

Project Echidna SSDA
07 September 2023

Shaun Williams
Senior Environmental Assessment Officer
Industry Assessments
Department of Planning and Environment

Your ref SSD-47320208
Our ref Project Echidna SSDA – RtS
File ref Rev 2

Arup
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Dear Shaun,

Project Echidna Data Centre State Significant Development Application (SSDA) Response to Submissions (RtS)

1. Introduction

The purpose of this RtS is to respond to submissions raised by the Department of Planning and Environment (DPE), Blacktown City Council (Council) and government agencies during the exhibition of the SSDA for Project Echidna Data Centre Eastern Creek (SSDA-47320208).

This RtS has been prepared in accordance with the provisions of the Responding to Submissions Guidelines (DPE, 2022). Each of the submissions received has been collated, analysed and addressed (as relevant).

No submissions were received from individuals or stakeholder groups during the exhibition of the SSDA.

2. Response to DPE and Government Agency Submissions

2.1 Department of Planning and Environment (DPE)

A formal submission comprising a letter (dated 17 July 2023) was received from DPE. Comments have been summarised below.

Issue	Comments	Response	Reference
1. Proposed Development	Further information and confirmation is required regarding the types/quantities of major plant and equipment associated with the operation of the development (including, but not limited to, cooling plant and equipment).	Electrical equipment includes: <ul style="list-style-type: none"> • Generators (19 units) • Dry-type transformers (19 units). Mechanical equipment includes: <ul style="list-style-type: none"> • Evaporative cooling air handling units (68 units) serving data halls • Exhaust air fan units (100 units) serving data halls • VRV and Split-DX system cooling units serving office areas. 	NA
	Further information on the processes and functions of the proposed cooling system is required to demonstrate how the system would work to cool the data halls.	The cooling strategy implemented for Project Echidna to cool the data halls uses direct evaporative cooling (DEC) with outside air economisation. No mechanical cooling system involving chillers and refrigerants are used for the data halls. The DEC system consists of a fan, water reservoir and cooling pads. The process involves drawing warm air through the wet cooling pads that cause the water to evaporate and absorb heat from the air, resulting in air leaving the system being cooler. During periods when the outdoor air temperature is lower than the desired indoor temperature, the outside air economisation	NA

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		<p>system will bring in cooler outdoor air into the data hall, bypassing the evaporative cooling system.</p> <p>The proposed DEC system with outside air economisation significantly reduces energy consumption as it does not require chillers or cooling towers to operate. Energy consumption of the cooling unit is attributed to the operation of the fan motors and a small water pump to circulate the water in the evaporative cooling system. In addition, water used in the evaporative cooling system is constantly being recirculated until the concentration of dissolved solids reaches an unacceptable level before fresh makeup water is being added.</p>	
	<p>Furthermore, further information must be provided in relation to the Applicant's consideration of alternative cooling systems/methods and the cost benefits associated with all systems/methods considered by the Applicant, including the proposed evaporative cooling system.</p>	<p>The Applicant's default cooling system used for data halls is with mechanical cooling using air-cooled chillers with outside air economiser. And for the proposal, an alternative cooling system using DEC, with outside air economisation, was being considered.</p> <p>The Applicant's typical data centre uses air cooled chillers with outside air economisers. However, they have investigated the use of the alternative DEC system from an energy consumption perspective and calculated that the proposed DEC system is found to offer 62% reduction in energy consumption compared to the default system with air cooled chillers. This estimated reduction is taken from the Applicant's experience in building data centres using both cooling systems within similar climatic region.</p>	<p>NA</p>

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		<p>In addition, the proposed DEC system does not use refrigerants and consequently the impact to greenhouse gas emissions typically associated with refrigerants used in cooling equipment is absent in Project Echidna. The proposed direct evaporative cooling system is therefore the most suitable cooling system to use for this proposal.</p>	
<p>2. Visual</p>	<p>The Department has a number of concerns in relation to the presentation of plant and equipment (particularly the generator exhaust flues) on the eastern facade of the development, and as demonstrated in Viewpoint 11 of the Visual Impact Assessment prepared by Genton.</p> <p>Further consideration of the potential visual impacts associated with this plant and equipment should be undertaken, including the need for any additional visual mitigation measures (e.g. visual screening, additional landscaping and façade treatment options for the development’s eastern façade).</p>	<p>Visual screening of generator exhaust pipes is shown in SK-01, SK-02 (Appendix E and Appendix F in this RtS). The colour solution for screening is considered as a colour change from the ground level to the sky from dark to light, which will allow mimicking the environment due to the reflection of light and objects around.</p> <p>In addition, the trees along the fence and Old Wallgrove Road are shown in SSDA-A-052-PROPOSED SITE MASTERPLAN (Appendix G). These trees and their crowns will be larger, screening the exhaust pipes of the generator.</p>	<p>Appendix E – SK-01 Overall site sections</p> <p>Appendix F – SK-02 3D Views</p> <p>Appendix G – SSDA-A-052 - PROPOSED SITE MASTERPLAN</p>
<p>3. Noise Impacts</p>	<p>The Noise and Vibration Impact Assessment (NVIA) notes that generator testing during the evening and night-time periods is desired by the Applicant, subject to confirming compliance with the night-time criteria during the development’s detailed design phase. Should the Applicant wish to undertake generator testing during these periods, then the NVIA will need</p>	<p>Predicted noise levels associated with the operation of the proposal will comply with the relevant noise criteria at surrounding sensitive receivers. Assessment of generators during the night-time period is presented in the Detailed Design Report (Project Echidna, Acoustic Design Report, Revision D, dated 17 November 2022). This report is included in Appendix A of this RtS.</p>	<p>Appendix A – Acoustic Design Report</p>

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	<p>to be updated to demonstrate that predicted noise levels associated with these activities will comply with the relevant noise criteria at surrounding sensitive receivers.</p> <p>The Noise Contour diagrams provided in Appendix D of the NVIA only appear to assess emergency back-up generators and does not appear to model all point sources identified elsewhere in the report (e.g. rooftop plant and equipment noise sources). The Department requests updated Noise Contour diagrams be provided that models the predicted noise emissions of all noise sources under a standard 'day-to-day' operating scenario.</p>	<p>The noise contours in the Appendix D Addendum to SSSA Report (dated 8 February 2023) present night-time emissions from both buildings and daytime emissions from both buildings and generator testing. All noise sources have been included in the noise contours.</p>	<p>Noise and Vibration Addendum to SSSA report</p>
<p>4. Air Quality</p>	<p>The Department notes that the development's pollution emissions have been assessed against a worst-case critical power failure scenario in the Air Quality Impact Assessment (AQIA). However, the Department notes that cumulative pollution emissions from approved Building 1 and 1A have not be considered in the assessment.</p> <p>The Department assumes a worst-case critical power failure scenario would also impact the operations of Building 1 and 1A on the site and therefore the Department requests that cumulative impacts of Building 1 and 1A emergency operations be</p>	<p>Under the emergency scenario (power failure), the Air Quality Report (Revision 2, dated 5 October 2022) has considered the cumulative pollution emissions impact from Building 1, Building 1A and the proposal's standby generators combined.</p> <p>This is evidenced in the following sections of the report:</p> <ul style="list-style-type: none"> • Executive Summary (first paragraph under the Pollutant Impact Assessment - Operation); • Section 1.2; • Section 3.2.1; and 	<p>Air Quality Technical Report submitted with the SSSA</p>

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	<p>considered in the assessment of a worst-case critical power failure scenario.</p> <p>The Department notes that the AQIA has modelled the standard operation scenario for a single generator test against either a 70% or 100% load, based on which load presents a greater impact for each pollutant assessed. The Department requests clarification on which load percentage was modelled for each pollutant assessed and subsequent justification for the assessment of the load percentage.</p>	<ul style="list-style-type: none"> Appendix E, showing the modelled stack sources for Building 1, Building 1A and the proposal (Building 2). <p>As per the proposed routine maintenance schedule, the Air Quality Technical Report assessed both of the following testing scenarios, applicable for each Building 1, 1A and the proposal:</p> <ul style="list-style-type: none"> Up to three generators tested concurrently and fortnightly with no load (assumed 10% load in the absence of emission data); and Up to one generator tested during quarterly (with 70% load) and yearly (with 100% load). Note that the load (70% or 100%) with the highest emission rate for each pollutant has been selected in this case to represent worst case scenario. For example, based on Table 11 in the report, a 100% load has been selected for NOx emissions for all generators. A 75% load has been selected for Building 1 CO emission, but the 100% load has been selected for the proposal's CO emission. The same approach has been adopted for the particulate matter. <p>Note that Building 1, 1A and the proposal's generators will not be tested concurrently among one another.</p> <p>The predicted results in Table 17 to Table 24 in the report have shown the comparison between the 3-generators tested and 1</p>	

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	<p>The Department considers there to be a disparity between the predicted incremental and cumulative impacts of pollutants compared between the two generator testing scenarios. The Department requests clarification on the disparity between the predicted results.</p>	<p>generator tested, which indicate compliance against the AQIA for both 3-generators and 1-generator tested arrangements.</p> <p>The dispersion modelling took into consideration hourly background concentrations of NO₂ and O₃ (for the OLM method), contemporaneous with the hourly meteorological data. In order to find the highest (100th percentile) concentration impact at a particular receiver, the model will scan hourly of met data within a year to determine the worst combination of meteorology, background NO₂ concentration and O₃ background concentration (for NO_x photochemical conversion to NO₂) data, along with emissions from sources (which are modelled as constant).</p> <p>For example, for three generators tested, the incremental concentration level of 53.7 ug/m³ at C1 occurs on 8pm, 16 April 2017 (from Project Echidna, Stack ID 1,2 and 3 combined), whereas inclusive of background concentration, the highest cumulative concentration level of 112.8 ug/m³ at C1 occurs on 8pm, 22 September 2017 (from Project Echidna, Stack ID 1,2 and 3 combined).</p> <p>Similarly for the single generator tested, the incremental concentration level of 111 ug/m³ at C1 occurs on 8pm, 29 October 2017 (from SYD701 building, Stack ID 1), whereas inclusive of background concentration, the highest cumulative concentration level of 127 ug/m³ at C1 occurs on 7pm, 16 July 2017 (from SYD701 building, Stack ID 1).</p>	

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		<p>Based on the above explanation, due to the contemporaneous hourly background concentration and meteorological data, the incremental and cumulative concentrations are not proportionally related. As noted above, the same cumulative values are due to the contemporaneous assessment method of hourly background concentrations, ozone concentrations and meteorological data at each receiver. This has resulted in similar cumulative concentrations, even if the incremental concentrations are different.</p>	
<p>5. Traffic Impacts</p>	<p>The Department notes in the Traffic and Transport Technical Report, that Table 4.2 of the identifies the traffic generation numbers of the development and Table 4.3 identifies the cumulative development trips of the development. Please clarify why the number of traffic generated by the development provided in Table 4.2 appears to be less than the cumulative development trips provided in Table 4.3.</p>	<p>As shown in the Traffic and Transport Technical Report (dated 13 March 2023), Table 4.2 outlines trips generated by the proposal, which represents additional traffic than Table 4.3 which relates to the impacts of cumulative development.</p> <p>The reason the proposal generates more trips than the cumulative development (Building 1/IA) is due to the size of proposal (which is 1,711sqm compared to Building 1). Therefore, the proposal requires additional staff to operate the building and creates higher demand for parking and generates more trips.</p>	<p>Traffic and Transport Technical Report submitted with the SSSA</p>
<p>6. Greenhouse Gas and Sustainability</p>	<p>The Department requests the Applicant provide an assessment of renewable energy opportunities that could be incorporated into the development, to help reduce the volume of greenhouse gas (GHG) emissions associated with its operation. The assessment should discuss the costs and benefits of identified renewable energy technologies and justify why the identified</p>	<p>GHGs reduction opportunities and commitments being applied to the proposal are included in Appendix D of this RtS and have been developed with a focus to reduce greenhouse gas emissions associated with the proposal's operation. The proposal has been designed to minimise carbon emission across all the life cycle of the proposed data centre.</p>	<p>Appendix D – Project Echidna GHG Reduction Opportunities and Commitments</p>

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	technologies will/will not be incorporated into the design of the development.		
7.Management and Mitigation Measures	In light of the comments provided above, the list of management and mitigation measures provided in Part G of the EIS should be updated to reflect any corresponding updates to the technical reports (including any operational mitigation measures for air quality/emissions). The updated list should be provided in both Microsoft Word and PDF formats.	No additional management and mitigation measures are required as part of this RtS.	NA

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	<p>buildings on site, when functional, has not been appropriately addressed.</p>	<p>5pm) and visitors are expected to come to the site throughout the office hours.</p> <p>As requested by Council during the meeting on 4 August 2023, an indicative roster has been prepared detailing shift times for the proposal and is included in Appendix C of this RtS.</p> <p>At any one time it is expected to have 48 office staff, 21 non-office staff and 6 visitors on site. Staff have a car mode share of 90-97%. This results in a parking demand of 70 spaces for the site.</p> <p>The original traffic assessment and the technical note in the Concept Design Approval have a parking demand of 60 spaces and proposed 64 spaces be provided on the site. These parking spaces were constructed as part of the recent works on the site.</p> <p>Project Echidna proposes 70 car parking spaces for the site to meet the demand. This means that additional 6 spaces are required on the site and are proposed to be constructed as part of and within Project Echidna. The remaining car parking space demand for the proposal (32 spaces) is provided in the original car parking quantum.</p> <p>A table has been attached to this report in Appendix B which breaks down the staff number, parking demand and</p>	

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		proposed car parking for the site for the Concept Design Approval and for the site, including Project Echidna.	
	b. A building height of 22.26m has been approved under SPP-19-00013 for Building 1, and also for the concept Building 2 (proposed data centre). The proposed building height is 25m, exceeding the concept approval. A height difference of 2.74m at this scale is significant. The applicant must provide revised elevations to re-consider the context of the proposed data centre in relation to the approved buildings on site.	<p>The height of the proposed data centre building from ground level to the parapet is 21.20 m (see Elevation Drawings SSDA-A-200, and SSDA-A-201).</p> <p>The height of 25 m represents the height of the generator exhaust pipes. Exhaust pipes in the proposed data centre building are lower than those listed in the Concept Design Approval (see Drawing SK-01 Overall site sections). Additionally, only Building 1 had nominated heights in the Concept Design Approval.</p>	<p>Elevation drawings submitted with the SSDA (Drawings SSDA-A-200 and SSDA-A-201)</p> <p>Appendix E - SK-01 Overall site sections</p>
	c. The proposal seeks to fill ground levels higher than the previous existing ground levels. The proposed ground level (70.00m) of the data centre is 1.1m higher than the ground level (68.90m) approved under SPP-19-00013 and subsequent modifications. The finished floor level of the centre should be dropped to reduce the overall bulk of the centre and decrease the impact on views in the area.	<p>The RL68.90 represents the approved Ground Floor Level for Building 1 (Concept Design Approval). The site location for the proposed second building (Project Echidna) has an existing site level of circa RL71.00 (much higher than the Building 1 location).</p> <p>Arterial road civil levels and stormwater drainage levels have informed the proposed ground floor level of RL70.00 (refer to Drawing SK-01).</p>	Appendix E - SK-01 Overall site sections
	d. The applicant must provide shadow diagrams for us to consider the shadow impacts.	Shadow diagrams have been prepared and are provided in Appendix I of this RtS.	Appendix I - SSDA-A-303 - SHADOW DIAGRAMS

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	e. The applicant must provide a revised site plan to indicate all the approved setbacks on plan.	Setbacks are shown for the approved building, and distances between buildings have also been included (see Appendix G - SSDA-A-052).	Appendix G - SSDA-A-052 - PROPOSED SITE MASTERPLAN
	f. Screening for the proposed data centre to the east and north is not satisfactory. The proposal to remove the approved median landscape zone between the proposed data centre and future substation, Building 1A and Building 1 is not supported.	<p>Screening to the north and east are consistent with the west and south (roof plant appropriately screened) (see Drawings SK-01 and SK-02).</p> <p>The median landscape area between the proposed data centre building and the substation has been removed to allow for vehicular traffic. Landscape areas have been relocated to more suitable locations near the second entrance to the proposed data centre building as shown on the site plan. The relocated landscape area is larger than the area specified in the Concept Design Approval. The approved landscape (SPP-19-00013, 2019) is 5,142 m². The latest approved landscape (MOD-21-00447, 2021) is equal to 5,462 m². Therefore, the landscape area between buildings should be 320 m² based on the above calculations. The proposed landscape in Project Echidna is 657 m² (see Drawing SSDA-A-052), which is larger than required (320 m² as noted above).</p>	<p>Appendix E - SK-01 Overall site sections</p> <p>Appendix F - SK-02 3D Views</p> <p>Appendix G - SSDA-A-052 - PROPOSED SITE MASTERPLAN</p>
	g. DA-20-01387 was approved on 23 December 2020 for installation of 4 temporary electricity kiosks within the front landscape setback of the proposed data centre. The applicant	The kiosks were temporary. These were to be decommissioned, removed and landscaping reinstated upon either the 2 years validity of the consent lapsing, or once the development works for a permanent substation in Stage 2 as	NA

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	<p>must address the relevance of that consent within the proposed development.</p>	<p>approved under SPP-19-00013 are complete and permanent power supply is available, whichever occurs earlier.</p> <p>Two years have passed from the date of consent and the development of permanent power supply has been lodged under a separate approval (DA-22-01312).</p>	
	<p>h. The applicant must address urban heat in the context of Western Sydney's climate. In this regard:</p> <ul style="list-style-type: none"> • it must be demonstrated that the roof of the data centre and associated buildings will utilise high albedo and high reflective emittance roofing materials in accordance with Blacktown City Council's Responding to Climate Change Strategy (https://www.blacktown.nsw.gov.au/About-Council/What-we-do/Environmental-Plans-and-Policies#section-2). • internal roads and hardstand surfaces must also utilise high albedo and high reflective emittance colours and materials. • additional tree planting shall be provided around the car parking areas. 	<p>Roof plant is generally galvanised steel construction. In addition, PV panels will be installed on the roof.</p> <p>Roof membrane (to be confirmed during detailed design) will be specified in a light (reflective) colour. This also benefits the product lifespan.</p> <p>All footpaths and walkways will be made of concrete. Internal roads and hardstands (proposed road and pedestrian pavements) will also be made of concrete. Concrete pavements have a higher albedo and reflectivity than an alternate asphalt finish.</p> <p>The Proposal provides for 6 additional parking spaces, which are located in the immediate vicinity of Building 2. Planting tall trees would interfere with building maintenance, such as replacing large equipment that utilises cranes. The proposed landscape area occupies the maximum possible area and is larger than the area of the Concept Design Approval.</p>	<p>NA</p>
	<p>a. Hardstand site coverage with this proposal is approximately 9,225m². This, on top of previously approved development</p>	<p>Due to the proposed building typology (large, isolated building) requiring trunk roads around the buildings for fire</p>	<p>NA</p>

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2. Natural areas and biodiversity	<p>across the lot, would result in very small areas on site available for landscaping or outdoor communal areas, and minimal areas of deep soil available for trees to provide shade and ameliorate heat. Concern is therefore raised to the high proportion of hardstand, building and road coverage on site with the addition of the data centre as proposed. Opportunities to increase lot boundary setbacks, increase distances between buildings and plant trees in car parks should be explored.</p>	<p>brigade access, and logistical access requirements for large articulated vehicles, the access road is larger than most industrial sites.</p> <p>As noted above, the proposal provides 6 additional parking spaces located in close proximity to the proposed Building 2. Planting trees around the car parking spaces might lead to difficulties in transporting equipment by cranes during the operation of the building (e.g. replacement of equipment).</p> <p>The rest of the parking spaces related to the Concept Design Approval. The road surface is made of light-coloured concrete, the roof waterproofing material is also light-coloured.</p>	
	<p>b. Open car parking areas should be landscaped to reduce the impact of hard paving. Established tall trees with wide-spreading foliage provide desirable shade and reduce the effects of heat in open car parking areas at a ratio of one (1) tree per three (3) carparks at minimum container size of 45L at the time of planting.</p>	<p>Addressed in response above.</p>	
	<p>c. The applicant must provide a Soil and Water Management Plan for implementation prior to the construction of the development, with adequate erosion and sediment control measures implemented.</p>	<p>To be included as a condition of consent. No response required.</p>	

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	<p>supply shall be separated with any other water supply including the cooling facility.</p>	<p>Calculations are provided in Appendix L in this RtS.</p>	
	<p><u>c. Drainage</u></p> <p>i. Detailed roof and gutter plan shall be provided.</p> <p>ii. DRAINS model shall be provided to confirm the drainage design and the connection in to Council's easement.</p> <p>iii. Any amendment to Council's trunk drainage needs to be approved by our Asset Maintenance team.</p>	<p>i. Hydraulic services drawings provided in Appendix M - Echidna-ARP-01-00L-DR-H-3000_OVERALL GROUND FLOOR SOILS & WASTE WATER LAYOUT [D] indicating roof and gutter design.</p> <p>ii. Drains models provided. Refer TO Appendix O - Echidna DRAINS model_Tender Proposed (with existing) 230227.drn".</p> <p>iii. Amendment to Council's trunk drainage is limited to the adjustment of pit lids to suit design surface levels. Suggest provision of design for the adjustment be a condition of consent.</p>	<p>Appendix M - SYD057-ARP-01-00L-DR-H-3000_OVERALL GROUND FLOOR SOILS & WASTE WATER LAYOUT [D]</p> <p>Appendix O - DRAINS model_Tender Proposed (with existing) 230227.drn</p>

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4.Environmental health	a. The applicant must provide a revised noise and vibration assessment which includes modelling the worst-case scenario in relation to emergency operation.	As noted above, assessment of generators during the night-time period is presented in the Detailed Design Report (Project Echidna, Acoustic Design Report, Revision D, dated 17 November 2022). This report is included in Appendix A of this RtS.	Appendix A – Acoustic Design Report
5. Traffic	a. The applicant must provide a parking layout plan to assess compliance with Australian Standards.	Refer to Appendix H – SSDA-A-302 showing the proposed car parking spaces with dimensions as required.	Appendix H – SSDA-A-302 - PROPOSED CAR PARKING SPACES

2.4 Submissions from Other Agencies

Submissions from other agencies included suggested conditions of consent (which required no response) or no comments, as outlined below:

- **Fire and Rescue NSW (FRNSW)** – Letter dated 23 June 2023 with suggested conditions of consent.
- **NSW Environment Protection Authority (EPA)** – Letter dated 5 July 2023 with no comments.
- **Sydney Water** – Letter dated 30 June 2023 with suggested conditions of consent.
- **Transport for NSW (TfNSW)** – Letter dated 5 July 2023 with suggested conditions of consent.

3. Supplementary Information

Supporting documentation submitted with this RtS and referenced above includes the following:

- Appendix A – Acoustic Design Report
- Appendix B – Staff and Parking Calculations
- Appendix C – Indicative Roster
- Appendix D – Project Echidna GHG Reduction Opportunities and Commitments
- Appendix E – SK-01 Overall site sections
- Appendix F – SK-02 3D Views
- Appendix G – SSDA-A-052 - PROPOSED SITE MASTERPLAN
- Appendix H – SSDA-A-302 - PROPOSED CAR PARKING SPACES
- Appendix I – SSDA-A-303 - SHADOW DIAGRAMS
- Appendix J – MUSIC Model Results
- Appendix K – ECHIDNA-AUR-XX- XX-DR-C6026 & 6027
- Appendix L – Rainwater Harvesting - Excluding Industrial Water Requirements
- Appendix M – Echidna-ARP-01-00L-DR-H-3000_OVERALL GROUND FLOOR SOILS & WASTE
- Appendix N – PMF Overland Flow Technical Note
- Appendix O – Echidna DRAINS model_Tender Proposed (with existing) 230227.drn

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If you require any further information, please do not hesitate to contact the undersigned to discuss.

Yours sincerely,

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Associate | ARUP

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