

28 September 2023

GHD Pty Ltd
 Level 9, 180 Russel Street
 Melbourne VIC 3000

Attention: Glenn Day

Dear Glenn

TOWN PLANNING ACOUSTIC ADVICE

GHD Pty Ltd on behalf of Mentone Grammar School have commissioned Marshall Day Acoustics Pty Ltd (MDA) to conduct an environmental noise assessment for the proposed new external spaces at Mentone Grammar School. The project scope is to create a combination of active and passive recreation spaces to extend the Junior Campus playground space.

This letter presents the acoustic considerations for the project based on supplied site information and typical noise emissions for playground spaces.

PROPOSED DEVELOPMENT AND ASSUMED NOISE LEVELS

The proposed external areas can be divided into the following three main areas:

- Provision of new basketball courts adjacent the existing courts
- Provision of new ‘San Francisco Lombard Street’ inspired passive garden with terraced grass play spaces and outdoor teaching area
- Provision of a new synthetic turf playing field.

The proposed hours of use are 0700 – 1800 hrs, Monday to Friday. Furthermore, additional bus parking is proposed along Naples Road.

MDA has previously measured noise of typical sporting activities such as netball, soccer and hockey. These noise levels have been used for the basketball courts and the new playing field.

For the passive garden, a scenario of six groups of six students each distributed throughout the garden has been considered, with groups talking at a voice level comparable to that used in a restaurant setting. The assumed noise levels used in the assessment are presented in Table 1.

Table 1: Noise levels used in assessment, sound power level

Description	Octave band mid frequency, Hz								
	A	63	125	250	500	1k	2k	4k	Hz
Sporting activity (mix of netball, soccer and hockey) – dB L_{eq}	94	98	93	89	86	89	90	82	dB
One group of six students – dB L_{eq}	81	69	71	72	79	77	73	66	dB
Sports whistle – dB L_{max}	104	80	80	82	88	84	102	90	dB



ACOUSTIC LEGISLATION AND GUIDELINES

There are no specific legislative documents that govern noise from sporting activities in Victoria. Noise from sport and voices is specifically exempt from EPA publication 1826.4 *Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues* (Noise Protocol).

In the absence of any specifically relevant noise guidelines, the following sections outline related guidance documents in Victoria and New South Wales and provide discussion on their relevance.

EPA publication 1254.2 Noise Control Guidelines

The EPA publication 1254.2 *Noise Control Guidelines* provides guidance for the control of noise from a number of sources. However, the only guidance relating to sporting activities included in this guideline relates to public address systems associated with sporting activity, which is not proposed for the playground space.

Australian Standard 2107

Australian/New Zealand Standard AS/NZS 2107:2016 Acoustics - Recommended design sound levels and reverberation times for building interiors (AS 2107) provides internal noise level targets for various types of buildings from steady-state or quasi-steady-state sounds. Given the potential for noise from the playground to be highly variable, consideration has been given to using internal criteria as a preliminary screening benchmark.

As the target noise levels are internal noise levels and the sound reduction of the existing building facade is not known, a conservative external to internal noise reduction of 15 dB has been assumed representing a slightly ajar window to establish the external noise benchmarks presented in Table 2.

Table 2: Derivation of external benchmark from AS 2107 recommended internal noise levels

Description	AS 2107 internal noise level criteria, dB L_{Aeq}	Adjustment for slightly open window	Corresponding external noise benchmark, dB L_{Aeq}
<i>Houses and Apartments in suburban areas near minor roads</i>			
Living areas	30 to 40	+ 15	45 to 55
Work areas	35 to 40	+ 15	50 to 55

General Environmental Duty

The General Environmental Duty (GED) is outlined in Part 3.2 of the Environment Protection Act 2017.

The GED requires anyone engaging in an activity posing a risk of harm to human health and/or the environment from pollution (including noise) and waste, to minimise those risks to prevent harm as far as reasonably practicable. Commercial premises are therefore required to continue to review and eliminate or reduce the risk of harm from any emission of noise as far as reasonably practicable.

The GED applies wherever there is a risk of harm, regardless of whether the noise emitted has caused complaints or caused harm to people or the environment.

Environmental Reference Standard (ERS)

The Environmental Reference Standard (ERS) is made under section 93 of the Environment Protection Act 2017. It includes environmental values, indicators and objectives that describe environmental and human health outcomes to be achieved or maintained in the whole or in parts of Victoria. These values, indicators and objectives are used to assess and report on changing environmental conditions by providing a reference point for decision makers to consider whether a proposal or activity is consistent with the environmental values identified in the ERS.

The ERS also allows decision makers to evaluate potential impacts on human health and the environment that may result from a proposal or activity. The objectives contained in the ERS are not to be used as criteria or limits to be achieved, but provide a reporting benchmark or point of reference when reviewing environmental noise.

The subject site and surrounding land is zoned General Residential Zone 3 (GRZ3). The ERS category relevant to the site is therefore Category III. The ERS objective for the day period is presented in Table 3. Further information is included in Appendix A. Sporting activities or the use of the bus parking is not proposed during the night period.

Table 3: ERS objectives

Land use category	Indicators	Objectives
Category III	Outdoor $L_{Aeq,16hr}$ from 0600 hrs to 2200 hrs	50 dB L_{Aeq}

It must be noted that noise measurements at the site show the existing noise environment during the day generally ranges between 52-61 dB L_{Aeq} , which is higher than the ERS objective of 50 dB L_{Aeq} . It is therefore suggested that a daytime benchmark range of 50 - 55 dB L_{Aeq} is more suitable. This is in line with the recommended external noise target based on AS 2107.

Maximum noise levels

The measured maximum noise levels at the site generally ranged between 70 – 83 dB L_{Amax} during the day period. In the absence of legislated criteria for maximum noise levels, the existing maximum noise levels at the site have been used as a benchmark.

Summary

Based on the above, the following noise benchmarks in Table 4 are proposed, based on the external areas at Mentone only being used during the daytime period 0700 – 1800 hrs, Monday to Friday.

Table 4: Noise benchmarks (0700 – 1800 hrs)

Description	Noise level
Average noise level, dB L_{Aeq}	50 – 55
Maximum noise level, dB L_{Amax}	70 – 83

PREDICTED NOISE LEVEL

Preliminary noise modelling shows that the predicted noise levels without any mitigation will be approximately 57-60 dB L_{Aeq} and 66-69 dB L_{Amax} at the worst affected receivers. A 2.5 m high acoustic barrier is proposed at the interface between the external areas and the adjacent residential dwellings to reduce the impact of noise on the neighbouring dwellings. The location of the proposed acoustic barrier is shown in Figure 1.

To provide the adequate noise attenuation, the construction material of the acoustic barrier should have a minimum surface density of 10 kg/m² and be free from holes and gaps.

Some suitable materials include the following:

- Wallmark Evo Wall Panels (75 mm thick, 15kg/m²)
- 18 mm thick timber panelling, overlapped
- 6 mm thick fibre cement sheet
- 9 mm thick Perspex, polycarbonate or Danpalon
- 6 mm toughened laminated safety glass.

Figure 1: Proposed location of acoustic barrier



The predicted noise levels with and without the barrier are shown in Table 5.

Table 5: Predicted noise levels, dB LAeq

Receiver	Without barrier	With 2.5 m high noise barrier
1/25 Warrigal Road	56	51
2/25 Warrigal Road	58	52
27 Warrigal Road – Ground floor	57	53
27 Warrigal Road – First floor	57	57
93 Naples Road	60	46
95 Naples Road	50	48

As shown, the barrier provides a noticeable reduction in noise. With the barrier in Figure 1 included, our calculations predict that the combined noise level from the courts, passive garden and playing field would be comparable to the noise benchmark at the ground floor of all noise sensitive receiver locations, and would be lower than the ambient noise previously measured in the area. It is not practicable to build a barrier high enough to shield the first floor receivers. As such, noise levels slightly above the benchmark are predicted for the first floor at 27 Warrigal Road.

The predicted noise levels at ground floor with and without the acoustic barrier are presented as noise contour maps in Appendix B.

It must be noted that the predicted noise levels above are for the cumulative impact of all external areas being used simultaneously, i.e. the old and new basketball courts, new synthetic turf playing field and passive garden. Noise levels would be lower if only some areas are used at the same time.

The predicted maximum noise levels with the barrier in place are 55 – 61 dB L_{Amax} , which is well below the existing maximum noise levels in the area.

BUS PARKING

Bus bay parking is to be installed along Naples Road to facilitate the schools bus fleet. It is expected that bus movements would not occur continuously throughout the day, but rather would likely only occur around the start and end of the school day.

The proposed location of the bus parking is adjacent the new sporting field and opposite St. Bedes Sports Centre. Parking is not currently proposed directly outside the residential dwellings. It is not practicable to install noise barriers along Naples Road. Consideration could be given to requesting drivers to turn the engine off whilst waiting, to reduce the noise.

CONCLUSION

MDA have undertaken an environmental assessment of the noise impacts of the proposed new playing fields and passive garden spaces at Mentone Grammar School to accompany a town planning application.

There is no clear Victorian legislation or guidelines for the proposed use. As such, noise level predictions have been compared to existing ambient noise in the area, ERS objectives and indoor noise levels recommended by AS 2107. A barrier would result in a noticeable reduction in noise at the ground floor of adjacent residences, and would reduce the predicted noise levels to better align with the noise benchmarks. Combined noise levels from the courts, passive garden and playing field are predicted to be similar or slightly lower than the ambient noise previously measured in the area.

We trust this information is sufficient for your requirements. Please contact us if you have any queries.

Yours faithfully

MARSHALL DAY ACOUSTICS PTY LTD



Bettina Kalt

Associate

APPENDIX A ENVIRONMENTAL REFERENCE STANDARD (ERS)

EPA Publication 1992 Guide to the Environmental Reference Standard (ERS), dated June 2021, provides the following information in relation to the ERS:

The Environment Reference Standard (ERS) is a new legislative instrument made under the Environment Protection Act 2017 (the Act). The ERS is an environmental benchmark. It brings together a collection of environmental values, indicators and objectives that describe environmental and human health outcomes to be achieved or maintained in the whole or in parts of Victoria. These values, indicators and objectives are used to assess and report on changing environmental conditions by providing a reference point for decision makers to consider whether a proposal or activity is consistent with the environmental values identified in the ERS. The ERS also allows decision makers to evaluate potential impacts on human health and the environment that may result from a proposal or activity. The ERS does not specify requirements that must be met by environmental managers or other duty holders.

The ERS is a tool that can be used to assess the impacts on human health and the environment that may result from a proposal or activity, or from existing environmental conditions on a site. This application of the ERS must be seen within the context of preventing harm from pollution and waste as part of the broader environment protection framework under the Act. Because it is preventative in nature, this framework seeks to minimise risks of harm to human health and the environment rather than setting and authorising acceptable levels of pollution and waste. The focus on prevention allows for continual improvement in managing these risks as knowledge expands and more effective risk- reduction techniques and technologies emerge.

The environmental values defined in the ERS are contained in Table 6.

Table 6: Environmental values of the ambient sound environment

Environmental value	Description of environmental value
Sleep during the night	An ambient sound environment that supports sleep during the night
Domestic and recreational activities	An ambient sound environment that supports recreational and domestic activities in a residential setting
Normal conversation	An ambient sound environment that allows for normal conversation indoors without the need to raise voices
Child learning and development	An ambient sound environment that supports cognitive development and learning in children
Human tranquillity and enjoyment outdoors in natural areas	An ambient sound environment that allows for the appreciation and enjoyment of the environment for its natural condition and the restorative benefits of tranquil soundscapes in natural areas
Musical entertainment	An ambient sound environment that recognises the community’s demand for a wide range of musical entertainment.

The ERS outlines environmental indicators and objectives for various land use categories. These are reproduced in Table 7.

Table 7: Land use categories for the ambient sound environment

Land Use Category	General Description	Planning Zones
Category I	An urban form with distinctive features or characteristics of taller buildings, high commercial and residential intensity and high site coverage.	Industrial Zone 1 (IN1Z) Industrial Zone 2 (IN2Z) Port Zone (PZ) Road 1 Zone (RDZ1) Capital City Zone (CCZ) Docklands Zone (DZ)
Category II	Medium rise building form with a strong urban or commercial character. Typically contains mixed land uses including activity centres and larger consolidated sites, and an active public realm.	Industrial Zone 3 (IN3Z) Commercial 1 Zone (C1Z) Commercial 2 Zone (C2Z) Commercial 3 Zone (C3Z) Activity Centre Zone (ACZ) Mixed Use Zone (MUZ) Road 2 Zone (RDZ2)
Category III	Lower rise building form including lower density residential development and detached housing typical of suburban residential settings or in towns of district or regional significance	Residential Growth Zone (RGZ) General Residential Zone (GRZ) Neighbourhood Residential Zone (NRZ) Urban Floodway Zone (UFZ) Public Park and Recreation Zone (PPRZ) Urban Growth Zone (UGZ)
Category IV	Lower density or sparse populations with settlements that include smaller hamlets, villages and small towns that are generally unsuited for further expansion. Land uses include primary industry and farming	Low Density Residential Zone (LDRZ) Township Zone (TZ) Rural Living Zone (RLZ) Green Wedge A Zone (GWAZ) Rural Conservation Zone (RCZ) Public Conservation and Resource Zone (PCRZ) Green Wedge Zone (GWZ) Farming Zone (FZ) Rural Activity Zone (RAZ)
Category V	Unique combinations of landscape, biodiversity and geodiversity. These natural areas typically provide undisturbed species habitat and enable people to see and interact with native vegetation and wildlife.	Natural areas are classified as land within Category V irrespective of the planning zones that apply to that land.

Land Use Category	General Description	Planning Zones
Category I, II, III or IV depending on surrounding land uses and the intent of the specific planning zone (which may have a diversity of uses) as specified in a schedule to the planning zone		Comprehensive Development Zone (CDZ) Priority Development Zone (PDZ) Special Use Zone (SUZ) Public Use Zone (PUZ)

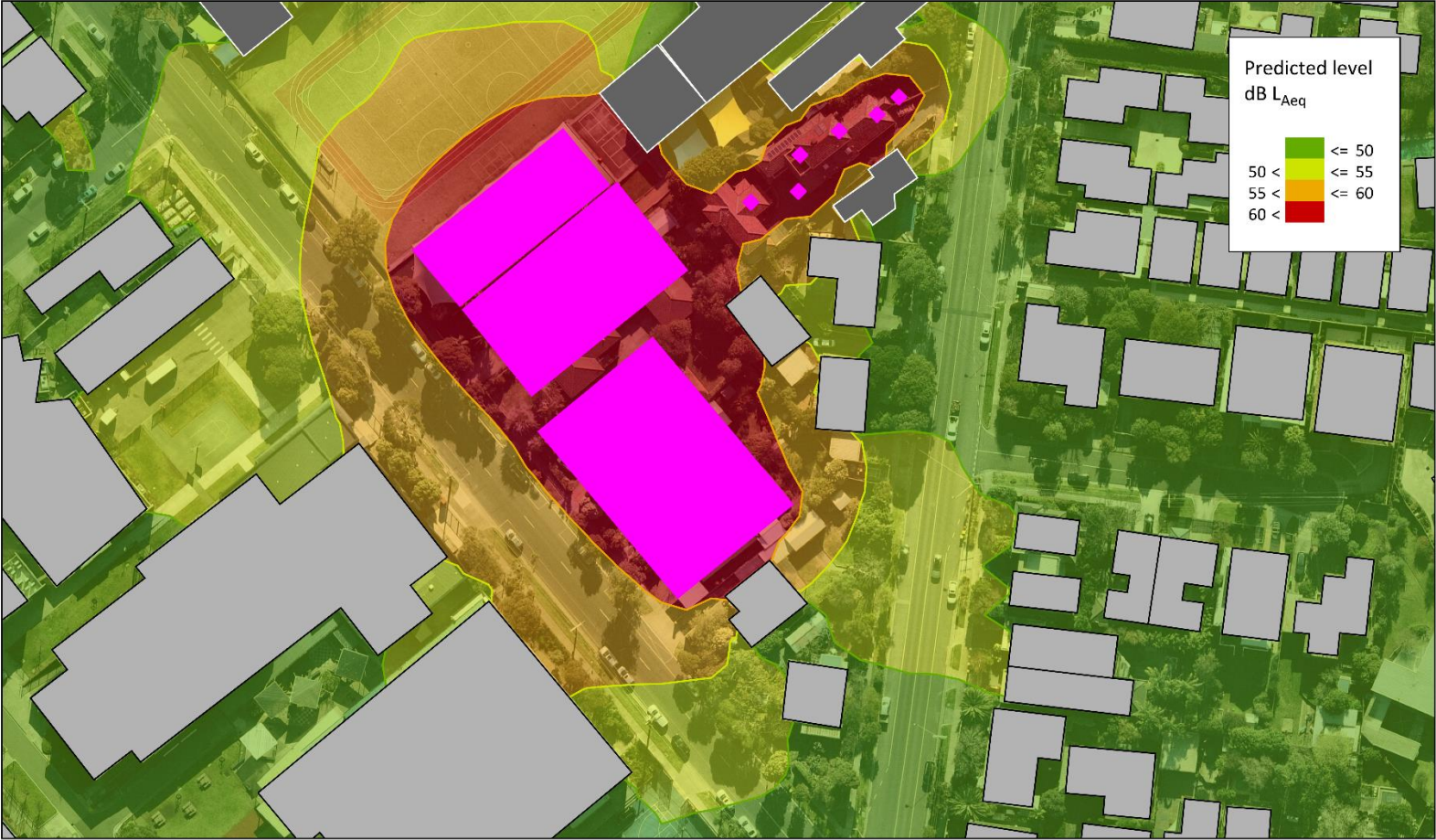
The project site is likely to represent Category III once constructed. The relevant indicators and objectives for these categories are presented in Table 8.

Table 8: Ambient sound environment indicators and objectives for land-use categories III, dB

Land use category	Indicators	Objectives
Category II	Outdoor $L_{Aeq,8h}$ from 2200 hrs to 0600 hrs	40
	Outdoor $L_{Aeq,16hr}$ from 0600 hrs to 2200 hrs	50

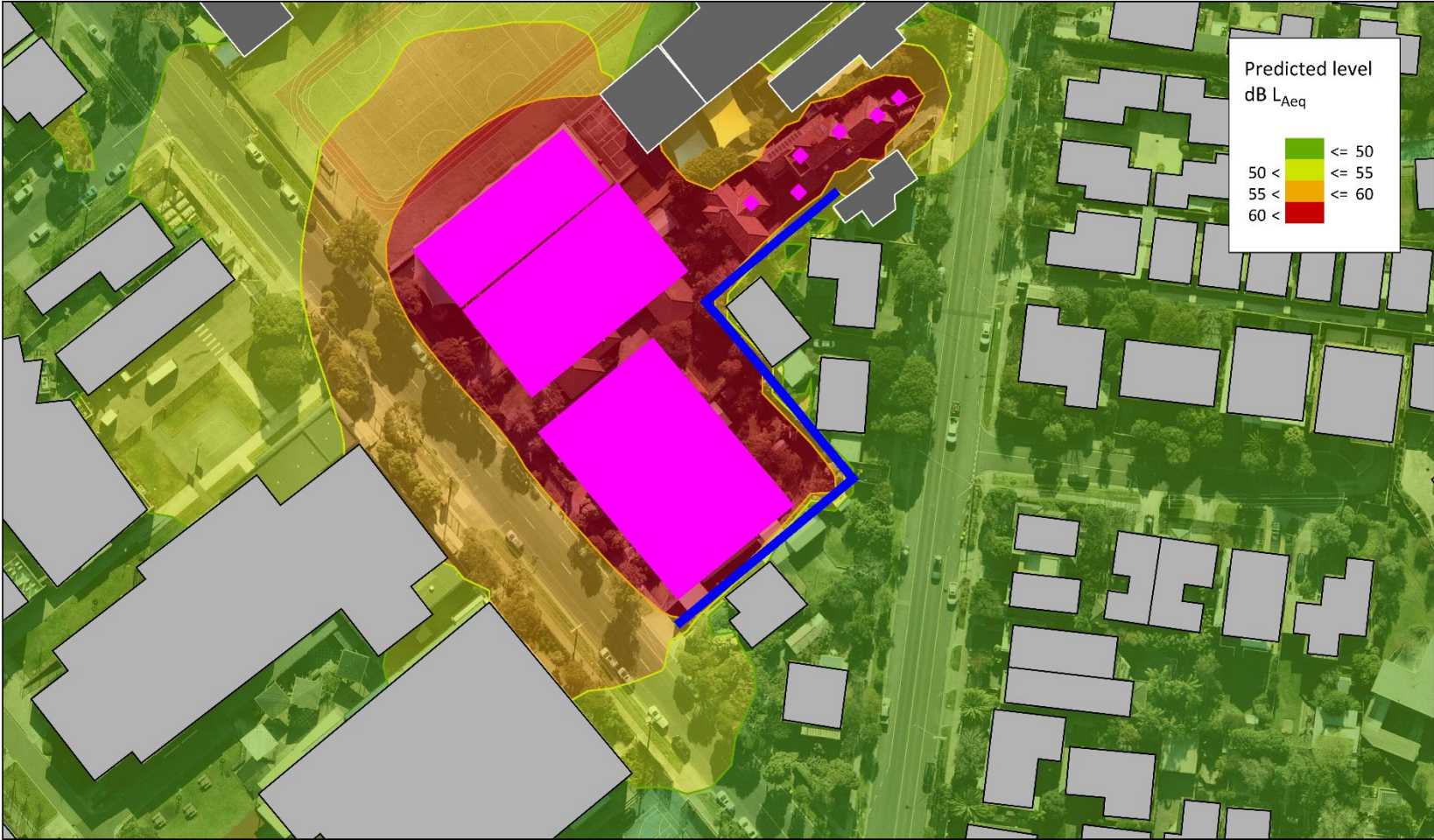
APPENDIX B NOISE CONTOUR MAPS AT GROUND FLOOR

No barrier



<p>LEGEND</p> <ul style="list-style-type: none"> Building School owned building Noise source 	<p>Version: SoundPLANnoise 9.0 Prediction method: ISO 9613-2 Model number: Model 2 Run No & Title: 1001/GNM sporting noise leq File: Sporting noise Leq Prediction Height: 1.5 m</p>	<p>Project: MGS playground Project number: 20220442 Client name: GHD</p>	<p>Eastern Playground Space No mitigation</p>
		<p>SCALE</p> <p>0 5 10 20 30 40 m</p> <p style="text-align: center;">↑ N</p>	<p>MARSHALL DAY Acoustics</p>

With proposed 2.5 m high acoustic barrier



<p>LEGEND</p> <ul style="list-style-type: none"> Building School owned building Noise source Acoustic barrier 	<p>Version: SoundPLANnoise 9.0 Prediction method: ISO 9613-2 Model number: Model 2 Run No & Title: 1005/GNM sporting noise Leq File: Sporting noise Leq with 2.5 m barrier Prediction Height: 1.5 m</p>	<p>Project: MGS playground Project number: 20220442 Client name: GHD</p> <p>SCALE</p> <p>0 5 10 20 30 40 m</p> <p style="text-align: center;">↑ N</p>	<p>Eastern Playground Space With 2.5 m high acoustic barrier</p> <p>MARSHALL DAY Acoustics</p>
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