Haynes Park Assembly Building

Twelve Architects & Masterplanners

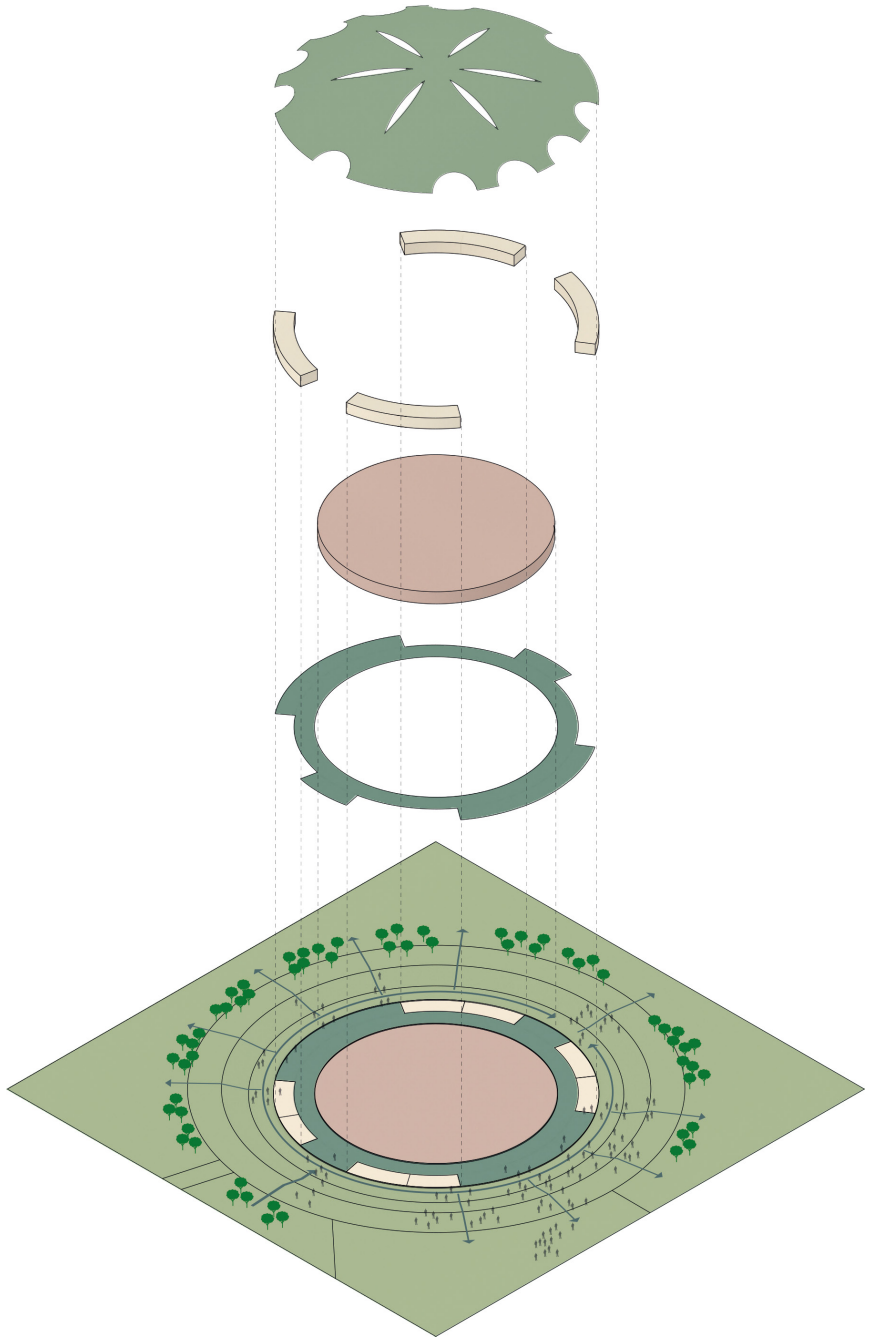
A landmark 25,000-seat assembly building at Haynes Park in Bedfordshire, set to become the UK's largest clear span structure of its kind, and one of the largest in the world.

Designed to create a permanent home for spiritual discourse events, the new 25,000 seat assembly building will sit within the historic grounds of the Grade I Listed Haynes Park House, replacing a temporary tented structure that has been erected annually for the past 25 years.

The structure takes the form of a shallow circular dome spanning an extraordinary 162.5 metres, making it the largest clear span building of its kind in the UK and amongst the top 30 worldwide. The design draws inspiration from the distinctive landscape of Bedfordshire's Greensand Ridge. The dome's softly undulating form creates a new rolling ridge within the parkland, blending seamlessly with the surrounding woodland.

From key vantage points, the structure will subtly emerge and recede into its natural surroundings, mirroring the behaviour of the region's wooded ridgelines, copses, mature hedgerows and conifer plantations. A biodiverse green sedum roof further enhances this visual and ecological integration, softening the presence of the building while contributing to the local habitat.
The entire structure is partially sunken to 1.4 metres below ground-level to minimise visual impact. A landscaped concourse ring mediates the internal and external levels, ensuring fully accessible entrances on all sides.

At the heart of the building, a state-of-the-art spherical auditorium will provide a unique and visually captivating space for meetings and gatherings. The meeting hall will be equipped with an elevated stage and radial seating arrangement, specifically designed to optimise visibility for the audience. Internally, the design is inspired by the *Seed of Life*, fostering a tranquil and contemplative atmosphere. The project represents a bold yet sensitive intervention in a historic and natural setting, delivering a world-class venue with a quiet yet powerful presence.



Landscape Design

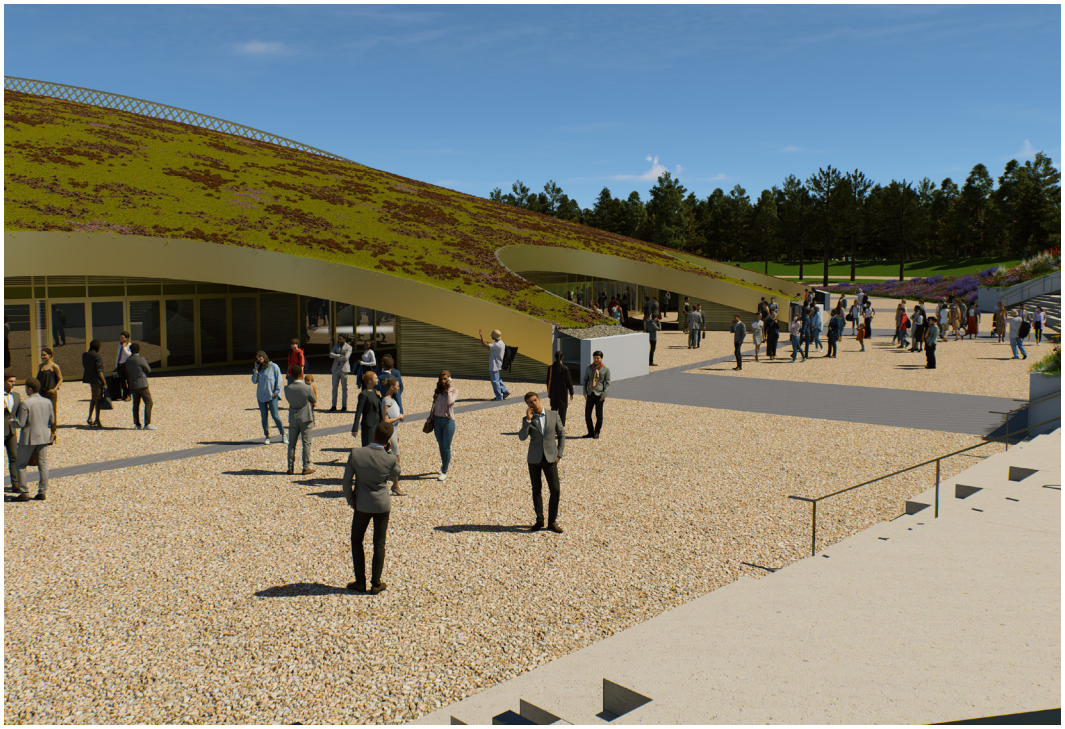
The site is located within Bedfordshire's Greensand Ridge, a prominent, elevated landform characterised by woodland and heathland areas. The building's form will allow it to blend sympathetically with its surroundings, with the addition of a biodiverse sedum roof to minimise visual impact.

The landscape design proposals are defined into two areas: the formal landscape of the circulation paths directly surrounding the building, and the wider parkland and woodland towards the extent of the site.

Two circulation paths, one higher and one lower in level, marry with the topography and provide a wide pedestrian and vehicular circulation route around the entire extent of the building. The change in level is accommodated by step and ramp access, with a robust planted band separating the two levels. These upper and lower circulation routes improve pedestrian access, ensuring safety and simplicity. Pockets of breakout amenity space are located opposite each entrance along the upper circulation route.

The wider landscape proposals consist of a dense woodland buffer of UK native deciduous trees, creating a green screen to the site and providing green infrastructure connections to and from the ancient woodland. Inside the woodland buffer, the landscape is divided into amenity parkland and heathland planting, replicating the existing habitat on the Greensand Ridge. Pockets of wildflower meadow and tree planting will draw the eye through the parkland. A large area is left clear to accommodate DDA parking and building access.

The soft landscaping palette has been developed to enhance biodiversity, connections to nature and to be sympathetic to the local context and character of the scheme. Species have been selected to match the anticipated microclimate, to define spaces and gateways, to enhance ecological diversity and to provide visual interest and colour throughout the seasons.



Interior Design

Despite the building's scale and capacity, the design has been carefully considered to create a calm and contemplative internal environment. The interior design concept reflects the principles of simplicity, purity, warmth, inspiration and truth. Drawing inspiration from the Greensand Ridge, the internal space is a continuation of the building's external form and surrounding natural landscape.

Internally, the design is inspired by the *Seed of Life*, an ancient geometric motif symbolising harmony and equilibrium. This manifests in a series of petal-shaped, acoustic, fabric elements suspended overhead. These petal geometries echo the softness and curvature of the building's form, reinforcing a sense of cohesion between structure and internal space. The transparency of the stretch fabric allows the lighting to softly highlight the structural steel truss and enhance the tranquil atmosphere. Warm, earthy tones and natural materials further contribute to a calm and welcoming environment.

The ceiling finishes incorporate sound-absorbing materials to facilitate a comfortable environment for listening. The perimeter walls also use sound absorption to attenuate long-delayed focused reflections.

The juxtaposition between the building's considerable scale and functional complexity, and its serene internal environment is achieved through refined spatial planning, considered material choices and a focus on natural light and acoustics. The result is an environment that supports collective reflection and quiet focus, even when accommodating tens of thousands of people.

The main assembly hall is designed to provide an optimal experience for large audiences. Its size is primarily dictated by the structural span, with the main truss set back from the outer partition wall to enable clear and efficient circulation around the perimeter. A radial seating arrangement optimises sightlines to the stage. Large suspended LED screens ensure that attendees further from the stage still have a clear view of the speaker.

There are multiple entrances around the building, all of which arrive into the main circulation concourse. This provides a space for large amount of people to quickly enter, exit or circulate around the building whilst acting as an acoustic barrier to minimise disruption to the discourse meeting. The character of this space is similar to that of a large sporting arena or venue.

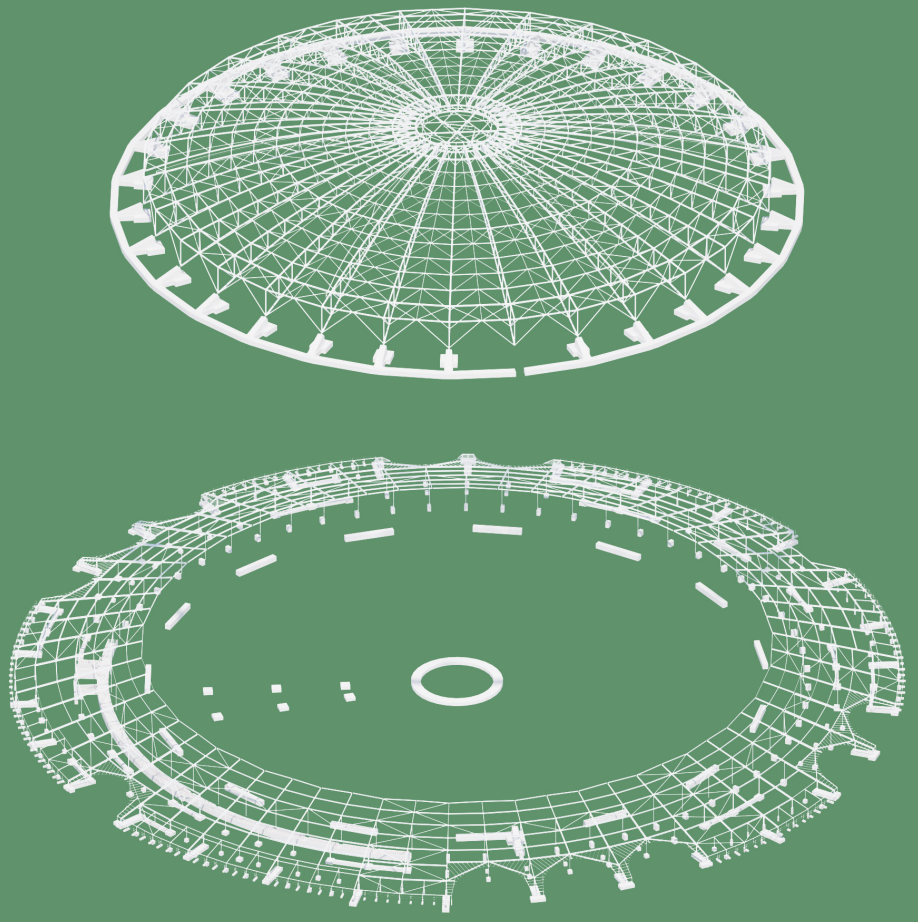
Structural Design

The proposed building at Haynes Park comprises a 162m diameter free-span dome constructed from a series of structural steel trusses arranged in a radial fashion to provide a column free hall space. The trusses are connected to a central steel compression ring at the central highest point of the dome and supported on reinforced concrete buttresses at the base.

The steel trusses are triangular on front elevation, utilising shared top chords and independent bottom chords, interconnected by a series of vertical and diagonal members and the depth of the trusses varies along the span between 6.5m at the supports and 1.5m at the centre. The high span/rise ratio of the dome of 9 requires the trusses to be designed for interaction between arching and bending action, whilst the 3D form and asymmetric loading introduce a degree of circumferential forces to be resisted.

External to the free-span dome, the perimeter ancillary and circulation spaces are formed with a conventional steel column and beam arrangement that is structurally separated from the main dome structure and independently stable. A conventional trapezoidal steel deck forms the roof surface throughout which will support a green roof.

The foundations comprise pad foundations that will bear onto the load-bearing clay stratum that was identified at shallow depth via a geo-environmental site investigation. The horizontal thrust from the arching action of the trusses is resisted by a tension ring beam at foundation level that extends around the whole perimeter of the dome and is fixed into the pad foundations of the RC buttresses.

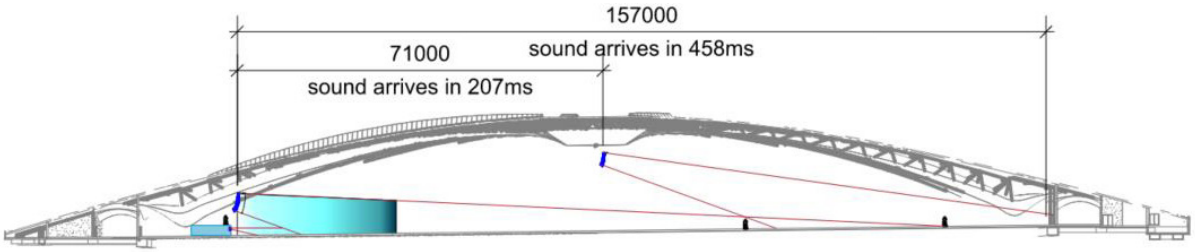


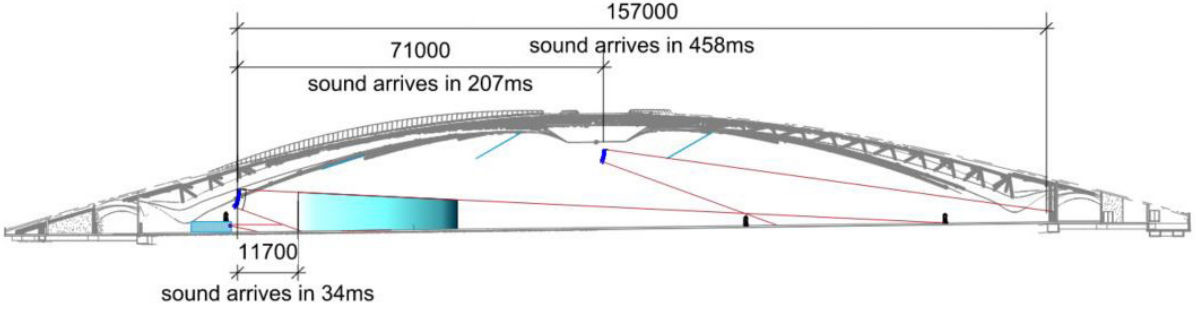
Acoustics & AV

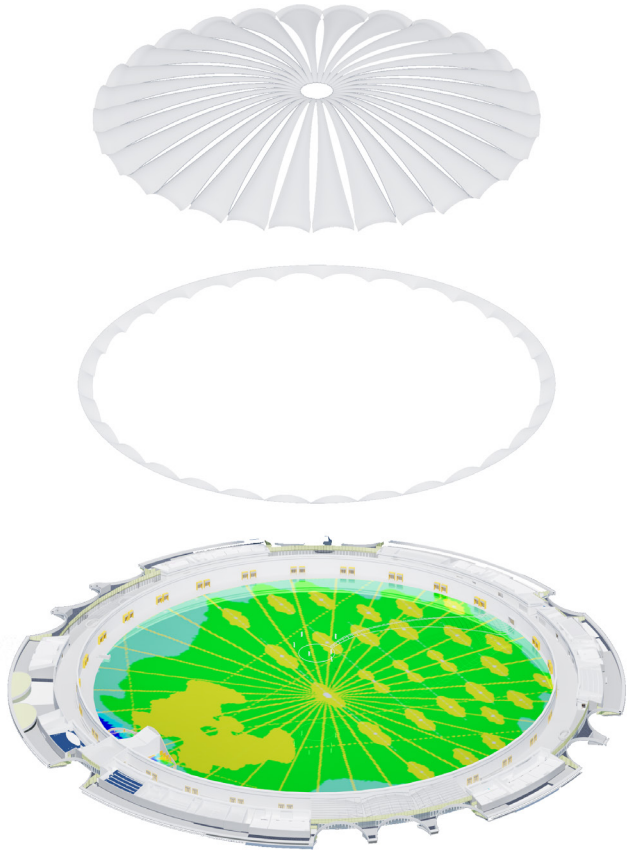
The building is designed to create a home for large-scale spiritual discourse events, accommodating up to 25,000 people. There are a lack of precedents for acoustic environments of this scale, that offer comfortable conditions for focused listening to spoken word. A careful strategy was devised to ensure optimal acoustic conditions could be achieved through design and material selection.

The location of loudspeakers and their architectural integration are key aspects of both the quality of sound and achieving the architectural objectives of the clear-spanning structure. The placement and directivity of loudspeakers and their interaction with the room geometry and finishes will be a primary investigation in the next phase of the project.

As a contemplative space, it is desired that the outside distractions and sounds are minimised. The provision of sound separating constructions and low-background noise building systems are critical in providing environments and ambient noise levels for concentration. The integration of sound-absorbing materials in the ceiling finishes will facilitate a comfortable environment for listening.



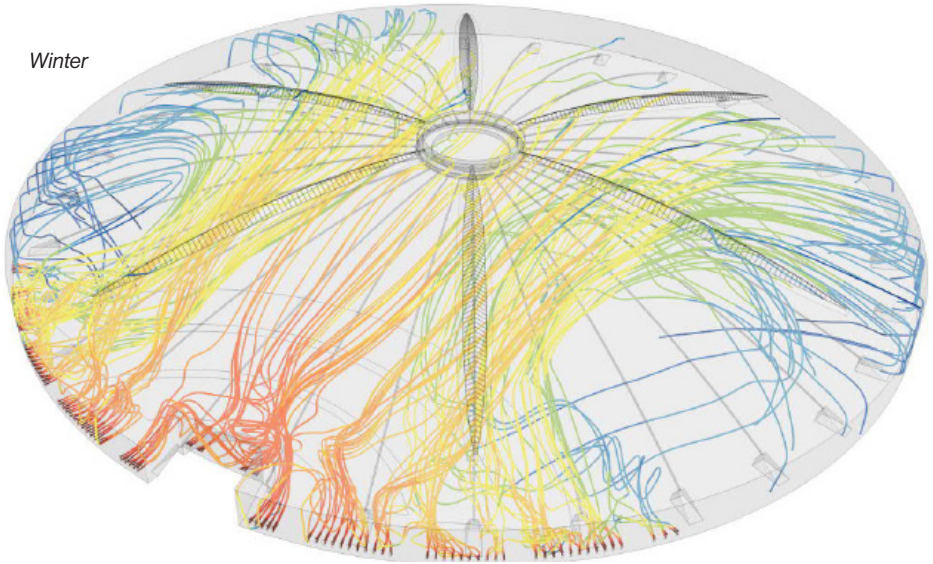




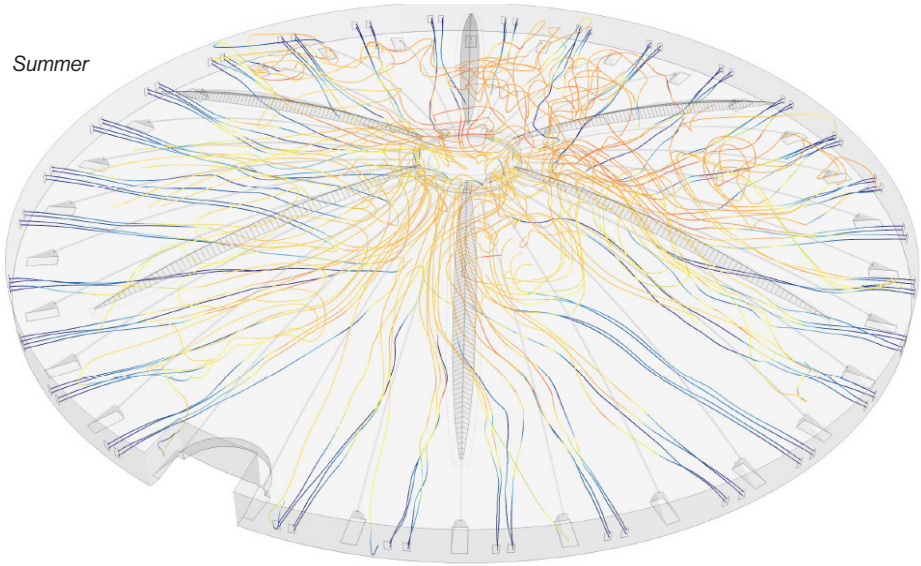
Heating & Cooling

The proposed HVAC strategy prioritises energy efficiency, comfort and sustainability across seasonal operations within the main auditorium and ancillary spaces. During summer, a mixed- mode ventilation system utilises a recessed slab for nighttime cooling storage, releasing it during the day. Operable vents facilitate natural airflow, with mechanical cooling activated as necessary to maintain thermal comfort while reducing energy consumption. For colder periods, an underfloor heating system delivers localised warmth to primary seating zones, supplemented by air source heat pumps and strategically placed fans for additional heating and ventilation.

Winter



Summer



Project Team

Client	RSSB
Lead Consultant, Architect & Interior Designer	Twelve Architects & Masterplanners
Planning & Heritage Consultant	Montagu Evans
Structural Engineer	Smith & Wallwork
MEP & Civil Engineer	WSP
Transport Consultant	WSP
Acoustics & AV Consultant	Charcoalblue
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Landscape Architect (Post-Planning)	Rappor