A STELLAR STADIUM WITH SEISMIC STABILITY

PHILIPPINE ARENA
BULACAN, PHILIPPINES

With room for 50,000 spectators and 5,000 performers, this state of the art arena on the outskirts of Manila is the largest capacity enclosed stadium in the world. BuroHappold Engineering was appointed as structural and building services engineers for this ambitious project.

Our first challenge came in designing a vast stadium roof spanning 165m in its shortest direction, which had to endure some of the most severe earthquakes and typhoons in the world. The seismicity of the region is such that during a tremor, equivalent lateral loads generated can be up to 40% of the mass of the building. We responded with a base isolated design for the entire arena, insulating the building at ground level to reduce acceleration of forces.

The roof itself is heavily insulated, reducing heat gain in the arena below and the amount of cooling plant required. To maximise space within the arena we located this plant in a separate energy centre where, given the unreliable grid supply of the region, we also included provision for 100% on-site energy generation. We combatted the problem of run-off rainwater during a typhoon through clever surrounding landscaping, which includes water features that provide attenuation as necessary to minimise impact on local drainage systems.

Our building services team were tasked with providing fresh air and a comfortable client for a huge number of people in a hot and humid climate. To achieve this, we supplied tempered fresh air to the seating area that was then extracted directly to the outside via fans on the upper level. We used CAD models to coordinate their positioning to further enhance performance without compromising on valuable interior space.

The Philippine Arena stands in testimony to our commitment to provide solutions that respond to unique local conditions, and the exemplary results it produces.

CLIENT
Iglesia Ni Cristo, Church of Christ

ARCHITECT
Populous

PROJECT VALUE
$150 million

DURATION
Completed 2013

SERVICES PROVIDED BY BuroHappold
Structural engineering, building services engineering

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