Lang Walker AO Medical Research Building - Macarthur

201117 CPTED REPORT

Client:

BVN Architecture

Revision:

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REPORT INFORMATION

Project	Lang Walker AO Medical Research Building - Macarthur
Title	Crime Prevention Through Environmental Design Report
Client	BVN Architecture
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REVISION SCHEDULE

Revision	Date	Issue Name	Author	Authorised
00	23 July 2021	Draft	Ben Hattersley	Lester Partridge
A	08 October 2021	Final	Ben Hattersley	Lester Partridge
B	20 October 2021	Amended Report Title	Ben Hattersley	Lester Partridge

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ABBREVIATIONS

Abbreviation	Meaning
ATM	Automatic Teller Machine
CPTED	Crime Prevention Through Environmental Design
DA	Development Application
DiD	Defence in Depth
IIAMR	Ingham Institute for Applied Medical Research
LCI	Lehr Consultants International
NAC	Natural Access Control
NS	Natural Surveillance
SRA	Security Risk Assessment
SRM	Security Risk Management
SWSLHD	South Western Sydney Local Health District
TR	Territorial Reinforcement
UNSW	University of New South Wales
WSU	Western Sydney University

1 EXECUTIVE SUMMARY

The Lang Walker AO Medical Research Building – Macarthur, will be located on the existing Campbelltown Hospital Campus and will be a shared facility bringing together the following four partner organisations:

> Western Sydney University (WSU),

> South Western Sydney Local Health District (SWSLHD),

> Ingham Institute for Applied Medical Research (IIAMR), and

> University of New South Wales (UNSW).

LCI was engaged as engineering design consultants, to provide a range of consultancy and design services on the project, including Security. A key component of any effective Security Risk Management (SRM) strategy is the understanding of Crime Prevention Through Environmental Design (CPTED) principles, and the implementation of measures intended to 'design out' opportunities for criminal activity to occur in the built environment.

LCI undertook a review of CPTED as it relates to the Medical Research Building, which involved speaking with key stakeholders for background information and context, reviewing existing standards and guidelines, and reviewing current architectural plans and site plans for the Development Application (DA) submission.

This report provides an overview of the three core principles of CPTED, Natural Surveillance, Natural Access Control, and Territorial Reinforcement, identifies key areas for consideration, and highlights potential vulnerabilities, as well as outlining recommendations to inform the architect, landscape architect, and relevant engineering disciplines, throughout the design process.

While the CPTED recommendations have been considered and key requirements reflected in the documentation, to the extent required at this stage of the design process, further review of relevant documentation will need to be undertaken in future design stages, to ensure the CPTED strategies are incorporated in the design, along with other physical and electronic security measures, as necessary.

2 INTRODUCTION

2.1 PROJECT OVERVIEW

"Combining people-centred health research facilities with public engagement spaces, the Macarthur Medical Research Centre (MMRC) will create a unique and exciting opportunity for community interaction and ownership. Located on the Campbelltown Hospital Campus, the Research Building will be a shared facility bringing together four partner organisations:

> Western Sydney University (WSU),

> South Western Sydney Local Health District (SWSLHD),

> Ingham Institute for Applied Medical Research (IIAMR), and

> University of New South Wales (UNSW).

Embedding the MMRC within the existing Hospital Campus will enable opportunities for translational research outcomes directly improving the health outcomes for the local population to be realised." (MMRC Project Brief)

2.2 SCOPE OF WORK

The scope of work of the Crime Prevention Through Environmental Design (CPTED) review for the Research Building includes the following key tasks:

> Speak with key stakeholders for background information and context.

> Source and review existing standards, design guides, and other relevant information.

> Desktop review of current architectural plans and site plans.

> Produce a draft CPTED report for review and comment, including project overview, standards, and guidelines, CPTED principles, key areas of concern/potential vulnerabilities, and recommendations in terms of 'designing out' opportunities for crime, to inform the architect, landscape architect, and relevant engineering disciplines.

> Assess feedback and address any issues/concerns with key stakeholders.

> Incorporate feedback in a final report, as necessary.

2.3 SECURITY RISK MANAGEMENT METHODOLOGY

Environmental design is a key element associated with core crime reduction strategies that support other core security and safety related approaches that include physical and electronic security, as well as operational security measures. CPTED measures play an important part in the overall Security Risk Management (SRM) function of any given facility and, as such, should be duly considered in the context of the Research Building.

A Security Risk Assessment (SRA) has not been undertaken for this project and, therefore, this report is not intended to provide an exhaustive examination of all security related risks as they may pertain to the project. The recommendations contained within the report are, for the most part, in relation to CPTED approaches only and should not be deemed sufficient to provide a comprehensive risk-based framework for all security decisions, including the security systems requirements, nor to define a holistic protective security strategy, for the whole of project.

3 STANDARDS, GUIDELINES AND PROJECT INPUTS

3.1 STANDARDS AND GUIDELINES

The following reference documents have been considered in the preparation of this report.

> Campbelltown (Sustainable City) Development Control Plan 2015
> Protecting People and Property: NSW Health Policy and Standards for Security Risk Management in NSW Health Agencies, June 2013
> ISO 22341:2021(en) Security and Resilience — Protective Security — Guidelines for Crime Prevention Through Environmental Design

3.2 STAKEHOLDER CONSULTATION

The following individuals have been identified as key Security stakeholders for the Research Building Project:

> Nicole Burr   Director, Capital Works and Infrastructure, SWSLHD
> Jarrod Borg   Campbelltown Health and Security Representative, SWSLHD
> Michael Crawford   Campbelltown Health and Security Representative, SWSLHD
> Matthew Dakin   Director, Campus Safety & Security, WSU
> Brett Gibson   Operations Manager, Campus Safety & Security, WSU
> Verity Foley   Security Operations Manager West - (Acting), WSU
> Nigel Hyland   Security Coordinator (North Campuses), WSU

LCI contacted representatives from both SWSLHD and WSU in relation to the CPTED Assessment, as a matter of courtesy, and to request any CPTED standards or guidelines that may be pertinent to the process, over and above the Campbelltown Development Control Plan referenced in the Project Brief.

Project stakeholders were provided an opportunity to review and comment on the draft report, and relevant feedback was duly considered and incorporated in this final report, where appropriate.

4 SECURITY AND CPTED PRINCIPLES

4.1 PRINCIPLES OF SECURITY

The four basic objectives of any protective security programme are to:

1.   **Deter** using physical barriers, and the risk of detection and prosecution.

2.   **Delay** with security barriers and effective construction methods.

3.   **Detect** using electronic security systems and physical surveillance

4.   **Respond** utilising alarm response and guard forces.
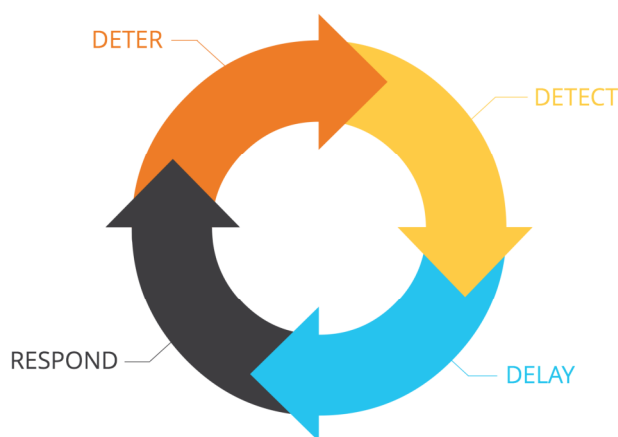
Figure 1: Principles of Security

4.2 DEFENCE-IN-DEPTH

Defence-in-Depth (DiD) involves the design and implementation of multiple layers of security designed to protect people, physical assets, and information. The physical barriers used in a DiD approach are often complemented through the application of psychological barriers (CPTED principles) to improve the overall effectiveness of the protective security strategy.

The first layer of physical security at a given facility is often a perimeter fence that defines the site boundary and is intended to deter unauthorised access by defining a legal boundary and enabling management to take appropriate responsive action, in the event of trespass occurring.

Additional layers in a DiD strategy typically include:

> Clear open spaces between fences and building perimeters or other assets.

> Physically secure building perimeters.

> Internal security zones.

> Secure equipment enclosures, including safes, vaults, communication racks etc.

4.3 CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN

CPTED is the use of design and space management concepts to influence human behaviour; specifically, criminal, and anti-social behaviour, and the use of psychological security concepts in a built environment can have positive effects on the surrounding area. CPTED is an approach to preventing crime with the objective of improving security

by limiting criminal opportunity and intensifying the perceived likelihood of being caught while committing a criminal act. By designing the built environment to take advantage of CPTED techniques, the perception of safety and security can be reinforced, by reducing the likelihood of opportunistic crime occurring, using passive techniques, in addition to standard, equipment-based, crime prevention measures, such as CCTV and electronic access control. CPTED approaches, when applied in combination with these more traditional protective security measures, help to achieve optimal security outcomes.

Three overlaying principles of CPTED can influence the way the physical environment is perceived by an individual. These are:

> Natural Access Control.

> Natural Surveillance.

> Territorial Reinforcement.

Of equal importance is the requirement for routine, ongoing **maintenance**, to ensure the CPTED measures remain effective over time.
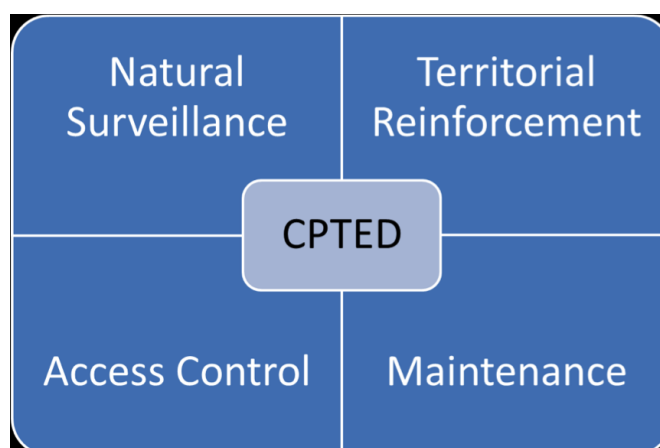

Figure 2: Crime Prevention Through Environmental Design Approaches

4.3.1 NATURAL ACCESS CONTROL

Natural Access Control (NAC) involves the use of the built and natural environments to influence how people move around a site, or in and around buildings to support security and safety objectives. This may have the effect of restricting access to certain areas, while creating a perception of detection and increased effort required by an offender with nefarious intent.

Influencing the ways in which people gain access to, and move around a site, enables greater control of the space. Lighting is an effective method of supporting access control strategies, designed to regulate the movement of people, as individuals are attracted to brightly lit areas at night. Effective lighting can be employed to direct pedestrian movements eg along designated pedestrian pathways, through tunnels and over bridges. Well-lit areas can deter crime, as there is a greater chance of an offender being observed in areas that are illuminated eg the external walls/doors of buildings, paths, fence lines, stair wells and carparks.

Other measures that can assist NAC include signage, purposefully designed landscaping, and both natural and manmade pathways, that influence the movement of pedestrians. Physical and psychological barriers can be used to attract, channel, or restrict the movement of people, and in turn, minimise opportunities for crime.

Examples of Natural Access Control include:

> Ensuring buildings are clearly identified by street number.

> Providing clear entry points.

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> Using the built environment to channel pedestrians into target areas.

> Using landscaping and other vegetation as natural barriers to deter unauthorised access.

> Using building materials/security hardware that reduces the opportunity for intruder access.

> Designing public spaces to encourage appropriate and lawful gatherings.

> Signage and wayfinding for parking areas and other spaces.

4.3.2 NATURAL SURVEILLANCE

By reducing opportunities for concealment, Natural Surveillance (NS) is enhanced, and a person's perceived risk of detection is increased, and this is, therefore, an effective crime deterrent. Well maintained landscaping with low shrubbery, uniform lighting, and wide-open spaces, will improve NS in external areas of any given site.

As an additional benefit, the effectiveness of CCTV systems is further increased when NS techniques are employed, by providing clear and open sight lines between cameras and target areas.

Effective surveillance can reduce the attractiveness of crime targets by enabling people to observe what others are doing, thereby deterring likely offenders from perpetrating criminal acts.

From a design perspective, Natural Surveillance can be enhanced by:

> Providing clear sightlines between public and private spaces.

> Avoiding blind corners along pedestrian pathways, and other trafficked areas.

> Ensuring that land uses increase opportunities for NS.

> Enabling clear oversight of communal and public areas.

> Locating building entry points so they are clearly visible from the street.

> Designing fences that maximise NS from the street to the building and from the building to the street and minimise opportunities for intruders to hide.

> Installing security grilles, shutters and doors that allow natural observation of the street from within buildings.

> Installing effective lighting in public places that does not produce glare or dark shadows.

> Ensuring that landscaping does not impede surveillance or provide a place to hide or entrap victims.

4.3.3 TERRITORIAL REINFORCEMENT

Territorial Reinforcement (TR) is achieved through physical design of the built environment, with the aim of cultivating a sense of 'territoriality' or 'ownership' in the legitimate users of the space, which further enhances the level of perceived risk to an offender. This can be achieved through the prompt removal of graffiti, repair or replacement of broken/vandalised property, and routine garden maintenance, which will give the impression of a frequently used/occupied space that is respected, appreciated, and cared for. This approach is often referred to as the 'Broken Windows' theory of crime prevention, which proposes that crime escalates in areas that are poorly maintained, as they are deemed more attractive to potential offenders.

5 RECOMMENDED CONTROLS

5.1 CAMPBELLTOWN (SUSTAINABLE CITY) DEVELOPMENT CONTROL PLAN 2015

The following is an excerpt from the Campbelltown (Sustainable City) Development Control Plan 2015, which has been identified as the core input document to the CPTED Assessment for MMRC.

'"2.7 SAFETY AND SECURITY

Objectives:

- Ensure developments are safe and secure for occupants and visitors and contribute to the safety of the public domain.
- Ensure that development incorporates security features in accordance with the principles of Crime Prevention through Environmental Design (CPTED).

Design Requirements:

1. Development should:

   i.   maximise casual surveillance opportunities to the street and surrounding public places.

   ii.   use streets fronting parks to provide opportunities for casual surveillance and improve safety of these areas.

   iii. ensure design does not give rise to dead ends and other possible entrapment areas.

   iv.   clearly identify and illuminate access points

   v.   create a sense of ownership for the public domain through design to encourage community guardianship.

   vi.   provide signage to make orientation and identification of public buildings and facilities clear.

   vii. ensure sight lines to all public areas shall be maximised. Concealed areas for possible hiding shall be avoided. Building designs shall minimise built elements which assist in providing illegitimate access. Service areas shall be secured or have surveillance.

   viii. ensure entrances shall be visible from the street.

   ix.   ensure external lighting shall be designed to:

   -    encourage the use of safe areas,

   -    define safe corridors for movement of people,

   -    allow facial recognition of approaching pedestrians at 15m.

   x.   minimise the use of external grilles, roller doors, downpipes and shelves which allow access to upper stories."

5.2 CPTED RECOMMENDATIONS

This section provides an overview of CPTED measures that have been tried and proven effective at reducing opportunities for crimes to be committed in educational and campus style settings, similar in nature to WSU and the Research Building.

5.2.1 PLACES OF CONCEALMENT

Entrapment spots and blind corners provide opportunities for crimes to be committed, including assault, vandalism, arson, and other malicious damage. As such, the following mitigation strategies should be considered:

> Entrapment areas should be designed out, wherever possible.

> Provide clear sight lines along pedestrian pathways.

> External seating should be in areas that are clearly visible with unobstructed views from surrounding areas.

> Barriers and other architectural features, including landscaping, fencing etc, should not restrict a person's ability to manoeuvre away from potential harm, because of entrapment.

> Mirrors should be installed, where appropriate, to provide visibility around corners.

> Stairwells should be designed with surveillance objectives in mind ie open stairwells, or with glazing or other viewing panels.

> Avoid the placement of seating in the immediate vicinity of high-risk areas, including ATM's, toilets, and isolated locations, to reduce opportunities for loitering.

5.2.2 LIGHTING

As previously indicated, lighting plays an important role in crime prevention as it reduces the likelihood of criminal activity being committed. The following is recommended in relation to the use of lighting as a means of reducing crime:

> All areas intended to be used at night should be provided with lighting, as required, to enhance visibility.

> Pedestrian pathways, lane ways and common access routes in external, publicly accessible areas, should be appropriately illuminated in accordance with relevant standards.

> Lighting should be uniform and clearly illuminate the faces of users of pedestrian pathways.

> Lights should be directed towards entry and egress routes to illuminate approaching/loitering persons, rather than towards buildings.

> Lighting should consider all vegetation, and landscaping should be well maintained, so as not to impede its performance.

> Avoid lighting spilling over into neighbouring properties.

> Illuminate possible places of concealment.

> External areas should be lit to enable users to identify a face 15m away, in accordance with the Campbelltown (Sustainable City) Development Control Plan 2015.

> All lighting should be well maintained and kept in clean, working condition, with prompt replacement of broken/burnt-out globes.

5.2.3 FENCING

Fencing should promote, rather than reduce, opportunities for Natural Surveillance of the street and the building, to reduce the likelihood of a crime being committed, and minimise the opportunities for potential offenders to hide, or conceal their crimes.

Fence types and locations should be determined based on the outcomes of the SRA process, to ensure they are fit for purpose, and appropriately mitigate identified risks, while not facilitating others.

5.2.4 LANDSCAPING

While landscaping can positively influence behaviours, and support access control objectives, it can also reduce surveillance opportunities by creating entrapment spots and reducing visibility around corners, which can facilitate crime. The following should be considered with respect to landscaping around the MMRC site.

> Planting arrangements such as low hedges and shrubs, low height ground cover and tall trees with bare trunks, promote Natural Surveillance, as opposed to medium height vegetation with thick foliage.

> Trees and other vegetation should not conceal building entrances from the street or public use toilets, ATM's etc.

> Landscaping should not impede artificial lighting.

> Trees should not provide a climbing aid to facilitate unauthorised access over fences, or into elevated windows, balconies etc.

5.2.5 BUILDING ENTRANCES

Key considerations for building entrances:

> Entrances should be at prominent positions and clearly visible and legible to the users.

> Design entrances to allow users to see into the building before entering.

> Entrances should be easily recognisable through design features and directional signage.

> Waiting/reception areas and entries to elevators/stairwells should be close to areas of frequent use and should be visible from main building entry points.

> Minimise the number of building entry points.

5.2.6 TERRITORIALITY

As noted, from a security and safety perspective, it is important that people have a sense of ownership of places where they live, work, or routinely frequent. Territorial Reinforcement, or Territoriality, can be promoted and enhanced through the following means:

> Ensuring that dwellings or groups of dwellings are readily recognizable by the residents using design features such as colouring, roof forms, vegetation, paving, artworks, fencing, furniture etc.

> Defining spatial areas and designated use zones, utilising physical and/or psychological barriers including roads, paths, fences, walls, landscaped gardens, and lawn areas.

> Beautification of common use areas, using landscaping, artworks, sculptures, street furniture and security features such as bollards, where appropriate.

> Repairing or replacing damaged or vandalised property.

> Prompt removal of graffiti.

> Use of appropriate signage as described below.

5.2.7 SIGNAGE

Appropriate and effective signage can assist the security function by providing information and direction to users of the space, controlling access, and influencing both vehicular and pedestrian movements. Key considerations, with respect to signage, include the following:

> Signs should be clearly visible and legible, with strong colours, and easily recognisable symbols, consistent with relevant standards.

> Signs should be located near entrances and at intersections of roads, corridors, or paths.

> Signs should indicate how to report maintenance problems in the complex.

> Main pedestrian routes through large buildings, groups of buildings, or large public spaces, should be clearly identifiable by signage.

> Where entry and exit points are impacted after hours, or where gates, carparks and other areas are closed at certain times of the day, or night, this should be clearly indicated using signage.

5.3 PHYSICAL AND ELECTRONIC SECURITY CONSIDERATIONS

An integral component of any effective crime prevention strategy is the use of physical security hardware, electronic security systems, and, ideally, and security operating procedures, that holistically serve to promote a sense of safety and security among legitimate users of the facility or public space.

Some of the physical, electronic, and operational security considerations include the following:

> Main entries to buildings including basement car parks, should be electronically access-controlled, to ensure requisite levels of security, while providing an audit trail of access control events.

> Where mechanical locking is provided, mechanical keys should be stored in an Electronic Key Management System (EKMS) for secure access and to audit key use.

> Mechanical locking and keying systems should be of high commercial quality and restricted keying profiles should be considered for high-risk areas and/or where high value assets are stored.

> Entry to basement parking should be through security access from within the building. Where access to the carpark is required by non-staff (without access cards), intercoms should be provided at entry/exit points.

> External storage/garbage areas should be physically secured and appropriately lit.

> Security grilles should be installed to secure operable windows, and other relevant building penetrations, at ground level, and in other accessible areas, as required.

> Ensure skylights and/or roof tiles cannot be readily removed or opened from outside.

> All perimeter doors, including fire stairs, should be provided with door closers and reed switches, to monitor door status.

> Install security alarm (including duress alarms) and CCTV systems in accordance with the risk profile for the facility and consistent with all relevant standards and guidelines.

> Ideally, an onsite security guard force should be engaged to monitor CCTV, as well as access control and alarm systems, and to respond to security events in a timely manner. Where an onsite guard force is deemed impractical, due to budgetary or operational constraints, an external alarm monitoring and response company should be contracted.

6 CONCLUSION

This CPTED report was circulated to relevant stakeholders and various design disciplines, including the architect and landscape architect engaged on the project, to inform their designs and to enable the CPTED related issues and recommendations to be duly considered, and reflected in the design documentation for the DA submission.

For the purposes of the DA submission, from a planning perspective, the primary considerations centre around the site layout and immediate surrounds, specifically in relation to the three core CPTED principles of Natural Surveillance, Natural Access Control and Territorial Reinforcement. LCI completed a desk top review of the architectural design drawings to identify any anomalies or major issues, from a CPTED perspective, and the key CPTED recommendations have been reflected in the documentation, to the extent required at this stage of the design process.

A review of relevant documentation will need to be undertaken in future design stages, to ensure the CPTED strategies are implemented where necessary, including demarcation of public and private spaces, and wayfinding, including, pathways, roadways, and signage, as well as landscaping and other urban design features.

As suggested, CPTED measures form one component of the overall security function and are supported by more traditional protective security approaches related to physical and electronic security. These additional measures will be addressed, to the extent required, throughout the design development process for the Medical Research Building Project.

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