Environmental Impact Statement

New Tweed Valley Hospital – Stage 2 (Main Works and Operation)

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Glossary of terms and acronyms

Term	*Description/Definition*
Aboriginal Heritage Information Management System (AHIMS)	This holds information about Aboriginal objects, Aboriginal places with special significance with respect to Aboriginal culture, and archaeological reports.
Acid Sulphate Soils (ASS)	Naturally acid clays, mud and other sediments usually found in swamps and estuaries. They may become extremely acidic when drained and exposed to oxygen and may produce acidic leachate and runoff that can pollute receiving waters and liberate toxins. ASS are classified as materials which are above the groundwater, are undergoing oxidation and have a pH of less than 4.0.
Amenity	The degree of pleasantness of an area or place.
Annual average daily traffic (AADT)	The total traffic in both directions at a specified location calculated from mechanically obtained axle counts.
Annual Exceedance Probability (AEP)	The chance of a flood of a given size (or larger) occurring in any one year, usually expressed as a percentage. For example, if a peak flood discharge of 500 m^3/s has an AEP of 5%, it means that there is a 5% chance (i.e. a 1 in 20 chance) of a peak discharge of 500 m^3/s (or larger) occurring in any one year (see also Average Recurrence Interval).
Archaeological site	A site with any material evidence of past Aboriginal activity that remains within a context or place that can be reliably related to that activity.
Australian height datum (AHD)	The standard reference level used to express the relative height of various features. A height given in metres AHD is essentially the height above sea level.
Average Recurrence Interval (ARI)	The long-term average number of years between the occurrence of a flood as big as (or larger than) the selected event. For example, floods with a discharge as great as (or greater than) the 20-year ARI design flood will occur on average once every 20 years. ARI is another way of expressing the likelihood of occurrence of a flood event (see also Annual Exceedance Probability).
BC Act	NSW *Biodiversity Conservation Act 2016*
Borehole	A hole produced in the ground by drilling for the investigation and assessment of soil and rock profiles.
Catchment	The area drained by a stream or body of water, or the area of land from which water is collected.
CIV	Capital investment value
Concept Proposal	Initial functional layout of a concept, such as a building, to provide a level of understanding to later establish detailed design parameters.
Concept Development Application	A development application that sets out concept proposals for the development of a site, and for which detailed proposals for the site or for separate parts of the site are to be the subject of a subsequent development application or applications.
CPTED	Crime Prevention Through Environmental Design Principles
Culvert	An enclosed channel for conveying a stream below a road
dBA	Decibels using the A-weighted scale. Decibels are used to measure sound levels. dBA measures loudness according to the human perception of sound.
Decibel	Decibels are used to measure sound levels

Term	Description/Definition
Earthworks	The process of extracting, moving and depositing earth during construction.
Ecologically sustainable development (ESD)	Using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained and the total quality of life, now and in the future, can be increased. ESD incorporates four key principles: ■ the precautionary principle ■ inter-generational equity ■ conservation of biological diversity and ecological integrity ■ improved valuation and pricing of environmental resources.
EIS	Environmental impact statement
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)
EPI	Environmental Planning Instrument
EPL	Environmental Protection Licence issued under the POEO Act
Flood immunity	Relates to the level at which a particular structure would be clear of a certain flood event.
FSR	Floor Space Ratio
Geological unit	A volume of rock of identifiable origin and age range that is readily mapped, such as a series of inter-bedded sandstone and claystone beds or a body of granite.
Geotechnical	Application of the methods of engineering and science to construction that involves natural soil and rock materials.
Grade/gradient	Slope or steepness
Habitat	The place where an organism lives. Habitats are measurable and can be described by their flora and physical components.
Health and Education Campus	A site that allows health and education providers to collaborate, share resources and grow to their mutual benefit and benefit the community.
HI	New South Wales Health Infrastructure
HV	Heavy vehicle
IPU	In Patient Unit
KLP	Kingscliff Locality Plan (exhibition draft)
LALC	Local Aboriginal Land Council
LEP	Local environmental plan
LGA	Local government area
Longitudinal section or 'long section'	The section drawn along the length of the route showing vertical elevation.
NCRP 2036	North Coast Regional Plan 2036
OEH	Office of Environment and Heritage
POEO Act	*Protection of the Environment Operations Act 1997*
Project	Development of a new hospital on a greenfield site in the Tweed, referred to as the Tweed Valley Hospital.
Project Site	The location of the Project, on land at 771 Cudgen Road, Cudgen, legally described as Lot 11 DP 1246853.
SEPP	State Environmental Planning Policy

Term	Description/Definition
SRD SEPP	State Environmental Planning Policy (State and Regional Development) 2011
SSD	State Significant Development
Threatened ecological community (TEC)	An ecological community identified by relevant legislation as having endangered status under the NSW *Biodiversity Conservation Act 2016* or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999.*
Threatened species	Animals or plants listed as endangered or vulnerable under the NSW *Biodiversity Conservation Act 2016* or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999.*
TTH	The (existing) Tweed Hospital at 14-34 Powell Street (Lot 628 DP755740), Tweed Heads on the far north coast of NSW.

Statement of Validity

Submission of Environmental Assessment (Environmental Impact Statement)

Prepared under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act)

Environmental Impact Statement prepared by

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In respect of

Applicant and Land Details

Proponent	Health Infrastructure
Subject Site	771 Cudgen Road, Cudgen NSW
Lot and DP	Lot 11 DP 1246853
Project Summary	New Tweed Valley Hospital – Stage 2 (Main Works and Operation)

Environmental Assessment

Environmental Impact Statement (EIS) pursuant to Part 4 of the EP&A Act.

Declaration

I certify that I have prepared the contents of the EIS in accordance with the requirements of the *Environmental Planning and Assessment Act 1979* and Regulation, the EIS contains all available information that is relevant to the environmental assessment of the activity, and that, to the best of my knowledge, the information contained in this report is not false or misleading.

Signature	.....	.....
Name	SIMON WATERWORTH	JACOB SICKINGER
Date	24 September 2019	

Executive Summary

Purpose of Report

This Environmental Impact Statement (EIS) informs a State Significant Development (SSD) application under Division 4.7 of Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). It has been prepared for Health Infrastructure (HI), to be lodged with the Stage 2 SSD application for the Main Works and Operation for the new Tweed Valley Hospital. Consent for the Concept Proposal and Stage 1 Early and Enabling Works (SSD 9575) was granted on 11 June 2019. The Stage 2 application comprises part of a staged development application (DA) under Section 4.22 of the EP&A Act.

A request for the issue of Secretary's Environmental Assessment Requirements (SEARs) was made on 21 June 2019. The SEARs were issued on 18 July 2019. The EIS addresses the SEARs and relevant SSD 9575 conditions of consent, assesses the potential impacts of Stage 2 of the Project, and outlines how the development relates to the local, State and Federal statutory environmental assessment framework. The report also sets out the commitments made by HI to minimise and manage potential impacts arising from the development.

Background and Overview of the Project

The Tweed Valley Hospital Project broadly consists of:

- Delivery of the Tweed Valley Hospital; a new Level 5 major regional referral hospital to provide the health services required to meet the needs of the growing population of the Tweed-Byron region (in conjunction with the other hospitals and community health facilities across the region)
- Delivery of the supporting infrastructure required for the Tweed Valley Hospital, including green space and other amenities, roads and car parking, external road upgrades and connections, utilities connections, and other supporting infrastructure.

Concept Proposal and Stage 1 Early and Enabling Works

The Concept Proposal and Stage 1 Early and Enabling Works were approved for the new Tweed Valley Hospital (SSD 9575) by the Minister for Planning (this portfolio is now known as the Minister for Planning and Public Spaces) on 11 June 2019. All documents relating to the Concept Proposal and Stage 1 Early and Enabling Works can be found on the major projects website of Department of Planning, Industry and Environment (DPIE) at https://www.planningportal.nsw.gov.au/major-projects/project/10756.

Stage 2 Hospital Delivery - Main Works and Operation

This SSD application applies to Stage 2 and seeks consent for the Main Works and Operation of the Tweed Valley Hospital, including:

- **Construction of Main Hospital Building**
  - Main entry and retail area
  - Administration
  - Community health
  - In-Patient units
  - Outpatient clinics and day only units
  - Child and Adolescent Services
  - Intensive Care Unit
  - Mental Health Unit
  - Maternity Unit and Birthing Suites
  - Renal Dialysis
  - Pathology
  - Pharmacy
  - Radiation Oncology as part of integrated Cancer Care
  - Emergency Department
  - Perioperative Services
  - Interventional Cardiology
  - Medical Imaging
  - Mortuary
  - Education, Training, Research
  - Back of House services
  - Rooftop Helipad
- **Construction of Support Buildings, referred to as the 'Health Hub', containing:**
  - Oral Health
  - Community Health
  - Aboriginal Health
  - Administration
  - Education, Training and Research
- **Internal roads and car parking, including multi-deck parking for staff, patients and visitors;**
- **Construction of a temporary building for the 'Tweed Valley Skills Centre'**
- **External road infrastructure upgrades and main site access**
- **Environmental and wetland rehabilitation, including rehabilitation of existing farm dam as outlined in the Biodiversity Development Assessment Report (BDAR)**
- **Site landscaping**
- **Signage**
- **Utility and service works.**

Stage 2 of the Tweed Valley Hospital will provide for a total of up to 545 hospital beds/treatment spaces (comprising 48 day beds, 451 in patient unit (IPU) beds, and 46 emergency treatment spaces). This number (545) is inclusive of 56 additional IPU beds that are subject to demand and funding.

There are additional components and changes identified in the Stage 2 SSD application that do not form part of the original Concept Proposal. As such, a modification to the approved Concept Proposal (SSD consent 9575) is also sought as part of a separate but concurrent application. These proposed modifications to the Concept Proposal are addressed in more detail in the separate modification application and associated Modification Report.

Overall, subject to modification of the approved Concept Proposal, the Stage 2 SSD application as outlined in this EIS would be generally consistent with the Concept Proposal.

The Project Site

The Project Site is a single lot located at 771 Cudgen Road, Cudgen NSW. It is legally described as Lot 11 DP 1246853 and has an area of 19.38 ha.

The Project Site is owned by the Health Administration Corporation (HAC) and this SSD application is made by HAC's Health Infrastructure (HI) division.

The Project Site fronts Cudgen Road and is immediately west of the Kingscliff urban area. It has proximal access to Tweed Coast Road, which connects to the Pacific Motorway (M1) in the north. The Site is approximately 13.5 km south of Tweed Heads. The Project Site is primarily zoned SP2 Infrastructure (Health Services Facility). Environmental areas, including mapped Coastal Wetlands, occur along its northern fringe. The surrounding land use context comprises a mix of urban, rural/ agricultural and environmental areas.

Planning Approval Pathway

As the Project is for a hospital and has an estimated capital investment value (CIV) of well over $30 million, it is classified as SSD.

The development is permissible with consent in the SP2 Infrastructure Zone (Health Services Facility).

Environmental and wetland rehabilitation works (as part of the Project), including those that extend into the 7(I) Environmental Protection zone and mapped Coastal Wetland under the State Environmental Planning Policy (Coastal Management) 2018, are permissible with consent and are assessed in this EIS.

Environmental Impacts and Mitigation Measures

The potential impacts of the proposed Stage 2 development are assessed throughout this EIS and the appended specialist reports. Key matters include: built form and urban design, visual impact, noise and vibration, traffic and transport, stormwater and adjacent environmentally sensitive areas. While some impacts may occur locally, they can be effectively minimised, managed or mitigated. Based on the overall design response and assessment undertaken, no significant adverse impacts are expected, and the Project will result in a net benefit for the local and regional community and economy.

Justification and Conclusion

The Project will benefit patients, carers, staff, other stakeholders and the wider Tweed-Byron community, delivering improved, greater capacity, and high-quality healthcare in a pleasant setting and contemporary and functional built form.

The Project Site is suitable, the development is permissible, and the Project is in the public interest. The potential impacts are not expected to be significant and can be effectively minimised and managed.

On balance the Project will result in a net social and economic benefit. Given this benefit and the planning merits of the application, the Stage 2 of the Project warrants approval by the Minister for Planning and Public Spaces or delegate.

1. Introduction

1.1 Purpose and Structure of the Report

This Environmental Impact Statement (EIS) is submitted to the Department of Planning, Industry and Environment (DPIE) in support of an application for State Significant Development (SSD) for Stage 2 of the Tweed Valley Hospital. The application seeks consent for the Main Works and Operation of the Tweed Valley Hospital.

The EIS has been prepared by GeoLINK on behalf of the proponent Health Infrastructure NSW (HI). It is based on the proposed plans at **Appendix B** and supporting technical and specialist information appended to this EIS (see Table of Contents).

Section 1 provides an overview of the proposal, the background/context and need for the Project. **Section 2** of this report identifies the subject site and its regional and local context, describes the physical characteristics and provides an analysis of the land. **Section 3** provides a detailed description of the proposal. **Section 4** gives an overview of agency, community and stakeholder consultation in relation to the Project. **Section 5** outlines the statutory planning approval pathway and environmental assessment undertaken for Stage 2 of the Project**.** An Environmental Risk Assessment is included in **Section 6**. A summary of recommended environmental management and mitigation measures are contained in **Section 7**. **Section 8** contains a conclusion to the EIS and provides justification for Stage 2 of the Project.

1.2 Background

The existing Tweed Hospital (TTH) is located at 14-34 Powell Street (Lot 628 DP755740), Tweed Heads on the far north coast of NSW. TTH is a Level 5 Major Non-Metropolitan Principal Referral Hospital and is a facility of the Northern NSW Local Health District (NNSW LHD). TTH catchment includes Tweed and Byron Local Government Areas (LGAs). Murwillumbah District Hospital, a Level 3 hospital, is closely networked to TTH (24.5 km from TTH), as is Byron Central Hospital (53.2 km from TTH), which is also a Level 3 hospital. The projected health service demand within the Tweed and Byron LGAs is significant, and TTH is currently at capacity with several major constraints affecting the development of new facilities on the TTH site.

On 13 June 2017, the NSW Government announced $534 million for a new state-of-the-art hospital on a greenfield site, including an expanded emergency department (ED), inpatient care and enhanced surgical and outpatient services. New services, including interventional cardiology and radiotherapy, will also be provided in response to clinical service planning priorities. The 2018-19 State Budget confirmed a $582 million investment in health for the Tweed-Byron LGAs, which will deliver the Tweed Valley Hospital (TVH) as well as interim upgrades at TTH to help meet community needs until services transfer to the new hospital.

On 11 June 2019 approval was granted for the Concept Proposal and Stage 1 Early and Enabling Works for the new Tweed Valley Hospital (SSD 9575) located at 771 Cudgen Road, Cudgen (Lot 11 DP1246853).

This EIS has been prepared to assist in the consideration of the Stage 2 SSD application for the Tweed Valley Hospital which will be assessed under Part 4 Division 4.7 of the EP&A Act. This, along with supporting documentation, will provide a clear description of the Stage 2 application.

The TVH Project broadly consists of:

- Delivery of the Tweed Valley Hospital; a new Level 5 major regional referral hospital to provide the health services required to meet the needs of the growing population of the Tweed-Byron region (in conjunction with the other hospitals and community health facilities across the region)
- Delivery of the supporting infrastructure required for the Tweed Valley Hospital, including green space and other amenities, roads and car parking, external road upgrades and connections, utilities connections, and other supporting infrastructure.

1.2.1 Concept Proposal and Stage 1 Early and Enabling Works

All documents relating to the Tweed Valley Hospital Concept Proposal and Stage 1 Early and Enabling Works (SSD 9575) are available on the major project website of DPIE at https://www.planningportal.nsw.gov.au/major-projects/project/10756. Consent was granted for the following:

A Concept Proposal comprising:

- *the maximum building envelope for a nine-storey hospital with helipad and plant rooms on the rooftop*
- *the maximum building envelope for a building for support services (health hub)*
- *the maximum gross floor area of 65,000 square metres for the hospital and health hub building on the site*
- *the site layout, internal roads, site access arrangements and car parking provisions*
- *a landscape masterplan, concept public domain treatments and stormwater strategy*
- *Tweed Coast Road and Cudgen Road intersection upgrade works.*

Concurrent Stage 1 Early and Enabling Works comprising:

- *site preparation and bulk earthworks to establish site levels*
- *identification of the construction compound with temporary car parking areas, laydowns and internal roads*
- *new vehicular access points from Cudgen Road*
- *improvements to the roundabout intersection of Turnock Street and Cudgen Road*
- *utility augmentation and connection of permanent services for the future hospital*
- *construction of retaining walls*
- *stormwater drainage works and soil and water management measures*
- *site remediation works*
- *piling works associated with the future hospital.*

The Stage 1 Early and Enabling Works have commenced.

1.2.2 Stage 2 Hospital Main Works and Operation and minor modifications to the Concept Plan

This SSD application seeks consent for Stage 2 of the Tweed Valley Hospital (Main Works and Operation) as described in **Section 3** of this EIS.

A modification to the Concept Proposal (SSD 9575) is also sought as part of a concurrent application to allow a number of changes and refinements (summarised in **Section 3**).

Stage 2 would continue on from and integrate with the Stage 1 Works to deliver the Main Works and Operation of the Tweed Valley Hospital, providing much-needed contemporary health service facilities for the surrounding region.

The Stage 2 application is to be assessed by DPIE and determined by the Minister for Planning and Public Spaces or delegate, under Part 4 Division 4.7 of the EP&A Act.

1.2.3 Potential Future Expansion

Any subsequent stages, future expansion or modifications to the proposal would be subject to separate applications as required.

1.3 Need for the Project

As outlined in the Concept Proposal and Stage 1 Works EIS, significant projected demand for healthcare services is driving the case for change in the Tweed-Byron LGAs. NNSW LHD is planning the clinical services for the future of the Tweed Valley, through provision of a Service Statement. During 2018, a comprehensive consultation process has been undertaken with senior clinicians and staff at TTH and across the Tweed-Byron network, to inform the development of the 2018 Service Statement. The 2018 Service Statement outlines the health service needs for the Tweed Valley to 2031/32 and informs the planning for the new Tweed Valley Hospital.

The Concept Proposal and Stage 1 Works EIS clearly outlined the strong rationale and need for the Project. In summary, the following factors are driving the need for the Project that will deliver much needed, improved, expanded and contemporary health services and facilities for the Tweed-Byron region:

- **Population Growth** - Northern NSW is one of the fastest growing regions in the State, with Tweed and Byron LGAs the fastest growing areas in NNSW LHD.
- **Demographic Trends** - A number of significant demographic trends are occurring in the catchment including an aging population, a high proportion of children aged 0-14 years, socio-economic disadvantage, continuing high rates of lifestyle risk factors, the changing nature of illness and the burden of chronic disease, and a higher percentage of Aboriginal people within Tweed LGA compared to the State.
- **Self-sufficiency** - There are significant gaps between the demand for healthcare services and the supply, accessibility and availability of services locally within the Tweed Valley. Investment in new services and new models of care will increase self-sufficiency and reduce the cross-border flows from Queensland. The new services at the Tweed Valley Hospital will mean that by 2031 over 5000 patients every year will be able to remain at Tweed Valley Hospital to receive life-saving treatments, rather than travel outside of the region.
- **New Models of Care** - Continual examination and renewal of models of care is required to maintain optimal service delivery and performance and to meet growing community expectations for access to high quality and safe health services locally. This requires facilities substantially compliant with the Australasian Health Facility Guidelines (AusHFGs) to support service provision consistent with the National Safety and Quality HealthCare Standards.
- **Service demand** – The service demand identified in the 2018 Service Statement means that the capacity of existing hospital facilities will be exceeded, and completion of the Project must take place as soon as possible. Any delay will require reliance on out-dated hospital facilities operating beyond their capacity leaving the demand for relevant hospital services unmet.

- **Long-term investment** - Hospitals must be planned to be around for the long-term. The Tweed-Byron population requires health services that accommodate current and growing demand, with a long-term plan for how expansion will occur in future, to meet the service demand to 2031 and beyond. The Project and Masterplan for the Hospital Campus on the Project Site provides this.
- **Constraints of TTH** – TTH does not provide equitable access for the Tweed-Byron population. Flooding is a key risk and TTH sits below the Probable Maximum Flood (PMF) level and retention of access to TTH during a major flooding event is a key issue. There is no alternative road access for the southern coastal population when the M1 and Tweed Coast Road are impacted by flooding, which means that the population south of the Tweed River cannot access acute hospital services locally (where those north of the Tweed River have access to acute services in Southern Queensland). TTH is at capacity and undersized compared to the AusHFGs. Redevelopment of TTH has been deemed to not be feasible.

1.4 Project Objectives

Taking into consideration the health service demand as well as the existing constraints of service delivery at TTH, the objectives of the Project are to:

- Deliver the service capacity needed now and into the future for a growing and ageing population, well placed to provide equitable access to the broader Tweed-Byron catchment.
- Improve self-sufficiency and minimise the complexity and costs associated with cross-border resident flows to services located in Queensland.
- Support further development of speciality and sub-specialty clinical services.
- Support contemporary models of care to improve health outcomes.
- Deliver patient-centred healthcare supported by an environment that fosters integrated service delivery.
- Improve utilisation of the workforce and develop an environment that will attract and retain a skilled and motivated workforce.
- Support development of increased clinical capability through education, training and research opportunities.
- Provide a tiered network clinical service model to support Byron Central Hospital and Murwillumbah District Hospital and community health and other out-of-hospital services across the region.

Approval of Stage 2 will enable the new Tweed Valley Hospital to be built.

1.5 Analysis of Alternatives

The site selection process and a comprehensive analysis of alternatives was detailed in the Concept Proposal and Stage 1 EIS. Stage 2 would see the continuation of development at the Project Site and realisation of the Project objectives.

1.6 Planning and Environmental Approvals

1.6.1 Permissibility Overview

The Project Site is located within the Tweed Shire LGA and planning controls are contained in three Local Environmental Plans (LEPs) that apply to different parts of the LGA. Apart from a small area along the north boundary being a deferred matter and still subject to the TLEP 2000, the site is zoned SP2 Infrastructure (Health Services Facility) and subject to the Tweed Local Environmental Plan (TLEP) 2014.

No height limits, floor space ratios and minimum lot size controls apply.

As outlined in **Section 5.1.1** the proposed hospital and associated infrastructure and works are permissible with consent.

1.6.2 State Significant Development (SSD)

The Project is a 'hospital' with a capital investment value greater than $30 million. Accordingly, pursuant to clause 14 of Schedule 1 of the State Environmental Planning Policy (State and Regional Development) 2011 (SRD SEPP), the Project is SSD and requires the preparation of an EIS.

In accordance with Section 4.12(8) of the EP&A Act and Schedule 2 of the Regulations, the Secretary's Environmental Assessment Requirements (SEARs) for the preparation of the EIS were issued on 18 July 2019. A copy of these is attached as **Appendix A**.

Appendix A includes a table that outlines where the SEARs have been addressed in the EIS and the supporting specialist assessments (contained in the other appendices).

1.7 Conditions of Consent (SSD 9575) to be addressed in Future Applications

SSD 9575 was approved subject to conditions, including those that need to be addressed in future development applications (Schedule 2 Part B of SSD 9575). The consent documents, including conditions, can be accessed on the DPIE major projects website at the following web address: https://www.planningportal.nsw.gov.au/major-projects/project/10756.

Appendix A also includes a table that outlines where the relevant conditions of consent applicable to Stage 2 have been addressed in both the EIS and supporting appendices (specialist reports).

1.8 The Proponent and Project Team

This EIS has been prepared for HI with the assistance of a comprehensive project team. The Project team and their responsibilities are outlined in the **Table 1.1** below.

Table 1.1 Project Team and Responsibilities

Name	*Role/Responsibility*
Health Infrastructure (HI)	Proponent and Project Director
TSA Management	Project Manager
STH + Bates Smart	Architects
Turf Design	Landscape Architects
GeoLINK	Town Planner and Bush Fire Consultant
Blackett Maguire Goldsmith	BCA and DDA Consultant
Elton	Consultation
Lendlease	Principal Contractor for Early and Enabling Works Contamination Geotech Surveyor
Robert Bird Group	Civil and Structural Engineers
LCI	Electrical, ICT, Security, Mechanical Engineering, ESD
JHA	Acoustics and Services
Altus Group	Cost Manager
Urbanite	Wayfinding and signage
ARC	Agronomist
Urbaine	Visual Impact Consultant
Avipro	Aviation Consultant
B&P Surveys	Surveyor
Bitzios	Traffic Engineers
BMT	Flooding Consultant
Greencap	Ecological Consultant
SMEC	Hydrology and wetland ecology
Niche	Heritage and Archaeology
SGS Economics & Planning	Social and Economic Assessment
Tim Fitzroy and Associates	Rural Land Use Conflict
OCTIEF and Cavvanba	Contamination
JBS&G	Accredited Site Auditor
Northern NSW Local Health District	Health Service Planning

2. The Project Site and Locality

2.1 Cadastral Description

The Project Site is a single lot located at 771 Cudgen Road, Cudgen NSW. It is legally described as Lot 11 DP 1246853 and has an area of 19.38 ha. **Illustration 2.1** is a recent aerial image of the Project Site and shows the lot boundary and an overlay of the development footprint.

2.2 Land Ownership

The Project Site is owned by the Health Administration Corporation (HAC) and this SSD application is made by HAC's Health Infrastructure (HI) division.

2.3 Site Context

The Project Site is located within the Tweed Shire Council (TSC) LGA.

The Project Site fronts Cudgen Road immediately west of the Kingscliff urban area. It has proximal access to Tweed Coast Road, which connects to the Pacific Motorway (M1) in the north. The Project Site is approximately 13.5 km south of Tweed Heads and is situated on the immediate urban periphery of Kingscliff.

Other land uses in proximity to the Project Site include urban, rural/agricultural and environmental uses/zones. To the east is the main Kingscliff urban and residential area. To the north is vegetated land, including environmental protection areas and mapped Coastal Wetlands (see **Illustration 2.4**). Beyond this, further to the north, is existing residential development. To the south, on the opposite side of Cudgen Road, is an educational facility (Kingscliff TAFE). To the south-west and west is fallow rural land and active farmland. The village of Cudgen is located west of the Project Site, on the western side of Tweed Coast Road.

Immediately to the north of the environmental area is land identified in the draft Kingscliff Locality Plan (KLP), as having major development potential, including a Business and Knowledge Precinct adjacent to the M1 and potential for residential development of around 1500 dwellings.

Illustration 2.2 shows the approximate location of the Project Site in the context of Tweed Heads and Kingscliff. **Plates 2.1 - 2.8** are photographs of the Project Site and surrounds.

Plate 2.1 Looking south across plateau to boundary with Cudgen Road

Plate 2.2 Looking north across site plateau

Plate 2.3 Looking north to environmental area

Plate 2.4 Looking east across lower areas of the site and existing sediment basin

Plate 2.5 Looking north to environmental area, over existing sediment basin

Plate 2.6 Looking east (to Kingscliff) along Cudgen Road site frontage

Plate 2.7 Looking west along Cudgen Road site frontage

Plate 2.8 Outlook from elevated area of Kingscliff (near water towers) toward Project Site

2.4 Project Site History and Current Use

The Project Site was previously used for small-scale agricultural purposes, including cropping and horticulture (predominantly sweet potatoes). It is understood that no stock animals have been on-site since 2010.

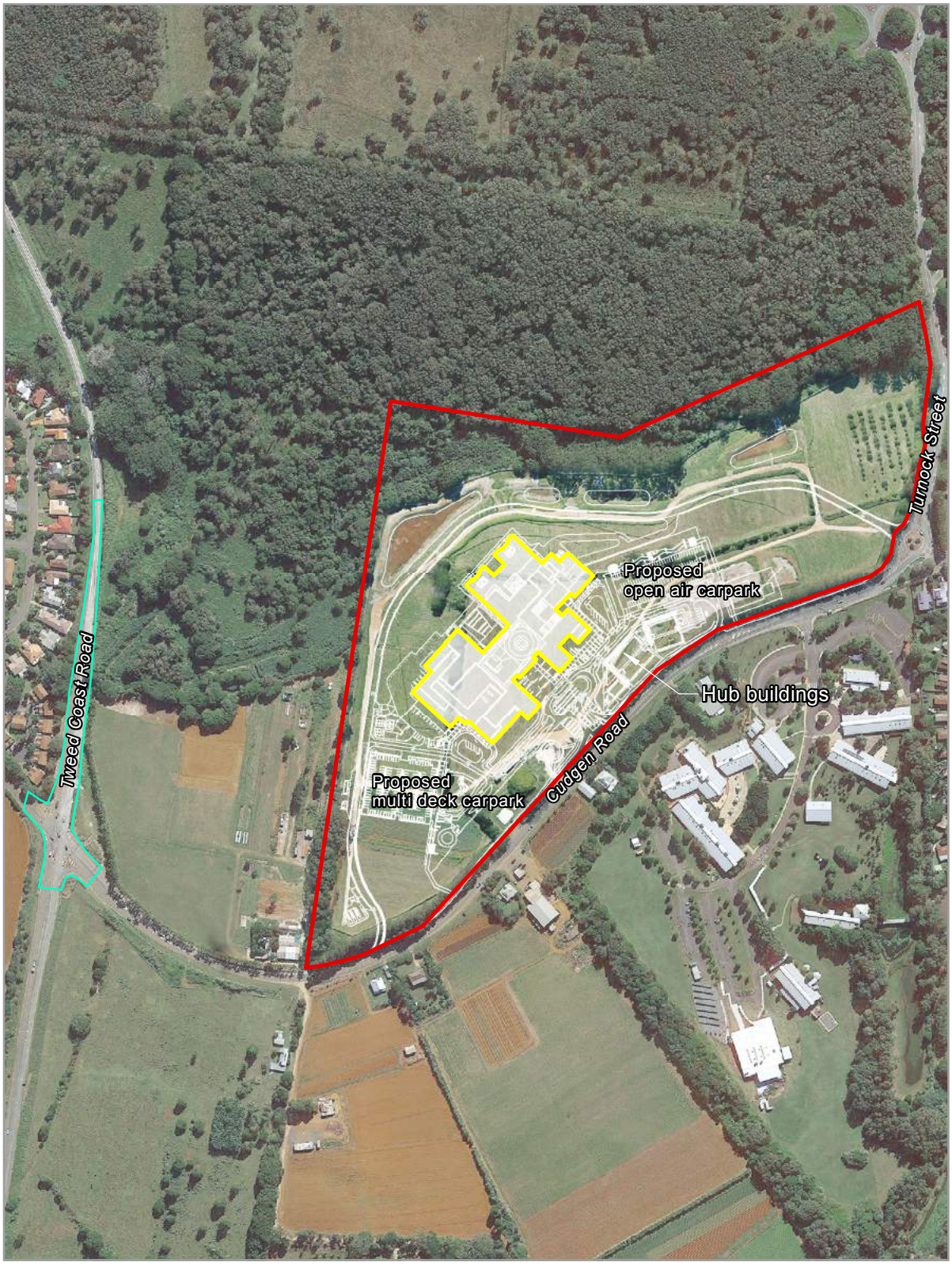
Under the former agricultural uses, approximately 11.24 ha of land was available for cultivation, with around eight hectares previously planted with sweet potato crops.

The northern fringe of the Project Site is mapped as Coastal Wetlands under the Coastal Management SEPP and is zoned 7(l) Environmental Protection (Habitat), along with smaller slivers of 2(c) Urban Expansion and 1(b1) Agricultural Protection pursuant to the TLEP 2000. These areas are deferred matters of the TLEP 2014.

Since acquisition and ownership of the Project Site by HAC, HI undertook some separate preliminary works to secure the Project Site, demolish redundant buildings (house and farm sheds), and ensure appropriate soil and water management control measures were in place to mitigate impacts of stormwater runoff from the unimproved site. These works have been completed.

Information shown is for illustrative purposes only

Drawn by: AB Checked by: AB Reviewed by: JTS Date: 12/09/2019
Source of base data: TSA, Tweed Shire Council and Silver Thomas Hanley & Bates Smart



LEGEND

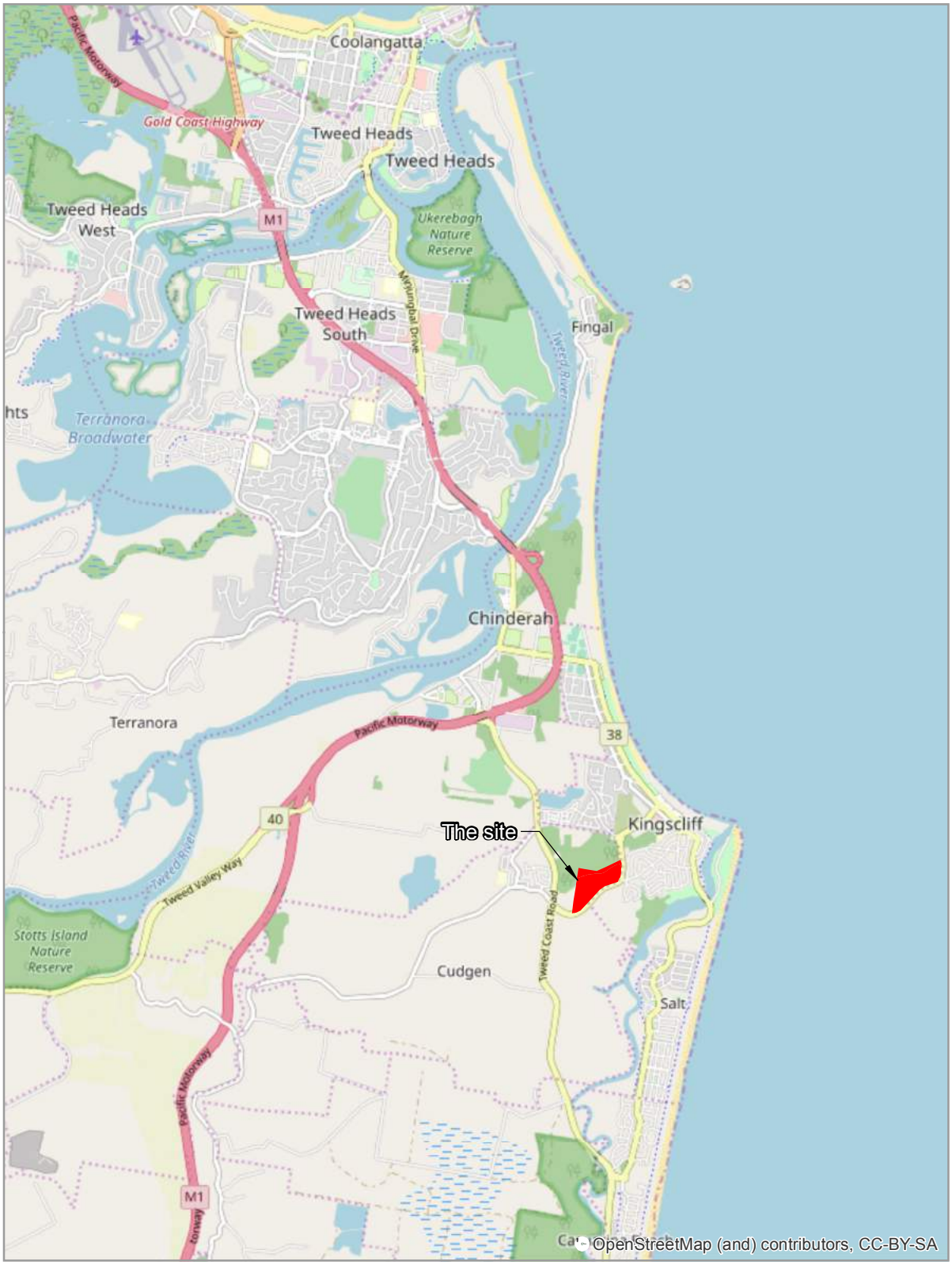
- Project site
- Tweed Coast Road intersection upgrade
- Proposed hospital building envelope

0 120

Project Site

Information shown is for illustrative purposes only

Drawn by: AB Checked by: RE Reviewed by: JTS Date: 06/08/2019
Source of base data: OpenStreetMap



0 1.5 Km

Site Context

2.5 Site Analysis

The topography of the site is varied, including relatively flat, elevated areas in the south, to sloping and low-lying in the north. The boundary to Cudgen Road represents its high point with maximum elevations of approximately 27 m Australian Height Datum (AHD). There is a relatively large plateau in this area that will support the main hospital building/development zone. Elevations in the northern point are low-lying, down to approximately one metre AHD.

The Project Site is substantially clear of vegetation, with some sparse scatters and stands of trees. More dense vegetation occurs along its northern fringe in low-lying areas, largely within the existing environmental zone. DPIE's eSPADE website indicates the site is largely made up of residual (Cudgen) soil landscapes.

The Project Site contains a number of environmental and development constraints, as addressed in the Concept Proposal and Stage 1 Works EIS, including:

- Remediation of a small area on the Project Site is subject to an approved Remediation Action Plan (RAP). A Site Auditor is engaged, and an interim Site Audit Statement has been prepared as evidence that the Project Site is being suitably remediated (**Appendix Q**)
- Part of the Project Site supports and is adjacent to mapped Coastal Wetlands, including the Coastal Wetlands proximity buffer under the Coastal Management SEPP (refer to **Illustration 2.4**)
- Bush fire prone land (category 1 vegetation and buffer)
- The northern fringe is flood prone, however, the majority of the Project Site including the main development area and access is above the PMF
- The majority of the Project Site is mapped as Class 5 Acid Sulfate Soils; however, the northern fringe includes Classes 2 and 3.

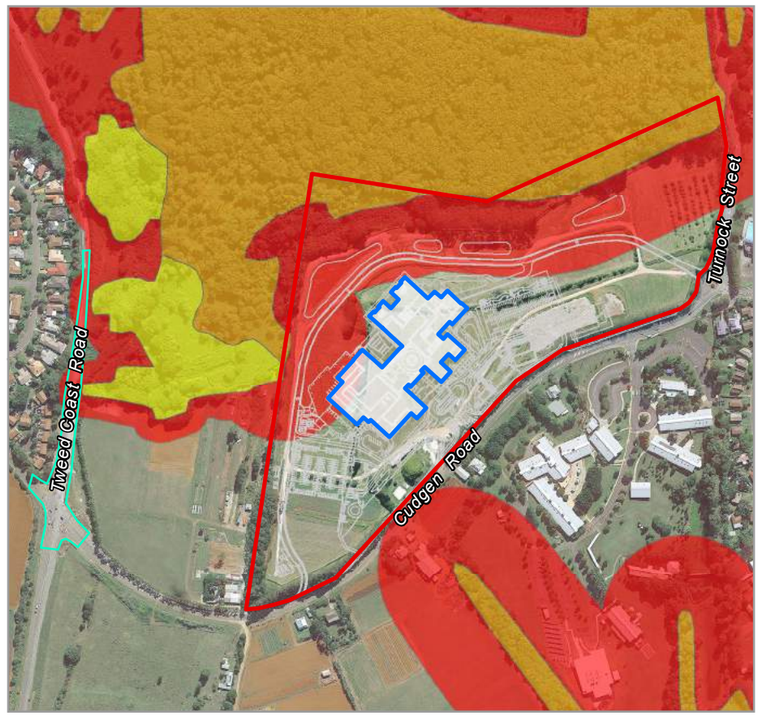
Illustrations 2.3 and **2.4** provide site analysis mapping showing key constraints and environmental features of the Project Site. Site analysis plans are also provided with the Architectural and Urban Design Report at **Appendix C**.

Information shown is for illustrative purposes only

Drawn by: AB Checked by: AB Reviewed by: JTS Date: 12/09/2019
Source of base data: TSA, DFS&I, BMT, Greencap and Tweed Shire

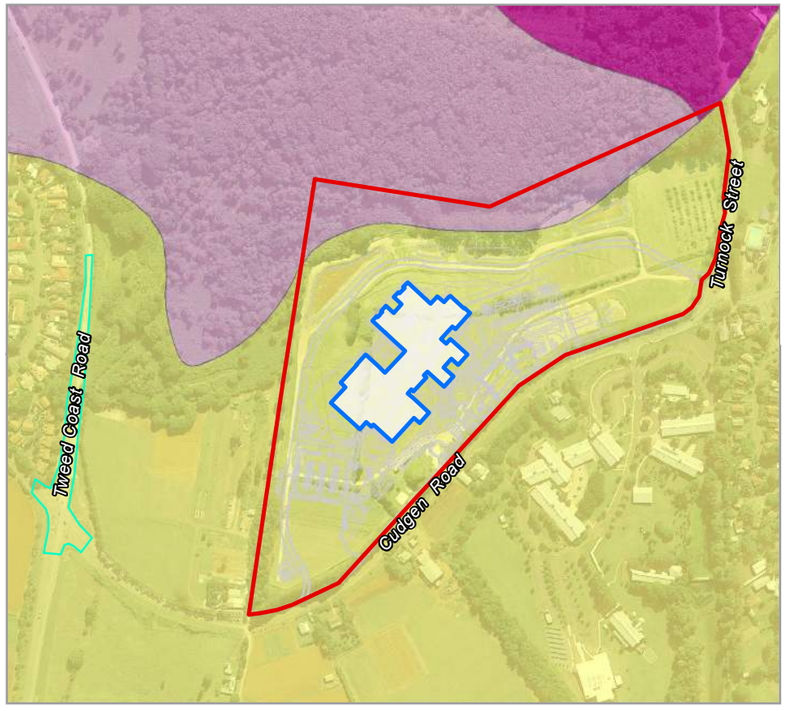
FLOOD

- Project site
- Proposed hospital building envelope
- Tweed Coast Road intersection upgrade
- PMF inundation area
- Proposed design layout



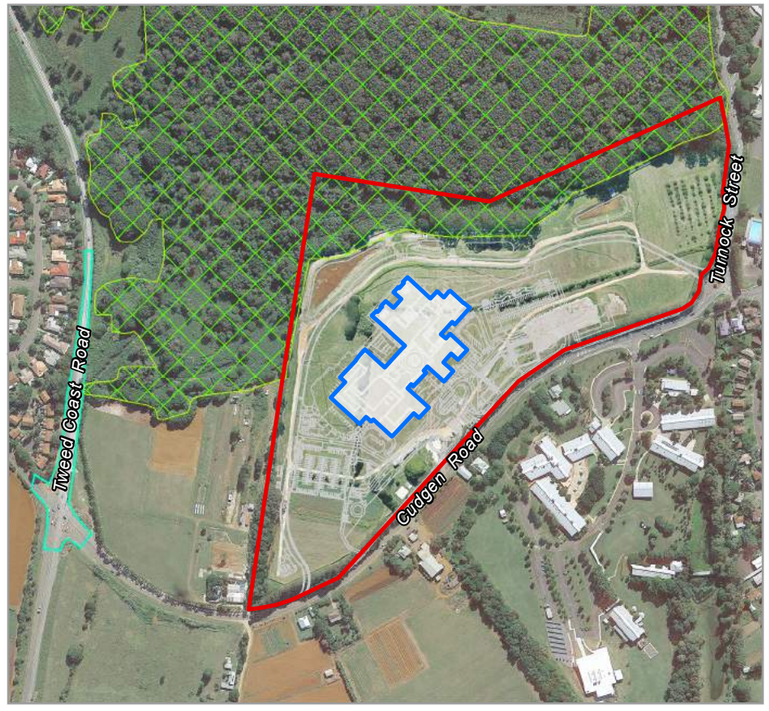
BUSHFIRE PRONE LAND

- Project site
- Proposed hospital building envelope
- Tweed Coast Road intersection upgrade
- Vegetation Buffer
- Vegetation Category 1
- Vegetation Category 2
- Proposed design layout



ACID SULFATE SOIL RISK

- Project site
- Proposed hospital building envelope
- Tweed Coast Road intersection upgrade
- Class 2
- Class 3
- Class 5
- Proposed design layout



VEGETATION

- Project site
- Proposed hospital building envelope
- Tweed Coast Road intersection upgrade
- Forested Wetlands - Coastal Swamp Forest
- Proposed design layout

North

0 160

GeoLINK environmental management and design

Site Analysis - Flood, Bushfire, Acid Sulfate Soils, Vegetation

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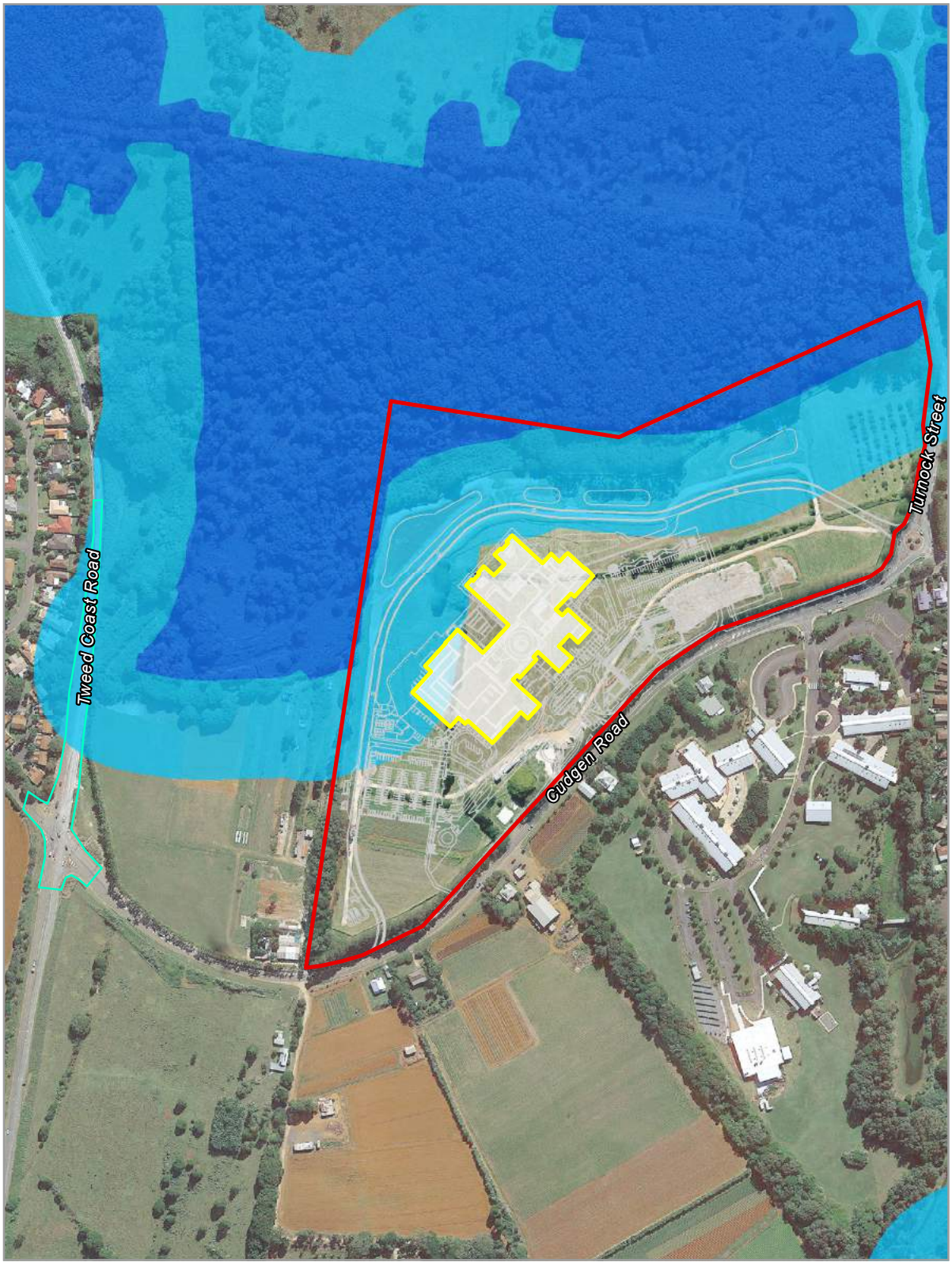
Drawn by: AB Checked by: AB Reviewed by: JTS Date: 12/09/2019
Source of base data: TSA, Tweed Shire Council and Silver Thomas Hanley & Bates Smart



LEGEND

- Project site
- Tweed Coast Road intersection upgrade
- Proposed hospital building envelope
- Coastal wetland
- Proximity area for coastal wetland
- Proposed design layout

0 120

Site Analysis
Coastal Management SEPP

3. Description of the Project

3.1 Overview: Stage 2 Hospital Main Works and Operation

This SSD application seeks consent for Stage 2 - Main Works and Operation of the Tweed Valley Hospital, including:

- **Construction of Main Hospital Building**
  - Main entry and retail area
  - Administration
  - Community Health
  - In-Patient units
  - Outpatient clinics and day only units
  - Child and Adolescent Services
  - Intensive Care Unit
  - Mental Health Unit
  - Maternity Unit and Birthing Suites
  - Renal Dialysis
  - Pathology
  - Pharmacy
  - Radiation Oncology as part of integrated Cancer Care
  - Emergency Department
  - Perioperative Services
  - Interventional Cardiology
  - Medical Imaging
  - Mortuary
  - Education, Training, Research
  - Back of House services
  - Rooftop Helipad
- **Construction of Support Buildings, referred to as the 'Health Hub', containing:**
  - Oral Health
  - Community Health
  - Aboriginal Health
  - Administration
  - Education, Training and Research
- **Internal roads and car parking, including multi-deck parking for staff, patients and visitors;**
- **Construction of a temporary building for the 'Tweed Valley Skills Centre'**
- **External road infrastructure upgrades and main site access**
- **Environmental and wetland rehabilitation, including rehabilitation of existing farm dam as outlined in the Biodiversity Development Assessment Report (BDAR)**
- **Site landscaping**
- **Signage**
- **Utility and service works.**

Table 3.1 provides a summary of key development elements associated with Stage 2.

Table 3.1 Project Summary – Stage 2 Tweed Valley Hospital

Project Element	*Summary of the Project*
Development/Land Use	▪ Health Services Facility (Hospital)
Project Site Area	▪ 19.38ha
Site Description	▪ 771 Cudgen Road, Cudgen (Lot 11 DP1246853)
GFA of permanent buildings	▪ Main Hospital (including Stage 2B): 62,096 m^2 ▪ Health Hub buildings: 2,950 m^2 ▪ Total: 65,046 m^2
GFA of temporary Skills Centre building	▪ Skills Centre: 612 m^2
Total beds	▪ 545 hospital beds/treatment spaces (comprising 48 day beds, 451 in patient unit (IPU) beds, and 46 emergency treatment spaces); inclusive of 56 IPU beds to be constructed as Stage 2B subject to demand and funding.

Project Element	Summary of the Project
Maximum Building Heights	■ Main Hospital: RL 64.650 (44.7 m above lowest ground level to the highest point of the building) ■ Health Hub buildings: RL 34.600 (8.15 m above ground level) ■ Multi-deck car park: RL 46.150 (29.2 m above ground level) ■ Skills Centre: RL 30.40 (8.4 m above ground level at lowest point of building).
Total Parking Spaces	■ The Project provides for a total maximum potential supply of 1,538 on-site parking spaces (plus a range of set-down/pick-up spaces). A minimum of 1,201 on-site parking spaces will be required/provided at the year of opening (2023) in line with the parking demands identified to 2023/24. Refer to **Section 3.7.3** for further detail and **5.7.2** for parking supply breakdown and assessment.
Bicycle Parking	■ 52 secure bicycle spaces for staff ■ 20 publicly accessible bicycle spaces for visitors
End-of-Trip Facilities	■ Showers and changes rooms for staff provided in multi-deck car park adjacent to staff bicycle storage.
Construction Hours	■ Monday to Friday – 7:00 am to 6:00 pm ■ Saturday – 8:00 am to 1:00 pm ■ No work Sundays or Public Holidays.
Workforce and Jobs	■ Refer to **Section 3.18**.
Hours of Operation	■ 24 hours a day, seven days a week, 365 days a year.
Helicopter Operations	■ A rooftop helipad is provided (with primary north-south flight paths) with anticipated helicopter movements estimated to be less than ten a month, with a typical expected average of six per month.
Road and Intersection Works	The following road and intersection works/upgrades are part of Stage 2: ■ Construction of the hospital's main entry and exit - a signalised access point/intersection on Cudgen Road ■ Construction of two new bus bays/stops and associated infrastructure along Cudgen Road at the hospital frontage to replace the existing bus stops ■ A secondary access point (inward only - un-signalised) off Cudgen Road east of the main entry ■ Upgrade of the Tweed Coast Road/Cudgen Road intersection ■ Construction of the hospital's internal road network.
Capital Investment Value (CIV)	■ Provided to DPIE as commercial-in-confidence as the CIV and it's supporting breakdown would have commercial utility in the market and its disclosure would prejudice future deliberative processes of Government, including procurement of the Main Works. The CIV is well over the SSD threshold of $30 million.

3.1.1 Construction Staging

The works outlined in **Section 3.1** comprises five key components, which are subject to various funding allocations/sources and may be delivered concurrently or as separate construction packages. Stage 2 has therefore been defined in the following sub-stages:

- Stage 2A – Main hospital building complete with supporting roads, services infrastructure and landscaping
- Stage 2B – Main hospital building incremental expansion areas
- Stage 2C – Health Hub
- Stage 2D – Tweed Valley Skills Centre
- Stage 2E – Multi-deck car park.

Development consent is sought for the all components of Stage 2 under this SSD application. These five components are further described in **Section 3.15**.

3.1.2 Modification to the Concept Approval

There are additional components and changes identified in the Stage 2 SSD application that do not form part of the original Concept Proposal. As such a modification to the approved Concept Proposal (SSD consent 9575) is also sought as part of a separate but concurrent application. In summary, the proposed modifications include:

- Additional car parking including multi-deck and at grade parking, as well as associated internal road refinements
- Addition of temporary building for Tweed Valley Skills Centre
- Hospital bed number increase from 430 to 499 day only and overnight beds (note this number includes additional overnight beds identified in Stage 2B, but excludes emergency treatment spaces (which equate to 46)
- Changes to main hospital envelope, and Health Hub envelope
- Building massing/density changes
- Maximum GFA increase (to accommodate Stage 2B)
- Amendments to the landscape zonal masterplan.

These proposed modifications to the Concept Proposal are addressed in more detail in the separate modification application and associated Modification Report.

3.2 Site Masterplan, Built Form and Urban Design Response

An Architectural and Urban Design Report has been prepared by the Project architects (STH+BS) and is attached at **Appendix C**. This report provides a comprehensive outline of the design philosophy and response for development of the Tweed Valley Hospital. A summary of the design response and key principles is provided in the following sections.

3.2.1 Key Design Principles

Aspirations and guiding principles relating to the masterplan, built form and urban design considerations for the Tweed Valley Hospital include:

- **Functionality and Flexibility** – The facility will be highly functional from the outset but will have an in-built capacity for change, flexibility and adaptation.
- **Access** – The built form will be inviting and facilitate ease of access – entry, exit and movement – throughout the facility.
- **Natural Light and Views** – Patient and staff rooms will have a view to bring the outside inside and to engage with the local environment.
- **Wayfinding** – The hospital will utilise colour and add depth to wayfinding methodologies through technology, landscaping and integration of art.
- **A Sustainable Facility** – The facility will incorporate sustainable design principles, including recycling, sustainable products and energy efficiency.
- **A Community Asset** – The campus will be a truly integrated community asset, including inside and outside spaces that promote lifestyle ‘wellness’ and ‘healthy being’ for the community, patients, staff and carers.

Together, the Concept Proposal and reaffirmed original Key Design Principles are the basis on which the Stage 2 Hospital Design has been developed.

Further detail relating to the built form and urban design response is provided in the Architectural and Urban Design Report at **Appendix C**.

3.2.2 Site Layout and Building Location

The site masterplan establishes the organising framework for site layout and future related development of the campus. This provides for hospital expansion, renewal and includes capacity for a host of future complementary programs. The campus layout and masterplan organising principles are developed in response to the site's topography and features. This includes consideration, utilisation and creation of the following features:

- Topography and the natural site axis
- North-south axis and creation of a civic entry
- East-west axis and creation of a Green Spine (central landscaped and pedestrianised linkage through the site)
- Natural landscape integration
- Vehicle, pedestrian and bicycle circulation
- Establishing the main hospital building as a site anchor.

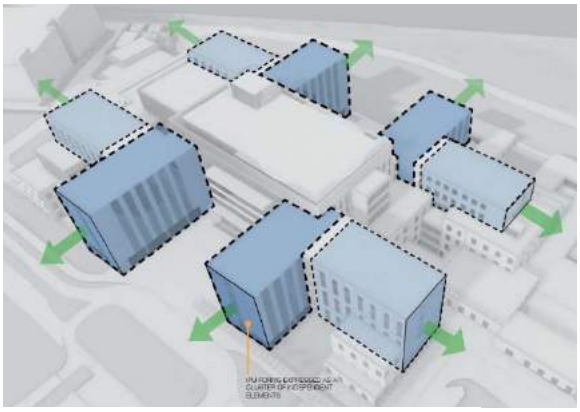
The site organising and design elements (including the above elements) are detailed in the Architectural and Urban Design Report at **Appendix C**. The proposed site plan is depicted in **Appendix B** and **Figure 3.3** (provided in **Section 3.7**).

3.3 Description of Main Hospital Building

The following provides an overview of the new main hospital building, with more detail provided in the Architectural and Urban Design Report at **Appendix C**.

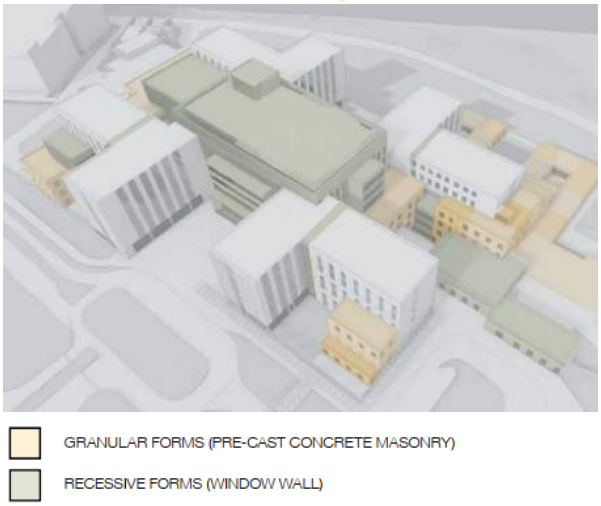
The main hospital building takes advantage of the site topography and is articulated as a cluster of scaled building forms. The hospital ensemble can be simplified into the following three distinctive elements, as described in the Architectural and Urban Design Report and depicted in **Figure 3.1** and **Figure 3.2**:

- Quadrant Anchors
- Recessive Core (connective tissue)
- Granular Forms.



QUADRANT ANCHOR FORMS (SHEET METAL CLADDING)

Figure 3.1 Hospital Quadrant Anchors



GRANULAR FORMS (PRE-CAST CONCRETE MASONRY)

RECESSIVE FORMS (WINDOW WALL)

Figure 3.2 Hospital Granular and Recessive Forms

The hospital's main public ground floor level is located at +27.75 m AHD which is elevated above the northern valley and lower ground levels that integrate into the slope. The site provides 360-degree high-quality views, including to the coastline and distant mountain ranges. The hospital design has taken advantage of this, contributing to high levels of internal amenity.

As depicted above, the building form can be characterised by its four-quadrant anchors, supported by a central connective core. The quadrants frame axial corridors which are experienced at all levels of the hospital, being a key public realm spatial ordering and orientation device.

At the base of each quadrant an increased floorplate area supports the clinical services functions. The additional floorplate, where practical, is expressed as a cluster of diverse smaller scaled forms, which have regard for site topography and terrace to the north along the site's ridgeline.

A description of the departments/facilities to be accommodated within the hospital is provided in **Table 3.2**. Further detail, including descriptions of external access, circulation paths and key linkages, is provided in the Architectural and Urban Design Report.

Table 3.2 Main Hospital Departments/Facilities Breakdown

Hospital Level	*Departments/Facilities*	
Level 7	▪ Helicopter Landing Site (HLS)	▪ Clinical Lobby
Level 6	▪ Plant	
Level 5	▪ Inpatient Units (including Stage 2B) ▪ Shared Staff Workspace/Support Area	▪ Public Amenities ▪ Plant
Level 4	▪ Medical and Surgical Inpatient Units ▪ Shared Staff Workspace/Support Area	▪ Public Amenities ▪ Plant
Level 3	▪ Intensive Care Unit ▪ Close Observation Unit ▪ Cardiac Inpatient Unit ▪ Cardiac Outpatient Services ▪ Medical Inpatient Unit	▪ Clinical Information Unit ▪ Shared Staff Workspace/Support Area ▪ Public Amenities ▪ Plant

Hospital Level	Departments/Facilities	
Level 2	■ Rehabilitation Services ■ Child and Adolescent Inpatient Unit and Outpatient Services ■ Older Persons Inpatient Unit ■ Central Sterilisation Services Unit	■ Shared Staff Workspace/Support Area ■ Public Amenities ■ Plant
Level 1	■ Perioperative Services ■ Interventional Radiography/Cardiac Catheterisation ■ Birthing Suite ■ Maternity Inpatient Unit	■ Special Care Nursery ■ Shared Staff Workspace/Support Area ■ Public Amenities ■ Plant
Ground Level	■ Main Entrance ■ Front of House/Administration/ Integrated Booking Unit ■ Ambulatory Care ■ Integrated Cancer Services ■ Medical Imaging	■ Renal ■ Specimen Collection ■ Transit Lounge ■ Public Amenities, Café and Retail ■ Plant
Lower Ground Level	■ Emergency ■ Satellite Medical Imaging ■ Mental Health Inpatient Unit ■ Community Mental Health (Outpatients) ■ Drug and Alcohol Services ■ Multi-Faith Space	■ Pharmacy ■ Pathology ■ Indigenous Meeting Area ■ Fleet Management ■ Public Amenities ■ Security ■ Plant
Basement	■ Engineering ■ Biomedical Engineering ■ Materials Management (including Loading Dock) ■ Environmental Services ■ Central Equipment Resource Unit	■ Food Services ■ Mortuary ■ Basement Staff Hub ■ Central Energy Plant ■ Plant Rooms

3.3.1 Building Height, Setbacks and Gross Floor Area

The main hospital building will be nine storeys, plus rooftop helipad and clinical lift lobby. It will read as six storeys, plus plant and helipad, from Cudgen Road, with two lower ground levels.

The maximum building height is RL 64.650. At its highest point the building is 44.7 m above ground level (NGL level of the logistics yard).

Table 3.3 provides a breakdown of the gross floor area (GFA), calculated in accordance with the Standard Instrument LEP definition and based on detail in the Architectural and Urban Design Report.

Table 3.3 Main Hospital Building – Summary Area Schedule (GFA)

Building/Floor Level	GFA (m^2)
Level 7 (helipad, lift and clinical lobby)	42
Level 6 (Plant)	15
Level 5 (includes Stage 2B IPUs)	5,991
Level 4	5,748
Level 3	7,005
Level 2	7,305

Building/Floor Level	*GFA (m^2)*
Level 1	9,253
Ground Level	11,681
Lower Ground Level	11,723
Basement	3,333
Total	**62,096**

The main hospital building is setback:

- A minimum of 62.9 m from the south-east boundary to Cudgen Road
- A minimum of 320.8 m from the east boundary
- A minimum of 57.9 m from the west boundary.

These details are shown on the architectural plans at **Appendix B**.

3.3.2 Materials and Finishes

The Project architects have selected a colour palette, materials and finishes that reflect the locality and are responsive to the landscape setting.

A full list of external finishes, including perspectives of the design, has been included in the architectural plans at **Appendix B**. Further detail, including description of the external material expression and internal finishes appropriate to the different zones within the hospital (i.e. front of house; shared admin; clinical areas) is detailed in the Architectural and Urban Design Report at **Appendix C**. The key external elements of the main hospital building would include:

- An earthy and durable material palette referencing the site.
- The Quadrant Anchors are to be clad in a lightweight metal façade, evoking an agrarian reference to the Australian Landscape. Profile depth variation will be utilised to express architectural hierarchies. Natural warm hue colouration will be adopted.
- The Granular Forms are to be built of precast concrete panel construction. Oxide pigments will introduce a range of warmer hues to connect with the site's earth tones.
- The Recessive Core form will adopt a window wall arrangement with combination metal panel and glazed façade. The finishes will be expressed in darker hues.

Plate 3.1 and **Plate 3.2** show perspectives of the façade and external material expression. Refer to **Appendix B** and **C** for detail and materials and finishes schedules.

Plate 3.1 Perspective of the Facade and Main Entry

Plate 3.2 Perspective of the Facade and Emergency Entry

3.4 Health Hub

The Health Hub comprises three, low-scale buildings, including:

- Clinical Building which is being planned for Oral Health, Community Health and Aboriginal Health services
- Learning, Development and Research (LDR) Building which would provide additional education, training and research functions for the Tweed Valley Hospital staff and students in conjunction with facilities within the Main Hospital Building
- Shelter and retail kiosk.

The Health Hub is positioned in the public realm foreground of the hospital, adjacent to the main public vehicle entrance off Cudgen Road and provides a locally recognisable scale building address.

The Health Hub defines an important entrance plaza arrival space for the campus. The space is activated by the presence of the Health Hub uses and will include pathways and seating supporting pedestrianisation and informal gathering. There is also the opportunity for further activation with the inclusion of the retail kiosk . The Health Hub space is the first civic area experienced by those arriving by public transport and provides a direct link to the main hospital building.

More detail is provided in the Architectural and Urban Design Report at **Appendix C**.

A description of the uses/departments within the Health Hub is provided in **Table 3.4**.

Table 3.4 Health Hub Department/Use Breakdown

Health Hub Level	*Departments/Use*
Level 1	■ Oral Health ■ Plant ■ Health Hub expansion - Additional Learning Development and Research (LDR) .
Ground Level	■ Learning, Development and Research (LDR) ■ Aboriginal Health Services ■ Health Assessment and Recovery Program (HARP) ■ Plant ■ Shelter and retail kiosk.

3.4.1 Building Height, Setbacks and Gross Floor Area

The Health Hub buildings range from one to two storeys in height with a maximum building height of RL 34.600. The maximum height above ground level is 8.15 m.

Table 3.5 provides a breakdown of the GFA, calculated in accordance with the Standard Instrument LEP definition and based on detail in the Architectural and Urban Design Report.

Table 3.5 Health Hub – Summary Area Schedule (GFA)

Building/Floor Level	*GFA (m^2)*
Level 1 (includes LDR L1 expansion)	1,523
Ground Level	1,427
Total	**2,950**

The Health Hub buildings are set back approximately 10-14 m from the boundary with Cudgen Road, with substantial east and west boundary setbacks.

These details are shown on the architectural plans at **Appendix B**.

3.4.2 Materials and Finishes

The pavilion forms are to be built of steel framing with precast concrete panel infill construction. Precast concrete is a resilient low maintenance material, that embodies a sense of mass and natural surface variation. The addition of pigments will introduce a range of warmer hues to establish closer dialogue with the sites earth tones.

Plate 3.3 shows a sample perspective/render of the two storey Health Hub building and its external material expression. Refer to **Appendix B** and **C** for more detail.

Plate 3.3 Sample Perspective/Render of Health Hub

3.5 Tweed Valley Skills Centre

The Tweed Valley Skills Centre will be a temporary single-storey building located adjacent to the Health Hub. It will be a contemporary working, learning and teaching environment that will be used by HI, NNSW LHD, the Main Works contractor, and TAFE NSW. The Tweed Valley Skills Centre will include:

- A Prototype and Simulation Suite - to inform and verify the detailed design of key clinical spaces for the hospital, and would also be used as a simulation space for TAFE NSW health education programs.
- A Skills and Employment Hub - a drop-in facility for community and local industry, providing information on training and careers in the construction industry, jobs on the Project and support in developing business capability and tendering for subcontract work packages and supply contracts.

The Tweed Valley Skills Centre is proposed to be developed in partnership with NSW TAFE, subject to funding. It is proposed as a modular building capable of being relocated as it is anticipated that the Skills Centre would transition to a suitable location on the NSW TAFE Kingscliff Campus at completion of the hospital's construction period (relocation will be subject a separate planning process, as required).

The Skills Centre would have a maximum building height of RL 30.40. The maximum height above ground level would be approximately 8.4 m. It is set back 14 m from Cudgen Road, and 134 m from the east boundary.

Given its anticipated temporary nature on the Project Site, it is proposed to provide pedestrian access to the Skills Centre and temporary parking would be provided as required as part of the Tweed Valley Hospital works.

Following removal of the Skills Centre towards the end of the Stage 2 construction period, the subject area would be finished as part of the overall Tweed Valley Hospital landscape design.

3.5.1 Staff and Student Numbers

TAFE NSW has indicated that there will be three teaching staff and up to 40 students that will be accommodated within the Skills Centre at any one time.

During the construction phase of the development, the numbers of staff and visitors from HI, NNSW LHD and the Main Works contractor that will be accommodated within the Skills Centre at any one time will vary and fluctuate.

3.5.2 Hours of Operation

As the Skills Centre has multiple functions with multiple partners accessing the facility for different purposes, a general guide to hours of operation is outlined below:

- Prototype Suite for use by HI and NNSW LHD – 8:00 am to 5:00 pm generally Monday to Friday with out of hours and weekend access as required
- Skills Centre Simulation Suite for use by TAFE NSW – 8:00 am to 10:00 pm on weekdays with weekend access as required
- Skills and Employment Hub for use by the Main Works contractor – 8:00 am to 5:00 pm generally Monday to Friday with out of hours and weekend access as required.

The Skills Centre will have controlled access after-hours. After-hours staff access will be by proximity access card.

3.6 Site Preparation and Earthworks

Site preparation works, including bulk earthworks and establishment of site levels, were approved under SSD 9575 - Concept Proposal and Stage 1 Early and Enabling Works.

The Stage 2 Main Works are not expected to involve significant earthworks. However, further earthworks including excavation are required during Stage 2. This includes general building and service/infrastructure works, along with changes to some site levels (e.g. solely tiered at-grade parking is no longer proposed) and, work to facilitate the on-site car parking reconfiguration and provision of a multi-deck car park (earthworks plans specific to the multi-deck car park are included at **Appendix B**), landscaping, road widening, intersection upgrades and bush regeneration. These works form part of this application.

Topsoil will also be reused on the site as detailed in Landscape Strategy and Agricultural Offset Plan (**Appendix D** and **I**)

3.7 Access, Circulation and Parking

3.7.1 Access and Vehicle Circulation

The Tweed Valley Hospital provides a total of four access locations as follows:

- **Access A**: Left-in only from Cudgen Road at the western boundary. The access is provided with an Auxiliary Left turn (AUL) treatment. This is a limited access only and provides access to the service ring road and staff car park and dedicated access for emergency and service vehicles.

Access A does not facilitate public vehicle access, however access is available to a cycleway that runs around the service ring road.

- **Access B**: Signalised all movements access to/from Cudgen Road. This is the site's primary access and provides access for visitors and a secondary access for emergency vehicles and staff.
- **Access C**: Left-in only from Cudgen Road east of the Kingscliff TAFE access. The access is provided with a short Auxiliary Left turn (AUL(s)) treatment. This access provides access to visitor car parking for certain services located in the eastern part of the main hospital building, including Renal, Cancer Care and Mental Health, as well as for more direct access to the Transit pick-up area.
- **Access D**: This provides access for staff, emergency and service vehicles to connect to the service ring road. Access D does not facilitate public access. All movements are provided to Cudgen Road/Turnock Street in the form of a fourth leg to the existing Turnock Street/Cudgen Road intersection.

The site access locations are illustrated in **Figure 3.3**. For further details refer to the plan and drawing set at **Appendix B**.

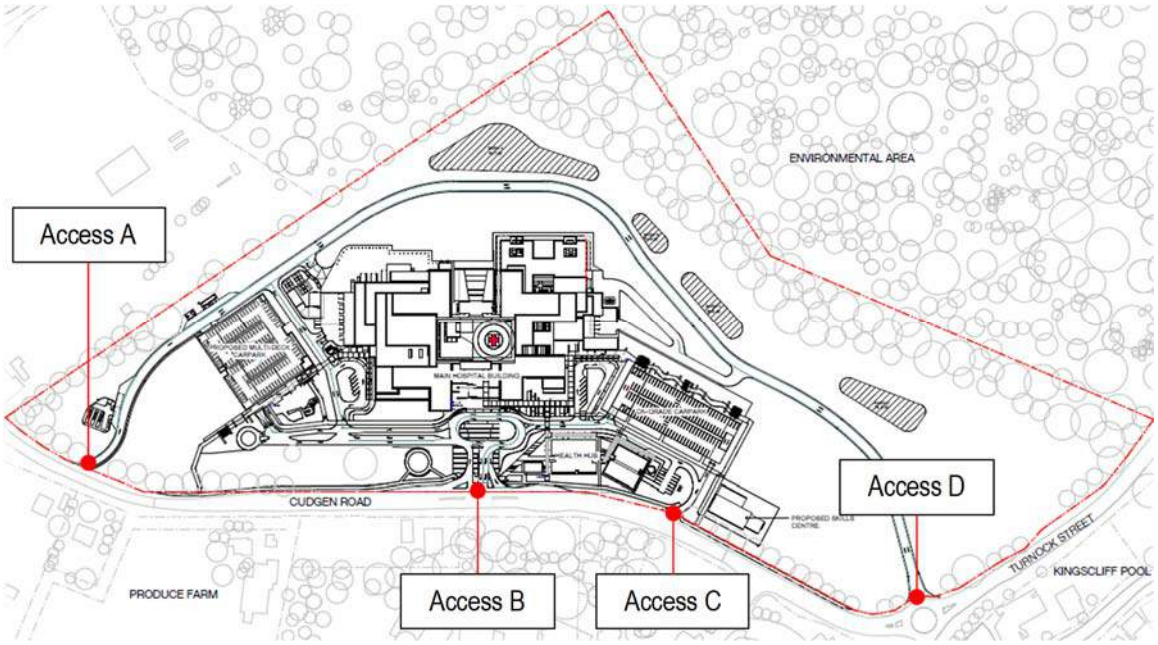


Figure 3.3 Site Access Locations

Construction of Access A and D were approved as part of SSD 9575. Approval for the construction of Access B and C, and the hospital's internal road network is sought as part of Stage 2. Further detail on the access and circulation arrangements is provided in the Traffic Impact Assessment (**Appendix K**) and the Architectural and Urban Design Report (**Appendix C**), with an overview below.

The public vehicle circulation strategy for the site provides a clear and intuitive arrangement. The public roadway network comprises the main entry (B) and secondary access-only slip road (C). The main public entrances link to a treed boulevard, which runs parallel to Cudgen Road.

The boulevard connects the public realm through the length of the development in parallel to the Green Spine pedestrian link and Cudgen Road, providing a landscaped pedestrian and public vehicle access route. To the west the boulevard provides public access to the multi-deck car park. The campus masterplan contemplates the boulevard extending through and connecting with Access D as part of future development potential to the east of the Health Hub.

There are public set-downs provided to the main and secondary entrance locations to the hospital. Public set-downs complemented with short stay parking spaces service the Emergency Department, and the Renal, Cancer Care and Mental Health departments.

Logistics, staff and emergency vehicles have two dedicated site access points located to the far east and west corners of the site. Entrances comprise entrance (A) “left-in only” slip road and entrance (D) two-way connection to the Cudgen Road/Turnock Street roundabout. These non-public entrances are connected by a services ring road located north of the hospital providing staff access to the multi-deck car park (staff parking component), Emergency Department ambulance vehicle set-down, logistics yard access, Mental Health patient transfers and Transit Lounge ambulance set-down. Service vehicles are required to exit via the Turnock Street roundabout, however ambulance and staff vehicles will have capacity to exit the site via the main hospital entrance (B) as a secondary means of leaving the site.

Ambulance access to the main Emergency Department set-down is via a dedicated ramp off the north service ring road, however the set-down can also be accessed when required, from the public boulevard via the main public site entrance.

3.7.2 Pedestrian and Bicycle Access

A clear and functional pedestrian and bicycle access path network is provided as described in the Architectural and Urban Design Report at **Appendix C**. This includes pedestrianised civic spaces and pathways, a dedicated bicycle access pathway, and end-of-trip facilities provided within the multi-deck car park accessed directly off the Green Spine. Clear and easy pedestrianised access to the main hospital building will be provided from new bus stops at the frontage of the site on Cudgen Road.

The main pedestrianised approach routes, including the public entrance off Cudgen Road, walkway from multi-deck car park to the west of the hospital and on-grade surface car park to the east of the hospital, will be provided with covered walkways liking to the hospital.

3.7.3 Car Parking, including Multi-deck Car Park

Approval is sought for a total maximum supply of 1,538 on-site car parking spaces via a combination of multi-deck, at-grade and short-term parking facilities (based on the design horizon and projected demand to 2031/32). A range of other public set-down/pick up and staff/logistics parking spaces (totalling 52) are also provided at key places.

Whilst approval is sought for the maximum potential supply of on-site car parking (i.e. 1,538 spaces), including the maximum potential scope of the multi-deck car park (i.e. up to 10 levels providing 1,388 parking spaces), construction of, or opening of car park levels within, the multi-deck car park may be staged as described in **Section 3.15.5**. This is so the provision of parking is commensurate with demand, the recommendations of the Traffic Impact Assessment (**Appendix K**), and available funding. On this basis, a minimum total of 1,201 on-site parking spaces (inclusive of the multi-deck, at-grade and short-term parking spaces) will be required/provided at the year of opening (2023), in line with the parking demands identified to 2023/24. Additional supply of parking and any associated additions to, or opening of levels within, the multi-deck car park (up to the maximum proposed/ approved provision and height), may be constructed or opened concurrently or staged subject to further demand assessment and funding.

An assessment and breakdown of the parking supply on-site is provided in **Section 5.7.2**.

The design response and function of the multi-deck car park is described in the Architectural and Urban Design Report at **Appendix C**. In summary it involves:

- Construction of a multi-deck car park up to a maximum of 10 storeys (subject to demand and funding), with a maximum height of RL 46.150. The building would have a maximum height above the adjacent lowest ground level of 29.2 m and be built into the slope of the site to minimise visual impact. Up to eight levels would be visible from Cudgen Road, which would read as four levels of the adjacent main hospital building.
- The multi-deck car park is positioned to the west of the hospital, addressing the public realm by holding the corner of the ambulance ramp and north edge of the west Green Spine.
- The building is read as a simple vertical patterned episodic concrete, metal and mesh form, articulated by depth of elements and interface of staff and public car park zones.
- The façade treatments vary. The lower level form is predominantly masonry, which transitions to a lightweight metal cladding at the upper levels. This solid materiality is teamed with a combination of louvres and mesh, plus green walls, to provide for natural ventilation and to address external views, amenity for users of the hospital, and to contain light and noise spill from vehicle movements.
- Public vehicle access to the multi-deck car park is from the east off the boulevard, via a ramp to basement level. The Green Spine consequently continues at-grade uninterrupted over the entrance providing cycle access from the west and pedestrian access to the possible future development zone identified on the campus masterplan to the west of the multi-deck car park.
- Staff vehicle access to the car park is from the north service ring road, with on-grade entrance direct to basement 2 level.
- The car park is designed to accommodate both staff and public car parking, back-to-back, with “soft division” to allow flexible management of peak staff and public demand periods.

On-site parking layouts have been developed in accordance with advice from the traffic and civil engineering consultants. The Traffic Impact Assessment is attached at **Appendix K**. All car parking has been designed in accordance with relevant Australian Standards.

3.7.4 Bicycle Parking and End-of-trip Facilities

The development provides for the following bicycle parking on-site:

- 52 secure bicycle spaces for staff within the multi-deck car park
- 20 public bicycle spaces. These consist of simple bicycle racks on the ground level near entrances.

End-of-trip facilities, including showers and change facilities, are provided within the multi-deck car park for staff use, conveniently located near the staff bicycle parking.

3.7.5 Emergency Services Bays

Ambulance bays are proposed on the ground level at the western side of the hospital. This area will be accessed via the west and east access points (accesses A and D) and associated ring road as described in **Section 3.7.1**.

Nine ambulance bays are provided at the Emergency Department, with a further four at the Transit Lounge set-down area.

3.7.6 Logistics, Loading Facilities and Waste

Dedicated entry points and connection to the internal ring road provide separate site access for ambulances, staff, contractors, couriers, delivery and waste collection vehicles. The ring road provides direct access for these vehicles to the staff car park, loading dock and contractor/courier set down, allowing for separation from public, vehicular and pedestrian traffic.

Bulk oxygen and LPG deliveries would occur via the same route, with a lay-by allowing for forward movement of these vehicles through the site, exiting at the Turnock Street roundabout, eliminating the need for turning around or reversing manoeuvres.

A loading dock with up to five truck bays is proposed on the basement level at the rear (western corner) of the hospital, providing direct access to the materials management department and hospital via logistics corridors and central lift cores. The loading area can be accessed via the service ring road. The loading dock will be serviced through two sides, with defined 'dirty' and 'clean' zones.

The waste storage and collection area is located at the basement level in association with the service yard and loading dock. Waste compactors, along with appropriate bin types for a range of waste will be provided as detailed in the operational Waste Management Plan at **Appendix W**.

An overview of deliveries is given in **Section 3.12.2**.

3.7.7 Public Transport

The site is accessible via public transport and the existing proximal bus stops will be relocated/ reconfigured to create two new indented bus bays on Cudgen Road along the frontage of the hospital site. Clear and easy access to the main hospital building via pedestrianised areas would be provided.

3.7.8 Road and Intersection Works

The following road and intersection works/upgrades are part of Stage 2:

- Construction of the primary access point on Cudgen Road (Access B). This access point will be a signalised intersection, providing the main public inward and outward access for the Tweed Valley Hospital.
- Construction of two new bus stops and associated infrastructure along Cudgen Road.
- A secondary access point (Access C: inward only - un-signalised) off Cudgen Road east of the main entry, providing access to the eastern car park (bypassing the main entry).
- Upgrade of the Tweed Coast Road/Cudgen Road intersection.
- Construction of the hospital's internal road network.

Details of these works/upgrades are provided in the Traffic Impact Assessment and plan package at **Appendix K** and **B** respectively.

3.8 Landscaping and Public Domain

Landscaping is proposed throughout the site, in courtyards, and around the new buildings to provide for pedestrianisation, visual amenity and access to outside spaces and a sense of healing and sanctuary.

A series of places are designed appropriate to scale and program, whilst broadly reading as a cohesive and legible patchwork of related elements. The key places are:

- Health Hub
- South Entry Plaza
- Viewing Terrace
- Green Spine (including West Entry and East Entry)
- Courtyards
- Open lawns (within the APZ)
- Bioretention Areas
- Vegetated Buffers.

Aboriginal and South Sea Islander heritage has also been considered in the landscape strategy where suitable. Refer to **Section 3.11** and **Appendix C, D** and **M.**

Proposed landscape materials reference existing site materials and the history of the site; including the use of natural materials where appropriate, and materials that are durable, cost effective and low maintenance.

Further detail is provided in the proposed landscape plans and design report at **Appendix B** and **D** respectively.

3.9 Wayfinding and Signage

3.9.1 Wayfinding and Signage at the Project Site

A range of signs will be installed as part of the Project, including identification, directional and operational signs. Temporary signage identifying the Project (and related information) is also proposed to be displayed at the Project Site during construction. The proposed signage includes a combination of illuminated and non-illuminated signs. The location and details of the proposed signs are shown in the Signage Plans and Wayfinding Strategy at **Appendix B** and **E**. These signs would be consistent with the purpose and needs of the hospital, facilitating identification and legibility as outlined in the Wayfinding Strategy.

3.9.2 External Road Network Wayfinding Signage

As a result of the hospital's relocation from Tweed Heads, hospital related wayfinding signage along the external public road network would need to be updated/installed. Bitzios has prepared a wayfinding signage plan for this purpose (included in **Appendix K**). It identifies signage that will need to be updated, replaced or installed along the public road network. This has been developed and would be undertaken in consultation with Roads and Maritime Services (RMS) and TSC in accordance with the provisions of the *Roads Act 1993*.

3.10 Services, Utilities and Stormwater

3.10.1 Hydraulic Services, Gas, Sewer, Communications and Electricity

The development would be serviced by:

- Potable water via a connection to the water main in Turnock Street
- Alternative non-potable water through provision of a reuse water tank
- Private bulk storage of Liquefied Petroleum Gas (LPG)
- Sewer via on-site pump station and connection to existing Cudgen Road rising main
- Communication connections to existing services in Cudgen Road
- Electricity from the Cudgen Zone Substation supplied into an incoming switching station (ISS). The high-voltage network will be backed up by up to three standby diesel high-voltage generators, to be co-located with the ISS toward the south-west corner of the Project Site.

Further detail is provided in Infrastructure Management Plans at **Appendix R**, with an overview of the utilities/servicing requirements provided at **Section 5.14** of the EIS.

3.10.2 Stormwater and Bio-detention Basins

The proposed drainage and stormwater measures include:

- Internal road drainage – pit and pipe network
- Conversion of the four existing sediment basins to bio-detention basins for stormwater discharge control and water quality treatment
- Discharge from the four bio-detention basins via existing headwalls at surface level with appropriate scour protection, allowing sheet flows to the wetland area, emulating existing flow characteristics
- Erosion and sediment control during construction
- Decommissioning and backfilling of an existing agricultural dam in the north-west corner of the site
- External road upgrades – pit and pipe network, connecting to existing road drainage discharge points.

Further detail is provided in the Stormwater Management Plan at **Appendix S**.

3.10.3 External Lighting Strategy

External lighting will be provided around the hospital campus to provide a safe and welcoming environment for patients, visitors and staff, in accordance with the standards and guidelines outlined in the lighting strategy prepared by LCI at **Appendix R**. This includes measures to address light spill and maintain amenity. The architectural design response and strategy include measures to ensure light spill associated with car lights from the multi-deck car park is minimised.

Due to the helicopter activity associated with the hospital, luminaires will generally be low-cutoff aeroscreen style to minimise uplight.

As the facility is a hospital, operating 24 hours a day, there is no curfew lighting period. External lighting will generally operate between dusk and dawn and be controlled by time-clock/light level sensors with a manual override located in a central location. Lighting control will be integrated into the main building management systems.

Light spill and amenity are addressed in **Section 5.5.7**.

3.10.4 Road Works and Utility Relocations

Relocation of existing utility assets along Cudgen Road and at the Tweed Coast Road/Cudgen Road intersection may be required and will be further developed during the detailed design as indicated in **Section 5.14.3**.

3.10.5 Temporary Works During Construction

A high-voltage electrical supply will be provided to a temporary kiosk substation and then reticulated around the site to service the site office, subcontractor offices, tower cranes, lifts, lighting and construction activities. Temporary lighting will be provided around the site to ensure a safe and accessible work area. An application for temporary supply was submitted to Essential Energy on 28 May 2019 and a Design Information Package provided on 4 July 2019.

3.11 Heritage and Interpretation

The proposed colours and materials of the development reference the history of the area, regional setting and surrounding landscape. The proposed design and landscape strategy make reference to the site's immediate landscape and the previous agricultural land use.

Aboriginal Health Services are integrated in the hospital design. The internal functional relationship of the Aboriginal Health Services will adopt a zonal approach to space distribution which will provide clarity of functions and articulate the relative zones required. An indigenous meeting zone adjacent to the western entry provides amenity and privacy for Aboriginal visitors, combined with an external gathering area proximal to the Emergency Department. More detail is provided in **Appendix C**.

Design of an Indigenous Courtyard is being undertaken in close collaboration with representatives of the local Indigenous community. This area will be specifically considered as a focus for Indigenous cultural interpretation (refer to **Appendix D**).

Five historical dry-stone walls with a total length of more than 750 m were identified during initial heritage survey of the site. The walls are early features of the site and were likely constructed by South Sea Islander workers during the 19th century and represent a connection of South Sea Islanders to the Tweed district. Three of the five dry-stone walls are located to the perimeter of the Project Site, and two are located within the central zone along the site's ridge line (see **Figure 5.6**).

Over 80 per cent of the 750+ metres of walls will be retained in their current location. Walls 1 (partial), 3 and 4, comprising less than 20 per cent of the total length of the dry-stone walls on the site, will be affected by the hospital development and have been removed as part of the approved SSD 9575 Stage 1 Works. Removal of the affected walls relates to Stage 1 Works, with suitable heritage interpretation to be included in Stage 2, in consultation with the South Sea Islander consultation group. The remaining walls will be stabilised and incorporated within the landscape design, as appropriate. Refer to **Appendix M** for details on the Historical Interpretation Strategy.

The identified mature native trees (two Fig trees and one Poinciana tree) are to be retained in the masterplan and landscape strategy. The trees have been surveyed by an arborist (**Appendix DD**) and appropriate tree protection would be provided at all construction stages.

3.12 Hospital Operational Parameters

3.12.1 Hospital Operation

The Tweed Valley Hospital will be a new Level 5 major regional hospital and would operate 24 hours a day, seven days a week, year-round.

The Tweed Valley Hospital will form the core of the network of hospital and community health centres across the Tweed-Byron region.

The level of hospital (in this case Level 5) defines the level of each of the services that it will provide for the community, with a higher level meaning there is an increased level of services available. This will position the Tweed Valley Hospital as a major referral hospital for the Tweed-Byron region. It will operate as part the public health network with Byron Central Hospital, Murwillumbah District Hospital, Gold Coast University Hospital (Level 6), and community health and other out-of-hospital services.

It is estimated that approximately 1,120 staff would be on-site during the day shift in year 2023 and approximately 1,300 in year 2033. With the inclusion of 56 additional inpatient beds (identified as Stage 2B), approximately 1,330 staff would be on-site during the day shift in year 2033. Note: staff numbers are indicative estimates subject to operational funding and detailed workforce planning. Projections of full-time-equivalent (FTE) staff numbers based on the operational phase of the Project are outlined in **Section 3.18**.

Weekday peak visitor numbers have been estimated at 408 in year 2026/27 and 448 in year 2031/32.

3.12.2 Deliveries

The largest vehicle required for the Tweed Valley Hospital is a 19 m Articulated Vehicle (AV) for oxygen and gas deliveries and smaller service vehicles for a range of other deliveries and servicing requirements (e.g. linen, medical supplies, food, equipment, general stock). The service yard has been designed to cater for a range of standard service vehicles. Most deliveries/collections will be through the loading dock.

Most deliveries would occur during the week. Deliveries and goods movements on weekends are minimal and mainly relate to food services department and retailers e.g. bread, milk, pastries, newspapers etc.

The hospital's loading dock is expected to have an eight-hour operating window, from 7:30 am to 3:30 pm. However, flexibility in the hours of dock operation, coupled with dock management, would be required.

Anticipated deliveries and collection vehicle movements relate to streams including: stock; non-stock; waste; linen; bulk fluids; food; pharmacy; pathology.

The Traffic Impact Assessment recommends that the Tweed Valley Hospital operate a Service Vehicle Management Plan (SVMP) that outlines standard servicing and refuse collection procedures and may incorporate timetables and schedules for deliveries.

3.12.3 Helipad and Helicopter Operations

A helipad is sited on the roof of the Tweed Valley Hospital, with the main flight paths to be in a north-south direction. The hospital is not proposed to be a major trauma facility with associated helicopter movements. Helicopter use would be predominantly for the transport of patients who are not able to be transported by road to and from other hospitals. The frequency and duration of helicopter movements is not expected to be high. Anticipated helicopter movements associated with the Tweed Valley Hospital would be less than 10 a month, with a typical expected average of six.

The typical helicopter movement and "noise" event associated with arrival and departure from the Tweed Valley Hospital would typically last for a total of approximately six minutes.

Refer to **Appendix V** and **Section 5.21** for more Aviation detail.

3.13 Ecologically Sustainable Development

The Tweed Valley Hospital incorporates Ecologically Sustainable Development (ESD) strategies and principles as defined in clause 7(4) of Schedule 2 of the EP&A Regulations, where appropriate to the scope of the development.

The Tweed Valley Hospital will achieve equivalency with a 4-Star Greenstar rating, in accordance with HI's ESD Guideline and Evaluation Tool.

In particular, the proposal will achieve ESD principles on an integrated design process with the intention of delivering:

- Lower operating costs for energy, water, waste and maintenance
- Improved indoor environmental quality
- Extended life through inherent flexibility and 'future-proofing'
- Water and resource consumption efficiency
- Waste reduction
- Electrical services with efficient lighting, lighting control and energy metering.

ESD principles and measures are further discussed in **Section 5.8** and **Appendix L**.

3.14 Environmental and Wetland Rehabilitation

Environmental and wetland rehabilitation works (including filling/rehabilitation of the existing redundant farm dam in the site's north-west corner) as outlined in the Biodiversity Development Assessment Report (BDAR) and consistent with the Biodiversity Management Plan (BMP) prepared in accordance with SSD 9575 conditions of consent, would be undertaken in Stage 2.

The farm dam consists of an excavated area and an earth bund to retain water for irrigation. The pump station for the dam has been decommissioned. Currently, there is an infestation of *salvinia molesta* growing in the dam which is considered undesirable.

In order to prevent further infestation, it has been proposed that the dam is backfilled so that this corner of the site returns to a more natural state of flow to the wetland to the north. The methodology for this is detailed in the Stormwater Management Plan, BMP, and CEMP (**Appendix S, U** and **Z**).

To enable effective vegetation management throughout the life of the Project, the Stage 2 BMP identifies vegetation management zones (MZ). The MZs reflect the landscape zones that have been identified in the landscape zonal plan (LZP) (Turf 2019) and MZs broadly reflect the BDAR Vegetation Zones as identified and assessed by Greencap.

In summary, a range of vegetation management activities will be implemented on the Project Site throughout Stage 2 of the Project including:

- Weed control (biosecurity risk)
- Native vegetation protection measures
- Regeneration (i.e. assisted regeneration that includes supplementary planting)
- Revegetation
- Maintenance
- Monitoring and reporting.

Further detail is provided in the BDAR and BMP at **Appendix U**.

3.15 Construction Staging

The first stage of the Tweed Valley Hospital development consisted of the Concept Proposal and Stage 1 Early and Enabling Works which has been approved under SSD 9575 and works commenced. Stage 2 would continue on from and integrate with the Stage 1 Works.

While development consent is sought for all components of Stage 2 under this SSD application, the works comprise five key components (defined as sub-stages) as outlined in **Section 3.1.1** and described below which are subject to various funding allocations/sources. Sub-stages may be delivered concurrently or as separate construction packages.

3.15.1 Stage 2A - Main Hospital Building

The main hospital building, complete with supporting roads, services infrastructure and landscaping, will be largely constructed in one main construction stage, with the potential for additional incremental expansion areas (Stage 2B) to be constructed in conjunction with this main stage or at a later date, subject to demand and funding.

3.15.2 Stage 2B – Incremental Expansion Areas (Main Hospital Building)

The design of the main hospital building includes a range of future-proofing provisions, which provide the opportunity for incremental expansion of healthcare services. Subject to capital and recurrent funding, some or all of this incremental expansion is able to be delivered concurrently with Stage 2A.

The additional scope defined as Stage 2B includes:

- Construction of two additional 28-bed inpatient units (totalling 56 additional IPU beds)
- Expansion of the Medical Imaging department to include a PET-CT suite (350 m^2)
- Expanded footprint for the Pathology service of up to 500 m^2 to provide for a full Anatomical Pathology service on-site and other service expansion.

The building design includes future-proofing for an additional two inpatient units on Level 5 of the Main Hospital Building. The expansion zone for Pathology would occur on the lower ground floor and the Medical Imaging expansion (PET-CT suite) on the ground level of the main hospital building.

For clarity, the proposed plans at **Appendix B** identify the Stage 2B scope, distinct from the Stage 2A scope for the main hospital building.

The Stage 2B scope may be sub-divided into further sub-stages, e.g. construction of additional building shell for a particular service with fit-out and operational commissioning occurring at a later date.

3.15.3 Stage 2C – Health Hub

The Health Hub comprises three buildings as described in **Section 3.4**.

The first floor expansion area to the LDR Building may be built concurrently with the other Health Hub buildings or as a separate sub-stage.

3.15.4 Stage 2D – Tweed Valley Skills Centre

As outlined in **Section 3.5**, the Tweed Valley Skills Centre is being planned as a modular building, constructed on the Tweed Valley Hospital site, and used for various functions to support the main construction phase and educational purposes.

At the end of the main construction phase, it is proposed to remove the building from the Tweed Valley Hospital and relocate it to a suitable location on the Kingscliff TAFE site, which will be subject to a separate planning approval process, as required.

3.15.5 Stage 2E – Multi-deck Car Park

The construction of the multi-deck car park will be subject to separate funding and may be delivered as a separate construction package to the main hospital building.

Whilst approval is sought for a total maximum potential supply of on-site car parking as described in **Section 3.7.3** (i.e. 1,538 multi-deck and at-grade spaces based on projected demand to 2031/32), including the maximum potential scope of the multi-deck car park (i.e. up to 10 levels providing 1,388 parking spaces), the supply of parking associated with the multi-deck may be staged. This is so the provision of parking is commensurate with demand and the recommendations of the Traffic Impact Assessment, ensuring that the right balance is struck, and potential counter-productive oversupply does not occur. The staged parking supply associated with the multi-deck car park may be achieved either through staged construction of the multi-deck car park levels, or full construction and staged opening of levels.

A minimum of eight levels, supplying approximately 1,078 parking spaces within the multi-deck car park, will be constructed concurrently with the main hospital building and at-grade parking to ensure that sufficient car parking (i.e. a minimum total of 1,201 on-site spaces) is available when the hospital commences operation. This provision is in line with the parking demands identified as part of the Car Parking Demand Study for Year 2023/24 (which includes year of opening).

Supply of additional parking, and any associated additions to or opening of levels within the multi-deck car park (up to the maximum proposed/approved provision and height), may be constructed or opened concurrently, or staged subject to further demand assessment and funding.

Refer to **Appendix K** and **Section 5.7** for assessment on traffic and parking.

3.16 Construction Hours

Proposed construction hours for Stage 2 of the Tweed Valley Hospital are standard construction hours of:

- Monday to Friday – 7:00 am to 6:00 pm
- Saturday – 8:00 am to 1:00 pm
- No work Sundays or Public Holidays.

3.17 Timing, Delivery and General Construction Methodology

There is an imperative to provide access to new and expanded healthcare facilities by the end of 2022 to meet the health needs of the Tweed-Byron community. The Stage 1 Early and Enabling Works commenced mid-2019, with an expected 10-month completion timeframe. The Main Works will immediately follow, to ensure the hospital is completed by the end of 2022. Adherence to these milestones is necessary for the Project to be delivered on schedule.

The following table presents indicative key milestones and construction timeframes for the Project.

Table 3.6 Indicative Key Milestones and Timeframes

Indicative Key Milestones and Timeframes	*Date*
Stage 1 Early and Enabling Works (approved)	
Construction commence	June 2019
Construction complete	Q1/2 2020
Stage 2 Main Works and Operation	
Construction commence	Q2 2020
Construction complete	Q4 2022
Go live	Q1 2023

As outlined in the preliminary Construction and Environmental Management Plan (CEMP) (**Appendix Z**), the delivery program for Stage 2, including the main hospital building, car parking and Health Hub, will involve the following general phases/components related to the construction methodology:

- Mobilisation
- Inground services and substructure
- Structure erection
- Stripping and prop removal
- Façade, services and fit-out
- Commissioning and validation
- Testing/integration
- Completion.

The preliminary CEMP provides further detail on the delivery program and construction process.

3.18 Project Value and Job Creation

The capital investment value (CIV) for the Tweed Valley Hospital is commercial-in-confidence but has been provided separately to DPIE as part of the documentation associated with lodgement of the SSD application. Its supporting breakdown would have commercial utility in the market and its disclosure would prejudice future deliberative processes of Government, including procurement of the Main Works. The Stage 2 CIV is well over the SSD threshold of $30 million.

Employment projections for this project can be considered in the following major streams:

- Construction phase – which refers to the stimulus generated by construction and works associated will generate 2700 Full Time Equivalent (FTE) jobs at 771 jobs per year over a 3.5-year period from 2019 to 2022 with up to 650 construction workers expected on site at the peak of construction activity in 2021-22.
- Operations phase – which refers to the stimulus generated by the operations of the new and expanded hospital. This includes:
  - Current FTE at TTH: 1,295 FTE
  - 2023 projected: 1,540 FTE
  - 2026 projected: 1,685 FTE
  - 2031 projected: 1,985 FTE
  - 2031 (with Stage 2B) projected: 2,055 FTE
  - Noting that all FTE numbers are indicative estimates subject to operational funding and workforce planning.

3.19 Consistency with Approved Concept Proposal

The proposed Stage 2 of the development has been designed with regard to the approved Concept Proposal. However, due to refinement, further analysis, consultation and detailed design, some modifications to the Concept Proposal are required. These have been sought via a concurrent Modification Application to amend the SSD 9575 consent. The proposed development's consistency with key development parameters of the approval are documented in **Section 5.1.2** and **Table 5.1**. Where modification is required (and has been sought), this has also been identified in this table. Overall, subject to proposed modifications Stage 2 would be consistent with the Concept Proposal.

4. Consultation

Elton Consulting has prepared a Stakeholder and Community Consultation Outcomes Report for Stage 2 (refer **Appendix G**). The report outlines the agency, stakeholder and community engagement activities undertaken to support the Tweed Valley Hospital Project, including that specific to Stage 2. An overview of the Project's consultation initiatives is provided below.

Various specialist reports (appended to the EIS) also document consultation relevant to their disciplines.

The principles of engagement for the Project have been established to achieve the overarching project vision, being:

- *"Together we're delivering a life-changing healthcare solution for the Tweed –Byron Region".*

Supporting this are the Project values, which are:

- We are inclusive, respectful and take a generous view
- Safe and empowered people
- We explore all opportunities
- We all bring our best and celebrate success.

These support the consultation principles that have been adapted from the NNSW LHD Community Engagement Framework, and are:

Ensuring people have a voice

- All stakeholders have a chance to share their point of view
- Everyone's point of view is valid and respected.

Ensuring many voices are represented

- The perspectives of many people and groups are represented.

Shared vision

- Everyone works together towards the same vision of the future.

Transparency

- Transparency means open communication and sharing of information
- It also means everyone has the same, accurate information.

Planning based on the strengths of the community

- The strengths and resources already in the community are recognised
- These are a strong basis for future plans.

Authentic engagement

- All perspectives are valued and used to make change.

Realistic aims and expectations

- Objectives and constraints are understood by everyone.

4.1 Community Engagement

Community engagement has been extensive and included ongoing consultation through the established Community Reference Panel, the production and distribution of fact sheets and community newsletters, as well as community-facing activities including pop-ups and door-knocking.

Community engagement has also involved particular groups/stakeholders for key elements associated with the development (e.g. including but not limited to: local residents in relation to the Visual Impact Assessment; Aboriginal and Torres Strait Islander Working Group; and the South Sea Islander community in relation to Historical Heritage and Interpretation). This is discussed in the relevant appendices, as applicable.

Refer to Section 3 of **Appendix G** for a comprehensive overview of community engagement, including workshops, summary of fact sheets and newsletters, and online engagement.

The design response is informed by a range of considerations, including (but not limited to), clinical planning, the site and local context, and engagement with the community and agencies as outlined in this Section of the EIS and detailed in the Architectural and Urban Design Report at **Appendix C**. The abovementioned community engagement has resulted in a range of design input and feedback for the design and Project team to consider. The Consultation Report (**Appendix G**) and the Architectural and Urban Design Report (**Appendix C**), identify key issues raised in the consultation process and discuss how the design has considered and responded to the feedback and issues raised, where relevant/ appropriate. This has resulted in a well-informed, considered, and acceptable design response and outcome.

4.2 Agency and Stakeholder Consultation

The Project team, including independent specialists undertook consultation with key stakeholders, including government agencies. The aim of this consultation was to seek guidance from and engage with relevant authorities on the preparation of detailed assessments as part of the Stage 2 SSD application. Consultation included the following key government agencies and non-government stakeholders:

- Various relevant service and utilities providers
- Office of Environment and Heritage (OEH)
- Tweed Shire Council (TSC)
- Health Infrastructure (HI)
- Cudgen Road Farms
- Transport for NSW (TfNSW)
- NSW Roads and Maritime Service (RMS)
- Government Architect NSW (GA NSW) and the State Design Review Panel
- NSW Rural Fire Service (RFS)
- Tweed Byron and Ballina Community Transport
- Surfside Buslines
- Kingscliff TAFE.

Refer to Section 2 of **Appendix G** for a comprehensive overview of government, agency, and key stakeholder consultation and project outcomes.

Engagement with the GA NSW and responses to design review feedback is detailed further in **Appendix C**.

4.3 Clinical and Staff Engagement

Staff across the Tweed Hospital, Murwillumbah District Hospital and Byron Central Hospital were engaged through frequent forums conducted to inform and consult with all staff. Newsletters and other formal correspondence are also used to keep staff informed and engaged. Topics that were raised included interim upgrade works and project progress updates and concept designs (refer to **Appendix G** for more detail on clinical and staff consultation, communication and forums).

Project User Groups (PUGs) were established in late 2017 and engagement has continued through the design phase of the Project. The PUGs consult with key members of staff, and form a conduit for broad, two-way staff engagement.

The PUGs provide valuable insight into design solutions to achieve clinical and operational outcomes. The process has been ongoing, and input has included:

- Development of draft models of care
- Opportunity to view and discuss the design with the Tweed Valley Hospital design team
- Development of macro level functional relationships to inform design, patient safety and operational efficiency.

5. Statutory and Environmental Assessment

5.1 SEAR 1 Statutory and Strategic Context

5.1.1 Permissibility

The majority of the Project Site is zoned SP2 Infrastructure (Health Services Facility) under TLEP 2014 and no height limits, Floor Space Ratio (FSR) or minimum lot size controls are included in this zone. The northern fringe of the Project Site remains a deferred matter from the TLEP 2014 and therefore defaults back to the TLEP 2000. This northern fringe is mostly zoned 7(l) Environmental Protection (Habitat), with small slivers of 2(c) Urban Expansion and 1(b1) Agricultural Protection under the TLEP 2000. These areas contain vegetated land (exotic and native), including areas mapped as Coastal Wetlands. **Illustration 5.1** and **5.2** show the current zoning arrangement on the Project Site and footprint of the new Tweed Valley Hospital. The objectives of these zones are as follows:

SP2 Infrastructure zone:

- *To provide for infrastructure and related uses*
- *To prevent development that is not compatible with or that may detract from the provision of infrastructure.*

7(l) Environmental Protection (Habitat):

- *To protect areas or features which have been identified as being of particular habitat significance*
- *To preserve the diversity of habitats for flora and fauna*
- *To protect and enhance land that acts as a wildlife corridor*
- *To protect areas of scenic value*
- *To allow for other development that is compatible with the primary function of the zone.*

2(c) Urban Expansion:

- *To identify land for urban expansion (which will comprise mainly residential development focused on multi-use neighbourhood centres) and to ensure its optimum utilisation consistent with environmental constraints and the need to minimise residential landtake*
- *To allow associated non-residential development which meets the recreation, shopping, commercial, employment and social needs of future residents*
- *To ensure that sensitive environmental areas within and outside the zone are protected from any adverse impacts of development*
- *To enable planning flexibility to achieve the other objectives of the zone by means of detailed guidelines in a development control plan.*

1(b1) Agricultural Protection:

- *To protect identified prime agricultural land from fragmentation and the economic pressure of competing land uses*
- *To allow other development that is compatible with agricultural activities.*

The Tweed Valley Hospital is defined as a Health Services Facility which means:

A building or place used to provide medical or other services relating to the maintenance or improvement of the health, or the restoration to health, of persons or the prevention of disease in or treatment of injury to persons, and includes any of the following:

(a) a medical centre,
(b) community health service facilities,
(c) health consulting rooms,
(d) patient transport facilities, including helipads and ambulance facilities,
(e) hospital.

The uses can then be further defined as follows:

- *A **hospital** means a building or place used for the purpose of providing professional health care services (such as preventative or convalescent care, diagnosis, medical or surgical treatment, psychiatric care or care for people with disabilities, or counselling services provided by health care professionals) to people admitted as in-patients (whether or not out-patients are also cared for or treated there), and includes ancillary facilities for (or that consist of) any of the following:*

  (a) day surgery, day procedures or health consulting rooms,
  (b) accommodation for nurses or other health care workers,
  (c) accommodation for persons receiving health care or for their visitors,
  (d) shops, kiosks, restaurants or cafes or take away food and drink premises,
  (e) patient transport facilities, including helipads, ambulance facilities and car parking,
  (f) educational purposes or any other health-related use,
  (g) research purposes (whether or not carried out by hospital staff or health care workers or for commercial purposes),
  (h) chapels,
  (i) hospices,
  (j) mortuaries.

- ***medical centre** means premises that are used for the purpose of providing health services (including preventative care, diagnosis, medical or surgical treatment, counselling or alternative therapies) to out-patients only, where such services are principally provided by health care professionals. It may include the ancillary provision of other health services.*
- ***health consulting rooms** means premises comprising one or more rooms within (or within the curtilage of) a dwelling house used by not more than 3 health care professionals at any one time.*
- ***mortuary** means premises that are used, or intended to be used, for the receiving, preparation, embalming and storage of bodies of deceased persons pending their interment or cremation.*
- ***emergency services facility** means a building or place (including a helipad) used in connection with the provision of emergency services by an emergency services organisation.*

Health Services Facilities are permissible with consent in the SP2 Infrastructure (Health Services Facility) zone under the provisions of TLEP 2014.

Environmental and wetland rehabilitation, including rehabilitation of the farm dam as outlined in the BDAR and consistent with the BMP prepared in accordance with the SSD 9575 conditions of consent, would extend into areas zoned 7(l) Environmental Protection (Habitat), 2(c) Urban Expansion and 1(b1) Agricultural Protection under the TLEP 2000. The environmental management works and rehabilitation are permissible with consent and are consistent with the Concept Proposal approval under SSD 9575.

Existing sedimentation basins would be converted to bio-detention basins for stormwater management purposes associated with the hospital. These basins, except for some of the existing headwalls and scour protection that marginally extend into the 7(l) Environmental Protection (Habitat) zone, sit within the SP2 Infrastructure zone. The stormwater management facilities are permissible with consent and are consistent with the approval under SSD 9575.

The Project is consistent with the aforementioned zone objectives of the TLEP. The Tweed Valley Hospital and its supporting site infrastructure would be accommodated within the SP2 Infrastructure Zone (Health Services Facility), meaning that health services facilities, including any development that is ordinarily incidental or ancillary to that purpose, are permissible with consent.

The environmental management and rehabilitation works are generally consistent with the objectives of the applicable zones within which they occur and the SSD 9575 consent requirements.

External road works, including intersection upgrades identified in the approved Concept Proposal, also form part of Stage 2. These occur on Cudgen Road along the frontage of the Project Site and at the Tweed Coast Road and Cudgen Road intersection west of the Project Site. These are existing roadways, zoned RU1 Primary Production and R2 Low Density Residential under the TLEP 2014. Some widening at the frontage of the Project Site, into the Site's SP2 Infrastructure zone is also required for the main entrance. Roads are permitted in these zones. The RU1 and R2 zones have the following objectives:

Zone RU1 Primary Production

- *To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.*
- *To encourage diversity in primary industry enterprises and systems appropriate for the area.*
- *To minimise the fragmentation and alienation of resource lands.*
- *To minimise conflict between land uses within this zone and land uses within adjoining zones.*
- *To protect prime agricultural land from the economic pressure of competing land uses.*

Zone R2 Low Density Residential

- *To provide for the housing needs of the community within a low density residential environment.*
- *To enable other land uses that provide facilities or services to meet the day to day needs of residents.*

Given the road works occur primarily within existing road reserves, with some widening into the Project Site for the main entrance, there would be no impact to surrounding land uses and the objectives of the respective zones would be upheld.

Information shown is for illustrative purposes only

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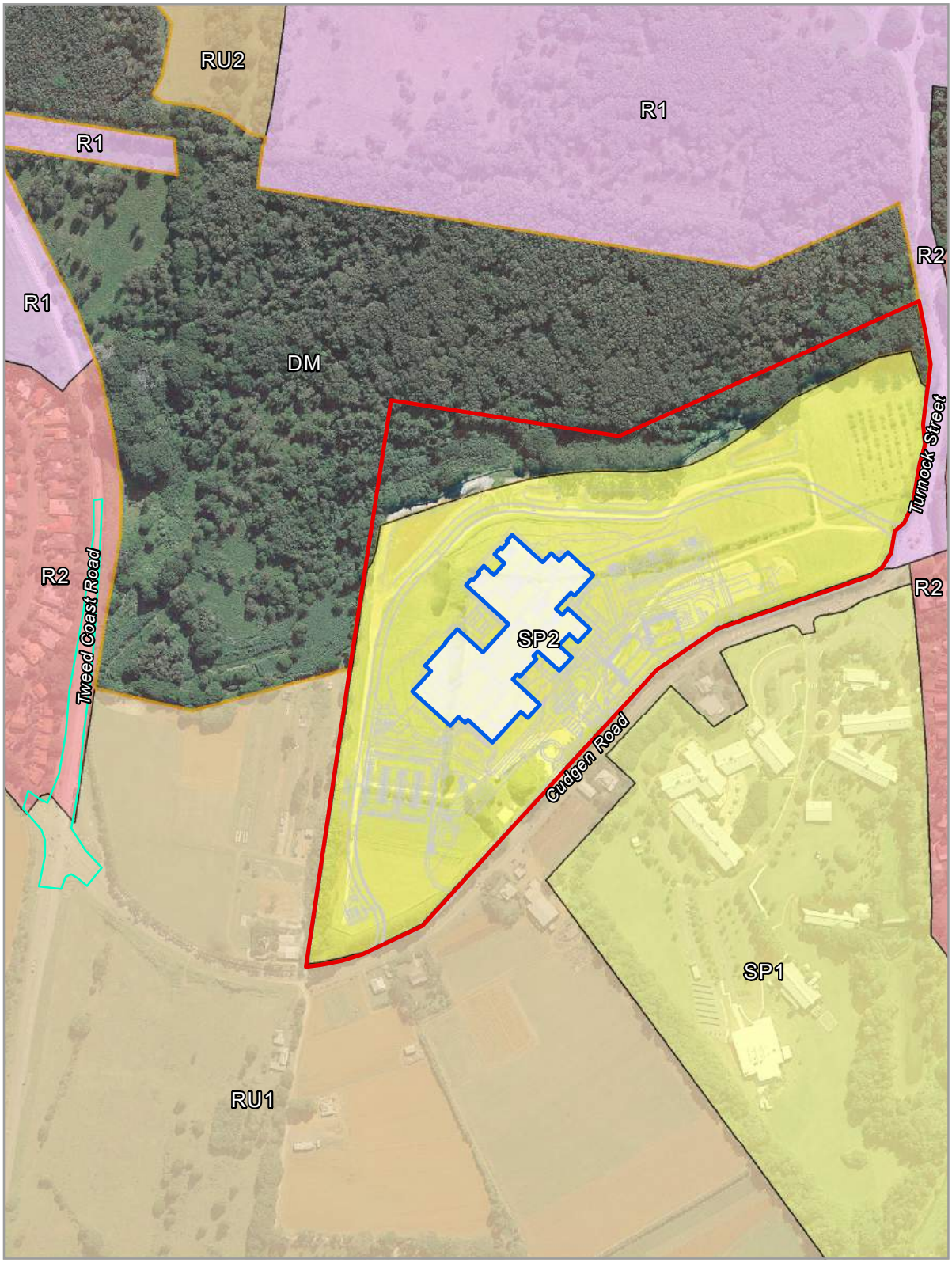
Source of base data: TSA, Tweed Shire Council and Silver Thomas Hanley & Bates Smart



LEGEND

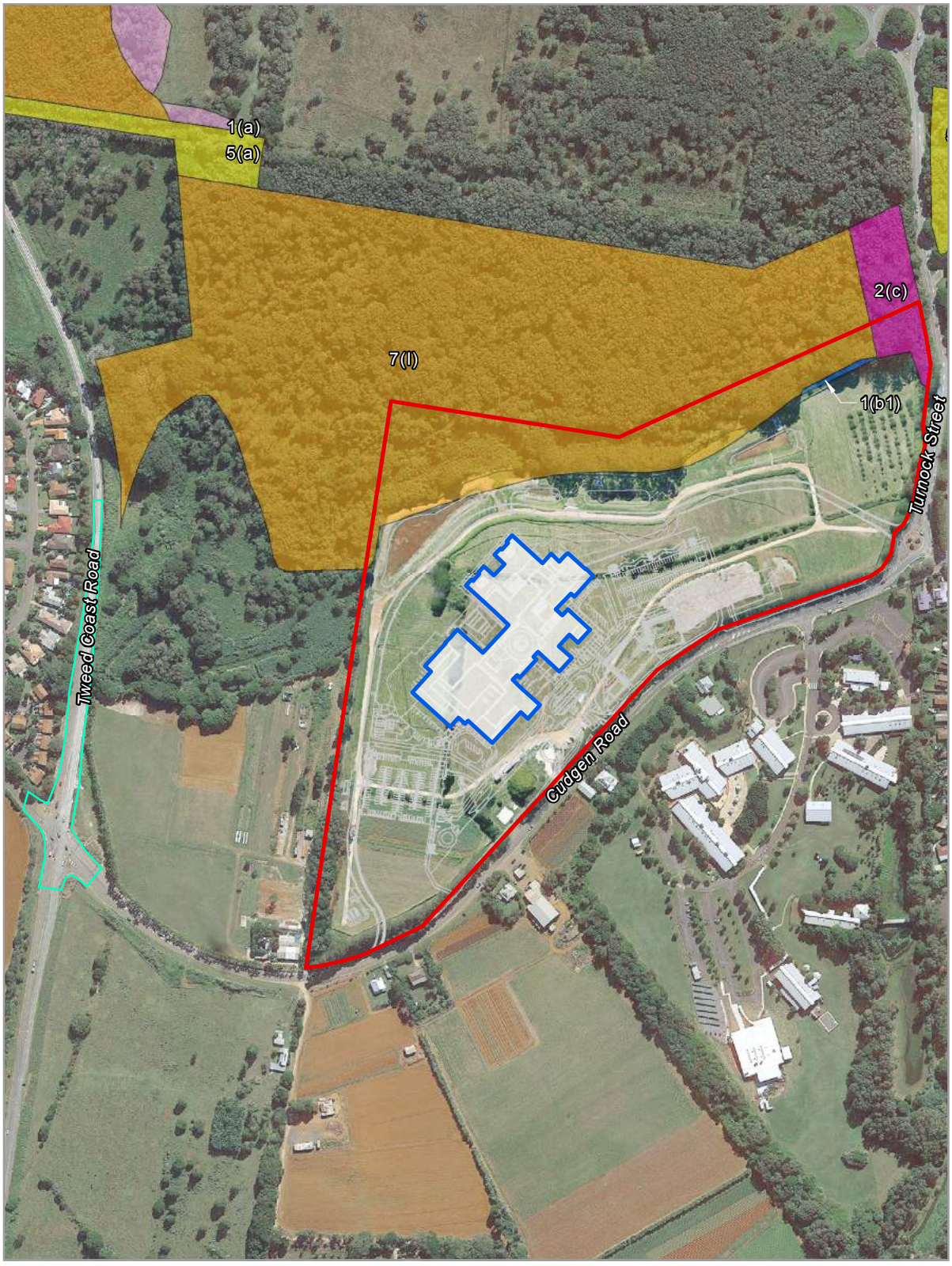
- Project site
- Proposed hospital building envelope
- Tweed Coast Road intersection upgrade
- Proposed design layout
- R1 General Residential
- R2 Low Density Residential
- RU1 Primary Production
- RU2 Rural Landscape
- SP1 Special Activities (Educational Establishment)
- SP2 Infrastructure (Health Services Facility)
- DM Deferred Matter

0 120

Site Zoning - TLEP 2014

Information shown is for illustrative purposes only

Drawn by: AB Checked by: AB Reviewed by: JTS Date: 12/09/2019
Source of base data: TSA, Tweed Shire Council and Silver Thomas Hanley & Bates Smart



LEGEND

- Project site
- Proposed hospital building envelope
- Tweed Coast Road intersection upgrade
- Proposed design layout

- 1(a) - Rural
- 1(b1) - Agricultural Protection
- 2(c) - Urban Expansion
- 5(a) - Special Uses
- 7(l) - Environmental Protection (Habitat)

0 120

Site Zoning - TLEP 2000

5.1.2 Consistency with Approved Concept Proposal

In accordance with Section 4.24 of the EP&A Act, the determination of any development application in respect of a site that is subject to an approved Concept Proposal cannot be inconsistent with that consent.

Stage 2 of the Project has been designed with regard for the approved Concept Proposal. However, due to refinement, further analysis, consultation and detailed design, there are additional components and changes identified in the Stage 2 SSD application that do not form part of the original Concept Proposal. As such a modification to the approved Concept Proposal (SSD consent 9575) is also sought as part of a separate but concurrent application. The proposed development's (Stage 2) consistency with key development parameters of the approved Concept Proposal are documented in **Table 5.1**. It has also been identified where modifications are required (and have been sought).

Table 5.1 Stage 2 Consistency with Approved Concept Proposal

Component	*Concept Proposal*	*Proposed Development*	*Consistent*
Land Use	Hospital	Hospital	Yes
Maximum Envelope - Hospital	Restricted to: (a) maximum building height of RL 67.1 including the helipad and plant rooms; (b) maximum building height of RL 54.85 for the main building mass; (c) the lowest basement level at RL 14.25; and (d) the level of the entry from Cudgen Road at RL 27.75	(a) maximum building height of RL 64.65 including the helipad and plant rooms; (b) maximum building height of RL 54.45 for the main building mass parapet; (c) the lowest basement level at RL 18.75; and (d) the level of the entry from Cudgen Road at RL 27.75	Yes.
Maximum Envelope – Health Hub (Support Building)	Restricted to: (a) a maximum height of RL 39.4; and (b) an entrance level floor height of RL 27.75 from Cudgen Road.	Three buildings comprise the Health Hub. The approved envelope has been marginally altered. Maximum height is RL 34.6, however the entry level is now set at RL 26.60.	Modification sought to envelope and entry level of Health Hub buildings to better interface with Cudgen Road.
GFA (hospital and support building, excluding helipad)	Maximum of 65,000 m^2	■ Main Hospital (including stage 2B): 62,096 m^2 ■ Health Hub buildings: 2,950 m^2 ■ Total: 65,046 m^2	Modification has been sought to increase GFA of the Concept Proposal.
Landscape masterplan	Endorsed concept zonal masterplan.	Detailed landscape strategy and masterplan, with minor variations to concept zonal masterplan.	In part. Modification has been sought to amend concept landscape zonal masterplan.

Component	Concept Proposal	Proposed Development	Consistent
On-site Car Parking	Tiered at grade car parking. Minimum of approximately 700 spaces to be provided.	Combination of multi-deck and at-grade car parking. Minimum of 1,201 spaces to be provided at opening, informed by demand study. Maximum proposed potential supply of 1,538.	Modification sought.
On-site Bicycle Parking	Minimum of 43 bicycle spaces to be provided.	Total 52 staff and 20 public/ visitor bicycle spaces provided.	Yes.
Total beds	430 beds (inclusive of day and overnight beds but excluding emergency treatment spaces).	499 beds (inclusive of day and overnight beds but excluding emergency treatment spaces (46)).	Modification sought to accommodate expansion of clinical services.
Site access and intersection upgrades	Main Cudgen Road intersection, secondary entry from Cudgen Road, and upgrade to Tweed Coast Road/Cudgen Road intersection.	As per Concept Proposal.	Yes.
Site and internal road layout	Building envelope locations and concept road/parking area layouts identified.	Building envelope locations, consistent with Concept Proposal; internal road layout has been slightly modified with some refinement; car parking layout and access thereto reconfigured.	In part. Modification has been sought to amend site layout in relation to multi-deck car park and access.
Addition of temporary Tweed Valley Skills Centre	Not part of original Concept Proposal.	Includes construction of temporary Tweed Valley Skills Centre.	Modification has been sought to include in the Concept Proposal.

While a number of minor variations to the approved Concept Proposal are required, the proposal seeks to build on the design framework, and include refinements that are proposed to improve the built form and urban design outcome, the public realm, and parking provision on-site. Some of the changes are considered to be refinements given their minor nature (e.g. small envelope/level adjustments), whereas others are more substantial (e.g. addition of multi-deck parking). As a consequence, a number of the SSD 9575 conditions would require modification to reflect the changes. A Modification Application to SSD Consent 9575 (lodged concurrently with the SSDA for Stage 2) has been prepared to address and seek approval for the key changes and therefore maintain consistency between the Stage 2 SSD application and that approved under the Concept Proposal.

5.1.3 State Environmental Planning Policies

The following table addresses relevant State Environmental Planning Policies (SEPPs) with regard to the Project.

Table 5.2 Relevant State Environmental Planning Policies

Policy	*Detail*	*Complies*
State Environmental Planning Policy No. 44 – Koala Habitat	State Environmental Planning Policy No. 44 aims to encourage the conservation and management of areas of natural vegetation that provide habitat for koalas to ensure a permanent free-living population and reverse the current trend of koala population decline.	The proposed development has been specifically sited within an area of the site that is largely cleared and would not significantly impact flora or fauna. Required clearing was assessed as part of the previous Concept Proposal and Stage 1 EIS, that was supported by a detailed Biodiversity Development Assessment Report (BDAR). An updated BDAR (**Appendix U**) has been prepared for Stage 2. There would be no significant impact to Koala habitat.
State Environmental Planning Policy No. 55 – Remediation of Land	The objective of this policy is to provide for a State-wide planning approach to the remediation of contaminated land. It aims to promote the remediation of contaminated land for the purpose of reducing the risk of harm to human health or any other aspect of the environment. A consent authority must consider the provisions of clause 7(1) of SEPP 55 in order to grant consent for a development.	Contamination was assessed and localised remediation approved to be undertaken as part of the Stage 1 Works, in accordance with a Remediation Action Plan (RAP) and conditions of consent. The interim Site Audit Statement attached at **Appendix Q** confirms that the required localised remediation is occurring, and subject to this the site would be suitable for the proposed development, satisfying SEPP 55.
Draft Remediation of Land State Environmental Planning Policy	State Environmental Planning Policy No. 55, and *Contaminated Land Planning Guidelines*, have provided the planning framework for the management of contaminated land in NSW. The draft Remediation of Land SEPP is part of a review program by the NSW Government. The new SEPP will retain key objectives from SEPP 55 as they remain relevant and add new provisions.	As outlined in relation to SEPP 55, remediation forms part of the Stage 1 Works. As per the interim Site Audit Statement attached at **Appendix Q** the Site would be suitable for the proposed development following localised remediation and therefore the provisions of the draft SEPP are satisfied.
State Environmental Planning Policy No. 64 – Advertising and Signage	The aim of this Policy is to improve the amenity of urban and natural settings by managing the impact of outdoor advertising. The proposal includes installation of a range of hospital identification and directional related signage as outlined in the signage and wayfinding strategy at **Appendix E** (signage plans are included as part of **Appendix B**). The location of these signs is shown on the applicable plans within the strategy. Signage types include illuminated and non-illuminated signs. The proposed hospital	The proposed signage is to be installed to convey information to the public and support identification of the hospital and to ensure that staff, patients and visitors know where to go when they arrive at the hospital (i.e. support way-finding). This is essential for patient and visitor safety and efficient movement within the campus. The signage style, design content and positioning are appropriate for a health services facility and serves the purpose of the hospital. The proposed signage is consistent with the character of the health campus and would not detract from the character or amenity of the surrounding broader area. There would be no adverse

Policy	Detail	Complies
	plans/elevations show the inclusion of hospital and emergency department identification signs, suitably integrated into the campus and building façade. Other identification and directional signage is spread throughout the campus. Temporary signage identifying the Project (and related information) is also proposed to be displayed at the Project Site during construction. The proposed signage is consistent with the aims and objectives of this Policy, in that it will: ■ Feature a distinct and high-quality design ■ Effectively communicate to the public the location and direction to relevant buildings/places within the hospital campus ■ Positively contribute to the public domain and streetscape, and ensure minimal visual disruption by integrating into the building and campus design ■ Make use of high-quality materials and finishes.	visual clutter, obscuring of important views/vistas, or related unreasonable visual impact as a result of the proposed signage. Signage would be appropriately designed and integrated into the public domain, streetscapes and buildings within the hospital campus in accordance with HI's policy on signage. Any illumination of signage would not result in unacceptable glare and would be designed to ensure safe operation of nearby roads. Illumination of signage is a standard and accepted requirement for a hospital given its 24-hour operation. The illumination of signage would not cause unacceptable light-spill and would not adversely impact surrounding residential areas given the physical separation distance. The proposed signage has been designed and sited for safe operation, without any adverse effect on pedestrians, road users or cyclists. The temporary signage identifying the Project (and related information) would be displayed during construction to convey information to the public. It would not adversely affect character, views, the streetscape, amenity, or safety, and would be removed at completion of the Project. Additional assessment of the signage to be installed, against the Assessment Criteria of the SEPP, is provided in **Appendix E**. Overall, it is considered that the proposed signage is consistent with the objectives of SEPP 64 and the criteria outlined in Schedule 1 of SEPP 64.
State Environmental Planning Policy (Coastal Management) 2018 (Coastal Management SEPP)	The Coastal Management SEPP aims to promote an integrated and co-ordinated approach to land use planning in the coastal zone in a manner consistent with the objectives of the *Coastal Management Act 2016*.	A comprehensive assessment of the proposal in accordance the relevant provisions of this SEPP is provided below.

The Coastal SEPP applies to part of the Project Site. An assessment of the relevant development controls contained within the SEPP and how they relate to Stage 2 is provided below.

Division 1 Coastal wetlands and littoral rainforests area

The Tweed Valley Hospital and associated infrastructure does not occur on land mapped as Coastal Wetlands or Littoral Rainforest on the "Coastal Wetlands and Littoral Rainforests Area Map" (refer **Illustration 2.4**). However, low-lying areas of the Project Site, north of the development area, are mapped as Coastal Wetlands and the associated proximity buffer extends southward into the Project Site. Some areas of the hospital and ancillary infrastructure would fall within the proximity buffer (refer **Illustration 2.4**).

Environmental and wetland rehabilitation works, including filling/rehabilitation of the redundant farm dam in the site's north-west corner, consistent with the BMP prepared in accordance with the SSD 9575 conditions of consent, involves works within areas of mapped Coastal Wetland.

As described in **Section 3.14**, in order to prevent further infestation, it has been recommended that the dam is decommissioned and filled so that this corner of the site returns to a more natural state.

Consent is required for works within mapped Coastal Wetlands. Detailed stormwater, ecological and hydrological assessments (refer to **Appendix U** and **S**) have been undertaken and determined that the environmental management/rehabilitation works would enhance, and adequately protect, the biophysical, hydrological and ecological integrity of the Coastal Wetland. There would be an improved environmental outcome for the wetland and local environment.

Clause 11 of Division 1 - development on land in proximity to coastal wetlands or littoral rainforest - provides the following:

(1) Development consent must not be granted to development on land identified as "proximity area for coastal wetlands" or "proximity area for littoral rainforest" on the Coastal Wetlands and Littoral Rainforests Area Map unless the consent authority is satisfied that the proposed development will not significantly impact on:

(a) the biophysical, hydrological or ecological integrity of the adjacent coastal wetland or littoral rainforest, or

(b) the quantity and quality of surface and ground water flows to and from the adjacent coastal wetland or littoral rainforest.

(2) This clause does not apply to land that is identified as "coastal wetlands" or "littoral rainforest" on the Coastal Wetlands and Littoral Rainforests Area Map.

Concept approval has already been given to the Project and the Concept Proposal and Stage 1 EIS provided an assessment of water resources and biodiversity matters, demonstrating that the development would not adversely affect the hydrological or ecological processes of the wetland. **Sections 5.16** and **5.19** of this EIS provides further relevant environmental assessment of the Project, including stormwater, ecological and hydrological considerations in light of the detailed design of the development and SSD 9575 conditions of consent. The assessment undertaken has found that the development would not significantly impact upon the Coastal Wetland and the above Coastal Management SEPP policy requirements associated with development in proximity to Coastal Wetlands would be satisfied.

Furthermore, the Project would result in an improved environmental outcome for the Coastal Wetland and receiving environment. This is achieved by way of a reduction in sediment and pollutant impacts by effectively designing for and managing stormwater runoff quantity and quality, compared to the previous existing conditions where pollutant and sediment laden runoff resulted from agricultural activities.

Division 2 Coastal vulnerability area

The Project does not impact on land mapped as a "coastal vulnerability area".

Division 3 Coastal environment area

The Project does not impact on land mapped as a "coastal environment area".

Division 4 Coastal Use Area

The Project does not impact on land mapped as a "coastal use area"

Policy	***Detail***	***Complies***
State Environmental Planning Policy (Infrastructure) 2007 (ISEPP)	State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) aims to facilitate the effective delivery of infrastructure across the State. Division 10 of	In accordance with Clause 104 and Schedule 3 of ISEPP, the proposed hospital will have more than 200 beds and therefore triggers referral to RMS.

Policy	Detail	Complies
	the ISEPP outlines approval requirements for health facilities. Clause 58 of the ISEPP stipulates the thresholds for health facilities that can be assessed as Development Without Consent. The proposal does not meet these requirements and therefore requires development consent.	RMS has been consulted throughout the planning and design process and reviewed the Traffic Impact Assessment that supported the Concept Proposal. The Traffic Impact Assessment applicable to Stage 2 (**Appendix K**) finds that the Project is acceptable from a traffic perspective.
State Environmental Planning Policy (State & Regional Development) 2011	The relevant provisions of this SEPP have been discussed previously	The proposal is classified as State Significant Development under this SEPP.
State Environmental Planning Policy No. 33 – Hazardous and Offensive Development	Potentially hazardous industry as defined in SEPP 33 *"means a development for the purposes of any industry which, if the development were to operate without employing any measures to reduce or minimise its impact in the locality or on the existing or likely future development on other land, would pose a significant risk in relation to the locality:* *a. to human health, life or property, or* *b. to the biophysical environment,* *and includes a hazardous industry and a hazardous storage establishment".* If a development is found to be potentially hazardous according to SEPP 33 screening, a Preliminary Hazard Analysis (PHA) is required in accordance with guidelines and circulars published by the NSW Department of Planning. The objectives of a PHA are to: ■ Identify potential hazards associated with the proposed and existing facilities ■ Determine likelihood of occurrence and consequences to people and the environment of identified hazards ■ Assess the risk in terms of location and land use ■ Recommend safeguards and mitigation measures if	A Preliminary Hazard Analysis (PHA) has been prepared for the Proposal and is attached as **Appendix AA.** The PHA confirms the acceptability of the Project in terms of hazard and risk management and no further assessment is required.

Policy	Detail	Complies
	required to achieve an acceptable level of risk.	
Draft State Environmental Planning Policy – Environment	The DPIE is undertaking a review of the State's planning policies to modernise and simplify the planning system. It is proposed that the following seven existing SEPPs will be merged into one SEPP (draft SEPP Environment): ■ State Environmental Planning Policy No. 19 – Bushland in Urban Areas ■ State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011 ■ State Environmental Planning Policy No. 50 – Canal Estate Development ■ Greater Metropolitan Regional Environmental Plan No. 2 – Georges River Catchment ■ Sydney Regional Environmental Plan No. 20 – Hawkesbury-Nepean River (No.2-1997) ■ Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005 ■ Willandra Lakes Regional Environmental Plan No. 1 – World Heritage Property.	None of these SEPPs have current application to the Project Site and therefore the draft SEPP - Environment is not applicable.

5.1.4 Tweed Local Environmental Plan

The proposed hospital and associated infrastructure are permissible within the SP2 Infrastructure zone under the TLEP 2014. An overview of relevant local provisions, including consideration of their objectives, has been provided in **Table 5.3**. The environmental rehabilitation works that fall within areas subject to the TLEP 2000 (including filling of redundant farm dam) have also been considered against relevant provisions of TLEP 2000 in this table.

Table 5.3 Consideration of TLEP Clauses

Local Planning Instruments and Controls		
TLEP 2014	Clause 4.3 Height of Buildings	No height control applies to the SP2 zone on the Site. The design response balances the clinical and functional needs of the hospital while suitably responding to contextual, amenity and urban design considerations. Based on the merits of the Project, the height is acceptable.
	Clause 4.4 Floor Space Ratio (FSR)	No floor space ratio controls apply. As above, the design response is acceptable.

Local Planning Instruments and Controls		
	Clause 5.10 Heritage Conservation	The site does not contain nor would the development impact on any listed heritage items. Heritage is addressed in **Section 5.10**.
	Clause 7.1 Acid Sulfate Soils (ASS)	Most ground disturbing works were assessed as part of Stage 1 works. The hospital footprint and associated infrastructure occur within Class 5 ASS. Disturbance of ASS is not expected, and no further action is required.
	Clause 7.2 Earthworks	Bulk earthworks were assessed as part of Stage 1. Earthworks associated with Stage 2 would occur within the existing disturbance footprint and established areas under Stage 1 with no further significant impact or detriment.
	Clause 7.3 Flood Planning	The proposed location of the new hospital and associated buildings and critical infrastructure are acceptably above the PMF level.
	Clause 7.10 Essential Services	Services and utilities are available and it has been demonstrated that the hospital can be adequately serviced.
TLEP 2000	Clause 28 Development in Zone 7 (l) Environmental Protection (Habitat) and on adjacent land	The hospital development footprint occurs within the SP2 Infrastructure zone, with some environmental rehabilitation work occurring in the adjacent 7(l) Environmental Protection (Habitat) zone in accordance with a BMP. The likely effects of the development on flora and fauna have been considered and would not be significant. The rehabilitation work and stormwater management measures to be implemented on the site would see environmental improvements. Flora (including weed management) and fauna management are outlined in the BMP along with appropriate mitigation measures and safeguards (refer to **Appendix U**).
	Clause 34 Flooding	None of the critical hospital infrastructure is proposed to be built within areas subject to the TLEP 2000. Environmental rehabilitation work and stormwater headwalls/outlets (existing) from the converted bio-detention basins are acceptable and there would be no adverse impact in relation to flooding.
	Clause 35 Acid sulfate soils	This was largely assessed in Stage 1 with no impact expected. Stage 2 Works are not expected to impact acid sulfate soils and a management plan is not required. Decommissioning of the farm dam involves filling, hence no acid sulfate soil disturbance is likely.
	Clause 40 Heritage provisions objectives	Only dry-stone Wall no. 5 identified on the Project Site sits within an area covered by the TLEP 2000 (near the northern extent of the site). Environmental rehabilitation works and conversion of existing basins for bio-detention purposes (to occur near this northern extent) would not adversely impact associated heritage values. Heritage is addressed in **Section 5.10**.

5.1.5 Developer Contributions Plan

There are a number of developer contribution plans that apply to development within the Tweed LGA, with most being associated with residential or tourist accommodation. Advice issued from DPIE states that in principle, the limitations on the imposition of developer contributions on public sector developments remain as outlined in Circular D6 – Crown Development Applications and conditions of consent (Department of Land and Water Conservation (DLWC) 2002, page 12 Section 27) which

states that *"Crown developments for community services e.g. education, health, community services and law and order are exempt from general developer charges."*

With regard to utilities connections involving Council's water and sewer assets, HI is in the process of ongoing engagement with Council to obtain an agreed approach for these connections. HI is seeking an exemption to any financial contributions to Council under the Project in relation to water and sewer connections (under Section 64 of the *Local Government Act 1993*), for the following reasons:

1. In accordance with Section 2.7 of Council's *Development Servicing Plans for Water Supply and Sewerage 2019*:

   "Crown developments for essential community services (education, health, community services, and law and order) are exempt from general developer charges. Water utilities may charge these developments only for that portion of the direct connection cost (e.g. for a lead-in main) relating to Crown development".

   As the new Tweed Valley Hospital is a development by the Crown for an essential health community service, this exemption applies. HI confirms the Project is funding the costs of the direct connection with respect to water and sewerage.
2. Consultation with Council's officers throughout the planning phase has confirmed that there is sufficient capacity in Council's existing water and sewer infrastructure to accommodate the additional demand created by the Project without the requirement to upgrade its assets.
3. The new hospital will provide significant social benefit to the Tweed-Byron region by providing a state-of-the-art hospital to meet the health needs of the community, along with the provision of improved public realm infrastructure on the campus such as cycle and pedestrian facilities.
4. The Project will provide significant economic benefit to the Tweed-Byron region from the creation of jobs and local expenditure during construction and once the hospital is operational.
5. The catalyst that the Project will provide for surrounding developments set out in the Kingscliff Locality Plan and the revenues that this will bring Council from developer contributions (that can be used to fund any resulting demand for infrastructure upgrades) and subsequent rates revenues.
6. The Project is investing significant capital in the upgrade of surrounding road infrastructure, to not only address the Project's impacts but also existing capacity and safety constraints.
7. The Project requires all available funds to deliver the required healthcare services and supporting facilities. Any reduction to available funds is likely to detrimentally impact the level of service the new hospital will be able to provide to the community.

For the reasons outlined above HI is of the view that Developer Charges (under Section 64 of the *Local Government Act 1993)* and Developer Contributions (under Section 7.11/7.12 of the EP&A Act) should not be levied for this Project.

HI will work with Council and RMS on the planning and delivery of the upgrades to the supporting road infrastructure and how these works will effectively interface with Council's future planned four-lane upgrade of Tweed Coast Road from the Pacific Highway to Cudgen Road.

5.1.6 Other NSW Legislation and Approvals

5.1.6.1 Protection of the Environment Operations Act 1997

The *Protection of the Environment Operations Act 1997* (POEO Act) includes provisions relating to the protection of the environment. One of the objectives of the POEO Act is to protect, restore and enhance the quality of the environment in NSW, having regard to the need to maintain ecologically sustainable development. There are serious offences under this Act for causing pollution of air, noise, water or land. NSW Health and the appointed contractor are required to meet the waste licensing obligations of Clauses 39 to 42 of Schedule 1 of the POEO Act in relation to the proposed works.

The Main Works contractor and HI are obliged to notify the NSW Office of Environment and Heritage (OEH) when a "pollution incident" occurs that causes or threatens "material harm" to the environment.

5.1.6.2 National Parks and Wildlife Act 1974

The *National Parks and Wildlife Act 1974* (NPW Act) provides the basis for the legal protection and management of Aboriginal sites within NSW.

An Aboriginal Cultural Heritage Assessment was prepared by Niche Environment and Heritage for the Concept Proposal and Stage 1 EIS that involved site clearing and bulk earthworks, highly disturbing activities. The assessment found no Aboriginal cultural heritage objects and there is no significant likelihood of Aboriginal objects occurring within the development area. The Project on this basis is unlikely to result in significant harm to Aboriginal Heritage. Standard mitigation measures and safeguards for unexpected finds would be employed during all works.

Pursuant to Clause 4.41 (1) (d) of the EP&A Act, an Aboriginal heritage impact permit under section 90 of the NPW Act 1974 is not required for SSD.

5.1.6.3 Fisheries Management Act 1994

Concurrence is required from the Minister for Department Industry for dredging and reclamation works on land that is periodically inundated by water in accordance with Section 199 of the *Fisheries Management Act 1994*. Reclamation works are proposed in the form of filling the existing farm dam within the mapped Coastal Wetland area.

The Project is not within a marine environment and no marine vegetation would be affected.

The works do not occur in areas that are likely to support threatened aquatic habitat for flora or fauna. Thus, the Project is considered unlikely to impact on any threatened aquatic species and communities. Pursuant to Clause 4.41(1)(b) of the EP&A Act, a permit under section 201, 205 or 219 of the *Fisheries Management Act 1994* is not required for SSD.

5.1.6.4 Biodiversity Conservation Act 2016

The *Biodiversity Conservation Act 2016* (BC Act) sets out the assessment framework for threatened species. It aims to maintain a healthy, productive and resilient environment for the greatest wellbeing of the community, now and into the future, consistent with the principles of ecologically sustainable development. The BC Act places obligations on proponents in relation to the consideration of threatened species and ecological communities.

In accordance with the SEARs, an updated BDAR has been prepared to accompany the Stage 2 SSDA. It confirms that no significant impacts would result, that the development has been suitably designed in response to biodiversity considerations, and that responsible construction and operational practices would not adversely impact flora and fauna. Further, in accordance with conditions of consent a BMP has been prepared for the site which addresses both construction and long-term management practices (refer **Section 5.19** and **Appendix U**). After avoiding and minimising the impact of the development on biodiversity, the residual impact of direct, indirect and prescribed impacts that cannot be avoided and minimised would be minor.

5.1.6.5 Heritage Act 1977

The *Heritage Act 1977* provides for the conservation of items of environmental heritage in NSW.

No part of the Project Site is listed as an item of State significance on the NSW State Heritage Register. Accordingly, the proposal does not require heritage approval under the *NSW Heritage Act 1977*. The archaeological provisions of the *NSW Heritage Act 1977* are applicable, however, as all "relics" are protected under the NSW Heritage Act, regardless of whether or not the place is listed as a heritage item at a local, State or National level.

A Historical Heritage Assessment was prepared for the Concept Proposal. The assessment identified five dry-stone walls on the site as being considered of local significance. More than 80 per cent of the total length of the walls was identified as being able to be retained, whilst other sections would be impacted by the development and require removal (with the implementation of mitigation measures). Overall, the proposal was considered to be sympathetic to heritage values. The conditions of consent for SSD 9575 require that the Stage 1 works include the details of the methods to retain the walls (where possible) and archival recording of any walls that require removal (either in part or full) prior to the commencement of Stage 1 works. The requirements of these conditions will be addressed during the Stage 1 works. The conditions also require that the Stage 2 application include details of the retained walls on the site (where feasible) and associated archival recordings and interpretation techniques. A report prepared by Niche (**Appendix M**) addressing Historical Heritage considerations and demonstrating compliance with the relevant conditions (applicable to Stage 2) has been prepared. Heritage is addressed in **Section 5.10**.

A range of standard safeguards and management measures would continue to be implemented in Stage 2 to mitigate any impacts on heritage, including an unexpected finds protocol.

Section 4.41 (previously 89J) of the EP&A Act outlines approvals that do not apply to SSDs. Of relevance to heritage approvals, under s4.41 the following do not apply to SSDs:

- An approval under Part 4, or an excavation permit under s139, of the *Heritage Act 1977*
- Division 8 of Part 6 of the *Heritage Act 1977*, which relates to controlling and restricting harm to buildings, works, relics and places not subject to interim heritage orders or State Heritage Register listing.

5.1.6.6 Environmental Protection and Biodiversity Conservation Act 1999 (Cwth)

Under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), any action that has, or is likely to have, a significant impact on Matters of National Environmental Significance (MNES) or other aspects of the environment, such as on Commonwealth land, may progress only with approval of the Commonwealth Minister for the Environment under Part 9 of the EPBC Act.

The assessment undertaken for the Concept Proposal and Stage 1 Works EIS, including an assessment of MNES by Greencap, confirmed that there would be no significant impact to MNES or Commonwealth land as a result of the development. The considerations relevant to MNES and Commonwealth land relevant to Stage 2 would not be dissimilar to that considered as part of the Concept Proposal and Stage 1 Works EIS. Stage 2 of the Project would be consistent with the assessment's findings. The main potential MNES identified in that assessment was with regard to the Mitchell's Rainforest Snail (*Thersites mitchellae*). An expert assessment (by Invertebrate Identification Australasia) of the potential impacts to the Mitchell's Rainforest Snail was submitted during the previous stage and this has been further investigated for Stage 2 (refer to **Appendix CC**). No significant impact to MNES pertaining to the Mitchell's Rainforest Snail in relation to Stage 2 would result, and the Project would enhance not reduce available habitat.

In addition to this, a Hydrology Assessment has been prepared by SMEC (Refer **Appendix S**) which assesses the ecological impact of the Proposal's stormwater outflows on the adjoining Coastal Wetland and wetland species. The assessment concluded that there is no increase in the total site discharge rate in the 5-year and 100-year Average Recurrence Interval (ARI) storm events (peak flows), and that the increase in frequent flows from the Proposal can be mitigated and will have minimal ecological impact on the wetland and that improved water quality through reduction of sediment load and nutrients may be of ecological benefit to wetland species. This is discussed further in **Section 5.16.7**.

The recommendations of the BDAR and BMP for Stage 2 (**Appendix U**) would mitigate direct, indirect and prescribed biodiversity impacts.

As no significant impact to MNES is expected in relation to Stage 2, referral to the Federal Department of Environment and Energy is not required. A summary of the relevant matters for consideration is provided in the following table.

Table 5.4 Assessment of Matters of National Environmental Significance (Stage 2)

	Factor	*Impact*
a	**Any Environmental Impact on a World Heritage Property?**	
	The proposed works are not in proximity to any lands listed as World Heritage Property, and therefore would have no impact on such lands. Mitigation measures stated within this EIS would negate any potential environmental impacts off-site.	Nil
b	**Any Environmental Impact on National Heritage Places?**	
	A search indicated that there are no nearby National Heritage Places. Therefore, the proposed works would not have a significant impact on any such places. Mitigation measures stated within **Section 7** of this EIS would negate any potential environmental impacts off-site.	Nil
c	**Any Environmental Impact on Wetlands of International Importance?**	
	The proposed works are not in proximity to any lands listed as Wetlands of International Significance (RAMSAR Sites), and therefore would have no impact on such lands. Mitigation measures stated within **Section 7** of this EIS would negate any potential environmental impacts off-site.	Nil

	Factor	*Impact*
d	**Any Environmental Impact on Commonwealth Listed Threatened Species or Ecological Communities?**	
	This aspect was assessed as part of the Concept Proposal and Stage 1 Works EIS. Stage 2 would be consistent with the findings of the Stage 1 endorsed BDAR and MNES assessment. An updated BDAR for Stage 2 and BMP has been prepared (**Appendix U**). The main potential MNES identified previously was the Mitchell's Rainforest Snail and this has been further investigated with regard to Stage 2 (refer to **Appendix CC**). The Project would enhance Mitchell's Rainforest Snail available habitat. Overall, it is not expected that any Commonwealth listed species would be significantly impacted by Stage 2.	Nil
e	**Any Environmental Impact on Commonwealth Listed Migratory Species?**	
	This aspect was assessed as part of the Concept Proposal and Stage 1 Works EIS. Stage 2 considerations are not dissimilar and is consistent with the previous assessment, and it is not expected that any Commonwealth listed migratory species would be significantly impacted by Stage 2.	Nil
f	**Any Environmental Impact on a Commonwealth Marine Area?**	
	The Project does not impact on a Commonwealth Marine Area.	Nil
g	**Any impact on the Great Barrier Reef Marine Park?**	
	The Project is distant from the Great Barrier Reef Marine Park and there would be no impact.	Nil
h	**Does Any Part of the Project Involve a Nuclear Action?**	
	The Project does not involve a nuclear action.	Nil
i	**Any impact on a water resource, in relation to coal seam gas development and large coal mining development?**	
	The Project does not involve coal seam gas or coal mining.	Nil
	Additionally, any impact (direct or indirect) to Commonwealth Land?	
	The protected matters search tool returned results for Commonwealth Land within 10 km of the Project Site; however, none occurs within one kilometre. There would be no impact to Commonwealth Land.	Nil

5.1.7 Approvals under other Legislation

Clause 7(d)(v) of Schedule 2 of the EP&A Regulation 2000 requires that an EIS list any approvals that must be obtained under any other Act. A review of relevant legislation indicates the following approvals may be required prior to the development being carried out unless otherwise exempted:

- Approval under Tweed Shire Council's Policy - Discharge of Liquid Trade Waste to the Sewerage System
- Approval under Section 68 of the *Local Government Act 1993* (LG Act) unless an exemption is afforded under Section 68 LG Act
- Approval under Section 138 of the *Roads Act 1993* (Roads Act).

5.2 SEAR 2 - Policies

5.2.1 NSW Strategic Plans and Policies

The Project's consistency with the State's relevant strategic plans and policies was considered and demonstrated as part of the Concept Proposal and Stage 1 Works SSDA. **Table** 5.5 below provides a summary that reaffirms that the Project, including Stage 2, is consistent with these plans and policies.

Table 5.5 Consistency with NSW Strategic Plans and Policies

Strategic Plan/Policy	***Comment***
NSW State and Premier Priorities NSW	NSW State and Premier's Priorities are the strategic vision by the NSW State Government, including 12 priorities of the Premier and 18 State priorities being action by the NSW Government. The Project would deliver on key priorities by: ■ Delivering critical and important social infrastructure ■ Creating jobs: both direct and indirect generation of employment ■ Improving Government Services, including delivering modern, expanded and high-quality healthcare services ■ Improving service levels in hospitals and for the Tweed-Byron region ■ Encouraging investment and generating significant economic multiplier effects ■ Building significant regional infrastructure ■ Delivering better services for the community and region, including cutting wait times for planned surgeries. *The Project is consistent with relevant Premier and NSW Government Priorities as it will deliver significant investment in and the construction of critical infrastructure, add to the creation of construction related and long-term operational jobs and will improve health facilities and services for the community of the Tweed-Byron region.*
North Coast Regional Plan 2036	The North Coast Regional Plan 2036 (NCRP 2036) is the NSW Government's blueprint for land use planning priorities and decisions to 2036. It provides an overarching framework to guide subsequent and more detailed land use plans, development proposals and infrastructure funding decisions. While a series of directions and priority actions are included, medium and longer-term actions will be identified to coincide with population growth and economic change. *The Project is consistent with the following relevant Goals and Directions of the NCRP 2036:* ■ *Goal 2: A thriving, interconnected economy* - *Direction 5: Strengthen communities of interest and cross-regional relationships* - *Direction 6: Develop successful centres of employment* - *Direction 11: Protect and enhance productive agricultural lands* ■ *Goal 3: Vibrant and engaged communities* - *Direction 14: Provide great places to live and work* - *Direction 15: Develop healthy, safe, socially engaged and well-connected communities* - *Direction 16: Collaborate and partner with Aboriginal communities* - *Direction 18: Respect and protect the North Coast's Aboriginal heritage* - *Direction 21: Coordinate local infrastructure delivery.*

Strategic Plan/Policy	Comment
State Infrastructure Strategy 2018-2038	The Project will deliver on the strategic objective in the Strategy to plan for and deliver world-class health infrastructure that supports a 21st century health system and improved health outcomes for the people of NSW. *The proposed Tweed Valley Hospital is consistent with this strategic objective and investment in health infrastructure.*
NSW State Health Plan towards 2021	The Project would be consistent with and contribute to the delivery of the following key directions and strategies: ■ Keeping people healthy ■ Providing world class clinical care ■ Delivering truly integrated care ■ Supporting and developing our workforce ■ Support and harnessing research and innovation ■ Enabling e-Health ■ Design and building future-focused infrastructure. *The proposed Tweed Valley Hospital is consistent with the State Health Plan as its key objectives are aligned with the Plan's Directions and Strategies, particularly designing and building future-focused infrastructure which would in turn facilitate support for and realisation of the other Directions and Strategies in the Plan.*
Future Transport Strategy 2056 and Supporting Plans	A key outcome for the plan is to "support successful places" by creating a transport network across the State that better connects regional cities and centres and will increase access to regional jobs, services and education. Improved transport will broaden the catchment and improve access to services at the Tweed Valley Hospital. The Project will: ■ Facilitate effective movement networks for people and various forms of transport ■ Ensure the Tweed Valley Hospital includes a clear and interconnected circulation and movement network that supports legible access and the integration of public transport and pedestrian infrastructure ■ Support a range of transport strategies and measures, including a Green Travel Plan to promote alternative and active travel. Consultation with TfNSW and bus operating companies has and would continue to occur to ensure the integration of transport networks to service the hospital. Road upgrades have been proposed to ensure connectivity and access to the Tweed Valley Hospital. The Traffic Impact Assessment prepared by Bitzios Consultants (refer **Appendix K**) provides details on the pedestrian, cycling and public transport options available to provide sustainable transport infrastructure to the Project. A preliminary Green Travel Plan has been prepared to promote alternative and active travel. *The Project is consistent with this Strategy.*
Draft Kingscliff Locality Plan (KLP)	Kingscliff plays an important and evolving role in the Tweed region. These attributes and future growth provide strong strategic planning support for the development of the Tweed Valley Hospital in this locality. This allows health services, including the Tweed Valley Hospital, to be established in the context of an existing and growing urban area, supported by existing and planned infrastructure and an urban setting that will deliver more housing, jobs, and services. It also provides the opportunity for health and educational clustering and partnerships, as well as net social and economic benefits.

Strategic Plan/Policy	Comment
	The hospital and associated campus have been designed to balance the clinical and operational needs of a health facility with the amenity considerations of the surrounding area and residents. Whist being an obvious change to the Project Site, the development would not adversely affect the character or strategic direction of the broader Kingscliff area or the coastal setting.
Planning Guidelines for Walking and Cycling	The Planning Guidelines for Walking and Cycling aim to improve walking and cycling in strategic planning and development assessment. Stage 2 of the Project will support the objectives and aims of the Planning Guidelines for Walking and Cycling, including the following measures: ■ A preliminary Green Travel Plan has been prepared (refer **Appendix K**). It aims to reduce the environmental impact of travel to and from the development and includes measures to encourage and provide support for alternative modes of transport ■ The detailed design supports safe and legible access and circulation for pedestrians and allows for connectively to other pedestrian infrastructure in the locality ■ Bicycle parking/storage (for commuters and short-term use) and end of trip (change/shower) facilities have been provided in convenient and safe locations to encourage and support cycling to the hospital ■ Appropriate weather protection along walkways and near bus stops has been provided. *The Project is consistent with these guidelines.*
Healthy Urban Development Checklist, NSW Health	The proposal will enable the construction of a new hospital. The proposed development will provide improved functionality and expanded capability whilst improving efficiency. The proposal is considered to be consistent with the intent of the Healthy Urban Development Checklist by providing a new development that is well connected to existing and future public transport, contributes to social infrastructure in the locality and region, and facilitates cycling and pedestrian accessibility. *Overall the Project is consistent with and supports the following items in the NSW Healthy Urban Development Checklist:* ■ **Physical activity:** the development would provide opportunities for active transport and access to quality outdoor/open space at the hospital including a range of walking loops and end of trip facilities. ■ **Transport and physical connectivity:** the development would integrate with the Kingscliff urban area and provide opportunities for alternative transport modes, including public transport, walking and cycling, assisting to reduce car dependence. ■ **Community safety and securing:** the design has considered crime prevention and security, and applied Crime Prevention Through Environmental Design (CPTED) Principles. ■ **Public open space:** the Tweed Valley Hospital will incorporate access to a range of quality open space, supporting a healing and pleasant environment. ■ **Social infrastructure:** the Project responds to the current and future healthcare needs of the region, supports opportunities for collaborative education and training, and provides a significant investment in social infrastructure. ■ **Environment and health:** environmental impacts of Stage 2 have been thoroughly considered in this EIS. The proposed development is not anticipated to result in significant environmental impacts and would ensure acceptable outcomes are achieved.

Strategic Plan/Policy	Comment
Better Placed – An integrated design policy for the built environment of NSW 2017	Better Placed is an integrated design policy for the built environment of NSW. The design response and urban design considerations are discussed in **Section 5.4** and **Appendix C**. Overall, the Tweed Valley Hospital responds to clinical needs, functionality and identity as a major hospital, whilst also respecting the scale of surrounding development and the broader contextual setting both in response to the adjacent urban areas of Kingscliff and Cudgen and to the rural land to the south-west. The urban design principles considered, and the overall design response, achieve effective integration of the development into the site and local setting. It fulfils the operational and functional needs of a hospital facility. The development would be accessible and welcoming facility, and is supported by a well-designed and purposeful built form. The Project has taken into consideration the Better Placed design objectives and principles. Further detail relevant to how these objectives have been considered is provided in the Architectural and Urban Design Report at **Appendix C**. A number of presentations of the proposed development and design progression have been made to the State Design Review Panel (SDRP). *Project is consistent with the policy.*
Greener Places	The following principles found in the Greener Places draft policy document have been considered and applied to the Landscape Design Strategy/proposal (**Appendix D**) developed for the Tweed Valley Hospital. ■ Connectivity – Urban connectivity has been improved with the provision of more direct active transport connections (including cycling infrastructure). Planting design augments existing native vegetation, and bioretention basins/rain gardens establish stepping stone habitat connectivity across the site. ■ Multifunctionality – The range of spaces are designed to accommodate a range of programmatic requirements and user groups. The landscape serves to provide health and well-being to the hospital population, whilst also bolstering local flora and fauna biodiversity. ■ Participation – Consultation with key user groups for the hospital during the design process - including the elderly, children, the Aboriginal and Torres Strait Islander community, the local South Sea Islander community and people with mental health issues – has informed design development. ■ Additional Wellbeing Benefits – The policy highlights the fact that green infrastructure can reduce stress and improve healing times – particularly relevant to this Project. It also notes that green infrastructure can reduce symptoms of depression and cardiovascular disease, foster creative play among children and walkability improves public transport inequity. These aspects align with the Tweed Valley Hospital proposal and design response. *Project is consistent with the policy.*

5.2.2 Development Control Plans

The Tweed Development Control Plan (DCP) 2008 supports the provisions of the LEP and provides a set of development objectives and provisions for local development within the Tweed LGA. As stated in Clause 11 of the SRD SEPP, development control plans do not apply to SSD.

The Project is therefore not subject to the requirements of the DCP 2008, however the DCPs general guidelines for development have been considered where appropriate.

An assessment against relevant DCP policy is provided below in compliance with the SEARs.

Table 5.6 Assessment of the Project against relevant parts of DCP 2008

Issue	Comment	Complies
Tweed Development Control Plan Sections - Whole of Shire		
A2 – Site Access and Parking Code	A Traffic Impact Assessment (**Appendix L**) has been prepared and includes assessment of the car parking requirements of the Project. An adequate provision of parking would be provided to service the hospital and no adverse impact to surrounding on-street parking is expected.	Yes
Section A3 – Development of Flood Liable Land	A Flooding Assessment of the Site was undertaken by BMT for the Concept Proposal and determined that the Project Site presents a minimal flood risk. The majority of the Project Site including the main development area and critical infrastructure and access would be above the PMF level.	Yes
Section A4 – Advertising Signs Code	A signage and wayfinding strategy have been prepared (refer **Appendix E** – to be read in conjunction with the plans at **Appendix B**). Signage would be provided for the reasonable identification and wayfinding needs of the hospital facility. The signage would not adversely affect amenity.	Yes
Section A6 – Biting Midge and Mosquito Control	Measures for mitigating against mosquitos and biting insects have been considered.	Yes
Section A13 – Socio-Economic Impact Assessment	A comprehensive Socio-Economic Impact Assessment has been prepared for Stage 2 (refer **Section 5.11** and **Appendix N**).	Yes
Section A15 - Waste Minimisation and Management	Preliminary construction and operational Waste Management Plans have been prepared (refer **Section 5.22**).	Yes
Section A16 - Preservation of Trees or Vegetation	No additional tree removal is proposed in Stage 2. An updated BDAR has been prepared for the development (refer **Appendix U**) which assesses impacts to biodiversity, including vegetation.	Yes
Section A18 - Heritage	As part of the Concept Proposal and Stage 1 EIS a detailed investigation to assess the potential for Aboriginal archaeological resources and consultation with the Registered Aboriginal Parties did not identify sites of Aboriginal cultural heritage on the Site and noted the subject area has extremely low potential to contain intact archaeological deposits.	Yes

Issue	Comment	Complies
	A Historic Heritage Assessment has been prepared for Stage 2 in accordance with conditions of consent (refer **Sections 5.10** and **Appendix O**).	
Section A19 - Biodiversity and Habitat Management	A BDAR and BMP has been prepared for the development (refer **Appendix U**).	Yes
Tweed Development Control Plan Sections - Specific Sites (where relevant)		
Section B2 – Tweed City Centre	This Plan applies to the North and South Tweed City Centre. Although it does not cover the Project Site, it does cover the existing Tweed Hospital site. The impacts of the Project on the Tweed City Centre (i.e. the relocation and expansion of the hospital) are discussed in **Section 5.11** and the Social and Economic Impact Assessment (SEIA) at **Appendix N**. Measures have been identified and would be implemented to help mitigate impacts associated with the hospital relocation. This includes NNSW LHD planning to retain a range of community health and other out-of-hospital services at or in close proximity to the existing site.	Yes
Section B4 – West Kingscliff	This Plan applies to all that land within the Shire of Tweed generally referred to as West Kingscliff. The Project Site is located within the defined West Kingscliff. The Project Site is not identified for any development in this part of the DCP, however it was rezoned to SP2 Infrastructure in February 2019 to support the development of the Tweed Valley Hospital. A range of matters have been considered, including (but not limited to) clinical requirements, scenic and residential amenity, character, operation and functionally, to ensure an acceptable and balanced design outcome. The Project can also be adequately serviced by utilities. A traffic impact assessment has been prepared (**Appendix K**) and a number of road and intersection upgrades are proposed as part of Stage 2 to support the Project.	Yes, given the Project Site has been rezoned and Concept Approval given.
Section B9 – Tweed Coast Strategy	This Section applies to all forms of development within an area specified by a map. The Project Site is located within this area. The Project is not consistent with aspects of the Tweed Coast Strategy as this Strategy has not been updated to take into account the rezoning of the Project Site to SP2 Infrastructure which permits health services facilities. Justification for the use of the Site as a hospital was established in the Concept Proposal and Stage 1 EIS and by way of the approval.	Yes, given the Project Site has been rezoned and Concept Approval given.

5.2.3 Crime Prevention through Environmental Design (CPTED)

The detailed design of the Project has considered the Crime Prevention Through Environmental Design (CPTED) principles, including the site layout, public realm, and building design to establish a safe and secure environment for users and local community (refer to **Section 5.4.6** for further discussion).

5.2.4 Other State Policies

The following policies were considered in the context of the Concept Proposal and Stage 1 Works EIS (as applicable). These policies have also been considered for Stage 2 and as relevant by the appended specialist/technical reports that support this EIS:

- NSW Energy Efficiency Action Plan 2013
- NSW Resource Efficiency Policy (GREP)
- NSW Climate Change Policy Framework
- Sustainability Policy for NSW Government
- NSW and ACT Government Regional Climate Modelling (NARCliM) climate change projections.

Ecologically Sustainable Development (ESD) has considered energy and resource efficiency, including Climate Change, sustainability and related policy. The ESD report (**Section 5.8** and **Appendix L**) sets out a sustainable design framework, measures and design principles which have been considered by the design disciplines and incorporated into the detailed design for Stage 2.

Climate Change and relevant projections have also been considered in the context of the environmental assessment undertaken for the Concept Proposal and Stage 1 EIS, including bush fire (e.g. provision of a more conservative Asset Protection Zone), flood impacts, coastal hazards, and stormwater management to ensure this is factored into the assessment and is consistent with relevant policy aims, including to be more resilient to a changing climate. Such matters applicable to Stage 2 have been further considered to achieve an acceptable development outcome.

The Project is generally consistent with the relevant provisions, goals and objectives of these policies.

5.2.5 Other Local (Tweed Shire) Policies and Strategies

The following local policies have been considered for Stage 2 and as relevant by the appended specialist/technical reports that support this EIS.

- Tweed Coast Comprehensive Koala Plan of Management 2015 and Tweed Flying-Fox Camp Management Plan 2017

The Stage 2 BDAR and BMP (**Appendix U**) includes consideration of koalas and flying-foxes, including any applicable environmental management measures in response to the proposed development. No significant impact to these species would occur.

- Tweed Shire Council Aboriginal Cultural Heritage Management Plan

A detailed investigation, in accordance with statutory requirements, to assess the potential for Aboriginal heritage, including consultation with the Registered Aboriginal Parties, was undertaken by Niche as part of the Concept Proposal and Stage 1 Works EIS. This investigation concluded that there are no Aboriginal cultural heritage objects, places or features situated within the Project Site. The proposed development will not impact on any Aboriginal cultural heritage values.

- Draft Tweed Scenic Landscape Strategy

The draft Tweed Scenic Landscape Strategy aims to protect and enhance the scenic landscapes of the Tweed Shire. The draft Strategy focuses on protecting and managing scenic landscapes seen from publicly accessible locations. It does not apply to views from private property. A comprehensive Visual Impact Assessment (refer to **Section 5.5.8** and **Appendix J**) has been prepared to support Stage 2. It has had regard for the draft Strategy as relevant.

- Tweed Sustainable Agricultural Strategy and draft Tweed Shire Council Rural Land Strategy 2017-2036

The Tweed Sustainable Agricultural Strategy provides a vision and framework for sustainable agriculture. It highlights key issues affecting farm sustainability and identifies steps to overcome existing and perceived future challenges.

The draft Tweed Rural Land Strategy 2018-2036 is intended to inform the planning and management of rural land in Tweed Shire for the next 20 years.

The Project Site is former rural/agricultural land that interfaces with urban areas and was rezoned by the Minister for Planning to SP2 Infrastructure to permit the hospital development. Detailed agricultural impact and LUCRA reports were prepared to support the Concept Proposal and Stage 1 EIS.

Stage 2 is supported by an updated LUCRA that confirms the development/land use would be compatible. Implementation of interface management measures and an Agricultural Offset Plan to minimise the risk of potential land use conflict and help protect the productivity of farmland would help to offset some of the impacts and support agriculture in the region (refer to **Section 5.9**).

5.3 SEAR 3 - Operation

Key operational details of the proposed hospital have been outlined at **Section 3.12**, and more broadly throughout **Section 3**.

5.4 SEAR 4 – Built Form and Urban Design

The Project Architects (STH+BS) have prepared an Architectural and Urban Design Report (**Appendix C**) to accompany the application, address SSD 9575 conditions of consent, and describe the design response in detail. This, combined with the description of the Project at **Section 3,** addresses SEAR item 4. A summary of key design elements and how the Project responds to its context, as well as an assessment of built form and urban design considerations is provided below. Visual impact is specifically addressed at **Section 5.5.8**.

5.4.1 Bulk, Scale and Urban Design

The proposed built form massing is the result of extensive design analysis undertaken by HI and STH+BS, including detailed consideration of feedback from four State Design Review Panels (SDRPs) and GA NSW (refer to **Appendix C** for detail). The proposed design has been aimed at achieving the optimum urban design outcome for the site, with regard to a range of complex variables, environmental considerations and stakeholder requirements. The height, density, bulk and scale of the building, including the setback and position of the hospital and Health Hub buildings were approved as part of the Concept Proposal.

The urban design and built form response of the proposed buildings, public spaces and open areas, proposed in this application have had regard for the Concept Proposal and principles in the Tweed Valley Hospital Built Form and Urban Design Report and addendum submitted as part of the Concept Proposal and Stage 1 Works SSD application. However, the design has experienced some evolution as part of the planning for Stage 2 and modifications to the Concept Proposal have been concurrently sought to accommodate these changes. The modifications have been assessed and justified in the

respective Modification Application to SSD 9575 and maintain a suitable design response, generally consistent with the original key design principles and considerations.

The new hospital building will be nine storeys, plus rooftop helipad and lift lobby. It will read as six storeys, plus plant and helipad, from Cudgen Road, with two lower ground levels, taking advantage of the site topography. Given the visibility, the hospital has been designed to be experienced in the round, having no side or rear condition when seen from distant views. The hospital form is articulated as a cluster of scaled building forms.

The main building form can be characterised by its quadrant anchors, supported by a central connective core. The quadrants frame axial corridors which are experienced at all levels of the hospital, being a key public realm spatial ordering and orientation device. The density of the proposed building envelope is reflective of the importance of the new, modern hospital facility within a large site, with the massing and quadrant arrangement providing for articulation of the form and visual breakup.

The multi-deck car park is proposed to reach up to 10 storeys; however, the floor to floor height of each storey is comparatively much lower than the floor to ceiling heights of the main hospital building. This, combined with the siting of the multi-deck car park, ensures its perceived scale is notably lower than the main hospital building, adding minimal additional low-level mass to the visible bulk of the development. The multi-deck is also situated to the west of the hospital, being the least sensitive side of the development site in terms of residential amenity. The design and material treatment ensure adequate visual interest and minimisation of bulk.

Whilst the hospital building and multi-deck car park are taller than surrounding developments, which are generally one to two storeys in height, the main built form massing and density is located more centrally within the site and away from more sensitive uses. The Health Hub buildings present as an ensemble of human scale pavilions that interface with Cudgen Road and the main site entry point. They provide a locally recognisable built form scale and effective scale transition between the streetscape and the site.

The Project achieves high quality architectural design, featuring materials and finishes that reflect the locality and are responsive to the landscape setting. The buildings, complemented by the landscape design, provide a contemporary architectural response to the site's history and context, including references to agricultural land uses and the Australian landscape. A detailed urban design analysis, including consideration of design quality, site layout, streetscape, façade, material expression, form, and master planning, is provided by the Architectural and Urban Design Report at **Appendix C**.

As documented in the Architectural and Urban Design Report and Consultation Report (**Appendix C** and **G**), the design process has involved continual engagement with the community and the NSW Government Architect, including reviews by the SDRPs and GA NSW. The appended documentation demonstrates how feedback has been considered and addressed.

5.4.2 Setbacks

The main hospital building is located centrally within the Project Site, with the multi-deck car park located west of the hospital. Substantial setbacks to surrounding sensitive receivers are provided (refer to **Figure 5.1**). The main multi-storey forms (i.e. main hospital building and multi-deck car park):

- Are set back a minimum of 62.9 m from Cudgen Road to the south, and approximately 80 m from the nearest dwellings located on the opposite side of Cudgen Road to the south
- Are set back more than 300 m from residential development to the east

- Do not adjoin sensitive uses to the west and are setback between approximately 32-58 m from this boundary
- Are not proximal to residential development located over 500 m to the north.

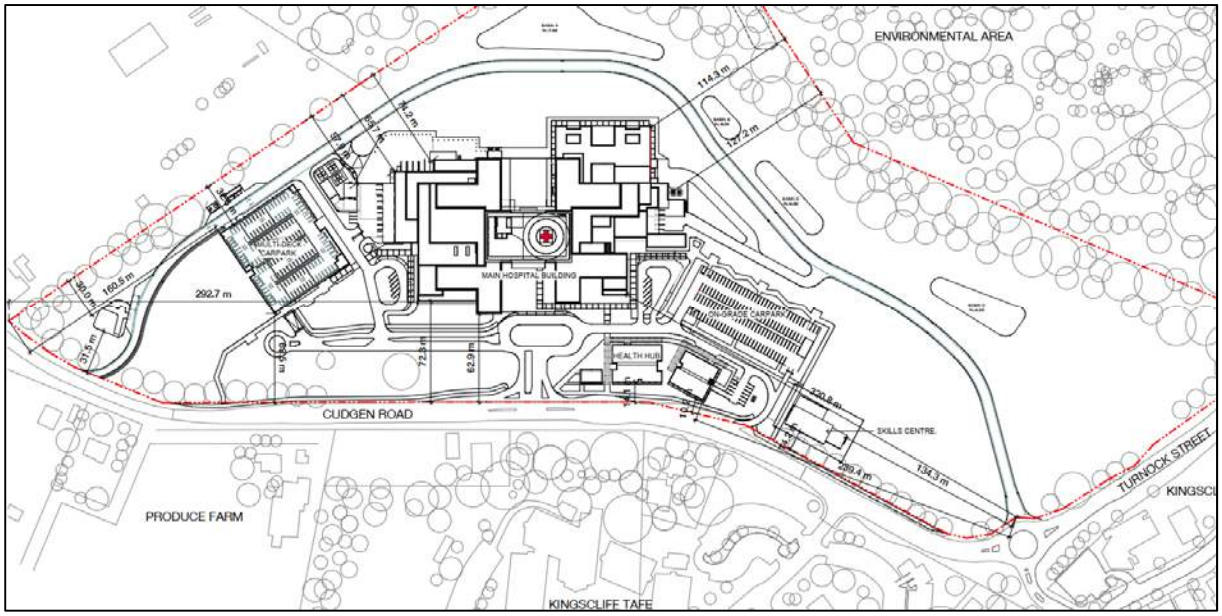


Figure 5.1 Building Setbacks

The low-scale Health Hub and Skill Centre are located closer to Cudgen Road, however these still have a minimum setback of approximately 10-14 m from the front boundary which is considered appropriate for this scale of built form.

The setbacks have been informed by the operational and functionality needs of the hospital as well as surrounding land uses. These include paths of travel, pedestrian and vehicular access, efficient use of land, interface and integration with the public domain, and surrounding sensitive receivers. The setbacks result in a suitably scaled development, with taller elements located into the site toward the centre, further away from sensitive interfaces, and lower, human scaled forms at the interface with Cudgen Road and the main site entry point.

The siting, orientation and setbacks also ensure there is no adverse visual bulk or overshadowing to other surrounding land uses (refer to **Section 5.5** for amenity considerations).

5.4.3 Public Realm and Landscape Design

As described in **Section 3.8** and the Landscape Plans and Design Strategy (at **Appendix B** and **D** respectively), a series of places are designed appropriate to scale and program, whilst broadly reading as a cohesive and legible patchwork of related elements referencing the landscape context.

Proposed landscape materials reflect existing site materials and history; including the use of natural materials where appropriate, and materials that are durable, cost effective and low maintenance.

Courtyards are provided within the hospital having regard for clinical planning, providing daylight and landscape relief to the deeper podium level floor plates.

A key principle underpinning the two main axis, is the establishment of a Green Spine (refer to landscape zonal plan) through the site and landscape corridors (physical and visual) through the building and connecting with the main entrance civic axis. These provide the public and staff with landscape contact through the site. Visual access to the landscape and courtyard spaces not only provides a spatial ordering device, but further functions as a wayfinding and orientation device, with calming therapeutic qualities.

The development presents an appealing and intuitive pedestrianised public realm, commencing at the main site entrance and leading to the Health Hub and entrance plaza to the hospital. High quality public realm treatments integrated with comprehensive soft landscaping provide for a well resolved campus and place-making outcome.

An opportunity for a Community Garden is also identified in the Landscape Plans and Design Report at **Appendix B** and **D,** and is described further in the Agricultural Offset Plan at **Appendix I**. In summary, the development of a community garden on the Project Site would be contingent on the identification of a suitable community organisation and establishment of a licence agreement to the satisfaction of Northern NSW Local Health District, with strict requirements about maintenance and management. Initially the Community Garden and associated plot(s) would potentially be located directly to the east of the at-grade car park.

The Community Garden opportunity would be an ancillary and integrated component of the hospital land use and its landscape strategy, yet it will be a more intensively managed landscape zone. The species selection is expected to be a diverse mix of culinary herbs and vegetables. The inclusion of the community garden is consistent with the conditions of consent, provides a linkage to the broader local agricultural context, and would complement the healing environment to be fostered at the Tweed Valley Hospital, as well as the Agricultural Offset Plan (refer to **Section 5.9.2**).

There are also opportunities for therapy gardens in courtyards being considered, as identified in the landscape plans. Research demonstrates that therapy gardens are particularly effective in the clinical areas of mental health and rehabilitation.

The use of retaining walls in Stage 2 has been minimised as far as practical, complemented by batters where appropriate and landscaping. Retaining walls would not exceed 3.4 m in height from proposed ground level in accordance with conditions of consent and comprise suitable materials that integrate with the landscape design strategy. A historical interpretation strategy for the dry-stone walls found on the site has also been developed, with detail provided at **Section 5.10** and **Appendix M**.

5.4.4 Services, Plant and Logistics Integration

The service yard, including loading dock and services related activity, would be located to the north-western corner at basement level. The service yard location conceals it from general public view and access.

The waste storage and collection are removed from key public interfaces, located at the basement level in association with the service yard and loading dock.

Bulk oxygen storage (Vacuum Insulated Evaporator - VIE) and underground bulk LPG storage are located adjacent a lay-by on the west side of the internal ring road, behind the multi-deck car park.

The hospital's back-up generators are to be co-located with the ISS toward the south-west corner of the Project Site. The generators would be containerised (pre-built, delivered and connected up). A diesel tank and pump room would provide the fuel source to the generators. This area would be screened by the vegetation buffers along the Project Site boundary.

Domestic hot water, space heating hot water and air-cooled condensers are located in the Level 6 rooftop plant room of the hospital. Air Handling Units are integrated and distributed throughout the building.

Mechanical plant and equipment are well integrated into the overall building design and broader campus. Access is generally located away from the main public entries. Where required, elements are screened or concealed from general direct public view.

5.4.5 Wayfinding and Signage

A suitable and effective wayfinding strategy has been developed as detailed in **Appendix E** (note: this is to be read in conjunction with signage plans included as part of **Appendix B**). The wayfinding system will focus on using intuitive wayfinding queues as a key means of supporting user journeys. More conventional static wayfinding signage is acknowledged and supports the intuitive cues and ensure user journeys are simple and confusion-free. Intuitive cues to facilitate wayfinding, as detailed in the strategy, include building forms, materials, art, colours, landscape elements, natural light, and sight lines.

The proposed signage scheme supports the wayfinding strategy and complements the intuitive cues, with the practical function of directing and reassuring visitors as they journey to, and into, the hospital campus. This requirement has led to the strategic consideration and selection of effective and appropriate signage size, proportions, placement and messaging.

Aesthetically the proposed signage scheme has been developed to be responsive to the architectural and landscape design schemes, complement the local site context and positively contribute to visual character. This focus has resulted in the considered selection of materials, graphic patterns, fonts, textures and colours and the overall form for the signs.

All signs have been specified to be constructed from high quality, durable materials suitable for external application in a site of significant prominence and public-usage, and to ensure longevity and minimal maintenance requirements.

5.4.6 Crime Prevention Through Environmental Design (CPTED)

Crime Prevention through Environmental Design (CPTED) promotes a multi-disciplinary approach to deterring criminal behaviour through environmental design and design of buildings and places that are safe and secure.

Current policies and procedures ensure contemporary regulations, occupational health and safety, and accreditation requirements are addressed as part of the new facility. The design has been informed by and developed in accordance with:

- Protecting People and Property, NSW Health Policy and Standards for Security Risk Management in NSW Health Agencies, 2013
- Physical Security Management Guidelines – Australian Government, 2011
- NSW Health Policy and Standards for Security Risk Management in NSW Health Agencies, 2013
- CPTED principles.

The four key CPTED principles are:

- Surveillance
- Access Control
- Territorial Reinforcement
- Space Management.

As detailed in the Architectural and Urban Design Report at **Appendix C**, the Tweed Valley Hospital has adopted the principles of CPTED to help ensure the establishment of a safe and secure environment for the range of users and the surrounding local community.

It is considered that the proposed design measures appropriately respond to reducing the risk of criminal and anti-social activities. The design and development of the hospital would support adequate public surveillance, access control, territorial enforcement and space management, thereby, suitably addressing principles of CPTED.

5.4.7 Masterplan, Future Expansion and Development

Although any future expansion or development would be subject to a separate planning approval process as required, the Architectural and Urban Design Report at **Appendix C** confirms consideration has been given to future expansion opportunities of the Tweed Valley Hospital and broader campus.

The following expansion design principles have been adopted:

- Optimise position of the hospital building to allow for expansion capacities
- Incremental expansion capacity is required
- Expansion should be designed to occur in locations that minimise the effect on the ongoing operation of the masterplan and key hospital functions.

Consideration has been given to hospital renewal and complementary development on the Project Site. The site layout and ordering principles allow for uncompromised future expansion to the east, with the boulevard and Green Spine capable of extending the full length of the Cudgen Road interface. Additional expansion zones for complementary uses are located to the south and west of the multi-deck car park, linked to the hospital via the Green Spine. Future buildings would take advantage of the street interface with Cudgen Road or alternatively the ridge, with the opportunity for semi-embedded lower ground floor levels supporting additional car parking and other support services as required. Structural grid orientation would follow the ridge orientation and the point of interface.

5.5 SEAR 5 - Environmental Amenity

The following provides an assessment of environmental amenity and key factors which influence the quality of amenity, particularly for residential receivers. A detailed environmental amenity statement is provided in the Architectural and Urban Design Report at **Appendix C**. Overall, no significant detriment to environmental amenity based on the factors considered, including surrounding residential land uses, is expected. A high standard of amenity would be retained for surrounding residential areas and adjacent properties. Appropriate measures to ensure adequate protection of residential amenity would be implemented, where required.

5.5.1 Overshadowing and Solar Access

Shadow diagrams have been prepared which depict the overshadowing impact of the development at hourly intervals from 9:00 am to 3:00 pm during the winter solstice (June 21 – worst case) as presented in **Appendix B**.

The shadow diagrams demonstrate that shadows cast by the development are mostly contained within the Project Site. A negligible encroachment of overshadowing from the multi-deck car park affects the western adjoining rural property at 9:00 am on 21 June. This shadow is removed at 10:00 am. Shadows generally start to extend beyond the south-eastern title boundary at around 1:00-2:00 pm with minor encroachment onto Cudgen Road. There is no overshadowing impact to dwellings or secluded private open space.

There is no overshadowing of adjacent active agricultural land. The negligible encroachment to the western property boundary at 9:00 am would not impact agricultural activity or productivity of the land.

Courtyards and key public spaces within the hospital site receive a good amount of direct sunlight, achieving more than two hours of direct light on its base surface for the majority of the year. The southernmost mental health courtyard does not receive direct light on its base surface in winter, however other accessible courtyards and public landscaped outdoor spaces with access to direct natural light are within close proximity. This is an acceptable outcome and on balance a good standard of amenity is provided.

5.5.2 Visual Privacy and Overlooking

The hospital is placed nominally at the centre of the deepest zone of the Project Site (proposed building setbacks are depicted in **Figure 5.1**). There would be negligible impact on privacy and overlooking for nearby properties and surrounding residential areas. The existing forested environmental area to the north will protect the environmental biodiversity and provide a visual buffer between the development and the residential area substantially separated (more than 500 m) to the north (Kingscliff West Precinct). Kingscliff Hill residents living on the west orientated slope will have views of the hospital, however due to the physical separation distance from the hospital (more than 300 m to the main building envelope) there would be no adverse impacts to resident's privacy. The nearest dwellings are located south of Cudgen Road (setback approximately 80 m from the main hospital building). Again, given the physical separation and landscaping proposed, no unreasonable impact to privacy or overlooking would result.

The tree lined site boundary and comprehensive landscape strategy assists to further minimise any perceived impacts of overlooking neighbouring lands from the upper levels of the hospital.

5.5.3 Noise

Noise and vibration impacts are addressed in **Section 5.12** and **Appendix O**. Noise and vibration can be appropriately managed during construction and operational noise is not expected to adversely affect sensitive receivers.

5.5.4 Reflectivity from Buildings

As outlined in the Architectural and Urban Design Report at **Appendix C**, glass or other materials with highly polished or glossy characteristics have potential to reflect sunlight. Adopting sensible glass quantities and glass reflectivity (Visible Light Reflectance (VLR); outside reflectivity percentages) levels combined with building geometry and orientation work together to affect reflectivity levels. Substantially glazed and angled façade buildings have greatest negative reflectivity impacts on surrounding receivers.

While the specific building glass is yet to be selected, the selection will aim to maintain external reflectivity percentages below 22 per cent. Working collectively with the façade matrix, overall reflectivity percentages would be maintained below 15 per cent.

Collectively the designed façade composition achieves a low reflective level, ensuring minimal impact to passing motorists or local neighbouring land users and sensitive receivers.

5.5.5 Wind

The Project Site interfaces with a vegetated environmental area to the north and has an existing established treed windrow along Cudgen Road to the south. The windrow returns partially on the west title boundary, which progressively falls away to the north. The required agricultural buffer requirements for the development will provide further wind screening augmentation to the west and south boundary, helping mitigate the wind impacts to the hospital.

The main hospital entrance forecourt and north public terrace are recessed within the building form ensemble providing shelter from the main prevailing wind directions.

The lower ground level west Emergency Department entrance is orientated south-west, towards the predominant winter wind direction. The west façade of the hospital will receive wind screening from the multi-deck car park building assisted by the boundary landscape treatment.

The hospital design provides for entrance airlocks at the main public entrance locations to the south, west, east and to the ground level public terrace to north. The building design incorporates a number of patient balcony spaces at the upper levels of the building. These will be screened with minimum 1.8 m tall glazed balustrades. Where functionally permissible, external doors will be designed to be sliding operated.

5.5.6 Helicopter Movements

Aviation is addressed in **Section 5.21** and **Appendix V**. Approach and departure paths accord well with the surrounding community and sensitive areas, avoiding to the maximum extent possible overflight of built-up and other sensitive areas.

Whilst some noise may be experienced in the locality during helicopter approach, landing, and departure, this is not expected to be significant nor unreasonable. Given the course of the flight paths and limited frequency of helicopter movements, no significant impact to residential amenity is expected.

At landing and take-off times the helicopter will produce rotor downwash. Downwash will have limited impact on the hospital function as there are no open terraces at the higher levels of the building. Given the separation distance, downwash would not affect surrounding properties.

5.5.7 Light Spill

LCI has prepared an External Light Strategy for the hospital (included in **Appendix R**).

External lighting within the site boundary will be provided to parking, roads and public spaces in accordance with AS/NSZ 1158 Lighting for Roads and Public Spaces.

A preliminary investigation into light spill, considered the following factors,:

- Effects on residents and adjacent properties
- Effects on transport system users
- Effects on transport signalling systems and helicopter lighting
- Effects on biota
- Effects on astronomical observations.

No adverse effects are expected in relation to these (with a light spill assessment to AS 4282 Control of the Obtrusive effects of Outdoor Lighting to be completed as part of design finalisation). Measures adopted to minimise the effects of obtrusive lighting and light spill into surrounding sensitive receivers will include:

- conducting a formal light spill assessment as part of the design development and finalisation
- mounting heights and luminaires shall be selected to minimise spillage and provide good control over the lighting distribution
- quality luminaires will be selected with good glare control
- luminaires will be set-back from the property boundary to reduce light spill where possible
- luminaires shall feature narrow beams and sharp cut-off angles
- luminaires shall have low vertical aiming angles
- the Architectural and Urban Design Report confirms that the design of the multi-deck car park, including a combination of masonry façade, metal louvres and mesh will contain light spill from vehicle movements. Site landscaping and perimeter vegetation will also filter light from vehicle movements.

A strategy has also been adopted to reduce the impact on biota, including the potential disruption to threatened wildlife species or reduced viability of adjacent habitat due to light spill. Further detail, along with the measures that would minimise any adverse impact, is provided in the External Light Strategy at **Appendix R** and biodiversity assessments at **Appendix U**.

5.5.8 Visual Impact

A Visual Impact Assessment (VIA) based on the design of the Tweed Valley Hospital has been prepared by Urbaine Architecture (**Appendix J**).

There are no set guidelines within Australia regarding the methodology for VIA. The methodology applied to the visual assessment of the current design proposal has had regard for the following key documents:

- Environmental Impact Assessment Practice Note, Guideline for Landscape Character and Visual Impact Assessment (EIA-N04) NSW RMS (2013)
- Visual Landscape Planning in Western Australia, A Manual for Evaluation, Assessment, Siting and Design, Western Australia Planning Commission (2007)
- Guidelines for Landscape and Visual Impact Assessment, (Wilson, 2002)
- Tweed Shire Scenic Landscape Evaluation Volumes 1 and 2 1995

- Visual Management System Tweed Pilot 2004 - Coastal Comprehensive Assessment.
- Draft Kingscliff Locality Plan, particularly in consideration of view lines and significant landmarks identified in the draft Kingscliff Locality Plan
- Draft Tweed Scenic Landscape Strategy.

In order to assess the visual impact of the Project, it is necessary to identify a suitable scope of viewpoints that may be impacted by it, evaluate the visual sensitivity of the Project to each location and determine the overall visual impact of the Project. Accessible locations that feature a prominent, direct and mostly unobstructed line of sight to the Project were used to assess the visual impact. The impact to each location was then assessed by overlaying an accurate visualisation of the new hospital design onto base photography (refer to **Appendix J** for viewpoint photomontages) and interpreting the amount of view loss/impact in each situation, together with potential opportunities for mitigation. The existing quality of views and the visual sensitivity (e.g. distance) to a proposal are taken into account.

In order to allow a quantitative assessment of the visual impact, viewpoints/photos were selected that represented relevant and representative public viewing locations from the surrounding area. Typically, these were from surrounding roads and residential areas within a three-kilometre radius of the Project Site. The Stage 2 VIA and selection of appropriate viewpoints included consideration of the Concept Proposal VIA prepared by GeoLINK (that was based on 10 key viewpoints). The Stage 2 VIA has built upon this and identified and considered a total of 21 viewpoint locations, including the 10 assessed as part of the Concept Proposal.

The selected viewpoints and photomontages are intended to allow consideration of the visual and urban impact of the hospital campus at both a local and regional level. They incorporate high traffic locations and many accessible public viewing locations with more distant, elevated, or panoramic views, where the subject site falls within, and impacts on the midground and background views.

The photomontages presented in the VIA include location descriptions and are to be read in conjunction with the site map that identifies the location of each viewpoint (**Figure 5.2**). Additionally, information is supplied in the VIA as to the distance from the site boundary for each location and the distance to the main building.

To assess the visual impact, two relevant aspects have been considered. These include view loss of actual substance (e.g. physical landscape, middle and distance view elements), and also sky view loss. These have been presented in the VIA analysis as a percentage ratio. The VIA methodology is explained further in **Appendix J**.

The quality of physical view loss can also be included, when assessing the overall impact. Distant views to hills, or mountains, or as in this case, the specific landmark of Mount Warning, will have a greater value than views of middle-distance residential property, for instance.

To a large extent, the value associated with a view is subjective, although a range of relative values can be assigned to assist with comparing views. The assessed viewpoints have been given a visual impact ratio that compares the physical/landscape view loss to sky view loss (mentioned above). They are also given a numeric value based on existing visual quality (referred to as an existing visual assessment scale in the VIA) and a visual impact assessment scale (i.e. the visual impact of the development). The scales are based on a range of 0 (negligible value/impact) to 15 (high value/ impact), based on the scale previously applied in the Concept Proposal VIA and further described in **Appendix J**. Note, the scales have been applied in the context of the montages prepared as part of the VIA.

In June and July 2019, TSA Management, in conjunction with Urbaine Architecture engaged in a community liaison exercise, specifically with regards to visual impact concerns and to help inform the assessment.

The full VIA methodology and assessment is outlined in **Appendix J**. The key assessment findings are summarised in **Table 5.7**.

Figure 5.2 Viewpoint Location Map

Table 5.7 Visual Assessment Findings for Key Viewpoints

View-point	*View loss to sky loss ratio (%)*	*Existing visual scale (0-15)*	*Visual impact scale (0-15)*
1	0 : 100	8	4
2	20 : 80	8	5
3	35 : 65	10	11
4	N/A	9	N/A
5	75 : 25	11	13
6	65 : 35	11	12
7	22 : 78	10	9
8	20 : 80	6	5
9	10 : 90	11	5
10	0 : 100	9	4

View-point	*View loss to sky loss ratio (%)*	*Existing visual scale (0-15)*	*Visual impact Scale (0-15)*
11	10 : 90	9	2
12	10 : 90	8	6
13	10 : 90	6	5
14	10 : 90	8	4
15	15 : 85	7	6
16	10 : 90	6	2
17	10 : 90	6	2
18	5 : 95	7	3
19	10 : 90	8	6
20	10 : 90	5	6
21	5 : 95	7	6

As demonstrated, most of the assessed viewpoints experience higher ratios of sky view loss compared to actual physical view loss. Most viewpoints have also been assessed as being subject to low to medium scale visual impact.

The provisions of the TLEP 2014 and associated visual amenity related policies indicate that local character, legibility and preservation of views to the natural environment are considered to be key factors in assessing future development.

Although development within the locality is varied and mixed, the density of residential development particularly along roads and streetscapes provides the area with a distinctive residential character.

The VIA has found that the scale, built form and planning of the proposed development provides a respectful response to the site and surroundings, whilst remaining within the designated volumetric and height limit controls defined in the Concept Proposal (as modified).

Views from the local area are mixed – some limited to the immediate area adjacent roads and streetscapes and others with middle and far distant views to the west and northwest, beyond the Project Site. There is limited connectivity within the local area in terms of views available. From the roads and streetscapes, it is clear that the proposed development, because of its lower elevation and proposed landscaping will not have impact on significant views from within the local area. The scenic values of the locality are comprised of open/vegetated land to the west and north-west of the site. Views to this land will be minimally affected by the proposed development and its built form. From high points in the broader locality, including Kingscliff, middle and distant views to the west and to the mountains in the distance will be impacted from a small number of locations, as will be observed from the visual impact assessment images provided in the VIA.

With regards to the draft Tweed Scenic Landscape Strategy, the only priority location relevant to the Project Site is a section of Tweed Coast Road, running south from the junction with Cudgen Road. This is deemed a Priority 1 Dynamic Viewing Situation. The VIA has included one view from the start of this dynamic viewpoint, at the junction of Cudgen Road and Tweed Coast Road, and one view from approximately 1.8 km south of the junction. In both of these instances, the lower levels of the development are well concealed by existing landscape and proposed future landscape, with the upper levels visible above the tree line. There are no direct views of the new development along the travel line of the road - it is observed at almost a 90 degree viewing angle at the point of greatest impact at the road junction previously referred to.

The proposed development, in terms of visual impact, is consistent with the aims and objectives of the TLEP 2014, in that it is a suitable development for the area. It enhances the economic vitality of the area through its engagement with Cudgen and Kingscliff, while retaining the ecological integrity through its preservation and enhancement of wetland areas to the north, setbacks and incorporation of native vegetation. It also assists in enhancing the cultural fabric of the area by providing care facilities and employment opportunities within the region.

The VIA considers that the development will strengthen the community and is adequately sympathetic to the landscape context, including broader residential area and its coastal recreational character. The quality of the proposed development is considered to be compatible with the primary function of the zone.

Mitigation of the visual and physical impact has been detailed in the Architectural and Urban Design Report at **Appendix C**, and this has been achieved through consideration of the overall design response. This included a range of considerations, including but not limited to, functional design requirements, building typology/density/massing, topography integration, siting and setbacks, and the use of appropriate materials, being of natural hues and non-reflective. Also, through the use of native

vegetation and landscaped retaining walls to the north and north-west of the site, where the natural landform drops away. As the landscape matures, so the buildings will blend increasingly into the natural surroundings. Although the Stage 1 works involve some vegetation removal, significant new landscaping is proposed as part of the Landscape Strategy to soften the visual impact of the hospital. This has been designed to surround the perimeter of the built form at ground level and also to break up the visual massing of the building.

The following key architectural design principles as they relate to visual impact/amenity have been considered in the design response, with more detail in **Appendix C**:

- Scale - Create a building scale which is respectful to the locality and the residential context.
- Topography - Arrange elements of the built form to minimise disruption to natural land forms, whilst utilising the sloping land to embed programme and minimise perceived massing.
- Nature - Maximise the dialogue between built form and natural context.

The development is informed by the organising principles developed in response to the site's topography and qualitative features as described in the Architectural and Urban Design Report at **Appendix C**.

Taller buildings are set back and step down with the slope, with the hospital positioned at the deepest width of the site (approximately 65 m from Cudgen Road). The lower scaled buildings (Health Hub) along Cudgen Road respond to the street and urban condition. The main building is substantially setback from sensitive interfaces. Integration with the site topography mean the main hospital building and multi-deck car park have a lower perceived height when viewed from Cudgen Road.

The design response and massing are the result of extensive design analysis, including consideration of feedback from the GA NSW (refer to **Appendix C**). The proposed design aims to achieve the optimum urban design outcome, with regard to a range of complex variables, environmental considerations, and stakeholder requirements. The height, density, bulk and scale of the building, including the setback and position of the buildings were key parameters defined as part of the Concept Proposal and have been thoughtfully considered in the Stage 2 design. Of note, the hospital's main building mass is notably below the maximum envelope parameters approved as part of the Concept Proposal, and the building density reduces with height.

The new hospital building despite being nine storeys, plus rooftop helipad and lift lobby, will read as six storeys, plus plant and helipad, from Cudgen Road, with two lower ground levels, taking advantage of the site topography. The hospital has also been designed to be experienced 'in the round', having no side or rear condition when seen from distant views. It is also articulated as a cluster of scaled building forms, with the massing and quadrant arrangement providing for articulation and visual breakup.

The hospital's forms frame the key organising movement and view corridors through the building and work in unison to express the agrarian textural patchwork concept inspiring the landscape design of the public realm spaces. The design also seeks to mitigate scale with the inclusion of horizontal break-lines that group floors into stacks of two and three levels. These datum lines redefine the reading of floor levels, by grouping. This is further reinforced by adopting double floor vertical fenestration expressions.

The multi-deck car park is integrated into the topography to reduce its perceived height and is situated to the west of the hospital building, being the least sensitive side of the Project Site in terms of residential amenity. The design and material treatment ensure adequate visual interest and minimisation of bulk.

The design approach seeks to integrate landscape with the built form materially through references to the vernacular, nature and agrarian landform textures. The development is supported by a comprehensive landscape design (including extensive soft landscaping and plantings), which along with the building colour palette, materials and finishes, are responsive to the landscape setting and will help soften and blend the presence of the development into the local and regional setting.

Of importance, are the coastal ocean views, particularly from Cudgen, looking across the site to the east. None of these view lines are compromised, since the development is located at the southern part of the site, with Kingscliff behind. The ocean views are to the north-east of this and not obscured by the development.

As a result of the sensitive design approach, the visual impacts of the proposed development are considered to be compatible with the existing visual context and satisfy the intents and objectives of the TLEP and visual/scenic policy considerations.

5.5.9 Surrounding Agricultural Activities

An updated LUCRA has been prepared for Stage 2 to consider any impacts that existing adjoining or adjacent agricultural land uses may have on the hospital and vice versa. The LUCRA is summarised at **Section 5.9.1** (full report at **Appendix H**). It finds that the hospital development would be compatible on the Project Site and recommends measures to avoid and minimise the potential for land use conflict. These would effectively address environmental amenity considerations associated with the interface between the Tweed Valley Hospital and nearby agricultural uses/activity.

The Traffic Impact Assessment (**Appendix K**) has also considered agricultural vehicle movements on Cudgen Road and found that the Project would not have an adverse effect in this context.

5.5.10 Internal Amenity

As outlined in the Architectural and Urban Design Report (**Appendix C**) internal amenity is important to establishing a healing environment and quality setting for patients, visitors and staff. The design response includes physical access to outdoor landscape, sunlight and fresh air with the Green Spine and walking loops being key devices in this regard. The in-patient units have been planned with patient rooms/beds orientated to maximise views of the surrounding landscape features. Interior design strategies will be informed by salutogenic inspired design philosophy. Design incorporating natural forms and materials provide a natural therapeutic healing environment and is known to improve patient healing outcomes.

The following aspects to support high levels of internal amenity and comfort have been considered in the design as detailed in the Architectural and Urban Design Report:

- Interior materiality and comfort
- Solar access and natural daylight penetration
- Passive ventilation within the Health Hub
- Acoustic separation of plant and spaces, along with acoustic insulation to minimise noise intrusion and disturbance
- Visual and physical access to the outdoor landscape and outside spaces from the main circulation spaces
- Solar orientation and glare management to reduce heat gain and adverse glare.

The new Tweed Valley Hospital would deliver a high standard of internal amenity for patients, visitors and staff, and promote wellbeing.

5.5.11 Air Quality

The operation of the Tweed Valley Hospital would not adversely impact air quality.

Air quality and dust management associated with Stage 2 Main Works is addressed in **Section 5.20**. Implementation of applicable mitigation measures and safeguards would effectively minimise the risk of dust during works.

5.6 SEAR 6 - Staging

Staging has been addressed in **Section 3.15**.

5.7 SEAR 7 - Transport and Accessibility

The Traffic Impact Assessment for Stage 2 (at **Appendix K** - prepared by Bitzios) provides an updated and refined assessment relative to the Concept Proposal and Stage 1 EIS and includes additional detail as required to support Stage 2 of the Project. In addressing the SEARs and relevant SSD 9575 conditions of consent, the assessment includes consideration of the traffic and transport conditions on the surrounding road network at the opening of the Tweed Valley Hospital and at the 10-year horizon to ensure the road network can accommodate the operation and expected traffic generation.

The Concept Proposal and Stage 1 (SSD 9575) traffic assessment identified that a number of site access points and intersection upgrades would be required to adequately service and cater for the Project. Further parking studies were also proposed to be undertaken. The Traffic Impact Assessment has reviewed these matters and confirms that these works will have an acceptable impact on the capacity of the surrounding road network and adequate parking will be provided.

Stage 2 is informed by service planning to 2031/2032. For the purpose of the traffic and parking components of the assessment the following has been used:

- 391 overnight and day only beds by Year 2023 (2018 Service Statement)
- 443 overnight and day only beds by Year 2033 (2018 Service Statement)
- Year 2023: approximately 1,120 staff on-site during the day shift (ASDS)
- Year 2033: approximately 1,300 staff on-site during the day shift (ASDS).

As outlined in **Section 3**, approval for an additional 56 inpatient unit beds (identified as Stage 2B - construction of which is subject to demand and funding) is also being sought as part of this application. Sensitivity testing has been undertaken for Year 2033 with the inclusion of the additional 56 beds (499 overnight and day only bed scenario by Year 2033). The sensitivity test includes approximately 1,330 staff on-site during the day shift (ASDS) in Year 2033.

It is noted that the total number of beds/treatment spaces included in the Stage 2 application is 545, which in addition to the abovementioned 499 overnight and day only beds, includes 46 emergency treatment spaces. Emergency treatment spaces are typically a point of initial treatment, with patients then transferred to overnight or day only beds. On this basis, and consistent with the Concept Proposal and Stage 1 assessment, emergency treatment spaces have therefore not been included as part of the traffic assessment.

5.7.1 Access and Internal Circulation

As detailed in the Traffic Impact Assessment, access and internal circulation have been designed to minimise queuing and congestion within the site and not to impact the operation of the external road network. The Tweed Valley Hospital provides for four access locations (A, B, C and D) and a clear and intuitive vehicle circulation arrangement as described in **Section 3.7.1** and depicted in **Figure 5.3** and **Figure 5.4**. Design details of each access are provided in the Traffic Impact Assessment.

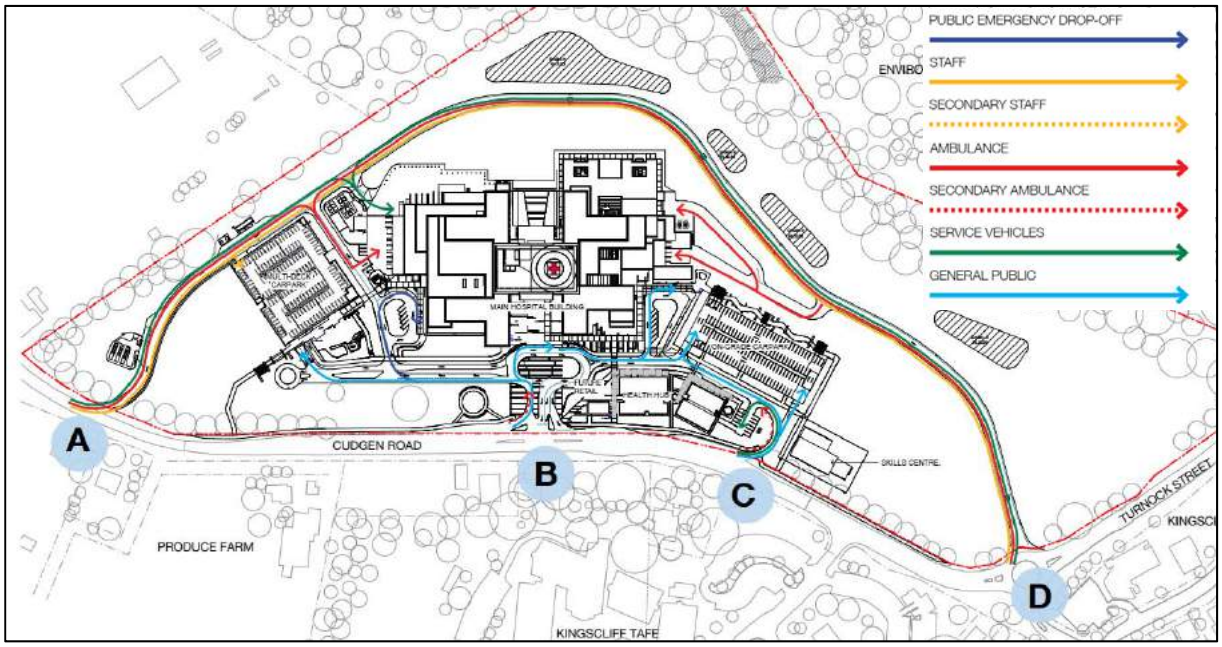


Figure 5.3 Vehicle Access Routes

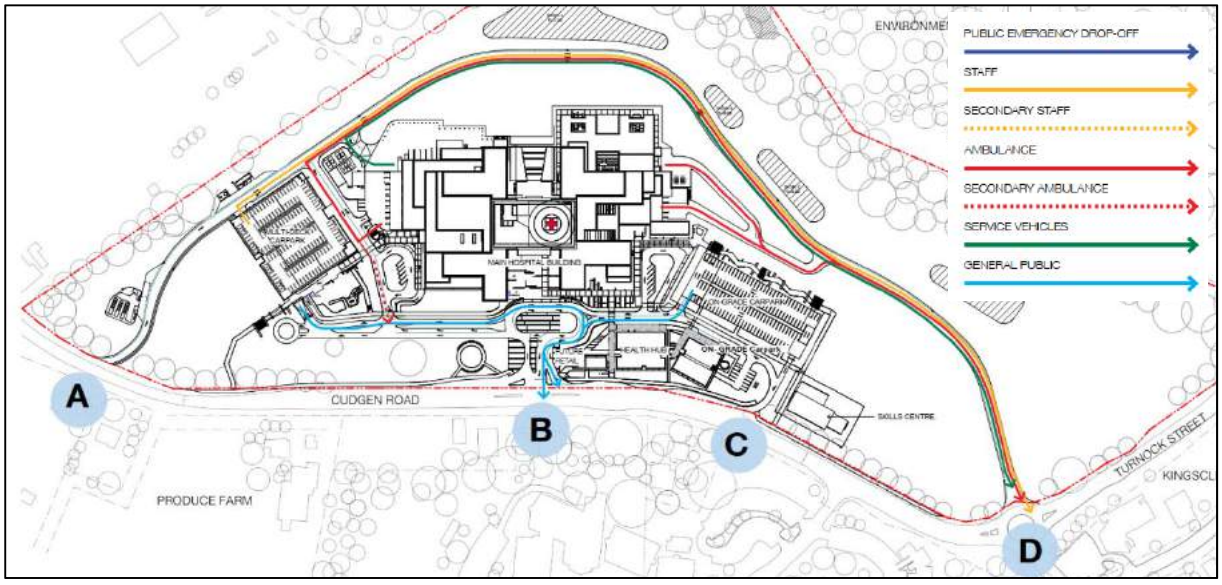


Figure 5.4 Vehicle Egress Routes

The Traffic Impact Assessment has considered: the access locations; sight distance requirements; service and emergency vehicle access and circulation; access queuing; general public parking and circulation; general public emergency drop-off; staff access and circulation; public transport access; and internal road geometry. Project Site access, internal circulation and egress movement paths, including those for emergency and servicing facilities, are satisfactory from a traffic engineering perspective and provide an appropriate level of road capacity, with the internal network and access points designed to reduce congestion on the public road network.

As detailed in the Traffic Impact Assessment, the internal road and parking geometry have been designed to comply with applicable Australian Standards, and a swept path assessment of key vehicle movements demonstrates satisfactory manoeuvrability.

5.7.2 Parking

In determining the parking requirements for the Hospital, the following was considered:

- Council's DCP minimum parking requirements for a hospital
- Peak parking accumulation based on the RMS *Guide to Traffic Generating Developments*
- The Project's car parking demand based on a detailed Project-specific Car Parking Demand Study.

Council's car parking requirements for the Project range from 626 spaces (Year 2023) to 710 spaces (Year 2033). Under the sensitivity test scenario (499 beds) Council's parking requirements are 800 spaces.

For comparison, the peak parking accumulation (PPA) was calculated based on the rate stipulated within the RMS *Guide to Traffic Generating Developments*. Based on this rate, the PPA ranges between 616 car parking spaces (Year 2023) and 708 car parking spaces (Year 2033). Under the sensitivity test the PPA is 764 car parking spaces (Year 2033).

A detailed Project-specific Car Parking Demand Study was undertaken for the Tweed Valley Hospital. The demand study considered the existing Tweed Hospital as well as projected staff numbers, bed numbers and service events. A summary of key weekday parking demands as identified in the Car Parking Demand Study is provided below:

- Staff demand: 718 parking spaces in Year 2023/2024, 838 parking spaces in Year 2026/2027 and 934 parking spaces in Year 2031/2032
- Public demand: 367 parking spaces in Year 2023/2024, 408 parking spaces in Year 2026/2027 and 448 parking spaces in Year 2031/2032
- Fleet vehicle parking demand: 71 vehicles in Year 2023/2024, 83 vehicles in Year 2026/2027 and 92 vehicles in Year 2031/2032
- Other parking demands: 45 parking spaces in Year 2023/2024, 49 parking spaces in Year 2026/2027 and 54 parking spaces in Year 2031/2032
- A total parking demand in the order of 1,201 car parking spaces in Year 2023/2024, 1,378 car parking spaces in Year 2026/2027 and up to 1,528 parking spaces in Year 2031/2032.

The car parking demand study assumes no change in behaviour (i.e. proportion driving, people per car, space turnover) from the existing Tweed Hospital. In determining the parking requirement, consideration has been given to the minimum requirements, the forecast demands and sustainable transport objectives. As such, the above estimates are considered to be a conservative (i.e. high) estimation of parking demand.

The minimum car parking requirements are specified by TSC Tweed Development Control Plan 2008, specifically Section A2 – Site Access and Parking Code. It is however noted, that this does not necessarily consider the site-specific demands. Additional parking to the minimum requirements has therefore been catered for on the site, predominantly through provision of a multi-deck car park. This additional parking primarily considers the parking demand study undertaken. The overall car parking supply considers the minimum parking requirements and forecast car parking demands and aims to find a balance between the minimum requirements, car parking demands and not encouraging the use of private vehicles through an oversupply of car parking. Car parking supply is also dictated by infrastructure costs and funding.

The ultimate on-site car parking provision (excluding service vehicle loading, ambulance bays, set-down bays etc) for the Tweed Valley Hospital based on projected demand to 2031/32 consists of a combination of multi-deck and at-grade parking as presented in **Table 5.8**. Other car parking spaces (including ambulance, logistics and set-down spaces) are presented in **Table 5.9**.

Table 5.8 Ultimate Car Parking Supply

Parking Type	*Parking Location/Type*	*Parking Supply*
Staff (inclusive of fleet vehicles)	Multi-deck car park	1075
Public	Multi-deck car park	313
Public	Eastern at-grade car park	128
Public	Short-term at-grade	22
	Total	**1,538**

Table 5.9 Other Car Parking and Set-down Areas

Other Parking Type	*Supply/Spaces*
Ambulance - Emergency Department	9
Ambulance – Response Parking	3
Ambulance – Transit Lounge	4
Mental Health (sally port)	1
Hearse	1
Logistics – contractor	6
Logistics – truck	5
Public Set-down spaces	23
Total Other Parking	**52**

As demonstrated in **Table 5.8**, ultimately a maximum provision of 1,538 spaces is proposed for the Tweed Valley Hospital. However, as discussed in **Sections 3.7.3** and **3.15.5**, the multi-deck car park and associated supply may be staged. As part of the total parking supply, 40 Person with Disability (PWD) parking spaces are provided, for both staff and the public. As indicated in **Table 5.9**, approximately 23 public set-down/drop-off/pick-up bays are also provided in proximity to the various entrances. Four dedicated bays are provided for patient transport vehicles adjacent to the transit lounge. The on-site parking provision (both the minimum to be provided at opening and the maximum potential supply) significantly exceeds the minimum requirements specified by TSC as well as the PPA. The maximum provision is consistent with the parking demands identified as part of the Car Parking Demand Study for Year 2031/32. At year of opening, a minimum of 1,201 car parking spaces will be required/provided, catering for the 2023/24 parking demand. Additional supply of parking and any associated additions to, or opening of levels within, the multi-deck car park (up to the maximum

proposed/approved provision and height), may be constructed or opened concurrently or staged subject to further demand assessment and funding. The parking provision is appropriate and achieves a balance between typical parking requirements, meeting the demand projections, and also not providing an unnecessary or counter-productive oversupply. The parking supply will also be supplemented with a range of supporting measures, including:

- Bicycle parking
- Active travel infrastructure
- End-of-trip facilities for active transport
- Public transport infrastructure and service changes/improvements
- A Green Travel Plan that will include periodic monitoring and refinements to initiatives.

These supporting measures aim to reduce the reliance on private vehicle and parking demands. Further detail on these measures is provided in the following sections and **Appendix K**.

The design of the multi-deck car park facilitates flexible allocation of staff and public car parking. This allows for 'tweaking' of the staff and public provisions to cater for actual demands once operational and changing demands into the future. This maximises efficiency of the car parking provision, by reducing any significant underutilised parking areas as needed.

Considering the above, the proposed parking supply is sufficient to cater for the parking demands of the Project. Once the Hospital is operational, implementation of the Green Travel Plan and parking operations on-site will be monitored to identify if any issues occur and mitigation measures will be implemented, if required.

5.7.2.1 Management of Car Parking Facilities

A car parking management plan will be developed as part of further planning and development of operational requirements. It is expected management of car parking facilities would include:

- Various time limits and restrictions at different locations and for different user groups (e.g. short-term parking adjacent to Emergency Department drop-off)
- Consideration of a structured fee for various time periods
- Multiple payment methods
- Boom gate access for the multi-storey car park
- Operation 24 hours a day, seven days a week.

Physical restrictions (i.e. boom gates) will only be placed on parking areas. Internal roads and patient drop-off areas will not be restricted.

A range of car parking funding options are being considered and there has been no NSW Government decision made at this time. Scenarios have been tested ranging from free parking to paid parking arrangements in line with Lismore Base Hospital. As an example, the current fee structure for public parking in the Lismore Base Hospital Uralba Street multi-deck car park is as follows and is expected to increase annually by CPI:

- 0-15 minutes: FREE
- 15 minutes – 1 hour: $3.50
- 1-2 hours: $5.50
- 2-3 hours: $6.50
- 3-4 hours: $7.50
- 4+ hours (daily maximum): $8.60.

The Traffic Impact Assessment has had regard for potential impacts on, and demand for, on-street parking. Management of car parking facilities is important to ensure use of on-site parking is by bona fide patients, staff and visitors. It also reduces non-essential parking demands and trips. Where parking is not managed or restricted there is a greater utilisation of parking as there is no consequence associated with parking. For example, if no parking restrictions or costs are imposed, a patient requiring a long-term stay (e.g. for a number of days) is more likely to park on-site than if a restriction or cost is imposed, in which case they would be more likely to arrange alternative transport that does not require parking (e.g. being dropped-off and picked-up by a friend or relative, or use of alternative transport). This reduces the demand on parking and increases the availability of parking for other users (e.g. patients who require frequent short duration trips or where alternatives are not available).

While parking restrictions and cost alone could reduce the desirability of parking and therefore may influence staff, patients and visitors to seek alternatives, the desirability of on-site parking for those who intend to park has been maximised by providing high quality and highly convenient on-site parking. Specifically, all parking is located as close to the main hospital building as possible (reducing walking distances), parking is managed, secure and well lit, and the majority of parking is covered. In conjunction with a supply that is aimed at meeting demand, the provision of high quality and convenient parking is expected to minimise potential external parking impacts (including on-street and at external off-street car parks). Management of car parking facilities will be paired with the new hospital's Green Travel Plan and Transport Access Guide which aims to minimise dependencies on private vehicle and on-street parking impacts.

Given the adequate parking supply and supporting alternative transport measures proposed, no adverse impact to surrounding on-street parking is expected as a result of the hospital's operation.

5.7.2.2 Car Parking Geometry

The internal car parking geometry has been generally designed to comply with Australian Standards AS2890.1 (Off-street parking) and AS2890.2 (Off-street commercial vehicle facilities). Further detailed analysis of the internal geometry would be undertaken during detailed design to ensure compliance with the relevant standards.

5.7.3 Bicycle Facilities

The Project provides 52 Class 2 Bicycle Parking Spaces (for staff). Bicycle racks have been provided on the ground floor of the multi-deck car parking facility. The racks are undercover and in a secure location consistent with the requirements of AS2890.3. The bicycle parking facility is accessible via pathways that connect to the main entrance of the hospital and to the external pathway network.

A total of 20 Class 3 Visitor Bicycle Parking Spaces have been provided (10 racks). These consist of simple bicycle racks on the ground level near entrances.

The above bicycle parking provision exceeds the requirement specified in the TSC DCP and SSD 9575 conditions of consent, and is suitable in facilitating targets specified in the preliminary Green Travel Plan.

End-of trip facilities have been provided for staff (showers, changing facilities and lockers). These are conveniently located adjacent to the staff bicycle parking facilities in the multi-deck car park.

5.7.4 Servicing and Refuse Requirements

The largest vehicle required to service the Tweed Valley Hospital is a 19 m articulated vehicle (AV) for oxygen and gas deliveries and smaller service vehicles for a range of other deliveries and servicing requirements (e.g. linen, medical supplies, food, equipment). The servicing yard has been designed to cater for a range of standard service vehicles including:

- 19 m AV
- 12.5 m HRV (Heavy Rigid Vehicle)
- 8.8 m MRV (Medium Rigid Vehicle)
- 6.4 m SRV (Small Rigid Vehicle).

A loading dock with up to five bays is proposed on the basement level toward the rear (western corner). It can be accessed via the service ring road. Refuse will also be collected from the loading area by a range of Refuse Collection Vehicles up to 12.5 m HRV.

The Project provides sufficient service vehicle parking with nine ambulance bays at the Emergency Department, three patient transfer vehicle bays (which also cater for ambulances) and one ambulance bay at the Transit Lounge set-down area, and provision for a range of service vehicles in the dedicated servicing yard, with five dedicated HRV bays. The loading area has been developed based on experience with similar projects and input from HI and various working groups to cater for the loading and servicing demands of the hospital.

A swept path assessment of key vehicle movements, demonstrating satisfactory manoeuvrability, is presented in the Traffic Impact Assessment (**Appendix K**). This includes service vehicle access to the site, manoeuvring in the loading area, and ambulance service area.

Estimated service vehicle delivery and collection frequencies are provided in **Section 3.12.2**. It is recommended that the Tweed Valley Hospital operate a Service Vehicle Management Plan (SVMP) that dictates standard servicing and refuse collection procedures and may incorporate timetables and schedules that specify when certain deliveries can occur.

5.7.5 Public and Community Transport

The site is accessible via public transport and the existing proximal bus stops will be relocated/reconfigured to create two new indented bus bays on Cudgen Road along the frontage of the hospital site, with clear and direct access to the hospital main entry. Transport services will also be improved, facilitating better access to the Tweed Valley Hospital.

A series of consultation sessions and planning has been undertaken with community transport operators (including Surfside Buslines), Council and Transport for NSW (TfNSW).

TfNSW outlined a series of planned changes to the public bus network which are to begin at the end of 2019. These updates were identified by TfNSW to be commensurate with the planned hospital location at Kingscliff as well as future residential growth in the Kingscliff region. Updates announced by the local state member in February 2019 and reconfirmed by TfNSW include:

- Route 601 to be upgraded to provide 30-minute services during the day as well as extended times from 5:00 am to 9:00 pm. This service will be the key spine service for the Tweed linking key destinations and also connections to other bus routes across the Tweed Shire and onto the Gold Coast

- Route 601 will directly connect the new hospital site via the bus stops on Cudgen Road to the existing site at Tweed Heads, along with extending into Coolangatta and West Tweed Heads.
- A new service linking Murwillumbah directly to Kingscliff is also planned to be operational. This will create a missing link for public transport in the Tweed and further improve the public transport services to the new hospital.
- Link to the media release regarding the planned bus route updates is as follows: https://geoffprovestmp.com.au/more-bus-services-for-the-tweed/

With the proposed service changes this will result in a 30-minute service frequency on weekdays. This results in a high frequency public transport shuttle-like service between the Tweed Valley Hospital and the area surrounding the existing Tweed Hospital site.

With the inclusion of the proposed bus stop infrastructure and service/route modifications, the public transport network and infrastructure will suitably service the Tweed Valley Hospital and support the community in accessing the new facility.

Access for community and aged care transport vehicles (B99 vehicles, mini-buses up to seven metres) has been catered for within the site geometry. Specifically, the site caters for drop-off and pick-up with these vehicles at all three drop-off areas. The Transit Lounge also provides a dedicated pick-up/drop-off area for patient transport vehicles (mini-buses up to seven metres and ambulances).

Tweed Byron and Ballina Community Transport is an existing community transport provider that provides a range of transport services to people who live in the Tweed, Byron, and Ballina shires on the far north coast of NSW. Tweed Byron and Ballina Community Transport is a not-for-profit, public institution, governed by a community management committee and funded to assist older people, people with a disability, their carers and others who have difficulty accessing public transport, or are disadvantaged by the lack of transport options in their area. They provide transport to medical appointments locally and where necessary within the region and north to South East Queensland. It is understood that these services will continue and will cater for trips to and from the new Tweed Valley Hospital.

Strategies for relocating existing community and aged-care transport from the existing hospital to the new hospital as well as provision of new services will be investigated as part of subsequent operational planning.

5.7.6 Active Transport and Green Travel Plan

The Project Site is well serviced by the existing active (i.e. walking and cycling) transport network, including pathways along the Project Site frontage, connections to residential areas to the west and residential, commercial, community and education areas to the east. Active transport access will be further improved with connections and cycle routes throughout the site and a new signalised crossing on Cudgen Road (i.e. the main access intersection) and pathway connection on the southern side of the Cudgen Road between the existing pathway, new bus stop and signalised crossing.

A preliminary Green Travel Plan has been prepared for the Tweed Valley Hospital to promote and support alternative transport utilisation. The preliminary Green Travel Plan includes:

- a review of existing infrastructure conditions and mode share
- objectives and targets for alternate transport utilisation
- actions required to achieve the objectives
- a monitoring and review process.

In addition to the preliminary Green Travel Plan a draft Transport Access Guide (TAG) has been prepared. The TAG provides details of transport options to support their utilisation and facilitate access to the hospital via a range of transport modes, including:

- bus stop locations
- bus routes and service times
- community transport services
- pedestrian and cycle routes
- bicycle parking and end of trip facility locations
- Person With Disability (PWD) parking locations.

These measures would ensure that the new hospital was accessible via a range of transport modes and helps mitigate the relocation of the hospital services from Tweed Heads to the Project Site.

5.7.7 Operational Traffic

The Traffic Impact Assessment presents a comprehensive assessment of operational traffic generation to understand the impact of the proposed development on the surrounding traffic network based on the year of opening (2023) and a 10-year horizon (2033), including sensitivity testing (that accounts for Stage 2B IPU bed expansion). In conjunction with assessing traffic related impacts, consultation with key stakeholders was undertaken, including TSC, RMS, TfNSW and Surfside Buslines as detailed in the Traffic Impact Assessment.

The RMS *Guide to Traffic Generating Developments* was used to calculate the Project's peak hour traffic generation. The RMS Guide does not provide daily traffic generation rates. In lieu of this the Institute of Transportation Engineers (ITE) daily rate of 11.81 trips/bed/day was used to estimate daily traffic generation. The peak and daily trip rates are summarised in **Table 5.10**. The daily traffic generation aligns with typical traffic profiles where peak hour traffic is approximately 10 per cent of daily volumes.

Table 5.10 Tweed Valley Hospital Traffic Generation

Year	*Yield*	*Peak Vehicle Trips (PVT)*	*Daily Trips*
2023	391 beds	602	4,618
2033	443 beds	694	5,232
2033	499 beds	742	5,894

Based on the calculated trip generation rates, traffic growth (based on survey data and the 2041 volumes from the Tweed Strategic Transport Model) and distribution analysis, impacts on the following key intersections have been modelled (using SIDRA) and assessed based on background and design traffic scenarios as applicable (i.e. without and with the influence of the Tweed Valley Hospital):

- Pacific Highway/Tweed Coast Road Interchange
- Tweed Coast Road/Cudgen Road signalised intersection
- Cudgen Road/Site Access
- Cudgen Road/Kingscliff TAFE Access
- Cudgen Road/Turnock Street roundabout
- Cudgen Road/Turnock Street roundabout
- Turnock Street/Elrond Drive roundabout
- Turnock Street/Pearl Street roundabout.

Design traffic consists of forecast background traffic and Tweed Valley Hospital traffic for Year 2023 (year of opening) and Year 2033 (10-year design horizon) for the Morning Commuter Peak Hour Vehicle Trips (MVT), Evening Commuter Peak Hour Vehicle Trips (EVT), and Peak Vehicle Trips (PVT) peak scenarios.

The road network performance was measured against the following key three parameters:

- Level of Service (LOS)
- Degree of Saturation (DOS)
- Average Vehicle Delay (AVD).

The detailed results and analysis of the SIDRA modelling are presented in **Appendix K**. In summary:

- the proposed accesses have been designed to cater for design traffic volumes (including ensuring access intersections operate within acceptable performance limits)
- the Tweed Valley Hospital is not expected to generate any internal queues that will impact the external road network
- with the exception of the Tweed Coast Road/Cudgen Road intersection, the external road network and intersections are expected to cater for the future background and design traffic scenarios and are shown to operate within acceptable performance limits in terms of degree of saturation, average delay and 95th percentile queue.

A range of capacity and performance upgrades for the Tweed Coast Road/Cudgen Road intersection have been identified and will be undertaken as part of Stage 2 to cater for design traffic volumes. This includes the addition of a turning lane, extension of stand-up lanes, lane discipline and phase changes. **Figure 5.5** shows the SIDRA intersection layout with a summary of the proposed changes, relative to the existing layout of the Tweed Coast Road/Cudgen Road intersection (refer to civil drawings for upgrade detail: RBG-CV-DWG-RIE-88-300; RBG-CV-DWG-RIE-88-301; RBG-CV-DWG-RIE-88-302). The proposed measures adequately mitigate against the Project's impacts and improves operations for the forecast background traffic scenario (irrespective of the Project) relative to the current intersection design and operations. Further upgrades are required in Year 2033 including the four-lane upgrade of Tweed Coast Road, which is expected to be completed by 2033. It is also noted that the results do not consider the inclusion of the additional future planned east-west links between Tweed Coast Road and Kingscliff which will significantly reduce turning volumes on Cudgen Road and improve intersection operations. Overall, the proposed works are acceptable and commensurate with Council's ultimate upgrade planning for Tweed Coast Road and the intersection with Cudgen Road.

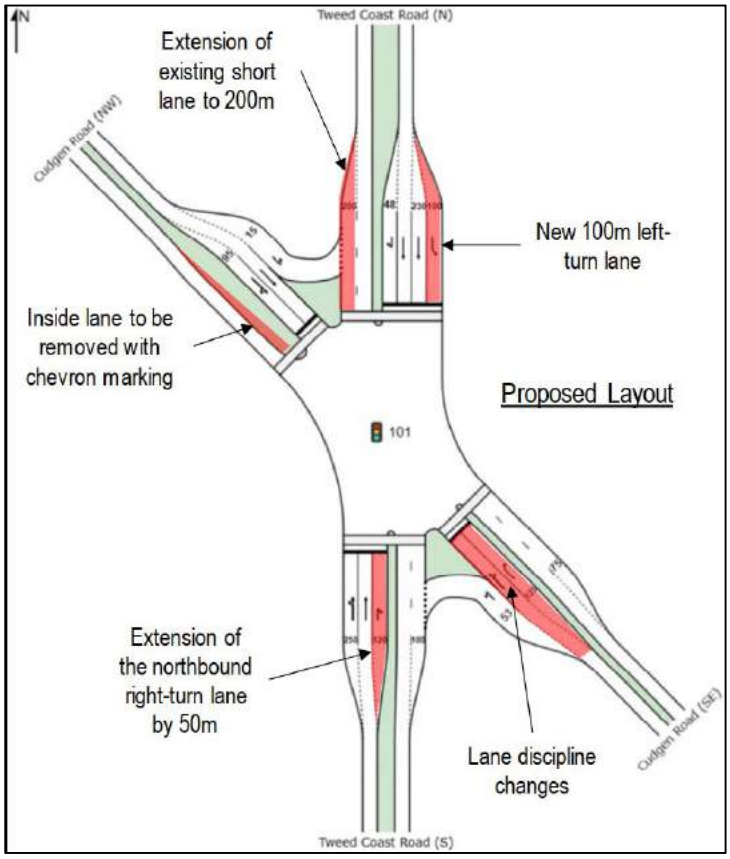


Figure 5.5 Tweed Coast Road/Cudgen Road – Upgrade Works (refer to civil drawings for detail)

5.7.8 Construction Traffic

All construction traffic and any impacts to the external road network due to road works/upgrades or in providing construction access to the Project Site will be managed under a Construction Traffic and Pedestrian Management Plan (CTPMP) and Traffic Control Plan (TCP).

Lendlease has prepared a preliminary CTPMP for Stage 2 (included at **Appendix Z** as part of the CEMP). The Main Works contractor will be required to develop and seek approval for the implementation of the CTPMP prior to commencement of construction to ensure safe and efficient management of traffic.

The primary haulage/truck routes to and from the Project Site are expected to be via Cudgen Road, Tweed Coast Road and the Pacific Highway, and will be confirmed in the detailed CTPMP prior to commencement of Stage 2 construction. Any required deviations to the designated truck route are to be authorised by the Construction Manager.

Construction works for Stage 2 are estimated to generate additional traffic movements (in the order of up to 250 heavy vehicle movements per day). They are expected to be spread throughout a typical day. Over a 12-hour period, this equates to approximately 20 heavy vehicle movements per hour.

The existing public and active transport infrastructure would adequately cater for any additional demand generated by construction activities (trips of this nature are expected to be low).

While there may be some traffic disruptions or delays during construction, given expected construction volumes, impacts are expected to be minimal and can be effectively managed under a CTPMP and TCP.

Pedestrian management will be in place at the site entry/exit points. During the works, pedestrian and cyclist access to the surrounding road network will be maintained. During the implementation of lane closures, pedestrians will be directed to follow the designated routes detailed on the TCP to be developed prior to Stage 2 construction commencing.

Safety of the surrounding road network will be managed under a CTPMP and TCP, with appropriate safety measures put in place.

5.7.9 Construction Parking

Construction parking will be provided on-site in the form of temporary hardstand parking. Access to these parking areas will be provided via a dedicated construction site access or accesses.

5.7.10 Conclusion

The overall conclusion from the investigations presented in the Traffic Impact Assessment is that traffic, parking, access and circulation arrangements for the Project would be satisfactory. The necessary road/intersection upgrades would be delivered as part of Stage 2, alternative transport measures would support the hospital's operation (including relocation), and there are no traffic or parking impediments to the Project.

5.8 SEAR 8 - Ecologically Sustainable Development

5.8.1 Overview of Sustainable Design Approach

As outlined in the Architectural and Urban Design and Ecologically Sustainable Design (ESD) reports at **Appendix C** and **L**, HI have set a design objective to achieve an ESD performance of at least 45 Points (which is generally equivalent to a Green Building Council of Australia 4 Star Greenstar rating). This will be achieved through a range of sustainability strategies and assessed in accordance with HI's ESD Guideline and Evaluation Tool and independently certified by a suitably qualified ESD Consultant.

The ESD report prepared by LCI identifies and details relevant government policy and/or targets pertinent to the new Tweed Valley Hospital development. It provides a summary of the relevant industry best practice guidelines and outlines how the development will respond to the implementation of ESD measures and initiatives for design, construction and operation of the hospital to achieve equivalency to a 4 Star Greenstar rating. Measures to minimise consumption of resources, water and energy, as well as providing better environmental quality outcomes are to be included in the design of the facility and the operational procedures. Implementation of these measures will realise the opportunity to achieve industry best practice. These measures include, but are not necessarily limited to:

- Energy and water efficient equipment, fittings, fixtures, and appliances
- Rainwater re-use on site for non-potable purposes
- Consideration given to type and quality of materials (including use of low embodied energy and recycled content, low Volatile Organic Compounds)

- Metering and monitoring
- Passive design strategies where feasible, such as orientation, natural daylight access, external shading, thermal mass, appropriate glazing selection, thermal efficiency and building fabric
- Specification of resilient finishes for longevity
- Waste management, reduction and recycling
- Opportunities for on-site renewable energy
- Efficient building management systems and equipment controls, including lighting and air-handling
- Investigation of water sensitive urban design (WSUD) and stormwater management
- Reduced quantity of surface parking to reduce heat island effect
- Green/sustainable transport plan
- The Project team is reviewing opportunities to work with the Australian Renewable Energy Agency (ARENA).

Consideration has been given to projected impacts of climate change in the ESD report and design of the facility. The ESD approach will help to reduce resource consumption and allow the development to be adequately responsive and fit for purpose in relation to future climate change impacts.

Refer to **Appendix L** for further detail.

5.8.2 Principles of Ecologically Sustainable Development

The Project has been assessed against the ecologically sustainable development principles outlined in Schedule 2 of the EP&A Regulation 2000 which is summarised below.

5.8.2.1 The precautionary principle

Schedule 2 of the EP&A Regulation 2000 states *"the precautionary principle"*, namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:

"Careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment. An assessment of the risk-weighted consequences of various options'".

The precautionary principle has been applied in the assessment of the Stage 2.

Potential environmental impacts of Stage 2 would be relatively minor due to the current condition of the Project Site and nature of the works which are predominantly restricted to the existing highly disturbed areas and where Stage 1 Works have already commenced/occurred (as approved). The Project is required to provide the Tweed-Byron region with an expanded and contemporary standard health facility and improved level of service.

Proactive measures to prevent environmental degradation will be included within the design, construction and operational phases of the proposed development (as summarised in **Section 7**). During the design and construction phases the Main Works contractor will implement an independently certified Environmental Management System (EMS) which demonstrates formalised systematic and methodical approach to planning, implementing and auditing. Throughout the building's operation, adherence to procedures that account for environmental risk and mitigation measures will be met.

Another precautionary measure is that hospitals are considered to be critical facilities and should be situated in a manner that reduces their susceptibility to risks or hazards. The Tweed region presents significant flooding challenges, with a large extent of land affected by the 100 Average Recurrence Interval (ARI) and Probable Maximal Flood (PMF) flood levels. It is best practice and government planning policy to locate hospitals on land above the PMF to ensure that such critical facilities are not adversely impacted or strained during flood events. The Project Site and design response ensure the hospital would not be prone to flooding and is above the PMF level.

A bushfire hazard assessment has also been prepared and the development can comply with Condition B19 of SSD 9575 and relevant legislation. Bushfire is assessed in **Section 5.18**.

5.8.2.2 Intergenerational equity

Schedule 2 of the EP&A Regulation 2000 defines inter-generational equity as "*the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations*".

Stage 2 of Project would not significantly affect the viability of local or threatened species, or any endangered ecological communities (EECs) or other environmental resources including water, soil and air. Therefore, local environmental values would not be substantially adversely affected by the Project and would be maintained for future generations. ESD initiatives incorporated into the Project would also help to deliver an environmentally responsible development, including reduced water and energy consumption. Without the works proceeding, the level and quality of hospital services provided to the Tweed-Byron region would decline.

The new hospital will provide improved health services in the region and help realise aspirations for increased education, training and research facilities.

Overall, the socio-economic, safety and environmental benefits of the Project would occur with minimal potential environmental expense.

5.8.2.3 Conservation of biological diversity and ecological integrity

Schedule 2 of the EP&A Regulation 2000 requires the "*conservation of biological diversity and ecological integrity*", namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration.

The impacts to ecological integrity and conservation of biological diversity at the site relevant to Stage 2 have been thoroughly assessed as part of this EIS (refer to the BDAR and BMP), supported by the initial assessment undertaken for the Concept Proposal and Stage 1 Works. No threatened species, endangered populations or threatened ecological communities (TECs) are likely to be adversely affected by Stage 2 of the Project. No populations of native species are likely to be made locally rare or unviable.

A net improvement in the quality of the stormwater discharged from the Site is expected to have a positive impact on balance for the receiving environment.

Further, the Project's ESD principles to reduce energy, water and waste consumption have an indirect impact to help conserve biodiversity and ecological integrity to the surrounding area.

*5.8.2.4 Consequently, ecological integrity and biological diversity would be maintained at and surrounding the site. Biodiversity has been specifically addressed at **Section 5.19**.Improved valuation, pricing and incentive mechanisms*

The following principles of valuation, pricing and incentive as per Schedule 2 of the EP&A Regulation 2000 are acknowledged as part of this review:

- Polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement.
- The users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste.
- Environmental goals, having been established, should be pursued in the most cost-effective way, by establishing incentive structures, including market mechanisms that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.

This EIS has undertaken a thorough assessment of potential impacts associated with Stage 2 and consequently a set of mitigation measures and safeguards would be implemented to ensure sound environmental practices and outcomes. The capital investment of the Project includes expenditure on environmental rehabilitation, ensuring that the works include adequate environmental measures, and allows for effective construction management and measures to reduce environmental impacts and address ESD principles.

5.9 SEAR 9 - Agricultural Impact

5.9.1 Land Use Conflict Risk Assessment (LUCRA)

Tim Fitzroy & Associates (TFA) prepared a Land Use Conflict Risk Assessment (LUCRA) for the Concept Proposal and have submitted an updated version (**Appendix H**) in support of Stage 2 and in response to SSD 9575 conditions of consent.

The LUCRA was prepared based on:

- a review of the Stage 2 proposal for the Tweed Valley Hospital
- discussions with TSA Management (including feedback from neighbouring residents/farms)
- site inspection
- review of surrounding land uses.

A site inspection coupled with a review of aerial photography has confirmed:

- The distance between the closest proposed hospital building and the existing vegetable cropping to south (Lot 1 DP1803772, Cudgen Road) is approximately 100 m.
- The distance between the closest proposed hospital building and the unused former plant nursery to the west (Lot 6 DP 727425, Cudgen Road) is approximately 60 m.
- The distance between the closest proposed hospital building and the sweet potato farm to the south-west (Lot 101 DP 866795, Cudgen Road) is approximately 280 m.

The LUCRA considered a range of potential land use conflicts, including:

- Agricultural chemical spray drift
- Odour
- Noise (including tractors and machinery operation)
- Dust
- Surface water and sediment runoff
- Traffic and access.

Any potential land use conflicts between the proposed hospital and existing agricultural land uses and activities were considered against a risk assessment matrix to rank the potential land use conflicts in terms of significance.

Based on the proximity of the existing vegetable cropping to the south of the Tweed Valley Hospital the LUCRA recommends a series of measures, including vegetated buffers and plantings at key interfaces. The LUCRA (and associated landscape design elements) adopts the precautionary principle and also considers the potential for any change in rural land use/intensity on the adjoining property to the west (currently fallow land and formerly greenhouse/nursery). The combination of agricultural buffer and elevation differential with the adjacent western site ground level will contribute to increased buffer effectiveness, and there is the ability to provide an increased buffer in the future if required (as described below).

Overall the LUCRA has concluded that the Project Site is suitable for the proposed development subject to the following recommendations, which have been incorporated into the Stage 2 design (refer to plans at **Appendix B**):

1. A **vegetated buffer** based on the following criteria is to be installed on the Project Site along the southern boundary:

    - contain random plantings of a variety of tree and shrub species of differing growth habits, at spacings of 4–5 m for a minimum width of 30 m
    - include species with long, thin and rough foliage which facilitates the more efficient capture of spray droplets
    - provide a permeable barrier which allows air to pass through the buffer. A porosity of 0.5 is acceptable (approximately 50 per cent of the screen should be air space)
    - foliage is from the base to the crown
    - include species which are fast growing and hardy
    - have a mature tree height at least three metres.

2. **Supplementary plantings** are to be installed between the existing row of mixed trees and shrubs on the western and south-western boundary of the Project Site based on the following criteria to form an improved vegetative screen:

    - contain random plantings of a variety of tree and shrub species of differing growth habits, at spacings of two to three metres for a minimum width of 10 m
    - include species with long, thin and rough foliage which facilitates the more efficient capture of spray droplets
    - provide a permeable barrier which allows air to pass through the buffer. A porosity of 0.5 is acceptable (approximately 50 per cent of the screen should be air space)
    - foliage is from the base to the crown [achieved by a variety of species]
    - include species which are fast growing and hardy
    - have a mature tree height of at least three metres

- Open spaces for patients should not be located along the southern frontage. By locating courtyards and balconies on the opposite side of the buildings to the southern farmland, the buildings themselves will provide physical screening of farm activities
- Hospital buildings will be air-conditioned. The air intake for air-conditioning should not be located on the southern side of the building/s
- Roof water shall not be utilised for potable use
- Any roof water utilised for secondary uses should be fitted with a first flush diverter and adequately filtered in accordance with the relevant Australian Standards for non-potable secondary use/s.

The proposed vegetated buffers have been developed following an assessment of the specific risk and consequences of conflicts between the proposed Tweed Valley Hospital commercial development and adjoining agricultural uses. Despite there being no existing agricultural land use on the adjacent property to west, the LUCRA has adopted the precautionary principle in proposing a 10 m wide vegetated buffer along the south-western/western boundary. Should intensification of agricultural activity occur on the adjacent lot to the west, the masterplan has capacity to accommodate the widening of the vegetated buffer from 10 m to a maximum width range of 14-30 m, with the exception of a length of approximately 40 m in the location of the bypass lane where an above ground Bulk Oxygen Storage and an underground Liquified Gas Cylinder will be located, as required. The bypass lane is to be located directly opposite a 10-storey car park which will have a shielding effect on air and noise impacts should there be any intensification of adjoining agricultural production. The arrangement is considered acceptable and would achieve appropriate interface management, as required (refer to **Appendix H** for details).

The *Pesticides Act 1999* regulates the use of pesticides in NSW. Management practices must either eliminate spray drift or at least minimise it to a level where it will not cause adverse health impacts.

Pests/Vermin - The proposed vegetated buffer will be located within a landscaped environment. The hospital gardens and adjoining vegetated buffer will be maintained by suitably qualitied people/staff to provide an effective biological screen to adjoining agricultural pursuits ensuring that the vegetation does not become overgrown and a potential harbourage for vermin.

A maintenance plan is to be prepared to ensure that the vegetated buffer and surrounding land are managed appropriately to minimise harbourage of vermin and pests.

Recommendations for Noise Impacts

Hospital; operations; machinery, air conditioning, aircraft (helicopter), Vehicles (staff, patients, visitors, deliveries, waste collection), generators, night work, from the proposed Tweed Valley Hospital are addressed in the Noise and Vibration Impact Assessment prepared by JHA to ensure that any noise impacts are sufficiently attenuated so as to comply with the Noise Policy for Industry (NSW EPA 2017) and the Interim Construction Noise Guidelines (DECC, 2009).

The Noise and Vibration assessment is attached at **Appendix O** and summarised in **Section 5.12**.

Recommendations for Stormwater Management

A Stormwater Management Plan has been prepared by Robert Bird Group for the construction and operational phases of the development to minimise the potential for erosion and sediment runoff to adjacent farm land, water courses and wetlands.

The nominated buffer areas can also be designed to utilise techniques such as water spreading and water diversion to reduce conflicts from stormwater run-off between the proposed development and adjacent farmland. Ongoing maintenance and enforcement must be identified and incorporated into conditions of approval.

Stormwater and sediment and erosion control are addressed in **Sections 5.16** and **5.20** respectively.

Recommendations for Traffic and Access

Measures to reduce traffic impacts have been addressed in the Traffic Impact Assessment (**Appendix K**) with regard to both construction and operations. The Tweed Valley Hospital entrance has been located so it is not directly opposite the farms. Other appropriate controls relating to turning lanes and lane dividers are proposed to adequately address traffic concerns. Implementation of the recommendations in the Traffic Impact Assessment will adequately address traffic and access issues.

5.9.2 Agricultural Offset Plan

In accordance with the SEARs and SSD 9575 conditions, GeoLINK has prepared an Agricultural Offset Plan (**Appendix I**) for Stage 2 of the Project. The Agricultural Offset Plan (to be read in conjunction with the Consultation Report, Landscape Strategy, and LUCRA appended to this EIS):

- Provides evidence of consultation with regard to agricultural impact
- Details any additional agricultural risks identified during consultation
- Details management and mitigation measures identified
- Details the feasibility of reuse of the existing topsoil on site
- Details the feasibility to reuse the remaining top-soil (if any) off site
- Details the opportunity for a community garden, including edible plant varieties
- Details a local food procurement strategy for the hospital
- Details the collaborative approach by the Tweed Valley Hospital Cross Agency Coordination Committee and other Government Agencies.

The measures in the Agricultural Offset Plan will assist in offsetting the minor loss of agricultural land due to the hospital's development, and help support the agricultural industry and activity in the local area and region. One of the initiatives, is that the Tweed Valley Productive Land Use Sub-Committee (established by the Cross Agency Coordination Committee) is engaging with farmers, industry and the community to look at the challenges associated with productive farming, and to consider mechanisms to increase productive land use in the region.

The identified measures in the Offset Plan, combined with those in the LUCRA to avoid and minimise potential land use conflict between the hospital and adjacent rural land, would ensure that the Tweed Valley Hospital can effectively coexist with other land uses in the locality, without having a detrimental effect on broader agricultural activity.

Further detail is provided in **Appendix I**.

5.10 SEAR 10 – Heritage

5.10.1 Aboriginal Cultural Heritage

A detailed Aboriginal Cultural Heritage and Archaeological Report by Niche Environment and Heritage (Niche), including consultation with the Registered Aboriginal Parties, was prepared to support the Concept Proposal and Stage 1 Works EIS. The assessment concluded that there are no Aboriginal cultural heritage objects, places or features situated within the Project Site. The proposed development will not impact on any Aboriginal cultural heritage values. No impacts associated with Stage 2 are expected and no further assessment is therefore required.

5.10.2 Historical Heritage - South Sea Islander Dry-Stone Walls

In response to the SSD 9575 conditions of consent and Stage 2 SEARs for the Project, Niche was commissioned to:

- update the Historical Heritage Assessment (HHA) for the Project and the impacts on those values of the proposed development to support the Stage 2 SSD application
- prepare an archival record of the dry-stone walls to be removed/impacted by the construction of the New Tweed Valley Hospital prior to the commencement of Stage 1 works
- undertake consultation with the local South Sea Islander community prior to the commencement of Stage 1 works
- prepare an Interpretation Strategy specifically relating to the dry-stone walls requiring removal.

The HHA, archival record, and Interpretation Strategy prepared by Niche are included at **Appendix M**.

No formally listed heritage items occur on the Project Site. In 2018 Niche prepared a HHA to inform the EIS for the Concept Proposal and Stage 1 Works for the Project. The assessment found that the dry-stone walls present on the Project Site (identified as Walls 1-5 as depicted in **Figure 5.6**) were the most important physical evidence of early activities, and likely date to that early phase of development when the Project Site was a large sugar cane plantation during the 19th century. The walls are likely to have been built with the use of South Sea Islander labour.

Figure 5.6 Dry-stone wall locations (Niche 2019)

Recommendations for the management of the dry-stone walls were put forward and conditions of consent under SSD 9575 were subsequently included in relation to retention of the stone walls on the site where possible/feasible, and archival recordings and interpretation techniques where removal is required. This includes Condition A12 and A13 of Schedule 3 (administrative conditions for Stage 1 Works) as follows:

- *A12. The Stage 1 works must include the details of the methods to retain the five walls (where possible, either in part or in full) identified in the Historical Heritage Assessment Report prepared by Niche Environment and Heritage dated 19 October 2018, in accordance with the recommendations of this report and in consultation with Council, including but not limited to:*
  (a) avoidance of works near wall 2 and 5;
  (b) retention of wall 4 (where possible, either in part or in full) and integration with the carpark area;
  (c) part retention of wall 3 with evidence that the demolished materials can be reused in the Stage 2 application; and
  (d) part retention of wall 1, archival recordings of the demolished section and reconstruction of the remaining section of the wall to ensure its stabilisation.
- *A13. If wall 1, wall 3 and wall 4, identified in the Historical Heritage Assessment Report prepared by Niche Environment and Heritage dated 19 October 2018, require removal (either in part or full), then archival recording of the walls must be conducted prior to the commencement of Stage 1 works, in consultation with Council.*

In addition to the above conditions that relate to and have been addressed as part of the Stage 1 Works, Condition B14 of Schedule 2 (conditions to be satisfied in future development applications) of the SSD 9575 consent, with respect to the dry-stone walls, must also be satisfied as part of the Stage 2 SSD application. This Condition does not prevent or restrict the removal of the walls under the Stage 1 Works, provided that Conditions A12 and A13 and the Niche recommendations are satisfied. Condition B14 (of SSD 9575 consent Schedule 2) requires:

- *B14. The Stage 2 application must include details of the retained stone walls on the site (where feasible), the associated archival recordings and interpretation techniques (where removal is proposed) as required by conditions A12 and A13 of schedule 3 and the recommendations of the Historical Heritage Assessment Report prepared by Niche Environment and Heritage dated 19 October 2018.*

The Stage 2 application therefore includes this detail and as detailed in the HHA, the following subsections summarise how the condition has been satisfied.

5.10.2.1 Archival Record

Engineering designs have confirmed that the dry-stone walls Wall 3 and Wall 4 needed to be removed to complete the approved Stage 1 Works and facilitate Stage 2. Further, 10 m of the western most portion of Wall 1 likewise needed to be removed. In accordance with Condition A13 of Schedule 3, an archival record was prepared prior to commencement of Stage 1 Works and removal of the identified walls. This is appended to the HHA.

5.10.2.2 Methods of Retention

Walls 2 and 5

As outlined above and in the Stage 1 HHA, more than 80 per cent of the 750 m of dry-stone walls on the Project Site will not be impacted by the works. This includes all of Wall 2 and Wall 5, and most of Wall 1.

The following controls will be implemented to protect the walls during works:

- Temporary fencing be erected along the boundary of the walls and the construction works; and/or
- High visibility barrier fencing and/or taping be erected along the boundary of the wall and the construction works.

Any temporary fencing erected should allow for a minimum buffer of two metres.

Construction workers will be briefed on the significance of the dry-stone walls as part of site inductions as well as their responsibilities.

Walls 1, 3 and 4

In accordance with Stage 1 conditions of consent, all three dry-stone walls were archivally recorded prior to their demolition/removal as part of Stage 1 Works.

Structural engineers undertook an assessment to determine how best to remove part of Wall 1 while retaining the structural integrity of the remainder of the wall. A demolition plan for the partial removal of Wall 1 and the removal of Wall 3 and Wall 4 was developed as part of these Stage 1 Works.

The interpretation and re-construction of the dry-stone walls are planned for those civic/open outdoor spaces that have high pedestrian flow. As part of the re-construction of the walls, interpretive signage would be placed within close proximity providing a summary history of the Project Site, the significance of the dry-stone walls to the South Sea Islander community and images of the removal and re-construction of the walls. The heritage interpretation signage would be installed as key message waypoints along those locations of the wall.

5.10.2.3 Consultation

To determine the social significance of the dry-stone walls to the local South Sea Islander community, Niche, on behalf of HI has led a program of consultation with those South Sea Islander communities who may have connection to the Project Site and the wider Tweed Valley area.

Consultation has also been undertaken with the Tweed Shire Council.

A 'Consultation Log' and summaries of the South Sea Islander Community Consultation meetings are included in the HHA.

5.10.2.4 Interpretation

An Interpretation Strategy specifically focusing on the dry-stone walls and the histories of the South Sea Islander community at the Project Site, has been prepared as part of the South Sea Islander community consultation. The Interpretation Strategy is attached to the HHA at **Appendix M**.

On the basis of the above, the SSD 9575 conditions have been satisfied and historic values associated with the dry-stone walls would be appropriately managed through retention where feasible, and archival recording and interpretation where removal was required as part of the approved Stage 1 Works.

5.10.3 Tweed Coast Road/Cudgen Road Intersection Upgrade

As part of the Concept Proposal and Stage 1 SSD application, Niche prepared a Statement of Heritage Impact (SoHI) to assess the proposed upgrade at the Tweed Coast Road/Cudgen Road intersection. Searches of the Australian Heritage Database, the State Heritage Register, State Heritage Inventory and the TLEP 2014 heritage listings did not reveal listed items within the Project Site (inclusive of the Tweed Coast Road/Cudgen Road intersection works). There are no listed items of State heritage significance located within proximity to the upgrade area. However, the works will take place directly adjacent to the locally listed 'Cudgen Sugar Mill Remains', a site with recognised archaeological values and listed in the TLEP 2014 (Schedule 5, Part 3, ID A2) for its historical and aesthetic significance (refer to **Figure 5.7**).

Figure 5.7 TLEP 2014 Heritage Map (part of Item A2 occurs on the lot adjacent to the intersection works)

The SoHI presented the results of background heritage register searches, historical research, a site inspection, and significance and impact assessments, prepared in accordance with relevant guidelines.

The intersection upgrade works involve a new left turn lane for the approach along Tweed Coast Road. As a result, the road would be widened to accommodate the new left turn lane. The widening of the road will occur within the existing road reserve. The intersection upgrade includes lane discipline, light/signal and sign changes, as well as potential service adjustments.

The subject area is part of Lot 3 DP828298, which forms the LEP listing for the Cudgen Sugar Mill Remains. However, based on the results of the SoHI, the subject area has been heavily modified in the recent past as evidenced by the presence of a large drainage culvert that runs from the north-east corner to the south-west, fill now covering over much of the subject area, and evidence that the land surface has been substantially lowered in the past to create a level surface.

The TLEP 2014 listing indicates that the main surviving evidence of the mill – remnants of the former chimney stack that was demolished c.1962 – are located to the north of the subject area and outside the impact area of the intersection upgrade.

There would be no direct physical impact on the archaeological values of the Cudgen Sugar Mill Remains and the assessment concluded that the upgrades will not impact on the significance of the adjacent heritage item. The SoHI confirmed that no additional assessment was required, unless later design changes result in works within the curtilage of the heritage item. The Stage 2 civil design confirms there would be no impact outside the road reserve.

The recommendations of the SoHI prepared for the Tweed Coast Road/Cudgen Road intersection upgrade would be applied during works and include:

- All construction personnel working on-site will receive training in their responsibilities under the *Heritage Act 1977*.
- Should non-Aboriginal heritage items be uncovered during works, all works in the vicinity of the find will cease and the State Heritage Office and the Council will be contacted.

- In the unlikely event that archaeological remains (relics) are discovered, work must cease in the affected area and the Heritage Council must be notified in writing in accordance with section 146 of the *Heritage Act 1977*. Depending on the nature of the discovery, additional assessment and possibly an excavation permit may be required prior to the recommencement of excavation in the affected area.
- If the Tweed Coast Road/Cudgen Road intersection design changes to include works within the curtilage of the heritage item, a revised Statement of Heritage Impact (SoHI) will need to be prepared to address possible impacts.

5.11 SEAR 11 - Social Impacts

A Social and Economic Impact Assessment (SEIA) has been prepared by SGS Economics and Planning (**Appendix N**). The social and economic impacts assessed cover three distinct but related threads of impact arising from the Project:

- Social impacts
- Economic impacts
- Localised impacts of relocation from the current hospital site near the Tweed Town Centre to the new site at Cudgen/Kingscliff.

Note that in the social, economic and relocation impact assessments, the impacts being assessed are marginal to the base case of no hospital relocation or expansion.

Whilst all impacts identified in the SEIA are ultimately of a social and economic nature, it is important to identify the impacts that the relocation of the hospital facility will have both on the community it moves away from (Tweed Heads) and community it joins (Cudgen/Kingscliff). This category naturally contains some economic-type impacts (such as the economic function of Tweed Town Centre) and some social impacts (such as community access to allied health services).

Table 5.11 to **Table 5.13** summarise the social and economic impacts generated from the relocation and expansion of the hospital as detailed in the SEIA. These are categorised as either positive or negative impacts. Each impact is qualitatively described as being High, Medium or Low, as well as whether an indication of whether the impact is a net positive or net negative impact for the NSW community. These qualitative descriptions are defined as follows:

- High – The impact is expected to have a significant effect and be felt throughout the whole catchment and even beyond, driven by the provision of services or infrastructure not currently within the catchment.
- Medium – The impact is expected to have a moderate impact throughout the catchment and be driven by a marginal change in infrastructure or services already provided.
- Low – The impact is likely to have negligible impact, be appropriately mitigated to remove its impact or have local or temporary impacts.

Those impacts that are considered medium or high are most likely to influence the overall findings of a net community benefit assessment or Cost Benefit Analysis.

Mitigation measures are identified, as appropriate, for negative impacts. For the full assessment refer to the SEIA at **Appendix N**.

Table 5.11 Summary of Net Social Impact and Mitigation Measures

Social Impacts	*Impact*	*Mitigation measures*	*Residual impact*
Impact on surrounding areas during construction	Medium Negative	Construction is temporary and on-site traffic and construction measures will mitigate the worst of the issues. Project Site is not immediately adjacent to residential areas.	Low
Impact on the amenity of the surrounding environment	Low Negative	Considered during design process to minimise visual impact (Refer to Architectural and Urban Design Report).	Low
Impact on rural lands	Low Negative	Land Use Conflict Risk Assessment undertaken with risk management recommendations made.	Low
Improved availability of health services and facilities	High Positive	N/A	
Increased capacity of health services and facilities	Medium Positive	N/A	
Improved quality of health care	Medium Positive	N/A	
Improved health care experience for patients, carers and families	Medium Positive	N/A	
Enhanced catchment self-sufficiency in service provision	High Positive	N/A	
Positive impact on skills, education and research capacity of NSW health care workers	High Positive	N/A	
Positive impact on the health outcomes of Aboriginal and Torres Strait Islander community of Northern NSW	Medium Positive	N/A	
Reduces the risk of patients, visitors and staff members being adversely affected by infectious diseases, the behaviour and actions of drug and alcohol affected patients, and from flooding.	High Positive	N/A	
Impact on surrounding areas during construction	Medium Negative	Construction is temporary and on-site traffic and construction management measures will mitigate these issues. Project Site is not immediately adjacent to residential areas.	Low
Impact on community safety	Low Negative	Application of CPTED principles in Stage 2 design.	Low
Night time noise impacts of emergency vehicles	Low Negative	Elevated helipad and standardised policy to minimise ambulance noise	Low

Table 5.12 Summary of Net Economic Impact and Mitigation Measures

Economic Impacts	*Impact*	*Mitigation measures*	*Residual impact*
Increased employment during construction phase	Medium Positive	N/A	
Increased Gross Regional Product (GRP) during construction	High Positive	N/A	
Loss of agricultural land	Medium Negative	Developed land unable to be relocated resulting in loss of land. Design measures seek to minimise impact on adjacent rural lands (see LUCRA). Implement Agricultural Offset Plan.	Low
Increased employment during construction phase	Medium Positive	N/A	
Increased employment during operational phase	High Positive	N/A	
Increased GRP during operations	High Positive	N/A	
Long-term agglomeration benefit associated with clustering of health sector activities	Medium Positive	N/A	

Table 5.13 Summary of Net Relocation Impact and Mitigation Measures

Relocation Impacts	*Impact*	*Mitigation measures*	*Residual impact*
Reduced traffic congestion in Tweed Town Centre	Medium Positive	N/A	
Improved public transport outcomes between Kingscliff and Tweed Town Centre	Low Positive	N/A	
Reduced parking demand in Tweed Town Centre	Low Positive	N/A	
Reduced economic function of the Tweed Town Centre	Medium Negative	Relocation of hospital remains within local catchment, minimising wider impacts; community health and other out-of-hospital services provided through proposed HealthOne within Tweed Heads Town Centre; redundant parts of current site likely to transition to another use, minimising the time negative trade impacts are felt. Development of Regional City Action Plan for Tweed (by DPIE and TSC).	Low
Increased traffic volumes at Kingscliff	Low Negative	Refer to Traffic Impact Assessment (**Appendix K**).	Low
Impact on physical accessibility of health services and facility	Medium Negative	Relocation of hospital remains within the local catchment, minimising wider impacts; increase bus service and frequency between Tweed Heads and	Low

Relocation Impacts	Impact	Mitigation measures	Residual impact
		Project Site to facilitate patient and visitor accessibility. Long-term population growth will benefit from more centralised health facilities; reduced cross-border patient flows will free up beds for NSW patients. Provision of the HealthOne facility at or in close proximity to the existing hospital site.	
Impact on the amenity of the surrounding environment	Low Negative	Considered during design process (Refer to Architectural and Urban Design Report).	Low
Impact on rural lands	Low Negative	Land Use Conflict Risk Assessment undertaken with risk management recommendations made.	Low
Impact on Tweed Heads Town Centre	Medium Negative	Relocation of hospital remains within local catchment, minimising wider impacts; community health and other out-of-hospital services provided through proposed HealthOne at or in close proximity to the existing hospital site; increased bus service and frequency between Tweed Heads and Project Site to facilitate patient and visitor accessibility; transition of redundant parts of current site to another use will mitigate issues around passive surveillance and centre activity. Development of Regional City Action Plan for Tweed (by DPIE and TSC).	Low

5.11.1 Conclusion and Key Hospital Relocation Mitigation Measures

Overall, the SEIA has applied a mix of quantitative and qualitative methods in the undertaking of its analysis. It considers both positive and negative impacts, however, it finds that the new Tweed Valley Hospital in Cudgen/Kingscliff will, on balance, create an overall positive social and economic impact to the region. Many of the negative impacts identified have tangible mitigation measures to reduce their impact, including those associated with relocated hospital services. As detailed in the relevant sections of this EIS, specialist reports, and the plan package at **Appendix B**, the relevant measures and recommendations to address social and economic impacts have been incorporated into the proposed design, construction and operation of the new hospital. The early stage negative impacts of both construction and the relocation from Tweed Heads will be exceeded by the long-term social and health-related positive impacts that the new hospital will provide to the catchment.

As indicated in the above tables, and specifically in response to SSD 9575 condition B32 of Schedule 2, the following measures will mitigate impacts of relocation of the existing hospital from the Tweed Heads town centre and address impacts during the transitional period of relocation:

- The Project will develop a targeted communications strategy to address community needs and expectations during the transition phase of hospital relocation. Community engagement will be ongoing through all phases of the Project.

- Alternative (including public and community based) transportation between Tweed Heads and the new hospital in Kingscliff will be improved. Public transport to the Project Site will be via bus. The Project will also benefit from access to community transport and aged care transport through standard cars/vans and mini buses. A series of consultation sessions and planning has been undertaken with community transport operators, Council and TfNSW. Further detail is provided in the Traffic Impact Assessment at **Appendix K** (summarised at **Section 5.7**).
- A range of community health and other out-of-hospital services would be located at or in close proximity to the existing hospital site in the form of a HealthOne model as detailed below.

5.11.1.1 Community Health and Other Out-of-hospital Services Close to Tweed Heads Town Centre

Community Health Centres are currently located at a number of locations including Tweed Heads, Kingscliff, Murwillumbah and Byron Bay. A HealthOne facility with a collocated general practice is located at Pottsville.

The 2018 Service Statement outlines the community health and other out-of-hospital services that will continue to be delivered in the Tweed Heads area, following the transfer of hospital services to the new Tweed Valley Hospital when complete. The Service Statement proposes a HealthOne model to deliver the following community health and hospital outreach services in Tweed Heads:

- Community and Allied Health Services
- Aboriginal Health and Integrated Aboriginal Chronic Care
- BreastScreen (existing service at TTH)
- Child and Family Health services
- Chronic Disease Management
- Community Nursing
- Day Therapy
- Hospital in the Home
- Harm Reduction, Needle and Syringe Program and HARP Health Promotion
- Older Person services
- Podiatry
- Women's Clinic
- Mental Health and Drug and Alcohol services
- Oral Health.

The future of the existing hospital site will be subject to a separate decision by the NSW Government and appropriate planning pathway.

5.12 SEAR 12 – Noise and Vibration

JHA were engaged to prepare a Noise and Vibration Impact Assessment for Stage 2 of the Project (**Appendix O**). The Stage 2 assessment has had regard for and utilised the noise criteria established during the noise and vibration assessment of the Concept Proposal and Stage 1 Works by Acoustic Studio.

As per the acoustic report for the Concept Proposal and Stage 1 EIS, the following catchment areas (depicted in **Figure 5.8**) and noise sensitive receivers have been considered for the noise and vibration impact assessment for Stage 2:

- Catchment Area A: Kingscliff Hill residential suburb and commercial properties along Turnock Street.
- Catchment Area B: Kingscliff TAFE campus, residential properties along Cudgen Road and agricultural properties along Cudgen Road.
- Catchment Area C: Cudgen residential suburb and agricultural properties along Cudgen Road.

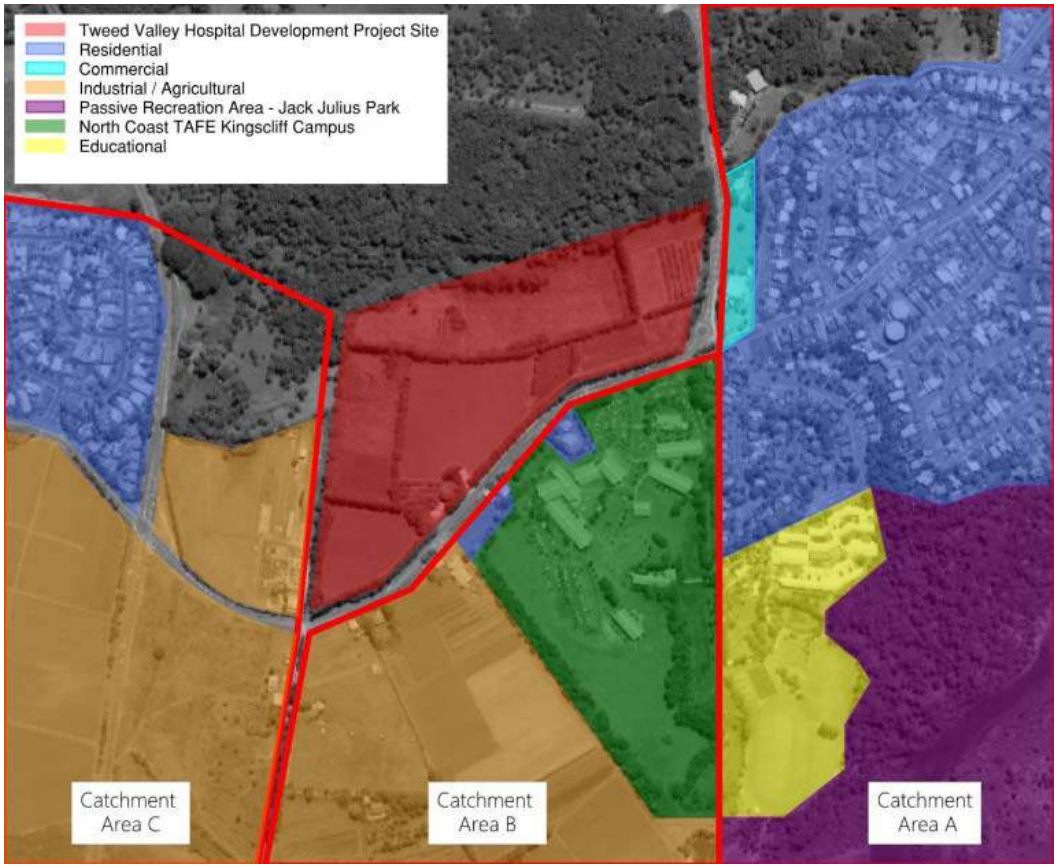


Figure 5.8 Noise Catchment Areas (NCA)

The existing noise environment has been established based on long-term and short-term monitoring data. Based on the results of the unattended noise monitoring, background noise levels have been established as per the methodology described in the NSW Noise Policy for Industry 2017. These values with the ambient noise levels, along with traffic noise monitoring and operator attended, short-term monitoring results are presented in the Noise and Vibration Impact Assessment.

5.12.1 Construction Noise

As per the SEARs requirements for the proposed construction activities, noise criteria are established in accordance with the NSW DECCW Interim Construction Noise Guideline (ICNG) 2009. This guideline provides Noise Management Levels (NMLs) for construction works. If NMLs are exceeded a feasible and reasonable action will be triggered to minimise noise impact to the nearest noise sensitive receivers.

The recommended construction hours are as follows:

- Monday to Friday: 7:00 am to 6:00 pm.
- Saturday: 8:00 am to 1:00 pm.
- Sundays and Public Holidays: No excavation or construction works.

The ICNG suggests construction noise management levels that may minimise the likelihood of impacts being caused to noise sensitive residential receivers depending on the duration of works. The management levels for long-term duration works are as follows:

- Within recommended standard hours:
  - The Management Level (LAeq,15 min) measured at the most exposed boundary of any affected residential receiver when the construction site is in operation must not exceed the background noise level (RBL) by more than 10 dB(A). This noise level represents the point above which there may be some community reaction to noise.
  - In the case of a highly noise affected area, the Management Level (LAeq,15 min) at the most exposed boundary of any affected residential receiver when the construction site is in operation should not exceed 75 dB(A). This level represents the point above which there may be strong community reaction to noise.
- Outside recommended standard hours:
  - The Management Level (LAeq,15 min) measured at the most exposed boundary of any affected residential receiver when the construction site is in operation must not exceed the background noise level (RBL) by more than 5 dB(A). It is noted justification is required for works outside the recommended standard hours.

ICNG suggests construction noise management levels for other sensitive land uses surrounding construction sites. **Table 5.14** reproduces the airborne construction noise criteria (NMLs) for the noise sensitive receivers surrounding the development site as presented in the Noise and Vibration Assessment.

Table 5.14 Construction Airborne Noise Criteria for Sensitive Receivers Surrounding the Site

Sensitive Receiver		**Airbore Construction Noise Criteria, L_{Aeq} dB(A)**	
		Within Standard Hours	***Outside Standard Hours***
Residential - Catchment A	Noise affected/external	55	43
	Highly noise affected/ external	75	N/A
Residential - Catchment B and C	Noise affected/external	57	39
	Highly noise affected/ external	75	N/A
Commercial	External	65	65
TAFE	External	45	45
Recreational	External	60	60

The ICNG recommends internal ground-borne noise maximum levels at residences affected by nearby construction activities. Ground-borne noise is noise generated by vibration transmitted through the ground into a structure and can be more noticeable than airborne noise for some sensitive receivers.

The ground-borne noise levels presented below from the ICNG are for residential receivers during evening and night-time periods only, as the objective is to protect the amenity and sleep of people when they are at home.

- Evening: LAeq,15 min 40 dB(A) - internal
- Night: LAeq,15 min 35 dB(A) – internal.

The level of construction noise will be dependent on the activity being undertaken and where on the site the activity is taking place.

Currently a detailed construction program is not yet fully defined for the Stage 2 Works, and a preliminary construction noise assessment has been carried out based on typical plant and machinery expected to be used throughout the construction stages of the hospital. The findings and assessment advice of the Noise and Vibration Impact Assessment in relation to construction noise and vibration management shall form the basis for the Contractor's detailed Construction Noise and Vibration Management Plan.

The preliminary noise assessment has been considered at the nearest existing residential receivers. The expected construction noise sources and the predicted noise levels at the nearest residential receivers are shown in the Noise and Vibration Impact Assessment (**Appendix O**).

Based on the results of the assessment presented in the Noise and Vibration Impact Assessment, the noise associated with the normal construction works is expected to meet the noise limits for standard hours and out-of-hours works in accordance with the ICNG.

Nevertheless, noise control measures and monitoring are recommended throughout the construction stages in order to ensure there are no adverse noise impacts at the nearest receivers.

5.12.1.1 Intersection Construction Works

In order to accommodate the additional traffic volumes generated by the development, the intersection at Tweed Coast Road and Cudgen Road will be upgraded as identified in the Traffic Impact Assessment.

Based on the results of the preliminary assessment (considered at the nearest existing residential receivers and based on typical plant and machinery), there are expected to be some noise exceedances during construction of the proposed road works as per the ICNG. In order to reduce the impact of construction noise generated by the road works on the adjacent residential properties, the following noise mitigation measures are recommended to be implemented where feasible:

- Maximising (as much as practical) the distance between noisy equipment and residential areas
- Regular maintenance of equipment
- Noise compliance monitoring as required
- Locating compounds and stockpiles as far as possible away from residential areas
- Scheduling respite periods for high noise activities
- Providing advanced notice of planned noisy work to neighbouring communities to help them plan.

Other control measures/elements are further discussed in **Section 5.12.3**.

5.12.2 Construction Vibration

Ground vibration criteria have been set in the Noise and Vibration Impact Assessment to safeguard existing structures and vibration to sensitive receivers proximate to the site. The assessment states that the following standards and associated criteria (as presented in the Noise and Vibration Impact Assessment) are to be adopted:

- Vibration criteria human comfort: 'Assessing Vibration: A Technical Guideline' (DECC 2006) and the guidelines contained in British Standard BS 6472.1:2008 'Guide to evaluation of human exposure to vibration in buildings – Vibration sources other than blasting'.
- Vibration criteria for building damage: German Standard DIN 4150.3:1993 and British Standard BS 7385.2:1993.

The Main Works contractor will prepare a detailed Construction Noise and Vibration Management Plan prior to commencement of works to ensure appropriate criteria and monitoring is in place.

5.12.3 Control Elements

In order to meet the noise and vibration requirements, the Main Works contractor will be required to engage a qualified acoustic consultant to assist in the compilation of a Construction Noise and Vibration Management Plan, and undertake noise and vibration monitoring for the duration of the Stage 2 Works.

5.12.3.1 General Noise and Vibration Control Elements

It is noted that the reduction of noise and vibration at the source and the control of the transmission path between the construction site and the receiver(s) are the preferred options for noise minimisation. Providing treatments at the affected receivers should only be considered as a last resort. Construction noise and vibration shall be managed by implementing the following broad key strategies:

- Plant and equipment selection, operation/use, and maintenance to minimise and control noise at the source.
- Employ on site noise management practices.
- Work scheduling: Scheduling work during periods when people are least affected is an important way of reducing adverse impacts.
- Consultation, notification and complaints handling.

Section 6.5 of the Noise and Vibration Impact Assessment expands upon these key strategies and outlines measures and practices in relation to each that will reduce noise and vibration impacts.

5.12.3.2 Additional Construction Noise and Vibration Control Elements

If, during construction, an item of equipment exceeds either the noise criteria at any location or the equipment noise level limits, the following noise control measures, together with construction best practices, shall be considered to minimise noise impacts on the neighbourhood:

- Schedule noisy activities to occur outside of the most sensitive times of the day for each nominated receiver.
- Consider implementing equipment-specific screening or other noise control measures recommended in Appendix C of AS 2436:2010.

- Limit the number of trucks on site at the commencement of site activities to the minimum required by the loading facilities on site.
- When loading trucks, adopt best practice noise management strategies to avoid materials being dropped from height into dump trucks.
- Avoid unnecessary idling of trucks and equipment.
- Ensure that any miscellaneous equipment (extraction fans, hand tools, etc) not specifically identified in the noise assessment/management plan incorporates silencing/shielding equipment as required to meet the noise criteria.

Implementation of all reasonable and feasible mitigation measures for all internal and underground works will ensure that any adverse noise impacts to surrounding residential, commercial and recreational receivers are minimised when noise goals cannot be met due to safety or space constraints.

The NSW RMS 'Construction Noise and Vibration Guideline' provides safe working distances for vibration intensive plant and are quoted for both 'cosmetic' damage (in accordance with BS 7385.2:1993) and human comfort (in accordance with DECC's 'Assessing Vibration: A Technical Guideline'). The recommended safe working distances for typical construction plant are provided in the Noise and Vibration Impact Assessment.

If Main Works contractor has concerns for the disruptions at nearest sensitive receivers due to vibration intensive plant use, it is recommended that prior to the commencement of the works, to undertake a preliminary vibration survey on each key vibration generating activity/equipment.

Vibration survey and assessment will determine whether vibration criteria would be exceeded and therefore whether mitigation and management measures will need to be put in place to ensure vibration impacts are minimised as far as practicable. Additionally, dilapidation surveys/reports have been prepared as per the requirements of the Stage 1 Works SSD9575 conditions.

5.12.4 Operational Noise

Noise break-out from the operation of the proposed Tweed Valley Hospital has the potential to impact on existing noise sensitive receivers. For the purpose of the noise impact assessment, the noise sources are assumed as follows:

- Noise emissions from mechanical plant from the hospital to the surrounding receivers
- Emergency generator emissions
- Noise emissions from traffic generated by the hospital
- Emergency helicopter and vehicle operation.

Each of these noise sources has been considered in the noise impact assessment which has considered the following:

- Premises will operate 24 hours a day, seven days per week. Therefore, the worst-case scenario will be during night-time periods
- Noise levels have been considered as continuous over assessment time period to provide the worst-case scenario
- Distance attenuation, building reflections and directivity.

5.12.4.1 Mechanical Plant

A preliminary noise assessment has been conducted considering the expected plant associated with the proposed development.

In order to achieve the night time criteria at residential catchment B and C, acoustic mitigation measures are recommended for the Cooling Tower plant. Further, acoustic louvres are recommended for the chiller plant rooms.

Based on the results of the assessment, the mechanical plant associated with the proposed development are expected to meet the external noise requirements upon implementation of the proposed mitigation measures. Nevertheless, noise controls will need to be considered during the design development and finalisation process to ensure that the cumulative noise levels from plant to the nearest sensitive receivers meets the noise level criteria.

Usual design noise controls that may need to be implemented typically include, but are not limited to:

- Strategic location and selection of plant to ensure the cumulative noise levels at the receiver boundaries is met
- Selection of appropriate quiet plant
- Acoustic noise control measures to be put in place to minimise noise impacts such as:
  - In-duct attenuation
  - Noise enclosures as required
  - Sound absorptive panels
  - Acoustic louvres as required
  - Noise barriers as required.

5.12.4.2 Emergency Generators

Emergency generators have been detailed as part of the proposed development and have been considered within the acoustic assessment. It is understood that the new emergency generators will operate up to eight hours operation per month for testing, or will continuously operate in the event of a utility network outage.

In the absence of any relevant NSW guideline for emergency generators and equipment, an increase of 5dB above the intrusiveness criteria identified in Section 4.6 of the Noise and Vibration Report is proposed. This criteria is in line with the duration correction provided in Table C3 of the NSW NPI.

Based on the proposed criteria and proximity to the nearest noise sensitive receiver, noise emissions from the emergency generators shall be limited to LAeq 90 dB(A) at one metre in order to meet the proposed criteria.

Noise controls will need to be incorporated to ensure that the noise levels from the emergency generator to the nearest noise sensitive receiver meet the noise level criteria. Usual design noise controls that may need to be implemented will typically include, but are not limited to:

- Selection of appropriate quiet emergency generator.
- Schedule maintenance and testing of plant during day time period where feasible
- Acoustic noise control measures to be put in place to minimise noise impacts such as:
  - Noise enclosures as required
  - Sound absorptive panels
  - Acoustic louvres as required
  - Noise barriers as required.

5.12.4.3 Traffic Generation Noise

A traffic generation noise assessment has been undertaken, informed by the Traffic Impact Assessment (prepared by Bitzios) in order to determine the potential noise impacts for the following areas:

- Cudgen Road
- Turnock Street
- Tweed Coast Road.

Based on the assessment presented in the Noise and Vibration Impact Assessment, traffic generated as a result of the proposed hospital development is not expected to have an adverse noise impact on the surrounding roads (i.e. less than 2dB(A) increase).

5.12.4.4 Multi-storey Car Park

The noise relating to the car park within the proposed hospital has been assessed. The resultant noise from the proposed car park is expected to comply with the noise criteria at the nearest sensitive receivers. It is recommended that further consideration should be given to the noise resulting from the car park on the proposed hospital during the design development and finalisation phase. It is the opinion of JHA that there will be a low risk of sleep disturbances to the nearby residents due to car park noise.

5.12.4.5 Emergency Helicopter Operations

Noise impacts relating to emergency helicopter operations are addressed within the Noise and Vibration Impact Assessment and the recommendations have been provided based on the Aviation report (**Appendix V**) prepared by Avipro. The assessment considers:

- Noise impacts from the helicopter operations to the nearby noise sensitive receivers
- Noise impacts from the helicopter operations on the proposed hospital development.

As the helicopter facilities are used exclusively for emergency purposes, there are no requirements in order to assess noise to the nearby noise sensitive receivers. Based on this, the Airservices Australia Principles and Procedures for minimising the impact of aircraft noise fly Neighbourly Guide have been considered. The general principles and procedures of this guide have been summarised below:

- No overflight of residential areas, if this cannot be achieved then;
- No overflight of residential area below 1,500 ft AGL, if this can't be achieved then;
- Minimisation of incidence of helicopters flying below 1,500 ft AGL, if this can't be achieved then;
- Minimisation of noise impact on residential areas by helicopters below 1,500 ft AGL.
- Minimisation of noise impacts on residential areas by hovering/circling helicopters.
- Implement Fly Neighbourly procedures.

Based on the advice provided by AviPro (refer to Aviation Assessment at **Appendix V**), the overflight of the helicopter is expected to be >1,500 ft AGL from the nearby residential receivers when under neutral weather conditions. The proposed helicopter flight paths indicated in **Figure 5.13** (in **Section 5.21**) shows that the helipad and associated north-south flight paths have been located as far as practicable from the nearby sensitive receivers. As concluded in the Aviation assessment:

- The elevated (rooftop) Helicopter Landing Surface (HLS) will have a positive effect in reducing noise and vibration to the surrounding environment as compared to an on-grade HLS.
- Noise and vibration impact on sensitive land uses has been minimised to the maximum extent that safety allows.
- Planned approach and departure paths avoid built-up and sensitive areas (including residential, educational and biodiversity related receivers) to the greatest extent possible.

5.12.4.6 Helicopter Noise Impact on the Proposed Hospital

The design targets have been based on the NSW Health Infrastructure Engineering Services Guidelines dated July 2016 (ESG 2016). This guideline has been used due to the absence of any updated noise criteria relating to helicopter events shown in the current document (ESG July 2017 Update).

Given the nature of the proposed development and the low frequency of helicopter movements expected, internal noise criteria of an absolute limit of 80 dBLA max for any occupied room has been adopted and is considered appropriate.

Based on the criteria outlined in the Noise and Vibration Impact Assessment, it is expected that the proposed hospital development will require external acoustic glazing and consideration of the façade in order to achieve the nominated internal noise levels. Consideration of acoustic glazing and other façade treatments will be developed further throughout detailed design.

5.12.4.7 Ambulance Operations

The potential noise sources associated with ambulance vehicle operations will be:

- Noise generated by vehicles movements, particularly ambulances dispatched for emergencies during night-time
- Noise generated by ambulance sirens.

It has been assumed that the worst-case scenario will be when ambulances depart or arrive at the hospital during a Priority 1 incident in night-time period.

In regard to ambulance vehicle noise emissions, the assessment indicates that there will be a marginal criteria exceedance of 1 dB(A). This is considered as a negligible exceedance as it exceeds the criteria by less than 2 dB(A). Based on the assessment, the noise levels associated with the impacts of ambulance noise are expected to meet the given noise criteria. Therefore, there would be no adverse noise impact related to sleep disturbances.

It is important to note that the hospital development does not involve an ambulance station, however there may be instances when ambulances respond to an incident from the hospital (e.g. after a drop-off). Regarding the use of ambulance sirens on site, this is not specifically addressed in relevant regulations. When in use, noise levels from ambulance sirens would be audible at the nearest sensitive receivers.

Events identified as Priority One events (Life Threatening Emergencies), require that warning devices must be used, including warning lights and sirens. The Emergency Driving and Use of Warning Devices Policy of NSW Ambulance Service states that:

"NSW Ambulance personnel who drive a vehicle under emergency response conditions shall use safety equipment provided by NSW Ambulance for that purpose which includes warning devices: lights and sirens. Lights can be used in isolation without the use of a siren if the driver of the vehicle deems the circumstances are safe to do so and can justify reasonable cause to do so."

Based on the above, it is understood that ambulance drivers will make a judgement call on whether to use ambulance sirens on case-by-case basis. It is further understood that is it the practice of paramedics to minimise the use of sirens when it will cause a noise disturbance and the sirens are deemed unnecessary.

On this basis no significant or unreasonable amenity impact is expected due to ambulance operations.

5.13 SEAR 13 – Contamination

Contamination was assessed as part of the Concept Proposal and Stage 1 Works EIS (SSD 9575). Andrew Lau, of JBS&G Australia Pty Ltd (JBS&G), was engaged by HI as a Site Auditor accredited by the NSW Environment Protection Authority (EPA) under the *Contaminated Land Management Act 1997*. A Site Audit Statement and Site Audit Report were previously issued for the Project Site by Andrew Lau on 4 February 2019, certifying that the Project Site could be made suitable for the proposed land use subject to remediation and management in accordance with the Remedial Action Plans (RAPs) prepared by OCTIEF and Cavvanba, and a number of conditions including the preparation of a Validation Sampling Analysis and Quality Plan (VSAQP) and Work Health and Safety Plan (WHSP) for subsequent review and endorsement by the Auditor prior to commencing the site works.

Development Consent (SSD 9575) has been granted for the Concept Proposal and Stage 1 Works, inclusive of remediation. Conditions B10, B11, B15 and B16 within Schedule 3, Part B of the Development Consent (Conditions of Consent for Stage 1 Works) require the preparation of a Soil and Groundwater Investigation Report, a RAP (for any additional contamination identified) and various management plans requiring review and endorsement by the Site Auditor prior to certification of site works. In accordance with Stage 1 Conditions, the required documents have subsequently been prepared by the consultants (Cavvanba and others) and provided to the Auditor for independent review to assist with the preparation of Interim Audit Advice. To satisfy the SSD 9575 Condition B34 of Schedule 2, applicable to the Stage 2 application, this advice has been attached at **Appendix Q**.

The documents reviewed as part of the preparation of the Interim Audit Advice include:

- B & P Survey Consulting Surveyors, *Remediation Area Plan*, ref: T16452, 9 August 2019;
- Cavvanba Consulting Pty Ltd (2019a) *Remedial Action Plan Addendum – Farm Shed, 771 Cudgen Road, Cudgen, NSW*, ref: 18084 R04 V2, 24 January 2019;
- Cavvanba Consulting Pty Ltd (2019b) *Soil Investigation Report – Residential House*, *771 Cudgen Road, Cudgen NSW*, ref: 18084 R01 V3, 1 August 2019;
- Cavvanba Consulting Pty Ltd (2019c) *Remedial Action Plan Addendum – Residential House, 771 Cudgen Road, Cudgen NSW*, ref: 18084 R02 V4, 1 August 2019;
- Cavvanba Consulting Pty Ltd (2019d) Grou*ndwater and Soil Investigation, 771 Cudgen Road, Cudgen NSW*, Ref: 19038 R02 V2, dated 22 August 2019;

- Cavvanba Consulting Pty Ltd (2019e) *Remedial Action Plan Addendum – Farm Pit, 771 Cudgen Road, Cudgen NSW*, ref: 19038 R03 V2, 19 August 2019;
- Cavvanba Consulting Pty Ltd (2019f) *Validation Data Quality Objectives and Sampling, Analysis and Quality Plan, Proposed Tweed Valley Hospital, 771 Cudgen Road, Cudgen NSW*, ref: 19038 R04 V1, 23 August 2019;
- Delta Pty Ltd (2019) *Work Health and Safety Plan*, dated 28 August 2019;
- Lendlease Building Pty Ltd (2019a) *Tweed Valley Hospital, Management Plan – Hazardous Materials*, Rev7, 28 August 2019; and
- Lendlease Building Pty Ltd (2019b) *Tweed Valley Hospital, Works Plan*, Rev3, 26 August 2019.

The Interim Audit Advice (**Appendix Q**) confirms that remediation is occurring as part of the approved Stage 1 Works and the Auditor notes that the remediation and validation procedures outlined in the relevant RAPs and VSAQP are appropriate to render the Project Site suitable for the proposed land use, subject to the following considerations:

- Implementation of the Hazardous Materials Management Plan (Lendlease 2019a), Works Plan (Lendlease 2019b) and Work Health and Safety Plan (Delta 2019) which have been prepared for the Project Site
- Undertaking an additional round of groundwater monitoring at the site which includes analysis of TRH silica gel clean up, major ions and trace level OCP
- Preparation of a validation report detailing the remediation and validation of the residential house, farm shed and farm pit in accordance with relevant guidelines
- Completion of a Site Audit Statement supported by a Site Audit Report, certifying suitability for the proposed use, following the successful completion of the remediation and validation activities at the Project Site.

The abovementioned final Site Audit Statement and Site Audit Report will be provided in due course, and prior to determination of the Stage 2 SSD application.

5.14 SEAR 14 – Utilities

A summary of services and utility requirements is provided in the following sections.

5.14.1 Hydraulic and Fire Services

JHA Consulting Engineers has prepared an Infrastructure Management Plan (IMP) and Integrated Water Management Plan (IWMP) to identify and summarise the proposed hydraulic and fire utility infrastructure requirements which will be incorporated into the design of the proposed Tweed Valley Hospital.

The infrastructure and water management plans are attached at **Appendix R** and summarised in the following sections.

5.14.1.1 Potable Water

Adequate and compliant potable water supply for infection control and to avoid potential contaminations, potable water systems for human consumption, hygiene purposes, cistern flushing and process equipment for the site, is available for connection to the Tweed Shire Council water main system (300 mm water main) located in Turnock Street (refer to **Figure 5.9** for water connection points). A storage tank and booster pump-sets are required for both potable cold water supply and fire services. The reliability of the water main has been confirmed with TSC and is reliable.

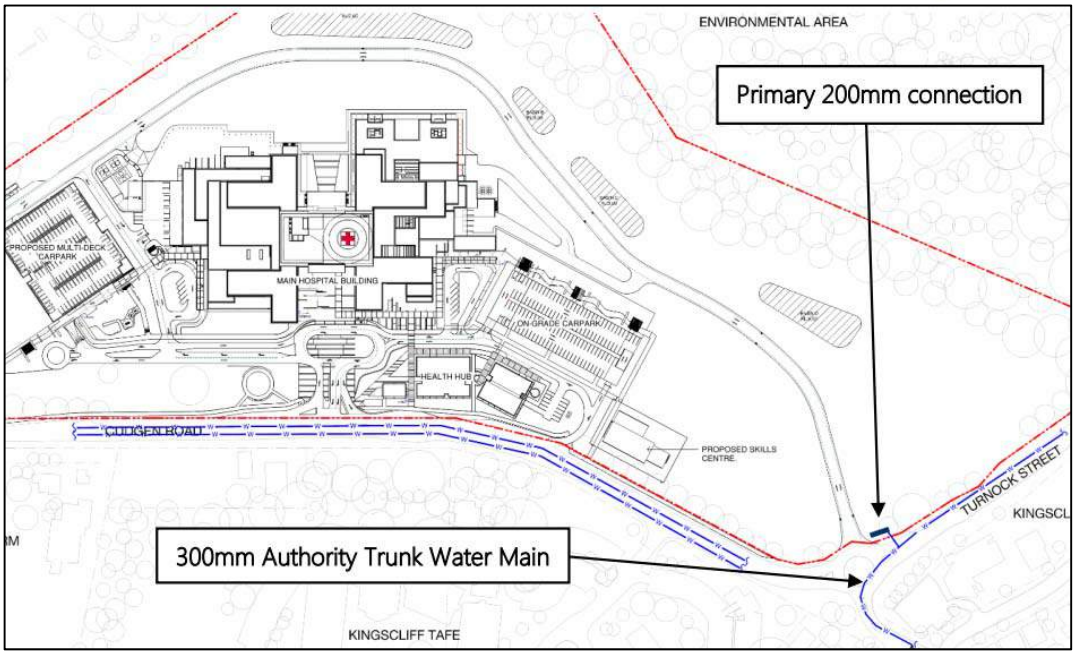


Figure 5.9 Potable Water Connection Point

5.14.1.2 Non-Potable Water

Alternative non-potable water supply is proposed to be supplied from a reuse water tank located adjacent to the service yard to provide supplementary landscape irrigation and cooling tower makeup water.

Based on available historical rainfall data, available roof collection area, volume of expected condensate discharge, RO discharge and water balance, calculations have indicated the Project will benefit from both a cost and environmental perspective by implementing a reuse system.

Reuse water collection and distribution to other non-potable applications (toilet flushing, fire tank refill) have been discounted due to risks associated with compromising the stringent infection control measures within this type of environment.

5.14.1.3 Sewer Drainage

Sewer discharges from the site can be achieved by discharging (via an on-site pump station) to the existing sewer rising main (pressure) in Cudgen Road. The deemed connection point is at the south-western corner of the site, which has adequate capacity to cater for the proposed hospital loads.

Connection is to be achieved via the installation of a gravity sewer drainage system, connecting to a new sewer pump station (inclusive of a 200 kL emergency storage tank). This tank will provide a 24-hour storage volume in case of emergency and shall be located as depicted in **Figure 5.10**.

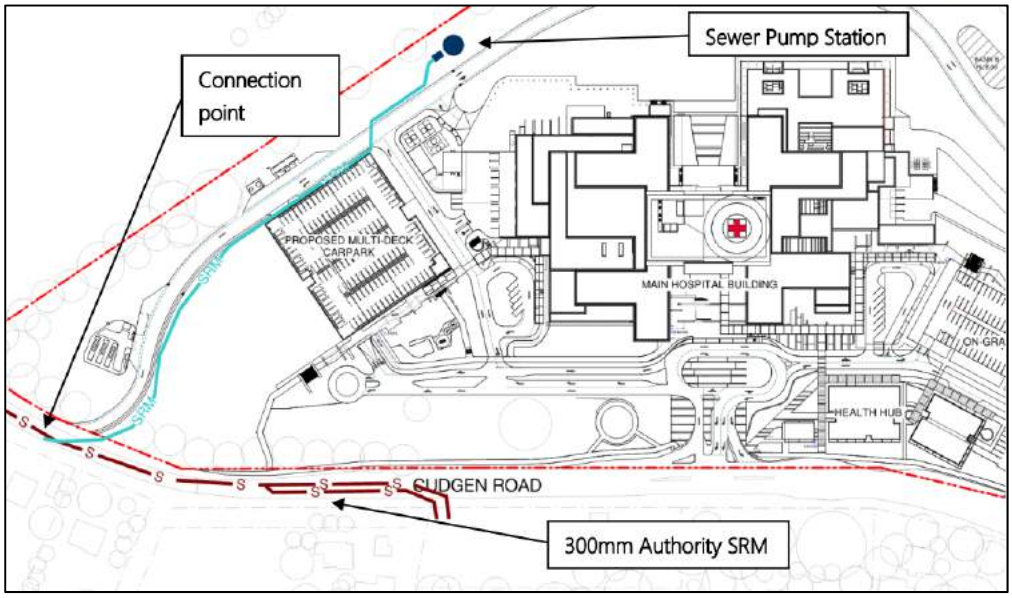


Figure 5.10 Proposed Sewer Connection Point

5.14.1.4 Fixtures and Fittings

5.14.1.5 To reduce the site's potable water demand, water efficient fixtures and fittings shall be used for staff and public amenities areas. Gas Services

There is currently no gas available in the vicinity of the Project Site, and no future planned works to provide natural gas to this area. A bulk underground Liquefied Petroleum Gas (LPG) storage is proposed to be utilised as the primary gas supply for domestic hot water, mechanical heating equipment, commercial cooking equipment and laboratories. The storage is proposed to be located adjacent to the multi-deck car park.

5.14.1.6 Engagement with Council for Water and Sewer Connections

The utilities consultants have engaged with TSC regard connections to water and sewer assets as detailed in **Appendix R**. With regard to connections involving TSC water and sewer assets, HI is in the process of ongoing engagement with Council to obtain an agreed approach for these connections. HI is seeking an exemption to any additional financial contributions over and above the provisions of correction infrastructure and road upgrades as detailed in **Section 5.1.5**.

5.14.2 Electrical and Communications

New electrical and communication infrastructure to allow connection to the local utility services will be required for the Project. LCI has prepared an Infrastructure Master Plan for the Project applicable to electrical and communications (attached at **Appendix R**).

5.14.2.1 Electrical

The estimated maximum electrical load for the campus, including anticipated future developments, is approximately 8 MVA. The electrical supply will be run from Cudgen Zone Substation, along Cudgen Road to an incoming switching station (ISS) within the site. From this point, the hospital will operate as a private high-voltage network, including reticulation to private substations and high-voltage generators. An electrical easement will be required on the site between Cudgen Road and the ISS and around the ISS switchgear, with requirements captured in the Level 3 design. Indicative sizes are:

- Two metre wide easement over electrical cables
- 7 x 4.2 m easement over the ISS.

Essential Energy has advised that:

- electrical capacity is available at Cudgen Zone Substation to service the site
- that existing overhead lines along Cudgen Road have insufficient capacity for the development
- that up to two new, dedicated, in-ground high-voltage feeder cables can be used to supply the site, optionally from separate transformers.

In terms of the incoming electricity supply, to meet Essential Energy and regulatory requirements, detailed design of the incoming supply will be by an Accredited Service Provider (ASP) Level 3 designer. The Level 3 design process includes environmental assessment and stakeholder engagement for this component of the works. To minimise disruption to traffic, it is anticipated that the cable will be installed by trenching and/or directional underbore along the verge of Cudgen Road.

The Infrastructure Master Plan shows the internal electricity infrastructure layout, comprising high and low-voltage underground cables which generally follow the main campus road layout.

5.14.2.2 Standby Electrical Supply

The high voltage network will be backed by standby diesel high-voltage generators, co-located near the ISS toward the south-west corner of the Project Site. These generators will operate in the event of a utility supply outage to provide electricity to critical patient care areas.

Diesel fuel will be stored on site in an AS 1692 compliant, double-walled tank with leak detection. Design development will determine if the tanks are installed above or under-ground, with indicative plans for an underground storage solution provided at this stage, beneath the services lay-by. The design solution will be in accordance with relevant Australian Standards, being:

- An underground fuel storage installation will be in accordance with the AS 4897 – The design, installation and operation of underground petroleum storage systems and Guidelines for implementing the protection of the environment operations (underground petroleum storage systems) regulation.
- An above-ground fuel storage installation will be in accordance with AS 1940 – The storage and handling of flammable and combustible liquids.

Sufficient fuel will be stored for 24 hours of generator operation at full load as per the requirements in the HI Engineering Services Guidelines.

To provide access for refuelling vehicles, the diesel tank and fill point will be accessible by a services truck lay-by, connecting to the internal ring road.

To ensure availability, generators require regular testing and maintenance. The details of the maintenance regime will be determined prior to hospital operations; however it is anticipated the generators will operate for short periods (up to eight hours per month) for testing purposes.

In the event of a power network failure, the generators will operate until the utility network supply can be restored.

5.14.2.3 Communications

In accordance with HI requirements, dual campus distributors will be located within the main hospital building. A separate pathway for incoming communications cabling will provided into each campus distributor, following diverse routes to connect with utility infrastructure on either side of the main entrance.

Cable routes within the campus will be provided to minimise the need for future relocations and so as to not reduce the flexibility of the site.

5.14.3 Road Works and Utility Relocations

The primary civil works in Cudgen Road involve road widening, provision of campus entries (including main access intersection) and bus stop relocations. Services will be located within the works areas by an accredited services locator.

Relocation of existing utility assets along Cudgen Road and at the Tweed Coast Road/Cudgen Road intersection may be required and will be further developed during the detailed design. Any relocation of Essential Energy assets will be captured as part of the Level 3 design.

A number of telecommunications providers have assets along Cudgen Road that will be affected by the road widening and intersection works. Telstra, Optus, AARNet and NBN will be further consulted to determine the preferred mitigation and relocations, if required.

5.14.4 Temporary Works

In consultation with Lendlease (Principal Contractor for Early and Enabling Works), electrical demand during the Stage 2 Works has been estimated at between 1.5 MVA and 2 MVA. Electrical supply will be provided at high-voltage to a temporary kiosk substation and from there reticulated around the site to serve the site office, subcontractor offices, tower cranes, lifts, lighting and construction loads.

Temporary lighting will be provided around the site to ensure a safe and accessible work area.

An application for temporary supply was submitted to Essential Energy on 28 May 2019 and a Design Information Package provided on 4 July 2019.

Essential Energy has advised that their network cannot support the anticipated full load of the construction site. Options for sourcing additional power are currently under investigation and may include the use of suitable noise attenuated diesel generators.

5.15 SEAR 15 – Contributions

This matter has been addressed previously in **Section 5.1.5**.

5.16 SEAR 16 – Drainage

Robert Bird Group (RBG) was engaged to design the Civil Engineering works for the Tweed Valley Hospital, including the preparation of a Stormwater Management Plan. The Stormwater Management Plan is at **Appendix S**, with key drainage and stormwater aspects outlined below.

The Stormwater Management Plan has been prepared to respond to the SEARs and Concept Proposal conditions of consent (including B18 and B31 of Scheduled 2 as applicable) relating to stormwater and drainage. Hydrology (**Appendix S**) and ecological (**Appendix U**) assessments have also been prepared to assess the stormwater management measures and flow regimes in terms of demonstrating no significant impact to the nearby wetlands and receiving environment.

The Stormwater Management Plan:

- Details drainage associated with the proposal, including stormwater and drainage infrastructure, in accordance with water quality and quantity targets
- Considered WSUD principles, in conjunction with the design and coordination of rainwater reuse, water supply and wastewater services documented by the services engineer, JHA
- Details measures to minimise operational water quality impacts on surface waters and groundwater, including the receiving environment and Coastal Wetland
- Addresses, relevant policies and guidelines, including TSC DCP and *Guidelines for Development Adjoining Land and Water Managed by DECCW* (OEH, 2013)
- Confirms that the development can comply with acceptable stormwater quantity and quality rates.

The hydrological assessment:

- Has been prepared to assess the hydrology impact of the proposed Tweed Valley Hospital development on the adjacent Coastal Wetland. Refer to **Section 5.16.7** for a summary of the assessment findings.

The ecological assessment:

- A suitability qualified ecologist has reviewed the stormwater management measures and the hydrology assessment with regard to the overall biophysical, hydrological and ecological integrity of the mapped Coastal Wetlands. Refer to **Section 5.16.8** for a summary of the assessment findings.

5.16.1 Flooding

A flood assessment has been carried out for the Project (Tweed Valley Hospital, Flooding and Coastal Hazards Assessment – BMT, October 2018) which concludes that the northern part of the site is within the Tweed River floodplain and is subject to inundation. The outlet pipes from the four proposed bio-detention basins are above the existing 1% AEP flood level (approx. RL 3.5 m AHD). All roads, buildings and other infrastructure will be constructed above the PMF flood level (approx. RL 8 m AHD).

5.16.2 Redundant Agricultural Dam

An existing redundant agricultural dam is situated in the north-west corner of the Project Site, within the mapped Coastal Wetland. The dam consists of an excavated area and an earth bund to retain water for irrigation. The pump station for the dam has been previously decommissioned. Currently, there is an infestation of *salvinia molesta* growing in the dam which is undesirable.

In order to prevent further infestation, it has been recommended that the dam is backfilled so that this corner of the site returns to a more natural state of flow to the wetland to the north (refer to the BMP for details on proposed environmental rehabilitation works). Pending detailed survey of the area, the finished ground levels will be designed to ensure that water no longer ponds on the surface.

5.16.3 Stormwater Drainage Design

The proposed stormwater works address the need to collect stormwater from the new impervious areas of the site, including buildings, roads, car parks and other hard-standings, and discharge treated water at a controlled rate to the existing wetland (receiving water course) to the north of the site.

The key issues addressed in the stormwater design include:

- Collection of stormwater using standard pits and pipes (design in accordance with the TSC Development Design Specification D5 – Stormwater Drainage Design).
- Detention of stormwater to ensure that the post development discharge rate does not exceed the pre-development rate in the 100-year and 5-year ARI storms (in accordance with the requirements of the *Guidelines for Development Adjoining Land managed by the Office of Environment and Heritage*). This will be achieved by converting existing sediment basins along the northern part of the site to bio-detention basins. In their response to the Concept Proposal and Stage 1 EIS submission, TSC confirmed that “limiting post-development discharge to pre-development levels would be appropriate”.
- Treatment of stormwater runoff, to ensure no increase in nutrient flows from the pre-existing state and to achieve the pollutant reduction targets as described in the TSC Development Design Specification D7 – Stormwater Quality. This will be achieved by using a standard treatment train approach, utilising grass swales, buffers and pit filter baskets in conjunction with the proposed bio-detention basins.
- Landscape planting areas and bio-detention basins will not have impermeable liners to maximise opportunities for infiltration to ground water.

The stormwater design has been carried out in accordance with the relevant local, state and national design guidelines (where not over-ridden by TSC requirements) and Australian Standard Codes of Practice, including:

- Australian Rainfall and Runoff – A Guide to Flood Estimation, Volumes 1 and 2 (1987, 2016) – The Institution of Engineers, Australia.
- AS/NZS 3500.3 (2015) National Plumbing and Drainage Part 3: Stormwater Drainage – Acceptable Solutions.
- Managing Urban Stormwater – Soils and Construction Volume 1 (4th Edition, March 2004) – NSW Department of Housing.
- Queensland Urban Drainage Manual (3rd Edition, October 2013)
- Guidelines for Development Adjoining Land Managed by the Office of Environment and Heritage
- Tweed Shire Council Development Design Specifications (D5 Stormwater Drainage Design; and D7 Stormwater Quality).

5.16.4 Stormwater Model and Results

The stormwater runoff produced within the site will be captured and conveyed within a pit and pipe system to mitigate against site inundation. To analyse this system a 12D model has been produced to calculate the hydrology and hydraulics of the stormwater network. It is also proposed that the pit and pipe system will discharge the stormwater runoff into four bio-detention basins, to allow for a controlled discharge. The computer software DRAINS has been used to analyse the preliminary basin design. The preliminary DRAINS model confirms that there is no increase in the total site discharge rate in the five-year and 100-year ARI storm events. The DRAINS results have been provided in the Stormwater Management Plan (**Appendix S**) and summarised in the table below.

Table 5.15 Summary DRAINS Basin Summary – Peak Discharge (RBG 2019)

Basin	*Catchment Area (% Impervious)*	*Min Detention Volume*	*Peak Discharge 5-year ARI*	*Peak Discharge 100-year ARI*
A	73,500 m^2 (45%)	5,450 m^3	1.500 m^3/s	1.690 m^3/s
B	3,000 m^2 (70%)	455 m^3	0.176 m^3/s	0.187 m^3/s
C	14,400 m^2 (80%)	1,080 m^3	0.417 m^3/s	0.475 m^3/s
D	34,100 m^2 (30%)	2,080 m^3	1.030 m^3/s	1.220 m^3/s
Bypass	10,900 m^2 (5%)	N/A	0.650 m^3/s	0.826 m^3/s
TOTAL	135,900 m^2	9,065 m^3	3.773 m^3/s	4.398 m^3/s
Pre-Development	118,700 m^2	N/A	4.3 m^3/s	5.440 m^3/s

The Stormwater Management Plan also confirms that the existing sediment basins can be adapted as bio-detention basins for the Project and that the existing size will be suitable following infill of the spillways.

5.16.5 Water Sensitive Urban Design (WSUD)

Stormwater quality modelling has been undertaken for the site to quantify the WSUD measures required to meet the development controls. Water quality control will be achieved through converting the four existing sediment basins to bio-detention basins in combination with the use of proprietary pit filter baskets (Enviropods or similar) to be provided in all stormwater pits.

The treatment aspect of the bio-detention is provided by vegetated soil media filters, which treat stormwater by allowing it to pond on the vegetated surface and slowly infiltrate downwards through the soil media. Treated water is collected via subsoil perforated pipes before being discharged to downstream waterways. They are effective in reducing the concentration of suspended solids (TSS), phosphorus (TP) and especially nitrogen (TN) via nutrient uptake and denitrification.

The filtration will be provided by three sub-surface layers as detailed in the Stormwater Management Plan (i.e. Filtration Layer; Transition Layer; Drainage Layer).

Water quality treatment devices would be regularly maintained.

5.16.6 Stormwater Quality

The stormwater quality outcomes have been modelled using MUSIC Version 6.2.1 software. For the purposes of this analysis, only those parts of the site which are directly affected by the development have been included in the model. Areas to the north of the proposed internal roads which will remain in their natural state and are outside of the works extents have not been included in the model.

The pollutant parameters chosen for use within this development are in accordance with Water by Design Music Modelling Guidelines November 2018 Consultation Draft. For the post development analysis the parameters chosen are in accordance with commercial developments.

The results of MUSIC modelling demonstrate compliance with the WSUD objectives and that the pollutant removal rate achieves the reduction targets. The results from the MUSIC model are shown below in **Table 5.16**.

Table 5.16 Stormwater Water Quality Outcomes from MUSIC Model (RBG 2019)

	Pre-development Annual Load	*Post-development Annual Load (Untreated)*	*Post-development Annual Load (Treated)*	*Percentage (%) Reduction*	*TSC Target*
Total Flow	78.7	136	134	1.7	N/A
Total Suspended Solids (TSS)	29,900	32,200	5,580	82.7	80%
Total Phosphorus (TP)	31,500	71.6	21.3	70.3	60%
Total Nitrogen (TN)	183	429	201	53.2	45%
Gross Pollutants (GP)	415	2100	0.054	100	90%

The stormwater management strategy demonstrates compliance with all the requirements of relevant plans and guidelines including the TSC DCP - including Tweed Urban Stormwater Quality Management Plan (2016), Landcom Managing Urban Stormwater: Soils and Construction, NSW Floodplain Development Manual (2005), and Guidelines for Development Adjoining Land and Water Managed by DECCW (OEH, 2013).

5.16.7 Hydrology Assessment

SMEC has prepared a report (refer **Appendix S**) to assess the hydrology impact of the proposed Tweed Valley Hospital development on the adjacent Coastal Wetland. The assessment undertakes a review of the Robert Bird Group Stormwater Management Plan which is also included in **Appendix S**. The SMEC report also reviewed the water quality (MUSIC) and water quantity (DRAINS) models for suitability and then used them to assess discharges into the Coastal Wetland.

The key findings of the hydrology assessment are as follows:

- The proposed RBG stormwater management reduces 1% AEP (100-year Average Recurrence Interval) peak flows from the development to below existing levels for the whole of site, and with minor basin modification, the 20% AEP for all basins. This reduction of peak one per cent and 20 per cent peak flows to below existing levels is a design requirement

- During frequent rain events (more frequent than the 20% AEP) the developed stormwater discharge is above existing levels
- Stormwater management for the site incorporates rainwater tanks and re-use of rainwater for irrigation
- The mean total annual flow volume from the site as increasing by just over 50 per cent from pre-development to post development. The reason for the large increase is that the development has a significant area that has become impervious (roofs, car parks, roads, paths) compared to the original agricultural land that readily allowed infiltration. The higher annual flow volumes can be mitigated by removing the proposed bio-basin lining and providing additional infiltration downstream of the basins, noting that the location is directly adjacent to the wetland and infiltration to groundwater would quickly connect to the basin. The groundwater in the existing condition is connected to the wetland and therefore adding infiltration provides limited practical benefit
- The impact of increased and more frequent flows on the wetland is assessed as minimal, however it is recommended that staging the basin outlets to reduce peak discharges during more frequent events than the 1% and 5% AEP design events be considered
- Infilling of the existing dam was assessed for a range of flood events and found to have no material impact on wetland flood levels, except a minor local affect for the frequent 4EY (four exceedance per year on average), due to the runoff filling in the local depressions

The SMEC report also assessed the ecological impacts of the proposal on the adjacent wetland including impacts on the:

- Swamp sclerophyll forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions EEC
- Lowland rainforest on floodplain in the NSW North Coast Bioregion EEC
- The Mitchell's rainforest snail *Thersites mitchellae* and
- Two pH dependent amphibians (Wallum froglet *Crinia tinnula* and Olongburra frog *Litoria olongburensis*)

The SMEC report concluded that:

- The ecological impact from development outflows and more frequent wetting events has been assessed as having minimal impact, with the change in flood level being very small (<50 mm), especially when compared to existing frequent flood inundation from Tweed River
- The increase in frequent flows and improved water quality through reduction of sediment load and nutrients will have no detriment and may be of ecological benefit to the wetland species.

5.16.8 Ecological Assessment

Greencap also undertook an ecological assessment of the hydrological and stormwater runoff impacts from the Proposal on the ecological receptors within the mapped Coastal Wetlands within the site and the adjoining lands (refer **Appendix U**). The report identifies that a range of mitigation measures have been identified in the Stage 2 Biodiversity Management Plan (**Appendix U**) and in the Stormwater Management Plan (**Appendix S**). The Greencap report concluded that, as a result of the application of the identified mitigation measures for stormwater runoff quality, the residual risk of adverse impact of any changes to stormwater runoff quality associated with the development on biophysical and ecological integrity of the EECs and threatened species is very low.

5.17 SEAR 17 – Flooding

A key consideration in selecting the site for the Tweed Valley Hospital was that it was strategically located above the probable maximum flood (PMF) level.

A Flooding and Coastal Hazard Assessment was undertaken by BMT and lodged with the Concept Proposal and Stage 1 Works EIS. It determined that the site presents a minimal flood risk, with the majority of the Project Site including the main development area (for roads, buildings and infrastructure) and access being above the Regional Tweed River PMF level (as depicted in **Figure 5.11** and **Appendix B**). This finding remains consistent with the Stage 2 design and development footprint. As such the Project would occur without any loss of floodplain storage for any flood event. The Project Site is also not subject to, nor in the vicinity of coastal hazards.

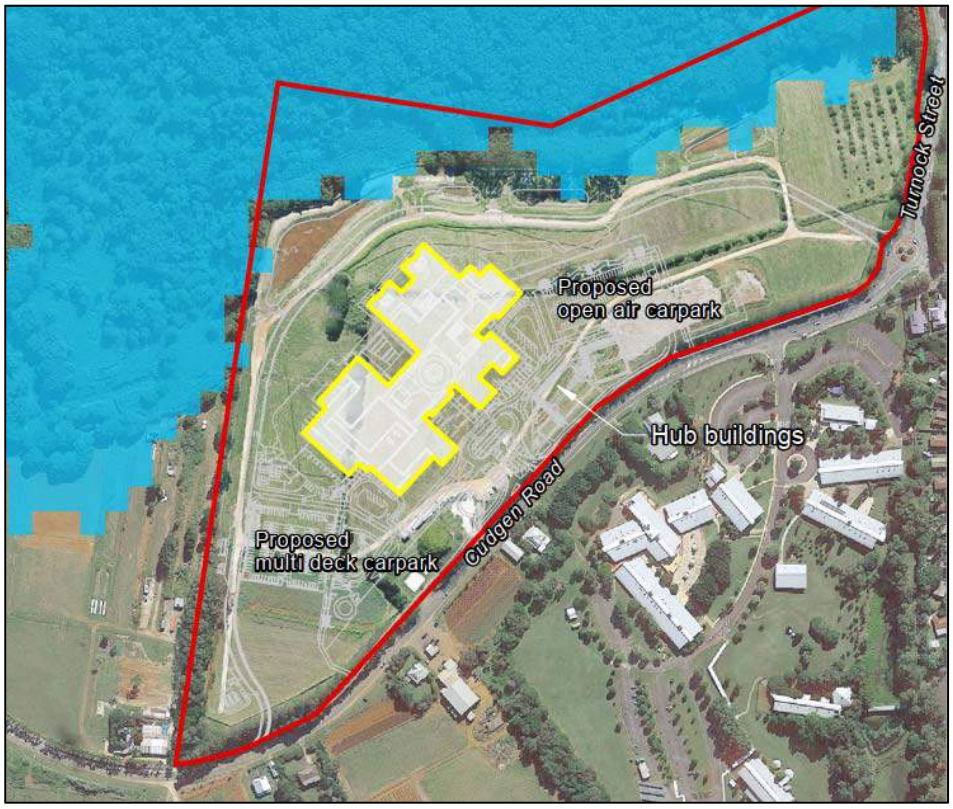


Figure 5.11 PMF Flood Level (light blue)

Additionally, on-site stormwater management infrastructure will be provided as part of the Project to manage peak flow impacts thereby addressing potential local catchment flooding impacts (refer to **Section 5.16** for further detail on stormwater management). The outlet pipes from the four proposed bio-detention basins are suitably above the existing 1% AEP flood level (approx. RL 3.5 m AHD).

On the basis of the assessment undertaken and that the main development footprint and critical infrastructure is above relevant flood levels, there are no planning, legislative or practical impediments to developing the Tweed Valley Hospital on the site from the perspective of achieving suitable flood immunity and addressing the key objectives of TSC for flood planning, floodplain risk management and broader agency requirements for emergency management.

In accordance with SSD 9575 Condition B31(a) of Schedule 2, an Emergency (Operational) Flood Evacuation Plan for the users of the facility and in case of a major flood event in the region, has been prepared and included at **Appendix BB**. An Emergency Flood Evacuation Plan would be implemented as part of the hospital's operational practices.

5.18 SEAR 18 – Bushfire Hazard

A Bushfire Hazard Assessment has been prepared by GeoLINK. The report is at **Appendix T**, with the findings summarised below.

The proposed development is located on or adjacent to land mapped by TSC as being bush fire prone. This triggers formal assessment against the provisions of Planning for Bush Fire Protection (PBP) 2006 and/or PBP Pre-release 2018. The proposed development is regarded as 'special fire protection purposes' (SFPP) and is SSD. SSD is exempt from requiring a Bush Fire Safety Authority (BSA) and is not required to be assessed under Section 4.14 of the EP&A Act.

The Bush Fire Hazard Assessment has been prepared in accordance with PBP 2006, Addendum 3 to PBP and PBP Pre-release 2018. RFS were also consulted as part of this assessment process. A site inspection was undertaken on 6 June 2019. Coastal Swamp Forest is located to the north and north-west of the Project Site which is regarded as the dominant bush fire hazard vegetation. Areas to the north are separated by a service road, landscaped gardens and Asset Protection Zone (APZ).

Based on the detailed assessment undertaken, it is recommended that the following conditions be included in the consent for approval:

- The proposed hospital building shall be built to BAL-12.5
- The proposed hospital building shall include a minimum APZ complying with Condition B19 of SSD9575 as marked in the approved plans and generally ,divided into a 47 m inner protection area (IPA) and 20 m outer protection area (OPA)
- Landscaping is to be in accordance with Appendix 4 of PBP Pre-release 2018
- Access provisions are to comply with Table 6.4b of PBP Pre-release 2018
- Water, electricity and gas supply services are to comply with Table 6.4c of PBP Pre-release 2018
- An Emergency and Evacuation Management Plan be prepared for the proposal.

As detailed in **Appendix T** and with regard to the provision of a suitable APZ, it is noted that the APZ that was mapped as part of Concept Proposal and Stage 1 of the proposed Tweed Valley Hospital was determined to ensure that the proposed building could be appropriately positioned within the Project Site. The approved APZ for Concept Proposal and Stage 1 therefore extended from the identified existing hazard vegetation towards the proposed building rather than from the building towards the hazard (refer to **Figure 5.12** for approved APZ offset line). Detailed design has since been completed and the APZ for Stage 2 therefore extends from the building towards the hazard. The proposal conforms with the Concept Proposal and Stage 1 (SSD 9575) conditions and stamped approved APZ plan. The APZ arrangement that satisfies the SSD 9575 (Concept Proposal and Stage 1) consent and PBP is depicted in **Figure 5.12**.

This Bushfire Hazard Assessment has taken into consideration the proposed Tweed Valley Hospital, which is identified as SFPP, landscaping, vegetation, effective slope and fire danger index (FDI) detailed within PBP Pre-release 2018. Adequate and appropriate bush fire hazard protection measures are available and can be implemented to facilitate the proposed hospital on 771 Cudgen Road, Cudgen, NSW (Lot 11 DP 1246853).

This Bushfire Hazard Assessment has determined that the proposal generally conforms to the standards and specific objectives set out in PBP 2006/PBP Pre-release 2018 and complies with relevant provisions of the EP&A Act. Condition of consent (SSD 9575) Schedule 2 B19 of the Concept Proposal and Stage 1 approval is also satisfied.

Figure 5.12 Asset Protection Zone

5.19 SEAR 19 – Biodiversity

Greencap Pty Ltd (Greencap) has prepared an updated Biodiversity Development Assessment Report (BDAR) for Stage 2 in accordance with the *Biodiversity Assessment Method Order 2017* (Office of Environment and Heritage [OEH], 2017) (BAM), and to address more broadly the requirements in the *Biodiversity Conservation Act 2016* (NSW) (BC Act). A Biodiversity Management Plan (BMP) has also been prepared in accordance with recommendations of the BDAR and SSD 9575 conditions of consent. These have been prepared in consultation with OEH.

The BDAR addresses the impacts of the Stage 2 SSD application. It is a revision of the endorsed Stage 1 BDAR (prepared by Greencap). It has been updated to include the detailed design plans and an assessment of any potential additional biodiversity impacts for the Project, including additional ecological and hydrological considerations in relation to stormwater management and the receiving environment.

The majority of the Project Site is cleared and disturbed, meaning only minor vegetation removal was required as part of Stage 1 Works. No further vegetation removal is proposed as part of Stage 2. The BDAR revision for Stage 2 has not removed information pertaining specifically to Stage 1 Works (e.g. vegetation clearing) in order to demonstrate consistency with the endorsed Stage 1 BDAR and the Matters of National Environmental Significance (MNES) report (Greencap 2019b) as per SSD 9575 Conditions Schedule 2 B20. An Arboricultural report (attached at **Appendix DD**) was also prepared for Stage 1 and the identified retained tree protection measures would continue to be applied during Stage 2 Main Works, as required.

The key findings of the updated BDAR are provided below (inclusive of matters applicable to the approved Stage 1 Works and previously endorsed BDAR), with the full report attached at **Appendix U**.

In accordance with the BAM, the Project has been located in order to avoid and minimise impacts upon biodiversity.

The updated BDAR includes an assessment of prescribed impacts, with a particular focus on any prescribed impact on water quality, water bodies and hydrological processes that sustain threatened species and threatened ecological communities. The detailed description and implementation of the measures identified in this BDAR are given in the Stage 1 and Stage 2 BMPs (refer to **Appendix U**), which comprise of three sub-plans: Vegetation Management Plan (VMP), Fauna Management Plan (FMP), and Water Quality Management Plan (WQMP).

Water impacts will be managed during both the construction and operation stages. Construction activities will be conducted in accordance with an approved CEMP. During construction the existing on-site sediment basins will minimise the impact of any change in water quality (as described in **Section 5.20**), and these will be converted to bio-detention basins to form part of the operational stormwater management. During operations, an integrated stormwater management system will convey stormwater runoff from buildings and associated infrastructure, roads, car parks and landscape areas to a treatment train and the bio-detention basins as described in **Section 5.16**. Additionally, the existing farm dam located at the north-west of the Site will be filled to return that part of the catchment to a more natural flow regime. On this basis, it is expected that operation of the Project will result in a net improvement in the quality of stormwater that is discharged from the Site and that the impact of the development on water quality, water bodies and hydrological process that sustain threatened species and threatened ecological communities is, on balance, a positive impact.

On this basis, the potential residual prescribed impact of the Project is considered to be negligible. Recommendations for adaptive management have been identified.

As described in the BDAR, a total of three ecosystem credits and 14 species credits were generated as a result of the Stage 1 works by the BAM calculator.

A decrease in vegetation integrity (VI) score for the 0.55 ha portion of Zone 4 and 0.40 ha portion of Zone 8 is due to the approved Stage 1 clearing of native vegetation within these vegetation zones. However, the current VI score for Zone 4 falls below the assessment threshold for Endangered Ecological Communities (i.e. VI ≥ 15), therefore in accordance with the BAM, no further assessment was required for these vegetation zones and it does not require offsetting.

The current VI score for Zone 8 exceeds the assessment threshold for Endangered Ecological Communities (i.e. VI ≥ 15) and requires offsetting (as attributable to Stage 1).

Fourteen threatened species credits were generated by the calculator based on assumed presence (i.e. powerful owl *Ninox strenua* and three-toed Snake-tooth Skink *Coeranoscincus reticulatus*). Two threatened species credits were generated from confirming presence through a survey (i.e. stinking Cryptocarya *Cryptocarya foetida*).

The Project has the potential to cause some prescribed impacts, however, mitigation measures including adaptive management strategies will reduce the likelihood and consequence of any residual impacts to low levels that do require an offset.

5.19.1 Summary of Recommendations

The Project will monitor and manage potential impacts which have been outlined in the Stage 1 and Stage 2 BMPs and sub-plans (VMP, FMP, WQMP), with reference to other documents including the CEMP, Stormwater Management Plan, and Erosion and Sediment Control Plan.

The BMPs include adaptive management for impacts on biodiversity that are uncertain in accordance with Section 9.4.2 of the BAM and include details of measures to monitor predicted impacts, guidelines and thresholds which will trigger adaptive management actions and other measures proposed to mitigate potential impacts.

The BMP will also address proposed measures that will contribute to the recovery of the Mitchell's rainforest snail *Thersites mitchellae* that are consistent with the published recovery plan (NPWS 2011). Revegetation of the exotic grassland in Zone 9 (0.95 ha) to rainforest will increase the area of potential habitat available to the snail and has been outlined in the VMP and FMP.

A range of vegetation management activities will be implemented on the Project Site in accordance with the BMP, including:

- Weed control (biosecurity risk)
- Native vegetation protection measures
- Regeneration (i.e. assisted regeneration that includes supplementary planting)
- Revegetation
- Maintenance
- Monitoring and reporting.

Overall, Stage 2 of the Project (Main Works and Operation) would not present a significant impact or risk to biodiversity, threatened species or sensitive receiving environments (e.g. the adjacent mapped Coastal Wetland) and the development is acceptable from an ecological perspective. Implementation of the BMP would enhance the environment and ensure appropriate protection and management of biodiversity values. Further detail is provided in the BDAR and BMP at **Appendix U**.

5.20 SEAR 20 – Soils, Sediment, Erosion and Dust Control

5.20.1 Erosion and Sediment Control

Erosion associated with the proposed works may pose a risk to the receiving environment if appropriate measures are not implemented. It is unlikely that the construction works will impact on the hydrology or flooding characteristics of the area given the lack of waterways on-site and that the main development/works area is not flood prone.

The quality of stormwater discharge from the site during the construction stage will be managed using erosion and sediment control and surface water management measures in accordance with the Landcom guidelines – *Managing Urban Stormwater Runoff: Soils and Construction* ("Blue Book") and *Tweed Shire Council Development Design Specification D7 – Stormwater Quality*.

During the initial construction stages, and until the excavation and fill surfaces have been surfaced or revegetated, the primary sediment control measure will be the use of the existing sediment basins. A series of bunds and swales will be used to ensure that runoff from the majority of the earthworks areas are directed to the four existing basins at the northern side of the site. The basins have been sized using the methodology described in the Landcom guideline for a five-day storm duration.

The sediment basins function by providing a large, standing body of water such that stormwater runoff entering the basins, which is laden with sediments, has a chance to settle to the base of the basin before it is discharged by pumping into the receiving watercourse. A flocculant (chosen for its suitably with regard to minimising potential impacts on receiving sensitive environments) will be used to dose the water to accelerate the naturally slow settlement rate of the natural soils. Water captured in the basins will be tested for pH and TSS (Total Suspended Solids) prior to pump out. Each basin will be dosed with flocculent per rain event and the sediment will typically settle and water quality will be confirmed by site specific testing prior to being pumped out within five days from the conclusion of a rainfall event. Sediment fences will be used to treat any water which overflows from the basins, however, in the event of an uncontrolled discharge, a monitoring event will be triggered to assess potential impacts resulting from surface water discharges on the receiving environment.

Any runoff from areas or earthworks which cannot be directed to the sediment basins will be treated by means of grass buffer strips and sediment fences.

A Construction Sediment and Erosion Control Management Plan has been prepared (**Appendix S** and **Z**) that details the specific strategies and measures that would be implemented during works to effectively minimise and manage runoff, sedimentation and erosion.

With effective implementation and management of controls, erosion and sedimentation risks can be minimised and do not pose a significant threat to the environment.

5.20.2 Air Quality

The following section addresses air quality and dust related impacts due to construction activity.

Existing air quality in the locality is considered to be good.

Emissions to the atmosphere during construction are typically divided into two categories:

- Dust and particulates (general works)
- Gaseous (vehicle and plant emissions).

Dust has the potential to be generated during construction activity. The total amount of dust generated depends on the silt and moisture content of the soil and the type of activities being carried out.

Emissions, such as those generated by vehicle exhausts are not considered to present a significant risk to the environment and community and would be of a short duration associated with the construction period. However, all vehicles, plant and equipment will be maintained to comply with the manufacturer's specifications, along with relevant standards and legislative requirements.

Potential impacts attributable to construction might include:

- Potential adverse health effects including eye, nose and throat irritation from excessive inhalation of fine particles
- Deposition of dust on surfaces
- Aesthetic effects that arise from visible airborne dust and from deposits of dust on surfaces
- Need for increased maintenance of air filtering systems (e.g. air conditioners etc)
- Impacts on water quality and/or vegetation health from dust deposition
- Impacts on residential sensitive receivers
- Complaints from the public relating to dust or odour
- Dust deposition impacts on threatened flora species or habitat for threatened fauna species
- Dust deposition impacts on sensitive agricultural receivers
- Dust contamination of water tanks.

5.20.2.1 Air Quality Management

The CEMP prepared by Lendlease addresses air quality and dust management and is supported by accompanying subplans, including a Construction Air Quality and Dust Management (CAQDM) subplan (refer to **Appendix Z**).

Objectives for the Project are to implement appropriate controls to suppress dust and other suspended particles in accordance with legislation and risk management requirements minimising the generation of dust on the site and potential emission issues relating to plant and equipment.

The strategy for air quality management (to be part of the CAQDM) would include consideration of, but is not limited to the following:

- Clear definition of trafficable and material storage areas to prevent unnecessary vehicle movement into other areas
- Use of watercart/trucks to dampen work areas and exposed soils to prevent the emission of excessive dust
- Installation of a wheel shaker grid and/or wash down facilities at the vehicle egress point
- Ensuring trucks transporting materials to and from the site use covers to prevent wind-blown dust or spillage
- Ensuring truck tailgate locking mechanisms are operational and in use
- Periodic inspection of surrounding roads to ensure no construction contamination and initiation of road sweeping if required
- Careful selection of materials for temporary road surfacing
- Temporary stockpiles that are not required for imminent use will be stabilised with spray grass or appropriate fabric
- Continuous monitoring of weather forecast to stop dust generating activities in case that high winds are expected
- Before extended breaks (e.g., Easter, Christmas), areas will be treated with spray grass

- Notwithstanding Stage 1 Works, only those areas where immediate structures are to be built will be stripped. Areas will be stripped at the latest possible date to comply with the program
- Construction haul roads and temporary car parking will maximise the use of permanent infrastructure. These roads/car parks will have a sacrificial seal to minimise dust generation
- Aspergillus control during construction works within existing buildings
- Subcontractors to maintain equipment/machinery to ensure exhaust emissions comply with relevant legislation and guidelines
- All waste material to be sorted, collected and removed from site (for recycling where possible)
- Air quality monitoring
- Dust screens and airlocks to be utilised with interior works
- Provide construction filters to air intake vents
- Controlling dust close to its source by installing sprays and sprinkler systems to prevent off-site migration
- Maintaining the site access to prevent dust generation and tracking off-site
- No blasting will be performed as part of the proposed construction works program.

Site inspections, monitoring and reporting will be undertaken as detailed in the EHS Plan and implementation framework identified in the CAQDM Subplan to ensure controls remain effective overtime.

With implementation of the CAQDM Subplan, dust generation can be effectively controlled, and the risk minimised.

5.20.3 Geotechnical

The following geotechnical reports (prepared by Morrison Geotechnic) are available for reference for the Project (the most recent is included at **Appendix P**):

- Preliminary Geotechnical Investigation, Proposed Tweed Valley Hospital Ref: GE18/144-Rev2
- Additional Geotechnical Investigation, Proposed Tweed Valley Hospital Ref: GE18/144.

The geotechnical investigations determined that the there are no significant geotechnical constraints for the Project and provide discussion and various recommendations in regard to:

- Description of subsurface materials
- Groundwater conditions including levels
- Site classification
- Earthworks
- Trafficability of subsoil material
- Retaining wall and batter design
- Footings and foundations
- Pavements
- Slope stability
- Soil permeability
- Re-use of material.

The geotechnical reports indicate that the Project Site is considered satisfactory for development in relation to slope stability, and the Landslide Risk posed to the property can be maintained to a level of “Low” or better for the long-term (at least 70 years) if the recommendations outlined in the assessment are followed and implemented, which is a tolerable level of risk.

With regard to SSD 9575 Condition B29 of Schedule 2, measures to control impacts on adjoining properties due to vibration during construction have been addressed as part of the Noise and Vibration Impact Assessment (refer to **Section 5.12** and **Appendix O**).

5.20.4 Acid Sulfate Soils

The site is mapped as having potential Acid Sulfate Soils (ASS) Classes 2, 3 and 5; however, the main development area within the Project Site is within the Class 5 category. ASS are not typically found in Class 5 areas as they usually occur below five metres AHD and beneath the water table.

Levels within the main development area indicate that the development and associated works will occur well above RL5.0 m AHD. Based on the subsurface geology of the site and depth to groundwater in the area of the proposed development, the development would not trigger the class 5 provisions and therefore an ASS management plan or investigation is not required. Slimily there would be no expected disturbance of ASS associated with the Tweed Coast Road/Cudgen Road intersection works (also mapped Class 5).

ASS risk mapping shows that the northern tip of the Project Site is classified as high risk (one to two metres), and the remainder of the forested area on the Project Site as high risk (two to four metres) (refer to BDAR at **Appendix U** for mapping). The northern tip of the Project Site in the forested area is a Class 2 area, with ASS soils likely to be found below the surface. While environmental rehabilitation work, including filling of the redundant farm dam would occur in such areas, the method involves filling and therefore no ASS disturbance is likely.

An ASS management plan is not required, and ASS are not expected to be encountered, given the above factors. Standard construction management measures for any unexpected or potential encounters with ASS would be implemented as required.

5.20.5 Soil Salinity

Based on laboratory analysis of five soil samples obtained from depths of between 0.15 m and one metre below the ground surfaces as part of contaminated land investigation undertaken on the site by OCTIEF, soil conductivity ranged between 14 and 61 µS/cm (0.014 and 0.061 dS/m). The BDAR (**Appendix U**) outlines that based on soil salinity criteria, the salinity rating for soil on the Project Site would fall into the “very low” category.

The soil salinity results from the contaminated land investigations undertaken for the Concept Proposal and Stage 1 EIS infer that soil salinity risks to ecological receptors associated with the proposed development are likely to be low. With respect to potential impacts due to soil-derived saline run-off to the wetlands, the risks are expected to be further reduced through the use of appropriate erosion and sediment control measures during construction. Additionally, under the previous conditions of the Project Site, a proportion of run-off entered the wetlands, further reducing the likelihood of increases in salinity in run-off from during construction and operational phases of the development.

5.21 SEAR 21 – Aviation

AviPro was engaged to assess Stage 2 of the Project with regards to protected airspace, vertical obstructions and helicopter movements (refer to **Appendix V** for full report).

The Project is located marginally within the Gold Coast Airport (GCA) (air traffic) Control Zone (CTR) and is therefore considered to be within 'prescribed airspace'. The CTR encompasses airspace from ground level up to 1500 feet (457 m) above mean sea level out to a distance of seven nautical miles (13 km). Structures up to a height of 500 feet (153 m) are permitted in the vicinity of Kingscliff/Cudgen as a matter of course (provided they are appropriately marked/lit as necessary) without impacting flight safety.

The assessment determined the positioning and proposed vertical development of the hospital at 771 Cudgen Road, Cudgen will not incur any negative air traffic or protected airspace factors or considerations (notwithstanding approval must still be sought). There are no constraints imposed by prescribed airspace associated with airports or airport instrument approach and standard departure profiles. As a consequence, the development of the hospital, and in particular vertical obstructions such as cranes, can be addressed from a "safety to flight" requirement for helicopters approaching to, operating from, the Tweed Valley Hospital Helicopter Landing Surface (HLS).

The TVH is sufficiently distant from GCA such that arriving and departing aircraft will not realise any traffic confliction with helicopters operating to and from the Tweed Valley Hospital HLS. Being within controlled airspace, Air Traffic Control would manage any traffic separation requirements. Protection of prescribed airspace will not be compromised either during the construction phase (e.g. crane erection) or in operation.

The Aviation assessment also considers the HLS and planned/preferred flight paths for medical helicopters. Primary considerations in selection of HLS approach and departure paths included:

- Direction of prevailing winds
- Availability of emergency landing areas
- Location of vertical structures and obstacles/hazards
- Airspace restrictions and limitations
- Avoidance of areas sensitive to noise and vibration
- Avoidance of ecologically and environmentally sensitive areas.

The siting and design of the rooftop HLS at the Tweed Valley Hospital, and its associated approach and departure paths (shown at **Figure 5.13**), has resulted in an acceptable outcome. To the best of the HLS designer's ability, the impact on receivers such as communities, residential buildings and educational establishments (TAFE and schools) has been minimised, cognisant of the fact that the primary determinant in good HLS design is safety. To the maximum extent possible, overflight of built-up and other sensitive areas is avoided whilst conforming with the most likely wind directions expected in the area and associated landing requirements. Refer to **Appendix V** for details.

The report also indicates that an elevated (rooftop) HLS will have a positive effect in reducing noise and vibration to the surrounding environment as compared to an on-grade HLS. This arrangement has also been considered in the design of the hospital to adequately minimise the transfer of noise and vibration into the structure and maintain internal acoustic amenity (this will also be addressed further in detailed design as referenced in the Noise and Vibration Report at **Appendix O**).

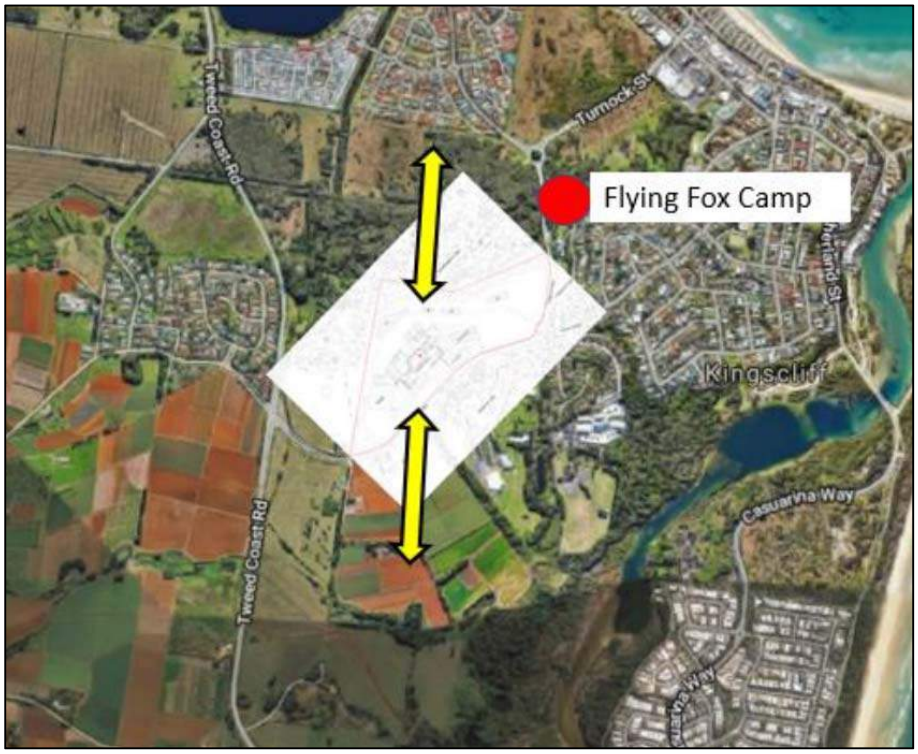


Figure 5.13 Indicative flight path to/from HLS at Tweed Valley Hospital (AviPro 2019)

It is noted however that complete avoidance of acoustic impacts on local residential and rural communities is impractical and cannot be guaranteed, and it will not be possible to avoid some noise impact to the houses immediately to the south of the hospital when helicopters are operating to or from that direction, and similarly to housing estates located further north of the site.

However as outlined in the Concept Proposal and Stage 1 EIS, the Tweed Valley Hospital is not proposed to be a major trauma facility. Anticipated helicopter movements are expected to be relatively infrequent, estimated to be less than ten a month, with a typical expected average of six. Furthermore, a typical helicopter "noise" event is of short duration (involving approach, landing, take-off, and departure), estimated to last a total of approximately six minutes. This, combined with the HLS design and flight paths, achieves an acceptable outcome, minimising impacts as far practical.

A known flying fox camp to the north-east of the Project Site will be avoided to the maximum extent possible in aviation approach and departure planning, noting that the flying foxes have a typical nightly flying range and camps are located across the Tweed-Byron region and are a recognised hazard for pilots. As outlined in a media release dated 8 January 2019, HI understands the potential strike risk between flying foxes and aircraft in flight is a hazard for aviation traffic across the Tweed Valley Region. This includes the Gold Coast Airport and also the current Tweed Hospital. Studies undertaken by expert consultants to inform the EIS for the Tweed Valley Hospital Project reviewed the proximity of flying fox camps to the site, taking into consideration also the Council's Management Plan. These assessments did not identify any significant aviation or ecological risks specific to the new hospital site posed by the local flying fox population. The aviation and biodiversity reports at **Appendix V** and **U** provide further detail.

Nearer to HLS commissioning, helicopter operators will be apprised of the exact location of the flying fox camp and procedures will be developed in consultation to provide maximum clearance on each occasion a helicopter approaches or departs the hospital.

In summary:

- The aviation report addresses all of the necessary HLS design guidelines required by the NSW Government and the HLS, including the approach and departure paths, will be compliant with NSW Health Policy GL2018_010 Guidelines for NSW Hospital HLS (and therefore by default compliant with CASA CAAP 92-2(2)).
- Noise and vibration impact on sensitive land uses has been minimised to the maximum extent that safety allows.
- Approach and departure path alignment has minimised the potential for impact on biodiversity values (including the potential for helicopter collision with grey-headed flying foxes) to the maximum extent that safety allows.
- No aviation approach and departure paths into and out of GCA will be impacted.
- No Object Identification Surfaces (formerly Obstacle Limitation Surfaces) for GCA will be penetrated.
- Planned approach and departure paths avoid built-up and sensitive areas to the greatest extent possible, whilst conforming with the most likely wind directions and providing pilots with the best available forced landing areas in the event of emergencies requiring immediate landing when on final approach to land or immediately after take-off.

5.22 SEAR 22 – Waste

Waste Management Plans (WMPs) have been prepared to address and manage the potential waste impacts of the construction and operation of the new Tweed Valley Hospital. The WMPs identify the potential types and volumes of waste that are expected to be generated in the construction and operational phases of the proposed development and identifies systems to be implemented to appropriately manage this waste.

Key waste management principles to be implemented during construction and operation include:

- Avoid generation of waste or reduce the volume produced
- Encourage waste reuse and recycling
- Carefully plan storage, segregation and handling of waste
- Dispose of unrecyclable waste in accordance with NSW EPA Waste Classification requirements.

5.22.1 Construction Waste Management

A construction Waste Management Plan (WMP) has been prepared by Lendlease for Stage 2 of the Tweed Valley Hospital and will form part of the CEMP (refer to **Appendix Z**).

The construction WMP provides strategies and measures to minimise, manage and track solid and liquid waste generation. It outlines appropriate measures to ensure that solid and liquid wastes are managed appropriately during site establishment, construction, and commissioning of the Project. The WMP identifies likely waste streams which may include solid construction wastes (e.g. soil, concrete, masonry, steel, timber, packaging and various plastics) and liquid wastes (e.g. washout waste water) produced during construction of the Project. It describes measures to be implemented during relevant construction activities, which enables minimisation and reduction of construction wastes. The WMP is based on the hierarchy of waste avoidance, reuse, recycling, treatment and disposal. Waste is to be managed in a way that ensures reuse and recycling is maximised and the volume of waste transported to landfill is minimised.

Generally, waste will be segregated on site and transported to a recycling facility. Waste that cannot be recycled would be transported to an appropriately licenced facility for disposal.

Further measures to manage construction waste are detailed in the construction WMP include at **Appendix Z.**

5.22.2 Operational Waste Management

An operational WMP has been prepared by TTM for the Tweed Valley Hospital (refer **Appendix W**).

The operational WMP outlines the waste management processes, equipment and construction requirements, and identifies the various waste streams and volumes that are anticipated for the Tweed Valley Hospital. The plan satisfies the requirements set out by the TSC and the NSW Environmental Protection Authority by providing the following information:

- Type and quantity of refuse materials that would be generated during the occupancy of the proposed development
- Refuse collection, storage, transfer and disposal arrangements during occupancy of the completed development
- Recommended operational requirements for the operational phase of the development, and design requirements for the building and refuse management facilities.

The identified refuse streams include:

- General waste
- Food waste
- Cooking waste
- Co-mingled recycling
- Cardboard
- Confidential waste
- Clinical and cytotoxic waste
- Hazardous Waste (paints, batteries and cartridges).

Recommendations for appropriate segregation methods for each refuse stream have also been proposed in the WMP.

The WMP identifies proposed bin and equipment numbers required for the operation of the hospital at full capacity.

All refuse from the hospital will be stored temporarily within the different wards and medical departments in appropriate bins (240 L or 660 L) or medical waste containers. This includes the emergency department where ambulance vehicles arrive.

Refuse from the retail/food and beverage outlets will be stored in bins up to 240 L within the tenancies.

The bins/containers will then be transferred to the bin rooms on the basement level next to the loading dock by staff/cleaners. Medical waste bins may be collected directly from within the building by the medical waste contractors.

Once emptied, bins (used for disposal of refuse within the different medical departments or other areas of the hospital) will be cleaned and stored in a clean bin holding area.

All refuse will be collected via the dirty loading dock on the western side of the facility on the basement level. All refuse from the facility is deemed commercial and will be collected by private waste contractors, including medical waste contractors.

Refuse minimisation strategies and options are also identified in the WMP to ensure operational sustainability of refuse volumes, equipment and economic feasibility.

Full details of operational waste management are provided at **Appendix W**. The provisions outlined in the operational WMP are considered appropriate for the development. Refuse rooms are suitably sized to accommodate the waste generated and number of bins proposed based on standard storage and collection methods. The refuse rooms will also accommodate all options for alternate equipment and disposal methods. Implementation and adherence would ensure effective waste minimisation and management during the life of the hospital.

5.22.3 Hazardous Waste

Hazardous waste will be managed and disposed of as per the Safety Data Sheet requirements and Environmental Protection (Controlled Waste) Regulations 2004. A Hazardous Material Management Plan would form part of the CEMP to ensure appropriate identification and management during construction.

All hazardous waste will be disposed of at approved waste facilities, in accordance with the requirements of the relevant legislation.

NSW Health operates under existing waste disposal guidelines for collection, control, storage and transport of clinical wastes that accord to NSW Health, NSW EPA, Safework NSW, relevant Australian Standards and industry best-practice guidelines.

5.23 SEAR 23 – Construction Hours

Section 3.16 of this EIS states that Stage 2 of the Project would be undertaken during standard construction hours.

5.24 Structural Design

Robert Bird Group have prepared a Structural Design Report for Stage 2 which is attached as **Appendix X**.

The structural design will be developed to ensure the adequate functioning of the building structure consistent with the intended use of the Project as described in the HI Engineering Services Guidelines (published on 26 August 2016), and will address the performance requirements of the structure in terms of strength, serviceability (deflection, vibration) and durability. The structural design and construction of the hospital will be in accordance with relevant Australian Standard Codes of Practice as outlined in the Structural Design Report, including but not limited to:

- Building Code of Australia (BCA)
- Engineering Services Guidelines NSW Health
- AS/NZS 1170.0 (2002) Structural Design Actions - General Principles
- AS/NZS 1170.1 (2011) Structural Design Actions - Permanent, Imposed and Other Actions
- AS/NZS 1170.2 (2011) Structural Design Actions - Loading Code Wind

- AS 1170.4 (2007) Structural Design Actions - Loading Code Earthquakes
- AS 2159 (2009) Piling Code
- AS/NZS 3600 (2018) Concrete Structures
- AS/NZS 3700 (2018) Masonry Code
- AS/NZS 4100 (1998) Steel Structures.

In addition to the standards listed above, all local service authority requirements will be complied with.

5.25 BCA and Accessibility

Blackett Maguire and Goldsmith prepared a National Construction Code (NCC) and Access Assessment for Stage 2 of the Project (refer to **Appendix Y**). It considers the requirements of the Building Code of Australia (BCA) 2019 and Disability (Access to Premises – Buildings) Standards 2010 (DDA). The assessment report:

- Confirms that the referenced SSD application has been reviewed by an appropriately qualitied Accredited Certifier
- Outlines the BCA compliance strategy for the building and certification pathway for the Project
- Identifies any BCA and Accessibility compliance matters that require further resolution (can typically be dealt with in detailed design)
- Identifies any potential matters that are required to be addressed by Performance Solutions prior to issue of a Section 6.28 Crown Certificate
- Enables the certifying authority to satisfy its statutory obligations under Section 6.28 of the EP&A Act
- Identifies the relevant essential fire safety measures that are applicable to the proposed development.

Arising from the assessment, Blackett Maguire and Goldsmith state that they are satisfied that the Project can meet the requirements of the NCC/BCA 2019, with the exception of the revised Section J (energy efficiency) requirements. Given the substantial changes to the Section J requirements in the NCC 2019, all projects are subject to a 1 year transition period from 1 May 2019, during which time, either the NCC 2016 or NCC 2019 requirements may be used. As the Project falls within this transition period, the Project will adopt the NCC 2016 Section J requirements.

The proposed works will be subject to further review as the design progresses. The compliance issues that will necessitate focus during the design development will relate to egress strategies and fire compartmentation.

5.26 Mosquitos and Biting Insects

The northern region of NSW, including Tweed Shire, is known to be affected by mosquitos, sandflies and midges. Furthermore, the Project Site is on land within proximity to Coastal Wetlands and floodplain areas, and the development includes stormwater detention areas on-site. These areas present potential biting insect breeding habitat.

Consistent with SSD 9575 condition of consent Schedule 2 B9(l), the risks associated with mosquitos and biting insects can be minimised through a range of management measures that can be incorporated into the design of the facility, the ongoing maintenance of the facility, and providing the opportunity to adopt personal protection measures.

Due regard has and would be given to the following (in relation to detailed design and operational management), as required:

- Measures for the exclusion of mosquitoes entering hospital buildings
- Minimising mosquito breeding risk in constructed stormwater management systems (e.g. basins would be permeable to minimise standing water)
- Hospital management awareness of any mosquito risks.

Specifically, the Architectural and Urban Design Report at **Appendix C** states that mosquito and biting midge nuisance as defined in TSC DCP has been considered during the design. Consideration has been given to minimise the impacts of these species on the users of the hospital, having regard for recommended propagation mitigation guidelines which are relevant to earthworks and landscaping affecting ground water drainage, landscape design proposals, the planning and design of usable outdoor space. Due to the general requirement for mechanical ventilation, the provision of openable windows will be highly limited. Where opening windows will occur, integration of a fine meshed fly screen would be provided.

At operational stage the hospital will need to implement a range of maintenance and control procedures to limit future species propagation opportunity by ensuring appropriate grounds management to safeguard the wellbeing of all its users.

5.27 Construction Environmental Management Plan

Lendlease has prepared a preliminary Construction Environmental Management Plan (CEMP) to accompany the Stage 2 SSD application. It is attached as **Appendix Z**, along with associated Sub-plans. The objective of the CEMP is to outline parameters for site management practices during construction and is intended to provide sufficient information to support the SSD application. This is addressed further in **Section 7.1**.

5.28 Cumulative Impacts

Potential cumulative impacts associated with the development of the new Tweed Valley Hospital were thoroughly considered as part of the Concept Proposal and Stage 1 Works EIS. Cumulative impacts associated with Stage 2 have been considered in this EIS and the associated specialist reports, as relevant.

Although the development would introduce a new use and built form, it makes use of a strategically located site and favourable land conditions to support delivery of the Tweed Valley Hospital. It would not result in significant or unreasonable social or economic impacts. The development can be effectively serviced by utilities and infrastructure and has good transport connectively and access attributes.

It is expected that Stage 2 of the Project would add to a number of common cumulative impacts, including resource consumption (e.g. construction material and waste) and generation of greenhouse gas emissions (e.g. through operation of vehicles and equipment, and use of electricity). However, the environmental management measures identified within **Section 7** and the methodology for completion of the Project aim to minimise the extent to which the Project contributes to cumulative environmental impacts.

A high-level review of DPIE's major projects register and Tweed Shire Council's DA tracker found no recently lodged or approved significant developments within proximity to the Project Site that could likely result in significant implications in regard to traffic, infrastructure services, amenity and/or environmental impacts when considered in-light of the Tweed Valley Hospital.

The Traffic Impact Assessment has investigated transport and traffic matters to ensure the capacity/ efficiency of the local road network is maintained. Required road/intersection upgrades would be undertaken to appropriately manage traffic generation and access requirements.

The SEIA finds that development of the Tweed Valley Hospital will, on balance, create an overall positive social and economic impact to the region. On this basis, and the overall assessment undertaken, including consideration of growth and other major approved or potential future developments in the locality, the Project is not expected to result in any significant adverse impacts. The Project would integrate with the expected growth in and around Kingscliff and support vitality in the locality and region.

Where applicable, the Project construction team would coordinate activities and undertake them in a manner to help minimise any potential cumulative impact where such risk may be present. If other major developments do occur concurrently with the Project, the potential for any such cumulative impacts would need to be considered and managed by the construction contractor once the timing of other developments becomes known. The CEMP would include a process to review and update mitigation measures, including those in response to new works coming online or if complaints are received.

Overall, the Site is well suited to the Project that would deliver socio-economic benefits for the community and can be undertaken with effective management and mitigation of environmental impacts, including any potential cumulative effects. Relevant mitigation measures are outlined throughout relevant parts of **Section 5** and summarised in **Section 7**.

5.29 Site Suitability

As demonstrated by the Concept Proposal and as outlined throughout this EIS in the context of Stage 2 of the Project, the site was selected as part of a comprehensive site selection and evaluation process, including due diligence investigations, consultation and consideration of alternatives.

The Project Site is strategically located, capable of supporting the Tweed Valley Hospital, and justifiable taking into account the anticipated benefits, potential environmental impacts and subsequent mitigation measures and safeguards that can effectively ensure sound development and environmental outcomes. Based on the assessment undertaken it has been demonstrated that the Project for a new major referral hospital on the Project Site is appropriate and suitable.

5.30 Public Interest

The existing Tweed Hospital and services will not meet the healthcare needs of the Tweed-Byron community into the future. The existing hospital is at capacity and the site has inadequate space to develop new buildings and other limiting constraints. There is a clear need for a new hospital and expansion.

The Project to develop a new hospital for the Tweed-Byron region on the selected greenfield site is a significant and important social and healthcare investment for the region and would deliver positive socio-economic benefits. There is clear rationale to support a greenfield development on the Project

Site and the Stage 2 proposal is generally consistent with the Concept Proposal (as proposed to be modified). The Project would deliver a much-needed renewal, expansion and modernisation of existing hospital services and healthcare, delivering long-term benefits to patients, staff, stakeholders and the wider community.

The Project's investment in social infrastructure would have positive economic multiplier effects and support long-term healthcare planning.

The potential environmental impacts posed by the Project have been thoroughly examined. The Project is sited on an already disturbed land parcel, is situated in a strategic location, and would have limited environmental impact (that can be managed) and on balance, net positive social and economic impacts. The Project is in the public interest.

6. Environmental Risk Assessment

The SEARs state that the EIS must include an environmental risk assessment to identify the potential environmental impacts associated with the development. Where relevant, the assessment of key issues below, and any other significant issues identified in the risk assessment, is to include:

- Adequate baseline data
- Consideration of the potential cumulative impacts due to other developments in the vicinity (completed, underway or proposed)
- Measures to avoid, minimise, and if necessary, offset predicted impacts, including contingency plans for managing any significant risks to the environment.

6.1 Assessing Environmental Risk

An environmental risk assessment has been prepared for the Project. This environmental risk assessment identifies, assesses and evaluates the potential risk of the various activities associated with the Project. The risk assessment process involved the following:

- Selection and development of an appropriate risk assessment process
- Identification of all potential environmental risks
- Analysis of all potential environmental risks
- Evaluation of environmental risks.

6.2 Methodology

6.2.1 Project Team Discussions

Individuals from the Project team (including consultants) held discussions to identify, analyse and value potential environmental risks for the Project.

6.2.2 Determination and Assigning the Environmental Risk Rating

Risk assessment is the process by which environmental hazards and associated impacts are systematically identified, assessed and ranked according to perceived risk. This environmental risk assessment has been carried out to ensure that all potential risks are identified so that they can be addressed by means of appropriate and effective controls through the development assessment process.

In this environmental risk assessment, the significance of an impact (relevant to the risk) has been characterised by considering the likelihood of the event occurring and the potential consequence of the event to specify the level of significance related to the environmental risk associated with each potential impact. The manageability of potential impacts has also been considered to determine a final risk rating.

6.2.3 Environmental Risk Rating

The Risk Assessment Matrix (as shown below in **Table 6.1**) illustrates how the residual environmental impacts of a proposal are assigned by reviewing the significance of potential impacts and the ability to manage those impacts. The risk assessment has been adapted from Australian Standard AS4369.1999 Risk Management and Environmental Risk Tools. The sum of the values assigned provides an indicative ranking of potential residual impacts after the mitigation measures are implemented as follows:

- The significance of impact is assigned a value between 1 and 5 based on:
  - the receiving environment
  - the level of understanding of the type and extent of impacts
  - the likelihood of occurrence
  - the severity/consequence of the impact
  - the likely community response to the environmental consequence of the Project
- The manageability of environmental impact is assigned a value between 1 and 5 based on:
  - the complexity of mitigation measures
  - the known level of performance of the safeguards or mitigation measures proposed
  - the opportunity for adaptive management.

It should be noted that the assessment is not intended to be exhaustive, rather it focuses on key risks.

Risk scores for likely and potential impacts were derived using the following risk matrix (**Table 6.1**).

Table 6.1 Risk Matrix

Significance of Impact	***Manageability of Impact***				
	5 Complex	4 Substantial	3 Elementary	2 Standard	1 Simple
1 – Low	6 (Medium)	5 (Low/Medium)	4 (Low/Medium)	3 (Low)	2 (Low)
2 – Minor	7 (High/Medium)	6 (Medium)	5 (Low/Medium)	4 (Low/Medium)	3 (Low)
3 – Moderate	8 (High/Medium)	7 (High/Medium)	6 (Medium)	5 (Low/Medium)	4 (Low/Medium)
4 – High	9 (High)	8 (High/Medium)	7 (High/Medium)	6 (Medium)	5 (Low/Medium)
5 – Extreme	10 (High)	9 (High)	8 (High/Medium	7 (High/Medium)	6 (Medium)

Table 6.2 provides the outcomes of the Environmental Risk Assessment undertaken for the Project and assigns anticipated risk ratings relevant to key potential impact parameters.

Table 6.2 Environmental Risk Assessment

Parameter	*Potential Impact*	*Summary of Proposed Mitigation*	*Significance of Impact*	*Manageability Impact*	*Residual impact*
Biodiversity	■ Potential impacts to flora and fauna during construction. ■ Indirect impacts to receiving environments.	■ Disturbances beyond the limit of works would be avoided. ■ If non-mobile fauna or habitat features are identified (e.g. birds nest) before or during construction, a suitably licensed and experienced ecologist is to be contacted and appropriate measures would be discussed and implemented prior to commencement/re-commencement of works. ■ Implement recommendations of the BDAR and BMP prepared by Greencap.	1	2	3 (Low)
Environmental Amenity	■ Effect on residential amenity.	■ Adequate setbacks from residential areas are provided to avoid or minimise amenity related impacts. ■ The design response has considered environmental amenity and the amenity of surrounding residential areas, including appropriate setbacks, articulation, selection of materials and finishes and soft landscaping. ■ Implementation of measures related to noise and visual amenity (commented on elsewhere).	2	2	4 (Low/Medium)

Parameter	Potential Impact	Summary of Proposed Mitigation	Significance of Impact	Manageability Impact	Residual impact
Landscape character and visual impact	■ Modification of site/ introduction of new elements/large built form into landscape and associated potential visual impact.	■ The design response is highly considered and balances the impact of height and bulk with the clinical and functional requirements of a hospital. There are substantial setbacks from surrounding sensitive receivers and the building is well articulated and has a complementary mix of materials and colour palette suitable for the context. ■ Pristine coastal views would not be impacted, and various views of distant mountain ranges would be reasonably maintained. ■ Soft landscaping is proposed throughout the site.	4	3	7 (High/Medium)
Traffic, Access and Parking	■ Increased traffic on local roads. ■ Parking demand. ■ Intersection performance.	■ Provision of adequate access and performing intersections, including intersection upgrades. ■ Provision of adequate car parking on-site. ■ Implement recommendations of Traffic Impact Assessment prepared by Bitzios.	3	2	5 (Low/Medium)
ESD	■ Demand on water, energy and resources.	■ ESD measures are proposed and would be incorporated into the design of the built form and construction methodologies for Stage 2.	3	1	4 (Low/Medium)
Aboriginal	■ Potential impact to unexpected Aboriginal sites or artefacts.	■ An unexpected finds procedure be adopted in the event of the discovery of any Aboriginal objects during construction.	1	1	2 (Low)

Parameter	Potential Impact	Summary of Proposed Mitigation	Significance of Impact	Manageability Impact	Residual impact
Historic Heritage	■ Potential impact to historic heritage.	■ The Project would be in accordance with the Historical Heritage Assessment prepared by Niche. ■ Over 80% of the 750 m of dry-stone walls on the site will be retained and historical interpretation measures integrated into the design of the hospital for walls requiring removal. ■ If any unexpected item of historic heritage is discovered during works, work shall cease immediately, and the Project heritage consultant or Office of Environment and Heritage be notified.	3	1	4 (Low/Medium)
Noise and vibration	■ Noise and vibration from construction activities. ■ Noise from operation of the facility.	■ The Project would be undertaken in accordance with the Noise and Vibration Assessment prepared by JHA for both construction and operational aspects.	3	2	5 (Low/Medium)
Soils and geotechnical	■ Potential exposure of contamination or hazardous materials during works, including management and remediation. ■ Soil erosion and sedimentation as a result of the works. ■ Negligible risk of potential acid sulfate soils.	■ The Project would be in accordance with the recommendations of the Geotechnical Report prepared by Morrison Geotechnics. ■ Required soil remediation has been undertaken as part of Stage 1 Works and a Site Audit Statement has confirmed the site is suitable for the proposed use. ■ The Project will be undertaken in accordance with the Stormwater Management Plan and Soil and Water Management Plan prepared by RBG.	3	2	5 (Low/Medium)

Parameter	Potential Impact	Summary of Proposed Mitigation	Significance of Impact	Manageability Impact	Residual impact
Utilities	■ Impacts to adjacent utilities. ■ Need for augmentation and increased demand on services.	■ The development will comply with the requirements of the relevant public authorities regarding the connection to, relocation and/or adjustment of services affected by the construction. ■ The site can and would be provisioned by adequate services and capacity. ■ The Project will be undertaken in accordance with the relevant infrastructure management plans prepared by LCI and JHA.	2	2	4 (Low/Medium)
Waste	■ Waste generation from construction. ■ Waste generation from operation. ■ Poor waste management, handling and disposal practices.	■ Construction waste will be managed in accordance a Construction Waste Management Plan. ■ Operational waste will be managed in accordance an Operational Waste Management Plan. ■ Resource management hierarchy principles would be followed. ■ Working areas would be maintained, kept free of rubbish and cleaned up at the end of each working day.	2	2	4 (Low/Medium)
Stormwater and water resources	■ Increased runoff. ■ Reduced water quality. ■ Impacts to surface and ground waters, including receiving wetlands.	■ The Project will be undertaken in accordance with the Stormwater Management Plan and hydrology assessment prepared by RBG and SMEC.	3	2	5 (Low/Medium)

Parameter	Potential Impact	Summary of Proposed Mitigation	Significance of Impact	Manageability Impact	Residual impact
Bush fire	■ Bush fire hazard and risk to development in event of bush fire.	■ An adequate APZ can be provided and relevant bush fire protection measures are to be adopted and implemented as per the Bushfire Hazard Assessment prepared by GeoLINK.	3	2	5 (Low/Medium)
Socio-economic	■ Relocation of health services. ■ Impacts to businesses and Tweed CBD. ■ Impact to agriculture. ■ On balance net positive impact.	■ Community health and other out-of-hospital services via a HealthOne model on or in close proximity to the existing hospital site. Implementation of relevant measures identified in the SEIA prepared by SGS Economics and Planning. ■ The findings of the SEIA confirm a net benefit to the community.	3	2	5 (Low/Medium)
Flooding	■ Flood risk (PMF) and evacuation management.	■ The development area and critical hospital buildings are above the PMF flood level. ■ An Emergency Flood Evacuation Management Plan has been prepared for the site, consistent with conditions of consent.	1	1	2 (Low)
Agriculture and potential rural land use conflict	■ Impact to/from agricultural land and activity.	■ Implementation of the recommendations of the LUCRA prepared by Tim Fitzroy and Associates. ■ Implement measures in the Agricultural Offset Plan prepared by GeoLINK.	3	2	5 (Low/Medium)

Parameter	Potential Impact	Summary of Proposed Mitigation	Significance of Impact	Manageability Impact	Residual impact
Air quality	■ Dust and emissions generated during construction.	■ Appropriate dust management measures would be implemented by the Main Works construction contractor as part of a CEMP. ■ Ensure plant and vehicles are fitted with appropriate exhaust systems.	2	2	4 (Low/Medium)
Aviation	■ Potential airspace conflict.	■ Project to be in accordance with findings and recommendations of the Aviation Report by Avipro.	2	2	4 (Low/Medium)
Hazards	■ Inappropriate storage, handling or disposal of hazardous material.	■ Effective management of hazardous material in accordance with relevant standards and the SEPP 33 assessment prepared by Salus Risk Consulting.	2	2	4 (Low/Medium)

7. Environmental Management

7.1 Construction Environmental Management Plan

Stage 2 Main Works would be delivered in accordance with a Construction Environmental Management Plan (CEMP). For the purposes of this application, Lendlease has prepared a preliminary CEMP for the Stage 2 Main Works which is attached as **Appendix Z**. The objective of the CEMP is to outline parameters for site management practices during construction and is intended to provide sufficient information to support the SSD application. The CEMP is intended to be further reviewed, refined and developed (as required) by the Main Works contractor to form the final detailed CEMP that will be implemented for the Stage 2 Main Works. The CEMP is supported by a range of relevant subplans.

The final CEMP would incorporate all relevant safeguards and management measures detailed in this EIS and the requirements of the development consent, along with other measures specific to the construction methodology and management of construction process. These would be implemented and complied with throughout all stages of the Project. The CEMP would be submitted to the DPIE for review and approval.

The construction management processes will provide:

- Seamless performance and accountability for all related construction works
- The works will be designed, constructed, commissioned cohesively by the integrated team
- Tried and proven delivery tools, techniques, strategies and structure to successfully deliver the Project.

The CEMP has been developed through the schematic design stage and contains Lendlease's overall construction methodology for the delivery of this complex integrated project. It is envisaged that the CEMP will evolve during the design development and finalisation phase in conjunction with the design consultant team, project stakeholders, consumer and community representatives, HI, NNSW LHD and TSA.

The CEMP sets out how the Main Works contractor will construct the Tweed Valley Hospital including their processes and controls throughout the construction phase, project finalisation, commission, validation, testing and transition to the operational commissioning team and final handover.

The proactive and collaborative approach is underpinned by the following overriding objectives:

- Minimise any impact on surrounding residents, the environment and existing road network
- To deliver a world class facility, on time and to the highest safety and quality standards
- Communicate in a timely fashion with all relevant stakeholders what, when and how we are planning to undertake the interface works.
- Present a positive public perception of the Project during the construction works
- Use experienced and competent subcontractors ensuring that local industry engagement and opportunities are maximised
- Enhancing opportunities for local indigenous businesses, employees and trainees
- Hands-on control of subcontractors from experienced site supervision.

The submitted preliminary CEMP provides the general overview of how construction of the new Tweed Valley Hospital Project will be managed. The CEMP will make reference to and be read in conjunction with the Tweed Valley Hospital Project Environmental, Health and Safety Management Plan (EH&S Plan) and all the Sub Plans referred therein, including (but not limited to):

- Construction Air Quality and Dust Management Sub Plan
- Construction Sediment and Erosion Control (soil and water) Management Plan
- Flood Emergency Response Management Plan
- Heritage and Archaeological Management Sub Plan
- Construction Noise and Vibration Management Sub Plan
- Construction Traffic Management Plan
- Construction Waste Management Plan.

These plans, in turn, provide further detail on the specific matter they have been developed for and make reference to external plans prepared by Consultants and other parties (e.g. Traffic Management Plan, Biodiversity Management Plan, etc)

The plans take into consideration site-specific risks that have been identified and document the implementation of control measures to effectively mitigate those risks. The plans would be accordance with the Development Consent and be approved and implemented prior to commencement of works. Unexpected finds protocols would also be outlined in the CEMP and relevant Sub Plans.

All construction staff and site personnel would be inducted and made aware of their obligations working at the Tweed Valley Hospital, their environmental responsibilities, and the safeguard measures to avoid and minimise potential impacts. Induction and toolbox talks would commence early in the program and continue as new personnel/contractors are engaged.

The CEMP also outlines stakeholder management, responsibilities and oversight. Implementation of the CEMP would ensure sound construction practices and acceptable environmental outcomes.

7.2 Mitigation Measures and Safeguards

This EIS and the supporting specialist reports have identified a number of safeguards, management and mitigation measures that are designed to avoid, minimise or mitigate adverse environmental, social and economic impacts that could potentially arise from Stage 2 of the Project. These are provided in **Table 7.1**.

The measures provided would manage construction risks associated with Stage 2 and any ongoing management associated with the operation of the hospital. Successful implementation would avoid where possible and otherwise minimise the risks or magnitude of impact. The identified measures would be incorporated into a detailed CEMP prior to commencement of works, which also outlines how the construction processes would be managed.

The environmental management measures for Stage 2 have been derived from the assessment undertaken and those (as relevant) detailed in appended specialist consultant reports.

Table 7.1 Stage 2 Main Works and Operation - Mitigation Measures and Safeguards

Matter	*Action/Measure*
General	■ A detailed CEMP would be prepared by the Main Works contractor prior to any works/activities commencing and would include all relevant sub plans. ■ All employees, contractors and subcontractors to receive a project induction. The environmental component may be covered in toolbox talks and should include: - Environmental mitigation measures - Unexpected Finds Protocols and responsibilities (historic heritage, Aboriginal heritage, contamination and waste) - Waste management strategies and measures. ■ Implement community consultation measures to keep the community informed of the construction program and potential impacts, including relevant contact details. ■ A complaint handling procedure and register will be implemented to assist in recording and managing complaints during construction.
Environmental Amenity	■ External materials and finishes that are complementary to the landscape context and natural colour palettes will be used where possible. ■ The proposed façade treatments and materials will be selected to ensure that building reflectivity does not exceed acceptable limits as per the Built Form and Urban Design Report prepared by STH+BS. ■ The development will be in accordance with the landscape design and strategy prepared by Turf Design.
Transport and Accessibility	■ Operational traffic will be in accordance with the recommendations of Traffic Impact Assessment prepared by Bitzios. ■ Construction traffic will be managed in accordance with the Construction Traffic Management Plan prepared by Lendlease.
Ecologically Sustainable Development	■ The detailed design of the development is to incorporate ESD principles and measures set out in the ESD report prepared by LCI.
Agricultural Impact	■ The development would be in accordance with the Land Use Conflict Risk Assessment prepared by Tim Fitzroy and Associates. ■ Implementation of the Agricultural Offset Plan prepared by GeoLINK.
Heritage	■ The development would be in accordance with the Historical Heritage Assessment, Interpretation Plan, and Statement of Heritage Impact prepared by Niche. ■ If any unexcepted item of Aboriginal or historical heritage is discovered during works, work in the vicinity shall cease immediately, and the Project heritage consultant or Office of Environment and Heritage be notified, and relevant protocols followed. Works would not recommence until clearance is provided.
Social and economic	■ Undertake further consultation and planning around the proposed HealthOne model for Tweed Heads and use of redundant parts of the existing hospital site noting that this will be subject to a separate decision by the NSW Government and appropriate planning pathway. ■ Implement the measures identified in the Social and Economic Impact Assessment prepared by SGS Economics and Planning.
Noise and Vibration	■ Noise and vibration impact for the construction and operation of the Tweed Valley Hospital will be in accordance with the recommendations of the Noise and Vibration Impact Assessment prepared by JHA.

Matter	Action/Measure
Contamination and Geotechnical	■ Confirmation of remediation and development of the Project Site for the purposes of a hospital is to be in accordance with the Site Audit Statement by JBS&G. ■ The development will be in accordance with the applicable recommendations of the Geotechnical Reports prepared by Morrison Geotechnics and any required further geotechnical investigations.
Services and Utilities	■ The Project will be adequately serviced, and relevant service and utility works will be undertaken in accordance with the relevant infrastructure management plans prepared by JHA and LCI.
Drainage and Stormwater	■ Drainage and stormwater management, including sedimentation and erosion control, will be in accordance with the Stormwater Management Plan (prepared by Robert Bird Group), Construction Sediment and Erosion Control Management Plan (prepared by Lendlease), and Hydrology Assessment (prepared by SMEC). ■ The CEMP prepared by the contractor would include: - Fuel and chemical storage requirements - Safety Data Sheet (SDS) register and requirements - Refuelling protocols - Spill management and response procedures. ■ All fuels, chemicals, and liquids will be stored at least 50 m away from any drainage line or waterways, or as far away as is practicable, and will be stored in an impervious bunded and covered area within the compound site. ■ Visual monitoring of local water quality (i.e. turbidity, sheen, oil and grease) will be undertaken regularly to identify any potential water quality issues.
Bush fire	■ The development will be in accordance with the Bushfire Hazard Assessment prepared by GeoLINK.
Biodiversity	■ Implement recommendations and measures of the Stage 2 BDAR and BMP prepared by Greencap.
Air Quality and Dust	■ Construction would be undertaken in accordance with a Construction Air Quality and Dust Management Sub Plan.
Aviation	■ The development will be in accordance with the advice from AviPro regarding aviation considerations.
Waste	■ Construction and operational waste would be managed in accordance with the Waste Management Plans prepared by Lendlease (Construction) and TTM (Operational).
Cumulative Construction Impacts	■ The CEMP would incorporate measures to manage potential cumulative construction impacts. The CEMP and relevant sub-plans would be reviewed and updated as required (such as when new work begins or if complaints are received) to incorporate potential cumulative impacts from surrounding development activities as they become known.

8. Justification and Conclusion

The Project would deliver a much-needed renewal, expansion and modernisation of existing hospital services and healthcare, delivering long-term benefits to patients, staff, stakeholders and the wider community.

The Concept Proposal and Stage 1 Early and Enabling Works received ministerial approval on 11 June 2019. The approval confirms the acceptability of the proposal in principle, subject to conditions of consent and lodgement/assessment of the Stage 2 State Significant Development (SSD) application. This application details and seeks consent for the Stage 2 Main Works and Operation of the Tweed Valley Hospital which will allow the actual hospital buildings and health campus to be developed and become operational for the community's benefit.

Key issues, such as built form and urban design, visual and environmental amenity, stormwater management, traffic and parking, and socio-economic considerations have been informed by the detailed design and further addressed in this Environmental Impact Statement (EIS). This EIS has outlined and assessed the design of the proposed buildings, main works, and operation of the Tweed Valley Hospital to ensure relevant environmental, social, and economic considerations are addressed and that SSD 9575 conditions of consent relevant to future development applications (i.e. Stage 2) are satisfied.

The Project will be a significant facility and social infrastructure investment for the region. Environmental, social and economic impacts can be effectively addressed and managed, including the delivery of necessary upgrades to road infrastructure. The Project will support a vibrant health campus that services the community and delivers considerable benefits.

The detailed design presented as part of Stage 2 demonstrates the suitability of the design response within the local context. While prominent, the built form and urban design outcome is acceptable and visually appropriate, delivering a high-quality architectural result that balances hospital and civic identity, clinical functionality, the context of the site, and amenity. The Project would not unreasonably detract from the overall amenity or environmental qualities of its setting and an appreciation of these important local qualities, coupled with a high standard health campus, would be experienced. Effective stormwater and biodiversity management, including environmental rehabilitation works, would see improvements for the nearby sensitive receiving environment and mapped Coastal wetlands.

Overall, the potential environmental impacts posed by Stage 2 of the Project have been thoroughly examined. It is considered that Stage 2 warrants approval for the following reasons:

- The EIS addresses the SEARs and satisfies the relevant SSD 9575 conditions of consent.
- Subject to the proposed modifications (due to further analysis, consultation, and detailed design) that have been concurrently applied for, Stage 2 would be consistent with the Concept Proposal.
- Stage 2 will allow development of the Tweed Valley Hospital to continue and be fully realised.
- The Project is considered justifiable taking into account the anticipated benefits, potential environmental impacts and subsequent mitigation measures and safeguards that can effectively ensure sound development and environmental outcomes. The assessment has demonstrated that the development would not generate environmental impacts that cannot be appropriately managed or that would be considered unacceptable.
- The Project is generally consistent with and achieves State policy.
- The Project is a significant investment in social infrastructure and would have positive socio-economic effect.

- The development can be adequately serviced and there are no traffic or parking impediments to the Project and appropriate supporting infrastructure would be delivered.
- The Tweed Valley Hospital would effectively integrate into the future growth and strategic direction of the locality and the Tweed-Byron region more broadly.
- The Project is consistent with the principles of Ecological Sustainable Development as defined by Schedule 2(7)(4) of the Environmental Planning and Assessment Regulation 2000.
- The Project is consistent with the objectives of the *Environmental Planning and Assessment Act 1979.*
- Balancing all relevant considerations, the Project is in the public interest.

Given the planning merits described above, and significant public benefits, Stage 2 of the Project deserves favourable consideration by the Minister for Planning and Public Spaces or delegate.

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