



New Dunedin Hospital

PIKI TE ORA


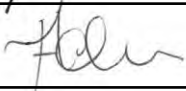


Preliminary Site
Masterplan
Report


04 | 02 | 2019

Document History and Status

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Preliminary Site Masterplan - SDHB Endorsement

Site Masterplan - The New Dunedin Hospital - SDHB Endorsement					
Revision	Purpose of Issue	Approved By	Role Position	Signature	Date Approved
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SDHB Project Management Office (PMO)		Mark Newsome	Acting Programme Director, SDHB PMO		14 12 18
SDHB Clinical Leadership Group (CLG)		Dr John Adams	Chair, CLG		14 12 18
		CLG accepts the Site Masterplan Report contingent on the feedback supplied to MoH separately in the Document Review spreadsheet.			
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Site Masterplan - The New Dunedin Hospital - MoH & SDHB Endorsement					
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		Endorsed by Project sponsors through roles on other groups.			
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New Dunedin Hospital Preliminary Site Masterplan Report

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Site Masterplan - The New Dunedin Hospital - MoH Endorsement					
Revision	Purpose of Issue	Approved By	Role Position	Signature	Date Approved
E	Final Issue - NDH Site Masterplan				
MoH Director General or Delegate		Dr Ashley Bloomfield	Director-General of Health		03 02 19





Executive Summary

This Preliminary Site Masterplan Report has been prepared for the Ministry of Health (MoH) as an input into the Detailed Business Case for the New Dunedin Hospital (NDH) project.

The approved Indicative Business Case (IBC) had determined that the new Dunedin Hospital would be a brown-field redevelopment for the replacement of nearly all SDHB services on a central city site in Dunedin. The MoH subsequently went through a site selection process to identify two blocks as the preferred site for the project, and have instigated a site acquisition process to purchase the land.

The masterplan therefore seeks to establish a spatial plan for the development of the Acute Services Buildings and the Ambulatory Services Centre as a first priority while still retaining flexibility for future growth and change.

The focus of later stages of the masterplan process has been to define the preferred location for the Acute Services Building and the Ambulatory Services Centre on the site, as the most significant built forms of the new project.

The masterplanning process has included inputs from a range of consultants and engagement with a wide range of Southern District Health Board (SDHB) and external stakeholders over a four-month period to inform masterplan briefing and option analysis. Many of the inputs have been necessarily high-level to inform preliminary planning studies, and several important areas of ongoing study have been identified as part of this process to inform further design stages.

This project provides a unique opportunity to establish the NDH as a key urban landmark for Dunedin that supports the city's long-standing relationship with health and health education, and can act as a catalyst for health-promotion in the city as well as positive place-making.

[Cover] Figure 1. Aerial photograph of Dunedin, New Zealand.
Figure 2. View looking towards first church and harbour basin.

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1.0 Introduction

1.1 Vision

The New Dunedin Hospital (NDH) aspires to be an exemplar of healthcare design in New Zealand, supporting best current practice in models-of-care and enabling an integrated digital hospital. The facility will be flexible, sustainable, and facilitate efficient patient flows and health-planning. The hospital will:

- Be patient and whānau focussed;
- Provide future adaptability, flexibility and sustainability;
- Be operationally cost effective and efficient;
- Promote healthy people spaces; and
- Optimise use of total health system resources.

The masterplan provides the framework for the design of the new hospital and is shaped by design principles and option assessment criteria developed by SDHB representatives and the project team.

These principles describe not only the aspects of the hospital that will best serve the health service delivery, but also the hospital’s place in the city.

This project aims to deliver a hospital that supports Dunedin’s long-term plan for urban renewal and improved place-making. The NDH will become an important landmark in the city, and will represent one of the largest single structures in Dunedin, located in walking distance from the centre of the city and other major landmarks.

1.2 Background

As one of the twenty District Health Boards in New Zealand, Southern District Health Board is responsible for most publicly funded hospital services and primary health care services in the Otago and Southland region. As with other DHBs, it has a statutory responsibility for improving, promoting, and protecting the health of the population living in the region. This includes planning, funding, and providing or contracting services to meet the health needs of the population.

The SDHB is the most rural of tertiary DHBs. The estimated resident population of Southern DHB in 2016/17 is 319,200. In addition, the DHB provides acute care to a number of visitors to the region.

The SDHB has district level healthcare facilities including Wakari Hospital, Southland Hospital, and Lakes Hospital and provides services out of a number of community owned rural facilities (Oamaru Hospital, Gore Hospital, Clutha Health First Hospital, Maniototo Hospital).

Dunedin Hospital is the main referral hospital for the SDHB offering a range of clinical, clinical support and non-clinical services. It is a small tertiary hospital and works in partnership with the district level hospital in Invercargill.

The clinical services provided from Wakari include mental health, acute mental health, forensic mental health, audiology and physical rehabilitation for those aged less than 65 years.

Dunedin Hospital is a University teaching and clinical training hospital with strong links to the University of Otago and the Otago Polytechnic Schools of Nursing, Midwifery and Health Sciences. The SDHB also partners with the University in health research activities and has established a Health Research Office to facilitate inter-disciplinary research by its staff and partners.

The planning work of the IBC reviewed a range of development options covering replacement of the existing Clinical Services building through to full facility replacement. These options were reviewed to:

- Confirm the strategic context and fit of the proposed investment into Dunedin Hospital.
- Confirm the need to invest and the case for change.
- Identify a range of potential options.
- Recommend a preferred way forward for further development of the investment proposal, supported by a limited number of short listed options for further analysis.

In August 2017 the Government approved the Indicative Business Case and gave endorsement to the Southern Partnership Group to proceed to the Detailed Business Case for the full facility replacement of Dunedin hospital located on a new site within the city.

Subsequently, the Ministry of Health undertook a site selection process that has resulted in the selection of two city blocks, bounded by Cumberland Street, Hanover Street, Castle Street, and the Otago Daily Times Building. The Ministry is currently in the process of purchasing these properties for the purpose of building the new Dunedin Hospital.

In parallel to the site selection activity the Ministry commissioned Functional Briefing from CCM Architects | Jacobs | Johnstaff as inputs to the Detailed Business Case. As site selection had not been completed, the briefing process was carried out without site specificity and without test-of-fit planning to validate the briefs. This briefing consisted of:

- Part A: Project Brief
- Part B: Strategic Brief
- Part C: Functional Design Brief
- Part D: Technical Brief
- Schedule of Accommodation

At the conclusion of the site selection and briefing processes, CCM Architects | Jacobs | Destraavis were commissioned to prepare this Preliminary Site Masterplan to validate the assumptions from the briefs and to provide a framework for the commencement of Concept Design for the NDH project.

1.0 Introduction

1.3 Principles

The methodology that has shaped this masterplan included the establishment of principles and criteria to guide option development and act as an assessment tool for comparing options and selecting a preferred planning option. The principles and criteria are described in detail in Section 5.1.

The following list describes high-level features of the principles as an introduction to the objectives if the project and the masterplanning approach:

				
<i>Patient & Whānau-Centred</i>	<i>Provide Future Adaptability, Flexibility & Sustainability</i>	<i>Be Operationally Cost Effective & Efficient</i>	<i>Promote Healthy People Spaces</i>	<i>Optimises use of Total Health System Resources</i>
Promote the reduction of harm to acceptable standards / to improve patient and staff experience.	Ability to adapt to create responsive infrastructure and capability that supports disruptive health system change.	Reduce non valued added time / create seamless patient journey / optimise use of total health system resources.	Create collaborative working environments for staff & students / promote health & well-being through urban design.	Enables efficient and cost-effective development and provides value on investment for the New Zealand government.
Positive Patient & Staff Experience	Sustainable Infrastructure	Health Service Delivery Efficiencies	Strong Organisational Culture	Enables Operational & Budget Efficiencies
<ul style="list-style-type: none">SalutogenicsWhānaungatanga - FamilyManaakitanga - Kind	<ul style="list-style-type: none">Kaitiakitanga - GuardianshipLow Energy LoadNatural DaylightNatural Ventilation	<ul style="list-style-type: none">Separates FlowsMinimise Travel DistancesConnect Services	<ul style="list-style-type: none">Inter-Professional ConnectivityInteractivity within Communal SpacesIdentity & PrideKotahitanga - Working as One	<ul style="list-style-type: none">Value for MoneyWhole of life cost approachSustainability principles & objectivesTime-efficient build programmeInnovative, market-sensitiveStaged delivery & parallel designPhased business transition if neededRecognises future integrationPositive urban fabric
Quality Equitable Access to Care	Future-Focused Strategy	Time Delivery of Value for Money Solution	Support Learning & Research	Support the timely delivery of a new service
<ul style="list-style-type: none">Intuitive WayfindingVehicular Access & CarparkingIntegration with Transport Hubs	<ul style="list-style-type: none">Whole of LifeCampus RenewalLong TermFlexibility	<ul style="list-style-type: none">Programme EfficiencyMaximise Existing AssetsWhole-of-LifeMinimise Service Delivery Risk	<ul style="list-style-type: none">SDHB Learning CommunityAccessible Learning EnvironmentsWider Community Learning OpportunitiesCollaboration with Educational Partners	<ul style="list-style-type: none">Support strategiesBalance between fastest delivery and best long-term outcomeSupport accelerated construction programme
Local Culture & Heritage Response	Innovative Models of Care	Safe & Functional Relationships	Establish an Active Precinct	
<ul style="list-style-type: none">Heritage ResponseNgai Tahu & Local RunangaIdentify Archaeological Significance	<ul style="list-style-type: none">AdaptabilityFlexible ChassisDigital Solution	<ul style="list-style-type: none">Priority Co-locationsPatient FlowEntry / Egress Strategy	<ul style="list-style-type: none">WalkabilityMinimise Over-ShadowingPorous Campus - Vistas through the cityMinimise Building Scale	

1.0 Introduction

1.4 Terms of Reference & Methodology

With the site selection of the Cadbury and Wilson blocks confirmed, the site masterplanning process commenced by reviewing a range of options around potential configuration of these two city blocks along with the Cadbury annex site situated across Castle Street from the Cadbury site. The central city location of the New Dunedin Hospital enables close proximity for access to the city centre, a central public transport hub, the University of Otago and Otago Polytechnic.

The options configuration considered a range of options for arranging defined buildings across these city blocks, taking into account both the immediate needs as set out below and the likely possible future needs of the Ministry.

Immediate (In-Scope) New Dunedin Hospital Project

- Acute Services Building
- Ambulatory Services Centre
- Energy Centre (EC)
- Car Parking
- Interprofessional Learning Centre (ILC)

Planning Concept A

Placed the Acute Services building on the Cadbury site and created a campus style arrangement of related buildings between it and the University to the north.

Planning Concept B

Placed the Acute Services Building on the Wilson site with the University to the north and created a campus style arrangement of related buildings to the south.

Option Refinement

An initial masterplanning workshop developed a set of Principles and Criteria which provided a framework against which to assess various options.

The initial review of the first nine options (Long-List) primarily focussed on the relationship between the Acute Services Building (the largest buildings) and the Ambulatory Services Centre, with appropriate development space preserved for the future delivery of identified functions in a suitable location.

The site yield analysis demonstrated that not all potential facilities identified for inclusion on the hospital masterplan would fit on these two city blocks. The Site Masterplanning process therefore identified prioritisation of which services to include across the Cadbury and Wilson sites with future services potentially being located on the Fraser or existing hospital site.

In the second masterplanning Workshop the long-list of options were reviewed with reference to the Principles and Criteria and options which failed to adequately meet the intent of the principles were then excluded. The remaining four options were taken forward in Workshop 03 which identified a preferred Option C2 and contingent Option W4.

Preferred Option – C2

While the two blocks provided reasonably similar constraints and opportunities, it was ultimately determined that Option C2 was preferred as it is providing:

- Good connectivity to Education partners through a porous northern block to the North, feeding the wider health precinct.
- Good future flexibility by spreading the main buildings across two sites.
- Reduced building height and a better urban design response by placing the lower density Ambulatory Services Centre on the Wilsons block. This resulted in good access to light within the building and good salutogenic opportunity.
- Retention of the heritage Dairy Building on the Cadbury block.

Planning Concept A



Cadbury:

- Acute Services Building
- Parking

Cadbury Annex:

- Energy Centre

Wilson:

- Ambulatory Service Centre
- Day Surgery Unit
- ILC

Planning Concept B



Cadbury:

- Ambulatory Service Centre
- Day Surgery Unit
- ILC

Cadbury Annex:

- Energy Centre

Wilson:

- Acute Services Building
- Parking

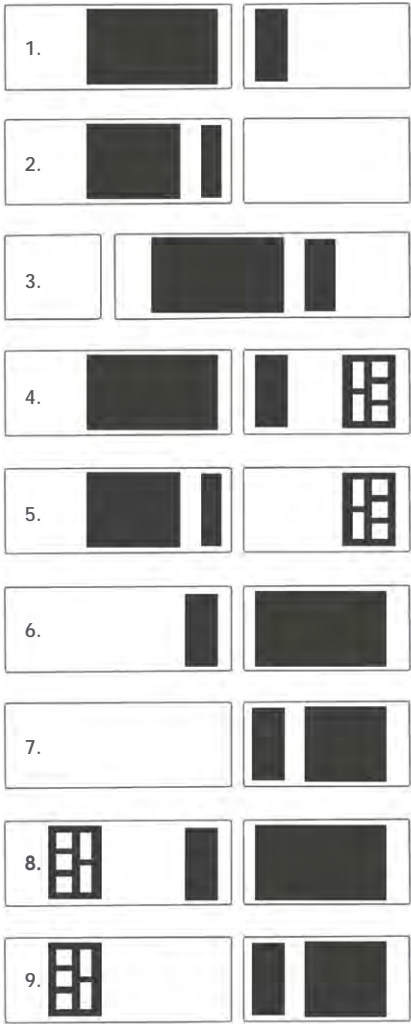
Planning Concept A

Places the Acute Services Building on the Cadbury site and creates a campus style arrangement of related buildings between it and the University to the north.

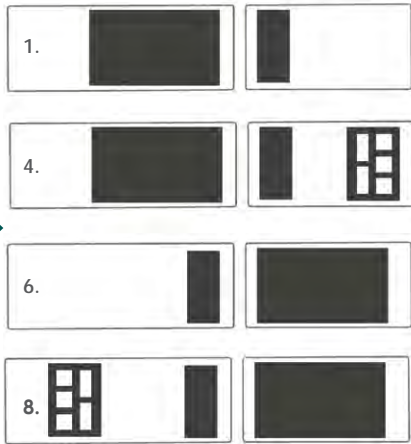
Planning Concept B

Places the Acute Services Building on the Wilson site with the University to the north and a campus style arrangement of related buildings to the south.

Long List



Short List



Preferred Option



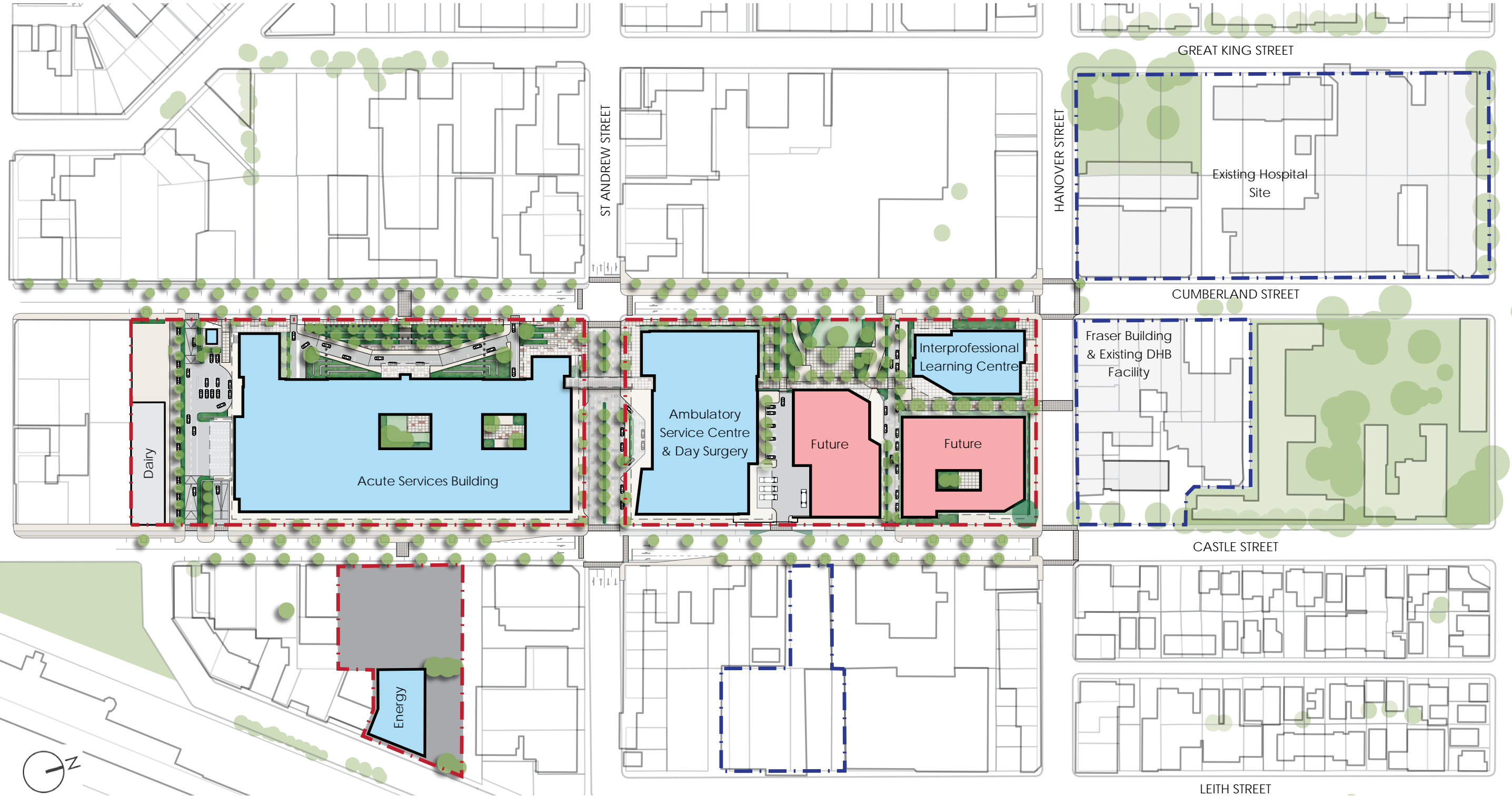
Contingency Option



Figure 3. Diagrammatic Representation of Masterplan Option Refinement

1.0 Introduction

Indicative Preferred Preliminary Site Masterplan



- Future Services to be Accommodated on Business Case Approval :
- Southern Blood & Cancer Services
 - Translational Research Centre



Figure 4. Aerial Photograph of
Dunedin by David Wall
(©davidwallphoto.com)

1.0 Introduction

1.5 Reference Documents

The following national, regional and local plans and strategies have been used to build a firm foundation for strategic direction and alignment throughout the Southern Health System.



2.0 Health Service Planning

2.1 SDHB Health Services

2.1.1 SDHB Overview

The vision of the Southern Health System is to achieve and deliver high quality and accessible healthcare to communities, supporting more people to enjoy a better, healthier, longer life. 'Better health, better lives, Whānau Ora'. The planning for the new Dunedin Hospital has been undertaken in the context of the broader health system vision and priorities, including the Southern Strategic Health Plan and the Primary and Community Care Strategy. The Southern Strategic Health Plan Piki te Ora, 2014 presents six priorities for the Southern Health System, which are:

- Developing a coherent Southern system of care.
- Building the system on a foundation of population health, and primary and community care.
- Securing sustainable access to specialised services.
- Strengthening clinical leadership, engagement and quality improvement.
- Enhancing system capability and capacity.
- Living within our means.

2.1.2 Dunedin Health Services

The existing Dunedin Hospital provides a range of secondary and tertiary level services catering to the population of Dunedin and the wider Southern Health System. Services currently offered on site are summarised in Table 1.

Services provided at the Wakari hospital site or which are community based within Dunedin city are summarised in Table 2.

Table 1. Current Dunedin Based Health Services

Current Dunedin Hospital Based Services		
Core Services - Inpatient, Ambulatory and Outpatient Services		
Children’s Health	Medical Services	Surgical Services
Women’s Health	Southern Blood and Cancer Services	Emergency Services
Other Clinical Services		
Primary Birthing	Renal Home Training Services	Sexual Health
Medical Imaging	Breast Care Service	Vera Heyward Child Development
Bowel Screening	Care Coordination Centre (CCC)	
Other Services		
Patient Support Services	Te Ara Hauora (Māori Health Liaison Service)	
Other Non-DHB Services On Campus		
University of Otago Clinical Services	Orthotics and Prosthetics Services	Health Research South
Southern Cross Pathology		

Table 2. Community Based Health Services

Wakari Hospital Based Services		
Mental Health, Addictions, and Intellectual Disability (MHAID) Services	Te Oranga Tonu Tanga (Māori Mental Health)	Rehabilitation (ISIS)
Executive Management Suite	Building and Property	Transport Services
Community Based Services		
District Nursing	Allied Health Services	Care Co-ordination
Public Health	Lead Maternity Carers	Oral Health
Child and Youth Mental Health Services	Continence and Stomal Services	Primary Care Providers

2.0 Health Service Planning

2.2 New Dunedin Hospital
2.2.1 Overview

The New Dunedin Hospital bases its planning on the forecast service demand to 2043.

2.2.2 Scope Summary

The new hospital will initially provide 396 inpatient beds (later increasing to 454 by 2043), and 61-day bed equivalents to safely provide inpatient, ambulatory and outpatient services for adults, children and neonates. The Acute Services Building will operate 24 hours a day, every day of the week providing a range of acute specialist services, emergency intervention, diagnostic services, acute and elective surgery, medical and surgical inpatient care, paediatric and maternal inpatient care, and related clinical and non-clinical support services. The Ambulatory Service Centre will operate as a single unit providing for the delivery of a comprehensive range of services offering consultation; treatments and therapies; day surgery, procedures and related diagnostic services in an ambulatory setting. Table 3 identifies the core service categories included in the project scope at the time of Site Masterplanning.

The Project scope has been revised during the Indicative Business Case and initial Detailed Business Case phases with various exclusions and inclusions agreed through the Southern Partnership Group process.

Services which are currently delivered from the Dunedin Hospital site which have been identified as out of scope of the new Dunedin Hospital project at the time of the Site Masterplanning are listed in Table 4. The Southern Blood and Cancer Services will remain in the existing facility. Other out of scope services will seek facility solutions either on or off site via separate business cases or alternative delivery solutions.

The Primary Birthing Unit is included in scope but subject to separate review by the SDHB. Thus, it may be removed from scope of the New Dunedin Hospital project. Current considerations identify that Primary Birthing will either be located adjacent to Maternity or located off-site.

Despite the specific inclusions/exclusions the masterplan seeks to maintain future flexibility to ensure the best long term outcome.

Table 3. New Dunedin Hospital Scope of Core Services

New Dunedin Hospital Scope of Core Services	
Acute Renal Unit	Information Services (Partial)
Administration - Clinical / Executive / Hospital	Inpatient units
Ambulatory Clinics & Medical Physiology Labs	Intensive Care unit
Maternity IPU, Primary & Secondary Birthing	Interprofessional Learning Centre
Breast Care	Medical Imaging & Nuclear Medicine
Building & Property (Partial)	Mortuary
Cardiac Interventional Suite	Multi-faith Centre
Clinical Engineering, Technology & Equipment Services	Neonatal Intensive Care Unit
Day Medical Unit	NZ Blood Service
Day Surgical & Procedural Unit	Operating Theatre Suite
Emergency Department	Public Amenities
Emergency Psychiatric Service	Security
Orderlies, Cleaning, Linen, Waste, & Mail Centre	Staff Amenities
Pathology (Shell Space for 3rd Party)	Sterile Services Unit
Procurement and Supply	Front of House Services
Food Services	Hospital Operations Centre

Table 4. Out of Scope Services currently on-site at Dunedin Hospital

Out of Scope Services (Currently On-site)	
Fertility Services	Renal - Home Dialysis Training Unit
Hydrotherapy and Lifestyle Centre	Southern Blood and Cancer Services (SBCS)
Information and Records Management	Sexual Health Service
Prosthetics - New Zealand Artificial Limb Service	Orthotics - Orthotic Clinic Limited

2.0 Health Service Planning

2.2.3 Schedule of Accommodation Summary

Dunedin Hospital - Area Schedule Summary		
Department	NDA sqm	GDA sqm
Front of House	1739	1945
Main Entrance	476	583
Multi-Faith	159	183
Public Amenities	754	829
Retail - FOH	350	350
Ambulatory	9804	12866
Ambulatory Services Centre	5048	6562
Breast Care	Included above	
Clinical Engineering, Technology and Equipment - ASC	37	44
Day Unit - Medical	178	247
Day Surgical & Procedural Unit	2576	3528
Front of House - Ambulatory Service Centre	300	367
Medical Physiology Labs - Respiratory, Sleep, Neuro	583	764
Medical Physiology Labs - Cardiac	514	671
Medical Physiology Labs - Vascular	293	382
Orthotics Prosthetics	Out of Scope	
Pathology - Ambulatory Service Centre	77	100
Renal Home Training Unit	Out of Scope	
Retail - Ambulatory Service Centre	200	200
Emergency Department	2486	3340
Emergency Department (incl. SSU)	2199	2958
Emergency Psychiatric Services	287	382
Impatient	17639	23180
Acute Renal Unit	432	561
Impatient Unit MED-A: Cardiac/CCU	1070	1409
Impatient Unit MED-B: General Medical	1139	1497
Impatient Unit MED-C: Medical OPMH (Part Fitout)	881	1151
Impatient Unit MED-D: Oncology Haematology	981	1284
Impatient Unit SURG-A: General Surgical	1115	1464
Impatient Unit SURG-B: General Surgical	1115	1464
Impatient Unit SURG-C: General Surgical	1115	1464
Impatient Unit SURG-D: General Surgical	1115	1464
Impatient Unit PAEDS: Children's & PADU	1178	1539
Impatient Unit REHAB-A: Rehabilitation	1028	1349

Dunedin Hospital - Area Schedule Summary		
IPU Support: REHAB-A&B Therapy Zone	44	584
Inpatient Unit REHAB-B: Rehabilitation Surgical	1047	1374
Inpatient Unit MAPU	1176	1544
Intensive Care Unit	2509	3346
Neonatal Intensive Care Unit	1298	1684
Birthing	1830	2426
Birthing Unit/Day Assessment/.Maternity IPU	1453	1927
Primary Birthing	377	500
Perioperative	6773	9068
Cardiac Interventiaional Suite	1155	1520
Operating Theatre Suite	4619	6331
Sterile Services Unit	1000	1218
Back of House	2115	2585
Building and Property	259	312
Food Services	888	1076
Orderlies, Linen, Waste & Mail Centre	500	612
Procurement & Supply	400	500
Security	69	86
Administration	6519	8508
Administration - Clinical	2888	3504
Administration - Executive	390	731
Administration - Collaboration	296	370
Administration - Interim use of Future Proof Shell	2592	3476
Clinical & Corporate Information Management	Off site MoC	
Hospital Operations Centre	186	255
Information Services	167	202
Clinical Support Services	5570	7212
Medical Imaging Department	2505	3309
Mortuary	248	302
Nuclear Medicine	377	489
NZ Blood Service	157	202
Orthotics and Prothetics	OOS	
Pathology	1148	1515
Pharmacy	718	886
Clinical Engineering / Central Equipment Service	418	507

Dunedin Hospital - Area Schedule Summary		
Staff Resources	1728	2028
Staff Amenities	1728	2028
Gross Department Area	56202	73158
Travel	16.0%	11705
Engineering	16.0%	11705
Sub Total		96569
Façade	2.75%	2656
Gross Building Area		99224

Dunedin Hospital - Area Schedule Summary		
Summary of Shell Space	NDA sqm	GDA sqm
Future proof - shell to be repurposed for workspace	2592	3476
Cardiac Interventional Suite - 2043	196	274
Inpatient Unit - Surgical (32 Beds)	1115	1464
Inpatient Unit - Medical (16 Beds)	431	568
ICU/HDU	510	699
Medical Imaging - 2043	85	115
Nuclear Med.	86	116
Operating Theatre Suite - Hybrid Capacity	171	239

Parking Summary	
Parking Requirement (no. of spaces)	250

2.0 Health Service Planning

Dunedin Hospital - Area Schedule Summary

Acute Services Building Summary	NDA sqm	GDA sqm
Acute Services Building	42535	55268
Gross Departmental Area	42535	55268
Travel	16.0%	8843
Engineering	16.0%	8843
Sub Total		72954
Façade	2.75%	2006
Gross Building Area		74960

Ambulatory Service Centre Summary	NDA sqm	GDA sqm
Ambulatory Service Centre	13667	17890
Gross Departmental Area	13667	17890
Travel	16.0%	2862
Engineering	16.0%	2862
Sub Total		23615
Façade	2.75%	649
Gross Building Area		24264

Interprofessional Learning Centre Summary (MoH Only)	NDA sqm	GDA sqm
Interprofessional Learning Centre	1413	1730
Gross Departmental Area	1413	1730
Travel	12.5%	216
Engineering	12.5%	216
Sub Total		2163
Façade	0	0
Gross Building Area		2163

Central Energy Plant Summary	NDA sqm	GDA sqm
Central Energy Plant	3452	3497
Gross Departmental Area	3452	3497
Travel	0	0
Engineering	0	0
Sub Total		3497
Façade	0	0
Gross Building Area		3497

Dunedin Hospital - Area Schedule Summary

Gross Building Area Summary	NDA sqm	GDA sqm
Acute Services Building		74960
Ambulatory Service Centre		24264
Interprofessional Learning Centre		2163
Central Energy Plant		3497
Gross Building Area		104884

2.0 Health Service Planning

2.3 Planning Approach

2.3.1 General

Access

- Public access to both the Acute Services Building and Ambulatory Service Centre via Front of House zones on Ground Level is supported by pedestrian entry ways and dedicated drop off / pick up zones.
- Dedicated emergency vehicle access to the emergency department providing a discrete entry for acutely unwell patients transferring from ambulance vehicles into the building.
- Ambulance and other emergency vehicle parking is provided with direct access to Triage and resuscitation zone.
- Public access to the emergency department is supported by a drop off / pick up zone with provision for limited short-term parking spaces.
- After hours access to primary and secondary birthing services on Level Five is provided from the ground floor emergency department with access supported by dedicated clinical lifts to the service.
- Discrete entry supporting access for escorted corrections facility patients is provided with a point of entry to the Acute Services Building via the ambulance entry and to the Ambulatory Service Centre via dedicated services entry.

Horizontal and Vertical Travel

- Link bridges between the Acute Services Building and Ambulatory Service Centre to support public, clinical, and service flows across Levels One, Two and Three respectively. This will ensure privacy for patients travelling within the buildings and efficient movement of staff, supplies and equipment.
- The vertical transportation strategy provides for dedicated lifts for public, patients and services. Two main lift cores are identified within the Acute Services Building and one central lift core within the Ambulatory Service Centre. Hot lifts are provisioned and located at the “acute” end of the Acute Services Building such that direct access from the Emergency Department, Theatres, Intensive Care and the Helipad can be achieved.
- Discrete and dignified transfer of patients between departments is supported by service corridors that will be distinctly separate to public pathways and back of house activities. This includes the movement of tūpāpaku to the mortuary or to dedicated hearse parking area.
- Dedicated parking at Lower Ground Level of Acute Services Building supports the movement of Building & Property staff and associated contractors to and from each site.
- Laneways to the rear of the Ambulatory Service Centre

are proposed to support the restricted flow of service vehicles in and out of the loading dock.

- A dedicated vehicle entry is provided to enable restricted service vehicle access to the Basement Level of the Acute Services Building.

2.3.2 Clinical Services

The site masterplan provides for the functional requirements of the following clinical services and the proposed models of care as described in the functional design briefs.

Emergency Department

- Ground floor of the Acute Services Building accommodates the Emergency Department with the potential for a single point triage to be established near the point of entry for ambulance and ambulatory presentations.
- Direct adjacency to the Psychiatric Emergency Services is supported.
- Other adjacencies which are assumed include a short stay unit within the ED footprint and close adjacency to the Medical Assessment and Planning Unit (MAPU).
- Medical Imaging for unplanned presentation is embedded in the ED. It is assumed that inpatients including intensive care patients will access the imaging resources on this level. Only planned ambulatory activity will be supported in the Medical Imaging Department located in the Ambulatory Service Centre.
- Immediate adjacency to the Hot lift is provided.
- Other resources which are located in close proximity to the ED include Security and the Multifaith space.

Inpatient Units

- Inpatient units are distributed across the four towers from Level Four to Seven.
- Level Four is predominately critical care services. It includes the Intensive Care Unit and a Medical Inpatient Unit which includes the Coronary Care Unit and is directly collocated with the Cardiac Interventional Suite. The ICU and CCU have access to external courtyard spaces on this level.
- Level Five is predominately Women’s and Children’s services. It includes

the Maternity inpatient unit with collocated Assessment Unit and the Secondary and Primary Birthing Units (location of Primary Birthing to be determined - potentially located off-site). The Neonatal Intensive Care is directly adjacent. Also on this level is the Paediatric Inpatient Unit with collocated Paediatric Assessment and Day Unit. As the Paediatric Day Unit is providing day oncology services the adjacency of the adult Oncology Inpatient Unit on this level provides some workforce synergies. All units on this level have access to external courtyards.

- Level Six provides for Rehabilitation services with dedicated allied health resources including a gym with direct access to external areas. Two inpatient units are also located on this floor one of which is scheduled to support Older Persons Mental Health. It is assumed the inpatient beds within these two units are providing for Medical cohort but the generic nature of the units enables full flexibility of use.
- Level Seven provides for 4 inpatient units. It is assumed these are surgical units in the current block and stack but the generic planning approach provides for full flexibility of use.
- Level Two provides a shell area for a future inpatient unit. The adjacency to the main Operating Theatre and the link to the Day Surgical and Procedural Unit would support a 23 hour surgical short stay model.
- The configuration of the inpatient units on Levels Four to Seven maximises access to natural light and external courtyard areas. Each inpatient unit is supported by dedicated service corridor and lift access as well as a public lift and entry.
- An allocation of public and staff amenities has been made central to each lift core.

Surgical Services

- The separation of acute and elective surgery flows will occur within the departmental planning of the main operating suite located on Level Two and the cardiac interventional suite located on Level Four.
- The separation of elective same day and overnight stay is supported by a precinct approach which provides a dedicated Day Surgical and Procedure Unit (DSPU) within the Ambulatory Services Centre for same day only activity. All overnight stay surgical patients will be managed within the Acute building including associated DOSA activity.
- The cardiac operating room, cardiac catheterisation labs along with the Cardiac – Medical Physiology Labs have been clustered to form a Cardiac Interventional Suite with direct adjacency to the Intensive Care Unit and the Hot Lifts.

2.0 Health Service Planning

Mortuary

- Discrete and dignified transfer of the deceased person/ tūpāpaku to the mortuary will be via separated paths from the movement of general public, patients and food. Direct access to designated parking at Lower Ground Level for funeral directors or whānau removing the body is provided.
- The mortuary will provide public access to both a whānau room and a viewing room to enable relatives to stay with the tūpāpaku if desired.

Medical Imaging

- Ambulatory Medical Imaging services will be located on Level One of Ambulatory Service Centre to support planned activity with direct adjacency to outpatient clinics and medical physiology labs.
- There will also be a Medical Imaging unit on ground floor of the Acute Services Building to provide immediate adjacency to the emergency department for all unplanned activity flows as well as planned inpatient imaging.

Other Clinical Support Services

- Level One provides for a number of clinical support services including Pathology and Pharmacy.
- These areas are predominately restricted access with limited public interface supported.
- It is noted that the Pathology service is provided by a third party and a warm shell space provisioned for only.
- The pharmacy model at this point in time does not include robotics.

2.3.3 Non-Clinical Services

The site masterplan provides for the functional requirements of non-clinical services described below.

Procurement and Supply

- The distribution model is comprised of two components; regional distribution warehouse located on Leith Street, and the hospital based receipt and distribution facility located on the Ground Level of the Ambulatory Service Centre with additional resources on Level Three adjacent to the service link to support efficient materials management flows across the facility.
- The loading dock and adjacent vehicle zone supports articulated and rigid truck access and provides local parking of SDHB and contractor vehicles.

Back of House Services

- Security services is predominately a mobile service with a base located on the ground floor of the Acute Services Building providing adjacency to the emergency department and emergency psychiatric services.
- Orderly, Linen, Mail and Waste management services will be located on the ground floor of the Ambulatory Service Centre with additional resources on Level Three adjacent to the service link to support efficient distribution and collection across the facility.

Building and Property

- Limited facilities for Building & Property to support the operation of the new hospital are located on the Basement Level of the Acute Services Building with the assumption that additional resources will be available off site.

Food Services

- The masterplan response locates food services on Level Three of the Ambulatory Service Centre, connected to the Acute Services Building via a link bridge supporting service workflows. The receipt of food supplies and movement of residual waste will be supported by direct vertical transport to the loading dock located at Ground Level of the Ambulatory Service Centre.
- The circulation strategy ensures the movement of food throughout the facility will remain separate from pathways used for the movement of the deceased.

2.3.4 Public Amenities

The site masterplan provides for the functional requirements of public amenities described below.

Whānau Spaces

- Dunedin Hospital actively encourages and supports whānau participation and partnership in all levels of service delivery, recognising the involvement of whānau in the delivery of healthcare is essential in fostering the Treaty of Waitangi principles of partnership, protection, and participation.
- Whānau spaces are provided in the ground floor front of house zone of both the Acute Services Building and Ambulatory Service Centre, and on each level external to the departmental area. Additional whānau spaces are allocated within nominated units including the emergency department, birthing, paediatric unit and the mortuary.

Multi-Faith

- The Dunedin Hospital Multi-faith Centre supports patients and their family and whānau during times of trauma, illness and loss. It is located close to the main entry on the ground floor of the Acute Services Building with immediately adjacent to the emergency department and with access to an external courtyard area.

Retail

- Opportunities for retail space on Ground and Level One of both the Acute Services Building and Ambulatory Service Centre is provided.

2.3.5 Staff Resources

The site masterplan provides for the functional requirements of staff resources as described below.

Workspace

- The New Dunedin Hospital will provide a range of contemporary workspace amenities that support staff to efficiently and effectively undertake the functions of their roles. These areas are scheduled within departments and also as a central collaborative zone on Level One of the Acute Services Building with access to an external area.

General Amenities

- Staff amenities are distributed across each floor level of the Acute Services Building and Ambulatory Service Centre with large staff dining and lounge facilities located on Level Three of the Acute Services Building providing access to an external courtyard.
- End of trip facilities for staff including the provision of secure bike storage will be located at Lower Ground Level of the Acute Services Building.
- Vertical and horizontal pathways support the efficient movement of staff through the facility.

2.0 Health Service Planning

2.4 Future Proof Response

2.4.1 Overview

Working towards a sustainable future demands the consideration of a range of building aspects and their immediate and long-term effects to ensure flexibility, adaptability and longevity. The masterplan response provides flexibility to respond to anticipated growth in the workforce, inpatient, medical imaging, and perioperative services.

Within the building footprint allocated shell space has been provided alongside nominated departments. External expansion zones have been considered for continued growth in demand beyond the current planning horizon of 2043.

2.4.2 Future Service Needs

Medical Imaging

- A future-proofing strategy provides warm shell spaces adjacent to the Medical Imaging department on Acute Services Building ground floor for future CT and Acute Services Building level one adjacent to Nuclear Medicine for future PET/MRI.

Perioperative Services

- Future proofing for additional surgical capacity has been anticipated with the shell space for an additional hybrid theatre within the operating theatre suite.
- The Cardiac Interventional Suite includes shell space for a hybrid cardiac catheterisation lab to manage anticipated growth in activity.

Inpatient Units (IPU)

- The delivery of a staged response to the forecast inpatient bed requirement includes the provision of shell space for future fit out as bed demand increases.
- Locations of shell area include ICU / HDU -10 beds; Medical & Older Persons Mental Health Inpatient unit – 16 beds; and one full 32 bed unit located on Acute Services Building level two adjacent to perioperative services.

Workspace

- A number of areas identified as shell space will be utilised for workspace in the interim years, with permanent future workspace facilities identified on-site as part of the masterplan response.

2.5 Staged Delivery of Ambulatory & Same Day Surgical Services

2.5.1 Overview

In the early stages of the Master Planning process the Southern Partnership Group identified a requirement for the early delivery of the Ambulatory Service Centre incorporating a Day Surgery Unit. Subsequently a Clinical Services Statement (CSS) was prepared describing the mix and breadth of services that could be provided in a standalone same Day Surgery Unit.

To best provide an interim standalone facility which supports nominated services, the recommended response is a Same Day Surgery Unit including three theatres, requisite recovery areas, and access to a suite of ambulatory consultation rooms.

Endoscopic activity will continue to be delivered in the recently refurbished Gastroenterology Unit within the existing Dunedin Hospital

2.5.2 Benefit Analysis

The establishment of a standalone Same Day Surgical and Procedure Unit at the New Dunedin Hospital site delivered early will support:

- Timely patient access to high quality and safe services.
- Reduced number of hospital-initiated postponements.
- Improved operating theatre utilisation.
- Efficient care by reducing variation in patient care pathways.
- Enable sustainable improvement in elective surgery and endoscopy performance which contributes to reduced waiting times, reduced waiting lists and reduced cancellations.
- Deliver patient centred, multidisciplinary team care.
- Strengthen partnerships with service partners across the continuum of care.
- Improve patient flow and more effective use of available capacity.
- Enhance operational productivity, efficiency, and sustainability.

Broader benefits of the early establishment of an Ambulatory Care Centre with a Same Day Surgical Unit surgery for Southern DHB are likely to include:

- Potential theatre and bed capacity released at Dunedin Hospital as a result of same day activity being delivered off site.
- Potential opportunity to repurpose vacated clinical space at Dunedin Hospital for alternative services.

- Increased service model efficiency due to high productivity and reduced length of stay may create revenue/savings opportunities for Southern DHB.

2.5.3 Scope Summary

It is assumed that the Day Surgical Centre will predominately support Ophthalmology and Ear, Nose & Throat same day surgical activity for both paediatrics and adults.

In consultation with the SDHB clinical teams, the following procedures were determined to be suitable for inclusion in a Same Day Surgery Centre, and may be incorporated into the service as the response to demand is established:

- Ophthalmology
- Ear, Nose & Throat
- Gynaecology
- Plastic & Reconstructive Surgery
- Orthopaedics
- Urology
- Vascular Surgery
- Non-Subspecialty Surgery
- Colorectal Surgery
- Neurosurgical procedures
- Haematological Surgery
- Head & Neck Surgery
- Upper GIT Surgery
- Thoracic Surgery
- Breast Surgery

2.0 Health Service Planning

2.5.4 Stand Alone Requirements

A stand alone day surgical unit will provide the following resources:

Day Surgery Unit

- Operating Theatres
- Stage 1 – PACU
- Stage 2 - Recovery
- Stage 3 – Discharge lounge
- Day of Surgery Admissions unit

Ambulatory Clinics

- Consultation rooms
- Procedure rooms
- Treatment rooms
- Clinical support spaces

Clinical support services

- Sterilisation Services – local holding of inventory only (no reprocessing)

Non Clinical Support services

- Loading dock
- Clean and dirty holding
- Storage – Turn around only

Access to on grade carparking in the adjacent zone

Depending on the nature of construction and delivery of the interim solution there may be shell space to provide for functional requirements of the long term Ambulatory Service Centre solution.

Stage 1
Completion of three day surgery theatres & zone of ambulatory clinics.

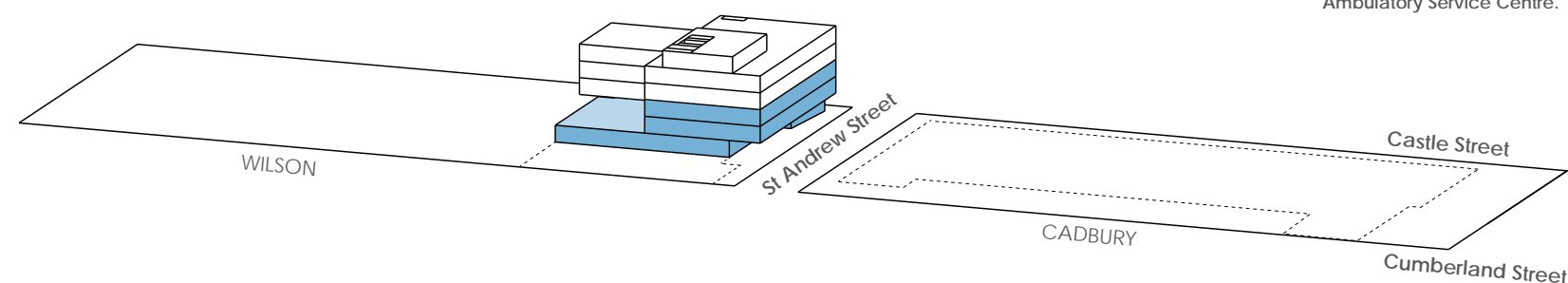
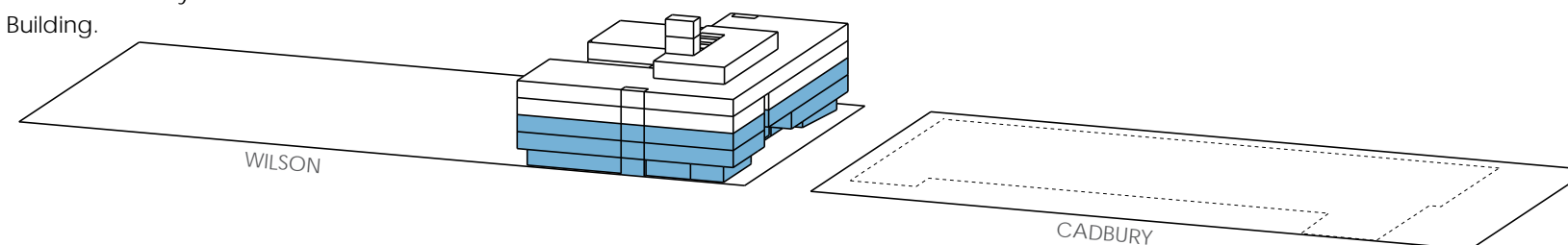
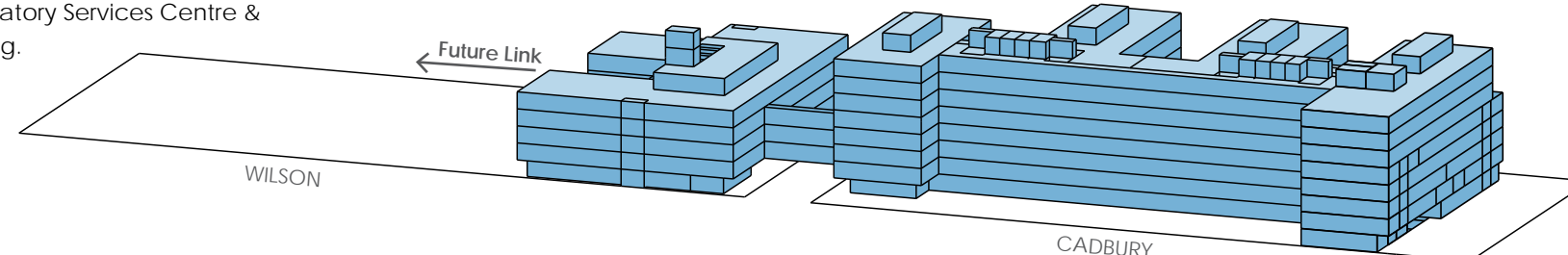


Figure 5. Potential Staging Sequence for Early Delivery of Day Surgery within the Ambulatory Service Centre.

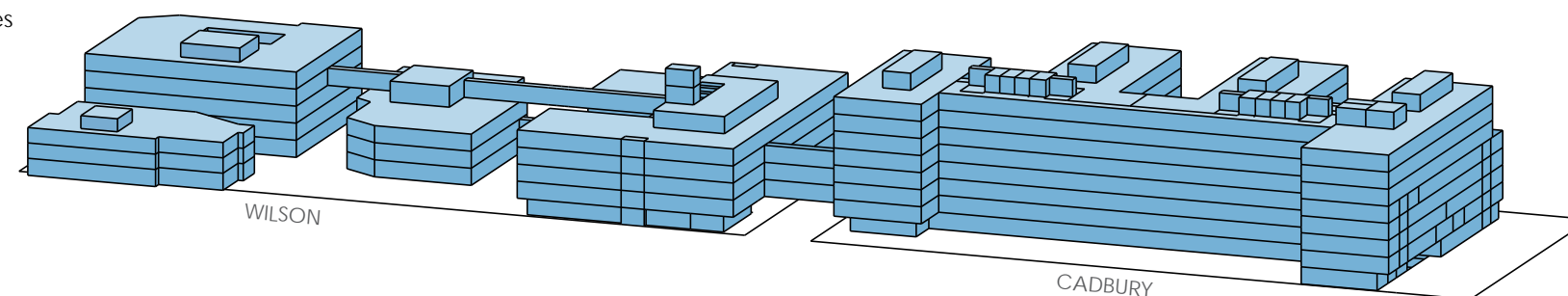
Stage 2
Completion of standalone Ambulatory Service Centre & Day Surgery Building.



Stage 3
Completion of Ambulatory Services Centre & Acute Services Building.



Potential Future Stages
(Subject to Business Case approval & funding)



Key
 □ Shell Space
 ■ Occupied Clinical & Non- Clinical Areas

3.0 Health Partnerships

3.1 Health Precinct

The new Dunedin Hospital preliminary site masterplan seeks to strengthen the working relationship between SDHB and its learning and research partners who include University of Otago and Otago Polytechnic. During the briefing process both the University and Polytechnic have indicated their interest in collocating future infrastructure around the new Dunedin Hospital to enhance Dunedin's health precinct to:

- Promote the flow of clinical and academic staff and students across the broader precinct.
- Promote learning and research activities and knowledge sharing through the establishment of collaborative environments including meeting spaces and simulation suite.
- Collocate clinical research activities alongside clinical service delivery.
- Embed staff resources, workspace and social space within the facilities.
- Establish complimentary and synergistic relationships on site between clinical service provision and learning and research.

The relationship between the SDHB and the learning and research partners provides a major opportunity for SDHB's patient healthcare role to be integrated with, and supported by, the "bench to bedside" continuum of research, teaching and clinical expertise and activity within the University of Otago and the Otago Polytechnic, within Dunedin Health Precinct to:

- Reflect the vision for health research identified in the New Zealand Health Research Strategy 2017 - 2027 in the provision of spaces and connections with the new Dunedin Hospital.

- Opportunities for University and teaching organisations to work in partnership with the Southern Health System.
- Desire to establish pathway (connection and flow) of relationships to the main hospital buildings to develop a University / SDHB health precinct.
- Desire of partners to collaborate with SDHB to determine future relationship and how this might translate into locations. The hospital rebuild is an opportunity to plan for a future hybrid model.
- Potential re-use of current hospital infrastructure or vacated land may be a future consideration.
- A centre to support clinical trials could be linked to ambulatory services. The centre would function as a base to support clinical trial staff who will link regularly to acute clinical areas.
- Access to workspace and linkages for clinical teams is a priority.
- Increased access to simulation space; changing types of simulation spaces and tools to the benefit of the students and future workforce, enabling interprofessional education to be normalised practice
- Fosters connectivity and collaboration across the domains of education, patient care and research.
- Conduct innovative and applied research that improves practice and health outcomes and attracts research funding and renowned researchers and clinical staff.

3.2 NZ Health Research Strategy 2017

The development of a precinct approach inclusive of an Interprofessional Learning Centre is consistent with the NZ Health Research Strategy 2017. Four strategic priorities have been identified as follows:

- Invest in excellent health research that addresses the health needs of all New Zealanders.
- Create a vibrant research environment in the health sector.
- Build and strengthen pathways for translating research findings into policy and practice.
- Advance innovative ideas and commercial opportunities.

Figure 6. University of Otago
Clock Tower Building

3.0 Health Partnerships

3.3 Interprofessional Learning Centre

The Business Case has identified the need to support the SDHB workforce through the delivery of training, learning and education for all staff at the new Dunedin Hospital. The facility requirements for a professional development unit which is available to all staff were established in the functional briefing phases of the project and remain within scope. It is anticipated that the identified model and spatial resources will be incorporated into the ILC such that the following goals may be met:

- Education and research are embedded into the core business of evidence-based service delivery at the new Dunedin Hospital.
- Teaching and learning meets the needs of the new Dunedin Hospital workforce and is responsive to the changing trends in practice and technology.
- The multiple dimensions of patient-centred care are supported through the development of integrated competent interprofessional teams delivering consistent high standards of care.

During the masterplanning an opportunity emerged to consider combining the University of Otago’s Advanced Learning Centre with the SDHB’s Professional Development Unit to deliver an Interprofessional Learning Centre which would provide:

- An environment which will promote interprofessional education as an important pedagogical approach for preparing health professions students to provide patient care in a collaborative team environment.
- Simulation, teaching and learning space to support training of future doctors, physiotherapists, pharmacists and dentists by University of Otago.
- A flexible teaching environment that is IT responsive.
- Collaborative learning areas providing breakout and social space for contemporary learning.

With the inclusion of the Otago Polytechnic, collocation of teaching and learning for training of future nurses, occupational therapists, midwives, counsellors, and healthcare assistants provides interdisciplinary learning and training.

The provision of the Interprofessional Learning Centre (ILC) within a health and education precinct will:

- Promote the flow of clinical and academic staff and students across the broader precinct.
- Promote learning and research activities and knowledge sharing through the establishment of collaborative environments including meeting spaces and simulation suite.
- Collocate clinical research activities alongside clinical service delivery.
- Embed staff resources, workspace and social space within the facilities.
- Establish complimentary and synergistic relationships on site between clinical service provision and learning and research.

The composition of stakeholders, operational model, space configuration, and the project delivery methodology of the Interprofessional Learning Centre is yet to be finalised. The Ministry of Health with the SDHB has committed to funding 2,163 sqm of space to support SDHB’s Professional Development requirements within the Interprofessional Learning Centre. The project team is currently exploring methodologies to deliver this standalone multi-organisation facility.

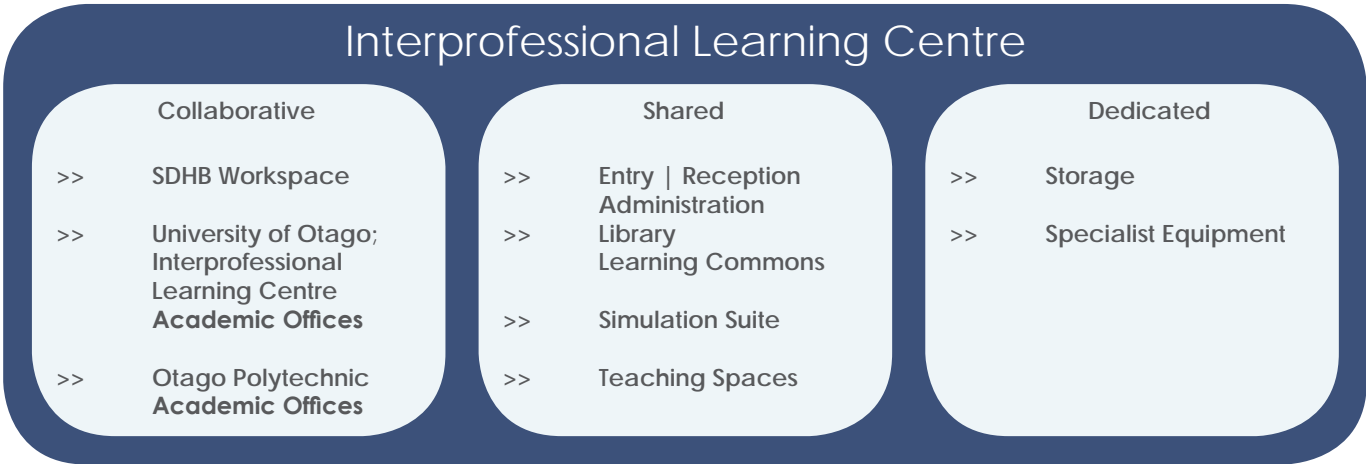


Figure 7. Diagram of Interprofessional Learning Centre Relationships

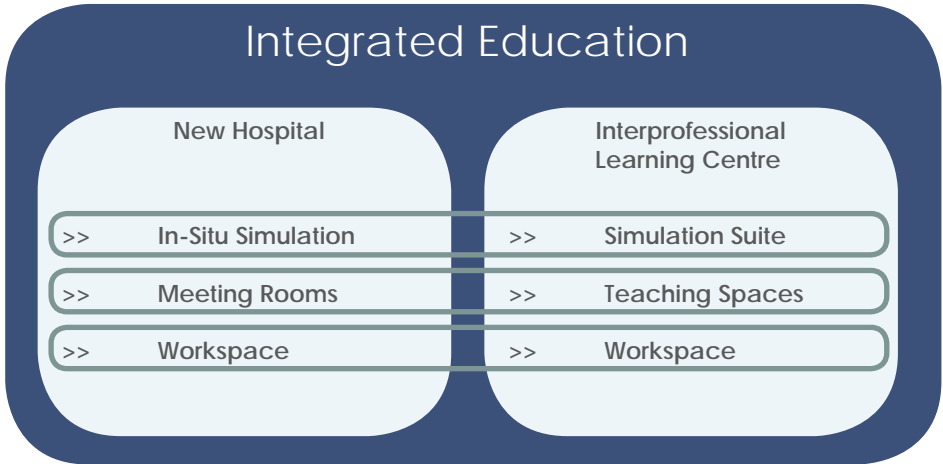


Figure 8. Diagram of Integrated Education Relationships



New Dunedin Hospital Site

Figure 9. Aerial Imagery of the proposed site & Dunedin

4.0 Site Analysis

4.1 Location

The site for the New Dunedin Hospital has been determined as the majority of two central city blocks, bounded by Cumberland Street to the west, Castle Street to the east, Hanover Street to the north and Stuart Street to the south. The two city blocks are bisected by St Andrew Street.

The New Zealand government has purchased the majority of the southern block, previously occupied by the Cadbury factory. This purchase included a mostly vacant site to the east of Castle Street, previously used as car parking for the Cadbury factory, with some existing low-level masonry buildings in poor condition. The southern boundary of the New Dunedin Hospital site on the Cadbury block is adjacent to a notable heritage building currently occupied by the Otago Daily Times.

4.2 Features

The site is currently occupied by a variety of buildings and structures, which will likely require demolition in accordance with staging plans. The buildings range in scale and type and include:

- Large industrial concrete and steel buildings on the Cadbury site, including transformers and other electrical and mechanical infrastructure.
- Smaller scale commercial buildings on the northern block including two-storey masonry buildings, steel-framed car park building, masonry residential construction, Concrete and steel framed multi-storey hall of residence, and low-scale commercial buildings.
- Asphalt and concrete on-grade car parking space.
- Aurora sub-station and building.

A significant tree is located on the north-east corner of the northern block. This tree is noted on the Dunedin City Council Proposed Second Generation Plan (2GP) as T294.

4.3 Topography

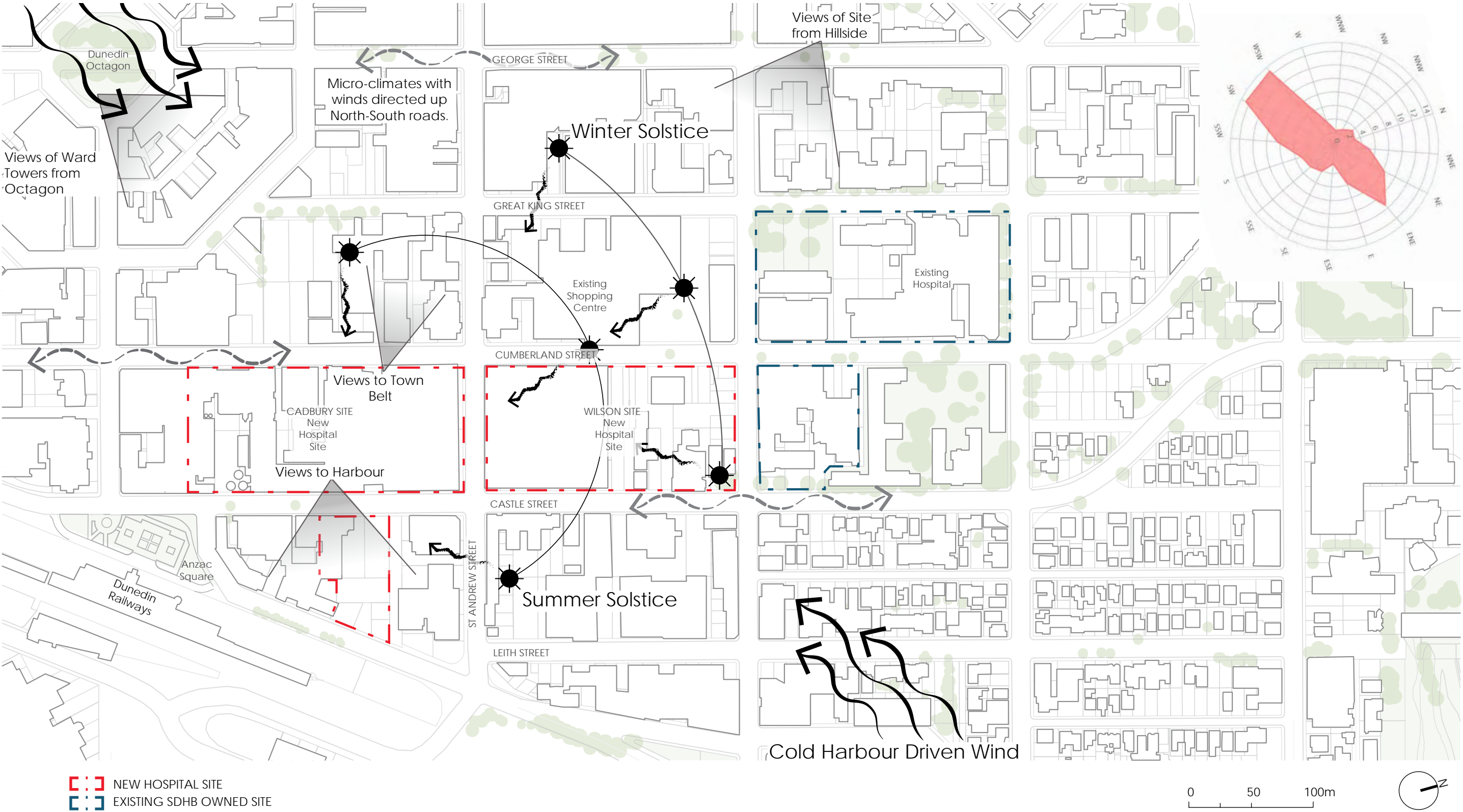
The site is mostly flat, and is located in a low-lying area of the city. This area of the city is prone to flooding in extreme events and is in the overland flow-path of the Leith River and its northern catchment. The southern block is located on the site of an old lagoon and estuary. The area was built up as part of reclamation works in the 19th Century.



Figure 10. Section of the Topography of Dunedin (Jacobs/CCM Architects; Topographical Data from Google Earth / Sketchup Data Extraction).

4.0 Site Analysis

Sun, Breezes & Views



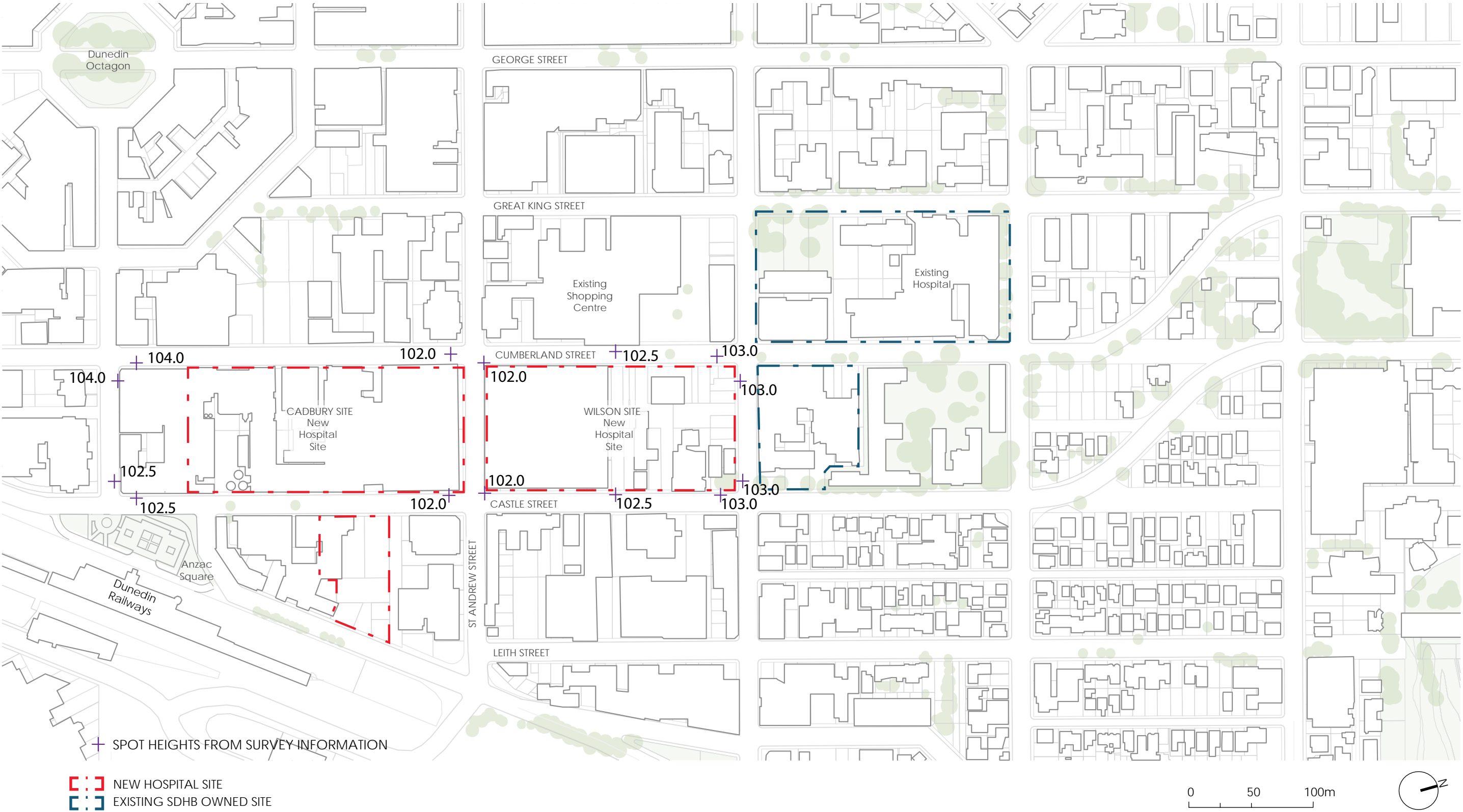
4.0 Site Analysis

Topography & Contours



4.0 Site Analysis

Site Spot Levels



4.0 Site Analysis

4.4 Climate

Central Dunedin's climate is generally temperate, with average high temperatures ranging from 10 to 19 degrees, and average low temperatures ranging from 3 to 11 degrees. Summer high temperatures occasionally hit 30 degrees, and winter low temperatures are occasionally below 0 degrees. Winters are regularly frosty, with occasional light snowfall to low levels of the hills surrounding the city.

Dunedin has relatively low rainfall, with an annual average of 812mm.

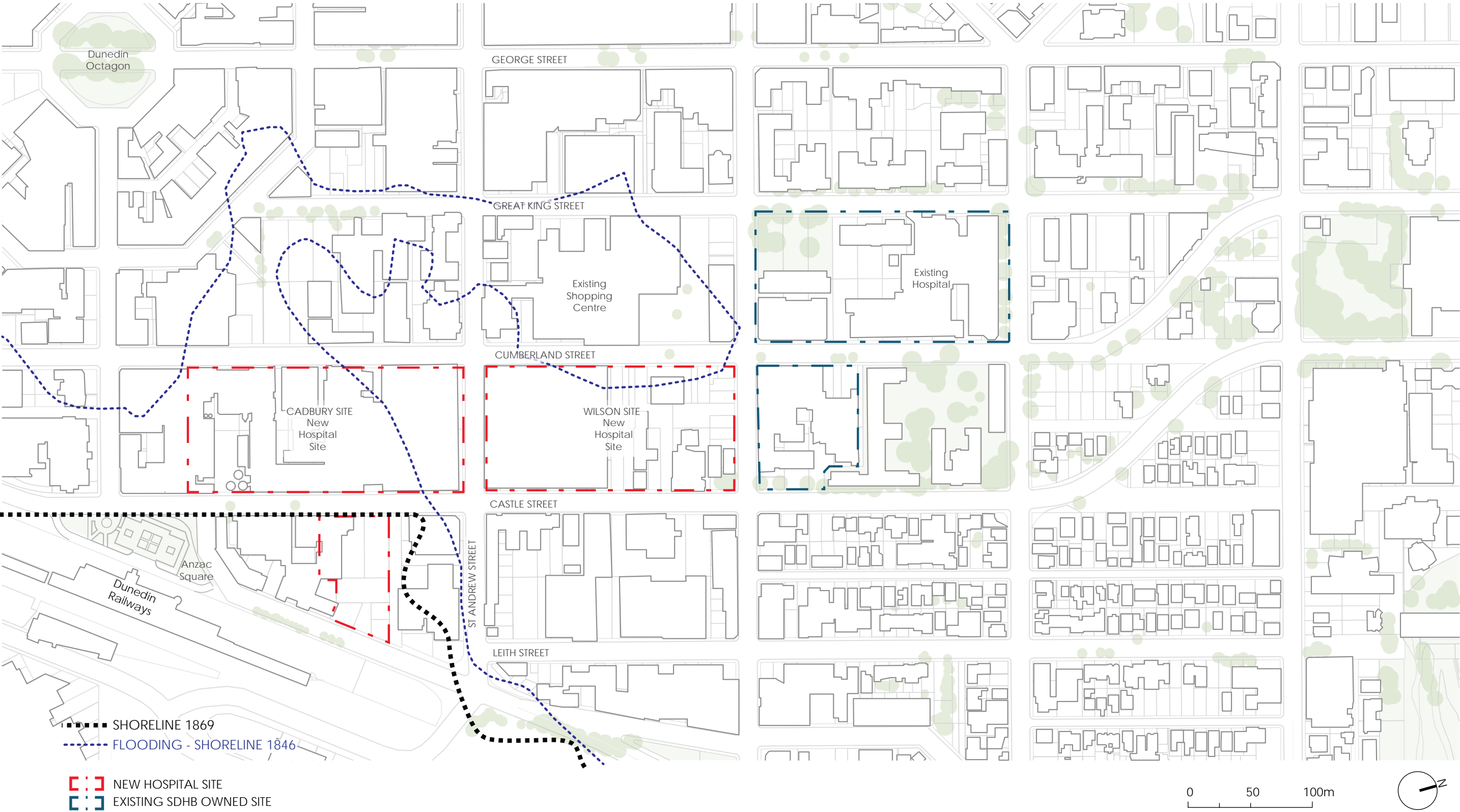
Dunedin has an average of 1,585 sunshine hours per year, making it one of the cloudiest centres in New Zealand.

The prevailing wind in the city is sometimes cool with south-easterly ocean breezes, which occasionally creates a cool microclimate with a stiff breeze following the north-south road corridor. North-easterlies and north-westerlies are also common, at different times of the year, and are generally warmer winds.

Much of the eastern edge of the city, including the new Hospital, is on low-lying reclaimed land and may be susceptible to future changes in sea-level.

4.0 Site Analysis

Flooding



4.0 Site Analysis

4.5 Heritage

The sites are currently occupied with a range of buildings, with varying degrees of heritage value. Preliminary information on the heritage values of these buildings has been provided by Heritage New Zealand and Dunedin City Council and the previous land owner/s.

The following structures on the site are included in the Dunedin City District Plan as Townscape and Heritage Buildings and Structures:

Cadburys Confectionery Ltd Buildings

- + Site Number: B030
- + Address: 40 Castle Street All
- + Legal Description: DP 1589 and All DP 5322 Blk XVI Town of Dunedin
- + HTP category: 2
- + Protection required: Façades to Castle and Cumberland Streets

In the Heritage New Zealand listing (List Number 2143), the entry specifies the four building façades down Cumberland Street.

Significant other heritage buildings are located adjacent or near to the sites, including:

- Allied Press Ltd building (formerly Evening Star building) located on Stuart Street (Category 2).
- Central Fire Station on Castle Street (Category 2).
- Dunedin Railway Station on Anzac Avenue (Category 1).
- Otago Therapeutic Pool on Hanover Street (part of existing hospital site) (Category 2).

The southern end of the southern block contains an area included in the TH 11 Anzac Square/Railway Station Heritage Precinct zone within the current District Plan. This area contains a building known as 'The Dairy' which has had recent façade and roof refurbishment and upgrade works, but remains in a poor state internally.

Refer 4.2 above for commentary on significant tree T294.



Figure 11. Anzac Square



Figure 12. Otago Daily Times

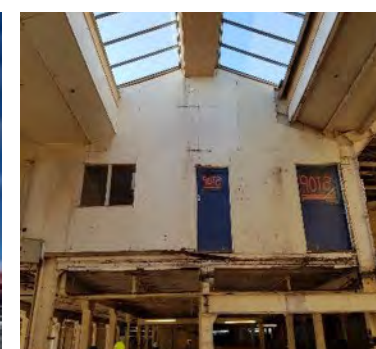


Figure 13. The Dairy Building



Figure 14. Otago Royal Navy Reserve Association Building

4.0 Site Analysis

Heritage



4.0 Site Analysis

4.6 Planning

In preparing of the masterplan, Jacobs, CCM Architects and the Ministry of Health have consulted with Dunedin City Council (DCC) and Greenwood Roche for high-level planning advice. It is expected that a suite of consents will be required to authorise the nature and scale of development anticipated on the site. As such, the current and proposed future zoning of the site has been considered but has not operated as a constraint in determining the most appropriate layout. In considering the preferred spatial layout for the blocks best practice design principles have been adopted. This has required consideration of:

- Impact of height on neighbouring sites including urban scale and shade.
- Impact of form on micro wind environment.
- Impact of noise (particularly emergency vehicles and helicopter).
- Avoidance of long uninterrupted façades, or mitigation of the effects of long façades.

In particular it is noted that the DCC is in the process of resolving the Proposed Second Generation Plan (2GP), which includes changes to the District Plan that will directly affect the site, including realignment of the TH 11 Anzac Square/ Railway Station Heritage Precinct zone outside of the boundaries of the site.

Although the site is currently zoned In 1 Industrial on the southern block (formerly occupied by the Cadbury factory), and LSR Large Scale Retail on the northern block. The 2GP rezones the site to CBD Edge Commercial Zones for Commercial and Mixed Use and provides for a range of activities including hospital and office activity.

Further, the 2GP identifies the blocks as being in the Coastal Minimum Floor Level zone with a minimal floor level of 102.6m OMD. Flood mitigation is likely to be an over-riding factor in establishing the minimum floor level.

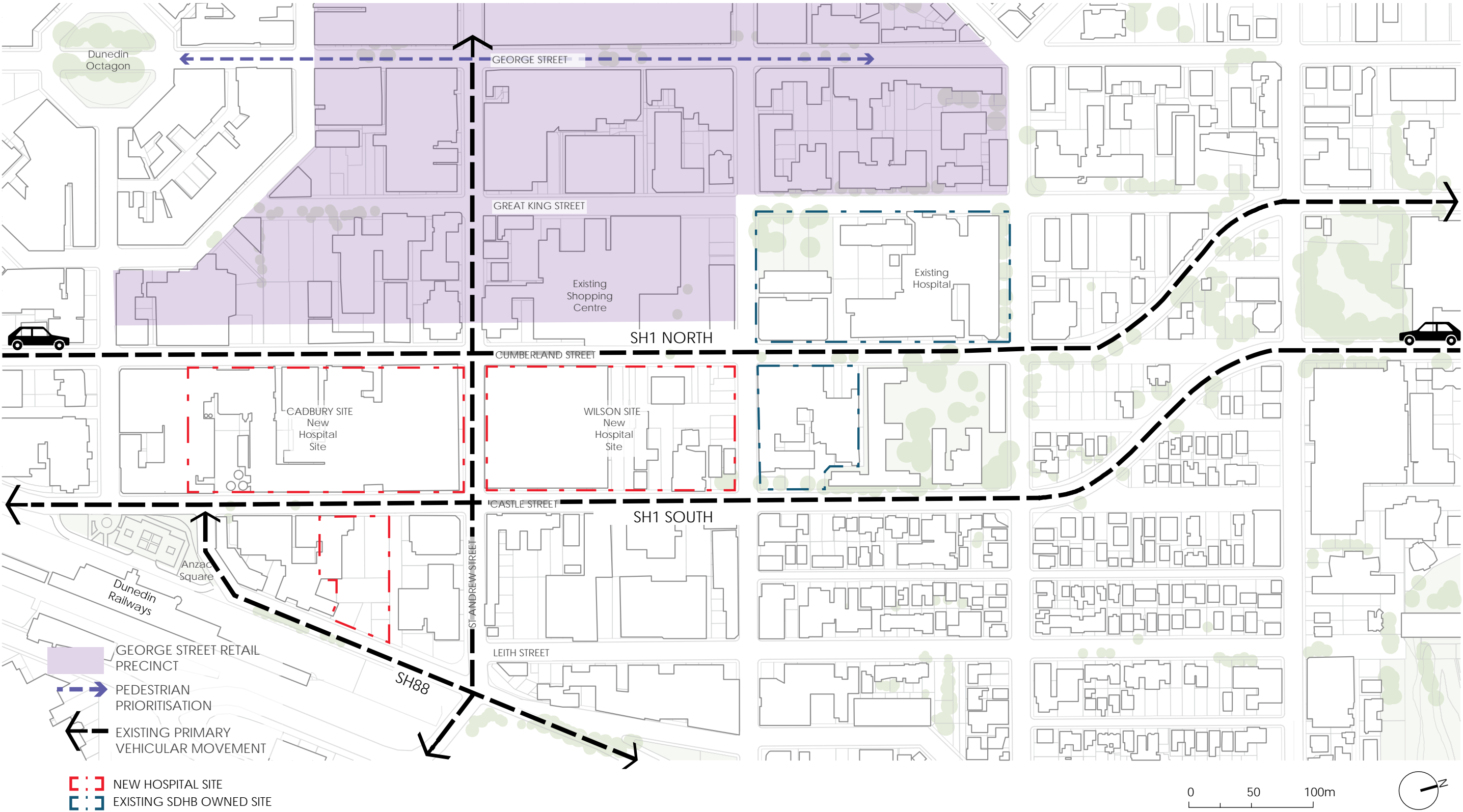
4.7 Authority Requirements

It is expected that as part of the necessary consents and authorisations the following will be required:

- Consents for demolition of existing buildings and construction of new facilities.
- Archaeological authority for groundworks across the entirety of the site.
- Approvals for changes to water supply, stormwater and sewer, incoming electrical supply, and incoming communications cabling.
- Approvals for new vehicle crossings and access points.
- Permissions from DCC and NZTA for bridge links.
- Permissions and approvals for changes to bus stops, parking, pedestrian crossings, and other features of the streetscape.
- Consents for changes to helicopter flight paths (subject to aviation control authorities).
- Permissions for new subterranean tunnels, links, and in-ground infrastructure across or down state highways or local roads.

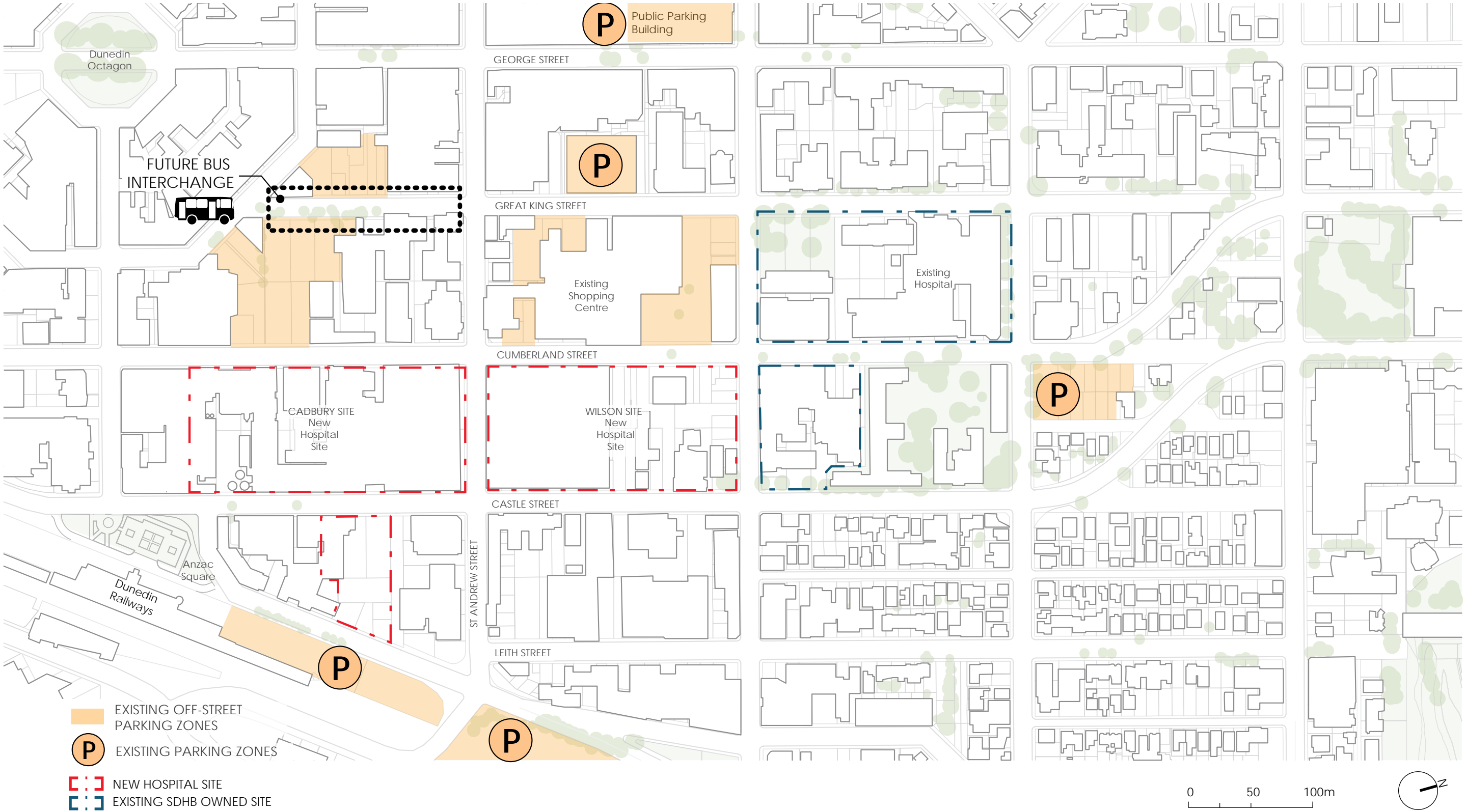
4.0 Site Analysis

Key Highway Adjacencies



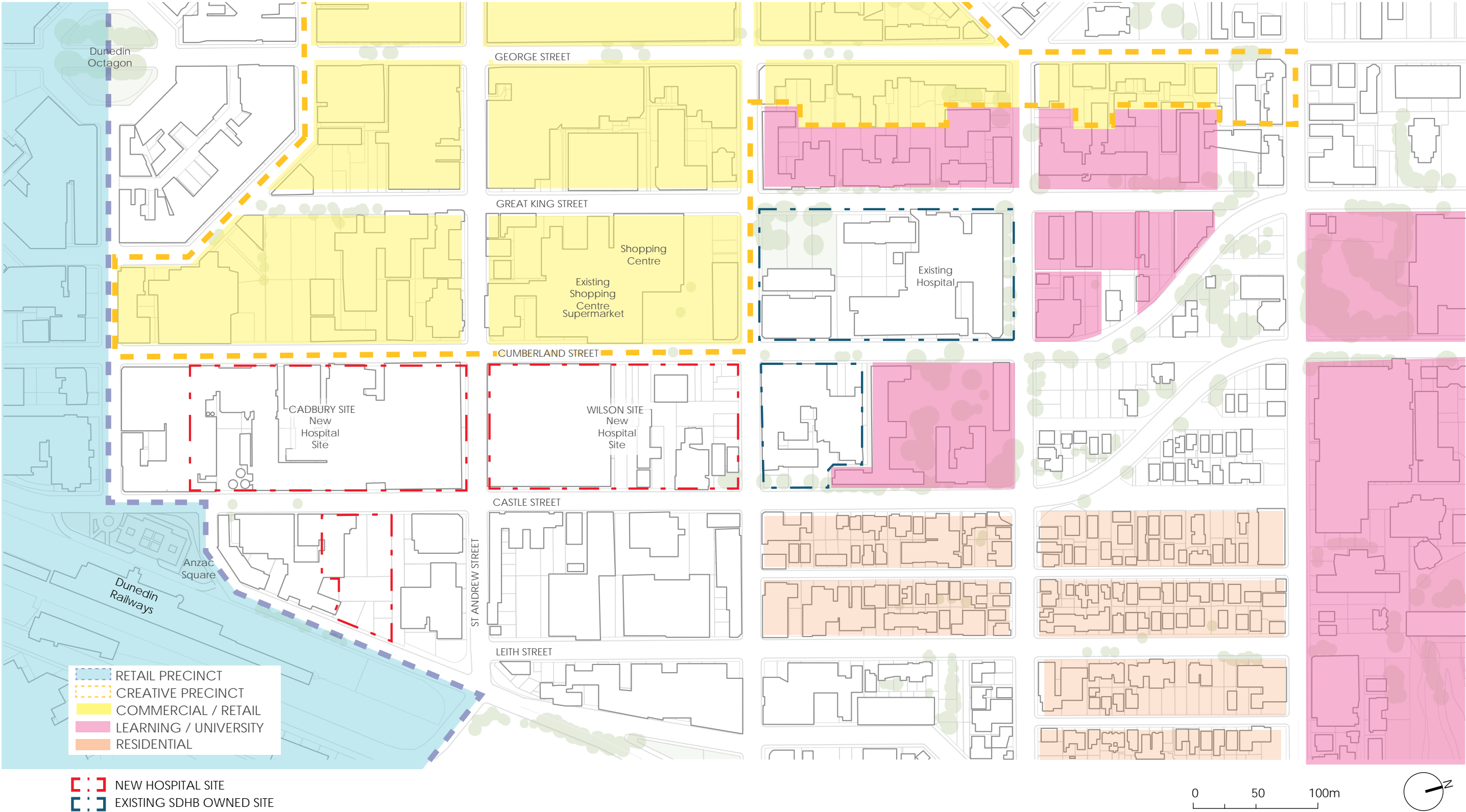
4.0 Site Analysis

Parking & Bus Interchange



4.0 Site Analysis

Zoning



4.0 Site Analysis

Building Heights

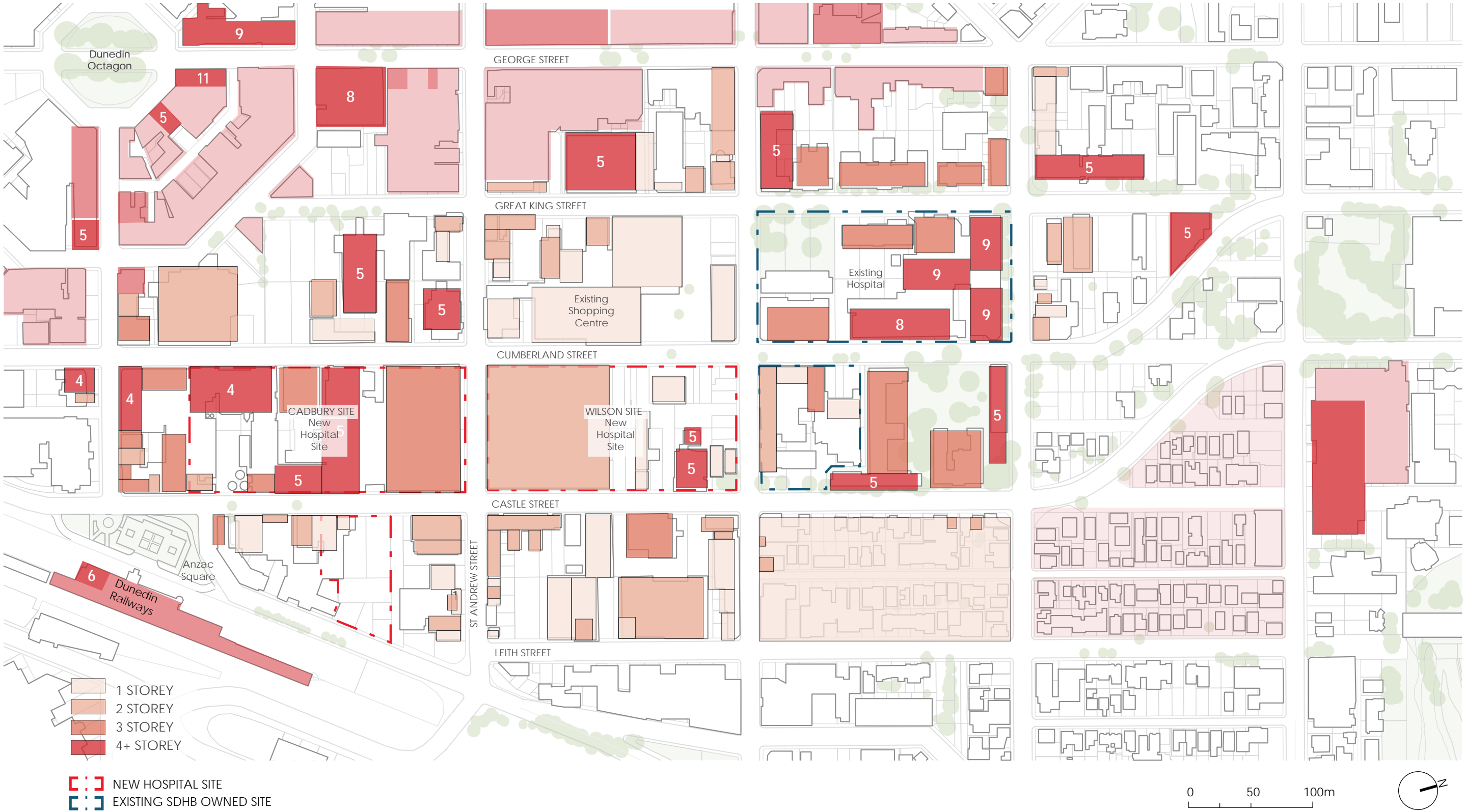




Figure 15. Gathering in front of River Leith and University of Otago.

4.0 Site Analysis

4.8 Urban Design

The site for the new hospital is a dynamic central city area, requiring careful consideration of the masterplan response in order to provide an important civic building that contributes positively to the built environment.

The two blocks are currently dominated by vehicular movement on the central city edge. Cumberland Street to the west and Castle Street to the east are one-way roads north and south respectively, forming State Highway 1 through Dunedin. NZTA are considering refinement of the state highway route through the city and this matter will have been taken into account as the design progresses. Opposite the new hospital site on Cumberland Street are major supermarkets, hotel accommodation, and small-scale retail. St Andrew Street (State Highway 88), running between the hospital sites, is a busy cross-city road connecting from the east side of the railway lines through to York Street and the west. Anzac Avenue to the east of the Cadbury annex site is characterised by single and double storey residential and small commercial activity.

The existing streets have little pedestrian appeal, with the one-way roads creating a barrier to pedestrian access from any direction. The main pedestrian activity around the area is concentrated on the retail areas of George Street to the north, through Albion Place and the central city. The Octagon forms a crucial node for the city, and Stuart Street between the Octagon and the Railway Station creates an important link between central nodes of the city. More pedestrian activity will be created with the introduction of the new bus hub on Great King Street.

With the exception of the notable heritage buildings described in Section 4.6, and adjacent heritage precincts, the built form currently on the site, and in the immediate vicinity of the site, provides little back to the city in terms of place-making or good streetscapes.

While the existing industrial and light commercial activities on the existing sites offer little to the street by way of active edges and public-facing activity, it is noted that much of the clinical activity within the hospital requires privacy, and that the likely raised ground floor level provides a challenge for the creation of a good street edge.

In addition, the scale of existing surrounding buildings suggests that the design of the new hospital will need to carefully consider how to mitigate the effects of bulk and height.

Attention must therefore be paid to the effects that the new hospital will have on adjacent spaces in terms of :

- Shading particularly in relation to heritage buildings and façades and other public spaces including the garden forecourt to the Railway Station.
- Road crossings and hospital traffic including public drop-off, public parking, emergency traffic, servicing vehicles, deliveries, mortuary vehicles.
- Wind effects
- Scale and heritage context

Shading to other hospital activities – the bulk and scale of the main hospital buildings are also likely to have an effect on the new public outdoor spaces implied in the masterplan. Location of new outdoor spaces should respond to sun, shading, and prevailing winds.



Figure 16. View looking towards Pitt Street.



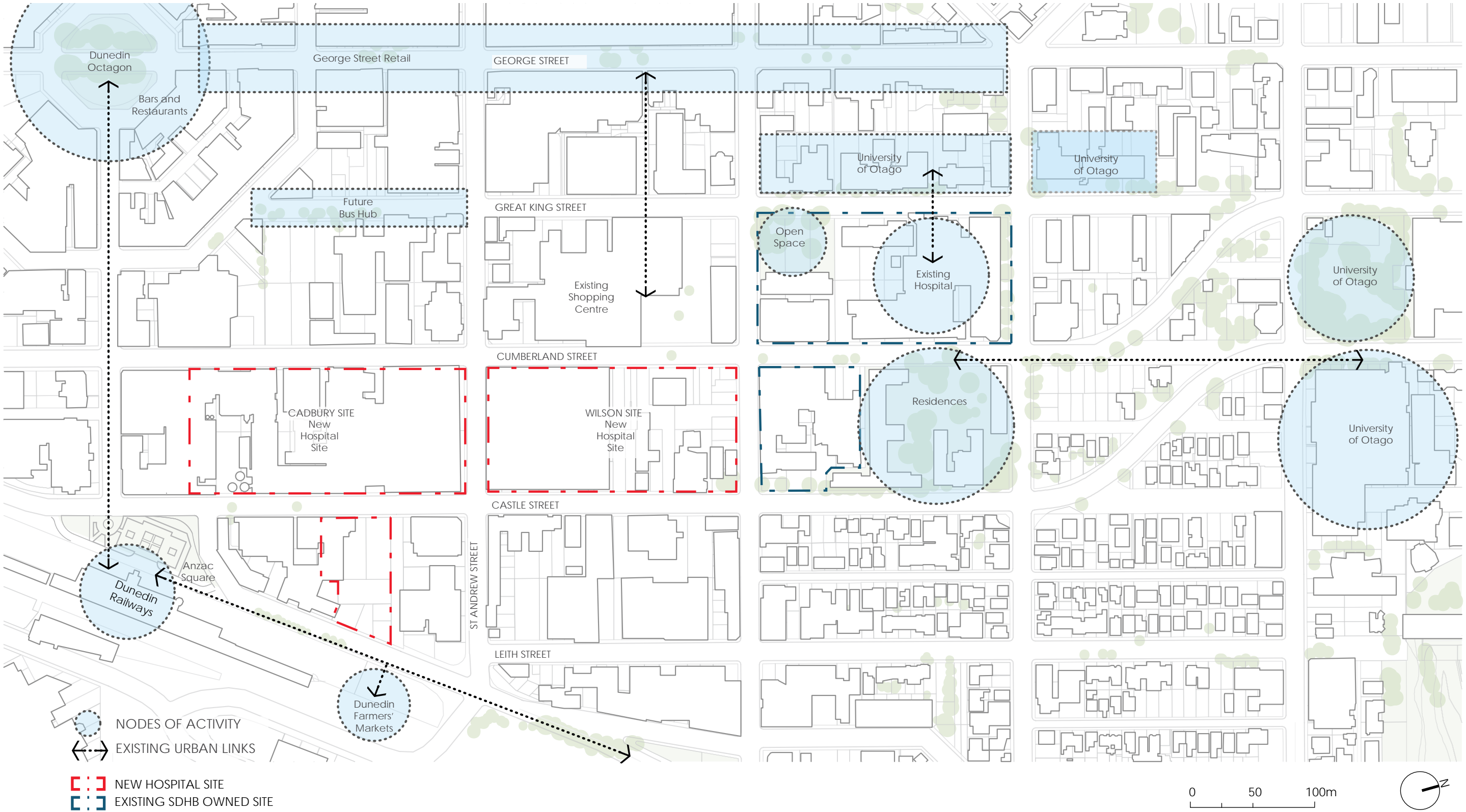
Figure 17. View Over-looking the new hospital site and harbour basin.



Figure 18. Esplanade at St Clair.

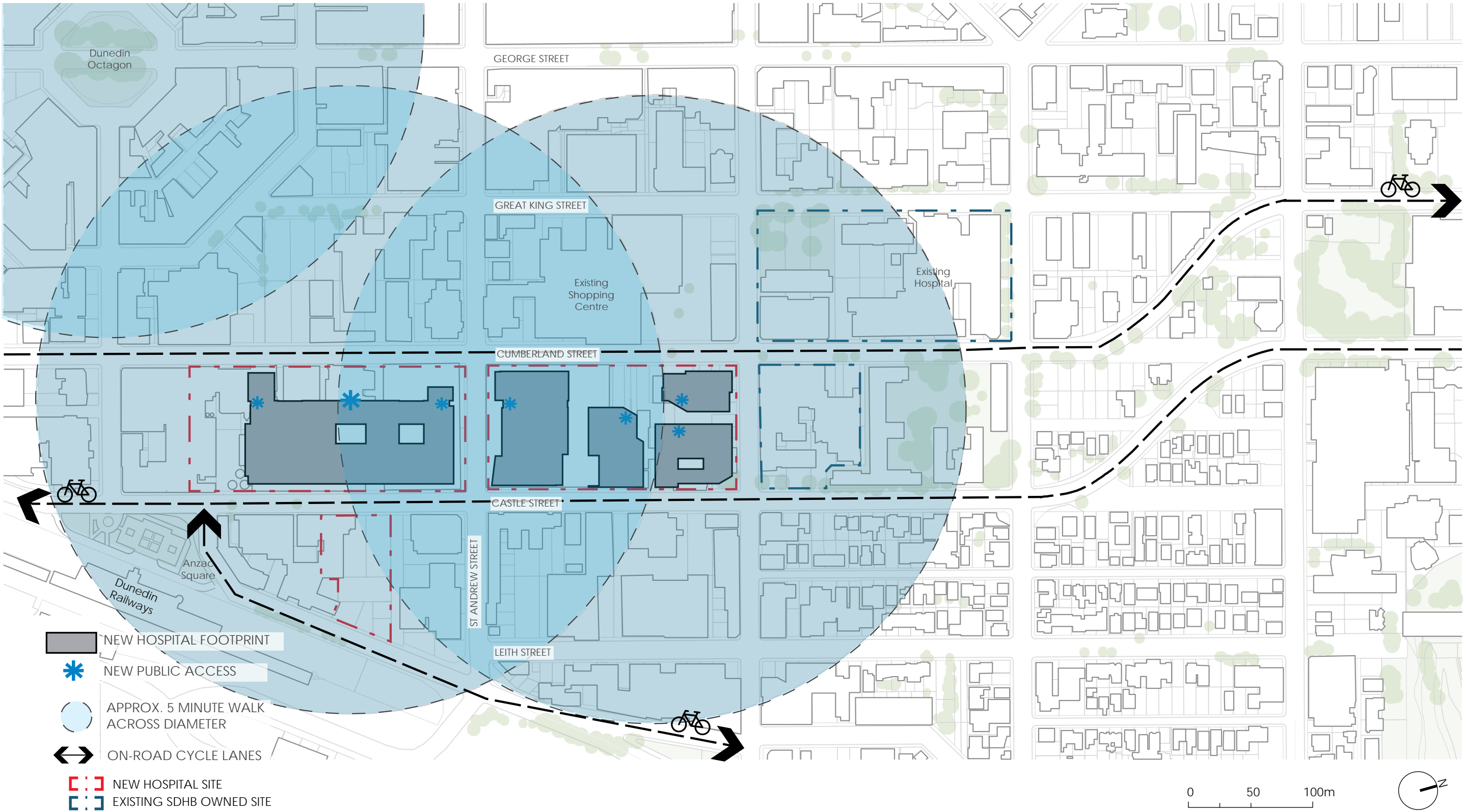
4.0 Site Analysis

Existing Nodes of Activity & Urban Links



4.0 Site Analysis

Walkability & Cycle Paths



5.0 Design Principles

5.1 Site Planning Principles

Through the preliminary site masterplanning workshop, project principles, design principles, and assessment criteria were discussed. The initial principles tabled within the presentation material were distilled from the Strategic and Technical Briefs previously discussed across SDHB leadership teams and user-groups, and were intended as broad themes to structure the discussion. Through the workshops, those principles were tested, additional principles emerged, and participants were challenged to consider how the principles might manifest in built form and the spaces between.

An initial list of Principles and Criteria generated from the workshop note was circulated to attendees and the Steering Committee. The subsequent preliminary site masterplanning workshop utilised the principles and criteria as shown herein which reflects the key themes as per the CLG and Detailed Business Case. To aid the process of reviewing and informing the Preliminary site masterplanning options and their ability to respond positively to the identified principles.

The order of the list is not intended to suggest importance or weighting or principles.

Patient and Whānau-Centred

5.1.1 Promote a Positive Patient, Visitor and Staff Experience

- Considers salutogenic principles such as access to views, natural light and outdoor space
- Supports Whānaungatanga and Manaakitanga
- Provides a welcoming, rich multisensory quiet environment

5.1.2 Provide Quality Equitable Access to Care

- Provides intuitive wayfinding and obvious points of entry
- Provides car drop-off and parking near points of entry
- Connects to public transport near points of entry

5.1.3 Recognises Local Culture and Heritage

- Retains or responds appropriately to the heritage features on the site
- Recognises the history and meaning of Ngai Tahu and local runanga
- Considers archaeological significance of the site

Future Adaptability, Flexibility and Sustainability

5.1.4 Promote Sustainability

- Supports Kaitiakitanga
- Promotes lower energy load
- Optimise daylight penetration through the campus
- Consider opportunities for natural ventilation
- Minimise disruption to existing hospital activities

5.1.5 Provide a Flexible, Future-Focused Development Strategy

- A solution which supports, change, expansion and modification over the life-cycle of the facility
- Provides long-term development plan for SDHB services not in scope i.e. SBCS and MHAID
- Allows for adaptability and flexibility in future developments on site without undermining the chassis of the site masterplan
- Describe a sustainable renewal and building replacement strategy

5.1.6 Support Innovative Models-of-Care

- Responds to the whole of system needs
- Enables flexible chasis for implementation of digital hospital and evolving IT solutions
- Provides flexible planning response to better enable adaptation of facilities for changing future models-of-care
- Maximise opportunities for sharing of infrastructure with other users

Operationally Cost Effective and Efficient

5.1.7 Provide Safe and Functional Clinical Relationships

- Optimises spatial requirements by co-location and departmental sharing
- Optimises clinical pathways and separation of patient flows
- Minimises implications of clinical service delivery across multiple sites

5.1.8 Promote Health Service Delivery Efficiencies for SDHB

- Minimise travel distances within departments, between departments, and across the campus
- Offers connectivity with neighbouring community-based services and other facilities
- Provides separation of circulation for servicing

Healthy People Spaces

5.1.9 Establish a Precinct that will Celebrate the Urban Built Environment

- Enhances the urban environment by providing active edges, publicly accessible green space, and visual interest
- Connects with the city by providing porous campus
- Provide a built response that minimises the impact of the building scale in the context, and sits well as part of the urban fabric.
- Minimises loss of amenity due to over shadowing and considers view shafts and vistas through the city

5.1.10 Support a Strong Organisational Culture

- Promotes multi-discipline and inter-professional connectivity that breaks down operational silos and is independent of hierarchy
- Promotes SDHB-wide interactivity within communal spaces
- Offers a strong sense of identity and pride
- Supports Kotahitanga

5.1.11 Support Learning and Research Activities

- Provides easily accessible learning environments near the clinical areas and workplace
- Connects well with the wider health precinct, including the University of Otago and Polytechnic facilities
- Promotes a learning community and culture across all staff (clinical and non-clinical)
- Promotes learning opportunities for the wide community

5.0 Design Principles

Optimises use of Total Health System Resources

5.1.12 Enables Operational and Budget Efficiencies

- Offers a Value for Money proposition or Meets a Value For Money test.
- A solution that adopts a ‘whole of life cost approach’ in its design and construction and which enables use of existing assets where appropriate.
- Efficient buildings that have low on-going operating and maintenance costs and facilitate a sustainable asset management approach.
- Facilitates appropriate sustainability principles and objectives being incorporated in the building outcomes.
- Enables a build programme to be completed within target completion dates and budgets.
- Offers the opportunity for innovative, market-sensitive (resourcing, build-ability constraints) and time-saving design and construction methods.
- Allows any infrastructure and land acquisition constraints to be prudently managed in a way which will support a time-efficient build programme.
- Offers the opportunity for staged delivery and parallel design and construction packages;
- Is sensitive to, and offers, a phased business transition if needed.
- Recognises future integration and connections to existing or proposed facilities and institutions (e.g. University, health services, research and teaching)
- Optimises the site opportunity and contributes positively to the urban fabric and built environment.

5.1.13 Support the Timely Delivery of a New Service

- Support strategies to deliver the new Dunedin hospital in a time-efficient manner and reduce the risk of catastrophic service failure within the existing facilities
- Consider balance between fastest delivery and best long-term outcome
- Opportunity to support accelerated construction programme such split construction into smaller packages to encourage parallel construction packages; and design for manufacture and assembly (DFMA), lean production, modularity and pre-fabrication

5.2 Post Disaster & Emergency Response

Through the development of the project brief, functional briefs, technical brief and the site masterplan, the following strategy has emerged for post-disaster and emergency response as relates to the site masterplan. We note that considerations around emergency planning for provision of healthcare services by the SDHB, regional response, and the emergency operation of the new building remain in their infancy, and require considerable continued exploration with the SDHB and external stakeholders. Coordination with Civil Defence, Regional Health providers, and other DHBs will be required to confirm post-disaster requirements for the new hospital.

Importance Levels for Seismic Design

All services with post-disaster functionality requirement to be located in Importance Level 4 (IL4) buildings. Other services to be located in Importance Level 3 or 2 (IL3 or IL2), depending on building use and type of occupancy.

Acute theatres, Emergency Department, and a range of in-patient facilities are expected to be included in the minimum post-disaster service requirements. Accordingly, the Acute Services Building has been nominated as the IL4 facility, with expectation that the entirety of the building structure will be designed to meet the minimum requirements of IL4 for ultimate limit state. Consideration of the extent to which the fitout of the building meets the appropriate serviceability limit state should focus on post-disaster requirements for service delivery. It may be considered necessary to treat all areas within the Acute Services Building as essential post-disaster services. There may be consideration, however, to treat non-essential services and areas of the building as IL3 fitouts within the IL4 structure and envelope in order to reduce the burden of SLS2 fitout detailing. In this scenario careful consideration should be given to the impact of damage to those areas that do not have a post-disaster functionality requirement on other areas of the IL4 facility, and the risks to future flexibility that such a strategy would entail. For the purposes of preliminary site masterplanning, the working assumption has been that all areas within the Acute Services Building will be designed to meet the minimum requirements of IL4 for seismic design.

Consideration of adjacent structures and the fall risk they represent must be taken into account. Initial desk-top assessment of the Otago Daily Times Building and the Dairy Building suggest maintaining a separation between those structures and the essential emergency traffic route to mitigate the fall risk posed by these buildings. It is noted that the hospital does not have control of development across the roads to adjacent buildings.

If the Energy Centre remains within the scope of the project (subject to completion of District Energy Scheme studies and concept design for the new hospital to determine energy requirements) the Energy Centre will be critical for the ongoing functionality of the hospital and will therefore be an IL4 facility. All infrastructure and links between the new energy centre and the Acute Services Building will also be IL4. Confirmation of post-disaster strategy for medical gases, supplies, water storage, waste storage and removal, kitchen services, warehousing etc. are to be defined in Concept Design.

The Ambulatory Service Centre is considered to be an IL3 facility. All health services located in this building are expected to have a post-disaster functionality requirement. The preliminary site masterplanning is indicating that this building on the northern site houses the kitchen and loading docks (in order to separate service activity from emergency traffic and other main hospital activities). This strategy creates a risk that kitchen and loading dock are not available post-disaster for a period of time. Hospital disaster management preparations would need to include provisions for emergency food and distribution to support the IL4. It is expected that maintaining clear on-grade car parking space on the Anzac Avenue site will provide useful amenity in this event.

The link bridge connecting the IL3 and IL4 facilities is expected to be designed as an IL3 structure.

Flood Mitigation

Flood protection works to the Leith River are continuing, and are expected to provide useful protection from flooding to this area of Dunedin up to 1 in 100 year flood events. Initial flood modelling and hydrology reporting indicates a flood risk to the site in Q500 (1 in 500 year) flood events. Further detailed modelling is required to confirm the relative levels for flooding events, and to set the appropriate minimum floor levels for flood mitigation. It is assumed that the IL4 building will be designed to stay operational through a Q500 flood event (noting that all road access to the entirety of the site will be severely compromised in such an event). Consequently the ground floor of the IL4 facility is expected to be raised considerably from the adjacent road and footpath, creating challenges for easy access and a good architectural interface with the street edge. The benefit of a raised ground floor plane, however, is the creation of a sub-floor zone (required for base isolator access if adopted as a structural system, and recommended in any event for long-term access to under-floor services to the ground floor), which can be excavated further to provide a large area of on-site parking beneath the hospital. As this lower-ground floor area will be flood-prone, it is not recommended for occupation in general, and certainly not for any services necessary for post-disaster functionality. Lift access, and general lift pits to the lower-ground level will need to carefully consider flood mitigation detailing.

Other facilities on site without the same post-disaster functionality requirement, may be able to be built with the ground floor at a lower level to provide better connectivity to the street, acknowledging the flood risk. Detailed hydrology will inform the appropriate response to flood modelling across the rest of the campus.

Refer to Technical Brief for description of resilience and emergency operational requirements for the new hospital.



Figure 19. View of the city centre of Dunedin.

6.0 Indicative Preliminary Masterplan (C2)

6.1 Analysis Diagrams

The following diagrams and text describes features of the Preliminary Site Masterplan to inform the design of the new Dunedin Hospital and future stages of masterplan implementation. The Masterplan Block and Stack studies have been used to test and validate the Functional Design Briefs and the Schedule of Accommodation that were both developed prior to final site selection, and independent of the Preliminary Site Masterplanning. The Block and Stack drawings can be considered a test-of-fit to the new sites, and have been discussed at a high-level with the Ministry of Health and SDHB participants to the masterplanning workshop process. The Block and Stack drawings, and the architectural forms that they have generated, are intended to inform the commencement of Concept Design, and to establish planning strategies, but are not intended to constrain design development or architectural treatments in the Concept Design phase.

The following descriptions and diagrams provide commentary on planning principles, features, issues, and outcomes that have been developed or arisen through the masterplanning process.

6.2 Bulk & Location

The site masterplanning process has determined a planning relationship with the Acute Services Building and Ambulatory Service Centre located on either side of St Andrew Street, connected by bridge link across the road. The decision to split the hospital activity across two buildings and two city blocks was driven by:

- a) The need to provide expansion space to both acute and ambulatory buildings
- b) The desire to reduce the height and scale of these large buildings to improve the relationships of these large buildings with their neighbours and limit the negative effects of large buildings on the urban environment.

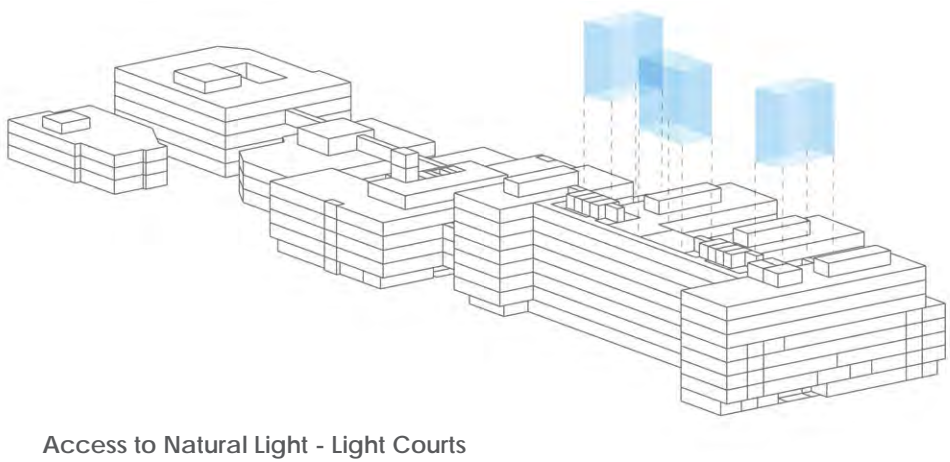
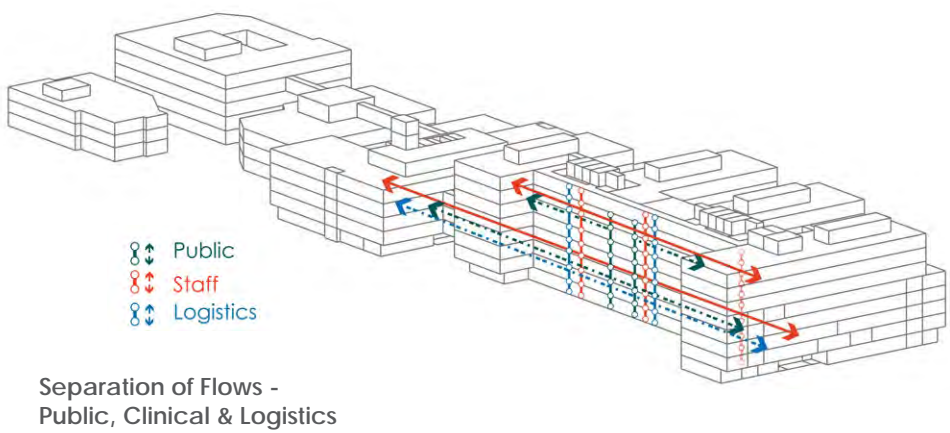
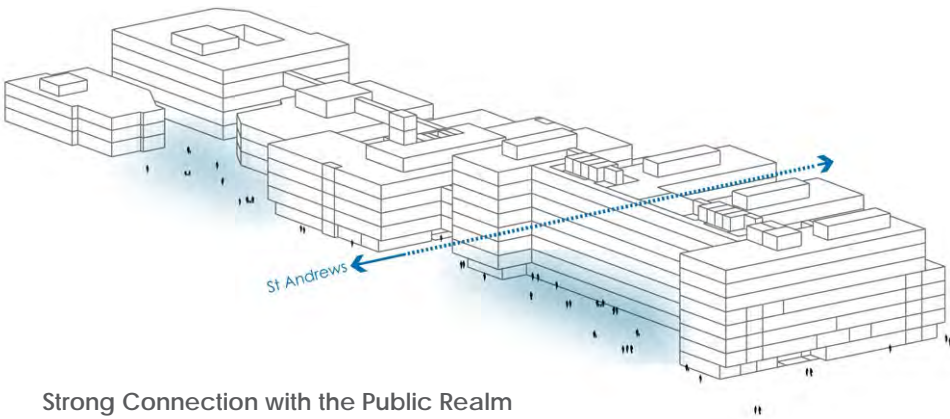
The pairing of these buildings across the road creates an important node on the corner of St Andrew and Cumberland Streets where the two main buildings on the campus connect. St Andrew Street is an important access point for pedestrians and bus-users, as well as vehicle traffic from the east or west. In response to these planning relationships, the masterplan is suggesting key entry points for the Acute Services Building and Ambulatory Service Centre relating to this corner. Both main buildings are large in the local context, and the visual relationship between the two forms across St Andrew Street will create an important urban corridor, as described in 6.8 below.

The massing of the Acute Services Building seeks to respond to the masterplanning design principles by:

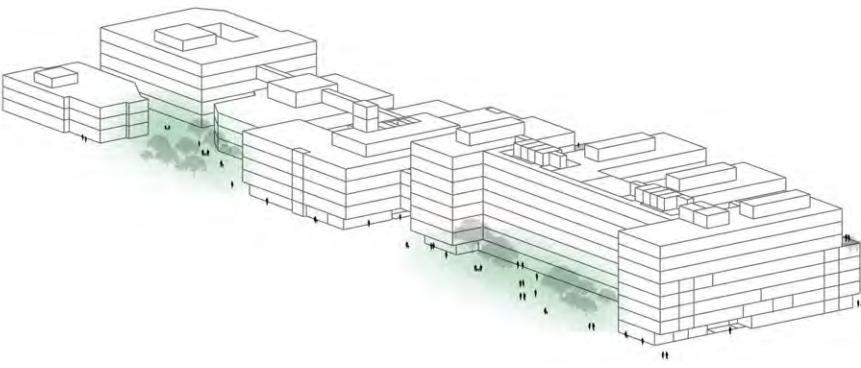
- Maximising access to daylight to in-patient areas. In-patient units are stacked in a series of low towers above the podium. Towers are arranged in a staggered relationship to maximise façade area for ward rooms and maximise access to views (towards the peninsular or towards the hills).
- Reducing shading towards the Dunedin Railway Station gardens by avoiding stacking of in-patient towers on the south-western corner of the site.
- Creating opportunities for access to outdoor amenity for in-patients by providing terrace spaces at the top of the podium accessible by in-patient activities with the greatest therapeutic case for access to adjacent outdoor space.
- Providing light-wells and courtyards within the overall massing of the building to bring daylight into the lower areas of the podium while also providing opportunities for visual connections between the floors and the outdoors.
- Providing a formal landscaped entry area to mitigate the impact of the raised ground floor and create a more gentle approach to the main entry. The landscape area can provide different areas in response to various types of outdoor use.
- Offering a massing strategy that allows architectural articulation of the building that can break the scale of the facility into smaller blocks and reducing the apparent bulk to the street.
- Provides a building form that informs an obvious point of entry from Cumberland Street for pedestrians and vehicle drop-off.
- Uses balance and symmetry as ordering principles to create a formality which is appropriate for the civic nature of the main hospital building.

The Ambulatory building is somewhat smaller, but is still a significant building in the central Dunedin context. The building has been massed to provide a strong street edge in response to the city grid, with an internal 'hospital street' that aligns with the bridge link, and provides a strong circulation spine through the building. The location of this internal street and bridge link is a key axis across the site and should be located very carefully as it sets up the circulation spine through the entire site. Maintaining this spine as an obvious pathway will create a clear organising feature of the campus.

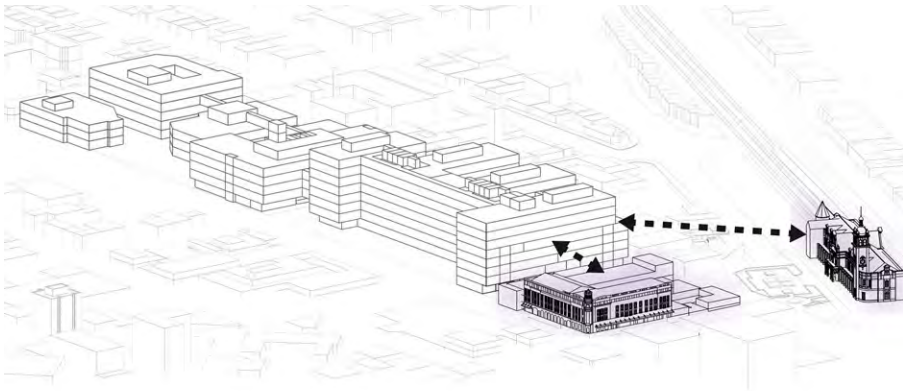
Public occupation of the Ambulatory building is more transient than the in-patient areas of the Acute Services Building, and the floorplate has been widened to provide appropriate efficient clinical flows.



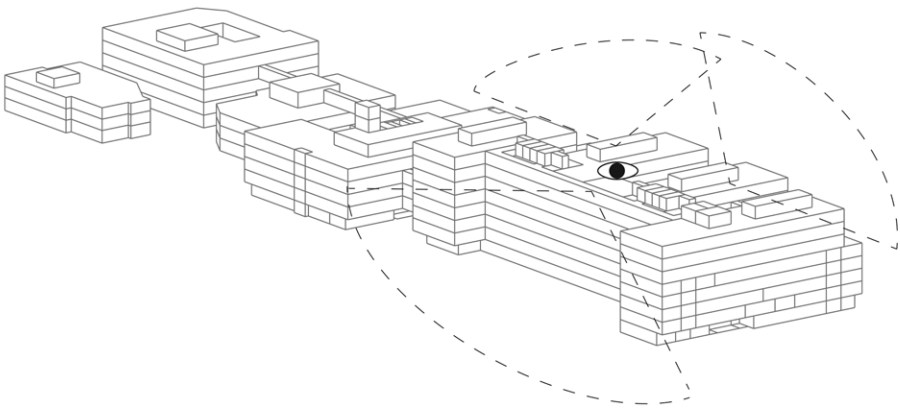
6.0 Indicative Preliminary Masterplan (C2)



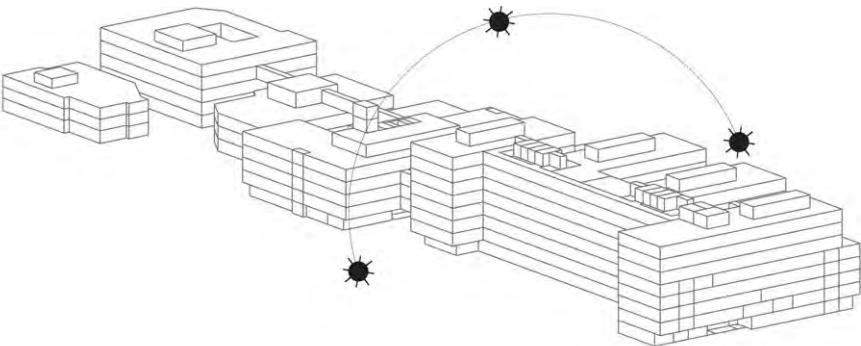
Connection with Green Space & Terraces



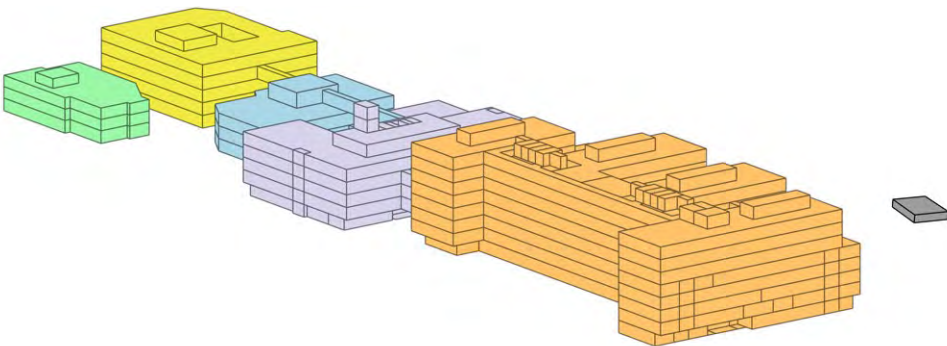
Consideration of the Surrounding Heritage Buildings



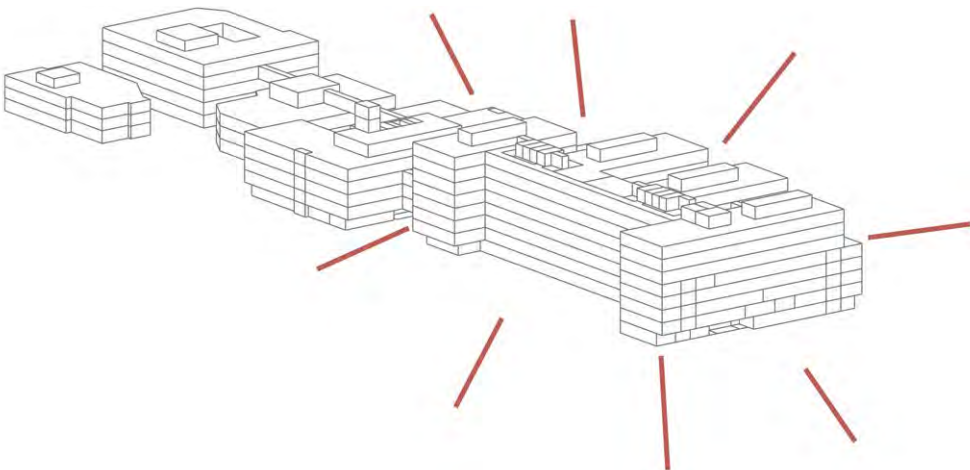
Optimal Views to the Harbour, City & Green Belt



Design for Sunlight and Daylight



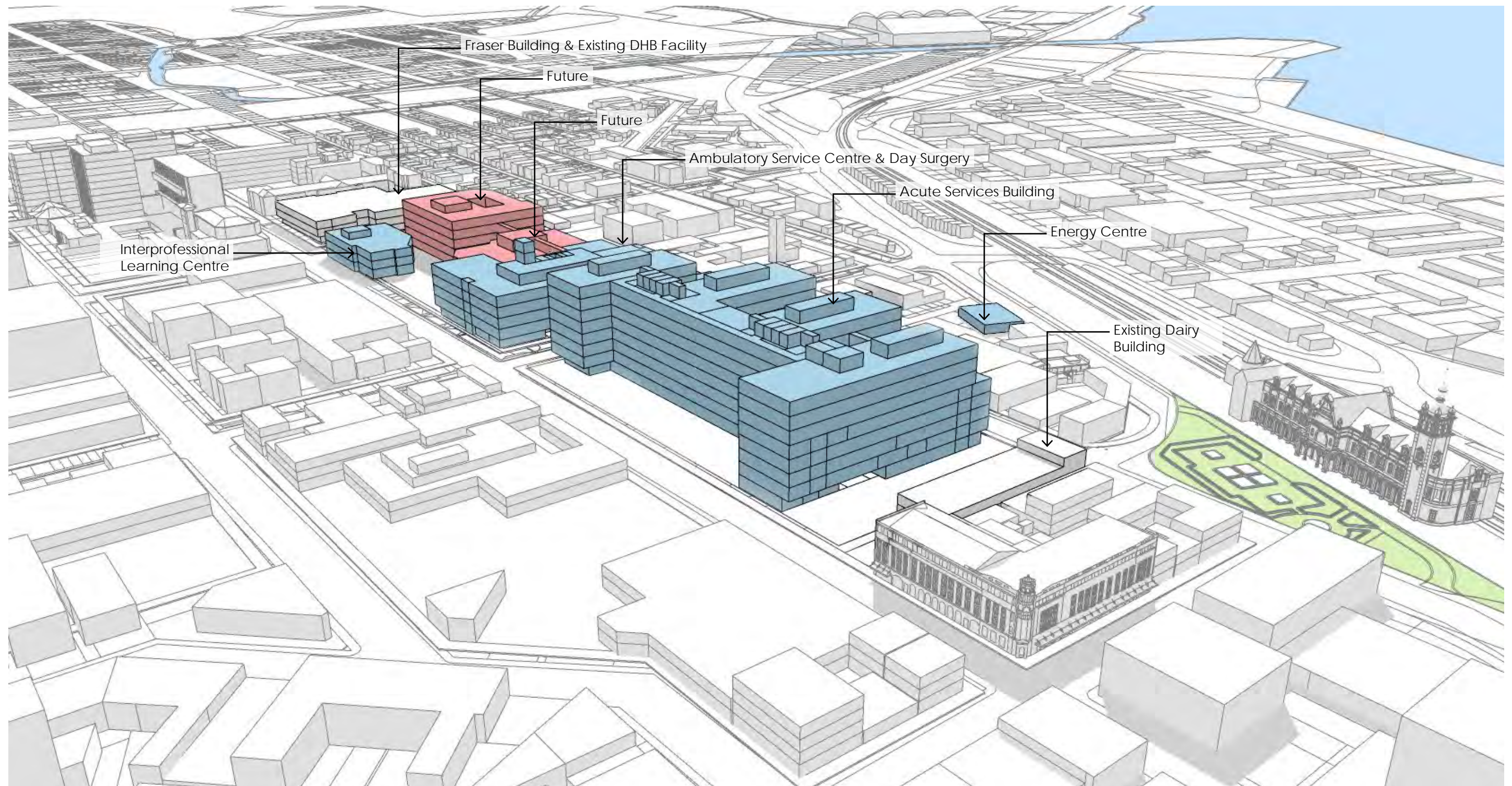
Clear Programmatic Identity



Strong Identity for the Hospital

6.0 Indicative Preliminary Masterplan (C2)

Indicative Massing Model



6.0 Indicative Preliminary Masterplan (C2)

Indicative Preliminary Masterplan



- Future services to be accommodated on Business Case approval :
- Southern Blood & Cancer Services
 - Translational Research Centre

6.0 Indicative Preliminary Masterplan (C2)

6.3 Staging

At Completion of the Indicative Business Case the project identified full facility replacement as the preferred outcome for the New Dunedin Hospital. During the Detailed Business Case, selection of preferred sites was confirmed for the hospital along with a wider understanding of some of the short-term challenges for the ongoing delivery of clinical services within the existing SDHB facilities.

The selection of the Cadbury and Wilson sites has allowed a more thorough understanding of the site-specific issues which feed into the staging plan. Geotechnical information for both sites is not yet available, and the existing Sub-station which feeds much of Central Dunedin that is located in the northern third of the Wilson Site will require careful relocation and timeframes for site acquisition are still to be confirmed.

During the masterplanning phase an urgent requirement to provide day surgery capability by 2022 was identified. The project team looked at a range of options with the SPG endorsing the decision to provide the Ambulatory Service Centre as two stage solution, with Stage 1 delivering day surgery capability in 2022, and Stage 2 completing the Ambulatory Service Centre.

The Interprofessional Learning Centre which houses the hospitals Professional Development Unit is a relatively new component of the masterplan. Benefit is seen in delivering this building early, supporting the realisation of future collaborative interprofessional learning environment, and use of the simulation suite as a catalyst for change management in the lead up to transitioning between from SDHB old facilities to the new Dunedin Hospital.

It is also noted that as a constrained central city location construction of the facility has the potential to create significant disruption. Ensuring appropriate facilities for construction works, including lay down areas and machinery parking are important considerations in the master plan.

Enabling Works

- Demolition of existing buildings across Cadbury and Wilson sites as required.
- Site remediation
- Ground improvements if required
- Relocation of sub-station. (Timing to be confirmed)

Stage 1

- Ambulatory Service Centre stage 1 with Day surgery capability operating as a standalone facility.
- Temporary car park

Stage 2

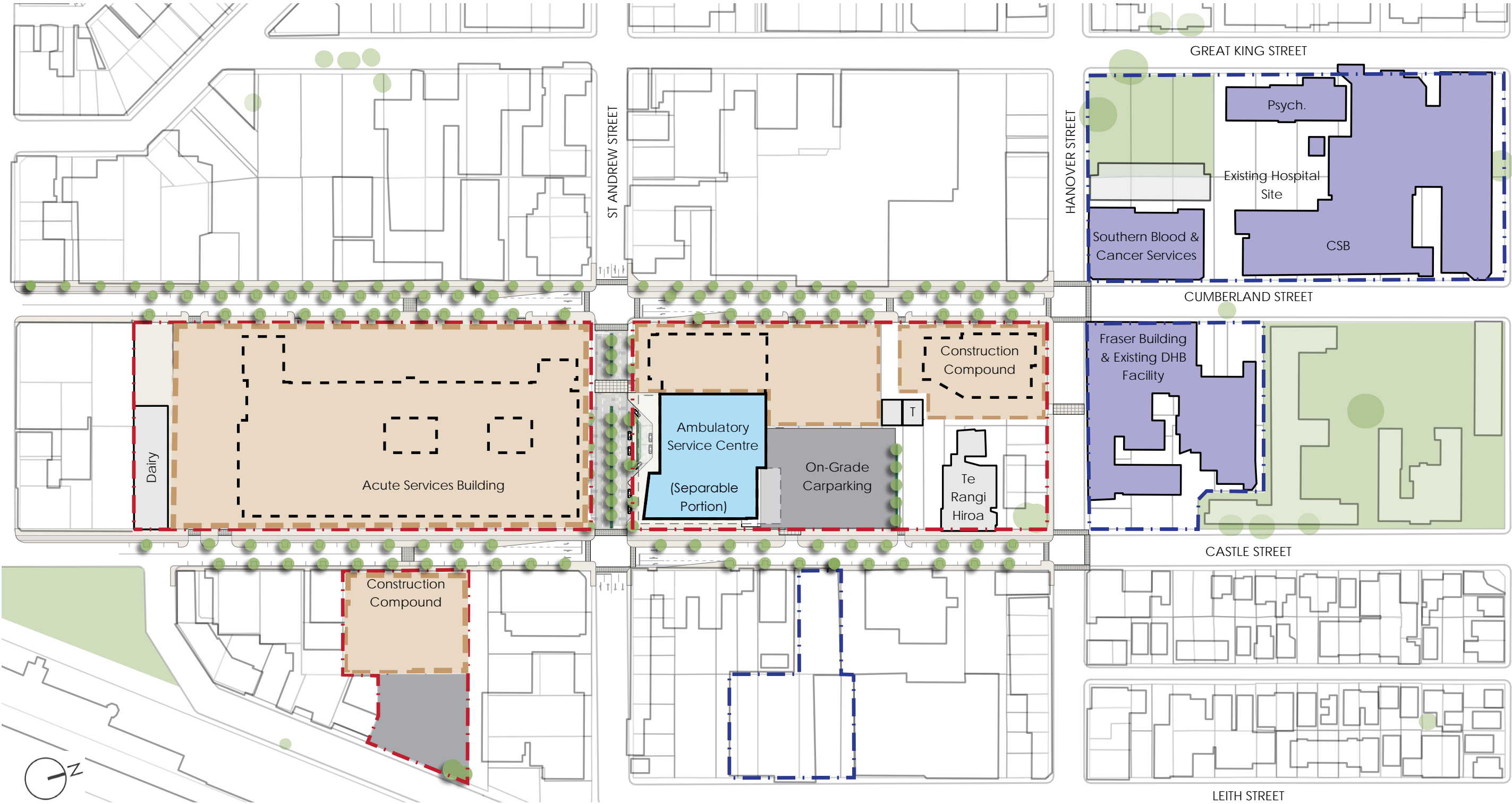
- Ambulatory Service Centre completion
- SDHB Preference for Interprofessional Learning Centre to be open before stage 3 to support change management.

Stage 3

- Completion of Acute Service Building
- Remedial reconfiguration or completion of shell space within the Ambulatory Service Centre to support operation of the Acute Service Building
- Energy Centre (If required)

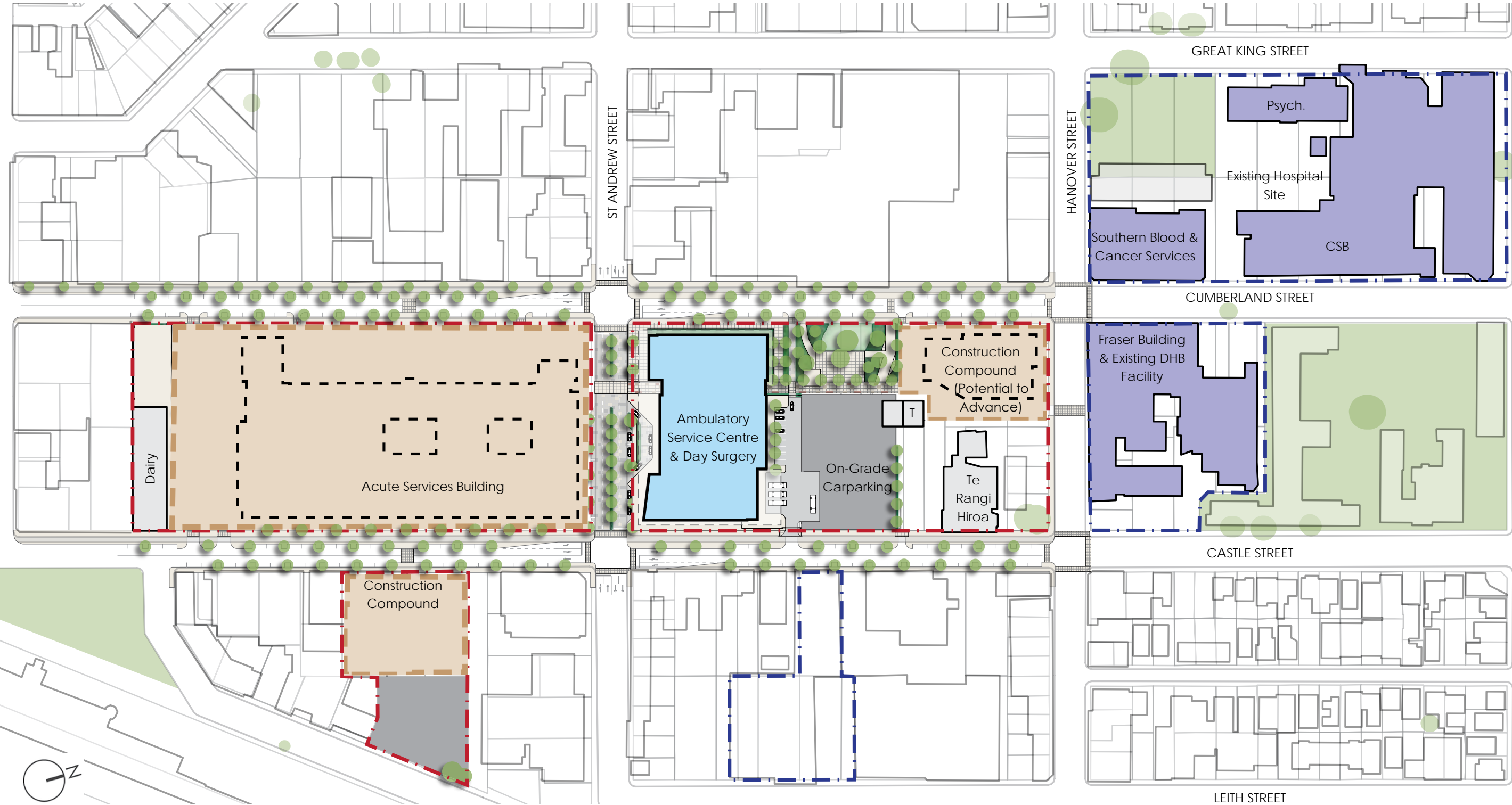
6.0 Indicative Preliminary Masterplan (C2)

Indicative Stage 1



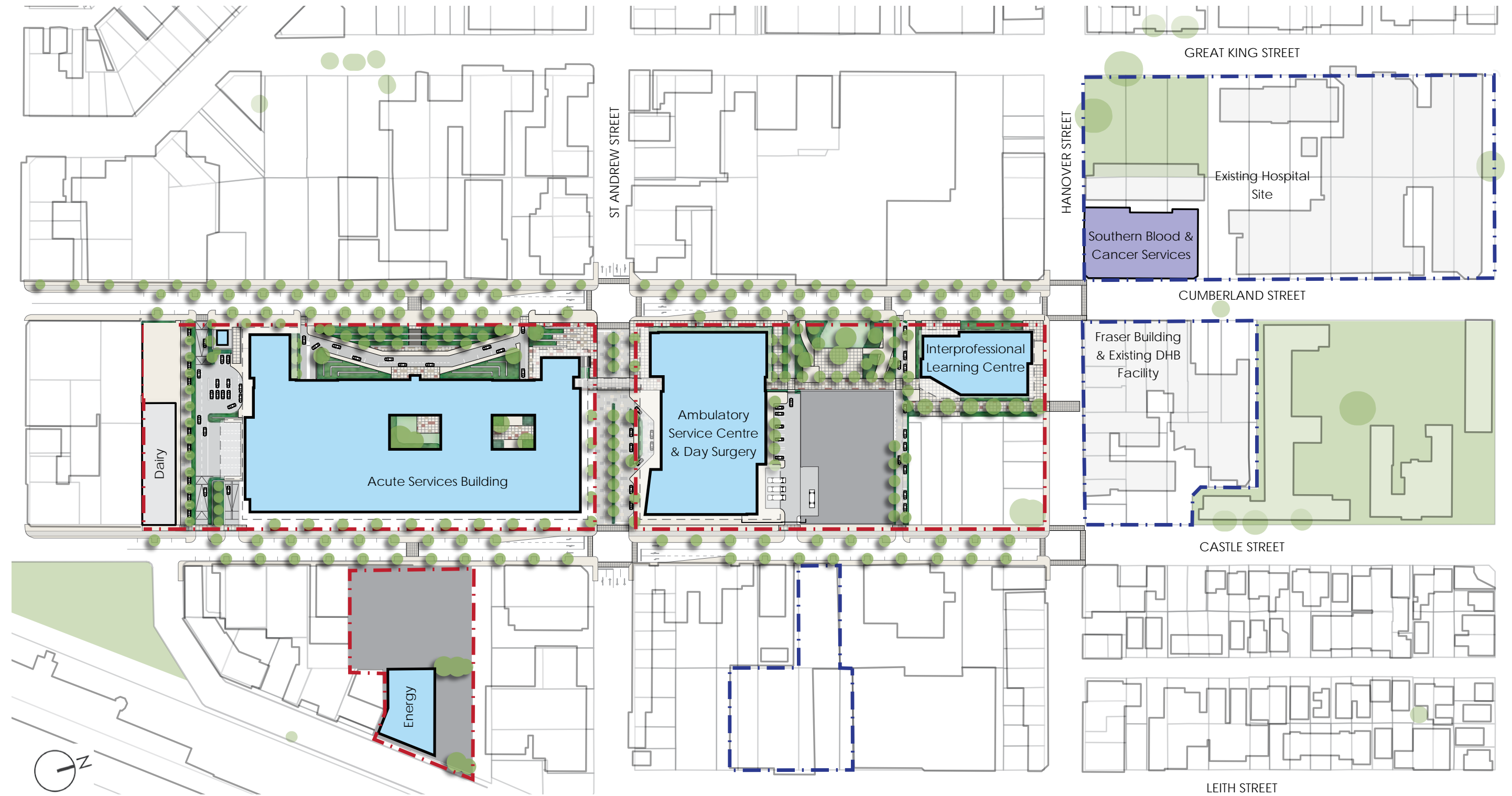
6.0 Indicative Preliminary Masterplan (C2)

Indicative Stage 2



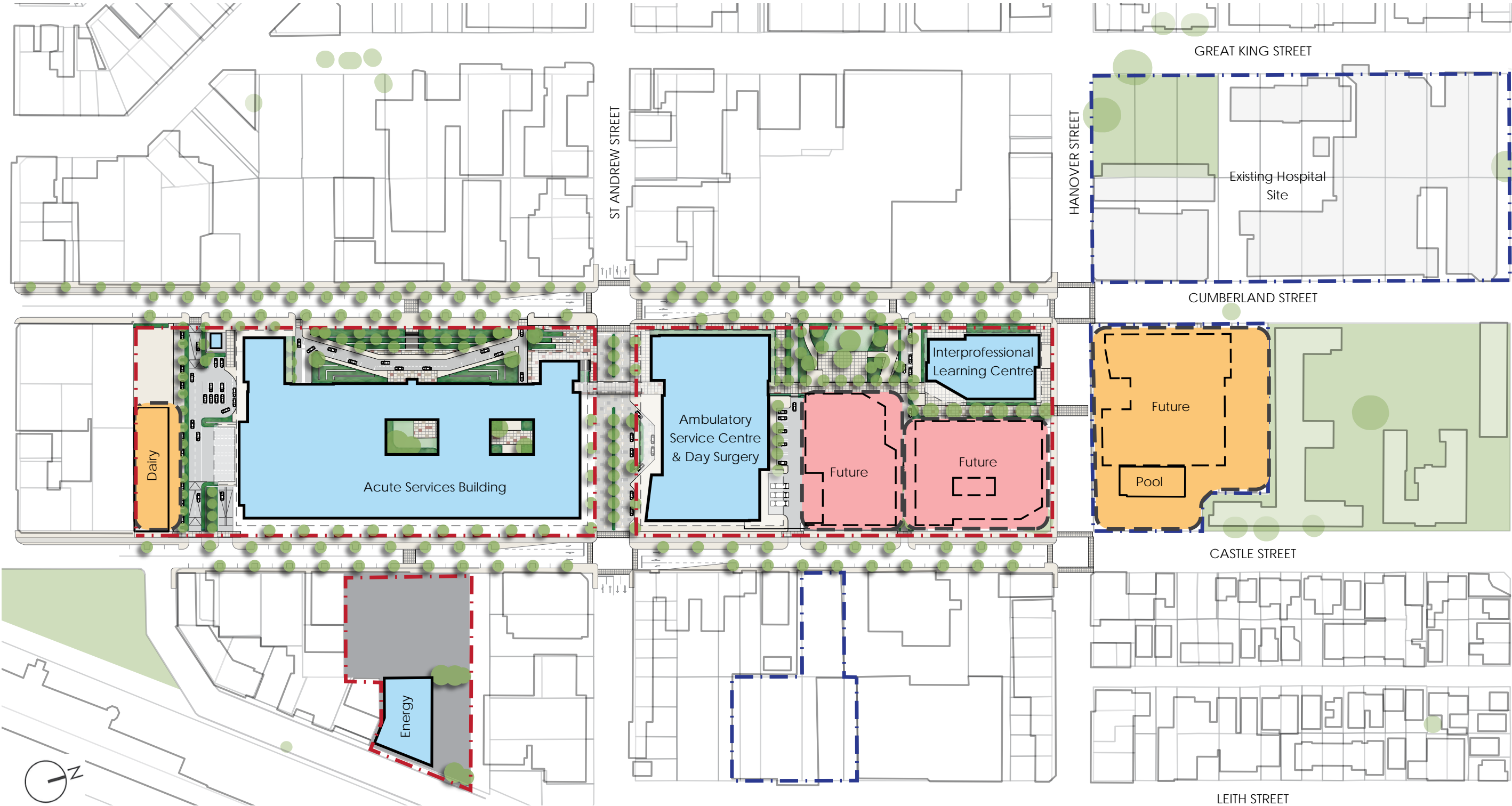
6.0 Indicative Preliminary Masterplan (C2)

Indicative Stage 3



6.0 Indicative Preliminary Masterplan (C2)

Indicative Future Stages



- Future services to be accommodated on Business Case approval :
- Southern Blood & Cancer Services
 - Translational Research Centre

6.0 Indicative Preliminary Masterplan (C2)

6.4 Expansion Strategy

As previously outlined this preliminary site masterplan identifies the preferred spatial arrangement for the immediate requirement to house an Acute Services Building, Ambulatory Services Centre and Interprofessional Learning Centre. At the same time it seeks to future proof those facilities to provide for future needs and to ensure that the site itself is appropriately planned to enable the development of additional facilities to host health related services as business cases are approved and funding made available.

For that reason the New Dunedin Hospital project, like all significant healthcare infrastructure projects, acknowledges the trends and direction in the delivery of care, and the speed of change which is occurring in this field. Whether from new diagnostics through to personalised medication, the New Dunedin Hospital seeks to accommodate the capability to embrace these changes with a future-proofing strategy that enables the facility to respond to changes in demand, to implement new technology and changes to models of care.

During the Detailed Business Case process, the project planning horizon was extended to 2043 to ensure the facility could respond appropriately to requirements in the near term. Specifically, this involved the provision of shell space responding to these near-term future needs across, Medical Imaging, Nuclear Medicine, Perioperative Services, Cardiac Interventional, ICU/HDU, and Inpatient Accommodation. In the interim, this shell space will be utilised for workspace which will need to be provided elsewhere as the shell space is progressively transformed into clinical accommodation.

As well as building new infrastructure to respond to future service requirements the block and stack has sought to provide soft space such as workspace in locations which may be transformed into clinical zones in the future supporting new and expanding clinical services within the current footprint and near existing services.

The location of the New Dunedin Hospital in the city centre offers many benefits to patients, staff and learning & research partners as well as to the local economy. However, the limited space available does restrict the opportunity to undertake the large scale construction project required and to accommodate for future buildings. Consequently, in order to facilitate future expansion the masterplan therefore also identifies potential expansion zones which are either adjacent to the Acute Services Building or Ambulatory Service Centre, or are alternatively free-standing development sites.

Acute Services Building

The proposed location of the Acute Services Building provides the capability to expand the Emergency Department which may also facilitate the expansion of clinical support services such as pathology, NZ blood, and Pharmacy, through to Perioperative expansion.

The entrance set back on the Western elevation may also offer an expansion opportunity.

Ambulatory Service Centre

The Ambulatory Service Centre offers expansion either via constructing northwards over the Gardens area or via utilisation of the future upper levels of future adjacent facilities. The ambulatory expansion over future buildings has been supported by the provision of dedicated open-ended travel corridors on Levels One and Three of the Ambulatory Services Centre which also support onward linkages towards the Translational Research Centre, which may also provide a range of ambulatory services and support the expansion of clinical services.

Existing Sites

The existing sites on Great King Street, the Fraser Building, and the regional distribution depot may also offer future expansion opportunities for new standalone facilities accommodating services which are currently not in scope such as Mental Health and other Wakari based services through to full facility replacement.

Workspace

With the provision of almost 3,000 sqm of shell space within the Acute Service Building being provided initially as workspace, as this space is transformed into clinical accommodation there will be a need to replace this workspace over time. A range of options exist and will need to be tested as the project moves forward.

Out of Scope Services but Considered in the Preliminary Site Masterplanning Process

Whilst undertaking the site masterplanning process a range of potential services not included in the scope of the IBC were considered and included in the briefings which were undertaken to understand their potential future needs on the site. Services reviewed included:

- Southern Blood and Cancer Services.
- Mental Health Unit.
- Community Health Hub.
- Translational Research Centre.
- The development of a central Community Health Hub as

- a collocation of community health services as described in the SDHB Primary and Community Care Strategy.
- Permanent workspace on campus.
- Facilities for other out of scope DHB services or third-party providers.
- Accommodation to provide for out of town whānau and patients attending multiple day treatments such as radiotherapy.

Out of Scope Services

The masterplan response seeks to provide sufficient flexibility for future inclusion of services not currently within the scope of the Detailed Business Case. As business cases are approved and funding made available, the master plan can adapt to these.

The Site Masterplanning also affords the SDHB with flexible and adaptable building approaches to enable staged expansion of the facility beyond 2043 including full replacement of the facility over time.

Southern Blood & Cancer Services

The requirements for Southern Blood and Cancer Services were evaluated at a high level (see separate briefing note outlining high level assumptions for the Southern Blood and Cancer Services). A zone adjacent to the Ambulatory Service Centre was identified which supports the relocation of current accommodation including bunkers and affords the opportunity to link the Ambulatory Service Centre to SBCS.

Mental Health

Future facility solutions for Mental Health, Addiction and Intellectual Disability services based at Wakari would be need to be explored as part of a separate detailed business case process.

6.0 Indicative Preliminary Masterplan (C2)

Indicative Expansion Zones



- Future services to be accommodated on Business Case approval :
- Southern Blood & Cancer Services
 - Translational Research Centre

6.0 Indicative Preliminary Masterplan (C2)

6.5 Block & Stack

The site masterplanning tested a range of options around the potential future configuration of the new Dunedin Hospital. Scenarios included co-locating ambulatory activities around the acute clinical services, all located on one city block through to the development of a separate Ambulatory Services Centre and Acute services Building located across the Cadbury and Wilson sites. With the development of a separate Ambulatory Services Centre and the need to provide new Day surgery Theatres capacity by 2022 the project moved the day surgery and endoscopy capability from the perioperative suites to the ambulatory Services Centre to provide a dedicated Day Surgery Centre which could operate in a standalone fashion for several years whilst the future Acute Services building was constructed.

The Acute Services building comprises of three components, a lower ground car park, a podium of four levels accommodating emergency department unplanned imaging, clinical support and theatres, and four ward towers of four stories each located above the podium and accommodating some acute services such as ICU, NICU, Cardiac Interventional, Maternity and Inpatient accommodation.

In addition to the Acute Services Building and the Ambulatory Services Centre, the project may need to deliver a new Energy Centre. However, it should be noted that the requirement for this infrastructure will not be expected to be confirmed until completion of preliminary design and will depend on the future energy characteristics of the building. The expectation though is if the Energy Centre is not required, the Facilities team may require an external compound for some materials storage.

The Hospital's Professional Development Unit is anticipated to be co located with University of Otago and Otago Polytechnic within the Interprofessional Learning Centre located to the North of the Ambulatory Services Centre.

The Primary Birthing Unit location is still under some discussion with the Unit either being provided adjacent to the maternity dept. located on Level Five or alternatively off site in an alternative location.

The block and stack has been developed with a strong chassis principal set around the separation of clinical, logistic and public circulation. Within the Acute Services Building, two principal vertical circulation nodes provide easy and direct access to most clinical departments for the public. Similarly, the clinical and logistic cores which are wrapped alongside provide good access for the discreet transfer of patients and hospital workforce.

The southern end of the Acute Services building accommodates two hot lifts providing easy and direct transfer from Emergency Department, Emergency Theatres, ICU, NICU, Birthing and the Helideck.

Acknowledging the potential risk around flooding below ground service tunnels the project has provided a service link bridge on Level Three with the expectation all deliveries, including supplies and waste management will be moved via the Ambulatory Service Centre loading dock, transferred to Level

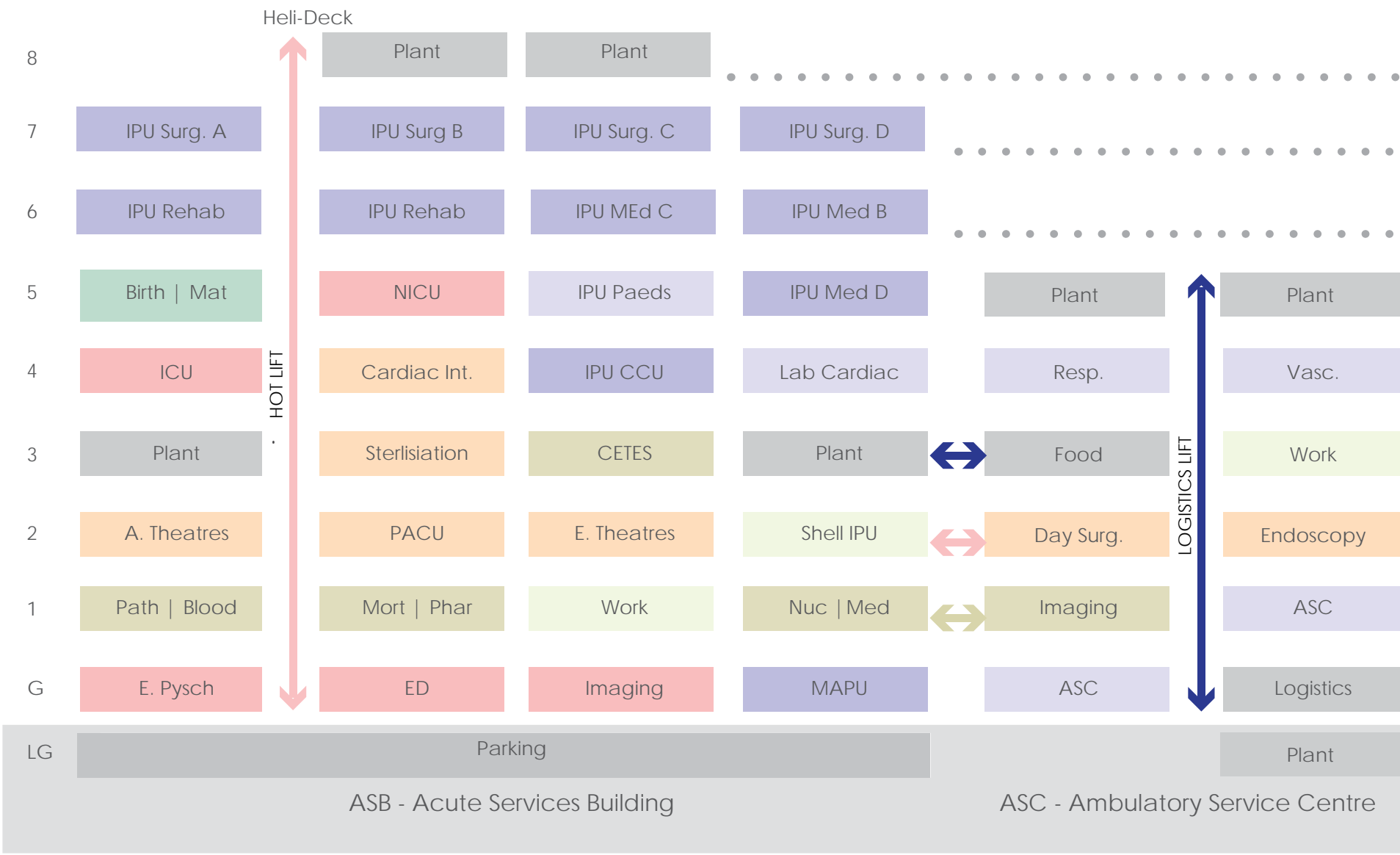


Figure 20. Indicative Block and Stack - Final Configuration may change in Preliminary Design Phase

Three via the dedicated logistics lifts and then moved to the Acute Services Building for onward transfer via the dedicated logistics lift. The expectation is that AGV's may undertake this logistic movement.

The Ambulatory Service Centre could provide future onward 'travel' connectivity to future buildings, enabling an integrated precinct. Whilst the Ambulatory Service Centre is operating as a standalone facility and undertaking day surgery the expectation is that the logistic lifts will be capable of undertaking emergency patient transfer via an appropriate transfer route.

Whilst seeking to provide separation of flow across the block and stack, the planning has sought to minimise deep floor plates such that staff and patients have good access to natural light and all inpatients on the upper levels will have the opportunity of views either towards the Harbour or Maori Hill.

6.0 Indicative Preliminary Masterplan (C2)

6.5 Diagrammatic Section

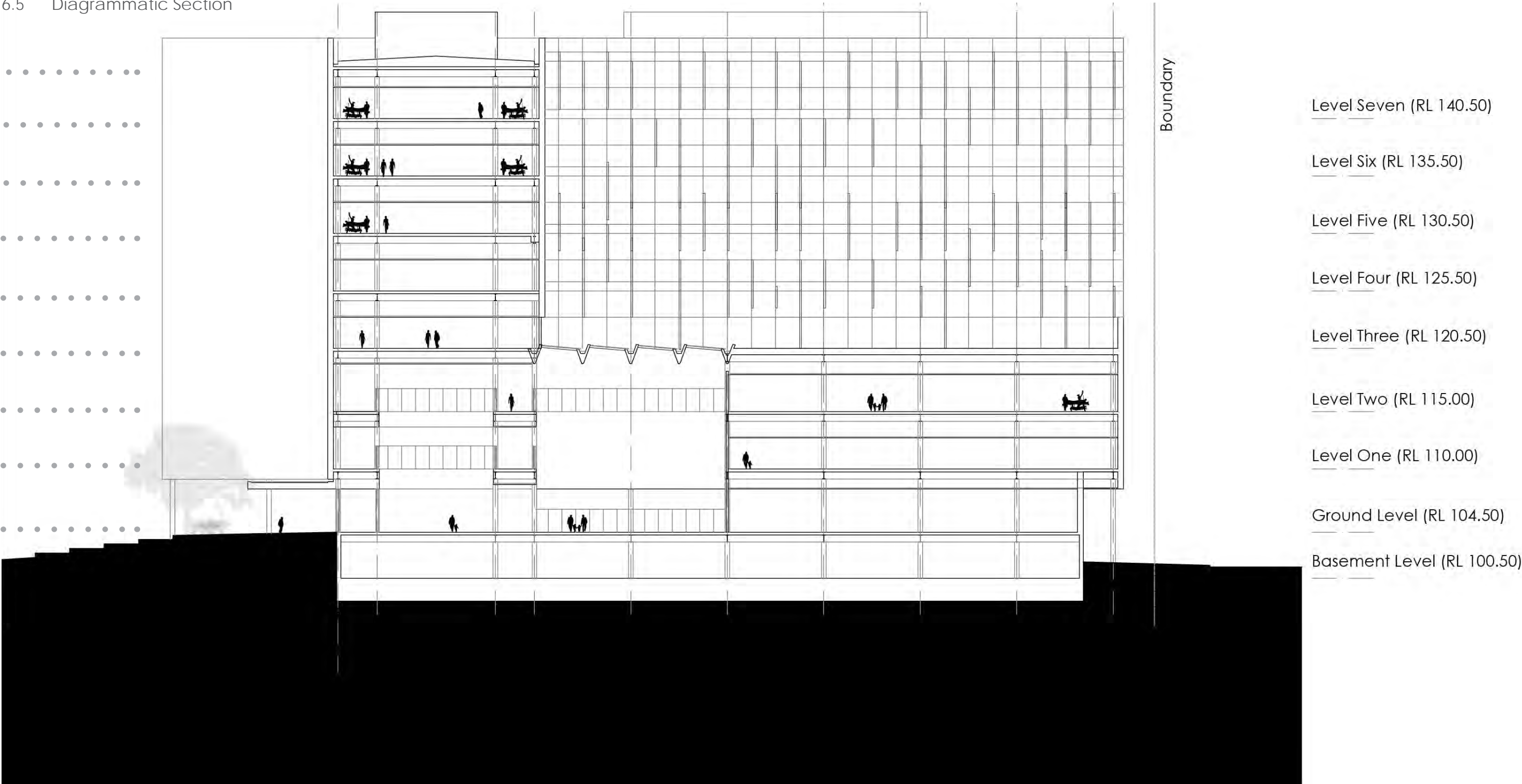
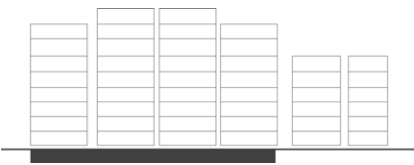


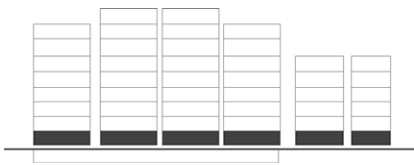
Figure 21. Indicative Block and Stack - Final Configuration may change in Preliminary Design Phase.

6.0 Indicative Preliminary Masterplan (C2)

6.5 Block & Stack



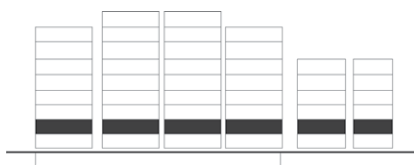
- Lower Ground Level - Acute:**
- Parking
 - Staff Amenities
 - Building & Property



- Ground - Acute:**
- Emergency Pysch. Services
 - Emergency Dept.
 - Medical Imaging (unplanned)
 - MAPU
 - Multi-faith
 - Front of House
 - Retail

Ground - Ambulatory:

- Ambulatory Clinics
- Front of House
- Supplies
- Orderlies
- Waste
- Loading Dock



- Level One - Acute:**
- Pathology
 - NZ Blood
 - Mortuary
 - Pharmacy
 - Workspace - Acute
 - Workspace - Ambulatory
 - Information Services
 - Hospital Operations
 - Nuclear Medicine

Level One - Ambulatory:

- Medical Imaging (Planned)
- Ambulatory Clinics
- Pathology (Collections)



- Level Two - Acute:**
- Main Operating Suite
 - IPU Surgical (Shell)

Level Two - Ambulatory:

- Day Surgery & Procedure Unit
- Day Medical Unit



- Level Three - Acute:**
- Sterilisation Services
 - CETES
 - Plant
 - Staff Amenities

Level Three - Ambulatory:

- Food Services
- Workspace



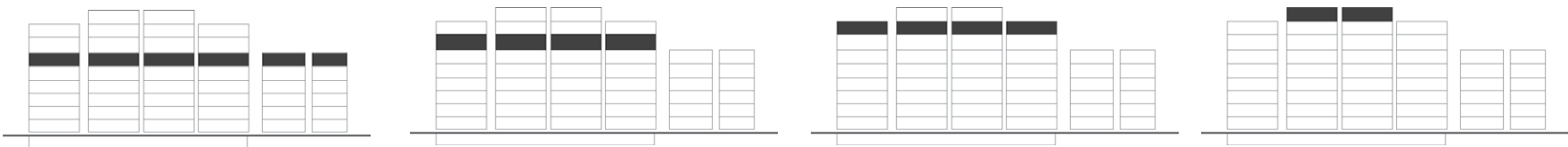
- Level Four - Acute:**
- ICU
 - Acute Renal
 - Cardiac Interventional
 - IPU Cardiology CCU
 - Med. Phys. Lab Cardiac

Level Four - Ambulatory:

- Med. Phys. Lab Resp.
- Med. Phys. Lab Vascular
- Ambulatory Clinics

6.0 Indicative Preliminary Masterplan (C2)

6.5 Block & Stack



Level Five - Acute:

- Birthing
- Primary Birthing (Secondary)
- IPU Maternity
- NICU
- IPU Paeds & PADU
- IPU Med. D. Oncology

Level Six - Acute:

- IPU Rehab A
- IPU Rehab B
- Therapy Zone Rehab
- IPU Med. C. OPMH
- IPU Med. B. Gen. Med.

Level Seven - Acute:

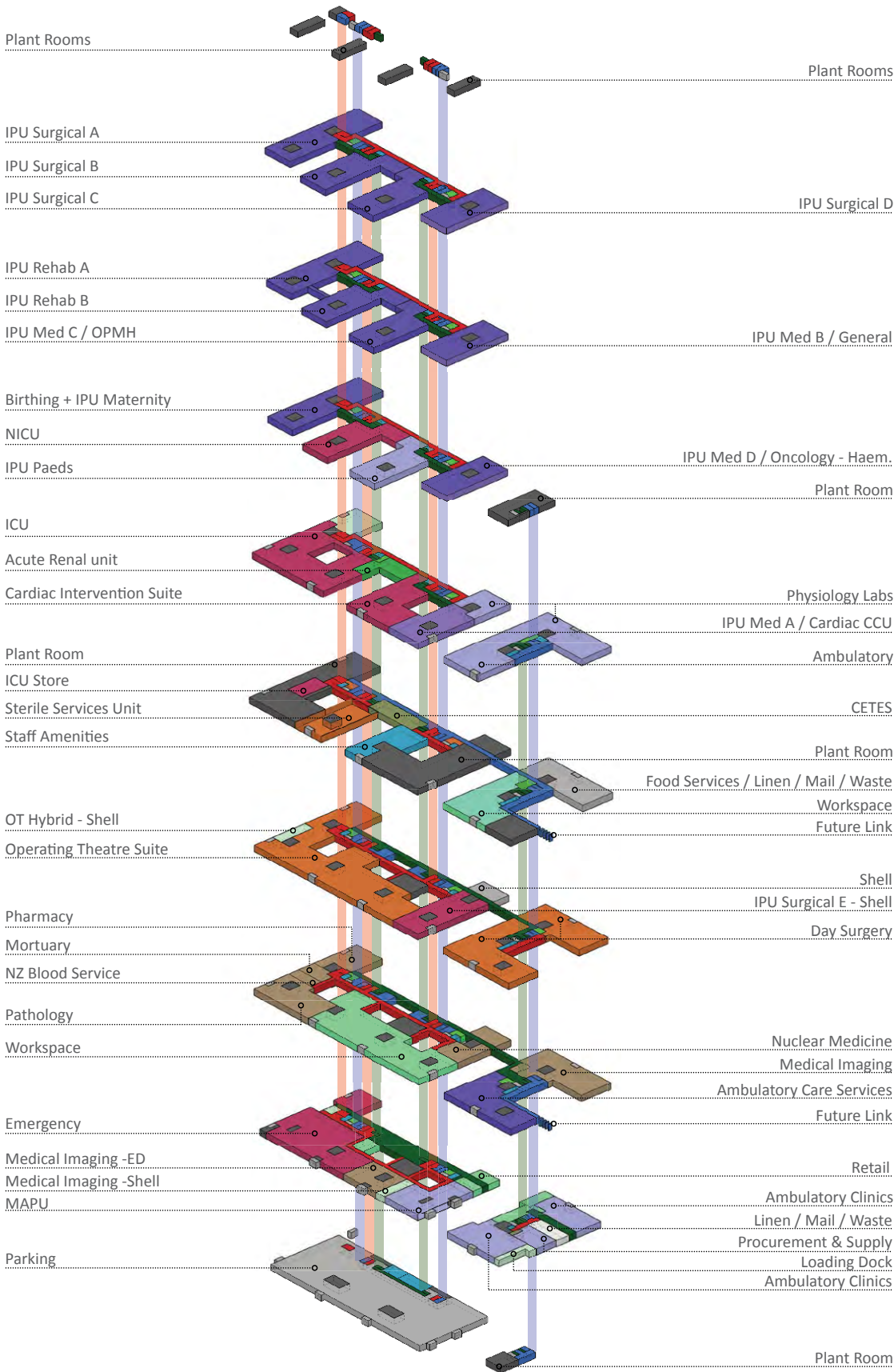
- IPU Surg. A
- IPU Surg. B
- IPU Surg. C
- IPU Surg. D

Level Eight - Acute:

- Helideck
- Plant

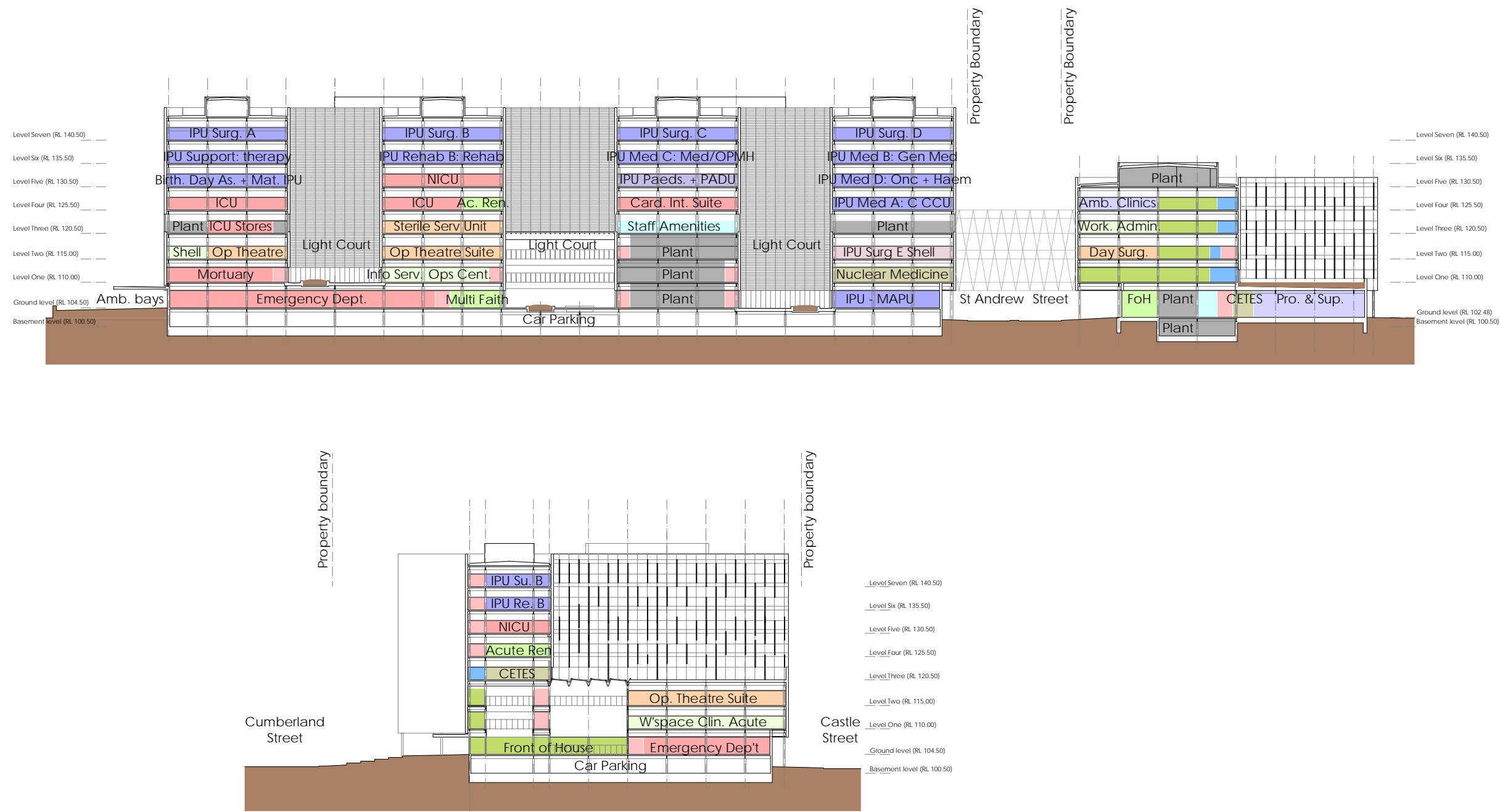
Level Five - Ambulatory:

- Plant



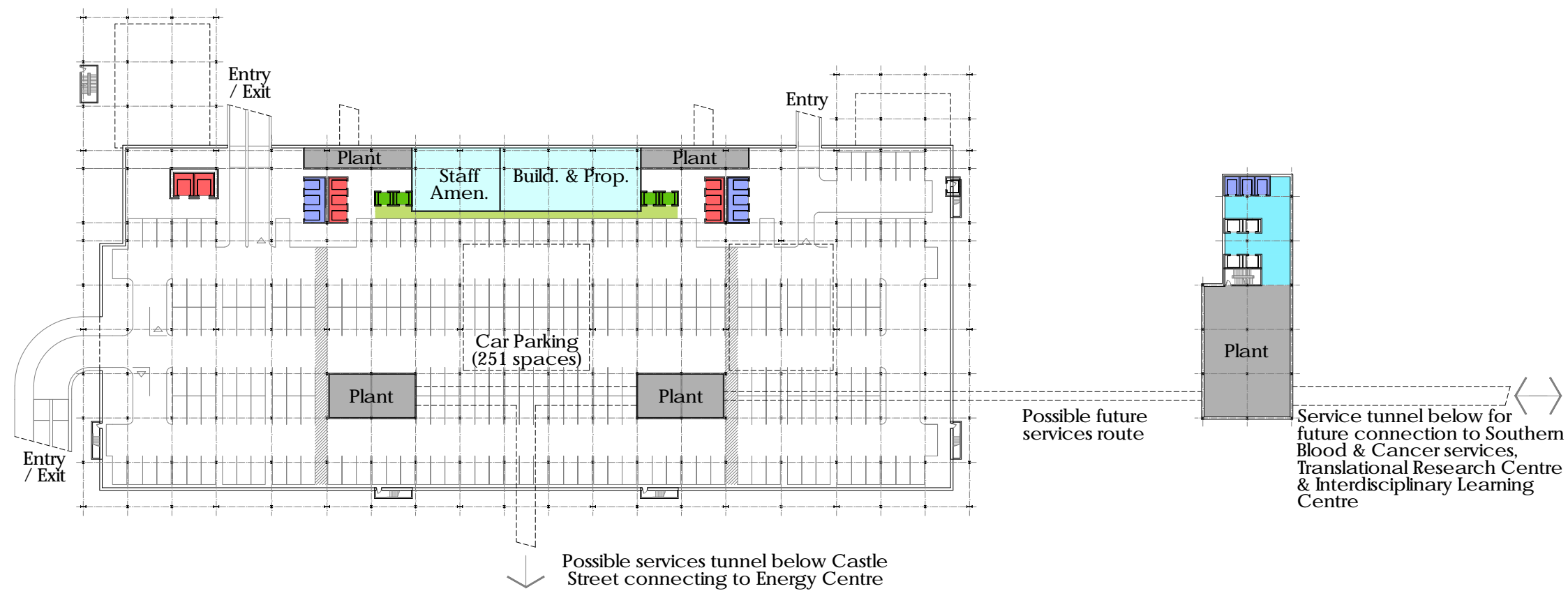
6.0 Indicative Preliminary Masterplan (C2)

Block and Stack Sections



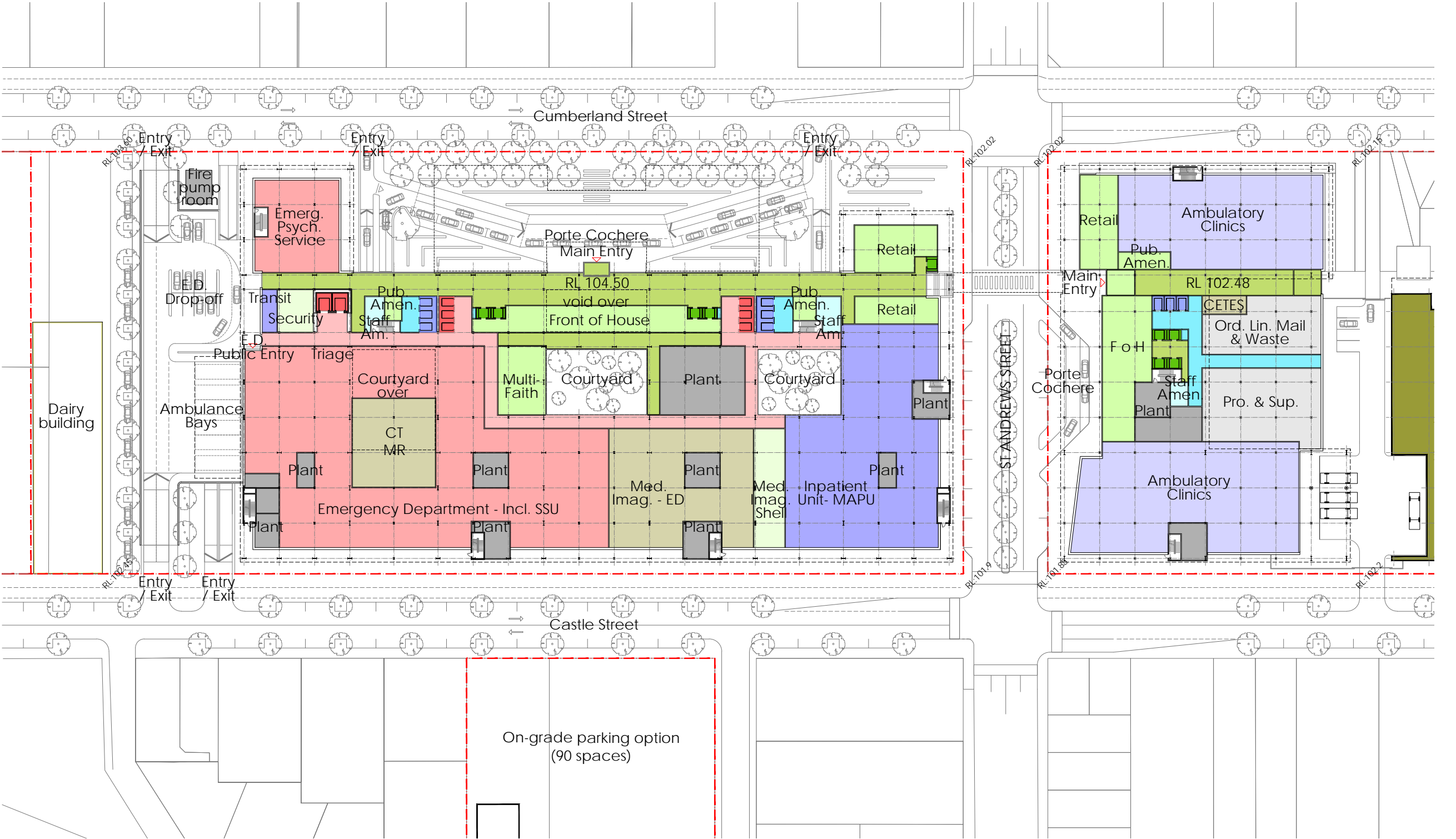
6.0 Indicative Preliminary Masterplan (C2)

Block and Stack Plan - Basement



6.0 Indicative Preliminary Masterplan (C2)

Block and Stack Plan - Ground Floor



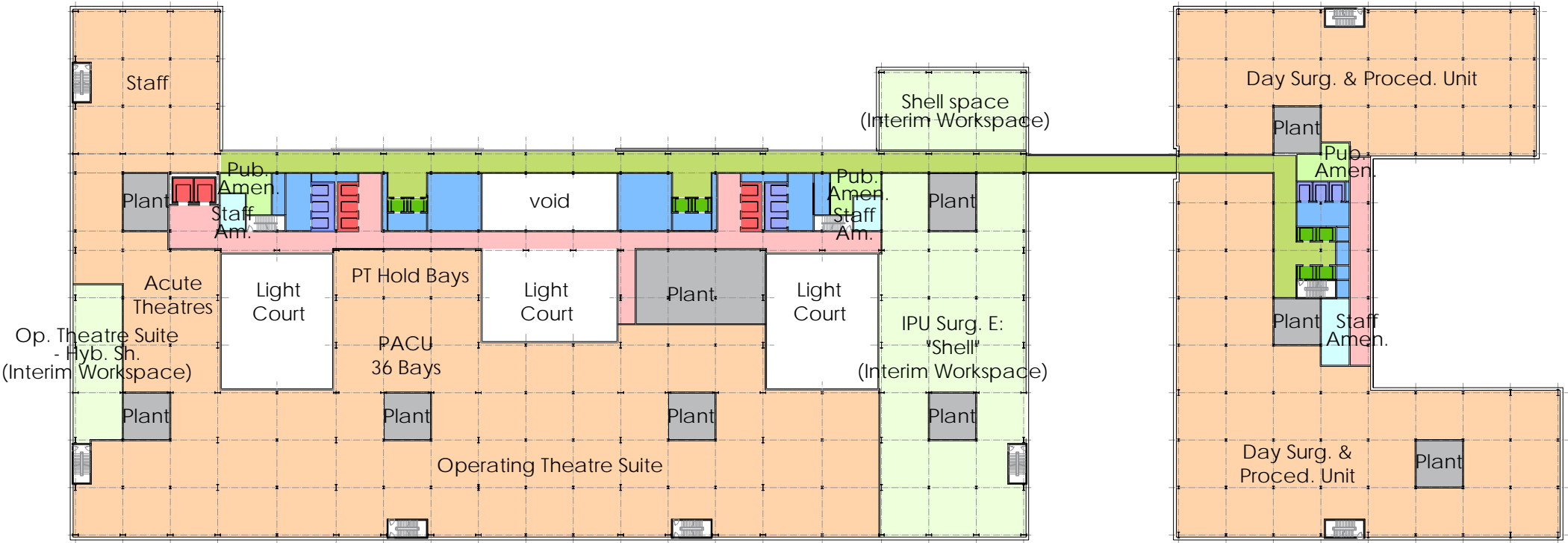
6.0 Indicative Preliminary Masterplan (C2)

Block and Stack Plan - Level One



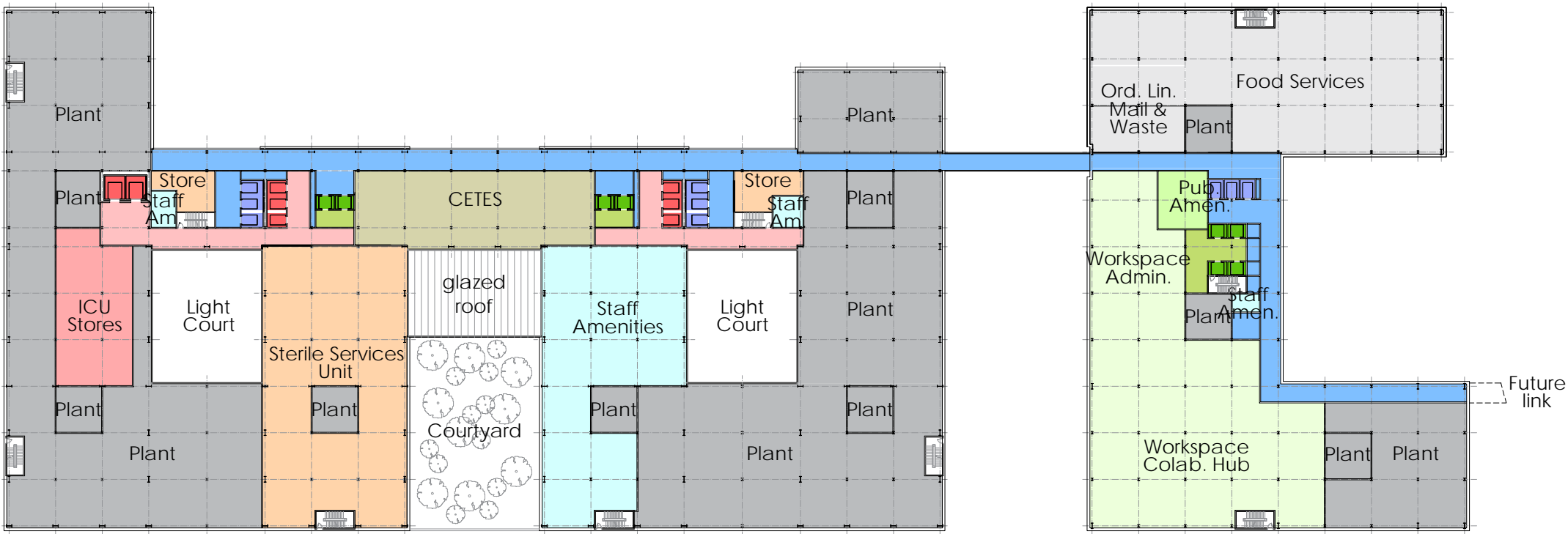
6.0 Indicative Preliminary Masterplan (C2)

Block and Stack Plan - Level Two



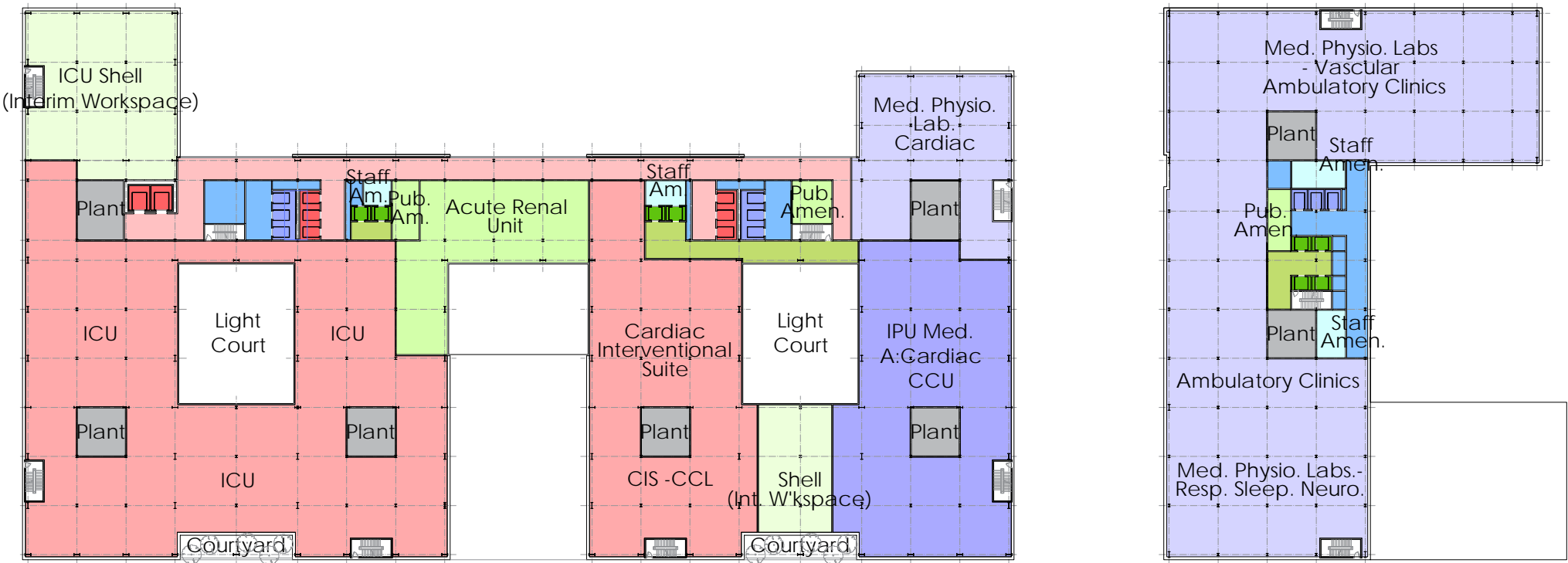
6.0 Indicative Preliminary Masterplan (C2)

Block and Stack Plan - Level Three



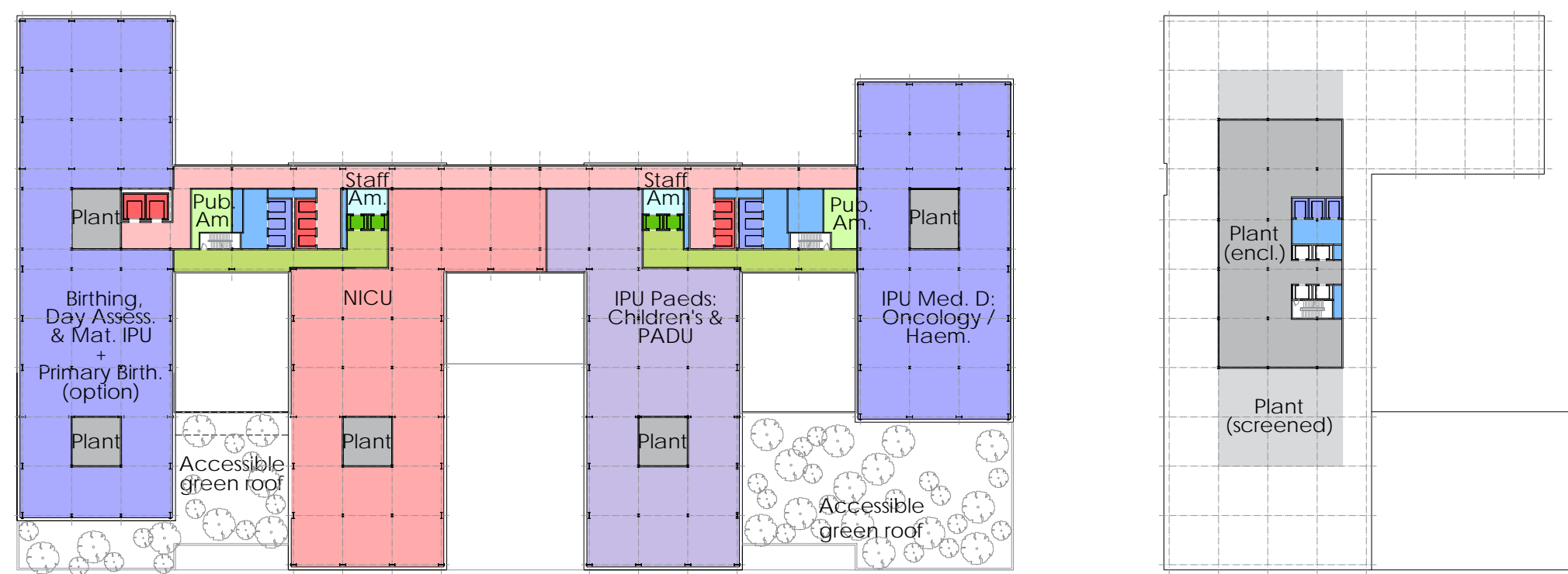
6.0 Indicative Preliminary Masterplan (C2)

Block and Stack Plan - Level Four



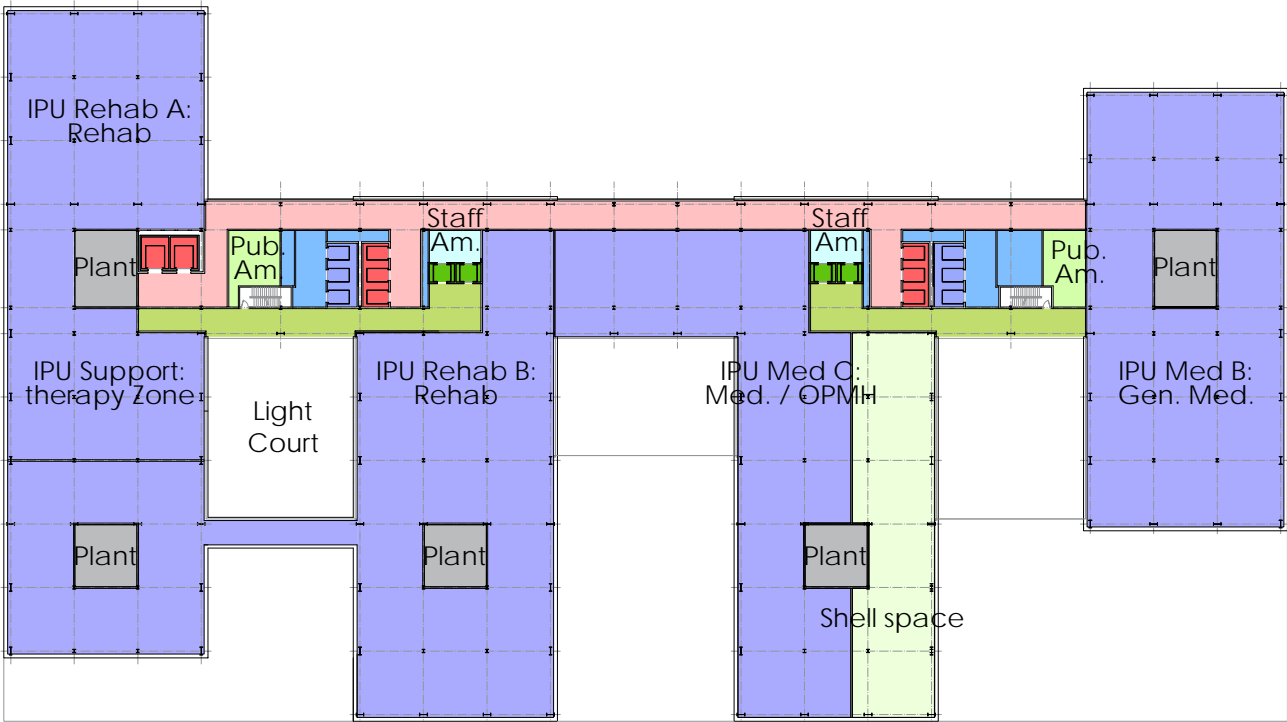
6.0 Indicative Preliminary Masterplan (C2)

Block and Stack Plan - Level Five



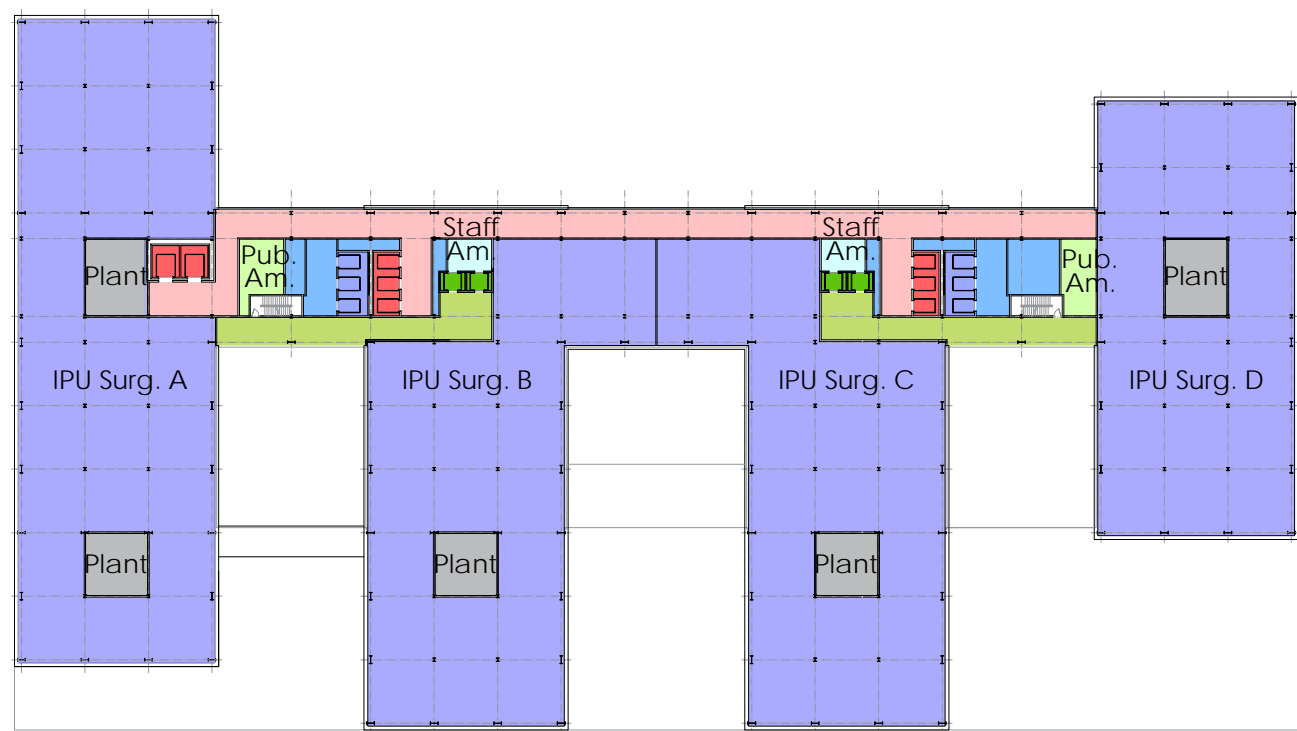
6.0 Indicative Preliminary Masterplan (C2)

Block and Stack Plan - Level Six



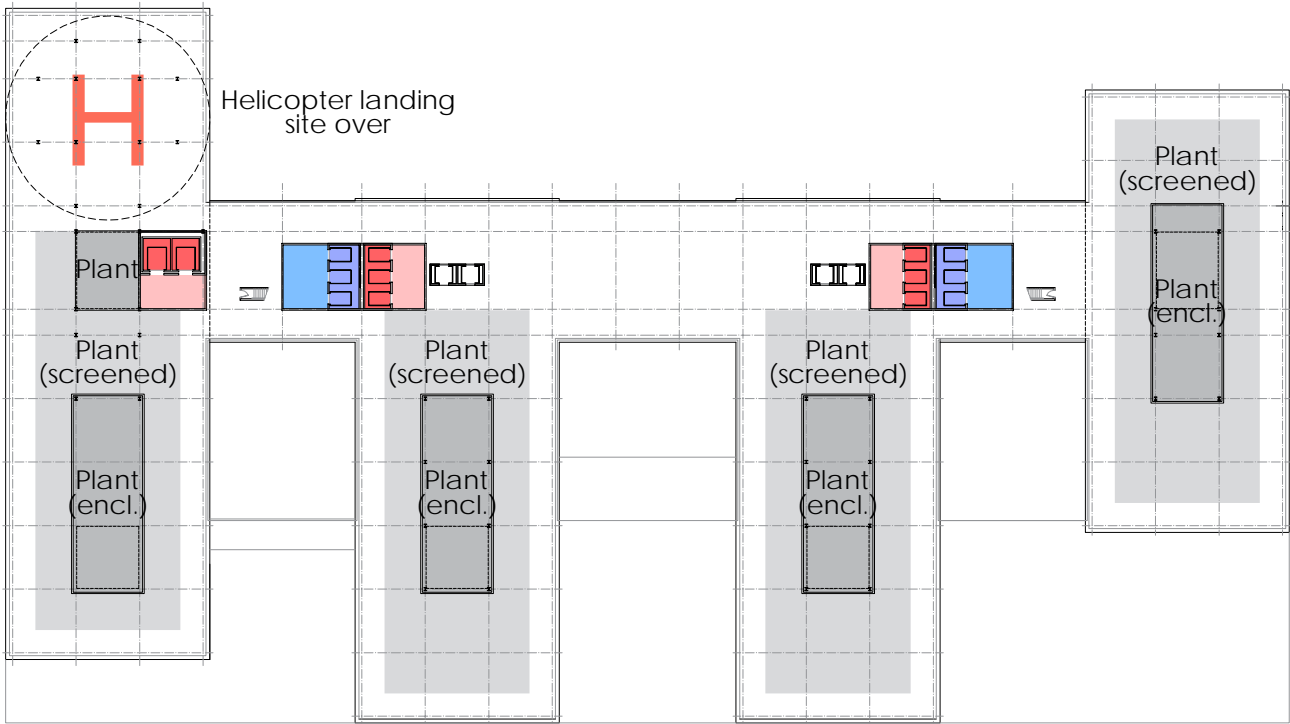
6.0 Indicative Preliminary Masterplan (C2)

Block and Stack Plan - Level Seven



6.0 Indicative Preliminary Masterplan (C2)

Block and Stack Plan - Level Eight



6.0 Indicative Preliminary Masterplan (C2)

6.6 Traffic & Access

One of the most significant constraints of the sites is the boundary condition on the eastern and western boundaries caused by the one-way pairs of State Highway 1. The highways are the busiest central city roads, and create a barrier to safe and easy pedestrian access to the building. The new Dunedin Hospital project has acted as a catalyst for a review of the roading network in Dunedin, led by NZTA in partnership with DCC and involving a wide range of stakeholders including ORC and the University of Otago. At the time of Preliminary Site Masterplanning reporting, the outcome of this review is unknown, but there are positive indications that the review may yield improvements to the network that are expected to be beneficial for the hospital.

Potential initiatives that may change the current road network in the vicinity include:

- Changing the one-way system to two-way.
- Improving the design of the streets to provide a better public realm.
- Reducing the amount of traffic on Cumberland Street to provide a more gentle western boundary condition between the hospital and the heart of the city.
- Strengthening Castle Street as the main arterial north-south road through the city. It is noted that this shift will not improve the link between the eastern side of the city and the hospital and central city precinct, and may increase the severance through Castle Street.
- Slow traffic on St Andrew Street between Castle Street and George Street, providing a more pedestrian friendly environment for hospital users and pedestrians commuting via the bus hub.

As the outcomes of this review are not yet resolved, the approach of the Preliminary Site Masterplanning has been to provide a masterplan response that allows for both the status quo and the new layouts. It is felt appropriate to anticipate future change, without assuming an outcome to an important piece of ongoing study.

The masterplan response includes the following access strategies and features:

- A. Separation of emergency, public, and servicing traffic.**
Location of emergency department access for hot ambulance and public entry away from main drop-offs and servicing locations is considered preferable for safety and clarity of access.
- B. Use of mid-block laneways to be able to react to changing roading patterns over time.**
Creation of east-west lanes for hospital traffic allows a flexible approach to site access, which is able to adapt to any changes in the roading network over time
- C. Emergency access at southernmost end of site.**
The Emergency Department has been located at the south end of the

southern Acute Services Building, furthest away from the entry node at St Andrew Street. This keeps the hot ambulance and public ED traffic away from other hospital traffic and a clear delineation of emergency parking. The parking areas are located against the adjacent heritage building making use of the potential fall zone on the northern side of the southern boundary. Ambulance access and public ED access is currently shown off the newly formed laneway. This provides a potential conflict of hot ambulance traffic and public ED traffic, but provides flexibility of access. This strategy is to be tested in Concept Design.

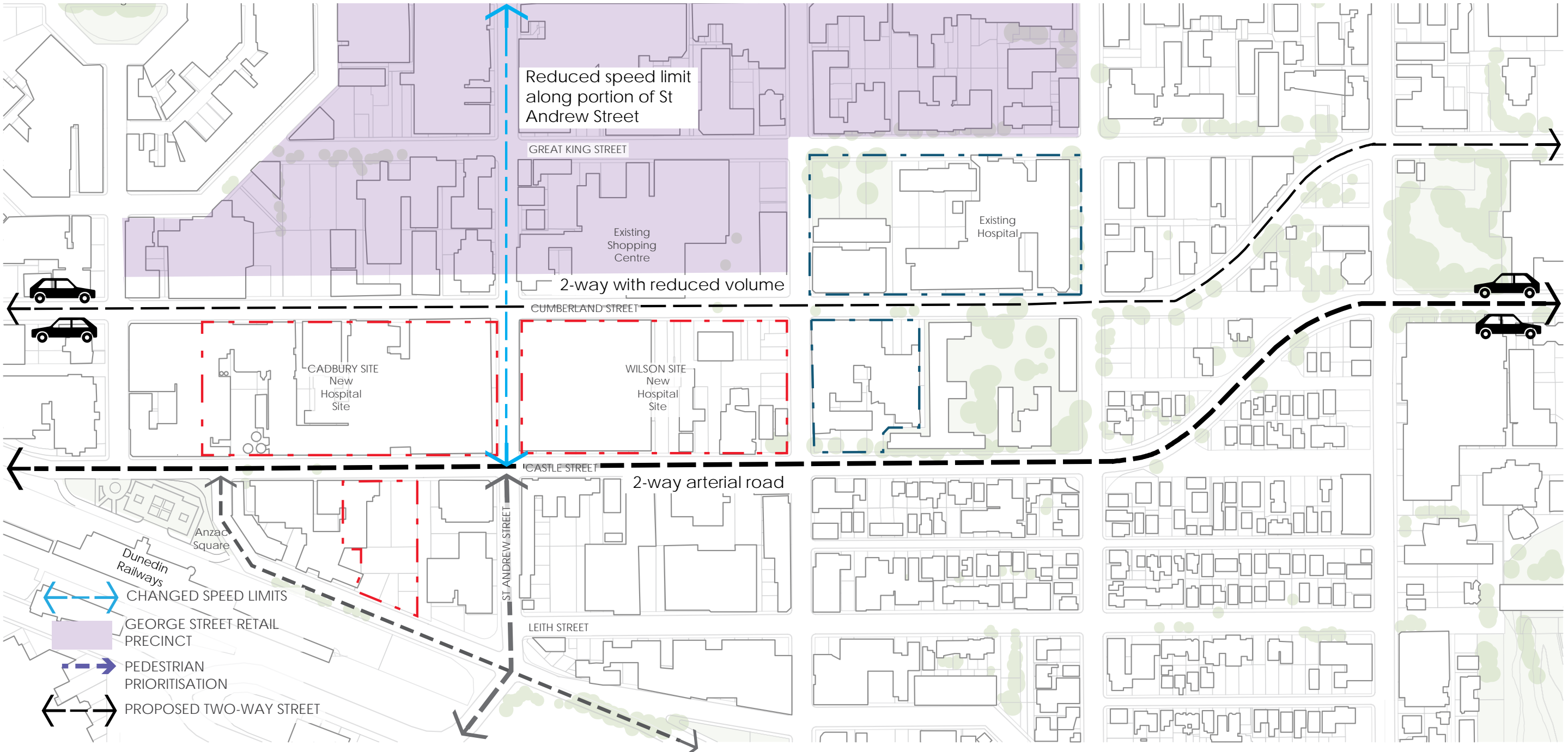
- D. Concentration of servicing access at northern end of Ambulatory Building.**
As a similar strategy, the main clean and dirty docks for the facility have been located on the northern end of the Ambulatory building, with a one-way service lane cutting through the site from east to west. This provides good access to the site from the main arterial route. And a discrete service courtyard mid-block on Castle Street where it is considered to have least impact on the streetscape. Careful management of loading activity will be required to prevent back-up of traffic onto the state highway. It is noted that this distribution feeds into the IL3 facility, and that provision must be made on the southern block for post-disaster loading directly into the Acute Services Building in the event of any temporary impact to ongoing operation of the IL3 building. Locations for medical gases, diesel tanks, and other key servicing requirements are to be carefully considered as part of the Concept Planning, and are encouraged to follow the strategy established in this masterplan for separation of service traffic from public and emergency traffic where possible.
- E. Control public entry points to main buildings to reinforce clear wayfinding strategies and simplify security management.**
Providing a main and obvious public entry to main buildings establishes the start of an intuitive way-finding strategy for public and visitors. In addition to the main Acute Services Building entry off Cumberland Street, the masterplan indicates a secondary entry off the main public corridor directed towards the Ambulatory building. The Ambulatory building is accessed off this same axis from both St Andrew Street and the northern block greenspace, reinforcing this circulation strategy. Emergency Department and Maternity access is separated to provide security controlled 24 hour access to the building and to enable other access points to the hospital to be managed.
- F. Public access from Cumberland Street.**
Public points of entry have been located on the western side of the building, facing towards the centre of the city, the afternoon sun, and the direction of approach from most pedestrians and public transport users. Drop-offs have been provided separately for the Acute Services Building and the Ambulatory Building, and a benefit of the change to a two-way system would be the ability to efficiently drive between entrances and parking facilities etc without the need to drive around the blocks.
- G. Accessibility and accessible parking.**
The biggest barriers to best-practice accessibility on this site are the

busy road network surrounding the site, and the likely height difference between the footpath and the ground floor of the Acute Services Building. Any reduction in traffic to Cumberland Street, slowing of traffic to St Andrew Street, or other safety measures to the roading network will help mitigate the risks represented by the roading network around the site. All public entries and egress points to the buildings are expected to be ramped or provide suitable accessible solutions. Refer 6.7 below for car parking provisions.

- H. Clinical face of Acute Services Building to Castle Street.**
The public address to Cumberland Street instigates a public-private split through the Acute Services Building internally, which establishes the Castle Street façade as a clinical face (i.e. without public-facing activity). This planning strategy suggests that public access points from Castle Street are unlikely as they will interrupt clinical flows and separations in the ground floor. Access points on Castle Street are likely to be limited to Fire egress and potentially staff entry points.
- I. Hospital parking access.**
Parking access is provided off the main entry forecourt to provide a simple and clear route for visitors.
- J. Emergency access points and parking.**
Emergency access points for fire appliances and other emergency response vehicles will need to be defined in the Concept design phase.
- K. Maintenance access.**
The site masterplanning suggests use of the full width of the blocks to provide opportunities for light wells and to provide good health-planning flexibility across a narrow campus. Consequently, the opportunity for on-site service routes around the building are limited. It is expected that building maintenance to Castle Street, St Andrew Street, and parts of Cumberland Street façades will be carried out from roof-top, or terraces down, with extra-ordinary maintenance or replacement requiring access to footpath or roadway. Analysis of building maintenance activities should be tested to interrogate the need for on-site maintenance access vehicles (as well as emergency vehicle access as noted above). Set-backs from the boundary may affect the overall form and planning efficiency of the building.
- L. Drop-off and taxi ranks.**
Drop-off to the Acute Services Building and limited taxi-standing are provided in the formal forecourt off Cumberland Street. It is noted that parts of the access are likely to be ramped to manage the expected level difference between the street and the ground floor. Drop off to the Ambulatory Building is indicated on St Andrew Street. Further drop-off provision is possible integrated with the landscaping to the northern block courtyard.
- M. Bus stops.**
The bus network is expected to change with any modification of the current one-way system to a two-way system. Currently, the new bus hub is being constructed just to the west of the site on Great King Street, providing relatively good connectivity between bus hub and the front door to the hospital. Additional bus stops may be provided on Cumberland Street. Provision for bus stops or boundary set-backs to allow for bus stops should be considered in Concept Design in consultation with ORC and DCC and in response to the outcome of the ongoing road network review.

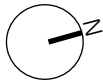
6.0 Indicative Preliminary Masterplan (C2)

Proposed Vehicular Movement



NEW HOSPITAL SITE
EXISTING SDHB OWNED SITE

0 50 100m



6.0 Indicative Preliminary Masterplan (C2)

Access: Public, Emergency & Services



6.0 Indicative Preliminary Masterplan (C2)

6.7 Car Parking

Car parking provision within the current project scope is limited to 250 spaces. However, a detailed car parking assessment will need to be carried out as part of any consenting requirement (as indicated in Section 7 below). Opportunities to provide car parking on site are likely to be limited by the building footprints required for hospital activity and it is anticipated that car parking provision may need to be supplemented with off-site solutions such as park and ride and third party car parking providers in the longer term, as later stages of the site masterplan are progressed and at grade parking areas are built upon.

The main feature of the current car parking strategy is the use of the Acute Services Building undercroft for hospital parking directly underneath the main building on site. This strategy has been prompted by the expectation that the ground floor level will be raised as part of flood risk mitigation, and the need to create a sub-floor undercroft to the ground floor for access to under-floor services and the likely need to access base-isolation in this zone. With additional excavation and the creation of a lower-ground floor, parking can be provided for public use, with excellent access to the Acute Services Building, and in close proximity to the Ambulatory building. Due to the flood risk, careful attention will need to be paid to detailing of any lifts that access this level. Security and safety issues will need to be considered in the design of this space. This car park will provide accessible parking linking to lift entry to the Acute Services Building.

Basement parking is possible below the Ambulatory building, however the ground level for the Ambulatory building is likely to be lower than the Acute Services Building, pushing any basement parking lower underground, increasing the cost of construction.

Additional accessible parking will likely need to be provided near the front door to the Ambulatory building, and any other distributed entry points.

Parking will also be needed for short-term ED usage at grade on the southern boundary of the site.

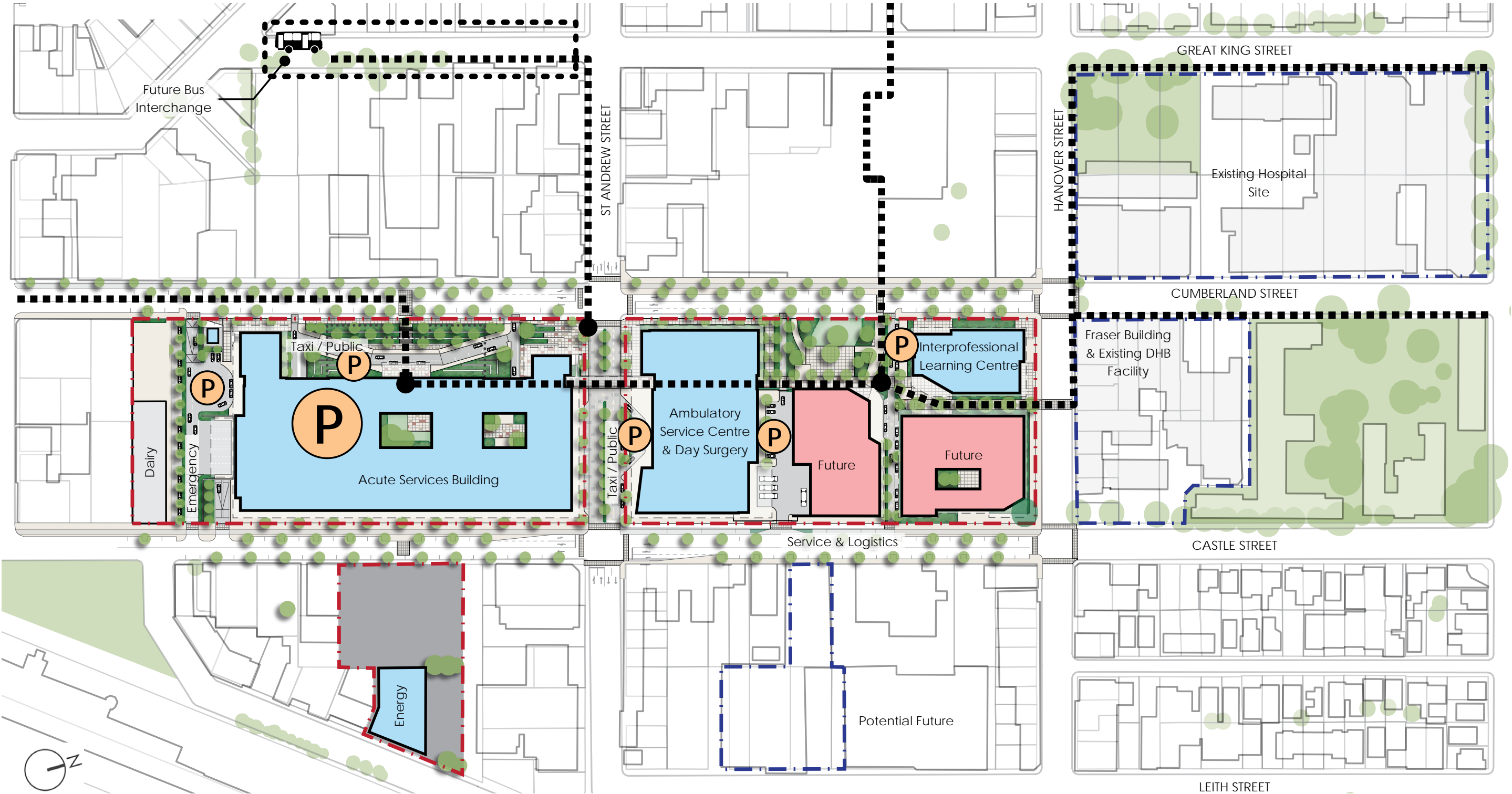
Limited service vehicle parking could be provided in the service yard adjacent to the loading docks.

At grade parking opportunities may be available at various locations around the site subject to final design.

On street parking is expected to be retained in some areas, though changes to the roading network, road calming, bus stops, new crossings, and instigation of a two-way system may reduce current capacity in the immediate vicinity of the hospital on Cumberland and Castle Streets. This will form part of any resource consenting parking strategy required.

6.0 Indicative Preliminary Masterplan (C2)

Connectivity: Pedestrian, Parking & Public Transport



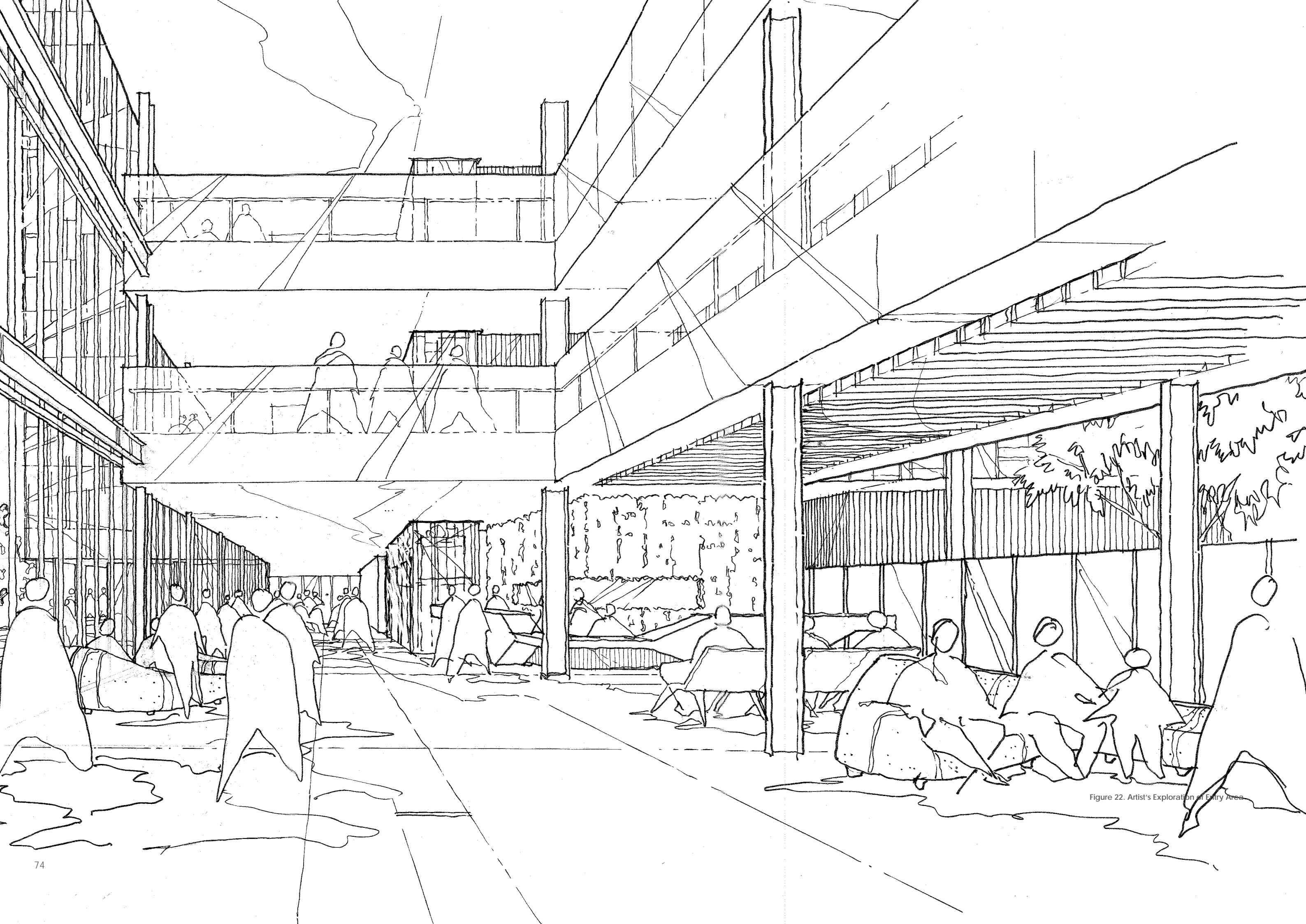


Figure 22. Artist's Exploration of Entry Area

6.0 Indicative Preliminary Masterplan (C2)

6.8 Urban Design

Aspects of the challenges for the design of this building in terms of Urban Design are discussed in 4.6 and 4.8 above. In addition to the description of bulk and location included in 6.2 above, other Urban Design features of the Preliminary Site Masterplan include:

- A. Creation of a formal landscaped entry plaza on the corner of Cumberland and St Andrew Streets on the southern block. This area is suggested as an extension of the public realm connecting to the key entry node of St Andrew and Cumberland Streets, relating to what is expected to be a busy pedestrian interchange at the intersection. Landscaping is intended to sensitively manage the difference in height from the street to the ground floor using ramp, steps and terraces, to create an entry threshold that is sunny, safe, welcoming, and accessible. This forecourt and the northern block greenspace must be developed as quality additions to the public realm.
- B. Consideration of St Andrew Street to a quiet street. Currently an important east-west connector, traffic slowing on this street to create a slow city street that is easier to navigate by foot would be advantageous. Consideration of a hospital plaza as a shared space (mixed traffic and pedestrians) has occurred, however the traffic volumes through the city, orientation of the street and the height of the new buildings on either side of the road are not thought to be especially conducive to the creation of an appealing public space. Trees and other landscaping features are recommended to reinforce the importance of this stretch of St Andrew Street as an important connector between the campus blocks. Particular attention should be paid to the detailing of the pedestrian crossing below the link. This crossing will provide an important connection between buildings, and between the Acute Services Building car park and the Ambulatory building.
- C. Creation of a public green space on the northern block. Access to quality green space has been identified by users and stakeholders as an important aspect of the new hospital design. Locating a greenspace in the centre of this block provides the opportunity for the greenspace to act as an outdoor amenity to the cluster of buildings located around the block including ambulatory services, and future health facilities. The greenspace is located to get good sunlight throughout the day but especially in the afternoon. The greenspace is flanked between two cross-block laneways to the north and south, and the circulation spine heading north-south, meaning that it has the potential to become a central landmark as part of the pedestrian network through the campus and the wider hospital precinct.
- D. Focussing the public-facing activities and entries to Cumberland prioritises pedestrian activity towards the city and provides the opportunity to make Cumberland a good urban street as part of the Dunedin central city precinct.

- E. Crime Prevention Through Environmental Design (CPTED) principles should be applied to the design resolution of the blocks to support safe ongoing use of the campus. Natural surveillance, access control, territorial reinforcement, lighting, ease of wayfinding and maintenance should be considered in the ongoing development of the site.
- F. The ability to activate edges is made more complex by the privacy requirements of the clinical activities within the building, however all opportunities to maximise street activation have been suggested in the masterplanning. These include: location of retail activities on prominent corners and street edges. Cafes at grade are located to be able to spill out onto hard landscaped areas, and retail will have good exposure to passing pedestrians as well as hospital users. The circulation spine is on an external façade where large areas are able to be exposed through large areas of glazing. This strategy provides animation of the building to the street, and exposes circulation activity where privacy concerns are less problematic than clinical areas. Stairwells are also located to the building edges where they can provide some visual relief from more enclosed areas. Castle Street presents a comparatively blank face to the street. The masterplan suggests an architectural approach to break up the apparent mass of the building and offer some variety of building treatment to the street. The level difference has been set back from the boundary to allow a landscaping solution to help mitigate the effects of a plinth to the building. Ventilation to the car parking areas can also help in this respect.
- G. The masterplan anticipates the Dairy Building remaining in situ. Detailed Design will consider this and other heritage aspects further but the masterplan anticipates the necessary removal of some heritage features currently on site gives the functional and structural requirements of new health facilities of the scale and nature required.
- H. A focus of the masterplanning has been around fostering an identity for the new hospital campus and seeding the establishment of a wider health precinct connecting the hospital to the University and wider health sciences facilities. The masterplan imagery suggests an architectural language that is both civic in its expression and lively but in a way that avoids an overtly attention-seeking address to the public. Reinforcing the importance of the building as a landmark in the city, visible from many areas through and around Dunedin, the building is intended to sit proudly and comfortably in the central city context. The importance of the hospital as a place-making landmark should not be overlooked, and the responsibility for creating a good urban area around this major piece of the built environment should not be taken lightly. The creation of an appropriate hospital precinct character is supported by the masterplan.
- I. The hospital project aspires to be a health-promoting facility for building users. Proximity to public transport, prioritisation of pedestrian activity, provision of pleasant staircases connecting floors of the building, offering access to quality external spaces all respond to this principle. Creating a public node at the northern block greenspace encourages public access to the buildings on site with a focus on wellness and education, providing opportunity for public awareness and

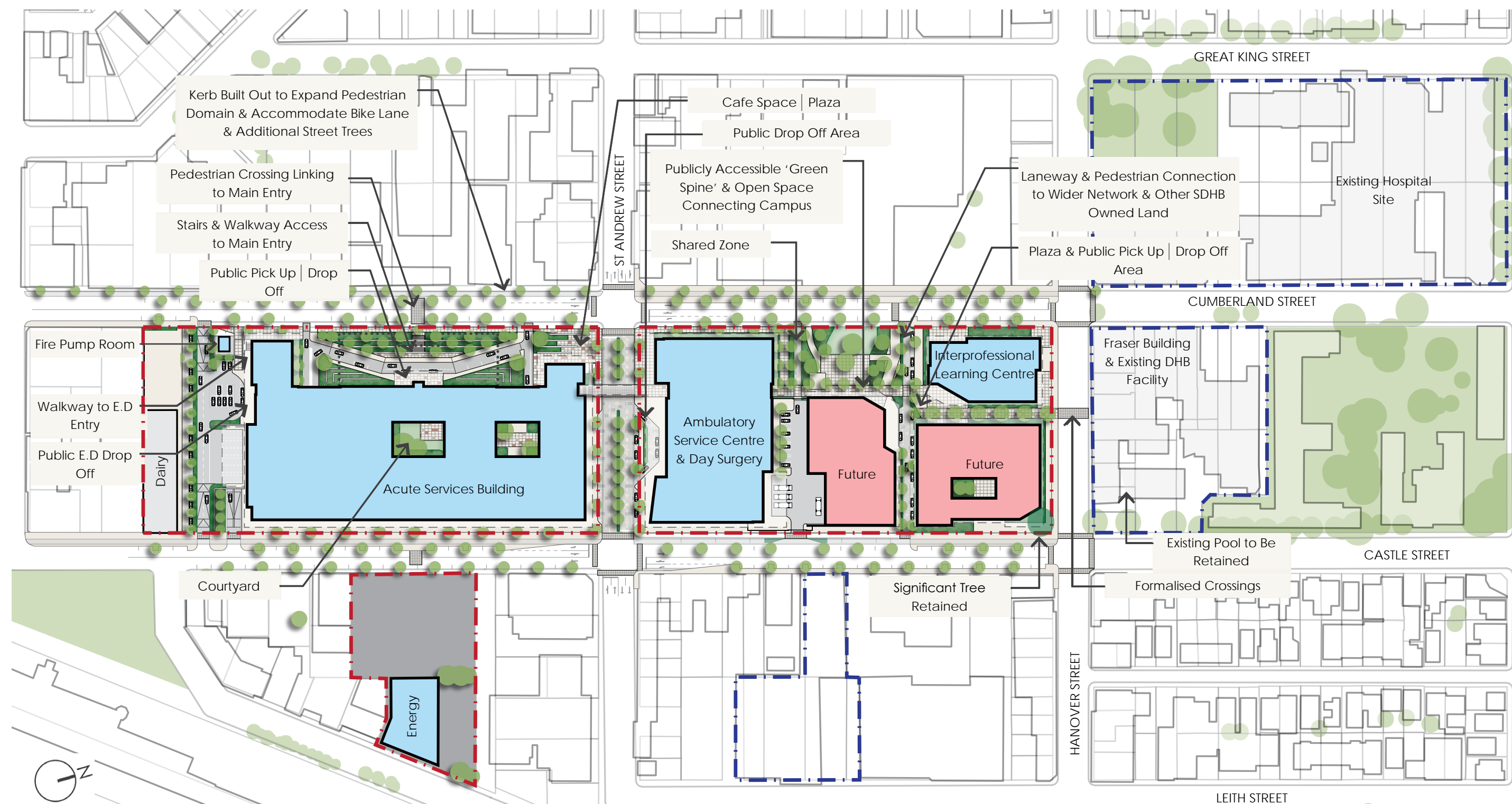
encouraging informal interaction with the most public of the hospital activities.

- J. Creation of the northern block as a porous campus promotes interactivity with the public, and interprofessional links with research and other Health Precinct users. The ease of movement through this block provides an alternative to the street for pedestrian activity between the hospital and the University, strengthening the connection between these institutions.
- K. The masterplan diagrams point to a campus plan which has legibility and simplicity, describing a clear campus development plan based on a flexible planning spine through the site.
- L. While the New Dunedin Hospital project fills most of the site, the masterplan allows for a certain amount of flexibility and adaptability in future development and for surrounding activities. It is hoped that diversity of use in the wider health precinct and adjacent streets that are complementary to the hospital activity, will be attracted over time as a result of the new hospital development.



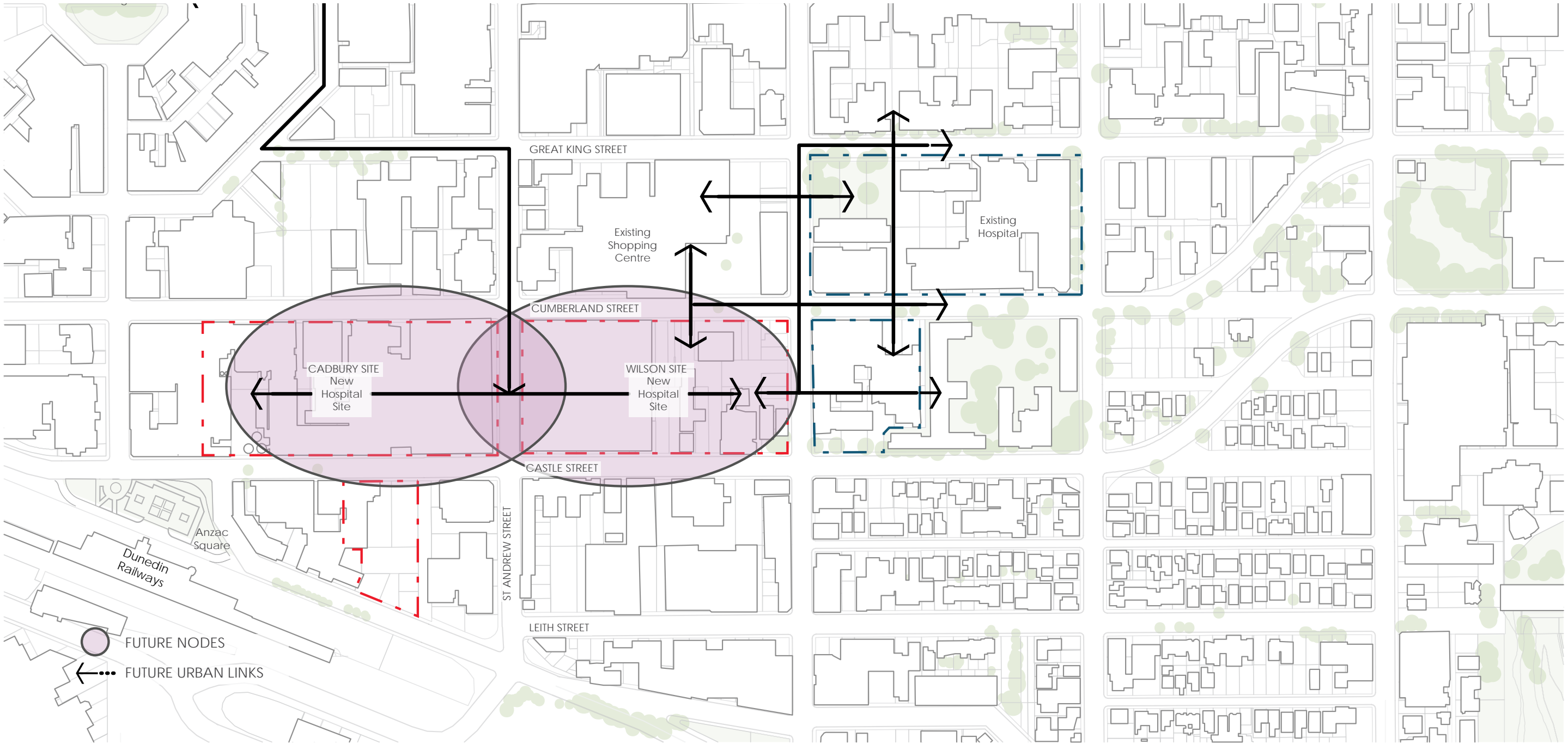
6.0 Indicative Preliminary Masterplan (C2)

Public Realm



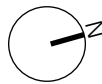
6.0 Indicative Preliminary Masterplan (C2)

Future Nodes & Urban Links



NEW HOSPITAL SITE
EXISTING SDHB OWNED SITE

0 50 100m



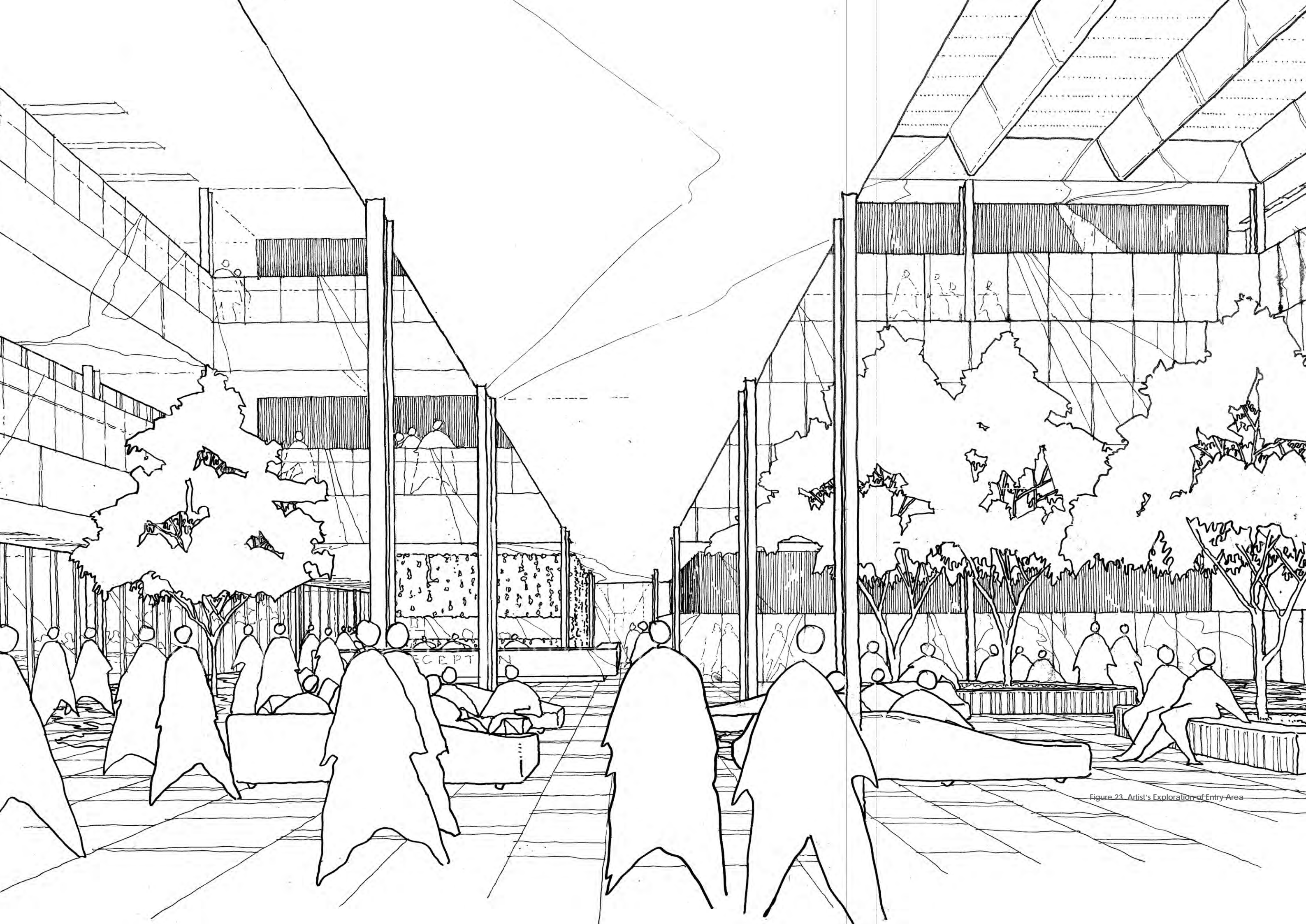


Figure 23. Artist's Exploration of Entry Area

6.0 Indicative Preliminary Masterplan (C2)

6.9 Sun Shading Studies

With the development of the masterplan, consideration was given to the bulk and massing of the future Acute Service Building on the Cadbury site and its relationship with nearby historic buildings and spaces, particularly, the Dunedin Railway Station and the landscaped garden forecourt, through to the recently renovated law courts buildings and Otago Daily Times building.

The tiered wedding cake effect of the building massing with higher floors being pulled away from Castle Street and the southern Inpatient tower be pulled westward lowering the south east corner of the site to just four levels all strongly assist in minimising the over-shading across these public spaces.

From spring through to autumn over shading is minimal and short-lived, whilst in the depth of winter the setting sun is blocked by Maori Hill and at this conceptual level the new Acute Services Building does not significantly add to the over-shading.

Sun & Shading All Day Composite

SUMMER SOLSTICE



SPRING & AUTUMN EQUINOX



WINTER SOLSTICE



- ALL DAY SUN
- 80% SUN (20% SHADOW)
- 60% SUN (40% SHADOW)
- 40% SUN (60% SHADOW)
- 20% SUN (80% SHADOW)
- ALL DAY SHADE



7.0 Ongoing Considerations

7.1 Activity Data Analysis

As part of the Preliminary Site Masterplanning, a review of the SDHB activity data was carried out to validate a changed delivery model for day surgery as a result of the split of hospital activities across St Andrew Street and a direction to accelerate delivery for Day Surgical services. The data used for this review was more recent and improved quality data than that used for previous activity analysis in the IBC and briefing processes. The new data modelling identified reduced demand requirement from that assumed for day surgical activities in earlier analysis, which led to a reduction in area requirement in the Schedule of Accommodation. It is recommended that similar analysis be undertaken of the revised data for other activities with the hope that further area savings can be made. Any such savings may provide an opportunity to reduce the floorplate for the Acute Services Building.

7.2 District Energy Scheme

Currently, a study is being undertaken to explore the establishment of a new District Energy Scheme (DES) to provide energy to the new hospital, as well as other stakeholders around Dunedin such as the University of Otago, and Dunedin City Council. If the DES is viable and agreed as the energy solution for the new hospital, it is expected that the Energy Centre included in the project scope of work will not be required in the same configuration. The location and distribution network for new DES plant has not been established, and the proposed Energy Centre site may provide a suitable location as part of the DES network. Potentially the building footprint shown for the Energy Centre will not be needed, providing additional area for fleet car parking and future hospital support facilities.

7.3 Traffic & Parking Study

As described above, an understanding of the ongoing review of the roading network around the site is critical for ongoing site planning. The Preliminary Site Masterplan takes into account a potential change from the one-way system to a two-way system, and the slowing of traffic on St Andrew Street. If these initiatives are not implemented, the site masterplan principles are still appropriate, but access will need to be adapted accordingly.

Furthermore, detailed analysis of patient numbers, workforce, and visitor activities is required to better inform vehicle movement studies and parking requirements. A detailed Traffic Impact Assessment will be required for Resource Consenting.

Detailed traffic engineering inputs around access points, and informed by more detailed inputs into servicing strategies and service traffic management, are likely to impact the design development of the site through Concept Design.

7.4 Geotechnical Discovery

Refer Appendix A.1.03 for Geo-technical and structural reports. The Preliminary Site Masterplan was informed by desktop studies by geo-technical and structural engineers. These studies highlighted a large gap in available knowledge around the geo-technical conditions for the central area of the site on either side of St Andrew Street. The Ministry of Health is in the process of procuring additional geo-technical information on the site that has not been available for the completion of the Preliminary Site Masterplanning. The difference in ground conditions between the southern end of the southern site and the northern end of the northern site imply significant variability within the area. Scenarios for how that variability may occur will inform the foundation strategy. The current preferred masterplan is based on a conservative view of the likely ground conditions, but the uncertainty is acknowledged to be significant. The outcome of the additional geo-technical studies will inform whether the current masterplan is viable and whether the contingency masterplan should be reconsidered.

7.5 Hydrology

Refer Appendix A.1.06 for Hydrology Report. The Preliminary Site Masterplan was informed by a high-level hydrology report to define likely flood risks for the site. This report indicated a considerable risk and recommended a raised ground floor level for critical activities and infrastructure as a result, which has been adopted in the masterplan for the Acute Services Building. More detailed modelling will be required to provide the requisite certainty in setting the appropriate level for the new hospital. Better data and modelling may suggest a reduction in the level difference, which would improve the accessibility of the hospital and the onerous requirements for ramp access to entries for pedestrians and vehicles. It is noted that a reduction in the level difference will push the parking level further down, which will add cost to the in-ground works.

7.6 Helicopter Access, Flight Paths & Consenting

Detailed study of changes to the existing helicopter flight path associated with the new hospital siting should be considered early in Concept Design phase. Impact on neighbours and flight path rules will need to be considered as part of the Resource Consent and aviation consenting. The working assumption of flexibility of helicopter pad location will need to be validated by an aviation consultant.

7.7 Reconciliation of Functional Briefs

During the masterplanning phase a range of service adjustment occurred specifically around:

- The Standalone Ambulatory Service Centre and the early provision of Day Surgery.
- Professional Development Unit and its integration into the Interprofessional Learning Centre.
- Primary Birthing and its potential location.

These adjustments have been captured within following updated documents which are attached within the appendices.

- Schedule of Accommodation.
- Clinical Services Statement.
- Updated Project Brief.
- Updated Strategic Brief.
- Updated functional briefs.
 - Peri-operative services overarching.
 - Main Operating Suite.
 - Day Surgical and Procedural Unit.
 - Medical Imaging.
 - Interprofessional Learning Centre (Functional Brief currently underway).