The Design and Construction of the Waiheke Library. A zero energy building

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SKETCH SUMMARY OF FEATURES

**ROOF SHADING.**
The trees on the roof will shade the building interior from most summer sun to mitigate overheating during the hotter months of the year.

**DECKS.**
Low thermal mass decking is located outside north facing glazing to mitigate outside heat being radiated back into the building during hotter months of the year.

**THERMAL MASS.**
Polished concrete floors provide thermal mass in front of north-facing windows. In floor heating will supplement solar heating during winter months.

**FEATURE CEILING.**
A perforated plywood ceiling provides a mixture of additional natural daylight in the middle of the building as well as acoustic absorption to mitigate excessive reverbartion. Rain impact noise is dampened with 18mm plywood under the metal roofing.

**DAYLIGHT TUBES.**
Daylight tubes in the centre of the building supplement daylight provided by the perimeter clerestory windows.

**NATURAL VENTILATION & COOLING.**
The building is predominantly naturally ventilated and cooled through a combination of low and high level opening windows. Large slow moving fans assist airflow on still days, and heat pumps assist cooling smaller enclosed rooms during peak occupancy.

**PHOTOVOLTAIC PANELS.**
Photovoltaic panels estimated to produce the same amount of electricity as the building consumes during summer.

**INSULATED & REFLECTIVE ROOF ASSEMBLY.**
An insulation level of R 5.0 is in the roofing assembly, together with a light coloured solar reflective coating.

**PERIMETER ENCLOSED ROOMS.**
Enclosed spaces around the perimeter of the building are at optimum depth for one sided ventilation.