



APPENDIX M

VISUAL IMPACT ASSESSMENT

CSR Advanced Manufacturing Hub



Modification 3 VISUAL IMPACT ASSESSMENT

PREPARED BY ENVISAGE CONSULTING
ON BEHALF OF ELEMENT ENVIRONMENT FOR CSR



**CSR ADVANCED MANUFACTURING HUB
MODIFICATION 3
VISUAL IMPACT ASSESSMENT**

FINAL

DATE: 25 February 2019
PREPARED FOR: CSR Building Products Limited
PREPARED BY: Alison Dodds, *PGCert Public Policy, BPlan, BLArch*
RPIA Registered Planner and
Stacey Brodbeck, *MEnvPlan, BLArch, CPP, RPIA*
AILA Registered Landscape Architect

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1 Introduction

1.1 Purpose of this report

CSR Building Products Limited (CSR) has Project Approval (PA10_0014) to operate a quarry and brick making facility at their Badgerys Creek site, western Sydney. Modification to the Project Approval has been proposed by CSR to construct and operate a new roof production facility and to extend the brick making facility (the Project). This report has been prepared to assess the visual impacts associated with the Project.

This assessment considers the visual impact of the proposed modifications on existing landscape character and to key viewpoints that surround the Project. It is to inform the Environmental Assessment (EA) prepared for the modification application (MP 10_0014 MOD 3) under section 75W of the *NSW Environmental Planning and Assessment Act 1979* (EP&A Act).

1.2 Project overview

CSR's Badgerys Creek site is located at 235 Martin Road, Badgerys Creek (the Site). The Site - approximately 200 hectares (ha) in size - borders the proposed Western Sydney Airport precinct. The Site is within the Liverpool local government area (LGA) and within the NSW Government's Western Sydney Aerotropolis.

The key visual features of the Project to modify the Project Approval include:

- Brick production
 - Extending the footprint of the approved PGH brick making facility (by approximately 10,600 m²). The extension would involve the removal of the existing 41m high kiln exhaust stack and include two new 41m high kiln exhaust stacks and rainwater tanks
 - Increasing the footprint of the existing administration building (by approximately 515 m²)
 - Constructing a new NATA (National Association of Testing Authorities) testing laboratory (approximately 450 m²)
 - Constructing a two-storey (approximately) innovation centre (with a footprint of approximately 900 m²)
 - Extending the existing visitors carpark, and creating new factory staff parking areas, and
 - Constructing a new access road to the factory staff parking area for use by light vehicles, bulk material deliveries and dispatch.
- Roof products production

- Constructing and operating a new Monier roof products manufacturing plant and associated structures - including silos (up to 27m high), wind tunnel, delivery bins, office and storage shed - to operate 24hrs/day
- Constructing a large hardstand storage yard including truck loading bays, and
- Constructing a new entry road to the Monier roof products plant, including weighbridge and parking within the footprint.
- General
 - Extending truck arrival and dispatch in the morning to 5:00am Monday to Friday, and to 6:00am Saturday (approved hours are from 7:00am Monday to Saturday).
 - Modifying the approved noise bunds by reducing the extent and height of the bund along the northern boundary, increasing the height of the existing bund along the entrance driveway, and installing a barrier in the northeast corner (north of the Site entrance)
 - Amendment to the extent of Pit 5 to include a 200m buffer zone to neighbouring residential properties required under the *Mining Act 1992*.

Project details are provided at **Section 4**.

Operations at the existing PGH brick making facility have been 'mothballed' for several years. When operations recommence at the Site, works already permitted under the Project Approval would be undertaken (including quarrying, brick manufacturing, receipt of raw materials, and transporting product from the Site). These approved activities are therefore not included as part of the Project (modification 3 to the Project Approval) being assessed in this report.

1.3 Report format

The principal tasks of the assessment process are set-out in the report's format:

- Defining the methodology for the assessment (**Section 2**)
- Establishing baseline conditions and describing the context of the site, including the visual environment and site visibility (**Section 3**)
- Describing the main visual changes associated with the Project (**Section 4**)
- Assessing the likely effects to landscape character (**Section 5**)
- Assessing the likely effects on surrounding key viewpoints (**Section 6**)
- Describing design and mitigation measures that have been, and could be, incorporated into the design to improve the visual outcome (**Section 7**) and
- Conclusion (**Section 8**).

2 Assessment methodology

The applied methodology has been tailored to address the particular visual impacts of establishing this type and scale of infrastructure in this location, based on professional experience and a number of visual assessment guidelines used by government authorities in Australia and internationally, including the:

- NSW Road and Maritime Services' (Roads and Maritime, 2013) Environmental Impact Assessment Practice Note: *Guideline for Landscape Character and Visual Impact Assessment EIA-N04*, March 2013;
- Western Australian Planning Commission's *Visual Landscape Planning in Western Australia* (2007); and
- Landscape Institute and Institute of Environmental Management and Assessment, 2013 (3RD edition), *Guidelines for Landscape and Visual Impact Assessment*.

2.1 Desktop analysis

Prior to the field inspection, an approximate viewshed¹ of the Project was determined using desktop analysis of aerial photography and elevation.

The approximate viewshed was used to identify possible areas from which there may be views of the Project - in particular, potentially sensitive viewing locations such as residences and publicly accessible areas such as local roads. Other potential viewpoints such as lookouts and public recreation areas were identified for verification during the site inspection².

2.2 Field survey

The Project Site was inspected on 10 April 2018 under the supervision of CSR staff and included a Site walk-over. The day of the inspection was dry and sunny.

Sensitive receptor locations were identified in the original EA Visual Assessment³. During the field survey, these sensitive receptor locations, as well as the Site and the surrounding area, were inspected to verify likely viewpoints. Confirmed viewpoints were assessed to determine their sensitivity to change, and the potential visual impact of the Project on each viewpoint.

¹ A viewshed indicates the approximate geographic area which may have views of a Site and indicates the potential extent of area to be assessed.

² The approximate viewshed does not take into account features such as vegetation and built elements which may obstruct views and must be verified on site.

³ Environmental Assessment, Continued Operation of Quarry and Brick Making Facility Boral, Badgerys Creek, AECOM, 2010.

2.3 Assessment

Following the field survey, two main types of visual effects (or impacts) were assessed:

- effect on the landscape character, and
- effect on key viewpoints (visual impact).

The *Guideline for Landscape Character and Visual Impact Assessment EIA-N04* (Roads and Maritime, 2013) states:

"Landscape character and visual assessment are equally important. Landscape character assessment helps determine the overall impact of a project on an area's character and sense of place. Visual impact assessment helps define the day to day visual effects of a project on people's views."

To assess the effect on landscape character and viewpoints, two criteria - sensitivity and magnitude of change – have been determined and combined. Sensitivity and magnitude of change are defined⁴ as:

- *Sensitivity - The sensitivity of a landscape character zone or view and its capacity to absorb change. In the case of visual impact this also relates to the type of viewer and number of viewers.*
- *Magnitude - The measurement of the scale, form and character of a development Project when compared to the existing condition. In the case of visual assessment this also relates to how far the Project is from the viewer.*

For the purposes of this assessment, the criteria specifically developed to determine sensitivity are listed in **TABLE 2-1**, and those to determine magnitude are listed in **TABLE 2-2**. These criteria have been defined for sensitivity and magnitude of change for both the assessment of landscape character and the visual impact to viewpoints. The combination of sensitivity and magnitude are combined to provide the rating of the level of impact, as shown in **TABLE 2-3** (as adapted for this type of project from Roads and Maritime Services', 2013).

TABLE 2-1: SENSITIVITY RANKING CRITERIA

Sensitivity	Criteria (general guide only, some or all may apply)
High	▪ Landscape or heritage of high to very high conservation value ▪ Public views with a high to very high number of users ▪ Viewers are in close proximity ▪ The site has a high visual prominence ▪ Viewers have opportunity for prolonged or stationary views
Moderate	▪ Landscape or heritage of moderate conservation value

⁴ Roads and Maritime Services' (2013)

Sensitivity	Criteria (general guide only, some or all may apply)
	- Public views with a moderate to high number of viewers - Viewers are in close or moderate proximity - The site is visually prominent - Private views in close proximity with mostly unimpeded views
Low	- Some landscape or heritage conservation value but of lower visual value - Public views for a small number of users - Viewers at a more distant proximity - Site is less visually prominent - Viewers have short-time period to view / transitory views
Negligible	- Landscape has no or very little heritage or visual value - Very few people can view - Viewers are long distance from site - Site is not visually prominent - Viewers have short time period to view / no private/stationary views

TABLE 2-2: MAGNITUDE OF CHANGE RANKING CRITERIA

Magnitude	Criteria (general guide only, some or all may apply)
High	- Significant size and extent of area affected - Permanent and irreversible change - The Project forms a significant and immediately apparent part of the scene, and one that significantly contrasts in scale and character (either existing or planned) and is severely detrimental to the quality of the scene
Moderate	- Moderate in size and extent of area affected - Temporary, or if permanent, effects reduced over time - The Project becomes the dominant feature of the scene to which other elements become subordinate, and one that significantly contrasts in scale and character (either existing or planned), possibly reducing the quality of the scene
Low	- Small in size and extent of area - Temporary, or if permanent, visual effects able to be reduced substantially - The Project forms a visible and recognisable new element within the overall scene, yet one that is relatively compatible with the surrounding character (either existing or planned)

Magnitude	Criteria (general guide only, some or all may apply)
Negligible	The Project constitutes only a minor component of the wider view, which might be missed by the casual observer or receptor. Awareness of the Project would not have a marked effect on the overall quality of the scene

TABLE 2-3: LANDSCAPE CHARACTER AND VISUAL IMPACT GRADING MATRIX

Magnitude					
Sensitivity		High	Moderate	Low	Negligible
	High	High impact	Moderate-high impact	Moderate impact	Negligible
	Moderate	Moderate-high impact	Moderate impact	Low-moderate impact	Negligible
	Low	Moderate impact	Low-moderate impact	Low impact	Negligible
	Negligible	Negligible impact	Negligible impact	Negligible impact	Negligible

2.4 Mitigation measures

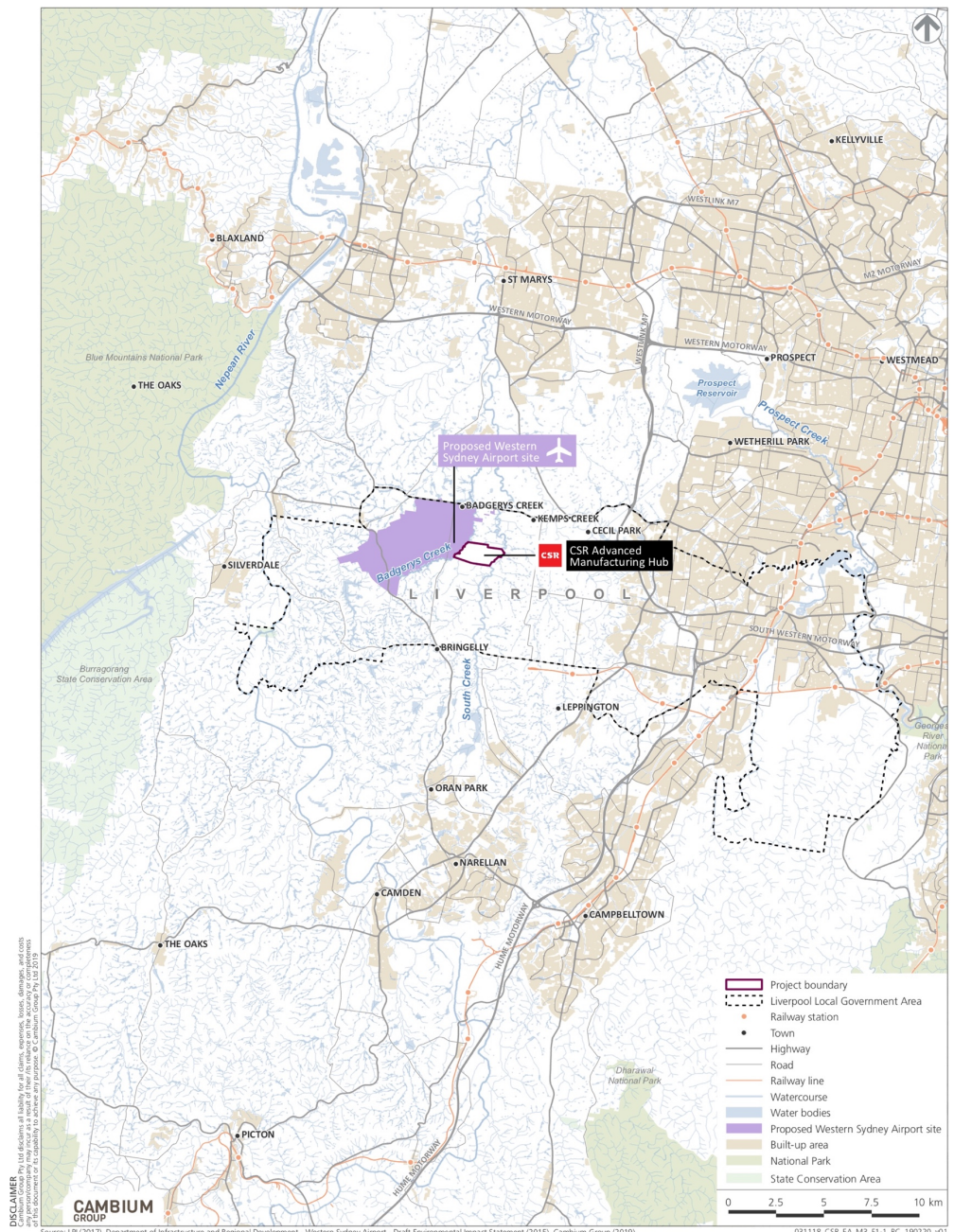
Following the assessment, where relevant and possible, mitigation measures have been recommended to reduce potentially adverse visual impacts to viewpoints. Mitigation measures include planting and design guidelines and are provided at **Section 7**.

3 Landscape character

This section of the report describes the existing landscape character within the vicinity of the Project, and of the Project Site.

3.1 Location

The Project Site at 235 Martin Road, Badgerys Creek, is identified on **FIGURE 3.1**. Access to the Project Site is from Martin Road, which runs off Elizabeth Drive (a designated B-double route). The local context of the Site is shown **FIGURE 3.2**.



⁵ Figure provided by Element Environment

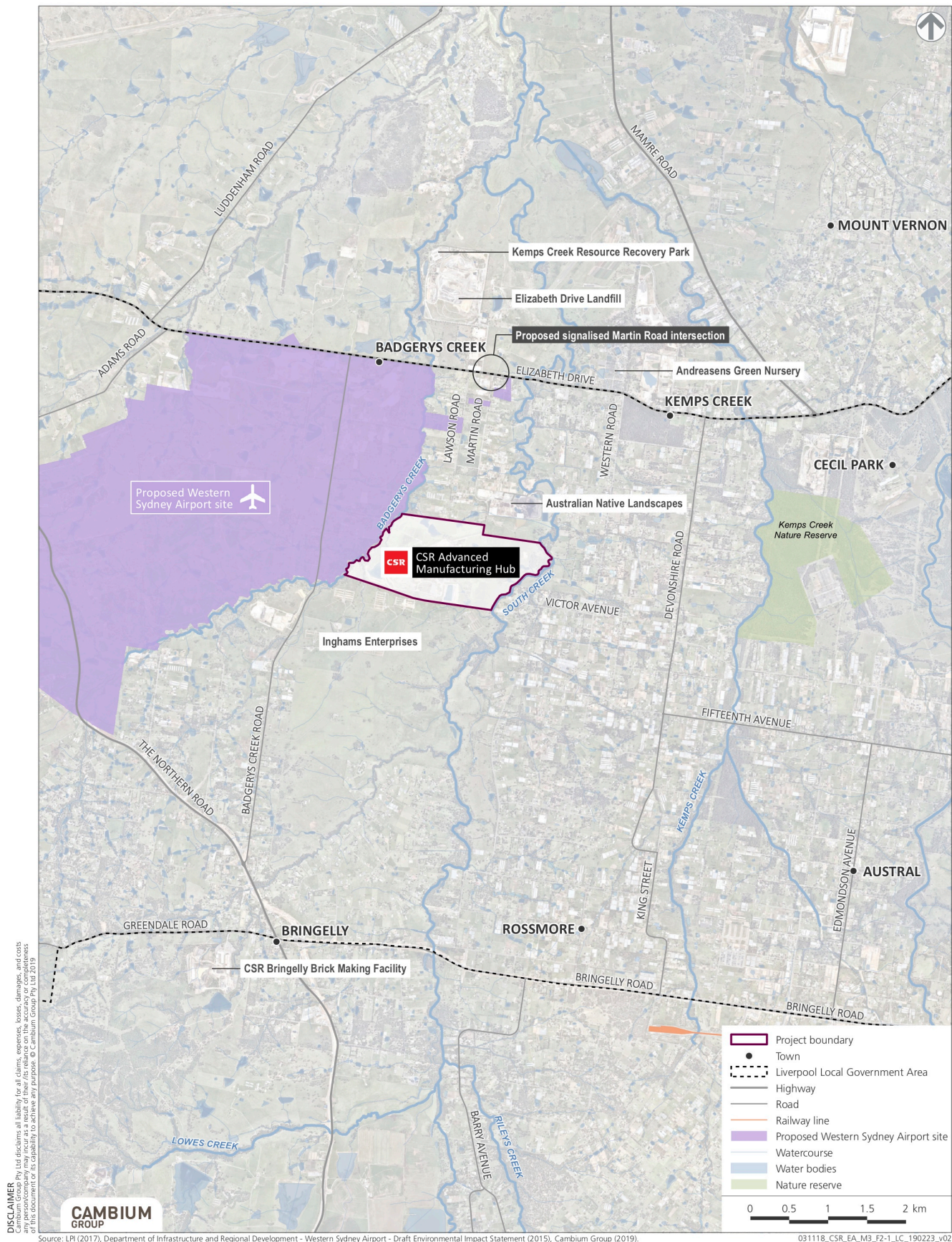


FIGURE 3.2: LOCAL CONTEXT OF PROJECT LOCATION⁶

⁶ Figure provided by Element Environment

Badgerys Creek forms the western boundary of the Site. The rural/agricultural area west of Badgerys Creek has been identified as the proposed Western Sydney Airport precinct (Western Sydney Aerotropolis). The Airport is scheduled to open in 2026⁷. Context for the future of the surrounding area and the Aerotropolis is provided at **Section 3.4**.

South Creek forms the eastern boundary of the Site. East of the Creek are rural residential allotments; smaller, detached, low-density residential properties; and a large campus for the Kemps Creek Cemetery and Crematorium. Further east is the Kemps Creek Nature Reserve, an important 197ha conservation habitat.

To the north is the Badgerys Creek community. The area includes rural residential properties and small agricultural allotments with farm buildings and fenced paddocks for livestock. There are also resource-based businesses such as Australian Native Landscapes, which features large warehouses, and fenced, hard-paved yards for vehicles and stock.

Immediately south is Inghams Chicken. This business is not currently operational. South, beyond the poultry sheds, are rural residential properties.

Rural properties in the vicinity are covered in pasture grasses with stands of tall trees scattered throughout the paddocks and within the road reserves. Dense vegetation lines the creeks. Landform in the area is undulating. There are no significantly elevated ridges or 'lookouts'.

The undulating landform and tall vegetation limit the extent of views.

3.2 Site description

3.2.1 Existing

The eastern portion of the Site at the end of Martin Road is generally rural/agricultural in character. The land has been largely cleared of trees, covered with pasture grasses and fenced. The eastern portion of the Site is accessed by an unsealed track running into the Site off Martin Road.

An existing, occupied, two-storey brick house (leased from CSR) is located on a small ridge near Martin Road. Over the ridge, the land falls toward South Creek, is quite flat and low lying. South Creek is densely tree-lined and isolated stands of trees are scattered across the lower areas of the Site. To illustrate the character of the property, an image of the eastern portion of the Site is shown at **FIGURE 3.3**. The existing residence and trees around the residence is shown at **Figure 3.4**.

⁷ <http://westernsydneyairport.gov.au> (accessed 16 April 2018)

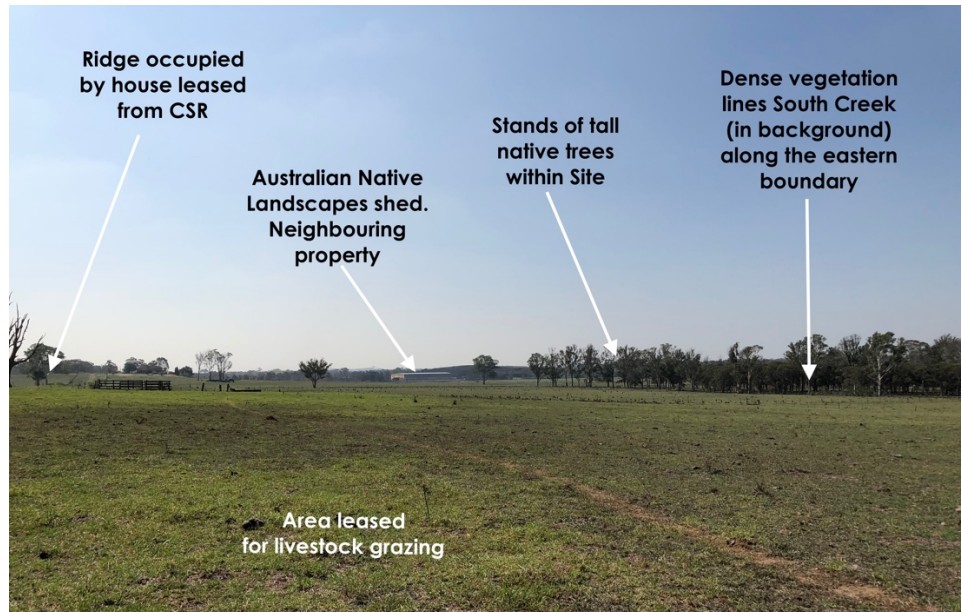


FIGURE 3.3: EASTERN-MOST PORTION OF SITE⁸



FIGURE 3.4: RESIDENCE AND TREES ON RIDGE AT END OF MARTIN ROAD⁹

A sealed driveway leads west from the end of Martin Road to the centre of the Site where the existing PGH brick making facility is located. The plant ('mothballed' since March 2012) is on a large hardstand area fenced-off with a security gate for access. An image of the brick making facility is shown at **FIGURE 3.5**. Shown in the figure is the tallest feature of the existing infrastructure, a 41m high kiln exhaust stack.

⁸ Photograph taken by the author, 10 April 2018, approximately 200m from southern site boundary, looking north-east

⁹ Photograph taken by the author, 10 April 2018, from Martin Road, approximately 140m north of site entry, looking south



FIGURE 3.5: CENTRAL HARDSTAND YARD AND BRICK MAKING FACILITY¹⁰

There are two single-story administration buildings near the PGH brick making facility security entry gate. Several staff are located at the Site to oversee administration. Product from the former operations is stacked on the open, hardstand yard.

There are quarry pits around the central hardstand area, stockpiles of clay, unusable materials (interburden and overburden), and sedimentation basins. There are also two earthen noise bunds (covered in pasture grasses), one (approximately 4.5 m high) along the northern side of the entrance driveway and the other (approximately 4.5 m high) along the eastern edge of Pit 3.

Beyond the noise bunds, fenced-off paddocks within the Site are leased for livestock grazing. Unsealed tracks across the Site provide access to these areas. The grazing area north of the PGH brick making facility is shown



¹⁰ Photograph taken by the author, 10 April 2018, from approximately 60m north of existing brick factory, looking south-east

FIGURE 3.6. The grazing area east of the PGH brick making facility is shown **FIGURE 3.7.**

Tall trees lining Badgerys Creek (to the west) and South Creek (to the east) provide a dense, vegetated screen along both boundaries of the Site. Isolated stands of trees are scattered across the Site, as are farm buildings, enhancing the rural/pastoral setting.



FIGURE 3.6: SITE EAST OF BRICK MAKING FACILITY¹¹

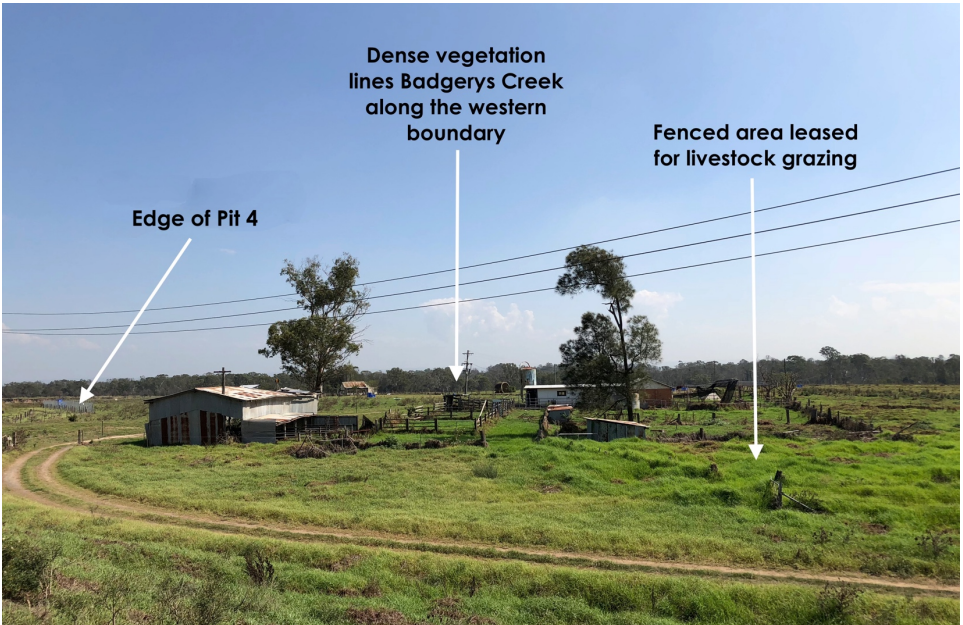


FIGURE 3.7: SITE WEST OF BRICK MAKING FACILITY¹²

¹¹ Photograph taken by author, 10 April 2018, approximately 90m south of Martin Road site entry, looking south-west

¹² Photograph taken by the author, 10 April 2018, approximately 50m north of existing brick plant, looking west

3.2.2 Approved activities

Project Approval (PA10_0014 issued 27 September 2011) outlines the activities already permitted at the Site. The approved quarrying and brick making activities are to:

- Extract 420,000 tonnes of clay per calendar year;
- Produce 252,000 tonnes of bricks per calendar year;
- Extract any clay shale or carry out any work in the extraction area no deeper than 35 metres below the pre-existing natural surface of the ground;
- Receive 20,000 tonnes of raw material for brick making per calendar year; and
- Dispatch more than 275,000 tonnes of raw materials from the site in any calendar year.

The layout of the approved activities (as per Project Approval 10_0014, Modification 2, 5 May 2018) is shown in **FIGURE 3.8**.

Product from the quarry and brick making facility is approved for transport entirely by road. The Project Approval limits the number of truckloads/heavy vehicle movements that can exit the site per day to:

- A maximum of 60 laden brick trucks (i.e. 120 movements), Monday to Friday; and
- A maximum of 20 laden brick trucks (i.e. 40 movements) on Saturdays.

The approved construction includes a 10m high noise attenuation bund along the length of the northern and part of the western Site boundaries; and a 7m high bund from the Martin Road Site entrance to the southern Site boundary east of Pit 4.

Additional commitments in the Project Approval which will reduce off-Site visual impact include:

- Minimising the off-site lighting impacts and ensure that all external lighting associated with the project complies with *Australian Standard AS4282 (INT) 1995 - Control of Obtrusive Effects of Outdoor Lighting*
- Rehabilitating the Site post-operations.

3.3 Planning and Legislative Requirements

Part 3A of the Environmental Planning and Assessment Act 1979 was repealed by the NSW Environmental Planning and Assessment Amendment (Part 3A Repeal) Act 2011 (Part 3A Repeal Act), which commenced on 1 October 2011. Under the Part 3A Repeal Act, projects deemed to be 'transitional Part 3A projects' will continue to be subject to Part 3A of the EP&A Act (as in force immediately before the repeal and as modified by the Part 3A Repeal Act). Transitional Part 3A projects include certain projects that were the subject of an existing approval under Part 3A.

As the Site has a Project Approval that was granted under Part 3A of the EP&A Act, it is a transitional Part 3A project. The provisions of Part 3A (as in force immediately prior to its repeal) continue to be applicable to the Project. Therefore, the Project is proposed to be assessed under s75W of the repealed Part 3A.

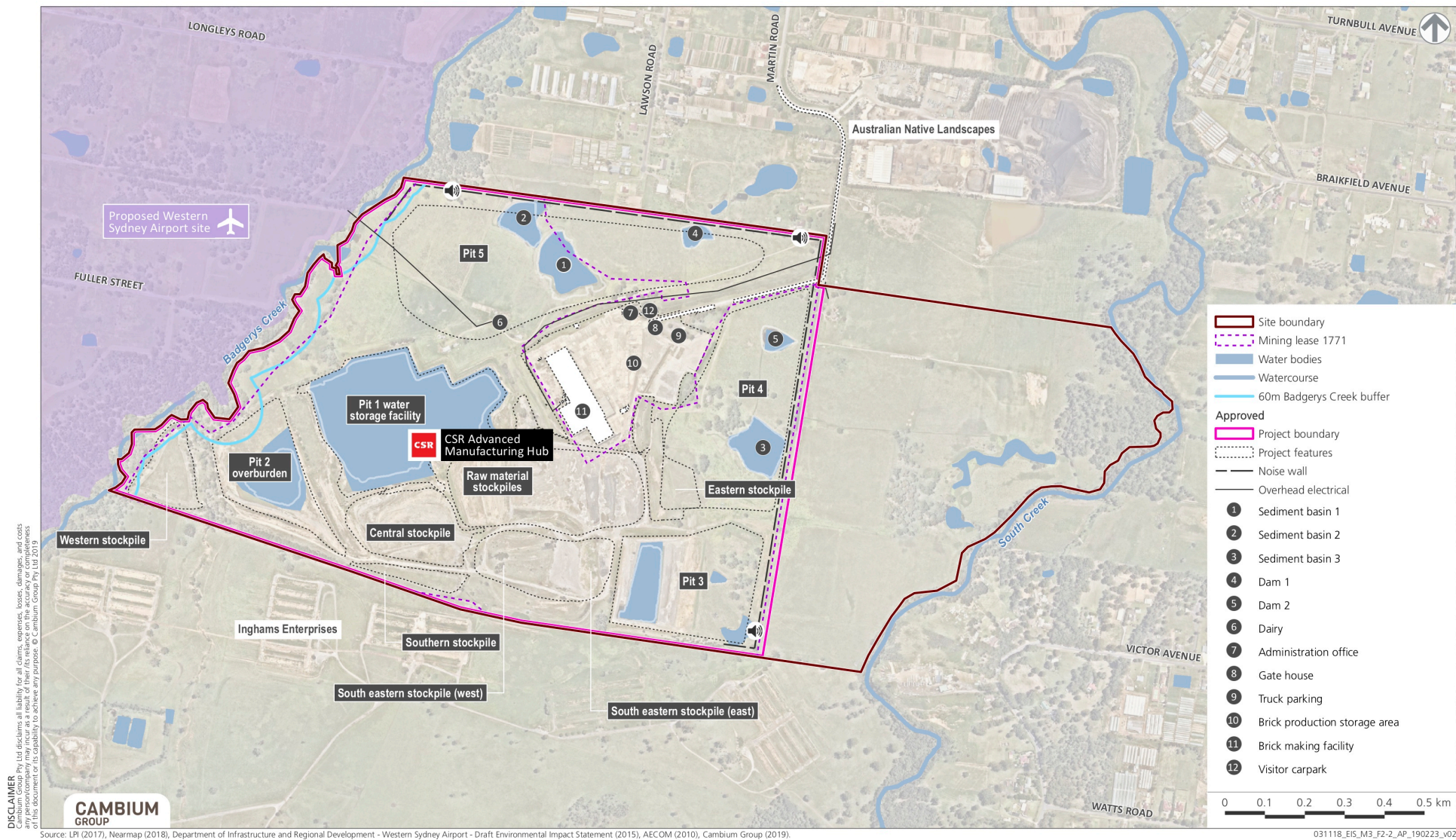


FIGURE 3.8: APPROVED PROJECT¹³

¹³ Figure provided by Element Environment

The transitional arrangements in the EP&A Act were repealed by the Environmental Planning and Assessment Bill 2017. This moved transitional Part 3A projects to the current State significant development and State significant infrastructure pathways, and applications to modify such projects will no longer be made under Section 75W. This modification application has been made within the transitional timeframe and is not affected by the above arrangements.

The SEARs issued by the Department of Planning and Environment (DPE) (dated 20/12/17) did not include specific requirements for preparation of the visual assessment, however, visual impact was identified as a low risk environmental factor in the Background Scoping Document (prepared by Element Environment) submitted to the DPE, and thus is included in the EA as a matter to be considered.

The DPE requested input from government agencies into the preparation of the SEARs. The EA must also address agency comments. No comments received referred directly to visual impact, however, some were related to visual matters. These comments and how they are addressed are included in

TABLE 3-1.

TABLE 3-1: AUTHORITY COMMENTS INCLUDED IN SEARS

Authority	Comment	How addressed?
Liverpool City Council 15 December 2017	...the production of roof products reliant upon materials imported to the site relates more strongly to an industrial manufacturing use, rather than a rural extractive industry use. This operation will significantly increase truck movements, which will impact upon the rural amenity of surrounding residents....	Additional truck movements are included in the assessment of views at Section 6 of this report.
DPE Division of Resources & Geoscience 14 December 2017	...supports the proposed...subject to there being no changes to the Project Approved rehabilitation management of the mine site....	There are no proposed changes to the approved rehabilitation management.
Department of Primary Industries 2 May 2017	...Badgerys Creek and South Creek adjacent to this site provide key fish habitat within Western Sydney. The Department recommends that the project is designed to: Potentially improve the environmental value of riparian buffer lands by planting with native species following completion of the quarrying activities...	Details regarding the riparian buffer is provided in the EA (prepared by Element Environment). There are no changes proposed to the buffer within this report.

Authority	Comment	How addressed?
	The Project Approval...included a condition...that the proponent should maintain a minimum setback width of 60m (measured from top of the high bank) between extraction areas and both Badgerys Creek and the Badgerys Creek tributary... The EIS should be required to address...details of final landform of the site...	
Department of Infrastructure and Regional Development 3 May 2017	...it will be important that the environmental assessment takes into account any potential impacts on the operations of the Western Sydney Airport. ...an environmental assessment should have regard to the National Airports Safeguarding Framework (NASF), taking into account the following: ...Any other activities that create hazards to aviation safety, including lighting that may cause distraction or interference for pilots of aircraft...	Details regarding aviation safety and lighting is provided in the EA (prepared by Element Environment). <i>NASF Guideline E: Managing the Risk of Distractions to Pilots from Lighting in the Vicinity of Airports</i> provides guidance for lighting near an aerodrome. The Guideline nominates four zones within a six-kilometre radius of an airstrip where ground light can cause interference as a pilot approaches to land. The intensity of light emissions within each light control zone is specified in the Guideline. Although within 6km of the Western Sydney Airport, the site is not within the four light control zones¹⁴. Proposed lighting at the site would comply with <i>Australian Standard AS4282 (INT) 1995 - Control of Obtrusive Effects of Outdoor Lighting</i>.
Department of Infrastructure and Regional Development 14 December 2017	...consider the proposed development in the context of precinct planning ongoing for the Western Sydney Airport Priority Growth Area.	Precinct planning for the Western Sydney Aerotropolis (formerly the Western Sydney Airport Priority Growth Area) has been included in the assessment of views at Section 6 of this report.

3.4 Planning in the vicinity

The (approximately) 200ha Project Site, and the areas north, east and south of the Site, are all located within the Western Sydney Aerotropolis. The NSW Government has identified the Western Sydney Aerotropolis as an area likely to undergo major change centred on the Western Sydney Airport¹⁵.

¹⁴ Guideline E, Attachment 1 to Lighting Guidelines

¹⁵ <http://www.planning.nsw.gov.au/Plans-for-your-area/Priority-Growth-Areas-and-Precincts/Western-Sydney-Airport-Growth-Area>

The Airport is anticipated to support almost 28,000 direct and indirect jobs by 2031¹⁶. Changes planned for the Western Sydney Aerotropolis include road improvement works, passenger and freight rail, and “unprecedented economic and housing growth”¹⁷.

The prioritisation of the airport, scheduled investment and infrastructure development within the area, would permanently change the character of Badgerys Creek and the vicinity. As noted in the draft Environmental Impact Statement for the Western Sydney Airport¹⁸:

Future development of the areas surrounding the airport site, under provisions of the Western Sydney Employment Area and the South West Priority Growth Area¹⁹, would lead to a significant transition from an environment that is predominantly rural in character to one that has a more urban form.

The DPE have been working with Liverpool Council (among other key stakeholders) to prepare the Western Sydney Aerotropolis Land Use and Infrastructure Implementation Plan (August 2018). The Plan is intended to guide new infrastructure investment, ensure new developments do not impact on the operation of the new Western Sydney Airport, identify locations for new homes and jobs close to transport, and coordinate services in the area.

The Implementation Plan refers to future development of the Badgerys Creek precinct, which includes the Site²⁰:

Directly adjoining the Airport to the east and Aerotropolis Core to the south, the Badgerys Creek precinct will support airport operations and the new urban centre. Affected by aircraft noise, it is not suitable for noise sensitive land uses. However, it will meet demand for a range of employment generating uses that do not require or benefit from direct access to public transport but which would benefit from proximity to airport operations and the new urban centre. Residential development is not appropriate²¹.

The Implementation Plan also refers to development of the South Creek precinct, which includes the western boundary of the Site. South Creek would be the central green spine for amenity and recreation²². It would protect biodiversity and endangered ecological communities (including remnant Cumberland Plain Woodland). and be accessible, attractive and environmentally rich²³.

¹⁶ <http://westernsydneyairport.gov.au> (accessed 16 April 2018)

¹⁷ <https://www.transport.nsw.gov.au/corridors> (accessed 16 April 2018)

¹⁸ Department of Infrastructure and Regional Development. 2015. Western Sydney Airport Draft Environmental Impact Statement

¹⁹ The Western Sydney Aerotropolis was previously identified as the Western Sydney Airport Priority Growth Area and the South West Priority area <http://www.planning.nsw.gov.au/Plans-for-your-area/Priority-Growth-Areas-and-Precincts/Western-Sydney-Airport-Growth-Area/Map>

²⁰ Refer to Appendix A for a map showing initial precincts identified for the Western Sydney Aerotropolis

²¹ Land Use and Infrastructure and Implementation Plan, p61

²² Land Use and Infrastructure and Implementation Plan, 24

²³ Land Use and Infrastructure and Implementation Plan, 38

The South Creek precinct is a focus of planning growth for the next five years²⁴. The Implementation Plan outlines urban design principles for the South Creek precinct:

- orientate development to face towards the creek corridor
- build a network of everyday uses within a walkable creek catchment
- provide creek connections and encourage waterfront activities.

²⁴ Land Use and Infrastructure and Implementation Plan, p20

4 Project description

This section describes the main components of the modification 3 Project and the changes that are likely to have visual impact during construction and operation.

4.1 The Project

The modification 3 Project would occur at two main areas of the Site in association with the two main development features:

- The PGH brick making facility which is within the central area of the Site; and
- The proposed Monier roof products manufacturing plant which is in the eastern portion of the Site.

General activities at other Site locations are also proposed.

The main features of the modification 3 Project, proposed activities and visual changes that would occur, are described below. An overview of the proposed Project is shown at **FIGURE 4.1**.

4.1.1 Changes associated with PGH brick making facility

The proposed changes to the central area of the site, associated with the PGH brick making facility, are shown at **Figure 4.2**. They include:

- Extending the footprint of the approved PGH brick making facility (by approximately 10,600 m²). The extension would include removal of the existing 41m high kiln stack and installation of two new 41m high kiln exhaust stacks and rainwater tanks
- Increasing the footprint of the existing administration building (by approximately 515 m²)
- Constructing a new NATA (National Association of Testing Authorities) testing laboratory (approximately 450 m²)
- Constructing an innovation centre (approximately 900 m²)
- Extending the existing visitors carpark, and creating new factory staff parking areas, and
- Constructing a new access road to the factory staff parking area for use by light vehicles and for bulk material deliveries and dispatch.

4.1.2 Extension to PGH brick making facility

CSR are proposing to replace the manufacturing equipment in the existing PGH brick making facility and extend the building to the north and east with an additional footprint of 10,600m².

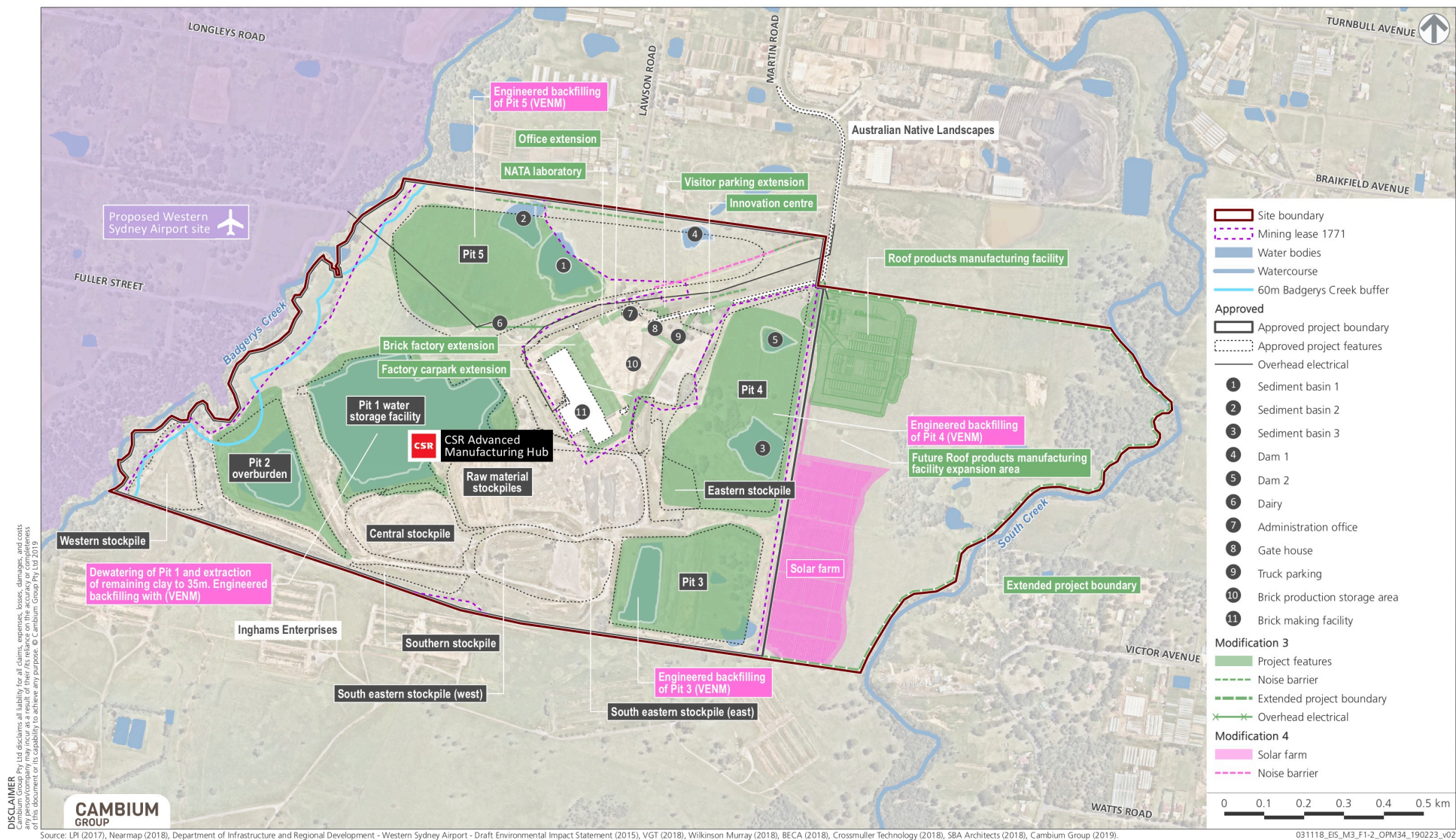


FIGURE 4.1: OVERVIEW OF PROPOSED PROJECT (MODIFICATIONS 3 AND 4) ²⁵

²⁵ Figure provided by Element Environment

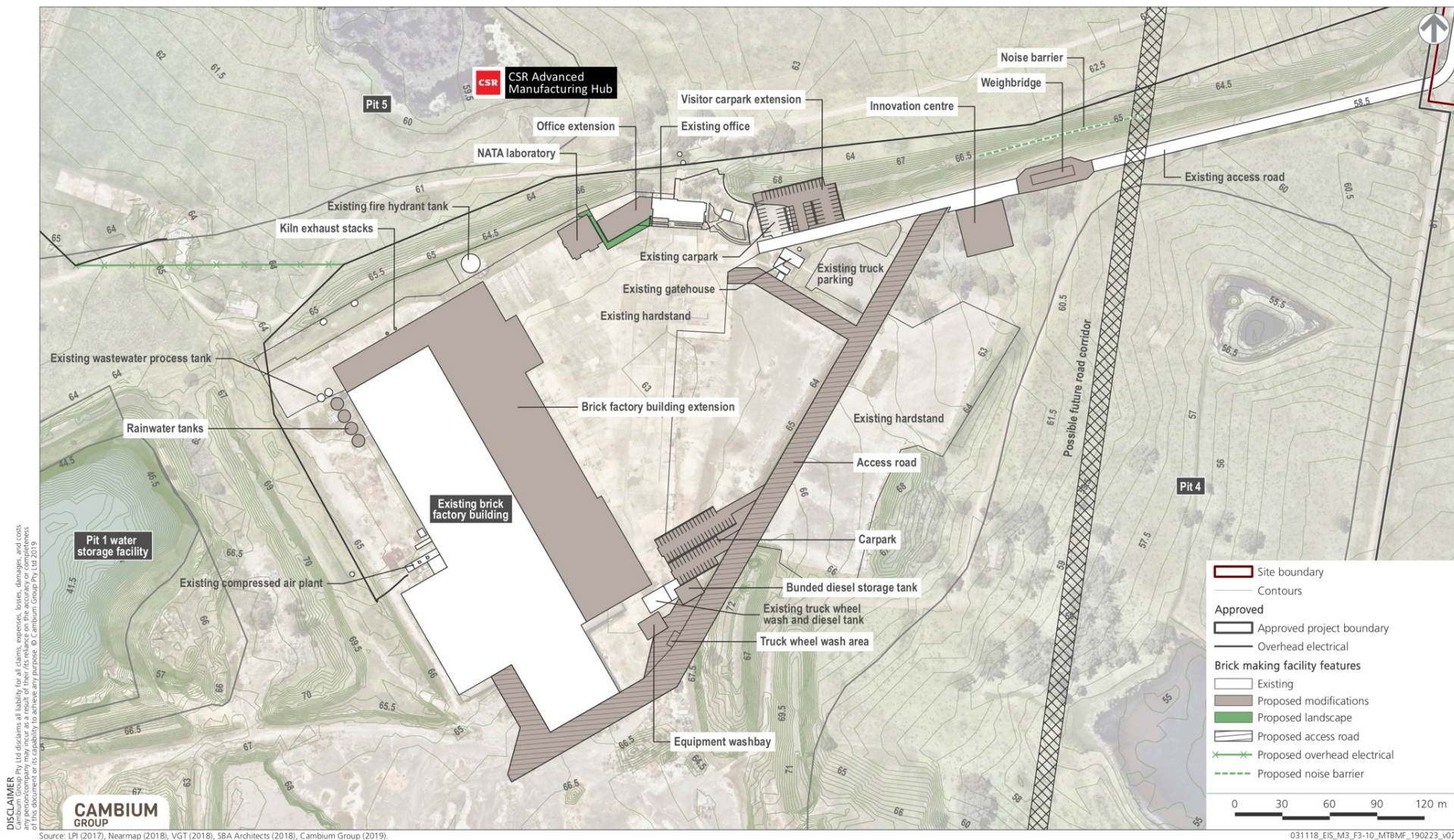


FIGURE 4.2: CHANGES ASSOCIATED WITH PGH BRICK MAKING FACILITY ²⁶

²⁶ Figure provided by Element Environment

The extension east would be approximately 45m wide and run the full length of the existing facility. The extension north would be approximately 18m wide and run the full width of the existing and proposed eastern extension. The proposed new roof structure would start from the eaves of the existing structure. The maximum height of the new roof would be approximately 9.5m - lower than the ridge of the existing roof (which is approximately 14m high).

The proposal includes demolition of the existing 41m high kiln stack and replacing it with two new kiln exhaust stacks, also approximately 41m high. The stacks would be the tallest features of the Project.

Other features to be incorporated into the facility include roller shutter doors and roof ventilation to the full length of the building. External supplementary components include a mobile crusher and rainwater tanks.

The design of the extensions would reflect the existing building form and continue the existing pitched roof alignment. The proposed extensions would be clad in the same building materials as the existing facility. The external walls would be clad in profiled metal sheeting. The existing building roof would be replaced with new metal roof sheeting to match the extensions. Colours would be muted and comprise grey/dark tones.

Elevations of the proposed extensions are shown at **Figure 4.3**.

4.1.3 Administration offices

An approximately 515m² westward extension of the existing administration building is proposed on existing concrete hardstand that currently forms part of the brick product storage yard. The proposed extension would almost double the footprint of the existing administration building.

The extension would be the same height as the existing (approximately 4m high). The design of the extensions would reflect the existing building form and continue the existing skillion roof alignment. The extension and the original building would comprise similar building materials. The external extension walls would be clad in face brick to match the original, with prefinished aluminium framed windows. The roof would comprise a prefinished metal parapet fascia to match the existing.

Elevations of the proposed extensions are shown at **Figure 4.4**.

4.1.4 NATA laboratory

A new separate building is proposed for a NATA accredited laboratory adjacent (west of) the administration offices, on existing concrete hardstand. The building would have a footprint of approximately 450m² (20m x 20m) and be approximately 7.7m tall.

The laboratory would have a maximum height of approximately 8m, be clad with face brick, have a tiled roof, aluminium framed doors, windows, and a prefinished metal roller shutter.

Elevations of the proposed laboratory are shown at **Figure 4.5**.

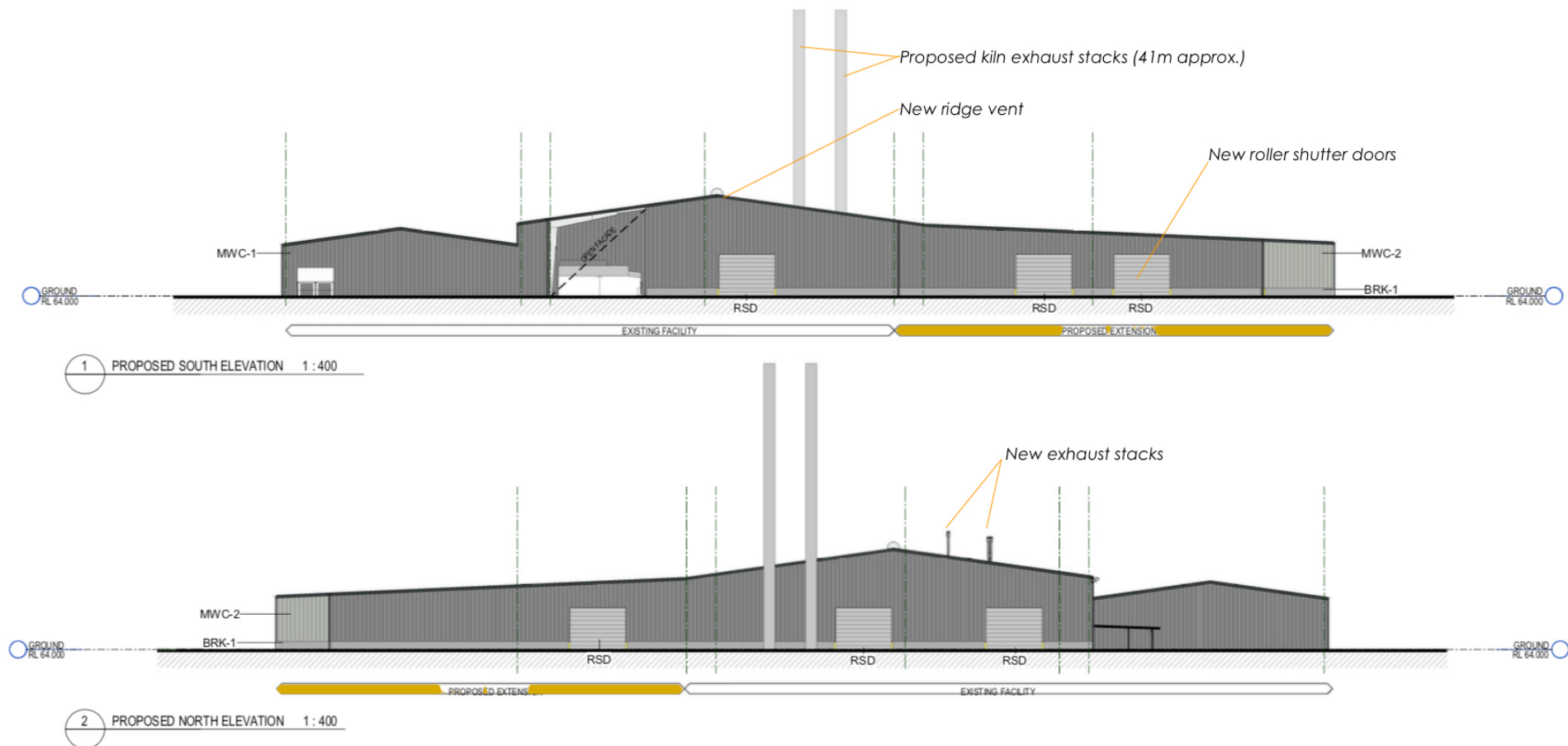


FIGURE 4.3: PROPOSED EXTENSIONS TO BRICK MANUFACTURING PLANT²⁷

²⁷ Extract from SBA ARCHITECTS dwg no. DA127 07/09/2018 REVISION A, notes in italics and colour added by the author

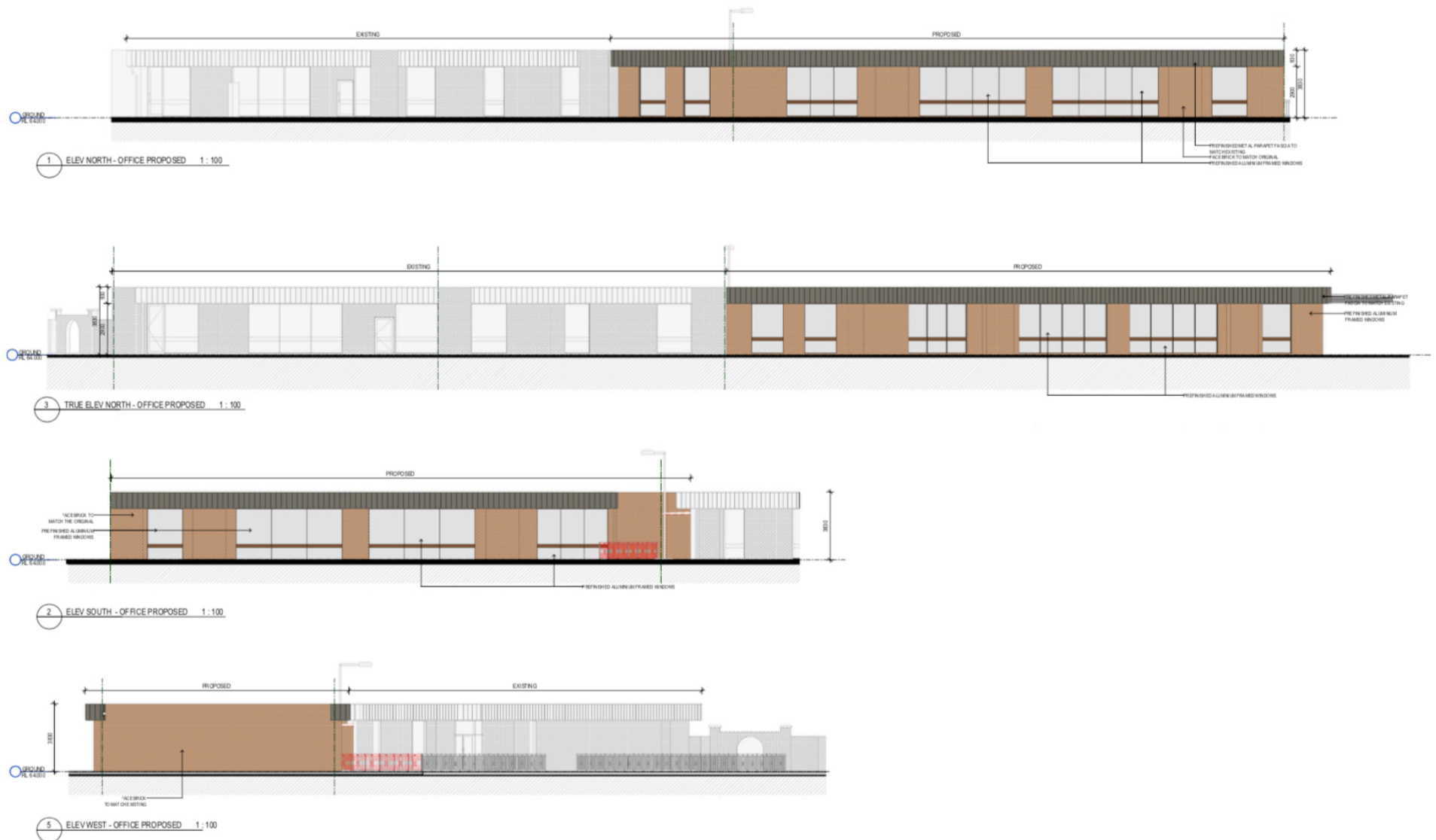


FIGURE 4.4: PROPOSED EXTENSION TO ADMINISTRATION BUILDING ²⁸

²⁸ Extract from SBA ARCHITECTS dwg no. DA143 07/09/2018 REVISION B

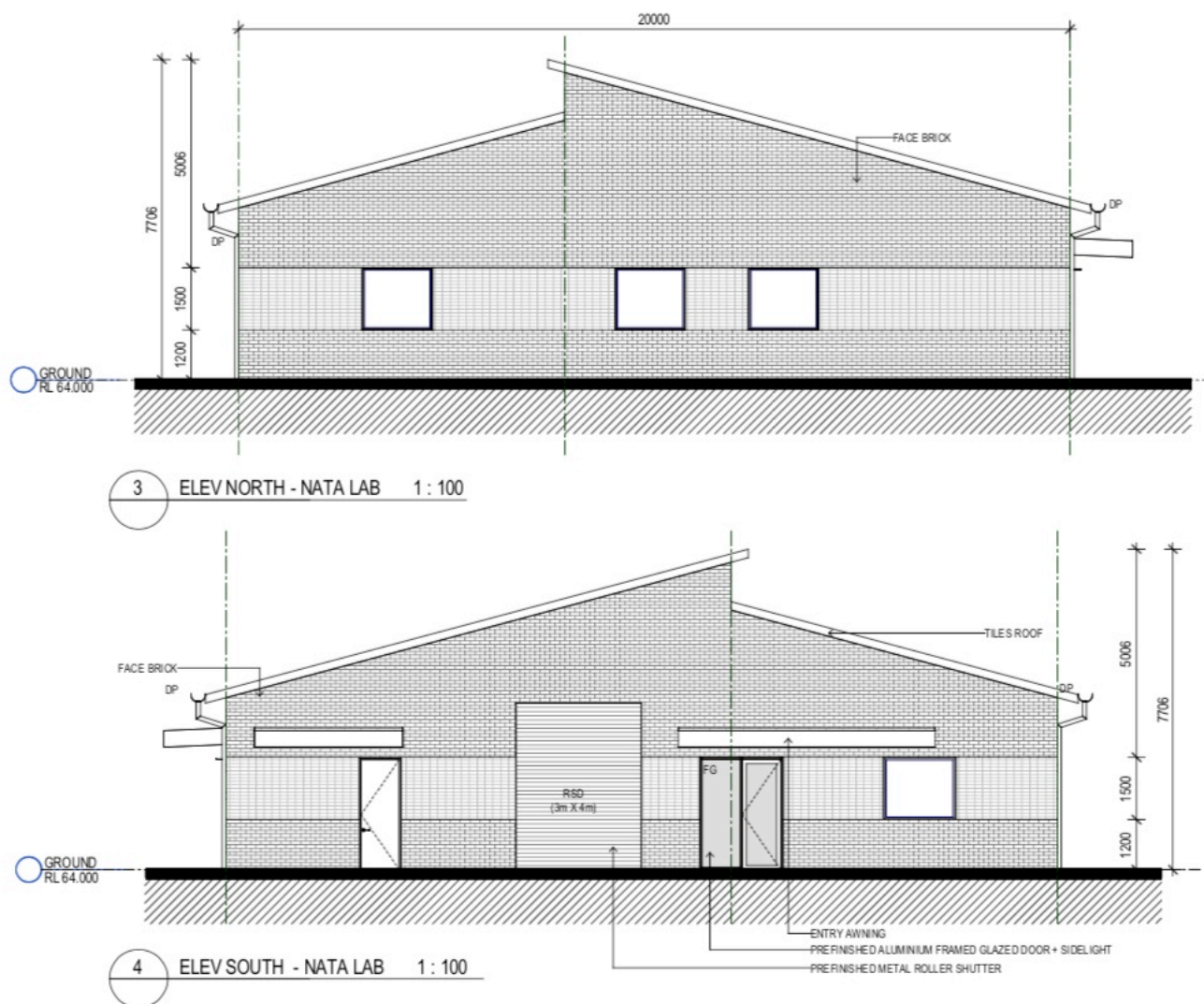


FIGURE 4.5: PROPOSED NATA LABORATORY²⁹

4.1.5 Innovation centre

An innovation centre is proposed to demonstrate the performance of products. The new structure would be approximately 30m x 30m and be designed to look like a two-storey residential home with pitched roof (approximately 7m high). It would be located immediately east of the visitor parking area and gate house.

The innovation centre would showcase different products. External and internal materials may change, as required, to demonstrate ideas and whole-of-house solutions. The building height may even change - rising to three-storey (approximately 9.5m). An image of the design of the innovation centre (as two-storey) is shown at **Figure 4.6**.

²⁹ Extract from SBA ARCHITECTS dwg no. DA130 07/09/2018 REVISION D



FIGURE 4.6: PROPOSED INNOVATION CENTRE (FIGURE FROM CSR)

4.1.6 Parking

The following parking for heavy and light vehicles is proposed:

- Visitors parking: The existing visitor's carpark would be extended to create 38 additional spaces, providing a total of 50 light vehicle car parking spaces
- Truck parking: A new parking area east of the gate house would provide 20 spaces for trucks
- Staff parking: 60 light vehicle parking spaces would be provided for factory staff adjacent (east) of the PGH brick making facility on existing concrete hardstand.

4.1.7 New access road

Access to the PGH brick making facility would remain off Martin Road and along the existing access road to the gatehouse. Prior to the gatehouse, a weighbridge is proposed to be installed to check tonnages of trucks entering and exiting.

A new access road is proposed to branch off to the south of the gatehouse and travel to the PGH brick making facility. It would be used by light vehicles accessing the staff parking area and heavy vehicles delivering or dispatching bulk raw material.

4.2 Changes associated with Monier roof products manufacturing plant

The proposal to construct a new Monier roof products manufacturing plant on the eastern portion of the Site would require a total site area of approximately 68,000m². This location is currently occupied by a brick residence and grazing paddocks which are leased by CSR to a local farmer.

The layout of the proposed Monier roof products manufacturing plant is shown at **Figure 4.7**. The proposal includes:

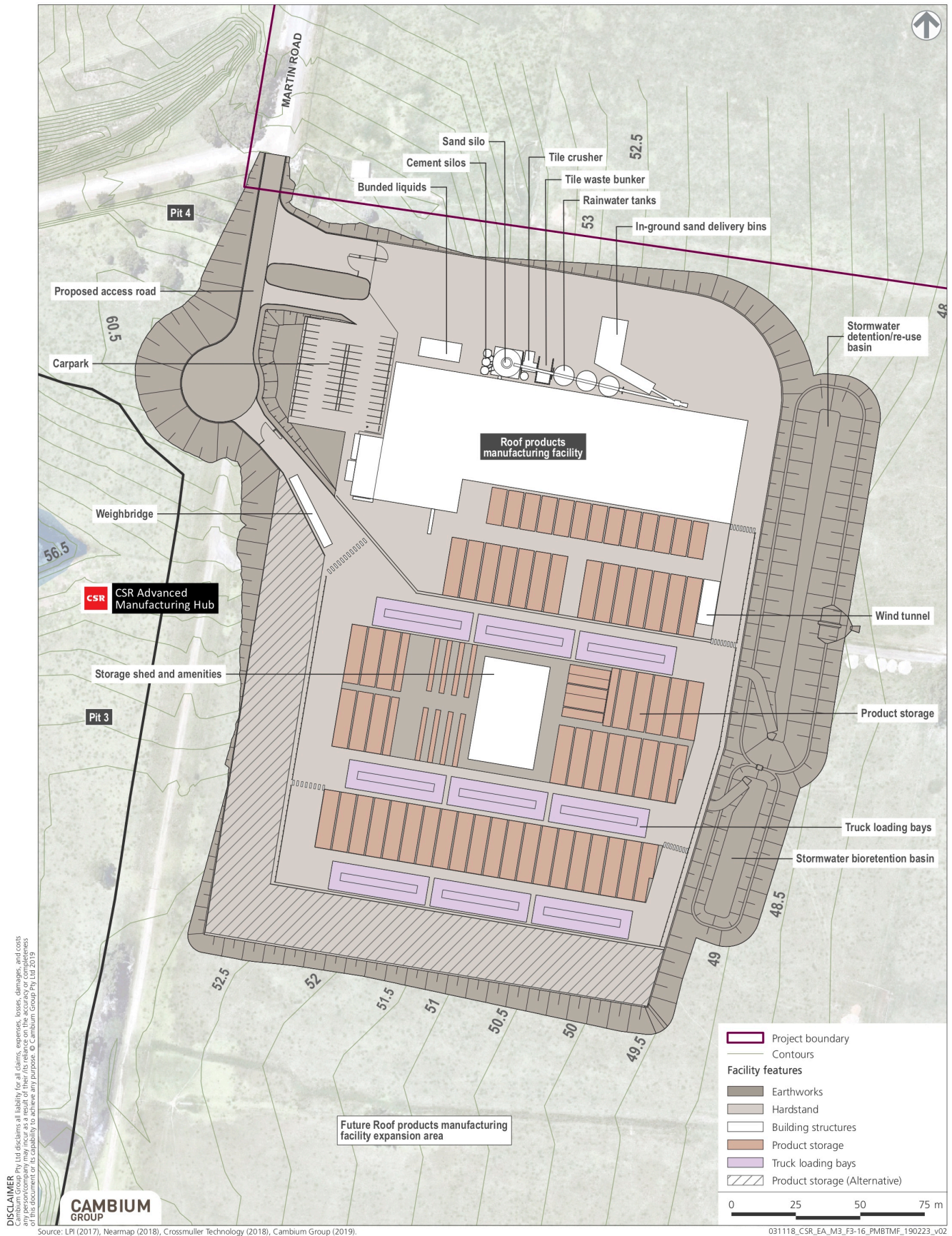


FIGURE 4.7: PROPOSED MONIER ROOF PRODUCTS PLANT SITE PLAN ³⁰

³⁰ Figure provided by Element Environment

- Constructing a new manufacturing plant and associated structures including silos (up to 27m high), wind tunnel, delivery bins, office and storage shed, with 24hrs/day operation
- Constructing a large hardstand storage yard including truck loading bays, and
- Constructing a new entry road to the Monier roof products manufacturing plant, including weighbridge and parking within the footprint.

The proposed works would require:

- demolition of the brick residence
- removal of existing vegetation within the footprint (garden plantings, several small native trees (approximately 4m high), several large exotic trees (approximately 7m high) and approximately 5-10 tall mature native trees (approximately 12m high), and
- levelling the site.

4.2.1 Monier roof products manufacturing plant

The new roof products manufacturing plant would be enclosed within a building approximately 10m high, 138m – 146m long and 41m to 54m wide (approximately 6,268m² in area). The building would have a pitched roof and be sheeted in steel. Process air vents and a gas burner exhaust would extend above the roofline.

The plant would incorporate three cement silos (approximately 18m high) and a large sand storage and mixing tower – the sand silo (27m high) - the tallest of the proposed new structures at the Monier roof products manufacturing plant. The sand silo would be fed by a conveyor (approximately 70m long) delivering material from storage bins below ground level, to the top of the mixing tower.

North and south elevations of the proposed Monier roof products manufacturing plant are shown at **Figure 4.8**. East and west elevations are shown at **Figure 4.9**. The elevations indicate the height and bulk of the proposed structures and their spatial relationship to the proposed Monier plant.

A proposed office and technical centre would be included in the Monier roof products manufacturing plant on its western side, close to the proposed carpark.

Several separate structures would be constructed across the Monier site in association with the manufacturing plant. To the north would be sand delivery bins (approximately 14m long x 5m wide), which would be open sided and roofed with a steel awning at approximately 14m high. Also to the north would be a bunded liquid materials storage area (approximately 16m x 7m) which would be covered by a steel awning and two 100,000 litre capacity rainwater tanks.

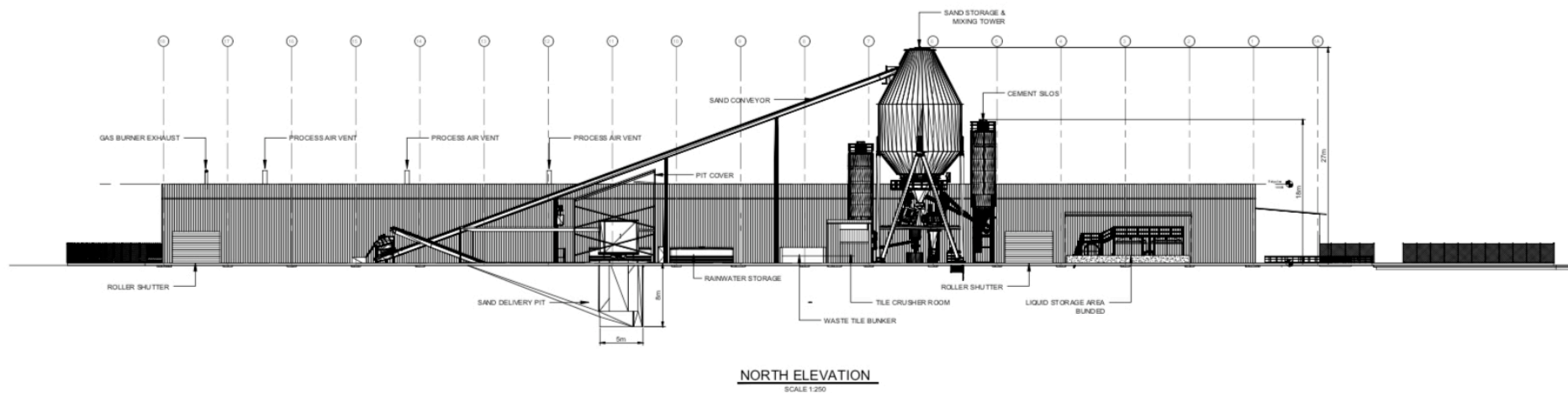
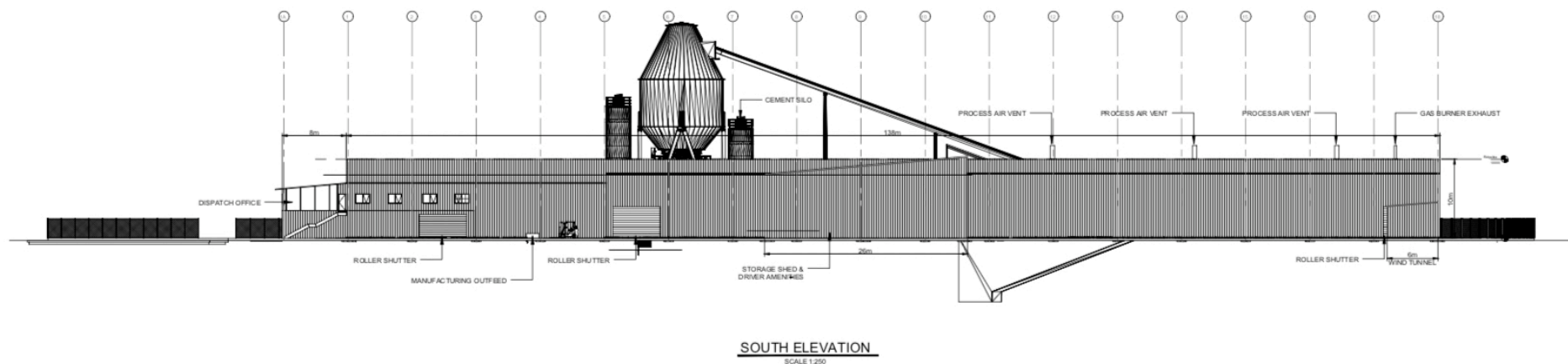


FIGURE 4.8: PROPOSED MONIER ROOF PRODUCTS PLANT, NORTH AND SOUTH ELEVATIONS ³¹

³¹ Crossmuller dwg no.6477L107, 9/11/2017, RevB

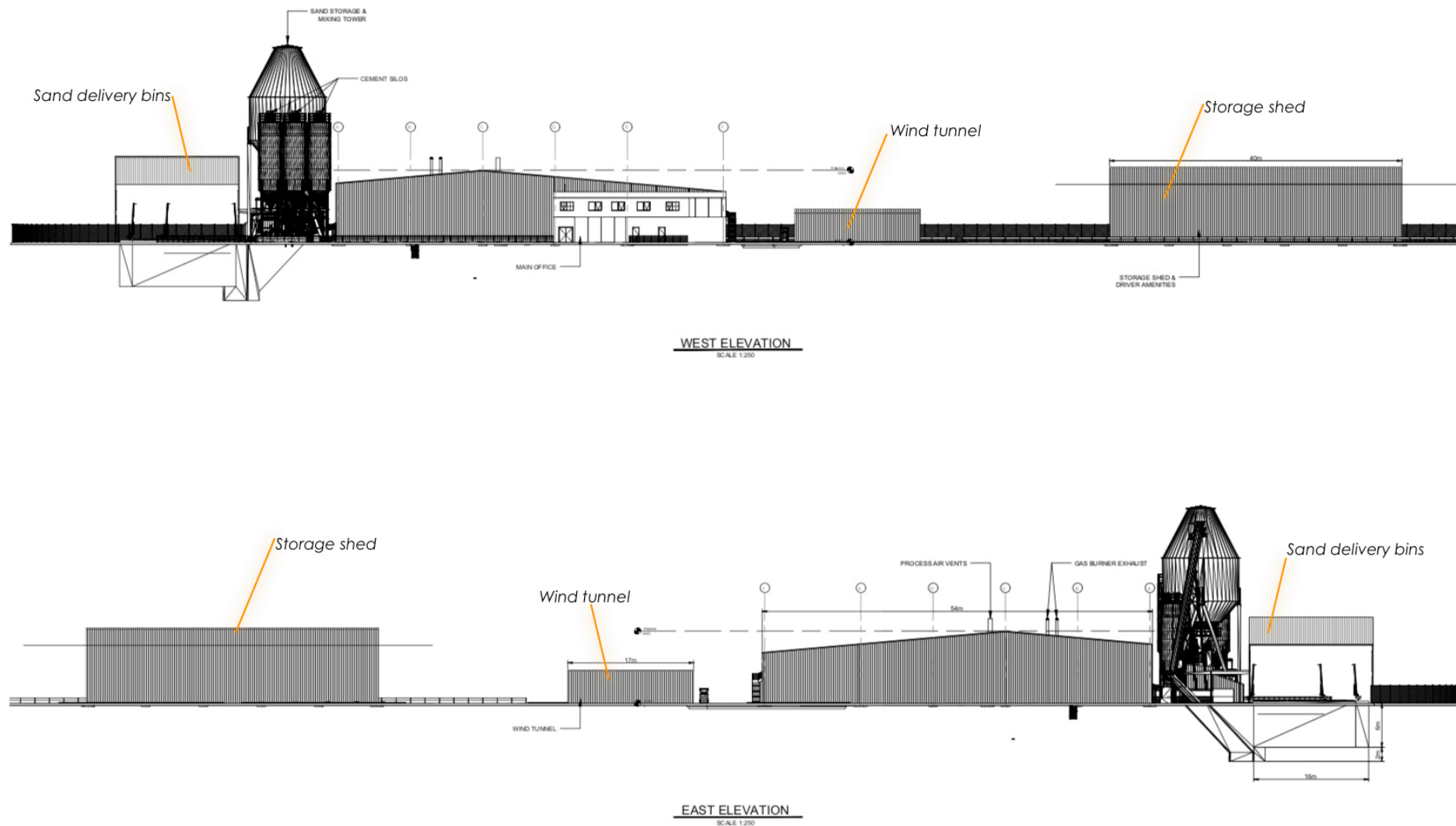


FIGURE 4.9: PROPOSED MONIER ROOF PRODUCTS PLANT, WEST AND EAST ELEVATIONS³²

³² Crossmuller dwg no.6477L108, 9/11/2017, RevB, notes in italics added by the author

South of the proposed Monier plant would be a wind tunnel (approximately 16m by 8m in area and 4.5m high). The wind tunnel would be fully enclosed and clad in metal sheeting. In the storage yard would be a large shed (1000m² or 40m x 25m) which would provide storage and driver amenities. The storage shed would be the same height as the proposed Monier plant (10m).

4.2.2 Lighting

24-hour operation would require night lighting of external spaces around the Monier roof products manufacturing plant. External lighting associated with the Project would comply with Australian Standard AS4282 (INT) 1995 - *Control of Obtrusive Effects of Outdoor Lighting*.

4.2.3 Storage yard

The plant would be located on a levelled hardstand approximately 42,890m². Construction of the hardstand would require substantial earthworks. The natural ground level would be reduced by up to 6m (approximately). Cut embankments would be formed in the north-west of the Monier site. Fill embankments (up to 4m above natural ground level) would be formed along the eastern and southern Monier site boundaries. Retaining walls are not proposed.

The boundary embankments would range in slope from 1-in-4 to 1-in-2. They would be stabilised (with grass or other stabilising material). The northern embankment and boundary would be landscaped as a visual screen.

Finished roof products would be stored in the open, hardstand storage yard, on the southern side of the Monier roof products manufacturing plant. Truck loading bays would be spaced between the storage areas.

4.2.4 Site access

A new access road would be constructed from the end of Martin Road to the hardstand with provision to turn around before entering the Monier site.

A car park for employees (approximately 49 car spaces proposed) would be located in the north-west of the Monier site, adjacent the office, and have direct access to the access road.

Trucks delivering raw materials to the Monier site would enter via a controlled access gate, travel along the northern boundary to unload, then turn and exit (all on the northern side). Trucks accessing the Monier Site to load manufactured roofing products would gain access in the same manner as raw material delivery trucks; but would continue east along the Monier site's northern boundary and would then travel south along the eastern boundary to reach the truck loading bays in the south of the Monier site. Prior to exiting, these trucks would pass over a weighbridge.

A security fence would surround the Monier site and maintain security.

4.3 General

Activities proposed to facilitate the Project include:

- Extending truck arrival and dispatch times
- Modifying the approved noise bunds
- Amending the extent of Pit 5 to include a 200m buffer zone to neighbouring residential properties required under the *Mining Act 1992*.

4.3.1 Truck movements

Truck movements to and from the site would extend by one hour in the morning to 5:00am Monday to Friday, and to 6:00am Saturday (approved hours are from 7:00am Monday to Saturday).

4.3.2 Noise bunds

A noise bund of up to 10m in height and over 1km long is approved along the northern boundary of the Site to mitigate noise impacts associated with Pit 5 quarrying activities for sensitive receivers in the north. Under the Project, the height of the bund is proposed to reduce to 8m, and the length of the bund is proposed to reduce by over a half (to approximately 435m)³³.

A noise bund 7m high and approximately 1km long is approved along the eastern side of Pits 3 and 4. This bund would not be constructed under the Project.

To mitigate noise impacts associated with the proposed Monier plant and quarrying activities in Pit 4 for sensitive receivers on Martin road, a barrier up to 6m high (approximately 100-150m long) is proposed to be located in the northeast corner of the Site, north of the Site entrance. To mitigate noise impacts associated with quarrying activities in Pit 4 for sensitive receivers at the end of Lawson Drive, the existing 4.5m bund on the northern side of the driveway would be raised in height by 2m for a distance of approximately 100-150m. The locations of the modified and proposed noise bunds are shown at **FIGURE 4.10**.

4.3.3 Pit 5

A 200m buffer zone is proposed around Pit 5 between the Pit and neighbouring residential properties to the north. The buffer zone would remain as grazing paddocks and continue to be leased for livestock grazing.

4.4 Construction

Subject to planning approval, construction is expected to commence in June 2020 and take around 18 months to complete. Standard construction hours would be adopted (Monday to Friday 7am – 6pm and 8am – 1pm Saturday).

At the PGH brick making facility, existing buildings (such as the gatehouse and administration building) would be used for the site office. Existing hardstand areas around the PGH brick making facility would be used for lay-down areas.

³³ Wilkinson Murray Noise Impact Assessment for the Proposal. Wilkinson Murray, CSR Advanced Manufacturing Hub, Noise Impact Assessment – MOD 3, January 2019



FIGURE 4.10: LOCATION OF MODIFICATION 3 PROPOSED NOISE ATTENUATION³⁴

³⁴ From Wilkinson Murray, CSR Advanced Manufacturing Hub, Noise Impact Assessment – MOD 3, January 2019. Figure 5-3

At the Monier roof products manufacturing plant, the existing house could temporarily be used for the site office. The site office would relocate during the construction period to a construction compound established either in the northern, or southern, side of the site. The construction compound would include a laydown area, as well as (eventually) a site office and amenities. A perimeter fence would be installed around the Monier site prior to the commencement of construction.

During construction at both the PGH brick making facility and the Monier roof products manufacturing plant, equipment such as cranes, scissor lifts, front-end loaders, excavators, dozers, compactors, agitators, trucks, jack hammers, steel/concrete saws and drills would be operating within the bounds of the construction footprint.

Earthworks would expose a large area of soil to create the level hardstand for the proposed Monier roof products manufacturing plant. Concrete trucks would deliver pre-mix concrete. Large transport (including B-doubles to rigid and semi-rigid heavy vehicles) would be required to deliver site materials.

4.5 Operation

Post-construction, the changes most likely to be noticed, and elements most likely to be visible are:

- PGH brick making facility:
 - The replacement of the existing 41m high kiln stack with two new kiln exhaust stacks approximately 41m high
 - The top of the extended CSR building, which would be the same height as the existing building, and
 - Site operating equipment such as drill rigs and excavators (primarily when they are operating at natural ground level in areas of the quarry pits closest to the site boundary).
- Monier roof products manufacturing plant:
 - The removal of the existing two-storey house and existing trees
 - The lowering of the ground level by up to 6m in the north west and raising the ground level by up to 4m along the eastern and southern Site boundaries.
 - The new 138m wide x 10m high steel clad Monier roof products manufacturing plant, featuring three 18m high cement silos and a 27m high sand silo,
 - Truck movement along the northern face of the Monier roof products manufacturing plant, and
 - Night lighting for 24hour use.

5 Assessment of landscape character changes

The landscape character in the vicinity of the Project has been described in **Section 3**. This section of the report assesses the likely impact of the Project on landscape character, based on the combination of two criteria: sensitivity and magnitude of change:

- Sensitivity refers to the nature of the receptor – the type and number of receptors, how sensitive the existing character of the setting is to the proposed change, and the value attached to the landscape.
- Magnitude refers to the nature of the effect – how much change is likely to occur, the size and scale of the change, 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.

5.1 Landscape character sensitivity

Sensitivity in this section refers to the sensitivity of the general landscape character of the area, not the sensitivity of private views from sensitive residential viewpoints. Residential viewpoints are considered separately at **Section 6**.

In terms of landscape character, the Site presently has a rural setting with open pastures, stands of native trees, and rural residential properties. The existing rural character provides a pleasant outlook and setting, however, the area also includes agricultural and extractive resource-based industries, and views of large sheds sited within open grassed properties.

Independently of the proposed Project, precinct-wide visual changes are anticipated to occur as the area has been identified by the NSW Government for significant investment and infrastructure growth related to the adjoining Western Sydney Airport development. Planned changes include road upgrades, increased housing and employment facilities (refer to **Section 3.4**).

Using the criteria listed in **TABLE 2-1**, landscape character is rated as having **low** sensitivity:

- The Site is not visually prominent to the public (being surrounded by vegetation or screened by landform), and is only seen from two local, no through roads (Lawson Drive and Martin Road)
- The landscape does not have particular landscape conservation value
- The landscape around the Site includes large sheds, security fencing, hard paved yards, and excavation activities, and
- The area has been identified for significant infrastructure and investment growth independently of the Project.

5.2 Landscape character - magnitude of change

Visual changes would occur in two key locations within the 200ha Site – the central area of the Site (associated with the PGH brick making facility), and the east of the Site (associated with the Monier roof products manufacturing plant).

These visual changes would occur in conjunction with works already permitted under the Project Approval: the continued operation of the brick making facility, quarrying, and other works.

The two areas of visual change are assessed separately for magnitude below.

5.2.1 Central area - PGH brick making facility

Construction

Using the criteria listed in **TABLE 2-2**, the magnitude of change to landscape character during construction is rated as **moderate**:

- Key construction activities are to:
 - extend the PGH brick making facility
 - construct the two/three storey innovation centre
 - construct the single storey NATA laboratory
 - refurbish and extend the administration building and
 - construct a new access road to the brick making facility
- Construction activities would be confined to the central area and occur over a relatively small proportion of the Site
- Construction would involve large, moving, tall equipment, such as cranes, scissor lifts, front-end loaders, excavators, and dozers
- Construction of the two new kiln stacks at 41m high and demolition of the existing 41m high stack may require extensive scaffolding and high lifting equipment
- Construction activities would be temporary and cease after an approximate 18-month construction period.

Operation

Using the criteria listed in **TABLE 2-2**, the magnitude of change to landscape character during operation is rated as **low**:

- The extension to the PGH brick making facility would be single storey and relatively low in height (the same height as, or lower than, the existing building)
- The extension to the brick making facility would be partially concealed by existing vegetation and landform
- The new NATA laboratory and innovation centre are likely to be completely concealed by existing vegetation and landform
- The two new kiln stacks at 41m high would be the same height as the existing stack and similar in appearance.

5.2.2 Eastern area - Monier roof products manufacturing plant

Construction

Using the criteria listed in **TABLE 2-2**, the magnitude of change to landscape character during construction is rated as **moderate**:

- The construction site would be within a pastoral section of the Site, not previously used for manufacturing activities
- Existing site features on the ridgetop (the two-storey residence and tall mature trees) would be demolished
- substantial earthworks would be required
- Construction activities would involve large, tall moving equipment (including transport deliveries, excavators and cranes)
- Construction activities would be temporary and cease after an approximate 18-month construction period.

Operation

Using the criteria listed in **TABLE 2-2**, the magnitude of change to landscape character during operation is rated as **moderate**:

- The new Monier roof products manufacturing plant would introduce a visible and recognisable new element within the overall scene
- The Monier roof products manufacturing plant would be a large building, 138-146m long, with a significant footprint (over 6,000m²), however, would be relatively low in height (at 10m high)
- The Monier roof products manufacturing plant would include several bulky elements, the largest of which is a sand silo (at 27m high)
- The northern embankment and boundary would be landscaped as a visual screen
- The Monier roof products manufacturing plant would initially be the dominant feature in the scene, (although the area has been identified for significant infrastructure and investment growth independently of the Project). Within 3-5 years, however, the visual screen proposed along the northern boundary would reduce the visual impact of the facility.

5.3 Level of Impact to landscape character

5.3.1 Central area - PGH brick making facility

Construction

The low sensitivity ranking, combined with the moderate magnitude of change during construction, leads to an overall low-moderate level of impact.

Operation

The low sensitivity ranking, combined with the low magnitude of change post-construction, leads to an overall low level of impact.

5.3.2 Eastern area - Monier roof products manufacturing plant

Construction

The low sensitivity ranking, combined with the moderate magnitude of change during construction, leads to an overall low-moderate level of impact.

Operation

The low sensitivity ranking, combined with the moderate magnitude of change post-construction, leads to an overall low-moderate level of impact.

6 Assessment of changes to viewpoints

This section identifies the key viewpoints in the area from which people would be likely to see the Project. It describes existing views and assesses the likely impact of the Project on each view.

The same methodology combining the two criteria - sensitivity and magnitude of change – is used to determine level of impact.

6.1 General visibility

Direct views into the Site are limited due to the undulating terrain, existing vegetation along roads and creeklines, limited public access, and lack of high vantage points in the vicinity.

Future changes to visibility and local character were taken into account during the assessment, in particular, the anticipated NSW Government precinct-wide changes associated with the adjoining Western Sydney Aerotropolis (refer to **Section 3.4**). These changes were taken into account during the assessment.

During the site inspection, potential sensitive viewing locations such as residences, and publicly accessible areas such as local roads were identified. The closest residential areas within the vicinity of the Project were inspected. Access to private properties was not possible, therefore, visibility was assessed from the closest public access to each viewpoint. In general, the publicly-accessible areas (public road reserves) provided adequate information for the assessment.

Five receptor (R) locations were identified in the original EA Visual Assessment³⁵. The same R locations have been used for consistency in this visual assessment, however, have been renamed as viewpoint (VP) locations. The original R locations and their corresponding VP numbers are shown in **Table 6-1**.

TABLE 6-1: VIEWPOINT LOCATIONS

Location	Receptor (R) number used in original EA visual assessment	Viewpoint (VP) number used in this report
Dairy farmer's residence	R1	VP1
Martin Road	R2	VP2
Lawson Road	R3	VP3
Victor Avenue	R4	VP4
Longleys Road	R5	VP5

The assessed viewpoint locations are identified on **FIGURE 6.1**.

³⁵ Environmental Assessment, Continued Operation of Quarry and Brick Making Facility Boral, Badgerys Creek, AECOM, 2010.



FIGURE 6.1: ASSESSED VIEWPOINTS³⁶

³⁶ Base figure provided by Element Environment. Viewpoint positions provided by Envisage Consulting.

The viewpoint locations are from private residences and from public roads. Viewpoints from businesses and agricultural/industrial enterprises in the vicinity were not assessed in the original EA as these are not considered as sensitive receptors and only occupied transiently.

There could also be views of the Project from aircraft arriving and departing from the proposed Western Sydney Airport, situated to the west of the Site. The Airport is planned to be developed as a large-scale commercial flight airport and would service both domestic and international travellers.

Each viewpoint is described and assessed below.

6.2 VP1: Dairy farmer's residence

Although identified in the original EA, VP1 is within the Project footprint. It is the existing brick residence proposed to be demolished at the location of the proposed Monier facility.

The residence is temporarily leased from CSR. The lease would be expected to end prior to the commencement of construction and hence VP1 is not considered further within this report.

6.3 VP2: Rural residential properties - Martin Road

VP2 is within the NSW Government's proposed Badgerys Creek precinct. The precinct is planned to support airport operations and the new urban centre, and would be developed for a range of employment generating uses. Residential development is not considered appropriate in the future development of the precinct.

Currently, VP2 is a cluster of three private properties located at the southern end of Martin Road near the Site entrance. The properties all lie on the elevated western side of Martin Road, between Australian Native Landscapes and the Site. VP2 also includes the views of travellers using Martin Road.

Visibility has been assessed from the closest public viewpoint to the residences which was Martin Road. Two residences are set back approximately 70m from Martin Road, and the third residence (opposite Australian Native Landscapes) is set back approximately 45m from the road. The closest residence to the Site is approximately 14m north of the boundary.

6.3.1 Existing view

VP2 residents are likely to have a pleasant, pastoral outlook. Tall native trees line Martin Road and the Site boundary east of Martin Road, filtering views into the Site.

From VP2, the two Project areas of the Site – the eastern portion where the Monier roof products plant is proposed; and the central area where the existing PGH brick making facility is located - can be seen when viewing different directions.

View southeast – Monier roof products plant

Views south and southeast toward the Site are partially screened and framed by existing trees within the road reserve and along the Site boundary.

When looking southeast from the residential properties, and for travellers heading south along Martin Road, the elevated ridge in the eastern portion of the Site is visible. The existing brick residence on the ridge and the existing trees surrounding the residence are in view.

An existing view from Martin Road looking southeast is shown at **Figure 6.2**. An existing view from Martin Road looking toward the northeastern Site boundary is shown at **Figure 6.3**.

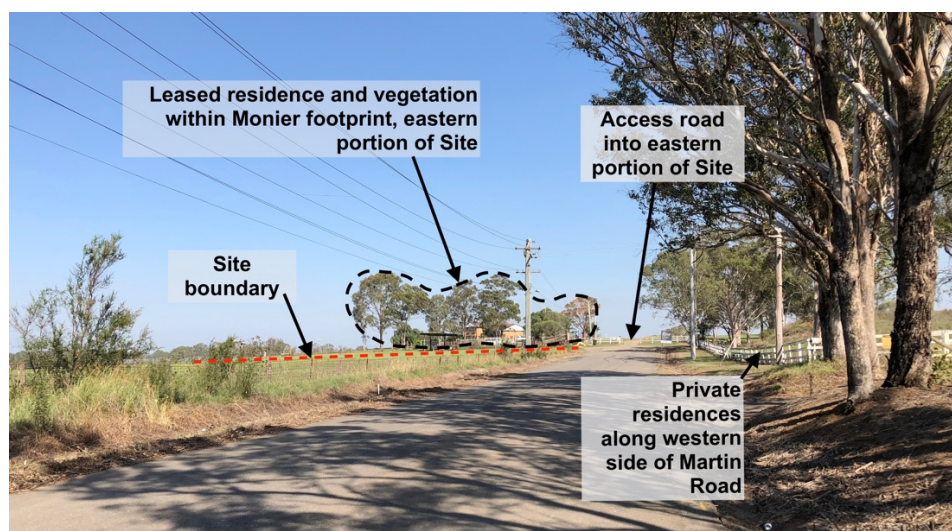


FIGURE 6.2: VP2 – VIEW TOWARD PROPOSED MONIER FACILITY³⁷



FIGURE 6.3: VP2 - VIEW TOWARD NORTHEAST CORNER OF SITE³⁸

³⁷ Photograph taken by the author, 10 April 2018, from Martin Road, approximately 140m north of site entry, looking south

³⁸ Photograph taken by the author, 10 April 2018, from Martin Road, approximately 10m north of northeastern boundary corner

View southwest – PGH brick making facility

When looking southwest from Martin Road, the existing 41m high stack of the PGH brick making facility is visible. Vegetation and landform limit views into the Site, so the plant and other Site infrastructure cannot be seen.

From within the Martin Road residential properties, although over 650m away from the closest residence, it is likely that limited views of the PGH brick making facility are possible, and certainly the top of the existing 41m tall kiln stack. It was reported in the original EA (AECOM 2010) that the area of Pit 5 could also be seen from VP2.

An existing view from Martin Road looking southwest toward the PGH brick making facility is shown at **Figure 6.4**.

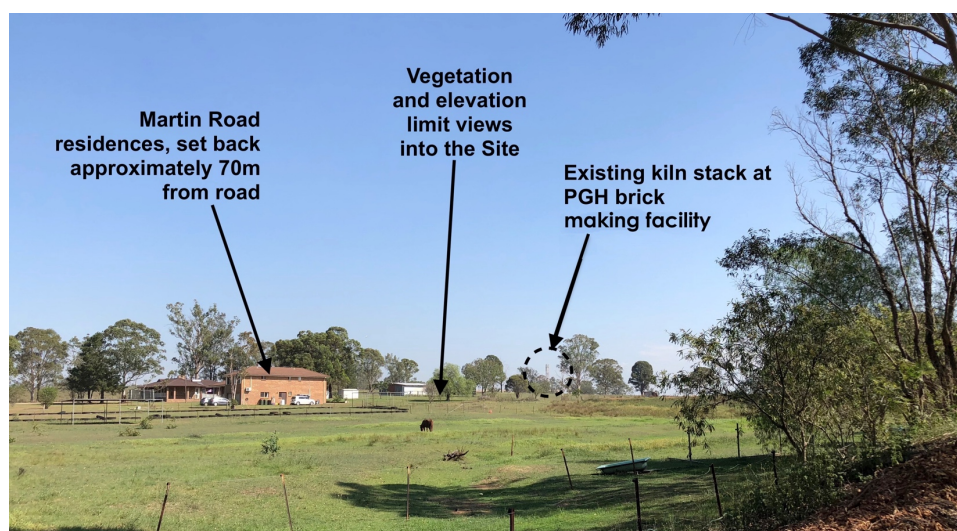


FIGURE 6.4: VP2 – VIEW SOUTHWEST TOWARD PGH BRICK MAKING FACILITY³⁹

6.3.2 Sensitivity

Using the criteria listed in **TABLE 2-1**, the sensitivity of the viewpoint is rated as **moderate**. This viewpoint:

- Provides views for three private residences and public views for a small number of users (Martin Road is a no-through road)
- The existing view is a pleasant, pastoral scene
- Residents are in close proximity to the Site. The closest residence is approximately 160m from the proposed Monier roof products manufacturing plant footprint, approximately 650m from the PGH brick making facility and approximately 14m north of the northern Site boundary
- From Martin Road, the eastern portion of the Site is visually prominent (being on a ridge directly in the line of view while travelling south)
- Existing industrial/agricultural uses are nearby, and major development changes are planned in the area in connection with the Western Sydney Aerotropolis.

³⁹ Photograph taken by the author, 10 April 2018, from Martin Road, approximately 225m north of site entry, looking south-west

6.3.3 Magnitude of change

PGH brick making facility

Construction

From the three Martin Road residential properties and from Martin Road, demolition of the existing kiln stack and construction of the two new 41m high kiln stacks would be visible. Scaffolding and lifting equipment would be seen.

From the two closest residences to the Site, it is probable that construction activities associated with the extension to the PGH brick making facility are likely to be seen.

Construction associated with the lower 8m high noise bund north of Pit 5 would be of a shorter duration and impact a smaller area than construction activities already approved for the 10m high bund (which would have run along the length of the northern Site boundary). The reduced area of construction impact also results in less impact to existing trees.

Using the criteria listed in **TABLE 2-2**, the magnitude of change to the view during construction is rated as **low**. From this viewpoint:

- Demolition of the existing kiln stack and construction of the two new kiln stacks are likely to be visible
- Construction activities of the plant extension would be limited due to existing landform and vegetation
- Construction would be temporary (18 months).

Operation

Post construction, two 41m high kiln stacks would be seen, as would parts of the extended brick making facility.

Using the criteria listed in **TABLE 2-2**, the magnitude of change to the view during operation is rated as **low**:

- There would be two kiln stacks in view, instead of one, however, a tall kiln stack has been at this location for many years, so it is a familiar element. The two new kiln stacks would be the same height as the existing stack they are replacing. The stacks are over 650m to the nearest residence.
- The extension would be at the same height as, or lower than, the existing plant. Although almost doubling in size, the extension would be single storey and relatively low in height. It is possible that residents could view the part of the extension, however, views would be limited due to existing landform and vegetation.
- The noise bund is lower (at 8m high) than the approved noise bund (at up to 10m high), is significantly shorter in length, and would occupy significantly less ground area. The barrier would thereby have less impact on existing vegetation and would be stabilised with pasture grasses.

Monier roof products plant

Construction

Demolition and earthmoving would occur in close proximity to residents, and directly in view of travellers heading south along Martin Road. Viewers would see the removal of the tall trees within the Monier footprint, excavating equipment scraping and levelling the earth, roadworks to improve the Site entrance, delivery and concrete trucks bringing materials, and construction of the new Monier building.

The construction compound may be located on the northern boundary, or alternatively, located south of the proposed Monier footprint. If located near the northern boundary, the compound would be visible from Martin Road.

At the northeastern corner of the Monier footprint (north of the Site entrance), construction associated with the noise barrier would be close to existing residents. The nearest residence could be around 30m from the construction site. However, construction activities associated with the barrier would be of a shorter duration and impact a smaller area than construction activities already approved for the 10m high bund (no longer proposed). It is unlikely that trees would be removed to construct the barrier, although tree removal is already approved under the current Project Approval.

Using the criteria listed in **TABLE 2-2**, the magnitude of change to the view during construction is rated as **moderate**. From this viewpoint, the construction would be:

- Moderate in size and extent of area affected
- Involve loss of existing trees on the ridge, reducing the quality of the scene
- Temporary (18 Months).

Operation

Post-construction, residents and visitors travelling along Martin Road would see the proposed Monier roof products manufacturing plant on the ridge at the end of Martin Road. Although only 10m high, the northern face of the facility would be 138m long, and at 27m high (approximately equivalent to a seven-storey building), the sand silo would be a significant tall, bulky feature of the facility.

The northern embankment and the northern boundary of the Site would be landscaped to provide visual screening.

There would be a noticeable increase in trucks travelling along Martin Road. As the facility would be 24hours, lights would be seen at the Site, however, external lights would be directed into the Site and would comply with *Australian Standard AS4282 (INT) 1995 - Control of Obtrusive Effects of Outdoor Lighting*".

The noise barrier (up to 6m high and up to 150m long) would be seen from Martin Road and from residences. The barrier would be almost half the height of the approved noise bund and would occupy significantly less ground area. The barrier would thereby have less impact on existing vegetation (no trees would be removed) and could be painted a dark colour (similar to the surrounding tree foliage) to reduce its visibility.

Using the criteria listed in **TABLE 2-2**, the magnitude of change to the view during operation is rated as **moderate**:

- The introduction of the large, 138m long, Monier roof products manufacturing plant and, in particular, the 27m tall sand silo, would be a noticeable change
- The new facility would be prominent in the view of Martin Road users (although few in number) and a recognisable new element within the overall scene
- From residential properties, views would be filtered (or possibly screened) by existing trees within the road reserve, trees within their properties, and trees along the northern boundary of the Site
- Within 3-5 years, the visual screen proposed along the northern boundary would reduce the visual impact of the facility.

6.3.4 Level of Impact

PGH brick making facility

Construction

The moderate sensitivity ranking, combined with the low magnitude of change during construction, leads to an overall low-moderate level of impact.

Operation

The moderate sensitivity ranking, combined with the low magnitude of change post construction, leads to an overall low-moderate level of impact.

Monier roof products manufacturing plant

Construction

The moderate sensitivity ranking, combined with the moderate magnitude of change during construction, leads to an overall moderate level of impact.

Operation

The moderate sensitivity ranking, combined with the moderate magnitude of change post construction, leads to an overall moderate level of impact.

6.4 VP3: Lawson Road

VP3 is also within the NSW Government's proposed Badgerys Creek precinct. Currently, VP3 is a cluster of private properties located at the southern end of Lawson Road, along the northern Site boundary. The properties are on an elevated ridge. VP3 also includes the views of travellers using Lawson Road (a no through road).

Visibility has been assessed from the closest public access which was within the road reserve of Lawson Road. The closest resident is approximately 45m from the Site boundary, and approximately 430m from the existing kiln stack of the PGH brick making facility. Within Lawson Road are intensive agricultural uses including (it has been assumed) poultry farming.

6.4.1 Existing view

From VP3, views to the Monier facility footprint to the southeast are prevented by elevation and vegetation. However, there are views of the PGH brick making facility directly south.

Due to the elevation of Lawson Road and its adjoining properties, the bulk of the brick making facility is visible, including the existing 41m high kiln stack. The ground level of the existing building is screened by the existing noise bund. The administration area and gatehouse cannot be seen as they are screened by existing vegetation and elevation. The original EA (AECOM 2010) reports that VP3 also has unobstructed views to the Pit 5.

A typical existing view from Lawson Road residential area toward the PGH brick making facility is shown at **Figure 6.5**.

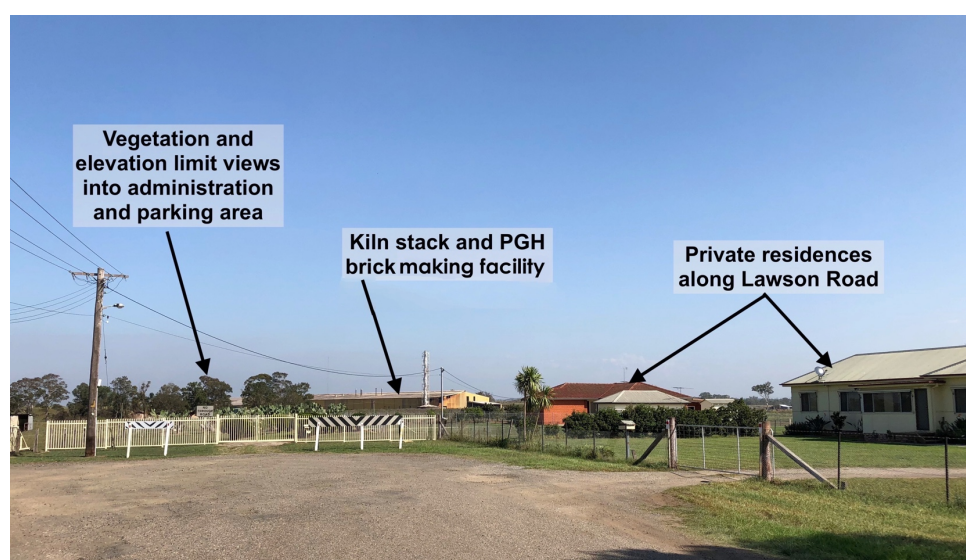


FIGURE 6.5: VP3 – VIEW TOWARD CSR FACILITY⁴⁰

6.4.2 Sensitivity

Using the criteria listed in **TABLE 2-1**, the sensitivity of the viewpoint is rated as **low**. This viewpoint:

- Provides views for several private residences and public views for a small number of users (Lawson Road is a no-through road)
- The existing view features the PGH brick making facility
- Residents are in close proximity to the Site, with the closest residence approximately 430m from the PGH facility

⁴⁰ Photograph taken by the author, 10 April 2018, 50m north of Lawson Road end, looking south

- From Lawson Road, the PGH facility is visually prominent (being directly in the line of view while travelling south)
- From the residences, homes generally face east or west rather than south, therefore, they do not look directly upon the PGH brick making facility from within the home
- Existing industrial/agricultural uses are nearby, and major development changes are planned in the area in connection with the Western Sydney Aerotropolis.

6.4.3 Magnitude of change

Construction

Construction of the proposed extension to the PGH brick making facility would be visible from VP3. Demolition of the existing kiln stack and construction of the two new 41m high kiln stacks may involve installation of tall scaffolding and use of cranes and lifting equipment.

The closest construction activities would be associated with the lower 8m high noise bund north of Pit 5. However, construction of the modified bund would be of a shorter duration and impact a smaller area than construction activities already approved for the 10m high bund.

Using the criteria listed in **TABLE 2-2**, the magnitude of change to the view during construction is rated as **moderate**. From this viewpoint:

- Construction would involve large, moving, tall equipment, such as cranes, scissor lifts, front-end loaders, excavators, and dozers
- Construction of the two new kiln stacks at 41m high and demolition of the existing 41m high stack may require extensive scaffolding and high lifting equipment
- Construction activities are temporary (18 months).

Operation

Post-construction, the extension would be seen from the elevated Lawson Road residential properties and from Lawson Road.

The additional buildings proposed (NATA laboratory, innovation centre, and extension to the administration building etc) would not be seen from VP3.

The modified noise bund along the northern boundary would be lower in height (at 8m) than the approved noise bund (10m), however, it is still likely to provide an effective screen to Pit 5 and may also reduce the extent of the brick making facility seen. Given its close proximity to residences (approximately 50m from the closest residence to the toe of the bund) the reduced height and bulk of the bund may be less visually intrusive. The bund would be stabilised with pasture grasses.

Using the criteria listed in **TABLE 2-2**, the magnitude of change to the view during operation is rated as **low**:

- There would be two kiln stacks in view, instead of one, however, a tall kiln stack has been at this location for many years, so it is a familiar element. The two new kiln stacks would be the same height as the existing stack they are replacing. They are over 430m from the nearest residence,
- The extension would be at the same height as, or lower than, the existing plant.
- The lower 8m high noise bund along the northern boundary would be likely to prevent views of Pit 5 and reduce the extent of views at the extension to the CSR facility.

6.4.4 Level of Impact

Construction

The low sensitivity ranking, combined with the moderate magnitude of change during construction, leads to an overall low-moderate level of impact.

Operation

The low sensitivity ranking, combined with the low magnitude of change post construction, leads to an overall low level of impact.

6.5 VP4: Victor Avenue

VP4 is on the eastern edge of the NSW Government proposed South Creek precinct. The precinct has been identified as a green corridor for the future living and working communities of the Aerotropolis.

Currently, VP4 is a cluster of residences east of South Creek on Victor Avenue. These residences are lower in elevation compared to the Site and are largely concealed due to the dense vegetation along South Creek. VP4 also includes the views of travellers using Victor Avenue.

Visibility has been assessed from the closest public access which was the road reserve of Victor Avenue. The closest resident is approximately 155m from the Site boundary, and approximately 755m from the proposed Monier footprint.

6.5.1 Existing view

From VP4, views of the PGH brick making facility are prevented by elevation and vegetation. Views to the Monier facility footprint are likely to be possible from a business (50 Victor Avenue) sited along Victor Avenue, and from the rear boundary of residential properties. Such views would be partially screened by and framed by existing trees. Public views from Victor Avenue to the Monier facility footprint are not possible.

From Victor Avenue residences, it is unlikely that views to the Monier facility footprint are possible due to the siting of the dwellings and density of existing vegetation. These properties are generally over 180m long (from their Victor Avenue frontage) and the residences are generally sited closer to (within 50m of) Victor Avenue. Dense existing vegetation growing within the large properties and along South Creek, prevent through views of the Site.

A typical view from Victor Avenue toward the Site is shown at **Figure 6.6**. A view from the Monier footprint toward Victor Avenue (**Figure 6.7**) shows the business with views of the Site.

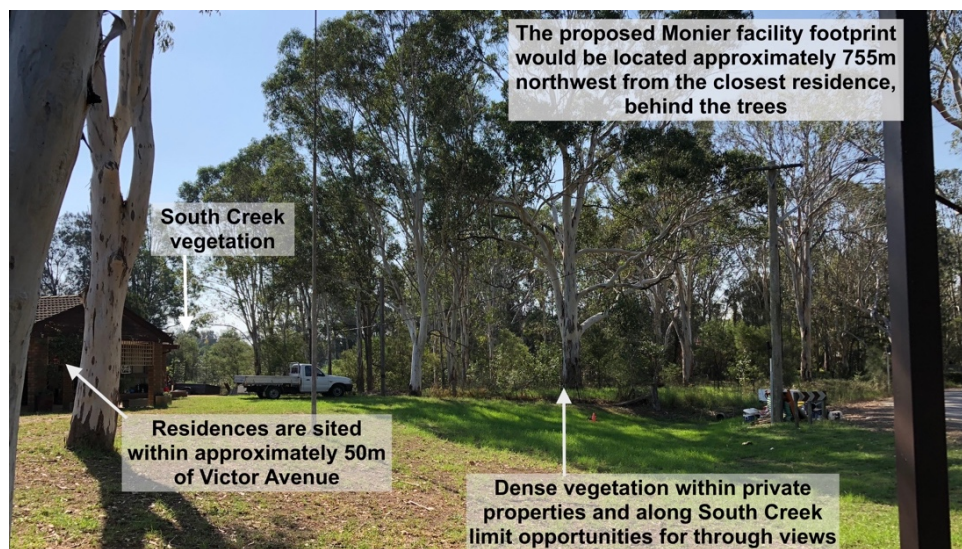


FIGURE 6.6: VP4 – VIEW TOWARD PROPOSED MONIER FACILITY⁴¹

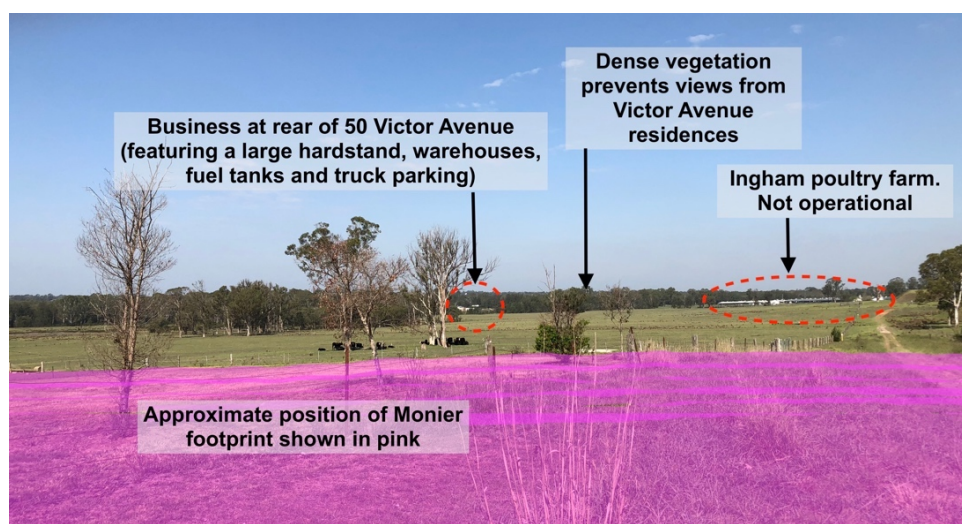


FIGURE 6.7: VIEW FROM PROPOSED MONIER FACILITY FOOTPRINT TOWARD VP4⁴²

6.5.2 Sensitivity

Using the criteria listed in **TABLE 2-1**, the sensitivity of the viewpoint is rated as **low**. This viewpoint:

- May provide views from the rear yard of several private residences, however, these views would be partially screened by dense vegetation
- Provides views from one business premises
- Does not provide public views

⁴¹ Photograph taken by the author, 10 April 2018, from road reserve at 50 Victor Avenue, looking north-west

⁴² Base photograph taken by the author, 10 April 2018, approximately 90m south of Martin Road site entry, looking south-west

- Is unlikely to provide views from within the homes of private residential property.

6.5.3 Magnitude

Construction

Using the criteria listed in **TABLE 2-2**, the magnitude of change to the view during construction is rated as **low**. From this viewpoint, the construction activities that would occur at the Monier footprint would be:

- Unlikely to be seen (with the exception of the rear boundary of limited Victor Avenue properties)
- Is not in close proximity of residents (755m to the closest residence)
- Temporary (18 months).

Operation

Post-construction, it is possible the proposed Monier facility would be seen from the rear boundary of several Victor Avenue properties, however, the Monier facility would be unlikely to be seen from Victor Avenue or residences.

Using the criteria listed in **TABLE 2-2**, the magnitude of change to the view during operation is rated as **low**:

- The Monier facility may be visible, although only from the rear boundary of residential property
- The vegetative buffer along South Creek would be maintained, thereby, views would continue to be screened
- The scale of the proposed Monier facility (at 27m high for the sand silo) would not be tall enough, and is not close enough, to be seen above the height of existing trees.

6.5.4 Level of Impact

Construction

The low sensitivity ranking, combined with the low magnitude of change during construction, leads to an overall low level of impact.

Operation

The low sensitivity ranking, combined with the low magnitude of change post construction, leads to an overall low level of impact.

6.6 VP5: Longleys Road

In the original EA (AECOM 2010), VP5 was a cluster of residences west of Badgerys Creek on Longleys Road. Those residences have since been demolished. VP5 is within the Western Sydney Airport Site and hence is not considered further within this report.

6.7 Aerial viewpoint

A likely view from aircraft entering and departing the Western Sydney Airport air space is surmised from aerial mapping for this assessment.

Earthworks are now underway for the Western Sydney Airport. Once completed, the Airport may have two runways and eventually cater to 82 million annual passengers⁴³. The large number of passengers would likely view the immediate airport tarmac and terminal, the neighbouring industrial/business land uses, the expanse of residential suburbs of Sydney, and the natural landscape of the Sydney region.

The aerial viewpoint associated with aircraft at high altitude approaching or departing the airport, would be wide and include many industrial sites, existing and proposed. When the Site comes into view at a distance, the proposed Project activities are unlikely to be distinct in the landscape. When closer to the runway, passengers may be able to view the proposed activities, however, they would be similar to already approved quarrying activities, and future surrounding industrial activity.

Visual impact from the air, both during construction and operation, has been assessed as **low**.

6.8 Summary of Visual Impact to Key Viewpoints

The assessment results of impact to key viewpoints are summarised in the tables below.

Table 6-2: Summary of Visual Impact to viewpoints- Construction

Viewpoint locations		Sensitivity	Magnitude of change	Impact level
VP1 – Dairy farmer's residence		N/A	N/A	N/A
VP2 - Martin Road	Views to Monier facility	Moderate	Moderate	Moderate
	Views to CSR facility	Moderate	Low	Low-moderate
VP3 - Lawson Road		Low	Moderate	Low-moderate
VP4 – Victor Avenue		Low	Low	Low
VP5 – Longleys Road		N/A	N/A	N/A
Aerial viewpoint		Low		

Table 6-3: Summary of Visual Impact to viewpoints – Operation

Viewpoint locations		Sensitivity	Magnitude of change	Impact level
VP1 – Dairy farmer's residence		N/A	N/A	N/A
	Views to Monier facility	Moderate	Moderate	Moderate

⁴³ Western Sydney Airport website <https://www.wsaco.com.au/#full-service>. Accessed 31 October 2018.

Viewpoint locations		Sensitivity	Magnitude of change	Impact level
VP2 – Martin Road	Views to CSR facility	Moderate	Low	Low-moderate
VP3 – Lawson Road		Low	Low	Low
VP4 – Victor Avenue		Low	Low	Low
VP5 – Longleys Road		N/A	N/A	N/A
Aerial viewpoint		Low		

7 Mitigation

This section of the report describes measures that have been, and are recommended to be, incorporated into the Project, to improve the visual outcome.

7.1 Positive visual attributes of the Project

The Project already incorporates a number of positive features and design measures which mitigate potential landscape character and visual impacts:

- It is located within an area identified by the NSW Government to undergo major changes associated with the future airport. Changes planned for the Western Sydney Aerotropolis include road improvement works, passenger and freight rail, and “unprecedented economic and housing growth”⁴⁴.
- There are very few private residences with views of the Site
- The nearest public roads are no-through roads so opportunity for public views of the Site are limited
- Elevation and existing vegetation within, and around the Site screen and limit views
- There are existing industrial/agricultural uses in the vicinity
- The Project is similar in character to already approved industrial uses at the Site
- Wide riparian corridors would maintain screening of the Site
- Off-site lighting impacts would be limited under the Project Approval and external lighting associated with the Project would comply with Australian Standard AS4282 (INT) 1995 - *Control of Obtrusive Effects of Outdoor Lighting*.

7.2 Additional mitigation measures

Together, with the existing positive design measures, the following additional measures are recommended for the Monier plant:

- External walls and roofing materials to be of a non-reflective material
- The colour of the Monier plant to be neutral or recessive (i.e. colours that blend into the background and do not have a high contrast), to reduce its visual dominance
- The colour of the noise barrier in the northeastern Site boundary (north of the Site entrance) to be recessive (ie. painted a dark colour similar to the existing tree foliage in the vicinity)

⁴⁴ <https://www.transport.nsw.gov.au/corridors> (accessed 16 April 2018)

- Plant a variety of tall and medium shrubs (1-4m eventual height) over the embankment on the northern side of the Monier plant to cover and stabilise the embankment
- Plant quick growing, tall native trees (15m+ eventual height) at the base of the northern embankment and along the northern boundary to eventually partially screen and reduce the visual bulk of the Monier facility
- Undertake measures to create an attractive street entrance to the Project including:
 - Use attractive fencing (such as black mesh fencing or black palisade fencing - black blends into surroundings) as security fencing in visually prominent areas such as along the northern boundary near Martin Road
 - Limit entrance signage in terms of size and rationalise to minimise number of signs
 - Plant trees along/near the entrance road.
- Prepare a landscape plan for the Monier facility which incorporates planting on the northern embankment, northern Site boundary and Site entrance. Nominate height of trees at time of planting (preferably 1.5m)
- Actively remove weeds during operations and maintain landscaping and grounds within the Site to a high standard
- Prior to construction, protect existing trees within or near the construction area that are able to be retained in accordance with Australian Standard *Protection of trees on development sites* AS4970-2009
- Reduce potential dust impacts through appropriate environmental controls.

8 Conclusion

The key visual features of the Project are:

- An extension to the PGH brick making facility, which includes demolition of an existing 41m high kiln stack, and construction of two new 41m high stacks
- Construction of a new Monier roof products manufacturing plant, which includes removal of a two-storey residence and tall, native trees, substantial earthworks, construction of a manufacturing plant (138m long and 10m high) and a 27m high sand silo.

Views of the Project are limited by elevation, vegetation and accessibility. Only two viewpoints would view the Project: VP2 (Martin Road and residences on Martin Road) and VP3 (Lawson Road and residences on Lawson Road).

From VP2, the new Monier roof products manufacturing plant; the proposed lower 6m high noise barrier (reduced from a 10m high earth bund) at the northeastern corner; and the two proposed kiln stacks at the CSR plant would be seen. From VP3, the extension to the PGH brick making facility as well as the two proposed kiln stacks would be seen. Additional Project activities (such as the NATA laboratory, extension to the administration building, and innovation centre etc) would not be seen from identified viewpoints.

The extension to the PGH brick making facility would be the same height as, or lower than, the existing brick making plant. The extension would be unlikely to increase visually prominence of the building, particularly given the proposed dark, muted colours of the cladding, and the limitations to visibility due to landform and existing trees. The two new stacks would be tall; however, they are the same height as the existing stack, and over 430m from the nearest residence.

The proposed Monier facility would present the most change, being located on a ridge, and directly in view of Martin Road users. It would be prominent and recognisable from the road, however, from residential properties, views would be filtered (or possibly screened) by existing trees within the road reserve, trees within their properties, and trees along the northeastern boundary of the Site.

The proposed (up to 6m high) noise barrier in the northeastern corner and the modified (8m high) noise bund along the northern boundary both have less impact than the approved 10m high noise bunds. They are lower in height, shorter in length and occupy less ground area.

Positive design measures have been incorporated to mitigate potential landscape character and visual impacts of the Project. Further mitigation measures have been recommended, (including planting along the northern boundary of and northern embankment of the Monier Site), to improve visual outcome. Within 3-5 years, the visual screen proposed would reduce the visual impact of the facility.

Importantly, the Project location is within an area identified by the NSW Government for planned development in association with the Western Sydney Airport. The Project is consistent with the existing use and character of the area, and with the planned growth of the precinct.

Overall, the Project would represent a low to low-moderate and acceptable level of change to the landscape character of the Site and its surrounds, and a low-moderate to moderate and acceptable impact to private and public viewpoints.

References

Landscape Institute and Institute of Environmental Management and Assessment, 2013 (3RD edition). *Guidelines for Landscape and Visual Impact Assessment*. Spoon press, United Kingdom.

New South Wales Roads and Traffic Authority, 2013. *Environmental Impact Assessment Guidance Note – Guidelines for Landscape Character and Visual Impact Assessment*.

Western Australian Planning Commission's *Visual Landscape Planning in Western Australia* (2007).

Appendix A: Initial Precincts

