research location.

### Considerations

The design implementation of contemporary interactional and sustainable techniques is what truly sets this facility apart from its peers.

Programming - The separation of research laboratories, office and support zones afford flexibility to the building. The use of a linking atrium zone to facilitate orientation and interaction is us implemented successfully in this facility

Design - The unique coloured glass louver facade system affords the facility the development of a unique identity and character. Further it also allows the development of exiting and stimulating research spaces.

Sustainability - The central connective atrium plays a key role in the passive climate control strategy in this facility. The atrium allows natural daylight to penetrate deep in to the facility, it allows for passive buoyancy ventilation in the non controlled passive office spaces, as well as passive night time cooling.

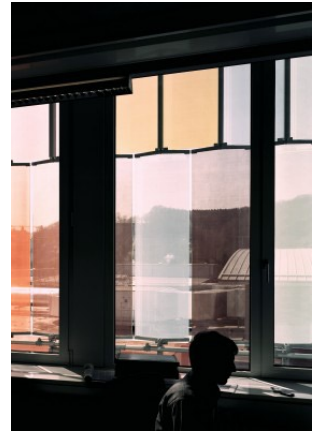
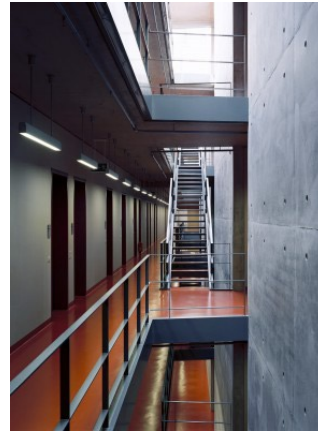
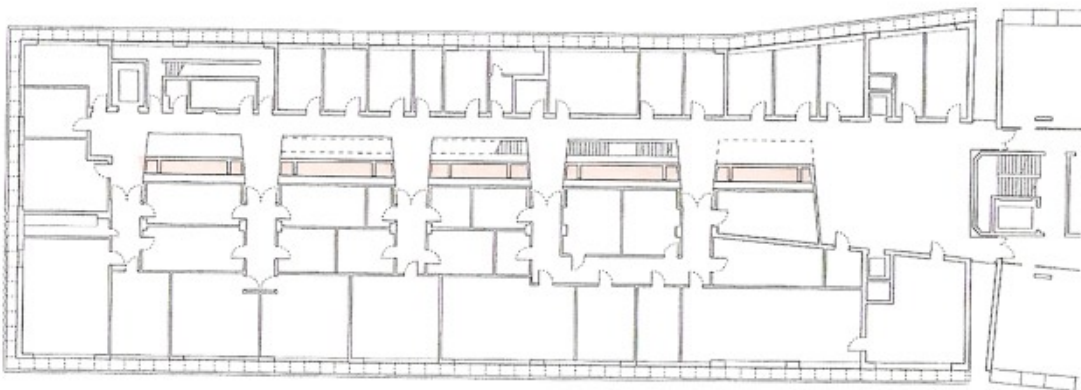


Figure 5.9-11: Exterior and interior views

Figure 5.12-14: Facade design



Figure 5.15: Plan Facilities





### 5.1.3 Clark Centre (Bio-X Research Centre)

Figure 5.16: Clark center central courtyard



“Providing laboratory, office and social spaces for 700 academics from the Schools of Humanities and Sciences, Engineering and Medicine, the Clarke Centre is strategically located at the heart of the campus, between the core science and engineering buildings and the medical centre. It acts as a social magnet for the University, encouraging students, lecturers and researchers from diverse disciplines to mix, (<http://www.fosterandpartners.com/Projects/1076/Default.aspx,02/10/2008>).”

Project: Bio-X Research Facility  
Location: Stanford, USA  
Architects: Foster and Partners  
Completed : 2003

#### Introduction

“In striking contrast to the traditional laboratory facility with its closed rooms and corridors, the Clark Centre is open and flexible: external balconies replace internal corridors and laboratory layouts can be re configured at will. All benches and desks are on wheels and can be moved to allow ad hoc team formation that can respond easily to fast-evolving research needs. This versatility is further enabled by workstations that plug into an overhead unistrut system of exposed services and flexible connections.

Externally, the three-storey building takes the form of three wings of laboratories, clad in rust-red painted steel and limestone to echo the tiled roofs and stone facades of Stanfords architectural vernacular, that frame an open courtyard overlooked by balconies. A forum at the heart of the courtyard is used for exhibitions, concerts and other events, while a restaurant on the ground floor of the south wing offers a new social focus for the entire campus with tables spilling out into the courtyard (<http://www.fosterandpartners.com/Projects/1076/Default.aspx,02/10/2008>).”

#### Considerations

The Bio-X centre was designed to challenge the stigma of labs as closed, private sealed and dark places. The design focused on opening up research, flexibility and interaction.

Programming - Laboratories were designed as generic modules that can adapt to any research requirement. Further the labs were designed as open entities in a physical and abstract sense. To allow this flexibility and openness of space the facility was programmed in zones, with fixed core services and facilities zones.

Structure - The structure of the building allows clear structure free spans within the research environments, allowing a much greater flexibility of space

Services - Services in the research labs are distributed on a flexible hose system supplied on a unistrut ceiling grid system at 3m intervals. This allowed total flexibility and adaptability of space and lab layouts. Mobile case work further enhanced the research experience.

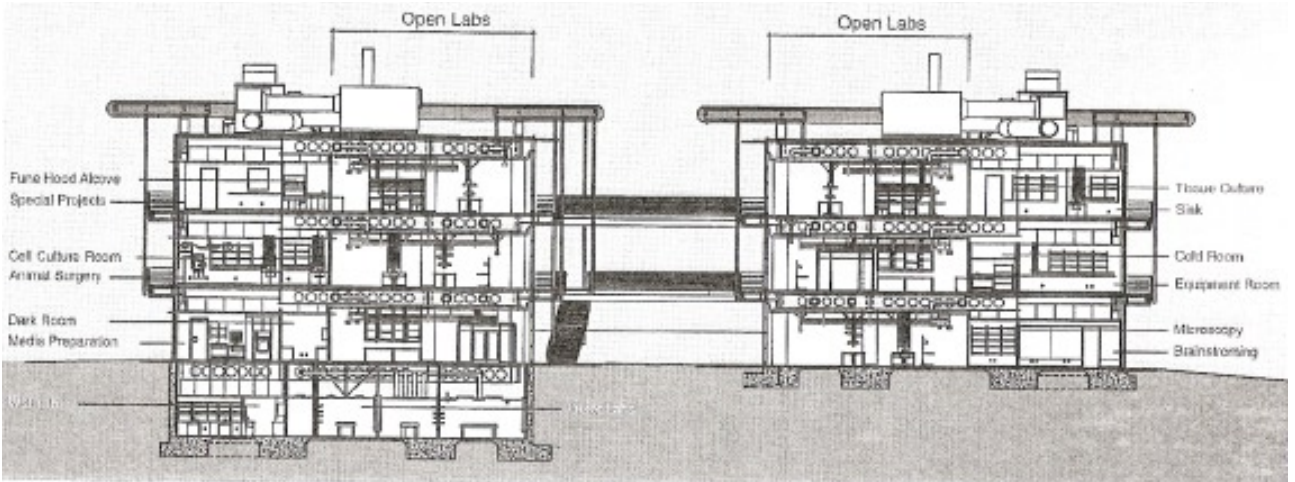


Figure 5.17-19: Internal courtyard views

Figure 5.20-22: Interior spaces



Figure 5.23: Facility Section





## 5.2 Surface Precedents

### 5.2.1 Blizzard Building



“Our aim has been to create a space that avoids the traditionally sanitised environment of laboratory research buildings - here the very fabric of the building speaks about science and is conducive to better science by bringing researchers together.”

Will Alsop

Project: Queen Mary Medical Sciences Research Institute

Location: Queen Mary University London, UK

Architects: Will Alsop

Completed : 2005

Figure 5.24: Atrium with pods

#### Introduction

“Aiming to create an outstanding new building for the College, plus a significant landmark and educational resource for the local community, the design team developed the building’s form around two primary concepts; firstly to foster better integration of the science disciplines through the provision of an open-plan environment; and secondly to create a building which broadcasts its purpose, achieved by the development of a seductively transparent building envelope.

400 scientists will, for the first time in the UK, work side by side in an open-plan work environment on a vast single research floor conducive to improved communication and the cross fertilisation of ideas. Supporting amenities are located in a series of pods suspended above the open-plan laboratory floor(Kiser, K. 2005).”

#### Considerations

Will Alsop architects designed this facility to completely break with the tradition of the stereotypical research laboratory. The creation of a truly unique and innovative research environment is what set this design apart from its peers.

Accommodation - Unusually for its type the research facility is clear and open. The great open plan research floor provides functionality to the research disciplines whilst allowing the flexibility necessary to accommodate their changing needs over time.

Transparency - The selectively transparent envelope permits the internal activities to be seen and so doing engages the surrounding community, however it maintains actual and visual security required.

Programming - The interior breaks with tradition in a number of ways, providing the ideal setting for collaboration as well as staging and inspiring research environment.





Figure 5.25: Interior of one pod



Figure 5.26: Facade of Building



Figure 5.27: Mezzanine level circulation

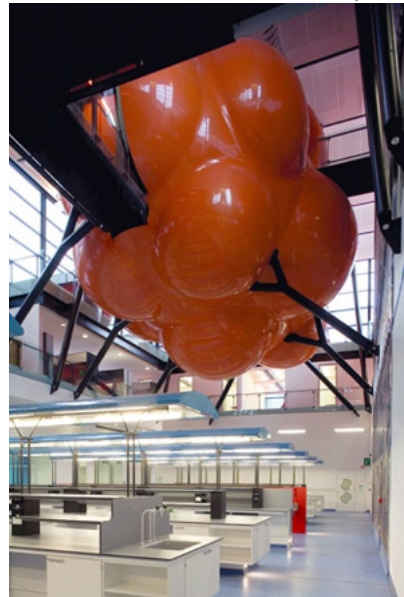
Figure 5.28: Connecting bridge of building



Figure 5.29: View of research floor and pods



Figure 5.30: View of research floor and pods



## 5.2.2 Prada Store

Figure 5.31: Exterior night time view of prada store



“The Tokyo store is a strikingly unconventional 6-story glass crystal that is soft despite its sharp angles – as a result of its five-sided shape, the smooth curves throughout its interior, and its signature diamond-shaped glass panes, which vary between flat, concave and convex ‘bubbles’ (Glynn, S. 2005).”

Project: Prada Flagship store  
Location: Tokyo  
Architects: Hertzog and de Meuron  
Completed : 2003

### Introduction

“Though it might appear capricious, the irregular geometry of the tower is in fact dictated by Tokyo’s complex zoning and planning laws that have shaped and eroded the basic six-storey block. Herzog & de Meuron’s early exploratory models resembled roughly carved pieces of ice, now evolved into a more streamlined and tautly chamfered form. This is wrapped in a rhomboidal grid, like a giant fishing net (or string vest), in filled with a mixture of flat, concave and convex panels of glass. Most are clear, some, where they enclose changing rooms, are translucent. The convex panels billow out gently through the grid like bubbles or puckered flesh. Cunningly, there is no single focal shop window; rather the entire building is a huge display case, generating faceted reflections and an array of changing, almost cinematic, views from both outside and inside. At night, light pulsates through the crystalline lattice, tantalizingly exposing floors of merchandise (Glynn, S. 2005).”

Structure - The use of a structural rhomboid lattice frees up the interior space of the facility from structural support constraints.

Surface - Here H&D explore surface as a transparent, translucent crystal like structure, giving character and identity to the building.

Tubes - The tubes act as the only private spaces within the facility and allow more personal spaces and activities to take place.

### Considerations

Architectural surface exploration is always at the forefront of Hertzog & Demeurons designs. In the prada store the exploration continues with the use of a rhomboid lattice structure and tube structures, that define a new surface exploration and opens up new possibilities.





Figure 5.32-34: Spatial development of building

Figure 5.35- 39: Views of rhomboid lattice structure



Figure 5.40-43: Interior and exterior view of prada store



## 5.2.3 Seattle Library

Figure 5.44: Side walk view of library



“The stacks, arranged along a continuous spiral ramp contained within a four-story slab, reinforce a sense of a world organized with machine-like precision.”

Nicolai Ouroussoff - Los Angeles Times

Project: Seattle Public Library

Location: Seattle, USA

Architects: OMA (Rem Koolhaas)

Completed : 2003

### Introduction

“Collection of books, government publications, periodicals, audio visual materials and the technology to access and distribute information from the physical collection online. The building is divided into eight horizontal layers, each varying in size to fit its function. A structural steel and glass skin unifies the multifaceted form and defines the public spaces in-between(Kiser, K. 2008).”

### Considerations

In the new library the formal exploration is what intrigued me the most. The exploration of appropriate architectural form and space related to a specific function.

Form - The facility is developed in terms of five platforms, each platform is designed to meet the functional requirements for that space.

Surface - OMA chose to unite these five platforms using a lattice frame surface. The steel structure, wraps and covers the entire building, clothing all of the platforms and adapting in density and form to their requirements.



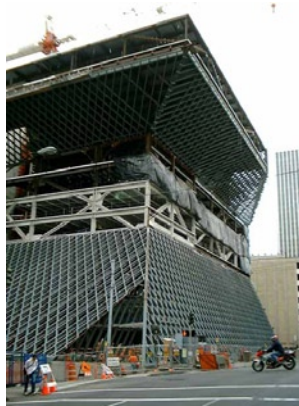


Figure 5.45-47: Facade lattice structure

Figure 5.48,49: Construction details

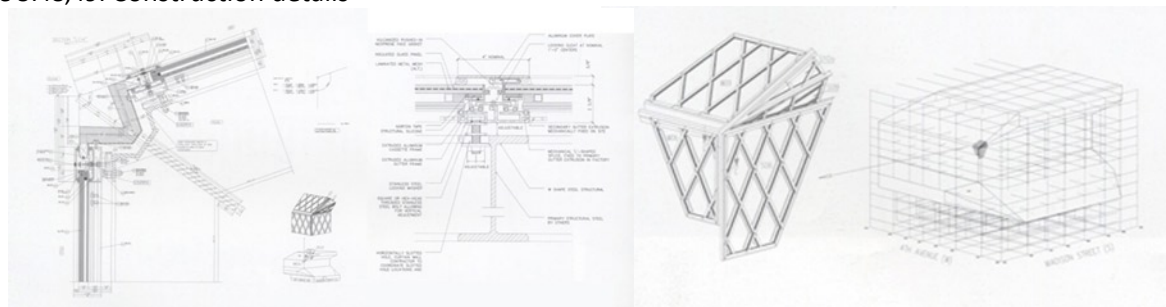
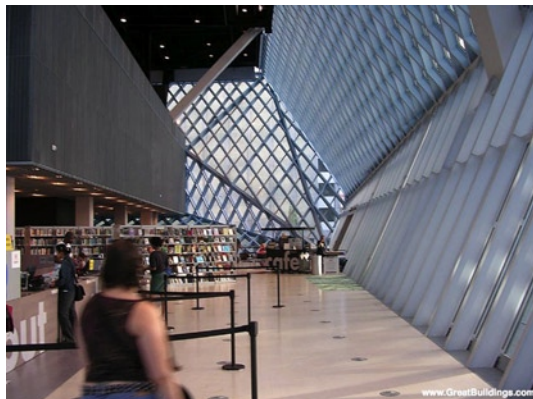


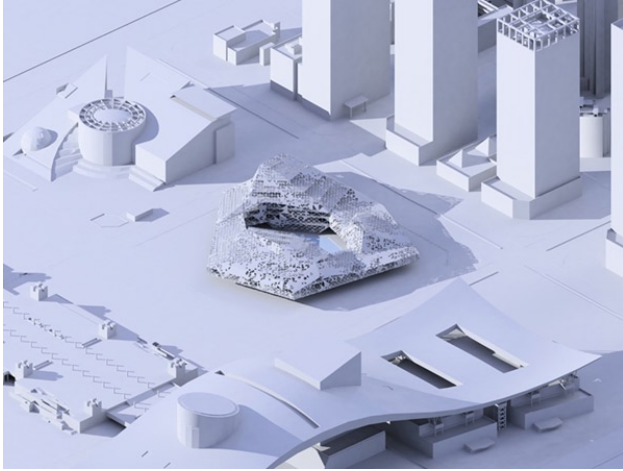
Figure 5.50-52: Construction, Interior and facade design views





## 5.2.4 AUTOLITH

Figure 5.53: Conceptual context rendering



Project: MOCAPÉ, museum of contemporary art & planning exhibition shenzhen  
Location: City of Shenzhen, China  
Architects: SERERO Architects  
Completed : International Competition, Finalist 2007

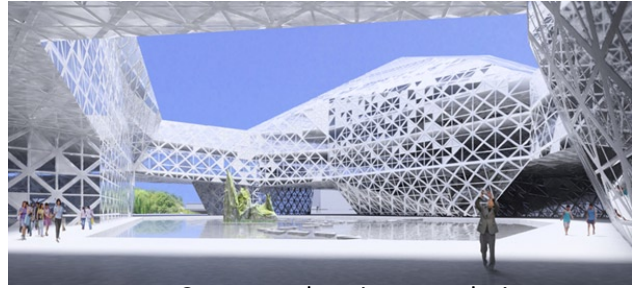


Figure 5.54-57: Conceptual projects renderings

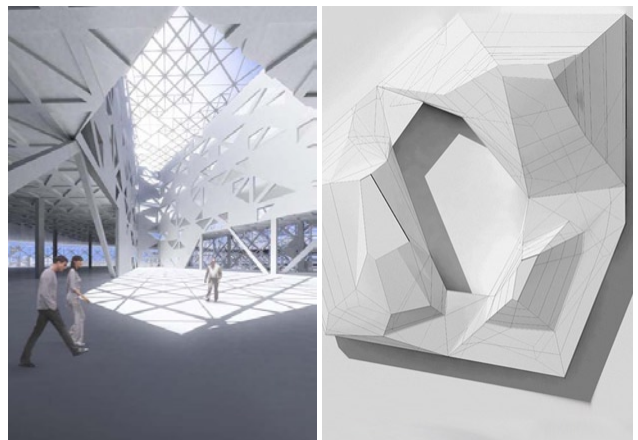
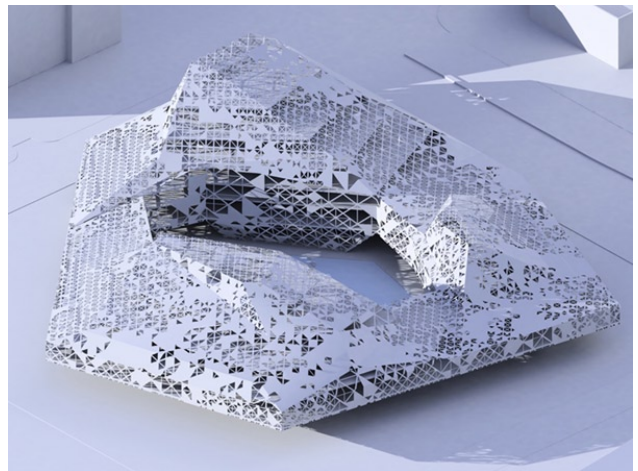
### Introduction

“The MOCAPÉ façade and rooftop system is a continuous surface with glass and steel cladding, which wraps around the whole building. Like the ancient Chinese puzzle, the Tangram, this surface is composed of triangular and square panels. They are creating at 3 different scale a set of figures (both abstract and figurative) which are endlessly changing the amount of light penetrating in the museum spaces and filtering the views to the surrounding buildings and to the museum interior courtyard.

The façade is a structural lattice, which operates at different scale. It combines photovoltaic panels to offset the building energy needs, as well as automatic solar shade systems included in the thickness of the glass to control the museum interior environment (Serero Architects. 2007)”

### Considerations

I studied Serero`s competition entry to better understand the intricate detail that could be developed with the use of a lattice surface structure.





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