Chinese Academy of Sciences IOT Center

About SKEW Collaborative:

SKEW Collaborative is an architecture and research practice that started in 1999 in the city of New York, and currently based in Shanghai and Hong Kong. Facing the need to reconcile these triangulated geographies, the cultural disparities between the cities became the raw material that feeds the studio's work. Through an analysis of culture and the city, SKEW seeks to create architecture that is elegant and relevant, but more critically, architecture that can increase awareness about our cities and natural environment. In every project, SKEW will examine architectural artifacts produced by different cultures in order to design architectural strategies that can bridge, critique and translate between cultures and systems.

Through various professional, research and academic platforms, the design principals of SKEW are committed to an inventive and culturally sensitive design practice. The design principals are currently teaching at the University of Hong Kong in Shanghai and Hong Kong. They have also taught at Columbia, Yale, Princeton Universities, NYU and Pratt Institute. SKEW's work has been featured at acclaimed design events and forums such as the 2004 Venice Biennale, 2004 Singapore Art Festival, 2004 SENI Contemporary Art Exhibition, 2005 ERA05 Copenhagen World Design Congress, 2005 Harvard Asia GSD Tsunami Design Conference, 2007 & 2009 Shenzhen Biennale, 2008 Fondazione Sandretto Re Rebaudengo's YOUprison Exhibition, 2010 Beijing Architecture Biennale, 2011 Chengdu Biennale, and 2011 Singapore Hub-to-Hub Public Art Exhibition.

Re-Generate, Re-Rationalize, Re-Birth

The site for this new exhibition center and laboratories was the former 1962 Soviet-designed low-density office cluster sitting amongst a heavily wooded compound. The architecture of this adaptive-reuse project is predicated on strategic insertions of new forms and voids within the structural framework of the original complex. The dialogue between the new and the old was not just an aesthetic exercise, but also one that is concerned with an enhancement of daylighting, natural ventilation, and the embodiment of new and existing landscape of mature camphor and pine trees. A new fenestration system was developed in order to rationalize and produce new envelopes suitable for the new programs and the environment.

Name of Project:*Chinese Academy of Sciences IOT Center*
Client: Chinese Academy of Sciences
Design Firm: SKEW Collaborative
Principal Architects: H. Koon Wee, Darren Zhou, Eunice Seng
Team: Jose Angel Remon, Chris Zhou, Catherine Wu, Sybren Boomsma, Iris Xu, Crystal Yiu, Zhang Yue, Melody Song

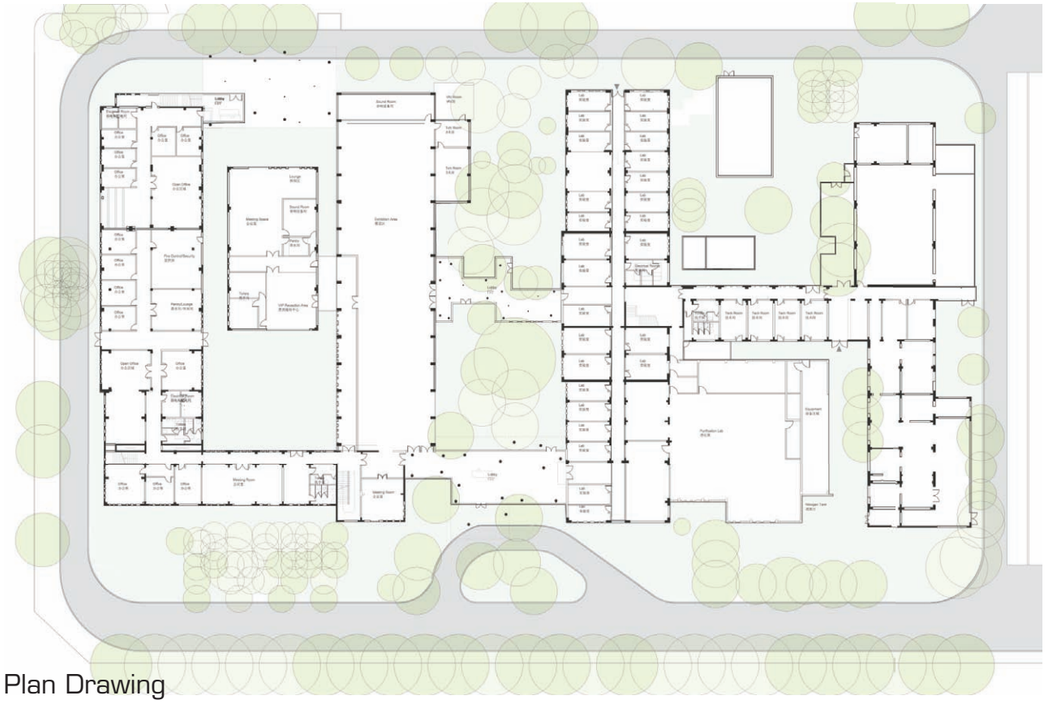
Green Dot Award Category: Build, Industrial

Operating on the Carcass II - Prostheses

The design sought to minimize the carbon footprint of new construction by retaining as much of the existing fabric, with selective demolition and reconstruction. The newly configured complex possesses a series of intimate courtyards that were created by weaving new architecture through forty-five mature trees and existing building structures.

As initially built, the cluster of buildings were separated into two distinct blocks that had accumulated, over time, additional barnacle-like extensions that are haphazardly attached to the main body. These included additional mezzanine levels and blocks constructed out of light-weight materials, and many had independent access points, resulting in a convoluted circulation system and an accumulative structural system. In this way, the site could be read as an archaeological artifact that documents its own history – from initial growth in the 60s through the 90s, to its decline that paralleled the relocation of industry out of Shanghai to the periphery as the city entered into an economy based on skills and services.

The biggest contribution to sustainable building practices for this project was the retention of most of the original fabric, whilst fulfilling the new needs of the client, which included an exhibition hall, laboratories, and offices used by multiple but related departments. The original buildings were reconfigured by borrowing from the accretive logic found onsite – new bridge buildings were inserted to link up the originally disparate blocks, while simultaneously creating new courtyards within the complex. New laboratories, offices and exhibition spaces are organized around these courtyards and terraces on two to three levels, each having views and access to the natural environment.

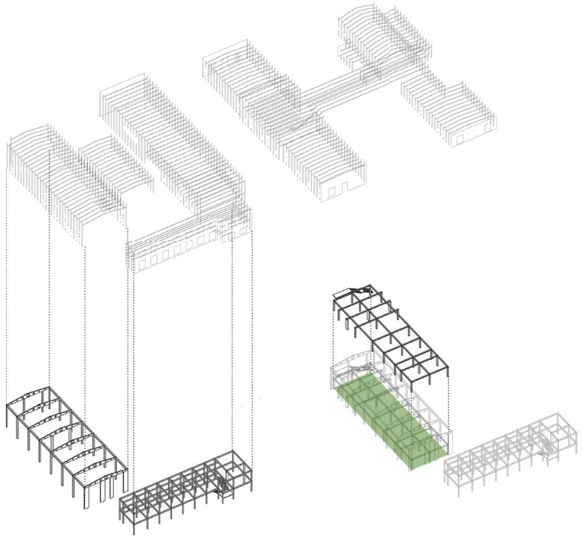


Plan Drawing

Operating on the Carcass II - Surgical Incisions

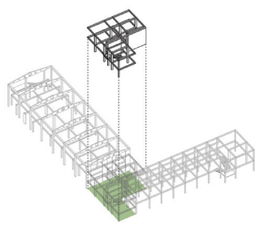
Besides the accretive logic demonstrated in the additions, we also created surgical incisions into the original fabric. Strategic areas were also demolished to enhance natural daylighting, views, ventilation, and circulation between the spaces. Where possible, these newly opened up spaces created outdoor terraces that became social attractors used by the workers. New circulation routes were carved out next to the exterior envelope of the original buildings to form ventilated corridors that required less energy load to condition. The notches also brought light into the deep industrial massings, thereby reducing reliance on artificial lighting systems.

The narrative of the project as a carcass, played out in the accumulative massing of the original site, was evoked through the tectonic moves employed – volumetric projections and subtractions that seem to recall prostheses and incisions – while the complex was linked together through a unified façade treatment.

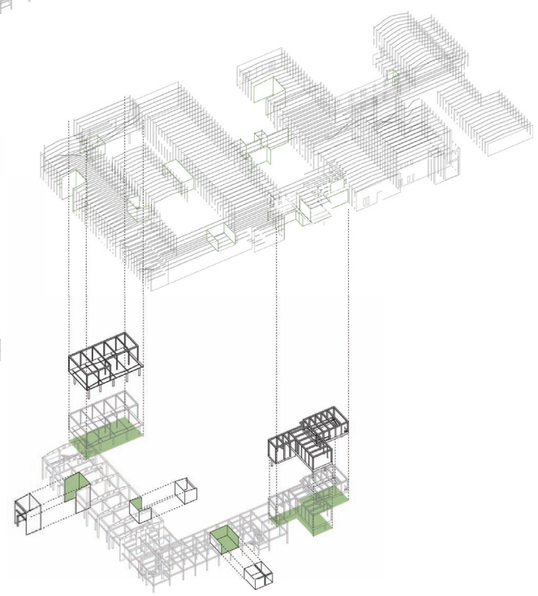


1960s
- Original separate buildings (office and factory)

1980s
- Mezzanine with dedicated access added



1990s
- Connecting block with dedicated access added



2010
- Bridge buildings added to connect original blocks
- Pathway established between all buildings

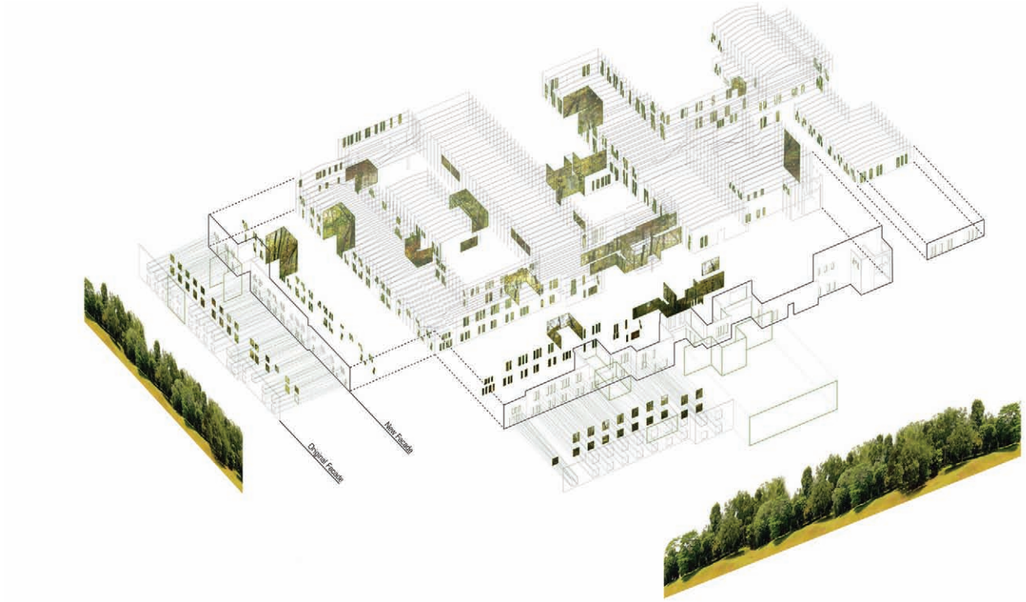
Preserving the Trees

The existing mature camphors and pines were one of the highlights of the site, and the client specifically requested that no mature tree was to be harmed during and after construction. Care was taken to weave the new architecture through the dense foliage without destroying a single tree. To this end, notches were carved out of the new bridge buildings as well as the original carcass, to frame the landscape spatially and visually. Exterior terraces at the level of the tree crowns were created to allow closer relations between the end users and nature, resulting in the effect of literally “walking amongst the trees”.

Framing and Multiplying Nature

Despite having lush foliage on the exterior, the original fenestration scheme of the factory spaces monotonously framed views to the exterior, as was befitting of the buildings' industrial nature. In the redesign of the complex, we wanted to rectify this and to intensify the experience of nature as one traverses the building. A new window organization was designed to echo the organic rhythm of the trees, while providing the user with multiple ways of viewing nature – through grouped windows, long vertical strip windows, large framed openings, and floor-to-ceiling glazing.

This multiplicity is not merely visual but haptic – the façade, through its highly articulated tectonic, literally increases the contact between building and landscape, interior and exterior. At the same time, ventilated corridors permit natural air circulation and light to enter the long spaces, physically bringing the outdoors in through a transition zone, while reducing the overall energy load of the complex.



Nature Multiplied through Framing

The Social and Experiential Drivers of Sustainability

The re-rationalized fenestration broke apart the previously monumental windows of the factory spaces, reflecting the change in program. Sufficient and comfortable levels of light were ensured for the different programs (office, laboratories, exhibition etc), while the smaller windows blended with the scale of the newly subdivided interior, bringing a more humane scale to the workplace. In addition, the thermal envelope was drastically improved through the reduction in glazing, and the replacement of the original windows with insulated glazing and seals.

The Chinese Academy of Sciences IOT Center ultimately tried to humanize a space to what was previously a factory complex meant for heavy duty production. This was ultimately achieved through a careful interweaving of work, social and outdoor spaces. The additions and notches created micro-environments centered around the mature trees, and encouraged a closer relation between the lab and office workers, and nature, while the new façade treatment allowed the end users to experience the landscape in many different ways, while bringing down the overall energy consumption of the complex. In this project, sustainability was not only thought of as building performance, but as an alibi for the increased proximity of man with nature, and ultimately, of man with himself.

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Elevation Drawing

Section Drawing