

# Memorandum

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Project: Southern Parallel Sports Campus – Noise assessment

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Meeting

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Telephone

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Memorandum

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File Note

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Acoustic Engineering Services Ltd (AES) has been engaged to undertake an assessment of the likely noise effects in relation to an application for the Southern Parallel Sports Campus (SPSC) to be referred under the COVID-19 Recovery (Fast-track Consenting) Act 2020. The application requires an assessment of the anticipated and known adverse effects on the environment, including temporary and permanent/ongoing effects.

We have based our analysis on our correspondence to date and the following documentation:

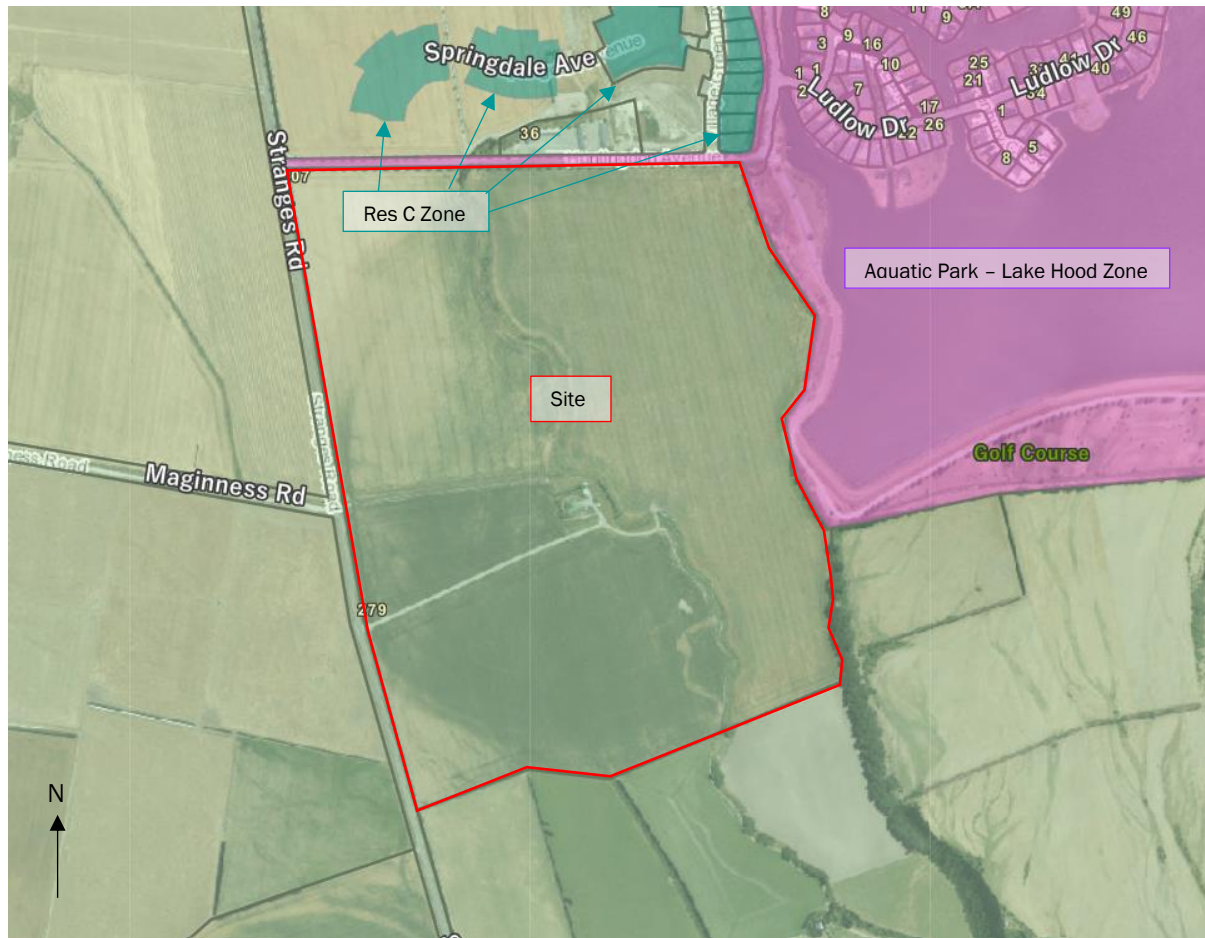
- Masterplan titled, *Southern Parallel Sports Campus Ltd, Rev F*, as prepared by Studio 4 Architects, and dated the 22<sup>nd</sup> of September 2022.
- Townhouse concept plans and elevations titled *SPSC House Development Concept*, as prepared by Studio 4 Architects, and dated the 22<sup>nd</sup> of September 2022.

Please find our analysis below.

## 1.0 BACKGROUND

The Southern Parallel Sports Campus Ltd a new live-in sports and rehabilitation facility, equestrian centre, associated accommodation and communal facilities to be located at 279 Stranges Road on the corner of Stranges Road and Huntingdon Avenue, in Huntingdon, Ashburton. The site and those surrounding it to the southeast, south, west and north are located in the Rural B Zone under the Ashburton District Plan. At the eastern end of the site immediately to the north are undeveloped properties zoned Residential C. To the east is a Recreation Reserve and beyond that across Huntingdon Avenue is Lake Hood in the Aquatic Park – Zone there are also residential properties in the Existing Residential area of the Aquatic Park zone to the northeast of the site. The site and surrounds are shown in figure 1.1 below.

We understand that the closest dwelling in the Rural B Zone is some 300 metres to the south of the site at 339 Stranges Road and is outside of the area shown in the figure below.



**Figure 1.1 – Site and locality**

The proposal is to build a private all-inclusive sports and rehabilitation training facility and equestrian centre – we understand the sports facility is primarily for injured ex-service personnel, high performance athletes, and para sports training. The facility will cater for a maximum of 250 participants and 40 staff. All participants will live at the campus for between 2 and 22 weeks and be transported from the townhouse accommodation on the north-eastern portion of the site to the facilities via coach or van.

The equestrian centre is located on the southern portion of the site and includes on-site stables, a vet, various training and competition facilities for equestrian sports events such as polo, dressage, show jumping and eventing.

Associated facilities include a café/restaurant which will be open to the public and used for functions and a 24-unit motel is also located on the site for events only and will not be open to the public.

There are three vehicle entrances to the site, the main entrance is from Stranges Road and will service all areas of the site, a secondary entrance near the southern boundary of the site is primarily for access to the horse float / truck parking and for circulation of traffic during larger events. An entrance from Huntingdon Avenue to the apartments is expected to generate very little traffic as most travel to and from the apartments will primarily use the Main Access and internal connections within the Campus.

We understand that all activity at the facility (apart from the accommodation uses) will be in the daytime between 0700 and 2200 hours.

The site plan is shown in figure 1.2 below.



Figure 1.2 – Site layout

## 2.0 APPROPRIATE NOISE LEVELS

Guidance as to the significance of any adverse noise effects may be obtained from several sources.

### 2.1 Ashburton District Plan noise standards

As stated in section 1.1, the site and those surrounding it to the southeast, south, west and north are within are located in the Rural B Zone as defined within the Ashburton District Plan.

The noise standards that apply to the site for noise emissions when received within the boundary of sites in the Residential C Zone or notional boundary of dwellings in a Rural B Zone are stated in Table 11-1 of Rule 11.8.1 and are as follows:

Daytime	(0700 to 2200 hours)	50 dB $L_{Aeq}$ (1 hr)	75 dB $L_{AFmax}$
Night-time	(2200 to 0700 hours)	40 dB $L_{Aeq}$ (1 hr)	65 dB $L_{AFmax}$

The noise standards that apply for noise emissions when received at the boundary of any other site in the Rural B Zone are as follows:

Daytime	(0700 to 2200 hours)	65 dB $L_{Aeq}$ (1 hr)	85 dB $L_{AFmax}$
Night-time	(2200 to 0700 hours)	45 dB $L_{Aeq}$ (1 hr)	70 dB $L_{AFmax}$

There are no specific noise limits for noise received in the Aquatic Park Zone from properties outside of the Zone. However, properties in the Aquatic Park Zone that are not in Residential areas are required to conduct activities such that the following noise levels are not exceeded at or within the site boundary of any occupied residential unit in the Residential areas of the Zone:

Daytime	(0730 to 2100 hours)	55 dB $L_{Aeq}$ (1 hr)
Night-time	(2100 to 0730 hours)	45 dB $L_{Aeq}$ (1 hr)

The District Plan states that noise shall be measured and assessed in accordance with NZS 6801:2008 *Acoustics – Measurement of Environmental Sound*, and NZS 6802:2008 *Acoustics – Environmental Noise*. The standard recommends a 15-minute measurement interval for fluctuating continuous sound.

## 2.2 NZS 6802:2008

NZS 6802:2008 *Acoustics – Environmental noise* sets out procedures for the assessment of noise for compliance with noise limits, and provides guidance for the setting of noise limits for consent conditions.

The standard outlines a guideline daytime limit of 55 dB  $L_{Aeq}$  (15 min) and a night-time noise limit of 45 dB  $L_{Aeq}$  (15 min) for “the reasonable protection of health and amenity associated with the use of land for residential purposes”. The Standard also recommends a night-time  $L_{max}$  noise limit of 75 dB  $L_{AFmax}$  to prevent sleep disturbance.

The standard recommends the site boundary of noise sensitive sites or notional boundary of a rural dwelling as the appropriate assessment location.

## 2.3 World Health Organisation

Guidelines for Community Noise<sup>1</sup>, a document produced by the World Health Organisation (WHO) based on extensive international research recommends a guideline limit of 55 dB  $L_{Aeq}$  (16 hours) to ensure few people are seriously annoyed in residential situations. A guideline limit of 50 dB  $L_{Aeq}$  (16 hours) is recommended to prevent moderate annoyance.

This document recommends the assessment of noise at the façade of dwellings and other noise sensitive locations.

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<sup>1</sup> Edited by Berglund, B *et al.* *Guidelines for community noise*. World Health Organization 1999.



These guidelines are measured at the façade of dwellings and other noise sensitive locations and apply for 16 hours in the daytime, and 8 hours for the night-time.

## **2.4 Discussion of noise limits and adverse effects**

Based on the above, noise from the SPSC which complies with the District Plan noise limits would not be expected to have a significant adverse effect when received at the notional boundary of any dwelling in the Rural B Zone or site boundary of any Rural B or Residential C property. We consider that some exceedance of the District Plan limits will be acceptable for unoccupied areas of properties in the Rural B zone.

We note that there are no limits for noise received in the Aquatic Park Zone; however, provided noise received in this zone meets the Residential C limits, we expect any noise effects would not be significant.

## **3.0 OPERATIONAL NOISE**

The most significant noise generating activities expected from operation of the SPSC are:

- Noise generated by light and heavy vehicles travelling about on the site (engine noise, road/tyre noise, door slams, engine starts and the like).
- Noise generated by sports games and spectators, equestrian training, occupation of the restaurant/cafe and events (including sports activities, supporter cheers, referee whistles, starting equipment, loudspeakers and PA systems).
- Mechanical plant noise associated with the various activities including outdoor condensers, and extract systems.

We have considered each of these separately below.

### **3.1 Noise associated with sports games, training and use of the equestrian centre**

#### **3.1.1 Typical activity**

We have undertaken an initial assessment of noise from we have considered the following day to day worst peak activity scenarios:

- Sports area: All four sport areas (cricket/baseball, athletics, multi-purpose and tennis) are occupied concurrently, the activity is occurring continuously in each area with 200 spectators on the embankments with half speaking in raised voices. We have also considered the Sprung Sheds to be occupied, with all doors open.
- Equestrian Centre: Based on the traffic report we understand that local equestrian events with up to 200 competitors may occur each week, we have assumed both polo fields are occupied concurrently, the activity is occurring continuously in each area with 200 spectators on the side-lines with half speaking in raised voices. We have also considered the arena and restaurant/café to be occupied, with all doors open.

Based on above and considering the embankments in place the noise levels are expected to be below 65 dB  $L_{Aeq}$  at all Rural B zoned boundaries and below 50 dB  $L_{Aeq}$  100 metres from any of the fields or arenas without any additional shielding. Therefore, noise is expected to comply with the District Plan daytime limits and the above criteria at all notional and site boundaries and we do not expect this noise to have a significant adverse effect.

To give confidence that noise emissions associated with the activity are maintained at appropriate levels, we recommend air horns are not to be used on site.

### **3.1.2 Event days**

We have undertaken high level indicative calculations to determine the noise level on the busiest even days where 4 – 5 times as many people may be present on site for the busiest national and international competitions.

Noise at the northern, western and southern, boundaries is expected to comply with the Rural B boundary limit of 65 dB  $L_{Aeq}$  and noise is expected to reduce to below 50 dB  $L_{Aeq}$  250 metres from any of the fields or arenas without any additional shielding. With the exception of the currently undeveloped Residential C Zone on Springfield Avenue all notional and residential site boundaries are more than 250 metres from the fields and arenas.

The Residential C Zone on Springfield Avenue is some 120 metres from the edge of the cricket oval/baseball diamond and without additional shielding the noise level could be up to 56 dB  $L_{Aeq}$ ; however, we understand that an embankment is to be constructed between this area and the properties to the north and it is reasonable to expect that this can be designed to reduce the noise to 50 dB  $L_{Aeq}$ , thus complying with the District Plan limits and that there would not be a significant adverse effect.

## **3.2 Vehicle noise**

### **3.2.1 Day to day vehicles**

The traffic report provides the following peak hour traffic generation (trips either in or out) for day-to-day activity:

- Staff – 30 light vehicles
- Sports Centre – 1 bus/coach
- Sports Centre visitors – 4 light vehicles
- Stables – 26 staff, visitors and horse floats
- Vet Clinic – 27 light vehicles
- Stables – 20 riders, trainers and horse floats
- Motel – 10 light vehicles
- Café restaurant – 22 light vehicles

We have assumed that half the stable and daily training vehicles are horse floats which we consider to be conservative as it is similar to an event scenario. Therefore, based on the above a peak hour may have 120 light vehicles and 1 bus using the main access and 26 heavy vehicles using the southern entrance. We have calculated noise levels based on a light vehicle having a sound power of 90 dB  $L_{WA}$  and horse floats and buses have a sound power level of 105 dB  $L_{WA}$  (which is conservative for this type of vehicle) travelling at 10 km/h on site.

Light vehicles and bus traffic will use the main entrance where during the peak hour the noise opposite the main entrance is expected to be 46 dB  $L_{Aeq}$  and at the southern boundary (some 13 metres from the centre of the internal road) where horse floats may enter the noise level will be 44 dB  $L_{Aeq}$ . These noise levels are well below the District Plan daytime boundary limit of 65 dB  $L_{Aeq}$  and noise is expected to be lower than this level at all other receivers and therefore comply with the daytime site or notional boundary criteria of 50 dB  $L_{Aeq}$  at all other receivers and we do not expect a significant adverse effect.

### 3.2.2 Event scenarios

We have undertaken an initial analysis of heavy vehicle noise, based on the traffic generation report for event scenarios. Peak light vehicle traffic will occur for international events at the sports centre and peak use of the equestrian centre occurs during a national type event.

For the international event at the sports centre 248 light vehicle trips are expected in the peak hour and we would expect noise at the boundary opposite the main entrance to be 49 dB  $L_{Aeq}$ .

The peak use of the southern entrance for events will be one or two times per year where 117 horse floats may use the southern entrance in a peak hour. Noise at the southern boundary would be 52 dB  $L_{Aeq}$ . Where some of the light vehicles use this access during the peak hour, noise levels could be up to 54 dB  $L_{Aeq}$ .

Therefore, noise is expected to comply with the District Plan daytime limits and the above criteria at all notional and site boundaries and we do not expect this noise to have a significant adverse effect.

### 3.3 $L_{AFmax}$ noise levels

We expect the highest  $L_{AFmax}$  noise levels produced on site would be generated by a bus releasing their airbrakes, a referee whistling, handheld speakers, trailer rattle, and the like.

We have assumed a maximum sound power of 118 dB  $L_{wAFmax}$  from a bus releasing their airbrakes, a referee whistling, a handheld speaker in the sport courts (cricket / baseball, athletics, football) or trailer rattle from horse floats using the southern entrance.

Based on the above the worst case  $L_{max}$  levels will be received at the southern boundary of the site where  $L_{max}$  is expected to be 88 dB  $L_{AFmax}$ . This exceeds the daytime limit by a small amount; however, as this area is not occupied, and the exceedance is only 3 dB which is a just audible difference and is only expected to occur infrequently we would not consider this to cause a significant adverse effect.  $L_{max}$  noise is expected to comply with the District Plan daytime limits and the above criteria at all other notional and site boundaries and we do not expect this noise to have a significant adverse effect.

### 3.4 Noise from mechanical plant

External plant associated with the proposed facility is likely to include mechanical supply and extraction systems for the kitchen toilets, and external air conditioning condenser units. It is reasonable to expect that these systems can be designed, installed and operate in compliance with the District Plan noise limits using standard good practice. Ultimately noise levels will depend on final plant selections and location, and which physical and operational mitigation are implemented. Mitigation options include the use of lower noise or silenced equipment, the use of varying noise operational modes at different times of day or night and physical screening by the facility and dedicated acoustic screens.

We note that typically the mechanical plant associated with swimming pools is high noise generating. We therefore recommend that the mechanical plant associated with the pool is designed to be located within a plant room.

### 3.5 Night-time noise

Very little activity is expected on site during the night-time except for residential use of the apartments and use of the motel units. These units are more than 100 metres from the nearest residential receiver, and we expect noise levels from typical residential activity to comply with the night-time limits and criteria. The apartment and motel units are occupied by residents of the facility or guests at the motel and we understand there will be managerial measures in place to ensure that there is no excessive noise in the night-time.

In addition, we expect that if on occasion a vet accessed the site or someone accessed the motel units after 2200 hours the night-time noise limits would not be exceeded; however to ensure that night-time limits are not exceeded use of the southern access should be limited to the daytime period.

#### 4.0 REVERSE SENSITIVITY EFFECTS

There are portions of neighbouring Rural B zoned properties that may receive over 50 dB  $L_{Aeq}$  during both event scenarios. In the future if a dwelling were built closer to these boundaries, we expect that physical mitigation could be introduced to reduce noise from the activity to meet the daytime notional boundary limit of 50 dB  $L_{Aeq}$  at any further possible dwelling.

#### 5.0 CONSTRUCTION NOISE

Noise generated by demolition and construction activities associated with the development of buildings and landscaping at this site has the potential to adversely affect nearby properties, especially if carried out during the early morning or evening hours.

The Ashburton District Plan specifically excludes construction activities from the noise standards for all zones, *Rule 11.8.3 Noise – Noise Standards – Construction Noise* states that construction noise shall comply with *NZS 6803:1999 Acoustics – Construction Noise*.

We therefore recommend that the Applicant adopts best practice procedures to reduce the likelihood of annoyance, nuisance and adverse health effects to people in the vicinity of construction work, and that these activities are planned and managed in accordance with *NZ 6803:1999 Acoustics – Construction Noise*, and that construction is undertaken to ensure noise does not exceed the sound levels specified in Table 2 of the Standard.

#### 6.0 CONCLUSION

Noise from all sources expected to be associated with the proposed Southern Parallel Sports Campus on Huntingdon Avenue, in Huntingdon, Ashburton, has been considered.

Based on our review of the relevant District Plan noise limits, national and international guidance, where noise levels associated with the proposal comply with the District Plan noise limits at rural notional boundaries and residential site boundaries, we consider it conservative to conclude that there will not be a significant adverse effect. However, we consider that some exceedance of the District Plan limits will be acceptable for unoccupied areas of properties in the Rural B zone.

Our analysis indicates that noise received at all nearby boundaries due to daytime activity at the facility is expected to be well below the District Plan limits, except for a potential exceedance of the  $L_{max}$  limit at the southern boundary on a portion of the site that is not occupied.

Noise levels due to national or international events is also expected to generally comply with the District Plan limits, (with the same exception of  $L_{max}$  limit) if the northern embankment of the cricket oval/baseball diamond is designed to provide a modest level of noise reduction.

We expect that mechanical plant associated with the site can be designed, installed, and operate in compliance with the District Plan noise standards at all adjoining properties using standard good practice in design and construction.

We therefore consider that it will be practicable for all known and anticipated noise from the proposal to be mitigated to ensure that there is no significant adverse effect.