Assignment7. Case Study

Environmental Strategies in Learning Hub, Singapore

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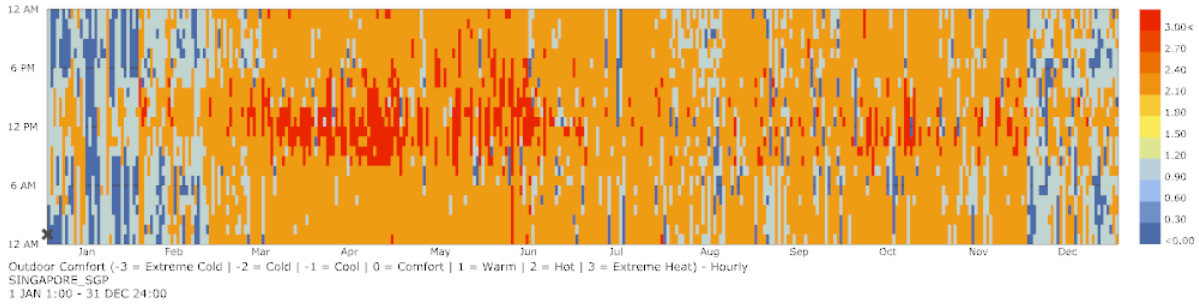
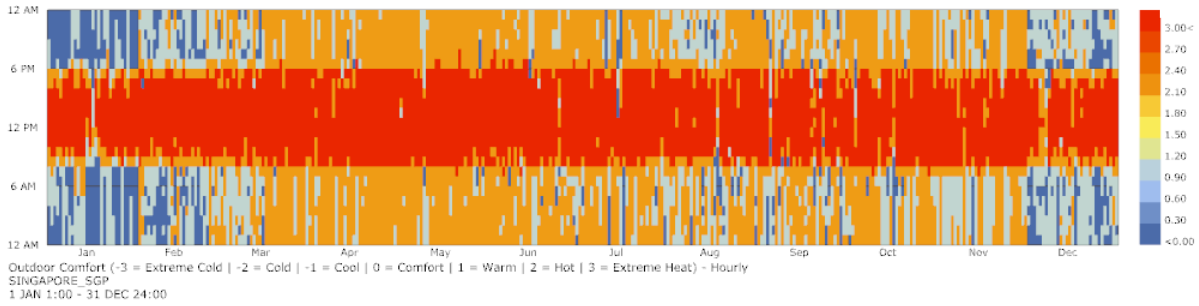
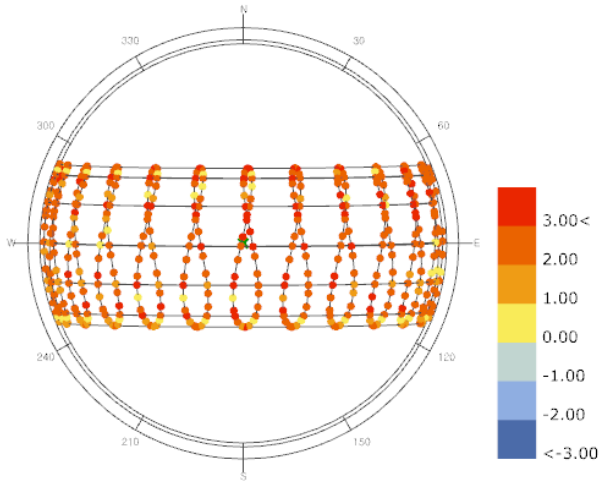
Weather in Singapore

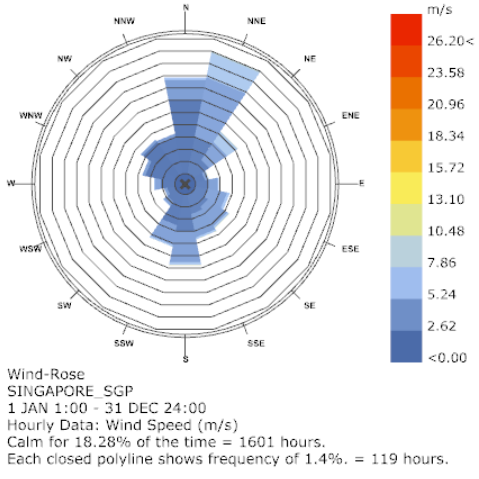
Temperature

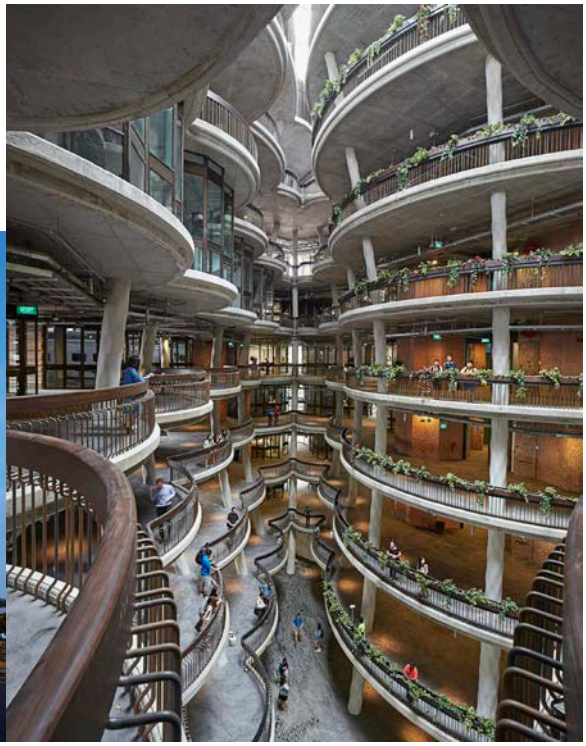


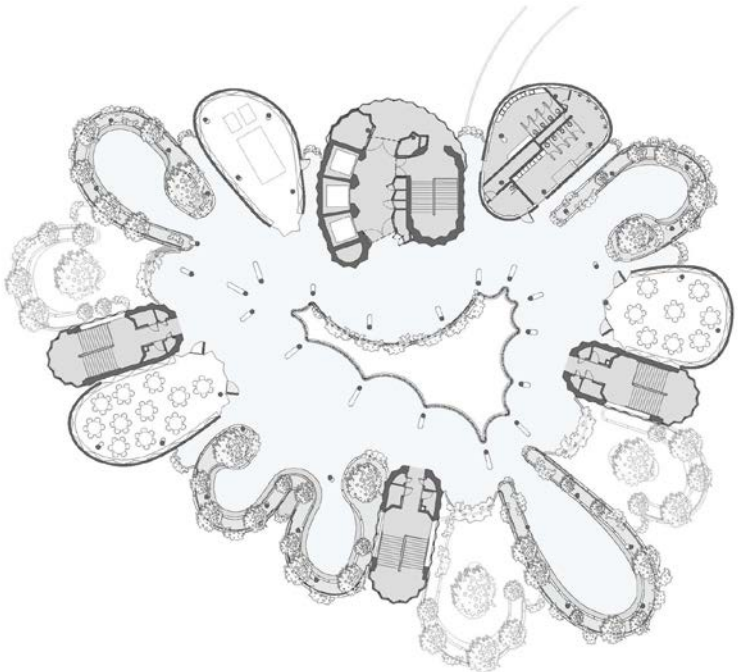


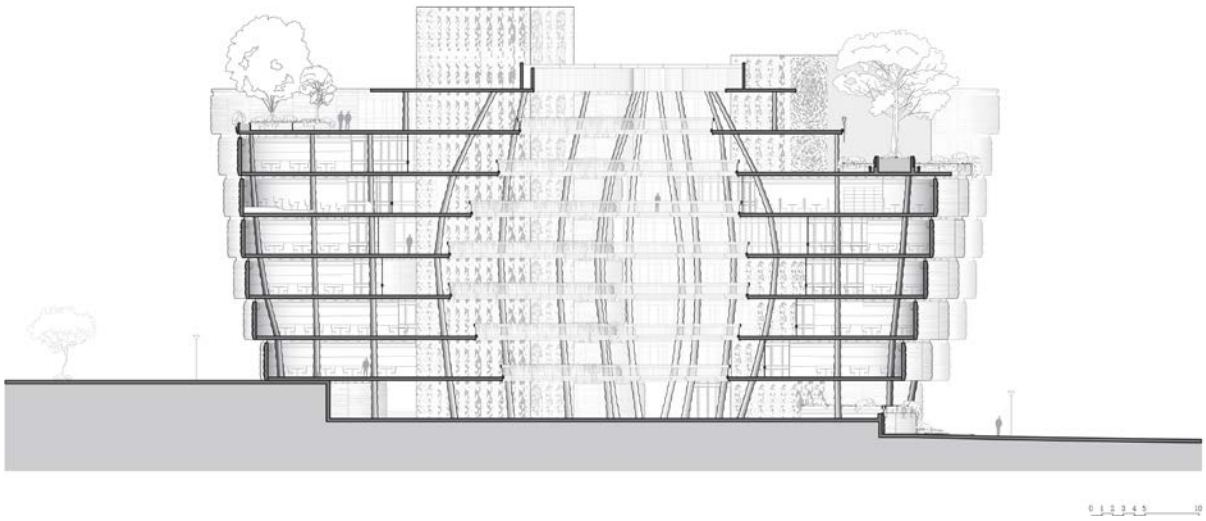
Radiation and Wind











Design Intent

To minimize solar gain, Heatherwick Studio introduced narrow bands of glazing around the perimeter of each classroom. Having rejected curved glass as too costly, but wishing to avoid a faceted appearance, the architects arranged the flat panes in a zig-zag pattern. A slight floor-by-floor cantilever further cuts the heat, turning each story into a natural sunshade for those below it. Meanwhile, induction units positioned under the windows passively ventilate the classrooms. Rounded bronze-mesh balconies situated between each classroom wing draw air into and through the courtyard, producing a cross breeze no matter the direction of the wind. The final pin in the Learning Hub's sustainability cap (the building achieved the highest sustainability rating awarded by the government of Singapore) is the hydroponic greenery distributed across the balconies and rooftop garden.

Effect on Heat Equation

Small windows in the classroom allow less amount of light to come in to the classrooms which allow less radiation heat. Further, the white exterior reflects the sunlight, which also allow less radiation.

Atrium in the middle of the building brings cool air into the building, and allow hot air to ventilated.

If I were in charge of the project

It seems like there is no greenery in the roof of the building. So, I would introduce more plants so that the concrete mass would not be heated by the sunlight. Further, the direction of the building can be changed to avoid the effect of sunlight.