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PENRITH NEPEAN HOSPITAL_ CPTED ASSESSMENT

Prepared for NSW Health Infrastructure
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HASSELL

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1 ____Introduction

1.1_Purpose of This Report

HASSELL has been engaged by NSW Health Infrastructure to undertake a Crime Prevention Through Environmental Design (CPTED) Assessment of the proposed redevelopment of the Penrith Nepean Hospital, located at Derby Street, Kingswood, New South Wales.

The CPTED Assessment is in accordance with the Department of Planning's guidelines titled *'Crime prevention and the assessment of development applications' (2001)* and also accords with section 79C of the *Environmental Planning and Assessment Act 1979*.

CPTED aims to create the reality (or perception) that the costs of committing crime are greater than the likely benefits. This is achieved by creating environmental and social conditions that:
_Maximise risk to offenders (increasing the likelihood of detection, challenge and apprehension);
_Maximise the effort required to commit crime (increasing the time, energy and resources required to commit crime);
_Minimise the actual and perceived benefits of crime (removing, minimising or concealing crime attractors and rewards); and
_Minimise excuse making opportunities (removing conditions that encourage/facilitate rationalisation of inappropriate behaviour).

The proposed development has been assessed against the four principles which assist in minimising the opportunity for crime, these are:
_Surveillance;
_Access control;
_Territorial reinforcement; and
_Space management.

This assessment does not analyse any internal layouts, internal security issues, internal sight lines, natural surveillance capabilities of the internal layout, or construction materials of the proposed development.

1.2_The Site and Development Proposal

The subject site is known as Penrith Nepean Hospital and is located in Kingswood, New South Wales, in the Penrith City Local Government Area (LGA). Penrith City is located at the base of the Blue Mountains, beside the Nepean River, and is one of the fastest growing areas in Sydney.

Penrith Nepean Hospital provides a full range of services including emergency, critical care, acute medicine, planned and emergency surgery, maternity, neonatal, paediatric medicine and minor surgery, mental health, aged care, rehabilitation services, drug and alcohol services, and a broad range of specialist outpatient clinics and services.

The site has an area of 16.28 hectares, and is bounded by Great Western Highway (to the north), Somerset Street (to the east), Derby Street (to the south) and Parker Street (to the west).

The Penrith Nepean Hospital development proposal includes the following works:

_Construction of a new East Block adjoining the existing North Block, comprising of:
  _Level one:
    _Car parking for 122 vehicles including two disabled access spaces;
    _Staff bicycle store for 10 bicycles;
    _Plant and equipment to service the building (chiller plant, medical air plant, fire sprinkler pump room, substation, and rainwater tank (100m3) with OSD tank below);
    _Courtyard to the east of the building, with a void above to levels two and three.
  _Level two: An Ambulatory Procedure Centre (APC) including:
    _Main entrance to East Block;
    _Six new operating theatres (linking to existing theatre suite in North Block);
    _Outpatients area (O/P);
    _Pre- and post-operative areas including stage 1 and stage 2 recovery areas, extended day only (EDO) area for overnight stay
    _Associated utility rooms, change rooms (staff), and patient ablutions.

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_Level three:
_60 overnight surgical beds (30 of which will be relocated from West Block) in two wards;
_External terraces;
_Raised green roof (2,525m2);
_Plant room;
_Associated utility rooms, offices and meeting rooms.
_Level four:
_Plant rooms.

_Construction of a new internal pedestrian link between the new East Block (level two) and the existing North Block.

_New external car parking (26 spaces) and access road to service the East Block, including a drop off bay near the building entrance and a fire vehicle layby to the north of the building;

_Refurbishment and expansion of the existing Intensive Care Unit (ICU), including:
_ Level two:
_ An increase in beds from 19 to 24
_ Additional office space, meeting room, and storage space;
_ Male and female change rooms for staff;
_ Clinical Cardiovascular Unit.
_ Level three:
_ Ancillary ICU functions including consulting rooms, meeting room, offices and testing labs;
_ Plant room.

_Expansion of the Renal Dialysis Incentre Unit from two dialysis stations to eight dialysis stations in the vacated surgical bed space on Level 5 of West Block; and

_Enhancements and upgrading of utilities and services.

A site plan showing the location of the works within the Hospital campus is provided in Appendix A, and shown in Figure 1.1.

This CPTED assessment will consider the new East Block building to be constructed on the site, and the ICU refurbishment / expansion which will result in a larger building footprint. The other works proposed for the development, such as internal works associated with the Renal Dialysis Incentre Unit and utility / services upgrades, are not considered in this assessment as they do not pose any external change to the environment.

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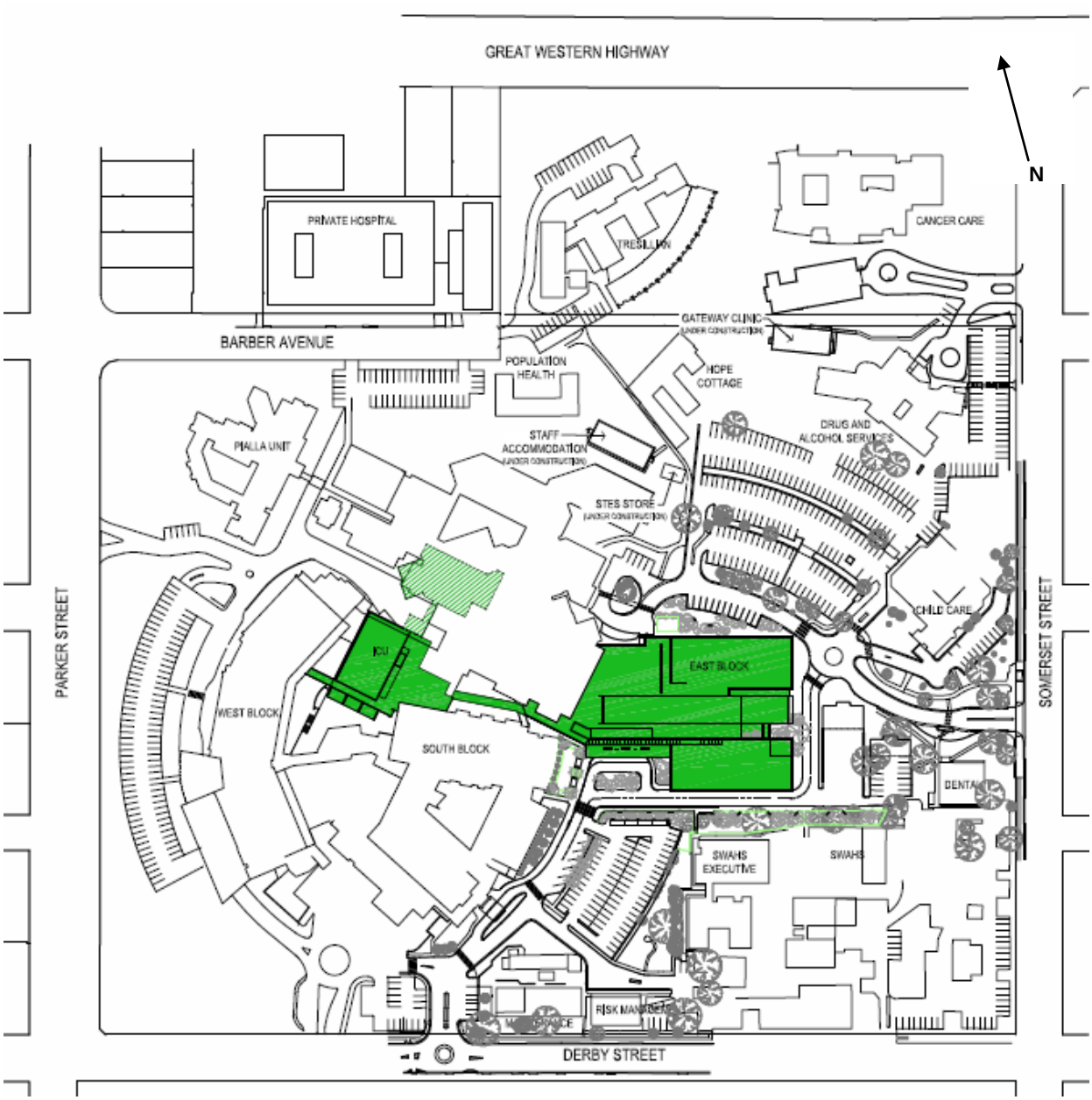

Figure 1.1: Site Plan showing location of proposed works within the Hospital campus.

2 ____CPTED Principles

The key principles of Crime Prevention through Environmental Design are outlined in the Department of Planning guideline titled *'Crime prevention and the assessment of development applications' (2001)*, and are summarised below.

2.1_Surveillance

Providing opportunities for surveillance, both natural and technical, can be highly effective in discouraging and reducing incidents of crime.

As noted in the *'Crime prevention and the assessment of development applications'* (Department of Planning, 2001:4), good surveillance means that people can see what others are doing. People feel safe in public areas when they can easily see and interact with others. Would-be offenders are often deterred from committing crime in areas with high levels of surveillance.

2.2_Access Control

Access controls use physical and symbolic barriers to attract, channel or restrict the movement of pedestrians.

As noted in the *'Crime prevention and the assessment of development applications'* (Department of Planning, 2001:5), by making it clear where people are permitted to go or not go, it becomes difficult for potential offenders to reach and victimise people and their property. Illegible boundary markers and confusing spatial definition make it easy for criminals to make excuses for being in restricted areas. However, care needs to be taken to ensure that the barriers are not tall or hostile, creating the effect of a compound.

2.3_Territorial Reinforcement

Territorial reinforcement refers to the clear identification of public spaces and providing a sense of community ownership over such spaces. As noted in the *'Crime prevention and the assessment of development applications'* (Department of Planning, 2001:5), people often feel comfortable in, and are more likely to visit, places which feel owned and cared for. Well used places also reduce opportunities for crime and increase risk to criminals.

If people feel that they have some ownership of public space, they are more likely to gather and to enjoy that space. Community ownership also increases the likelihood that people who witness crime will respond by quickly reporting it or by attempting to prevent it.

2.4_Space Management

Space management refers to providing attractive, well maintained and well used spaces. As noted in the *'Crime prevention and the assessment of development applications'* (Department of Planning, 2001:5), space management strategies include activity coordination, site cleanliness, rapid repair of vandalism and graffiti, the replacement of burned out pedestrian and car park lighting and the removal or refurbishment of decayed physical elements.

These principles have been used as the basis for this CPTED assessment, in conjunction with the *Penrith Development Control Plan 2006* (Penrith DCP) which incorporates these key principles and provides design controls and practical guidelines for developments.

3 ____Design Assessment

The following assessment is undertaken with reference to the key principles of Crime Prevention through Environmental Design as outlined in the Department of Planning's *'Crime prevention and the assessment of development applications' (2001*) guideline, and the relevant sections of Part 2, Section 2.2 of the *Penrith Development Control Plan 2006* (Penrith DCP), which outlines Crime Prevention through Environmental Design controls and guidelines.

3.1_Lighting

As identified in the Penrith DCP (2006:6), lighting plays a vital role in crime prevention and personal safety as you can see and respond to what is around you and ahead of you. Moreover, others can see you, which further reduce the likelihood of a crime being committed.

The final lighting design configuration for the new East block is be determined in the detailed design stage, and therefore a review is not undertaken in this report. However it is recommended that the following lighting design criteria, as outlined in the Penrith DCP (2006:6), is taken into consideration during the detailed design of the lighting for East Block. A review of the existing lighting in place for the ICU and Renal units should also be undertaken against these criteria and measures incorporated where possible.

(a) All areas intended to be used at night should allow appropriate levels of visibility.
(b) Pedestrian pathways, lane ways and access routes in outdoor public spaces should be lit to the minimum Australian Standard of AS 1158. Lighting should be consistent in order to reduce the contrast between shadows and illuminated areas. Lighting should be designed in accordance with AS4282 – Control of the obtrusive effects of outdoor lighting.
(c) Lighting should have a wide beam of illumination, which reaches to the beam of the next light, or the perimeter of the site or area being traversed. Moreover, lighting should clearly illuminate the faces of users of pathways.
(d) Streetlights should shine on pedestrian pathways and possible entrapment spaces as well as on the road.
(e) Lights should be directed towards access/egress routes to illuminate potential offenders, rather than towards buildings or resident observation points.
(f) Lighting should take into account all vegetation and landscaping that may act as an entrapment spot.
(g) Lighting should be designed so that it is "vandal tough" or difficult for vandals to break.
(h) Where appropriate use movement sensitive and diffused lights.
(i) Avoid lighting spillage onto neighbouring properties as this can cause nuisance and reduce opportunities for natural surveillance.
(j) Illuminate possible places for intruders to hide.
(k) As a guide areas should be lit to enable users to identify a face 15 metres away.
(l) All lighting should be maintained and kept in a clean condition with all broken or burnt out globes replaced quickly.
(m) Use energy efficient lamps/fittings/switches to save energy.

3.2_Fencing

As identified in the Penrith DCP (2006:8), if fencing is too high or made of inappropriate materials it reduces the opportunity for casual surveillance of the street and for users of the public domain to see what activities are taking place on your site. This then further increases the likelihood of a crime being committed.

Existing fencing surrounding the East Block site is to be retained. This fencing is of a low (approximately 0.5 metres high) timber rail construction, thus maximising the opportunities for surveillance of the site.

No additional fencing is proposed for the development.

3.3_Car Parking

As identified in the Penrith DCP (2006:9), poorly designed car parks whether underground or not can be a dangerous environment for their users. Through the provision of some basic design elements, such as lighting and signage these spaces can be made safer.

The new East Block building incorporates car parking for 122 cars on Level One of the building, including two disabled access spaces, as shown in Figure 3.1 below.

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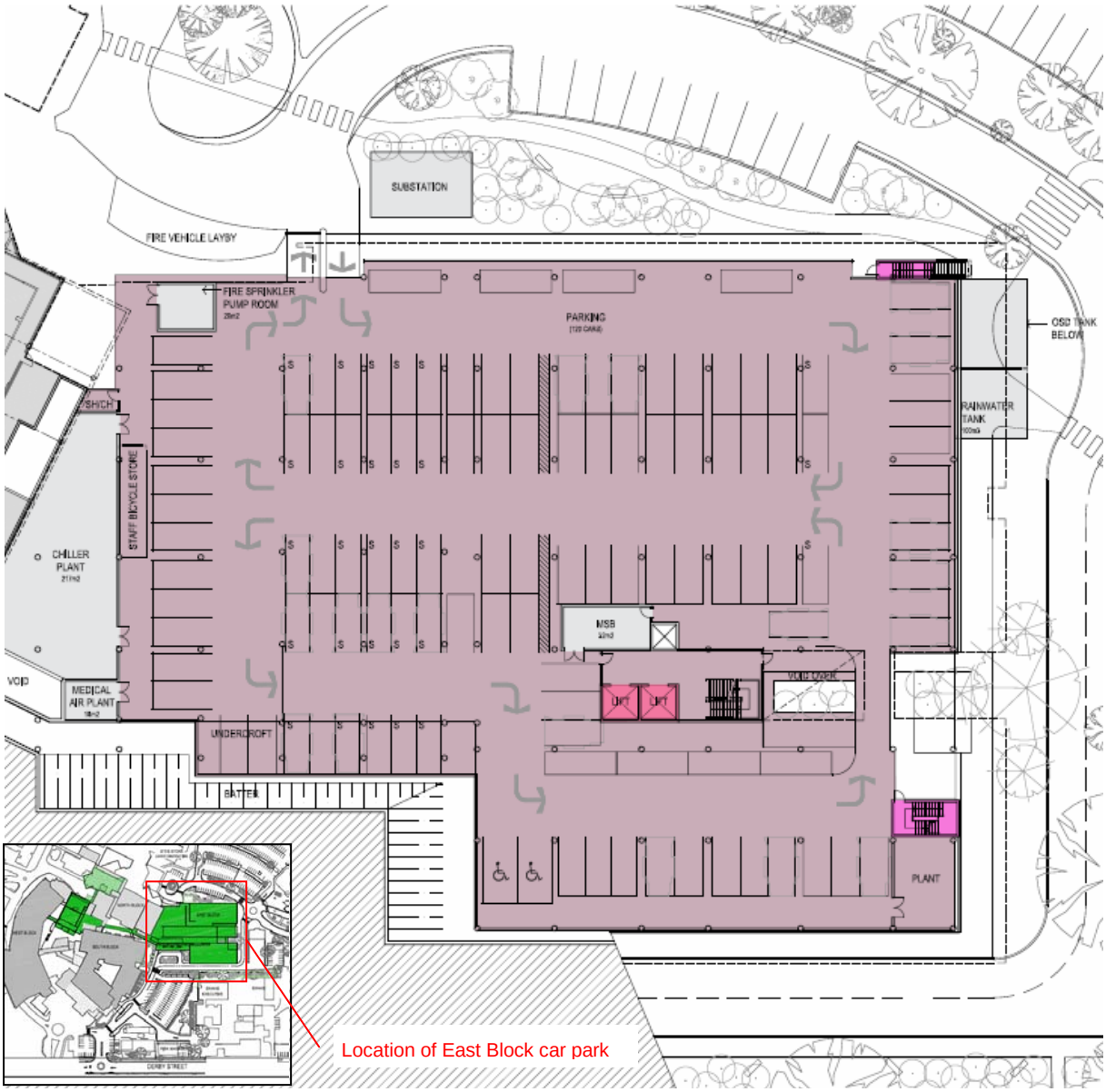

Figure 3.1_East Block Car Parking Layout (Level One)

The following table provides an assessment of the proposed development against the Penrith DCP car parking design criteria.

Design Criteria	East Block Assessment
(a) Carparks, aisles and manoeuvring areas shall be: designed with safety and function in mind, and have dimensions in conformity with Australian Standards 2890 - Parking Facilities. Relevant parts of this standard are: _AS2890.1 - Off-street parking. _AS2890.2 - Commercial vehicle facilities. _AS2890.3 - Bicycle parking facilities.	The car park has been designed to comply with *AS 2890 - Parking Facilities*.

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(b) Where parking spaces are to be provided for people with disabilities, these spaces are to be: _suitably located near entrances to the building and lifts/ access ramps, if required; and _provided in accordance with Australian Standards 1428.1 - Design for access and mobility. _Appropriate signage and tactile pavement treatments should also be installed, where required.	Two disabled spaces are provided within the car park, in accordance with *AS 1428.1 - Design for access and mobility*. These are located in close proximity to the lifts. It is recommended that signage and tactile pavement treatment is incorporated into the car park detailed design, to direct disabled users to the lifts.
(c) The design of carparking areas should incorporate the following elements: _provision of a safe and convenient vehicle entry and exit that avoids traffic/pedestrian conflict and impact on the surrounding road; _the internal (vehicular) circulation network is free of disruption to circulating traffic and ensures pedestrian safety.	The car park has one combined entry and exit on the northern elevation, as shown in figure 3.2. Pedestrians are provided with a clearly defined walkway with associated pedestrian crossings, located at a sufficient distance from the car park entrance to ensure minimal conflicts or safety issues arise between different users. The car park is provided with access from a dedicated branch of the Hospital internal road network.

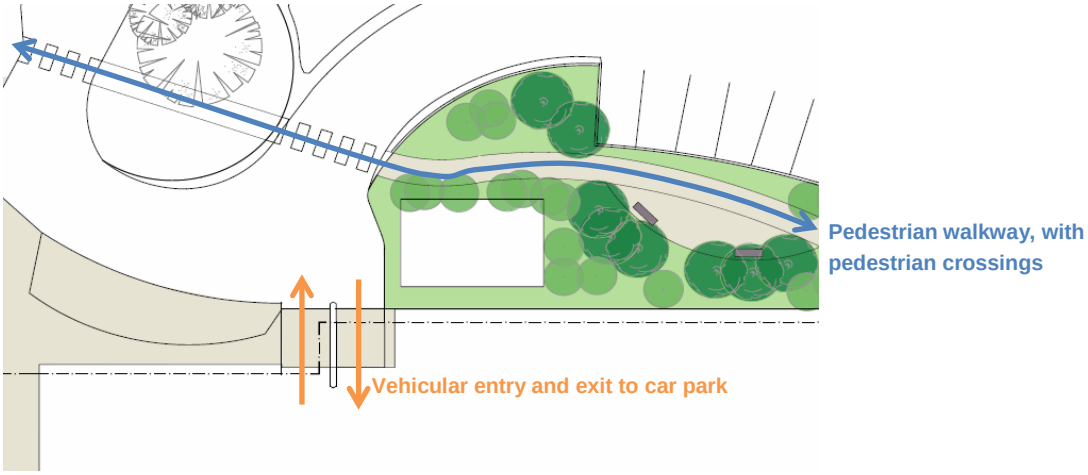

Figure 3.2_Entrance to East Block car park

(d) The movement of pedestrians throughout the carpark should be clearly delineated by all users of the carpark and minimises conflict with vehicles.	Pedestrian walkways are provided in the centre of the car park, along the entire length, providing a convenient and clearly defined pedestrian movement corridor.
(e) The design of the car park should ensure that passive surveillance is possible and where appropriate, incorporate active measures such as cameras and security patrols. Car parks should be designed to minimize dark areas through the provision of appropriate lighting.	All exterior edges of the car park will be screened, as shown in Figure 3.3 below, using spaced steel rods within a fixed frame. The screening will maintain transparency and allow surveillance from the surrounding external areas while preventing access into the car park from the perimeter. Lighting is to be designed to meet Australian standards for car parking. It is recommended that lighting is of a uniform nature so as to avoid problems associated with adjustment of vision for motorists and pedestrians moving from dark to light areas. Lighting should cover all of the parking area and not just driving aisles.

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	Pedestrian exit and entry points should also be uniformly lit to ensure smooth visual transition from the interior of the facility to the external environment. It is recommended that CCTV is incorporated into the car park.

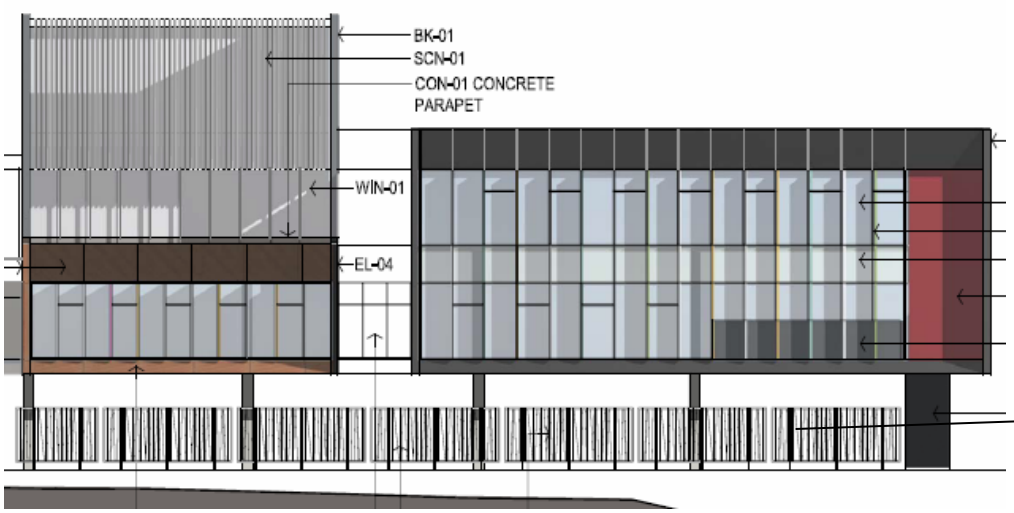

Figure 3.3_Screening of East Block Car Parking

(f) Large car parks should incorporate communication devices such as: Intercoms, Public address systems, Telephones, Emergency alarms	The car park is of a moderate size, and it is therefore recommended that intercoms and emergency alarms are provided.
(g) To ensure users of large car parks are easily able to determine their location, exit and access points, security intercoms, and the like appropriate signage is to be included.	It is recommended that the car park incorporates signage to indicate the location of the exit, lifts, stairwells, intercoms, and emergency alarms.
(h) All surfaces in the car park should be painted in light coloured paint or finished in light grey concrete to reflect as much light as possible.	It is recommended that the car park is retained as light grey concrete or painted in a light colour in order to reflect as much light as possible.
(i) All potential entrapment points should be avoided, e.g. under stairs, blind corners and wide columns. Adequate lighting and mirrors should be used when certain design features are unavoidable.	The car park is generally spacious and open, however there are corners in the north-east and north-west which could provide concealment opportunities. It is recommended that mirrors are provided in this area to provide full visual coverage to pedestrians and vehicles approaching this area. Additionally, the lift area is an enclosed space that could provide an entrapment point. It is recommended that sufficient lighting and CCTV coverage is provided at this point to discourage any loiterers. The stairwells should also be provided with sufficient lighting and CCTV coverage. It is recommended that doors incorporate transparent panels to provide sightlines and give advanced warning of any potential dangers.

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3.4_Entrapment Spots and Blind Corners

As identified in the Penrith DCP (2006:11), entrapment spots and blind corners provide opportunities for perpetrators of crime to hide and or commit crime.

The following table provides an assessment of the proposed development against the Penrith DCP design criteria for entrapment spots and blind corners.

Design Criteria	East Block	ICU
(a) Pathways should be direct. All barriers along pathways should be permeable including landscaping, fencing etc.	Pathways are provided around the perimeter of the East Block, providing access from surrounding car parking areas and directing movement around the building and towards the main entrance.	ICU is located on Level Two of the existing North Block building, and is accessed internally.
(b) Consider the installation of mirrors to allow users to see ahead and around corners. The installation of glass or stainless steel panels in stairwells can also assist in this regard.	Consideration should be given to installing mirrors at the edge of the courtyard area to provide views around the corners. It is recommended that doors to any stairwells incorporate glass panels.	It is recommended that doors to any stairwells incorporate glass panels.
(c) Entrapment spots adjacent to main pedestrian routes such as a storage area or small alley should be eliminated from all designs.	No such entrapment spots identified. Note that the courtyard area to the east of the building, whilst being an enclosed space, has voids located above giving views from Level 2 and 3 down to the courtyard.	No such entrapment spots identified. External areas surrounding the ICU are spacious and well overlooked by the surrounding buildings, being located in the main active part of the Hospital.
(d) If entrapment spots are unavoidable they should be well lit with aids to visibility such as convex mirrors and locked after hours.	No entrapment spots identified.	No entrapment spots identified.
(e) To eliminate excuse making for individuals to loiter, avoid placement of seating near or adjacent to ATM's, public phone boxes, toilets, corridors and isolated locations.	External seating is only proposed to be provided within landscaped areas, and outside the main entrance, within full view of other users.	No external seating proposed.

3.5_Landscaping

As identified in the Penrith DCP (2006:12), trees and shrubs that are inappropriately located can easily reduce surveillance opportunities and provide entrapment spots and blind corners.

Landscaping is proposed in the vicinity of the new East Block building, as shown in Figure 3.4.

The expansion of the ICU building footprint will extend into an existing courtyard area predominantly composed of hard landscaping. No landscaping is proposed for the ICU development, with any impacts on existing hard landscaping to be made good following building construction.

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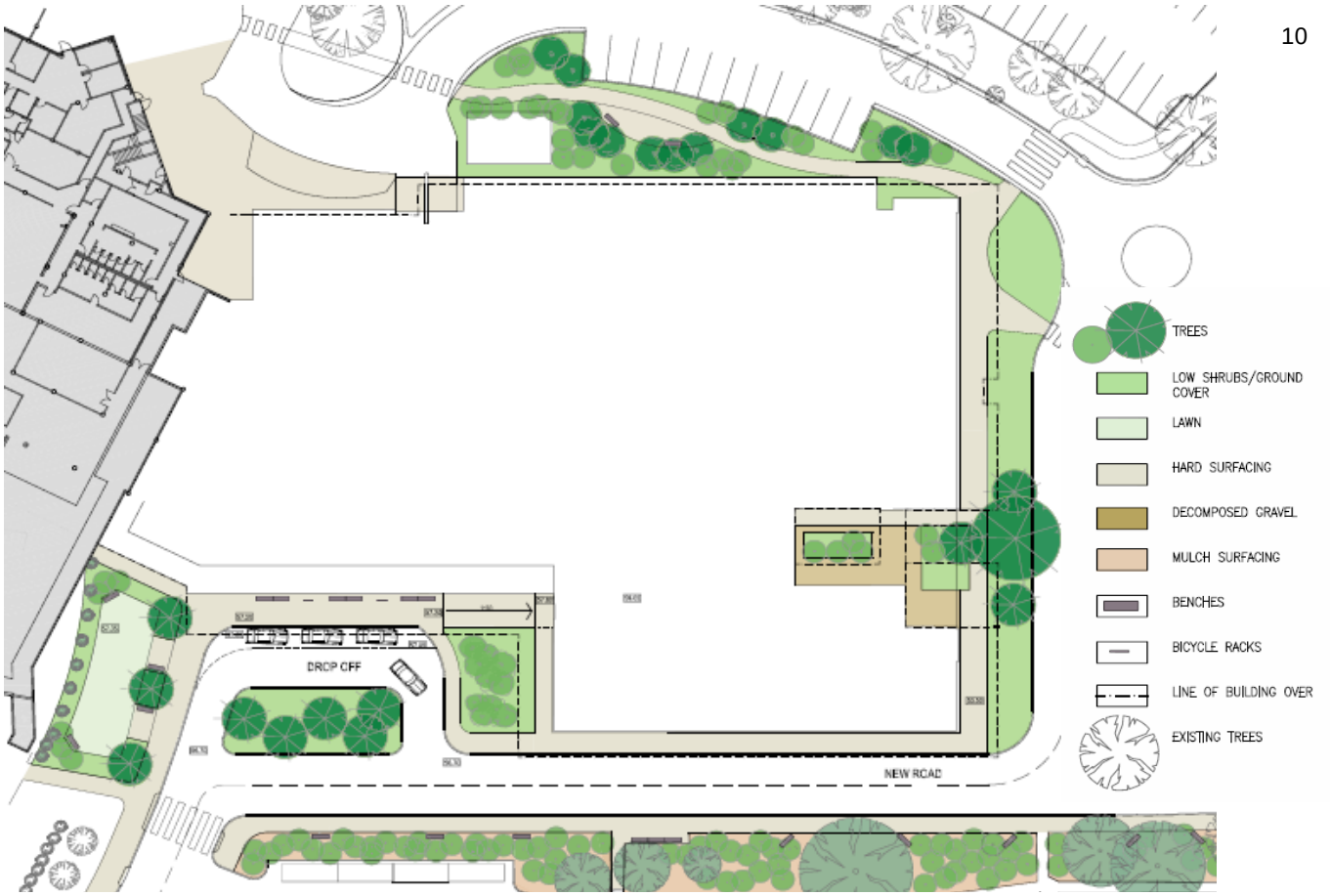

Figure 3.4_Landscaping Plan, East Block.

The following table provides an assessment of the proposed development against the Penrith DCP landscaping design criteria.

Design Criteria	East Block
(a) Avoid medium height vegetation with concentrated top to bottom foliage. Plants such as low hedges and shrubs, creepers, ground covers and high canopied vegetation are good for natural surveillance. (b) Trees with dense low growth foliage should be spaced or crown raised to avoid a continuous barrier. (c) Use low ground cover or high-canopied trees with clean trunks. (d) Avoid vegetation which conceals the building entrance from the street. (f) Avoid vegetation that impedes the effectiveness of public and private space lighting.	It is recommended that a detailed landscape plan is prepared that: _stipulates the use of canopy trees and low-level shrubs; _stipulates spacing requirements for any dense low growth foliage; _requires any vegetation near the main entrance to be of low-level so as to maintain visibility of the entrance; _highlights the location of street lighting and stipulates vegetation of a height and type that will not interfere with the lighting of the public space; and _recommends appropriate plant varieties to achieve the above.
(e) Avoid vegetation screening of all public use toilets.	No external public toilets are proposed.
(g) Use “green screens” (wall hugging vegetation that cannot be hidden behind) if screening large expanses of fencing to minimise graffiti.	No large expanses of fencing are proposed.

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3.6_Communal / Public Areas

As identified in the Penrith DCP (2006:13), communal or public open space areas that do not have adequate natural surveillance are a risk to personal safety.

Public areas provided as part of the East Block are identified in Figure 3.5 below. The ICU development will extend into an existing hard paved courtyard.

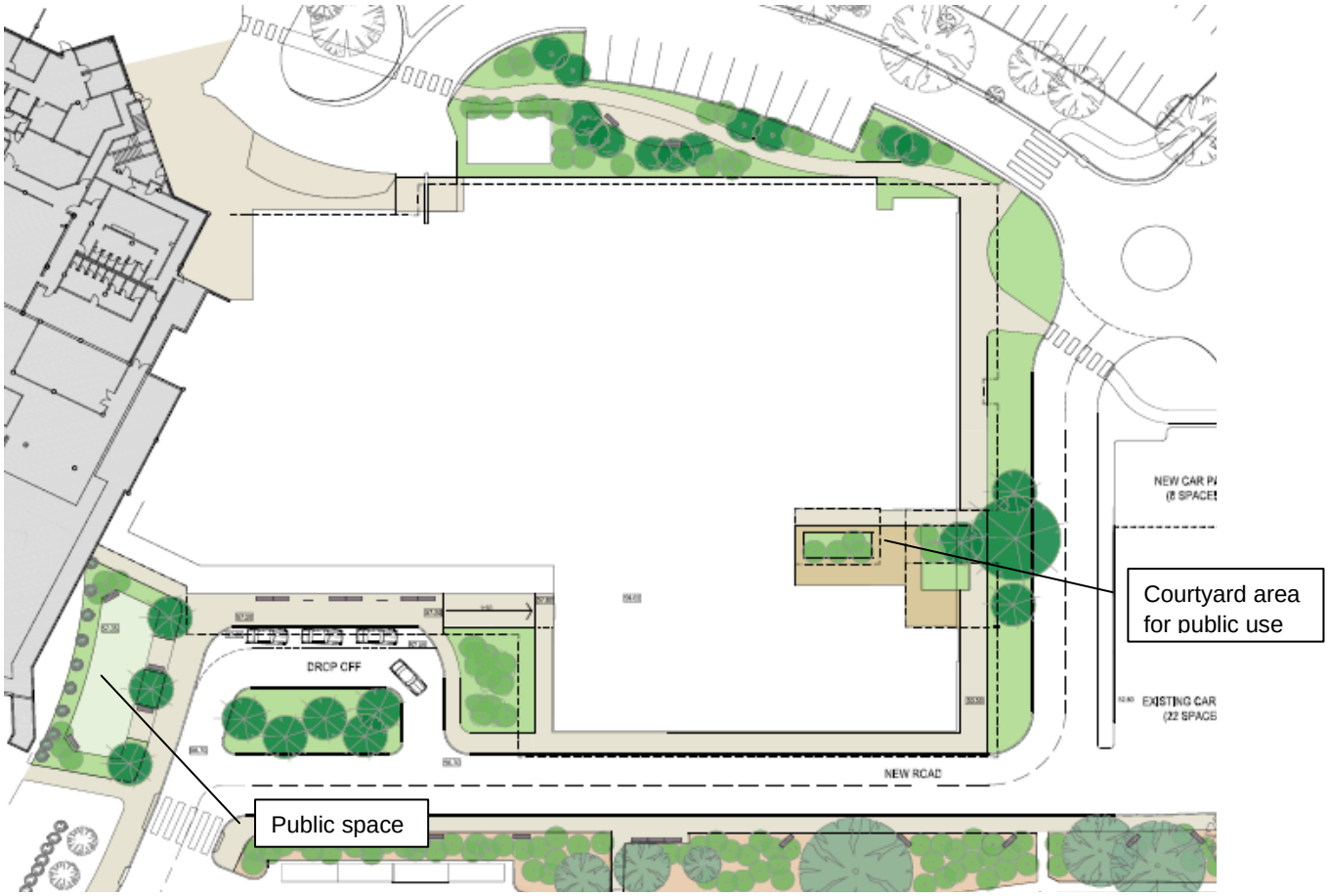

Figure 3.5_Public space areas, East Block.

The following table provides an assessment of the proposed development against the Penrith DCP communal / public space design criteria.

Design Criteria	East Block	ICU
(a) Position active uses or habitable rooms with windows adjacent to main communal/public areas e.g. playgrounds, swimming pools, gardens, car parks etc.	Public space is provided near the main entrance to East Block, therefore providing surveillance of the area as it is near to a busy thoroughfare. The courtyard area has voids located above whereby it is overlooked from Levels 2 and 3.	The existing courtyard adjacent to the ICU building is well overlooked by surrounding Hospital buildings.
(b) Communal areas and utilities e.g. laundries and garbage bays should be easily seen and well lit.	Not applicable. All utility areas are for staff access only.	Not applicable. All utility areas are for staff access only.

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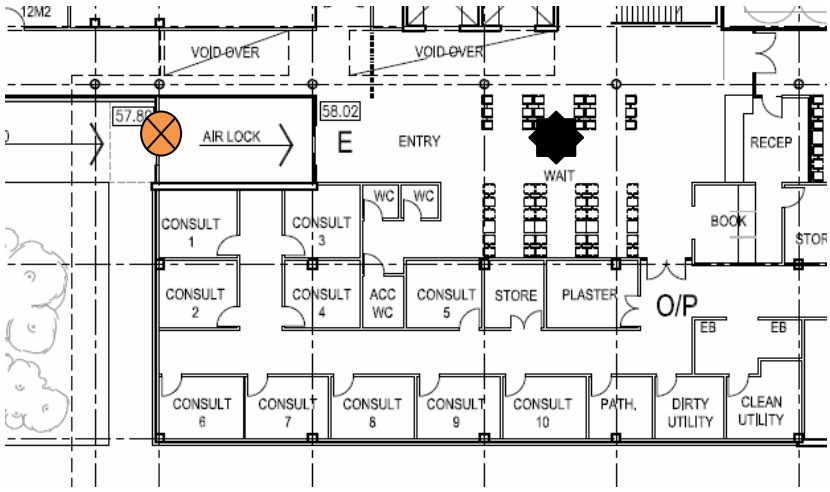
(c) Where elevators or stairwells are provided, open style or transparent materials are encouraged on doors and/or walls of elevators/stairwells.	It is recommended that doors to any stairwells incorporate glass panels.	It is recommended that doors to any stairwells incorporate glass panels.
(d) Waiting areas and entries to elevators/stairwells should be close to areas of active uses, and should be visible from the building entry.	The reception and waiting room is accessed directly from, and is visible from, the main entrance. (Refer to figure 3.6 below).	The reception and waiting room (Level Two) is accessed directly from the main entrance to the ICU, located along the main connective corridor on this level, in close vicinity to the stairwell entry point. (Refer to figure 3.7 below).
(e) Seating should be located in areas of active uses.	Seating is provided near the main entrance, and near existing well used buildings with high footfall.	No external seating is proposed.

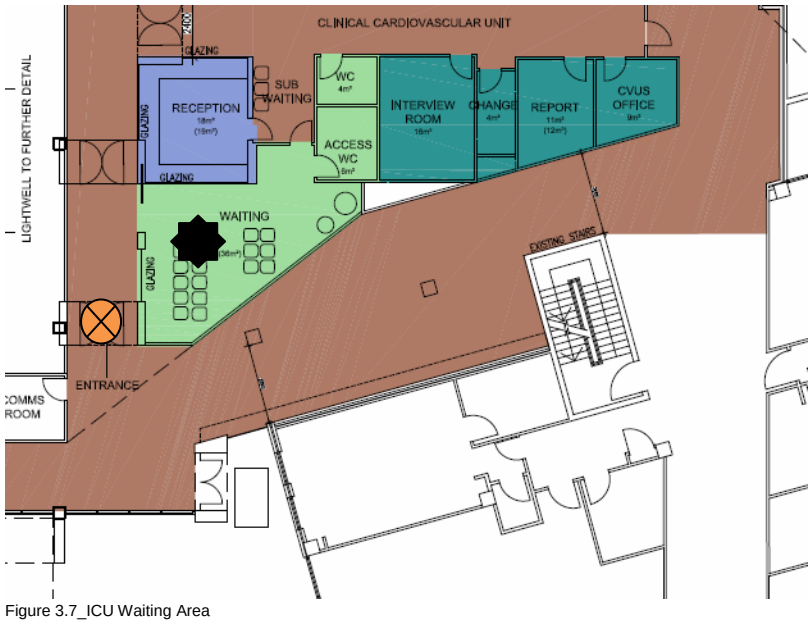


Legend:

Entrance

Waiting Area

Figure 3.6_East Block Waiting Area



Legend:

Entrance

Waiting Area

Figure 3.7_ICU Waiting Area

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3.7_Movement Predictors

As identified in the Penrith DCP (2006:15), movement predictors are routes which people move through on a regular and predictable basis such as a pedestrian underpass. Careful design is needed to ensure that they are not included in a development or are appropriately treated where included to reduce the risk. Through site links are another type of movement predictor, however, unlike under passes these can provide a benefit to the community if designed appropriately to ensure safety.

Design criteria outlined in the Penrith DCP (2006:15) includes:

(a) Pedestrian underpasses should not be included in new developments. Where existing developments, which include underpasses, are being redeveloped all efforts should be made to remove them.
(b) Where movement predictors are used the users of it should have clear site lines so they can see what is ahead and behind at all times.
(c) Lighting of movement predictors is essential. Natural lighting should be used where possible with consideration given to wall and ceiling materials to help reflect light.
(d) Emergency intercoms, telephones and security videos should be included in the design of movement predictors. Adequate consideration should be given to who will be monitoring such equipment.
(e) No entrapment spots should be included in any movement predictor.

A movement predictor is a predictable or unchangeable route or path that offers no choice to pedestrians, for example pedestrian tunnels, narrow passageways, stairwells and pedestrian bridges.

The proposed development does not include any movement predictors in the external environment. The area surrounding the East Block is open, with good sightlines, and does not have any constrained movement pathways. Access to the ICU is via existing main Hospital entrances. Internal stairwells could potentially act as movement predictors, and it is recommended that doors to stairwells incorporate glass panels to aid visibility and sightlines.

3.8_Entrances

As identified in the Penrith DCP (2006:16), entrances to all types of development that are not visible from the public domain provide an opportunity for perpetrators of crime to hide and or commit crime. Entrances to all types of development need to be clearly visible and legible so that the users can obtain entry quickly and expediently.

Figure 3.8_East Block main entrance.

Design criteria outlined in the Penrith DCP (2006:16) includes:

(a) Entrances should be at prominent positions and clearly visible and legible to the users
(b) Design entrances to allow users to see into the building before entering.
(c) Entrances should be easily recognisable through design features and directional signage.
(d) Minimise the number of entry points – no more than 10 dwellings should share a common building entry.
(e) If staff entrances must be separated from the main entrance, they should maximise opportunities for natural surveillance from the street.
(f) Avoid blank walls fronting the street.
(g) In industrial developments, administration/offices should be located at the front of the building.

The ICU development utilises existing Hospital entrances. The entry to the East Block is provided in a convenient location on the new building, at a point where it is visible from the main Hospital buildings of the North, South and

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West Block, and from surrounding car park areas. It is provided with a drop off vehicle area which further promotes ease of access. Signage is to be provided, in keeping with the existing comprehensive directional and way-finding signage provided on the Hospital campus.

3.9_Building Identification

As identified in the Penrith DCP (2006:19), adequate building identification is essential to ensure that people can easily find a destination and do not have to walk up and down the street searching for it.

The following table provides an assessment of the proposed development against the Penrith DCP building identification design criteria.

Design Criteria	East Block	ICU
(a) Street numbers should be at least 7cm high, and positioned between 1m and 1.5m above ground level on the street frontage.	Not applicable.	Not applicable.
(b) Street numbers should be made of durable materials preferably reflective or luminous, and should be unobstructed (e.g. by foliage).	Not applicable.	Not applicable.
(c) Location maps and directional signage should be provided for larger developments.	Signage on the Hospital campus is to be updated to clearly show the location of the new buildings and facilities, and to provide directions.	Signage on the Hospital campus is to be updated to clearly show the location of the new buildings and facilities, and to provide directions.

3.10_Security

As identified in the Penrith DCP (2006:20), a crucial part of a crime prevention strategy is the use of security hardware and/or personnel to reduce opportunities for unauthorised access.

Design criteria outlined in the Penrith DCP (2006:16) includes:

(a) Install intercom, code or card locks or similar for main entries to buildings including car parks.
(b) Main entry doors for apartment buildings should be displayed requesting residents not to leave doors wedged open.
(c) Australian Standard 220 - door and window locks should be installed in all dwellings.
(d) Consider installing user/sensor electronic security gates at car park entrances, garbage areas and laundry areas etc, or provide alternative access controls.
(e) Entry to basement parking should be through security access via the main building.
(f) External storage areas should be well secured and well lit.
(g) Install viewers on entry doors to allow residents to see who is at the door before it is opened.
(h) If security grilles are used on windows they should be operable from inside in case of emergencies.
(i) Ensure skylights and/or roof tiles cannot be readily removed or opened from outside.
(j) Consider monitored alarm systems.
(k) Provide lockable gates on side and rear access.
(l) Consider building supervisors or security guards.

The new buildings have been designed to provide separate functional areas for staff and patients / visitors.

General public / visitor access to the facilities will be via a central reception and control point, which is designed to be located directly adjacent to the entrance point. It is our understanding that existing security systems provided at the Hospital will be extended to the new buildings. Required security systems include closed circuit television (CCTV), video-links, intercoms, and swipe card access to staff areas and these will be detailed in a further design stage.

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Entry to patient and staff areas will be strictly controlled in accordance with standard Hospital operating procedures.

It is recommended that a Security Management Plan is prepared detailing the processes that will be implemented to effectively manage the security of patients, staff and visitors to the new facilities. This includes the use of security personnel, closed-circuit television systems, alarms and monitoring systems to provide a safe and secure environment.

3.11_Ownership and Space Management

As identified in the Penrith DCP (2006:22), it is important that people have a sense of ownership of a place whether it is residential or commercial as a person who feels attached to a place is more likely to watch out for it and the other users of it.

Design criteria outlined in the Penrith DCP (2006:16) includes:

(a) Ensure that dwellings or groups of dwellings are readily recognizable by the residents through the use of design features such as colouring, roof forms, vegetation, paving, artworks, fencing, furniture etc.
(b) Physical and/or psychological barriers, e.g. fences, gardens, lawn strips, varying textured surfaces can be used to define different spaces.
(c) Ensure the speedy repair or cleaning of damaged or vandalised property.
(d) Provide for the swift removal of graffiti.
(e) Provide information advising where to go for help and how to report maintenance or vandalism problems.
(f) Council, through its Community Safety Partnership Initiatives can provide residents with Community Safety advice on how to enhance property and personal safety and how to promptly report criminal or inappropriate behaviour to relevant authorities.

As a new building, the new East Block is able to use external finishing and materials to clearly define the building. It is further defined by the encircling internal road and footpath layout, as well as complementary landscaping around the space. The ICU, as an internal space within a larger Hospital block, uses clearly defined corridors, signage, and reception / waiting rooms to provide distinction from other facilities within the same building.

The maintenance of the new Hospital buildings will be managed in accordance with established Hospital procedure. The site will be subject to regular maintenance to all external (and internal) areas of the site and building.

The maintenance program employed by the Hospital ensures the prompt removal of graffiti, which acts as a strong deterrent to further vandalism and graffiti.

3.12_Way Finding / Finding Help

As identified in the Penrith DCP (2006:24), the ability to escape, communicate or find help when in danger can be assisted through improved signage and legible design. Moreover, knowing where you are in a large open space or shopping centre contributes to a feeling of safety.

The Hospital incorporates existing way finding and finding help signage. The new buildings and facilities to be provided as part of the proposed development will need to be incorporated into the existing system.

Where possible, it is recommended that the new signage to be provided seeks to meet the following design criteria outlined in the Penrith DCP (2006:24):

(a) Signs should be large and legible, with strong colours, standard symbols (e.g. for washrooms) and simple graphics. They should indicate where to go for help or assistance.
(b) Signs should be strategically located at entrances and near activity nodes such as intersections of corridors or paths.
(c) Signs should indicate how to report maintenance problems in the complex.
(d) The main pedestrian route through a large building, sets of building or areas of open public space should be indicated as such with appropriate signage.
(e) Where exits to pedestrian routs are closed after hours this should be indicated at the entrance to the route and information on alternative routes should clearly advised.
(f) Signs that provide way finding information should not be relied upon solely, the overall legibility of the design needs to be well considered. Users of the space need to be able to intuitively understand where they are within the complex or area and how they can get away.

4 ____Conclusion and Recommendations

The proposed development at Penrith Nepean Hospital generally complies with the Department of Planning's guidelines titled *'Crime prevention and the assessment of development applications' (2001)* by using appropriate design measures to minimise the incidence of crime.

An assessment of the proposed development has been undertaken with reference to the key principles of Crime Prevention through Environmental Design as outlined in the Department of Planning's *'Crime prevention and the assessment of development applications' (2001*) guideline, and the relevant sections of Part 2, Section 2.2 of the *Penrith Development Control Plan 2006* (Penrith DCP), which outlines Crime Prevention through Environmental Design controls and guidelines.

Recommendations based on this assessment are provided below.

4.1_Recommendations

The recommendations provided throughout this assessment report are summarised below.

Lighting

It is recommended that the following lighting design criteria, as outlined in the Penrith DCP (2006:6), is taken into consideration during the detailed design of the lighting for East Block. A review of the existing lighting in place for the ICU and Renal units should also be undertaken against these criteria and measures incorporated where possible.

(a) All areas intended to be used at night should allow appropriate levels of visibility.
(b) Pedestrian pathways, lane ways and access routes in outdoor public spaces should be lit to the minimum Australian Standard of AS 1158. Lighting should be consistent in order to reduce the contrast between shadows and illuminated areas. Lighting should be designed in accordance with AS4282 – Control of the obtrusive effects of outdoor lighting.
(c) Lighting should have a wide beam of illumination, which reaches to the beam of the next light, or the perimeter of the site or area being traversed. Moreover, lighting should clearly illuminate the faces of users of pathways.
(d) Streetlights should shine on pedestrian pathways and possible entrapment spaces as well as on the road.
(e) Lights should be directed towards access/egress routes to illuminate potential offenders, rather than towards buildings or resident observation points.
(f) Lighting should take into account all vegetation and landscaping that may act as an entrapment spot.
(g) Lighting should be designed so that it is "vandal tough" or difficult for vandals to break.
(h) Where appropriate use movement sensitive and diffused lights.
(i) Avoid lighting spillage onto neighbouring properties as this can cause nuisance and reduce opportunities for natural surveillance.
(j) Illuminate possible places for intruders to hide.
(k) As a guide areas should be lit to enable users to identify a face 15 metres away.
(l) All lighting should be maintained and kept in a clean condition with al broken or burnt out globes replaced quickly.
(m) Use energy efficient lamps/fittings/switches to save energy.

Car Parking

It is recommended that:

Lighting of the car park should meet Australian standards for car parking, and be of a uniform nature so as to avoid problems associated with adjustment of vision for motorists and pedestrians moving from dark to light areas. Lighting should cover all of the parking area and not just driving aisles. Pedestrian exit and entry points should also be uniformly lit to ensure smooth visual transition from the interior of the facility to the external environment.

The car park is retained as light grey concrete or painted in a light colour in order to reflect as much light as possible. CCTV, intercoms and emergency alarms should be incorporated into the car park.

The car park incorporates signage to indicate the location of the exit, lifts, stairwells, intercoms, and emergency alarms.

The car park is generally spacious and open, however there are corners in the north-east and north-west which could provide concealment opportunities. It is recommended that mirrors are provided in this area to provide full visual coverage to pedestrians and vehicles approaching this area.

4 ____ Conclusion and Recommendations

Particular attention should be paid to providing sufficient lighting and CCTV coverage to the lift area and stairwells, as they represent potential entrapment points.

All stairwell doors incorporate transparent panels to provide sightlines and give advanced warning of any potential dangers.

Signage and tactile pavement treatment is incorporated into the East Block car park detailed design, to direct disabled users to the lifts.

Entrapment Spots and Blind Corners

It is recommended that:

Consideration should be given to installing mirrors at the edge of the external East Block courtyard area to provide views around the corners.

Doors to any stairwells throughout the development incorporate glass panels.

Landscaping

It is recommended that a detailed landscape plan is prepared that:
_stipulates the use of canopy trees and low-level shrubs;
_stipulates spacing requirements for any dense low growth foliage;
_requires any vegetation near the main entrance to be of low-level so as to maintain visibility of the entrance;
_highlights the location of street lighting and stipulates vegetation of a height and type that will not interfere with the lighting of the public space; and
_recommends appropriate plant varieties to achieve the above.

Building Identification and Way Finding

It is recommended that:

Signage on the Hospital campus is to be updated to clearly show the location of the new buildings and facilities, and to provide directions.

Where possible, new signage seeks to meet the following design criteria outlined in the Penrith DCP (2006:24):

(a) Signs should be large and legible, with strong colours, standard symbols (e.g. for washrooms) and simple graphics. They should indicate where to go for help or assistance.
(b) Signs should be strategically located at entrances and near activity nodes such as intersections of corridors or paths.
(c) Signs should indicate how to report maintenance problems in the complex.
(d) The main pedestrian route through a large building, sets of building or areas of open public space should be indicated as such with appropriate signage.
(e) Where exits to pedestrian routs are closed after hours this should be indicated at the entrance to the route and information on alternative routes should clearly advised.
(f) Signs that provide way finding information should not be relied upon solely, the overall legibility of the design needs to be well considered. Users of the space need to be able to intuitively understand where they are within the complex or area and how they can get away.

Security

It is recommended that:

Existing security systems provided at the Hospital are to be extended to the new buildings.

A Security Management Plan is prepared detailing the processes that will be implemented to effectively manage the security of patients, staff and visitors to the new facilities. This includes the use of security personnel, closed-circuit television systems, alarms and monitoring systems to provide a safe and secure environment.

_____ Appendix A – Site Plan