N.Z.E.
INNOVATION
HIGH PERFORMANCE SCHOOL PROTOTYPE

20TH CENTURY
Grey Economy

21ST-CENTURY
Green Economy

The NZE Prototype is a highly flexible design comprising two independent structural bays. This modular design approach allows the size of the building to be adjusted by expanding or contracting the number of structural bays. All major building components such as structural elements, mechanical and electrical systems, roofing, and façade are pre-fabricated off-site, which expedites construction, reduces waste, and minimizes traffic.

The NZE Prototype employs an innovative mixed-mode climate system that combines natural ventilation with efficient low-energy mechanical heating and cooling. Both systems can be used independently or in concert. In winter, the mechanical system delivers low-cost, low-emitting heat while summer cooling is provided by large-scale evaporative coolers. In warm climates, ventilation is used to remove indoor heat and exhaust air. The mechanical system can be used to maintain indoor comfort in the winter and for emergency operation.

The NZE Prototype is wrapped by a solar skin which creates a double façade for solar, shading, and ventilation. The skin plays multiple roles: it may be customized for different site conditions. An acoustical screen or landscape element. It also serves as a solar heat rejector, which helps to maintain indoor comfort. Its large size can be adjusted based on the site’s solar exposure, shading requirements, and the use of renewable energy systems such as solar panels and heat pumps. The skin also helps to reduce the temperature of the building’s envelope, thereby improving indoor comfort and energy efficiency.

The NZE Prototype utilizes innovative light and ventilation chimneys to bring natural light to the occupied zone of the space, allowing warm air and contaminants to naturally rise and be extracted by the chimneys. This natural ventilation strategy interacts with the mechanical system to maintain indoor comfort. In summer, the chimneys can be used to cool the building by drawing fresh air in from the exterior windows and exhausting heated air to the outside. The chimneys also serve dual purposes: they can be used to cool the building in the summer and to provide natural ventilation in the winter.

The NZE Prototype is designed to be highly adaptable to different climates, site conditions, and building programs. It can be customized for different locations and building types, such as schools, offices, and residential buildings. The building is designed to be highly energy efficient, with a zero net energy (ZNE) goal. The building envelope is highly insulated and tight, and the building is designed to be highly responsive to its environment.

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The NZE Prototype can be customized for different site conditions and building programs. It can be adapted to utilize different materials, systems, and technologies suited to a particular region, with similar goals and results. For example, a low-carbon school can be designed and built to achieve ZNE goals. The NZE Prototype can also be adapted to utilize different materials, systems, and technologies suited to a particular region, with similar goals and results. For example, a low-carbon building can be designed and built to achieve ZNE goals.

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