POWERHOUSE PARRAMATTA
ENVIRONMENTAL IMPACT STATEMENT

APPENDIX AA
CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN REPORT

Arup

NSW GOVERNMENT

Infrastructure NSW

Powerhouse Precinct Parramatta

Powerhouse SSDA report – Security CPTED Assessment

PHM-ARP-REP-SC-0005

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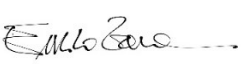
		Signature			
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Contents

1 Introduction

This report supports a State Significant Development (SSD) Development Application (DA) for the development of the Powerhouse Parramatta at 34-54 & 30B Phillip Street and 338 Church Street, Parramatta. The Powerhouse Parramatta is a museum (information and education facility) that has a capital investment value in excess of $30 million and as such the DA is submitted to the Minister for Planning pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The purpose of this CPTED report is to identify opportunities for implementing passive security strategies to reduce crime security risks for the precinct. The following activities have been undertaken:

- A review of architectural and landscape drawings of the precinct;
- A study of crime data at both a state and LGA level;
- Development of CPTED recommendations according to the specific locations identified across the precinct, which should be taken into consideration when proceeding with future design.

Infrastructure NSW is the proponent of the DA.

2 Background

The Powerhouse is Australia's contemporary museum for excellence and innovation in applied arts and sciences. The museum was established in 1879 in the Garden Palace which emerged from a history of 19th Century grand exhibition halls, including the Grand Palais. It currently encompasses the Powerhouse in Ultimo, Sydney Observatory in The Rocks and the Museums Discovery Centre in Castle Hill. The Powerhouse has occupied the Ultimo site since 1988.

Parramatta, in the heart of Western Sydney, is entering a period of rapid growth. It was identified in 2014's *A Plan for Growing Sydney* as the metropolis' emerging second Central Business District, with the provision of supporting social and cultural infrastructure regarded as integral to its success. The strategic importance of Parramatta as an economic and social capital for Sydney has been subsequently reinforced and further emphasised through its designation as the metropolitan centre of the Central City under the *Greater Sydney Region Plan*.

Powerhouse Parramatta will be the first State cultural institution to be located in Western Sydney – the geographical heart of Sydney. In December 2019, the Government announced the winning design, by Moreau Kusunoki and Genton, for the Powerhouse Parramatta from an international design competition.

Powerhouse Parramatta will establish a new paradigm for museums through the creation of an institution that is innately flexible. It will become a national and international destination renowned for its distinctive programs driven by original research and inspired by its expansive collections. It will be a place of collaboration, a mirror of its communities forever embedded in the contemporary identity of Greater Sydney and NSW.

3 Site Description

The site is located at the northern edge of the Parramatta CBD on the southern bank of the Parramatta River. It occupies an area of approximately 2.5 hectares and has extensive frontages to Phillip Street, Wilde Avenue and the Parramatta River. A small portion of the site extends along the foreshore of the Parramatta River to the west, close to the Lennox Street Bridge on Church Street. The site boundary is identified in Figure 1 and Figure 2.

The site is currently occupied by a number of buildings and structures, including:

- Riverbank Car Park – a four-level public car park
- Willow Grove – a two-storey villa of Victorian Italianate style constructed in the 1870s
- St George's Terrace – a two-storey terrace of seven houses fronting Phillip Street constructed in the 1880s
- 36 Phillip Street – a two-storey building comprising retail and business premises
- 40 Phillip Street – a two-storey building comprising retail and business premises
- 42 Phillip Street – a substation building set back from the street

The immediate context of the site comprises a range of land uses including office premises, retail premises, hotel, serviced apartments and residential apartments. To the north is the Parramatta River and open space corridor, beyond which are predominately residential uses. The Riverside Theatre is located to the north-west across the Parramatta River.

Figure 1. Aerial photograph of the site and its context

Source: Mark Merton Photography

Figure 2. Site boundary, key existing features and immediate local context

Source: Ethos Urban

4 Overview of Proposed Development

The Powerhouse was established in 1879, and Powerhouse Parramatta will radically return to its origins through the creation of seven presentation spaces of extraordinary scale that will enable the delivery of an ambitious, constantly changing program that provides new levels of access to Powerhouse Collection. The Powerhouse will set a new international benchmark in experiential learning through the creation of an immensely scaled 360-degree digital space, unique to Australia.

Powerhouse Parramatta will reflect the communities and cultures of one of Australia's fastest growing regions. It will hold First Nations culture at its core and set a new national benchmark in culturally diverse programming. The Powerhouse will be highly connected through multiple transport links, and integrate into the fine grain of the city.

Powerhouse Parramatta will be an active working precinct and include the Powerlab, which will enable researchers, scientists, artists and students from across regional NSW, Australia and around the world to collaborate and participate in Powerhouse programs. The Powerlab will feature digital studios to support music and screen industries alongside co-working spaces, life-long learning and community spaces. Integrated into the Powerlab will be a research

kitchen and library that will support a NSW industry development program including archives and oral histories.

This application will deliver an iconic cultural institution for Parramatta in the heart of Sydney's Central City. The SSD DA seeks consent for the delivery of the Powerhouse Parramatta as a single stage, comprising:

- site preparation works, including the termination or relocation of site services and infrastructure, tree removal and the erection of site protection hoardings and fencing;
- demolition of existing buildings including the existing Riverbank Car Park, 'Willow Grove', 'St George's Terrace' and all other existing structures located on the site;
- construction of the Powerhouse Parramatta, including:
    - seven major public presentation spaces for the exhibition of Powerhouse Collection;
    - front and back-of-house spaces;
    - studio, co-working and collaboration spaces comprising the 'Powerlab', supported by 40 residences (serviced apartments) for scientists, researchers, students and 60 dormitory beds for school students;
    - education and community spaces for staff, researchers and the Powerlab residents, the community, and education and commercial hirers;
    - commercial kitchen comprising the 'Powerlab Kitchen' used for cultural food programs, research, education and events;
    - film, photography, and postproduction studios that will connect communities with industry and content that will interpret the Powerhouse Collection;
    - public facing research library and archive for community, industry, students and researchers to access materials; and
    - a mix of retail spaces including food and drink tenancies with outdoor dining.
- operation and use of the Powerhouse Parramatta including use of the public domain provided on the site to support programs and functions;
- maintenance of the existing vehicular access easement via Dirrabarri Lane, the removal of Oyster Lane and termination of George Khattar Lane, and the provision of a new vehicular access point to Wilde Avenue for loading;
- public domain within the site including new public open space areas, landscaping and tree planting across the site; and
- building identification signage.

The project does not seek consent for the carrying out of works outside of the site boundary, and in particular does not involve any alterations to the existing edge of the formed concrete edge of the Parramatta River or to the waterway itself.

5 Assessment Requirements

Arup has been engaged to undertake a Crime Prevention Through Environmental Design (CPTED) review of Powerhouse Parramatta as a result of the Planning Secretary's Environmental Assessment Requirements (SEARS). It is stated that the Environmental Impact Statement (EIS) for the built form, heritage and urban design must address CPTED principles via a CPTED Assessment report.

Division 4.3, s. 4.15 of the *Environmental Planning and Assessment Act 1979* states that the consent authority must consider "*the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality".*

In 2001, the NSW Department of Urban Affairs and Planning (now known as NSW Department of Planning, Industry and Environment), constructed guidelines known as 'Crime Prevention and the Assessment of Development Applications'. These guidelines were under section 79C of the *Environmental Planning and Assessment Act*, where it was stated that a two-step process is recommended for the incorporation of CPTED principles in design:

- Part A: Crime risk assessment – to contextualise the crime risk of the development area and inform CPTED strategies to address these risks.
- Part B: Implement the key CPTED principles of natural surveillance, natural access control and territoriality into the design.

These principles are discussed in Section 6.1.

This report has been prepared having regard to the SEARs as follows:

Table 1. SEARs Assessment Requirements

SEAR	Where Addressed
3. Built form, heritage and urban design The EIS shall: • Address Crime Prevention Through Environmental Design (CPTED) Principles via a CPTED Assessment Report.	*Section 9*

6 CPTED Principles

6.1 Crime Prevention Through Environmental Design

CPTED refers to the process of designing spaces to reduce opportunities for/ decrease risks associated with criminal behaviour. As stated in the "*Crime prevention and the assessment of development applications*", the four main principles of CPTED include:

- **Natural surveillance** – increased visibility of space to observe and detect antisocial behaviours, as well as provide a deterrence effect for potential offenders.
- **Natural Access Control** – manipulating the layout of a space to deter offenders from gaining unauthorised access and limiting potential 'escape routes'.
- **Territoriality** – refers to the clear distinction between public and private space. This can assist in enhancing the ability of legitimate users of the space to detect unauthorised access.
- **Space management** – ensures that the space is regularly maintained and cared for.

However, additional principles have been developed in more modern interpretations of the CPTED concept, known as 2nd Generation CPTED (Saville and Cleveland 1997) that supplement the above. These include the following:

- **Social Cohesion** – facilitating a sense of community through designing spaces that fulfil the needs of the local community (e.g. community halls, schools and playgrounds), reducing boredom and/or disconnect within the community;
- **Connectivity** – designing spaces that provide the capacity for diverse interaction between community members. This encourages space activation and increased liveability;
- **Community culture** – designing spaces to generate an interest and sense of ownership of the space through providing for cultural identity (e.g. displaying public art).

7 Crime Risk Assessment

A crime risk assessment is the evaluation of a site/area and identify the rate of incidence of certain crime types in their current context. This information is intended to assist in determining the CPTED strategies to be implemented. The following information has been referenced to inform this crime risk assessment:

- NSW Bureau of Crime Statistics and Research (BOCSAR) data.

7.1 State Analysis

Based on statistics gathered from BOCSAR for recorded incidents for all major offences in December 2019, NSW has had a relatively stable rate of occurrences over the past 24 months, with a decrease in some crime types between 1.1% to 9.6%.

The only crimes that have increased in trend in the last 24 months have been '*domestic violence related assault'*, increasing by 5.0% and '*steal from retail store*', increasing by 8.3%.

The below table highlights all major offences in NSW and their subsequent trends over the past 24 months and 60 months, leading up to December 2019.

Table 2: NSW offences recorded over the past 60 months to December 2019

Offence Category	Trend over last 24 months	Trend over last 60 months
Murder	Stable	Stable*
Domestic violence related assault	Up by 5.0%	Stable*
Non-domestic violence related assault	Stable	Stable*
Sexual assault	Stable	Up by 5.9%
Indecent assault, act of indecency and other sexual offences	Stable	Up by 4.7%
Robbery without a weapon	Stable	Stable*
Robbery with a firearm	Stable	Stable*
Robbery with a weapon not a firearm	Stable	Stable*
Break and enter dwelling	Stable	Down by 5.3%
Break and enter non-dwelling	Stable	Down by 4.5%
Motor vehicle theft	Stable	Stable*
Steal from motor vehicle	Stable	Down by 1.1%
Steal from retail store	Up by 8.3%	Up by 5.1%
Steal from dwelling	Stable	Down by 3.3%
Steal from person	Down by 7.1%	Down by 9.6%

Fraud	Stable	Stable*
Malicious damage to property	Stable	Down by 2.9%

*A non-significant test result (p > .05) is denoted by 'Stable' or by 'ns' in some larger LGA tables (NSW Recorded Crime Statistics, Quarterly Update - December 2019, BOCSAR)

7.2 LGA Analysis

When analysing crime within the Parramatta LGA the following were identified as primary concerns based on their rates of incidence:

Table 3: Parramatta Major Relevant Offences recorded over the past 60 months to December 2019

Crime Type	Rate per 100,000 population (Jan – Dec 2019)	2-year trend and annual percent change (Jan 2018-Dec 2019)	5-year trend and average annual percent change (Jan 2015-Dec 2019)
Non-domestic violence related assault	348.6	Stable	Stable
Intimidation, stalking and harassment	352.9	Up 9.4%	Up 4.5%
Steal from motor vehicle	597.7	Up 20.4%	Stable
Motor vehicle theft	159.2	Up 23.5%	Up 5.7%
Break and enter dwelling	374.8	Stable	Stable

Other crime types that should be considered for CPTED design interventions include:

- **Graffiti**: Property damage caused by substances, e.g. paint, posters, plastic and metal compounds.
- **Other theft**: other types of theft not including motor vehicle theft, e.g. steal from person and steal from retail store.

Table 4: Parramatta Offences (Other) recorded over the past 60 months to December 2019

Crime Type	Rate per 100,000 population (Jan – Dec 2019)	2-year trend and annual percent change (Jan 2018-Dec 2019)	5-year trend and average annual percent change (Jan 2015-Dec 2019)
Malicious Damage to Property (Graffiti/Vandalism)	538.8	Stable	Down 2.9%
Steal from person	89.9	Stable	Stable
Steal from retail store	335	Stable	Up 4.2%
Break and enter non-dwelling	88.7	Stable	Down 8.9%
Other theft	386	Stable	Stable

Based on the crime data, the following (opportunistic) crime threat scenarios have been identified for the project at this time, being:

- Assault;
- Steal from person;
- Motor vehicle theft;
- Steal from motor vehicle;
- Break and enter non-dwelling;
- Steal from retail store;
- Intimidation, stalking and harassment; and
- Graffiti/vandalism.

It is noted that further threat scenarios will be identified and analysed in the security risk assessment (SRA) work for the project.

7.3 Fidelity of Crime Data

Arup recognises that past crime statistics may not be a reliable indicator of future crime trends. The changes to local social, economic and environmental elements that are associated with installing new, large-scale infrastructure may lead to significant variations to the current crime context.

However, it is important to note that the current crime context does provide some indication of the immediate issues to address and can account for potential future crime trends. Further, it is expected that the establishment of the Powerhouse Museum is anticipated to significantly change the crime risk profile of the site.

8 Locations

For the purposes of this report, the site has been split based on common spatial characteristics to provide clarity of the proposed design strategies to implement CPTED principles across the site to reduce opportunities for criminal behaviour.

The design strategies recommended in the CPTED Report are based on the following reference documents:

- NSW Crime Prevention and the Assessment of Development Applications (NSW Department of Urban Affairs and Planning, April 2001);
- QLD CPTED Guidelines Part A: Essential Features of Safer Places (Queensland Government, 2007), and;
- QLD CPTED Guidelines Part B: Implementation Guide (Queensland Government, 2007).

Based on the guidance above, the focus of the CPTED strategy is as detailed below:

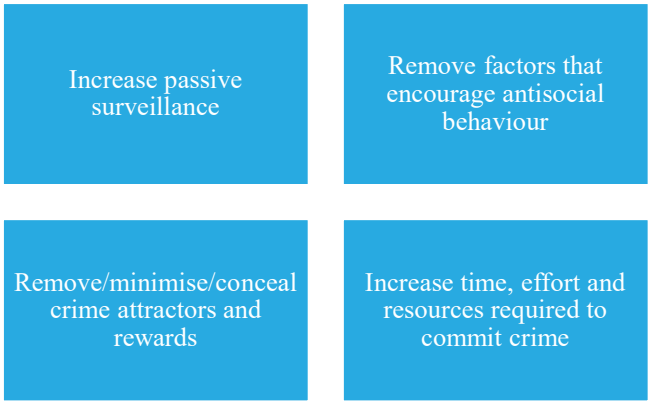

Figure 3: CPTED objectives

Following a review of the current plans, Arup has identified the following locations as key design intervention points where CPTED principles may be applied:

- Pedestrian walkways;
- Building entrances;
- Building undercrofts;
- Façade/exoskeleton;
- Open Space areas (i.e. parks);
- Seating areas;
- Vehicle entrances; and
- Bus stops.

9 Implementing CPTED Principles into Design

This section provides recommendations for the implementation of CPTED principles for the locations identified in Section 8. Recommendations have been developed for each of the individual locations, however the following overarching strategies are proposed at a site-wide level:

Landscaping

Landscaping should be well maintained and considerate of the impact of planting on the visibility of public spaces. As such, passive surveillance can be increased, improving capabilities of detecting anti-social and criminal behaviours, supporting CCTV field of view and limiting opportunities to vandalise plant beds and trees. It is recommended that branch height be 3m (1.5m in critical areas) for trees, and shrub heights be below 600mm to remove the potential use as a hiding spot.

Key Design Objectives

Minimise impact of planting on natural surveillance

Lighting

Lighting is an important component of natural surveillance and may contribute to the public perception of safety of a site.

The public domain lighting design should avoid high contrast ratio (i.e. 'walls of darkness') and support the identification of a person's face from c. 15m distance. The lighting design should be implemented in a manner that encourages the legitimate use of safe spaces around the site – e.g. safe pathways where other controls have been implemented, such as CCTV or operational controls. Effective lighting design may improve passive surveillance by encouraging evening space activation and supporting the night-time economy of the Powerhouse precinct as applicable.

Further, it is noted that the undercrofts for both buildings need to be considered as potential risk areas as a result of lower visibility. Therefore, it is recommended lighting measures are implemented to promote visibility of the space and to support CCTV coverage.

Key Design Objectives

Facilitate identification of a person's face from c. 15m

Limit stark contrasts in lighting to avoid creating 'walls of darkness'

Support technical security controls (e.g. CCTV)

Maintenance

Public spaces that are not well-maintained may result in poor perceptions of safety for the site and encourage illegitimate use (per 'broken windows' theory – Wilson and Kelly, 1982) due to a perceived absence of guardianship for the space. Implementing consistent maintenance regimes for the precinct (i.e. promptly cleaning up graffiti/ repairing damage) may demonstrate guardianship over the space and discourage such behaviours by removing the associated 'rewards'.

Key Design Objectives

Implement ongoing maintenance regimes/ response capabilities to property damage.

Anti-Climbing Measures

The current design of the building façade contains a perforated exoskeleton design with 2-3 levels of lattice. This presents potential climbing opportunities noting the lattice may be used for hand/foot holds. This presents several security, safety and operational concerns.

In order to address this issue, coordination between façades, architect and the security teams is to be undertaken to consider a reduction in climbing opportunities. Solutions may include limiting potential finger holds at ground level and/or utilisation of material finishes that increase the difficulty of climbing the exoskeleton.

Key Design Objectives

Facilitate coordination between design teams to reduce climbing opportunities in the design.

9.1 Pedestrian Walkways

Current plans show numerous primary pathways that direct pedestrians into popular sections throughout the precinct. Due to the site's permeability, pedestrians are encouraged to use the dedicated pathways outside of operational hours, which is likely to present potential opportunities for threat actors to target people where isolated. Potential crime threat scenarios associated with walkways include: assaults, steal from person and intimidation, stalking and harassment.

The following strategies are proposed to implement CPTED principles into the design of pedestrian walkways in the precinct:

- Limit alcoves close to pedestrian walkways and impact to natural surveillance to reduce opportunities for threat actors to leverage site layouts to ambush patrons and to allow pedestrians to identify potential hazards in time to react;
- Ensure lighting/ natural and technical surveillance is not blocked by mature plants or other structures, and;
- Support way-finding through the use of signage and maps incorporated throughout the space to encourage use of safe pathways through the precinct.

Figure 4: Powerhouse Museum Precinct Pedestrian Walkways

9.2 Building Entrances

Multiple building entrances have been noted throughout the precinct (see Figure 5). As a result of the potential for higher foot traffic in these locations during operational hours, relatively high natural surveillance is expected. It is anticipated that this will reduce outside of operational hours where the precinct is less populated and may present opportunities for carrying out criminal behaviours with lower likelihood of detection. Crime threat scenarios for building entrances may include: crimes against the person such as assault and steal from person. It also is noted that there is the potential for property crimes including break and enter and general theft offences.

The following CPTED strategies are proposed for building entrances:

- Provide clear sightlines from pathways to entrances;
- Facilitate clear sight lines from within the building such that users can see the space prior to exiting;
- Clearly distinguish the entrance from public walkways through:
  - Changes of material and texture in the pavement;
  - Level changes, and;
  - Signage – to indicate public entrances/ restricted access entrances as well as direct patrons leaving the facility toward key transport/ exits (e.g. buses, taxis etc.)
- Design the entrance to limit opportunities for potential threat actors to hide.

Figure 5: Powerhouse Museum Precinct Entrances

9.3 Open Space areas

Open space areas (i.e. parks) are shown on plan interfacing with key pedestrian walkways. It is anticipated that pedestrians will gather in this area for extended periods of time. However, at night-time and during off-peak hours (where natural surveillance is limited), landscaped areas that lead away from clear sightlines may lead to isolation of potential crime targets. Key crime threat scenarios for these locations may include: assault, steal from person and intimidation, stalking and harassment.

CPTED strategies proposed for the park areas include:

- Maintaining landscaping per the site-wide guidance to limit obstructions to natural surveillance. Consider (on a risk basis) maintaining minimum branch heights on trees above 1.5m to discourage climbing/ vandalism (breaking of branches) and to support passive surveillance.
- Mature plant heights in garden beds are below 600mm in height where practical. Alternatively, plant species selection may be selected that minimise obstructions to passive sightlines and lighting through the site;
- Design should consider activation of the space to encourage legitimate use (e.g. seating, recreational equipment, events flexibility) to promote sense of community ownership. If incorporated, vandal resistant materials and finishes should be implemented where practical.

Figure 6. Powerhouse Museum Precinct Open Space Areas

9.4 Seating areas

Based on the current plans, one main seating area was identified in the precinct. The presence of seating is anticipated to encourage patronage in this area during operational hours – facilitating natural surveillance. It should be noted that, as with other locations, this space may present opportunities for a range of crime threats out of hours, including: crimes against the person – i.e. assault, steal from person and intimidation, stalking and harassment. It is noted that crimes against the property, such as vandalism of seating and tables is also a potential threat scenario identified for seating locations. CPTED strategies proposed for seating areas include:

- Implementing regular maintenance schemes in line with the site-wide recommendations to repair/ restore furniture that is damaged.
- Designing lighting to enable pedestrians seated in the area to identify potential security hazards around them;
- Vandal resistant materials and finishes should be considered for furniture. Additionally, removable furniture can be considered for usage while complying with the proposed strategies.
- Implement signage/ changes to pavement material/ texture to direct patrons to safe pathways.

Figure 7: Powerhouse Museum Precinct Seating Areas

9.5 Vehicle entrances

A number of vehicle entrances have been identified on plan, along Dirrabarri Lane and Wilde Avenue. Due to the isolated nature of Dirrabarri Lane (off-peak times) in relation to the rest of the precinct, there is a possibility that pedestrians who wander into this space may be followed and targeted by threat actors – e.g. assault, stalking and steal from person. It should also be noted that unauthorised vehicle access to restricted areas (e.g. loading dock circulation) could occur from both entrances. CPTED strategies proposed for vehicle entrances include:

- Clearly signpost loading/service vehicle access points and segregate public/ restricted access points where practical.
- Demarcate vehicle entrances and pedestrian entrances to discourage pedestrian usage of vehicle entries through the use of signage.

Figure 8: Powerhouse Museum Precinct Vehicle Entrance

9.6 Coach Stop

A coach stop area is shown on the current plan (see Figure 9). While the bus stops are expected to encourage patronage of the location – and it is located on a main road – late-night usage may present opportunities for isolated patrons to be targeted by threat actors. However, it is noted that this stop is not intended for public use, but instead by coaches for school excursions, tour groups and other such groups. As such, it is not expected that users of this location will be loitering in this space outside of Powerhouse Parramatta's operating hours.

While large groups at any given time are likely to deter potential offenders, there still exists a number of potential crime threat scenarios. These include assault, steal from person and intimidation, stalking and harassment. In addition, crimes against property are a possibility, including vandalism of the bus stop and associated assets. The following CPTED strategies are proposed for the bus stop:

- Minimise potential hiding opportunities by facilitating clear passive surveillance of the bus stop from the footpath and roadway. Consider impact on visibility of assets such as rubbish bins, bus shelters and landscaping.
- Implement lighting and maintenance strategies consistent with the site wide guidelines;
- Vandal resistant materials and finishes should be considered for any bus stop assets (e.g. shelters, signage) that are proposed.

Figure 9. Powerhouse Museum Precinct Coach Stop

10 Conclusion

In accordance with the requirements set out by SEARS, the Environmental Impact Statement (EIS) for the built form, heritage and urban design must address Crime Prevention Through Environmental Design (CPTED) principles via a CPTED Assessment report. To begin, a review of current architectural (DA062 – Proposed Site Master Plan) and landscape (LD_DA_00-02-Landscape Plan – Podium Level) drawings of the proposed Powerhouse precinct development was undertaken to gain an understanding of the layout of the site and its potential to facilitate for the implementation of CPTED principles.

In order to better contextualise the threat of certain crimes and threat actors, a study of crime data was completed at a state and LGA (Parramatta) level. This assisted in identifying threats relevant to the site, however, will require future meetings with stakeholders and additional security risk assessment work to further identify threat scenarios.

Several locations were identified the site, based on their spatial characteristics and were analysed based on the types of risks that could occur/be attracted to these areas. As such, overarching CPTED principles were recommended at a site-wide level and location-specific CPTED strategies were recommended to address risks identified. It is recommended that a final review of the plans be undertaken during the detailed design phase and prior to construction to confirm CPTED recommendations and mitigations proposed in this report have been adopted into the design.