



Kamay Energy Storage SSD

171-189 Captain Cook Drive, Kurnell

Final Landscape and Visual Impact Assessment

Submitted to Ausgrid

Prepared by Colliers Urban Planning

17 December 2025 | 2250674



'Gura Bulga'

Liz Belanjee Cameron

'Gura Bulga' – translates to Warm Green Country. Representing New South Wales.



'Dagura Buumarri'

Liz Belanjee Cameron

'Dagura Buumarri' – translates to Cold Brown Country. Representing Victoria.



'Gadalung Djarri'

Liz Belanjee Cameron

'Gadalung Djarri' – translates to Hot Red Country. Representing Queensland.

Colliers Urban Planning acknowledges the Traditional Custodians of Country throughout Australia and recognises their continuing connection to land, waters and culture.

We pay our respects to their Elders past and present.

In supporting the Uluru Statement from the Heart, we walk with Aboriginal and Torres Strait Islander people in a movement of the Australian people for a better future.

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27/10/2025

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17/12/2025

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Executive Summary

This Landscape and Visual Impact Assessment (LVIA) has been prepared by Colliers Urban Planning in collaboration with Virtual Ideas and CMS Surveyors on behalf of Ausgrid ('the Applicant') in support of a State Significant Development Application (SSDA) for the proposed Kamay Energy Storage Project (the Project) within Ausgrid's existing Kurnell Zone Substation located at 171-189 Captain Cook Drive, Kurnell (the site).

The Project will store electricity from the grid that can be released into the grid during peak period of electricity demand and provide ancillary services to the NEM. The Project will be located within vacant sections of the site and will connect into the Kurnell Zone Substation via a proposed 33kV underground cable.

The purpose of this LVIA is to determine whether the Project has an acceptable visual impact through address of relevant Secretary's Environmental Assessment Requirements (SEARs). An acceptable visual impact is where:

- the Project does not have the potential for significant visual impact, or
- where the Project does have the potential for significant visual impact, it is consistent with relevant parts of the planning framework (including broader, relevant environmental planning grounds) or can be appropriately mitigated to achieve consistency with relevant parts of the applicable planning framework.

The site and its context

The site is located within the Sutherland Shire Local Government Area (LGA) and comprises one allotment identified as Lot 1, DP 869365, with a site area of approximately 1.4ha.

The site is located within a broader area of highly modified land that is predominantly used for infrastructure and industrial uses.

Key LVIA issues

Based on the planning framework, the key issues to be considered by the LVIA are:

- **Visual Character:** responsiveness to existing valued visual characteristics including scenic and cultural landscapes
- **Visual Amenity:** impact on the visual amenity of surrounding residences, key locations, significant vistas and road corridors in the public domain
- **Landscape Setting:** impact on the landscape setting of the site and its surroundings.
- **Interfaces:** impact on the sites interface with the existing wetlands and the local road network.

Method

The LVIA has been undertaken generally in accordance with the principles of the 'Guidelines for Landscape and Visual Impact Assessment – Third Edition' (GLVIA3) (Landscape Institute; I.E.M.A., 2013), as adjusted to better align with the NSW planning system under the Environmental Planning and Assessment Act 1979 (EP&A Act). To inform the LVIA, photos showing the existing visual environment and survey aligned photomontages showing the likely future visual environment prepared in accordance with the Land and Environment Court of NSW 'Use of Photomontages and Visualisation Tools' (17 May 2024) were prepared for 4 key viewpoints representing key aspects of the pattern of viewing in the surrounding primary visual catchment.

Visual analysis

The primary visual catchment generally consists of the Captain Cook Drive transport route and the Kurnell township.

The general pattern of viewing in the primary visual catchment can be considered to be Kurnell residents, motorists along Captain Cook Drive and visitors to Kurnell Recreation Club and Marton Park along the Captain Cook Drive road corridor.

Visual impact assessment

Under the GLVIA3, a key step is to determine whether the Project has the potential for significant visual impact informed by judgements about the sensitivity of the primary visual catchment to the nature of change proposed, and the magnitude of the nature of change proposed.

The significance of visual impact has been qualitatively assessed as:

- **Viewpoint 1: Marton Park:** negligible significance of visual impact
- **Viewpoint 2: Dampier Street:** negligible significance of visual impact
- **Viewpoint 3: Captain Cook Drive - southern approach (cnr Sir Joseph Banks Dr):** negligible significance of visual impact
- **Viewpoint 4: Kurnell Recreation Club - Captain Cook Drive - northern approach:** negligible significance of visual impact

Consideration of key issues

In accordance with the planning framework, the Project does not impact on the existing highly modified land of the site or the interfacing wetlands and nature reserve landscape.

Mitigation measures

This LVIA concludes the primary design measures for the proposed works are sufficient to mitigate the project's visual impact. Therefore, additional major or large-scale mitigation measures are not considered necessary.

Secondary measures - such as specifying colours, artwork and/or incorporating boundary planting (particularly along the proposed noise and safety wall on Captain Cook Drive) - may be appropriate where they align with relevant and reasonable conditions of development consent and complement existing visual amenity along Captain Cook Drive.

Conclusion

Given the Project will have negligible significance of visual impact, it is the conclusion of this LVIA that the Project can be supported on visual impact grounds.

Table 1 *Key Terms*

Term	Meaning
Amenity	The pleasantness, attractiveness, desirability or utility of a place, facility, building or feature
Characteristics	Elements, or combinations of elements, which make a contribution to distinctive landscape character
Elements	Individual parts which make up the landscape, such as, for example, trees, hedges and buildings
Feature	Particularly prominent or eye-catching elements in the landscape, such as tree clumps, church towers or wooded skylines
Key characteristics	Those combinations of elements which are particularly important to the current character of the landscape and help to give an area its particularly distinctive sense of place
Landscape	An area, as perceived by people, the character of which is the result of the action and interaction of natural and/or human factors
Magnitude	A term that combines judgements about the size and scale of the effect, the extent of the area over which it occurs, whether it is reversible or irreversible and whether it is short or long term in duration
Sensitivity	A term applied to specific receptors, combining judgements of the susceptibility of the receptor to the specific type of change or development proposed and the value related to that receptor
Significance	A measure of the importance or gravity of the environmental effect, defined by significance criteria specific to the environmental topic
Visual impact	Effects on specific views and on the general visual amenity experienced by people
Visual receptors	Individuals and/or defined groups of people who have the potential to be affected by a project

1.0 Introduction

1.1 Introduction

This Landscape and Visual Impact Assessment has been prepared by Colliers Urban Planning in collaboration with Virtual Ideas and CMS Surveyors on behalf of Ausgrid (‘the Applicant’) in support of a State Significant Development Application (SSDA) for a proposed Kamay Energy Storage Project (the Project) within Ausgrid’s existing Kurnell Zone Substation located at 171-189 Captain Cook Drive, Kurnell (the site).

1.2 Purpose of this LVIA

The purpose of this LVIA is to determine whether the project has an acceptable visual impact through address of relevant Secretary’s Environmental Assessment Requirements (SEARs). An acceptable visual impact is where:

- the project does not have the potential for significant visual impact, or
- where the project does have the potential for significant visual impact, it is consistent with relevant parts of the planning framework (including broader, relevant environmental planning grounds) or can be appropriately mitigated to achieve consistency with relevant parts of the applicable planning framework.

Table 2 SEARs relevant to LVIA for SSD-92494458

Issue	Requirement	Relevant report chapter
Visual	• a detailed assessment of the likely visual impacts of all components of the project on surrounding residences (including approved developments, lodged development applications and dwelling entitlements), and key locations, scenic of significant vistas and road corridors in the public domain; and • details of measures to mitigate and/or manage potential impacts (including a draft landscaping plan for on-site perimeter planting, with evidence it has been developed in consultation with affected landowners).	• Section 8 • Section 11

Source: The Department of Planning, Housing and Infrastructure

1.3 Structure of this of this LVIA

The structure of this LVIA is as follows:

- Part 1 Introduction: Identifies the purpose and structure of this LVIA
- Part 2 The site and its context: Describes the site, adjoining and surrounding land, and its broader context
- Part 3 The Project: Outlines the project
- Part 4 Planning framework: Identifies the relevant parts of the planning framework to the application
- Part 5 Key issues: Identifies the key issues to be considered by the LVIA
- Part 6 Method: Outlines the method used by this LVIA
- Part 7 Visual analysis: Provides a visual analysis, including identification of the visual catchment, the primary visual catchment, pattern of viewing, and viewpoints for more detailed assessment
- Part 8 Visual impact assessment: Undertakes LVIA of the project, including whether the project has the potential for significant visual impact informed by judgements about sensitivity and magnitude, and supported by photos and survey aligned photomontages
- Part 9 Consideration of key issues: Assesses the project and its visual impact against the relevant parts of the planning framework to the application

- Part 10 Mitigation measures: Identifies whether any appropriate primary and / or secondary mitigation measures are required / recommended to address visual impact
- Part 11 Conclusion: Identifies whether the project can be supported on visual impact grounds
- Appendix A: Provides a copy of the evidence base of photos and photomontages upon which this LVIA relies.

This LVIA forms part of a larger suite of documents prepared to support the project. It does not repeat matters that are more appropriately covered in these documents. As such, it should be read together with the suite of other documents.

2.0 The site and its context

2.1 The site

The site is located within the Sutherland Shire Local Government Area (LGA) and comprises one allotment identified as Lot 1, DP 869365, with a site area of approximately 1.4ha.

The site is located within a broader area of highly modified land that is predominantly used for infrastructure and industrial uses. The site is bounded by Captain Cook Drive to the east and wetland vegetation to all other boundaries. The site is currently accessed via two driveways access points along Captain Cook Drive (see figure below).



 The Site

 NOT TO SCALE

Figure 1 Site Aerial Map

Source: Nearmap edited by Colliers Urban Planning

2.2 Visual character – The site

The visual character of sites is established by the interplay of a number of natural and human factors which also impact views from the public domain. These factors are:

Natural factors

Natural factors are:

- topography
- waterways and waterbodies
- trees and vegetation.

Topography

The site is generally level.

Waterways and waterbodies

The site does not feature formed, surface level waterways or waterbodies.

Trees and vegetation

The site is predominantly paved with hardstand concrete or gravel and contains limited vegetation (mainly weeds and introduced grasses).

The site abuts existing wetlands along the north, west and south. These significant trees and vegetation provide natural visual screening and visually enclose the site.

Roadside vegetation is generally present along either side of Captain Cook Drive, further enclosing the site from view – with the exception of the southern portion of the site abutting the roadway, which features minimal to no vegetation, affording views from the road through to the site.

Human factors

Human factors are:

- public domain
- buildings and structures

Public domain

The site does not support public or publicly accessible areas such as streets or parks.

Buildings and structures

Development on the site consists of the existing Kurnell Zone Substation. Specifically, the site contains the following:

- A substation building at the north-eastern corner that consists of an active 132kV switch room, control room and 11kV switch room
- Along the northern boundary, there are two high voltage transformers and one vacant transformer bay around and between which there are concrete fire walls approximately 6m in height. There are also six reactors.
- An unused area within the centre of the site that contains former substation infrastructure
- Vacant area long the south-eastern boundary that is currently used as pole storage
- Perimeter fencing and gates
- Two driveways from Captain Cook Drive.



Figure 2 *Captain Cook Drive site frontage (southern portion)*

Source: Google

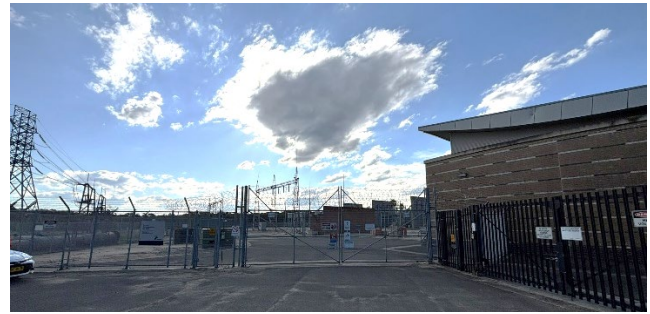


Figure 3 *Substation building and southern driveway from Captain Cook drive*

Source: Colliers Urban Planning

2.3 The site context

The site context includes:

North

- The site has an interface with significant vegetation associated with the Towra Point Nature Reserve, characterised as coastal wetlands, including saltmarshes, mangroves and seagrasses.
- North of the wetlands and bushland is the low density residential area of the Kurnell village, comprising low density residential development.
- Further north is Botany Bay.

East

- The site is bounded by Captain Cook Drive along the eastern frontage.
- East of Captain Cook Drive is the Ampol Kurnell terminal, an extensive site that is highly modified.
- Abutting the Ampol terminal further east is significant coastal vegetation and heathlands associated with the Kamay Botany Bay National Park.

South

- South of the site (beyond the Ampol Kurnell terminal) is the Sydney Desalination Plant and a range of commercial and industrial developments; all located within highly modified sites.
- Further south is Kamay Botany Bay National Park

West

- Abutting the site to the west is significant vegetation associated with the Towra Point Nature Reserve. Parts of the wetlands are identified as being of international importance under the RAMSAR Convention on Wetlands.



Figure 4 *Wetlands to the west*

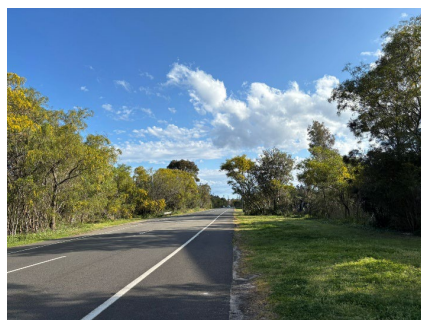


Figure 5 *Captain Cook drive (looking south)*

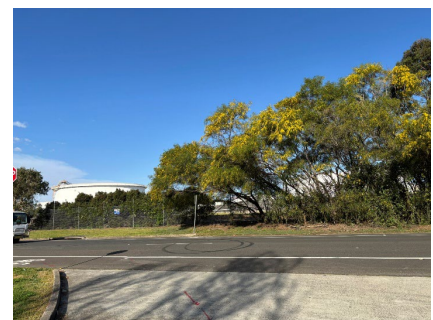


Figure 6 *Ampol site to the east*

Source: Colliers Urban Planning

2.4 Existing conditions

There are a number of factors that contribute to understanding the existing landscape of the site and surrounds. This includes:

- **Topography:** The topography is generally flat across the site. In the wider area high points exist along the eastern coastline of the Kamay Botany Bay National Park.
- **Waterways and drainage:** The Towra Point Nature Reserve and wetlands abut the site to the north and west. With Quibray Bay located further west. Botany Bay is located further north of the Kurnell township.
- **Trees and vegetation:** Significant vegetation is present to the west of the site associated with the Towra Point Nature Reserve and wetlands and to the east within the Kamay Botany Bay National Park. Roadside vegetation is also present along the Captain Cook Drive road corridor.
- **Roads and movement:** Captain Cook Drive interfaces with the sites eastern frontage and is a key transport route north to the Kurnell township.
- **Historical and cultural features:** The Towra Point Nature Reserve and wetlands is a designated RAMSAR site, which supports mangrove and saltmarsh communities and is an important ecological habitat. The Kamay Botany Bay National Park is a significant coastal heritage landscape.
- **Land use and built form:** The site is located within a parcel of land already operating as the Kurnell Zone Substation. Other surrounding uses include the Ampol Kurnell terminal, Sydney Desalination Plant, a range of commercial and industrial uses to the south and residential and community uses to the north.
- **Visual receptors:** Key visual receptors include motorists along Captain Cook Drive and nearby Kurnell Recreation Club, Marton Park and residents of dwellings located in the Kurnell township.

The below map provides an overview of the existing conditions.

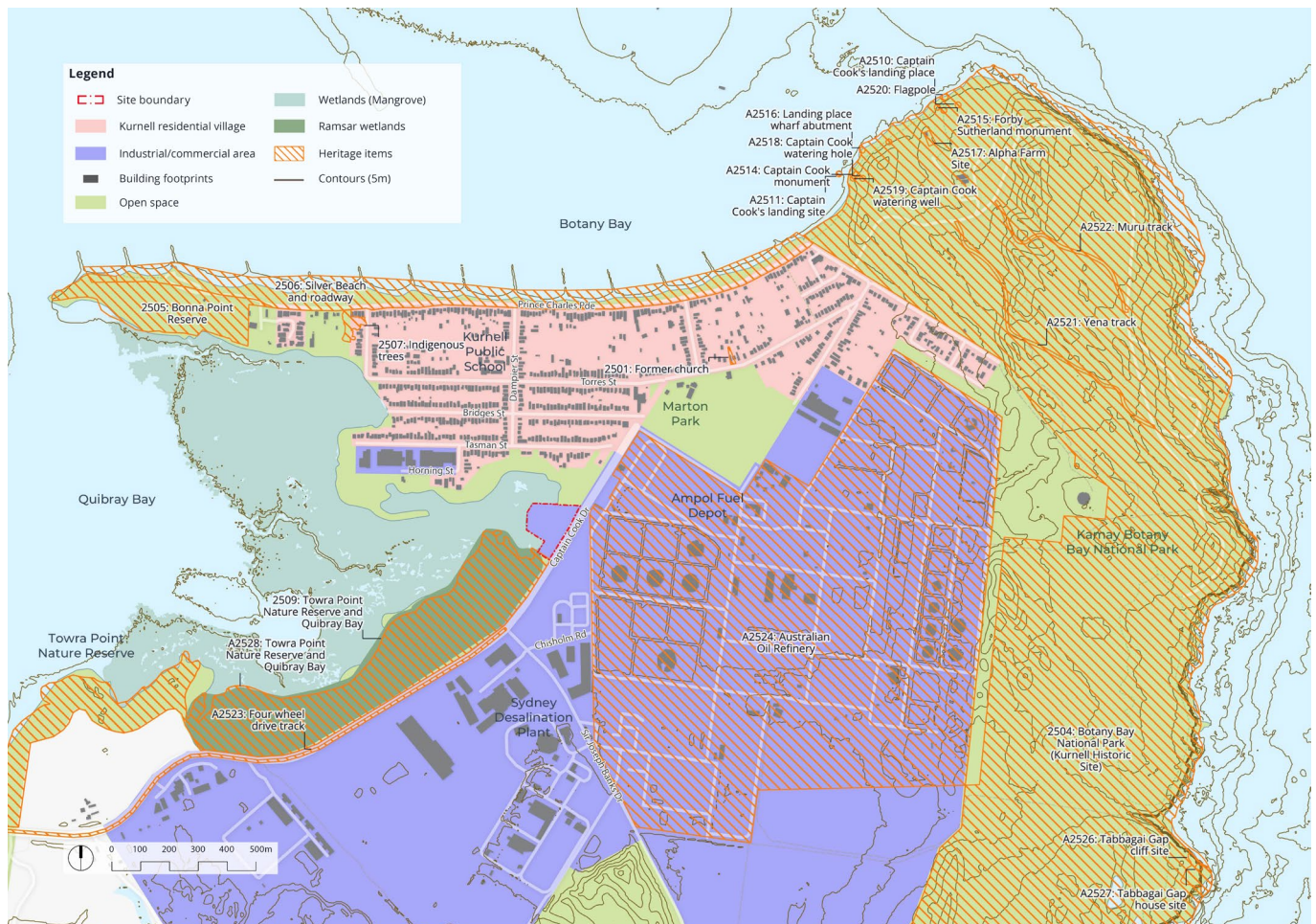


Figure 7 Existing Conditions Map

Source: Colliers Urban Planning

2.5 Existing landscape conditions

As a result of analysis of the broader area, four distinct landscape conditions have been identified. These include:

- **Highly modified land (the site):** This area is generally characterised by flat topography that is highly modified and has been cleared of vegetation, with the exception of roadside vegetation along key transport routes that visually mitigates industrial, and infrastructure uses from the public realm.
- **Kurnell Village:** This area is characterised by predominantly low scale residential development set within moderately sized lots. These areas are flat to gently sloping and include intermittent vegetation and trees within the private and public realm.
- **Wetlands and nature reserve:** Characterised by large scale wetlands and a high level of native vegetation, the area is identified as a RAMSAR nature reserve that is valued for its cultural and ecological significance.
- **Highly vegetated National Park:** Characterised by sloping topography and significant coastal vegetation and heathlands associated with the Kamay Botany Bay National Park.

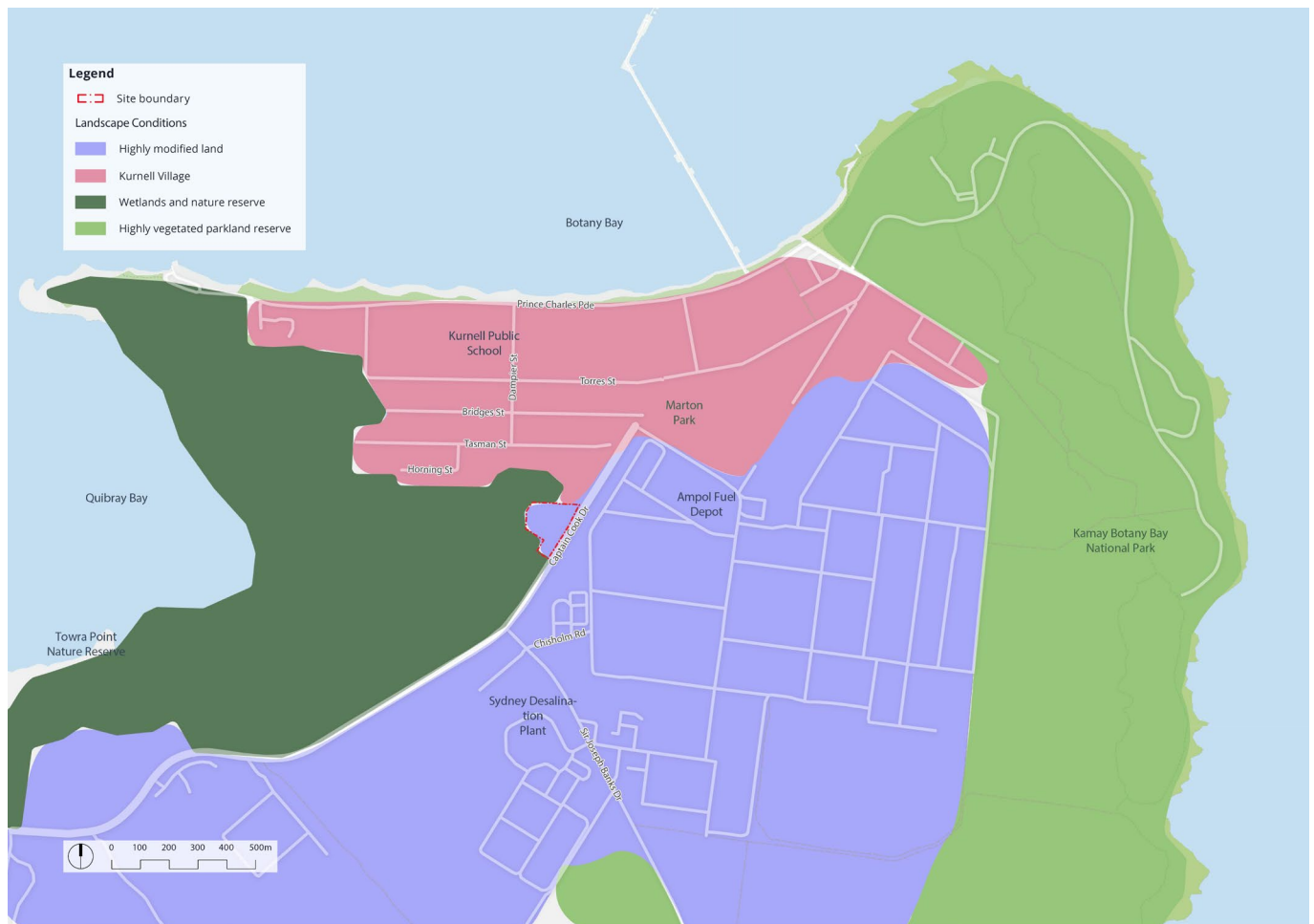


Figure 8 Existing Landscape Conditions Map

Source: Colliers Urban Planning

As identified in the above Existing Landscape Conditions Map, the site is located within highly modified land.

The site is located within a broader area of highly modified land that is predominantly used for infrastructure and industrial uses.

Given the area has already been cleared of landscape and is highly modified, it has the capacity to accommodate change without detrimental impacts on the existing landscape.

3.0 The Project

Note: The EIS outlines the Project scope in greater detail.

This SSDA seeks development consent under 'Division 4.7 – Stage Significant Development' of the EP&A Act for the development of a BESS with up to 150MW maximum power output capacity with 2-hour duration (up to 300MWh), referred to as the Project. The Project will store electricity from the grid that can be released into the grid during peak period of electricity demand and provide ancillary services to the NEM. The Project will be located within vacant sections of the site and will connect into the Kurnell Zone Substation via a proposed 33kV underground cable.

Specifically, this SSDA seeks approval for:

- Construction and operation of a BESS with up to 150MW maximum power output capacity with 2-hour duration (up to 300MWh)
- Connection of the BESS to the Kurnell Zone Substation infrastructure via a 33 kV underground cable
- Other ancillary infrastructure and services such as internal access roads, laydown areas, control and operational buildings.

Construction of the Project may be carried out in multiple delivery stages, though the development consent is not proposed to be staged.

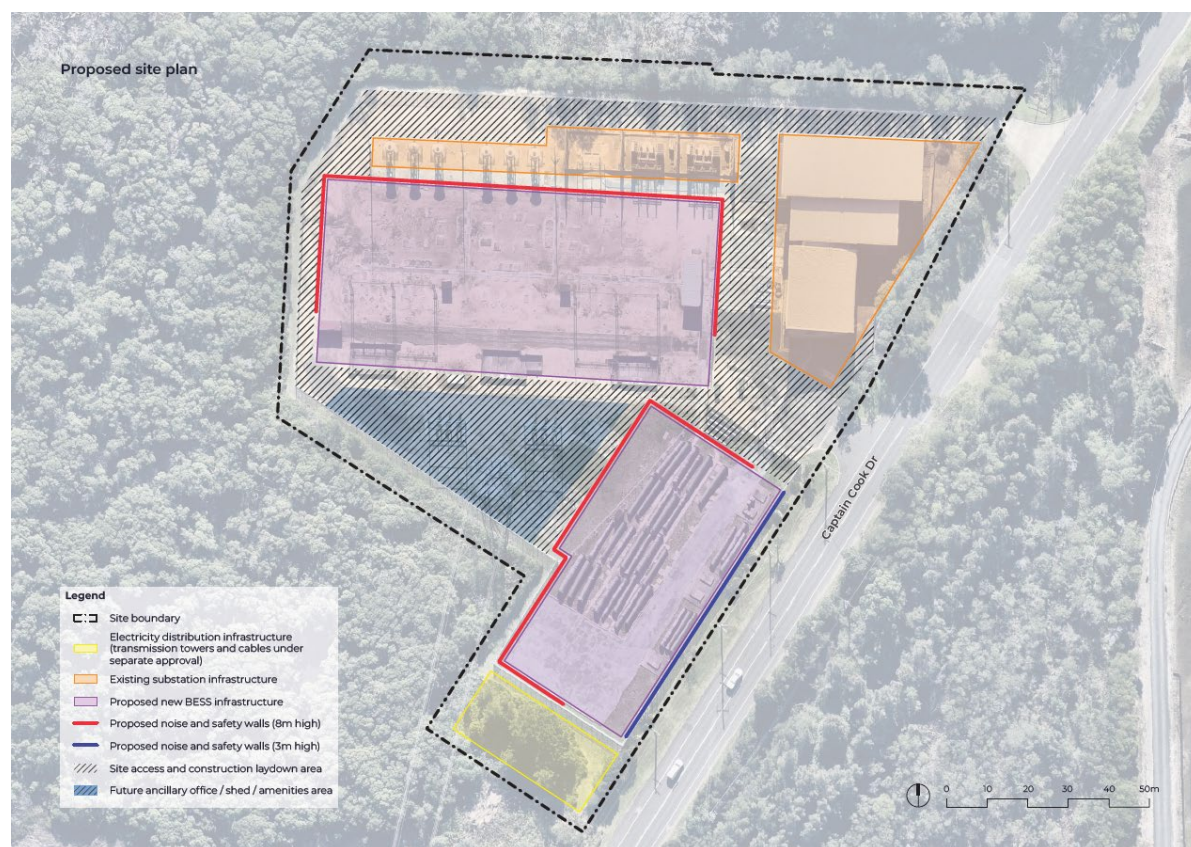


Figure 9 *Proposed site layout plan*

Source: Nearmap edited by Colliers Urban Planning

4.0 Planning framework

4.1 Planning framework

This section provides a summary of the relevant planning policies and framework which apply to the site in relation to landscape and visual impact.

Government priorities

- the National Housing Accord

Strategic planning framework (including supporting documents)

- NSW Electricity Strategy (DCCEE, 2022a).
- The NSW Electricity Strategy (DPIE, 2019)
- The NSW State Infrastructure Strategy (SIS) 2022-2042 (Infrastructure NSW, 2022)
- The 'Greater Sydney Region Plan – A Metropolis of Three Cities' (the Region Plan) (former Greater Sydney Commission, 2018)
- 'South City District Plan' (the District Plan) (former Greater Sydney Commission, 2018)
- Sutherland Shire Local Strategic Planning Statement (Sutherland Shire Council,
- State environmental planning policies (note: while these are not categorised as part of the strategic planning framework under the Environmental Planning and Assessment Act 1979 (EP&A Act 1979), they are regarded as such by the Guideline)
- Section 9.1 directions.

The Guideline enables consideration of 'a change in circumstances that has not been recognised by the existing planning framework'. Factors that lead to responding to a change in circumstances may include:

- 'Key infrastructure investment or opportunity to plan for future infrastructure unanticipated by the existing strategic planning framework
- Response to key Government priorities – Premier's Priorities, climate change, or a shift in government policy (e.g. NSW Government's Net Zero Plan)
- Changes to population and demographic trends and associated needs such as housing or jobs.

Site specific merit includes a range of factors and will include consideration of the project's view and visual impact.

Greater Sydney Region Plan – A Metropolis of Three Cities

The Greater Sydney Region Plan – A Metropolis of Three Cities (Greater Sydney Commission, 2018) (GSRP) aims to improve the connectedness of residents to the necessary services and infrastructure required for liveable communities and healthy lives.

In particular, the Region Plan highlights that "*Scenic and cultural landscapes are protected*" as a key objective of the plan. This includes enhancing and protecting views of scenic foreshore areas and landscapes. Enhancing and protecting views of scenic and cultural landscapes from the public realm is noted as a key strategy as part of this objective.

South District Plan – Our Greater Sydney 2056

The South District Plan creates a plan for the southern LGAs of Greater Sydney to guide growth and development in these areas. The plan outlines five key themes to guide the strategic planning of the city including infrastructure and collaboration, liveability, productivity, sustainability and implementation. In particular, the District Plan focusses on the delivery of infrastructure alongside development, to plan for a city supported by infrastructure. Additionally, the plan highlights the importance of protecting and enhancing the bushland, biodiversity and scenic and cultural landscapes in the district. This includes protecting the scenic qualities of bushland ridgelines and landscape elements which are highly valued in the district.

Sutherland Shire Local Strategic Planning Statement

The LSPS highlight the importance of natural landscape views and landscapes in the LGA. In relation to view and visual impact, the LSPS highlights creating attractive and distinctive centres and places as a key planning priority.

4.2 The SSDA

Section 4.15 'Evaluation' of the Environmental Planning and Assessment Act 1979 (EP&A Act) establishes the matters that the Department is to take into consideration for this SSDA.

Statutory plans

The most relevant matters for VIA comprise:

- the provisions of Sutherland Local Environmental Plan 2015 (SLEP 2015)
- the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality.

The most relevant parts of the SLEP 2012 to VIA are:

- section 1.2 'Aims of Plan'
- section 2.3 'Zone objectives and Land Use Table' (for Zone E2 'Commercial Centre')
- section 4.3 'Height of buildings'
- section 4.4 'Floor space ratio'
- clause 6.16 'Urban Design – general'

While State Environmental Planning Policy (Housing) 2021 (the Housing SEPP) applies to the project more broadly, it does not contain provisions that are highly relevant to LVIA.

While under section 2.10 of the State Environmental Planning Policy (Planning Systems) 2021 (the Planning Systems SEPP) development control plans do not apply to SSDAs, consideration as appropriate has also been given in this LVIA to the provisions of the Sutherland Development Control Plan 2015 (SDCP 2015). The SDCP 2015 does not detail specific provisions for development for the purposes of infrastructure or general visual impact controls. However, Chapter 30 relating to IN3 Heavy Industrial Zone (which surrounds the site), notes the following provision in relation to the protection of views:

"Where development sites adjoin Woollooware Bay or an open space reservation, the site layout and building forms should allow views from within the site to the bay or foreshore."

It is noted that decisions on SSDA require consideration and weighing of a large number and range of relevant environmental planning matters in addition to visual impact. In this regard, particular reference is made to the separate, supporting Environmental Impact Statement (EIS).

4.3 Sutherland Local Environmental Plan 2015

Under the SLEP 2015, the site is subject to the key provisions shown in the following table.

Table 3 Sutherland Local Environmental Plan 2015 – Key provisions

Item	Provision
Land zoning (s1.3)	The site is included in the SP2 'Infrastructure' zone
Height of buildings (s4.3)	No maximum building height applies to the site

4.3.1 Land zoning

The objectives of the SP2 Infrastructure zone are as follows:

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

4.3.2 Height of buildings

While there is no maximum height standard that applies to the site, the objectives of the height of building clause are as follows:

- *to ensure that the scale of buildings—*
 - *is compatible with adjoining development, and*
 - *is consistent with the desired scale and character of the street and locality in which the buildings are located or the desired future scale and character, and*
 - *complements any natural landscape setting of the buildings,*
- *to allow reasonable daylight access to all buildings and the public domain,*
- *to minimise the impacts of new buildings on adjoining or nearby properties from loss of views, loss of privacy, overshadowing or visual intrusion,*
- *to ensure that the visual impact of buildings is minimised when viewed from adjoining properties, the street, waterways and public reserves,*
- *to ensure, where possible, that the height of non-residential buildings in residential zones is compatible with the scale of residential buildings in those zones,*
- *to achieve transitions in building scale from higher intensity employment and retail centres to surrounding residential areas.*

4.3.3 Urban design

Clause 6.16 provides specific controls relating to urban design, which have been extracted below with emphasis added for items related to visual impact.

(1) In deciding whether to grant development consent for any development, the consent authority must consider the following—

(a) the extent to which high quality design and development outcomes for the urban environment of Sutherland Shire have been attained, or will be attained, by the development,

(b) the extent to which any buildings are designed and will be constructed to—

(i) strengthen, enhance or integrate into the existing character of distinctive locations, neighbourhoods and streetscapes, and

(ii) contribute to the desired future character of the locality concerned,

(c) the extent to which recognition has been given to the public domain in the design of the development and the extent to which that design will facilitate improvements to the public domain,

(d) the extent to which the natural environment will be retained or enhanced by the development,

(e) the extent to which the development will respond to the natural landform of the site of the development,

(f) the extent to which the development will preserve, enhance or reinforce specific areas of high visual quality, ridgelines and landmark locations, including gateways, nodes, views and vistas,

(g) the principles for minimising crime risk set out in Part B of the Crime Prevention Guidelines and the extent to which the design of the proposed development applies those principles.

5.0 Key issues

The following table shows the key LVIA issues identified in the planning framework.

Table 4 Key LVIA issues

Part of the planning framework	Part	Matter / issue
Government priorities and strategic planning framework	The Region Plan	Scenic and cultural landscapes
	South District Plan	Scenic and cultural landscapes
	The LSPS	Natural landscape views and landscapes
	State environmental planning policies	Not highly relevant
Sutherland Local Environmental Plan 2015	Section 1.3 'Land zoning'	Not highly relevant
	Section 4.3 'Height of buildings'	Desired character, natural landscape setting, view impacts on surrounding residential areas
	Section 6.16 'Urban Design'	Desired character, views and vistas

Based on review of the site and its context, the Project and the planning framework, in addition to the procedural matters identified in the SEARs the following are the key issues that need to be considered by the LVIA:

- **Visual Character:** responsiveness to existing valued visual characteristics including scenic and cultural landscapes
- **Visual Amenity:** impact on the visual amenity of surrounding residences, key locations, significant vistas and road corridors in the public domain
- **Landscape Setting:** impact on the landscape setting of the site and its surroundings.
- **Interfaces:** impact on the sites interface with the existing wetlands and the local road network.

It is noted that there is a level of overlap between these issues. It is also noted that many are also highly relevant to planning and design considerations. As such, reference is to be made to the separate, supporting planning and design documentation.

6.0 Method

As has already been noted, the purpose of this LVIA is to identify and determine the acceptability of a Project's likely visual impact by addressing the SEARs.

LVIA is highly complex and involves qualitative and professional value judgements. While there is a wealth of guidance documents, there is currently no universally agreed, national level guideline for LVIA in Australia (AILA, 2019). As noted by the Land and Environment Court of New South Wales in *Rose Bay Marina Pty Limited v Woollahra Municipal Council and anor* [2013] NSWLEC 1046 (Rose Bay), the key to addressing this challenge is to adopt a rigorous methodology.

With reference to its purpose, the method used by this LVIA has the following key steps:

Identifying the Projects likely visual impacts

- **Visual analysis:** undertaking visual analysis
- **Survey aligned photomontages:** preparing an evidence base of survey aligned photomontages
- **Significance of visual impact:** assessing the significance of the Project's likely visual impact

Determining the acceptability of the Project's likely visual impacts

- **Consistency with the planning framework:** assessing the consistency of the Project's likely visual impact against relevant parts of the planning framework. Due to the concurrent rezoning, the application is to be merit assessed with considerable weight placed on the strategic planning framework. While relevant, less weight is to be given to the statutory planning framework.

6.1 Visual analysis

This stage involves the following key steps:

- understand the visual character of the Project, the precinct and the visual catchment, which is the area in which the Project may ordinarily be seen in totality or part
- identify the people within the visual catchment who will ordinarily be exposed to views of the Project
- identify the pattern of viewing
- identify viewpoints that are representative of the pattern of viewing and through the preparation of an evidence base of survey aligned photomontages may be used to inform identification of likely visual impact.

The methodological basis underpinning this stage is derived from the international standard 'Guidelines for Landscape and Visual Impact Assessment – third edition' (GLVIA3) (Landscape Institute and Institute of Environmental Management & Assessment, 2013). The GLVIA3 is widely referenced in LVIA in Australia (AILA, 2019) including in Secretary's environmental assessment requirements (SEARs) for state significant development (SSD). It is more versatile for a range of contexts in particular those of an urban nature compared to other commonly referenced but more highly specialised guidance such as that prepared by the US Forestry Service.

Where appropriate, the LVIA also has regard to other VIA guidance including the planning principle established by the NSW Land and Environment Court in *Rose Bay Marina Pty Limited v Woollahra Municipal Council and anor* [2013] NSWLEC 1046 (Rose Bay), 'Topic Paper 6 – Techniques and criteria for judging capacity and sensitivity' (the Countryside Agency and Scottish Natural Heritage, 2014) and the 'Guideline for landscape character and visual impact assessment' (TfNSW, 2023).

6.2 Survey aligned photomontages

To inform the qualitative and professional value judgements made in this LVIA, an evidence base of survey aligned photomontages for 4 viewpoints representative of the area and the visual catchment was prepared in accordance with the NSW Land and Environment Court 'Photomontage Policy'. This represents the highest possible standard of accuracy for visual representation, and is based on on-site survey and photographic and specialist software work. **Appendix A** provides further detail on the methodology used. Where appropriate, reference has also been made to 3D simulated views and other photography taken by others are readily available in the public domain.

6.3 Significance of visual impact

As with visual analysis, the methodological basis for this stage is derived from the GLVIA3. This is focussed on the significance of visual impact based on the factors of sensitivity of the Precinct and visual catchment to the nature of change proposed and the magnitude of the nature of change proposed.

To assist in providing a level of consistency to the assessment of sensitivity, magnitude and significance, the LVIA uses a series of matrix tables. The following table identifies the considerations that inform the factors of sensitivity magnitude.

Table 5 *Factors of sensitivity and magnitude*

Sensitivity	Magnitude
• Cultural and social value of the view • The prevailing type of people ordinarily exposed to the view • The prevailing number of people ordinarily exposed to the view	• Scale of change (eg, compatibility with existing visual character) • Geographical extent of the area influenced • Duration and / or reversibility of the change

No pre-determined weighting is given to each factor. Rather, where one factor strongly influences the assessment, weighting is to be discussed in the context of a particular view.

Significance is expressed in terms of how the Project may ordinarily be perceived by people on a five-point qualitative scale:

- negligible significance of impact
- low significance of impact
- moderate significance of impact
- high significance of impact
- major significance of impact.

There is no pre-determined definition of what the difference between each of these findings. Rather, as has been noted, it is inherently subjective and varied according to the nature of each view. In this regard the GLVIA3 makes the following observation:

‘There are no hard and fast rules about what makes a significant effect, and there cannot be a standard approach since circumstances vary with the location and context and with the type of Project. In making a judgement about the significance of visual effects the following points should be noted:

- Effects on people who are particularly sensitive to changes in views and visual amenity are more likely to be significant
- Effects on people at recognised and important viewpoints or from recognised scenic routes are more likely to be significant
- Large-scale changes which introduce new, non-characteristic or discordant or intrusive elements into the view are more likely to be significant than small changes or changes involving features already present within the view’.

6.4 Consistency with the planning framework

Determination of significance does not automatically equate to unacceptability. Rather, acceptability is determined by consistency with relevant parts of the applicable planning framework.

The planning framework is the appropriate reference for this judgement as it represents the policy position of the NSW Government, and in the case of local planning instruments that of Sutherland Shire Council, on relevant matters.

6.5 Assumptions, limitations and exclusions

In addition to any others expressed in the relevant part of this LVIA, the following key assumptions, limitations and exclusions apply to this LVIA:

- it is assumed that all inputs from other parties are accurate
- as the Project is not for strata titled residential uses or involve extensive alteration of natural landform or removal of native bushland, for the purposes of magnitude assessment the Project is considered to be ongoing but capable of being reversed (ie, demolished and the land remediated to its current or near its current state)

- to enable a focus on assessment of scale and form, architectural and landscaping detail has not been included in the photomontages
- as with all LVIA, there is considerable interplay between planning, design and visual impact matters. As such, while the LVIA touches on matters such as character, size and scale, due regard should be given to other relevant documents for full address of these matters
- while photomontages provide an indication of likely future visual environment, they can only provide an approximation of the rich visual experience enabled by the human eye. As they are based on photographs, the same limitations that apply to photography, including optical distortion, apply (refer to Attachment A for further detail)
- detailed consideration of heritage, including impact on values and significance, is excluded
- consideration of impact on Aboriginal cultural heritage values associations is excluded. This is only appropriately undertaken by a member or member or qualified representative of the Aboriginal community
- consideration of night-time impact, including lighting, is excluded.

7.0 Visual analysis

7.1 The visual catchment

The visual catchment is the area of the public domain from which the Project may ordinarily be seen by people, either in totality or in part, and as such has a visual connection with the site.

The extent of the visual catchment is influenced by an interplay of a number of factors including topography, public domain, buildings and structures, and vegetation.

The visual catchment generally extends to:

- **north:** Kurnell residential area
- **south:** Sir Joseph Banks Drive intersection with Captain Cook Drive
- **east:** Captain Cook Drive
- **west:** Western site boundary

It should be noted that although there are identified viewing points, tracks and recreational areas located within the Kamay Botany Bay National Park approximately 2km east of the site, due to distance, topography and significant vegetation cover in addition to the relatively low scale nature of the Project, these locations are not considered to be within the visual catchment of the site.

Similarly, the existing wetlands abutting the site to the west, form part of the Towra Bay Nature Reserve and are not considered to be within the subject site's visual catchment for the purposes of this LVIA, due to the significant vegetation cover providing natural screening from the relatively low scale nature of the Project.

7.2 Primary visual catchment

The primary visual catchment is the part of the visual catchment from which the Project is likely to be most visible, and by association likely have the greatest visual impact.

The primary visual catchment generally consists of:

- The Captain Cook Drive transport route
- Kurnell township

7.3 Pattern of viewing

The way in which people (visual receptors) typically experience the visual catchment is called the 'pattern of viewing'.

Views can typically be seen at closer or longer range. There are not universal standards as to what constitutes the numerical boundaries between these ranges. Rather, they are relative to each other.

It is considered that the pattern of viewing for the Project is generally as follows:

- residents at home located in the residential area to the north
- motorists in vehicles along Captain Cook Drive, generally within close proximity to site between Sir Joseph Banks Drive to the south and Kurnell Recreation Club to the north
- users/visitors of Kurnell Recreation Club to the north
- users of Marton Park to the north

7.4 Viewpoints

The nature and extent of visual impact changes with a person's location in the landscape (viewpoint) based on factors such as direction, distance, angle, and duration of visibility (eg, static or moving).

As there is a near infinite number of viewpoints, a selection of viewpoints to form the basis of the LVIA is required. In this regard, the GLVIA3 provides the following guidance:

- 'The viewpoints used need to cover as wide a range of situations as is possible, reasonable and necessary to cover the likely significant effects. It is not possible to give specific guidance on the appropriate number of viewpoints since this depends on the context, the nature of the Project and the range and location of visual receptors. The emphasis must always be on proportionality in relation to the scale and nature of the Project and its likely significant effects.'

As can be seen, the focus is on achieving a balance between adequacy of coverage and reasonableness.

Informed by this the following table identifies the viewpoints that have been selected for assessment as part of this LVIA, including the reason for this selection.

Table 6 Viewpoints

Ref	Location	Target	Reason
1	Marton Park	The Project	Assess impact on visual amenity of key open space and recreation located within close proximity to the site.
2	Dampier Street	The Project	A key north-south view corridor that affords medium range views from the local residential streetscape towards the site. This view location is a representative view to assess impact on surrounding residential area to the north.
3	Captain Cook Drive - southern approach (cnr Sir Joseph Banks Dr)	The Project	Assess impact on the visual character of key transport routes that are highly frequented and located within close proximity to the site. / Key intersection with increased traffic located close to the site.

Ref	Location	Target	Reason
4	Kurnell Recreation Club - Captain Cook Drive - northern approach	The Project	Assess impact on the visual character of key transport routes that are highly frequented and located within close proximity to the site. / Key location for increased traffic to assess impact on visual amenity of a key community facility within close proximity to the site.



Figure 10 Key public viewpoints

Source: Nearmap edited by Colliers Urban Planning

8.0 Visual impact assessment

This visual impact assessment has been undertaken on the Project at 171-189 Captain Cook Drive, Kurnell.

8.1 Viewpoint 1: Marton Park

Table 7 Viewpoint 1: Marton Park

Parameter	Description
View target	The Project
Direction of view	South-west
Range	Medium
Distance (approx.) relative to site	550m

Parameter	Description
Elevation relative to site	Level

8.1.1 Existing view



Figure 11 Viewpoint 1: Marton Park

Source: Virtual Ideas

Description of the view

- The foreground consists of grassed open space.
- The midground consists of a mix of substantial canopy trees and vegetation, planted around the perimeter of the recreational open space, in addition to a low scale club house building form and utility pole.
- The background consists of a vast amount of sky.

8.1.2 Sensitivity

The following table assesses the sensitivity of the viewpoint to the nature of change proposed. The viewpoint is considered to have a **medium** sensitivity of the viewpoint to the nature of change proposed.

Table 8 Viewpoint 1: Marton Park – sensitivity to the change proposed

Factor	Level of sensitivity
Receptor Type	Low-medium
Number of People	Medium
Social and cultural value of the view	Medium

Factor	Level of sensitivity
Visual Characteristics	Low-medium
Sensitivity: Medium	

8.1.3 Proposed view



Figure 12 Viewpoint 1: Marton Park – Proposed view

Source: Virtual Ideas

Note: The yellow dotted line represents the outline of the Project. Noting that it is not visible from this viewpoint.

8.1.4 Magnitude

The following table assesses the magnitude of the nature of change proposed. The Project is considered to have an **imperceptible** magnitude of change given it is not visible from this viewpoint.

Table 9 Viewpoint 1: Marton Park – Magnitude of the nature of change proposed

		Duration and reversibility			
		Ongoing and irreversible	Ongoing capable of being reversed	Limited life (5 – 10 years)	Limited life (< 5 years)
Size and scale of change	Major change over wide area	Dominant	Considerable	Considerable	Noticeable
	Major change over restricted area, or Moderate change over wide area	Considerable	Considerable	Noticeable	Noticeable
	Moderate change over restricted area; or Minor change over a wide area	Considerable	Noticeable	Noticeable	Perceptible

		Duration and reversibility			
		Ongoing and irreversible	Ongoing capable of being reversed	Limited life (5 – 10 years)	Limited life (< 5 years)
	Minor change over a restricted area; or Insignificant change	Perceptible	Perceptible	Perceptible	Imperceptible
	Imperceptible change	Imperceptible	Imperceptible	Imperceptible	Imperceptible

8.1.5 Significance

The following table assesses the significance of the nature of change proposed. Overall, the Project is considered to have a **negligible** significance of visual impact.

Table 10 Viewpoint 1: Marton Park – Significance of the nature of change proposed

		Magnitude				
		Dominant	Considerable	Noticeable	Perceptible	Imperceptible
Sensitivity	High	Major	High	Moderate	Low	Negligible
	Medium	High	Moderate	Low	Low	Negligible
	Low	Moderate	Low	Low	Negligible	Negligible
	Negligible	Low	Low	Negligible	Negligible	Negligible

8.2 Viewpoint 2: Dampier Street

Table 11 Viewpoint 2: Dampier Street

Parameter	Description
View target	The Project
Direction of view	South
Range	Medium
Distance (approx.) relative to site	380m
Elevation relative to site	Level

8.2.1 Existing view



Figure 13 Viewpoint 2: Dampier Street
Source: Virtual Ideas

Description of the view

- The foreground consists of a local road reserve with nature strips on either side, featuring intermittent vegetation and trees in addition to a typical footpath along the western edge of the road reserve.
- The midground consists of low scale residential dwellings sited within varying landscaped settings, along with utility poles and infrastructure. Large trees, utility poles and power lines penetrate views of the sky along the streetscape.
- The background consists of a vast amount of sky.

8.2.2 Sensitivity

The following table assesses the sensitivity of the viewpoint to the nature of change proposed. The viewpoint is considered to have a **medium** sensitivity of the viewpoint to the nature of change proposed.

Table 12 Viewpoint 2: Dampier Street – sensitivity to the change proposed

Factor	Level of sensitivity
Receptor Type	Medium
Number of People	Medium
Social and cultural value of the view	Medium
Visual Characteristics	Medium
Sensitivity: Medium	

8.2.3 Proposed view



Figure 14 Viewpoint 2: Dampier Street – Proposed view

Source: Virtual Ideas

Note: The yellow dotted line represents the outline of the Project. Noting that it is not visible from this viewpoint.

8.2.4 Magnitude

The following table assesses the magnitude of the nature of change proposed. The Project is considered to have an **imperceptible** magnitude of change given it is not visible from this viewpoint.

Table 13 Viewpoint 2: Dampier Street – Magnitude of the nature of change proposed

		Duration and reversibility			
		Ongoing and irreversible	Ongoing capable of being reversed	Limited life (5 – 10 years)	Limited life (< 5 years)
Size and scale of change	Major change over wide area	Dominant	Considerable	Considerable	Noticeable
	Major change over restricted area, or Moderate change over wide area	Considerable	Considerable	Noticeable	Noticeable
	Moderate change over restricted area; or Minor change over a wide area	Considerable	Noticeable	Noticeable	Perceptible
	Minor change over a restricted area; or Insignificant change	Perceptible	Perceptible	Perceptible	Imperceptible
	Imperceptible change	Imperceptible	Imperceptible	Imperceptible	Imperceptible

8.2.5 Significance

The following table assesses the significance of the nature of change proposed. Overall, the Project is considered to have a **negligible** significance of visual impact.

Table 14 Viewpoint 2: Dampier Street – Significance of the nature of change proposed

		Magnitude				
		Dominant	Considerable	Noticeable	Perceptible	Imperceptible
Sensitivity	High	Major	High	Moderate	Low	Negligible
	Medium	High	Moderate	Low	Low	Negligible
	Low	Moderate	Low	Low	Negligible	Negligible
	Negligible	Low	Low	Negligible	Negligible	Negligible

8.3 Viewpoint 3: Captain Cook Drive - southern approach (cnr Sir Joseph Banks Dr)

Table 15 Viewpoint 3: Captain Cook Drive - southern approach (cnr Sir Joseph Banks Dr)

Parameter	Description
View target	The Project
Direction of view	North-east
Range	Medium
Distance (approx.) relative to site	330m
Elevation relative to site	Level

8.3.1 Existing view



Figure 15 Viewpoint 3: Captain Cook Drive - southern approach (cnr Sir Joseph Banks Dr)

Source: Virtual Ideas

Description of the view

- The foreground consists of the road reserve of major transport route; Captain Cook Drive with grassed swale verges along both sides.
- Significant trees and vegetation, generally associated with the existing wetlands in addition to utility poles and power lines are predominant within the midground of this view. Upper portions of utility poles and power lines penetrate the sky.
- The background consists of a vast amount of sky.

8.3.2 Sensitivity

The following table assesses the sensitivity of the viewpoint to the nature of change proposed. The viewpoint is considered to have a **low** sensitivity of the viewpoint to the nature of change proposed.

Table 16 Viewpoint 3: Captain Cook Drive - southern approach (cnr Sir Joseph Banks Dr)

Factor	Level of sensitivity
Receptor Type	Low
Number of People	High
Social and cultural value of the view	Low
Visual Characteristics	Low
Sensitivity: Low	

8.3.3 Proposed view



Figure 16 Viewpoint 3: Captain Cook Drive - southern approach (cnr Sir Joseph Banks Dr) – Proposed view

Source: Virtual Ideas

Note: The yellow dotted line represents the outline of the Project. Noting that it is not visible from this viewpoint.

8.3.4 Magnitude

The following table assesses the magnitude of the nature of change proposed. The Project is considered to have an **imperceptible** magnitude of change given it is not visible from this viewpoint.

Table 17 Viewpoint 3: Captain Cook Drive - southern approach (cnr Sir Joseph Banks Dr)– Magnitude of the nature of change proposed

		Duration and reversibility			
		Ongoing and irreversible	Ongoing capable of being reversed	Limited life (5 – 10 years)	Limited life (< 5 years)
Size and scale of change	Major change over wide area	Dominant	Considerable	Considerable	Noticeable
	Major change over restricted area, or Moderate change over wide area	Considerable	Considerable	Noticeable	Noticeable
	Moderate change over restricted area; or Minor change over a wide area	Considerable	Noticeable	Noticeable	Perceptible
	Minor change over a restricted area; or Insignificant change	Perceptible	Perceptible	Perceptible	Imperceptible

		Duration and reversibility			
		Ongoing and irreversible	Ongoing capable of being reversed	Limited life (5 – 10 years)	Limited life (< 5 years)
	Imperceptible change	Imperceptible	Imperceptible	Imperceptible	Imperceptible

8.3.5 Significance

The following table assesses the significance of the nature of change proposed. Overall, the Project is considered to have a **negligible** significance of visual impact.

Table 18 Viewpoint 3: Captain Cook Drive - southern approach (cnr Sir Joseph Banks Dr)– Significance of the nature of change proposed

		Magnitude				
		Dominant	Considerable	Noticeable	Perceptible	Imperceptible
Sensitivity	High	Major	High	Moderate	Low	Negligible
	Medium	High	Moderate	Low	Low	Negligible
	Low	Moderate	Low	Low	Negligible	Negligible
	Negligible	Low	Low	Negligible	Negligible	Negligible

8.4 Viewpoint 4: Kurnell Recreation Club - Captain Cook Drive - northern approach

Table 19 Viewpoint 4: Kurnell Recreation Club - Captain Cook Drive - northern approach

Parameter	Description
View target	The Project
Direction of view	South-west
Range	Close -medium
Distance (approx.) relative to site	180m
Elevation relative to site	Level

8.4.1 Existing view



Figure 17 *Viewpoint 4: Kurnell Recreation Club - Captain Cook Drive - northern approach*
Source: Virtual Ideas

Description of the view

- The foreground consists of the road reserve of major transport route; Captain Cook Drive with kerb and channel gutters and grassed verges along both sides.
- Significant trees and vegetation, generally associated with the existing wetlands in addition to utility poles and power lines and road signs are predominant within the midground of this view.
- The background consists of views to the sky.

8.4.2 **Sensitivity**

The following table assesses the sensitivity of the viewpoint to the nature of change proposed. The viewpoint is considered to have a **low** sensitivity of the viewpoint to the nature of change proposed.

Table 20 *Viewpoint 4: Kurnell Recreation Club - Captain Cook Drive - northern approach*

Factor	Level of sensitivity
Receptor Type	Low
Number of People	High
Social and cultural value of the view	Low
Visual Characteristics	Low
Sensitivity: Low	

8.4.3 Proposed view



Figure 18 Viewpoint 4: Kurnell Recreation Club - Captain Cook Drive - northern approach – Proposed view

Source: Virtual Ideas

Note: The yellow dotted line represents the outline of the Project. Noting that it is not visible from this viewpoint.

8.4.4 Magnitude

The following table assesses the magnitude of the nature of change proposed. The Project is considered to have an **imperceptible** magnitude of change given it is not visible from this viewpoint.

Table 21 Viewpoint 4: Kurnell Recreation Club - Captain Cook Drive - northern approach– Magnitude of the nature of change proposed

		Duration and reversibility			
		Ongoing and irreversible	Ongoing capable of being reversed	Limited life (5 – 10 years)	Limited life (< 5 years)
Size and scale of change	Major change over wide area	Dominant	Considerable	Considerable	Noticeable
	Major change over restricted area, or Moderate change over wide area	Considerable	Considerable	Noticeable	Noticeable
	Moderate change over restricted area; or Minor change over a wide area	Considerable	Noticeable	Noticeable	Perceptible
	Minor change over a restricted area; or Insignificant change	Perceptible	Perceptible	Perceptible	Imperceptible

		Duration and reversibility			
		Ongoing and irreversible	Ongoing capable of being reversed	Limited life (5 – 10 years)	Limited life (< 5 years)
	Imperceptible change	Imperceptible	Imperceptible	Imperceptible	Imperceptible

8.4.5 Significance

The following table assesses the significance of the nature of change proposed. Overall, the Project is considered to have a **negligible** significance of visual impact.

Table 22 Viewpoint 4: Kurnell Recreation Club - Captain Cook Drive - northern approach - Significance of the nature of change proposed

		Magnitude				
		Dominant	Considerable	Noticeable	Perceptible	Imperceptible
Sensitivity	High	Major	High	Moderate	Low	Negligible
	Medium	High	Moderate	Low	Low	Negligible
	Low	Moderate	Low	Low	Negligible	Negligible
	Negligible	Low	Low	Negligible	Negligible	Negligible

9.0 Findings

Table 23 Consolidated photos and photomontages

Photo of existing view	Photomontage of proposed view
 Viewpoint 1: Marton Park – existing view	 Viewpoint 1: Marton Park – proposed view

Photo of existing view

Photomontage of proposed view



Viewpoint 2: Dampier Street – existing view



Viewpoint 2: Dampier Street – proposed view



Viewpoint 3: Captain Cook Drive - southern approach (cnr Sir Joseph Banks Dr) – existing view



Viewpoint 3: Captain Cook Drive - southern approach (cnr Sir Joseph Banks Dr) – proposed view



Viewpoint 4: Kurnell Recreation Club - Captain Cook Drive - northern approach – existing view



Viewpoint 4: Kurnell Recreation Club - Captain Cook Drive - northern approach – proposed view

Table 24 Findings of the LVIA

Viewpoint	Sensitivity	Magnitude	Significance
Viewpoint 1: Marton Park	Medium	Imperceptible	Negligible
Viewpoint 2: Dampier Street	Medium	Imperceptible	Negligible
Viewpoint 3: Captain Cook Drive - southern approach (cnr Sir Joseph Banks Dr)	Low	Imperceptible	Negligible
Viewpoint 4: Kurnell Recreation Club - Captain Cook Drive - northern approach	Low	Imperceptible	Negligible

10.0 Consideration of key issues

10.1 Visual character

The predominant visual character of the site is influenced by the existing substation land use, that sits within a predominantly visually enclosed area, naturally screened by existing vegetation.

The Project will not impact the existing visual character of the area as it is generally visually synonymous with the existing land use of the site.

10.2 Visual amenity

The Project will have minimal impact on the visual amenity of the site and surrounds, given the Project will be visually integrated with the existing Kurnell Zone Substation.

The surrounding dense vegetation obstructs views towards the site. In addition, the distance some key viewpoints have from the site also results in the visibility of the Project being imperceptible, reducing the overall impact on visual amenity.

10.3 Landscape setting

The site and its immediate surrounds are predominately flat. Existing abutting vegetation and roadside vegetation along Captain Cook Drive are associated with the Towra Point Nature Reserve, predominantly screening the site from the roadway and surrounding receptors.

In accordance with the planning framework, the Project does not impact on the existing highly modified land of the site or the interfacing Wetlands and Nature Reserve landscape.

11.0 Mitigation measures

Under the principles for the management of environmental impacts in the GLVIA3 there are three broad types of mitigation measures:

1. avoid
2. minimise
3. offset.

There are a number of stages in the development process when mitigation measures should be considered. Of relevance to this Project are the following:

- **primary measures:** considered as part of design development
- **secondary measures:** considered as part of conditioning a development consent.

A number of primary mitigation measures have already been incorporated through the design of the Project to improve visual amenity and mitigate visual impact. These include:

- there is no loss of existing vegetation.
- the Project is located on previously cleared land and will sit within the context of the existing Kurnell Zone Substation, minimising impact and encroachment on the surrounding heavily vegetated land.
- connection of the BESS to the Kurnell Zone Substation will be via an underground cable.

The incorporation of these design measures have been critical to the determination of acceptable visual impact of the Project. On this basis, it is not considered necessary to make further fundamental or otherwise large-scale amendments to the Project in its current form to satisfactorily manage visual impact.

Although the site is largely visually enclosed due to existing roadside vegetation present along the sites northern interface with Captain Cook Drive, the southern portion of this interface features minimal vegetation. As the Project would be visible from this immediate road frontage the following secondary mitigation measures should be considered to further mitigate visual impact:

- Specifying colours consistent with the surrounding landscape and vegetation of the proposed noise and safety walls (specifically the proposed wall along the Captain Cook Drive).
- Low level boundary planting along the southern section of the sites Captain Cook Drive interface, using plant species in keeping with the existing roadside vegetation.

12.0 Conclusion

The Project is identified as having a negligible visual impact on the site and surrounds.

On the balance of relevant matters, the Project has an acceptable visual impact for the following reasons:

- the existing surrounding landscape provides natural visual screening of the site from key locations and visual receptors.
- supported by the findings on sensitivity and magnitude, the Project has a scale and form, that is generally visually synonymous with the existing land use of the site.
- the site has already been highly modified and has capacity to accommodate change without detrimental impacts on the existing landscape and visual character.
- the nature of view impact is in keeping with what could reasonably be expected under the planning framework.
- the Project has been informed by detailed site and context analysis, that has included consideration of visual impact

As such, it is the conclusion of this LVIA that the Project can be supported on visual impact grounds.



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Kurnell BESS, 189 Captain Cook Drive, Kurnell, NSW

Visual impact photomontages and methodology report

17th October 2025

VIRTUAL IDEAS

1. INTRODUCTION

This document, created by Virtual Ideas, aims to showcase the visual impact of the proposed development for 189 Captain Cook Drive, Kurnell, NSW in comparison to the existing built form and site conditions.

2. VIRTUAL IDEAS EXPERTISE

Virtual Ideas is an experienced architectural visualisation company with over 15 years of expertise in crafting visual impact assessment content and reports for projects of significant magnitude, aligning with the standards set by local and state planning authorities.

Our reports have served as evidence in proceedings before both the Land and Environment Court and the Supreme Court of NSW. Our director, Grant Kolln, has provided expert testimony in visual impact assessment in the Supreme Court of NSW.

Virtual Ideas’ methodologies and outcomes have undergone thorough scrutiny by court-appointed experts in relation to previous visual impact assessment submissions, consistently garnering recognition for their precision and reliability.

3. RENDERINGS METHODOLOGY

The following outlines the meticulous process employed by Virtual Ideas to produce the renderings that underpin this report.

3.1 DIGITAL 3D SCENE CREATION

Our initial stage involves crafting a precise, true-to-life digital 3D environment using Autodesk 3ds Max software, accurately scaled to real-world dimensions, and aligned to a standardised reference point utilising the MGA 56 GDA 2020 coordinate system.

To construct this environment, we combine various data sources, encompassing existing, approved and proposed building 3D models, along with site survey data. Further information regarding the origins of these data sources is provided in Appendices A, and B.

In cases where data sources lack alignment with the MGA-56 GDA 2020 coordinates, we employ identifiable features common across datasets, such as site boundaries and building outlines, which can be aligned with those already situated in the MGA-56 GDA 2020 framework.

Detailed accounts of the alignment processes for each data source are elaborated upon in Section 3.3.

3.2 SITE PHOTOGRAPHY

The site photography was captured by Virtual Ideas, with the respective viewpoint locations delineated on the viewpoint map in Section 4 of this document.

The selection of camera lens and composition of photography from each viewpoint was instructed by Ethos Urban after careful consideration of multiple factors. Paramount among these were the distance of the camera position from the site and the scale of the proposed development in relation to the surrounding built environment and landscape.

For these public domain photomontages, a lens focal length of 24mm was chosen. This lens choice ensures adequate visibility of both the proposed development and the immediate surrounding context, facilitating a thorough assessment of the proposed development’s visual impact.

For certain scenarios, employing a 50mm lens may produce the most effective photomontage for assessing visual impact. The 50mm lens is often favoured for its close approximation to the human eye perception of distance. However, in instances where a 50mm lens fails to encompass an adequate surrounding context for comprehensive visual impact assessment, opting for a wider lens becomes imperative. All photographs are lens profile corrected in Camera RAW, which removes the distortion associated with the curvature of the lens.

Comprehensive metadata, including date, time, and lens information, is recorded during site photography. This critical data enables precise analysis and documentation of each photograph’s attributes.

3.3 ALIGNMENT OF 3D SCENE

To accurately position the 3D scene within its geographical context, we employed the following data:

- 1. Site Survey Alignment: Utilising a provided site survey, we aligned the boundaries of the proposed buildings with geo-referenced data, ensuring precise positioning within the digital environment.
- 2. Camera Alignment: Cameras were aligned to surveyed positions supplied by CMS Surveyors, adhering to the MGA-56 GDA 2020 coordinate system. This meticulous alignment ensured that viewpoints captured within the 3D scene accurately reflected real-world perspectives.

3.4 RENDERING CREATION

Following the completion of the camera alignment, we proceeded to integrate lighting into the 3D scene. To replicate natural lighting conditions accurately, a digital sunlight system was incorporated into the 3D environment. This system emulates the directional lighting of the sun leveraging location data, as well as time and date information. Implemented through specialised software, the sunlight system ensures precise alignment with the sun’s angle, enhancing realism within the scene.

The proposed building model was rendered with a basic chalk white material. This differentiation aids in visual clarity and enhances the presentation of the design elements.

4. VIEWPOINTS

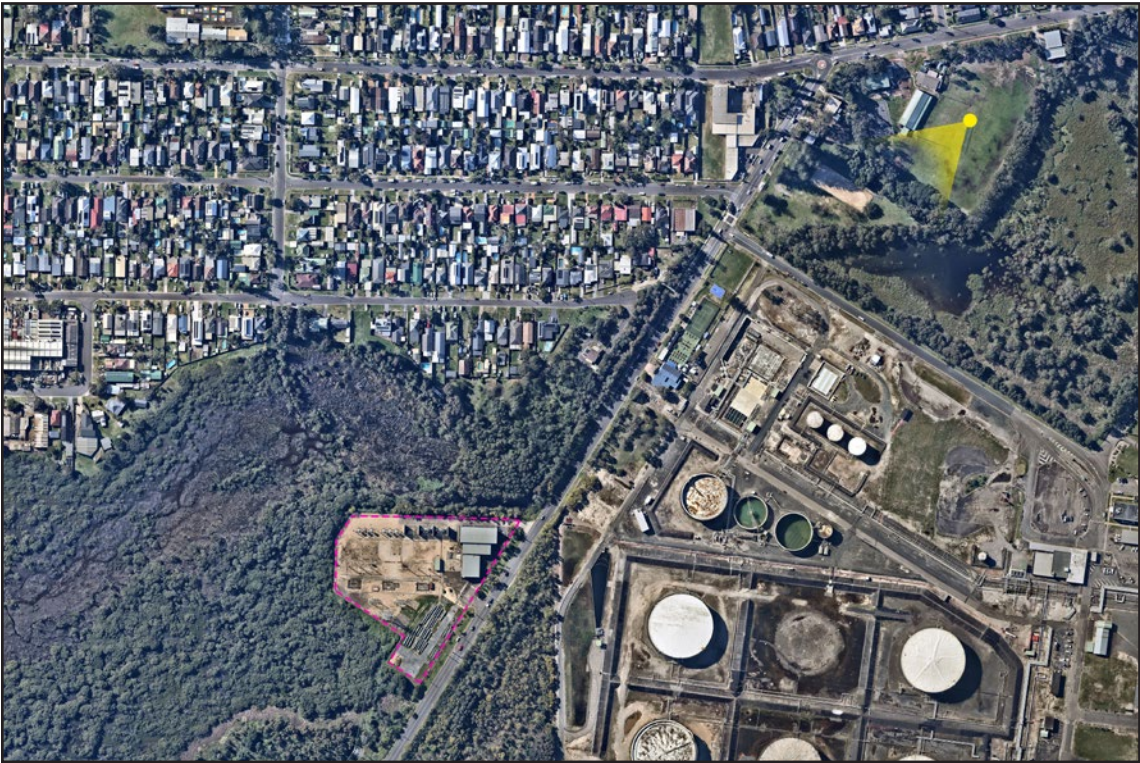
MAP ILLUSTRATING VIEWPOINT LOCATIONS



- Viewpoint 01. Marton Park
- Viewpoint 02. Dampier Street at Torres Street
- Viewpoint 03. Captain Cook Drive at Southern Cross Drive
- Viewpoint 04. Kurnell Recreation Club, 160 Captain Cook Drive

5.1 VIEWPOINT POSITION 01 - Marton Park

VIEWPOINT LOCATION



ALIGNMENT OF SURVEYED POINTS



PHOTOGRAPH DETAILS

File Name: View 01_24mm_02
Author: Virtual Ideas
Format: ARW
Date: 8 October 2025
Time: 14:48 AEST
Lens: FE 24-70mm F2.8 GM
Model: Sony ILCE-7RM4A
Sensor: Full frame
Focal length: 24mm

ORIGINAL PHOTOGRAPH



ORIGINAL PHOTOGRAPH WITH PROPOSED



5.2 VIEWPOINT POSITION 01 - Marton Park

VIEWPOINT LOCATION



— Proposed Site

5.3 VIEWPOINT POSITION 01 - Marton Park

ALIGNMENT OF SURVEYED POINTS



5.4 VIEWPOINT POSITION 01 - Marton Park

ORIGINAL PHOTOGRAPH



5.5 VIEWPOINT POSITION 01 - Marton Park

ORIGINAL PHOTOGRAPH WITH PROPOSED



--- Proposed Development not visible from viewpoint

6.1 VIEWPOINT POSITION 02 - Dampier Street at Torres Street

VIEWPOINT LOCATION



ALIGNMENT OF SURVEYED POINTS



PHOTOGRAPH DETAILS

File Name: View 02A_24mm_02
Author: Virtual Ideas
Format: ARW
Date: 8 October 2025
Time: 11:37 AEST
Lens: FE 24-70mm F2.8 GM
Model: Sony ILCE-7RM4A
Sensor: Full frame
Focal length: 24mm

ORIGINAL PHOTOGRAPH



ORIGINAL PHOTOGRAPH WITH PROPOSED



6.2 VIEWPOINT POSITION 02 - Dampier Street at Torres Street

VIEWPOINT LOCATION



— Proposed Site

6.3 VIEWPOINT POSITION 02 - Dampier Street at Torres Street

ALIGNMENT OF SURVEYED POINTS



6.4 VIEWPOINT POSITION 02 - Dampier Street at Torres Street

ORIGINAL PHOTOGRAPH



6.5 VIEWPOINT POSITION 02 - Dampier Street at Torres Street

ORIGINAL PHOTOGRAPH WITH PROPOSED



— Proposed Development not visible from viewpoint

7.1 VIEWPOINT POSITION 03 - Captain Cook Drive at Southern Cross Drive

VIEWPOINT LOCATION



ALIGNMENT OF SURVEYED POINTS



PHOTOGRAPH DETAILS

File Name: View 03_24mm_04
Author: Virtual Ideas
Format: ARW
Date: 8 October 2025
Time: 14:26 AEST
Lens: FE 24-70mm F2.8 GM
Model: Sony ILCE-7RM4A
Sensor: Full frame
Focal length: 24mm

ORIGINAL PHOTOGRAPH



ORIGINAL PHOTOGRAPH WITH PROPOSED



7.2 VIEWPOINT POSITION 03 - Lowden Square at Wollongong Station

VIEWPOINT LOCATION



— Proposed Site

7.3 VIEWPOINT POSITION 03 - Captain Cook Drive at Southern Cross Drive

ALIGNMENT OF SURVEYED POINTS



7.4 VIEWPOINT POSITION 03 - Captain Cook Drive at Southern Cross Drive

ORIGINAL PHOTOGRAPH



7.5 VIEWPOINT POSITION 03 - Captain Cook Drive at Southern Cross Drive

ORIGINAL PHOTOGRAPH WITH PROPOSED



— Proposed Development not visible from viewpoint

8.1 VIEWPOINT POSITION 04 - Kurnell Recreation Club, 160 Captain Cook Drive

VIEWPOINT LOCATION



ALIGNMENT OF SURVEYED POINTS



PHOTOGRAPH DETAILS

File Name: View 04B_24mm_01
Author: Virtual Ideas
Format: ARW
Date: 8 October 2025
Time: 14:17 AEST
Lens: FE 24-70mm F2.8 GM
Model: Sony ILCE-7RM4A
Sensor: Full frame
Focal length: 24mm

ORIGINAL PHOTOGRAPH



ORIGINAL PHOTOGRAPH WITH PROPOSED



8.2 VIEWPOINT POSITION 04 - Kurnell Recreation Club, 160 Captain Cook Drive

VIEWPOINT LOCATION



Proposed Site

8.3 VIEWPOINT POSITION 04 - Kurnell Recreation Club, 160 Captain Cook Drive

ALIGNMENT OF SURVEYED POINTS



8.4 VIEWPOINT POSITION 04 - Kurnell Recreation Club, 160 Captain Cook Drive

ORIGINAL PHOTOGRAPH



8.5 VIEWPOINT POSITION 04 - Kurnell Recreation Club, 160 Captain Cook Drive

ORIGINAL PHOTOGRAPH WITH PROPOSED



— Proposed Development not visible from viewpoint

9.1 3D SCENE DATA SOURCES

1- Site Survey - refer to Appendix A for details

File Name: 24886photolocations 1
Author: CMS Surveyors
Format: Autocad DWG
Alignment: MGA 56 GDA2020

2 - Existing Site Survey - refer to Appendix B for details

File Name: Survey Plan Kurnell
Author: Ausgrid
Format: Autocad DWG
Alignment: MGA 56 GDA2020

9.3 APPENDIX A: SITE PHOTOGRAPHY SURVEY SUPPLIED BY CMS SURVEYORS



LAND SURVEYING | CONSTRUCTION | 3D SCAN AND MODEL

Date: 14-10-2025
Our Ref: 24886 Photo Locations

Studio 71/61 Marlborough Street
Surry Hills
NSW 2010

Dear Rick Mansfield,

RE: PHOTO LOCATIONS – KURNELL

As requested, we have attended site and measured the Co-ordinates and Elevation of the photo locations for Kurnell.

Co-ordinates are MGA 56 (GDA 2020) and elevation to Australian Height datum (AHD).

Measurements were taken using Leica Total Station and GNSS measurements. Checks taken to SCIMS marks: PM 57319, PM 33981, SSM 63048, SSM 43144, SSM 43145.

DWG of locations have also been supplied.

Point Number	Easting	Northing	Reduced Level (RL)	Photo Point
2017	334886.7989	6235135.88	2.096	CAMERA SPOT 1
2012	334821.8239	6235134.268	8.18	ROOF RIDGE
2013	334822.4897	6235124.275	4.605	CORNER OF CONTAINER
2014	334833.4314	6235125.018	17.977	END OF BAR ON POLE
2015	334808.874	6235106.578	4.021	TOP OF POST
2016	334875.8463	6235109.99	1.972	CORNER OF CRICKET PITCH
13	334217.119	6235166.188	2.738	CAMERA SPOT 2
2018	334231.7561	6235113.188	10.024	TOP OF POWERPOLE
2019	334220.734	6235157.202	4.754	TOP OF SIGNPOST
2020	334232.3664	6235136.216	10.139	TOP OF POWERPOLE
2021	334250.9138	6235141.575	8.759	ROOF RIDGE
2022	334241.7531	6235153.168	8.124	CORNER OF ROOF
2000	334217.0287	6234347.781	2.714	CAMERA SPOT 3
2001	334220.3954	6234355.749	2.792	TIP OF ARROW
2002	334218.3365	6234357.235	2.777	CORNER OF LINE MARK
2003	334230.4509	6234400.443	14.299	TOP OF POWERPOLE
2004	334262.6298	6234440.463	14.277	TOP OF POWERPOLE
2005	334287.8425	6234478.346	14.98	TOP OF POWERPOLE

CMS SURVEYORS PTY LIMITED

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ABN 79 096 240 201
PO Box 463, Dee Why NSW 2099
www.cmssurveyors.com.au

Liability limited by a scheme approved under Professional Standards Legislation

LOCATIONS

Head Office 2/99A South Creek Rd, Dee Why NSW 2099
Western Sydney 7/36 Holbeche Rd, Arndell Park NSW 2148
Riverina 90 Wallendoon St, Cootamundra NSW 2590



Point Number	Easting	Northing	Reduced Level (RL)	Photo Point
2011	334565.8438	6234889.583	2.543	CAMERA SPOT 4
2006	334560.4401	6234883.352	2.371	SPLIT IN KERB LIP
2007	334556.9274	6234877.836	2.38	TIP OF ARROW
2008	334542.0276	6234878.272	14.224	TOP OF POWERPOLE
2009	334524.6492	6234850.112	5.692	TOP OF SIGNPOST
2010	334501.8384	6234817.331	14.473	TOP OF POWERPOLE

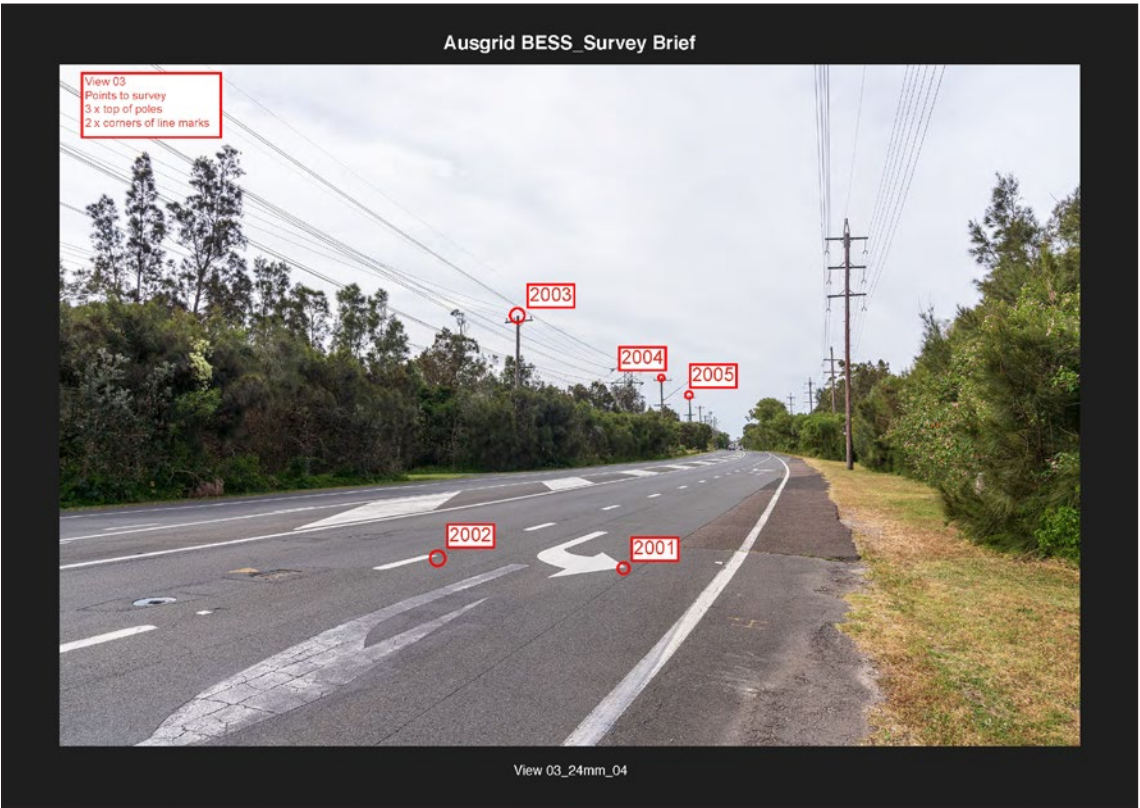
Note: R.L. shown on the report for photo locations are ground levels. Camera height should be added to the supplied RL of each corresponding photo location.

Yours faithfully,
CMS Surveyors Pty Limited
Luka Pusic
Bachelor of Spatial Science, Surveying

COLLABORATE | MASTER | SOLVE

CMS SURVEYORS 2

9.3 APPENDIX A: SITE PHOTOGRAPHY SURVEY SUPPLIED BY CMS SURVEYORS



9.4 APPENDIX B: EXISTING SITE SURVEY SUPPLIED BY AUSGRID

