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1st August 2025

Enquiries: Meisha Stevens
Project No: 301351444

James Woods
CDC Data Centres

Attention: James Woods

RE: CDC Marsden Park
Acoustic Impact Assessment

In regards to the Data Centre precinct located at 105-113 Hollinsworth Rd, Marsden Park, Stantec would like to request the conditional approval for the operation of the development based on the assumptions and conditions presented in the Stantec Acoustic Report *"AC-RE-SSDA_009"* dated 01/08/2025.

As part of our Response to Submissions, Stantec recently conducted additional noise monitoring to re-establish project noise trigger levels representative of the local noise environment for sensitive receivers. The results indicated a decrease in daytime noise criteria in comparison to previous data, noting evening and night-time remained unchanged. Reviewing the trends of the recently conducted noise monitoring shows a significant lull in the L90 noise level between approximately 9:00am - 3:00pm (typical on most days during the monitoring).

Based on the additional noise monitoring, the criteria for day-time has reduced resulting in a negligible (2dB) exceedance for the day ultimate (Stage 3) operational conditions (Scenario 1) when predicted to the most affected noise sensitive receivers. The Evening operational condition (Scenario 1) for Stage 3 continues to have no exceedances, whilst the night time for the same condition is demonstrating a 1dB exceedance during a temperature inversion only and compliance in all other meteorological conditions.

Feedback from the department has insisted that all reasonable and feasible mitigation has been adopted and Stantec believes to this point these avenues have been exhausted. This letter, read in conjunction with the latest report will outline the extents to which have been implemented to mitigate the noise as much as reasonably practicable. The table of reasonable and feasible mitigation has been included in the appendix of this letter for reference.

A summary of mitigations that have already been included in the acoustic modelling include:

- Orientation of chillers to optimise shielding and line of site so that noisiest side is away from residents
- The chiller stacks to the top of the units, have been effective to the point in our calculations that the contribution from the tops of the chillers is not the driving contributor of chiller noise at receivers – the sides of the chillers are much greater contribution and as such, further mitigation to the chiller tops/ exhaust does not further reduce our overall noise.
- The noise from the chiller sides, has been further attenuated (beyond the attenuation that the supplier has proposed) by adding an enclosure to the condensers.
- The chiller supplier has already undergone rigorous R&D in order to optimise the enclosures and units themselves to reduce the noise as much as practical; this process took several months and was undertaken last year in order for us to use the lowest possible noise levels available. Noting that the original units proposed for this project where much louder, we can confirm that the reduction from chiller noise has been thoroughly considered and exhausted. Ie original units lowest possible offering from Mitsubishi was 102dB(A) vs the current spec from Schnieder Electric at 100dB(A) SWL, with further optimisation and reduction for

evening and night at 96db(A) and 95db(A) – these have been verified with the max temperatures for the relevant periods using weather data over the past 5 years.

- Barrier extents have been completely exhausted in order to retain the airflow requirements. As such the multiple layers of barriers have been implemented to reduce any line of sight as a result of gaps below the chiller deck in some sections.
- Generators have now been updated to be modelled as industrial building sources, providing optimisation from the shielding of the units themselves, again optimising the orientation of surfaces with louder noise levels facing away from receivers.
- Generator manufacturer has also been engaged to provide optimal attenuation and performance to CDC, including acoustic enclosures, acoustic louvres and attenuators.
- Transformers have been significantly attenuated by a series of barriers to attenuate as much as practical the noise contribution from these units.
- Options for additional barriers within the nature strip between the site and Hassall Grove residential estate have been investigated – noting insignificant return – ie 10m high barrier with a less than 1 dB reduction. This is not reasonable or feasible due to the significant of the structure size and the impact on shade this would have on the residents- therefore the option has been excluded.
- Additional options available to CDC if exceedances are recorded during operation include a BMS to manage the chillers so the ones furthest away from sensitive receivers are operated under worst case weather conditions limiting impact.

Despite the predicted noise level exceedance we believe that this should be considered as acceptable by the Department for the following reasons.

1. All reasonable and feasible mitigation measures have been considered. (Listed in Section 5.3.3 of the Stantec Acoustic Report and shown in Appendix to this letter).
2. The predicted exceedance is minor and will not result in offensive noise as defined in the POEO Act 1997.
3. Table 4.1 of the Noise Policy for Industry defines an exceedance of up to 2dB as *"negligible"* and *"would not be discernible by the average listener and therefore would not warrant receiver-based treatments or controls".*
4. Noise exceeding the project noise criteria during the day has less impact than during the night as per Section 2.3 of the Noise Policy for Industry which states the following *"In some rural situations, the RBL may be the same for the day, evening and night. In these cases, it is recognised that excursions of noise above the project intrusiveness noise level during the day would not usually have the same impact as they would during the evening or night. This is due to the more sensitive nature of activities likely to be disturbed at night (for example, sleep and relaxation)".* Noting the site is not rural, the sensitivity around day and night and human activity is relevant to typical residential receiver (ie sleeping and relaxation at night etc).
5. The exceedance only occurs considering extreme weather conditions for modelling (i.e. 46°C day-time ambient temperature). The re-established noise levels were undertaken in winter, where the maximum daytime temperature was recorded at 26.2°C. The night time chiller levels (set for worst case 28°C) are 5dB lower than the day time mode. By this logic, on cooler days, the chillers would be up to 5dB quieter *each*.
6. The context of the exceedances and manner in which we have been asked to demonstrate worst case conditions matter:
    a. In winter (when the background noise was established) sound can travel farther due to temperature inversions (which have been modeled) but we know the cooler ambient conditions means the chillers will NOT be operating at the maximum capacity which has been asked to be presented.
    b. During the summer months, sound will be affected by how far it travels due to the warmer air at ground level which can cause sound to refract upwards and can make sound sources at a distance seem quieter. It is also noted that background noise in summer is likely to be higher (especially in

Australia) where most houses will run some form of air conditioning, pools with pumps etc increasing the noise levels within the residential suburb, as well as the increase in activity as more people are out and about, walking, in the park, gardening etc, the outdoor activity increases and so does the ambient noise level during these hotter months.

c. To summarize: Our model shows the worst case ambient SUMMER condition for chiller operation and have been assessed against a lower WINTER background noise level. In actual operation, the differences in background noise and actual noise emissions from the site will be more aligned ie, the maximum operational noise of chillers would be against a higher ambient noise level, and the lower noise level (current PNTL) would be against a much lower ambient operating temperature for the chillers.

7. It is noted that lowest currently available chiller data has been used in the model, and that CDC will has a target of reduction to this for any newly procured chillers ie for stages 2 and 3. Stantec recommends compliance will be achieved in all operational conditions with chillers no more than 98dB (A) SWL – a 2dB reduction on the currently nominated units. We understand technology is evolving in this space, and CDC has an obligation to explore all future opportunities to meet these reduced noise level targets.

Table 4.1: Significance of residual noise impacts.

If the predicted noise level minus the project noise trigger level is:	And the total cumulative industrial noise level is:	Then the significance of residual noise level is:
≤ 2 dB(A)	Not applicable	Negligible
≥ 3 but ≤ 5 dB(A)	< recommended amenity noise level or > recommended amenity noise level, but the increase in total cumulative industrial noise level resulting from the development is less than or equal to 1dB	Marginal
≥ 3 but ≤ 5 dB(A)	> recommended amenity noise level and the increase in total cumulative industrial noise level resulting from the development is more than 1 dB	Moderate
> 5 dB(A)	≤ recommended amenity noise level	Moderate
> 5 dB(A)	> recommended amenity noise level	Significant

Note: This approach is designed for new and substantially-modified developments and should be applied with caution to assessments of existing operations.

Examples of noise mitigation at a residence that **may** be required by planning authorities to mitigate residual noise impacts are outlined in Table 4.2.

Table 4.2: Examples of receiver-based treatments to mitigate residual noise impacts.

Significance of residual noise level	Example of potential treatment
Negligible	The exceedances would not be discernible by the average listener and therefore would not warrant receiver-based treatments or controls.
Marginal	Provide mechanical ventilation/comfort condition systems to enable windows to be closed without compromising internal air quality/amenity.
Moderate	As for 'marginal', but also upgraded façade elements, such as windows, doors or roof insulation, to further increase the ability of the building façade to reduce noise levels.
Significant	May include suitable commercial agreements where considered feasible and reasonable.

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Additionally, there are expected to be some noise exceedances to the noise criteria for the proposed routine testing of the back-up generators (scenario 2). A summary of these exceedances is shown below. It is our opinion that these exceedances are also acceptable for the following reasons.

Table 1 - Scenario 2 Exceedances Summary

Stage	Decibel of exceedance	Number of residences impacted
1	1	7
2	1	16
	2	10
3	1	34
	2	31
	3	13

It is noted that no testing and maintenance (Scenario 2) for any stage has an exceedance of low frequency criteria by more than 5 dB, and as such, no daytime low frequency penalty is applied.

1. All reasonable and feasible mitigation measures have been considered. (Listed in Section 5.3.3 of the Stantec Acoustic Report and Appendix of this letter)
2. There is no noise criteria is NSW that specifically relates to intermittent/maintenance of backup generators
3. The generators are in place to protect life and property and maintenance is essential to provide safety.
4. Testing is scheduled to be during the day time only to minimise adverse noise impacts.
5. The testing and maintenance scenario for generators (Scenario 2) is presented as exceeding up to 3dB at 13 identified receivers. This exceedance is only expected for a short duration (up to half an hour per month).
6. More common occurrences of 1 – 2 dB exceedances have been identified at the first row of houses directly south of the data centre development. This is expected to occur up to 6 hours a month which is representative of 0.8% of the year. Stantec believes that all of the calculations shown are overly conservative and the following points which are not captured in the noise model should be considered when looking to validate the approval:
    a. Generators are using a sound spectrum provided by the manufacturer running at 100% load, whilst the actual monthly testing is planned to take place between 25% - 50% load only. Research suggests that typically generators operating at a 50% load reduction can result in a decrease of approximately 3dB(A). This has not been applied to our model in absence of manufacturer specific data but should be considered.
    b. Generator Testing will not occur on days which exceed 30°C (due to health and safety requirements), and therefore the chillers associated with site operation will be running at a lower load and consequently lower cumulative noise levels.
    c. In the acoustic report, Stantec have provided additional assumptions around typical day time operation by which the chillers will be operating at a lower noise level based on the historical weather data for lower ambient temperatures. These adjustments which have been provided in order to reduce conservativeness and demonstrate full compliance for Scenario 2 for all stages. These corrections mean that the overall noise level even during maintenance should not give rise to exceedances when the site is in operation.

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Furthermore, Stantec have proposed additional noise monitoring to be carried out in accordance with Section 7 (Monitoring Performance) of the NSW Noise Policy for Industry (2017), which recommends implementing a monitoring program to confirm predicted noise levels and demonstrate compliance with the project noise criteria.

Monitoring at various stages of the project will verify that noise emissions remain within the levels assessed and modelled. This approach allows proactive identification of any exceedances or unforeseen impacts and provides a basis for implementing additional mitigation measures if necessary, thereby ensuring that noise impacts on nearby sensitive receivers are effectively managed and controlled over the life of the facility. The specific monitoring procedure is shown below:

- Noise monitoring to take place 'day negative 1' to establish the noise level in the absence of operational load, and again at day 1 with the site in operation. Once the data center starts to operate, we cannot turn the equipment off and on to calculate the contribution levels, we will use the day negative 1 measurements as a benchmark and aim to undertake monitoring in similar conditions on multiple occasions including at 3 months, 6 months and 12 months post completion to ensure there is no significant noise creep associated with the site.
- Monitoring to be conducted at 2 locations; one which is representative of the sensitive residential receivers, and one which is within the site boundary / perimeter. This will be to establish a consistent location at a quantifiable distance from the industrial noise sources, as well as the background noise at a distance in the residential estate. This way the contribution can be calculated from the site and filter out any extraneous noise which may have increased the background noise in the area over time (i.e. new developments, increase in traffic, residential activities etc.).
- Check points for each stage can be included to ensure stage 1, 2 and 3 are able to be monitored and validate the predictions in the noise model as they come online.
- If any receivers are identified and validated as exceeding the scenario 1 operation noise level by 3 dB or more, the operator will be responsible for mitigating the impact to the receiver by means of upgrades to facade elements and mechanical ventilation and air conditioning systems if not existing.

In summary, this letter demonstrates that all feasible and reasonable measures have been applied to minimise the potential noise impacts from the proposed data centre. The identified exceedances are minor, occur only during only worst-case conditions or short-duration maintenance activities, and are consistent with the NSW Noise Policy for Industry. A monitoring program will verify compliance and ensure any unforeseen impacts are addressed, supporting effective management of noise emissions throughout the project lifecycle.

Please do not hesitate to contact the undersigned if you have any queries.

Yours sincerely

STANTEC AUSTRALIA PTY LTD

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APPENDIX

Table 2: Feasible and Reasonable mitigation test (Extracted from Stantec Acoustic Report)

Mitigation option	Feasible mitigation test	Reasonable mitigation test	Justification for adopting or disregarding this option
Mitigation at source			
Option1: Using the quietest Plant that can do the job BATEA – best available technology economically achievable	Selecting the quietest units is a feasible mitigation measure that has been conducted during the investigation of equipment procurement. This option is a practical and cost effective solution for reducing operational noise from the proposed development. Sound Level has been provided by manufacturers based on rigorous R&D.	This is considered a reasonable mitigation approach. Prioritising quieter units ensures long-term noise reduction without relying solely on secondary controls.	**Yes -** Rigorous R&D has been undertaken by the chiller supplier in order to optimise the enclosures and units themselves to reduce the noise as much as practical. Noting that the original plant proposed for the project were notably louder. The noise reduction from the chiller noise has been thoroughly considered and exhausted. Further optimisation and reduction for the evening and night time periods (where the chillers are operating at lower ambient temperatures) has been factored in for the selected units.

Option 2: Chiller Stack installed to the top of the chillers and enclosure installed around the compressor of each chiller	Proprietary product is easily obtainable and installed to chillers. Offers significant attenuation and is considered feasible from an installation and cost perspective.	Product is required 1 per chiller resulting in significant uplift of cost. The mitigation provides a significant benefit to the surrounding receivers.	**Yes -** Chiller stacks have been included as they provide a significant amount of attenuation from the top of the chillers, and compliance with the project criteria would not be possible without it. As the treatment is required to be installed on each chiller, there is expected to be significant cost associated with this, however, are still considered reasonable given the benefits they provide to the noise environment.
Option 3: Installation of discharge cowls (to redirect noise away from sensitive receivers)	Chillers would need to increase in size to allow for the static pressure drop caused by the cowl, resulting in louder equipment.	This option was not deemed reasonable due to the operational impacts on the chillers and the airflow requirements.	**No –** This option has not been adopted on the basis of the impacts to the operational conditions of the chillers. Installation would require selection of larger equipment and resulting in higher level of noise emissions. As noted in option 2, the chiller stacks have been effective in mitigating the noise from the top of the units and are no longer the driving factor in perceived noise at the residents.

Option 4: Acoustic Enclosure and attenuators installed to the generators	Manufacturers test data provided has included acoustic enclosures and attenuators to the generators in order to meet the noise levels presented. These options are considered feasible and to be included upon manufacturing of the units and delivered as a complete package.	Unit is supplied as a complete package with the prescribed mitigations in order to minimise noise emissions from the units. As they are provided as one packaged unit, it has been deemed reasonable for ease of installation on site.	**Yes -** The Acoustic Enclosures are included for the project as being provided as a whole system by the manufacturer. The attenuation provided by this treatment significantly decreases the impact of the generators. Whilst exceedances are still expected, the impact without these treatments are considerably higher to the surrounding local environment.
Option 5: Barriers to Generators	Installation of additional barriers to the generators are not deemed feasible. Due to Double stacking of generators the height required to get any meaningful attenuation from barriers would require significant structural uplift and footings to support the barrier structures. This would also incur a significant cost uplift to account for wind loading and structural support of the barriers.	As the generators are proposed to only operate in specific conditions, the impact from these sources on receivers are expected to be short term. Justification for additional treatments beyond what has been proposed for the generators is not deemed reasonable.	**No -** The barriers for the generators have not been included as part of the mitigation for the proposed development. The standard testing/maintenance scenario of the generators is expected to exceed the noise limits established for the project (by up to 2dB which is not expected to cause any significant adverse impacts) It is not deemed practical to install given the cost associated with installation given how infrequent the use of the equipment is expected to be.

Option 6: Scheduling the use of noisy equipment at the least-sensitive time of day	This is considered a highly feasible mitigation strategy (when considering maintenance and testing of generator equipment) and typically only requires administrative controls and coordination, not physical modifications or treatment. The data centre operation is continuous across a 24hr period. Reductions to noise emissions have been investigated for sensitive periods.	Reasonable to include, particularly in environments where noise sensitivity varies throughout the day. By aligning noisy operations with periods of reduced sensitivity, the strategy minimizes disturbance while allowing necessary tasks (i.e. maintenance) to proceed without significant delay.	**Yes -** Noisy equipment associated with testing and maintenance has been limited to the day-time (least-sensitive) period to minimise impact to the surrounding sensitive receivers.
Option 7: Not operating, or reducing operations at night	Optimisation and reduction for the evening and night time periods (where the chillers are operating at lower ambient temperatures) has been factored in for the selected units.	Reasonable to reduce the operation during the evening and night time periods where less demand for cooling is placed on the development.	**Partial -** Reductions to the noise emissions for the evening and night-time periods has been accounted for in the model. Furthermore, investigation into the maximum reduction of the quantity of units has been conducted and implemented into the model. It is not practical for the development to not operate are night.

Option 8: Orientation of equipment so that noise emissions are directed away from sensitive areas	Orienting equipment to direct noise away from sensitive areas is a feasible and low-cost mitigation measure.	Reasonable mitigation strategy, particularly for the residential zone within Hassall Grove to the south.	**Yes -** Chillers have been oriented as such to have noisier sides of the equipment facing away from the most sensitive receivers. Where possible, the site layout has been designed so that the buildings and chillers themselves screen the noisier areas of the development from the most affected sensitive receivers as much as practical.
Option 9: Where there are several noisy pieces of equipment, scheduling operations so they are used separately rather than concurrently	It is not deemed feasible or reasonable to run noisy pieces of equipment associated with the typical operations of the development (Scenario 1) as the data centre is proposed to operate consistently over a 24 hour period. However, it may be feasible and reasonable to include operational management strategies to minimise impact to noise sensitive receivers (such as operating units further away from noise sensitive receivers during temperature inversion events)		**Yes -** In the event of exceedances in progressive stages of the development, an automatic control system via the BMS to manage the chillers so the furthest units from the sensitive receivers are operated under certain weather conditions (i.e. temperature inversions) limiting the impact. This item can be implemented in the event of exceedances identified during monitoring at the commencement of each stage if necessary.

Option 10: Keeping equipment well-maintained and operating it in a proper and efficient manner	Regular maintenance and proper operation of equipment is a highly feasible measure and is anticipated for the project.	Poorly maintained or improperly operated equipment will generate significantly higher noise levels. By ensuring equipment runs efficiently and within design parameters, it not only reduces noise emissions but also improves performance, extent of equipment life and reduce risk of failures.	**Yes -** CDC have management schedules in place to ensure correct operation of equipment is maintained. The operating model of the chillers has multiple layers of redundancies, allowing chillers to cycle through at regular intervals so as to minimise 'wear' on the equipment.
Option 11: Running staff-education programs and regular toolbox talks on the effects of noise and the use of quiet work practices	Considered feasible as education programs can be integrated into existing training schedules to make staff aware of noise emissions (particularly during scheduled maintenance).	Raising awareness about the impacts of noise and promoting quiet work practices will assist in staff operating equipment properly, recognise potential risks and adopt quieter methods where possible.	**Yes -** These management and training strategies have not been included in the acoustic model and is not expected to make a distinct impact on the results, however awareness can ensure that the noise emissions associated with site operation remain as low as practically reasonable and feasible.

Mitigation in the Transmission Path			
Option 1: Acoustic Barriers proposed to chiller deck plant **Option 2:** Acoustic Lining to inside faces of the proposed barriers. **Option 3:** Acoustic Barriers around Transformers in the substation	Acoustic barries at the heights and extent outlined in this report are considered feasible due to the proposed construction and being in line with building height constraints. Acoustic lining assists in reducing the influence of reflections from the noise generating equipment and assists in reducing the impact from the development. Installation is simple and feasible by fixing to the proposed barriers	The proposed acoustic barriers will significantly reduce the impact to the surrounding noise environment to maintain a peaceful and liveable environment. Overall acoustic barriers are deemed a practical and cost-effective solution for mitigation achieved with its implementation. The extent of barriers outlined in this report are considered reasonable due to restrictions of operation (i.e. airflow to chiller deck).	**Yes -** The extent of acoustic barriers shown are included which provide a notable level of attenuation bringing the overall noise level to a compliant level. Without the barriers, the overall impact from the chiller operation will cause exceedances at the receiver during all time periods. Acoustic barriers provide the biggest form of attenuation on the project and are a efficient cost-effective solution for the amount of attenuation achieved. Barriers assist in shielding the plant deck, which provide visual amenity to receivers.
Option 4: Additional Barriers to rooftop plant	Additional barriers limit the airflow for the units and will impact the operation of the chillers and are not considered feasible. Free flow pedestrian access on the rooftop is also affected heavily by additional barriers, impacting safety and maintenance requirements.	Additional barrier extent beyond what is proposed in this document is not deemed reasonable. Due to the distance of receivers, additional height and extent of barriers yields diminishing returns regarding the attenuation provided for the cost implication associated.	**No -** Additional height will increase the overall height of the project and visibility from the surrounding environment, with minimal attenuation and cost uplift and is not deemed feasible or reasonable. The extent of barriers have been optimised and exhausted through an iterative process to balance the operational requirements and the acoustic benefits.

Option 5: Secondary Acoustic Barriers in nature strip to the south.	Investigation into additional barriers between the development site and residential receivers to the south was investigated, however was not deemed feasible for the mitigation returns.	The overall impact of these additional barriers would present significant aesthetic impacts on the community with little benefit from attenuation.	**No -** Additional Barriers were disregarded as they would achieve less than 1dB of attenuation and would be a significant cost to cover the full extent of residential receivers to the south. The treatment would significantly impact the views of the receivers and interfere with the natural environment.
Mitigation at receiver			
Option 1: Upgrade in glazing to affected receivers **Option 2:** Offer HVAC to affected residents	Considered feasible as upgraded glazing (either secondary or replacement of existing) or providing HVAC to residents that don't have this installed is a common solution. The number of anticipated affected receivers is minimal and only be implemented upon verification.	The mitigation is considered reasonable when there is significant evidence to support that the noise intrusion from the development is causing repeatable exceedances to the established noise criteria.	**Potential -** The cost of service to individuals who may be affected will be limited to those verified instances. Not expected to be used as a blanket solution to the entire residential area. Note that this solution will only reduce the impact to the internal spaces of the affected receivers. Mitigation to reduce external noise at the boundary or most affect point, have been implement where feasible and reasonable. These solutions do not impact the receivers visual amenity and comfort with minimal inconvenience of installation.