

03

Sydney Opera House | 1957-73

Jørn Utzon
Sydney, Australia

Danish architect Jørn Utzon won an international competition to design the Sydney Opera House in 1957 with a design using free-form concrete shells. These were structurally ambitious for the time, and Utzon changed the forms to be segments of spheres that could be analysed and constructed. The building is a complex modern monument with a poetic and expressive form that responds brilliantly to its prominent location on a peninsula jutting out into Sydney Harbour.

From the initiation of its construction to its completion, the Opera House was a controversial project. Today, the building is a world-famous symbol of Sydney and of Australian culture.

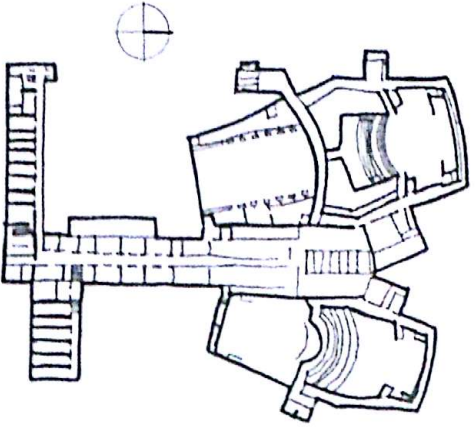
Selen Morkoc, Truy Nguyen and Amy Holland



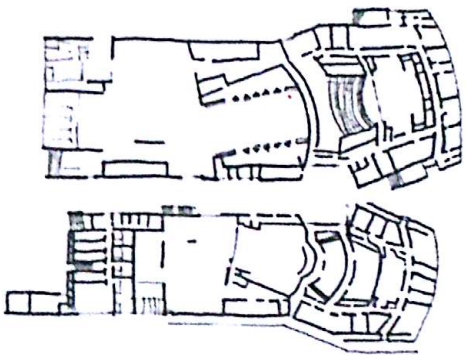


Planning

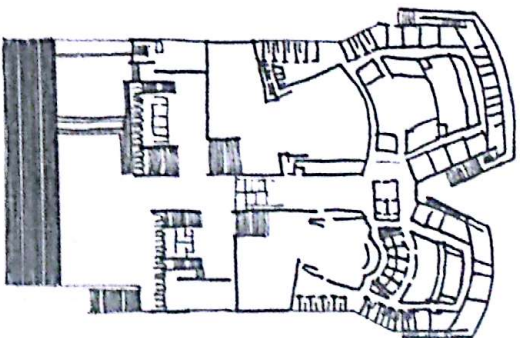
Basement



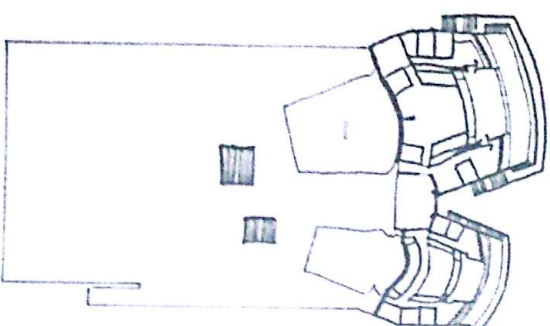
Ground floor



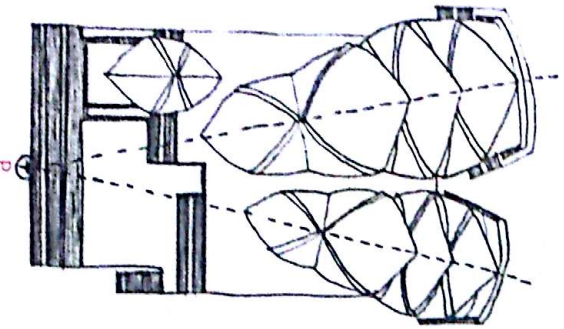
First floor



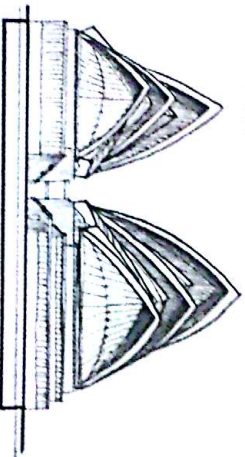
Second floor



The inaugural plaque and the grid system



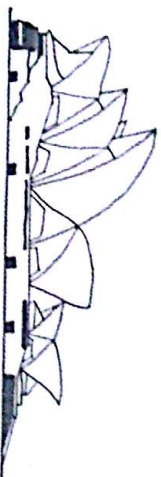
North elevation



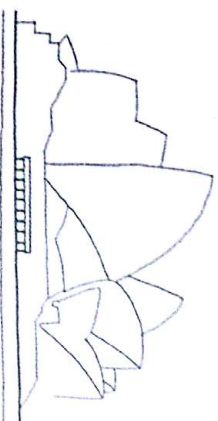
The studio and storage facilities are placed underground to reduce the number of visible floors.

A plaque (P) locates the point of intersection of the axes of the two main building clusters, the basic reference point for setting out the design.

West elevation



The building has limited openings in the base. This allows the artificial platform to maintain its solidity. The mass of the horizontal platform is in striking contrast with the white roof shells.



In the early 2000s, Utzon with his son Kim Utzon designed a small addition and interior changes to mark and improve the entrance to the drama theatre in the podium.

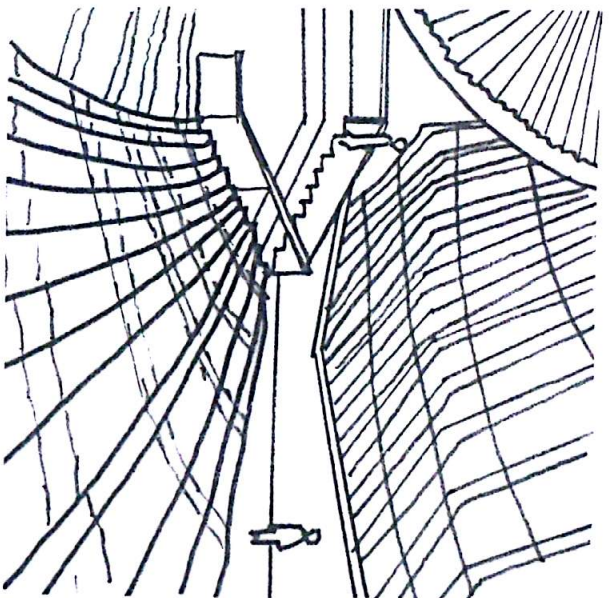
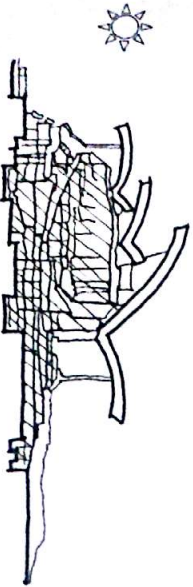
The in-between spaces

The space between the two halls and the enveloping roofs is occupied by stairs and foyers. These are dramatic spaces characterized by the underside of the roof, sweeping glass and spectacular views of the harbour.

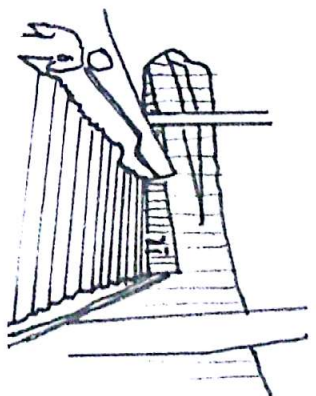
The wall and ceiling structures create a dynamic space within and around the building that allows one to orient oneself inside the building despite the constant change of interior forms.

Lighting

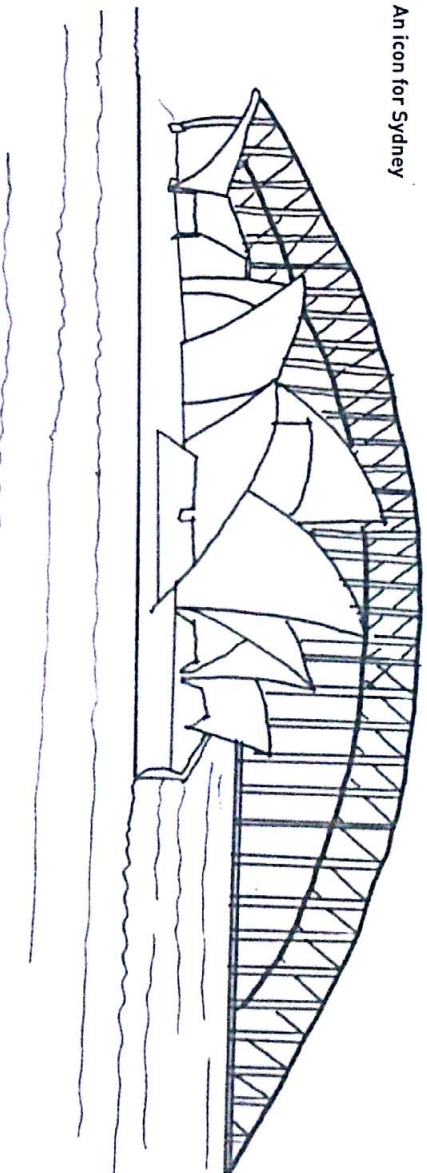
Sydney has a mild climate and there is sunshine on most days. The sunlight brightens the white tiles of the roof and is reflected around the raised platform. Natural light reaches only the edges of the building interior, and artificial light is used in its core.



Stairways are dynamic paths that lead to different functions and adapt their form to the changing shapes of the structure.

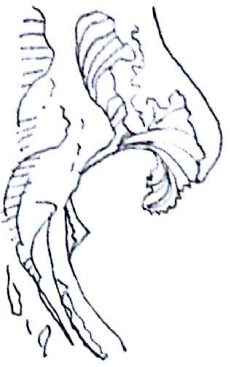


An icon for Sydney

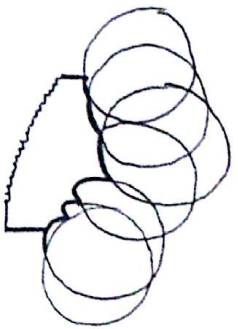


The view of the Opera House with the Harbour Bridge in the background has become the iconic image of Sydney. The vertical, exposed structural steel frame of the bridge contrasts with the shiny white curvilinear surfaces of the building's roof shells and rock-like mass of its platform base.

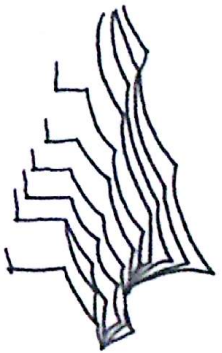
Form generation: Utzon's designs for the halls as proposed in 1962



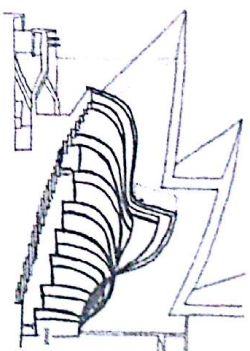
Minor hall Movement of water forming the ridges of a wave inspired the design of the minor hall.



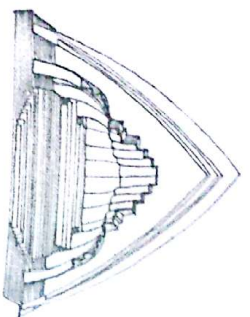
In order to achieve this in the ceiling form, Utzon used convex curves based on successive circle grids.



The drawing shows the overlapping of geometrical convex curves that form the ceiling pattern.



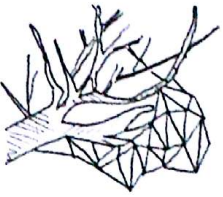
The convex curve structure of the ceiling also serves the function of diffusion of sound.



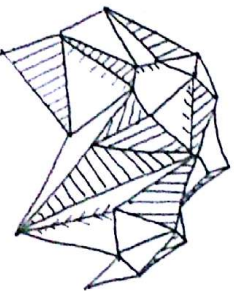
The outside shell vault and the symmetrical structure of the ceiling waves form a double shell.



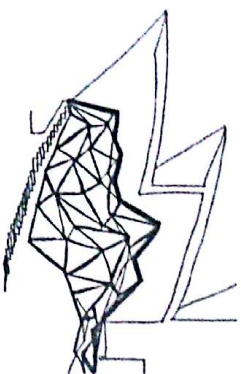
Major hall The branches of a beech tree as seen from below inspired the idea of the major hall ceiling.



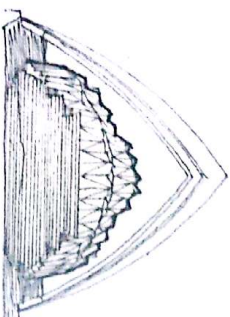
The abstract forms of the branches create a triangular reticulation



Utzon created the multifaceted ceiling planes based on the triangular forms.

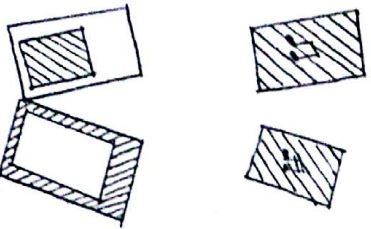


The shape of the ceiling was designed to utilize the space under the shell roof as much as possible, helping to secure the largest possible volume.



The system of triangulation allowed the ceiling to follow the form of the roof and was useful in achieving the relatively long reverberation time needed for music.

Utzon's plans were altered during the construction process. The larger hall was initially intended for opera as well as concerts but later became a single-purpose concert hall. An orchestral pit was installed in the smaller drama theatre, which was modified to become the opera theatre. This allowed much larger audiences for concerts, but meant that the opera theatre had restricted stage tower and side wings. A rehearsal room in the podium became a small drama theatre.



Utzon resigned from the project before its completion. Peter Hall with Lionel Todd and David Livermore led the interior design of the halls. The execution is very different from Utzon's proposals.

