



Building HVAC Upgrade

Dadanco Pty Ltd



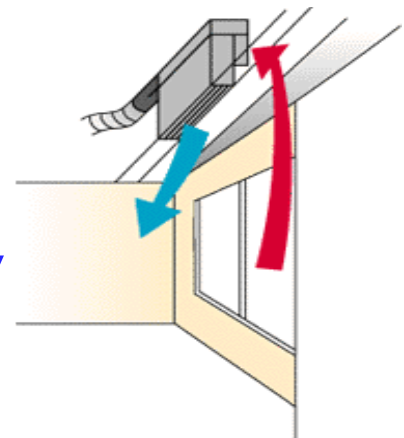
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|------------------------------|---------------------------------------|
| Project Name: | Holden Hill Police Adelaide, S.A. |
| Date Completed: | November, 2003 |
| Building Size: | 2,575m ² |
| Installed Sensible Capacity: | 287 kW |
| Designed By: | Bassett Consulting Engineers |
| Installed By: | Frigrite |
| System Used: | CM10 Perimeter IDS60e Centre Zones |
| Number of Units: | 97 CM10 Units 130 IDS60 Infusers |
| <u>Design Criteria:</u> | |
| Room Temperature: | 24°C / 50%RH |
| Chilled Water Temperature: | 13.5°C |
| Primary Air Temperature: | 12.0°C |
| Maximum Available Air: | 15,287 l/s |

active chilled beam

Perimeter system

Infuser cold air solution

Refurbishment, sustainability + flexibility



Circa 1987 4 story purpose-built regional metropolitan police station complex with approximately 2,575m² of air conditioned area, consisting of 980m² of perimeter and 1,595m² of centre zone space.

Building required significant increase in delivered cooling capacity of +24% with necessary increases in air quantity to suit modern occupancies and a minimum 4.5 l/s/m² air distribution rate.

Existing on-floor chilled water HVAC systems and air infrastructure not capable of delivering higher air quantities to each floor. Solution must deliver best practice air quantities and increased cooling capacity using ductwork infrastructure no larger than the existing on-floor ductwork.



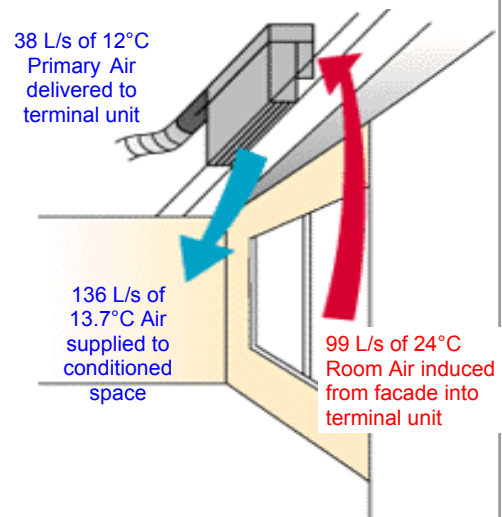
The Challenges

- Insufficient cooling capacity for current occupancy & use
- Insufficient on-floor air distribution in centre zones (<3.4 L/s/m²)
- Air quantity limited to 15,280 l/s maximum available air for entire building
- Sufficient reduction in supply air temperature to solve capacity problems would result in air diffusion problems (Cold Air Dumping)
- Existing single AHU per floor limits flexibility and zone control options
- Building HVAC must be refurbished as a '24X7 Live Building' with minimum disruption to operations

The ideal solution must deliver best practice air distribution and increased cooling capacity using ductwork infrastructure no larger than the existing on - floor ductwork.

The Solution

- Install 97 CM10 perimeter terminal units
- Replace existing on-floor AHU's with separate smaller AHU's for each of North and South perimeter zones
- Install new smaller primary air ductwork & secondary water loop throughout building perimeter for new induction terminal units
- Install 130 High Induction IDS60e Inffuser™ units throughout centre zones
- Install new smaller, higher capacity, AHU for each centre zone
- Reduce supply air (Primary Air) temperature from 15°C to 12°C for increased cooling capacity
- New total centre zone supply air quantity of 13,005 l/s delivered for only 6,407 l/s of primary air processed by the AHU



The Benefits

- ✓ Refurbishment work was carried out on each floor in a "Live Building" scenario
- ✓ Delivered +24% increase in sensible cooling capacity for a lower total air quantity to that previously installed
- ✓ Perimeter cooling capacity increased by 23% to 113,625W while primary air quantity reduced by 75% to 2,072 l/s
- ✓ Retained & re-used existing on-floor ductwork infrastructure
- ✓ Increased air distribution rates to higher than 7.0 L/s/m² to all areas of the building
- ✓ Increased latent & sensible cooling performance without increasing air flow by reducing primary air temperature to 12°C
- ✓ Improved perimeter office individual temperature controllability by allowing individual control of secondary chilled water in perimeter units where required