

Jørn Utzon

Jørn Utzon's architectural ideas were largely inspired by nature. His frequent use of biological metaphors throughout his career and the application of these ideas in his works reflect a deep respect and understanding for the workings of nature. He believed that buildings were like seeds of the same plant which have the same potential for growth and development, but depending on various factors such as the environment, the seedlings would develop differently. At the same time, Utzon, being an advocator of technology, is also considered an architect of the modern era. He believed that an architect must "master technology in order to develop your [his] ideas¹." This was applied to his works through the use of geometric calculations and concrete and pre-fabrication techniques.

Utzon's aim was to recreate in the users of his architecture the spirit and sensation of a place through his designs. This he did through his nature-inspired designs, enabled by prefabrication technology. Utzon's key ideas were reflected in his vision statement called "The Innermost Being of Architecture," where he compared the heart of architecture to "that of nature's seed" such that "nature's principle of growth ought to be a fundamental concept in architecture." Stemming from this belief, Utzon developed the principle of "Additive Architecture". Additive architecture is composition-by-addition, construction through modular assembly. It is the combination of prefabricated components in a structural assembly to achieve a unified form. This incremental architecture is flexible, economic and organic at the same time².

The Bagsværd Church, touted by Kenneth Frampton as Utzon's "most compelling Danish work", was conceived by Utzon when he was lying on the

¹ Denys Lasdun, *Architecture in an age of skepticism* (London: Heinemann, 1983), p. 214

² Kenneth Frampton, *The Architecture of Jørn Utzon*, Pritzker Prize 2003 Speech

beach in Hawaii, staring into the sky. He was awed by the regular passage of clouds above him, imagining it to be the ceiling of the new church. To illustrate his idea, Utzon sketched a group of people walking across a beach towards the sea. Above them were large cylindrical and cumulus clouds, through which light streamed down on them. This drawing of a gathering at the beach was further developed into a congregation framed by tree-like columns and “cloud vaults” walking towards a cross in the horizon. It was this experience at the seaside and these early sketches that formed the overall concept of the church, with its cloud-like undulating folds of the *in-situ* reinforced concrete roof³ and its horizontal beach-like broad room plan.



The construction of the cloud-like, thin-shell vaults of the ceiling, which were inspired from Utzon’s natural encounter at the beach, had pushed technology to its limits. The ceiling vaults were built using a combination of hand-

³ Kenneth Frampton, The Architecture of Jørn Utzon, Pritzker Prize 2003 Speech

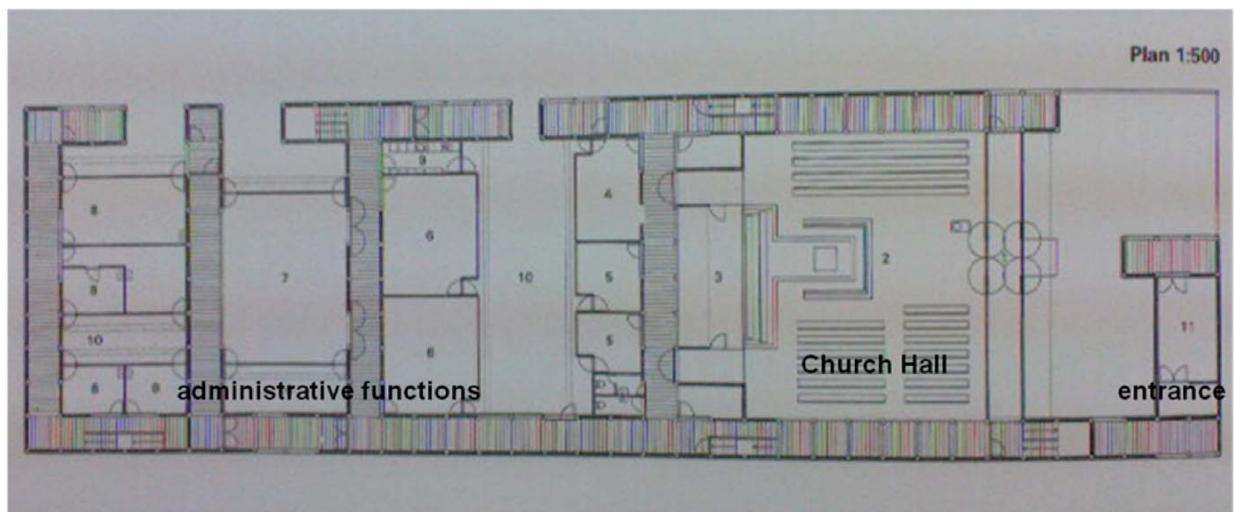
crafted timber shutters made *in-situ* and state-of-the-art sprayed concrete, reinforced by prefabricated meshes. They were geometrically engineered using a series of cylinders. They spanned 17 meters over the worship space with concrete varying in thickness of only 8-13 centimeters.⁴



A broad room plan was chosen to enable the on-goings of the church to happen lengthwise. This would enable people to approach the throne of God together, like-mindedly. It reflected how people at the beach would instinctively be drawn to a beautiful sunrise or sunset as they stood in awe of it. Utzon's intention was to guide the congregation to center their thoughts on the main event, for example a funeral or the worship of God, instead of staring awkwardly into one another's eyes which would have been the effect if the altar was located in the middle as in a radial plan. The plan was also designed in a

⁴ Jørn Utzon Logbook Volume II (Marieveg: Edition Blondal, 2005) p. 159

manner such that the venue for worship was separated from the administration part of the church where the offices and meeting rooms were located. Corridors were located at the wings of the church to keep the main church hall sacred and un-treaded upon, except during services or functions. People were hence able to select their programme, whether working or worshipping and make use of the corridors to get there. Such a circulation kept the Church Hall consecrated and the highlight of the entire building, especially with its beautiful cylindrical-shaped ceilings.



This use of natural analogies in design came naturally to Utzon who grew up with a love for outdoor activities such as hunting and fishing. He was also acutely sensitive and attuned to nature and therefore eagerly adapted ideas from it. He often made references to the formal quality of natural forms in the descriptions of his works. In the design of the Sydney Opera House, Utzon's most acclaimed and seminal work, Utzon made analogies with the walnut, explaining to critics that the dissimilarity between the halls and the magnificent exterior was not unlike the dissimilarity between the bumpy surfaces of the nut and its green husks.⁵ Being aware that the Opera House was located at the focal point of the

⁵ Philip Goad, *An Appeal for Modernism: Sigfried Giedion and the Sydney Opera House*. Fabrications: 8, 129-145. July 1997. P. 139

harbor, and was completely exposed, visible from all angles, he deliberately designed an impressive and attention-grabbing roof consisting of a group of shells. He avoided expressing the various functions of the building under one big square box and instead tried to make a living sculpture out of the roof. To express the liveliness of the shells, they were covered with glazed, shiny, white tiles.⁶ As a result, this fifth facade was stunning, its surface regarded as one of the “most radiant and alive surfaces in architecture.” This living sculpture responded to passing clouds and the movement of the sun. As viewers moved by, the shells “glow(ed), gleam(ed) or flash(ed) with light,” and present an ever-changing spectacle.⁷



An aspect of the Bagsværd Church that reflected Utzon’s attention to and adaptation from nature was how ‘Additive Architecture’ was implemented in its conception and construction. This was seen in the use of the prefabricated system which showcased the technological progress in factory mass production of this modern age. The surrounding walls of the church were built of columns that were set on site and filled-in with concrete pre-fabricated braces made off site. This modular assembly of pre-fabricated elements enabled the building to be varied in height and even be continued endlessly. The wall behind the altar

⁶ Denys Lasdun, *Architecture in an age of skepticism* (London: Heinemann, 1983), p. 217

⁷ Richard Weston, *Utzon (Inspiration, Vision, Architecture)*. (Hellerup: Edition Bløndal), p. 156

was also constructed of thin Flensburg bricks placed on their edges in triangular patterns. This was not unlike how Mother Nature builds her structures – by fitting together similar but varied modules to form an organized whole, like how the many similar branches of a tree form the crown of a tree. Within the church, the altar, pulpit and font (a receptacle for baptismal or holy water) were also constructed from pre-fabricated white concrete units and assembled by masons on-site.



This principle of additive architecture through prefabrication was also visible in the tower-crane assembly of the segmental pre-cast concrete ribs of the shell roofs of the Sydney Opera House. This was followed by the coffering of over 4,000 pre-cast, Swedish-imported tile lids, being swung into place and sequentially secured to each other, two hundred feet in the air, to cover the spherical shells. As such, the prefabricated units were assembled together like a jigsaw puzzle *in-situ*. In addition to the assembly of the vault and the ceramic tile cladding, the plywood mullions for the glass walls and the acoustic ceilings made of plywood box-beams, were also achieved through a prefabricated system.



Utzon's enthusiasm and usage of such industrialized building methods in his architecture displayed his willingness to break away from the traditional Danish vernacular methods of building houses, which were to assemble buildings brick by brick, most of the job done *in-situ*. This lego-block form of construction enabled the man-hour requirement to be cut by 40% as compared to that of traditional building⁸. Pre-fabrication also required fewer labourers and hence reduced the wage proportion of the building cost. Through the exploration of prefabrication in his architectural works, Utzon realized the architectural possibilities of mass production. And not only provided the world with appropriate type-forms but also an economical method to achieve such forms.⁹ By embracing prefabrication technology, Utzon enabled modern architecture to take a step forward.

⁸ Housing from the Factory. Proceedings of the Conference. (London: Cement and Concrete Association, 1962)

⁹ Kenneth Frampton, The Architecture of Jørn Utzon, Pritzker Prize 2003 Speech

Utzon achieved his meaningful and timeless designs through careful observation and adaptation from natural forms such as living organisms and natural landscapes. Nature is architecture's best teacher, having been present since the beginning of time, and having evolved to have figured out the solutions to many structural and aesthetic problems. Through inspiration from nature's design, Utzon developed his 'additive architecture' principle that was permitted by prefabrication technology. As a result, Utzon stunned us with his beautiful creations and intelligent structural solutions.

Bibliography

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