

BAROSSA ASSESSMENT PANEL

Notice is hereby given that a meeting of the Barossa Assessment Panel will be held at the Council Offices, 43-51 Tanunda Road, Nuriootpa on

Tuesday, 2 May 2023, commencing at 5.00pm

Aaron Curtis
Assessment Manager



AGENDA

Please note that due to federal copyright law restrictions, attachments associated with the proposed development are available on our website for viewing only and are locked for printing or copying

NOTE: Plans contained in this agenda are subject to Copyright Laws.

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1. WELCOME**2. ATTENDANCE****2.1 Present****2.2 Apologies****2.3 Absent****3. CONFIRMATION OF MINUTES****RECOMMENDATION**

That the minutes of the Barossa Assessment Panel meeting held on Tuesday 7 March 2023 be received and confirmed.

4. BUSINESS ARISING**5. DECLARATION OF INTEREST BY MEMBERS OF THE PANEL**

The Minister's Assessment Panel Members – Code of Conduct requires that a member of an assessment panel who has a direct or indirect personal or pecuniary interest in a matter before the assessment panel (other than an indirect interest that exists in common with a substantial class of persons):

- a. must, as soon as he or she becomes aware of his or her interest, disclose the nature and extent of the interest to the assessment panel; and
- b. must not take part in any hearings conducted by the assessment panel, or in any deliberations or decision of the assessment panel, on the matter and must be absent from the meeting when any deliberations are taking place or decision is being made.

A member of an assessment panel will be taken to have an interest in a matter if an associate of the member (within the meaning of section 3(7) of the PDI Act) has an interest in the matter.

Any member that considers that they have an interest must notify the Presiding Member and have it recorded in the minutes as to the nature and extent of the interest.

6. REPORTS – APPLICATION FOR DECISION (PLANNING, DEVELOPMENT AND INFRASTRUCTURE ACT 2016)

6.1 23005204 - Allotment 321 Parrot Hill Road Moculta

APPLICATION DETAILS

PROPOSAL	Installation and operation of 1 (one) FrostBoss C49 Frost Fan with Perkins Engineer
APPLICANT	Australian Frost Fans Pty Ltd
OWNER	Henschke Cellars Pty Ltd
APPLICATION NO	23005204
CERTIFICATE(S) OF TITLE	CT 5529/393
AREA	33.7 ha
CURRENT USE	Primary Production, agriculture, horticulture (viticulture), dam, agricultural building and one frost fan
PLANNING AND DEVELOPMENT CODE VERSION	2023.3 – 16 February 2023
PLANNING AND DESIGN CODE EXTRACT LINK	Relevant Code Extract
ZONE	Rural
OVERLAYS	Character Preservation District Hazards (Bushfire – Medium Risk) Heritage Adjacency Hazards (Flooding – Evidence Required) Limited Land Division Native Vegetation Prescribed Water Resources Area Water Protection Area Water Resources
APPLICATION TYPE	Performance Assessed
PUBLIC NOTIFICATION	Notified, No Sign
REFERRALS	Nil
PREVIOUS APPLICATIONS	960/263/2003 – Vineyard 960/925/2003 - Dam 960/546/2010 – Farm Building 960/325/2015 – 2 x Frost Fans
ASSESSING OFFICER	Janine Lennon
RECOMMENDATION	That Development Plan be GRANTED subject to conditions

INTRODUCTION

The site owner seeks Development Approval for the '*Installation and operation of one (1) Frostboss C49 frost fan with Perkins engine*' at Allot 321 Parrot Hill Road, Moculta.

The proposed development was subject to Performance Assessment and public notification. The application was notified in accordance with Section 107 of the *Planning, Development and Infrastructure Act 2016* and received no representations.

This application is subject to a decision of the Barossa Assessment Panel (BAP) for the following reason:

- (1) As per the amended Delegation Instrument C, adopted by the BAP on 7 June 2022, the BAP will not delegate applications for decision wherein the nature of development is a frost fan.

No statutory referrals were applicable.

The site is in a Rural Zone where horticulture (including viticulture) is an envisaged use. There is one frost fan currently operating on the subject site positioned approximately 190 metres south of the proposed frost fan.

The allotment sits approximately 75 metres from Parrot Hill Road and 370 metres from Gnadenberg Road. The slimline design of the proposed frost fan and the hilly terrain, satisfactorily limits visual impact in this rural locality. The applicant has shown, with expert input, that the anticipated noise level of the frost fan when in operation, will not exceed the quantitative noise levels for nearby dwellings as set out in the *Environment Protection (Noise) Policy 2007*. Compliance with this State Government set policy is considered sufficient to demonstrate that noise levels should not unreasonably impact non-associated dwellings in the wider locality.

It is considered that the proposal supports the viticultural use of the land and will have an acceptable level of visual impact in the locality. As such, Planning Consent is warranted, subject to recommended Conditions of Consent.

SITE AND LOCALITY

The site for the proposed frost fan is a regular shaped allotment with a frontage to Gnadenberg Road of approximately 580 metres and a similar frontage to Parrot Hill Road of approximately 580 metres. The site has a maximum depth of 580 metres with total site area of approximately 33.7 hectares.

The site is predominantly used for agriculture (grazing) with approximately 5.1 hectares planted with vines and numerous plantings of semi-mature and mature native vegetation approximately seven hectares across the site. The site contains a couple of agricultural buildings, dwelling, and rainwater tanks. An existing frost fan is located approximately 185 metres from the Gnadenberg Road boundary and 130 metres from the Parrot Hill Road boundary located within the vines.

The site is positioned on the northern side of Gnadenberg Road and the western side of Parrot Hill Road and is generally surrounded by broad acre farming and low intensity agriculture on large allotments. Land is undulating providing limited vistas generally of open fields interspersed with native trees and shrubs.

There are no dwellings on the adjoining allotments with the closest non-associated dwellings shown on **Figure 3**. These are all located in excess of 600 metres from the proposed fan site and generally not within sightlines from the property.

The nearest township is Moculta which is located more than three kilometres north-west from the subject site.

Figure 1 highlights the subject site below.



Figure 1: Zone Map – subject site within the Rural Zone

An aerial view of the site and locality are contained in **Figure 2** and **Figure 3**.

Site photos are provided in **Figure 4** and **Figure 5**.

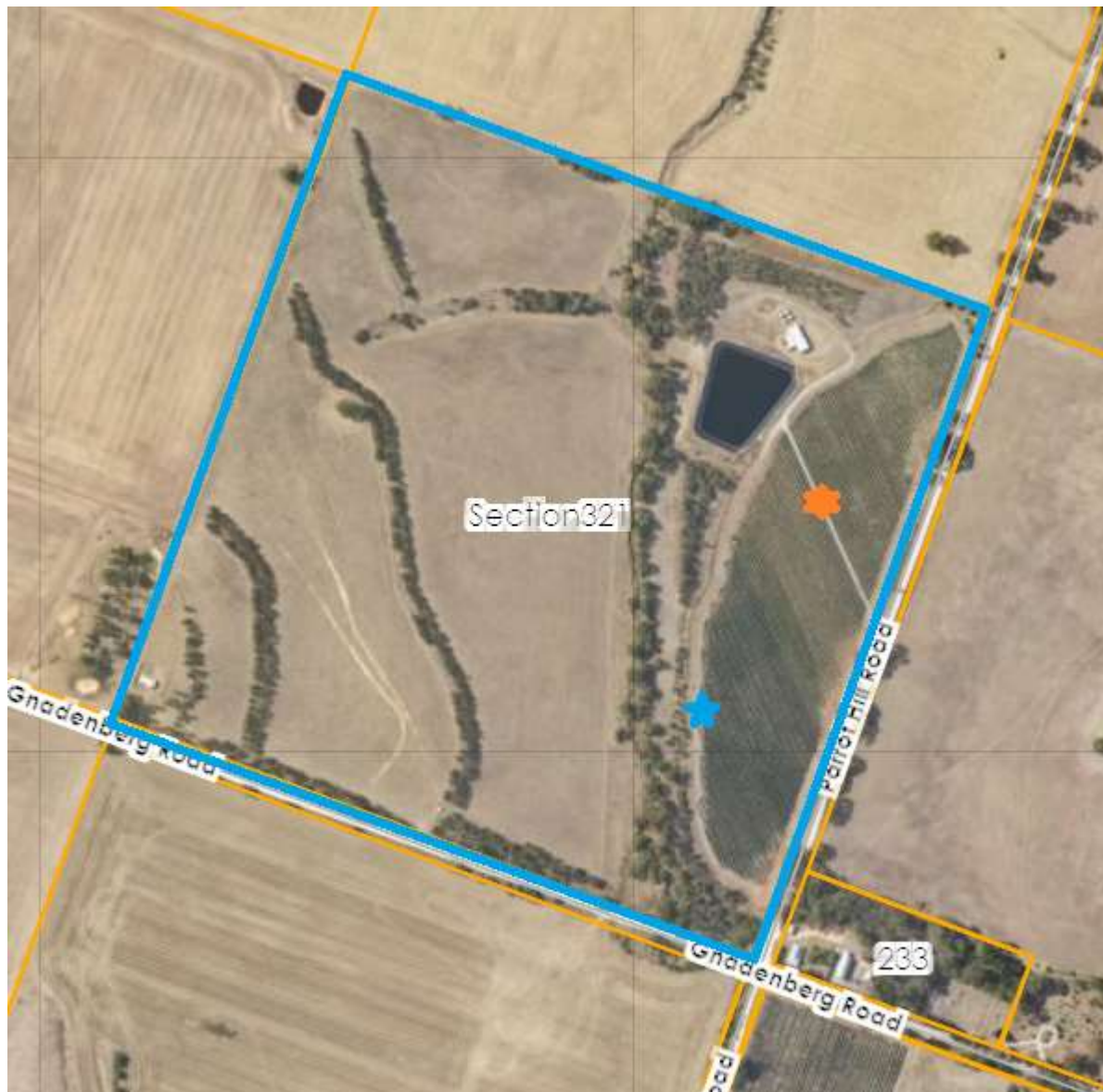


Figure 2: Aerial View – Subject Site, existing frost fan in blue, proposed in orange



Figure 3: Aerial View – Locality – site in blue, non-associated dwellings indicated with a red star



Figure 4: Looking south-west from Parrot Hill Road toward the existing frost fan. The proposed frost fan is not expected to be visible from Gnadenberg Road



Figure 5: Looking north-west from Parrot Hill Road, approximate location of proposed frost fan is identified by the red ellipse

PROPOSAL

The application seeks development approval for the installation of one (1) frost control fan (Frost Boss model C49) on the subject site.

The frost fan comprises a metal tower 10.38 metres in height and 0.435 metres in diameter, with a five-blade fan rotating on a tilted axis mounted at the top of the tower. Each blade has a radius of 2.75 metres. The overall maximum height of the fan from ground level to tip of propeller is 13.45 metres.

The main tower and propeller blades are proposed to be of a galvanised iron finish. A small tower radio, anemometer and strobe light (solar powered) is located at the midpoint of the tower.

The tower will be erected on a concrete foundation measuring 2.29 metres square and with a depth of 0.94 metres.

The frost fan is powered by a Perkins 1006-6T Turbo diesel engine enclosed within a steel cabinet at the base of the tower.

The frost fan is intended to provide effective permanent protection against cold injury and frost damage to existing vines during night-time periods of temperatures around 1.5 degrees or less (typically on still nights). The frost fan is located on the subject site taking into account landform, direction of cold nocturnal drift and other internal wind shelter effects. The tower is sited approximately 75 metres from the eastern Parrot Hill Road boundary, 370 metres from the southern Gnadenberg Road boundary, 210 metres from the northern boundary and 510 metres from the western side boundary.

Attachment 1 provides a copy of the application and associated documentation.

APPLICATION TYPE

The site is located within the Rural Zone under the Planning and Design Code.

The proposed development is not listed in Tables 1-4 and therefore defaults to 'Performance Assessed' pathway under Table 3 of the Rural Zone.

PUBLIC NOTIFICATION

The application was subject to public notification in accordance with Table 5 – Procedural Matters – Notification of the Rural Zone. The proposed development in nature of a frost fan is a type of development not listed in Table 5 as being exempt from notification. The proposal is not deemed to be a minor form of development.

<i>Class of Development (Column A)</i>	<i>Exceptions (Column B)</i>
1. Development which, in the opinion of the relevant authority, is of a minor nature only and will not unreasonably impact on the owners or occupiers of land in the locality of the site of the development.	i. None specified.
2. Any development involving any of the following (or of any combination of any of the following): a) advertisement b) agricultural building c) air handling unit, air conditioning system or exhaust fan d) ancillary accommodation e) building work on railway land f) carport g) dwelling h) dwelling addition i) farming j) fence k) horse keeping l) internal building works m) land division n) outbuilding o) private bushfire shelter p) protective tree netting structure q) replacement building r) retaining wall s) shade sail t) solar photovoltaic panels (roof mounted) u) swimming pool or spa pool v) temporary accommodation in an area affected by bushfire w) tree damaging activity x) verandah y) water tank.	i. None specified.

No representations were received during the Public Notification period.

REFERRALS

External

Pursuant to Schedule 9 of the *Planning, Development and Infrastructure (General Regulations 2017)* and Part 9 of the Planning and Design Code, the application was not subject to any referrals.

Internal

There were no internal referrals undertaken for this application.

ASSESSMENT

Please refer to the following link, the Planning and Design Code extract for this proposal, dated (insert date), Version (version number):

Planning and Design Code Extract Link	Relevant Code Extract
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Seriously at Variance

Pursuant to Section 107(2)(c) of the *Planning, Development and Infrastructure Act 2016*, it is recommended that the Panel determine that the proposed development is not seriously at variance with the relevant provisions of the Planning and Design Code.

An Environmental Noise Assessment has been provided by Echo Acoustic Consulting. The report has assessed the predicted noise emissions of the frost fan when measured from the closest non associated dwellings. The C49 machine predicts a noise level, when measured from the closest (non-associated) dwellings of 41-49 dB(A). These noise levels are below the minimum thresholds contained in the *Environment Protection (Noise) Policy 2007* based on the zoning applicable to the locality.

The existing viticultural activity is an envisaged use in the Zone. The proposed frost fan is designed to prevent crop loss through frost damage and support ongoing business advancement and viability. Built form and visual impact is considered to be acceptable. The applicant has satisfactorily addressed noise and amenity concerns. The proposal is therefore not considered to be seriously at variance with the provisions of the Planning and Design Code.

Character Preservation (Barossa Valley) Act 2012

Pursuant to Section 6(2) of the *Character Preservation (Barossa Valley) Act 2012*, having regard to the Objects of the Act, it is recommended that the Panel determine that the proposed development does not adversely impact the character values of the district. The character values of the district are:

- (a) the rural and natural landscape and visual amenity of the district
- (b) the heritage attributes of the district
- (c) the built form of the townships as they relate to the district
- (d) the viticultural, agricultural and associated industries of the district
- (e) the scenic and tourism attributes of the district

Further discussion is contained under the Assessment section below in relation to the Character Preservation District Overlay.

Assessment

Detailed assessment of the proposal has taken place against the relevant provisions of the Planning and Design Code as quoted above. Commentary is provided below under headings:

Land Use

Rural Zone	
Desired Outcomes	
DO1	A zone supporting the economic prosperity of South Australia primarily through the production, processing, storage and distribution of primary produce, forestry and the generation of energy from renewable sources.
DO2	A zone supporting diversification of existing businesses that promote value-adding such as industry, storage and warehousing activities, the sale and consumption of primary produce, tourist development and accommodation.
Relevant Performance Outcomes/Designated Performance Features	
Land use and Intensity	
PO 1.1 The productive value of rural land for a range of primary production activities and associated value adding, processing, warehousing and distribution is supported, protected and maintained.	DTS/DPF 1.1 Development comprises one or more of the following: a) Advertisement b) Agricultural building c) Brewery d) Carport e) Cidery f) Dairy g) Dam h) Distillery i) Dwelling j) Dwelling addition k) Farming l) Horse keeping m) Horticulture n) Industry o) Intensive animal husbandry p) Low intensity animal husbandry q) Outbuilding r) Renewable energy facility s) Shop t) Small-scale ground mounted solar power facility u) Stock slaughter works v) Tourist accommodation w) Transport distribution x) Verandah y) Warehouse z) Winery - aa) Workers' accommodation

Rural Zone Performance Outcome 1.1 speaks of supporting the productive value of rural land. The envisaged land uses for the zone includes horticulture, winery and farming. The subject site has a longstanding horticulture (viticulture) use (as part of the Henschke Cellars. The frost fan is ancillary to the established use of the land and intended to reduce damage loss and therefore support the ongoing viability and sustainability of this primary production site.

Subject to noise and visual assessment, frost fans are considered an appropriate form of development within the Rural Zone, given their association with horticulture. They positively contribute to the sustainability of the plantation by providing an effective solution to frost damage, which has significant economic impact through loss of crop.

Built form and character

Built form and character	
PO 10.1 <i>Large buildings are designed and sited to reduce impacts on scenic and rural vistas by:</i> <i>having substantial setbacks from boundaries and adjacent public roads using low-reflective materials and finishes that blend with the surrounding landscape being located below ridgelines.</i>	DTS/DPF 10.1 <i>None are applicable.</i>

The proposal is for one (1) C49 model frost fan comprising a structure with the following features:

- A concrete foundation pad and post baseplate
- Engine cabinet located at ground level
- 10.38 metres high tower
- Gearbox and a 4-blade propeller fan with a 5.5 metre wide diameter

The top of the main tower/column stands at a height of 10.38 metres with the overall height of the fan to tip of propeller being 13.45 metres.

The proposed galvanised iron finish has a grey colour tone and is the prevailing finish of frost fans used commonly in the Barossa Valley region and typical of the rural character. The narrow, cylindrical tower and blades are not highly reflective, having relatively limited surface area. The galvanised finish shall weather and dull overtime. The proposed material and colour are therefore considered acceptable.

The tower is sited approximately 75 metres from the eastern Parrot Hill Road boundary, 370 metres from the southern Gnadenberg Road boundary, 210 metres from the northern boundary and 510 metres from the western side boundary.

The proposed frost fan is sufficiently setback within the property at:

- Approximately 370 metres from southern frontage of Gnadenberg Road
- Approximately 75 metres from the eastern Parrot Hill Road boundary
- 654 metres from closest dwelling (identified in the noise assessment as NAD 4)

The subject site gently slopes away to a watercourse when viewed from Parrot Hill Road, before rising to a 20 metre higher peak in the south-western corner of the site. There are rows of native vegetation planted at five metre altitude intervals across the site, effectively providing a landscape backdrop to the frost fan in lieu of the sky from most vantage points. Some screening is provided by the terrain (albeit only effective from Gnadenberg Road and allotments to the west). The existing frost fan is visible from Parrot Hill Road albeit not a dominant visual element due to its slender built form, setback and existing vegetation.

Whilst the height of the proposed frost fan structure is notable, the narrow diameter of the main column/shaft limits the bulk associated with the structure. In addition, the tower is setback a substantive distance from all boundaries.

While it will be a visual feature in the landscape (combined with the existing frost fan), a frost fan is a common element in the Barossa landscape, it will not be visually obtrusive and its existence has a clear and important function which is considered an important offset consideration in this assessment.

Character Preservation Overlay

Character Preservation District Overlay	
Desired Outcomes	
DO1	Recognise, protect and enhance the special character of Character Preservation Districts.
DO2	The long term use of land outside of townships for primary production and associated value adding enterprises is assured and promoted.
Relevant Performance Outcomes/Designated Performance Features	
Built Form and Character	
PO 2.2 Development contributes to and maintains the historic identity and character of townships through appropriate: a) form b) scale c) siting d) design e) landscaping	DTS/DPF 2.2 None are applicable.
Built Form and Character in the Rural Areas	
PO 3.1 Preservation of existing natural features including topography, watercourses and mature trees.	DTS/DPF 3.1 None are applicable.
PO 3.2 Buildings and structures do not interrupt views of the skyline through measures including being sited below ridge lines.	DTS/DPF 3.2 None are applicable.
PO 3.3 Buildings and structures harmonise with the natural features of the landscape and reinforce the rural character through the use of muted, neutral, non-reflective landscape colours on external surfaces.	DTS/DPF 3.3 None are applicable
PO 3.4 Large buildings and structures are sited and oriented to minimise their visual bulk, particularly if close to roads or in open settings where there are no other buildings or mature trees in close proximity.	DTS/DPF 3.4 None are applicable.
PO 3.5 Buildings and structures are grouped to create compact clusters well set back from public roads.	DTS/DPF 3.5 None are applicable.

The Character Preservation District Overlay seeks to recognise, protect and enhance the area's special character with a further remit to assure long term use of the land outside of townships for primary production activities.

The site is located within rural land approximately 3 kilometres south-east of the Moculta township that is primarily used for viticulture and broadacre farming. Local character is defined by the presence of agrarian activities interspersed with agricultural buildings, some dwellings and the Gnadenberg Church. Frost fans are an increasing visual element within the rural parts of the Barossa Valley and have typically been assessed by Councils within the district as an acceptable addition to the existing landscape.

It is always a balanced decision when assessing built form that can intrude into a landscape. In determining that the proposal accords with Overlay policies it is considered important to acknowledge that the structure has an intended purpose of crop protection, and its height and design is a factor of function plus form.

Having regard to the Character values of the district and Overlay policies, it is considered that the proposed frost fan, associated with the existing vineyard will not detrimentally affect the special character of the district for the following reasons:

- Frost fan structures are a common feature in the wider locality and in areas of rural landscape across the district.
- The fan is silhouetted against trees and terrain to the rear of the allotment and will not adversely interrupt skyline views.
- Whilst the height of the frost fan is some 13 metres to the top of the propeller, the narrow diameter of the main column/shaft limits the bulk associated with the structure. Frost fans are noticeable but not considered highly intrusive to existing character.
- The galvanised iron finish of the frost fan is not highly reflective. The grey colour will help minimise the visual impact of the structure.
- The frost fan will support a primary production operation within the Rural Zone which in turn helps deliver positive economic outcomes in the area.

Heritage Adjacency Overlay

Character Preservation District Overlay	
Desired Outcomes	
DO1	Development adjacent to State and Local Heritage Places maintains the heritage and cultural values of those Places
Relevant Performance Outcomes/Designated Performance Features	
Built Form	
PO 1.1 Development adjacent to a State or Local Heritage Place does not dominate, encroach on or unduly impact on the setting of the Place.	DTS/DPF 1.1 None are applicable.

There is a Local Heritage listed structure at Allot 502 Gnadenberg Road (refer **Figure 6**), directly across Gnadenberg Road from the subject site as demonstrated in **Figure 7**.

The proposed frost fan will not be visible from the Local Heritage Place, it likewise will not unduly impact upon the setting of the Place given that it will be located (approximately) a further 195 metres from the existing frost fan.



Figure 6: Local Heritage listed ruin at Allot 502 Gnadenberg Road, Moculta (file photo)



Figure 7: Aerial View indicating the location of the Local Heritage Place in the context of the existing frost fan and the proposed frost fan

Clearance from Overhead Powerlines

General Development Policies	
Clearance from Overhead Powerlines	
Desired Outcomes	
DO1	Protection of human health and safety when undertaking development in the vicinity of overhead transmission powerlines.
Relevant Performance Outcomes/Designated Performance Features	
PO 1.1 Buildings are adequately separated from aboveground powerlines to minimise potential hazard to people and property.	DTS/DPF 1.1 One of the following is satisfied: a) a declaration is provided by or on behalf of the applicant to the effect that the proposal would not be

	contrary to the regulations prescribed for the purposes of section 86 of the Electricity Act 1996 b) there are no aboveground powerlines adjoining the site that are the subject of the proposed development.
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DTS/DPF 1.1 clause has been met and therefore the related Performance Outcome 1.1 will be achieved.

Interface between Land Uses

General Development Policies	
Interface between Land Uses	
Desired Outcomes	
DO1	Development is located and designed to mitigate adverse effects on or from neighbouring and proximate land uses.
General Land Use Compatibility	
PO 1.2 Development adjacent to a site containing a sensitive receiver (or lawfully approved sensitive receiver) or zone primarily intended to accommodate sensitive receivers is designed to minimise adverse impacts.	DTS/DPF 1.2 None are applicable.
Activities Generating Noise or Vibration	
PO 4.1 Development that emits noise (other than music) does not unreasonably impact the amenity of sensitive receivers (or lawfully approved sensitive receivers).	DTS/DPF 4.1 Noise that affects sensitive receivers achieves the relevant Environment Protection (Noise) Policy criteria.
PO 4.2 Areas for the on-site manoeuvring of service and delivery vehicles, plant and equipment, outdoor work spaces (and the like) are designed and sited to not unreasonably impact the amenity of adjacent sensitive receivers (or lawfully approved sensitive receivers) and zones primarily intended to accommodate sensitive receivers due to noise and vibration by adopting techniques including: a) locating openings of buildings and associated services away from the interface with the adjacent sensitive receivers and zones primarily intended to accommodate sensitive receivers. b) when sited outdoors, locating such areas as far as practicable from adjacent sensitive receivers and zones primarily intended to accommodate sensitive receivers. c) housing plant and equipment within an enclosed structure or acoustic enclosure.	DTS/DPF 4.2 None are applicable.

d) providing a suitable acoustic barrier between the plant and / or equipment and the adjacent sensitive receiver boundary or zone.	
PO 4.4 External noise into bedrooms is minimised by separating or shielding these rooms from service equipment areas and fixed noise sources located on the same or an adjoining allotment.	DTS/DPF 4.4 Adjacent land is used for residential purposes.
Solar Reflectivity / Glare	
PO 7.1 Development is designed and comprised of materials and finishes that do not unreasonably cause a distraction to adjacent road users and pedestrian areas or unreasonably cause heat loading and micro-climatic impacts on adjacent buildings and land uses as a result of reflective solar glare.	DTS/DPF 7.1 None are applicable.

The primary concern with the operation of frost fans is the potential for noise generation which could impact upon the amenity of the predominantly rural locality.

The applicant has engaged Echo Acoustic Consulting to undertake an Environmental Noise Assessment of the proposed frost fan to predict noise levels and assess against criterion established under the *Environment Protection (Noise) Policy 2007*. This Policy document has been prepared by the EPA and sets out specifically the noise control provisions applicable to frost fans. The parent legislation for this Policy is the *Environment Protection Act 1993* which incorporates a requirement to ensure the acoustic amenity of a locality is not unreasonably interfered with. Division 5 of the Policy provides specific allowable noise levels for frost control fan operation that is based on a balance between protecting primary production through the effective use of frost control fans and minimising the noise impact on neighbouring properties. There are other stipulated operational requirements which should be addressed in a noise assessment such as limiting fan dimensions and operating speed to that reasonably required for its effective operation.

As identified in DPF 4.1, compliance with Performance Outcome 4.1 is considered satisfied when the "Noise that affects sensitive receivers achieves the relevant *Environment Protection (Noise) Policy* criteria".

An additional EPA document, the 'EPA Evaluation Distances for Effective Air Quality and Noise Management 2016' identifies an evaluation distance of 2,000 metres for a frost fan from a sensitive receiver. This is a recommended evaluation distance to help guide the potential radius of sensitive receivers for a proposed development and is not considered absolute criteria. The guide states that "If a proponent wishes to reduce the distance, the EPA will request the proponent to demonstrate that adverse impacts are reduced to acceptable levels (or below)." That is part of the purpose of the Environmental Noise Assessment report to demonstrate impact and recommend any mitigation measures and to show (or otherwise) compliance with the *Environment Protection (Noise) Policy 2007*. Compliance with the Policy is generally required to be demonstrated where a frost fan is proposed within the 2,000 metre evaluation distance in order to allow reduced separation to sensitive receivers. This is a typical assessment process for frost fans in the Rural Zone.

In their assessment, Echo Acoustic Consulting identify that the applicant will operate the Frost Boss C49 fan at an engine speed of 1,750rpm which corresponds to fan speed operating at 418rpm. The report further notes that:

- Noise modelling which accounts for the propagation in noise during the specific meteorological conditions that occur during frost conditions (this aligns with Division 5, Part 32 (1)(b) of the Policy).
- One new FrostBoss C49 frost control fan being operated with one existing C49 frost control fan on the premises.

In addition, the following operating criteria is proposed as conditions in the Environmental Noise Report:

- (1) The frost control fan must not be operated except during a period when frost occurs or is reasonably likely to occur, or as necessary for maintenance work and maintenance work must not be carried out on the fans except between 7.00 a.m. and 10.00 p.m. on the same day.
- (2) The frost control fan must not exceed an equivalent noise level LAeq, of 55 dB(A) when measured over the full rotation of the fan about the tower at any non-associated dwelling which exists in the Rural Zone (or similar) at the time of approval. Where an equivalent noise level LAeq, of 55 dB(A) is exceeded, then the operation of the fan must be modified to achieve that external noise level, or it must be shown that an equivalent noise level LAeq full rotation of 35 dB(A) is achieved in the habitable rooms of that non-associated dwelling.

These suggested conditions align with allowable noise levels in Division 5, Part 32 (1)(6) of the Policy. They have been integrated, where appropriate, in recommended Conditions of Consent.

Echo Acoustic Consultants identify the closest dwellings from the proposed frost fan where noise measurements have been undertaken and assessed. These are all located between 654 metres to 1,982 metres from the proposed structure. The location of each property is shown in Figure 1 of the Environmental Noise Report and included below in **Figure 8**. All these dwellings are located in the Rural Zone.

The predicted noise levels (C49 fan) operating at normal speed for NAD 1 - 4 are:

- NAD 1 – 1,108 metres separation distance (44 dB(A))
- NAD 2 – 1,512 metres separation distance (43 dB(A))
- NAD 3 – 1,982 metres separation distance (49 dB(A))
- NAD 4 - 654 metres separation distance (41 dB(A))



Figure 8: Aerial View indicating closest dwellings from the proposed frost fan where noise measurements have been undertaken and assessed

The predicted cumulative noise levels (ie. generated by both frost fans on the site) for these dwellings therefore significantly fall (between 15-17dB(A)) below the criterion of 55 dB(A) for the Rural Zone. While the *Environment Protection (Noise) Policy 2007* applies a higher allowable noise level for the Rural Zone accepting the primary intent of the zone to support ongoing, viable agricultural operations.

With regards to the Policy threshold, the EPA has previously advised that noise at a certain level such as 55 dB(A) is audible particularly if the background level of noise is low such as a rural area at night-time. However, this threshold has also been established cognisant that frost fans operate occasionally throughout each year when the ambient temperature reaches a very low level of around 1.0 – 1.5 degree Celsius (usually late night/early morning).

Overall, the Environmental Noise Assessment Report utilises accepted calculation methodology and the conclusions drawn are reasonable. Based on this report, the proposal is considered to achieve the *Environment Protection (Noise) Policy 2007* criteria and therefore Performance Outcome 4.1 and DPF 4.1 is satisfied.

It should also be acknowledged that the primary intent of the Rural Zone is for support and protection of farming, horticulture and similar activities. In acknowledging amenity issues, residents should have some expectation of noise, odour or other amenity (obviously within any set guidelines/parameters) impacts. This is supported in the approach previously adopted by the Environment, Resources and Development (ERD) Court. In *Takhar v District Council of Light (1994)*, the Court stated the following:

"Those who choose to live outside of the more settled areas, and thus closer to farming activities, have to be prepared to accept some "strange" odours and noises which are to be experienced in farming areas. That is the price that they might have to pay for escaping from the effects of the urban lifestyle".

Transport, access and parking

General Development Policies	
Transport, Access and Parking	
Desired Outcomes	
DO1	A comprehensive, integrated and connected transport system that is safe, sustainable, efficient, convenient and accessible to all users.
Relevant Performance Outcomes/Designated Performance Features	
Vehicle Access	
PO 3.1 Safe and convenient access minimises impact or interruption on the operation of public roads.	DTS/DPF 3.1 The access is: a) provided via a lawfully existing or authorised driveway or access point or an access point for which consent has been granted as part of an application for the division of land or b) not located within six metres of an intersection of two or more roads or a pedestrian activated crossing.
Vehicle parking areas	
PO 6.1 Vehicle parking areas are sited and designed to minimise impact on the operation of public roads by avoiding the use of public roads when moving from one part of a parking area to another.	DTS/DPF 6.1 Movement between vehicle parking areas within the site can occur without the need to use a public road.
PO 6.2 Vehicle parking areas are appropriately located, designed and constructed to minimise impacts on adjacent sensitive receivers through measures such as ensuring they are attractively developed and landscaped, screen fenced, and the like.	DTS/DPF 6.2 None are applicable.
PO 6.3 Vehicle parking areas are designed to provide opportunity for integration and shared-use of adjacent car parking areas to reduce the total extent of vehicle parking areas and access points.	DTS/DPF 6.3 None are applicable.

There will be occasional servicing needs for the fan. There is an internal driveway running through the site that provides access to the position of the new frost fan. There is a cleared pathway with sufficient width to allow parking and entry/exit in a forward direction. This is also likely to be used for any servicing of the existing frost fan. Relevant Performance Outcomes are considered to be met.

Other Overlays

The following Overlays have been considered in the assessment of the proposed development but are not applicable to the proposal given that:

Hazards (Bushfire – Medium Risk) Overlay

The frost fan will be located within the allotment which is accessible via vehicles for maintenance. There are no habitable buildings on-site.

Hazards (Flooding - Evidence Required) Overlay

There are no water courses that traverse the land where the frost fan is proposed. The frost fan has a minimal footprint and will not contribute to any flooding impacts within the locality.

Limited Land Division Overlay

No division of land is proposed as part of this application.

Native Vegetation Overlay

No native vegetation is identified to be removed as part of the development. The Native Declaration form has been signed by the applicant.

Prescribed Water Resources Area Overlay

The frost fan will be associated with an established vineyard area and will not be located near any watercourses.

Water Protection Area Overlay

The proposed development does not involve any activities listed in PO 1.1 and will not alter water use or change water supply arrangements for the existing activity.

Water Resources Overlay

The frost fan will be associated with an established vineyard area and given the minimal building footprint will not result in increased surface water run-off or deposition of material in any watercourses.

CONCLUSION

The proposal comprises the '*Installation and operation of one (1) Frostboss C49 frost fan with Perkins engine*'. The application was subject to 'Performance Assessment' and public notification. The application was notified in accordance with Section 107 of the *Planning, Development and Infrastructure Act 2016* with no representations received.

This report has provided a detailed assessment of the proposal against the relevant provisions of the Planning and Design Code.

The nature of the proposal is acceptable as the frost fan is intended to support the existing viticultural use of the land. Viticulture is an envisaged use in the Rural Zone.

The primary assessment issues relate to visual impact and noise emission. It is considered that the frost fan will have an acceptable visual impact taking into account its height, slender frame, setbacks and clearly expressed functional form. Frost fans are another built element in the Barossa Valley landscape and while it will be visible its visual impact is not sufficiently detracting on the landscape and related special character of the area.

The applicant has shown with expert input that the anticipated noise level of the frost fan (cumulative with the existing frost fan) when in operation, will not exceed the quantitative noise levels for nearby dwellings as set out in the *Environment Protection (Noise) Policy 2007*. Compliance with this State Government set policy is considered sufficient to demonstrate that noise levels should not unreasonably impact the amenity of adjacent residential land uses.

Assessment has identified that the proposed development is reasonably consistent with the Desired Outcome and Performance Outcomes of the Rural Zone and other relevant provisions of the Planning and Design Code, such that Planning Consent is warranted, subject to recommended Conditions of Consent.

RECOMMENDATION 1

Not Seriously at Variance

The Barossa Assessment Panel, having considered the application, resolves that the development proposal has sufficient merit, and is not seriously at variance with the Planning and Design Code.

RECOMMENDATION 2

Character Preservation

Pursuant to Section 6(2) of the *Character Preservation (Barossa Valley) Act 2012*, the Barossa Assessment Panel has had regard to the objects of that Act and, in determining this application, has resolved that there are potential impacts on the character values of the district, but is worthy of further consideration.

RECOMMENDATION 3

Granting of Planning Consent

The Barossa Assessment Panel, having considered the application for consent to carry out development of land and pursuant to the provisions of the *Planning, Development and Infrastructure Act 2016* resolves to GRANT Planning Consent for Application No. 23005204 by Australian Frost Fans Pty Ltd to undertake installation and operation of one frost fan at Lot 321 Parrot Hill Rd, Moculta (CT 5529/393) subject to the following conditions and advisory notes:

Council Conditions

- (1) The development shall be undertaken in accordance with the endorsed plans and documentation (as amended) accompanying Application No. xxx except where varied by any condition(s) listed below.

Plan Type	Prepared By	Drawing No.	Issue No./Date
C49 Tower Elevations	Design Phase	Sheet No. 1 Issue 1	26 June 2023
C49 Foundation and Baseplate Details	Design Phase	Sheet No. 2, Issue 1	26 June 2023
Acoustic Report	Echo Acoustic Consulting	Reference ID: 23-26-1	22 Feb 2023

- (2) The frost fan must be operated in accordance with the provisions of the *Environment Protection (Noise) Policy 2007* relating to frost fans, as amended or superseded from time to time.

- (3) An annual report shall be prepared detailing the prevailing ambient temperature, times and duration the frost fan was in use as well as setting out any maintenance, repairs, modification or other service. The report(s) shall be provided to the Relevant Authority on request and shall be prepared at least once each calendar year.
- (4) No audible alarm to signal frost malfunction shall be installed. A limiting switch may be installed that immediately turns the frost fan off during a malfunction and includes an effective operator warning system that can be remotely monitored, to the satisfaction of the Relevant Authority. A person capable of managing the use and function of the approved frost fan shall be available to attend promptly, to the reasonable satisfaction of the Relevant Authority, at the vineyard site, at all times during operations.
- (5) The frost fan shall be maintained at all times in good repair and condition, in accordance with the manufacturer's specifications. Maintenance, repair, modification work or other service on the frost fan shall only be carried out between 7:00 am and 10:00 pm. A log of all such work shall be kept and produced to the Relevant Authority upon request.
- (6) The frost fan shall be set with a fan 'start' temperature of 1.5°C and a fan 'stop' temperature of 3.5°C.
- (7) The operating motor speed for the frost fan must be mechanically limited to a maximum of 1750 rpm and the fan speed must not exceed a maximum of 418 rpm.
- (8) The diesel engine cabinet attached to the frost fan shall be clad using a muted colour, such as Colorbond "Woodland Grey".

Advisory Notes

- (1) Any portion of Council's infrastructure damaged as a result of work undertaken within the development site or associated with the development shall be repaired/reinstated to Council's satisfaction at the developer's expense.
- (2) Any variation of this approved development and/or the conditions of consent will require a separate request and approval by the relevant authority. Approval of this application does not necessarily imply that future requests for variations would be approved. Any future request will be assessed by having regard to the relevant rules and requirements in force at the time any request is lodged.
- (3) The adjoining owner should be advised of the proposed work on the boundary and matters such as access to perform work, removal of fences, finished levels and retaining walls should be resolved before building work commences. This approval does not create an automatic right to access neighbouring land.

- (4) Any works associated with the development such as tree planting, tree removal, footpath renewal or construction of new vehicle entrances proposed to be undertaken within the road reserve (ie the road carriageway, verge or footpath area) requires an independent approval from Council pursuant to the *Local Government Act 1999*. Further enquiries should be directed to the Works and Engineering team on 8563 8444.
- (5) The applicant is reminded of its general environmental duty, as required by Section 25 of the *Environment Protection Act 1993*, to take all reasonable and practicable measures to ensure that the activities on the whole site including during construction, do not pollute the environment in a way which causes or may cause environmental harm.
- (6) Construction shall not take place on any Sunday or Public Holiday or after 7:00 pm or before 7:00 am on any other day, and all practicable steps must be taken during construction to minimise the impact of noise emissions on neighbouring properties.
- (7) The applicant is advised that this consent does not permit anyone to clear, remove limbs or trim native vegetation. Any proposal to clear, remove limbs or trim native vegetation will require approval or confirmation of exemption from the Native Vegetation Council. An interactive guide is available to help owners and others determine the requirements that apply under the *Native Vegetation Act 1991*, <https://www.environment.sa.gov.au/topics/native-vegetation/interactive-guide>. Any specific queries regarding the clearance, removal or trimming of native vegetation should be directed to the South Australian Native Vegetation Council.
- (8) The applicant is advised that any proposal to clear, remove limbs or trim native vegetation should be undertaken after first notifying the Native Vegetation Council of intended works.

ATTACHMENTS OR OTHER SUPPORTING REFERENCES

Attachment 1 Application and Associated Documents [↓](#) 

Development Locations

Location 1

Location reference

LOT 321 PARROT HILL RD MOCULTA SA 5353

Title Ref

CT 5529/393

Plan Parcel

H160600 SE321

Additional Location Information**Council**

THE BAROSSA COUNCIL

Zone Overlays

Zones

- Rural

Sub-zones

(None)

Overlays

- Character Preservation District
- Hazards (Bushfire - Medium Risk)
- Heritage Adjacency
- Hazards (Flooding - Evidence Required)
- Limited Land Division
- Native Vegetation
- Prescribed Water Resources Area
- Water Protection Area
- Water Resources

Variations

- Minimum Site Area (Minimum site area is 32 ha)
- Minimum Dwelling Allotment Size (Minimum dwelling allotment size is 60 ha)

Application Contacts

Applicant(s)

Stakeholder info

Australian Frost Fans Pty Ltd
1429 Omaha Road
Hastings
4175

Contact

Stakeholder info

Mrs Lyn Elliott

Invoice Contact

Stakeholder info

Australian Frost Fans Pty Ltd
1429 Omaha Road
Hastings
4175

Invoice sector type

Builder

Stakeholder info

Australian Frost Fans Pty Ltd
1429 Omaha Road
Hastings
4175

Land owners

Stakeholder info

Henschke Cellars Pty Ltd
1428 KEYNETON ROAD
KEYNETON
SA
5353

Nature Of Development

Nature of development

Installation and operation of one (1) FrostBoss C49 frost fan with a Perkins engine

Development Details

Current Use

Viticulture

Proposed Use

No change - Viticulture

Development Cost

\$74,250.00

Proposed Development Details

Installation and operation of one (1) FrostBoss C49 frost fan with a Perkins engine

Element Details

You have selected the following elements

Other - Rural - \$74,250.00

- frost fan for frost protection of crops

Septic/Sewer information submitted by applicant

Does this development require a septic system, i.e. septic tank and/or waste water disposal area?

No

Certificate of Title information submitted by applicant

Does the Certificate of Title (CT) have one or more constraints registered over the property?

No

Consent Details

Consent list:

- Planning Consent
- Building Consent

Have any of the required consents for this development already been granted using a different system?

No

Planning Consent

Apply Now?

Yes

Who should assess your planning consent?

Assessment panel/Assessment manager at The Barossa Council

If public notification is required for your planning consent, who would you like to erect the public notification sign on the land?

Applicant

Building Consent

Do you wish to have your building consent assessed in multiple stages?

No

Apply Now?

Yes

Who should assess your building consent?

The Barossa Council

Has Construction Industry Training Fund Levy (CITB) been paid?

Yes

CITB Receipt Number

253582

Has a builder been engaged for the proposed development?

Yes

Is the development being constructed by an Owner Builder?

No

Consent Order

Recommended order of consent assessments

1. Planning Consent
2. Building Consent

Do you have a pre-lodgement agreement?

No

Declarations

Electricity Declaration

In accordance with the requirements under Clause 6(1) of Schedule 8 of the Planning, Development and Infrastructure (General) Regulations 2017, the proposed development will involve the construction of a building which would, if constructed in accordance with the plans submitted, not be contrary to the regulations prescribed for the purposes of section 86 of the Electricity Act 1996.

Native Vegetation Declaration

The proposed development will not or would not, involve the clearance of Native Vegetation under the Native Vegetation Act 1991, including any clearance that may occur in connection with a relevant access point and/or driveway, and/or within 10m of a building (other than a residential building or tourist accommodation), and/or within 20m of a dwelling or addition to an existing dwelling for fire prevention and control, and/or within 50m of residential or tourist accommodation in connection with a requirement under a relevant overlay to establish an asset protection zone in a bushfire prone area.

Submission Declaration

All documents attached to this application have been uploaded with the permission of the relevant rights holders. It has been acknowledged that copies of this application and supporting documentation may be provided to interested persons in accordance with the Act and Regulations.

Documents

Document	Document Type	Date Created
Calculations - NZ FROST FANS.pdf	Engineering Structural	23 Feb 2023 11:48 AM
DPL- C49.pdf	Engineering Structural	23 Feb 2023 11:48 AM
Noise report for MDC - Perkins.pdf	Technical Report - Acoustic	23 Feb 2023 11:48 AM
23- 28- 1 Environmental Noise Assessment.pdf	Technical Report - Acoustic	23 Feb 2023 11:48 AM
186634.pdf	CITB Payment Reference	23 Feb 2023 11:48 AM
253582.pdf	CITB Payment Reference	23 Feb 2023 11:48 AM
20230223000172_Register_Search_Plus.pdf	Certificate of Title	23 Feb 2023 11:48 AM
Schillings - council distances.pdf	Location Plan	23 Feb 2023 11:48 AM
Statement of Support and Effect Henschke Cellars Schillings.pdf	Environmental Impact Statement	23 Feb 2023 11:48 AM

Application Created User and Date/Time

Created User

lyn.elliott

Created Date/Time

23 Feb 2023 11:48 AM



Product Register Search Plus
(CT 5529/393)
Date/Time 23/02/2023 07:20AM
Customer Reference Henschke
Order ID 20230223000172

REAL PROPERTY ACT, 1886



South Australia

The Registrar-General certifies that this Title Register Search displays the records maintained in the Register Book and other notations at the time of searching.



Certificate of Title - Volume 5529 Folio 393

Parent Title(s) CT 4045/585
Creating Dealing(s) CONVERTED TITLE
Title Issued 30/04/1998 **Edition** 2 **Edition Issued** 30/07/1999

Estate Type

FEE SIMPLE

Registered Proprietor

CYRIL HENSCHKE PTY. LTD. (ACN: 007 691 018)
OF PO BOX 100 KEYNETON SA 5353

Description of Land

SECTION 321
HUNDRED OF MOOROOROO
IN THE AREA NAMED MOCULTA

Easements

NIL

Schedule of Dealings

NIL

Notations

Dealings Affecting Title NIL
Priority Notices NIL
Notations on Plan NIL

Registrar-General's Notes

APPROVED FX256795

Administrative Interests NIL



Product

Register Search Plus
(CT 5529/393)

Date/Time

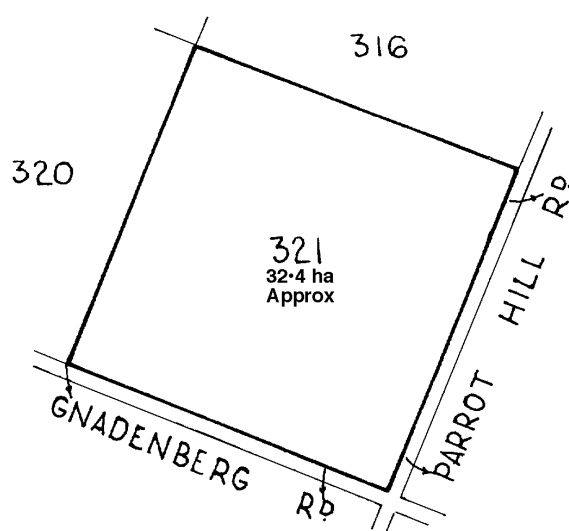
23/02/2023 07:20AM

Customer Reference

Henschke

Order ID

20230223000172



0 100 200 300 400 Metres

A horizontal scale bar with markings at 0, 100, 200, 300, and 400 metres.



Product Historical Search
Date/Time 23/02/2023 07:20AM
Customer Reference Henschke
Order ID 20230223000172

Certificate of Title

Title Reference: CT 5529/393
Status: CURRENT
Parent Title(s): CT 4045/585
Dealing(s) Creating Title: CONVERTED TITLE
Title Issued: 30/04/1998
Edition: 2

Dealings

Lodgement Date	Completion Date	Dealing Number	Dealing Type	Dealing Status	Details
07/05/1999	02/08/1999	8677735	TRANSFER	REGISTERED	CYRIL HENSCHKE PTY. LTD. (ACN: 007 691 018)
07/05/1999	02/08/1999	8677734	DISCHARGE OF MORTGAGE	REGISTERED	7378054
07/05/1999	02/08/1999	8677732	DISCHARGE OF MORTGAGE	REGISTERED	7013533
07/05/1999	02/08/1999	8677730	DISCHARGE OF MORTGAGE	REGISTERED	5068288
07/05/1999	29/07/1999	8677729	TRANSFER OF MORTGAGE	REGISTERED	SYLVIA GERTRUDE DOECKE 5068288
07/05/1999	29/07/1999	8677728	TRANSMISSION APPLICATION (SUBSIDIARY INTEREST)	REGISTERED	HAROLD NEIL DOECKE (DECD), WESLEY KLEM DOECKE (EXEC), STEVEN ROGER DOECKE (EXEC) 5068288
01/10/1992	22/10/1992	7378054	MORTGAGE	REGISTERED	
16/11/1990	17/01/1991	7013533	MORTGAGE	REGISTERED	
30/06/1983	30/06/1983	5068288	MORTGAGE	REGISTERED	



Structural Drawings for Frost Fans C49

NO.	DATE	DESCRIPTION
1	25/06/2021	ISSUE

Drawing Index

S - Series

Sheet No.	Sheet Name	Issue Date	Rev. No.
S.01	C49 Tower Elevations	25/06/2021	1
S.02	C49 Foundation & Baseplate Details	25/06/2021	1



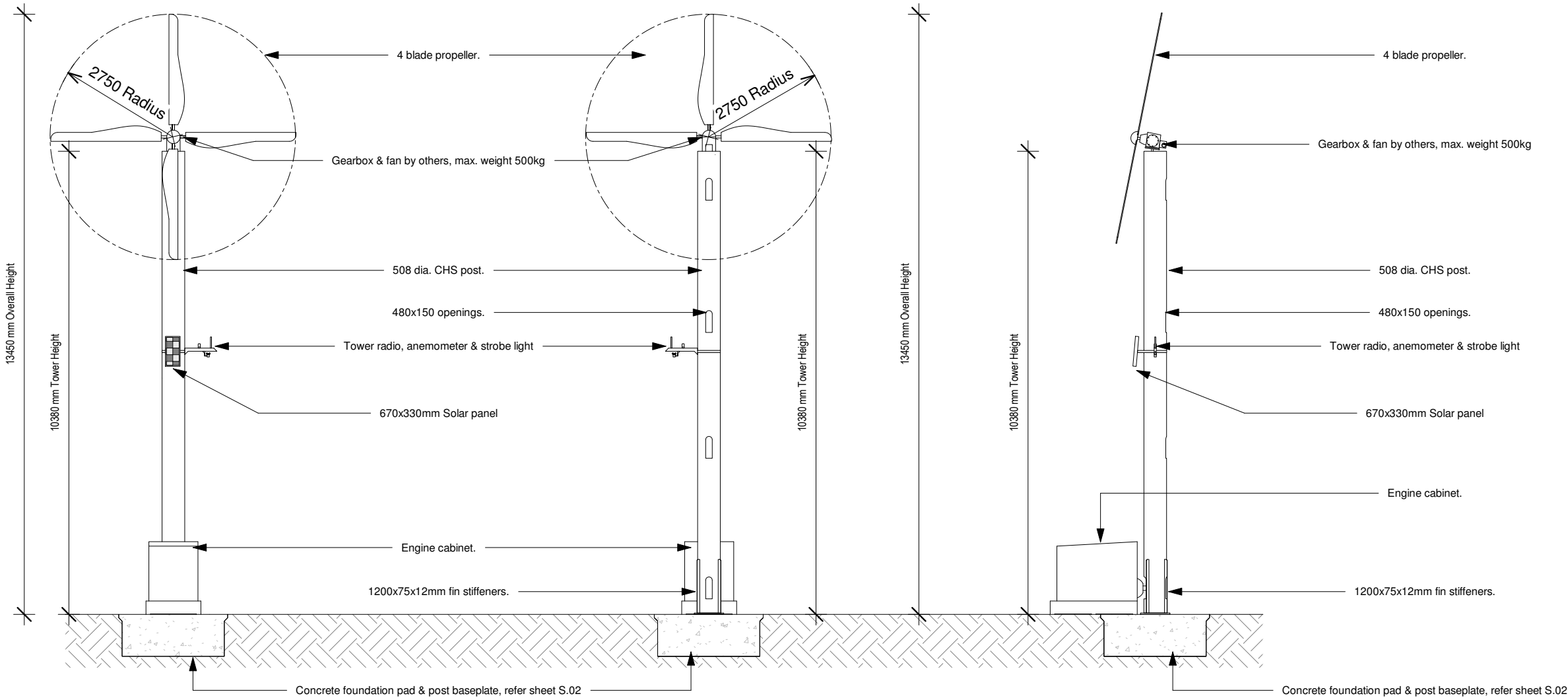
PH: 06 878 5130
114 QUEEN STREET EAST, HASTINGS

PROJECT TITLE
Frost Boss C49
PROJECT ADDRESS
1429 Omahu Road, Twyford
CLIENT NAME
Frstot Fans
SHEET NAME
Cover Page

DATE 25/06/2021
DRAWN BY KB

PROJECT NO.	SHEET NO.
1951	000

NO.	DATE	DESCRIPTION
1	25/06/2021	ISSUE



1 C49 Frost Fans
1: 100 @ A3



PH: 06 878 5130
114 QUEEN STREET EAST, HASTINGS

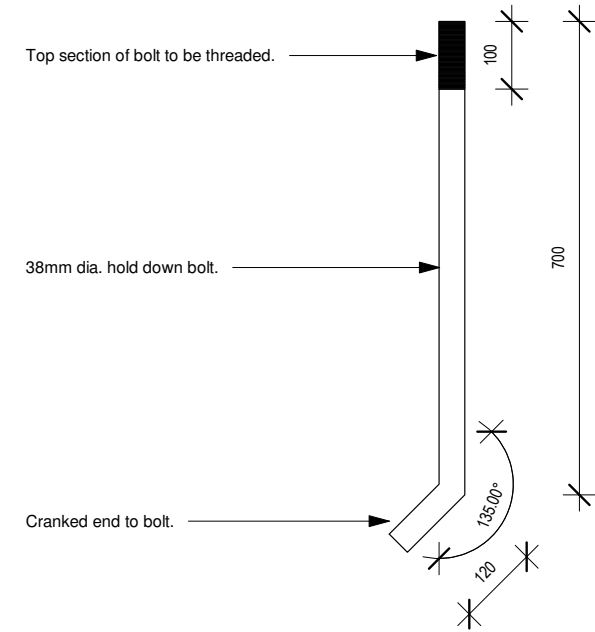
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Frost Boss C49
PROJECT ADDRESS
1429 Omahu Road, Twyford
CLIENT NAME
Frstot Fans

SHEET NAME
C49 Tower Elevations

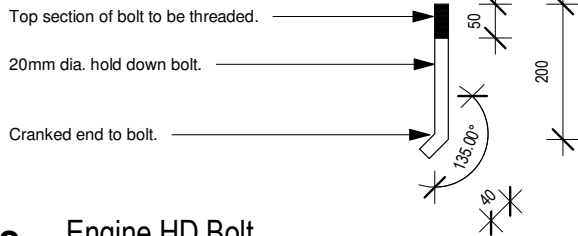
DATE 25/06/2021
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SHEET NO. S.01

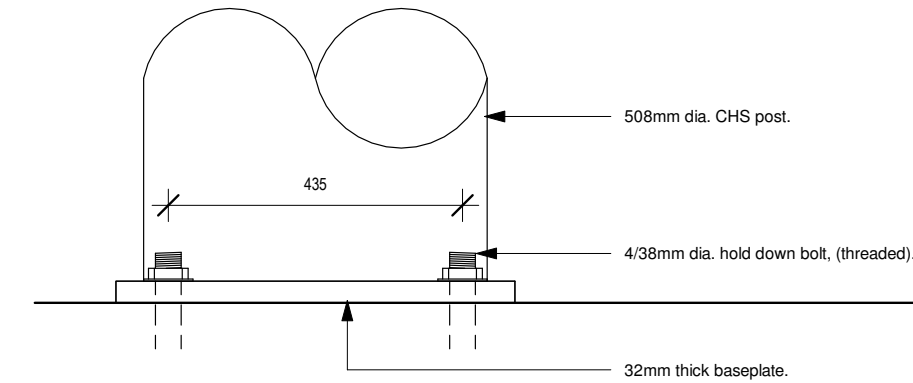
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1	25/06/2021	ISSUE



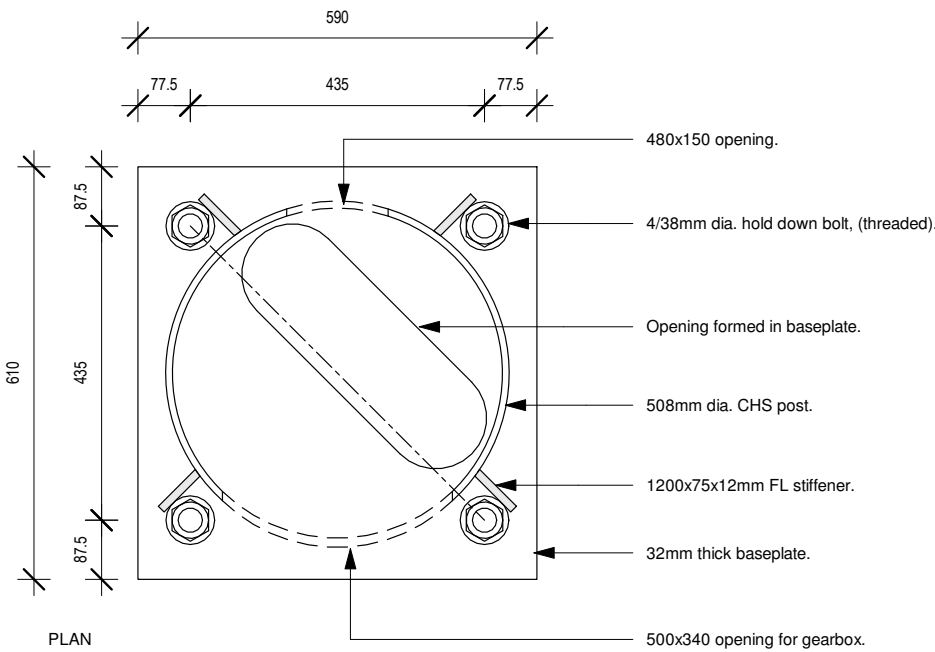
1 Tower HD Bolt
1 : 10 @ A3



2 Engine HD Bolt
1 : 10 @ A3

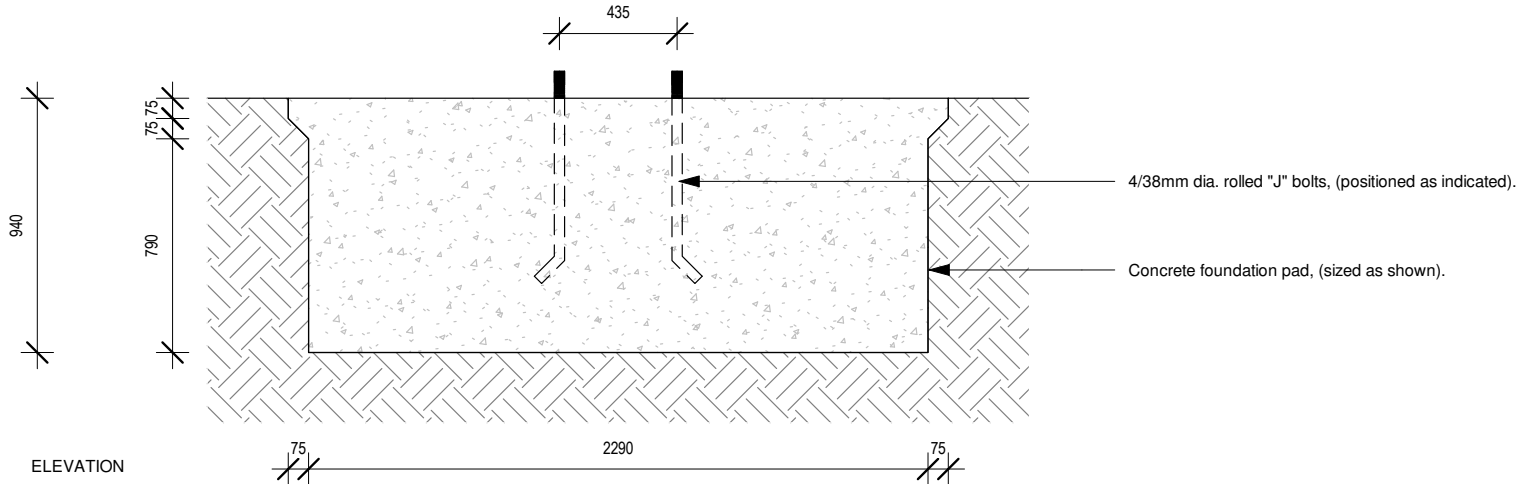


ELEVATION

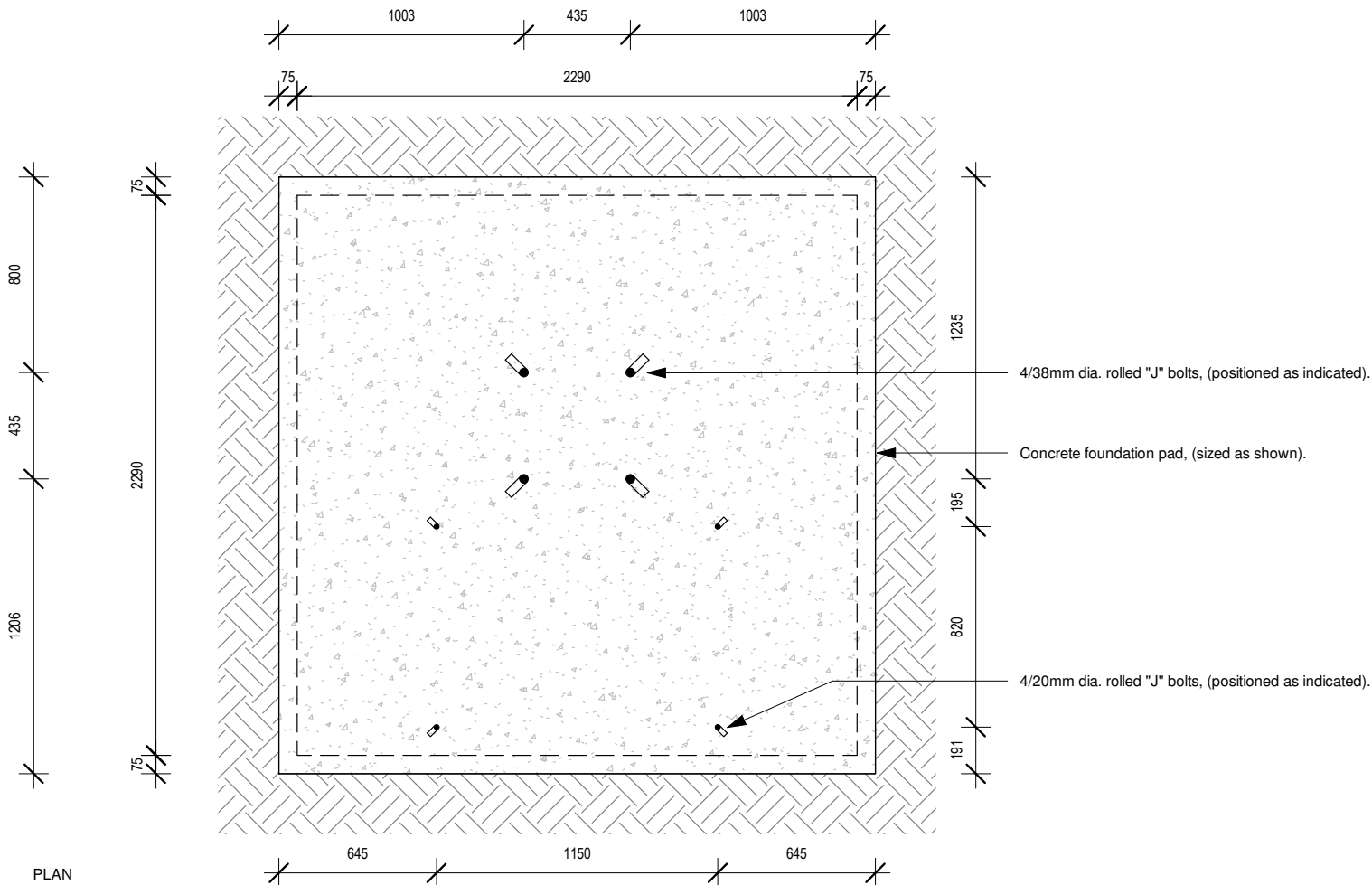


PLAN

3 Tower Baseplate
1 : 10 @ A3



ELEVATION



PLAN

4 Tower Foundation
1 : 25 @ A3



PH: 06 878 5130
114 QUEEN STREET EAST, HASTINGS

PROJECT TITLE
Frost Boss C49
PROJECT ADDRESS
1429 Omaha Road, Twyford
CLIENT NAME
Frstot Fans

SHEET NAME
C49 Foundation & Baseplate Details

DATE 25/06/2021
DRAWN BY KB

PROJECT NO. SHEET NO.
1951 S.02

STATEMENT OF SUPPORT AND EFFECTS.
Assessment of Environmental Effects
On the Use of the Frost Boss C49 Frost Fan
For the Protection of Crops

Henschke Cellars
Lot 20 Hutton Vale Rd
Angaston SA 5353

CT 5529/393

1. Introduction:

1.1 Henschke Cellars Ltd submits the following Statement of Support and Effects on the Environment in respect to an application for a Resource Consent for the installation of 1 Frost Boss C49 frost fan at **Lot 321 Parrot Hill Rd Moculta**.

1.2 The proposed installation is designed to provide effective permanent protection against cold injury and frost damage to the vineyard.

1.3 The proposed Frost Fan blade is considered within the industry to be the best available in terms of technology and design in the context of performance, effectiveness and noise minimization.

1.4 It is anticipated that the frost fan will only be used on an occasional or infrequent basis. **However, actual usage will be dictated by the weather**; namely the occurrence of crop threatening frost events taking place at a time when buds and fruit are susceptible to cold injury or frost damage. FrostBoss® machines in the area average approx. 40 hours of run time per annum.

1.5 The intended months of operation are September through to November; but crop threatening frost and cold air events can occur at any time. Usage will be restricted to nights when the ambient temperature reaches a critical level.

1.5.1 In practice, the wind machine will start automatically when temperatures fall to an appropriate critical level (**Recommended start temperature 1°C and shut off temperature 3°C**) . Generally, these low temperatures are reached in the early hours of the morning. Temperatures start to rise again just after sun rise, and the machines will automatically shut off when the measured temperature at the affected crop position reaches +2°C above the start temperature.

1.5.2 Temperatures and machines performance within the vineyard will be closely monitored electronically/remotely on 'frost risk nights' by the manager / owner.

1.5.3 In addition to these events, it will also be necessary to run the frost fan at least once a month for maintenance reasons. This will be carried out during normal daylight hours.



Figure 1: FrostBoss C49 Frost Fan blade

1.6 The map below shows the optimum placement position for the proposed frost fans and takes into consideration the following 'placement' factors:

- To provide frost protection to the frost susceptible blocks
- The predominant direction of the cold nocturnal (nighttime) drift
- The size and shape of the block in relation to the nocturnal drift direction
- The topography of the block and in particular features that have the potential to stall or dam the cold air flowing through the vineyard,

The placement option selected focuses on retarding the development of frost within the vineyard. Machines marked in red are existing, the machines for consideration under this Development Application are marked in purple.



2 Background:

2.1 Recent experience suggests that the need for permanent frost protection is now required for this vineyard. In particular, the occurrence and frequency of crop threatening frost events appears to be increasing through spring.

2.2 The primary concern has been the increasingly unpredictable nature of the weather; in particular, the increasing frequency and severity of frost events throughout the region.

2.3 The use of frost fans for the frost protection of orchards is **a well recognised and well accepted farming practice**. The frost fan draws down warm air from the inversion, mixing it with the cold air that is

already flowing through the field, thereby lifting ambient temperatures within the field and preventing cold injury damage and frost damage to the crop.

2.4 Careful consideration has been given to the many and varied alternative methods of frost protection, but the frost fan offers the best overall solution for this site. Should this application fail the vineyard will be protected by the next best option which could be use of a helicopter flying repeatedly over the property.

3 Assessment of Effects:

3.1 **Physical effects:** The frost fan consists of a tower 10.5 metres in height and 0.5 metres in diameter, and a 5.5 metre diameter 4-blade fan. The overall height to the top of the fan tip is 13.3 metres. The unit is powered by a Perkins diesel engine which is housed in a noise attenuated lockable enclosure which sits at the bottom of the tower. The fan rotates around the tower every 6mins 40 seconds.

3.2 **Landscape effects:** The fan assembly and upper portion of the towers will be visible from a distance, but less so up close. Similarly, from the surrounding properties but the frost fan is generally hidden behind the external or internal trees. The visual impact will be minimal as the galvanized tower and the painted composite blades are a grey colour that blends with the colour of the sky. In many cases the roadside trees provide natural screening.

3.3 **Noise effects:** Recent independent noise testing showed the noise level of the Frost Boss C49 Frost Fan, when run at its designed maximum operating engine speed of 1800 rpm, (fan speed of 418rpm) was to be 64 LeAq at 100 metres, 51 dBA LeAq at 300 metres. (See Hegley Acoustic Consultants report dated April 2016 attached). See attached graph for FrostBoss C49.

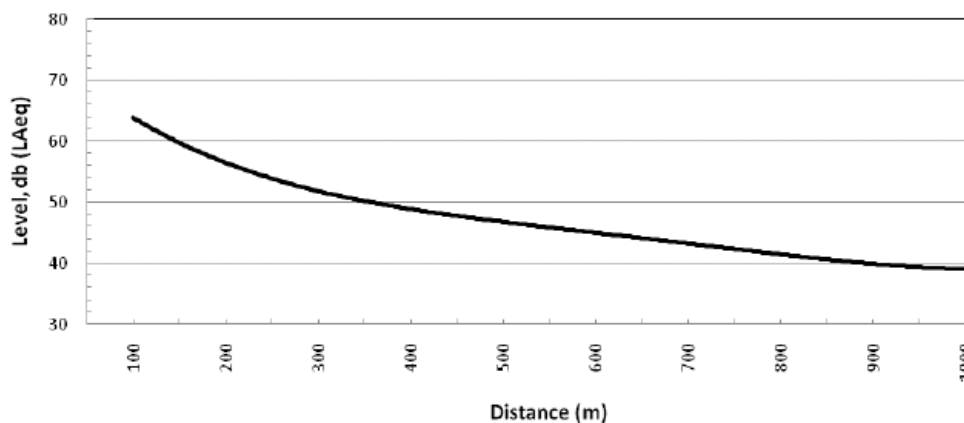


Figure 8. Noise Level at Different Distances

The major source of noise from a frost fans is from the fan, followed by the engine, and then the gearboxes and other rotating machinery (radiator fan, turbo charger, alternator, etc). The noise from the fan is the product of the blade efficiency (the shape and the length) and the speed of rotation.

3.4 Lessening the Environmental Effects:

Ways to mitigate the environmental effects of the noise are:

- That the hours of operation be restricted to the times when the danger of frost damage is imminent or for maintenance purposes.
- That the frost fans shall be operated in such a manner to start when the air temperature on the vineyard drops to the critical crop temperature or below
- The FrostBoss C49 frost fan shall be run at a maximum engine speed of 1750rpm normal mode.
- The frost fans shall be maintained annually in accordance with the manufacturer's specifications. (see section 4)
- Operation of the frost fans for maintenance purposes shall take place only between the hours of 8am and 5pm on weekdays or for emergency maintenance at other times.
- Installation of C49 (Composite) blades

3.5 Effect on Livestock. Livestock is generally not affected by noise that they are accustomed to. Sheep, cattle, horses and pigs are usually very docile and in practice do not get unsettled by noise from Frost Fans or sources that they have heard before; tractors, trucks, trains etc. (Effects of Aircraft Noise and Sonic Booms on Domestic Animals and Wildlife. NERC 88/29 AFESC TR88.14 June 1988 Engineering Services Centre US Airforce.

3.6 Effect on neighboring properties (with regard to temperature).

The frost fans have no climactic or effect on temperatures outside their effective radius. They do no "dam up" or "push" cold air, their effect is to simply bring warmer inversion air from the inversion layer to crop level by forced convection, which is carried across the vineyard by the naturally occurring nocturnal drift. A frost fan CAN NOT make a neighboring or adjoining property colder.

3.7 Frost Fan Specs:

Frost Fan Specs

- | | |
|-------------------------|--|
| • Frost Fan Model: | Frost Boss C49 Diesel Frost Fan |
| • Engine specifications | Perkins 6 cylinder Diesel powered; |
| • Engine casing | N.Z. Frost Fans noise attenuated factory Cabinet |
| • Gear Box Ratios | Top Box Amarillo ratio 1.6364:1
Bottom Box Amarillo ratio 2.563:1
Overall ratio of 4.194 |
| • Operating Engine RPM | 1750 |
| • Tower height | 10.5m |
| • Blade RPM | 418 |
| • Blade Length and Type | C49 FrostBoss Blade – 5.5m diameter – fixed pitch |

Manufactured in composite materials by NZ Frost Fans

4 Machine Maintenance

4.1 The frost fan will be serviced annually. Unlike a vehicle, it is the lack of use that can cause the problems. The preventative maintenance is imperative to maintain reliability and longevity of the frost fan so that it is ready to perform when needed. The maintenance program is carried out by experienced FrostBoss staff and involved in this annual maintenance and safety check is:

- A thorough general check over & adjustment where necessary
- Grease the universal joints, inspect the hanger bearings, adjust the slew & check the blades for deterioration
- Oil & grease the drive shaft joints inside the tower
- Change the engine oil & engine filter. Change the fuel filter
- Remove the air filter inspect & clean it
- Check the belts, hoses, light units, flapper & exhaust systems & all connections
- Examine cabinet door fastenings & hinges, remove spiders and spray down
- Check condition of radiator coolant and gearbox oil
- Check throttle connections & adjustments
- Check start function & test
- Check tower hold down bolts & tighten if necessary
- Test run the frost fan
- Check fuel level & report to owner if fuel is low
- Inspect area surrounding frost fan for tree growth near the blades & safe access to site

5 Operational Requirements for Frost Fans

- The hours of operation are restricted to times when danger of frost damage is imminent or for maintenance purposes. The frost fan shall only be operated for frost protection and when the air temperature on the orchard drops to a critical level for the vines (measured at 1.0 meters above ground level)
- The frost fans will cease operation when the air temperature reaches +2°C above the start temperature. (**Start temperature 1°C and shut off temperature 3°C**)
- The thermometer used to determine the temperature shall be in calibrated by a suitably qualified AFF technician in order to ensure that it accurately measures temperature.
- The frost fan shall be run at a maximum engine speed of 1800rpm – this can be lowered to further reduce noise as required.

- Operation of the machines for maintenance purposes shall take place only between the hours of 0800am and 05.00pm on weekdays. Test operations outside these hours may take place only for noise monitoring with Council's approval or for emergency
- The frost fan shall be remote electronically monitored at all times
- The frost fans shall be maintained annually in accordance with the manufacturer's specifications and service records shall be made available to council upon request
- The frost fans shall only be operated for protection of crops from bud burst each Spring.
- The blade tip speed does not exceed 340 metres per second for the FrostBoss C49 blade
- The orchard manager or a person appropriately trained to manage frost risk by the use of frost fans shall always be present on the vineyard while any frost fan is operating on this orchard
- There in **NO audible alarm** to identify faults. Fault notification is by electronic monitoring notification and a small flashing amber light on the fan tower.
- For safety and efficiency the FrostBoss C49 is designed to cease operation when the wind speed reaches 10kmph and will not restart again until the wind speed reduces below 8kmph.

In addition:

- The independent acoustic impact study proves that the installation conforms to South Australian EPA and council requirements.
- This application is made in good faith and in compliance with all statutory laws and environmental guidelines established under the SA EPA guidelines for frost fan noise and the general EPA environmental noise policy.



Henschke Shillings Vineyard Lot 321 Parrot Hill Road Moculta

Environmental Noise Assessment

22 February 2023
Reference ID: 23-26-1



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Tables

Table 1 Predicted Noise Levels at Non-Associated Dwellings dB(A).....	5
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Abbreviations

DO	Desired Outcome of the Code
DTS	Deemed to Satisfy provision within the Code
EPA	South Australian Environment Protection Authority
PO	Performance Outcome of the Code
rpm	revolutions per minute
WHO	World Health Organization

Glossary

A-weighting	A mathematical adjustment to the measured noise levels to represent the human response to sound. An <i>A-weighted noise level</i> is presented as dB(A)
Associated dwelling	A dwelling which is associated with the installation and is not considered to be a <i>noise-affected premises</i> under the Policy
Code	<i>Planning and Design Code Version 2023.3 dated 16 February 2023, PlanSA</i>
EP Act	<i>Environment Protection Act 1993</i>
dB	The logarithmic unit of measurement to define the magnitude of a fluctuating air pressure wave. Used as the unit for <i>sound</i> or <i>noise level</i> .
Equivalent noise level	The A-weighted noise level which is equivalent to a noise level which varies over time. The descriptor is L_{Aeq} and it is the A-weighted <i>source noise level</i> (<i>continuous</i>) referenced in the Policy. The L_{Aeq} is also referenced as an average noise level in this assessment for simplicity
Noise	An interchangeable term with sound but which is most often described as <i>unwanted sound</i>
Noise affected premises	A location at which noise levels are to be assessed against the Policy
Non-associated dwelling	A dwelling which is not associated with the installation and is considered to be a <i>noise affected premises</i> under the Policy
Policy	<i>The Environment Protection (Noise) Policy 2007</i>
Sound	An activity or operation which generates a fluctuating air pressure wave. The ear drum can perceive both the frequency (pitch) and the magnitude (loudness) of the fluctuations to convert those waves to sound
Sound pressure level	The magnitude of sound (or noise) at a position. The sound pressure level can vary according to location relative to the noise source, and operational, meteorological and topographical influences. The terms <i>sound pressure level</i> and <i>noise level</i> are used interchangeably in this assessment



Background

Frosts occur for relatively short durations and on infrequent occurrence in South Australia when air temperatures at ground level drop below 0 degrees Celsius. During a frost, agricultural crops can be damaged.

Frosts typically occur in the early hours of the morning before dawn when the meteorological conditions result in the air temperature at 10 (to 50) metres above ground level being warmer than the sub zero-degree temperatures at ground level.

Frost control fans are used to draw this warmer air down into the agricultural crops. The frost control fans are triggered when the temperature at ground level approaches a frost condition, and they continue to operate until the temperature at ground level rises.

Frost control fans (comprising four or five fixed pitch blades) are located on a galvanised tower with a height in the order of 10m and powered by a diesel engine. The noise level generated by a fan is associated with the aerodynamic noise of the blades moving at 418rpm and varies as the fans rotate 360 degrees around the tower. The engine drive operates at approximately 1750rpm and is not audible in comparison to the aerodynamic noise from the blades (at distances required to satisfy the noise requirements in this report).

The *Environment Protection (Noise) Policy 2007* (the **Policy**) provides specific allowable noise levels for frost control fan operation that are based on a balance between protecting primary production in a rural zone through the effective use of frost control fans and minimising the impact on neighbouring properties.

The balance changes depending on the land use zone in which the neighbouring properties are located, with lower noise limits applying in a rural living or a residential zone.

As frost control fans typically operate during frost conditions in the early hours before dawn, the Policy establishes the allowable noise levels based on impacts to habitable spaces (bedrooms) of a dwelling with windows closed. The Policy primarily promotes measurements (and assessments) to be made against the allowable noise level outside of a dwelling which accounts for the difference in noise level from inside to outside.

The influence of frost conditions on noise propagation are well understood and the noise levels generated by a frost control fan installation can be predicted and/or measured in-situ with accuracy.

Environmental noise assessments predict the noise level from a proposed frost control fan installation and compares that noise level against the Policy. The predicted noise level can (and must) account for the cumulative effect of the frost control fans at a premises operating together (where there are more than one installed). Where the Policy cannot be achieved, the assessments determine whether the fan installation can be relocated, reduced in operational speed, or removed, to satisfy the Policy.

This assessment considers the installation of one new FrostBoss® C49 frost control fan in addition to one existing FrostBoss® C49 frost control fan at the Henschke Shillings vineyard site at Lot 321 Parrot Hill Road, Moculta in the Barossa Council area.



Introduction

This assessment considers the noise associated with one new FrostBoss® C49 frost control fan (with a diesel engine and four fixed pitch fan blades) proposed to be installed at the Henschke Shillings vineyard site at Lot 321 Parrot Hill Road, Moculta in the Barossa Council area. There is one existing FrostBoss® C49 frost control fan at the premises. The frost control fans (including coordinates) and the closest dwellings are shown in Figure 1 below.

Figure 1 The frost control fan locations and closest dwellings



Source Plan SA – SA Property & Planning Atlas



Assessment Criteria

The Code

The frost control fans and the nearest non-associated dwellings are all in a *Rural Zone* within the *Planning and Design Code Version 2023.3 dated 16 February 2023* (the **Code**).

The following provisions within the Code are considered relevant to the environmental noise assessment.

Interface between Land Uses (Part 4 – General Development Policies)

Desired Outcome DO 1

Development is located and designed to *mitigate adverse effects* on or from neighbouring and proximate land uses.

Performance Outcome PO 1.2

Development adjacent to a site containing a sensitive receiver (or lawfully approved sensitive receiver) or zone primarily intended to accommodate sensitive receivers is *designed to minimise adverse impacts*.

Performance Outcome PO 2.1

Non-residential development *does not unreasonably impact the amenity* of sensitive receivers (or lawfully approved sensitive receivers) or an adjacent zone primarily for sensitive receivers through its hours of operation having regard to:

- a) the nature of the development
- b) measures to mitigate off-site impacts
- c) the extent to which the development is desired in the zone
- d) measures that might be taken in an adjacent zone primarily for sensitive receivers that mitigate adverse impacts without unreasonably compromising the intended use of that land.

Performance Outcome PO 4.1

Development that emits noise (other than music) *does not unreasonably impact the amenity* of sensitive receivers (or lawfully approved sensitive receivers).

Deemed to Satisfy Criteria DTS 4.1

Noise that might affect sensitive receivers achieves the relevant Environment Protection (Noise) Policy criteria.



The Policy

Interface between Land Uses DTS 4.1 references the *Environment Protection (Noise) Policy 2007* (the Policy).

The Policy was developed under the *Environment Protection Act 1993* (the EP Act). The EP Act incorporates a requirement to ensure the acoustic *amenity of a locality is not unreasonably interfered with*. *Division 5* of the Policy provides specific allowable noise levels for frost control fan operation that are based on a balance between protecting primary production through the effective use of frost control fans and minimising the impact on neighbouring properties.

Compliance with the Policy will satisfy *Interface between Land Uses DTS 4.1* and is considered to also satisfy the subjective requirements of the Desired and Performance Outcomes in the Code (being the *Interface between Land Uses DO 1, PO 1.2, PO 2.1 and PO 4.1*).

Division 5 of the Policy establishes an allowable noise level within both a habitable room and a location outside a dwelling. Where the external noise levels are achieved, then noise from the frost control fan installation is not considered excessive. Where the external noise levels are not achieved, then the habitable room becomes the location for assessment.

This assessment has been made against the allowable external noise levels of the Policy.

The allowable noise level varies depending on the land use zoning in which the non-associated dwelling is located. For a location *in a zone where Residential or Rural Living is principally promoted*, the allowable noise level at a non-associated dwelling is 45 dB(A). For all other zones the allowable noise level at a non-associated dwelling is 55 dB(A).

In this circumstance, an allowable noise level of 55 dB(A) applies at the non-associated dwellings in the *Rural Zone*. The level of 55 dB(A) is to be achieved from all frost control fans on the premises operating at the same time. For this assessment there is one new FrostBoss® C49 frost control fan proposed and one existing FrostBoss® C49 frost control fan at the premises.

The Policy also requires that the frost control fans *must not be operated except during a period when frost occurs or is reasonably likely to occur, or as necessary for maintenance work and maintenance work must not be carried out on the fan except between 7.00 a.m. and 10.00 p.m. on the same day*.



Assessment

The Policy

The Policy is utilised by this assessment to satisfy the Code requirements as a Deemed to Satisfy approach.

The following inputs have been utilised for the assessment of the proposed frost control fan installation (over the full rotation of the fans about the tower) and are the basis for the predicted noise levels provided in Table 1:

- a noise level of 55 dB(A) at 240 metres in frost conditions for the operation of the *FrostBoss® C49* frost control fan at a fan speed of 418rpm (this correlates to an engine drive speed of 1750rpm), as summarised in the *Hegley Acoustic Consultants – Frost Boss C49 Frost Fan Field Testing Noise Report, dated September 2010*
- noise modelling which accounts for the propagation in noise during the specific meteorological conditions that occur during frost conditions
- one new FrostBoss® C49 frost control fan and one existing FrostBoss® C49 frost control fan being operated at the premises (with fan coordinates) as detailed in Figure 1
- the closest non-associated dwelling locations being as depicted in Figure 1.

Table 1 Predicted Noise Levels at Non-Associated Dwellings dB(A)

Non-associated dwelling	Criterion (dB(A))	Predicted Noise Level (dB(A))	Compliance
1	55	44	Yes
2	55	43	Yes
3	55	49	Yes
4	55	41	Yes

With reference to Table 1, the cumulative noise from the one new FrostBoss® C49 frost control fan and one existing FrostBoss® C49 frost control fan will easily comply with the allowable noise levels at all non-associated dwellings and satisfy the Code.



Conclusion

Environmental noise assessments predict the noise level from a proposed frost control fan installation based on established input data and compares that noise level against the specific requirements of *Division 5 of the Environment Protection (Noise) Policy 2007* (the Policy).

The predicted noise level can (and must) account for the cumulative effect of the proposed number of frost control fans operating together. Where the Policy cannot be achieved, the assessments determine the measures required to satisfy the Policy.

This assessment considers the installation of one new FrostBoss® C49 frost control fan operating with one existing FrostBoss® C49 frost control fan at the Henschke Shillings vineyard site at Lot 321 Parrot Hill Road, Moculta. The assessment determines that the cumulative noise from the operation of the frost control fans can easily achieve the allowable noise level of the Policy at all non-associated dwellings in the *Rural Zone*.

In complying with the Policy, the proposed frost control fan installation will satisfy the relevant Planning and Design Code provisions.

The following conditions of operation will ensure consistency with this assessment and the mandatory provisions in the Policy:

1. *The frost control fans must not be operated except during a period when frost occurs or is reasonably likely to occur, or as necessary for maintenance work and maintenance work must not be carried out on the fans except between 7.00 a.m. and 10.00 p.m. on the same day*
2. *The frost control fans must not exceed an equivalent noise level L_{Aeq} of 55 dB(A) when measured over the full rotation of the fans about the tower at any non-associated dwelling which exists in the Rural Zone (or similar) at the time of approval. Where an equivalent noise level L_{Aeq} full rotation of 55 dB(A) is exceeded, then the operation of the fans must be modified to achieve that external noise level, or it must be shown that an equivalent noise level L_{Aeq} full rotation of 35 dB(A) is achieved in the habitable rooms of that non-associated dwelling.*



References

Planning and Design Code Version 2023.3 dated 16 February 2023, PlanSA

Environment Protection (Noise) Policy 2007, SA EPA

Guidelines For The Use Of The Environment Protection (Noise) Policy 2007, SA EPA June 2009

Hegley Acoustic Consultants – Frost Boss C49 Frost Fan Field Testing Noise Report, dated September 2010



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Reference ID: 23-26-1

Henschke Shillings Vineyard Lot 321 Parrot Hill Road Moculta - Environmental Noise Assessment

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**HEGLEY ACOUSTIC
CONSULTANTS****FROST BOSS C49 FROST FAN
FIELD TESTING
NOISE REPORT****INTRODUCTION**

This report sets out the results of field measurements undertaken on the night of 11 – 12 August 2010 of a Frost Boss C49 frost fan. Measurements were undertaken at 300m from the frost fan at 382 Twyford Road, Hastings as shown on Figure 1.

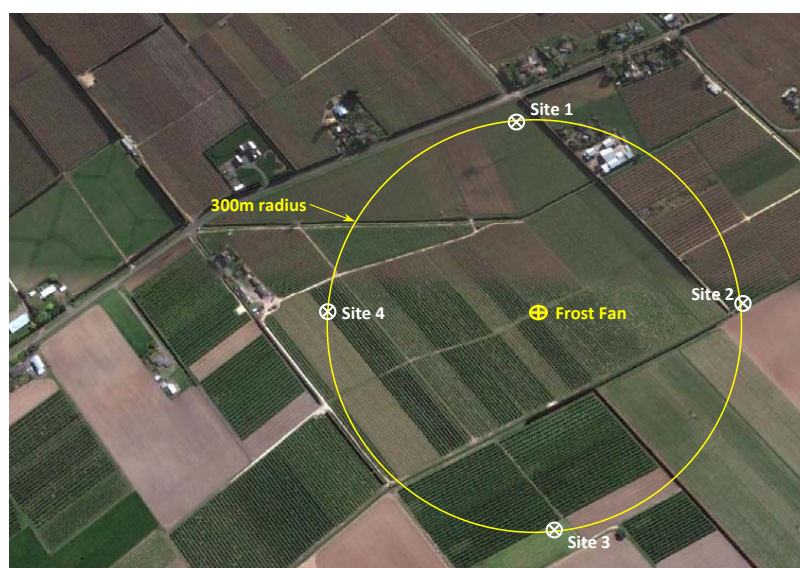


Figure 1. Test Locations

TEST CONDITIONS

The weather during the noise monitoring was fine and the sky was clear. It was generally calm although there was the occasional gust of wind as shown on Figure 2.

Environmental & Industrial Noise Control Engineering

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Normally these gusts would have shut the frost fan down but for the testing the automatic sensor was turned off. This did result in some temporary higher noise levels which have been included in the assessment (and are highlighted later in the report). The meteorological conditions were compatible with those set out for Category 5 in Concawe¹, which gives slightly enhanced meteorological conditions. Testing commenced with the temperature at 0°C dropping to -2°C at the completion of the testing. Even taking into account the occasional gust of wind, which did not have any significant effect on the results of the measurements, the conditions were considered ideal for monitoring the frost fan noise. The topography was flat with apple trees in a dormant state without any leaves in the orchard tested.

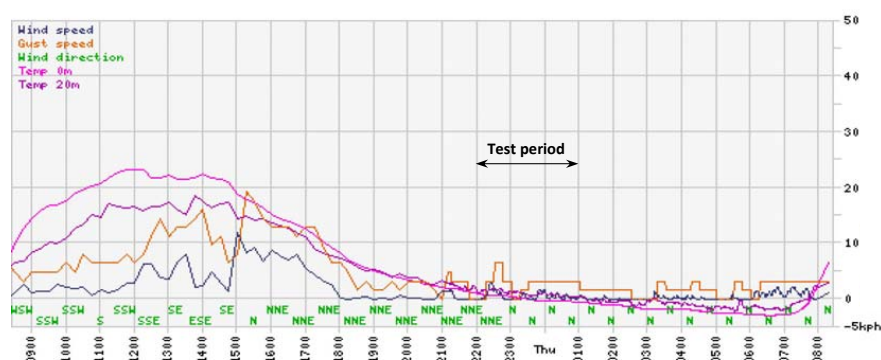


Figure 2. Meteorological Conditions

The technical information of the frost fan tested is:

- C49 Frost Fan
- 5.5m diameter
- fixed pitch (it cannot be changed)
- manufactured in composite materials by NZ Frost Fans
- upper gearbox is a DeRan GB11 ratio $42:25 = 1.68$;
- lower gearbox is DeRan CT10 ratio $41:16 = 2.56$;
- overall ratio of 4.3;

¹ The Propagation of Noise from Petroleum and Petrochemical Complexes to Neighbouring Communities, Report No 4/81, May 1981 prepared by C J Manning, Acoustic Technology for Concawe's Special Task Force on Noise Propagation

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- fan speed at 418rpm when the engine is at 1800rpm;
- external rotation ring gear teeth number = 112;
- rotation pinion teeth number = 8;
- procession time 6 minutes 40 seconds;
- engine details:
 - i) perkins 1006-6T (6 cylinder turbo diesel);
 - ii) 160 hp;
 - iii) diesel powered;
 - iv) muffler manufactured by NZ Frost Fans to Perkins specification;
 - v) engine rubber mounted and housed in a fully enclosed noise attenuated metal cabinet manufactured by NZ Frost Fans;
- tower height 10.5m.

The noise measurement equipment used was:

- Brüel & Kjær 2250 Hand-held Analyser platform with Sound Level Meter Software BZ 7222, Frequency Analysis Software and BZ 7225 Enhanced Logging Software. Re-calibration is next due in May 2011;
- Brüel & Kjær ½" type 4189 microphone, serial number 2650951. Re-calibration is next due in May 2011;
- Brüel & Kjær 4230 calibrator serial number 930422. Re-calibration is next due in September 2010;
- Brüel & Kjær type UA0237 90mm diameter Windscreen;
- All measurements were undertaken in accordance with the requirements of NZS 6801:2008 Acoustics - Measurement of Environmental Sound and assessed in accordance with the requirements of NZS 6802:2008 Acoustics – Environmental Noise.

TEST RESULTS

Measurements were undertaken at four locations at 300m; one upwind, one downwind and two at 90° clockwise from these two measurements as shown on Figure 1 and labelled Sites 1 – 4. Each site was measured for a minimum of 15 minutes, which gave just over two full rotations of the frost fan. The real time noise trace was recorded as well as the sound spectrum for each measurement.

Figure 3 - 6 shows an example of the real time trace for Sites 1 - 4.

4

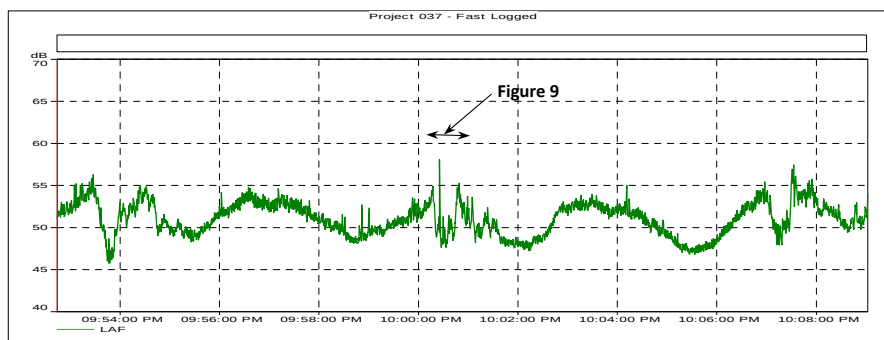


Figure 3. Real Time Noise Trace for Site 1

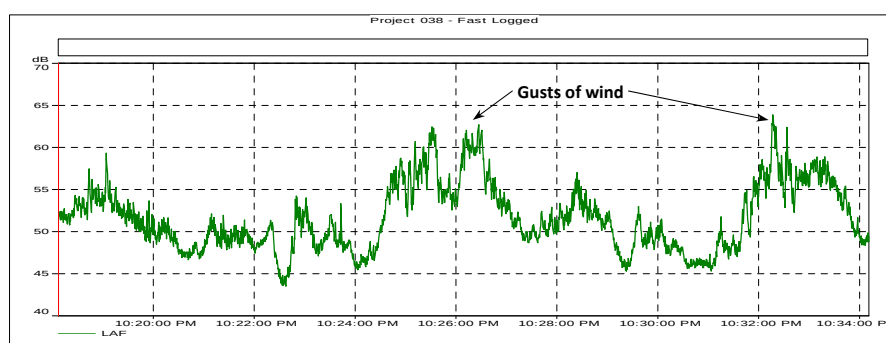


Figure 4. Real Time Noise Trace for Site 2

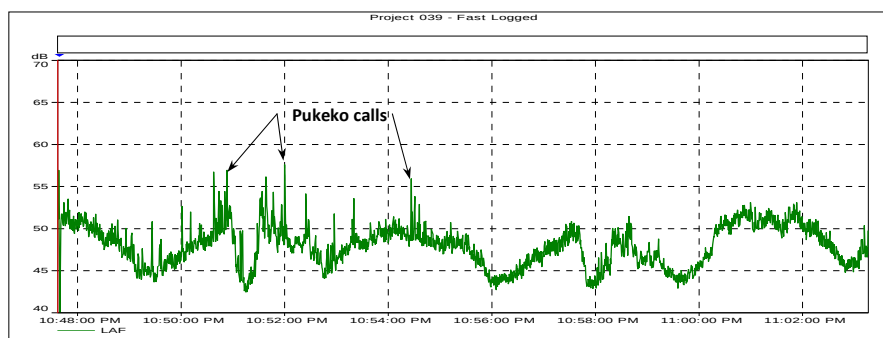


Figure 5. Real Time Noise Trace for Site 3

5

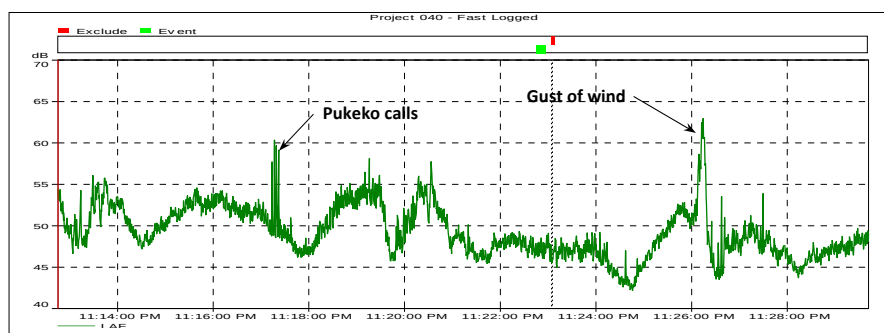


Figure 6. Real Time Noise Trace for Site 4

Figure 7 shows the sound spectrum in one third octave bands as measured over a 15 minute period for the tests undertaken at 300m and 1800rpm and Figure 8 shows the same information in octave bands for Sites 1 – 4. It is noted that the higher level recorded at Site 2 between 250 – 630Hz is the result of a gust of wind passing through.

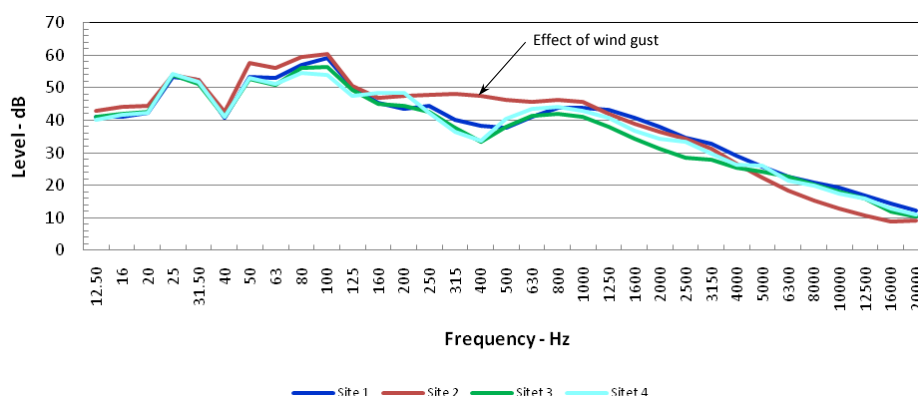


Figure 7. Sound Spectrum at 300m and 1800rpm (One Third Octave)

6

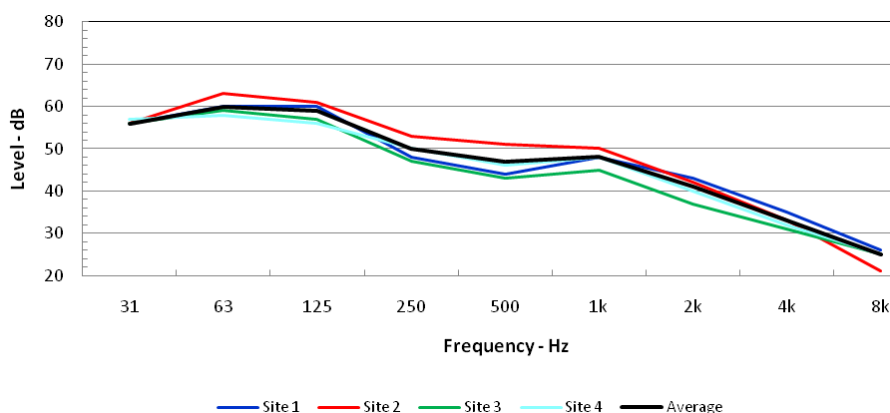


Figure 8. Sound Spectrum at 300m and 1800rpm (Octave)

The overall logarithmic average noise level over a minimum of 15 minutes duration at each of the four sites tested around the Frost Boss C49 frost fan at 300m is 51dB $L_{Aeq(15 \text{ min})}$ with a ± 2 dB variation in four of the tests when operating at 1800rpm. This difference includes the effects of the wind gust, which would not normally occur as the machine would have automatically been shut down.

This gives a level of 55dBA $L_{Aeq(15 \text{ min})}$ at 240m.

Appendix B4 of NZS 6802:2008 Acoustics – Environmental Noise sets the test to determine if there is a tone to the sound of interest. To determine if a tone is present the relevant section of the Standard states:

B4.2 Objective test methods

Where there is doubt about the presence of tonality, the following two methods provide an objective measure for tonality. The simplified test method may be carried out using one-third octave band measurement equipment. The reference test method requires the use of narrow band analysis. If the simplified method does not indicate tonality, it may still be necessary to use the reference method to confirm the presence or absence of tonality. In addition, the reference method can properly assess modulated tones or complex tones.

B4.3 Simplified test method for tonality

A test for the presence of a prominent discrete-frequency spectral component (tonality) can be made by comparing the levels of neighbouring one-third octave bands in the sound spectrum. An adjustment for tonality shall be applied if the LEQ in a one-third-octave band exceeds the arithmetic mean of the LEQ in both adjacent bands by more than the values given in table B2.

Table B2 - One-third octave band level differences

One-third octave band	Level difference
25 - 125 Hz	15dB
160 - 400 Hz	8dB
500 - 10000 Hz	5dB
NOTE - At frequencies below 500Hz the criterion could be too severe and tones might be identified where none is actually audible. For complex spectra the method is often inadequate and the reference method should be used.	

A visual check of the individual frequencies as set out on Figures 4 and 5 (1/3 octave and octave bands) does not indicate any tonal characteristic to the sound. In addition, a mathematical check of the differences in the frequencies has been undertaken, which verifies there is no tonal characteristic to the sound from the C49 frost fan operating. That is, there is no special audible characteristics to the sound.

There is also the potential of an impulsive sound from the frost fans this aspect of the sound has been considered. In the evaluation of the impulsive nature of the frost fan the testing undertaken during the wind gusts has not been included in the analysis as in normal conditions the frost fans would have turned off automatically under such conditions. This feature was overridden during the testing in order to ensure the 15 minutes required in accordance with the Council requirement was achieved.

When checking for impulsive noise guidance was taken from a DELTA² paper Objective Method for the Measurement of Prominence of Impulsive Sounds and for Adjustment of L_{eq} by Torben Holm Pederson, December 2000. Essentially, this paper adopted an approach that the sudden onset of a sound is defined as an impulse where the onset of a sound is defined as part of the positive slope of a time history of L_{pAF} where the gradient exceeds 10dB/s.

Figure 9 is an example of the checking undertaken where the most impulsive part of the sound trace shown in Figure 3 has been evaluated. Figure 3 shows the sound plotted at 10 times a second so the rise time can be evaluated accurately. From this trace the noise from the frost fan was not impulsive and this confirmed the subjective effect of these frost fans although as already noted, if the fans operate with a wind blowing there is the potential for there to be impulsive noise to the sound. However, operating the frost fans in windy conditions can damage the machines so they have automatic shut offs to ensure this does not occur during normal operation.

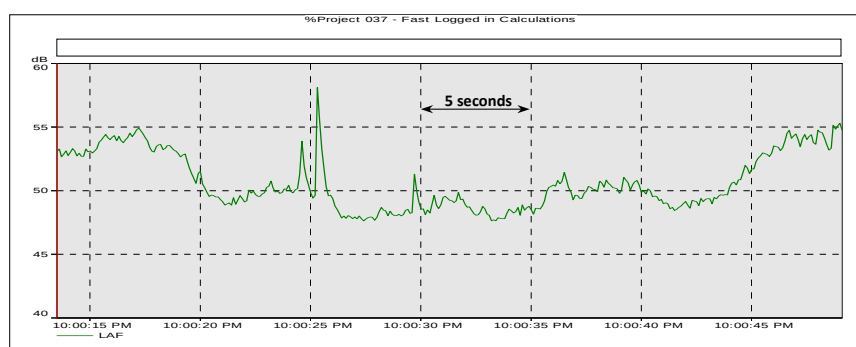


Figure 9. Inspection of Potential Impulsive noise

CONCLUSIONS

Based on the above, when measured in accordance with the requirements of NZS 6801:2008 Acoustics - Measurement of Environmental Sound and assessed in

² Danish Electronics, Light & Acoustics

accordance with the requirements of NZS 6802:2008 Acoustics – Environmental Noise, the noise from the Frost Boss C49 frost fan operating at 1800rpm is 51dB $L_{Aeq}(15 \text{ min})$ when measured at 300m.

Based on field testing there are no special audible characteristics to the frost fan noise.

Field measurements have also been undertaken at 100m, 1700rpm and 1900rpm. While fewer measurements were undertaken for these tests, based on the more detailed testing undertaken at 1800rpm and 300m the additional measurements will be within $\pm 2\text{dB}$ of any more detailed monitoring.

The sound power level has been calculated for 1800rpm and the sound power at 1700rpm will be 3dB lower and at 1900rpm 2dB higher than for 1800rpm.



Nevil Hegley
September 2010

7. REPORTS – REVIEW OF ASSESSMENT MANAGER DECISIONS (PLANNING, DEVELOPMENT AND INFRASTRUCTURE ACT 2016)

Nil.

8. REPORTS – PANEL UPDATES

Nil.

9. REPORTS – OTHER BUSINESS

Nil.

10. REPORTS – CONFIDENTIAL

Nil.

11. NEXT MEETING

Tuesday 6 June 2023 commencing at 5.00 pm

12. CLOSURE OF MEETING

The Presiding Member will declare the meeting closed.