

THIESS

2014 AUSTRALIAN CONSTRUCTION
ACHIEVEMENT AWARD

ROYAL NORTH SHORE HOSPITAL REDEVELOPMENT

RNSH ASB architecture
Image courtesy of InfraShore,
photography by John Gollings



Introduction

The \$1.127 billion Royal North Shore Hospital (RNSH) and Community Health Services Redevelopment is an award-winning demonstration of expert construction management. The project converted a health precinct with a 126-year history into a 21st century, integrated campus of impressive, purpose-built facilities.

InfraShore was established to deliver the PPP contract, spanning finance, design, construction, and O&M (with the exception of clinical services) for a 28-year period. As D&C contractor, Thiess' \$721 million contract brought this NSW Project of State Significance to life.

Thiess' approach simplified or removed legacy infrastructure constraints and ensured in-built flexibility so RNSH can expand and adapt to meet Sydney's future healthcare needs and healthcare innovations.

RNSH INCLUDED THE:

- » Acute Services Building (ASB - the hospital) - the highly efficient, nine-level, 96,000m² centrepiece of the redevelopment project
- » Community Health Building (CHB) - an eight-level, 10,000m² building
- » Douglas Building Refurbishment
- » Multi-level car park - a new seven-level, 567-space building of 23,000m²
- » Additional works - including pedestrian link bridges, roads and civil works, services diversions, demolition and decanting.

This submission focuses on the completed works of the ASB and CHB representing 93% of the scope.

Project name

Royal North Shore Hospital

Location

St Leonards, New South Wales

Contract value

\$721 million

Client/Owner

NSW Health Infrastructure

Outcomes achieved against planned targets for key project parameters



RNSH SURPASSED CLIENT OBJECTIVES BY:

- » Delivering on budget, on time
- » Successfully handing over facilities to facilities management (FM) operators integrated since the project's inception
- » Completing works with minimal disruption to existing hospital operations
- » Managing approximately 300 variations within the original contract timeline
- » Establishing a decant command centre for real-time issues resolution
- » Providing extensive facility and equipment training for staff within a best-practice decant process.

RNSH SETS A NEW BENCHMARK, SURPASSING EXPECTATIONS IN ALL KEY RESULT AREAS:

- » **Safety** – achieving an LTIFR and LTISR of zero and a RIFR of 1.17 – approximately 10 times better than industry averages – supported by initiatives such as rigorous safety-in-design workshops.
- » **Time** – handing over buildings to the FM operators ahead of schedule, with the CHB completed two weeks ahead and the ASB two days ahead.
- » **Cost** – exceeding all financial expectations and delivering on budget, with NSW Health acknowledging RNSH as the lowest cost per square metre tertiary hospital of its type in recent times.
- » **Quality** – integrating construction and O&M teams during the full D&C process, ensuring maximum operability and asset life, and employing a dedicated health planner to ensure unparalleled functionality and fit-out including exceeding NSW Health policies for infection prevention.
- » **Environment** – delivering a natural gas-fired cogeneration plant – a NSW hospital first, alongside a 4 star rating (ABGR Green Star Healthcare Pilot) for the ASB with a perfect environmental record during construction
- » **Heritage** – the project showcases a large heritage feature wall that celebrates the site's history.

- » **Construction sustainability** – recycling more than 89 per cent of total waste during construction, among several other operational measures and delivering industry-first construction achievements to create a flexible hospital that can adapt to change for years to come.
- » **Stakeholder satisfaction and engagement** – delivering the largest user-group process of its kind, involving 700 meetings with more than 134 user groups, to ensure RNSH responded to user requirements and achieved maximum sustainability, attracting outstanding feedback from hospital staff, InfraShore, NSW Health, partners and suppliers.
- » **Community** – ensuring beyond compliance community consultation during construction, raising more than \$900,000 in donations and in-kind support for charities, including providing a new courtyard to the RNSH Spinal Injury Unit.

This is one of the biggest, most expensive hospitals rebuilt in the history of the State...it's value for money compared to buildings of its kind in other parts of Australia.

HEALTH MINISTER JILLIAN SKINNER

POSITIVE PUBLIC COMMENTS FROM THE NSW GOVERNMENT REINFORCE THE STANDARD SET BY THE PROJECT TEAM.



Cogeneration facility
Photography by Steve White

AS THE MOST TECHNOLOGICALLY-ADVANCED NSW PUBLIC HOSPITAL, RNSH SETS A NEW STANDARD FOR WHOLE-OF-LIFE DELIVERY:

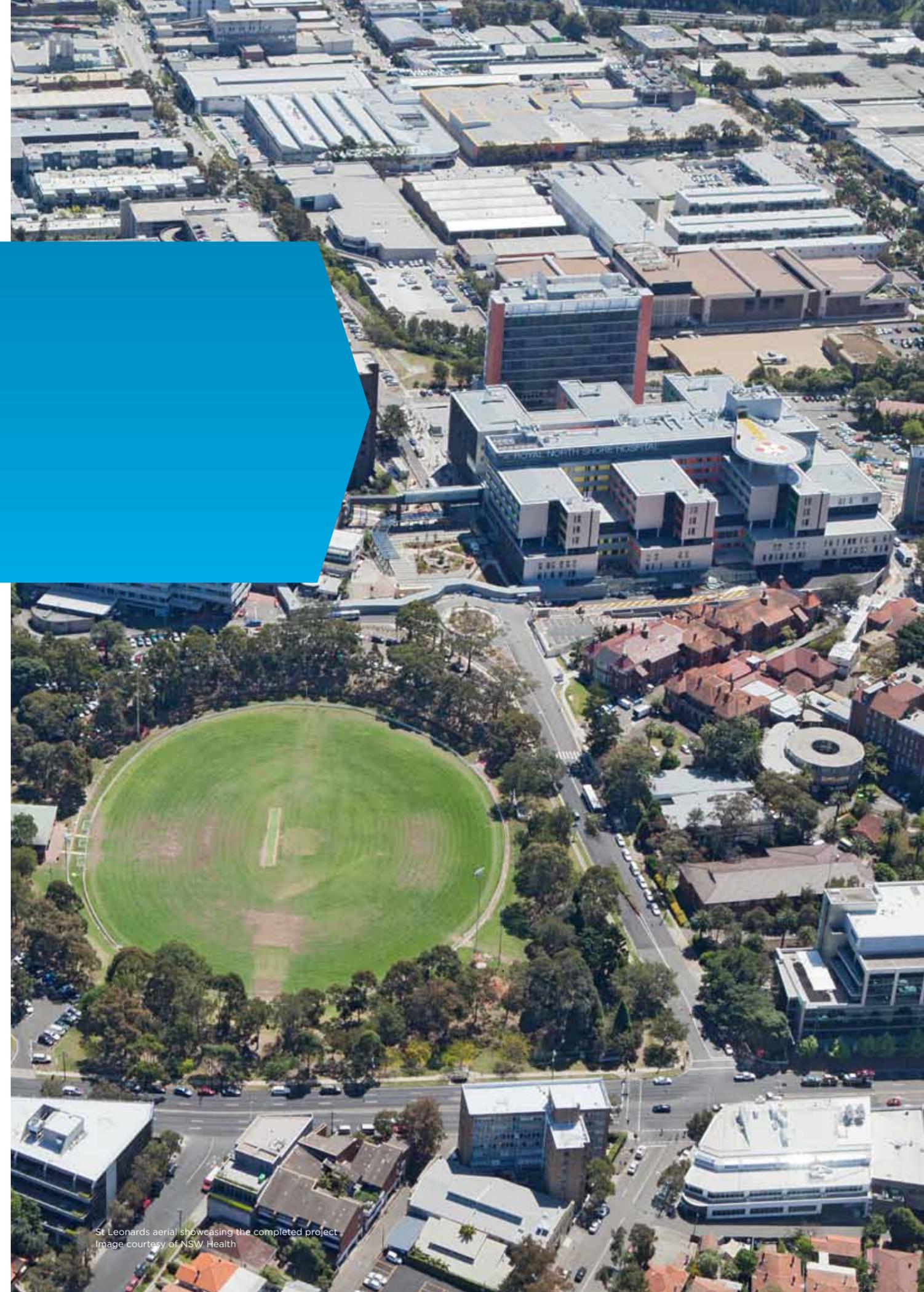
- » Engineers worked alongside the hard and soft FM providers to develop solutions that maximised operability and reduced overall costs for NSW Health
- » Construction innovations enabled delivery in a brownfield environment, essentially replacing an entire campus in an operational health precinct without serious disruption to clinical services
- » Extensive D&C features have future-proofed the ASB to allow expansion, spatial changes and increased services capacity over time; features that are transferable to other infrastructure.

RNSH HAS BEEN HAILED BY INDUSTRY AS AN EXEMPLAR PROJECT, WINNING AWARDS INCLUDING:

- » **Australian Institute of Building (AIB)** – Building Professional of The Year (NSW and National)
- » **AIB** – Professional Excellence Award (NSW and National)
- » **Infrastructure Partnerships Australia** – National Infrastructure Award, Contractor Excellence.

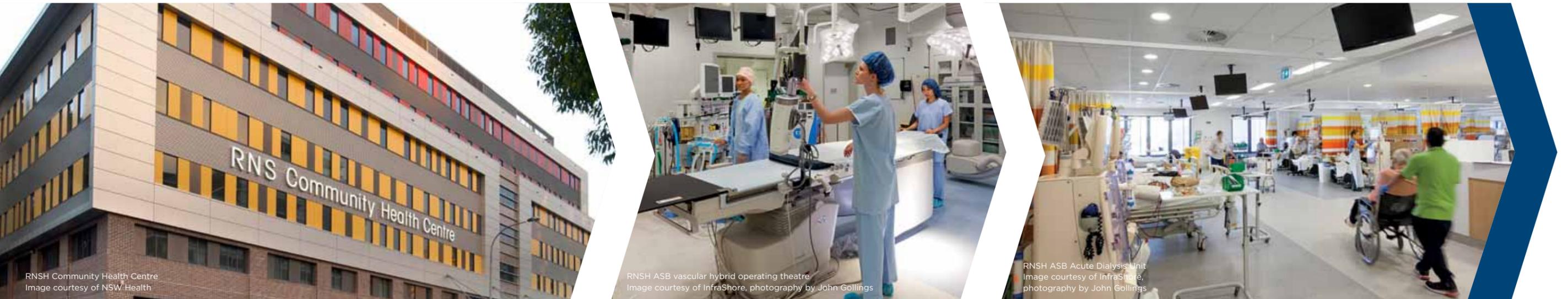
Thiess provided critical expertise, insight and skill to deliver a remarkable piece of health infrastructure...Every stage of the project has been expertly delivered to the highest standard...On all key performance areas, Thiess has delivered on or beyond expectation.

SCOTT GARTRELL, CEO, INFRASHORE



St Leonards aerial showcasing the completed project
Image courtesy of NSW Health

Complexity, difficulty and optimisation of the construction task



RNSH Community Health Centre
Image courtesy of NSW Health

RNSH ASB vascular hybrid operating theatre
Image courtesy of InfraShore, photography by John Gollings

RNSH ASB Acute Dialysis Unit
Image courtesy of InfraShore,
photography by John Gollings

RNSH was delivered within a complex brownfield environment. Construction staging, temporary facilities and decanting had to work in and around an operating hospital.

Thiess' Method of Works Plans for every interface risking clinical service disruption, ensured all necessary stakeholders were aware of progress and risks – a process expertly repeated more than 335 times. Rigorous traffic control, parking and access management, and dust and noise monitoring, minimised negative impacts on the wider community.

Hospital redevelopments demand arguably the industry's highest interface between engineering services and physical structures. **Specialised health requirements** required extreme precision, from lead-lined walls in radiation rooms to access ways that accommodated patient movement to material selection for infection control.

Collaboration between NSW Health, Thiess and diverse **stakeholders** was central to the project, including navigating often-competing requirements. Thiess' user group process validated user requirements within the project's cost and time parameters, and identified numerous opportunities to go beyond the usual 'how to build' of construction to the 'how to function' of a health precinct.

To meet NSW Health's **future-proofing requirement**, Thiess implemented strategies such as riser construction to allow future access, structural space for future vertical expansion zones, façade features developed for flexibility to internal spatial changes and additional capacity for infrastructure services.

The team also accommodated approximately 300 **variations** within the program. For example, when NSW Health changed suppliers of Major Medical Imaging Equipment (MMIE), it saved millions, but required 25 hospital rooms to be redesigned and rebuilt.

UNIQUE RISKS INCLUDED:

- » **Services and site age** – there were virtually no infrastructure drawings for the 100-year-old campus. A team of engineers, electricians, plumbers and gasfitters surveyed and documented existing services and on-site engineering was required for partial demolition works.
- » **Project size** – as the largest health infrastructure project of its kind in NSW, the team used construction techniques such as slip-forming, precast materials, a shared resource pool and progressive inspections and verifications to minimise the risk of rework while upholding the highest quality standards. Works were staged for utmost efficiency and Thiess implemented an innovative procurement strategy by establishing D&C services subcontractors as alliance partners, creating stronger accountability.
- » **Team size including subcontractor management** – the project employed more than 5,250 people during its life, with the team working across multiple faces. Thiess oversaw more than 160 subcontractor companies, with a continual need to manage supply and value chain risks.

OPTIMISATION STRATEGIES INCLUDED:

- » Consolidating the hospital in one area and temporarily accommodating departments outside the construction footprint to enable a single-stage construction program, saving two years off the original program.
- » Giving area-based teams high-level responsibility and accountability for their section of the overall project
- » Designing the project's critical path and work sequencing to open certain areas earlier for high-level services rough-in
- » Multi-purposing numerous temporary features for time, cost and quality savings (eg scaffolding and cranes)
- » Breaking internal works into 'QA zones' for improved prioritising
- » Prototyping key features to identify time and quality improvements.

Leadership and management of the project delivery



Image courtesy of InfraShore, photography by John Gollings

Relationships

Thies worked with NSW Health staff and end users to ensure integration of RNSH with existing facilities and the neighbouring community, including managing the enormous, highly successful decant process. Early involvement and partnership with consultants and subcontractors continually delivered time and cost savings, quality improvements and innovations. Collaboration and transparency drove a strong ethos of inclusiveness, with no major industrial issues.

Innovations

RNSH'S CONSTRUCTION INNOVATIONS INCLUDED:

- » Integration of FM providers from the outset for whole-of-life excellence and best-practice O&M
- » Implementation of the first-of-its-kind cogeneration plant
- » Development of fire safety system improvements, saving more than \$1.5 million through O&M efficiency
- » Bracing of cranes to the slip-formed cores, enabling the cores to act as unrestrained cantilevers for optimal crane location
- » Use of a mock-up process, saving about 1,125 manual handling hours for one feature alone
- » Creation of a suspended slab to meet extremely low-vibration criteria
- » Design of a simplified stud wall façade system and modular rain screen system to simplify the façade construction package
- » Introduction of an interactive decant 'MOVE' website, communicating with all hospital staff.

Design contribution

Thies influenced the masterplan solution to maximise the campus footprint, initiated the best-practice user group consultation process that drove numerous design improvements, and delivered future-proofing solutions in addition to:

- » Permanent bracing and support of existing, partially demolished in-ground tunnels, enabling future serviceability
- » Redesigned aluminium feature fold perimeter overhangs, saving materials and time and reducing OH&S risks
- » A precast panel solution in one area, saving time and money
- » A late-entry helipad design that ensured the shortest, safest and most immediate access to the critical operational areas.

EARLY INVOLVEMENT AND PARTNERSHIP WITH CONSULTANTS AND SUBCONTRACTORS CONTINUALLY DELIVERED TIME AND COST SAVINGS, QUALITY IMPROVEMENTS AND INNOVATIONS.



Planning and control

Construction methodology was determined during the bid process, ensuring all parties knew where they fitted into the overall plan. The project was divided into five cost management centres to spread accountability while empowering and upskilling team members. Site works remained ahead of schedule because of engineers' meticulous look-ahead programs.

Health and safety

Safety reached beyond the site team to all stakeholders entering and exiting the site. The excellent safety record was underpinned by disciplined processes, comprehensive communication, and the strong safety culture. This drove improvements such as a new ground disturbance permit and procedure, influenced by on-site learnings which improved control of a high-risk activity.

New technologies

A SNAPSHOT OF THE TECHNOLOGIES ADVANCED BY RNSH INCLUDE:

- » Custom dye casting and prefabrication
- » Modularised systems
- » Slip-formed concrete
- » Post-tensioned floor plates
- » Electronic mapping of stormwater systems
- » Superbarrier safety system (helipad construction)

Training and development

The project's commitment to on-the-job training boosted the skill base of hundreds of professional personnel and skilled trades and more than 30 apprentices and graduates. A tailored development matrix directed personal training. Every opportunity was sought to celebrate the team's achievements and innovations and strengthen learning opportunities.

Consortium

InfraShore	Project Company
Thiess	Joint Sponsor and Design and Construction Contractor
Thiess Services	Hard facilities management
ISS Facilities Management	Soft facilities management
Wilson Parking	Car park operators
Royal Bank of Scotland (RBS)	Sponsor/financier
Zouki	Retail

Thiess

Jim Tragotsalos	Project Director
Anthony Armstrong	Project Manager
Steve Tamone	Construction Manager
Ian Lindsay	Commercial Manager
Carinne Watson	Health Facility Planner
Raz Favotto	Project Manager
Mark Foster	Senior Site Manager
Jim Barber	Senior Services Manager
Les Sorm	Senior Services Manager
Andrew Cooksley	Building HSE Manager
Mike Troup	Cost Planning Manager
Anthony Lillycrop	Administration Manager
Luke Gallagher	Site Manager

Others

Bligh Voller Nield	Architect – ASB and Douglas Building refurbishment
Hyder Consulting	Structural, civil, façade and traffic engineer, transport
Cox Richardson	Architect – CHB, multi-deck car park and retail
Arup	Fire engineering, ESD consultant, vertical transportation, Section J, Green Star
Acoustic Logic Consultancy	Acoustic engineer
Urbis JHD	Statutory planning
Oculus	Landscape architect
Aurecon	Electrical designer via Star Group
Fredon Air Pty Ltd	Mechanical
Warren Smith & Partners	Hydraulic via Axis Plumbing NSW
Wormald	Fire
Hendry Group	BCA
Phillip Chun & Assoc	Principal certifying authority
Anne Gordon Design	Wayfinding signage

Image courtesy of InfraShore,
photography by John Gollings



Thiess logo variations

Primary logos*

*GRADIENT



SOLID



Secondary logos

MONO



REVERSED



Colours

SOLID BLUE

PMS 300 | C100 M63 YO K0 | RO G99 B190

MONO (BLACK)

PMS 426 | CO M0 YO K90 | R26 G26 B26

Assets supplied

Thiess_NewLogo_PMS.eps
 Thiess_NewLogo_Gradient.eps
 Thiess_NewLogo_Mono.eps
 Thiess_NewLogo_Mono_White.eps

*NOTE: The solid version of the logo should be used across all signage or whenever single-colour printing is required, while the gradient version should be used for all screen and online reproduction. This is the preferred version of the logo and should be used across all full-colour print jobs.

Entry form

We submit the following entry for consideration for the 2014 Australian Construction Achievement Award.

Project Details		
Project title: Royal North Shore Hospital & Community Health Services Redevelopment PPP	Location: St Leonards, New South Wales	
Summary of scope of work (maximum of 50 words please): Project design and construction including:		
<ul style="list-style-type: none"> Community Health Building – an eight-level, 10,000m² building Acute Services Building – the nine-level, 96,000m² centrepiece of the redevelopment project Douglas Building Refurbishment Multi-level car park – a seven-level, 567-space building of 23,000m² Additional works – including pedestrian link bridges, roads and civil works, services diversions, demolition and decanting. 		
Contract value: \$721 million	Contract type: Design and Construct	
Contract period: October 2008 – July 2014	Date of Substantial Completion: 5 December 2012	
<i>This submission focuses on the completed works of the ASB and CHB representing 93% of the scope.</i>		
Purpose of project: Redevelop the RNSH into a state-of-the-art health facility to meet the needs of an expanding and ageing community		Name of client/principal: NSW Health Infrastructure (through Health Administration Corporation via InfraShore Pty Ltd)
Address: Royal North Shore Hospital, St Leonards, NSW		
Postcode: 2065	Contact name: Jim Tragotsalos	Title: Project Director
Telephone: 02 9468 2126		Facsimile: 02 9468 2194
Description:	Data required	Response
Contract	Contract tendered value or equivalent (e.g. TOC)	\$721 million
	Contract final value or actual outturn cost (AOC)	\$745 million (estimate with 93% of works complete)
	Principal reasons for variances	Client variations
	Any unresolved disputes? Status of those disputes?	Nil
Contract period	Commencement date	28 October 2008
	Original completion date	7 December 2012
	Actual completion date	5 December 2012
	Principal reasons for variances	Completed early
Safety	Total hours worked	4.54 million ongoing (as at Dec 2012)
	Total Recordable Incident Rate	1.17 (as at Dec 2012)
	Details of any fatalities on the project	None

Entry form continued

Details of Entrant		
Name and position (Managing Director or equivalent): Bruce Munro		
Address: 179 Grey Street, South Bank, Qld		Postcode: 4101
Contact name: Nadia Farha	Title: Group Communications Manager	
Telephone: 07 3002 9374	Facsimile: 07 3002 9689	Email: nfarha@thiess.com.au
Contact for logo approval: Janine Scott	Name of organisation: Thiess	
Address: 179 Grey Street, South Bank, Qld		Postcode: 4101
Contact name: Janine Scott	Title: Group Marketing Manager	
Telephone: 07 3002 9664	Facsimile: 07 3002 9689	Email: jmscott@thiess.com.au
Contact for PR information: Nadia Farha	Name of organisation: Thiess	
Address: 179 Grey Street, South Bank, Qld		Postcode: 4101
Contact name: Nadia Farha	Title: Group Communications Manager	
Telephone: 07 3002 9374	Facsimile: 07 3002 9689	Email: nfarha@thiess.com.au
Contact for video content: Alex Smith	Name of organisation: Thiess	
Address: 179 Grey Street, South Bank, Qld		Postcode: 4101
Contact name: Alex Smith	Title: Group Media Manager	
Telephone: 07 3002 9673	Facsimile: 07 3002 9689	Email: asmith1@thiess.com.au

Declaration

WE ARE DULY AUTHORISED TO SUBMIT THIS ENTRY ON BEHALF OF THE ENTRANT NAMED ON THIS FORM AND:

- » Agree to abide by the rules and conditions governing the Australian Construction Achievement Award as set out in this document, including payment of final entry fees if selected as a finalist.
- » Declare that substantial completion of the project has been achieved in the 12 months prior to 30 September 2013.



BRUCE MUNRO
MANAGING DIRECTOR, THIESS

7 November 2013

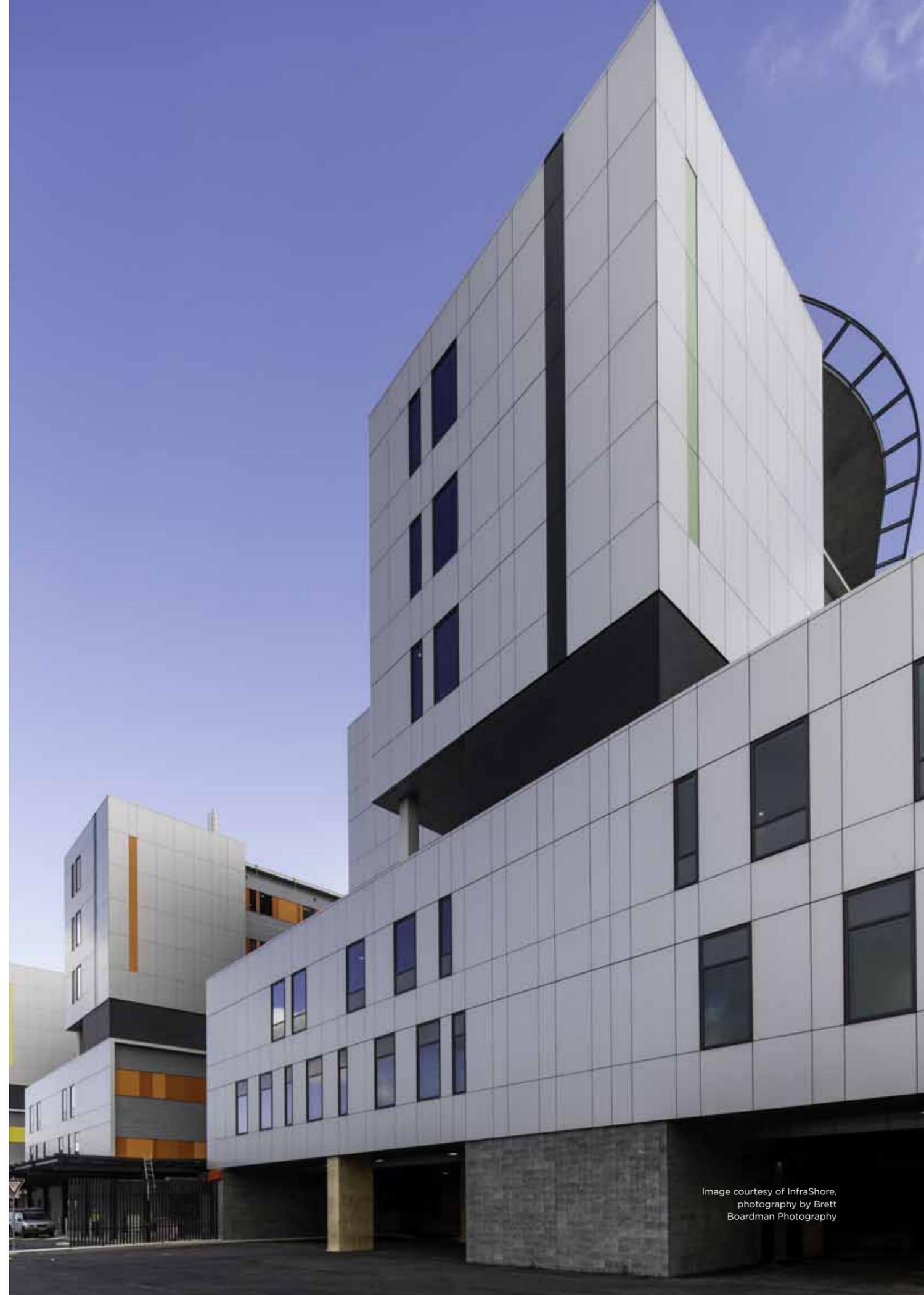


Image courtesy of InfraShore,
photography by Brett
Boardman Photography

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