



CIVIL REPORT

# Stormwater Management & Servicing Plan

## BAESA – Precinct Entry Works

Jeffries Circuit, Williamtown NSW 2314

Ref: NL223031-00-CV-RP01  
Rev: I  
Date: 11 November 2024

**PREPARED FOR**  
Built.  
Level 1/155, 157 Lambton Road  
Broadmeadow NSW 2292



# Civil Report

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# 1. Introduction

Northrop Consulting Engineers Pty Ltd (Northrop) have been engaged by Built Pty Ltd to provide civil engineering services for the purpose of supporting a Development Application (DA) for the proposed Precinct Entry Works as part of the BAE Systems Australia (BAE Systems) Williamtown Facilities Expansion, located at Jeffries Circuit, Williamtown. The purpose of this report is to provide background to the design assumptions and methodologies employed in developing the stormwater management system and connection of essential services.

The information below has been provided in conjunction with the civil design documentation prepared by Northrop, which has been included in Appendix A. The proposed civil design for the development has been produced in accordance with the *Port Stephens Development Control Plan 2014 (DCP)*, the *Port Stephens Local Environmental Plan 2013 (LEP)*, AUS-SPEC design specifications and relevant Australian Standards.

## 1.1 Site Description and Proposed Development

The proposed Precinct Entry Works, herein known as 'The Site,' comprises part of Proposed Lot 100, and Proposed Lot 101, and 102 in Lot 11, DP 1036501, 38 Cabbage Tree Road, and part Lot 43, DP 1045602 and part Lot 103, DP 873512, Williamtown Drive, Williamtown. The site is accessed via Jeffries Circuit.

The Site is bound by existing BAE Systems facilities to the north, an existing transpiration pond to the east, Jeffries Circuit to the south and undeveloped hardstand to the west. At present, the site consists of relatively flat, undeveloped hardstand, with existing surface levels ranging from 2.87m AHD (within the existing drainage channel) to 5.70m AHD. Williamtown and the Port Stephens Council Local Government Area sit upon the traditional lands of the Worimi people.

The proposed development is for demolition of a building, construction of site access and a car park with associated security building, gates and fencing and landscaping. It is noted that the stormwater management assessment and design has been restricted to the proposed extent of the works, shown below in Figure 1.



Figure 1 – Proposed Site Location

### Site Areas

- Total site area (subject of current DA) = 11,470 m<sup>2</sup>
  - Hardstand area = 9513 m<sup>2</sup>
  - Roof area = 105 m<sup>2</sup>
  - Landscaped area = 1,852 m<sup>2</sup>
  - Percentage Impervious = 84%

### 1.2 Scope of Works

The proposed Precinct Entry Works development is to incorporate the following work elements:

- Construction of a new access road from Jeffries Circuit, including a secure point of entry with boom gates, a rejection path and other associated security infrastructure
- Construction of a new 2-person guardhouse, including services
- Construction of a secure carparking area for BAE System personnel
- Construction of an external visit carparking area
- Associated landscaping, civil infrastructure and service reticulation
- Provision of 26 future electric vehicle (EV) charging spaces

### 1.3 Existing Stormwater Management Strategy

In 2022, Port Stephens Council granted approval to a modification to the Astra Aerolab Development Consent 16-2009-324-3, which included acceptance of the *Stormwater Management Report for Astra Aerolab*, prepared by Northrop Consulting Engineers reference NL182640-E10 [A] dated 24 June 2021 (Northrop 2021).

The general philosophy of the Astra Aerolab subdivision stormwater management strategy is:

- Rain Gardens – stormwater runoff from road pavements will be treated by rain gardens located throughout the site. The rain gardens have been designed to include pre-treatment forebays to capture litter, organic debris and sediment and to protect the filter media.
- Vegetated Channels/ Buffer Strips – vegetated channels are proposed as conveyance measures between the piped outlets from lots and rain gardens to end of line stormwater basins. They will provide pre-treatment for runoff prior to it entering end of line treatment.
- Constructed Wetlands – the two stormwater basins have been modelled as constructed wetlands, providing end of line tertiary treatment for runoff prior to discharging from site. The wetland systems are shallow, vegetated water bodies that use enhanced sedimentation, fine filtration and biological uptake processes to remove pollutants from stormwater.
- Stage 1 of the Astra Aerolab subdivision, which includes Lot 100, 101 and 102, has been modelled as an Industrial source node with 90% impervious surface area.

Per the Stormwater Management Report for Astra Aerolab prepared by Northrop (ref: NL182640-E10, dated 14 December 2021), both flood mitigation measures and water quality treatment infrastructure have been incorporated into the broader development of allotment areas for Stage 1, 2A and 2B (in which the Development is situated), and therefore do not require any additional on-lot infrastructure.

### 1.4 Existing Flooding Assessment

To achieve immunity to 1% AEP regional flooding, filling for Stage 1 of the Astra Aerolab subdivision, which includes Lot 100, 101 and 102, has been completed in accordance with the approved Stormwater Management Report (Northrop 2021). Filling in the proposed Precinct Entry Works site varies from 4.0m AHD to 4.7m AHD.



## 2. Proposed Stormwater Management Strategy

### 2.1 Stormwater Quality and Quantity Management Strategy

The proposed site area results in an impervious area of 84%, significantly less than the 90% assumed in the approved Stormwater Management Report (Northrop, 2021). The development is therefore within the water quality and quantity allowances in the existing Astra Aerolab stormwater management system and no further on-site treatment is proposed.

Reshaping of the site is proposed to allow surface falls towards an internal pit and pipe network which will discharge to the existing stormwater connection points for each site. Additionally, to incorporate best-practice Water Sensitive Urban Design (WSUD) principles into the development, a proprietary pit inlet filter basket is to be installed within each proposed stormwater pit located in a hardstand area to capture gross pollutants. Flows exceeding the minor design event will sheet flow into Jeffries Circuit.

It is noted that a net balance of earthworks is to be achieved.

### 2.2 Filling of Existing Channel

As shown in Figure 2, there is an existing channel around the western and southern sides of the existing BAE Systems facilities. Survey file 210325C prepared by Monteath & Powys identifies the base of the channel at approximate RL3.30 AHD and effectively flat. Figure 3 [E] in Northrop 2021 identifies a depth of up to 500mm in the channel during a 1% AEP storm event.

To provide connectivity to the existing BAE Systems facilities, it is proposed to fill the channel to approximate RL4.70m AHD, above the 1% AEP flood level. In the absence of further flood modelling, it is proposed that reinforced box culverts be installed to maintain the existing capacity of the channel for storm events up to the 1% AEP event. An assessment of the survey data determined existing storage of 4m<sup>2</sup> / linear meter. To achieve this, twin 3300(W) x 600(H) reinforced concrete box culverts are proposed. Filling and installation of culverts is to be undertaken in two stages as shown in the typical sections on Northrop drawing NL223031 PEW-C09.01.



Figure 2 – Location of Existing Channel to be Filled

## 4. Essential Services

Essential services will be required for the WC and kitchen within the guardhouse, as well as for lighting and EV charging stations. As the site is part of the recently constructed Astra Aerolab subdivision, essential services are already available to the site as described below. Connection to existing services will require the necessary application to relevant authorities prior to construction.

### 4.1 Sewer

Sewer demand from the proposed development is to cater for 3 WC and kitchen within the guardhouse. Water and Wastewater Servicing Strategy Reference 239903 [B] was prepared by ADW Johnson for the Astra Aerolab Subdivision. Drawing 239903-STRAT-002 included in the report identifies the site as Precinct 3, and Table 6 identifies Precinct 3 as having a demand of 7 ET/Ha. Based on a site area of 1.17 Ha, a demand of 8.2 ET has been allowed for, which exceeds what the development is expected to generate.

A review of Before You Dig Australia (BYDA) confirms an existing pressure sewer rising main connection is available to all three Lots, discharging to Williamtown 1 WWPS. Each Lot is serviced via a 40 PE100-PN16 pressure main connection. The proposed development will include construction of a new pump well to pump discharge from the guardhouse to the existing boundary kit within Lot 102. Connection will require application for a Section 50 to Hunter Water Corporation.

### 4.2 Water

A review of Before You Dig Australia (BYDA) confirms an existing Hunter Water Corporation owned 150 PVC-0 PN16 water main connection is available to the site, located in the opposite verge in Jeffries Circuit. Water supply is required for the 3 WC and kitchen in the proposed guardhouse. It is noted that the Water and Wastewater Servicing Strategy Reference 239903 [B] prepared by ADW Johnson for the Astra Aerolab Subdivision assumed the site would consist of commercial land with an average day demand of 19 kL/day which is significantly more than the development will require. Connection will require application for a Section 50 to Hunter Water Corporation.

### 4.3 Electrical

An existing substation is located on Jeffries Circuit adjacent Lot 100. Existing buried LV and HV mains are available in Jeffries Circuit. Design of the Astra Aerolab subdivision included power supply of 100A each to Lot 101 and 102, which could be increased to 200A each without any network upgrades. Lot 100 has an available supply of 400A with an option of up to 800A pending timing and demand of other lots in the subdivision.

The development will consist of carpark lighting and the guardhouse, which can be connected to existing LV supply. In addition, supply for 26 future trickle-feed EV charging stations has been considered with an estimated demand of 223 Amps. The existing network is therefore expected to have sufficient capacity, subject to formal Ausgrid application.

### 4.4 Communications

Existing buried NBN, Telstra and SCEC networks are available for connection in Jeffries Circuit.

### 4.5 Lighting Design

Concept lighting design has been undertaken for the carpark, noting the site is location in the Zone 'D' extraneous lighting zone with maximum intensity of light sources (candela), measured at 3 degrees above the horizontal restricted to 450cd. Design has been undertaken to address the relevant requirements of National Airports Safeguarding Framework (NASF) Guideline E: Managing Pilot Lighting Distraction, as well as AS4282. Concept lighting design is enclosed, as well as certification confirming compliance with the necessary requirements.

## Conclusion

Based on the results of the above assessment, it has been demonstrated that the works proposed as part of the BAE Systems Precinct Entry Works can be developed generally in accordance with the approved Stormwater Management Strategy (Northorp 2021), intent of the PSC DCP, relevant guidelines and industry-standard best-practice civil engineering strategies.

The proposed development is within the design assumptions for the broader Stormwater Management Strategy of the GNAPL Astra Aerolab development and therefore additional on-lot treatment infrastructure is not required. Despite this, to incorporate best-practice water quality treatment, each proposed pit located within hardstand areas is to be fitted with a proprietary pit inlet filter basket to capture gross pollutants.

Reshaping of the site will not change the existing Astra Aerolab catchment assumptions, with all surface runoff directed to the existing stormwater connection points provided for each lot. Furthermore, a qualitative flood impact assessment has been undertaken for the proposed filling of the existing channel, providing equivalent storage volume in the form of reinforced concrete box culvert. Therefore, the proposed works will not create any significant adverse impacts to the existing flood behaviour.

Essential services were constructed as part of the Astra Aerolab subdivision, with adequate design capacity allowance to service the proposed demand.

We trust that the above report provides sufficient justification to allow Port Stephens Council to adequately assess the proposal. Should you have any queries, please do not hesitate to contact the undersigned.

Yours sincerely,

A handwritten signature in black ink, appearing to read "Chris Piper".

**Chris Piper**  
Principal | Senior Civil Engineer  
BEng (Civil) (Hons) MIEAust CPEng NER (Civil)



## Appendix A – Civil Design Documentation

Provided separately due to size

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# CIVIL TRANSMITTAL

JOB No.	JOB NAME	PAGES
NL223031	BAE SYSTEMS PRECINCT ENTRY WORKS	1

DESCRIPTION	DEVELOPMENT APPLICATION
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	DATE	D	6	3	11					
		M	8	9	11					
		Y	24	24	24					

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