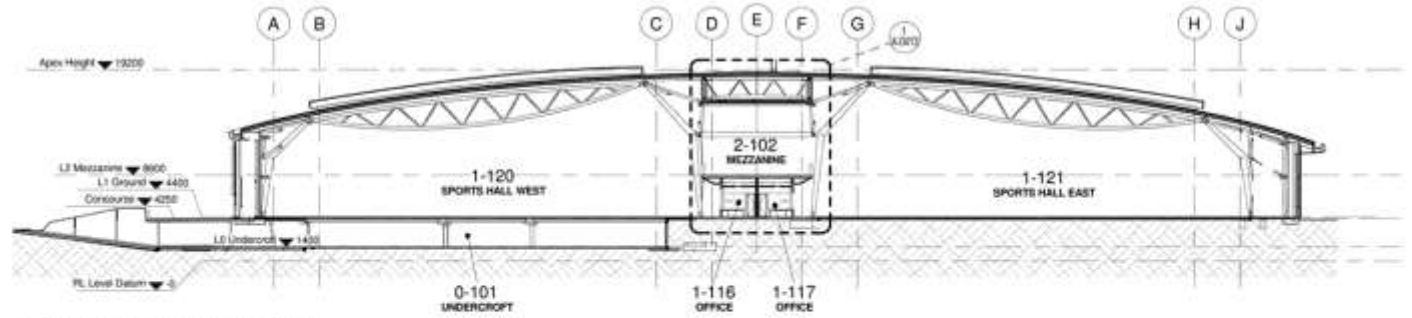
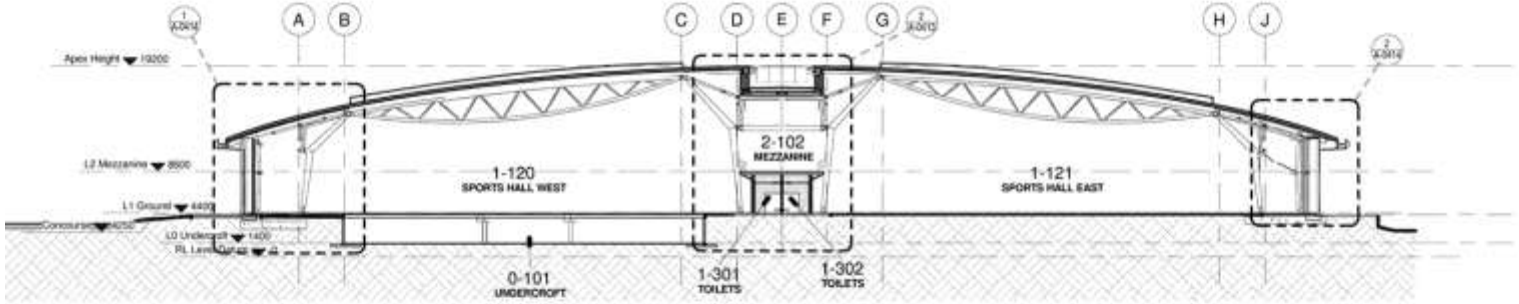
- Context, Site and Exterior Form
- Interior and Sports Functionality
- Building Fabric and ESD
  - Roof
  - Walls
  - Floor
  - ESD

Wellington

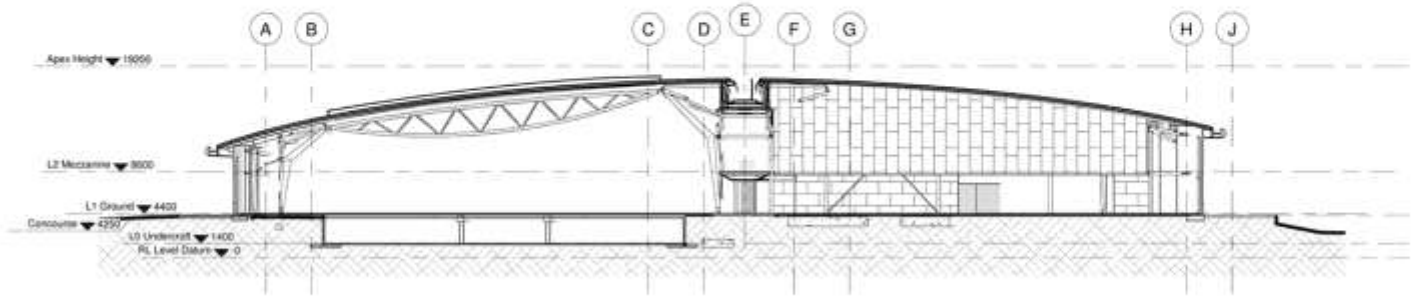
Indoor Community Sports Centre



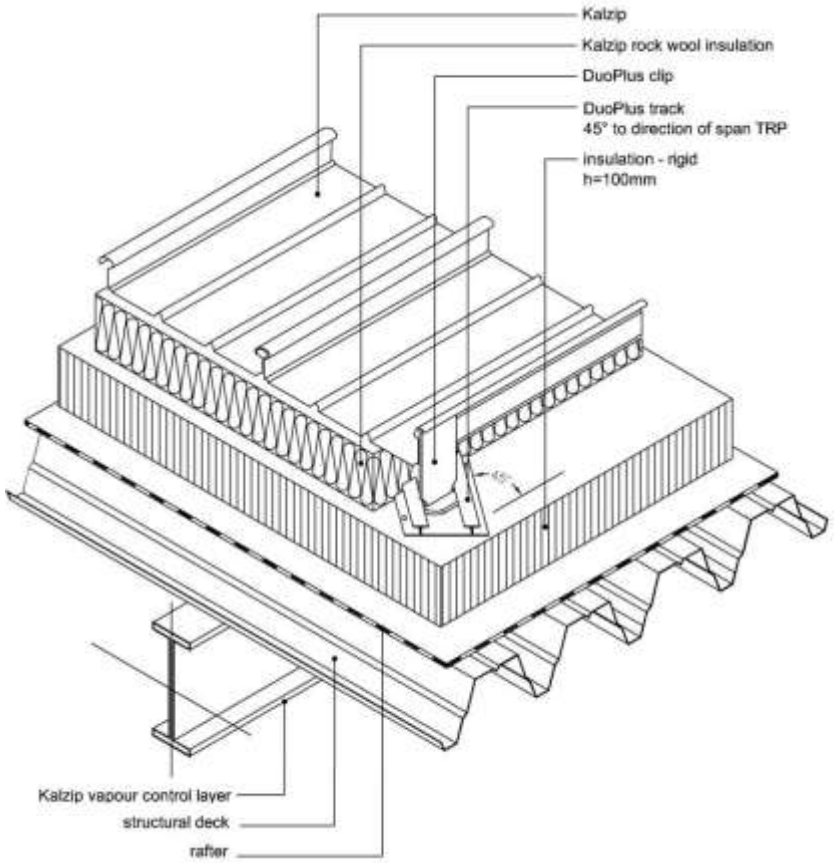
3 A-0101 Cross Section East West Grid 3, 4
1 : 250

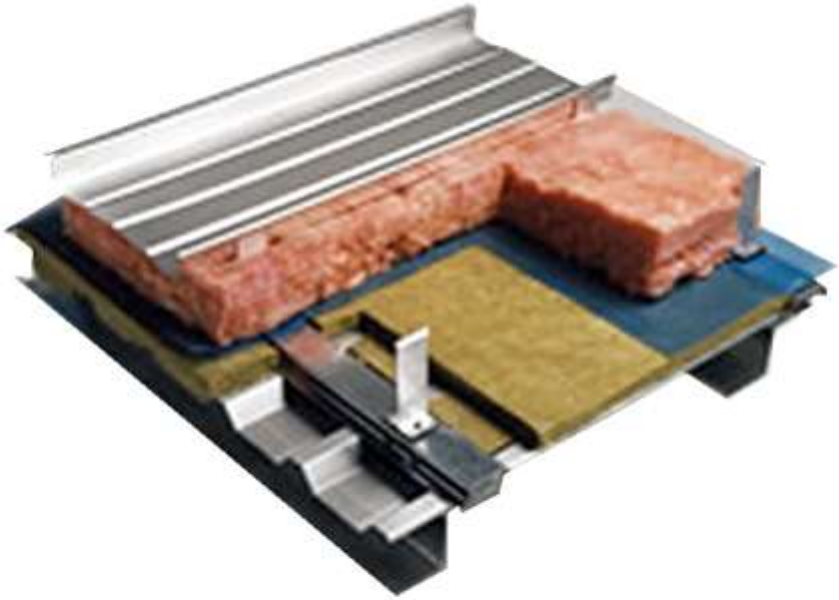


1 A-0101 Cross Section East West Grid 6
1 : 250



Cross-Section: *Roof, Walls, Floor*





Assessed as optimum roof system for the Community Sports Centre and aggressive coastal environment

Kalzip Roof System*: Construction detail*

Roof - 12,257m² of Kalzip

•Optimum material for coastal site

•70 year life with little or low maintenance

•Whole of life costing indicates a $270,000 increase in capital cost returns $22million over 70 year life.

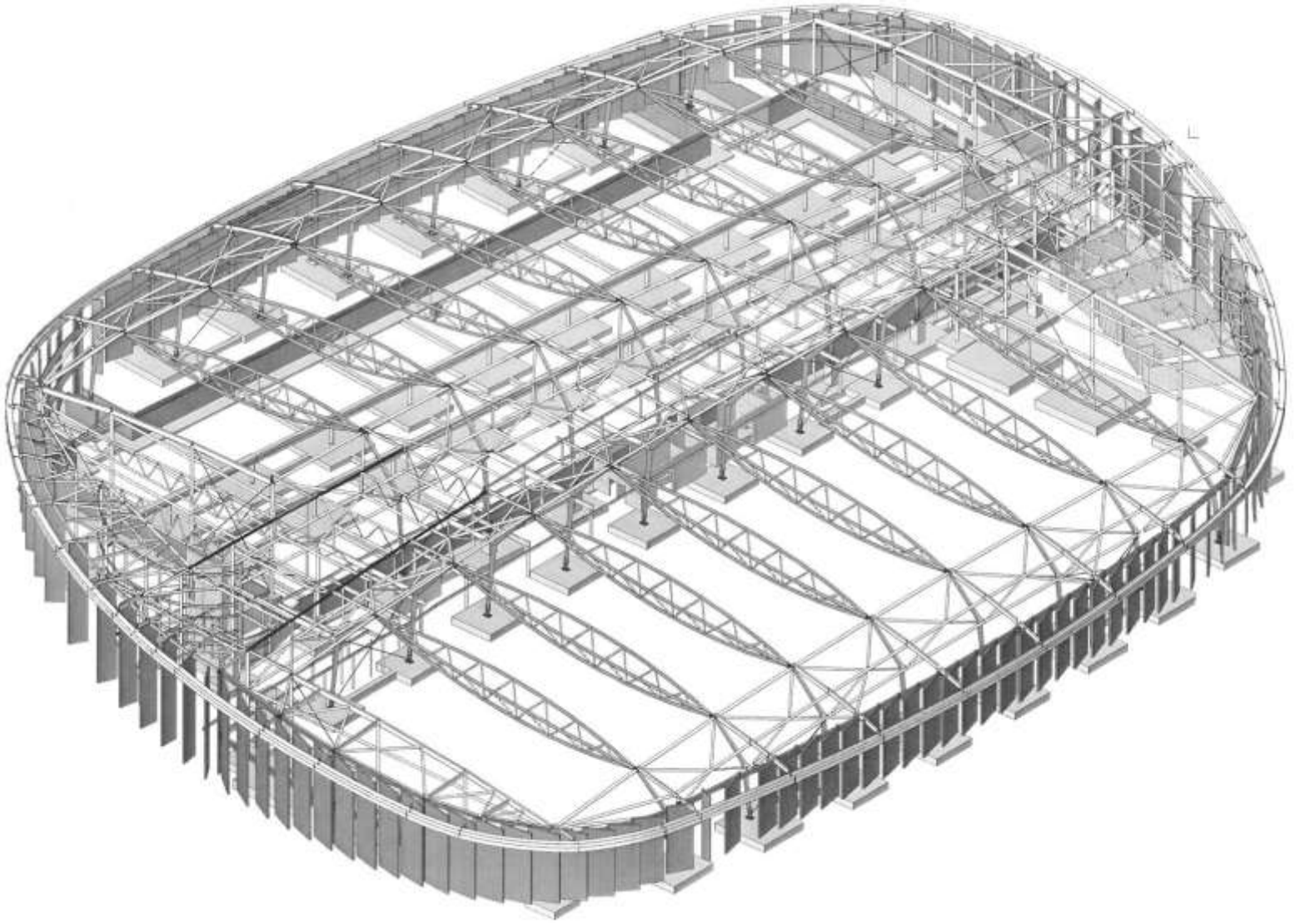
•Highly sustainable product of min 60% recycled content and more than 95% recycled at end of life.

•Composite ceiling and roofing system offering high quality thermal and acoustic insulation.

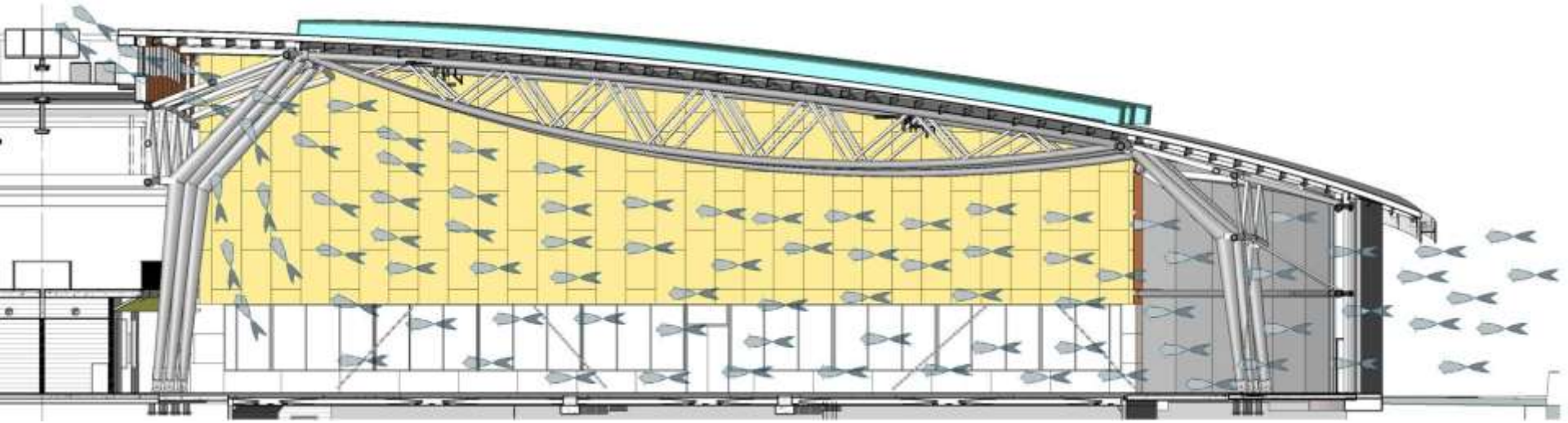
•Durable ceiling

•System with integral skylights

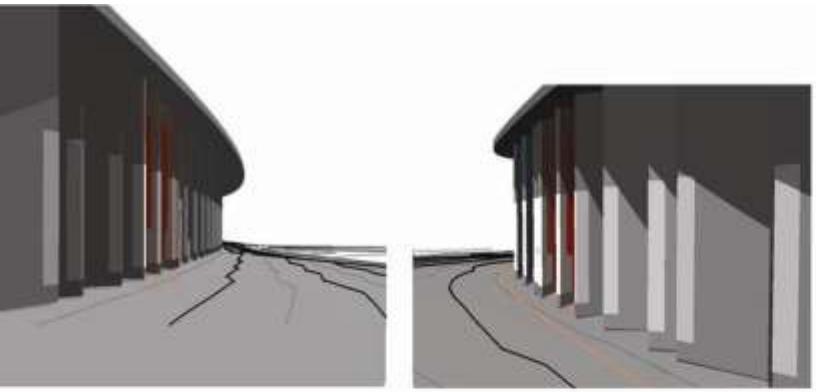
Roof: *Kalzip standing seam aluminium roof system*

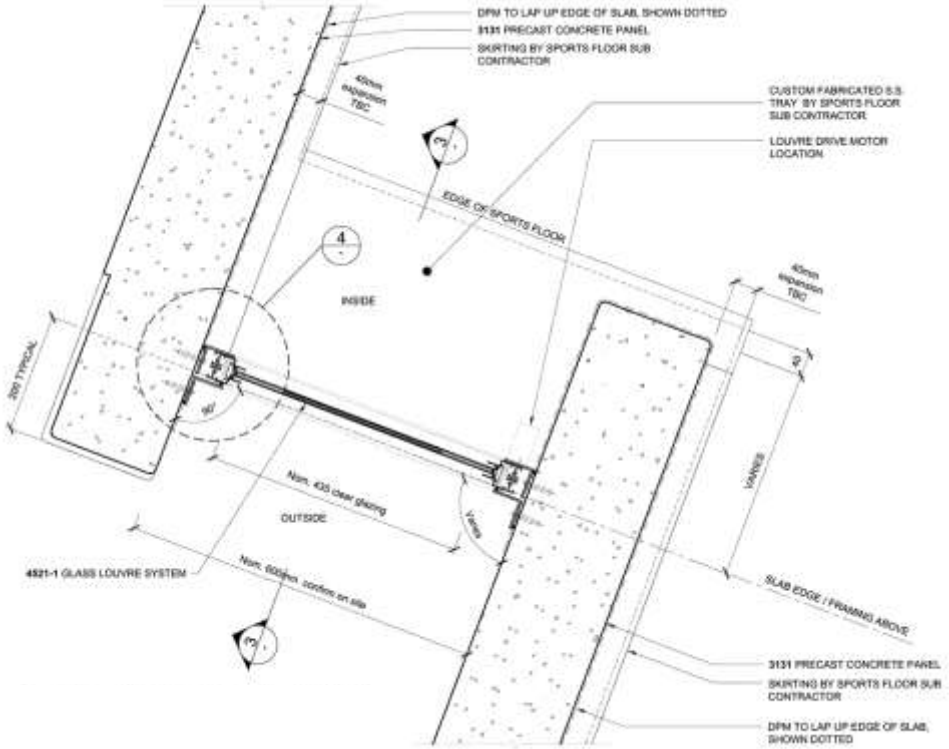


Walls: *Structural Isometric*

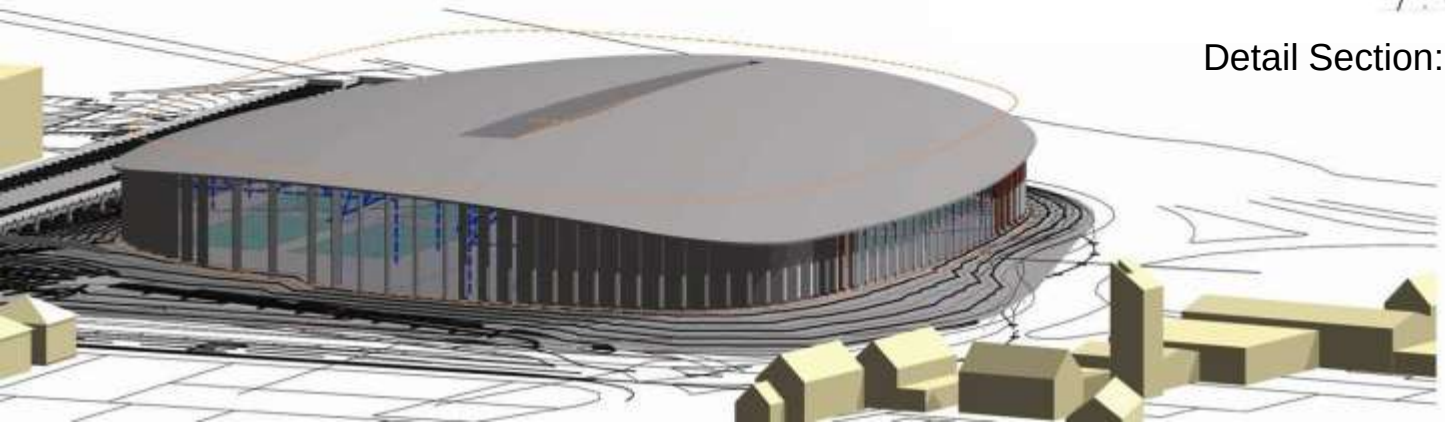


Ventilating Pre-cast concrete walls: *providing natural thermo-siphon*

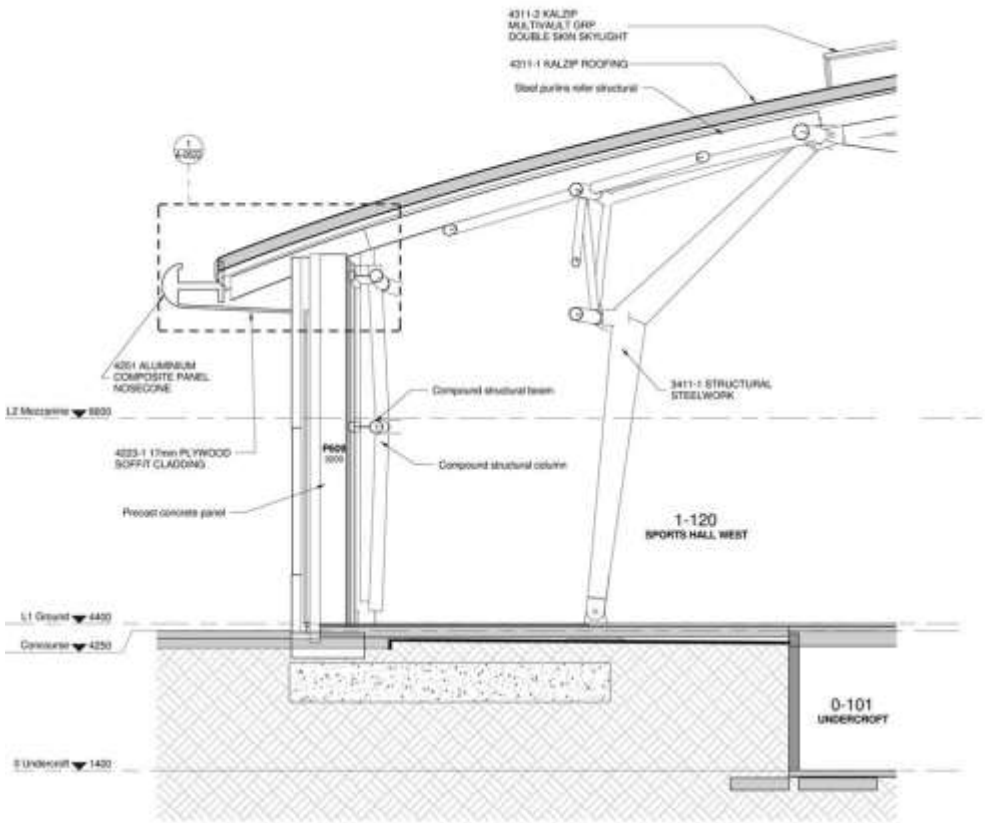




Detail Section: *Pre-cast Concrete Panels Jamb Detail*



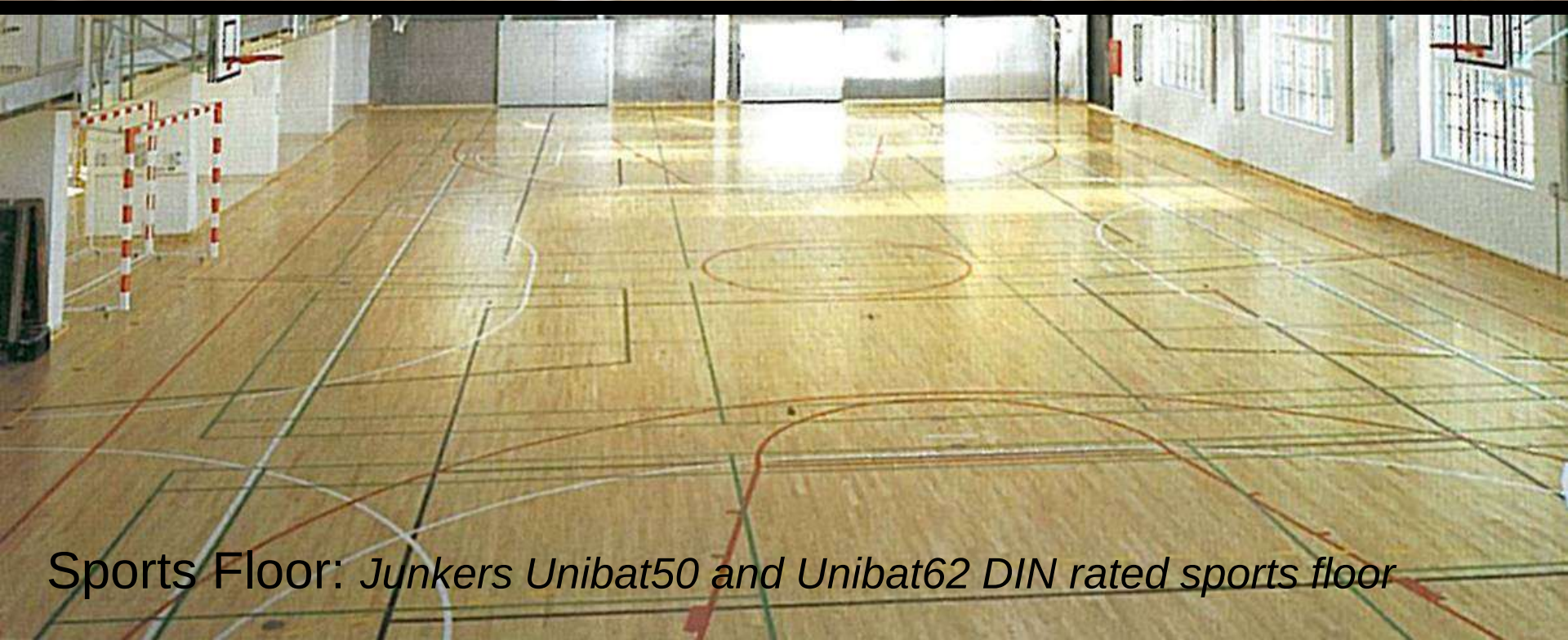
Pre-cast wall fins: *with glazed louvres between*



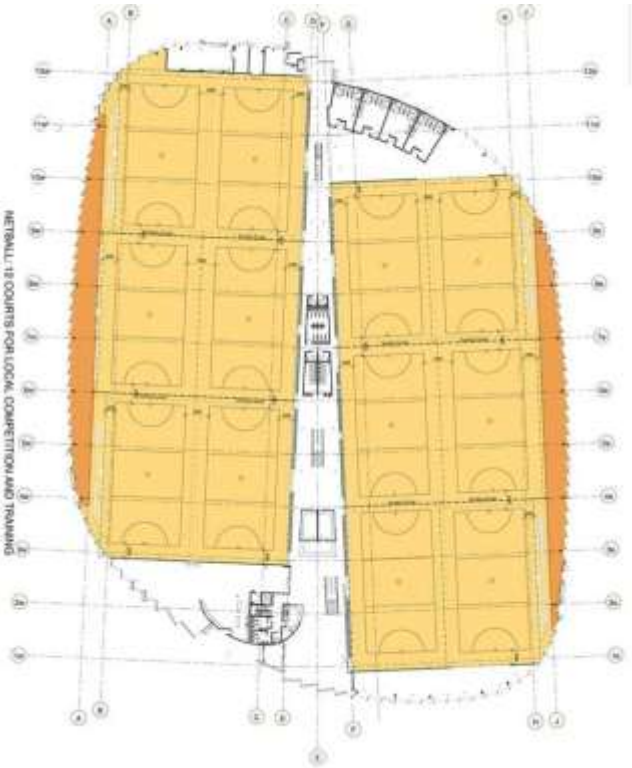
Walls

- Concrete is the optimimum material for coastal site
- 70 year life with little or low maintenance
- Highly durable internal walls from floor to ceiling
- Whole of life costing indicates a $400,000 increase in capital cost returns $11million over 70 year life.

Walls: *External envelope cross-section*



Sports Floor: *Junkers Unibat50 and Unibat62 DIN rated sports floor*

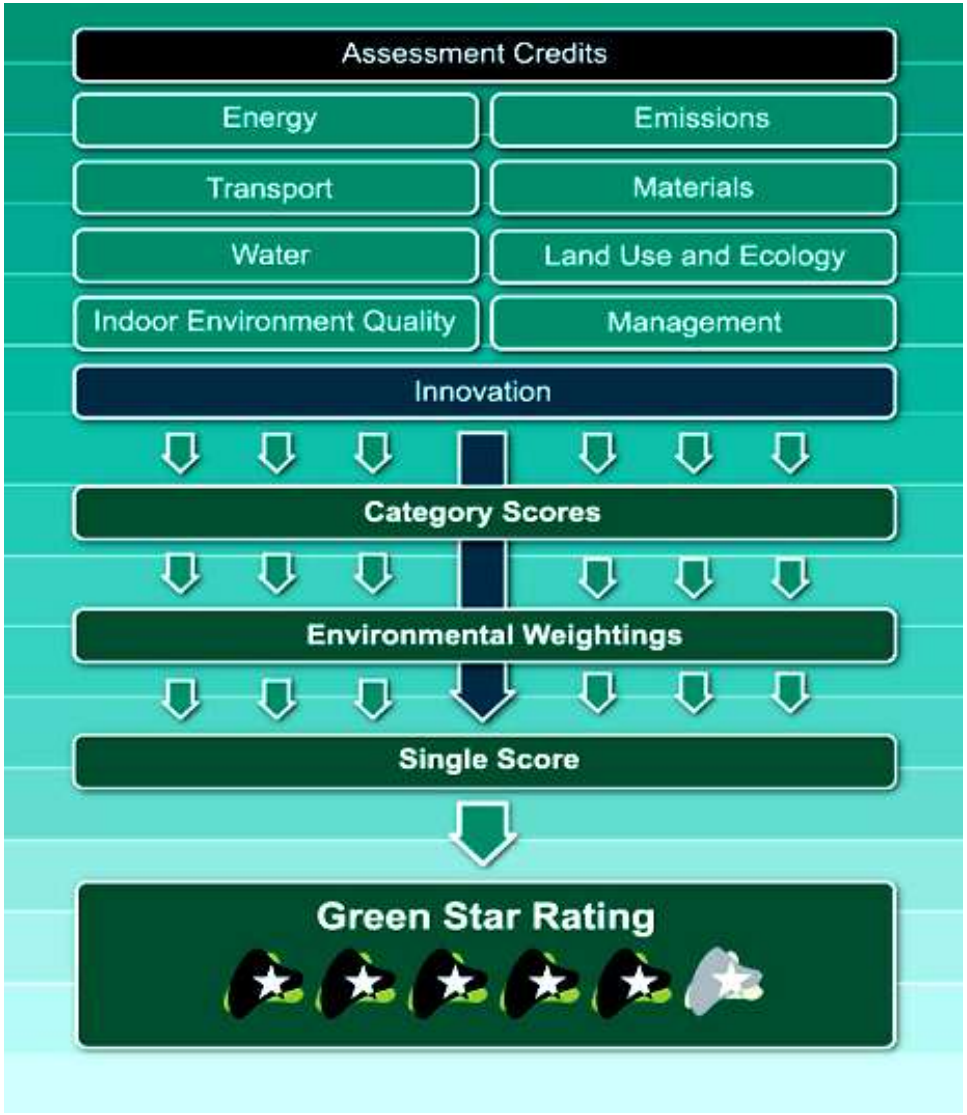


Loaded Unloaded

Sports Floor – 9130m²

- A sprung timber floor is the optimum flooring for a sports centre.
- Expected 30-40 year life with regular maintenance and care.
- Initial flooring system was a timber joist floor structure in eastern chamber.
- This was ultimately rejected, as such floors cannot achieve DIN sports floor ratings.
- As required by the sporting codes when competing to hold a tournament.
- Sports floor timbers from sustainable sources and designed to withstand maintenance loads.

Sports Floor

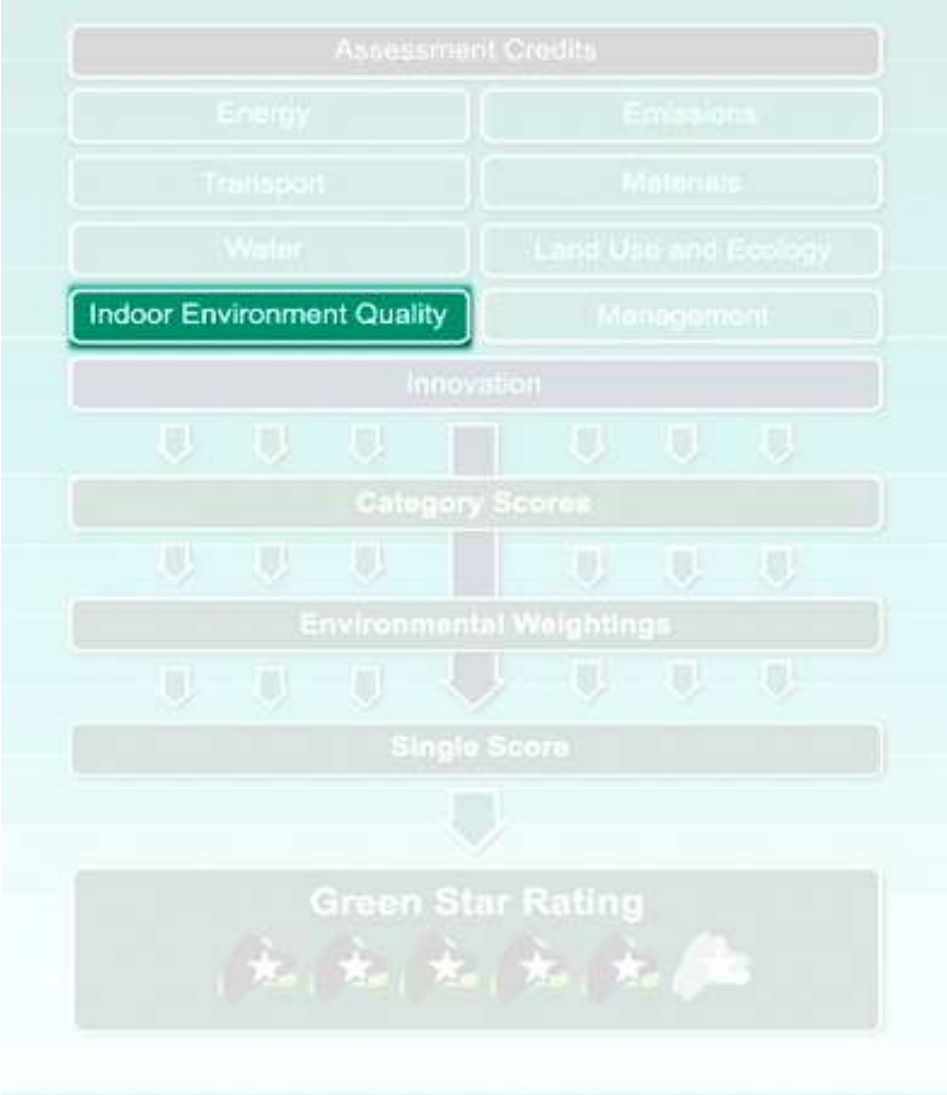


•Currently no assessment tools for sport centres with NZGBC

•Design principles for WICSC developed using this Green star structure

•During design development we ran a series of ESD workshops and created ESD targets

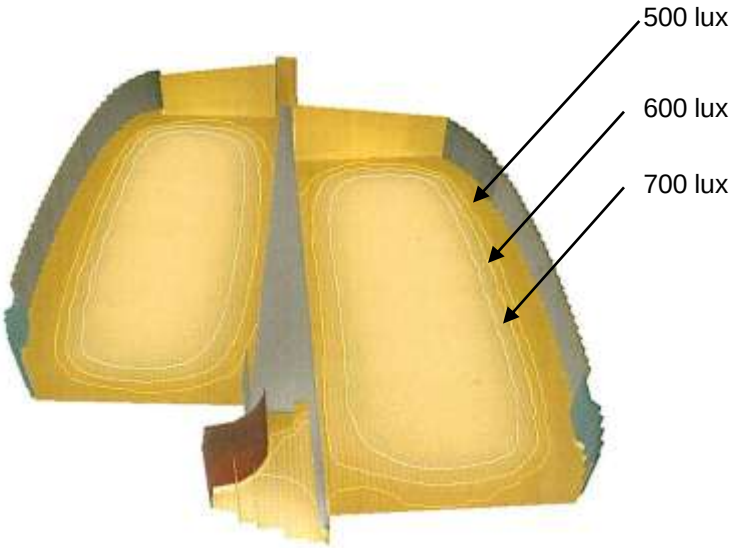
ESD: Environmentally Sustainable Design



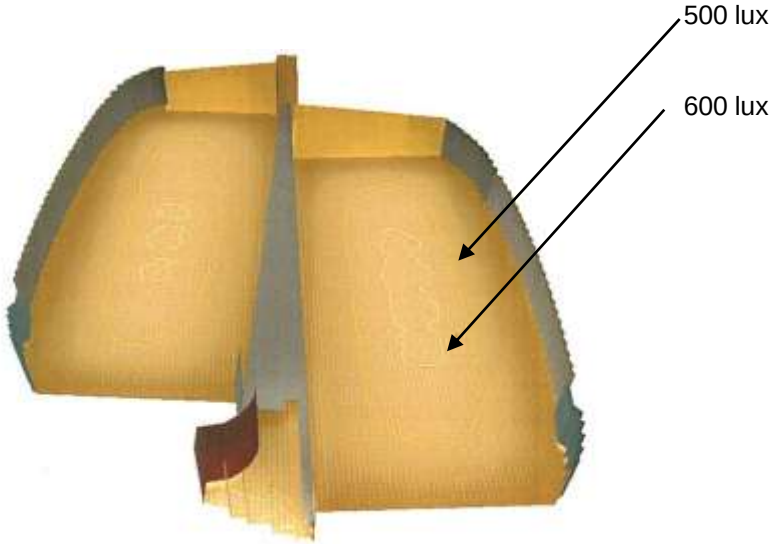
- Typically indoor sports centres are artificially lit and ventilated

- For WICSC we have targeted maximum natural light and ventilation

Green star assessment criteria: *Indoor Environment Quality*



Summer day Feb 28th 2008 8.30am



Winter day Aug 28th 2008 4.30pm

Lighting

- Natural lighting provided by double skin roof lights
- South light through precast walls
- Offering 3-4 hour period with no artificial light
- Dimmable electronic fluorescent hi-bays that will attune to the natural lighting conditions.

ESD Indoor Environment Quality: *Lighting*

Natural Ventilation

•Natural ventilation - via high and low level natural ventilation

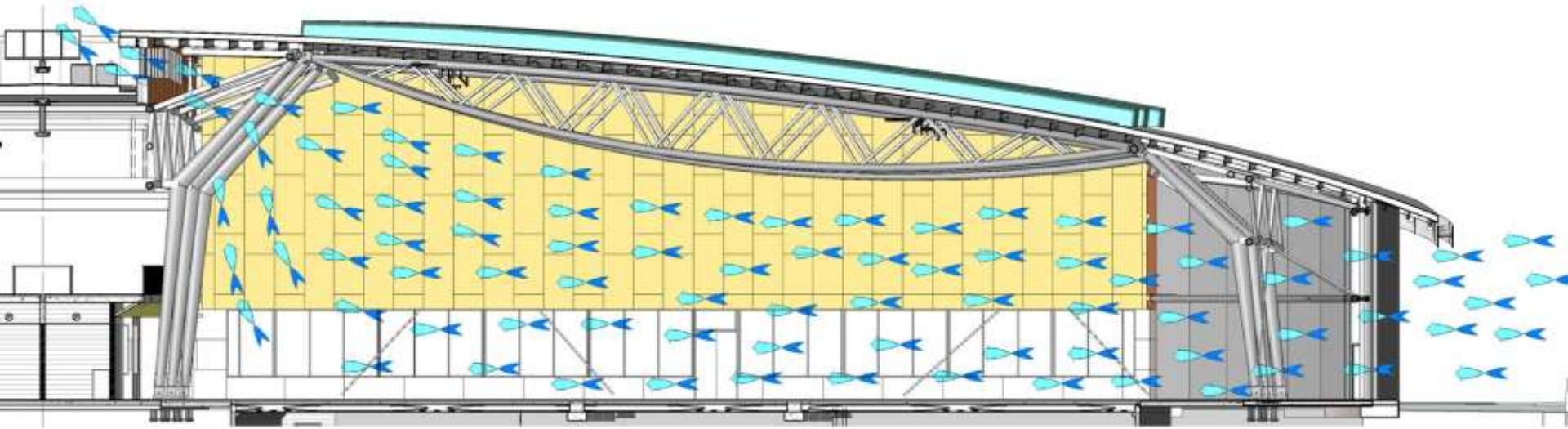
•Activated louvres can open to allow high volume fresh air for summer events on still days and large occupancy

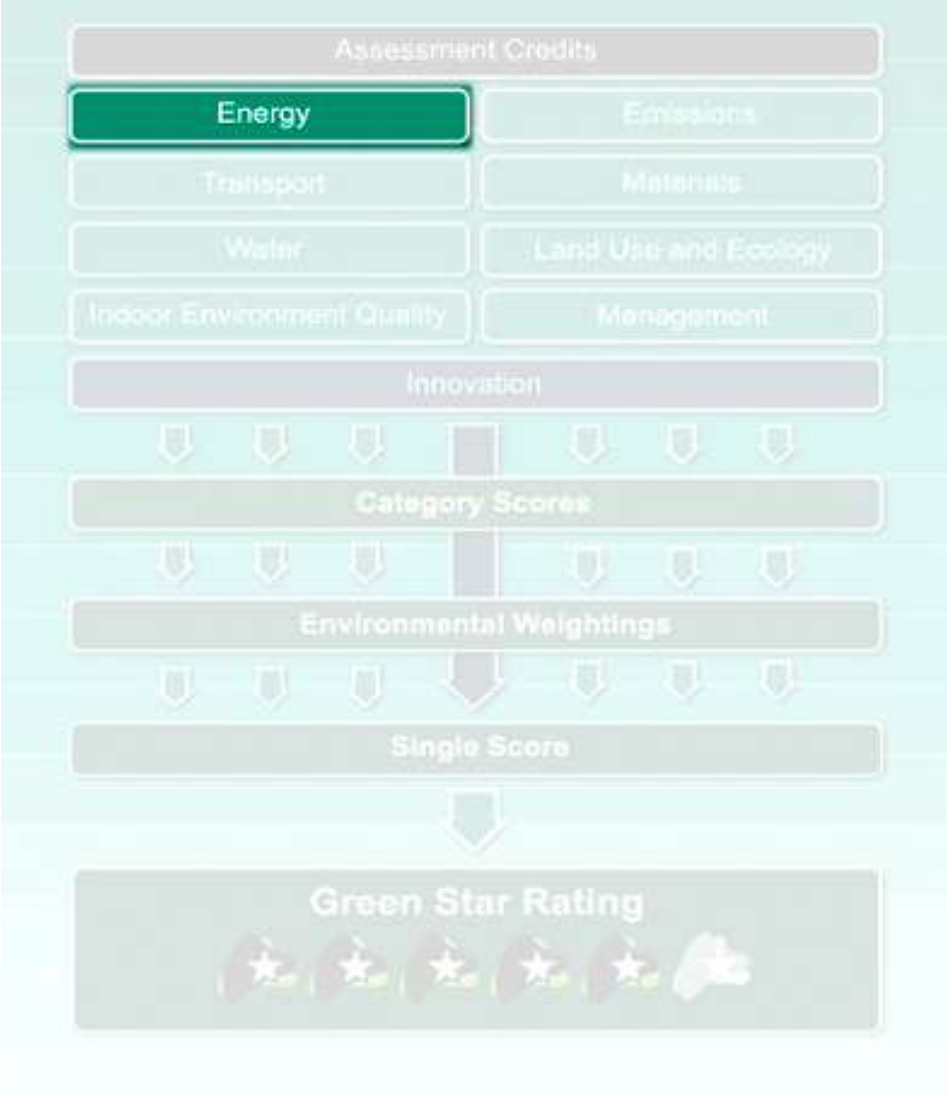
•2 weather stations to respond weather conditions
•No HVAC all ancillary spaces naturally ventilated

Thermal Environment

•Radiant Gas heating is included with pipe work installed at high level

•Concrete elements providing thermal mass, moderates temperature fluctuations





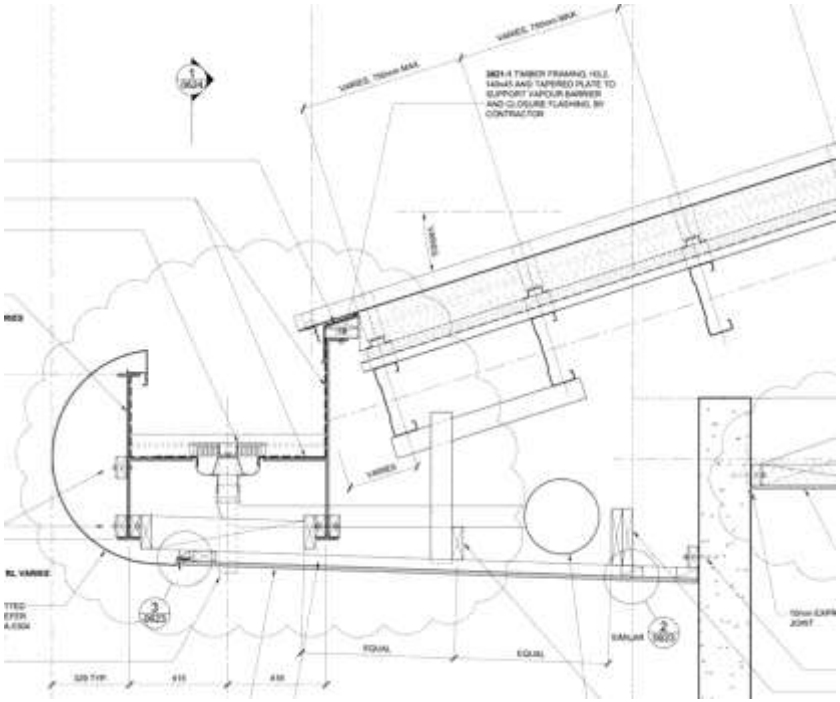
•Solar hot water heating providing 45% of water heating requirements

•Power density targets
- •Baseline is UK sports centre 165/kWh/m²
- •Our ESD target 105/kWh/m²
- •Current assessed density 70-75/kWh/m²

•This equates (at 14c/kWh) to power savings of $164k/annum

•Further savings in maintenance of $30-$40k/annum on comparative size facility with full mechanical ventilation and artificial lighting.

Green star assessment criteria: *Energy*



Water

•Efficient showers, taps and toilets

•Storm water detention enabled for toilet flushing

•Water metering

Land-use and Ecology

•Rehabilitation of a Brownfield site with contaminated materials

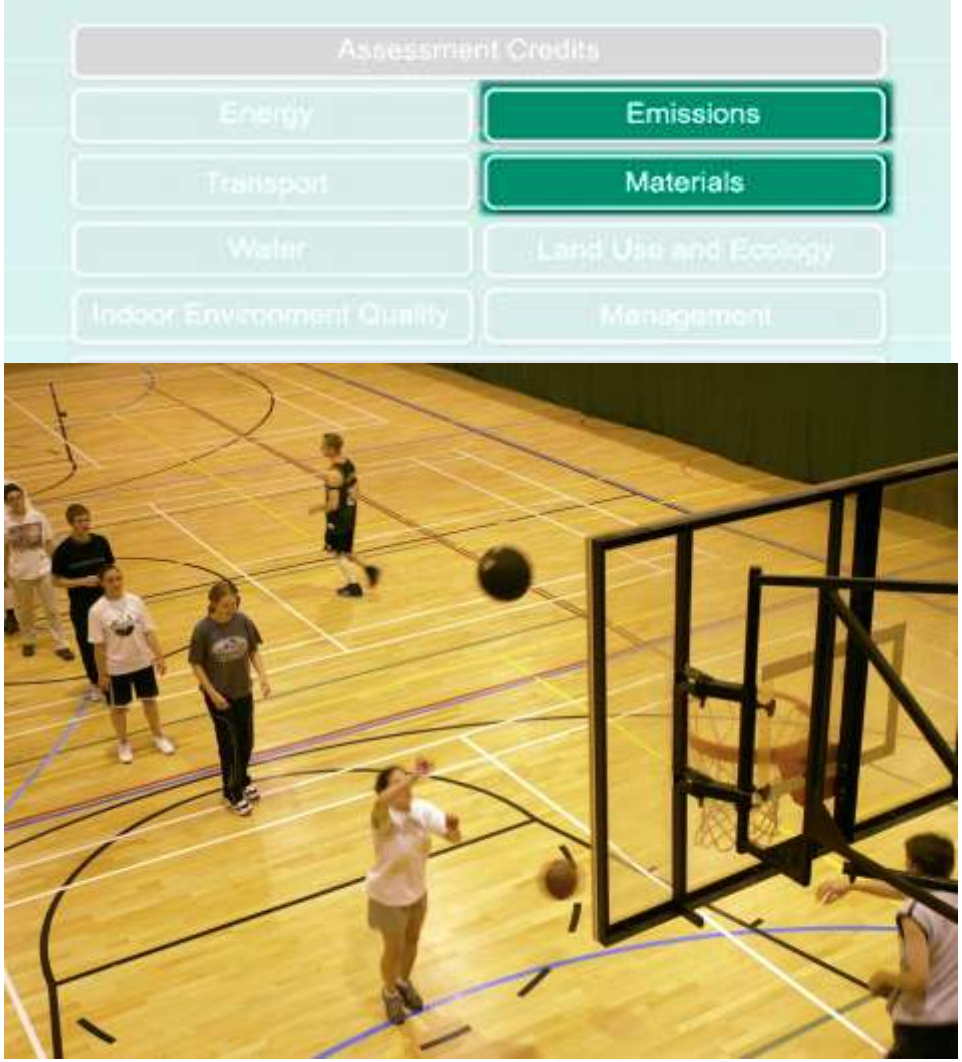
•Removal of exotics and use of local natives

•Landscaping materials locally sourced

•Reuse of existing Pohutakawa trees

•Minimised cut to waste,

Green star assessment criteria: *Water + Land-use and Ecology*



Materials

•Locally sourced plywood

•Sports floor sustainably sourced

•Low formaldehyde MDF specified

•Aluminium roofing 60% recycled content and 100% recyclable

•Refrigerants with zero CFC content and zero ODP

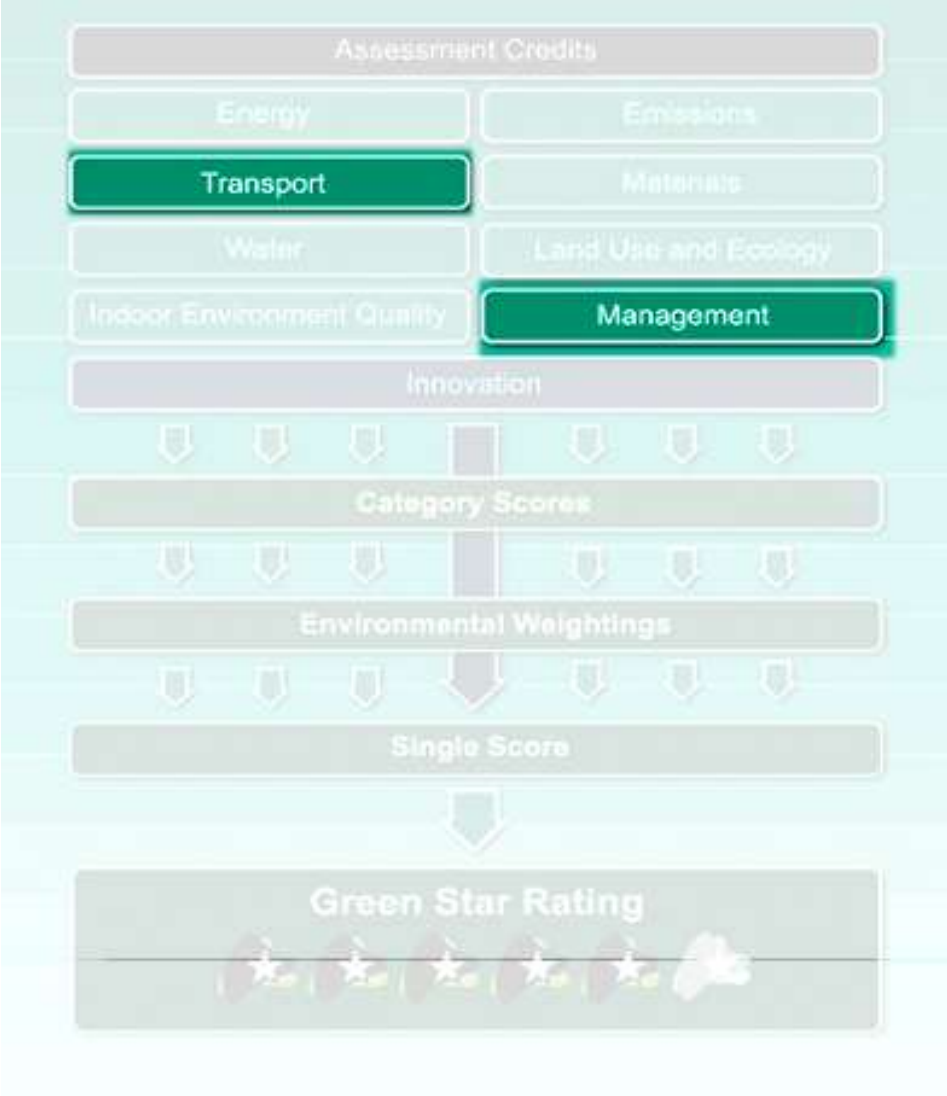
Waste + Emissions

•Construction waste recycling specified

•Recycling stations within joinery

•Low plant requirements therefore low emissions

ESD returns: *Materials* + *Waste* + *Emissions*



Transport

•Proximity to bus routes – will respond to changes in demand

•130 bike racks and city to airport cycle way

•Linked to WCC Ngauranga to Airport strategy.

•Travel Demand Management Plan – This plan contains strategies to increase mode share to public transport and vehicle sharing

Management

•BMS involving sensors for natural building ventilation and lighting controls

•Monitoring and targeting of energy consumption levels

•Post occupancy evaluation

•Recycling initiatives

Green star assessment criteria: *Transport*

- A dedicated Community Sports Centre for the players
- Recognisable gateway civic building
- Transparent and inviting
- Ease of access for high turnover of players, spectators and all community groups
- Durable building fabric with low maintenance and low running costs. Under $1 mill increase capital cost returning $33 mill over 70 year life
- High quality internal environment with natural light, air and views out; innovative for New Zealand indoor sports facilities