



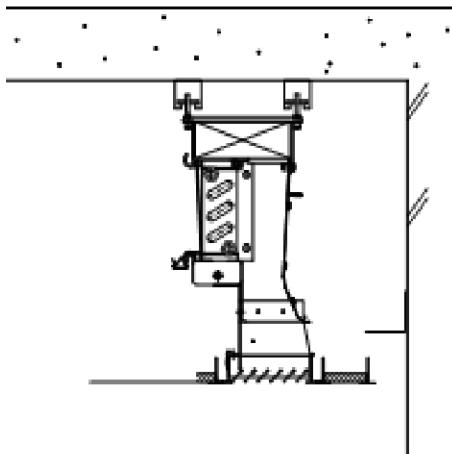
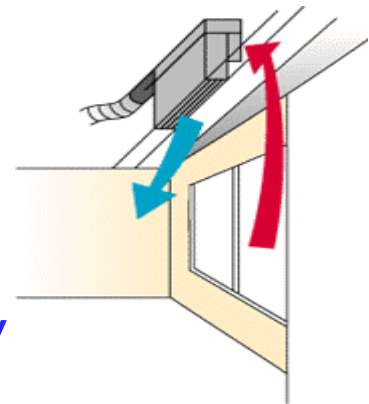
Perimeter Induction Unit Replacement

Project Name:	AMP Sydney Cove SYDNEY, NSW
Date Completed:	September 2004
Building Size:	27,500 m ²
Installed Sensible Capacity:	1,410 kW
Designed By:	N.D.Y. Sydney
Installed By:	Key Services Ltd
System Used:	CM10 Perimeter Terminal Unit
Number of Units:	1,095
<u>Design Criteria:</u>	
Room Temperature:	24°C / 50%RH
Chilled Water Temperature:	13.0°C
Primary Air Temperature:	12.7°C
Maximum Available Air:	1,326 l/s per floor
Max Available Water:	4.68 l/s per floor

Active Chilled Beam

Perimeter System

Refurbishment, sustainability + flexibility



Typical Ceiling Mounted
CM10 Unit Installation

25 story high-profile multi-tenancy Sydney CBD office building with approximately 1100m² net lettable area per typical floor.

Building originally installed with Worthington under-sill perimeter induction terminal units operating at 350Pa static pressure.

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

Existing on-floor 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 within tight spatial constraints of 350-380mm ceiling void.

Infuser cold air solution

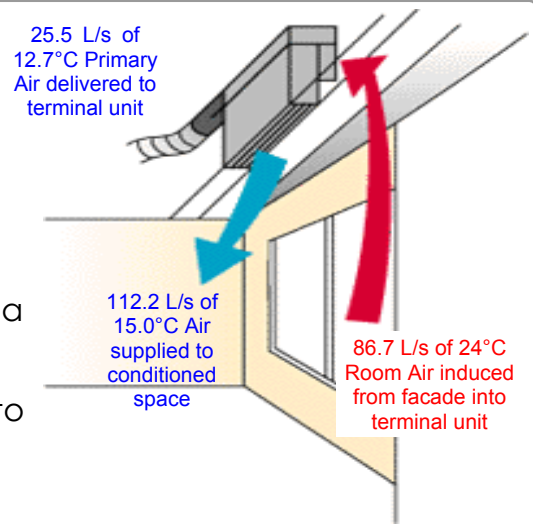


The Challenges

- Insufficient on-floor perimeter cooling capacity & air distribution from original under-sill induction unit system
- Existing air & water risers could not be enlarged
- Primary air quantity limited by existing infrastructure to 25.5 L/s per unit
- Secondary chilled water quantity limited by existing infrastructure to 0.09 L/s per unit
- Required perimeter sensible cooling capacity per typical floor of 67,000 watts
- Ceiling void spatial constraints of 350-380mm imposed by slab-to-slab clearance
- Desirable to reduce primary air pressure for energy efficiency improvements (Original system operating at 350Pa static pressure)

The Solution

- Re-route primary air & secondary chilled water infrastructure through the slab to the ceiling space of each refurbished floor below
- Install 1095 High Induction 'CM10' ceiling mounted perimeter terminal units
- Reduce primary air pressure from 350Pa to 250Pa
- Retain primary air quantity of 1,326 L/s per floor
- Deliver uniform 12.7°C primary air temperature to all perimeter units
- Increase chilled water temperature to 13°C



The Benefits

- ✓ Achieved new installed perimeter capacity of 67,235 watts sensible cooling per typical floor using the original 1,326 L/s of primary air
- ✓ Same delivered sensible cooling capacity would have required 4,620 L/s of air using 12°C air
- ✓ New total perimeter supply air quantity of 5,834 L/s delivered for only 1,326 L/s of primary air processed
- ✓ Delivered increased air distribution rate for perimeter zones
- ✓ Secondary sensible cooling capacity of 48,885 watts per typical floor delivered for 4.68 L/s of 13°C secondary chilled water per typical floor
- ✓ Secondary sensible cooling capacity of 48,885 watts per typical floor delivered for **NO FAN POWER REQUIREMENT**
- ✓ Delivered 71% of installed sensible cooling capacity through secondary air cooling for maximum energy efficiency and greatest zone controllability