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Memorandum

To	Brenton Burman		
CC	Andrew Raeburn, Rob Mason		
Subject	Aviation Hangar Project Major Development Plan - Utility Plan Memorandum		
From	Adam Nestmann		
File/Ref No.	Final	Date	25-June-24

1.0 Introduction

The purpose of this memo is to present findings from the utility servicing investigation undertaken to provide technical input to Aviation Hangar Project Major Development Plan (MDP). The investigation covers:

- Electrical supply
- Potable water supply
- Sewer connection
- Communications servicing
- Fire water storage

The investigation considers the supply of utilities to the proposed development to ensure that feasible arrangements are available to meet the demand from the development. The scope does not include detail of services reticulation within the development itself which would be part of future stages of design.

This investigation aims to:

- Serve as key technical input to the Aviation Hangar Project MDP
- Assist with streamlining development concurrence and approvals through the Department of Infrastructure, Transport, Regional Development, Communications and the Arts.

AECOM notes that a separate scope of works is currently underway to develop a broader master plan for potable water, sewer and communications servicing of Bankstown Airport and that the outcomes of this scope of works may affect the recommendations, proposed supply arrangements and connection points within this memo. It is not anticipated that there will be any barriers to servicing of the proposed development as a result of the outcomes of the Bankstown Airport Services master planning works.

2.0 Sources of Information

AECOM has undertaken a desktop investigation on utilities within and around the proposed development site. The assessment has been carried out with reference to the following:

- Site Layout from Crawford Architects (Crawford Architects 2023, Concept F)
- Bankstown Airport Electrical Master Plan (Waterman, R, Angelin, A 2022, Rev 1.1)
- Before You Dig Australia (BYDA) for determining external utilities connection point
- Australian Standards AS2419 – Fire Hydrant Installations

- Australian Standards AS3000 - Electrical Installations

3.0 Electrical

Electrical planning for the Bankstown Airport site has recently been updated as part of the Bankstown Airport Electrical Master Plan (AECOM, 2022).

The expected electrical demand for Aviation Hangar Project has been calculated through breakdown of areas based on usage, as detailed in Table 1. The peak electrical demand for site is expected to be around 1040 kVA. This figure is based on standards and assumed loads on site that are yet to be confirmed as they are subject to subsequent design stages.

In addition to the demand from the new built form, additional items are being considered which will see the electrification of aircraft and more particularly electric vertical take-off and landing "eVTOL". To support such technology would significantly increase the above estimated demand. A single rapid charging station, capable of recharging a 300kWh eVTOL battery in 15 minutes requires approximately 1,500 kVA which would more than double site demand.

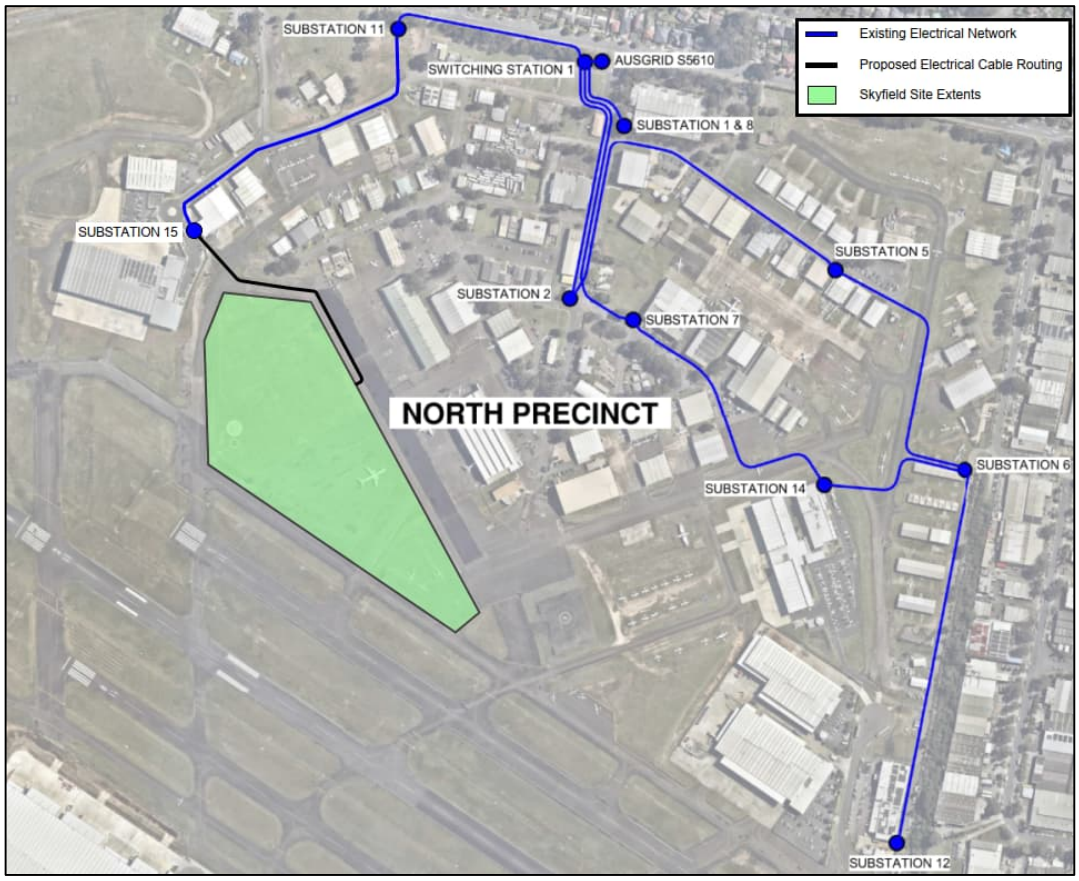
A more feasible eVTOL solution would provide slow charging eVTOL stations. This would result in lower electrical load on the network at the cost of longer charge times (overnight). An allowance of 400 kVA has been added to demand calculations to account for slow eVTOL chargers, raising the total site load to 1440kVA. Although the above has been accounted for within this memo, it is understood that eVTOL charging and Electric vehicle charging does not form part of the current MDP.

Table 1 – Aviation Hangar Project Electrical Demand Breakdown

Item	Area (m²)	VA/ m²	kVA	Notes
Hangar Light & Power	9978	20	200	As per AS/NZS3000 Table C3 for Light Industrial
Hanger Ventilation	9978	20	200	As per AS/NZS3000 Table C3 for Light Industrial
External Lighting	4488	1	4	As per AS/NZS3000 Table C3
Office Light & Power	3506	50	175	Diversified office load - accounts for mechanical, hydraulic and fire services
Office Mechanical Cooling	3506	50	175	Diversified office load - accounts for mechanical, hydraulic and fire services
Comms Room Load			20	Assumed 10 racks in total @ 2 kVA per rack
Compressed Air System			20	
Spare Capacity (20%)			159	
EV			90	Assumed 6 chargers @ 15 kVA per charger
Sub-Total			**1043**	Total demand calculation based on MDP submission
eVTOL			400	EV chargers used for slow eVTOL charging
Total			**1443**	Total load with consideration of slow eVTOL charging

The Aviation Hangar Project site is located near the North Precinct, with substation 15, 2, and 7 being situated nearest to the site. Figure 1 shows the location of all Northern Precinct substations relative to the Aviation Hangar Project site.

Figure 1 – Northern Precinct Substation Locations



As substations 2 and 7 are slightly further away from the site, substation 15 is the preferred connection point as shown in Figure 1. The connection point to site is indicative and will be confirmed in subsequent design stages. From review of provided single line diagrams of the northern precinct and cable sizes from substation 15 back to the Ausgrid network supply point, suitable HV capacity for Aviation Hangar Project is available provided a new substation is provided in the development.

A new pad-mount substation would be required to supply the Aviation Hangar Project LV demand noted above in Table 1. The Substation would be supplied with a new extension of the 11kV HV feeder network from the adjacent substation 15. This new substation is anticipated to be located within the carpark area; the exact location is to be determined in subsequent design stages.

It is understood that existing external feed from Ausgrid to the northern precinct airport site is nearing capacity, and that Bankstown Airport is in negotiations to upgrade supply with the external electrical authority (Ausgrid). This is not anticipated to be an obstacle to the servicing of the Aviation Hangar Project, as it is part of a wider Northern Precinct electrical upgrade program of works.

4.0 Potable Water

Potable water demand from the development has been estimated using rates taken from analysis of demands across a range of commercial airports for similar land uses. The assessment of potable water demand is presented in Table 2 , with the potable water demand for the site expected to be in the range of 11.7 – 20.8 kL/day. A lower and upper limit have been provided to account for forecasting purposes.

Table 2 – Potable Water Estimated Demand for the Aviation Hangar Project (kL/day)

Development Type	Lower (kL/m²/day)	Upper (kL/m²/day)	Total Area (m²)	Total Demand (kL/day)
Office	2.7	5.25	3582	9.7-18.8 kL/day
Hangar	0.2	0.2	9978	2.0 kL/day

As indicated in Figure 2, an existing 250 uPVC Sydney Water pipeline runs immediately north of the Aviation Hangar Project site. This main currently provides potable water supply to all of the development north of the runways.

It is expected that the Aviation Hangar Project can connect to this existing Sydney Water main between lot 558, 531 and 562. The connection location proposed is close to the northern extent of site and has a stop value and hydrant just upstream from the proposed connection point.

Figure 2 – BYDA Potable Plans Showing Proposed Water Connection Point

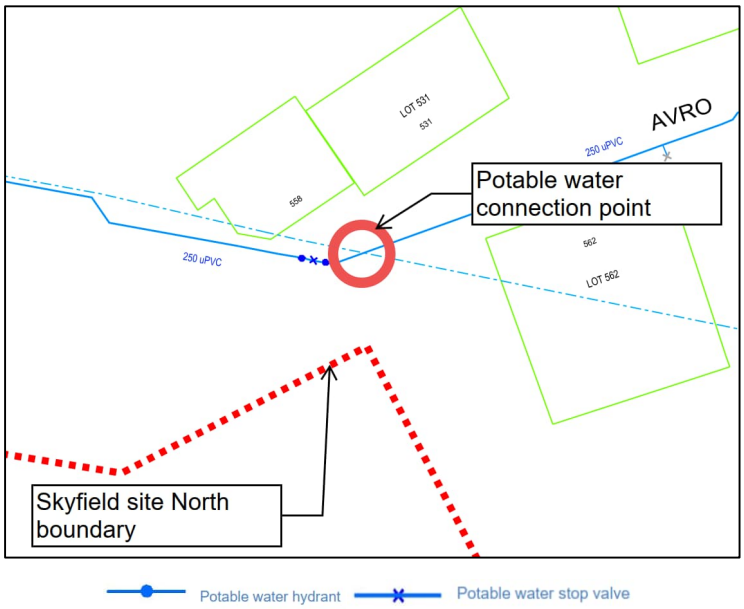
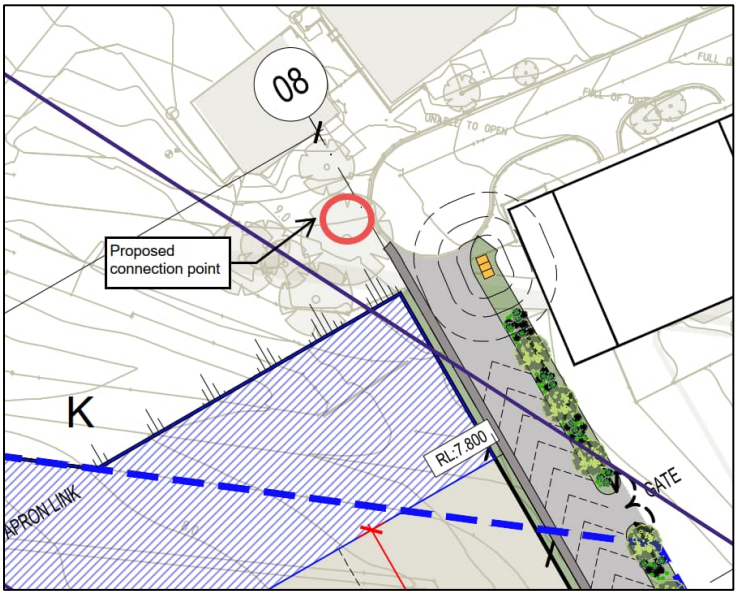


Figure 3 – Proposed Water Connection



5.0 Sewer

The estimated sewer demand from the development has been estimated by applying a Sewer Usage Discharge Factor (SUDF) developed from analysis of loading factors from a range of commercial airports, with a potable water return factor of 90% being adopted. Combining this factor with the estimated potable water demand of 11.7 – 20.8 kL/day estimates an Average Dry Weather Flow (ADWF) of 10.5 – 18.7 kL/day.

Based on the existing services survey, there is opportunity to connect the development to the existing sewer network that runs to the north-east, specifically at an existing sewer manhole located in front of site 638 as shown in Figure 4 and Figure 5.

Figure 4 – Proposed Sewer Connection Point

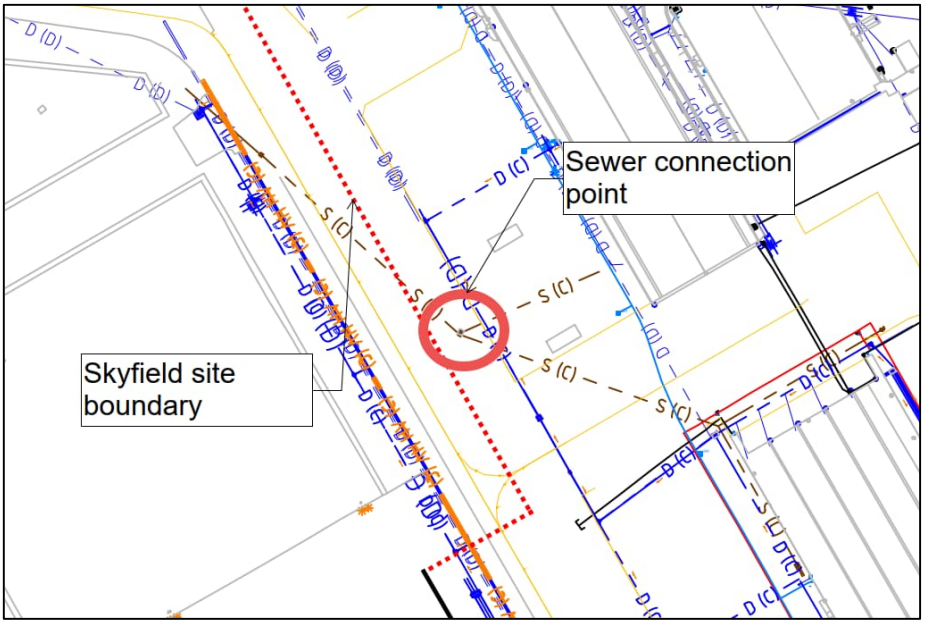
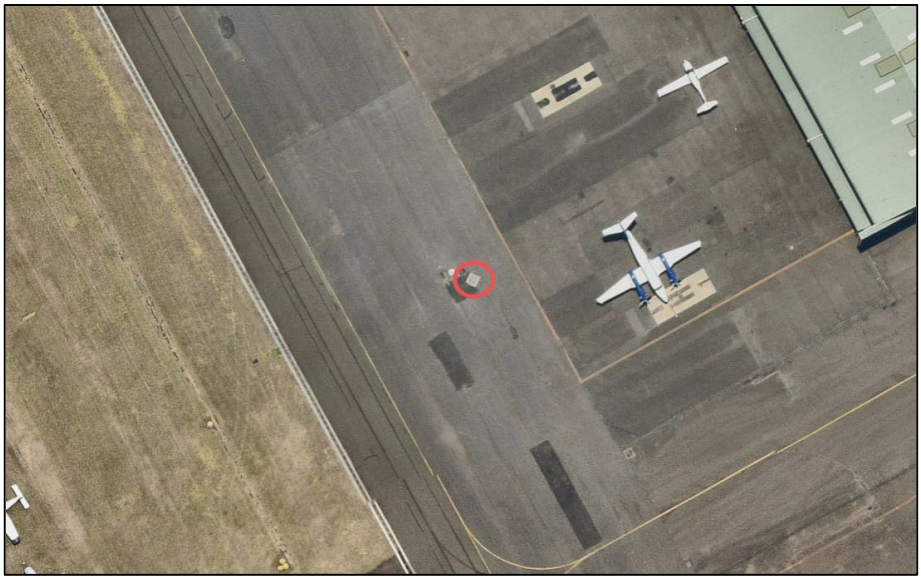


Figure 5 – Aerial of Proposed Sewer Connection



6.0 Telecommunications

There is an extensive existing Telstra and NBN network currently servicing the northern area of the airport.

This existing network provides opportunity for establishment of a telecommunications connection point for the proposed development. As shown in Figure 6 and 7, there is an existing network located east of Hangar 14 which provides the opportunity for extension to the development site boundary.

Figure 6 – Proposed Comms connection Point

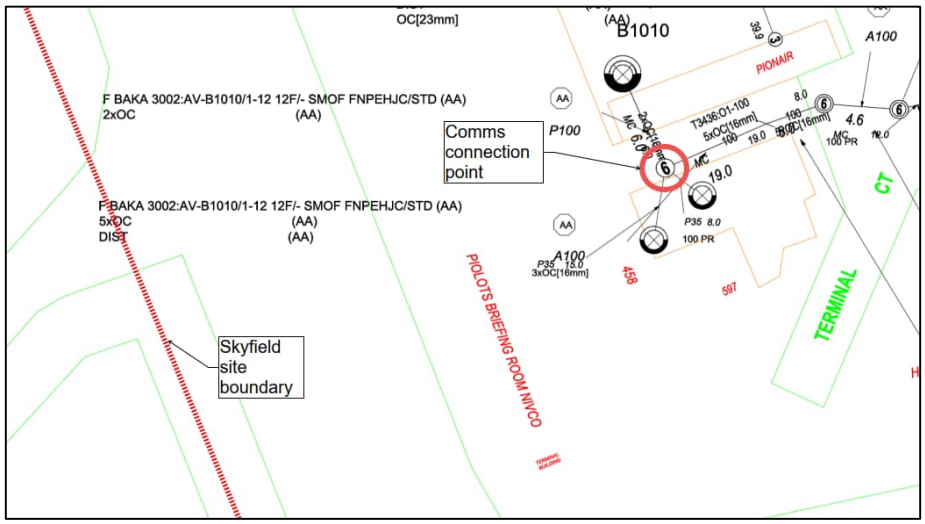
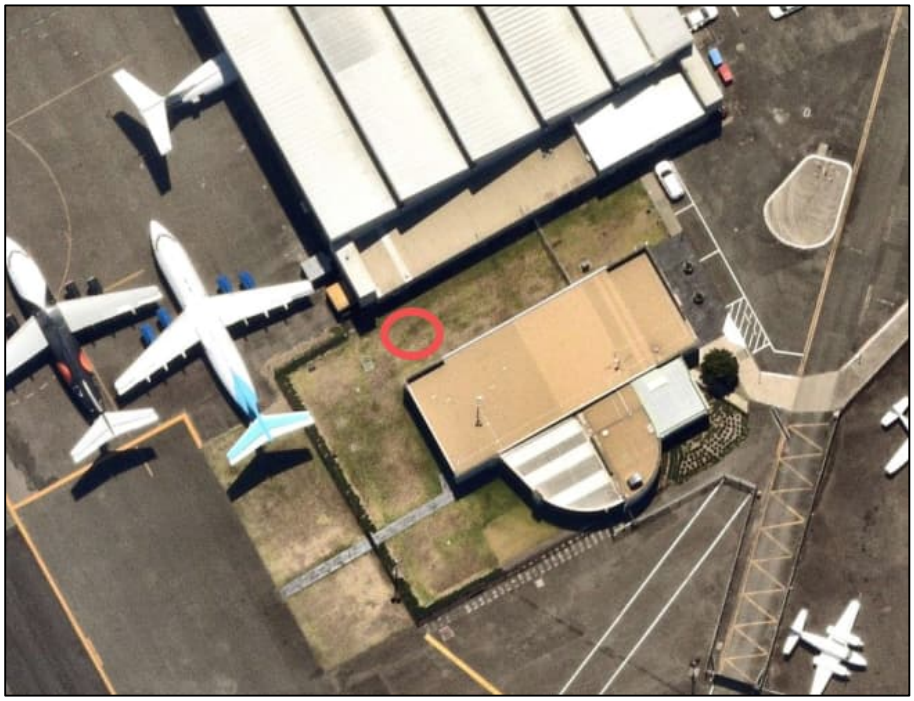


Figure 7 – Aerial of Proposed Comms Connection



7.0 Fire Safety

Fire safety arrangements are considered in relation to supply of water for firefighting to the site and access for fire fighting vehicles. Details of internal fire protection and engineering arrangements are subject to design of the buildings themselves.

7.1 On-site Water Storage Requirements

To address network based fire safety requirements, hydrants and associated storage tanks are required on the site. The requirements for this development have been determined using AS2419:2021 – Hydrant Installations (tables 2.2.5(B) and 2.2.6, and clause 4.2.6.3) and are summarised in Table 3. The tanks have been sized for servicing an area of >10,000m², requiring 3 hydrants.

Table 3 – Tank Sizing Requirements

No. of Hydrants	Hydrant Flow per Hydrant	Total Flow time	Volume required
3	10L/s	4 hours	432kL

A compliant storage configuration will need to meet the minimum 432kL volume required, such as 2 tanks configured as follows:

1. 7.5m diameter and 5m height – 220.8 kL
2. 6.5m diameter and 7m height. – 232.2 kL

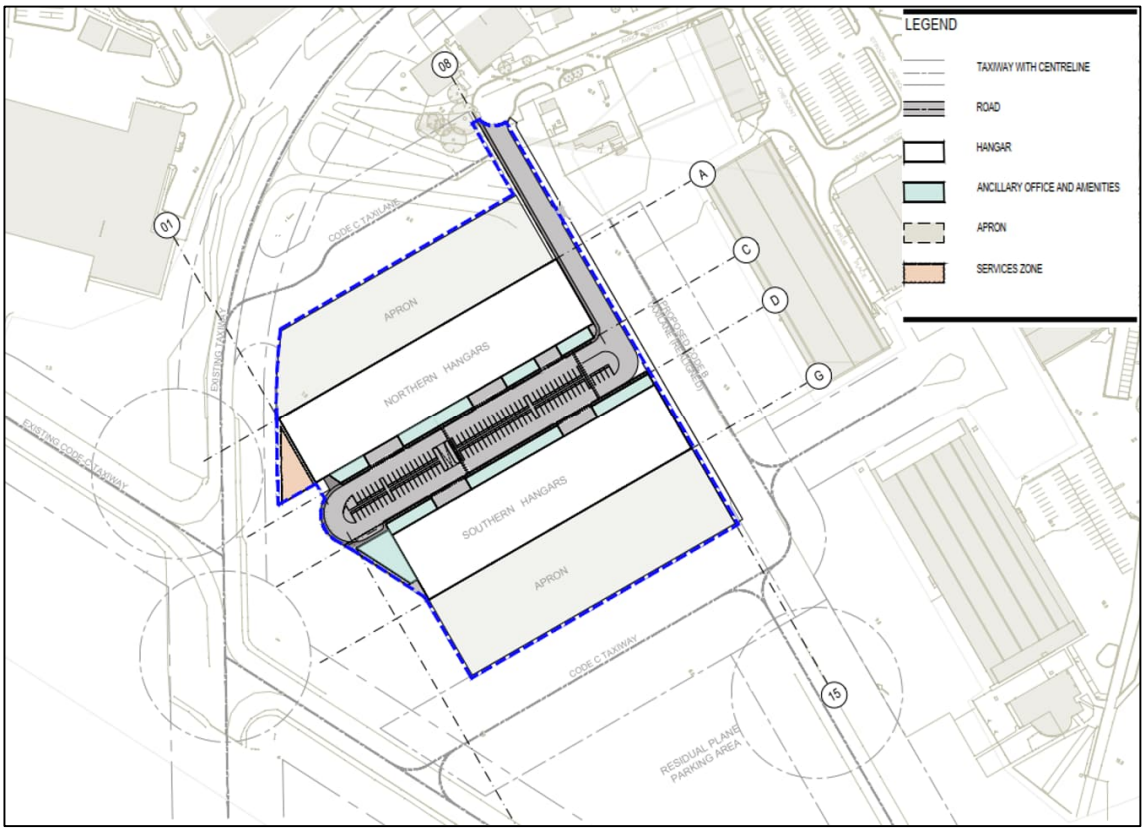
It is understood that the current proposals do not propose sprinkler systems since they are not required on site and as such sprinkler storage requirements have not been allowed in this assessment. If this changes in subsequent stages, the storage may need to increase.

7.2 Emergency Vehicle Access Routes

The external fire safety provisions also include consideration of emergency vehicle access to the development site. As per the current proposed layout and security gate locations, the Aviation Hangar Project site is accessible for emergency Fire brigade vehicles from two different access gates; Avro Street and Airport Avenue.

It is noted that the standard design considerations have been made with respect to emergency vehicle access routes and that the fire brigade will be consulted as required.

Figure 8 – Site Layout of Fire Vehicle Entry Points



8.0 Conclusion

To support the utilities technical input for the Aviation Hangar Project MDP, the following points are summarised:

- Electrical supply to the development can be provided through installation of a new padmount substation within the proposed development site. The padmount substation can be fed from an extension of the existing site 11kV reticulation located to the north of the development.
- Potable water supply to the development is available from the 250mm uPVC Sydney Water main, adjacent to lots 558 and 531.
- Sewer connection for the development can be made to the existing sewer manhole, located adjacent to site 638 and Taxiway K.
- Telecommunications connection is available from the existing network located adjacent to Hangar 14.
- Fire water storage tanks are required to provide a minimum volume of 432 kL for the supply of 3 hydrants. Sprinkler storage is not required on site as it is assumed hangars will not be sprinklered.
- Fire brigade vehicle access can be obtained via Avro Street to the North of site and via Airport Avenue Southeast of site and then continuing through the airfield to new gate.

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