



Simulated View* Trees shown at maturity **

----- MPE Stage 1 (subject to separate application)

view 18

Viewing Location	South of site, Moorebank Avenue
Visual Adaptation	
Approximate Viewing Distance	250m to site boundary (approx.)
Prominence of the Development	<p>There is a relatively unobstructed view from this portion of Moorebank Avenue to the Proposal.</p> <p>The MPE Stage 1 development would be highly prominent from this location as would the southern portion of the Proposal.</p>
Landscape Compatibility	<p>The addition of any new industrial development within this viewpoint would not alter the existing landscape amenity. There is little existing vegetation and the existing industrial elements sitting within the boundary of the site are highly visible. The addition of the Proposal would not detract from the urban context despite changes to the viewpoint being somewhat prominent. As such, a moderate visual adaptation is identified.</p>
Visual Sensitivity	<p>The existing industrial use at this location demonstrates a low visual sensitivity for this viewpoint area. Most users of the area would be travelling through an established industrial precinct, only being exposed for a short period of time.</p>
Visual Impact	<p>The Proposal would be highly prominent at this location. However, the compatibility of the existing urban context would mean that any additional industrial elements would not detract from the visual amenity of the area, resulting in a low/moderate visual impact.</p>



Simulated View* Trees shown at maturity **



MPW Stage 2 (subject to separate approval)

view 19

Viewing Location	South of site, Moorebank Avenue
Visual Adaptation	
Approximate Viewing Distance	50m to site boundary (approx.)
Prominence of the Development	<p>There is a relatively unobstructed view from this portion of Moorebank Avenue to the Proposal.</p> <p>The MPE Stage 1 development would be highly prominent from this location as would the southern portion of the Proposal.</p>
Landscape Compatibility	<p>The addition of any further industrial development within this viewpoint would not alter the existing landscape amenity. There is little existing vegetation and the existing industrial elements sitting within the boundary of the site are highly visible. The addition of the Proposal would not detract from the urban context despite changes to the viewpoint being somewhat prominent. As such, a moderate visual adaptation is identified.</p>
Visual Sensitivity	<p>The existing industrial use at this location demonstrates a low visual sensitivity for this viewpoint area. Most users of the area would be travelling through an established industrial precinct, only being exposed for a short period of time.</p>
Visual Impact	<p>The Proposal would be prominent at this location but largely screened by the MPE Stage 1 development. However, the compatibility of the existing urban context would mean that any additional industrial elements would not detract from the visual amenity of the area, resulting in a low/moderate visual impact.</p>



Simulated View* Trees shown at maturity **



MPW Stage 2 (subject to separate approval)

view 20

Viewing Location	West of site, Moorebank Avenue
Visual Adaptation	
Approximate Viewing Distance	20m to site boundary (approx.)
Prominence of the Development	The viewpoint is located adjacent to the site on Moorebank Avenue, looking toward the Proposal. From this location the Proposal would be highly prominent.
Landscape Compatibility	A moderate visual adaptation is identified as the existing urban context is of industrial use. Any addition to such would not negatively impact the visual amenity.
Visual Sensitivity	The existing industrial use of this location demonstrates a low visual sensitivity for this area. Users would be travelling through an established industrial precinct, only being exposed for a short period of time.
Visual Impact	The Proposal would be highly prominent at this location. However, the compatibility of the existing urban context would mean that any addition to the industrial precinct would not detract from the visual amenity of the viewpoint, resulting in a low/moderate visual impact.




Simulated View* Trees shown at maturity **
[Green Box] MPW Stage 2 (subject to separate approval)
----- MPE Stage 1 (subject to separate approval)

view 21

Viewing Location	North-West of site, Moorebank Avenue
Visual Adaptation	
Approximate Viewing Distance	500m to site boundary (approx.)
Prominence of the Development	The viewpoint is located north of the site on Moorebank Avenue, looking toward the Proposal. From this location the Proposal would be highly prominent.
Landscape Compatibility	A moderate visual adaptation is identified as the existing urban context is of industrial use. Any addition to such would not negatively impact the visual amenity.
Visual Sensitivity	The existing industrial use of this location demonstrates a low visual sensitivity for this area. Users would be travelling through an established industrial precinct, only being exposed for a short period of time.
Visual Impact	The Proposal would be highly prominent at this location. However, the compatibility of the existing urban context would mean that any addition to the industrial precinct would not detract from the visual amenity of the viewpoint, resulting in a low/moderate visual impact.



Simulated View* Trees shown at maturity **

 MPW Stage 2 (subject to separate approval)


----- MPE Stage 1 (subject to separate approval)

view 22

Viewing Location	North of site, Corner of Moorebank Avenue and Anzac Road
Visual Adaptation	
Approximate Viewing Distance	750m to site boundary (approx.)
Prominence of the Development	The viewpoint is located north of the site on Moorebank Avenue, looking toward the Proposal. From this location the Proposal would be highly prominent.
Landscape Compatibility	A moderate visual adaptation is identified as the existing urban context is of industrial use. Any addition to such would not negatively impact the visual amenity.
Visual Sensitivity	The existing industrial use of this location demonstrates a low visual sensitivity for this area. Users would be travelling through an established industrial precinct, only being exposed for a short period of time.
Visual Impact	The Proposal would be highly prominent at this location. However, the compatibility of the existing urban context would mean that any addition to the industrial precinct would not detract from the visual amenity of the viewpoint, resulting in a low/moderate visual impact.



Simulated View* Trees shown at maturity **

 MPW Stage 2 (subject to separate approval)

----- MPE Stage 1 (subject to separate approval)

view 23

Viewing Location	Corner of Moorebank Av. and Road marked as DS NNSW LMA
Visual Adaptation	
Approximate Viewing Distance	20m to site boundary (approx.)
Prominence of the Development	The viewpoint is located adjacent to the site on Moorebank Avenue, looking toward the Proposal. From this location the Proposal would be highly prominent.
Landscape Compatibility	A moderate visual adaptation is identified as the existing urban context is of industrial use. Any addition to such would not negatively impact the visual amenity.
Visual Sensitivity	The existing industrial use of this location demonstrates a low visual sensitivity for this area. Users would be travelling through an established industrial precinct, only being exposed for a short period of time.
Visual Impact	The Proposal would be highly prominent at this location. However, the compatibility of the existing urban context would mean that any addition to the industrial precinct would not detract from the visual amenity of the viewpoint, resulting in a low/moderate visual impact.

7.1 visual impact during construction

Construction of the Proposal is proposed to take between 24 and 36 months, commencing in the final quarter of 2017, with the completion of construction in the third quarter of 2019 (should construction take 24 months).

The following construction works are likely to be visible from surrounding areas and have been considered:

- Vegetation clearing and building demolition;
- Establishment and decommissioning of ancillary facilities including batch plant;
- Earthworks including stockpiling of material;
- Installation of drainage and utilities;
- Construction of access and egress points connecting to existing road network, including signage and signalling.
- Construction of warehousing precinct (including associated infrastructure and services).
- Construction of freight village (including associated infrastructure and services).

During the above construction works the most visible elements are likely to be equipment such as cranes and piling rigs. These are likely to be visible from areas such as Moorebank Avenue, the nearby passenger rail lines and nearby residential areas of Casula and Wattle Grove. However, given the low rise nature of construction works, it is unlikely that these works would be overly intrusive and that any visual impacts would be localised and temporary in nature.

Other sources of visual impact during construction such as the establishment of hoardings and construction fencing would tend to create highly localised visual impacts primarily along Moorebank Avenue and also in areas visible to Wattle Grove.

Based on the their location and the works proposed, the visual impact during construction has been assessed for the following viewpoints:

View Location Name	Area	Type	Visual Adaptation	Visual Sensitivity	Visual Impact
View 01	Casula	Residential	Negligible	Moderate	Negligible
View 02	Casula	Public space	Negligible	Low	Negligible
View 03	Casula	Public space	Negligible	Moderate	Negligible
View 04	Casula	Public space	Low/Moderate	Moderate/high	Moderate/high
View 05	Casula	Public space	Moderate	Low	Low/Moderate
View 06	Casula	Residential	Negligible	High	Negligible
View 07	Casula	Road/Industrial	Negligible	Moderate	Negligible
View 08	Moorebank	Road/Industrial	Low/Moderate	Low	Low/Moderate
View 09	Moorebank	Industrial	Low	Low	Low
View 10	Wattle Grove	Residential/Industrial	Low	Low/Moderate	Low/Moderate
View 11	Wattle Grove	Residential	Low	Moderate	Low/Moderate
View 12	Wattle Grove	Residential	Low	Moderate	Low/Moderate
View 13	Wattle Grove	Residential	Low	Moderate	Low/Moderate
View 14	Wattle Grove	Residential	Negligible	High	Negligible
View 15	Wattle Grove	Residential	Negligible	High	Negligible
View 16	Wattle Grove	Residential	Negligible	High	Negligible
View 17	Holsworthy	Road	Negligible	Low	Low
View 18	Moorebank	Road	Moderate	Low	Low/Moderate
View 19	Moorebank	Road	Moderate	Low	Low/Moderate
View 20	Moorebank	Road	Moderate	Low	Low/Moderate
View 21	Moorebank	Road	Moderate	Low	Low/Moderate
View 22	Moorebank	Road	Moderate	Low	Low/Moderate
View 23	Moorebank	Road	Moderate	Low	Low/Moderate

Table 8 - Visual Impact during Construction

The following mitigation measures would be implemented to reduce the overall visual impact during construction phase:

- Existing vegetation around the perimeter of construction sites would be retained where feasible and reasonable;
- The early implementation of landscape planting would be recommended for consideration in order to provide visual screening during the construction of the Proposal;
- Elements within construction sites would be located to minimise visual impacts as far as feasible and reasonable, e.g. setting back large equipment from site boundaries;
- Design of site hoardings would consider the use of artwork or project information;
- Regular maintenance would be undertaken of site hoardings and perimeter areas including the prompt removal of graffiti;
- Re-vegetation/landscaping would be undertaken progressively; and
- Where required for construction works, cut-off and directed lighting would be used and lighting locations considered to ensure glare and light spill are minimised.

7.2 cumulative visual impact of the Proposal(s)

This section of the report provides a cumulative impact assessment for the following:

- MPE Stage 1 (14-6766) and MPE Stage 2 (16-7628)
- MPW Stage 2 (SSD 5066) (as modified)

Methodology

The potential visual cumulative impact by the inclusion of the proposals on the MPE and MPW sites is demonstrated by pursuing the following general approach and methodology:

- Selection of appropriate/representative viewpoints from the Section 7 of this report.
- Indicative overlay of previous stages within the precinct.
- An assessment against the criteria outlines in Section 3 of this report summarised in Table 9 that follows.

Based on their location and the works proposed, the cumulative visual impact of the Proposal(s) has been assessed for the following viewpoints:

View Location Name	Area	Type	Visual Adaptation	Visual Sensitivity	Visual Impact
View 01	Casula	Residential	Negligible	Moderate	Negligible
View 02	Casula	Public space	Low/Moderate	Low	Low/Moderate
View 03	Casula	Public space	Low	Moderate	Low/Moderate
View 04	Casula	Public space	Moderate	Moderate	Moderate
View 05	Casula	Public space	Moderate	Moderate	Moderate
View 06	Casula	Residential	Negligible	High	Negligible
View 07	Casula	Road/Industrial	Negligible	Moderate	Negligible
View 08	Moorebank	Road/Industrial	Low/Moderate	Low	Low/Moderate
View 09	Moorebank	Industrial	Low	Low	Low
View 10	Wattle Grove	Residential/Industrial	Low	Low/Moderate	Low/Moderate
View 11	Wattle Grove	Residential	Low	Moderate	Low/Moderate
View 12	Wattle Grove	Residential	Low	Moderate	Low/Moderate
View 13	Wattle Grove	Residential	Low	Moderate	Low/Moderate
View 14	Wattle Grove	Residential	Negligible	High	Negligible
View 15	Wattle Grove	Residential	Negligible	High	Negligible
View 16	Wattle Grove	Residential	Negligible	High	Negligible
View 17	Holsworthy	Road	Negligible	Low	Negligible
View 18	Moorebank	Road	Moderate	Low	Low/Moderate
View 19	Moorebank	Road	Moderate	Low	Low/Moderate
View 20	Moorebank	Road	Moderate	Low	Low/Moderate
View 21	Moorebank	Road	Moderate	Low	Low/Moderate
View 22	Moorebank	Road	Moderate	Low	Low/Moderate
View 23	Moorebank	Road	Moderate	Low	Low/Moderate

Table 9 - Cumulative Visual Impact of the Proposal(s)

THIS PAGE HAS BEEN LEFT BLANK INTENTIONALLY

08 light spill assessment

For full report refer to Appendix A for the Light Spill Assessment prepared by Arcadis.

09 conclusion

The MPE Stage 2 proposal is to be developed on a site that had previously been occupied by the Department of Defence for many years and has been primarily utilised for warehouse and distribution/logistics related activities. Many of the facilities on the existing site have reached or are beyond their useful life.

Besides secure perimeter fencing there is very little existing landscaping or other visual screening to shield operations from the public view and that of surrounding developments.

The site is surrounded by expansive areas of dense bushland and other lands owned and occupied by the Commonwealth for industrial and Military related uses.

The next closest developments to the site are also largely industrial, with the closest residential areas being Wattle Grove to the north and east, and Casula approximately 1km to the west across the Georges River.

The Proposal would generally be in keeping with the existing character of the area. Some high and/or bulky structures/equipment may however increase the visibility of the site beyond its current levels, with some limited and localised visual impacts.

The pattern of development surrounding the site would screen the development from much of the surrounding area. Potential views do occur along viewing corridors created by streets bounding the site (Moorebank Avenue and Anzac Road), and where topography provides some elevation above potential obstructions to views.

Visual impact has been assessed from locations with potential views of the development as identified through a digital viewshed analysis. The anticipated visual impact of each viewpoint has been analysed using a range and combination of qualitative criteria.

Given the nature of the Proposal and its consistency with general industry within the local area, higher visual impact locations would be primarily those in residential areas that have prominent views of site elements. This study found minimal visual impact to residential areas.

The limited visual impact to residential areas is mainly due to distance, existing visual barriers and undulating topography between the site and these residential zones.

The most prominent views of the development would occur at localised boundary points such as Moorebank Avenue and Anzac Road, however these are regarded to be of relatively low impact because the existing urban context being reasonably compatible with the Proposal.

A number of visual impact mitigation measures have been proposed including significant and intensive landscaping, planting and built-form screening that would reduce the visibility of the development and improve the overall visual amenity of the site and area generally.

The light spill assessment concludes that minimal effect on adjacent properties and the environment can be achieved through appropriate selection of light source, luminaire make and direction as well as pole positions and height from static site lighting. These would comply with limits stipulated in AS 4282 - 1997 Control of the obtrusive effects of outdoor lighting.

appendix A

Light Spill Study Report

Arcadis

Moorebank Precinct East (MPE) - Stage 2 Proposal

Light Spill Assessment



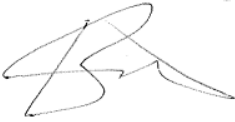
SIMTA


SYDNEY INTERMODAL TERMINAL ALLIANCE


Part 4, Division 4.1, State Significant
Development

MOOREBANK PRECINCT EAST STAGE 2

Light Spill Assessment

Author Brent Tough 

Checker Anna Zolotukhina 

Approver Claire Vahtra 

Report No R-0002-AA009017-AAR-01
Date 10/11/2016
Revision Text 01

This report has been prepared for Sydney Intermodal Terminal Alliance in accordance with the terms and conditions of the appointment. Arcadis Australia Pacific Pty Limited (ABN 76 104 485 289) cannot accept any responsibility for any use of or reliance on the contents of this report by any third party.

REVISIONS

Revision	Date	Description	Prepared by	Approved by
P1	13/10/2016	Draft Issue	IN	MK
P2	28/10/2016	For Information	BT	AZ
01	10/11/2016	For SSD application	BT	CV

CONTENTS

1 INTRODUCTION.....	6
1.1 Purpose of this report.....	7
1.2 Overview of the Proposal	9
1.3 Key terms relevant to the Proposal	10
2 LIGHT SPILL ASSESSMENT.....	14
2.1 Background	14
2.2 Methodology	14
2.3 Lighting Standards	15
2.4 Lighting Design	15
2.4.1 Luminaire Selection	16
2.4.2 Luminaire Position and Mounting Height.....	16
2.4.3 Compliance with AS 4282-1997 Control of the obtrusive effects of outdoor lighting	17
2.4.4 Mobile and Transitory Lighting.....	17
2.5 Luminaire schedule	19
3 ASSESSMENT RESULT	20
3.1.1 Compliance with AS 4282	20

FIGURES

Figure 1: Overview of the Proposal

Figure 2: Site context and relevant boundary

Figure 3: Sylvania Roadster

Figure 4: General site layout showing light spill isolux curves both external and internal to the site

TABLES

Table 1: Secretary’s Environmental Assessment Requirements relevant to this study

Table 2: Concept Plan conditions of approval and Statement of Commitments relevant to this study

Table 3: Summary of key terms used throughout this document

Table 4: Luminaire Schedule

APPENDICES

Appendix A – Light spill result Boundary 1.0 / 2.0

1 INTRODUCTION

Concept Plan Approval (MP 10_0193) for an intermodal terminal (IMT) facility at Moorebank, NSW (the Moorebank Precinct East Project (MPE Project) (formerly the SIMTA Project)) was received on 29 September 2014 from the NSW Department of Planning and Environment (DP&E). The Concept Plan for the MPE Project involves the development of an IMT, including a rail link to the Southern Sydney Freight Line (SSFL) within the Rail Corridor, warehouse and distribution facilities with ancillary offices, a freight village (ancillary site and operational services), stormwater, landscaping, servicing, associated works on the eastern side of Moorebank Avenue, Moorebank, and construction or operation of any part of the project, which is subject to separate approval(s) under the *Environmental Planning and Assessment Act 1979* (EP&A Act).

This Environmental Impact Statement (EIS) is seeking approval, under Part 4, Division 4.1 of the EP&A Act, for the construction and operation of Stage 2 of the MPE Project (herein referred to as the Proposal) under the Concept Plan Approval for the MPE Project, being the construction and operation of warehouse and distribution facilities.

This EIS has been prepared to address:

- The Secretary's Environmental Assessment Requirements (SEARs) (SSD 16-7628) for the Proposal, issued by NSW DP&E on 27 May 2016 (Appendix A).
- The relevant requirements of the Concept Plan Approval MP 10_0913 dated 29 September 2014 (as modified) (Appendix A).
- The relevant requirements of the approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (No. 2011/6229, granted in March 2014 by the Commonwealth Department of the Environment (DoE)) (as relevant) (Appendix A).

This EIS also gives consideration to the MPE Stage 1 Project (SSD 14-6766) including the mitigation measures and conditions of consent as relevant to this Proposal.

This EIS has been prepared to provide a complete assessment of the potential environmental impacts associated with the construction and operation of the Proposal. This EIS proposes measures to mitigate these issues and reduce any unreasonable impacts on the environment and surrounding community.

1.1 Purpose of this report

This report supports the Environmental Impact Statement (EIS) for the Proposal (refer to Section 1.2 below for an overview of the Proposal) and has been prepared as part of a State Significant Development (SSD) Application for which approval is sought under Part 4, Division 4.1 of the EP&A Act.

This report has been prepared to address:

- The Secretary’s Environmental Assessment Requirements (SEARs) (SSD 16-7628) for the Proposal, issued by NSW DP&E on 27 May 2016.
- The relevant requirements of Concept Plan Approval MP 10_0913 dated 29 September 2014 (as modified).
- The relevant requirements of the approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (No. 2011/6229, granted in March 2014 by the Commonwealth Department of the Environment (DoE)) (as relevant).

The SEARs and the Concept Plan Conditions of Approval and Statement of Commitments relevant to this light spill study, and the section of this report where they have been addressed are provided in *Table 1* and *Table 2* respectively.

Table 1: Secretary’s Environmental Assessment Requirements relevant to this study

Section	Environmental Assessment Requirement	Where addressed in this report
10. Visual Amenity, Urban Design and Landscaping	Consider lighting impacts in the local area, analyse and describe the contribution and impacts of the proposed facility on light spill at the local scale and to sensitive receivers	Section 3

Table 2 Concept Plan conditions of approval and Statement of Commitments relevant to this study

Section	Environmental Assessment Requirement	Where addressed in this report
Concept Plan Conditions of Approval		
There are no Concept Plan Conditions of Approval that specifically relate to light spill.		
Concept Plan Statement of Commitments		
Visual and Urban Design	The Proponent will use lighting which is in accordance with <i>Australian Standard AS4282-1997 – Control of Obtrusive Effect of Outdoor Lighting</i> . The height of the permanent light poles will be a maximum of 40 metres and reduced in height, where possible, to minimise potential light spill while maintaining appropriate safety standards.	Section 2.4.3 and Section 3.1.1.

The preliminary lighting layout and proposed lux levels for the operational area of the Proposal have been used to inform the light spill study.

The objectives of the light spill study are as follows:

- Analyse light spill limits and complete a high-level assessment of lighting requirements for the operation of the Proposal
- Provision of a preliminary external lighting design for internal roadways, warehouses and carparks
- Assess the results of the software modelling to demonstrate compliance in accordance with the requirements of:
 - The Secretary's Environmental Assessment Requirements (SEARs) and Concept Plan Statement of Commitments relevant to the Proposal; and
 - Australian Standard AS4282-1997 – Control of Obtrusive Effect of Outdoor Lighting.

1.2 Overview of the Proposal

The Proposal involves the construction and operation of Stage 2 of the MPE Project, comprising warehousing and distribution facilities on the MPE site and upgrades to approximately 1.4 kilometres of Moorebank Avenue between the northern MPE site boundary and 120 metres south of the southern MPE site boundary.

Key components of the Proposal include:

- Warehousing comprising approximately 300,000m² GFA, additional ancillary offices and the ancillary freight village
- Establishment of an internal road network, and connection of the Proposal to the surrounding public road network
- Ancillary supporting infrastructure within the Proposal site, including:
 - Stormwater, drainage and flooding infrastructure
 - Utilities relocation and installation
 - Vegetation clearing, remediation, earthworks, signage and landscaping
- Subdivision of the MPE Stage 2 site
- The Moorebank Avenue upgrade would be comprised of the following key components:
 - Modifications to the existing lane configuration, including some widening
 - Earthworks, including construction of embankments and tie-ins to existing Moorebank Avenue road level at the Proposal's southern and northern extents
 - Raking of the existing pavement and installation of new road pavement
 - Establishment of temporary drainage infrastructure, including temporary basins and / or swales
 - Raising the vertical alignment by about two metres from the existing levels, including kerbs, gutters and a sealed shoulder
 - Signalling and intersection works
- Upgrading existing intersections along Moorebank Avenue, including:
 - Moorebank Avenue / MPE Stage 2 access
 - Moorebank Avenue / MPE Stage 1 northern access
 - Moorebank Avenue / MPE Stage 2 central access
 - MPW Northern Access / MPE Stage 2 southern emergency access

The Proposal would interact with the MPE Stage 1 Project (SSD_6766) via the transfer of containers between the MPE Stage 1 IMT and the Proposal's warehousing and distribution facilities. This transfer of freight would be via a fleet of heavy vehicles capable of being loaded with containers and owned by SIMTA. The fleet of vehicles would be stored and used on the MPE Stage 2 site, but registered and suitable for on-road use. The Proposal is expected to operate 24 hours a day, seven days per week.

An overview of the Proposal is shown in *Figure 1*. To facilitate operation of the Proposal, the following construction activities would be carried out across and surrounding the Proposal site (area on which the Proposal is to be developed):

- Vegetation clearance
- Remediation works
- Demolition of existing buildings and infrastructure on the Proposal site
- Earthworks and levelling of the Proposal site, including within the terminal hardstand
- Drainage and utilities installation
- Establishment of hardstand across the Proposal site, including the terminal hardstand
- Construction of a temporary diversion road to allow for traffic management along the Moorebank Avenue site during construction (including temporary signalised intersections adjacent to the existing intersections) (the Moorebank Avenue Diversion Road)
- Construction of warehouses and distribution facilities, ancillary offices and the ancillary freight village
- Construction works associated with signage, landscaping, stormwater and drainage works.

Construction works associated with signage, landscaping, stormwater and drainage works. The Proposal would operate 24 hours a day, 7 days a week.

The footprint and operational layout of the Proposal are shown on *Figure 1*.

1.3 Key terms relevant to the Proposal

Table 3 provides a summary of the key terms relevant to the Proposal, which are included throughout this report.

Table 3 Summary of key terms used throughout this document

Term	Definition
General terms	
The Moorebank Precinct	Refers to the whole Moorebank intermodal precinct, i.e. the MPE site and the MPW site
Moorebank Precinct West (MPW) Project (formerly the MIC Project)	The MPW Intermodal Terminal Facility as approved under the MPW Concept Plan Approval (SSD_5066) and the MPW EPBC Approval (No. 2011/6086).
Moorebank Precinct West (MPW) site (formerly the MIC site)	The site which is the subject of the MPW Concept Plan Approval, MPW EPBC Approval and MPW Planning Proposal. The MPW site does not include the rail link as referenced in the MPW Concept Plan Approval or MPE Concept Plan Approval.
Moorebank Precinct East (MPE) Concept Plan Approval (formerly the SIMTA Concept Plan Approval)	MPE Concept Plan Approval (SSD_0193) granted by the NSW Department of Planning and Environment on 29 September 2014 for the development of former defence land at Moorebank to be developed in three stages; a rail link connecting the site to the Southern Sydney Freight Line, an intermodal terminal, warehousing and distribution facilities and a freight village.

Moorebank Precinct East Stage 2

Term	Definition
Moorebank Precinct East (MPE) Project (formerly the SIMTA Project)	The MPE Intermodal Terminal Facility, including a rail link and warehouse and distribution facilities at Moorebank (eastern side of Moorebank Avenue) as approved by the Concept Plan Approval (MP 10_0913) and the MPE Stage 1 Approval (14_6766).
Moorebank Precinct East (MPE) Site (formerly the SIMTA Site)	Including the former DSNDC site and the land owned by SIMTA which is subject to the Concept Plan Approval. The MPE site does not include the rail corridor, which relates to the land on which the rail link is to be constructed.
Statement of Commitments (SoC)	Recommendations provided in the specialist consultant reports prepared as part of the MPE Concept Plan application to mitigate environmental impacts, monitor environmental performance and/or achieve a positive environmentally sustainable outcome in respect of the MPE Project. The Statement of Commitments have been proposed by SIMTA as the Proponent of the MPE Concept Plan Approval.
MPE Stage 1 Project-specific terms	
Rail Corridor	Area defined as the 'Rail Corridor' within the MPE Concept Plan Approval.
Rail Link	The rail link from the South Sydney Freight Line to the MPE IMEX Terminal, including the area on either side to be impacted by the construction works included in MPE Stage 1.
MPE Stage 1	Stage 1 (14-6766) of the MPE Concept Plan Approval for the development of the MPE Intermodal Terminal Facility, including the rail link at Moorebank. This reference also includes associated conditions of approval and environmental management measures which form part of the documentation for the approval.
MPE Stage 1 site	Includes the MPE Stage 1 site and the Rail Corridor, i.e. the area for which approval (construction and operation) was sought within the MPE Stage 1 Proposal EIS.
MPE Stage 2 specific terms	
MPE Stage 2 Proposal/ the Proposal	The subject of this EIS; being Stage 2 of the MPE Concept Plan Approval including the construction and operation of 300,000m ² of warehousing and distribution facilities on the MPE site and the Moorebank Avenue upgrade within the Moorebank Precinct.
MPE Stage 2 site	The area within the MPE site which would be disturbed by the MPE Stage 2 Proposal (including the operational area and construction area). The MPE Stage 2 site includes the former DSNDC site and the land owned by SIMTA which is subject to the MPE Concept Plan Approval. The MPE site does not include the rail corridor, which relates to the land on which the rail link is to be constructed.
The Moorebank Avenue site	The extent of construction works to facilitate the construction of the Moorebank Avenue upgrade.

Term	Definition
The Moorebank Avenue upgrade	Raising of the vertical alignment of Moorebank Avenue for 1.5 kilometres of its length by about two metres, from the northern boundary of the MPE site to approximately 120 metres south of the MPE site. The Moorebank Avenue upgrade also includes upgrades to intersections, ancillary works and the construction of an on-site detention basin to the west of Moorebank Avenue within the MPW site.
Construction area	Extent of construction works, namely areas to be disturbed during the construction of the MPE Stage 2 Proposal (the Proposal).
Operational area	Extent of operational activities for the operation of the MPE Stage 2 Proposal (the Proposal).

Moorebank Precinct East Stage 2

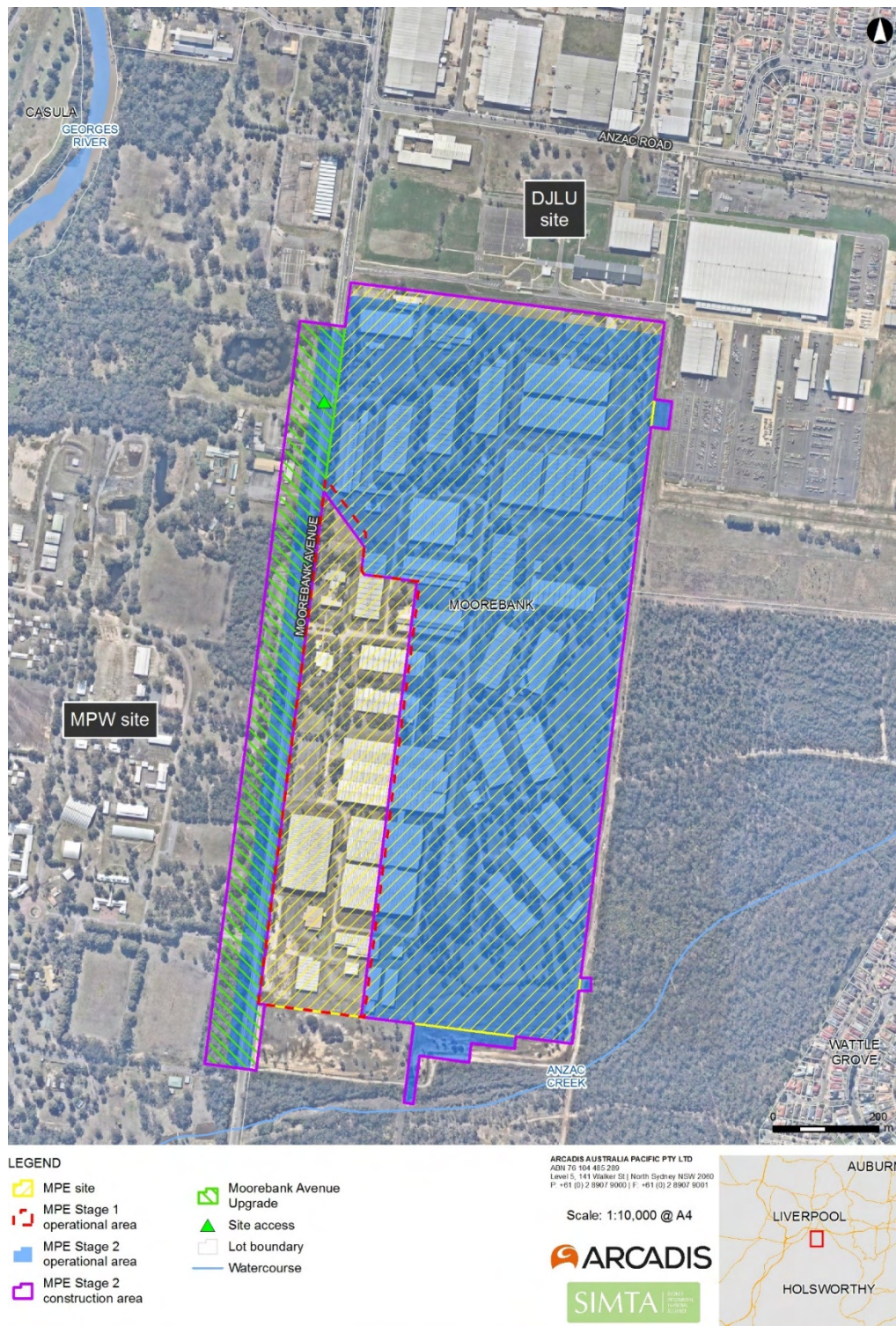


Figure 1 Overview of the Proposal

2 LIGHT SPILL ASSESSMENT

2.1 Background

The external lighting at the MPE Stage 2 site is provided by using high pressure sodium (HPS) lamps for roadways and carparks. The use of this type of lamp provides for an energy efficient lighting solution, while also providing a light spectrum which has minimal light spill and visual impact.

2.2 Methodology

The light spill study has been undertaken with an understanding of the sites proposed work processes and usage. This is to ensure the site lighting provides safe work practice, avoids potential interference with equipment used on site and at the same time minimises light spill from the site. The pole positions, luminaire mounting heights, luminaire selection and luminaire aiming angles have been derived to provide an optimum result within the restrictions of the site.

The light spill assessment has been undertaken in accordance with Australian Standard AS 4282 – 1997 and have been modelled using industry lighting design software, AGi32 version 16.7.

The model includes pole positions, luminaire mounting heights, luminaire selection and luminaire aiming angles. The light spill has been modelled as per the standards at relevant boundaries: Boundary 1.0 & 2.0.

The illuminance, luminous intensity and threshold increment have been assessed during post curfew hours as follows for both boundaries:

- Boundary 1.0 – Residential area in dark surrounds – recommended maximum vertical illuminance of 1lx and a luminous intensity emitted by luminaires of 500cd.
- Boundary 2.0 – At the boundary of commercial and residential areas – recommended maximum vertical illuminance of 4lx and a luminous intensity emitted by luminaires of 2,500cd.

An isolux plot was created of the area and the result shows that the light leaving the site is less than 0.1Lux – refer Figure 4.

Note: Transitory lighting such as headlights of forklifts and trucks do not form part of the site lighting assessment as discussed in section 2.4.4.

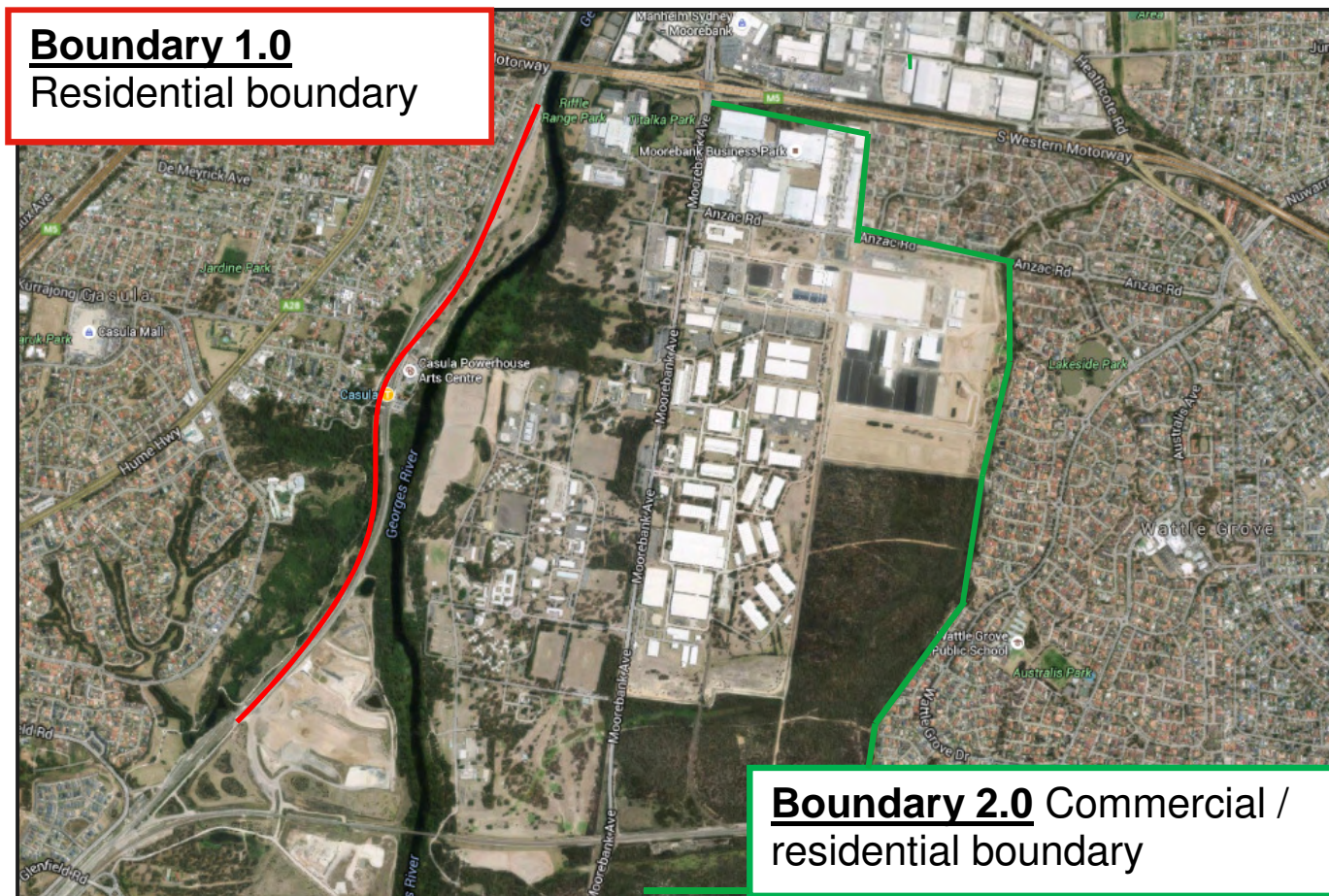


Figure 2 Site context and relevant boundary

2.3 Lighting Standards

The proposal is lit in accordance with the following Australian standards

- AS/NZS 1680.5:2012 Australian and New Zealand Interior and workplace lighting, Part5: outdoor workplace lighting for the container yard lighting.
- AS/NZS 1158:2005 Australian and New Zealand Lighting for roads and public spaces, Part 1.1 Lighting for roads and public spaces – Vehicular traffic (Category V) lighting & Part 3.1: Pedestrian area (Category P) lighting – Performance and design requirements – for roadways and carpark lighting
- AS 4282 - 1997 Control of the obtrusive effects of outdoor lighting.

2.4 Lighting Design

The lighting has been designed to minimise any direct light spill by selecting luminaires with a horizontal front glass for the warehouse yard and internal roads. The lighting along the proposed perimeter road along Moorebank Avenue and Anzac Road will consist of traditional road lighting fixtures with side throw to maximise the light distribution along the site and minimise backwards light spill.

2.4.1 Luminaire Selection

The luminaire selected to maximise light distribution and minimise light spill is the Sylvania Roadster 400W with high pressure sodium lamp.

The Sylvania Roadster is a road lighting luminaire with a side throw distribution, this is proposed to ensure maximum light distribution across the sites perimeter and internal roads. This fitting is also proposed for the carparks and internal roadways. Figure 3 shows this fitting.



Figure 3 Sylvania Roadster

2.4.2 Luminaire Position and Mounting Height

The key to meeting the light spill requirements is finding an ideal height for the luminaires. This consists of a balance between light spread and limiting spill.

The site pole heights have been limited to 13.5m to provide a consistent spread of lighting throughout. This is a maximum pole height which provides an even lighting spread across the internal roads and carparks. This height is also low enough to not cause any light spills issues.

There are 65 poles in total (P1-P65) mounted at 13.5m fitted with Sylvania Roadster 400W HPS lamps. The luminaires are positioned to provide equal amount of light in each direction and ensure uniform lighting across the internal roads and carparks.

Similar HPS fittings are also mounted on the external façade of the warehouses as shown on Figure 4. These fittings are included in the light spill assessment.

2.4.3 Compliance with AS 4282-1997 Control of the obtrusive effects of outdoor lighting

The Proposal is defined as a 'commercial area' according to AS4282-1198 and the illuminance, luminous intensities and threshold increments have been assessed according to the standard's post curfew hours:

- Boundary 1.0 – Residential area in dark surrounds – recommended maximum vertical illuminance of 1lx and a luminous intensity emitted by luminaires of 500cd.
- Boundary 2.0 – At the boundary of commercial and residential areas – recommended maximum vertical illuminance of 4lx and a luminous intensity emitted by luminaires of 2,500cd.

The results of the assessment are represented in Figure 4, which shows that the combination of the lighting design, luminaire selection, positioning and aiming produce results that are in compliance with the requirements of AS4282-1997 – refer Appendix A for further detail.

Note: transitory lighting such as headlights of forklifts and trucks do not form part of the site lighting assessment.

2.4.4 Mobile and Transitory Lighting

Lighting associated with forklifts and vehicles will generally not be of concern since it has a fixed downward aiming lighting which is generally close to the ground unlike the elevated pole mounted and warehouse mounted luminaires. For this reason mobile transitory lighting was considered to have no additional light spill and excluded from the assessment.

Legend	
	0.1 lx
	1 lx
	14 lx
	40 lx

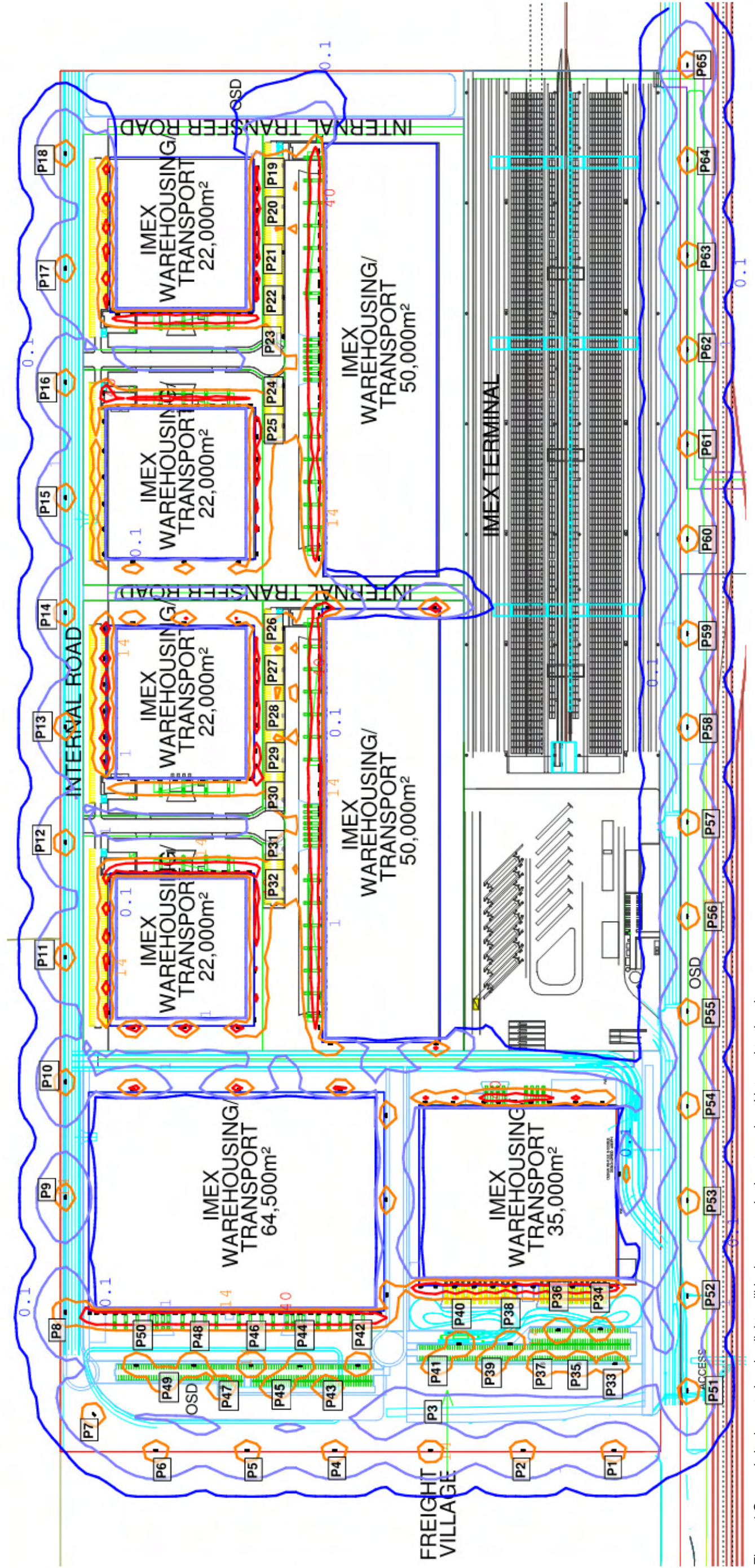


Figure 4 General site layout showing spill light isolux curves both external and internal to the site.

2.5 Luminaire schedule

The light spill assessment has been modelled based on the luminaire provided in Table 4 below. Refer Figure 4 General site layout showing light spill isolux curves both external and internal to the Figure 4 for location of luminaires.

Table 4 Luminaire Schedule

Pole	Height (m)	Sylvania Roadster Aero 400W HPS	Pole	Height (m)	Sylvania Roadster Aero 400W HPS	Pole	Height (m)	Sylvania Roadster Aero 400W HPS
P1	13.5	1	P23	13.5	1	P45	13.5	1
P2	13.5	1	P24	13.5	1	P46	13.5	1
P3	13.5	1	P25	13.5	1	P47	13.5	1
P4	13.5	1	P26	13.5	1	P48	13.5	1
P5	13.5	1	P27	13.5	1	P49	13.5	1
P6	13.5	1	P28	13.5	1	P50	13.5	1
P7	13.5	1	P29	13.5	1	P51	13.5	1
P8	13.5	1	P30	13.5	1	P52	13.5	1
P9	13.5	1	P31	13.5	1	P53	13.5	1
P10	13.5	1	P32	13.5	1	P54	13.5	1
P11	13.5	1	P33	13.5	1	P55	13.5	1
P12	13.5	1	P34	13.5	1	P56	13.5	1
P13	13.5	1	P35	13.5	1	P57	13.5	1
P14	13.5	1	P36	13.5	1	P58	13.5	1
P15	13.5	1	P37	13.5	1	P59	13.5	1
P16	13.5	1	P38	13.5	1	P60	13.5	1
P17	13.5	1	P39	13.5	1	P61	13.5	1
P18	13.5	1	P40	13.5	1	P62	13.5	1
P19	13.5	1	P41	13.5	1	P63	13.5	1
P20	13.5	1	P42	13.5	1	P64	13.5	1
P21	13.5	1	P43	13.5	1	P65	13.5	1
P22	13.5	1	P44	13.5	1			

3 ASSESMENT RESULT

The lighting of the Proposal will have a minimal effect on the surrounding environment. The design assessed and developed in this report ensure a minimal direct light spill and as a result minimal effect on neighbouring properties.

3.1.1 Compliance with AS 4282

The site lighting design outlined in this report complies with 'AS4282- 1997 Control of the obtrusive effects of outdoor lighting' – refer Appendix A for more details.

4 CONCLUSION

A Light Spill Analysis has been undertaken for the operation of the Proposal, including the preparation of an operational lighting design and a light spill assessment using AGi32 version 16.7.

The lighting for the Proposal has been designed to minimise any direct light spill by selecting luminaires with a horizontal front glass for the warehouse yard and internal roads. The lighting design for the MPE Stage 2 site includes a total of 50 13.5 m high poles (P1-P50) with Sylvania Roadster 400W HPS lamps. Lighting pole heights have been limited to a maximum 13.5 m to provide a consistent lighting height across the lighting design within the MPE Stage 2 site, and an even lighting spread across the internal road network and carparks.

The lighting design for the Proposal would have a minimal effect on the surrounding environment, and would comply with the requirements of *Australian Standard AS4282-1997 – Control of the Obtrusive Effects of Outdoor Lighting*.

APPENDIX A

Light spill result - Boundary 1.0 / 2.0

The result of the maximum illuminance and luminous intensity at vertical planes at Boundary 1.0 & 2.0

Obtrusive Light - Compliance Report

AS 4282-1997, Post-Curfew, Residential - Dark Surrounds
 Filename: SIMTA Stage 2
 12/08/2016 3:35:55 PM

Illuminance

Maximum Allowable Value: 1 Lux
 Calculations Tested (24):

Calculation Label	Test Result (Pass/Fail)	Maximum Illuminance
ObtrusiveLight-Resi-Post-West_III_Seg1	Pass	0.0
ObtrusiveLight-Resi-Post-West_III_Seg2	Pass	0.0
ObtrusiveLight-Resi-Post-West_III_Seg3	Pass	0.0
ObtrusiveLight-Resi-Post-West_III_Seg4	Pass	0.0
ObtrusiveLight-Resi-Post-West_III_Seg5	Pass	0.0
ObtrusiveLight-Resi-Post-West_III_Seg6	Pass	0.0
ObtrusiveLight-Resi-Post-West_III_Seg7	Pass	0.0
ObtrusiveLight-Resi-Post-West_III_Seg8	Pass	0.0
ObtrusiveLight-Resi-Post-West_III_Seg9	Pass	0.0
ObtrusiveLight-Resi-Post-West_III_Seg10	Pass	0.0
ObtrusiveLight-Resi-Post-West_III_Seg11	Pass	0.0
ObtrusiveLight-Resi-Post-West_III_Seg12	Pass	0.0
ObtrusiveLight-Resi-Post-West_III_Seg13	Pass	0.0
ObtrusiveLight-Resi-Post-West_III_Seg14	Pass	0.0
ObtrusiveLight-Resi-Post-West_III_Seg15	Pass	0.0
ObtrusiveLight-Resi-Post-West_III_Seg16	Pass	0.0
ObtrusiveLight-Resi-Post-West_III_Seg17	Pass	0.0
ObtrusiveLight-Resi-Post-West_III_Seg18	Pass	0.0
ObtrusiveLight-Resi-Post-East_III_Seg1	Pass	0.0
ObtrusiveLight-Resi-Post-East_III_Seg2	Pass	0.0
ObtrusiveLight-Resi-Post-East_III_Seg3	Pass	0.0
ObtrusiveLight-Resi-Post-East_III_Seg4	Pass	0.0
ObtrusiveLight-Resi-Post-East_III_Seg5	Pass	0.0
ObtrusiveLight-Resi-Post-East_III_Seg6	Pass	0.0

Luminous Intensity (Cd) At Vertical Planes

Maximum Allowable Value: 500 Cd

Calculations Tested (24):

Calculation Label	Test Result (Pass/Fail)
ObtrusiveLight-Resi-Post-West_Cd_Seg1	Pass
ObtrusiveLight-Resi-Post-West_Cd_Seg2	Pass
ObtrusiveLight-Resi-Post-West_Cd_Seg3	Pass
ObtrusiveLight-Resi-Post-West_Cd_Seg4	Pass
ObtrusiveLight-Resi-Post-West_Cd_Seg5	Pass
ObtrusiveLight-Resi-Post-West_Cd_Seg6	Pass
ObtrusiveLight-Resi-Post-West_Cd_Seg7	Pass
ObtrusiveLight-Resi-Post-West_Cd_Seg8	Pass
ObtrusiveLight-Resi-Post-West_Cd_Seg9	Pass
ObtrusiveLight-Resi-Post-West_Cd_Seg10	Pass
ObtrusiveLight-Resi-Post-West_Cd_Seg11	Pass
ObtrusiveLight-Resi-Post-West_Cd_Seg12	Pass
ObtrusiveLight-Resi-Post-West_Cd_Seg13	Pass
ObtrusiveLight-Resi-Post-West_Cd_Seg14	Pass
ObtrusiveLight-Resi-Post-West_Cd_Seg15	Pass
ObtrusiveLight-Resi-Post-West_Cd_Seg16	Pass
ObtrusiveLight-Resi-Post-West_Cd_Seg17	Pass
ObtrusiveLight-Resi-Post-West_Cd_Seg18	Pass
ObtrusiveLight-Resi-Post-East_Cd_Seg1	Pass
ObtrusiveLight-Resi-Post-East_Cd_Seg2	Pass
ObtrusiveLight-Resi-Post-East_Cd_Seg3	Pass
ObtrusiveLight-Resi-Post-East_Cd_Seg4	Pass
ObtrusiveLight-Resi-Post-East_Cd_Seg5	Pass
ObtrusiveLight-Resi-Post-East_Cd_Seg6	Pass

Threshold Increment (TI)

Maximum Allowable Value: 20 %

Calculations Tested (4):

Calculation Label	Adaption Luminance (%)	Test Result (Pass/Fail)
ObtrusiveLight_TI_Rail_north	10	Pass
ObtrusiveLight_TI_North_MIC_Rail	10	Pass
ObtrusiveLight_TI_South_MIC_Rail	10	Pass
ObtrusiveLight_TI_Rail_South	10	Pass

