We have transformed the aircraft hangars originally used by Howard Hughes for the construction of the Hercules 4 amphibious timber airplane (also known as the "Spruce Goose") into modern office accommodations. The two large hangars and two smaller saddle buildings located in Playa Vista Los Angeles, CA—which stretch to a length of 740ft and a height of 75ft—were built during the Second World War and are a registered national historic building.

Arup worked in collaboration with the architecture firm, ZGF, to rehabilitate and seismically upgrade the existing timber building and to create four new levels of office and film production spaces within the hangars.

The existing structure consists of glue laminated wood arches considered as new technology at the time they were glued on-site in 1943. 17,000 fully-threaded screws were used to retrofit the original glue laminated arches showing signs of small to heavy delamination. Fully-threaded screws were chosen due to installation and cost efficiencies, and resulted in the first time these screws were used in Los Angeles. Arup specified a condition assessment that was performed by an external timber assessment consultant. An overview of each of the delaminations per arch in elevation was used to create construction documents including retrofit details and schedules that corresponded to various delamination classifications. This allowed the contractor to measure the depth of each delamination in-field and determine the applicable retrofit detail. Due to this lightweight solution, additional costs for a gravity retrofit that would have otherwise been triggered was avoided.


The conceptual connection of the tie-rods to the glue laminated wood arches is shown on the left, as computed to the detail as constructed in-field on the right. The pre-tensioned tie rods are a critical part of the retrofit as they significantly reduce transverse building stress and subsequently, stresses in the glue laminated arches.