



21 December 2017

Kazuhiro Kojima

5083\_AC/AQ\_R  
AJM

Attn: Mr Kazuhiro Kojima

Dear Sir,

RE: 254 Charles St environmental noise and odour impact assessment.

## 1. INTRODUCTION

Tarkarri Engineering was commissioned by Kazuhiro Kojima to conduct an environmental noise and odour assessment for the proposed Kosaten restaurant at 254 Charles St, Launceston.

The restaurant would utilise a grill and deep fryer, with associated range hood, and the potential for environmental noise and odour emissions from this source are considered here. Operation of the grill and fryer and associated ventilation system is expected to occur between 1100 and 2130 hrs 7 days a week. The extraction fan associated with the ventilation system would be located on the roof with a discharge point approx. 5 m above ground height.

Figure 1 provides an aerial view with the 254 Charles St, Launceston, location marked. Figure 2 provides a schematic view of the restaurant with the location of the range hood and discharge ducting marked.



Figure 1 – Aerial view.

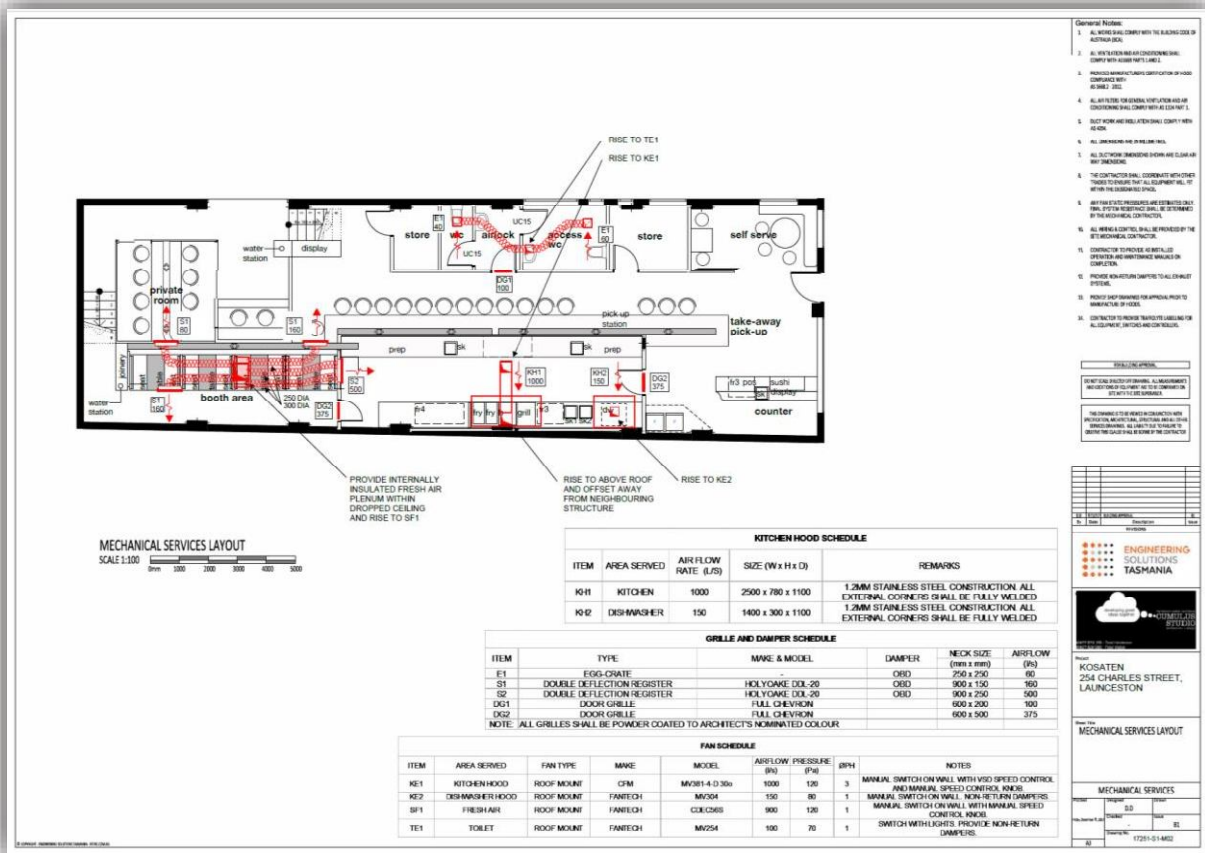


Figure 2 – Plan view schematic of Kosaten restaurant at 254 Charles St, Launceston (provided by Kazuhiro Kojima).

## 2. ENVIRONMENTAL NOISE

A vertical exhaust fan to be installed as a part of the proposed canopy ventilation system has the potential to generate environmental noise emissions to surrounding areas from the fan discharge point on the roof of the building.

The fan selected for the proposed installation is a CFM MV381-4-D 30o (see figure 2 above) and manufacturers sound power level spectral data was provided.

To predict potential noise emission levels following assumptions were used:-

- Distance attenuation via hemispheric spreading with frequency dependent 2-dimensional vertical directivity
- Barrier attenuation where existing buildings create a barrier between the fan discharge and residences.

Four potentially noise sensitive receiver locations were selected for the prediction of noise emission levels and these are shown in figure 3 below with the prediction results presented in table 1.



Figure 3 – Noise sensitive receiver locations and source location.

Predicted noise emission levels		
Receiver	Approx. height above ground (m)	SPL (dBA)
R1	1.5	38
R2	6	36
R3	5	35
R4	5	34

Table 1 – Predicted noise emission levels.

With predicted noise levels below 40 dBA excessive impact from the kitchen hood ventilation fan at the Kosaten restaurant, 254 Charles St, is considered highly unlikely. 40 dBA is a typical evening (1800 to 2200 hrs) noise emission limit for a green-field commercial/industrial site in Tasmania.

**NB:** Should operating hours extend beyond 10 pm (i.e. night period) then a noise emission limit of 35 dBA may be more appropriate. Given this impact may become excessive at some locations and noise attenuation may be required.



### 3. ODOUR

Tarkarri Engineering generated a CALPUF model with meteorological input from TAPM (year 2011).

Assessment criteria are provided in the Tasmanian Environmental Protection Policy (Air Quality) 2004. The relevant table from the policy is provided below with the applicable criteria highlighted in red.

**Table 1 – Odour criteria**

Column 1	Column 2	Column 3	Column 4
	Criterion	Averaging Period	Percentile
Known pollutant(s)	See Schedule 2	See Schedule 2	99.9 <sup>a</sup>
Unknown mixture	2 odour units <sup>1,a</sup>	1 hour	99.5 <sup>b</sup>

1 “Odour unit” has the same meaning as in Australian Standard AS/NZS 4323.3 *Stationary source emissions – Determination of odour concentration by dynamic olfactometry*.

- a Modelled 99.9 percentile concentration at or beyond the boundary of a facility (whichever is higher) in cases where local high-quality meteorological and emissions data are available. In cases where such data are not available, the 100 percentile concentration modelled at or beyond the boundary of a facility applies.
- b Modelled 99.5 percentile concentration at or beyond the boundary of a facility (whichever is higher) in cases where local high-quality meteorological and emissions data are available. In cases where such data are not available, the 100 percentile concentration modelled at or beyond the boundary of a facility applies.

Emissions data was sourced from published data in relation to maximum odour emission concentrations from large franchise commercial fast food restaurants. It was assumed that the Kosaten restaurant at 254 Charles St would have approx. 5 % of the throughput of such restaurants (based on meat usage estimates provided to Tarkarri Engineering by Kazuhiro Kojima) and therefore the determined emission rate was scaled accordingly. The emission rate used here was as follows with a volumetric flow rate of 1 m<sup>3</sup>/s:-

- 162 OU/m<sup>3</sup>/s

**NB:** OU = ‘Odour unit’ as defined in AS/NZS 4323.3.

The emission rate was applied on an hourly basis between 1100 and 2130 hrs with a discharge temperature of 50°C, discharge height of 5 m and exit velocity of 8.2 m/s. Building Profile Input Program (BPIP) for the calculation of building downwash was considered in the predictions. Ground level concentrations were predicted at five discrete receptor locations as shown in figure 4 below with results presented in table 2.

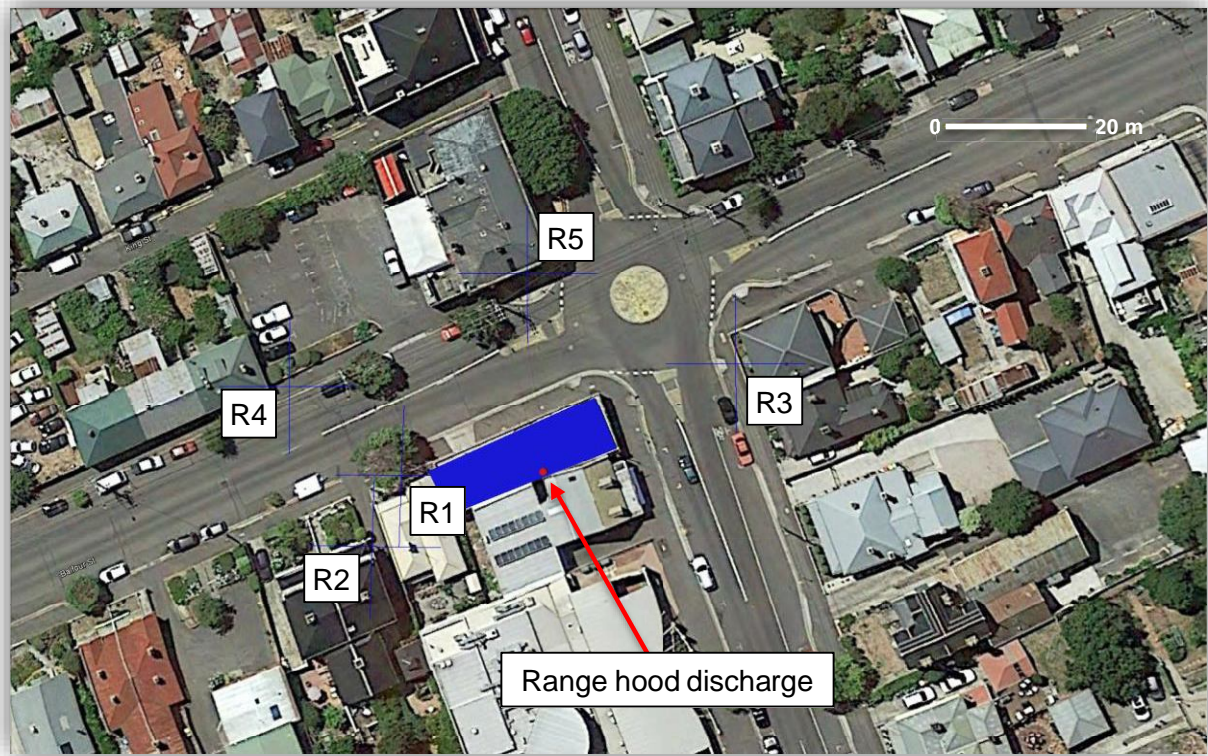


Figure 4 – Discrete receptor and source locations.

Predicted odour emission levels	
Receptor	Odour concentration (OU)
R1	0.131
R2*	0.080
R3	0.091
R4	0.071
R5	0.117

\* Receptor at 6 m above ground level.

Table 2 – Predicted odour emission levels.

The results show that the 99.5<sup>th</sup> percentile concentrations predicted are well below the 2 OU limit and suggests that nuisance from odour emissions from the grill and deep fryer and associated ventilation system at the Kosaten restaurant, 254 Charles St, is unlikely to generate excessive nuisance.

**NB:** Regular maintenance and cleaning of the ventilation system filters is imperative to maintain their odour control performance (i.e. grease removal from air stream).



Kojima, Kazuhiro – 254 Charles St environmental noise and odour impact assessment.

I hope this information meets your immediate requirements.

Please contact me directly if you have any questions concerning this work.

Yours faithfully,  
**Tarkarri Engineering Pty Ltd**

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