



All-Air Cold Air Delivery System

Project Name:	50 -72 Union Street, Sydney NSW
Date Completed:	2007
Sensible Capacity Installed:	1,112 kW
Building Size:	16,800 m ²
Designed By:	Hastie (D&C)
Installed By:	Hastie Australia
System Used:	Infuser IDL10e & IDL20e
Number of Units:	997
<u>Design Criteria:</u>	
Room Temp:	24°C / 50%RH
Chilled Water Temp:	Not Applicable
Primary Air Temperature:	9.5°C
Sensible Cooling Load:	135 W/m ²
Total Primary Air Quantity:	67,905 l/s

active chilled beam

Perimeter system

Energy,

efficiency

+ with all air



To achieve energy efficiency targets not every project has to have Chilled Beams or is suitable for them.

The Atrium at 60-72 Union St, Pyrmont is a 7 story 16,800 m² A Grade Office Building with a 4.5 star Base Building ABGR rating requiring a delicate balance between high efficiency, thermal comfort and capital cost in a design & construct project.

Meeting these targets required an optimised all-air VAV system designed to deliver best practice air distribution rates while minimising air processed at the air handlers to achieve the lowest possible fan energy and smallest possible installed ductwork infrastructure.

Infuser cold air solution



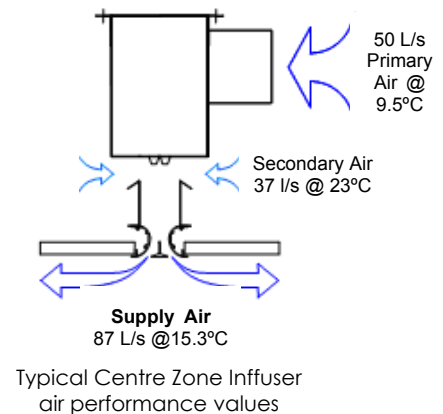
The Challenges

- Project requires a capital cost competitive base building ABGR 4.5 Star rating
- Conventional heating & cooling loads
- Need to minimise air quantities for smallest possible air risers & on-floor ductwork
- Provide medium & long term tenant flexibility
- Safely deliver cold primary air while guaranteeing on-floor air distribution rates
- Safely deliver cold air without air diffusion performance problems (dumping)
- Solution must deliver best practice air distribution rates to suit modern tenancies

The Solution

INFFUSERS provided a solution for the delivery of low temperature primary air by inducing secondary room air from the conditioned space to be mixed with cold primary air before discharging the combined warmer air streams through the air outlet as mixed supply air.

- Install 997 IDL10e & IDL20e linear style Inffusers throughout the building
- Deliver 9.5°C primary air to all Inffusers (centre zones & perimeter zones)
- Entrain secondary air from the conditioned space to increase air delivery per Inffuser
- Install smaller but conventional VAV boxes for individual zone controllability
- Provide linear style 1-way discharge Inffusers in the perimeter and 2-way discharge terminals in centre zones



The Benefits

- Deliver architecturally pleasing cold air terminal solution (linear grille)
- Safe Delivery of low temperature 9.5°C primary air
- Provide separate optimised perimeter and centre zone air delivery solutions
- Deliver integrated fitout 4 Star ABGR rating (4.5 Star ABGR base building)
- Air distribution rates of ≥ 4.9 l/s/m² achieved for the entire building from typical minimum 2.8 l/s/m² primary air processed at the air handlers
- Enable smaller infrastructure (flexible ducts, on-floor ductwork, VAV boxes, air risers and air handlers) to be used for maximum space savings
- Deliver real comfort (Humidity & temperature control + air movement)
- Deliver air performance at conventional terminal pressures of ≤ 50 Pa