

Channels for Learning

A Zero-Energy Campus for Impoverished Students in Siem Reap, Cambodia

Massachusetts
Institute of
Technology



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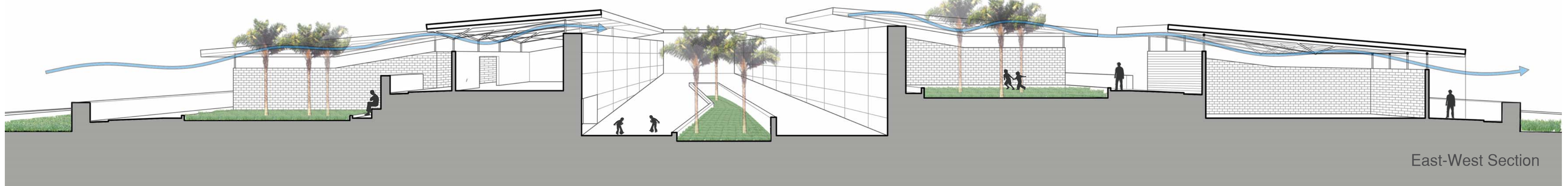
Croc-wash Station in Central Street

High School & K-8 Campus

'Channels for Learning' is a proposal for a new k-12 campus in the context of impoverished rural Siem Reap, Cambodia which aims to manage challenging issues of water resource distribution and harness wind driven ventilation to create a zero energy school. The Jay Pritzker Academy recruits bright young student from some of the poorest farming villages in the surrounding area and provides them with a world class education in an attempt at elevating the country through higher learning. Our project proposes an affordable and sustainable new campus to accommodate the expansion of the original school by 800 students. This campus is to have a distinct junior and senior high school that are connected through shared central programs but distinct in their individual identities.



Natural Daylight in Classroom



East-West Section

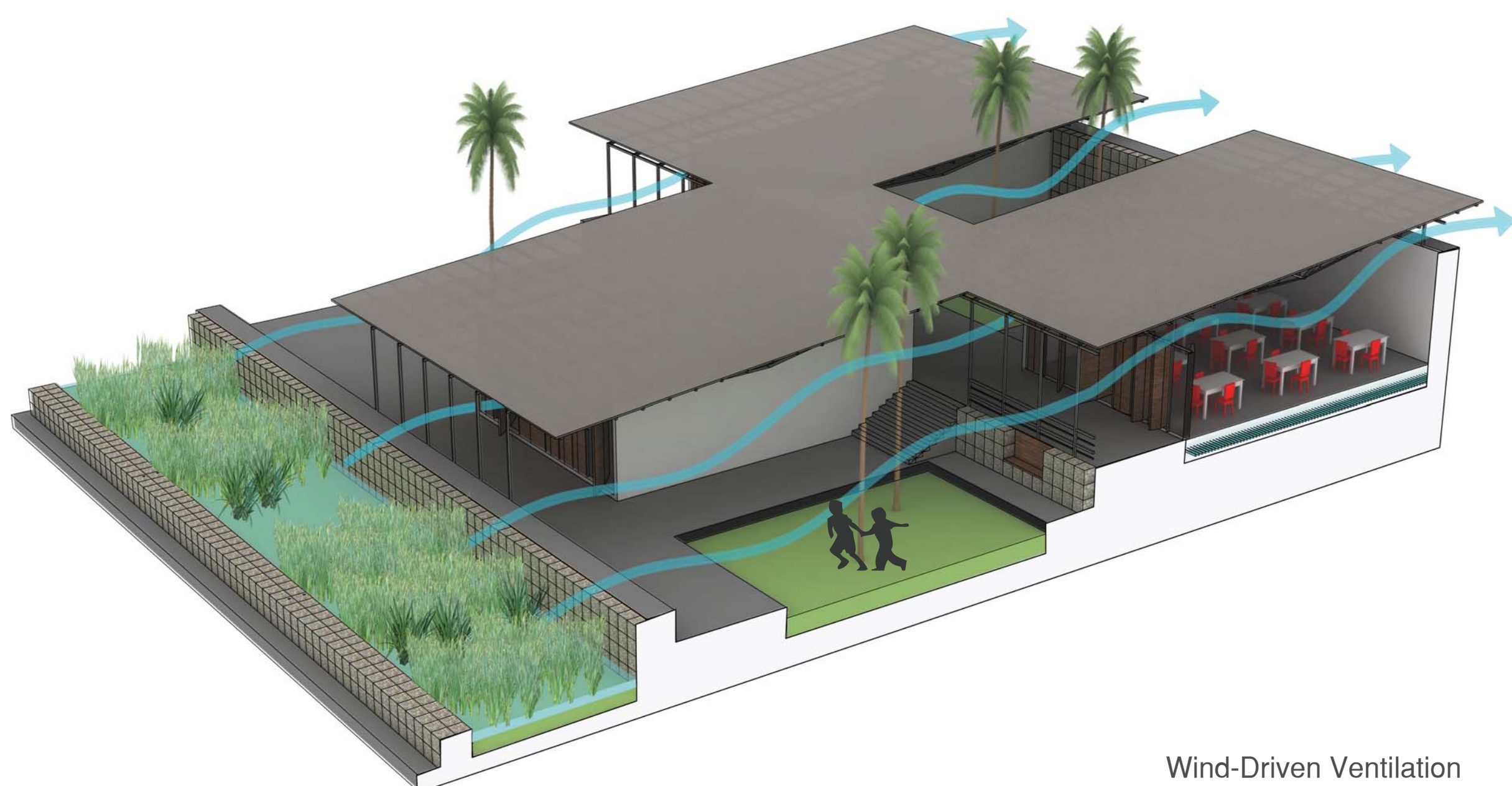
Water & Wind-Driven Ventilation



Annual Flooding



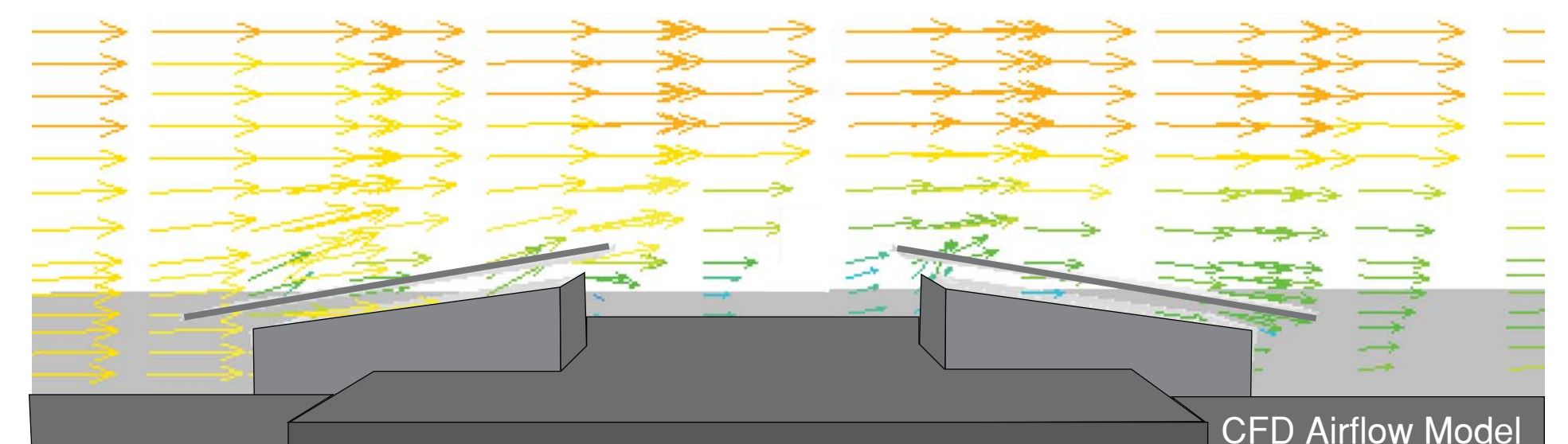
Croc-wash Station in Central Street



Wind-Driven Ventilation

Rainwater & Natural Ventilation

Oriented North-South along this axis, the campus is terraced in order to take advantage of prevailing winds and to aid in the overall ventilation strategy for each classroom. Each side of the campus is oriented around a shared central street that ramps up from the ground plane to an elevated central hub, along which the students are able to socialize, recreate, and study. We optimized the roof design to channel southern and western winds across the top of the classrooms to flush out hot and stagnant air, while lifting up from the walls to allow a consistent clerestory opening for even daylight distribution down onto the desks, thus eliminating the need for electric lighting. Rainwater is collected off the rooftops of shared central programs into a series of large, covered cisterns located adjacent to the central street. From there, water is channeled throughout the site to be used in a 'croc-washing' station for the children arriving from their muddy commute to school as well as gravity fed channel under each terraced classroom to create a passive cooling feature beneath the vented floor.



CFD Airflow Model