The National Assembly for Wales

By Richard Rogers

Jaimie Roudebush

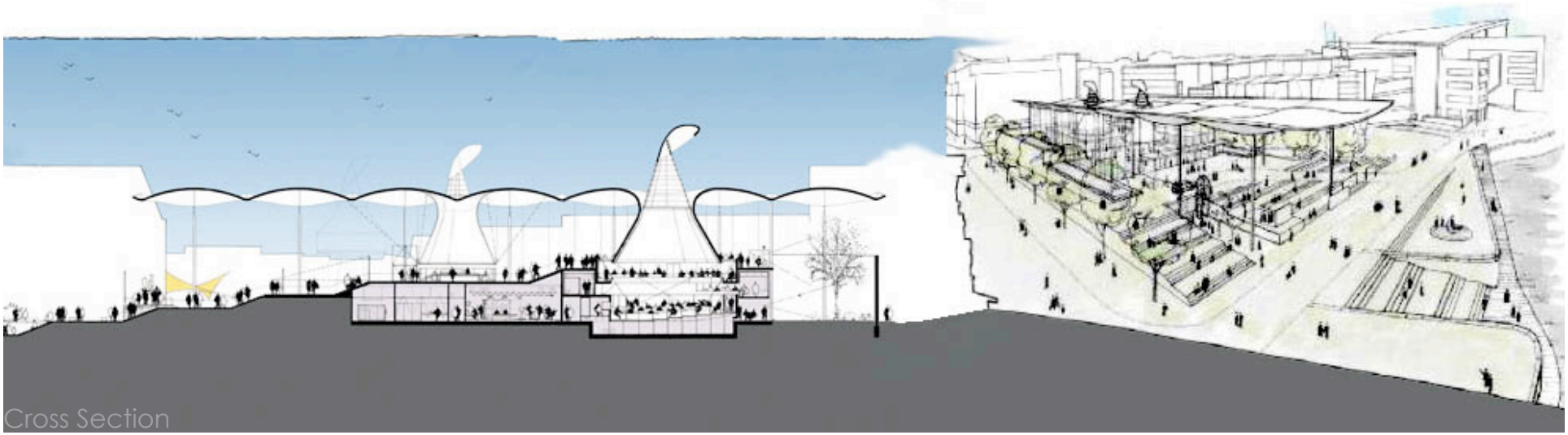
History of the National Assembly for Wales

The Welsh National Assembly was founded in 1987 after a referendum (unanimous vote). The Senedd, or Senate, needed "a world-class building to portray its identity and to encourage local pride and interest in politics"[10]. The National Assembly was at that time being housed in the Crickhowell House, which is located next to the area in which the Richard Rogers National Assembly was built. The Senedd required more space for the debating chamber and committee rooms, so they had to look at constructing a new building[7].

Nationality:	United Kingdom
Birth date:	July 23, 1933 (age 75)
Birth place:	Florence
Education:	Architectural Association
	Yale University, M.Arch 1954-59
Practice name:	Rogers Stirk Harbour + Partners (formerly RRP)
Date Founded (RRP):	1977
Significant buildings:	Centre Pompidou
	Lloyd's Building
	Millennium Dome
	National Assembly for Wales
	European Court of Human Rights
Awards and prizes:	Pritzker Prize (2007)
	Stirling Prize (2006)

About Sir Richard Rogers

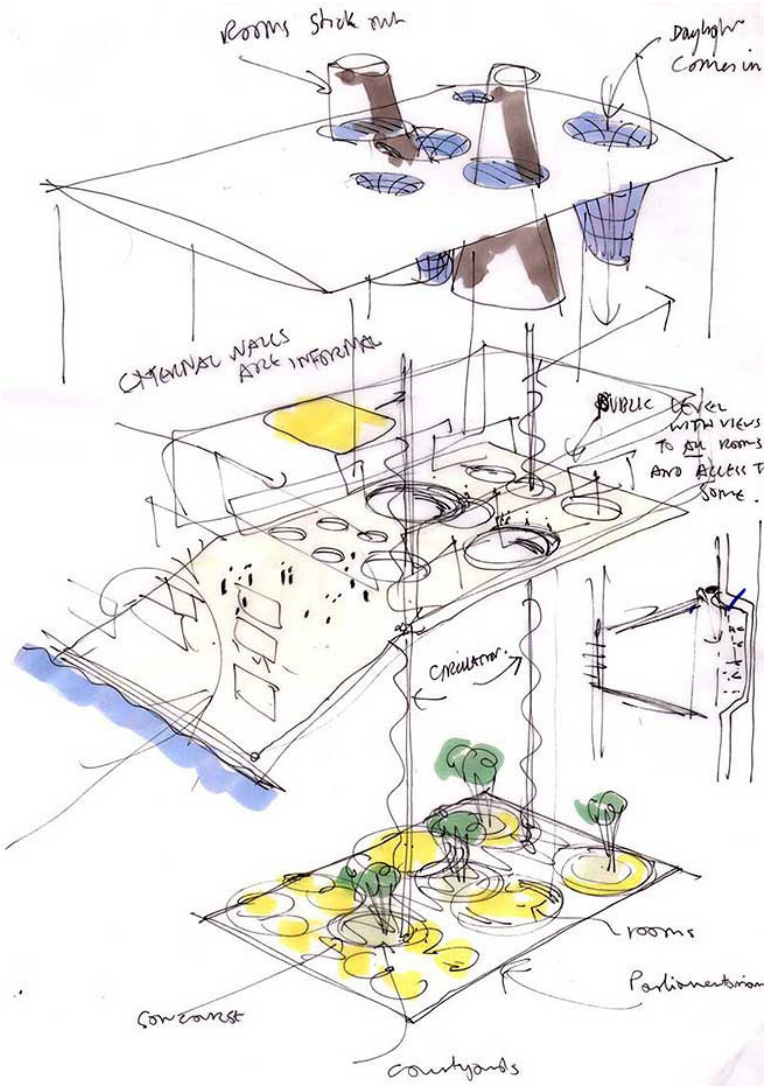
Rogers is a world renowned designer of buildings that are modern and derive their form from function. He is the designer of many well known buildings and, as such, was knighted by Queen Elizabeth in 1991. In the past, Rogers has worked with such established architects as Norman Foster and Renzo Piano and has been chosen to design Tower 3 as part of the design to Commemorate September 11 [4].



Cross Section

The Process

Prime Minister Lord Callaghan and Ian Ritchie led the Jury for an international design competition searching for a new building that was to be open and democratic, something that was appropriate for the new millennium. The jury looked at designs from six architects, and chose Richard Rogers Partnership's concept[4]. The design was described as "a symbol of Wales looking with confidence to its future, and as a new form of democracy of which the whole of Wales could be proud of." [3] The jury also stipulated that the building needed to be sustainable, use Welsh materials when possible, and last at least 100 years.



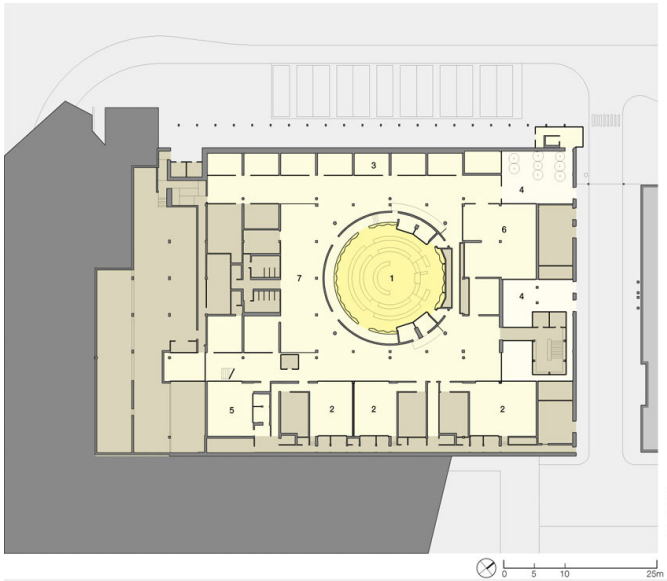
Ground Floor: Private

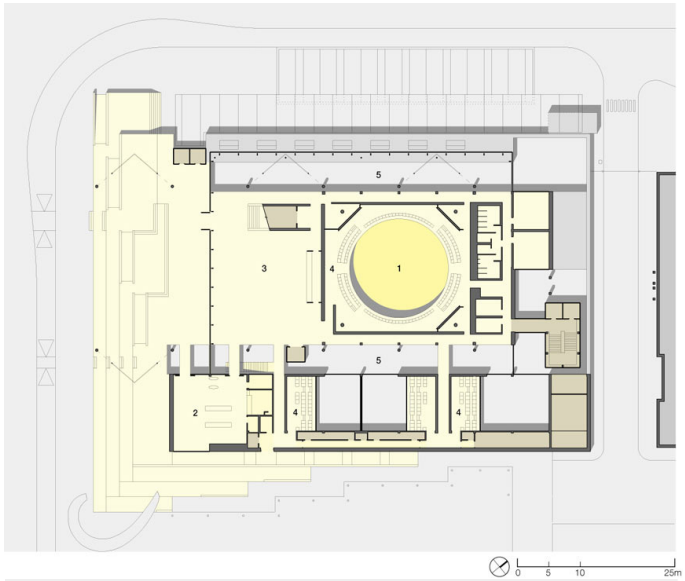
First Floor: Open to Public

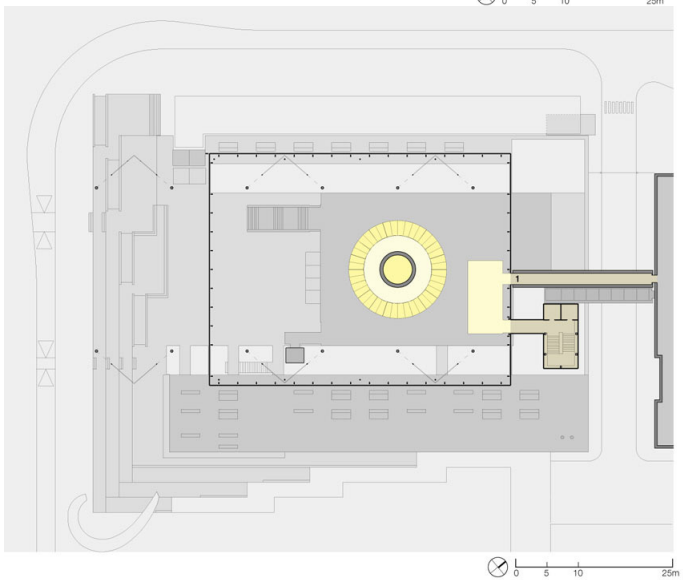
Second Floor: Open to Public

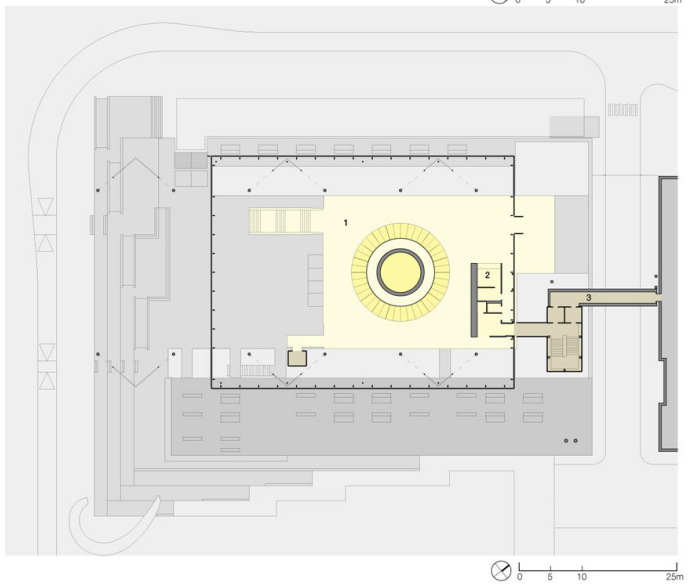
Design Concept

RRP took the National Assembly's desire for an open building as the main idea behind the design. "The building was not to be an insular, closed edifice. Rather it would be a transparent envelope, looking outwards to Cardiff Bay and beyond, making visible the inner workings of the Assembly and encouraging public participation in the democratic process"[4].The public spaces were elevated in order to let light into the administrative areas, which connected the "electorate and the elected". The undulations in the lightweight roof define the purposes of the building. The roof line is broken by a wind cowl that naturally ventilates the debate chamber below. This cantilevered, rippling roof makes the National Assembly building which is of much smaller scale than the buildings around it, seem to hold it's own [4].



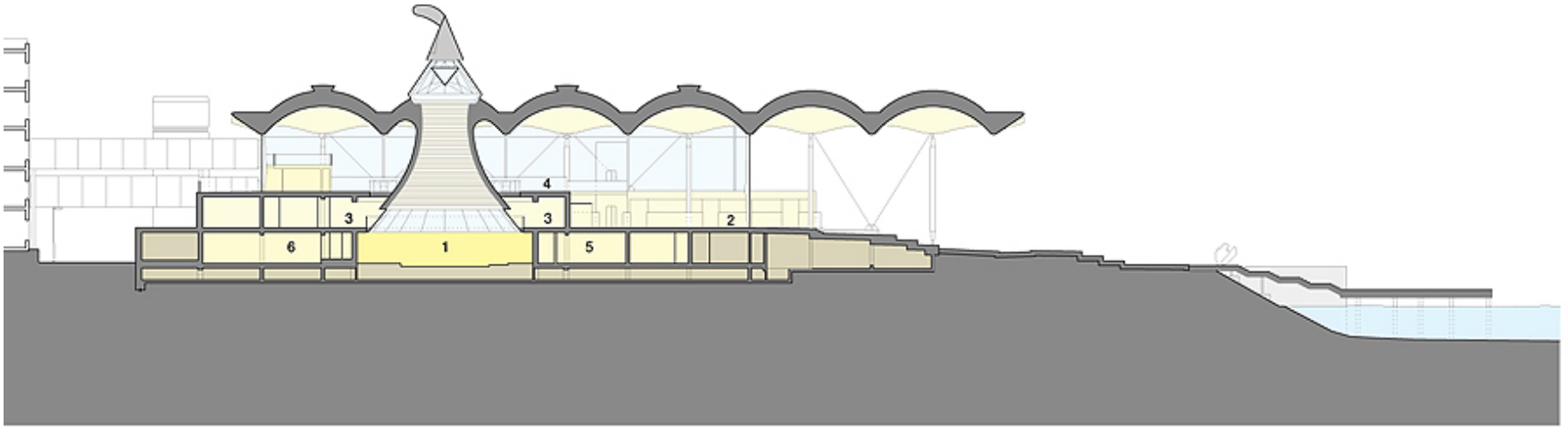


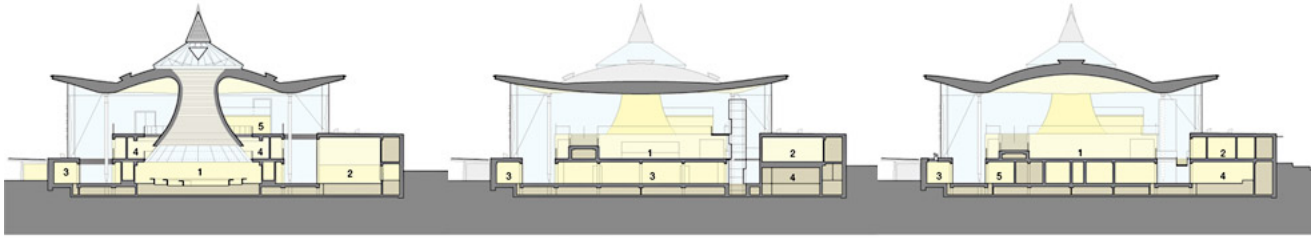




Plans

Clockwise from top left:
Ground Floor Plan
First Floor Plan
Second Floor Plan
Bridge Link Level Plan





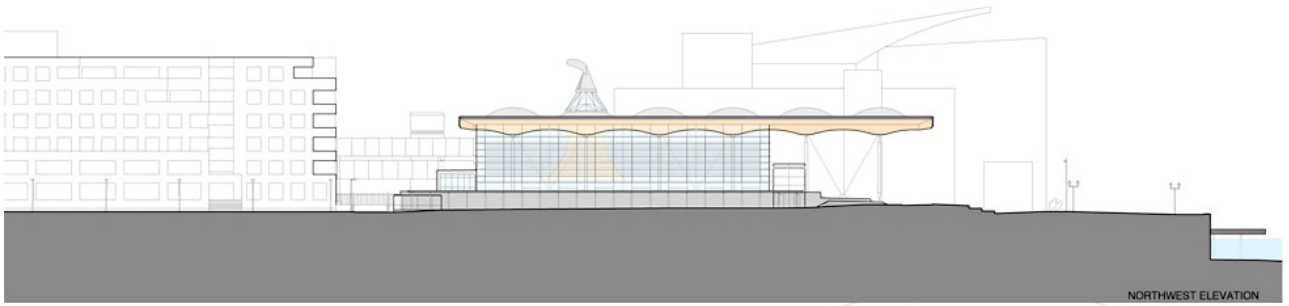
1 Debating Chamber
2 Committee rooms
3 Meeting rooms / Offices
4 Public Gallery
5 Upper Foyer

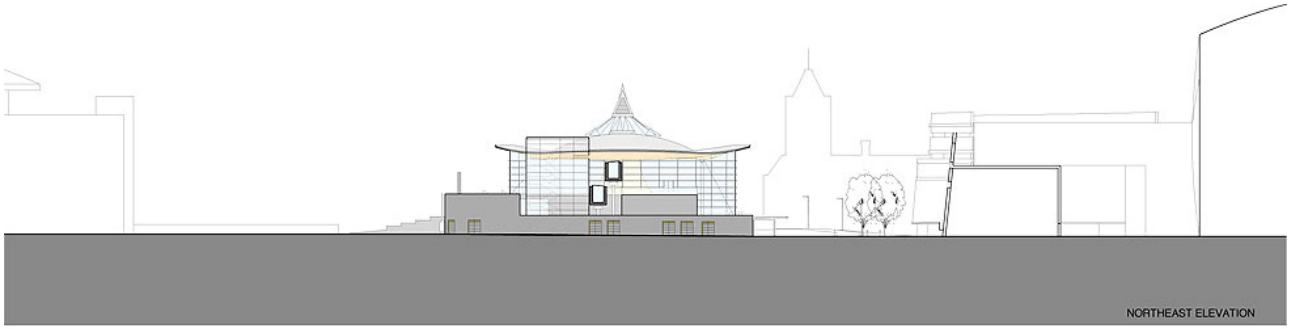
1 Foyer
2 Public Gallery
3 Meeting rooms / Offices
4 Offices
5 Milling space

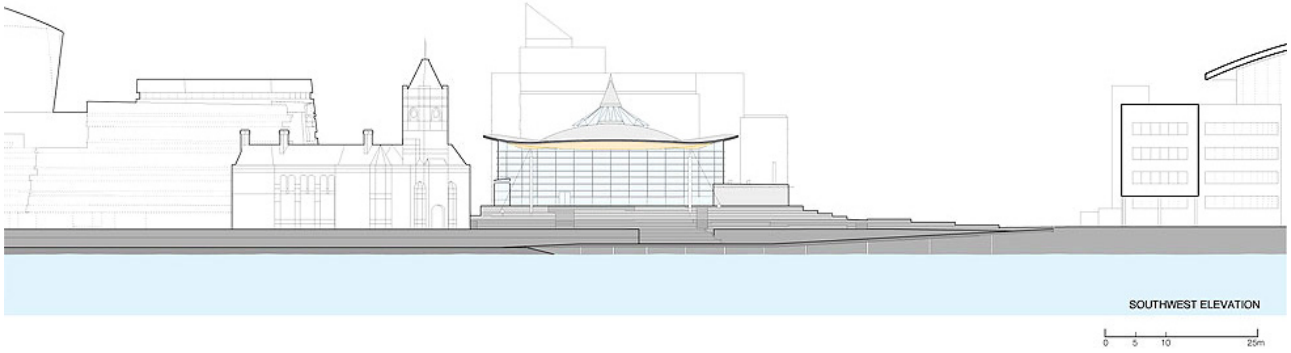
1 Foyer
2 Security check
3 Meeting rooms / Offices
4 Media Briefing room
5 Offices

Sections

Top:
Longitudinal Section
Bottom:
Transverse Sections

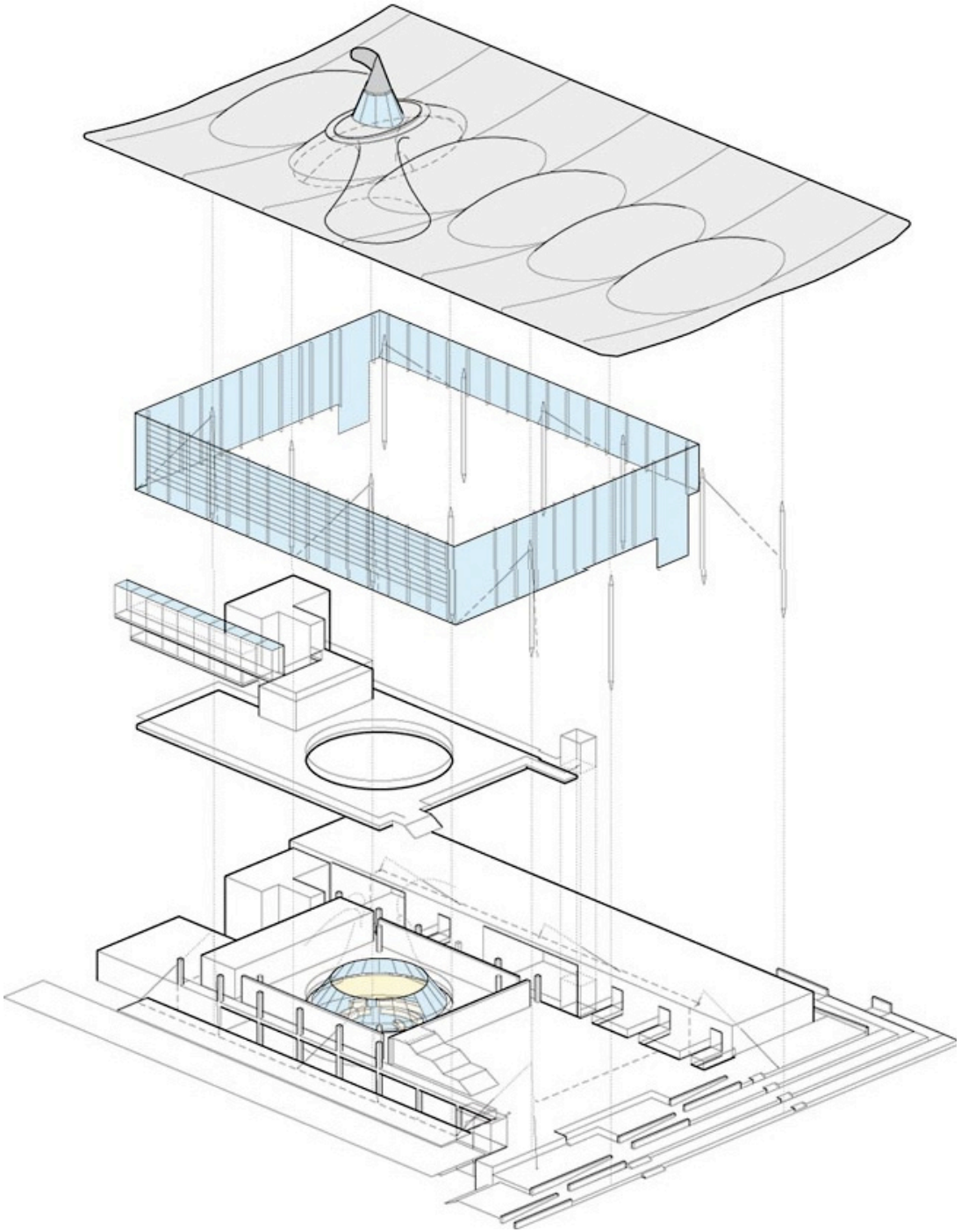




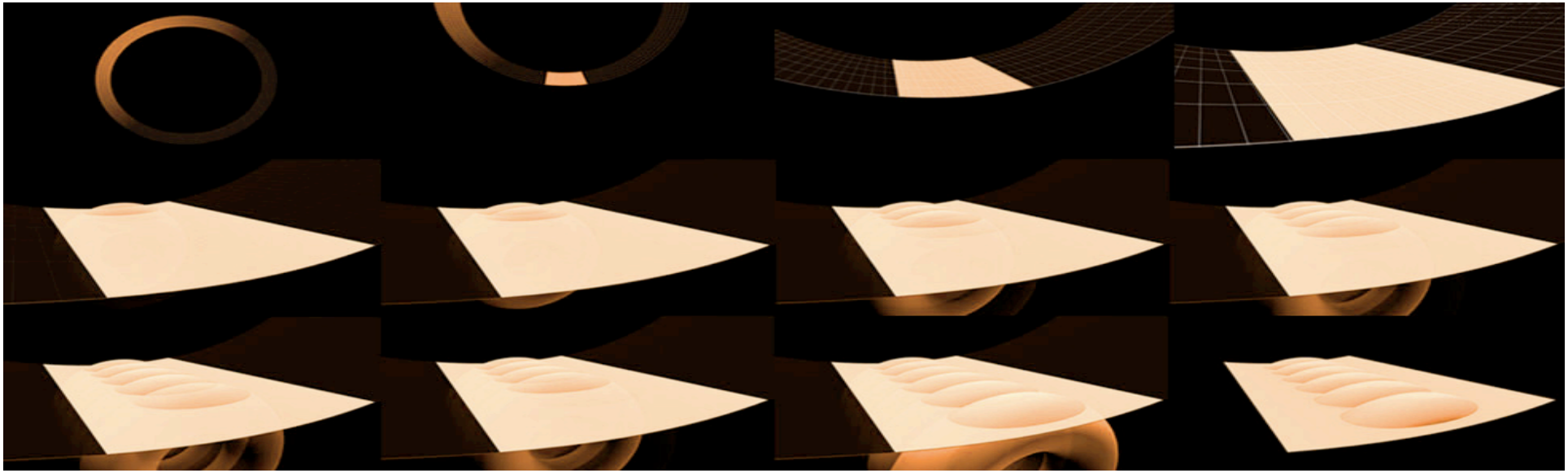


Elevations

Top to Bottom:
Northwest
Southeast
Northeast
Southwest

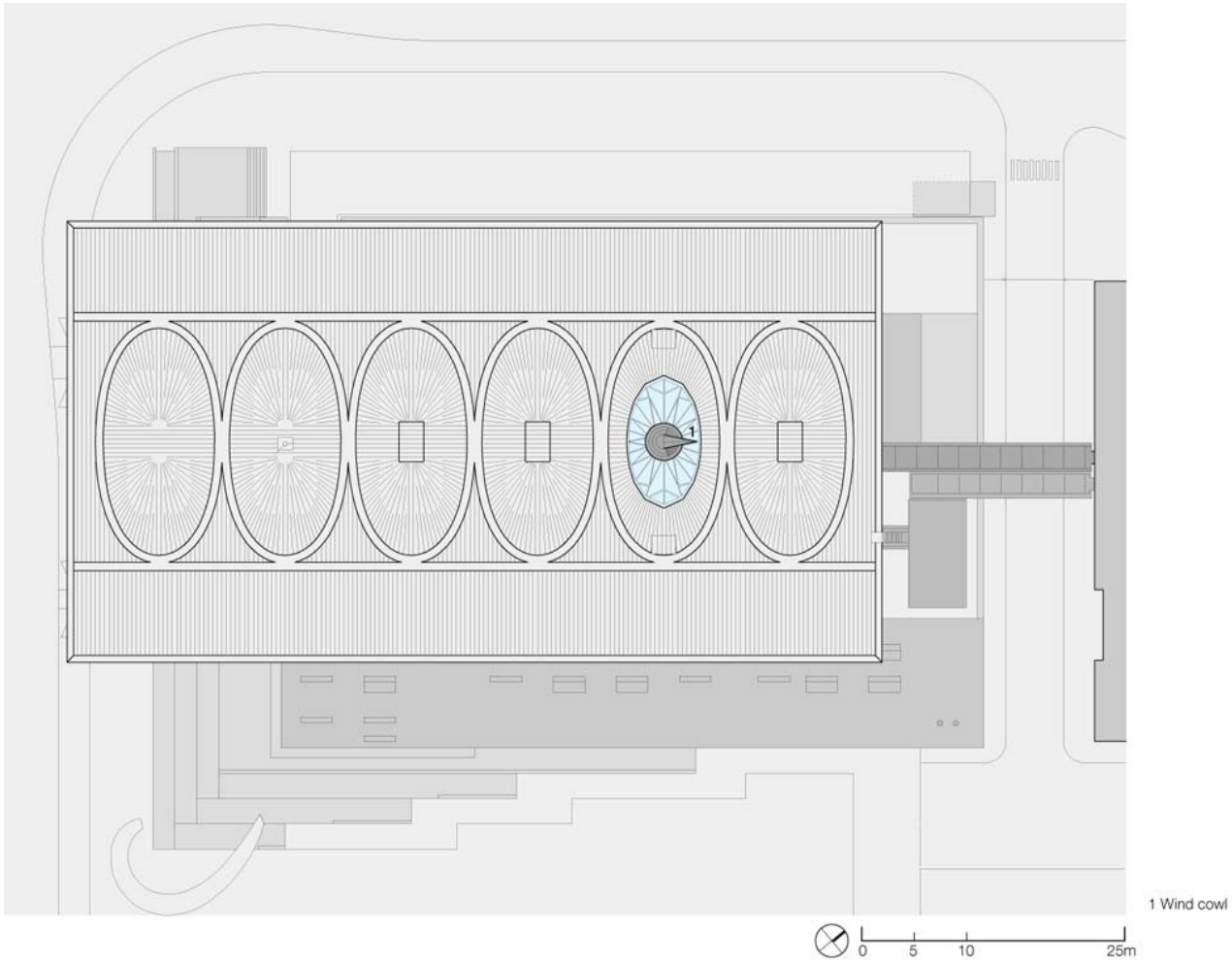


Framing Plan



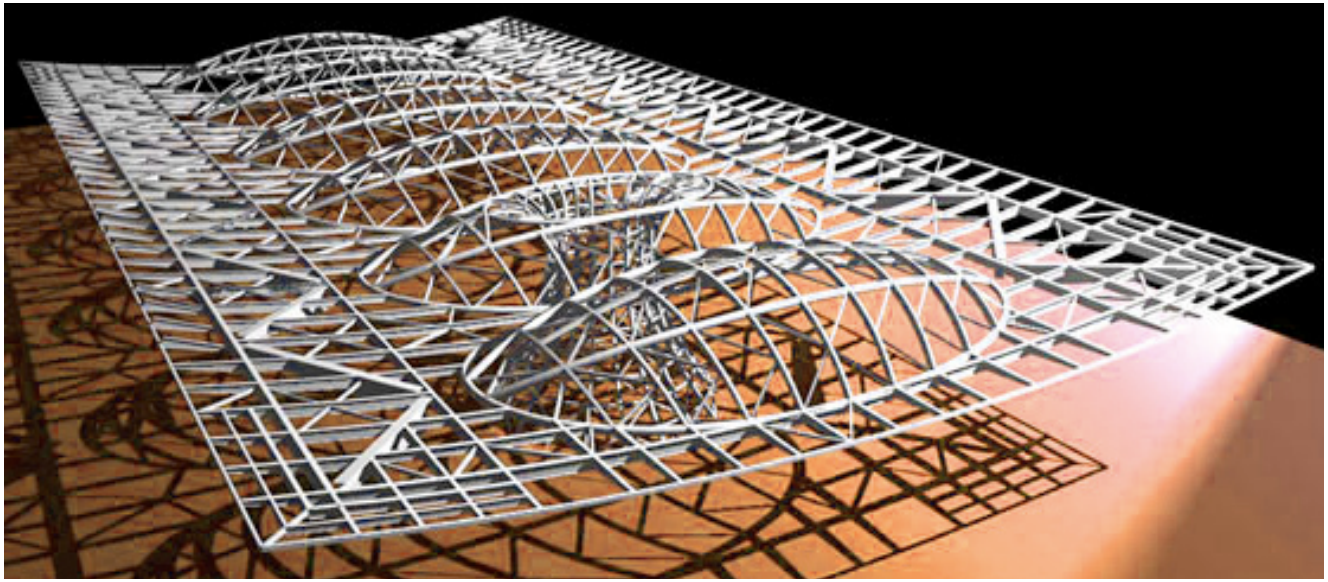
Formation of the Roof

3-D Animation sequence used to create the roof out of simple geometric forms. Five of these undulations of the roof are the same. The sixth one, which supports the bell and lantern structure, is a little bit different. Each interior module measures 12m by 41.5m and the two end modules are 12m by 44m[1].



Roof Plan

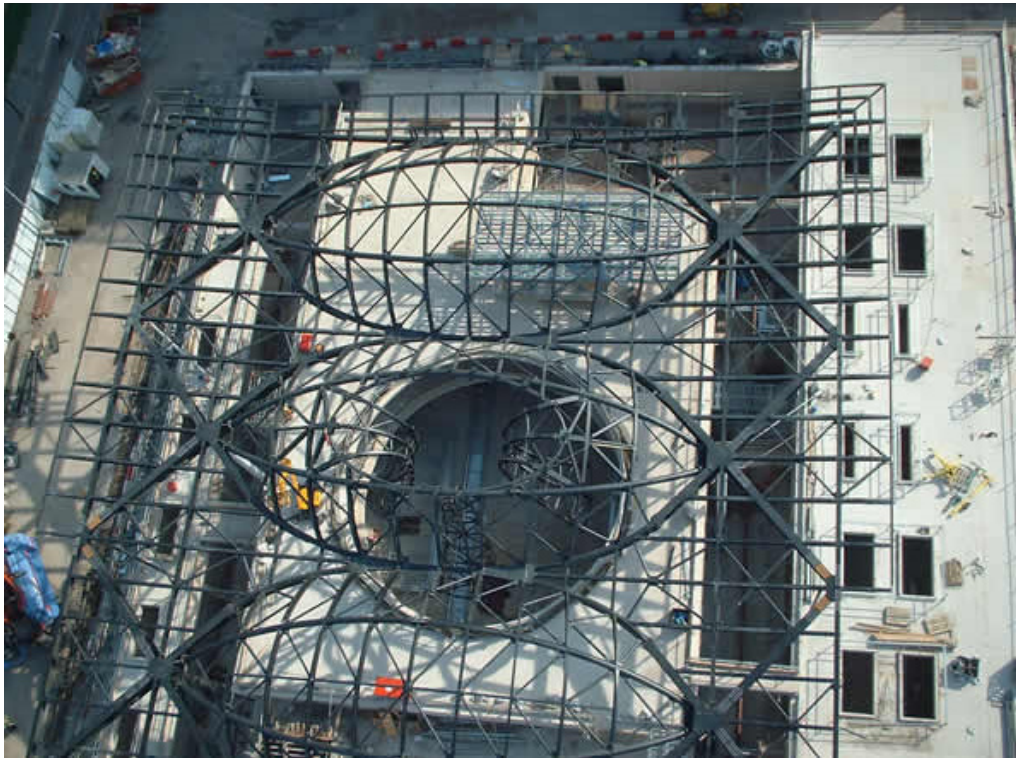
blue = lantern
dark gray = cowl



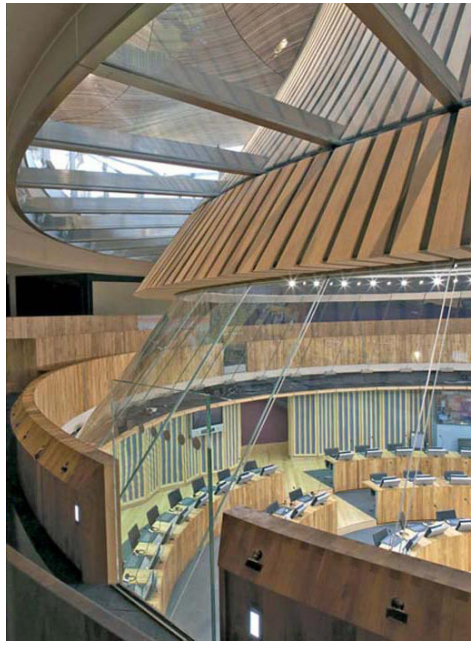
The two main arches of the roof structure are inclined at nearly 45 degrees with an arching ratio of roughly 1:8 to allow the structure to "act as an offset tied arch in the transverse direction."[1] Columns at the bottoms of the arches help to withstand vertical thrust, whereas angled struts that are attached to the arches by offset ties help fight against horizontal thrust. The cantilever of the roof, a distance of up to 15m, is also supported by these angled struts. The size of the building is small enough that the longitudinal members that form the undulating roof can just span from arch to arch. The longitudinal members are all straight simply supported beams[1].

Structure of the Roof and Facade

A series of pre-stressed rods give the roof lateral stability. The braced roof structure performs as a diaphragm to shift lateral loads to stability members. The loads from the facade of the building are supported by "a series of props at the top of the façade mullions" that connect to the stability structure. The structure of the roof and the facade and its structure are independent of each other, as they are separated by 2.5m[1].

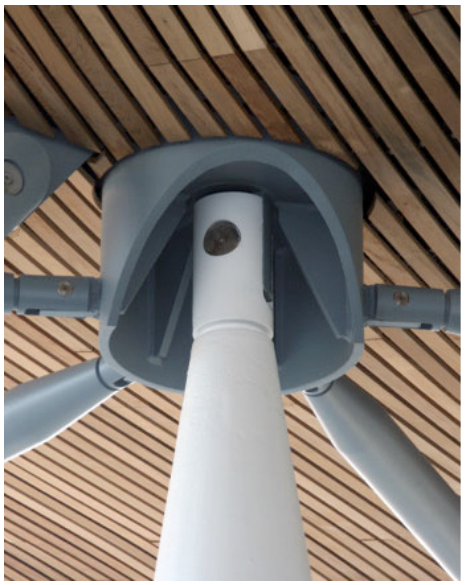


Structure of the Funnel



Glazing

Since one of the main goals of the building was for it to be a very open space, Rogers incorporated a lot of glazing. There are glazed walls as well as glass surrounding the room in which the Senedd meets, giving the public the opportunity to watch government at work. After September 11th occurred, it was necessary to make the glazing blast proof. There are lateral restraining ties that support all of the glazed walls which have steel framing[9].



Detail

One of these steel columns supports either end of the arches on the undulating roof. The columns are tapered to increase the moment of inertia in the center of the column, where it would buckle first. The picture on the left shows the column head with its hinge connections. The column itself fights vertical thrust and is aided by the offset ties that resist horizontal thrust. These ties are tapered to "generate a push-pull action between the main column and the side of the braced dome.[2]" Some of these ties also go back to the glazed walls, cunningly disguising the fact that they are blast proof [9].

Detail

Tie rod base detail. These tie rods use tension to reinforce the cantilevered roof[2].

Detail

This cowl which sits on the fifth arch back of the roof and raises up 6 meters, making it the largest of its type in Europe. When the wind changes direction, the cowl rotates with the "wind passing the leeward side of the cowl producing a negative pressure" [7] which makes the warm air in the debating chamber below to raise out, naturally ventilating the space. Below the cowl is a lantern (just visible in the image) which allows daylight to enter into the space as well.

Detail

Many materials that are utilized in the building are natural to the area such as Penryn Slate (used as a facade to cover an exterior plinth and also for the stairs and floors throughout much of the building) and Welsh Oak (used for the desks and public seating). Rogers also made sure that these materials were durable, had a good lifetime value, and had manageable maintenance requirements[5].

Roof (top):	aluminum standing seem roof
Roof (underside):	untreated red cedar soffit
Structural Columns:	steel
Frame:	primarily steel
Outer Walls:	mainly slate and glass
Plinth:	reinforced concrete and dark welsh slate

Construction Information

The concrete used for the structure of the building was cast in-situ and for environmental and architectural reasons, parts of it were left exposed. It was designed to resist blast, as it is a government building, and after September 11, all of the structure had changes made to keep the government officials safe. The concrete also helps to control the temperature inside of the building because of its thermal mass. "A lightweight foamed concrete fill to save the upheaval and expense of future ground re-levelling" was devised by the structural engineers so that the maintenance costs of the concrete could be reduced[2].

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