Barangaroo: a building services overview

By Tim Spies
International Towers Sydney, Barangaroo

Image courtesy of Lend Lease
NDY’s role – Base Building

NDY engaged by Lend Lease for detailed design and documentation of the following services for Towers T1, T2 & T3 of International Towers Sydney:

- Mechanical
- Electrical
- Communications
- Security
- BIM Management
NDY’s role – Fitout

NDY engaged by all the major tenants:

- Westpac
- KPMG
- PwC
- Lend Lease

Similar services engagements.

Lendlease design provided concept design for Mechanical services and specialist lighting design for their tenancy.
Key Features – Building

- 5+ Star NABERS Energy Rating
- 6 Star Green Star
- 2,900m Floor to Ceiling
- 2,300m² floor plates
- Cooling provided by District Plant
- Basement located 5m below sea level
Key Features – Mechanical

- District cooling plant (72MWr)
- Harbour Heat rejection from district cooling plant
- Low, Mid, High rise plant rooms serving only the levels below
- Each plant rise matching lift configuration
- Chilled beams
- 100% dehumidified one pass outside air for base and tenant supplementary.
- Demand control O/A ventilation
- Relief air heat recovery
- Integrated BMS
Typically each building is divided into low, mid and high rise. Each served by its own dedicated plant space.

Plant rooms incorporate air handling plant, high temperature chilled water circuits (serving chilled beams) and tenant ventilation (Toilet exhaust, general exhaust, kitchen exhaust, base building and supplementary outside air)

AC System General Configuration

![Diagram of AC System General Configuration]

- Central heating plant located in Roof plantroom
- Low, Mid and High Rise Plant rooms serve each rise of the building
- District Cooling Plant located in basement
- Energy Transfer Station for Tower DCP CHW interface inclusive of N+1 pump redundancy
Key Features – Electrical

- 33kv/400v LV infrastructure
- Distributed substitutions – low, mid, high rise
- LED lights
- Fully programmable lighting
- Standby power generation
Services Risers - Accessible

- Fire Riser
- Tenant Comm Riser
- Fuel Riser
- Tenant DB & Future ATS
- House DB & T-Off Box
- Supply Authority METERING Panel
- Lighting Control
- Tenant DB
- Tenant Future Riser
- Tenant Comms Riser
- ICN 1
- Security BMCS&EMS
- Future ATS's
- Tenant DBS
- Tenant Future Comm Riser
- Good Lift Lobby
- Main Elec Core West Wall
- Main Elec Core East Wall
- Tenant DB
- Future Riser
Key challenges – Ceiling Void
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Key challenges – Mechanical design

- Modelling of glazed/ transparent sun shading
- Optimisation of façade to suite chilled beams
- UFAD to ground floor lobby space
- Glazed lift shafts
- Integrated tenant fitout
- Utilisation of CFD analysis
- Coordination with other services
- Coordination with basement services and risers from basement through podium.
Innovations – Chilled beams

- Largest chilled beams installation in Australia
- Incorporation and testing of variable volume ACB’s
- Coordination in tight ceiling space
- Incorporation of demand control ventilation
- Extensive factory testing
- Above ceiling ACB’s – Westpac
- Side blow CHB in vertical villages
Innovations – Chilled beams

Largest installation in Australia

Incorporating variable volume ACB’s

Extensive factory testing

Above ceiling ACB’s – Westpac

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Innovations – Chilled beams

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Side blow CHB in vertical villages
Innovations – LED Lighting

• All LED lighting solution
• Project specific custom luminaire
• Improved visual comfort
• 20% energy savings over traditional solution (approx)
• Extended service life expectancy (50,000 hours at only 10% depreciation)
• 7 year extended warranty
• Prototype and mock-ups for testing and user feedback
• Extensive independent laboratory testing
Innovations – BMC’s

Zone Voting

- Zones Vote for heating and cooling depending on how far they are away from their set point.
- Votes are counted and analysed to determine the heat / cool demand
- Results calculate an optimised Control Set point
Innovations – BMC’s
Innovations – 3D/BIM

- Full 3D model for the building
- Ceiling coordination
- Plantroom coordination
- BIM management
- Integration with subcontractors model
Tenant Fitouts

- Most delivered as integrated fitouts
- Westpac has achieved practical completion
- Delivered by different design team’s
- Incorporation of tenant brief

Specialist areas
- Kitchens
- Comms rooms
- Multi-function
Legacy

- Internationally recognised development
- Innovative technologies incorporated
- Home to major professional and financial services firms
- NDY is immensely proud of the opportunity
- Great working with Lend Lease and the professional teams
- Experience with a Lend Lease-led collaborative approach to deliver innovative solutions with the project design and delivery teams.

Image courtesy of Lend Lease
About Tim

As the Director-in-Charge of the Sydney office Tim Spies has overall responsibility for the operation of Norman Disney & Young's New South Wales business. Tim has had almost 20 years experience within the industry across a diverse range of sectors.

Tim joined NDYs Sydney office in 1998. Since then Tim has worked in the Melbourne, London and most recently was the Director-in-Charge of the Manchester (UK) office before returning to Sydney in 2012. Tim’s excellent understanding of the design issues facing a multidisciplinary team has been well received by his Clients. This is particularly true for projects demanding a high degree of complexity, such as laboratories, healthcare facilities and large commercial office fitouts.

Tim has led or worked on a number of major projects in Australia and the United Kingdom including Barangaroo, Burlington Danes Imaging Centre, Greater Manchester Police Force and Division Headquarters buildings, and the Fox Studios Redevelopment.

Find out more: www.ndy.com