NORTHROP

SSDA ESD REPORT

Charter Hall Holdings Pty Ltd

Huntingwood Processing Expansion

PREPARED FOR
FDC Construction and Fitout
22-24 Junction Street
Forest Lodge NSW

Tel: 02 8117 5000

Ref: SY210341
Rev: 5
Date: 02.08.2021

SSDA ESD Report

Revision Schedule

Date	Revision	Issue	Prepared By	Approved By
09.02.2021	1	Draft Issue	R. McShane	I. Van Eerden
21.05.2021	2	SEAR's Amendment	R. McShane	I. Van Eerden
31.05.2021	3	Amendment	R. McShane	I. Van Eerden
16.07.2021	4	Amendment	R. McShane	I. Van Eerden
02.08.2021	5	Amendment	R. McShane	I. Van Eerden

Northrop Consulting Engineers Pty Ltd

ACN 064 775 088 | ABN 81 094 433 100

Level 11, 345 George Street, Sydney NSW 2000

02 9241 4188 | sydney@northrop.com.au | www.northrop.com.au

© 2021 Northrop Consulting Engineers Pty Ltd. All rights reserved.

This document has been prepared on behalf of and for the exclusive use of FDC and is subject to and issued in accordance with the agreement between FDC and Northrop Consulting Engineers. Northrop Consulting Engineers accepts no liability or responsibility whatsoever for it in respect of any use of or reliance upon this document by any third party. Copying this document without the permission of FDC or Northrop Consulting Engineers is not permitted.

Table of Contents

1. Introduction 3
   1.1 Response to Secretaries Environmental Assessment Requirements (SEARs) 4
   1.2 Limitations 4
2. The Proposal 5
   2.1 Project Details 5
   2.2 Proposed Development 6
3. Legislation, Regulation & Guidance 7
   3.1 Energy Usage 7
   3.2 Energy Efficiency: 8
   3.3 Energy Generation: 9
   3.4 Indoor Environment Quality 9
   3.5 Water Efficiency 9
   3.6 Improved Ecology 10
   3.7 Waste Management 10
4. Climate Change Projections 12
5. Conclusion 14

1. Introduction

This Ecologically Sustainable Design (ESD) and Greenhouse Gas Assessment has been prepared on behalf of Charter Hall Holdings Pty Ltd for the proposed expansion of the existing food processing facility (bakery) at 65 Huntingwood Drive, Huntingwood. The existing facility is occupied by Arnott's Biscuit's.

This report is intended to provide an overview of the ESD principles and greenhouse gas and energy efficiency measures that will be implemented and is intended to form part of the Environmental Impact Statement (EIS) for the State Significant Development Application (SSDA).

Specific sustainability initiatives proposed for the building include, but are not limited to:

- Space efficient building layout.
- High Efficiency Electrical Systems
- Large scale on-site renewable energy generation
- Off-site renewable energy sourcing
- Increased use of daylighting to reduce power usage
- Installation of a large-scale rainwater capture and reuse system
- Energy Efficient heating, ventilation and air conditioning including natural ventilation to open spaces.
- Waste Minimisation strategies.

Through the implementation of the initiatives noted in this report, the project addresses and endeavors to mitigate against negative environmental, social and economic impacts associated with the site.

1.1 Response to Secretaries Environmental Assessment Requirements (SEARs)

This report addresses how the proposed project addresses Item 7 of the SEARs. These requirements are outlined below alongside where the response to each can be found within this report;

Item for inclusion	Action to Address Requirement	Report Location
Greenhouse gas and energy efficiency – including an assessment of the energy use of the proposal and all reasonable and feasible measures that would be implemented on site to minimise the proposal's greenhouse gas and carbon emissions (reflecting the Government's goal of net zero emissions by 2050).	The proposal, as outlined in the report, will seek to include substantial energy efficiency measures to minimise the proposal's greenhouse gas and carbon emissions.	Section 3.1
A description of how the proposal will incorporate the principles of ecologically sustainable development in the design, construction, and ongoing operation of the development.	This ESD report details how the project aims to address ESD Principles and their incorporation into the design and ongoing operation of the project.	Section 3
Demonstration of how the development will meet or exceed the relevant industry recognised building sustainability and environmental performance standards, and;	This report will outline how through the integration of best practice design principles, the relevant building standards have been surpassed.	Section 3
a description of the measures to be implemented to minimise consumption of resources, especially energy and water.	A report is to be prepared regarding strategies put in place to manage increasingly volatile climate situations. This report will produce outcomes for design to reduce the impact of these climate outcomes.	Section 3.2 & 3.5

1.2 Limitations

Due care and skill have been exercised in the preparation of this report.

No responsibility or liability to any third party is accepted for any loss or damage arising out of the use of this report by any third party. Any third party wishing to act upon any material contained in this report should first contact Northrop for detailed advice, which will consider that party's requirements.

All simulations and performances noted within this report are estimations only. They are based on the existing design of the facility and best practice estimation techniques. These figures are indicative only and should not be used for cost or other analysis purposes.

2. The Proposal

2.1 Project Details

Component	Description
Address and Legal Description	65 Huntingwood Drive, Huntingwood Lot 1 DP866251
Site Area	Total area of 163,933 sqm (16.4 ha)
Current Use	The current operations on the site involve food processing (bakery) which operates 24 hours a day, seven days a week.

The site is located within the Huntingwood Industrial Estate, 32km west of the Sydney CBD and 4km south of Blacktown Town Centre. The site is situated along the southern boundary of Huntingwood, bordering the Western Motorway (M4) to the south and Huntingwood Drive to the north.

The site is occupied by the existing Arnott's Biscuits processing facility which operates 24 hours a day, seven days a week. The site currently contains three large freestanding industrial buildings, the main 'L-shaped' processing building to the north and two warehouses to the south. The balance of the site includes small ancillary buildings, car parking, loading areas and privately used open space. The north-west corner of the site currently acts as an on-site detention (OSD) basin.

The north-western edge of the site sits up to approximately 4m above the surrounding road reserves. The balance of the site is reasonably flat with a slight fall towards the north-west.

Vehicular access to the site for light vehicles is via an existing entry and exit driveway at the Huntingwood Drive frontage. Separate heavy vehicle access to the site is available from Huntingwood Drive adjacent to the eastern boundary. Heavy vehicle access to the high-bay warehouse is also available from Brabham Drive.

2.2 Proposed Development

The proposed development comprises the expansion of the existing Arnott's facility at 65 Huntingwood Drive, Huntingwood. The development is outlined in the following table:

Element	Proposed
Site Preparation	▪ Removal of existing car parking, driveway and ancillary structures. ▪ Vegetation clearing. ▪ Excavation for car park and bulk earthworks and supporting structures. ▪ Drainage connections. ▪ Land stabilisation.
Development summary	▪ Construction of a new processing facility (24,775sqm) with first-floor amenities in the northwest corner of the site. ▪ Construction of a new ingredient silo building (1,000sqm) along the Huntingwood Drive frontage ▪ Construction of a storage building (270sqm) to the east of the existing building ▪ Construction of a new processing building (1,200sqm) and ingredient silo building (120sqm) to the south of the main facility. ▪ Replacement of the existing on-site detention basin (OSD) with an OSD tank below the basement car park. ▪ Landscaped setbacks along both street frontages to screen the new processing facility and loading area.
Access and Parking	▪ New loading area above two levels of car parking (468 spaces) at the north-west corner of Huntingwood Drive and Brabham Drive. ▪ Trucks will utilise the existing access point adjacent to the eastern boundary of the site. ▪ The existing (westernmost) vehicle access to Huntingwood Drive will be retained and upgraded to provide access to the new car park.
Hours of Operation	▪ The facility will continue to operate 24 hours per day, seven days per week

Table 1 - Overview of Proposed Development

3. Legislation, Regulation & Guidance

The following section describes how ESD principals (as defined in clause 7(4) of Schedule 2 of the Environmental Planning and Assessment Regulation 2000) are being incorporated in the design, construction, and operation phases of the project. These initiatives illustrate how the project addresses the following;

- The precautionary principle – through the implementation of environmental management and an assessment of the building's operational maintainability, the project attempts to incorporate adaptability and resilience into the project design. The concepts behind the precautionary principle is to create spaces that can both; accommodate for changes, which may eventuate in the future, and avoid the risk of serious or irreversible damage to the environment.
- Inter-generational equity to ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations – through the inclusion of zero ozone depleting refrigerants, best practice PVC and low impact paints, sealants and adhesives, alongside a focus on providing greater vegetation and support for the buildings connection with nature, the project demonstrates a strong commitment to the preservation of environmental health, diversity and productivity of the local area.
- Conservation of biological diversity and ecological integrity – through the planting of native vegetation, improvement of stormwater runoff from the site and use of integrated landscaping, the project will act to improve, conserve and support the local biological diversity and integrity.
- Improved valuation, pricing and incentive mechanisms - the design process should involve significant input from the Quantity Surveyor who will be involved ensure that the project both remains on budget and effectively considers environmental factors in the valuation of assets and services. Furthermore, the project will look at maintainability and the operational costs associated with individual design initiatives and the overall design.

Through the inclusion of the above and the sustainability initiative outlined within this report the project clearly addresses the ESD Principles into the design, construction and operation of the building as defined in clause 7(4) of schedule 2 of the Environmental Planning and Assessment Regulation 2000. Further detail of the general sustainability initiatives is outlined below.

3.1 Energy Usage

Initial energy estimations for the site's energy consumption indicate that energy consumption for the expansion project is likely to be circa 6.3 GWh a year assuming 24/7 operation. This energy usage will be reduced significantly with inclusion of on-site solar energy generation, which is discussed within this report.

The expansion will also look to minimise the use of fossil fuels, in line with Arnott's commitment to achieve net-zero emissions by 2040, and across the value chain by 2050. This will be supported by a transition plan and power purchase agreements, resulting in an elimination of Greenhouse Gas Emissions from the facility 10 years ahead of the Government's goal of net zero emissions by 2050.

3.2 Energy Efficiency:

Energy efficiency will be considered throughout the design development process with the following improvements to be considered by the design team. It is expected that the measures outlined in the following section, alongside a large solar array, will significantly reduce the site's grid electricity demands when compared to a standard practice building.

3.2.1 Natural Ventilation of Tertiary Spaces

The project incorporates significant logistic areas, and areas for circulation and vehicles, these spaces will, where achievable, be naturally ventilated or open air in the case of truck loading areas. These areas will be able to operate as naturally ventilated spaces exploiting the buoyancy of air to draw ventilation through the space. Central circulation spaces such as bathrooms and stairs should also look to incorporate natural ventilation and the use of spill air from adjacent spaces to provide passive temperature control.

3.2.2 Airconditioning within the Warehouse Spaces

Given the nature of the project, housing food production, there is a need for air conditioning and refrigeration of the warehouse areas, using an efficient lighting and HVAC set-up will help to minimise the energy use for these spaces. Additionally, each of the conditioned warehouse will incorporate insulation to exceed the requirements of the code and minimise heat gains into these spaces. As the detailed design of the HVAC system progresses further details will be incorporated to optimise energy use and to provide flexibility of conditioning within the large warehouse spaces.

3.2.3 Improved building fabric and glazing performance

The building envelope comprises several different façade types, with the proposed scheme using a combination of light-coloured metal finishes, prefabricated concrete and glazing to lower heat gains throughout summer while maintaining good daylighting throughout of the building.

The use of well-designed glazing and building materials will also assist the projects targets for energy efficiency, acoustic performance and thermal comfort.

3.2.4 Integration of Cool roofs

To address heat islanding across the site and wider area the site should incorporate cool roofing with a high Solar Reflectivity Index (SRI 82) which will minimise the buildup of heat within the material and reduce load on the HVAC system.

3.2.5 HVAC System Control

The proposed HVAC system incorporates individual area controls for thermal comfort conditions within the office spaces allowing building occupants to maintain comfort conditions suitable to the use and occupancy of spaces. This system assists in optimising the sites energy efficiency while maintaining comfortable conditions.

3.2.6 Energy Metering and Monitoring

An energy metering and monitoring strategy is to be considered to effectively monitor the main energy uses within the building, alongside the lighting and small power use. This aims to provide fault detection and monitoring of the different areas of the building.

3.2.7 Improved Outdoor Air Provision

The project will aim to improve the outdoor air provided to regularly occupied spaces. This will minimise CO2 build up within the office areas and improve comfort for the building occupants.

In order to address energy use concerns the design will also look to incorporate on an outdoor air economy cycle which will allow the building to exploit periods where the buildings external conditions can effectively provide thermal comfort in the space reducing the run times of the air-conditioning system.

3.2.8 Highly efficient lighting system

The installation of LED lighting throughout the building will assist in the minimisation of lighting energy use. Improved lighting energy also reduces the heat loads within cooled spaces and therefore lowers the energy used to condition the building. The use of efficient controlled lighting within the warehouse areas will provide a significant improvement in energy use due to the high levels of automation within these areas.

3.3 Energy Generation:

With the above energy efficiency measures, the energy load of the facility will be reduced, allowing a large portion of the sites electrical energy demand to be met through the inclusion of a large solar array. This will assist to both offset the sites energy use and minimise the sites daytime peak demand from the grid.

3.4 Indoor Environment Quality

Indoor environment quality is always an important consideration in spaces that are regularly occupied such as the offices and ambient warehouse areas. The following considerations have been considered as part of the building design:

3.4.1 Daylight Access

The design of the extension should aim to allow good daylight penetration into both internal and external spaces. Daylighting can be achieved through skylights and other methods, whilst not sacrificing thermal transfer. This access to daylight throughout the building will both minimise energy used for lighting and will improve occupant connection to their external environment.

3.4.2 Interior noise level control

Internal noise levels will be actively considered with the building layout and systems design considering how noise will reverberate through the building. The use of acoustic insulation and sound isolation will ensure that interior noise levels to be maintained below acceptable limits.

3.4.3 Material selection

Materials selection for the project aims to improve the internal environment of the site with materials with low volatile organic compound and formaldehyde content preferred to help minimise respiratory issues for building occupants.

3.5 Water Efficiency

A strong focus has been put on the effective management of water within the building with the following initiatives being included in the design in all areas throughout the project. It is expected that these initiatives will reduce the sites potable water demand by more than 50% compared to a standard practice building.

3.5.1 Water efficient fixtures and fittings

Water Efficient fixtures and fitting will reduce the water consumption of the site. As an indication, the following should be targeted:

- Wash hand basin taps 6-star WELS
- General taps 6-star WELS
- Toilets dual flush 4-star WELS
- Urinals 0.8 L per flush 6-star WELS
- Shower heads 7-9 L per minutes 3WELS

3.5.2 Water Sensitive Urban Design

The project will look to incorporate a strong focus on water sensitive urban design with the external landscape design assisting to minimise water use for irrigation. The inclusion of landscaped area will also assist in the reduction of site stormwater discharge and assist in the management of the projects broader impact on urban stormwater flows.

3.5.3 Rainwater capture and reuse

A large rainwater capture and reuse system could be designed for installation to offset the sites water usage for washdown, cooling towers, toilet flushing and other facets of production. This system would have the ability to offset most of the sites potable water usage.

3.6 Improved Ecology

Through planting native vegetation and promoting improved interaction with the natural environment, the project will look to improve the site's ecology and minimise the ongoing environmental impact of the project. The project is currently implementing the following:

- Incorporation of a site vegetation.
- Minimisation of light spill from the facility which impacts on migratory animals and insects; and
- Reduced dissolved pollutants in stormwater discharged from the site.

3.7 Waste Management

Effective waste management throughout demolition, construction and operation of the site will help to promote resource efficiency and minimise the adverse environmental impacts of the project. The following are being considered as part of the design process.

3.7.1 Separated Waste and Recycling Streams

The provision of separated waste and recycling streams could allow for more effective recycling of the project's operation waste. Providing separate bins for cardboard/paper waste, glass, food wastes, comingled recycling and general waste will improve the buildings operational efficiency and result in significant environmental benefits.

3.7.2 Construction and Demolition Waste Minimisation

The project should look to minimise the demolition and construction waste associated with the project and can aim to divert over 90% of waste from landfill to recycling or reuse facilities.

4. Climate Change Projections

As part of the design review the project has completed a risk assessment for the sites climate adaption risks based on the CSIRO climate change projections for Western Sydney. This risk assessment reviewed the following three elements:

- Consequence: what will be the effect of the development should the impact occur?
- Likelihood: how likely is it that the impact will occur?
- Risk Rating: what is the associated risk of the development when the likelihood of it happening is measured against the possible consequence of the impact?

Key risks posed to the site which will be addressed as part of this process and high-level issues are outlined below with comment on how these are addressed within the current design; further detail will be developed within the projects detailed design development stages.

- Changing Surface Temperatures should be addressed through the following.
    - Use of high reflectivity roofing to minimise heat gain and heat island effects.
    - Integration of solar panels to provide shading to areas of the roof and provide increased power to the site when peak energy use for cooling is required.
    - Incorporation of heating, ventilation, air conditioning (HVAC) systems designed to modulate in the event of changing outside air temperatures. Equipment will be rated to continue operating during higher temperatures.
- An increase in rainfall intensity should be managed through the following.
    - Inclusion of rainwater and stormwater storage systems to modulate flows exiting the site.
    - Ability to provide increased finished floor level (FFL) designed to be 0.30 m above freeboard requirement to account for increased flooding potential at the site.
    - Inclusion of awnings to the entry access points to promote allow continued operation during adverse conditions.
- An increase to wind speed intensity should be addressed through the following.
    - The metal roof design incorporating roof bracing to fasten the roof onto the building structure to account for increasingly strong winds on site and prevent damage to the roof due to prevailing winds.
    - Improved structural integrity to ensure that the building is not significantly impacted in the event of high intensity wind loads. This includes wind loading on loading dock awnings and doors.
- Decrease in humidity and increased drought conditions will be addressed through the following.
    - Increased capacity within the fire safety systems to assist in the management of bushfire risk associated with dryer conditions.
    - Additional non potable water supply for irrigation needs and the integration of native and drought tolerant vegetation.

Overall, the current design incorporates significant measures to address key projections for climate change in the near term. The project will incorporate further initiatives to address all high and extreme risks posed to the site as per the Climate Adaption Credit within the targeted Green Star rating.

5. Conclusion

This report has addressed the ESD and Greenhouse Gas requirements to support the SSDA for the expansion of Arnott's facility at 65 Huntingwood Drive, Huntingwood.

Specific sustainability initiatives proposed for the building include, but are not limited to:

- Space efficient building layout.
- High Efficiency Electrical Systems
- Large scale on-site renewable energy generation
- Off-site renewable energy sourcing
- Increased use of daylighting to reduce power usage
- Installation of a large-scale rainwater capture and reuse system
- Energy Efficient heating, ventilation and air conditioning including natural ventilation to open spaces.
- Waste Minimisation strategies.

Overall, through the implementation of the initiatives noted within this report the project clearly demonstrates the site's commitment to ESD principles throughout the design, construction, and operation. Additionally, the project design team has worked to optimise the sites energy performance, address key climate related risks posed to the site, and align to the NSW Government's commitment to carbon neutrality by 2050. This work will continue to be developed throughout the detailed design process aligning to Arnott's and Charter Hall's commitment to Sustainability.