

AZRAS System Overview

AZRAS is a system developed from the RC Upright Method, a construction method patented in Japan approximately 20 years ago and used to construct three actual buildings. The system was created to comprehensively evaluate the method's long-term durability, environmental performance, energy performance, economic viability, and related factors.

The RC Upright Method is based on low-rise terrace housing in which 300 mm-thick unidirectional reinforced-concrete walls form a long-life structural core, or skeleton. In AZRAS, this RC core is evaluated on the basis of a 200-year long-term service-life scenario. The replaceable interior components are defined as the “Infill,” while replaceable exterior components other than the RC core are referred to as the “Outfill.”

The concept is to retain the same RC structural core over the long term while renewing the Infill and Outfill as needs, uses, and technologies change. This makes the building system highly compatible with AI and digital-twin technologies that can continuously accumulate, update, and manage building information over long periods.

AZRAS development initially began as a means of evaluating factors such as CO₂ emissions and energy performance of the RC Upright Method. It subsequently evolved into a system capable of comparing and evaluating not only AZRAS but also other construction methods under equivalent conditions in various regions around the world.

The principal areas of evaluation include CO₂ emissions, energy consumption, construction cost, long-term economic and business performance, feasibility, and disaster risk. The system also incorporates continuous building-information management through a digital twin.

Accordingly, AZRAS is not an evaluation system limited to the AZRAS construction concept itself. It can be used at the planning stage to evaluate a wide range of construction methods across environmental performance, energy performance, economics, disaster risk, and other criteria.

The system primarily uses detailed architectural drawings exported directly to PDF from CAD or similar software. Basic default values are already provided. Once the required drawings and project conditions are prepared, users can follow the User Guide and enter the necessary information to establish a complete set of evaluation conditions in a relatively short time.

The included samples contain PDF drawings and Project JSON files for three construction methods using the same floor plan: “AZRAS,” “2×6,” and “RC Frame.” These samples allow users to examine the comparison process and results when only the construction method is changed while the plan and other principal conditions remain the same.

We recommend beginning with the included samples, running each Module, and exploring the comparative evaluation capabilities of the AZRAS System.