

## Chengdu Museum, China

*A practice-based output by Architects Sutherland-Hussey. The research investigation is concerned with applying the critically acclaimed architectural design methods devised and used in Stirling's office in Glasgow to an unfamiliar setting and culture in devising Chengdu's new City Museum.*

Submitted by C. Sutherland



## INTRODUCTION

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The focus of all the work of our practice is concerned with 'context' and the genius loci of place. Our work builds upon our experiences as design assistants within the office of James Stirling back in the late 1980s and early 1990s, at a time when his own work had shifted from the technically inventive (eg the Cambridge Library, the Florey building in Oxford and the Leceister Engineering) to an interest in contextualism (such as the StaatsGalerie in Stuttgart and the Tate in London).

Since setting up our own practice in 1996 we have been fascinated with the idea that every place has its own unique qualities, both in terms of its physical qualities and its cultural , political, economic and social characteristics, and that logically the responsibility of the architect is to be sensitive to those unique qualities, to enhance them rather than to destroy them.

As a practice we have been influenced by the ideas first expounded by Ken Frampton in his book *'Towards a Critical Regionalism: Six points for an architecture of resistance'* where he recalls Paul Ricoeur's "how to become modern and to return to sources; how to revive an old, dormant civilization and take part in universal civilization". According to Frampton's proposal, critical regionalism should adopt modern architecture, critically, for its universal progressive qualities but at the same time value should be placed on the geographical context of the building. Emphasis, Frampton says, should be on topography, climate, light; on tectonic form rather than on scenography.

Our Project for the new City Museum in Chengdu presented us with all these challenges and issues in an unfamiliar context and culture touching on another aspect of our work as an extension of our experience within Stirlings office.

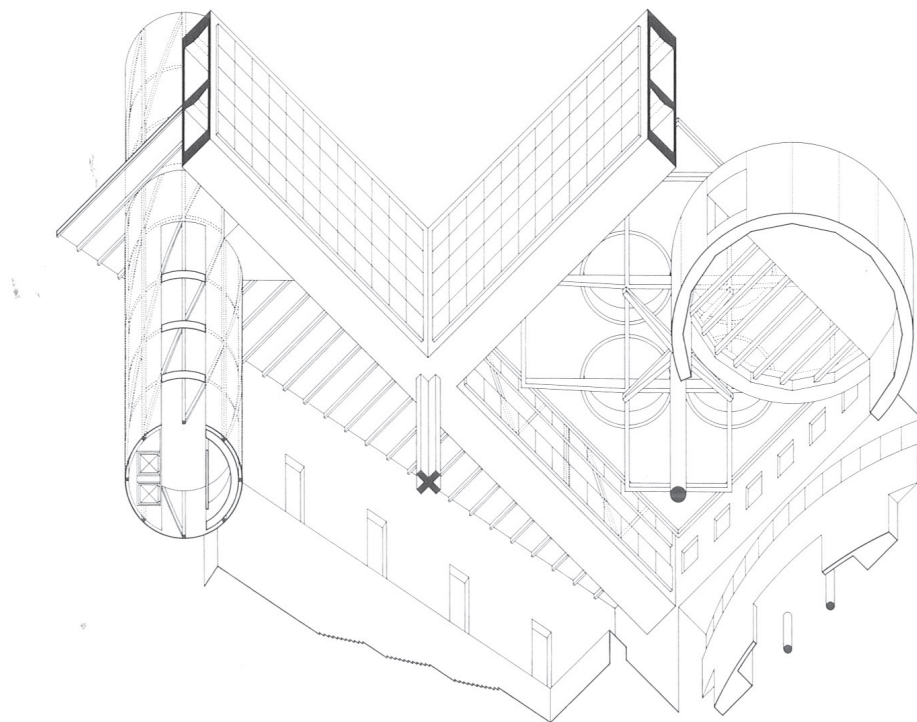


Singapore Arts Centre and the New British Embassy Berlin

We had both been involved in a number of high profile International projects overseas, these included the Temasek Polytechnic Singapore, the Singapore National Arts centre, The New British Embassy Berlin and The State Music School Stuttgart among others,

These were all projects which were conceived designed and controlled from Stirling's London office in Fitzroy Square , and despite the scale complexity and significance of these projects, the office of less than 20 Architects would maintain total control, Artistic and Architectural integrity throughout, mainly by developing a method of defining in strictly hierarchical terms the priorities of a project through a set of highly distilled set of drawings many of which evolved a highly codified language of their own.

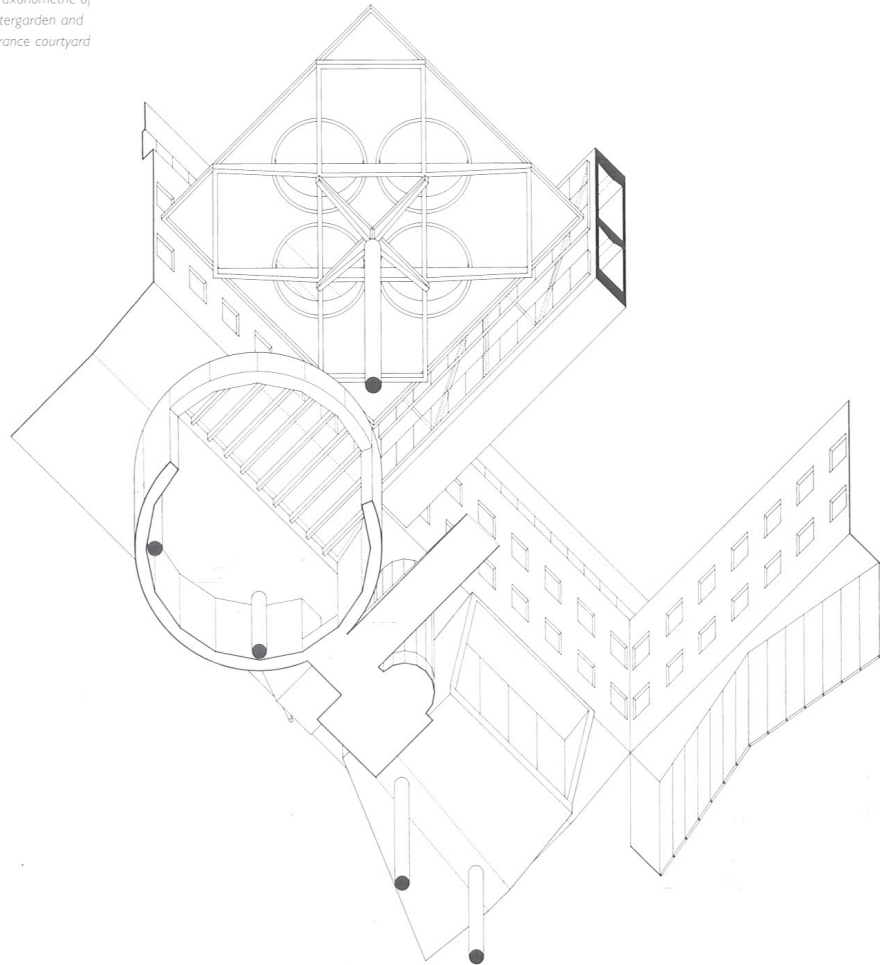
*Up axonometric of  
entrance courtyard  
and wintergarden*



Up view Axonometrics done by CS whilst developing designs for the competition winning New British Embassy Berlin This was typical of the exploratory spatial drawings exploited by Stirling

## CHENGDU MUSEUM, SICHUAN PROVINCE, CHINA

*Up axonometric of  
wintergarden and  
entrance courtyard*



The Cutaway axonometrics as with all design drawings were seen as 'complete' in their own right as a designed drawing and not just information or a means to an end.

The working methods uniquely established by Stirling in his office were ideally suited to delivering International projects of this scale and arguably these methods evolved as a direct result of such projects.

The tightly controlled design nucleus in London would have a delivery partner on the ground in the overseas region, Our experience of this working method and strategic design approach were both critical and influenced greatly the way we approach our work in China

The Chengdu Museum project is an explicit example of these issues in which we are both evolving an architecture within a remote cultural context and how we translate and deliver this successfully. on the other side of the globe.



## NARRATIVE

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The issues surrounding of this project multiple and complex and relate both to the extraordinary economic growth of China and its own development and rediscovery of its cultural past and how we can help contribute to thiiier cultural future,

It is also how we as invited experts engage, interpret and respond to these highly complex political social and historical contexts. We are not simply working with the physical context of site and place We are activley enfaged with the process by which China delivers its cultural policy and locally how this tranlates linto a building with regional cultural and cotextual meaning and relevamnce. Our international collaboration is one significant aspect of this process of finding a balance to these sometimes conflicting agendas.

The other major issue which is raised in this project is the Chinese National policy directive that Western Architects must be part of the conceptual design all Natioanally significant buildings. This has had the consequence that design and consruction of projects in China have been entireley separated and consequently the resolutioun of bulidings are very poor interpretations of the original design intent

The cultural differences and ways of working can mean the experience of collaborating in China very frustrating and the conceptual design stage can often become devalued and treated with very little repect as it becpomes orphaned in this process.

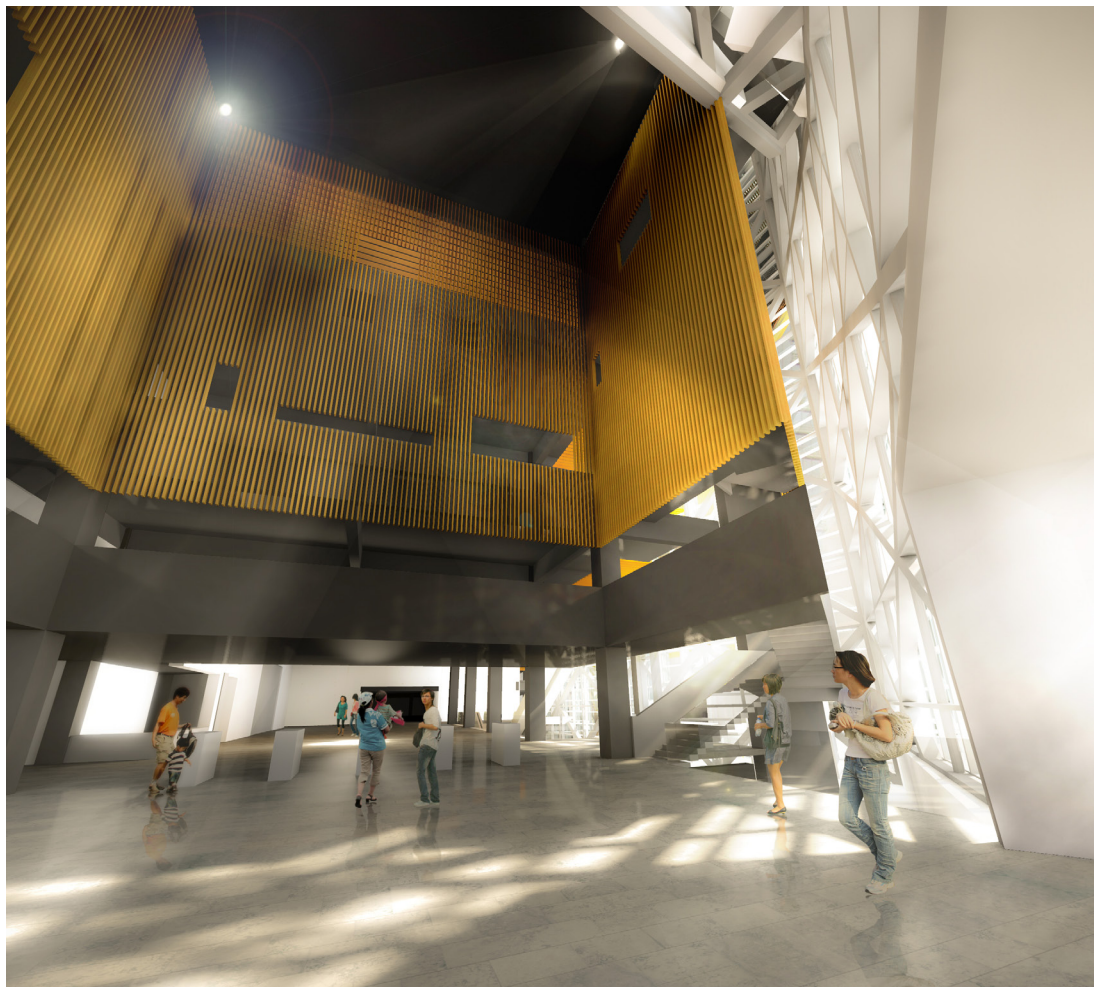


View from Tianfu Square

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This project raises a number of questions related to the Cultural Economic and Political context as well as the fact that we are primarily located nearly five thousand miles distant from the site, the client and the contractor, The key issues related to this are encapsulated and summarised by three main questions:-

1. What are the Architectural challenges of designing museums in China - the cultural differences and the significance of symbolism.
2. Architectural design in China how to retain authorship, quality and integrity of design despite the challenges of distance, language and culture
3. The external expression of a museum - how to embrace and reflect contemporary and historic cultural values and ideas



View of main entrance hall

## CONTEXT

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China's rise as a new global economic power has meant that it has become a frontier land for all those involved in the Construction Industry. The Incredible rate of economic growth has been fuelled by the massive urbanization programme which has necessarily required \China to look outside for expertise and skills.

In 2007 it was reported that China would build 5000 museums in the following five years as part of a national programme to rediscover their heritage and to promote international tourism

The previous and extant generations of Building professionals were all schooled in the science of building with an emphasis on engineering and planning. The culture of Architecture and design was limited, and the delivery of design was entirely state controlled through the huge design Institutes, the only licenced Architectural practices with the legal authority to practice in China

The skills transfer required to deliver these national policies needed to be rapid and immediate and many collaborations and partnerships were established in the early 21st century between Western practices and Chinese design Institutes to facilitate this need.

The method by which all public contracts are awarded in China is through the competition process, normally Internationally Invited participants. The process is very heavily driven by careerist politicians who use development and Architecture as evidence of their individual achievements in office.

The Chengdu museum competition was the culmination of a long process on behalf of the culture bureau in Chengdu, having secured the site at the time of the formation of Tianfu square in 2003. A proposal by American Chinese Architect IM Pei, the Architect for the Louvre extension in Paris was rejected by the city and an International competition was initiated

The Capital Museum in Beijing had recently been completed and in terms of scale the Chengdu museum would be slightly larger at a total of 65,000 square metres but was to be an equivalent City Museum curating artefacts from earliest Archaeological discoveries and





**The Beijing Capital Museum, slightly smaller than the Chendu City Museum at 63,000 SqM**

civilizations through to contemporary Chengdu artefacts and these could range in scale from a dinosaur to a jade burial artefact

The competition was largely focussed on identifying a formal Architectural response and to understand ones attitude to the site in terms of scale and massing, and ones contextual and cultural response to the city. Very little information was given in terms of a programme or detailed briefing. In contrast to the way that competitions are carried out in Europe the

Major urban scale issues would be addressed before detailed designs were developed. This was a complete departure from our normal method of working which encouraged us to present abstract ideas and concepts with little or no requirement to demonstrate or prove the detailed resolution of internal planning and organisation. The major concern and criteria for judging the success of the submission was



1. The overall shape, scale and massing in relation to Tianfu Square
2. The massing relationship to the historic Muslim temple at the rear of the site
3. The pedestrian and vehicle flow and sequence of entry
4. The expression of the museum and how it is represented in the city

The expectation in Chinese competitions is that as a conceptual design proposal, the design intent and concept would establish the guiding principles which would determine the subsequent stages of refinement including the budget. The primary purpose was to find a strong and robust concept which could readily communicate the essential idea.



**V and A ,Dundee An example of a typical Western competition submission**

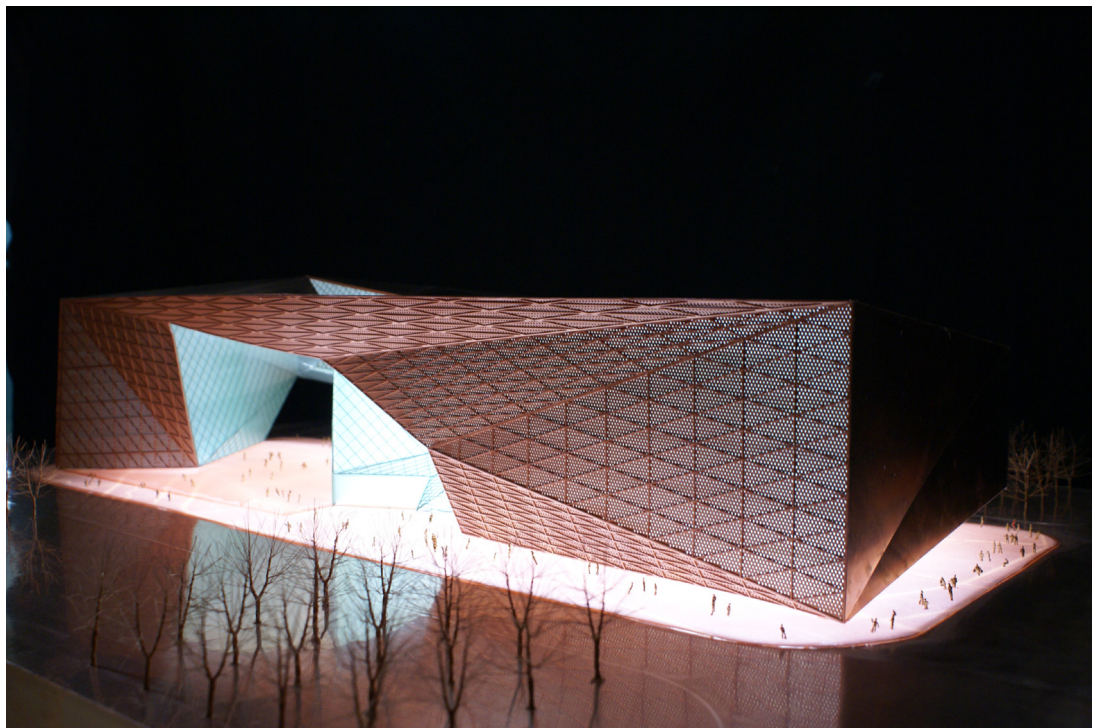
By way of example our submission for the invited International competition for the new V&A in Dundee was a traditional European competition requiring an extensive and thorough presentation which in addition to the civic and urban issues was to include all interior design with full costings and 1:100 scale models. This required a fully resolved proposal which would meet with the curatorial aims and building standards with strict judging criteria that all designs would be independently costed and any deemed to be outside the budget would be rejected. (the winning proposal was 3x the scale of all other proposals and clearly over budget)

Being awarded first place in the conceptual design stage effectively handed ownership of our design to the Chinese state at which point the second stage of realisation would commence.

This process of procuring public buildings in China is generally designed to ensure that the realisation phase is carried out by only the State run and licenced design Institutes and that the design Architects, not being licenced to practice in China beyond Conceptual stage planning, have no further involvement or responsibility

In order to secure the realisation stage, we entered a joint venture agreement with Pansoulution International to secure the right to carry out the realisation stage in a second stage tender in 2010

By securing with our partners the critical design realisation packages we secured a significant role through to the completion of the project .which is a highly unusual situation for Western collaborations in China and could be seen as a model for future collaborations.



**Competition model for Chengdu City Museum**

The design process involved a number of tools and procedures: and is separated into two stages, the competition, and post competition as they employ markedly different methods

1. The initial design process was a rapid and exploratory series of small scale urban model making, testing the programme on the site and formal arrangements to provoke discussion with the Director of the museum in a series of briefing discussions prior to the competition submission
2. A rapid series of research site visits which explored the cultural and historical context of Chengdu through a series of meetings with several mayors/poets/artists from the city to discuss the wider cultural influences from understanding the Geology and the geography of the city which defended the city as a haven for artists, to its historical status as the melting pot of the tribes, and the significance of shadow play theatre.
3. The final design stage for the competition submission was focussed on synthesising the raw research material we had gathered along with what we had learned through testing studies into a culturally loaded if not overloaded artefact
4. The representation of the design was the coalescence of an interchange of ideas metaphors and images between Edinburgh and Beijing which reiterated and refocussed the design representation to reinforce the core ideas which underpinned the design, a highly visual presentation which could express the ideas without words.



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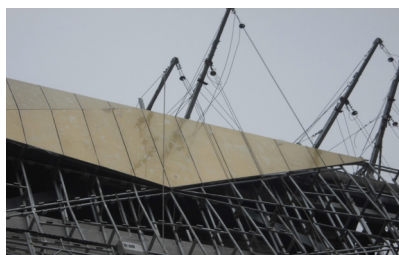
The process which we had to develop for this project was largely down to the logistical challenges of communication, methods of representation and the understanding of the cultural context.

We drew upon our previous experiences of working with partners abroad within Sir James Stirlings office and along with rapid methods of digital modelling which could explain ideas and concepts very quickly and easy methods of transferring information to China.

For instance the final iteration of the model was developed within two to three days of intensive modelling in Edinburgh which formed the basis for a team of Beijing animators and renderers to produce films and stills for the final presentation and to produce a 1:200 physical model within a matter of days before the presentation.

## POST COMPETITION

1. Physical and digital models exploring the spatial and programmatic needs of the museum and to help the museum director and the team understand the complex spatial geometries and to test and explore the building and its integration with structure and services.
2. Parametric modeling methods employed from an early stage to develop quick methods of adjusting complex interrelated geometries of the skin and scripting developed to generate the folded subdivision automatically and for all production information of the developed skin drawings to be generated from the model.
3. Extensive modelling in Microstation GC and Rhino to develop the skin geometry and the topological issues of establishing parallel structural planes
4. Research into the copper alloy material from sourcing the supplier to the manufacture and installation and fabrication including an extensive research visits to Europe to understand the fabrication limitations and possibilities at the factory, and to research the application of the material in several significant projects in Germany Finland and UK to understand the effects of oxidation maintenance and different methods of installation
5. Full size testing of copper alloy mesh and cable facade assemblies to research visual appearance and detail assembly issues
6. On going full size mock ups and assemblies to test combinations of panels mesh and glazing



copper alloy test panels



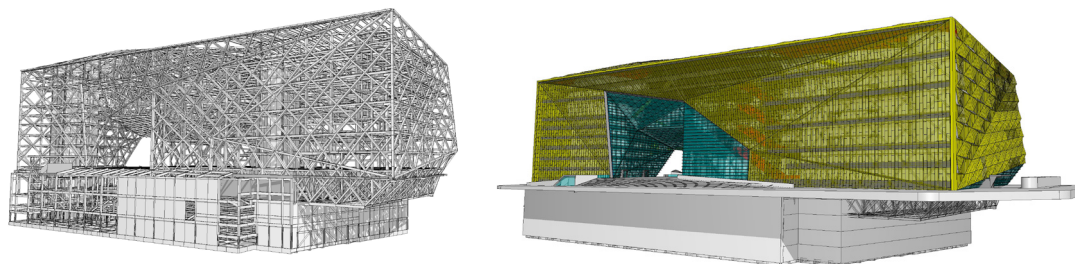


copper alloy and mesh test panels

The Post competition methodology was essentially to enable design development and delivery. The normal course of events would have ensured that the design would have passed to the Design Institute without any reference to us but our method of developing the design involved a constant iteration of digital models in Microstation which we retained ownership and control of in Edinburgh.

The design Institute tried to find alternative methods of reproducing our models even resorting to hiring rendering companies to try and replicate the design, however without our original model and our input this proved impossible to reproduce.

Our method and strategy of retaining all the information within a single model was both efficient in coordinating and communication but also ensured that the integrity of the project was maintained and our involvement beyond what would normally be expected in China..



Microstation model which contains all the geometric and constructional information

## **Context and Research Methods**

### **COMPETITION**

The research methods employed at the initial stages of the design were in a very large part led and directed by our local partners, We recorded through film and photography the city and having access through existing projects much of the hinterland and landscape beyond a highly significant influencing factor on why Chengdu exists.

We also had access to many politicians who were more than willing to give opinions and direction along with local artists/ poets who could give a more measured perspective we interviewed and provoked the director of the Museum to give a curatorial context and vision and responded to a number of his personal interests and collections which the museum was developing particularly the Shadow play collection which was the largest in China.

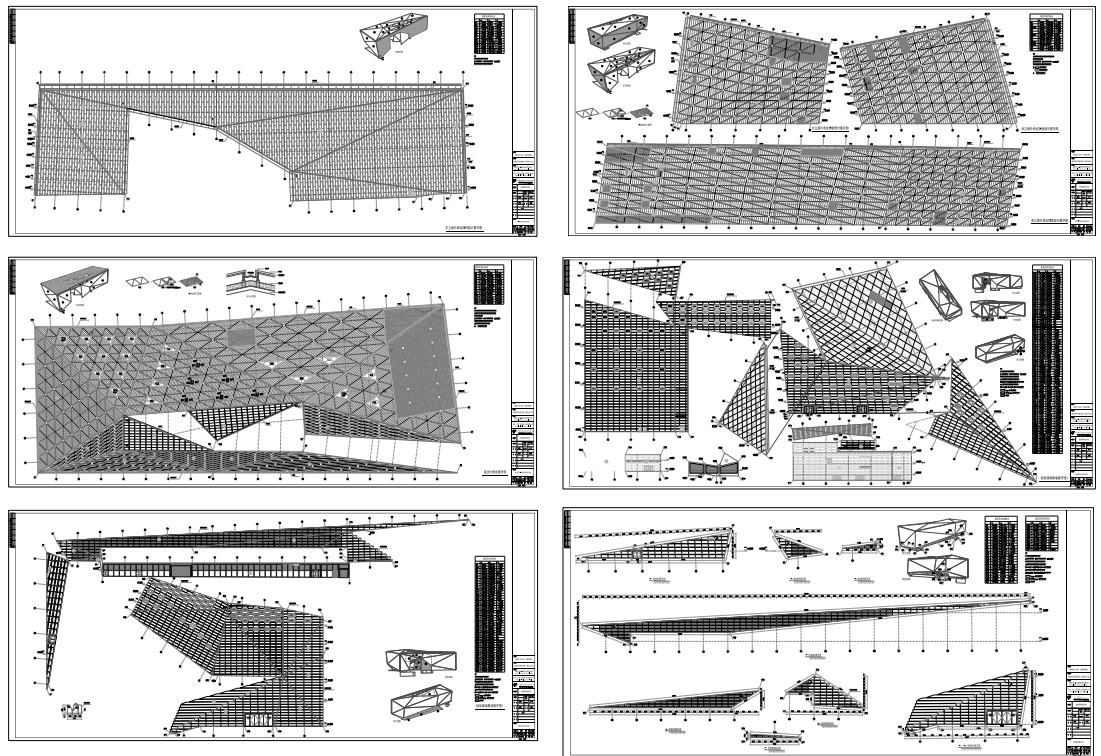
The daily life of Chengdu and the habits and customs were observed and recorded revealing the phenomena of 'grey space' the covered public space which allows for gathering in climatic extremes in Chengdu and the understanding that the city as a gateway to the mountains and the himalayan trails is a haven and meeting point for many tribes and ethnic groups creating a multi diverse and vibrant city,

The view of a city or culture through foreign eyes is sometimes an advantage when observing and recording and this process was as revealing to our partners as ourselves and allowed for fruitful interpretations of our ideas into more culturally resonant expression.

### **POST COMPETITION**

Post Competition the methods became much more exacting and about how to deliver a high quality building of a highly complex nature in a country which does not have a culture of precision

The design development became about how to be as strategic as possible to allow for the tolerances that may be required during construction and where to focus one's efforts to ensure that the best result could be achieved within the budget and programme.



Production information for the skin fabrication generated from the 3D model

The main area of research developed from the geometrical and physical issues related to the skin. The main structure for the building is a diagrid which follows the geometry of the outer skin and provides a column free interior which allows the 30 M free spanning spaces required by the exhibition halls.

Structurally the diagrid required that all the centroids of structure meet at the corners. Visually we also required that all the external visual planes meet at the corners. It was also a requirement that the structure and the skin were parallel and within a certain range of dimensional variables.

This created a topological problem which had to be resolved and we employed Microstation Generative Components and Rhino to both explore how to achieve and to test and check that the parallel planes were within the dimensional range. We also had to ensure that the centroid planes and the skin planes were all flat and fully enclosed and meeting precisely at every fold and corner.



The methods use to test adjust and verify these parameters could only be achieved using parametric design and scripting tools

Other methods employed to ensure quality and deliverability were largely to understand the limitations of the Chinese market and abilities of site operatives

Research into ways of prefabricating the skin as much as possible would ensure the best result and much effort went into determining the best material, its manufacture and once it was established it could only be a European supplier how to ensure fabrication quality in China a great deal of materials research was carried out to establish the thickness and optimum size of panel



Research trip photographs on the use of copper alloy

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## AIMS AND OBJECTIVES

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### **1. *The Architectural challenges of designing museums in China - the cultural differences and the significance of symbolism.***

The Contemporary Museum is a new typology in China. The legacy from Chairman Mao's cultural Revolution where wholesale destruction of the old was the corollary of the 'the great leap forward'

Many museums in China are designed around abstract ideas and do not necessarily contain artefacts as we might expect in the West, and one can generally find a museum curating almost anything, and in many cases they are simply glorified retail stores. The Great tradition of the 'collection' which formed the basis of many museums in the West does not significantly exist yet in the public realm.

Outside of the first tier cities the provinces are largely bereft of any cultural institutions and the most significant buildings are either historic relics or Hotels or other commercial activities. The desire to create a new unique identity for these aspiring new conurbations is great and many new urban design proposals are centred around a civic core comprising the Party headquarters, an opera house and a city museum as a bare minimum

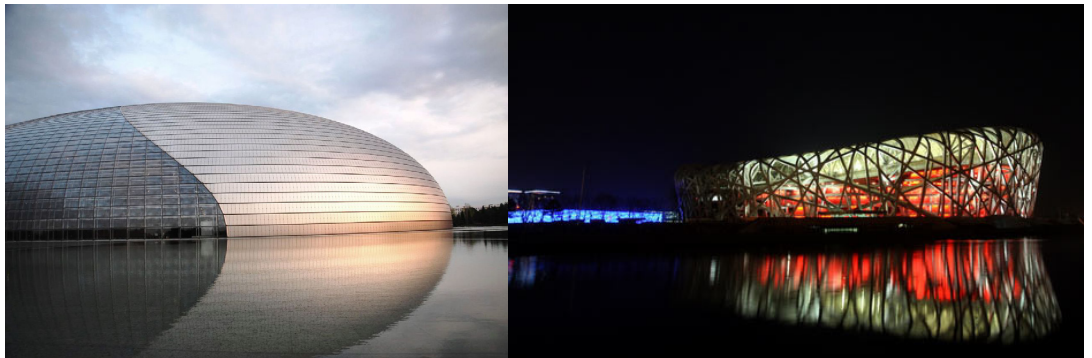
The pressures on these buildings to shake off the grey monotony of the communist era is so great and the desire for the mayor to make a name within the party, that these invariably take the form of the most exotic fruit imaginable and become very quickly a building of empty rhetoric and gesture without the content or substance to sustain a museum as we know it

The challenges we faced on arriving in Chengdu in 2007 were not entirely clear to us and our modus operandi was to approach the project like any other through thorough extensive research, analysis and testing

It is clear on reflection that this 'innocence' to the bigger question of designing museums in China and the context and circumstances surrounding the procurement of a new museum was clearly an advantage to us.

Architectural proposals in China at conceptual design stage always rely heavily upon metaphor and symbolism making direct reference to Chinese culture and history many are tried and tested and have become very overused and formulaic and consequently perceived as a kind of cliché. The design for Tianfu square is a prime example of this using the ying and yang as its inspiration for the design.

The Duck egg, form of the Beijing Opera by Paul Andreu is a simple and direct metaphor and the famous Bird's Nest by Herzog and DeMeuron and Ai Weiwei both create a very strong visual impact which also sustains the design through from conceptual design to realisation



Example of the visual metaphor in China the 'Duck egg' and the 'Bird's nest'

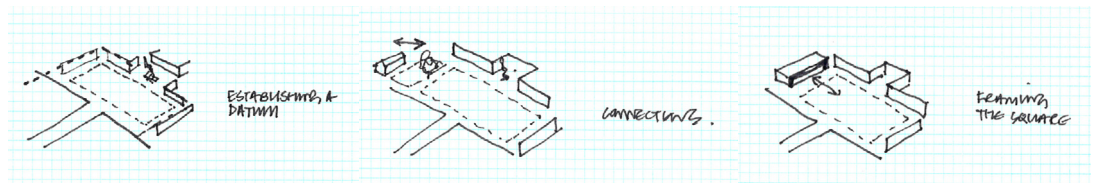
As we had no real experience of this phenomena our research had led us to look at more obscure and less obvious references as a means of searching for meaning and relevance to local and more directly relevant sources and the geology and rock formations of the region and the folding geometries of tangram were influential and the fretwork and craft and the play of light used in the traditional shadow play theatre became crucial sources

Another symptom of China's highly visual culture, is that everything is judged immediately upon the impact of first visual impression. We were guided heavily by our partners in this respect but our working method in Edinburgh was already very visually based, Much of our work is virtual and we test all our ideas through modelling and constant visually assessing the developing ideas through real time rendering.

*( this is a method we used in Stirlings office translated into the digital era, we would constantly manually update a series of three dimensional line drawings from all angles up down and from each cardinal position to 'test' the visual impact of development this is a lot quicker with a digital model )*

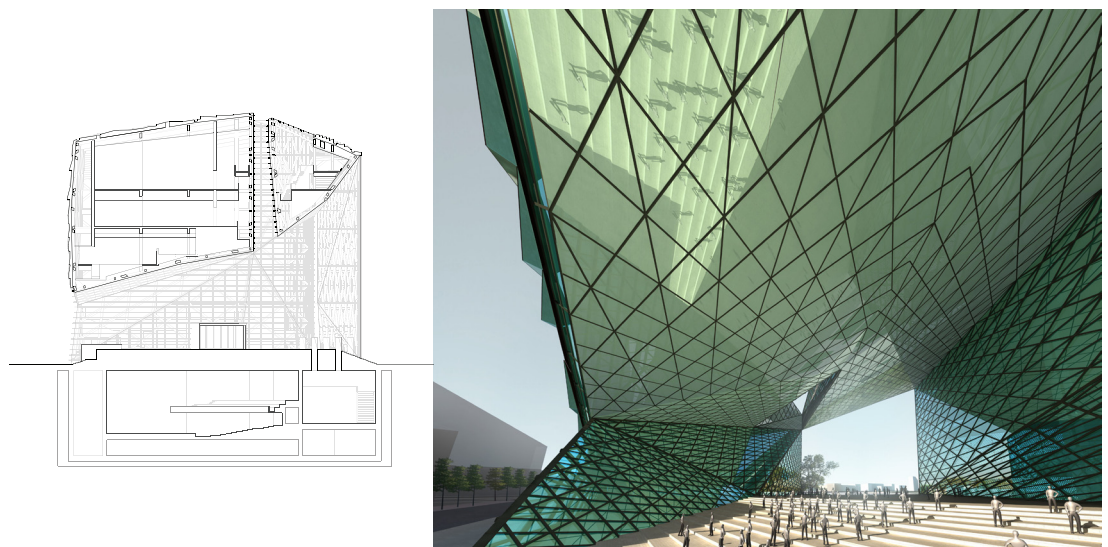
So when it came to representing ideas visually we had evolved the visual language inherently in the design model

The biggest challenge for us Architecturally was trying to resist the strong desire of our partners and the briefing discussions to produce a building with a strong symbolic shape or form the default position in Chinese culture is that important buildings should be expressive and a varied skyline was almost demanded by the brief.



We felt very strongly from our own judgement and perhaps our western sensibility that Tianfu was such a large urban space and that along with the existing science museum to the North that the museum should have an emphatically strong datum and that the building should help to define this enormous urban space.

In order to achieve this we developed a formal Architectural strategy which maximised the building profile to the allowable planning maximum and within this volume we carved away the public space as a 'grey space' under the building, this allowed the building to fill the entire west side of the square to 'hold' and address the grand space of Tianfu square and yet still create the external public realm required as a forecourt for a building of such status



Tradition of 'Grey space' in Chengdu covered public space for gathering and events

**2. *Architectural design in China how to retain authorship, quality and integrity of design despite the challenges of distance, language and culture***

The issue of design copyright in China is very well known and along with all design from cars to fashion it is both copied remorselessly and without sanction

Architectural design is always a difficult territory to defend in any country there are always elements of design which are copied and imitated and this is referred to as referencing and in the natural evolution of architecture it is rare to see truly original work

In China there are cases recently where wholesale copying has occurred as in the Zaha Hadid SoHo development in Beijing and quite a few reproductions such as Le Corbusier's Ronchamp



Example of reproduction buildings in China Le Corbusier's Chapel at Ronchamp

In these cases it is after the event plagiarism and Zaha Hadid has been on record as saying she finds it 'flattering'

More of an issue is where a design, originated by an Architect through a competition, is given to another Architect or Institute to realise, which is explained earlier in the research methods section

In this case the design is generally very poorly executed and authorship is passed to the Institute who realised the building.

There were a number of ways in which we managed to address and circumvent these issues arising in the design development of Chengdu Museum after the competition stage.

Firstly it was immediately acknowledged by the clients and the judges, when the result was announced on the day of the presentations, that the design was markedly different from the other competitors to such a degree that the originality of the design was clearly established.



In some cases the first place may be awarded some weeks after the presentations other elements of other entries might be 'adopted' by favoured competitors which in some cases results in virtually copying other entries before announcing the result.

It was also clear that although the urban design and external formal design of the museum was developed and resolved, the integration of a detailed programme was not, and that a lot of work had to be done with the culture department and the museum staff to develop this beyond the strategic planning we had proposed.

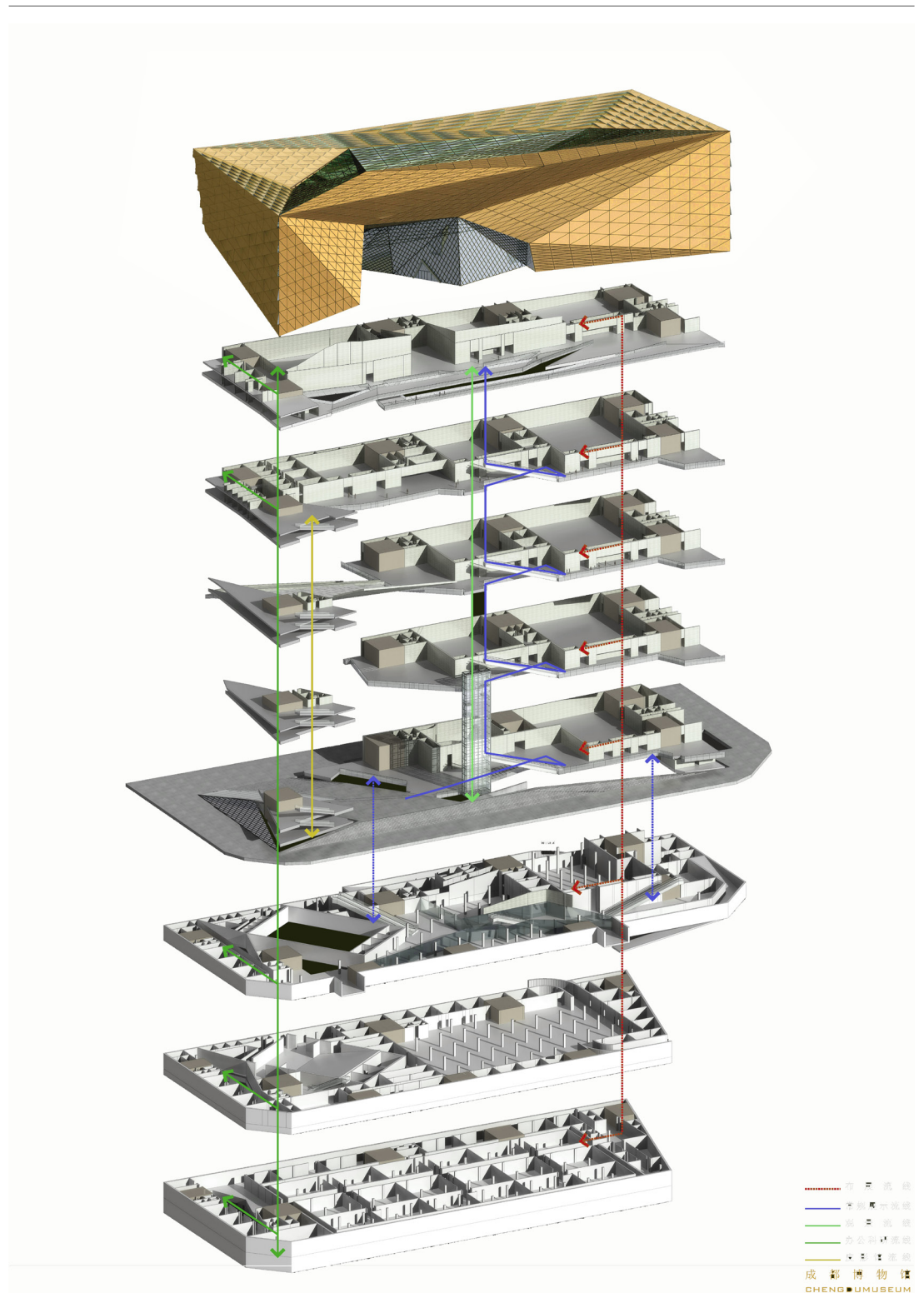
This would normally not have been a problem in that a regular design solution could have been adopted by any Architect and the interior planning developed. However the design we presented required that the internal planning would involve a lot more three dimensional and spatial planning and organisation to work within a highly complex envelope, and we were very careful to retain all the live digital information in a particular model format in Edinburgh.

Secondly an equally critical aspect of retaining authorship was linked to our collaboration with our partners, Pansoulution International in Beijing.

We had established a very good working relationship and understanding by recently completing a commission for the design of a new National park and a number of buildings in the Xiling mountains an hour from Chengdu city.

The understanding reached was that we would be responsible for all design issues and retain creative control of the entire project until completion and that we would develop all the design drawings and models and be responsible for the design coordination between consultants, Their responsibility was for the communication and coordination with clients and consultants and that after the awarding of the detailed design contract they would be responsible for the delivery of all tender and production information drawings

This split of responsibility was the same way in which we would work in Stirlings office when delivering a design overseas. We also developed the design drawings in the same way, these would be models which defined the only spatial profile and material and be a template for other consultants to input the information, any conflict would be highlighted and resolved by SHA in Edinburgh.

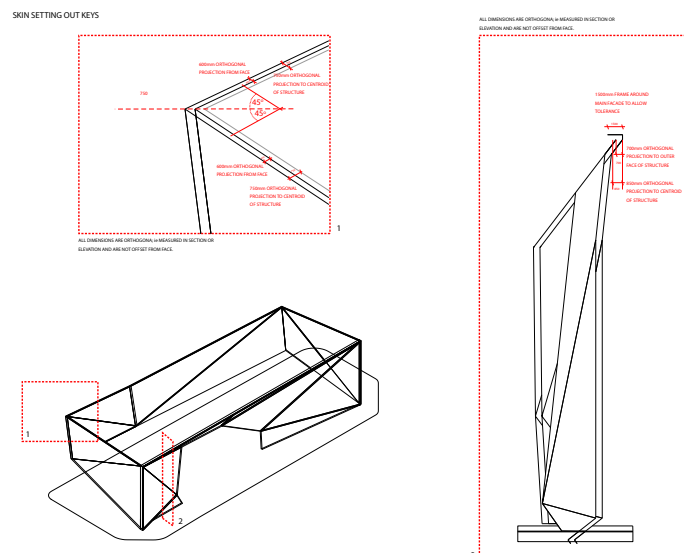


The Museum's internal programme developed in detail once the overall urban form had been developed and refined.

A significant crisis arose when having completed the design drawings and the project had to be tendered for the realisation stage, we formed a three way consortium between Sutherland Hussey, Pansoloution and CAPDI a Beijing based design Institute

As soon as we were awarded the contract the design Institute decided that our services would no longer be required and they could complete that project without us and for a period of about one year they developed the structural model without any reference to the skin design

As described in the earlier sections the diagrid structural model had been developed following pure structural principles whereby the centroids of all the diagrid frames would all meet perfectly this would mean that the folded skin surfaces offset by about 900mm would consequently not all meet at one point and so was visually a total disaster.



The topological problem of the skin being fitted over the structural frame required a series of translations to be carefully considered and mapped to ensure all the geometries of skin and structure would all fit together

Having endeavoured to find local Beijing Architects and rendering companies to resolve the mess they had created they were eventually forced to concede that we were the only people who understood the design principles and could resolve the problem.

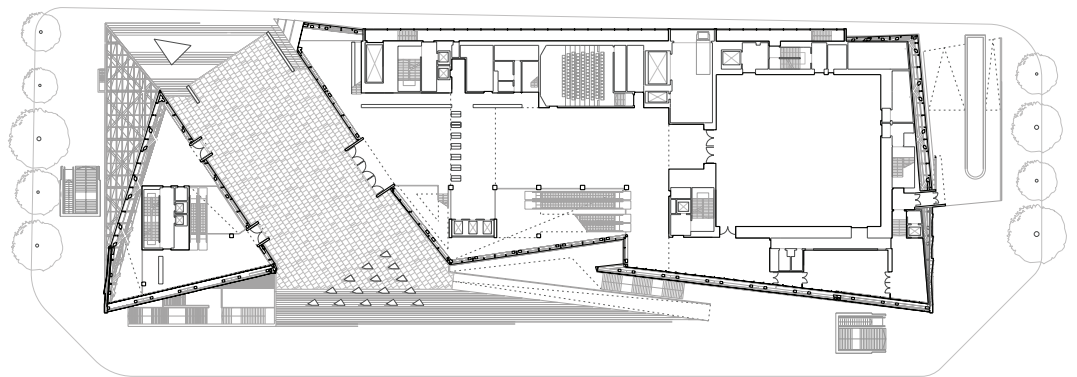
This hiatus ensured that we were reinstated with entire design responsibility for the skin the major interior public spaces and the landscape with Pansoloution delivering all tender and production information.

## CHENGDU MUSEUM, SICHUAN PROVINCE, CHINA

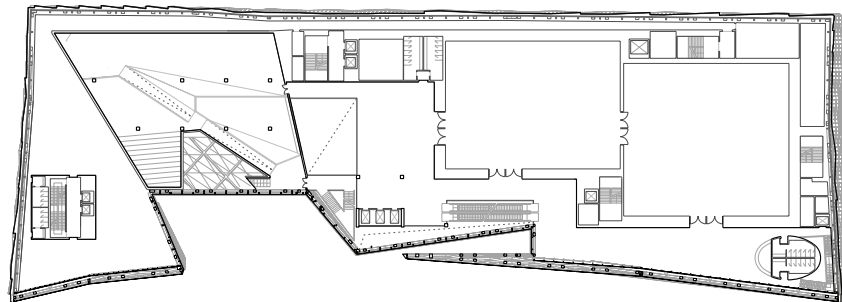
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Since completing the production information for all these packages we are now retained by the clients for site supervision stages of all these untill completion This is a highly unusual situation whereby we carry design authority over the design institute for all visual issues related to the completion of the building

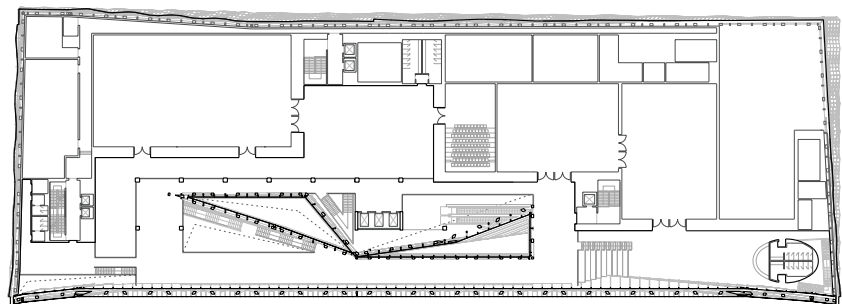
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Entrance level plan



Mid level plan



Upper level plan



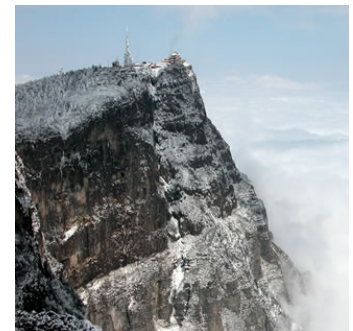
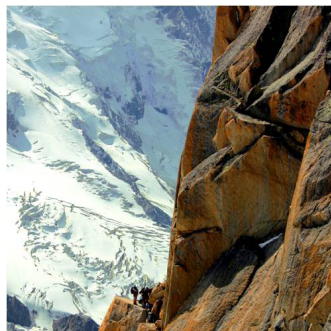
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3. ***The external expression of a museum - how to embrace and reflect contemporary and historic cultural values and ideas***

The external expression of Chengdu museum has evolved from a number of varied and different sources. The formal resolution is not only the product of a number of urban concerns explained earlier, the scale and response to the square and the need to create an appropriately scaled building, but also a concern that the building should somehow be an expression of the precious artefacts held within.

**Formal expression**

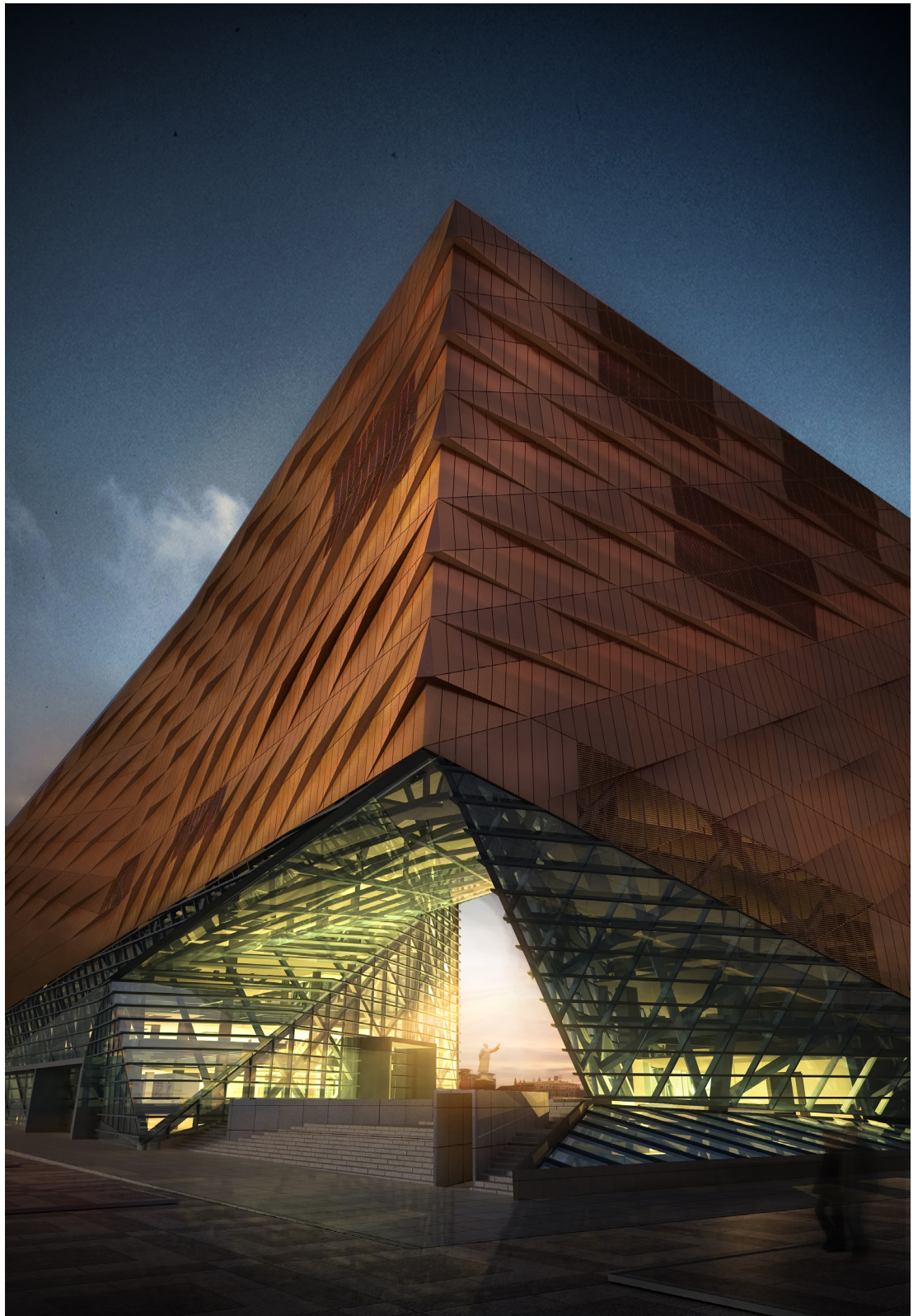
Contemporary museum design, particularly on a site with four public facades and a long dimension of 170M, has a real issue when it comes to the expression of the building to the city. All the museum exhibition spaces are essentially black boxes with conservation and curatorial control demanding a very high standard of climatic control and with a very limited number of spaces actually requiring direct light and air, the issue of the undifferentiated wall becomes a seriously problematic expression. For the North, South and West facades.



Geological formations and mountains of the region are an inspiration for the monolithic mass of the body of the Museum.

Our attitude was to accept and to work with this monolithic quality and to reference time by adopting a posture borne from the massive spirit and scale of a geological rock formation akin to the spectacular mountain ranges which surround the Chengdu city basin.

It emerges from the earth as if forged from below (acknowledging to the huge amount of accommodation lurking below ground) and the giant cleft through the building akin to a hewn crevice or cave—a parting which accommodates a natural pedestrian desire line through the site and forms a covered entrance portal and forecourt.



The Approach through the Mountains to the Chengdu basin was how many visitors would first encounter the city - analogous to the cut through the site and under the mass of the museum to Tianfu Square (Charman Mao is hailing a taxi in the distance)

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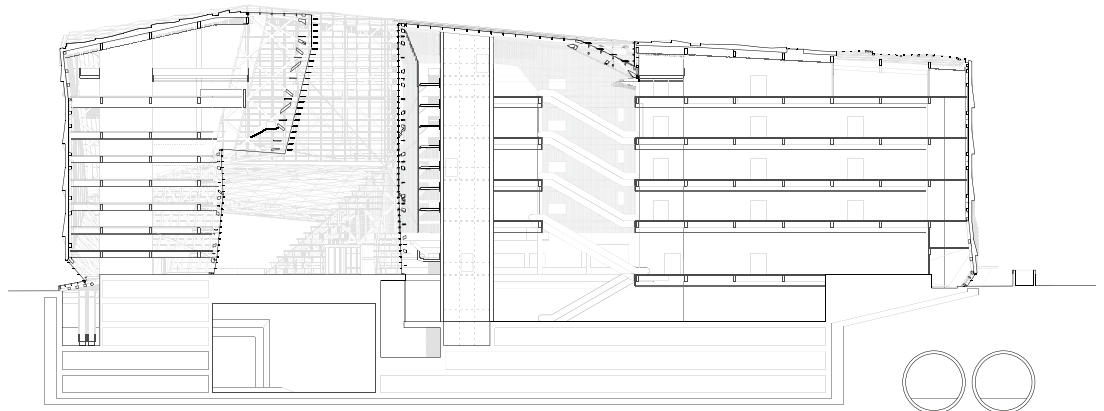


This asymmetric and dynamic form is reconciled on the East facade facing the square into a formal 'gate' contained by a strict and composed rectilinear geometry. This acknowledges the civic responsibility of the 'Face' to the city.

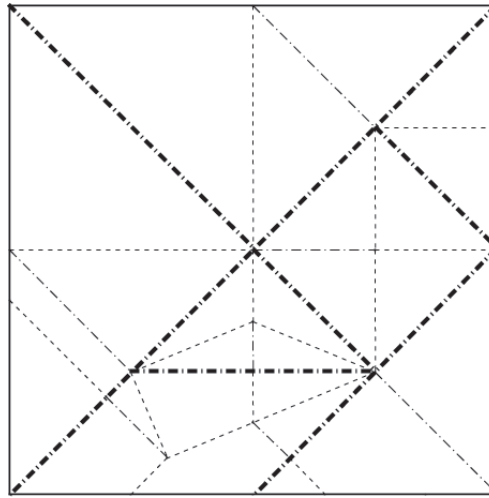


The primary structure completed in 2012

The dynamic flexing of the external form is a result of the opportunity which was exploited from a number of engineering issues being addressed. Firstly the museum is within a category III earthquake region which demands that the structure resist up to 8 on the Richter scale. Secondly a briefing requirement for 30M clear span in the exhibition halls. Finally the newly constructed subway passes under the North part of the site demanding that the superstructure cantilever around 30M to avoid any loads passing through to the tunnels below.



The diagrid structure is designed to withstand an earthquake of 8 on the Richter scale and cantilever over the subway and span the gateway opening through the site (the shadow play theatre is located in the basement below this cut through).



The Tangram an early source of inspiration for the folded geometry of the external form for the Museum

The Diagrid structure proposed creates a very stiff structure which while resisting earthquake can also span and cantilever large distances and negotiate the folding geometry and profile of the external form



Seattle library and the De young museum San Francisco both exploit the structure to great visual effect and inextricably linked to their formal expression.

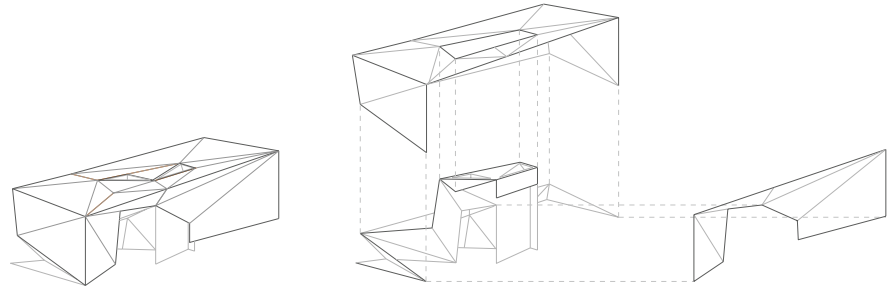
This is a contemporary use of structure which in other examples such as the De young museum in San Francisco by Herzog and DeMeuron and the Seattle library by Rem Koolhaas is used to solve structural challenges but intimately linked if not intrinsic to the Architectural and formal expression of the building.

On the east facade this expression of the form and structure is at its clearest, the entire facade is open to the square with the diagrid structure forming the armature to support a veil or mask of transparent layers of glass and copper mesh.



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## Material Expression



The carapace of copper alloy contains a crystalline internal landscape of glass. The 'face' to the square is an open fretwork of Copper mesh as a veil or screen to the foyers behind.

If the timeless quality is expressed in the monolithic form, the idea of the rare and precious artefact is expressed through the material and crafted quality of the skin.

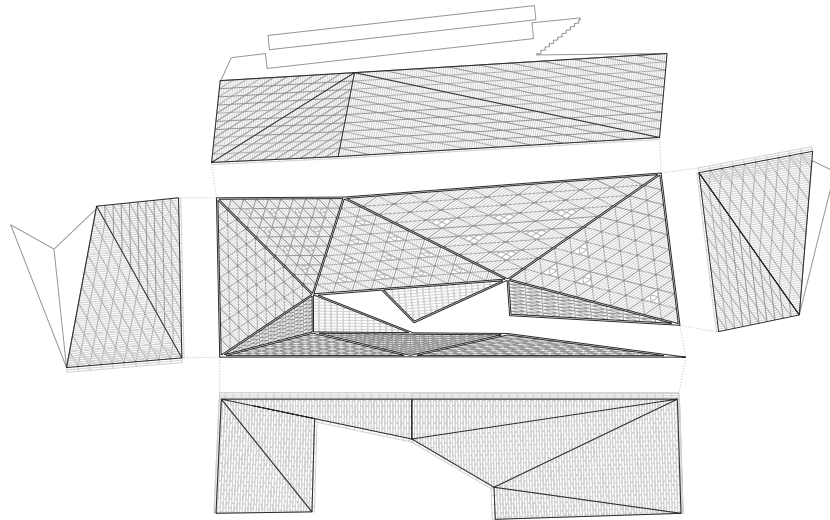
During our research we extensively studied the museum's collections. The director Mr Wang Yi is a very well renowned Archaeologist in China and gave us access to much of the archives. What was most striking about some of the most ancient and precious artefacts was the material quality: jade, gold, copper and bronze – rich and lustrous cultural icons laden with meaning and potency.

We were very concerned that the skin should not be read as a regular commercial building product and carry with it all the values and references that would bring with it.

By using copper as the primary enclosing carapace we might forge some connections and references to Chengdu's culturally rich historic legacy.

The qualities of copper as a building material are both in its material quality and durability, as well as the way it can be folded and formed, and we used this property to its maximum potential to play with the idea of fabrication and craft.

Production techniques today negate the tyranny of systemisation and allow us to tailor make individual solutions for buildings, and the skin we proposed would be fitted like a piece of haute couture to the diagrid bodice.



The unfolded 'net' of the copper skin, akin to a dressmaking pattern

Copper was an entirely new building material in Modern China. It had only ever been used in small areas for interior design or shop fit-out. The idea that an entire building be clad in this material was quite radical and required that we substantiate with extensive research into the quality, durability, and visual appearance.

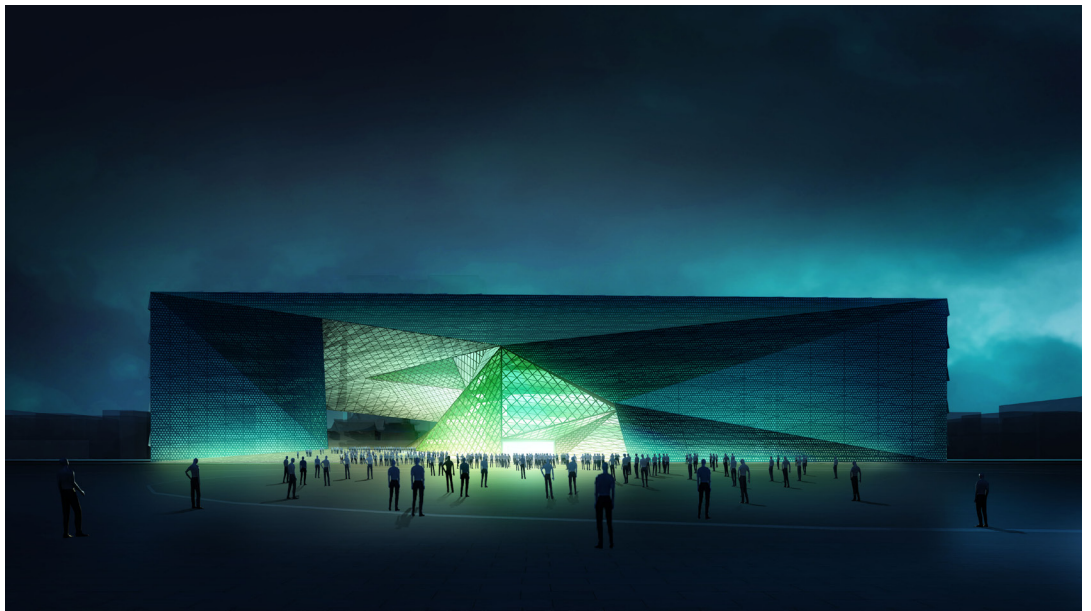
The advantage of being first in this context is that we did not have any other references to compare either negatively or otherwise, and we had the opportunity to establish the identity of the Chengdu Museum as a unique artefact in the City and indeed China.



Artefacts which represent the idea of carapace and interior or the metaphor 'gold wrapped jade'

Once we had designed the copper skin with the glassy internal incisions, we felt it did not require any further explanation. However, the visual metaphor 'Gold wrapped Jade'—a term to describe something beyond value—was adopted by our partners as part of the 'Chinese way' of reinforcing every idea with a visual metaphor.

Stronger references for us were more to do with highly symbolic meaning of the 'Gate' in Chinese culture and the importance of 'Face' in China in how the the fascade repsonds to Tianfu square with references to the Shadow play theatre. Shadow play is storytelling through light and shadow played out by back projecting light through delicateley crafted fretwork figures made of leather on to a veil or screen



The East fascade in the spirit of Chinese shadow play and can be used as a screen at night which can play with light and shadow and the spatial depth behind the screen

The director of the Museum had the largest collection of Chinese shadow figures in China and there would be a theatre within the museum specifically for this collection

With all the foyers and public circulation located behind the East fascade there was a great opportunity to exploit the visual depth of the building when veiwed from the square particularly at night and the use of a veil or screen to mediate between the inside and the Square



screens and shadow play figures aquired from Chegdu markets during the competition



## CHENGDU MUSEUM, SICHUAN PROVINCE, CHINA

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This fretwork screen would also be made of copper and so would visually complete the copper artefact during the day at night the copper mesh would allow the fascade to operate as a giant shadow play screen using digital methods of light projection within the fascade construction

The overriding concern in developing the form and expression of Chengdu Museum was to find a balance between the contemporary, historic and ancient influences and to represent them in such a way that will sustain its meaning and relevance and have a lasting resonance with the local and regional culture of Chengdu and the Sichuan region.





## CONCLUSIONS

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To summarise the three questions raised and how we have responded in design terms -

1. **The Architectural challenges of designing museums in China - the cultural differences and the significance of symbolism.**
  - Maintain robust and intuitive design principles based on thorough research
  - Resist the tendency to lazy metaphors and the political expectations of design
  - Be flexible in adopting new working methods and approaches and to embrace the very rich cultural traditions and practice
2. **Architectural design in China how to retain authorship, quality and integrity of design despite the challenges of distance, language and culture**
  - Establish a partnership with clearly defined roles with a local practice
  - Ensure the client recognises any originality and specialism in the design
  - Maintain a small nucleus of design responsibility with tightly controlled information flow
3. **The external expression of a museum - how to embrace and reflect contemporary and historic cultural values and ideas**
  - Research and explore a diverse and wide range of contextual and local cultural influences
  - Embrace the opportunities presented by resolving challenges both contextual and technical
  - Understand and reflect the contemporary cultural ambitions and desires within Chinese society

## DISSEMINATION

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### EXHIBITIONS

2007	The project was exhibited in the Mayor's Hall along with all the other competition entries following the announcement of the winners
2010	3x3 Exhibition Royal Scottish Academy Edinburgh

### AWARDS

2007	International Architectural competition -
First prize	Sutherland Hussey Architects (UK) A & P Architects (France) AREP (France) China Southwest Architectural Design & Research Institute
Judges	Deputy Mayors Mr He (Chair) and Mr Deng(vice chair) The City of Chengdu Culture Bureau Director of Chengdu Museum Mr Wang Yi Mr He Jian President of of CTD ( culture and tourism department Sichuan province)
Technical jury	Representatives Sichuan Architects Association Museum directors/curators (names TBC)

### PUBLICATIONS

20.04.14	100 new museums in China- Princeton Architectural Press
12.06.12	BD magazine - 'Sutherland Hussey's Chinese masterpiece takes shape' - article on project as it gets underway on site.
12.12..07	World Architecture News - 'Top prize for Sutherland Hussey' - article on competition win.
10.12.07	Scottish Architecture.com - article about the project.
06.12.07	Building Design Magazine- Sutherland Hussey's museum gem' - article on Chengdu competition-Page 2
06.12.07	The Architects Journal - 'Sutherland Hussey unveils China Museum' - article on Chengdu competition-Page 24

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05.12.07	BD magazine - 'Sutherland Hussey wins Chinese museum in international competition' - article and images
03.12.07	The Times - 'Design sketched on a sheet of A4 wins £240m museum for Scots architects' - article on Chengdu competition-Page 24

## **Esteem Indicators**

In her publication for the British Council Penny Lewis (a lecturer at Robert Gordon University and architectural journalist) wrote the following:

"One interesting exception is Sutherland Hussey Architects, a practice of a dozen staff based in Leith; the majority of their work is front end design work in China. The two Charlies, the founding partners, were educated at the Mackintosh School of Architecture and worked for James Stirling and Michael Wilford in London before setting up practice in Scotland in 1997. The work closely with Pansolution, a young Chinese practiced formed by students from Beijing's Tsinghua University. In 2007 SHA and Pansolution won the competition for a 70,000square metres city Museum for Chengdu, the capital of Sichuan, a large province in central of China. The £240 million museum, which is currently under construction forms one side of the city's central Tian fu square. Although SHA is not supervising the work they have had more control over the development of the project than is common. SHA is responsible for the conceptual co-ordination of the design, the detailed production drawings are produced by the Chinese for the local construction industry which is becoming increasingly technically skilled, SHA provide tectonic principles, a guide to how the skin should be detailed. The practice is working on a number of other projects in Chengdu, the City Mayor has commissioned them to produce a city development plan and they have master-planned a New Town to the East of the city, drawing on some urban design traditions developed through the Enlightenment expansion of Edinburgh. A good working relationship with Pansolution gives SHA a particular insight into Chinese client's expectations. The Chinese understand the European sensibility in particular SHA's interest in working at a particular scale and the making of streets, an enthusiasm strongly associated with the Mackintosh School in Glasgow.

"Our belief is that architecture is always driven by context" says Hussey. "China is a leap into a whole other context in the broadest sense of the word. Unlike European modernist design, Chinese projects often start with little in terms of programmatic demand, urbanistically and sculpturally there is a huge emphasis on visual impact. China has a very sophisticated visual culture. It's clear from their calligraphy that this is a country that loves symbols and symbolism."

## APPENDIX

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Sichuan Province in relation to China



Sichuan Province



Chengdu City



# CHENGDU MUSEUM, SICHUAN PROVINCE, CHINA

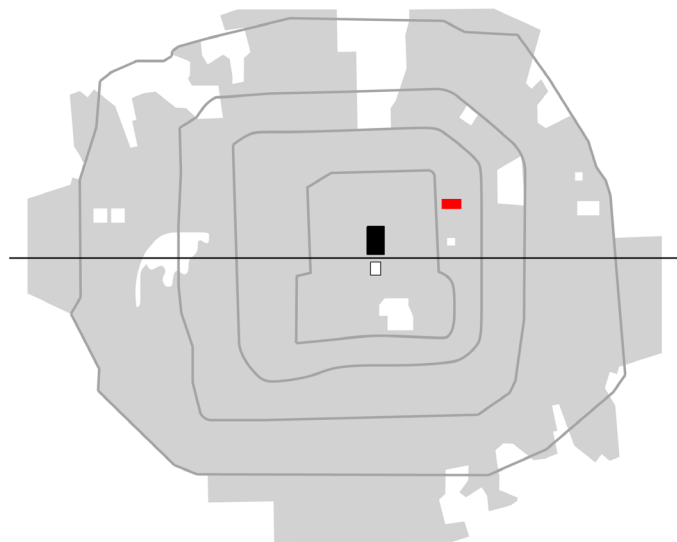


Arial view of the site and its surroundings

## CHENGDU MUSEUM, SICHUAN PROVINCE, CHINA



Tian Fu Square

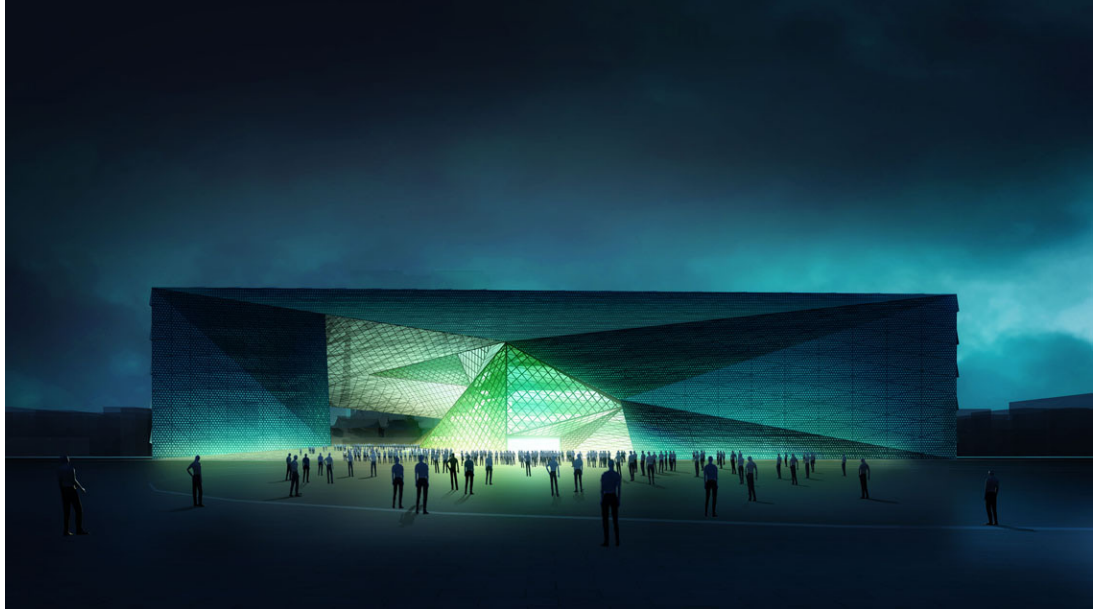


Diagrammatic organisation of Chengdu City



## Competition images

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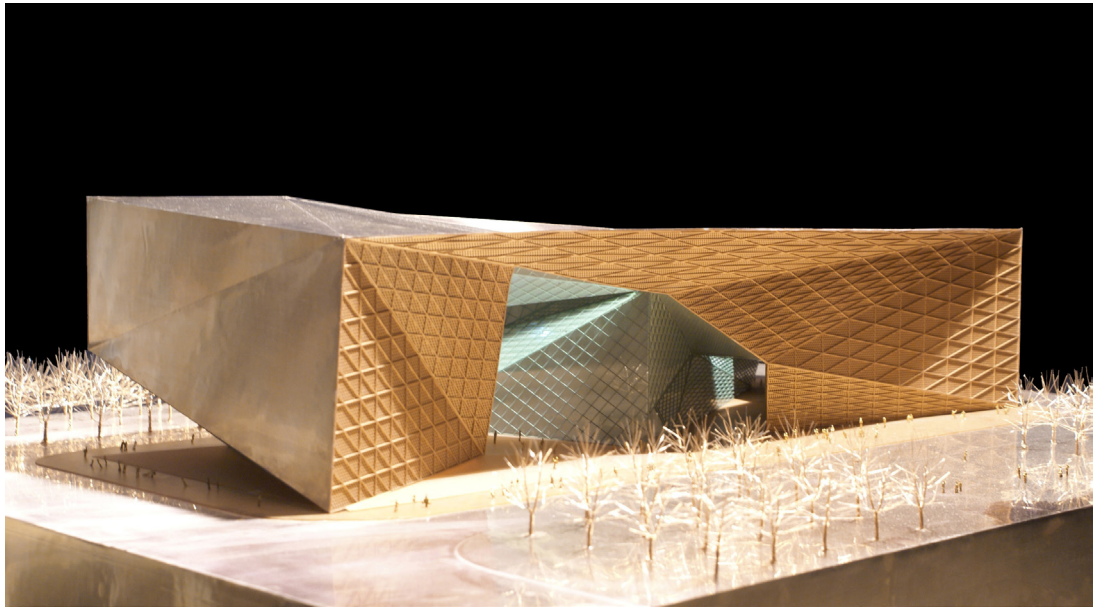
Competition entry CGI night view



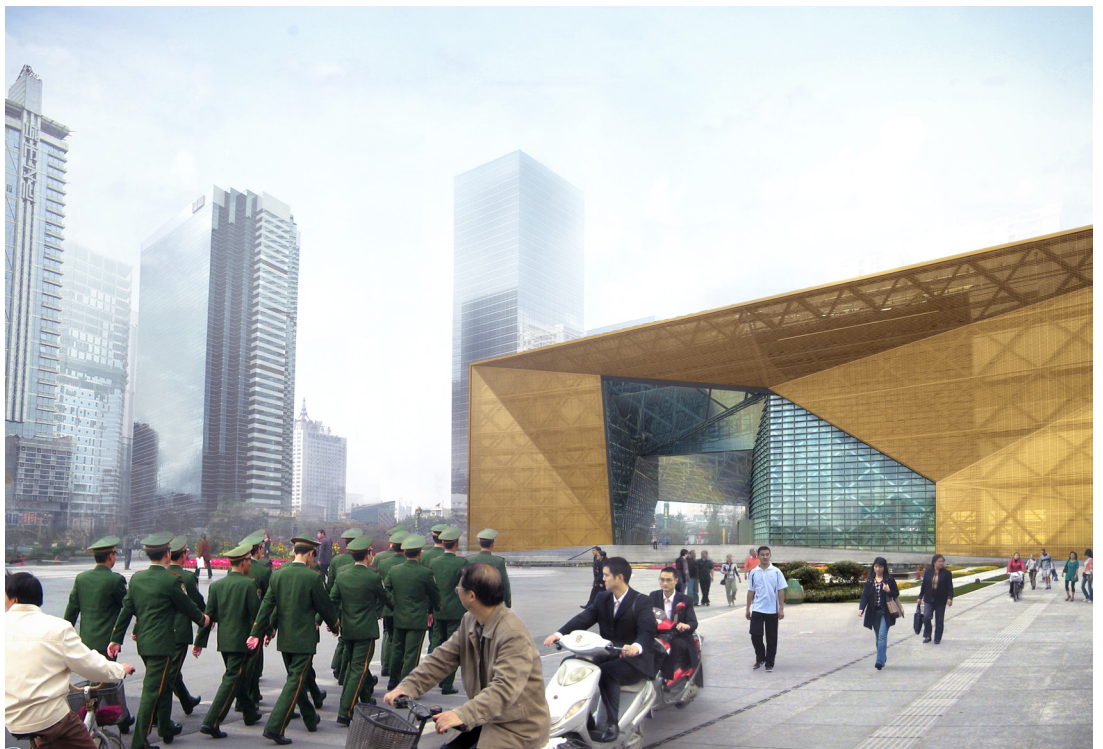
Physical Model night view

## Early Computer study and model

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## Competition submission concept model

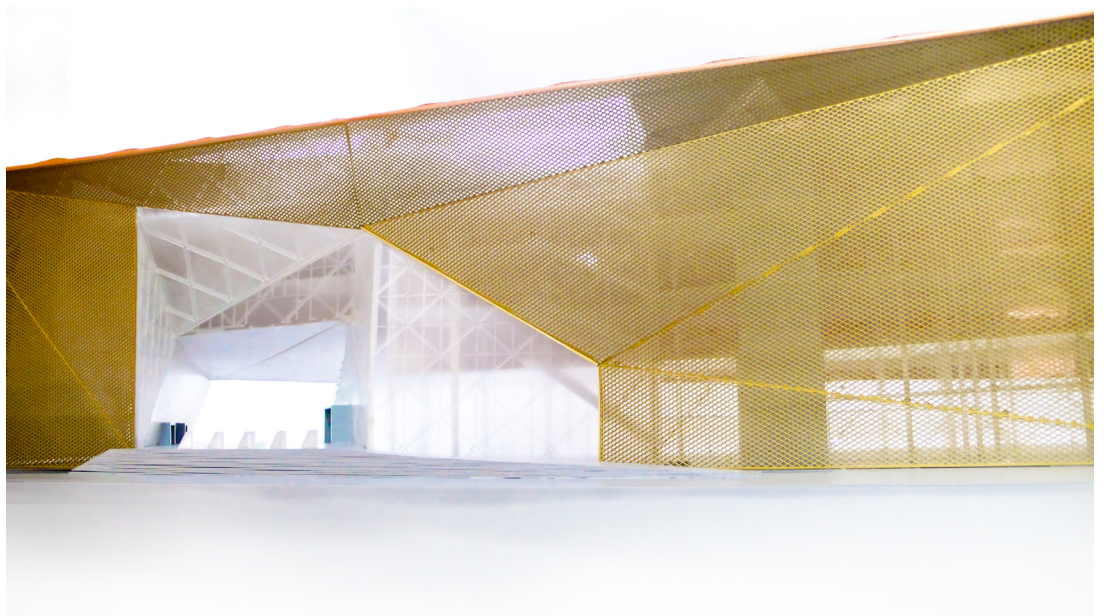
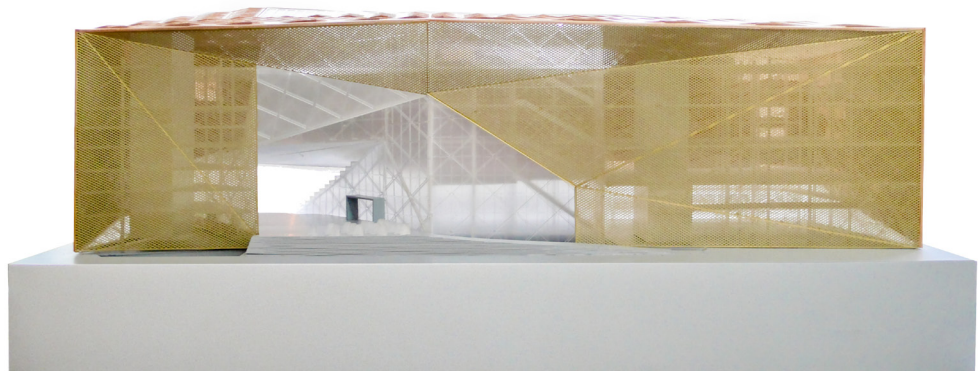


## Competition submission perspective from square

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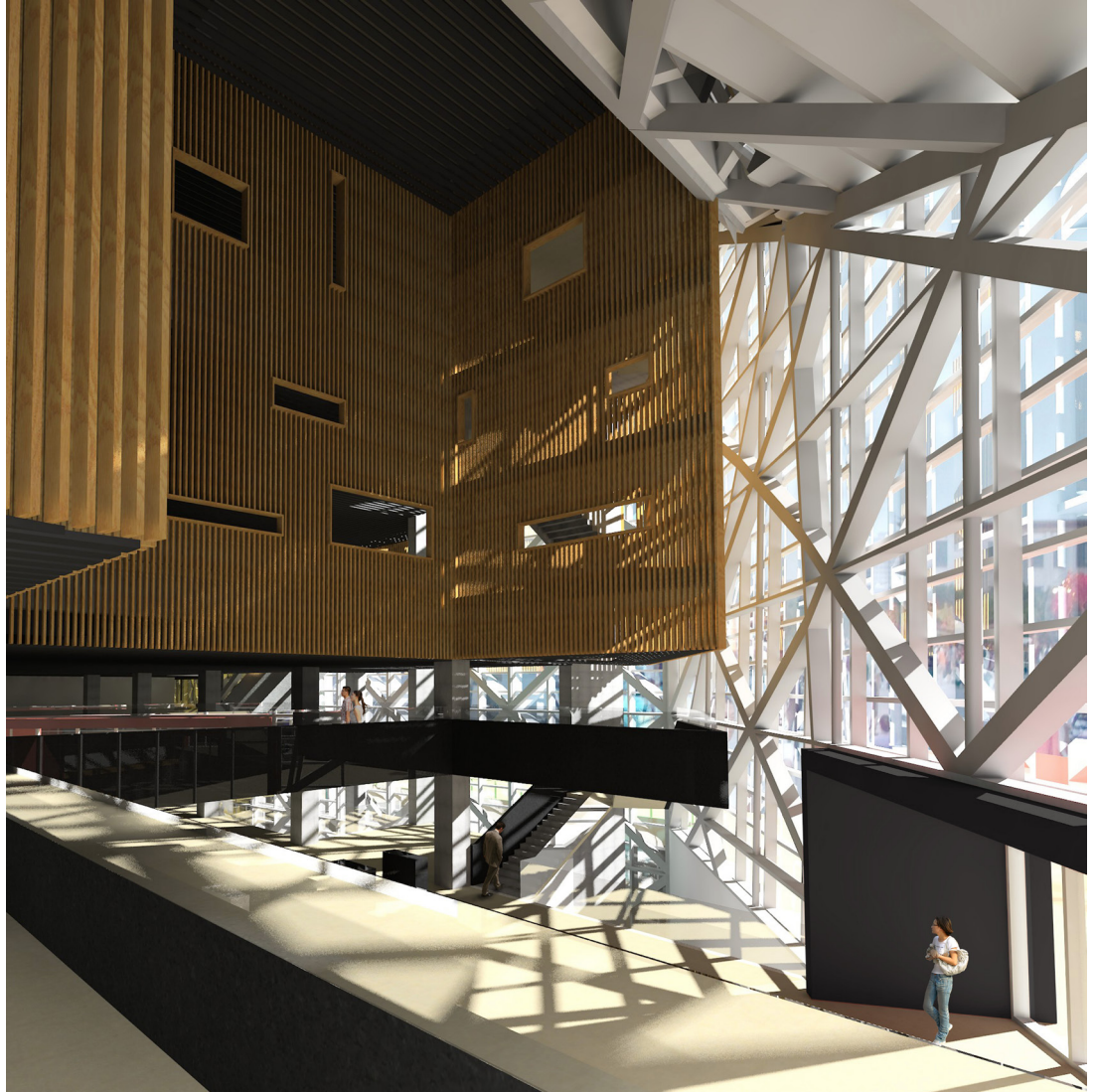
## CHENGDU MUSEUM, SICHUAN PROVINCE, CHINA



The Skin - Model studies

Final Computer images

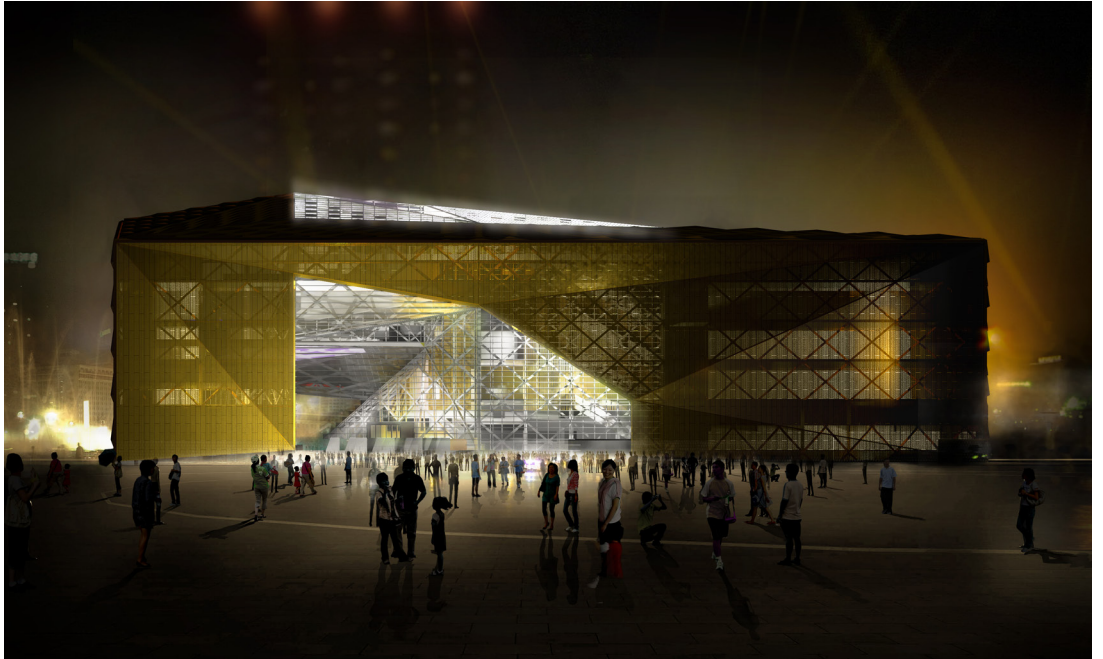
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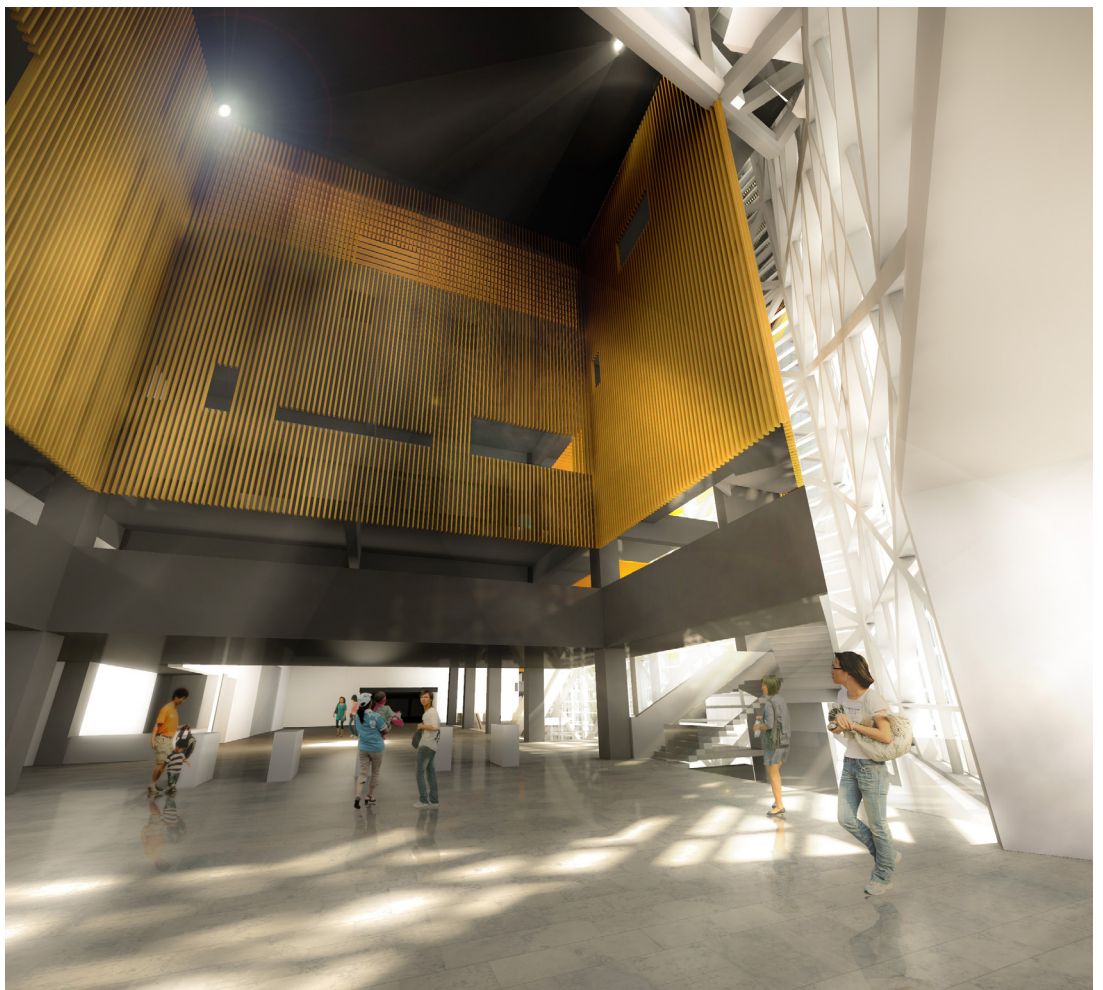
Interior view of Entrance Hall



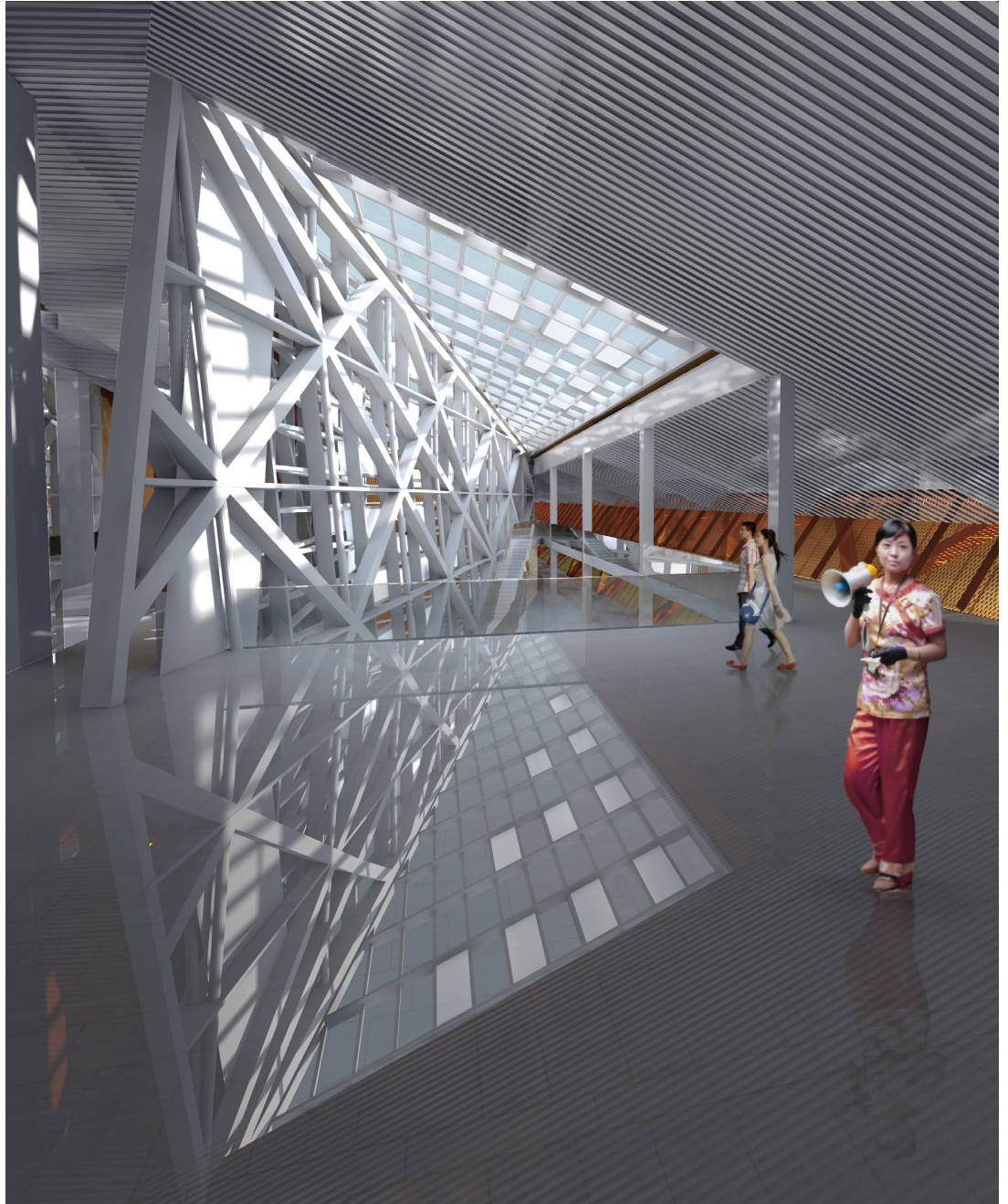
## CHENGDU MUSEUM, SICHUAN PROVINCE, CHINA



Night view from square



Interior view of Entrance Hall



Interior view of upper foyer



Construction on site

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## General Description

1.0

### Project Details

**Date:** 2007-2012

**Location:** Chengdu, Sichuan, China

**Project:** Design of a new City Museum for Chengdu

**Contract value:** £240m

### The Project:

Sutherland Hussey Architects, in collaboration with Pansolution International Design, were awarded first prize in the Invited international competition for the design of the new City Museum for City of Chengdu, Sichuan, China.

The Museum requirements extend to over 65,000m<sup>2</sup> of development and will include exhibition space for Natural History, History and Folk, and Chinese Shadow Play as well as an International standard Temporary Exhibition halls.

### The Site:

The site for the new City Museum sits along the full extent of the west edge of Tian Fu Square. It is approximately 180 metres long and 70 metres wide and is separated from the main Square by a five lane road, lined with large, mature trees. It is a hugely significant site, forming the western edge of the most important central Square in the city.

To the North the Statue of Chairman Mao guards the entrance to the Science Museum and addresses the main north south axis which bisects Tian fu square

The new museum will form the centrepiece of the new cultural quarter in Chengdu comprising a new Central Library located at the Northwest corner the opposite North East corner will sit the New Concert Hall for the City

**Project Description:**

The New City Museum will be the most important new cultural building in Chengdu and needs to assert itself on the Tian Fu Square against a backdrop of ever-increasing commercial development. As part of our overall masterplan for the square we proposed an agreed datum corresponding to the adjacent Mayor's building be established for three sides of the square, whilst along the southern edge, commercial developments are allowed to go significantly higher. With this in mind our proposal obeys strict adherence to a 36 metre datum along the full length of the front façade.

The proposal includes the creation of a new undercover outdoor space opposite the Mosque (which is situated to the rear of the site) - a monumental opening through the building, offering a large, covered outdoor space opposite the City Mosque where people can gather, cultural events can take place, and the market stalls can extend into, with the intention of giving the Mosque a large civic forecourt appropriate to its cultural status.

Aside of an interest in the urban condition we were also intrigued by the importance of symbolism in Chinese culture - that the architectural language should not just be a manifestation of a set of functional requirements (as it so often is in European architecture) but also should have symbolic value. We became interested in the historic artefacts of the Sichuan province and the use of precious materials such as gold and jade.

Jade is a stone ingrained in Chinese art, culture and history, stretching 9,000 years back into the ancient and enormous Chinese empire. Jade has always been a special stone, used not just for fine objects but also as material for grave goods for the imperial family. It is believed to be a link between both the physical and the spiritual worlds, and is the only material that completely encapsulates both the yin and yang qualities of Heaven and Earth, earning it the moniker The Stone of Heaven. Likewise Gold as well as the golden colour has always been considered to be a symbol of lavishness in the Chinese culture. We developed our proposal to encapsulate these two qualities: