



Perimeter Active Chilled Beams

Project Name:	259 George Street Sydney, NSW Suncorp Place
Date Completed:	August, 2007
Building Size:	43,000 m ²
Installed Perimeter Capacity:	900 kW
Engineered By:	Norman Disney & Young
Installed By:	Triple M Mechanical
System Used:	ACB50 Perimeter Active Chilled Beams
Number of Units:	576
<u>Design Criteria:</u>	
Room Temperature:	22.5°C / 50%RH
Chilled Water Temperature:	11.6°C
Primary Air Temperature:	13.5°C
Primary Air Quantity:	1,145 L/s per floor

Active Chilled Beam

Perimeter System

Inffuser cold air solution

Refurbishment,

sustainability

+ efficiency



42 story high-profile multi-tenancy Sydney CBD office building completed in 1983 with approximately 940-1000m² net lettable area per typical floor.

Building originally installed with ceiling mounted perimeter induction terminal units.

Building required significant increase in delivered perimeter cooling capacity together with desirable reductions in air noise levels to suit modern occupancies.

Existing chilled water HVAC systems, on-floor infrastructure and existing perimeter induction units not capable of delivering higher cooling capacities to each floor.

Solution must deliver best practice air performance, reduced noise and increased cooling capacity using existing primary air ductwork and secondary chilled water infrastructure and risers.

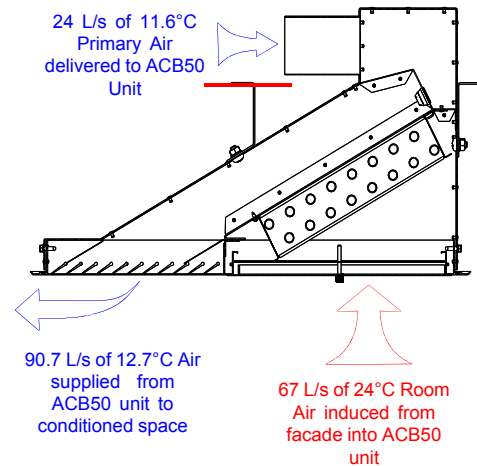


The Challenges

- Insufficient on-floor perimeter cooling capacity
- Required increase in perimeter cooling to 45,500W per typical floor
- Existing perimeter induction units at the end of their useful life
- Existing air risers and chilled water infrastructure could not be changed
- Perimeter zones Primary Air quantity limited to 1,145 L/s maximum available air per floor
- Existing primary air temperature of 11.6°C and secondary water temperature of 13.5°C must be retained as other floors will retain existing systems
- Existing spatial constraints limit replacement unit opportunities

The Solution

- Modify on-floor primary air & secondary chilled water infrastructure to accommodate new perimeter Active Chilled Beam layout
- Install 576 High Induction 'ACB50' perimeter Active Chilled Beams throughout 22 floors
- Retain primary air pressure of 250-275Pa
- Retain primary air quantity of 1,145 L/s per floor
- Deliver uniform 11.6°C primary air temperature to all perimeter Active Chilled Beams
- Increase secondary chilled water flow by 4%



The Benefits

- ✓ Achieved increased perimeter cooling capacity per typical floor using only 1,145 L/s of primary air per floor
- ✓ Achieved ≤ 40 dbA noise level in the conditioned perimeter space
- ✓ Delivered reduction in air generated noise for the same primary air quantity and pressure as previously installed
- ✓ Delivered average primary air distribution rate of 2.73 L/s/m²
- ✓ Delivered increased air distribution rate for perimeter zones of 10 L/s/m²
- ✓ Secondary sensible cooling capacity of 62,635 watts per floor and increased air distributions rates delivered for **NO ADDITIONAL FAN ENERGY**
- ✓ Delivered a compact ceiling mounted Active Chilled Beam to fit within tight spatial constraints around perimeter edge and band beams