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MEMORANDUM

TO:	Nishan Kugan, Pavarani Holdings Inc.	DATE:	May 8, 2019
FROM:	Darcie Dillon, P.Eng.	PROJECT #:	19-011
PROJECT:	Gas Station and Coffee Shop, 575 King Street East, Gananoque		
SUBJECT:	Noise Assessment		

1. Introduction

The purpose of this technical memorandum is to review the noise impacts from vehicular sources from the proposed gas station and coffee shop to be located at 575 King Street East, Gananoque, Ontario. The site plan is shown in **Attachment 1**.

The proposed development will be built on the south side of King Street East in Gananoque, Ontario. The site will generate traffic on King Street East and attract customers already travelling along King Street East. The residential properties located south of the site (on Pine Street East and Elmwood Drive) are considered noise sensitive land uses and require an acoustic assessment to determine the effects of the proposed development.

2. Methodology

The assessment was conducted within the Study Area to determine the impact to noise sensitive areas (NSA's) and what mitigation measures, if any, should be incorporated into the site plan design.

The assessment was completed in accordance with the Ministry of the Environment, Conservation and Parks' (MECP's) Noise Assessment Criteria, which is used for the planning of noise sensitive lands uses. These guidelines define the equivalent sound level criterion for indoor and outdoor amenity areas.

STAMSON 2.5 was used to calculate the sound levels for one representative receiver site (101 Elmwood Drive). It is the closest receiver site to the development and would experience the highest level of impact. The receiver site was situated to be on an outdoor residential space during the day and inside a bedroom at night.

Outdoor Sound Level Criteria

The significance of a noise impact on day-time sound levels is assessed by using the objective of 55 dBA (7 a.m. to 11 p.m.) for road sources. These levels are established as acceptable sound levels for outdoor recreation areas of developments adjacent to transportation noise (roads, transit, light rail, and rail).

Plane of Window (Sleeping Quarters)

Outdoor night-time (8 hr) roadway sound levels at the plane of a bedroom (3rd storey) window must not exceed 60 dBA, otherwise air conditioning is required.

3. Traffic Input Data

Traffic volumes for the existing year 2019 provided were used to assess impacts of the site construction in 2019. Annual average daily traffic (AADT) traffic volumes were obtained for King Street East and Pine Street East/Elmwood Drive. The AADT volumes provided included truck volumes on King Street East, as illustrated in **Table 1**. Pine Street East and Elmwood Drive are local streets and would only carry local delivery truck volume. A 90/10 daytime/nighttime split for traffic volumes was used.

Table 1: Traffic Input Data

	2019 AADT (Cars)	2019 AADT (Medium Trucks)	2019 AADT (Heavy Trucks)
King Street East	14,250	600	150
Pine Street East/ Elmwood Drive	1,000	0	0

Additional input to the STAMSON model included:

- The intermediate ground surface (hard surface reflects sound, soft surface absorbs sound);
- Distance, in metres, from the source to the receiver, using the centreline of the road as the source;
- The angle at which the receiver (apartment) intercepts the source (roadway and/or railway), measured relative to the perpendicular line between the source and the receiver;
- Receiver height (standard is 1.5 m above ground level during the daytime and 4.5 m above ground level during the nighttime);
- Posted speed limit – the posted speed limit for King Street East is 50 km/h and for Pine Street East/Elmwood Drive 40 km/h within the study limits;
- Depth of woods (0-30 m, 30-60 m, 60 m or more);
- Roadway grade (slope);
- Topography (hills, flatlands); and
- Existing attenuation due to shielding from barriers (natural or man-made).

King Street East is an arterial roadway which travels through the downtown of the Town of Gananoque. It is a 3-lane roadway, including a two-way left-turn lane, in front of the development. The posted speed limit at the project site is 50 km/h.

Pine Street East/Elmwood Drive is a local road, connecting on a curve at the back of the development site. It is a 2-lane undivided roadway with a speed limit is 50 km/h.

4. Analysis of Sound Levels

Year 2019 16-hour equivalent daytime sound levels and 8-hour nighttime sound levels for the receiver site, calculated using the STAMSON noise software program, are shown in **Table 2**.

Table 2: Existing Sound Levels

Receiver Site	Year 2019 Daytime (16 h) Sound Level, Leq (dBA)	Year 2019 Nighttime (8 h) Sound Level, Leq (dBA)
R1	46.7	40.0

Approximately an additional 1,100 vehicles/day will use the site, based on the Traffic Assessment Memo completed by BTE. Three assumptions were made:

- 1) Half the users of the development will use the drive-thru and the other half will park;
- 2) The coffee shop is not a 24/7 service drive-thru (i.e. no nighttime sound levels); and
- 3) The operating speed of the drive-thru is 20 km/h.

The future sound level increases from the site are forecast to increase sound levels by no more than 2 dBA for receiver sites within 90 m of the traffic source and 1 dBA for receiver sites within 150 m of the site.

The calculated site development sound levels are shown in **Table 3**.

Table 3: 2019 Site Development (With Project) Sound Levels

Receiver Site	Year 2019 Daytime (16 h) Sound Level, Leq (dBA)	Year 2019 Nighttime (8 h) Sound Level, Leq (dBA)
R1	48.7	40.0

5. Conclusion

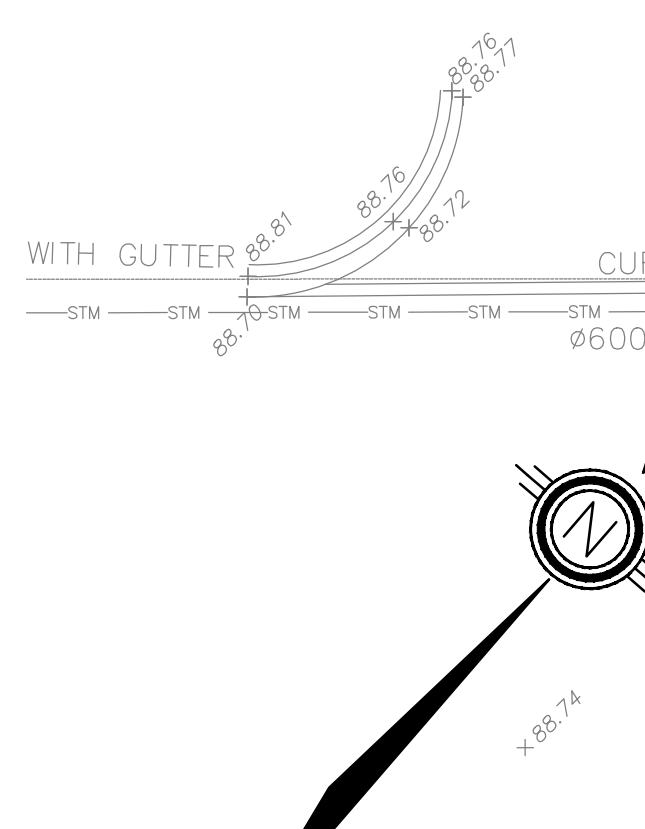
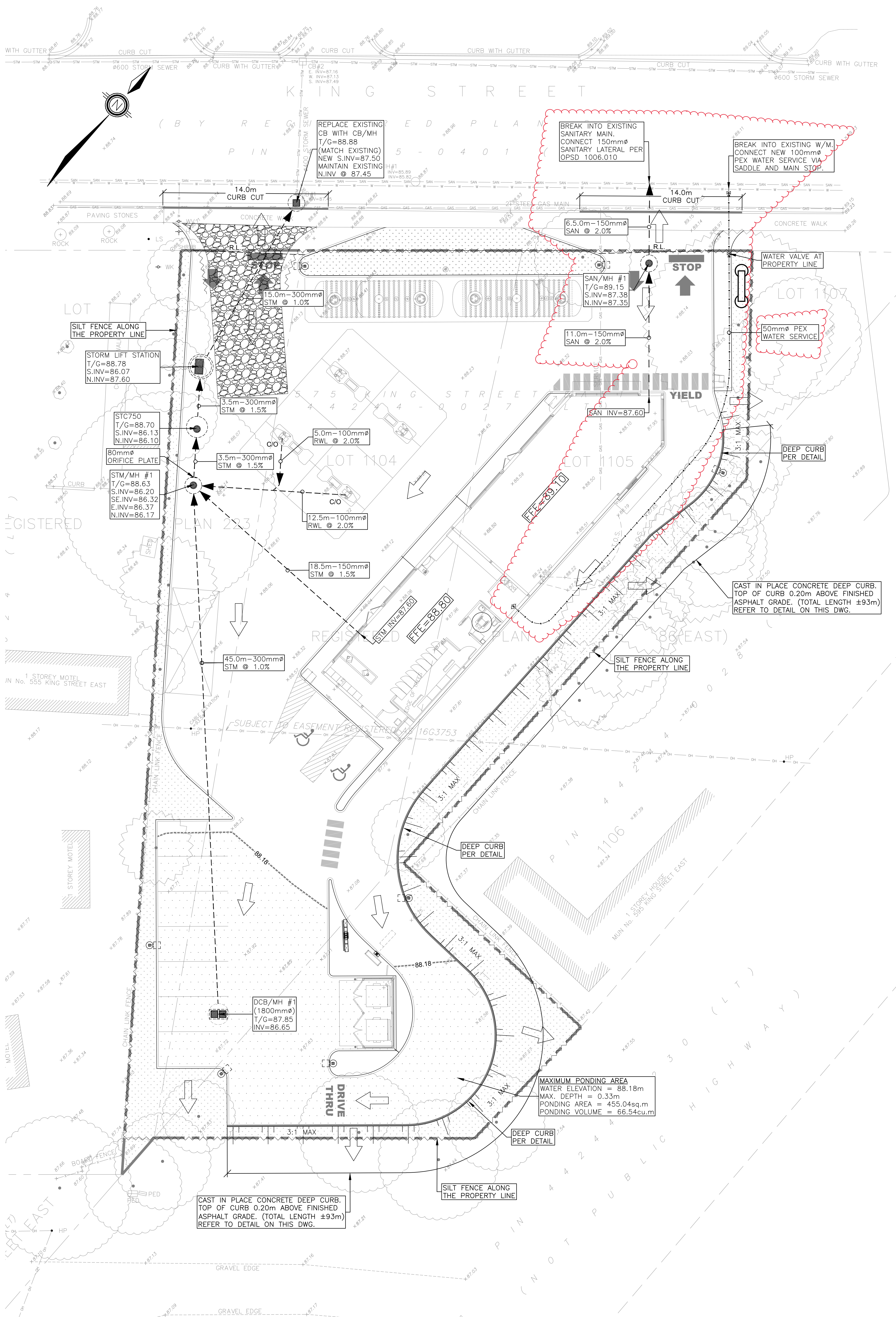
Based on the calculated sound levels during both daytime and nighttime, no perceptible (greater than 5 dBA) increases in sound level are forecast to occur, and sound levels are below the daytime and nighttime objectives of 55 dBA and 60 dBA, respectively. Therefore, no mitigation is required for residents on Pine Street East/Elmwood Drive.

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Attachments

Attachment 1: Site Plan



REPLACE EXISTING
CB WITH CB/MH
T/G=88.88
(MATCH EXISTING)
NEW S.INV=87.50
MAINTAIN EXISTING
N.INV @ 87.45

BREAK INTO EXISTING
SANITARY MAIN.
CONNECT 150mmØ
SANITARY LATERAL PER
OPSD 1006.010

BREAK INTO EXISTING W/M.
CONNECT NEW 100mmØ
PEX WATER SERVICE VIA
SADDLE AND MAIN STOP.

SILT FENCE ALONG
THE PROPERTY LINE

STORM LIFT STATION
T/G=88.78
S.INV=86.07
N.INV=87.60

STC750
T/G=88.70
S.INV=86.13
N.INV=86.10

80mmØ
ORIFICE PLATE

STM/MH #1
T/G=88.63
S.INV=86.20
SE.INV=86.32
E.INV=86.37
N.INV=86.17

15.0m-300mmØ
STM @ 1.0%

3.5m-300mmØ
STM @ 1.5%

3.5m-300mmØ
STM @ 1.5%

12.5m-100mmØ
RWL @ 2.0%

18.5m-150mmØ
STM @ 1.5%

45.0m-300mmØ
STM @ 1.0%

DCB/MH #1
(1800mmØ)
T/G=87.85
INV=86.65

MAXIMUM PONDING AREA
WATER ELEVATION = 88.18m
MAX. DEPTH = 0.33m
PONDING AREA = 455.04sq.m
PONDING VOLUME = 66.54cu.m

CAST IN PLACE CONCRETE DEEP CURB.
TOP OF CURB 0.20m ABOVE FINISHED
ASPHALT GRADE. (TOTAL LENGTH ±93m)
REFER TO DETAIL ON THIS DWG.

SILT FENCE ALONG
THE PROPERTY LINE

CAST IN PLACE CONCRETE DEEP CURB.
TOP OF CURB 0.20m ABOVE FINISHED
ASPHALT GRADE. (TOTAL LENGTH ±93m)
REFER TO DETAIL ON THIS DWG.

WATER VALVE AT
PROPERTY LINE

50mmØ PEX
WATER SERVICE

DEEP CURB
PER DETAIL

SILT FENCE ALONG
THE PROPERTY LINE

DEEP CURB
PER DETAIL

DEEP CURB
PER DETAIL

1 STOREY MOTEL
IN No. 555 KING STREET EAST

1 STOREY MOTEL

MOTEL

1 STOREY HOUSE
MUN No. 595 KING STREET EAST

1 STOREY HOUSE
MUN No. 595 KING STREET EAST

1 STOREY HOUSE
MUN No. 595 KING STREET EAST