

Appendix D Visual and Urban Design Assessment



CLOUSTON associates

3.0

Visual Impact Assessment

Carroll Park looking east



3.0 VISUAL IMPACT ASSESSMENT

3.1 EXISTING VISUAL ENVIRONMENT

3.1.1 Private domain

The site is principally visible from a number of residential properties located next to Leacock Regional Park, properties backing onto Carroll Park and properties backing onto St Andrews Park, as well as properties that back onto the SSFL near Lakewood Crescent. Views towards the site from other properties within the suburb of Casula are blocked by a combination of built form and topography.

3.1.2 Public domain

The site is principally visible from high points along the M5 South Western Motorway and along the length of Moorebank Avenue. It is also visible from parts of minor local roads Marsh Parade, Lakewood Crescent, St Andrew Boulevard and Leacocks Lane. Parks from which the site is visible from include Carroll Park, St Andrew Park and Leacock Regional Park to the west. Direct views north into the site are offered from the East Hills Line rail corridor south of the Project.

Figure 06 provides a summary of the visual catchment of the existing site.

In summary, visual accessibility into the site is highest at the following locations:

- from parks and selected residences on elevated ground to the west of the site
- along Moorebank Avenue
- from the M5 freeway overpass.

Multiple entries to the site are allocated along the length of Moorebank Avenue (refer Photo E and Figure 06) from roads including Jacquinet Road, Chatham Avenue, Bapaume Road and Ypres Road. Car parking facilities are also provided along Moorebank Avenue within the site boundary.

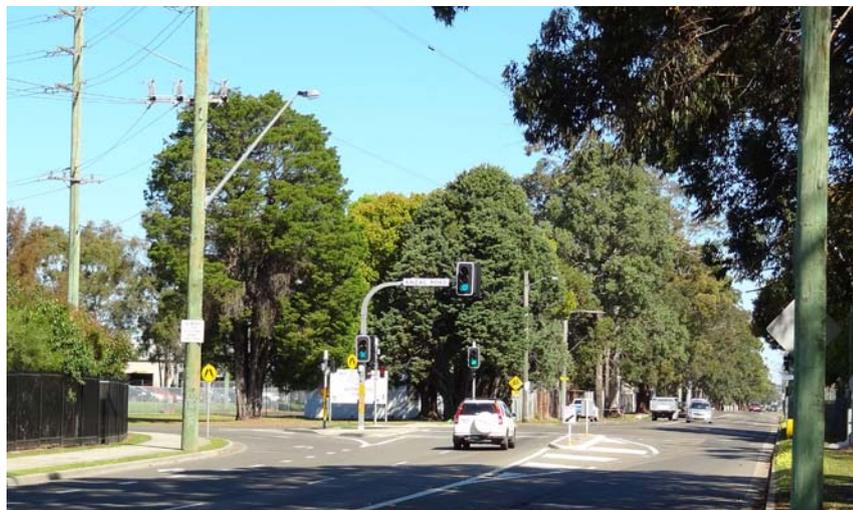


Photo E - Moorebank Avenue looking south

3.2 VISUAL CATCHMENT ANALYSIS

Prior to preparing the detailed visual receptor analysis, a desktop study was conducted using aerial mapping to identify a visual catchment zone and key receptors that may be visually impacted by the Project. Figure 06 indicates the Zone of Theoretical Visibility (ZTV) as defined and created by topography, street layout, existing buildings and existing vegetation. This is for the existing site as it currently stands, without taking into account the proposed development.

3.2.1 Viewer Description

The types of viewers which currently have visual access to the site include combined open space and residential receptors backing onto and surrounding Carrolls Park, Leacock Nature Reserve and St Andrews Park located on the western boundary. Other significant receptors identified include public road and transportation corridor receptors at the intersection of the **M5 South Western Motorway and Moorebank Avenue**, as well as road users along Moorebank Avenue. Public road corridor receptors also exist looking west along Anzac Rd in the suburb of Wattle Grove. Here filtered, oblique views of the site are offered. No residential receptors were identified within the suburb of Wattle Grove.

Residential receptors are limited by the nature of the topography and vegetation, restricting views into the site to a limited number of properties.

3.2.2 Viewer Analysis

During a visit to the site, a final list of eight key receptor sites with the potential to be visually impacted by some element of the Project were selected (refer Figure 07 and 7B). The final list does not represent the entire number of receptors likely to be visually impacted, but rather provides a representation of the range of viewers potentially impacted by the Project. Each selected viewpoint represents a group of receptors within that immediate area.

The locations identified are:

1. Southern section of Leacock Regional Park
2. Leacock Regional Park and associated residential heritage properties backing onto the parklands.
3. Carroll Park and associated residential properties backing onto the park.
4. Casula Powerhouse Arts Centre
5. Georges River Casula Parklands
6. St Andrews Park and associated residential properties surrounding the park, as well as properties that back onto the SSFL.
7. Junction of M5 South Western Motorway and Moorebank Avenue.
8. Moorebank Avenue heading south.

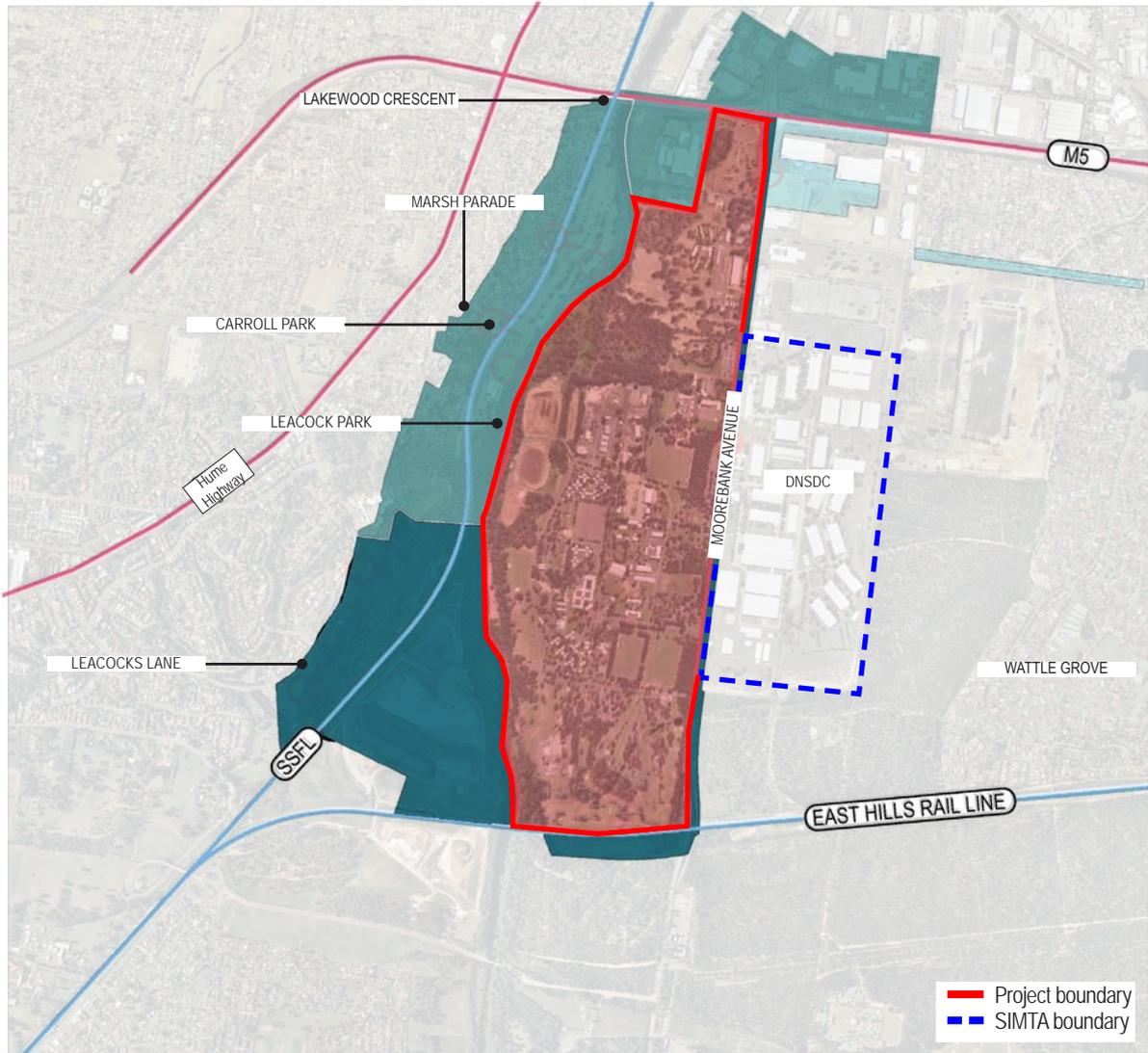


Figure 06 Zone of Theoretical Visibility (ZVT) for the existing site

KEY

-  Visual Catchment within the site
-  Existing rail
-  Existing major roads

Visual Catchment outside the site (Approximated)

-  Direct views of the site
-  Filtered views of the site
-  Heavily filtered/screened views of the site

NB: Catchment analysis for the existing site was prepared prior to the site visit. It does not consider the placement of individual built elements within the masterplan of the proposed development.

3.3 VISUAL ASSESSMENT

A detailed photographic survey was undertaken at each selected viewpoint (refer Figure 07 and 7B). An assessment of the expected visual impact for each Project development phase and concept layout was then conducted. The results are summarised within the following tables which include a description of the current view followed by a discussion of the visual impacts of the Project on that view.

Each phase of construction is analysed in the table, followed by the operational phase. The overall impact rating of the Project on any visual receptor is based on themes of magnitude and sensitivity as described with the Methodology section of this report. The severity of these impacts are calculated using Table 02.

For the three development phases (Scenario 1 - Phase A, Scenario 2 - Phase B and Scenario 2b - Phase C) one overall impact rating is given. This is a collective impact rating for all three stages and takes into account parts of the Project that are already operational at the conclusion of each phase.

For a detailed description of the assessment criteria and impact ratings used, see Appendix A.

		Magnitude					
		High	High to Moderate	Moderate	Moderate to Low	Low	Negligible
Sensitivity	High	High Impact	High Impact	Moderate-high	Moderate-high	Moderate	Negligible
	High to Moderate	High Impact	Moderate-high	Moderate-high	Moderate	Moderate	Negligible
	Moderate	Moderate-high	Moderate-high	Moderate	Moderate	Moderate-low	Negligible
	Moderate to Low	Moderate-high	Moderate	Moderate	Moderate-low	Moderate-low	Negligible
	Low	Moderate	Moderate	Moderate-low	Moderate-low	Low Impact	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

Table 02: Overall Impact Rating as a combination of Sensitivity and Magnitude.
Source: RMS Guidelines for Landscape Character and Visual Impact Assessment



Figure 07 Viewpoint locations and direction of view

KEY

- ① Viewpoint 1 - Southern section of Leacock Regional Park
- ② Viewpoint 2 - Leacock Regional Park and associated residential heritage properties within the parklands
- ③ Viewpoint 3 - Carroll Park and associated residential properties backing onto the park
- ④ Viewpoint 4 - Casula Powerhouse Arts Centre
- ⑤ Viewpoint 5 - Georges River Casula Parklands
- ⑥ Viewpoint 6 - St Andrews Park and associated residential properties surrounding the park
- ⑦ Viewpoint 7 - Junction of M5 South Western Motorway and Moorebank Avenue
- ⑧ Viewpoint 8 - Moorebank Avenue heading south

- Project Boundary
- - - SIMTA Boundary
- Existing Rail
- Existing Road

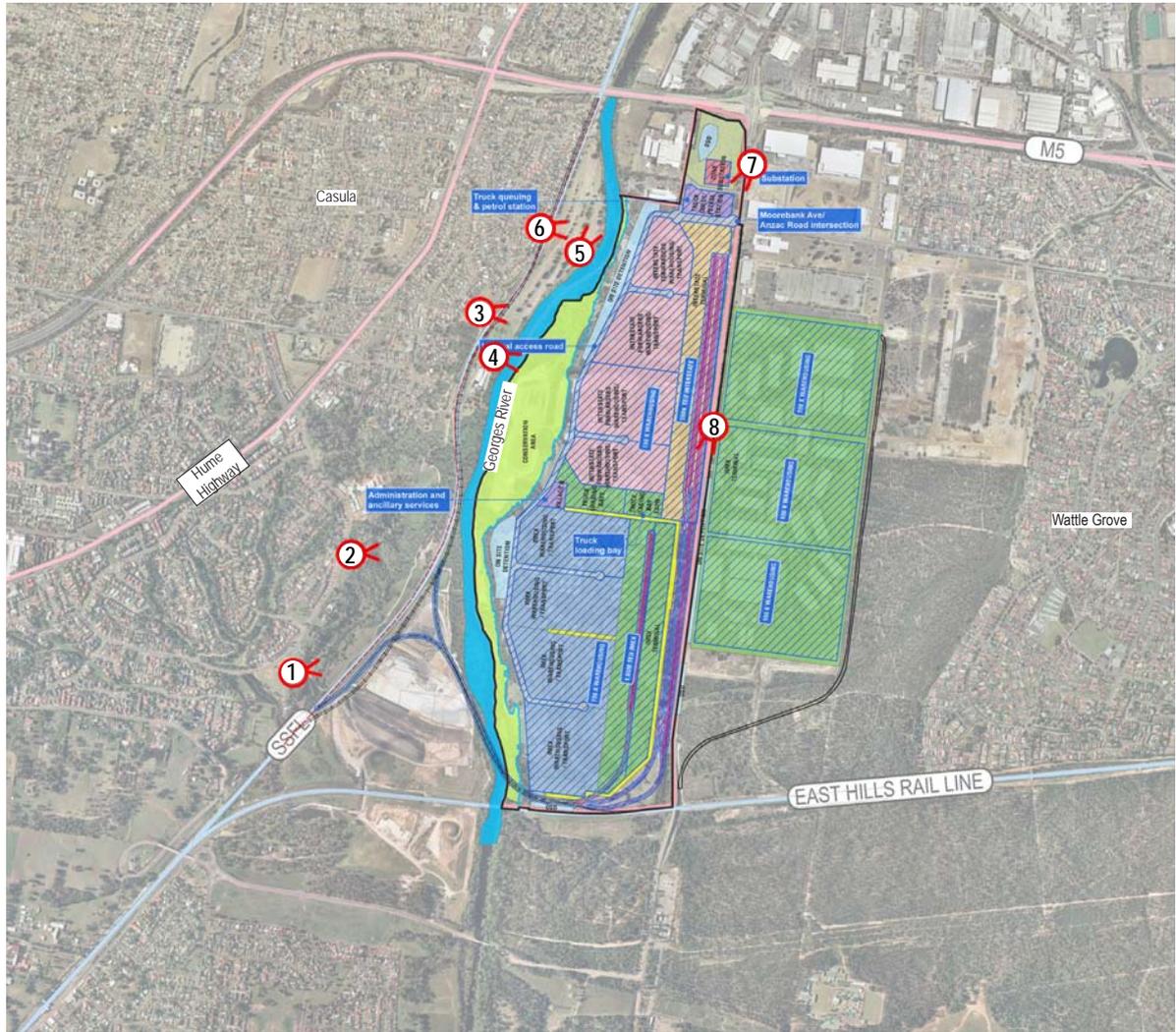


Figure 7B - Viewpoint locations overlaid on indicative concept layout. Source: Parsons Brinckerhoff

KEY

— Existing Rail
— Existing Road

- ① Viewpoint 1 - Southern section of Leacock Regional Park
- ② Viewpoint 2 - Leacock Regional Park and associated residential heritage properties within the parklands
- ③ Viewpoint 3 - Carroll Park and associated residential properties backing onto the park
- ④ Viewpoint 4 - Casula Powerhouse Arts Centre
- ⑤ Viewpoint 5 - Georges River Casula Parklands
- ⑥ Viewpoint 6 - St Andrews Park and associated residential properties surrounding the park
- ⑦ Viewpoint 7 - Junction of M5 South Western Motorway and Moorebank Avenue
- ⑧ Viewpoint 8 - Moorebank Avenue heading south

Description	Current View
This viewpoint is located in Leacock Regional Park, a public open space area. A grassed slope leads up from Leacock Lane to a ridge overlooking the site. The park is frequented by dog walkers and local residents. There are no residential properties within the park.	As shown in view 1, current views are primarily of riparian vegetation in the middle distance with no views of any site buildings due to screening by vegetation. In the foreground of the view is the SSFL and the Glenfield landfill (not within the Project site). Distant vegetation is visible at the rear of the foreground treeline.

VISUAL IMPACT

Phase	Impact
Early Works	Existing riparian vegetation along the Georges River corridor and the retained conservation zone will assist in screening a substantial amount of the ground based construction activities such as demolition and truck movements.
Scenario 1 Project Phase A	There would potentially be views of the top of construction equipment such as cranes and views of crane gantries, lights and building structures as they are constructed. There would also be extensive views of the construction of the rail connection from the SSFL to the Project site and associated removal of vegetation. Existing rail infrastructure is already visible within the view and will reduce the visual impact of the new rail spur.
Scenario 2A Project Phase B	The second half of IMEX will be established. The tops of cranes and other construction equipment may be visible from this viewpoint. Half the IMEX and a portion of the warehousing will be operational. The tops buildings (21m), lighting columns (30m) and some gantries (27.7m) may be visible above the tree canopy. Long freight trains will also be visible crossing the rail spur into the Project site.
Scenario 2B Project Phase C	Much of the site will have already been constructed and the majority of the IMEX and Interstate will be operational. The tops of warehouses, lighting columns and some gantries may be visible above the tree canopy. Construction equipment associated with additional warehousing may also be visible from this viewpoint. Long freight trains will be visible crossing the rail spur into the Project site.

Operational Phase - Project Full Build	
Scenario 3 Project Phase C	<p>Views of the development will be partially screened by retained riparian vegetation running along the Georges River (refer photomontage 1). The tops of warehouse buildings (21m), lighting columns (30m) and some of the crane gantries (27.7m) may be visible above the tree canopy. Vegetation planted as part of the rehabilitation works within the conservation zone along the full length of the site would initially provide little screening from this viewpoint. Over time, as rehabilitation vegetation reaches mature height, this planting may provide some screening of the development. Properties behind this viewpoint (to the west of Leacock Lane) will not have views of the Project due to the nature of the topography.</p> <p>The relatively low elevation of this location reduces the visual impact in this area. The new rail spur will be visible in the foreground, behind the current SSFL track. Long freight trains will be visible crossing into the Project site. The existence of current rail infrastructure of a similar scale and bulk to the proposed, assists in reducing the magnitude of the changes from this viewpoint and therefore reduces the level of visual impact of the new rail crossing.</p>

			QUANTITATIVE ASSESSMENT							COMBINED IMPACT RATING
RECEPTOR TYPE	RECEPTOR IDENTIFICATION	VIEWPOINT	DISTANCE	QUANTUM OF VIEW	DURATION	MAGNITUDE OF CHANGE	SUMMARY OF RATINGS	RECEPTOR		
Early Works		1	M	M	L	L	L	M	MODERATE/LOW	
Development Phases		1	M	M	L	L	M/L	M	MODERATE	
Operational Phase		1	M	M	L	M	M/L	M	MODERATE	

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Photomontage 1 - Potential view east from Leacock Regional Park - indicative only, subject to detailed design



VIEWPOINT 2

Location: Leacock Regional Park and associated residential properties backing onto the parkland.

Distance to main Project boundary - 460m

Number of residential properties likely to be impacted: 3 (an additional 6 double storey properties on Leacocks Lane may have views over the site from their second storey windows)

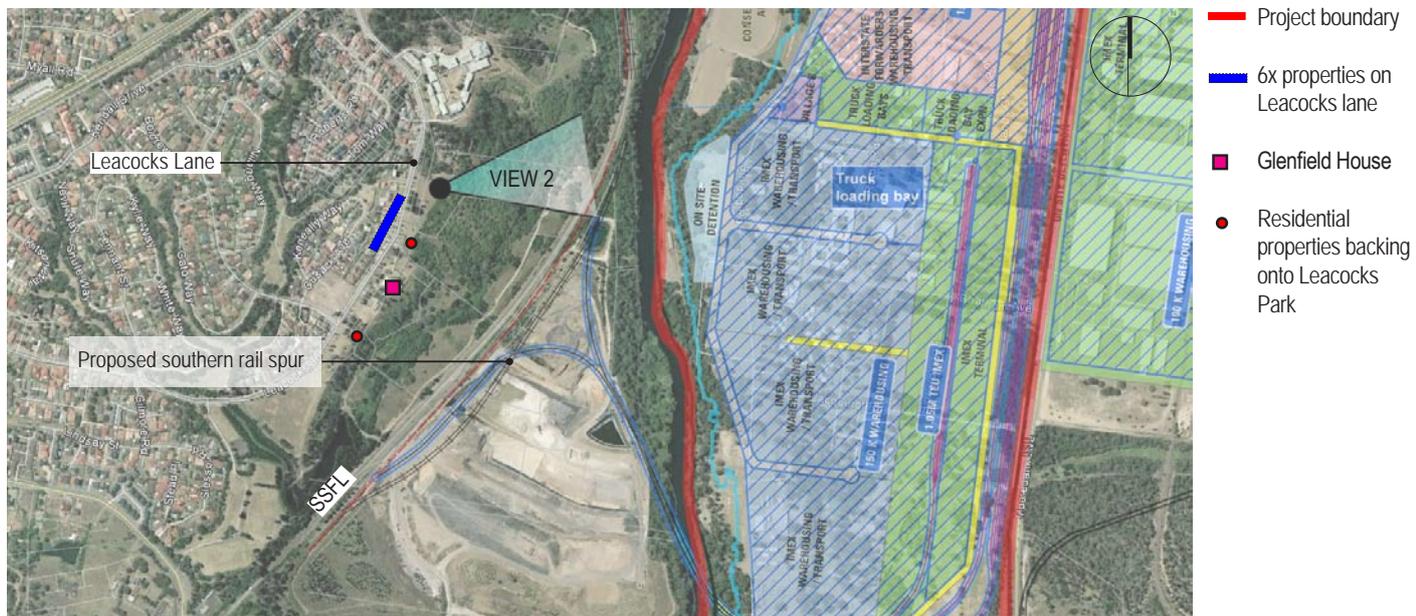


Figure 8B - viewpoint 2 location map



View 2 - Existing view east from Leacock Regional Park

Description	Current View
An elevated section of park situated on a ridgeline overlooking the site. Large areas of grassland and scattered shrubs/trees. Three residential properties back onto the park, including the heritage listed Glenfield house.	As shown in view 2, current views are far reaching and extensive over the site and beyond, towards the horizon. The view is primarily of vegetation in the foreground, middle and far distance, with several water towers seen towards the horizon. There are no views of buildings within the site.

VISUAL IMPACT

Phase	Impact
Early Works	Existing riparian vegetation along the Georges River corridor and the retained conservation zone will assist in screening a substantial amount of the ground based construction activities such as demolition and truck movements.
Scenario 1 Project Phase A	There would be clear views of tall construction equipment such as cranes above the treeline as warehousing is constructed in the southern portion of the site. There may be the noticeable removal of vegetation in the middle distance, as it is cleared in the main portion of the site. The southern rail spur will not be visible.
Scenario 2A Project Phase B	The second half of IMEX will be established. The tops of cranes and other construction equipment may be visible from this viewpoint. Half the IMEX and a portion of the warehousing will be operational. The tallest parts of the gantries, container stacks, lighting columns and warehouses will be visible above the tree line from Leacocks Park and associated residential properties. The southern rail spur will not be visible.
Scenario 2B Project Phase C	Much of the site will have already been constructed and be fully operational. The tallest parts of the gantries, container stacks, lighting columns and warehouses will be visible above the tree line. Construction equipment and vegetation removal associated with additional warehousing will also be visible from this viewpoint. The southern rail spur will not be visible.

Operational Phase - Project Full Build	
Scenario 3 Project Phase C	<p>Sections of the parkland have direct and extensive views over the site and proposed development. Three properties (including the heritage listed Glenfield House) are located within close proximity to the parkland. These properties would have views over the development, although existing tree planting within their gardens would assist in screening some views. Six double storey properties along Leacocks Lane may have views over the development from their second storey windows, although access to these properties for assessment was not possible.</p> <p>Foreground vegetation along the Georges River will screen views of the lower sections of buildings, railway tracks and gantries. Due to the elevated nature of this viewpoint compared to viewpoint 1, the tallest parts of the gantries, container stacks, lighting columns and warehouses will have increased visibility above the tree line. Vegetation planted as part of the rehabilitation works in the conservation zone would provide little screening during the early operational stages but once established, may offer a greater level of screening of the Project from this viewpoint.</p>

			QUANTITATIVE ASSESSMENT							COMBINED IMPACT RATING
RECEPTOR TYPE	RECEPTOR IDENTIFICATION	VIEWPOINT NUMBER	DISTANCE	QUANTUM OF VIEW	DURATION	MAGNITUDE OF CHANGE	SUMMARY OF RATINGS	RECEPTOR SENSITIVITY		
Early Works		2	M	M	M/H	L	L	M	MODERATE/LOW	
Development Phases		2	M	M/H	M/H	M/H	M/H	M/H	MODERATE/HIGH	
Operational Phase		2	M	M/H	M/H	M/H	M/H	M/H	MODERATE/HIGH	

VIEWPOINT 3

Location: Carroll Park and associated residential properties backing onto the park and along Buckland Road and Marsh Parade
Distance to main Project boundary - 250m

Number of residential properties likely to be impacted: 28 (a further 16 properties along Buckland Road and Marsh Parade may have filtered views from second storey windows)

- Project boundary
- Residential properties with direct views
- Residential properties with filtered views



Figure 8C - viewpoint 3 location map



View 3 - Existing view east from Carroll Park

Description	Current View
An area of public open space, sloping steeply down to the east to the SSFL railway line with residential properties backing onto the park.	As shown in view 3, there are extensive views over the Project site, dominated by vegetation in the mid and far distance. The SSFL is visible in the foreground (not within the Project site), with a significant band of riparian vegetation associated with the Georges River corridor behind. The exposed earth of the plant and equipment training area, the 'dust bowl', is visible behind this to the right, partially screened by the foreground trees. Several low rise buildings are visible through the trees within the site. Two distant towers are also visible in the far distance.

VISUAL IMPACT

Phase	Impact
Early Works	Existing riparian vegetation along the Georges River corridor and the retained conservation zone will assist in screening a substantial amount of the ground based construction activities such as demolition and truck movements.
Scenario 1 Project Phase A	There would be oblique views of the top of construction equipment to the south of this viewpoint, associated with the construction of warehousing and part of the IMEX facility within the southern portion of the Project site. The central portion of the Project site (directly in front of this viewpoint) will not be developed until phase 2b and will remain mostly unchanged. The southern rail spur will not be visible from this viewpoint.
Scenario 2A Project Phase B	Additional warehousing and the second half of the IMEX will be established and so the tops of cranes and other construction equipment will be visible above the foreground treeline to the south of this viewpoint. Half the IMEX and a portion of the warehousing will be operational. The tallest parts of the gantries, container stacks, lighting columns and warehouses will be visible above the tree line from upper sections of the park and residential properties backing onto the park. The southern rail spur will not be visible.
Scenario 2B Project Phase C	Construction equipment associated with additional warehousing will be clearly visible directly in front of this viewpoint. The tallest parts of the gantries, container stacks, lighting columns and warehouses will be visible above the tree line from upper sections of the park and residential properties backing onto the park. The southern rail spur will not be visible.

Operational Phase - Project Full Build	
Scenario 3 Project Phase C	<p>Elevated above the site, the upper section of the park and residential properties backing onto the park will have direct views over the development (refer photomontage 2). Properties along Marsh Parade and Buckland Road may have filtered views of the site from their second storey windows, although access to individual properties for assessment was not possible.</p> <p>Foreground riparian vegetation along the Georges River will assist in screening views of the lower sections of buildings. Parts of the gantries, container stacks, lighting columns and warehousing will be visible above the tree line. Vegetation planted as part of the rehabilitation works in the conservation zone would provide little screening during the early operational stages but once established, may offer a greater level of screening of some of the Project elements. The southern rail spur will be obscured by vegetation and will not be visible from this viewpoint.</p>

			QUANTITATIVE ASSESSMENT							COMBINED IMPACT RATING
RECEPTOR TYPE	RECEPTOR IDENTIFICATION	VIEWPOINT	DISTANCE	QUANTUM OF VIEW	DURATION	MAGNITUDE OF CHANGE	SUMMARY OF RATINGS	RECEPTOR		
Early Works		3	H	M	M/H	L	L	M/H	MODERATE/LOW	
Development Phases		3	H	H	M/H	M/H	M/H	M/H	MODERATE/HIGH	
Operational Phase		3	H	H	M/H	M/H	M/H	M/H	MODERATE/HIGH	



Photomontage 2 - Potential view east from Carroll Park - indicative only, subject to detailed design



3.0 VISUAL IMPACT ASSESSMENT

VIEWPOINT 4

Location: Casula Powerhouse Arts Centre
Distance to main Project boundary - 120m
Number of residential properties likely to be impacted: 0



Figure 8D - viewpoint 4 location map



View 4 - Existing view east from Casula Powerhouse Arts Centre

3.0 VISUAL IMPACT ASSESSMENT

Description	Current View
A public arts centre, situated on flat ground elevated above the banks of the Georges River. Casula Rail Station is located immediately to the west of the Powerhouse building, with the riparian vegetation of the Georges River corridor to the east. The Georges River Casula Parklands spread along the river bank to the north of the Arts Centre.	As shown in view 4, the current view from the northern edge of the building extends over the Georges River Casula Parklands with the SSFL visible to the west and views of the Georges River available to the east, heavily screened by riparian vegetation along the river's banks. Glimpses into the site, including several shed buildings are available, heavily screened by vegetation on either side of the river.

VISUAL IMPACT

Phase	Impact
Early Works	Retained vegetation within the conservation zone and along the Georges River will assist in blocking views of all ground based construction activities such demolition and truck movements.
Scenario 1 Project Phase A	There may be a slight removal of vegetation in the middle distance, as it is cleared for internal access roads. Works to rehabilitate the conservation zone may also be visible. The southern rail spur will not be visible from this viewpoint.
Scenario 2A Project Phase B	The majority of development at this stage will occur in the southern and central section of the Project site. There will be negligible change from this viewpoint during this stage.
Scenario 2B Project Phase C	The tops of construction equipment associated with additional warehousing may be visible from this viewpoint. The very tallest parts of the gantries, container stacks, lighting columns and warehouses might potentially be visible above the tree line.

Operational Phase - Project Full Build	
Scenario 3 Project Phase C	The Powerhouse Arts Centre and surrounding land sit at a similar elevation to the Project site with views towards the development heavily screened by riparian vegetation along both sides of the Georges River. Views of the tops of elements such as gantries and lighting columns may be visible above the treeline, although the vegetation planted as part of the rehabilitation works in the conservation zone will offer a greater level of screening of the Project from this viewpoint as it matures.

			QUANTITATIVE ASSESSMENT							
RECEPTOR TYPE	RECEPTOR IDENTIFICATION	VIEWPOINT NUMBER	DISTANCE	QUANTUM OF VIEW	DURATION	MAGNITUDE OF CHANGE	SUMMARY OF RATINGS	RECEPTOR SENSITIVITY	COMBINED IMPACT RATING	
Early works		4	H	M	M/H	L	L	M/H	MODERATE/LOW	
Development Phases		4	H	L	L	L	L	M	MODERATE/LOW	
Operational Phase		4	H	L	L	L	L	M	MODERATE/LOW	

VIEWPOINT 5

Location: Georges River Casula Parklands

Distance to main Project boundary - 110m

Number of residential properties likely to be impacted: 0



Figure 8E - viewpoint 5 location map



View 5 - Existing view from central section of Georges River Casula Parklands, looking north

Description	Current View
The parklands (formerly the Casula Powerhouse golf course) stretch north from the Powerhouse Arts Centre, bounded to the west by the SSFL and to the east by the Georges River.	The SSFL and new Powerhouse access road are clearly visible on the western edge of the view, while the M5 bridge over the Georges River can be identified in the middle distance - refer view 5. The parklands are a mix of maintained grassland interspersed with clumps of mature trees and shrubs, increasing in density along the riparian corridor.

VISUAL IMPACT

Phase	Impact
Early Works	There will be no views of early works from this viewpoint.
Scenario 1 Project Phase A	There will be no views of Phase A works from this viewpoint.
Scenario 2A Project Phase B	There will be no views of Phase 2A works from this viewpoint.
Scenario 2B Project Phase C	The very tops of construction equipment associated with additional warehousing may be visible above the foreground treeline.

Operational Phase - Project Full Build	
Scenario 3 Project Phase C	As the parklands sit at a similar elevation to the Project site, views towards the Project will be blocked by the conservation zone and existing riparian vegetation along the Georges River.

			QUANTITATIVE ASSESSMENT						COMBINED IMPACT RATING
RECEPTOR TYPE	RECEPTOR IDENTIFICATION	VIEWPOINT NUMBER	DISTANCE	QUANTUM OF VIEW	DURATION	MAGNITUDE OF CHANGE	SUMMARY OF RATINGS	RECEPTOR SENSITIVITY	
Early Works		5	H	N	N	N	N	M/H	NEGLIGIBLE
Development Phases		5	H	N	N	N	N	M/H	NEGLIGIBLE
Operational Phase		5	H	N	N	N	N	M/H	NEGLIGIBLE

VIEWPOINT 6

Location: St Andrews Park and residential properties backing onto the park as well as properties along Buckland Road, St Andrews Boulevard and Lakewood Crescent.

Distance to main Project boundary - 290m

Number of residential properties likely to be impacted: 31

(a further 23 properties along the western side of St Andrews Boulevard may have direct views of the tops of construction cranes from second storey windows. There is also the potential for views of the very tops of some Project elements from the second storey of these properties)

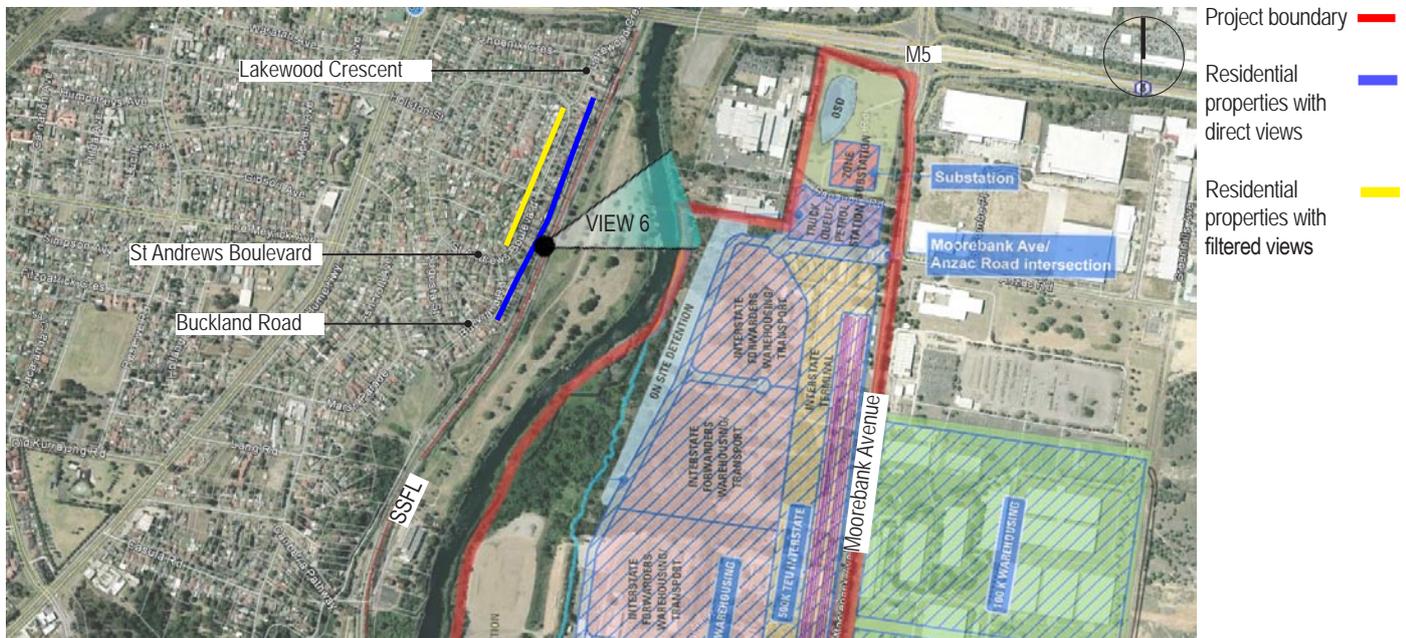


Figure 8F - viewpoint 6 location map



View 6 - Existing view east from St Andrews Park

Description	Current View
St Andrews Park and associated residential properties surrounding the park as well as properties on the eastern and western side of roads backing onto the SSFL.	The SSFL is clearly visible in the foreground of this view, with the Georges River Casual Parklands (formerly the Casula Powerhouse golf course) behind. In the middle distance, the view is dominated by a thick wall of tall vegetation (approx 25m high) associated with the Georges River corridor - refer view 6.

VISUAL IMPACT

Phase	Impact
Early Works	Retained vegetation within the conservation zone and along the Georges River will assist in screening views of the majority of ground based construction activities such as demolition and truck movements.
Scenario 1 Project Phase A	There may potentially be views of equipment associated with the construction of the internal access road, heavily screened by foreground vegetation. There will be no views of other Phase A works from this viewpoint.
Scenario 2A Project Phase B	There will be no views of Phase 2A works from this viewpoint.
Scenario 2B Project Phase C	Construction equipment associated with additional warehousing may be visible above the foreground treeline. The tops of operational warehousing may be visible to the south of this viewpoint.

Operational Phase - Project Full Build	
Scenario 3 Project Phase C	The park and nearby residential properties sit at a similar elevation to the Project site, with views towards the main part of the development blocked by the conservation zone along the Georges River. The second storey of properties along the western edge of St Andrews Boulevard may have direct views of the very tops of gantries, container stacks and lighting poles, protruding over the vegetation screen running along the Georges River. Access to individual properties was not possible for assessment.

			QUANTITATIVE ASSESSMENT						COMBINED IMPACT RATING
RECEPTOR TYPE	RECEPTOR IDENTIFICATION	VIEWPOINT NUMBER	DISTANCE	QUANTUM OF VIEW	DURATION	MAGNITUDE OF CHANGE	SUMMARY OF RATINGS	RECEPTOR SENSITIVITY	
Early works		6	H	M/L	L	L	L	M/H	MODERATE/LOW
Development Phases		6	H	L	M/L	L	L	M/H	MODERATE/LOW
Operational Phase		6	H	L	M/L	L	L	M/H	MODERATE/LOW

VIEWPOINT 7

Location: Junction of M5 and Moorebank Avenue, looking south

Distance to main Project boundary - 10m

Number of residential properties likely to be impacted: 0



Figure 8G- viewpoint 7 location map



View 7 - Existing view along Moorebank Avenue looking south

Description	Current View
A busy intersection between the M5 motorway and Moorebank Avenue (1km further north to viewpoint 8).	This view looks south down Moorebank Avenue with a pavement, lighting and transmission poles on the eastern side. The road is flanked by dense tree planting, screening views of buildings behind. Both sides of the road are fenced and a warehouse building (not within the site) is visible on the left, behind trees - refer view 7.

VISUAL IMPACT

Phase	Impact
Early Works	Some early works activities may be visible from this location, depending on the amount of vegetation removed from the western edge of Moorebank Avenue. Currently vegetation in this location blocks views into the site.
Scenario 1 Project Phase A	Moorebank Avenue will be widened from a two lane to four lane road as far as Anzac Parade. A new intersection will be built, linking Moorebank Avenue to the Project's primary internal access road. The northern section of the site will remain undeveloped. Increased construction traffic on Moorebank Avenue and the surrounding road network may be highly visible.
Scenario 2A Project Phase B	The interstate terminal will be established requiring the removal of vegetation along the western side of Moorebank Avenue. Clear and direct views of construction equipment may be afforded from this viewpoint. Once operational, rail infrastructure, freight trains and stacked containers will be highly visible from the road. Construction traffic on Moorebank Avenue and the surrounding road network will be highly visible.
Scenario 2B Project Phase C	Much of the Project site will have already been constructed and the interstate will be fully operational. Construction equipment associated with additional warehousing construction may be visible from this viewpoint, behind other site buildings. Rail infrastructure, freight trains and stacked containers will be highly visible from the road.

Operational Phase - Project Full Build	
Scenario 3 Project Phase C	Moorebank Avenue will be significantly wider in this location, altering the visual context from a minor transit way to a major road. Removal of mature vegetation along the western edge of the road will impact the visual amenity of the road corridor. Rail infrastructure, trains and stacked containers will be highly visible (refer Photomontage 5). The low sensitivity of visual receptors on Moorebank Avenue and the short duration of the view experienced by motorists has assisted in reducing the level of visual impact once construction is complete.

			QUANTITATIVE ASSESSMENT						COMBINED IMPACT RATING
RECEPTOR TYPE	RECEPTOR IDENTIFICATION	VIEWPOINT NUMBER	DISTANCE	QUANTUM OF VIEW	DURATION	MAGNITUDE OF CHANGE	SUMMARY OF RATINGS	RECEPTOR SENSITIVITY	
Early Works		7	H	M	L	M	M	L	MODERATE/LOW
Development Phases		7	H	H	L	H	H	L	MODERATE/HIGH
Operational Phase		7	H	H	L	M/H	M/H	L	MODERATE



Photomontage 5 - Potential view south along Moorebank Avenue (indicative only, subject to detailed design)



VIEWPOINT 8

Location: Moorebank Avenue looking south west (1km further south than viewpoint 7)

Distance to main Project boundary - 5m

Number of residential properties likely to be impacted: 0



Figure 8H - viewpoint 6 location map



View 8 - Existing view along Moorebank Avenue looking south

Description	Current View
Moorebank Avenue - a moderately trafficked road	This view looks towards the Project site from a point along Moorebank Avenue. In the foreground an existing car park is visible as well as lighting and transmission poles. Several individual trees are also visible in the foreground. A dense wall of vegetation is visible to the rear of the car park, blocking all views further into the site - refer view 8.

VISUAL IMPACT

Phase	Impact
Early Works	There are unlikely to be any views of early works activities from this viewpoint.
Scenario 1 Project Phase A	There may be views of construction equipment associated with the construction of warehousing and part of the IMEX facility in the southern section of the Project site.
Scenario 2A Project Phase B	The interstate terminal will be established requiring the removal of vegetation along the western side of Moorebank Avenue. Clear and direct views of construction equipment may be afforded from this viewpoint. Once operational, rail infrastructure, freight trains and stacked containers will be highly visible in close proximity to the road. Construction traffic on Moorebank Avenue and the surrounding road network will be highly visible.
Scenario 2B Project Phase C	Much of the Project site will have already been constructed and the interstate will be fully operational. Construction equipment associated with additional warehousing construction may be visible from this viewpoint, behind other site buildings. Rail infrastructure, freight trains and stacked containers will be highly visible from the road.

Operational Phase - Project Full Build	
Scenario 3 Project Phase C	The removal of mature vegetation along the western edge of the road will impact the visual amenity of the road corridor. Rail infrastructure, trains and stacked containers will be highly visible (refer Photomontage 6). The low sensitivity of visual receptors on Moorebank Avenue and the short duration of the view experienced by motorists has assisted in reducing the level of visual impact once construction is complete.

			QUANTITATIVE ASSESSMENT						
RECEPTOR TYPE	RECEPTOR IDENTIFICATION	VIEWPOINT NUMBER	DISTANCE	QUANTUM OF VIEW	DURATION	MAGNITUDE OF CHANGE	SUMMARY OF RATINGS	RECEPTOR SENSITIVITY	COMBINED IMPACT RATING
Early Works		8	H	M	L	M	M	L	MODERATE/LOW
Development Phases		8	H	H	L	H	H	L	MODERATE/HIGH
Operational Phase		8	H	H	L	H	M/H	L	MODERATE

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Photomontage 6 - Potential view south along Moorebank Avenue (indicative only, subject to detailed design)



3.0 VISUAL IMPACT ASSESSMENT

3.4 VISUAL IMPACT SUMMARY

The foregoing assessment of eight key viewpoints is representative of a wide range of visual receptors surrounding the Project site. Visual impacts during the full life cycle of the Project range from negligible to moderate/high.

3.4.1 Early Works

The most visually prominent activities associated with the early works are likely to include:

- establishment of construction facilities
- demolition or relocation of existing buildings, structures and contaminated buildings not being removed as part of the MUR Project or the site rehabilitation;
- relocation of trees, including hollow bearing trees (i.e. those that provide ecologically important roosting habitats)
- establishment of the conservation area within the plant and equipment operation training area (dust bowl) including seed banking and planting.

As seen in table 9A, the early works will have a limited impact on visual amenity. Of the eight viewpoints studied, seven receive a moderate/low impact rating and one negligible. Existing riparian vegetation along the Georges River corridor and the retained conservation zone will assist in screening a substantial amount of the ground based early works activities for viewpoints located west of the river. Receptors on Moorebank Avenue (viewpoints 7 and 8) may notice an increase in site traffic and diversions, although the low sensitivity and short duration of view for these receptors limits the severity of any impacts.

3.4.2 Development Phase

All three development phases (A, B and C) have been analysed and collated into a single impact rating which includes the completed operational elements of the Project at each stage. Impacts range from negligible to moderate/high. Visual impacts during the development phase will include:

- clearing of development area of the site prior to construction
- temporary fencing, lighting and builders' compounds
- earthworks, infrastructure installation
- road and rail building
- stockpiling of materials
- tall construction cranes and other construction equipment

No receptors have received an impact rating of high. For receptors west of the Georges River, retained vegetation along the river and within the conservation zone assists in screening ground construction activities and construction of low new buildings. Moderate/high impacts are recorded for many viewpoints due to their high sensitivity to visual change (private residences and public parks) and the impact of tall construction equipment that will be seen above the treeline during construction of both the IMEX and interstate facility.

3.0 VISUAL IMPACT ASSESSMENT

3.4.3 Operational Phase

Once the facility is fully operational, the visual impact for receptors along Moorebank Avenue reduces as construction machinery is removed (refer Figure 10).

The greatest visual impact of the completed development will be on the public parks and residential properties that are situated on the elevated topography sloping west from the Georges River, as well as the residential properties backing onto the SSFL. Direct views over the entire development are limited to the properties directly adjacent to Leacock and Carroll Park, where views are not blocked by garden vegetation or other built form. The development is also potentially visible from the second storey of a small number of properties to the west of Leacocks Lane, although these properties could not be accessed for assessment.

EARLY WORKS

RECEPTOR TYPE	VIEWPOINT NUMBER	QUANTITATIVE ASSESSMENT						COMBINED IMPACT RATING
		DISTANCE	QUANTUM OF VIEW	DURATION	MAGNITUDE OF CHANGE	SUMMARY OF RATINGS	RECEPTOR SENSITIVITY	
Public park	1	M	M	L	L	L	M	Moderate/Low
Public park	2	M	M	M/H	L	L	M	Moderate/Low
Public park / Residential properties	3	H	M	M/H	L	L	M/H	Moderate/Low
Public Facility	4	H	L	L	L	L	M	Moderate/Low
Public park	5	H	N	N	N	N	M/H	Negligible
Public park / Residential properties	6	H	M/L	L	L	L	M/H	Moderate/Low
Public road	7	H	M	L	M	M	L	Moderate/Low
Public road	8	H	M	L	M	M	L	Moderate/Low

Table 9A - Early Works Visual Impact Summary Table

DEVELOPMENT PHASE S

RECEPTOR TYPE	VIEWPOINT NUMBER	QUANTITATIVE ASSESSMENT						RECEPTOR SENSITIVITY	COMBINED IMPACT RATING
		DISTANCE	QUANTUM OF VIEW	DURATION	MAGNITUDE OF CHANGE	SUMMARY OF RATINGS			
Public park	1	M	M	L	L	M/L	M/H	Moderate	
Public park	2	M	M/H	M/H	M/H	M/H	M/H	Moderate/High	
Public park / Residential properties	3	H	H	M/H	M/H	M/H	M/H	Moderate/High	
Public Facility	4	H	L	L	L	L	M	Moderate/Low	
Public park	5	H	N	N	N	N	M/H	Negligible	
Public park / Residential properties	6	H	L	M/L	L	L	M/H	Moderate/Low	
Public road	7	H	H	L	H	H	L	Moderate/High	
Public road	8	H	H	L	H	H	L	Moderate/High	

OPERATIONAL PHASE

Public park	1	M	M	L	M	M/L	M/H	Moderate
Public park	2	M	M/H	M/H	M/H	M/H	M/H	Moderate/High
Public park / Residential properties	3	H	H	M/H	M/H	M/H	M/H	Moderate/High
Public Facility	4	H	L	L	L	L	M	Moderate/Low
Public park	5	H	N	N	N	N	M/H	Negligible
Public park / Residential properties	6	H	L	M/L	L	L	M/H	Moderate/Low
Public road	7	H	H	L	M/H	M/H	L	Moderate
Public road	8	H	H	L	M/H	M/H	L	Moderate

Table 9B - Development and Operational Phase Visual Impact Summary Table

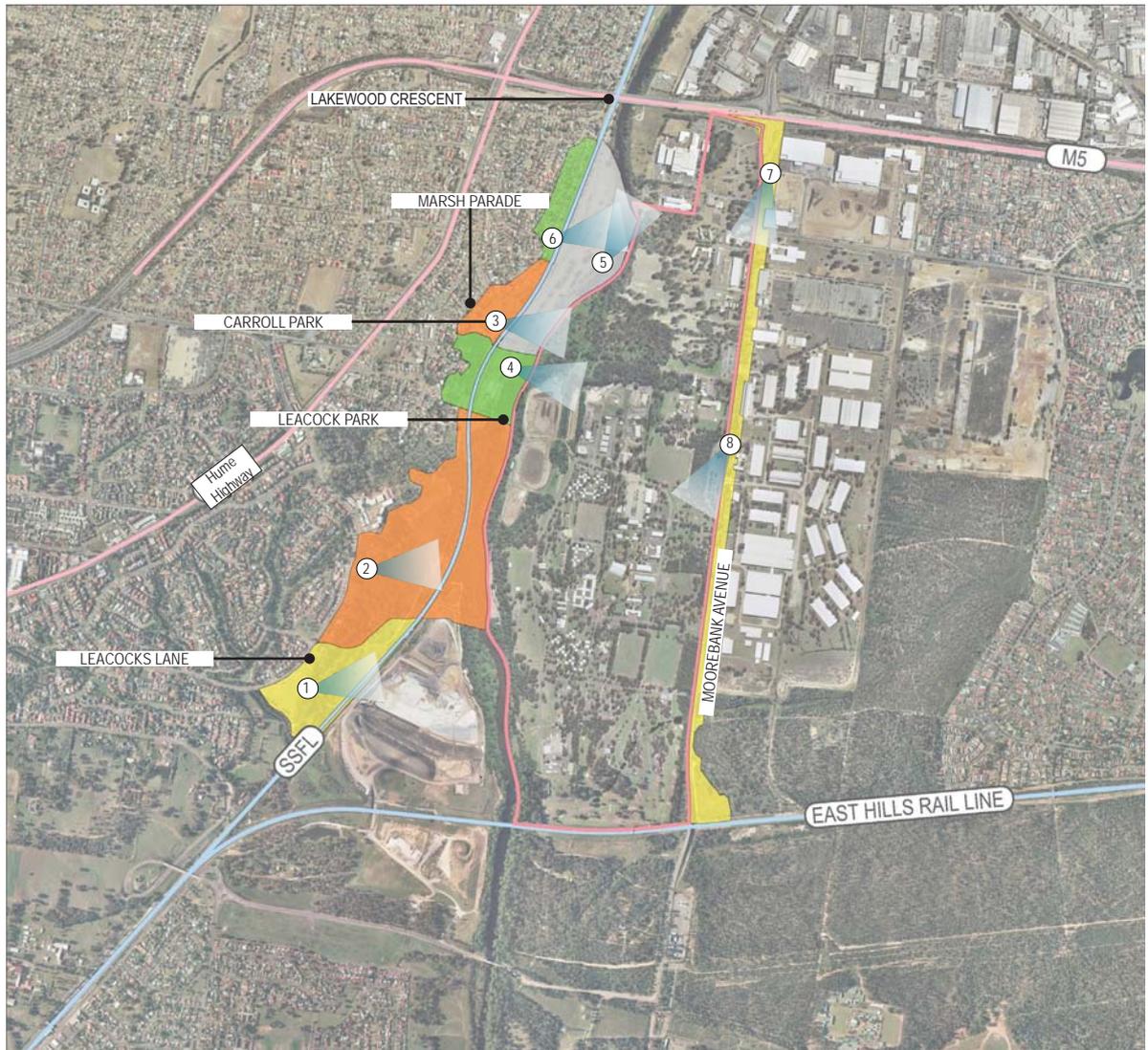


Figure 10 Summary of Visual Impacts - Operation Phase Project Full Build



Table 9C - Operational Phase Visual Impact Summary Table

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4.0

Mitigation Recommendations and Conclusion

The 'dustbowl' training area

4.0 MITIGATION AND CONCLUSION

4.1 MITIGATION

Effective mitigation measures for any form of potential visual impact are those that entail:

- avoidance
- reduction
- alteration
- off site mitigation
- off site compensation.

Mitigation measures have been considered during the concept design process and reflected in the current concept plan. Current and suggested additional mitigation measures for the detailed design stage, including all rail access options, are discussed below and illustrated in Figure 11.

4.1.1 Avoidance

The Project has been subject to significant regional analysis and is based on a site that has a long history of industrial activity. The proposed terminal is of state and national importance and its location is central to its functionality, so avoidance measures have not been considered appropriate.

4.1.2 Reduction

The principal forms of reduction are associated with refinements and modifications that address the siting, bulk and articulation of built form, minimising building and lighting pole heights where possible.

Concept Design measures already included:

- Siting of designed elements so to avoid the removal of large stands of vegetation currently obscuring and filtering views into the site (in particular along Moorebank Avenue).

Detailed Design measure to be considered:

- Align and locate car parks to minimise visual impacts from the public domain or residents
- Building and car park siting to permit and equate tree planting, especially along road fronts
- Refinements to building siting and alignment of infrastructure locations to assist in retaining significant existing vegetation such as individual tree specimens or groups of trees
- Maximising the integration of terminal facilities and warehousing precincts by providing screening, breakout space for public and staff, and visual relief, as well as aiding way-finding throughout the site.
- Where possible retain existing native trees along Moorebank Avenue to mitigate visual impact as well as providing additional native trees to the carpark areas to maximise the opportunity for shade and to provide a landscape frontage that is scaled to complement the new development.
- Landscaping along Moorebank Avenue is of particular importance and must provide visual relief from the industrial appearance of the rail infrastructure. The detailed landscape strategy should provide a layered approach along the streetscape.

- Consider the use of lower, more frequent light poles where possible to mitigate light spill effects and ambient light impacts.
- Integration of car parking, planting and signage to present as one cohesive address.
- Consider localised earth mounding and provide native canopy trees to internal landscape areas on the western side of the new buildings to mitigate visual impacts from the residential area.

4.1.3 Alleviation

Options to alleviate impacts are usually associated with detailed design features such as materials, finishes, articulation, reflectivity, planting character and the like. The principle forms of mitigation applicable to this project at detailed design stage include:

Concept Design measures already included:

- Minimising vegetation clearing on the rest of the site.

Detailed Design measures to be considered:

- Choice of finishes and materials based on limiting the amount of contrast with the surrounding landscape with the preferred use of muted colours.
- On site planting of suitable vegetation species at a range of heights.
- Utilise opportunities to commence early rehabilitation and supplementary planting of endemic species to the conservation zone on the western boundary and to commence early screen planting at the junction of Moorebank Avenue and M5 South Western Motorway to mitigate visual impact.

4.1.4 Off Site Mitigation

Any attempt to provide mitigation in the way of screening vegetation off site such as within the public domain in Carroll, Leacock and St Andrews Parks runs a risk of limiting existing regional views and the value to the community. It is recommended that this is not pursued.

4.1.5 Off Site Compensation

Given the nature of the proposed on site mitigation measures outlined in 'Alleviation', the resultant visual impact is considered not to be of a level of significance to warrant any off site compensation.

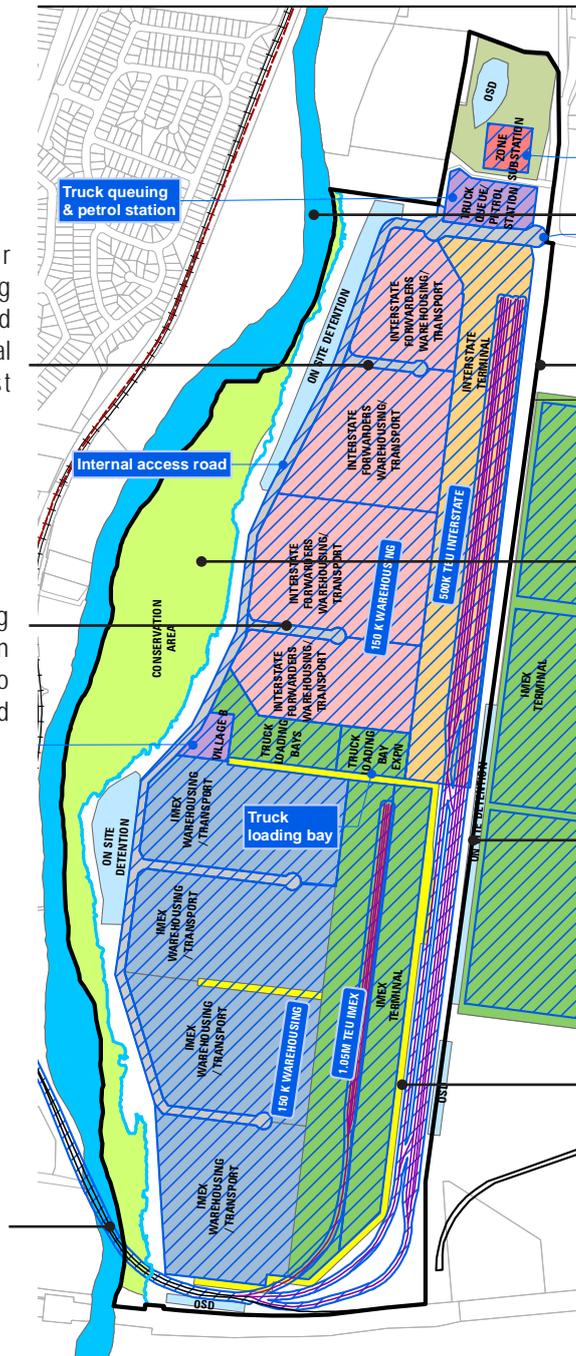
4.1.6 Lighting

Placement of lighting columns and the specification of suitable lighting levels that would ensure minimal light spillage to surrounding residential areas. An assessment should be made (potentially in consultation with affected residents at a stage when detailed impact assessment has been completed) to establish whether selected street trees could assist in mitigating the impacts of floodlighting from the site.

Consider options for permeable tree planting adjoining buildings and rail lines to reduce visual impacts and to cast shadows.

Consider heights of lighting poles with an option for an increase in lower poles to reduce spill effects and ambient light impacts.

Design of Georges River Rail Crossing Bridge to reduce visual impact and maintain amenity value of Georges River Casula Parklands.



Enhance vegetation adjoining water bodies.

Consider any mitigative street planting that might ameliorate flood light impact.

Enhance existing native trees with extended and consolidated planting.

Review car park locations and alignments along Moorebank Avenue to permit retention of significant existing roadside trees and to permit new tree planting to create avenues of trees.

Include extensive tree and shrub planting on road frontages to mitigate view impacts of high buildings.

Figure 11 - Mitigation Recommendations

CONCLUSION

4.2 CONCLUSION

4.2.1 Landscape Character Impacts

The impact of the Project on landscape character varies over the studied character zones with the greatest impact shown to be on the fragmented vegetation within the site. The clearing of vegetation will affect the look and feel of this character zone, although the proposed replacement of some of this lost vegetation within the conservation area will assist in mitigating the impact. The riparian corridor is mostly unaffected by the development and should retain its distinct character.

The Project would see an increase in the scale and bulk of development within the local area, with a certain level of impact on residential and commercial areas. The Project, however, generally fits within a wider context of large scale built form, especially along Moorebank Avenue. This assists in reducing the commercial, residential and light industrial developments sensitivity to change, resulting in a relatively low landscape character impact for these areas.

4.2.2 Visual impacts

The proposed Moorebank Intermodal Terminal is a significant development, covering a large operational area and involving a proposed increase in the scale, height and bulk of the buildings within the site. The visual impacts are, however, limited to a relatively small area surrounding the development due to the nature of the topography and presence of screening vegetation along the Georges River.

The abundance of tall, mature vegetation along the Georges River riparian corridor and the retention and rehabilitation of this as a conservation corridor, assists in blocking views of lower Project elements (such as roads, rail infrastructure and warehousing) from the residential suburb of Casula.

During construction, tall construction cranes are likely to be the most visible element of the Project and potentially visible from all the key viewpoints studied in this report. Other sources of visual impact during construction, such as the establishment of hoardings and construction fencing will tend to create highly localised visual impacts, primarily along Moorebank Avenue.

The phasing of the construction process means that visual impacts will gradually increase over time as elements of the Project become operational. Project Phase A is associated with the largest level of vegetation clearing. By the end of phase A, half of the IMEX facility will be operational and lighting poles, gantries and warehousing will be visible to visual receptors west of the Georges River. By Phase C, a large proportion of the site will be operational and the only additional visual impacts are likely to be construction cranes associated with the building of the final portion of the IMEX and additional warehousing.

In summary the major impacts of the Project for the studied receptors will comprise:

- scale, height and bulk of the proposed buildings, especially light towers
- increase in the scale of Moorebank Avenue to a four lane road

Lesser impacts will include:

- areas of rail infrastructure, trains and containers
- car parks and adjoining roads
- light spill from light towers
- movement of freight trains across the Glenfield landfill site.

The greatest visual impact of the completed development will be on the public parks and associated residential properties that are situated on the elevated topography sloping west from the Georges River. These will have clear views over the site and the taller project elements such as lighting towers and gantries.

4.2.3 Lighting impact

A separate study will be conducted into the impact of the proposed lighting on the surrounding area by a lighting specialist. The proposed lighting poles are 30m high and likely to be visible from all but viewpoint 5 and 6. Lighting has been considered within the mitigation section of this report.

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5.0

Appendices



5.0 APPENDIX A - VISUAL IMPACT RATING TABLE

An explanation of the rating categories used to determine the level of visual impact at each viewpoint

<p>Magnitude of change</p>	<p>H M/H M M/L L N</p>	<p>Magnitude of change is a quantitative assessment of the change in compositional elements of the view. If the proposed development is largely similar in nature and scale to that of existing elements in the vicinity, the magnitude of change is low. If the development radically changes the nature or composition of the elements in the view, the magnitude of change is high. Distance from the development will accentuate or moderate the scale and variety of visible elements in the overall view and hence influence this rating:</p> <p>Elements within the view will be greatly at odds with existing features in the landscape Elements within the view will be largely at odds with existing features in the landscape Elements within the view will be at odds with existing features in the landscape Elements within the view will be partly at odds with existing features in the landscape Elements and composition of the view will remain largely unaltered . No view of the development from this location.</p>
<p>Summary of Ratings</p>	<p>From H to N</p>	<p>A summary rating that combines all of the quantitative ratings. This is rated either high, moderate to high, moderate, moderate to low, low or none, where none implies no visible change based on the above criteria and high implies significant visible change in terms of the combined quantitative criteria</p>
<p>QUALITATIVE ASSESSMENT DEFINITIONS</p>		
<p>Receptor sensitivity</p>	<p>H M/H M M/L L</p>	<p>Each visual receptor type has an inherent and varied sensitivity to change in the visual scene based on their personal context in which the view is being experienced. This will have a direct bearing on the perception of visual impact experienced by the receptor and qualifies the quantitative impacts:</p> <p>Residential (R): view from dwelling or garden may be experienced regularly over extended periods of time; residents may have chosen the location specifically for the view and/or develop a strong familiarity and association with the view and have high sensitivity to change</p> <p>Public Reserve (PD) Parks, Reserves, Public walkways: the purpose of visiting and using reserves largely relates to an enhanced sense of wellbeing. Receptor is more sensitive to both positive and negative visual experiences, especially where the reserve is the destination for leisure and relaxation.</p> <p>Public Roads/Transport (T): the view experienced can be important to the driver/passenger but is sometimes a brief experience and the driver is usually focused on the road.</p> <p>Commercial Property (C) - Work: view can enhance the work or education experience but focus of activity is not principally on the view.</p> <p>Semi-Private property (P) - Work/Education/Service provider: view can enhance the work or education experience but focus of activity is not principally on the view.</p>
<p>Comments</p>		<p>Written summary of the key visual impacts, both quantitative and qualitative.</p>
<p>SUMMARY</p>		
<p>Combined Rating</p>	<p>H M/H M M/L L</p>	<p>The nature of the visual impact may be beneficial or adverse, based on a transparent professional assessment of the combined totals of qualitative and quantitative ratings and comments as outlined above:</p> <p>Highly adverse. Moderately to Highly adverse. Moderately adverse. Slightly adverse. Neutral or Beneficial.</p>

5.0 APPENDIX A - VISUAL IMPACT RATING TABLE

Receptor Description		The location of the visual receptor.
Photo Location		The photo reference of the viewpoint
QUANTITATIVE ASSESSMENT DEFINITIONS		
Distance		The effect the development has on the view relating to the distance between the development and the visual receptor. The distances are from the approximate centre of the site and categorised as:
	H	Within 100 - 300 metres- high impact.
	M	300 to 1000 metres - high to moderate impact.
	L	Further than 1000 metres - low impact.
Quantum of view		The Quantum of view relates to the openness of the view and the angle of the view to the visual receptor. A development located in the direct line of sight has a higher impact than if it were located obliquely at the edge of the view. Whether the view of the development is filtered by vegetation etc. also affects the impact, as does the nature of the view (panoramic, restricted etc.). A small element within a panoramic view has less impact than the same element within a restricted or narrow view. The effects can be categorised as:
	H	A direct view of the development or its presence (sometimes in a very narrow or highly framed view), where the development occupies the greater proportion of the view cone.
	M/H	A direct view of the development within a panoramic view where the development occupies a large proportion of the view cone.
	M	A direct view of the development or its presence in a broader view where the development occupies a moderate proportion of the view cone.
	M/L	A direct or slightly oblique view of the development within a broad or panoramic view cone
	L N	An oblique, highly filtered or largely obscured view of the development. No view of the development site from this location.
Duration		The length of time the visual receptor is exposed to the view. The duration of view affects the impact of the development on the viewer - the longer the exposure the more detailed the impression of the proposed change in terms of visual impact:
	H	Significant part of the day - high impact: usually residential property.
	M/H	5 minutes to several hours - high to moderate impact: often from a garden or park or commercial property and work places.
	M	10 seconds to 1 minute - moderate impact: usually from a road/driveway entrance, walking past or entrance to commercial property.
	M/L L	5 to 10 seconds - moderate to low impact: often from a road or walking past. 1 to 5 seconds - low impact: usually from a road or railway

CLOUSTON associates



The Project site as viewed from Carroll Park.

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