



Project Name:	14-16 Brindabella Circ Canberra Int'l Airport
Date Completed:	September, 2003
Building Size:	13,000 m <sup>2</sup>
Installed Sensible Cooling Capacity:	615 kW
Designed By:	RUDDS Consulting Engineers
Installed By:	Benmax Pty Ltd
System Used:	IDL20 Inffuser
Number of Units:	555
<u>Design Criteria:</u>	
Room Temperature:	24°C / 45%rh
Primary Air Temperature:	11°C
Maximum Available Air per Floor:	11,500 L/s

Efficiency,

# sustainability

## + flexibility



### Overview

14-16 Brindabella Circuit is a modern 4 story twin-tower multi-tenancy office building with approximately 3,250m<sup>2</sup> net lettable area per typical floor located at Brindabella Business Park, Canberra International Airport.

Building design required necessary best practice air quantity to suit modern occupancies and a minimum 5.0 L/s/m<sup>2</sup> air distribution rate for potential government department tenancies.

District central plant and 10 smaller central station air handlers were specified to permit greater individual zone control.

Active Chilled Beam

Perimeter system

**Inffuser cold air solution**

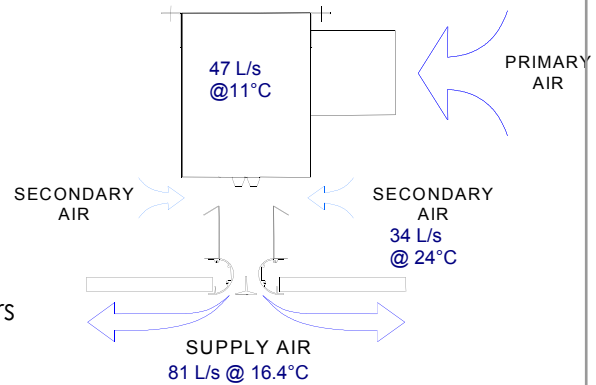


## The Challenges

- Design requires On-Floor air distribution rates of  $\geq 5 \text{ L/s/m}^2$  required
- Large perimeter areas of  $1,720\text{m}^2$  per typical floor
- Required sensible cooling capacity per floor of 153,700 watts
- Perimeter zones represent 61% of total floor sensible load
- Air quantity limited to 11,500 L/s maximum available air per floor
- Sizes of external air risers and on-floor ductwork needed to be minimised
- Spatial constraints imposed by 3350mm slab-to-slab clearance and 2700mm ceiling heights
- Available ceiling void space of 550mm limits possibilities for all-air system larger ductwork
- High load diversity from façade to façade

## The Solution

- Reduced on-floor duct and riser sizes by reducing primary air quantity
- Reduce Primary Air quantity by specifying primary air temperature of  $11^\circ\text{C}$
- Install 555 High Induction 'IDL-20' Linear Inffuser™ units throughout the building
- Safely deliver  $11^\circ\text{C}$  primary air through entrainment of secondary room air into Inffusers for higher mixed air temperature and more buoyant supply air



## The Benefits

- ✓ Delivered required sensible cooling capacity for 20% less air than would be required with conventional all-air system design using  $14\text{-}15^\circ\text{C}$  supply air temperatures
- ✓ True 'High Induction' diffusers provided mixing of primary air and secondary air upstream of the supply air grille for safe delivery of cold air to eliminate potential for condensation on grilles and ceiling tiles
- ✓ Safely delivered  $11^\circ\text{C}$  primary air as typical  $16.4\text{-}17.3^\circ\text{C}$  mixed supply air
- ✓ Delivered air distribution rates off higher than  $5.0 \text{ L/s/m}^2$  to all areas of the building
- ✓ Allowed installation of smaller VAV boxes for individual zone temperature control using conventional VAV zone control strategy
- ✓ Increased latent capacity without increasing air flow by reducing primary air temperature to  $11^\circ\text{C}^*$
- ✓ Provided centre zone air distribution churn flexibility by using all-air 'Inffuser' solution
- ✓ 8 smaller individual perimeter zone air handlers sized 1000 – 2530 L/s air quantity each
- ✓ 2 centre zone air handlers of typically 6,750 L/s air quantity each serve the entire building centre zone areas