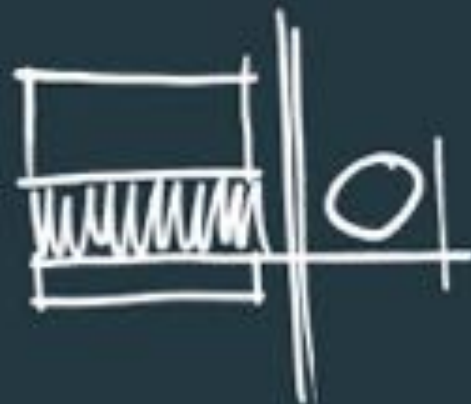


CONTEXT AS A DRIVER FOR SUSTAINABLE HEALTHCARE DESIGN

a case study of the sunshine coast university hospital

ronald hicks

hdr principal, head of health australia



EHCD conference

royal college of physicians, london, uk | 17-19 June 2019

Sunshine Coast
Hospital and Health Service

HDR

CONTEXT AS A DRIVER FOR.....

- socio-economic advances
- placemaking + expression
- clinical planning concepts
- sustainability initiatives



sunshine coast university hospital

- largest non-replacement public hospital built in australia in 25 years
- first public health PPP project in Queensland
- clearly defined brief – unambiguous specification of MOC and functional brief
- highly competitive commercially focused PPP
- demanding + very specific expansion strategy 507 [2017] – 738 [2021] + beyond up to 900
- project co – Exemplar Health – Lend Lease; Capella Finance; Spotless; Siemens
- project delivered as SCA Architects (HDR + architectus)



sunshine coast awards received

- **2019 PCA Innovation & Excellence Awards – Award for Best Public Building**
- **2018 WAF Shortlisted – Health (Completed Buildings)**
- **2018 Healthcare Design Award of Merit (Phoenix Arizona USA)**
- 2018 Aurecon Industry Awards – Winner: Queensland Engineering Excellence Award
- **2018 International Federation of Hospital Engineering (IFHE) – Healthcare Building of the Year**
- **2017 AIA National Award – Public Architecture**
- **2017 Architecture and Design Sustainability Awards: Sustainability Award – Public Architecture**
- **2017 AIA Queensland Architecture Awards – Public Architecture – F D G Stanley Award**
- **2017 AIA Queensland Architecture Awards – Urban Design – Karl Langer Award**
- **2017 AIA Sunshine Coast Regional Award – Gabriel Poole Building of the Year**
- 2017 AIA Sunshine Coast Regional Award – Regional Commendation
- 2017 AIA Sunshine Coast Regional Award – People's Choice Award
- 2017 Awards for Excellence in Concrete QLD
- 2017 AVT Best Project Award – Hospitals
- **2017 Master Builders National Excellence in Building & Construction Awards – National Health Facility Award**
- 2017 Master Builders Association Housing & Construction Awards QLD – Sunshine Coast Major Awards – Project of the Year
- 2017 Master Builders Association Housing & Construction Awards QLD – Sunshine Coast Construction Awards – Health Facilities over \$20 million
- 2016 Construction Skills Queensland Excellence Awards
- 2013 Infrastructure Partnerships Australia – Financial Excellence Award
- 2012 Project Finance International – Asia-Pacific Healthcare Deal of the Year





LONDON

EUROPEAN
HEALTHCARE DESIGN
DESIGNING THE FUTURE OF HEALTHCARE

QUEENSLAND

- Queensland Population – **4.90 million**
- Density **2.64** people per sqkm
- Queensland area – **1,853,000** sqkm
- Australian annual health spend - AU\$ **171 billion**
- **70%** federal and state governments
- Average AU\$ **6,900** per capita

UNITED KINGDOM

- **66.04** milion
- **272** people per sqkm
- **242,000** sqkm

AUSTRALIA

sunshine coast
university hospital

sydney

All figures refer 2016 – 2017

Source Australian Institute of Health + Welfare

queensland hospital + health boards

- Queensland annual health spend AU\$ **35 billion**
- Average AU\$ **7,150** per capita
- State ranking **3/7**
- Divided into **16** Hospital + Health Boards

SUNSHINE COAST HOSPITAL + HEALTH BOARD (SCHHB)

- Population **407,000** (2018)
- Growth rate **22%** (state average **23%**)
- **21%** over the age of 65
- **5** main hospitals
- regional referral roles



the economics of the PPP

- Ongoing facilities management for **25** year period – key indicators determine fee abatements
- Operation of carparking and retail
- Project delivered on time and on budget
- Local employment target – **80%** of all construction workers from within **50km** radius
- LendLease initiative “The Work Shop” created **807** new construction jobs
- **1** in **7** workers on site hired through The Work Shop



The Work Shop’s economic impact through construction has been 1,822 additional jobs in the region, \$115M in local wages and \$184M in gross regional product. ”

NIEIR 2015

National Institute of Economic and Industry Research

CELEBRATING 807 JOBS!

33 occupations > 89 contractors



107
Young people
(15-25yrs)



82%
665 LOCALS



151
Previously
unemployed



42
Women



180
Mature
(45+yrs)



59
Trainees and
Apprentices

Sunshine Coast economic impact of 807 construction jobs



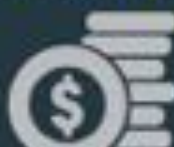
1,822

Additional jobs
in the region



\$115.3m

Local wages
and salaries



\$183.5m

Gross regional product
(GRP)

location – glass house mountains



location – noosa, sunshine coast



location – sunshine coast national park



“ This project is a demonstration of the value of patient centred hospitals, responding here both in form and content to its place in subtropical Queensland. ”

Michael Keniger

Architecture Australia October 2017



site context december 2012



site location june 2018

**sunshine coast
university hospital**



london, uk

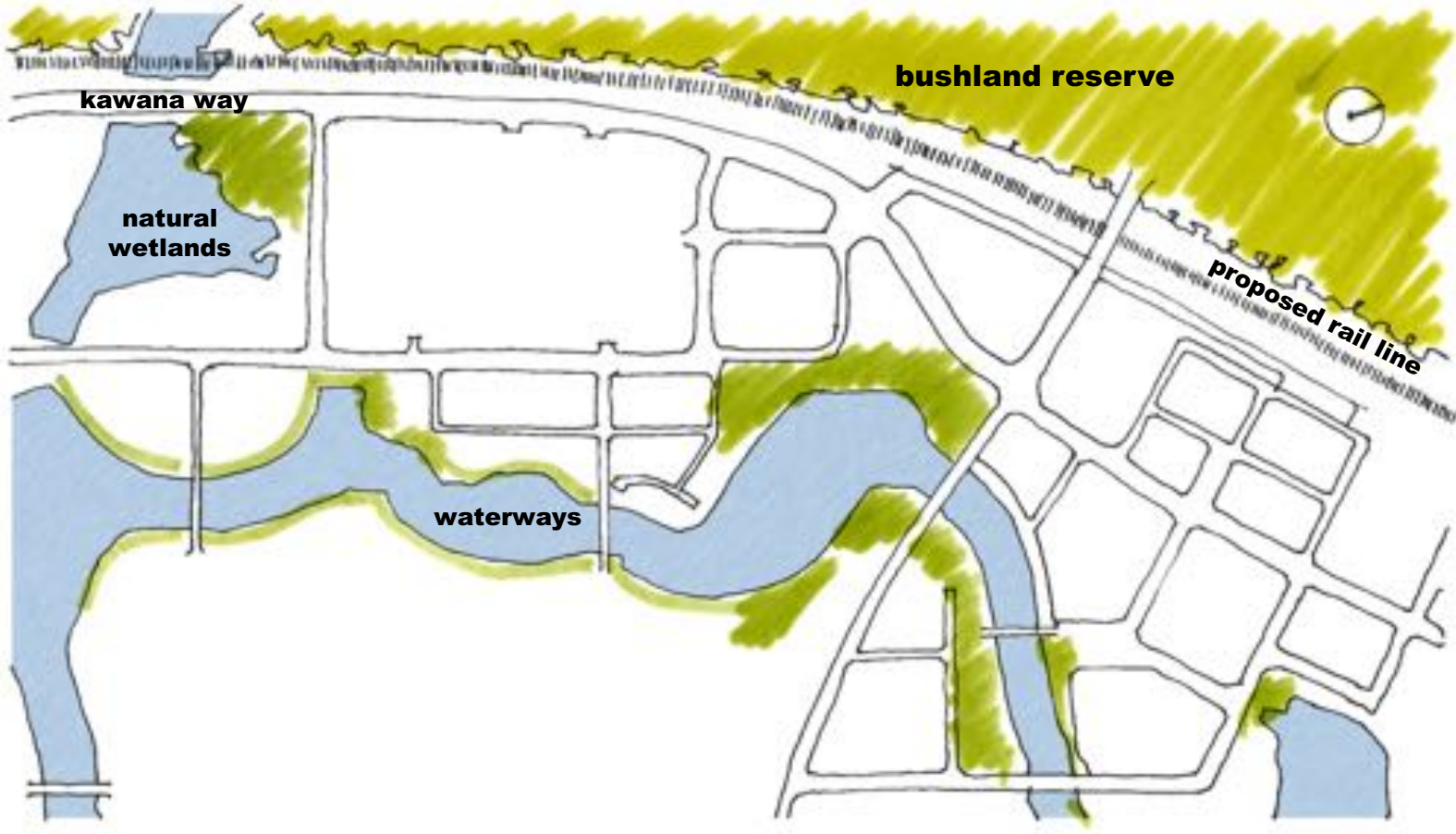
● **royal college
of physicians**

● **st paul's
cathedral**

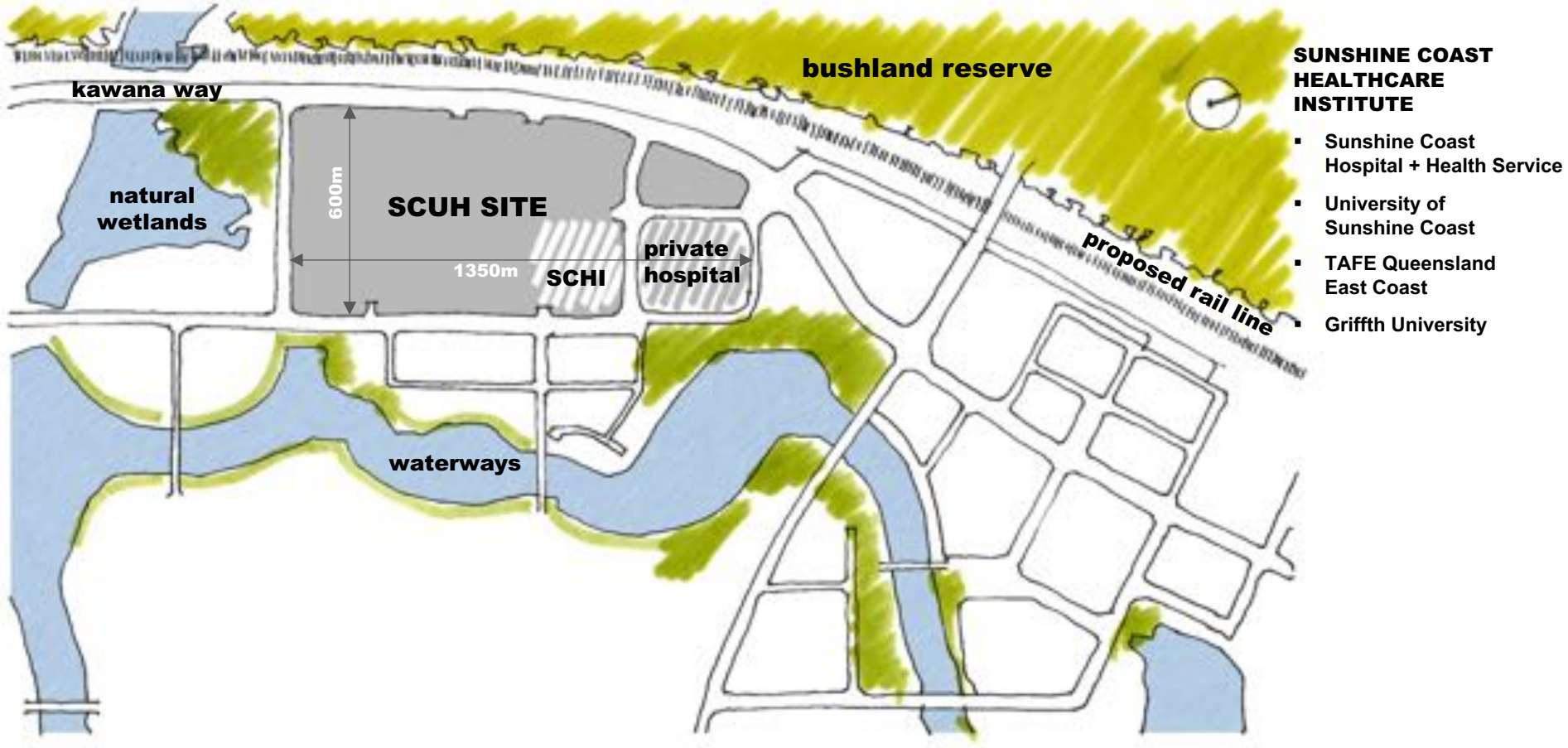
**sunshine coast
university hospital**



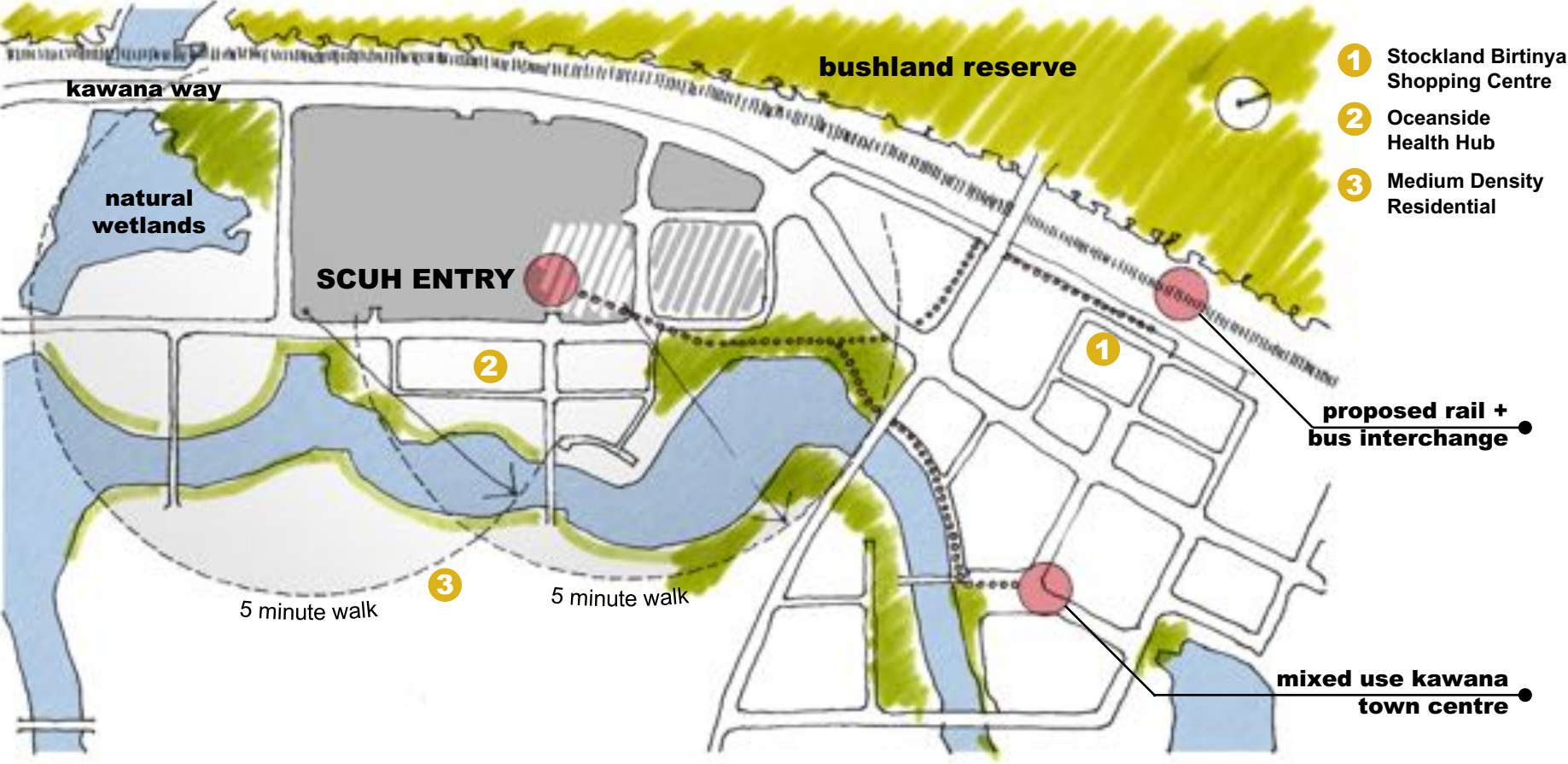
site analysis



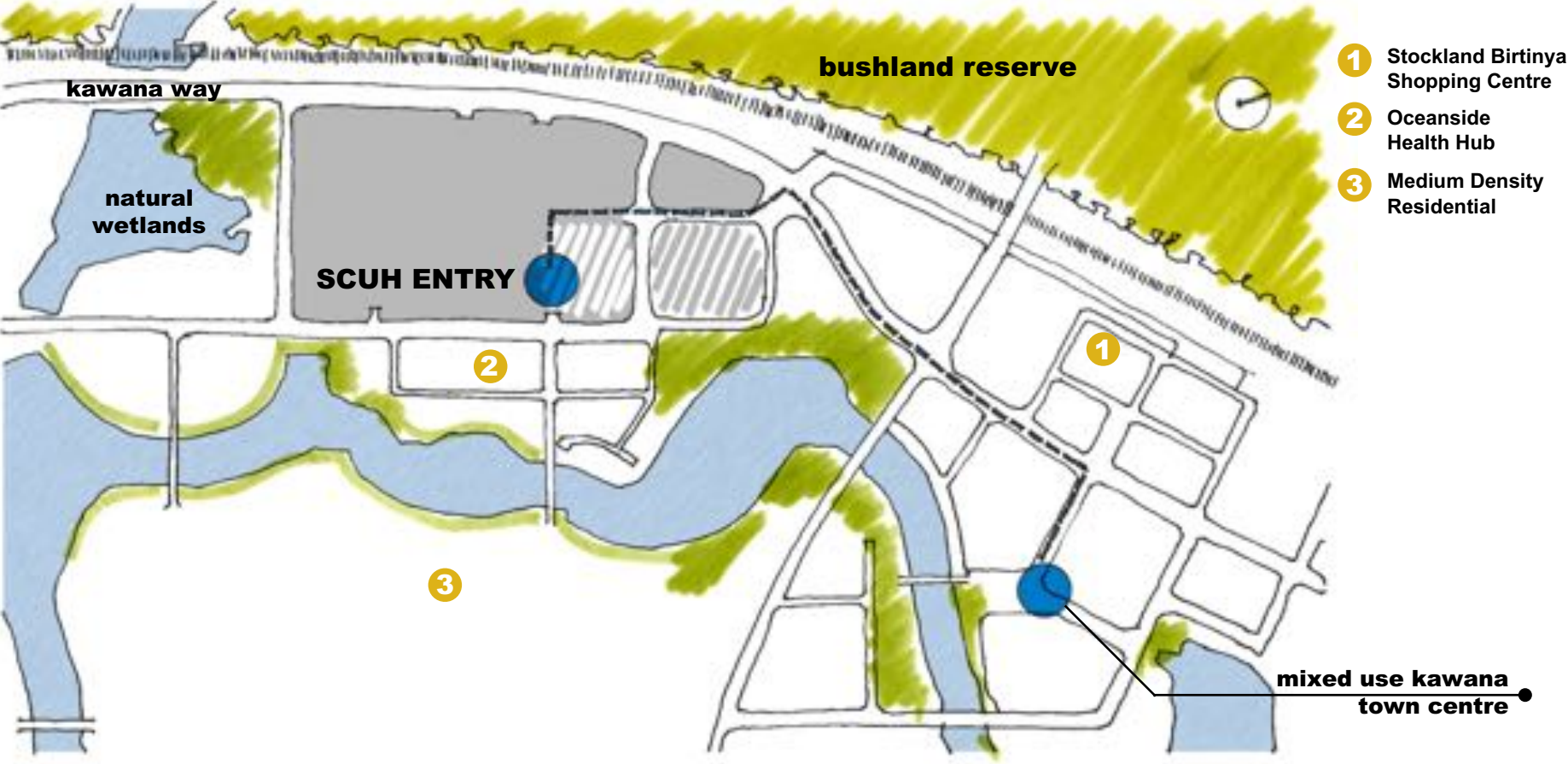
site analysis



site analysis – pedestrian



site analysis – vehicular





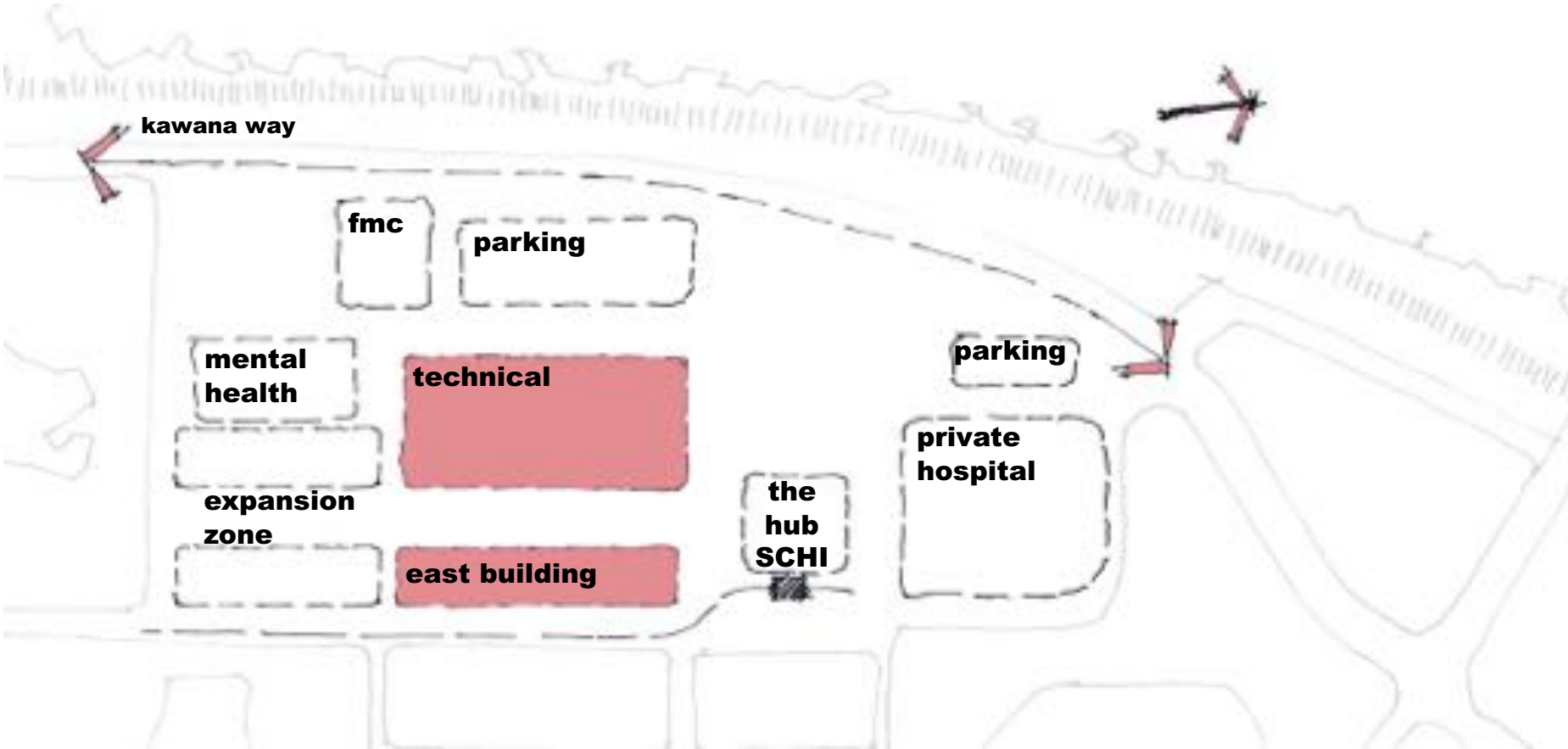




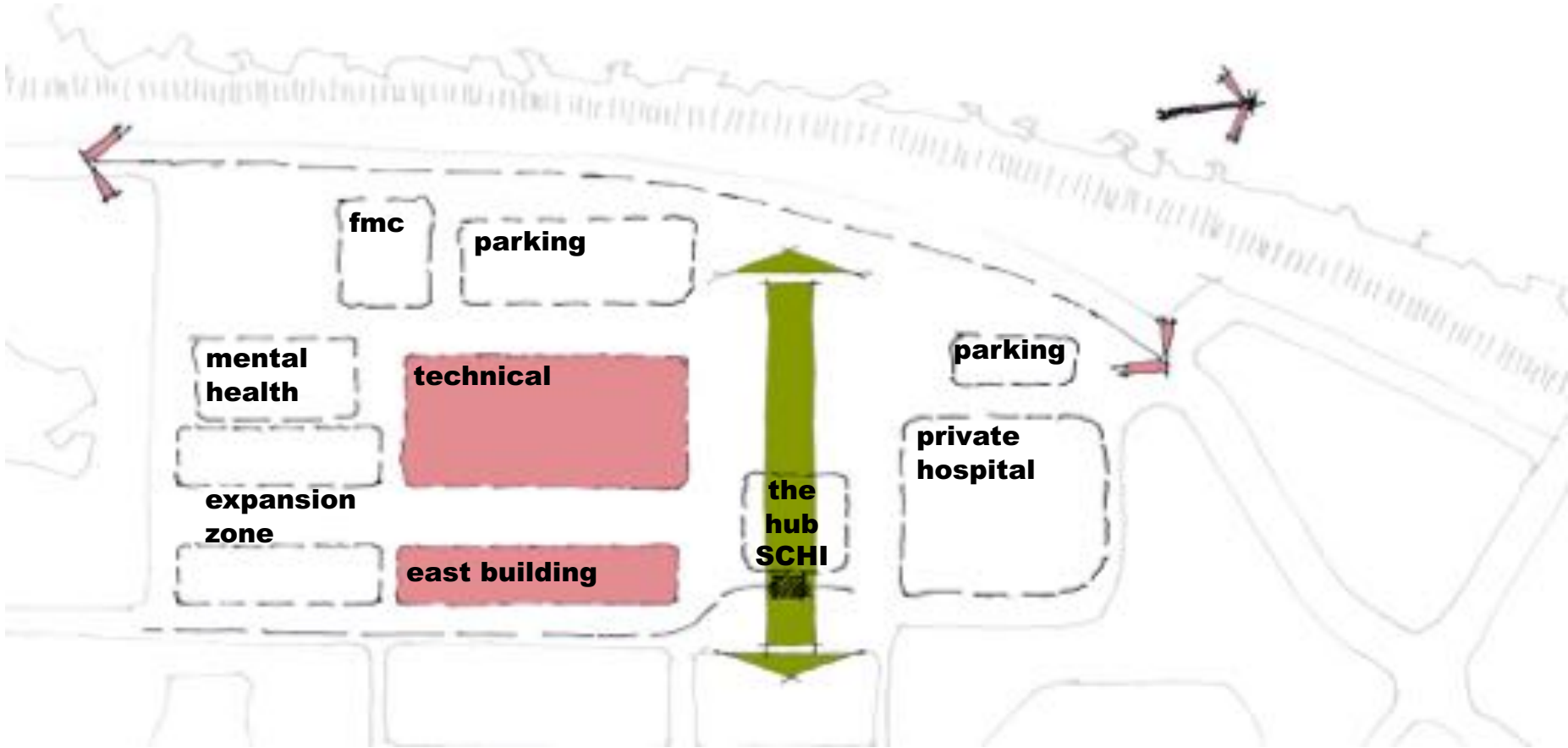
Oceanside
Health Hub

Kawana
Health Campus

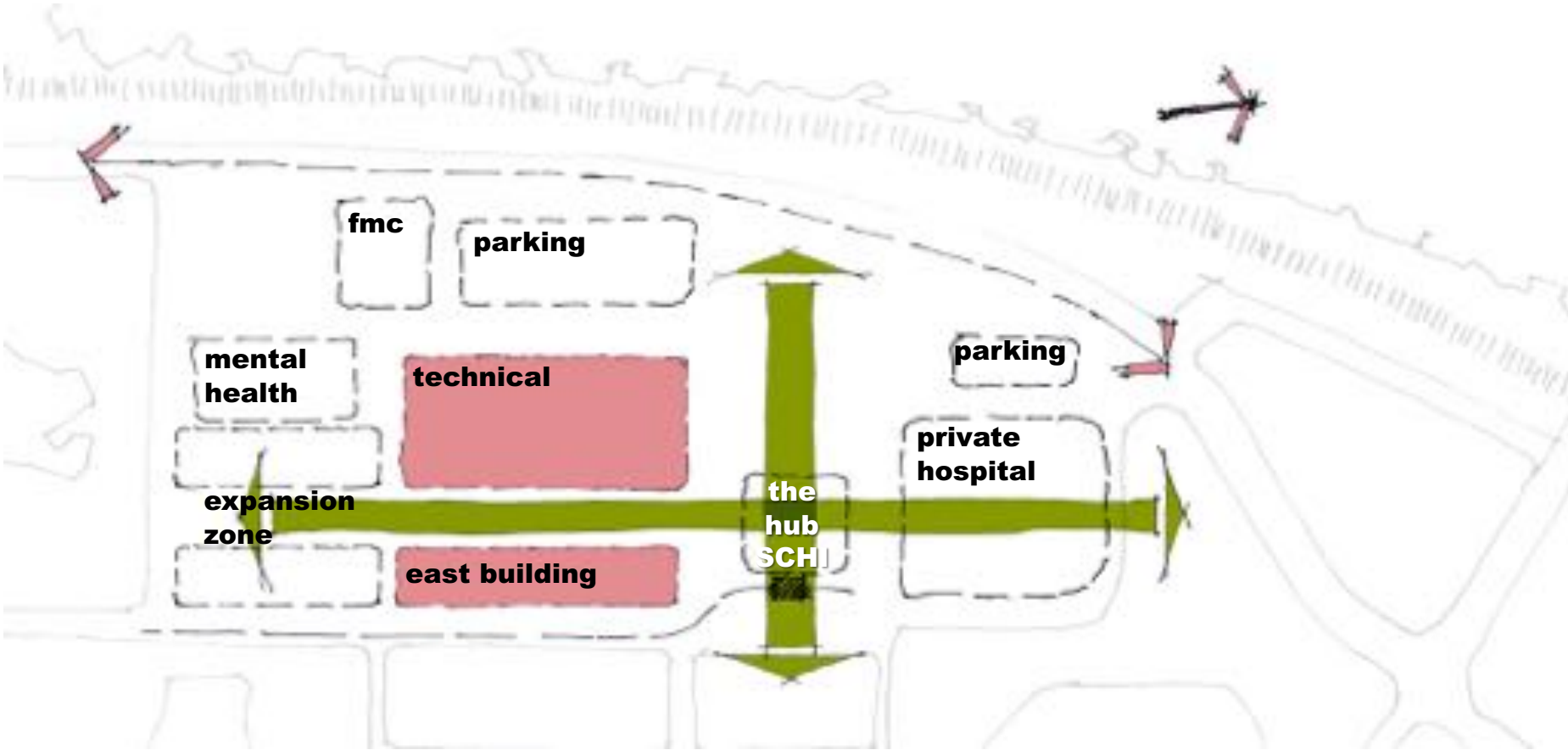
zonal analysis



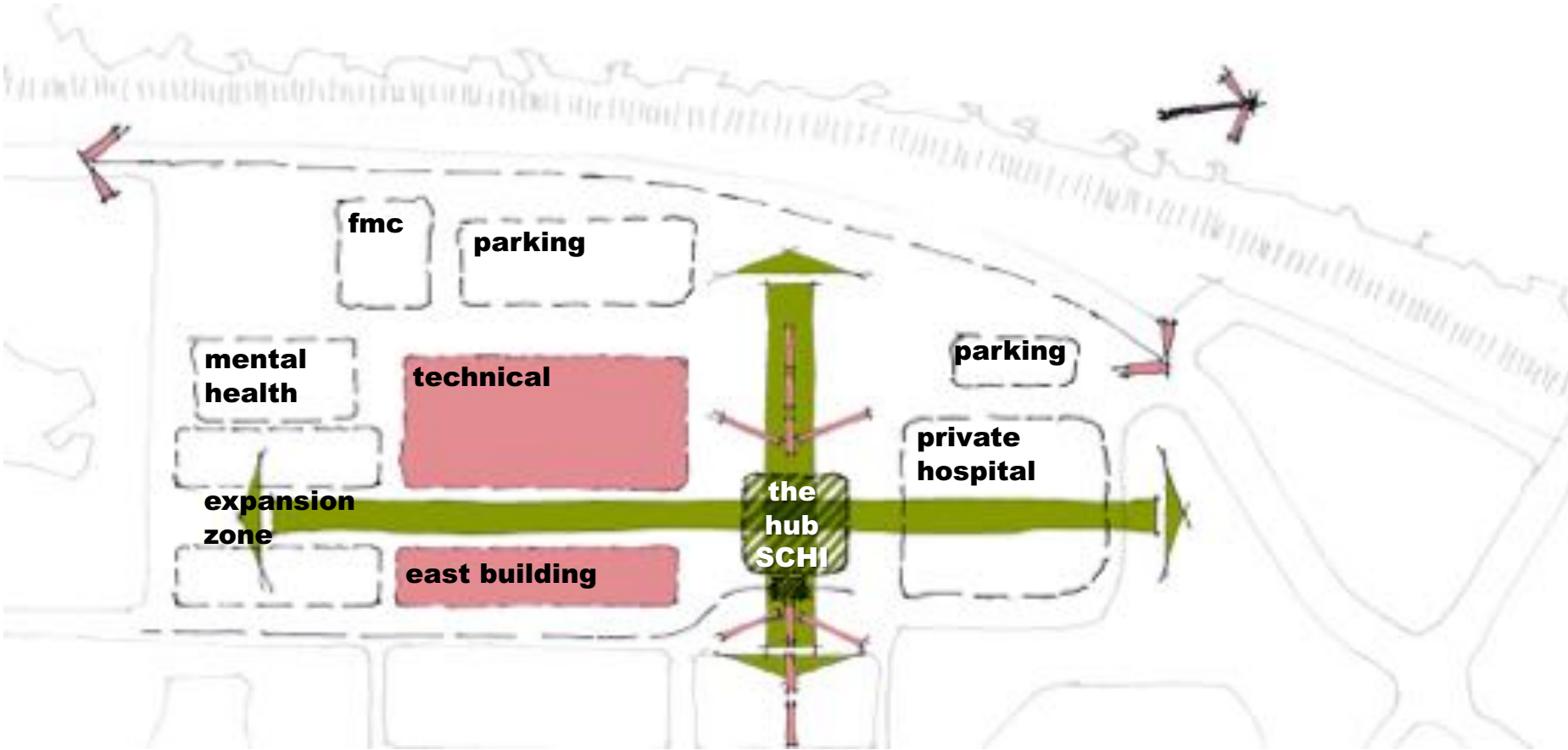
zonal analysis



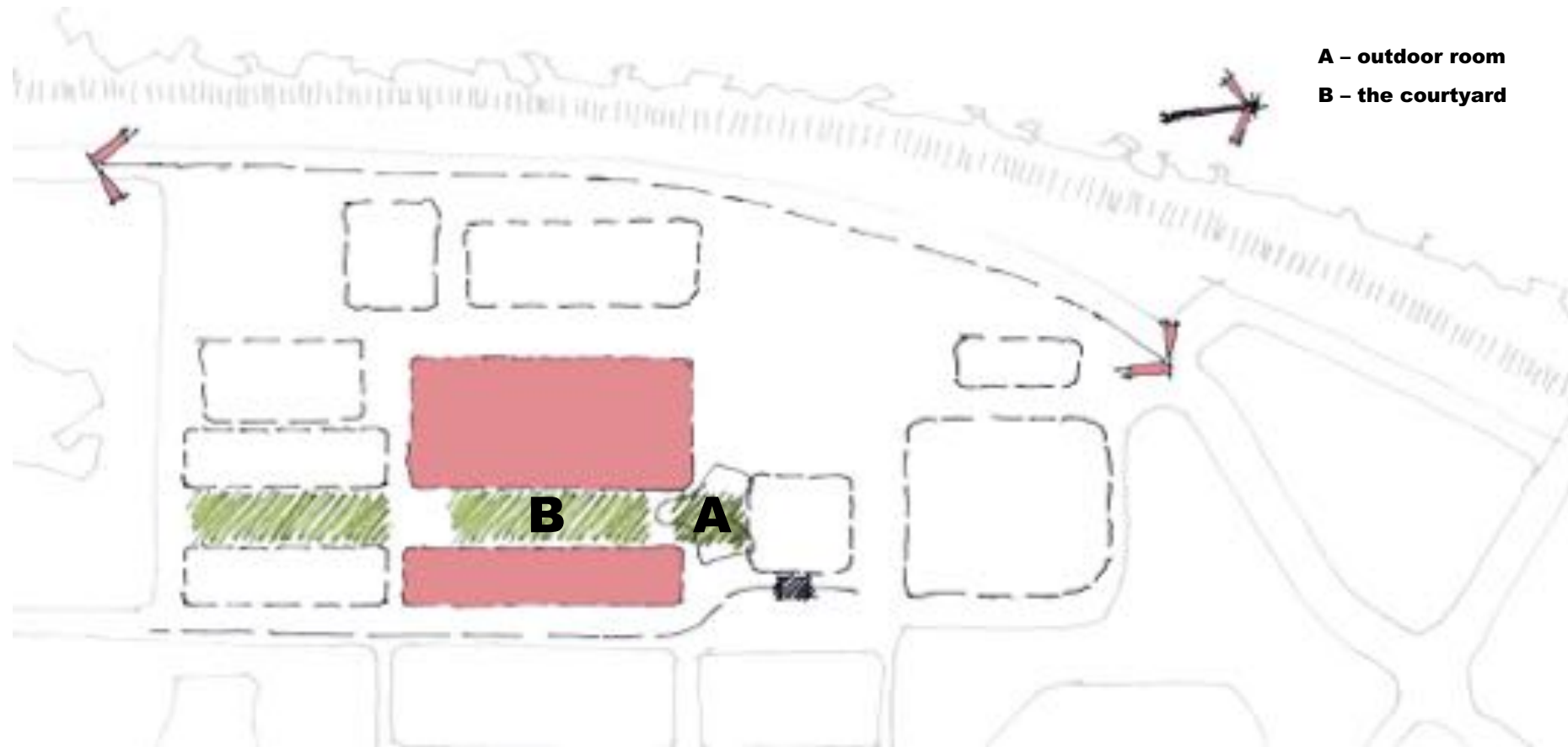
zonal analysis



zonal analysis



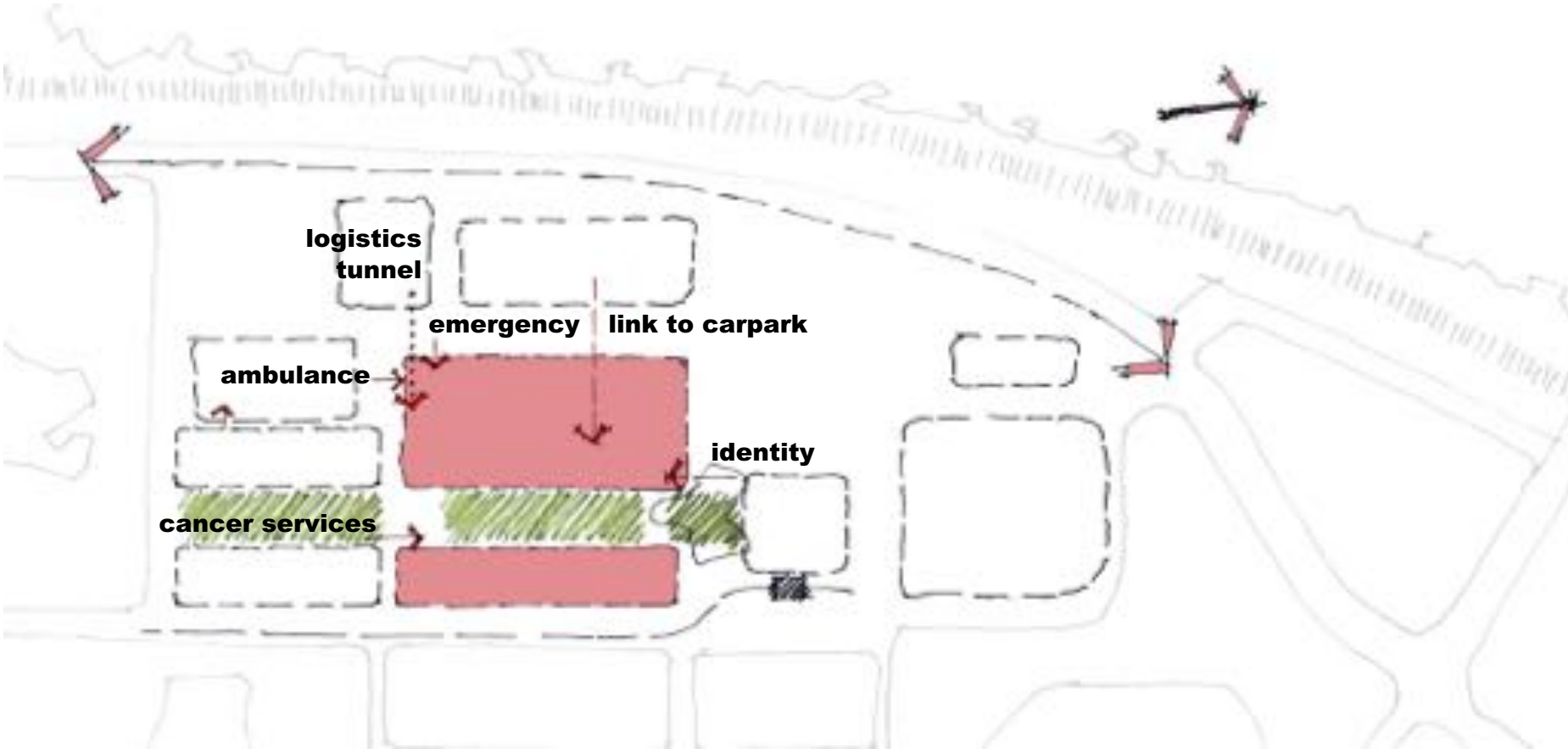
public space



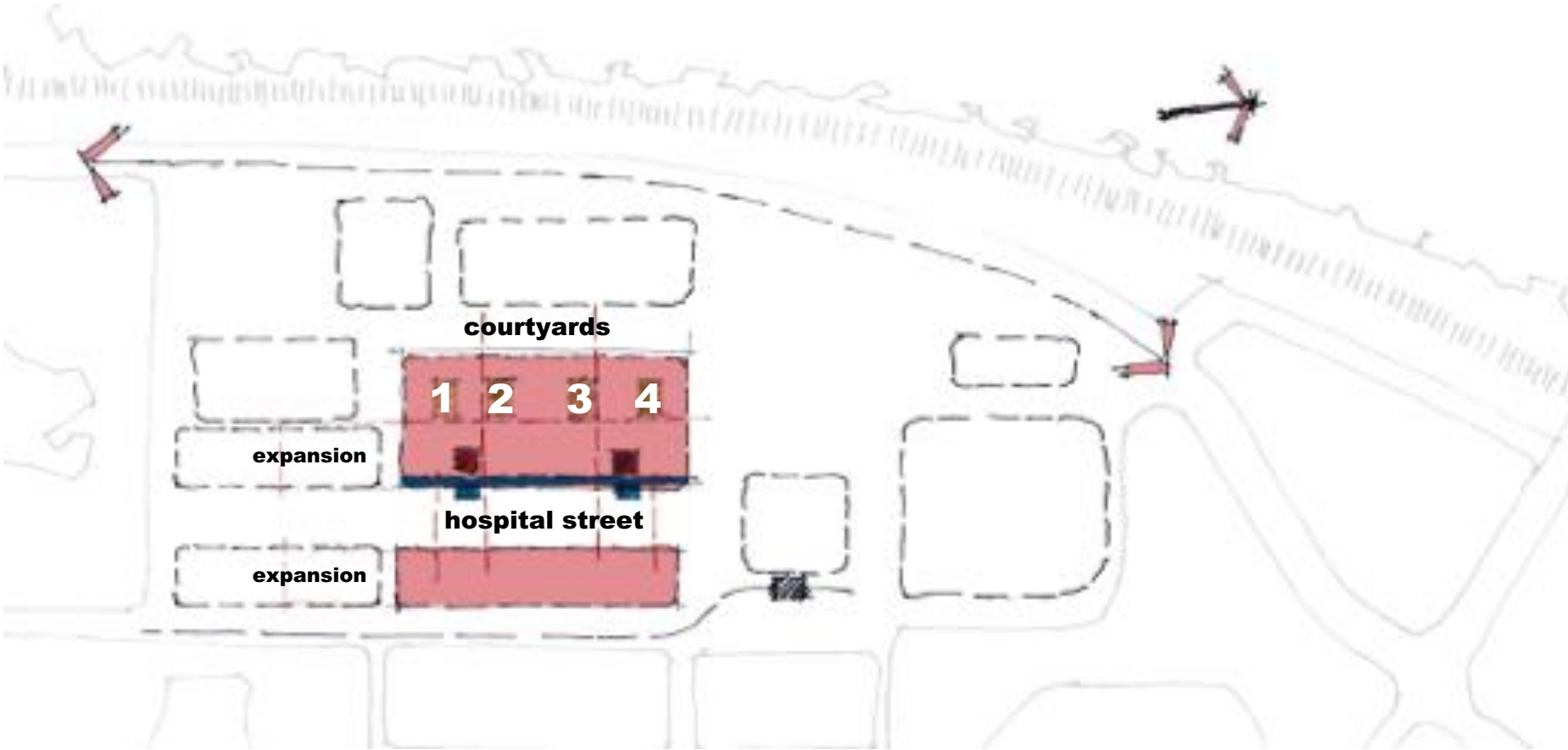
A – outdoor room

B – the courtyard

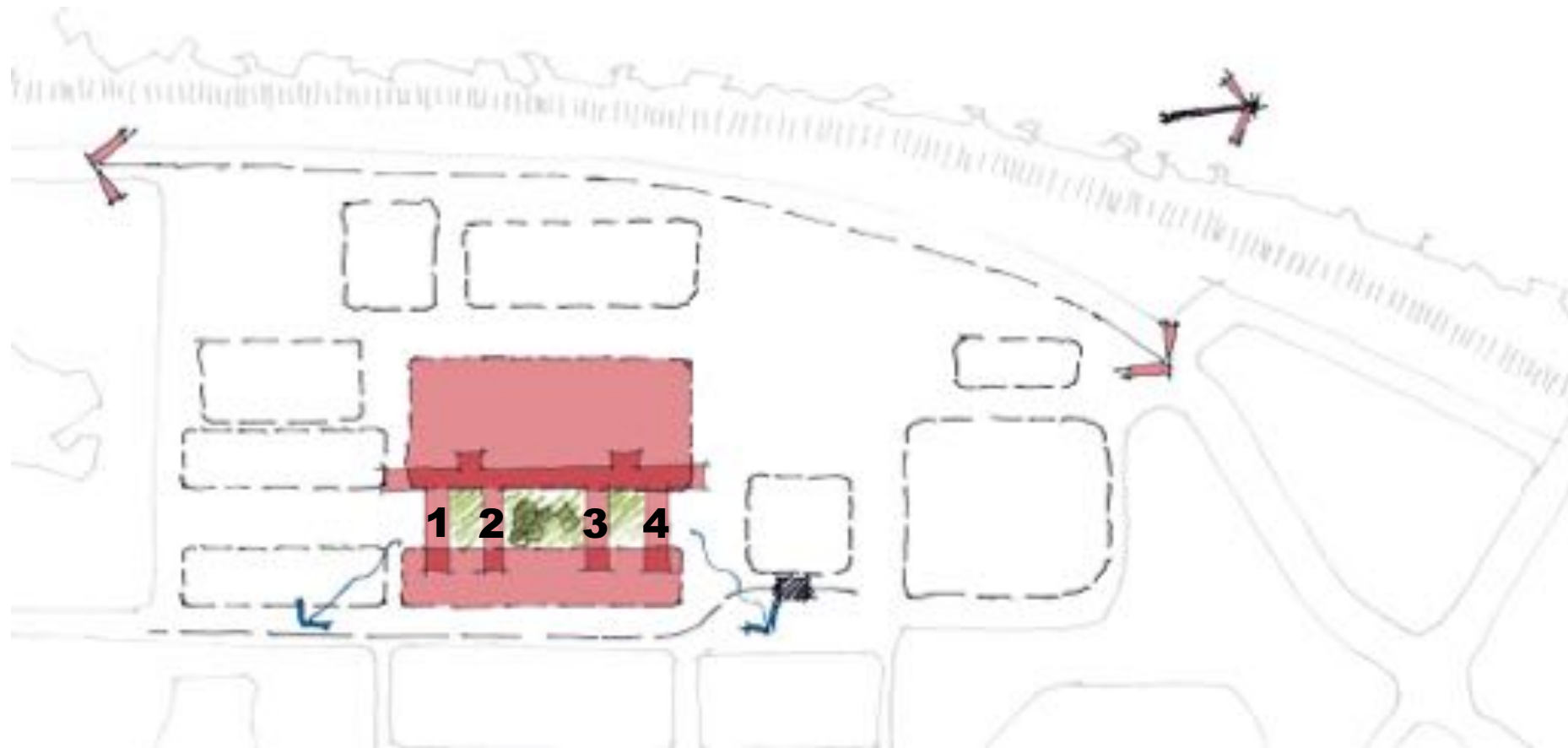
hierarchy of entries



planning order



ipu strategy





zonal analysis



SCUH service profile

- major tertiary referral hospital in SCHHB
- **165,000** sqm clinical space
- **11,000** sqm academic and research facility SCHI
- **4,000** sqm mental health
- **6,800** sqm facilities management centre
- **3,500** car spaces
- **100** place child care facility
- emergency medicine
- nuclear medicine
- integrated cancer centre
- medical imaging
- ambulatory care centre
- interventional hot floor
- ICU + CCU
- discrete staff centre
- women's + children centre

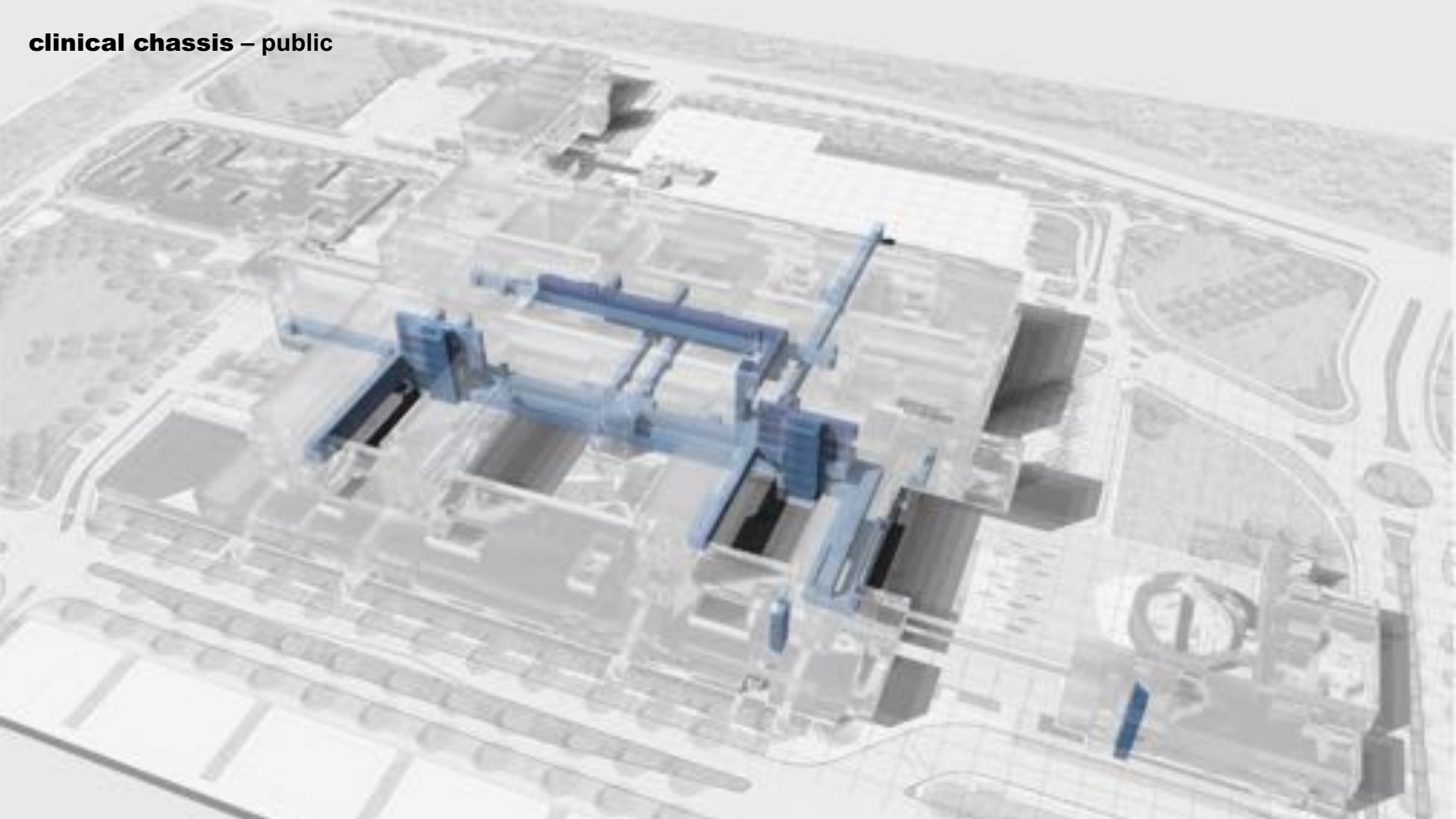


sectional analysis

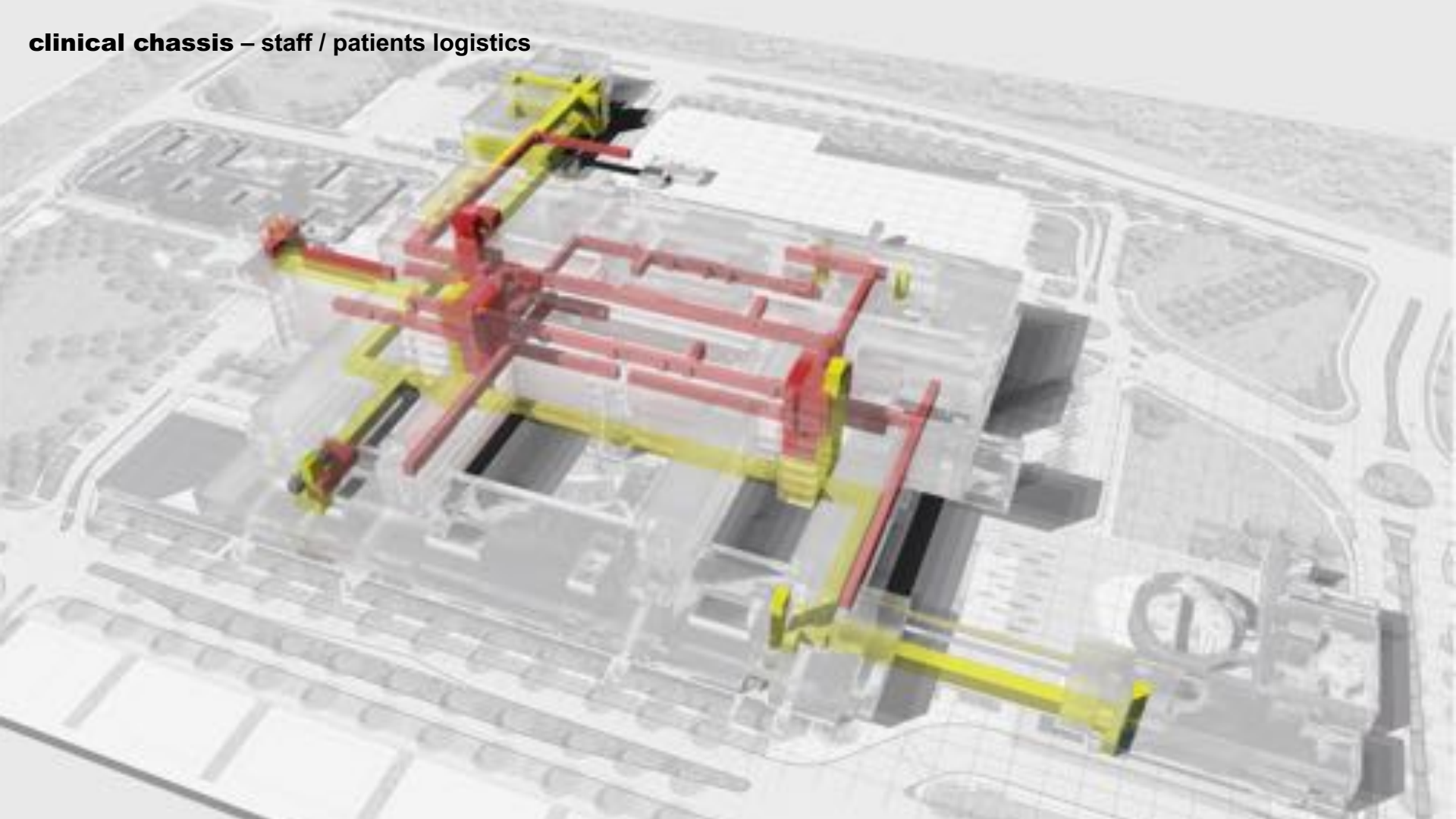


- optimized clinical chassis – reduced travel times – max travel time of **5** minutes across **165,000** sqm clinical footprint
- patient room design standardized + size increased – flexibility, functionality
- “super” interventional hot floor – **26,000** sqm – **24** OR’s; **6** interventional labs; **4** minor procedure; **40** ICU; **12** CCU
- informed building chassis – shared space with access to light and fresh air
- differentiated circulation pathways with reduced travel times
- optimal departmental functional relationships

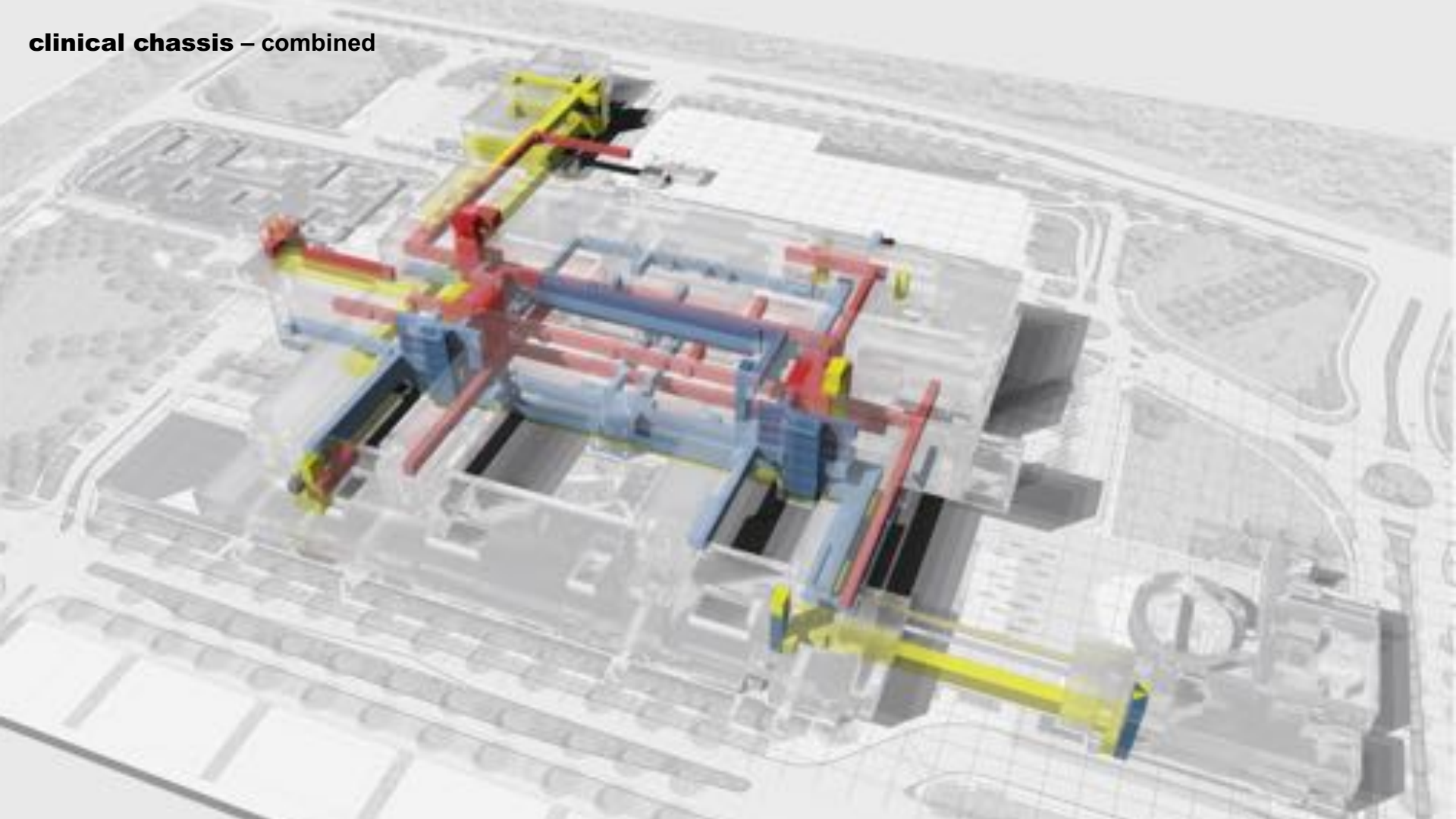
clinical chassis – public



clinical chassis – staff / patients logistics



clinical chassis – combined



SCUH timeline

- **PPP bid August 2011 – February 2012**
- **PPP Financial Close – July 2012**
- **Opened doors to patients – March 2017**

“

The scale speed and complexity of the project required the development of unique strategies to ensure the design team could plan and execute user consultation and design development with certainty. ”

Jo Campbell
General Manager Healthcare LendLease



Staff focus

- **719** doctors
- **2134** nurses
- **485** health practitioners
- coffee shop, kitchen + dining
- doctors lounge and library
- outdoor courtyards + recreation space
- gymnasium + recreation zone
- chill space – sleep pods
- overnight on-call accommodation

“Design features such as connectivity, natural light and biophilia are all elements that can reduce the turnover of medical professionals.”

Gail Vittori

Co Director, Center for Maximum Potential Building Systems



Sunshine Coast University Hospital







- **6,400** sqm of user respite space (indoor and outdoor)
- **49,000** sqm of green space across entire development
















PPP briefed sustainability goals

- deliver best practice in sustainable design principles, construction + operation
- renewable and energy efficient
- low emissions and minimal ecological impact
- minimize recurrent operating costs
- achieve 4 green star design + as built



“ Design to aid in the healing process and enhance the general wellbeing of visitors and users, increasing the buildings effectiveness. long term operational efficiency and sustainability. ”

SCUH is the largest healthcare building in Australia to achieve 6 star green star design + as built healthcare v1 ratings of GBCA (LEED Platinum equivalent), signifying 'World Leadership' in environmentally-sustainable building practices.



60,000_{M²}

Organic response lighting

Largest commercial use of Organic Response (OR) lighting systems in Australia. Some 60,000m² of lighting is controlled by 13,000 nodes.



Energy consumption

Significant reductions in 'business as usual' energy consumption (-25% energy, -40% peak usage, -20% embodied energy).

90%

Rainwater harvesting

Rainwater harvested from approximately 80% of SCUH's 38,000m² roof, with a storage tank capacity of 1.5 million litres. 90% of all water harvested is reused.



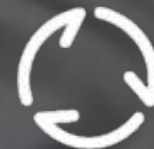
Air leakage

Air leakage rate measured at 3.2m³ per hr·m² in the first large-scale air tightness test of a hospital facade in Australia.



Electric car parking

LED carpark lighting, 20 electric charge stations and 139 electric-ready parks.



Construction waste

Approximately 98% of construction waste was recycled, equating to a 'waste to landfill' ratio of 3kg per square metre of gross floor area.



Indoor air quality

A 15% improvement over BCA requirements for daylight and thermal performance, together with high levels of fresh air.



Ventilation

Levels 50% higher than code with twin duct HVAC, CO2 monitoring, naturally ventilated carparks



Renewable hot water

The solar hot water heat exchange with gas boost system utilizes 440m² of photovoltaic collectors



Material selection

Low VOC and low emission formaldehyde products.
Reduced cement usage + 39% manufactured sand (non virgin materials).
Sustainable timbers, readily available + locally sourced + fabricated.
Sustainable furniture + fittings – third party certified (EPD, GECA + Green Tag)

thank you



EHCD conference
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Sunshine Coast
Hospital and Health Service

