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9. 12
Building Façade
The building façade has a large effect on the overall thermal efficiency of the building. Good air-tightness and thermal performance limit the amount of energy lost to the atmosphere. High performance glazing with a shading system integrated into the architectural design and optimised through environmental analysis can reduce the amount of heat gain whilst optimising the daylight in all appropriate spaces, reducing the need for artificial lighting. As a minimum the façade will meet the requirements of Building Regulations Part L 2010.

9. 13
The form and articulation of the building envelope responds to environmental considerations. Each façade of the Proposed Development has been carefully designed to consider the environmental impact of orientation and minimise solar heat gain while maximising daylight availability.

9. 14
The taller southern wing serves to shade and protect the central atrium glazing set in the lower northern wing.

9. 15
The vertical orientation of the east and west elevations shade the glazing against the low sun angles on these façades.

9. 16
The narrow windows (1 meter wide) in the terracotta walls are recessed 200mm into the deep walls, providing a vertical shading on the east and west façades.

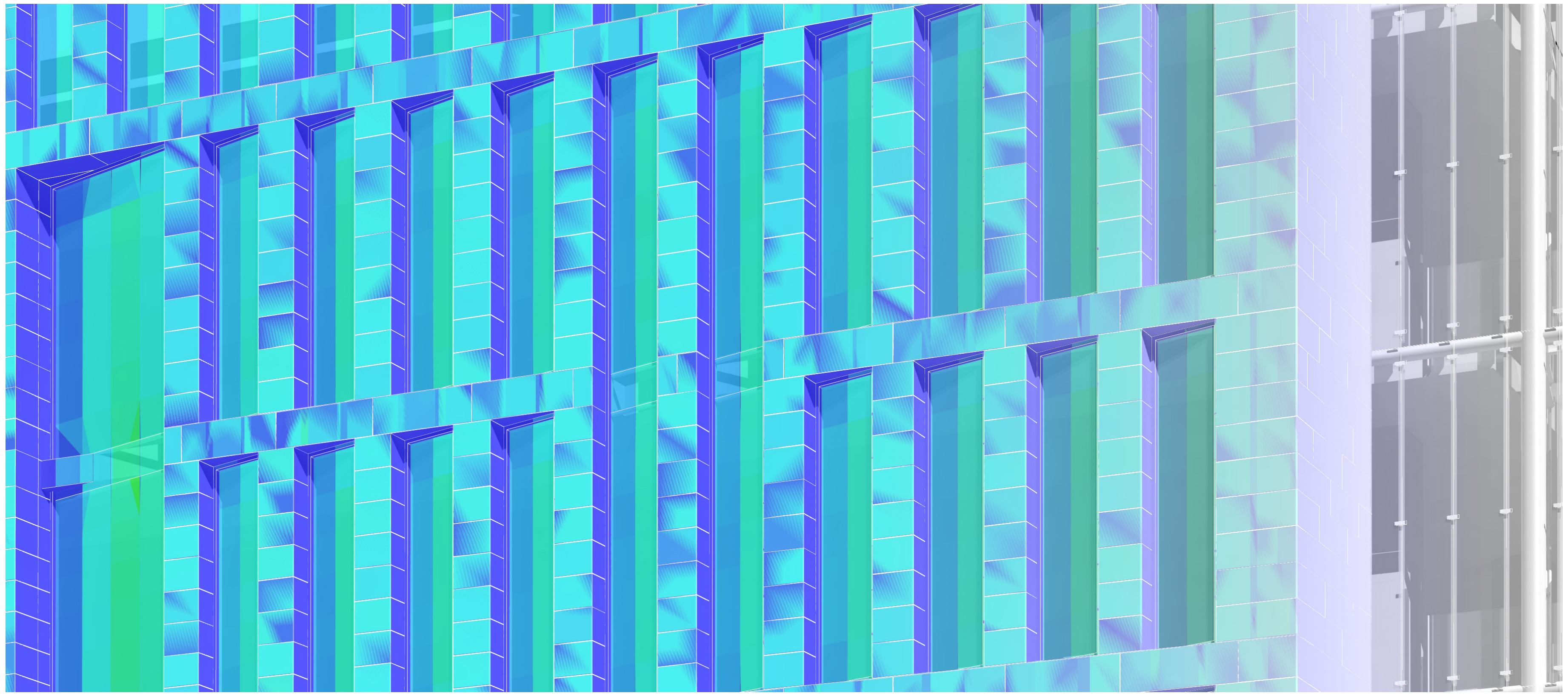

Fig 9-11. Diagrammatic solar radiation on facades. Depth of terracotta help shade recessed glazing.

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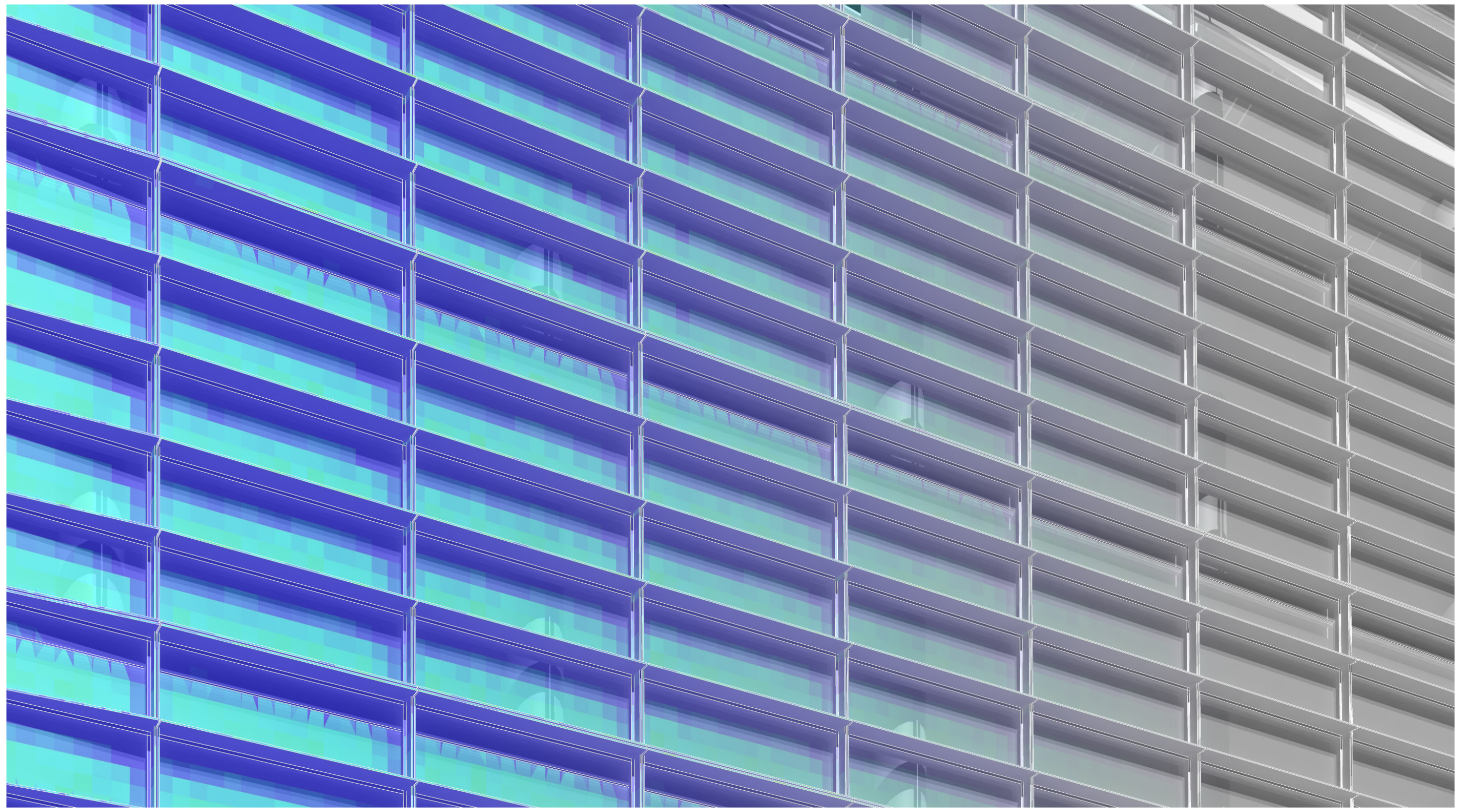
9. 17
By contrast, the southern elevation has a horizontal orientation that assists in solar shading to glazing on this elevation. The bay façades are shaded with a bris-soleil integrated into the curtain walling system: horizontal extrusions at 1 meter spacing (projecting 240 mm on the south).

9. 18
High performance glass is used throughout the building, with a shading coefficient of 0.39



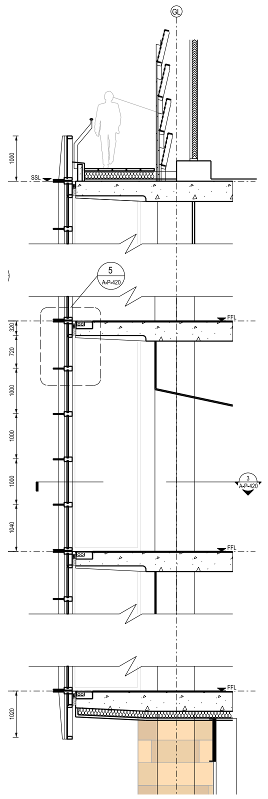


Fig 9-12. Diagrammatic solar radiation on facades. Fins on bay windows help shade façades

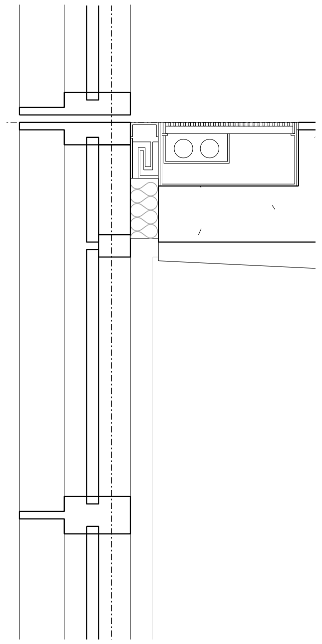


Fig 9-13. North bay window elevation detail

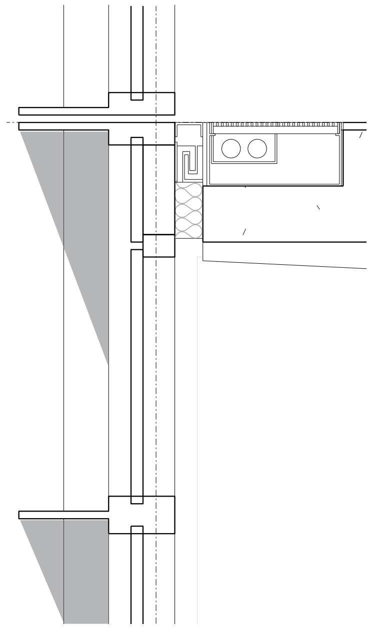


Fig 9-14. South bay window elevation detail; depth of fin assists in shading the glazed areas.

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9. 19
Lighting and Lighting Control
The internal ceiling profile of the laboratory is profiled to maximise daylight penetration into the laboratory to minimise reliance on artificial lighting. Where possible, central circulation spaces will be lit, at least in part, by daylight into the atrium. The lighting design for internal circulation areas will give the illuminance level required for safe passage and movement and could be a combination of direct and indirect lighting.

9. 20
The lighting control in the primary laboratory areas will be by means of local control for the ambient lighting with separate control for the task lighting on the benches in the laboratory space. The lighting control will incorporate an out of hour function which would operate at a pre determined time to reduce the lighting levels in the laboratory prior to them being automatically turned off. Any laboratory user will have the ability to override the out of hours function via the local control function. Support areas, meeting rooms, stores, toilets, plant areas etc would incorporate occupancy sensors with local control to override the sensors if required by the occupant. Lighting on the perimeter corridors will incorporate daylight dimming when adequate levels of daylighting are available. High efficiency ballasts will be used where possible and a complete lighting control system will be provided to maximise operational efficiency serving as a tool for energy saving. Energy-efficient external lighting will be specified and all light fittings will be controlled for the presence of daylight.

Fig 9-15. Photo of model from above. Atrium will benefit from natural light