
SS WILSON ASSOCIATES

Consulting Engineers

July 20, 2018

Mr. Ed Fothergill
Fothergill Planning & Development Inc.
62 Daffodil Cres.
Ancaster, ON
L9K 1E1

Email: edf@nas.net

Dear Ed,

**Re: Preliminary Noise Control Study, Creation of Two Residential Lots;
Parts 5 and 6 on English Church Road, City of Hamilton
SSWA File No.: WA18-027**

1.0 INTRODUCTION

The services of SS Wilson Associates (SSWA) have been retained by your firm, on behalf of Mr. Steve Schiedel of Green Horizons Group of Farms Ltd. in Mount Hope to prepare this noise control study in connection with their proposal to develop the above noted two (2) lots, for a single family dwelling on each lot.

One of the objectives of this noise study is to examine the projected sound levels from two existing lots on Upper James Street in Hamilton as compared to two lots that the owner is trying to create on English Church Road. The proponent currently owns two lots on Upper James Street in Hamilton which are now vacant but could each accommodate a single family dwelling (Parts 1 and 2). The proponent is also proposing these two lots to be assembled into the abutting agricultural property (Part 3), thus creating a larger agricultural property. In exchange the proponent would like to sever off two lots (Parts 5 and 6) adjacent to the golf course he owns (Part 4).

Therefore, while the primary subject of this Preliminary Noise Control Study is to address all issues related to the potential noise impact on the 2 lots; Parts 5 and 6 on English Church Road, reference will also be made, for comparison purposes with the existing and potential noise impacts on the currently designated residential lots on Parts 1 and 2.

2.0 OBJECTIVES OF THIS PRELIMINARY NOISE CONTROL STUDY

The primary objective of this study is to provide the City of Hamilton with factual data related to the current and future environmental noise impacts on the

SSWA INC. 15 Wertheim Court, Suite 211, Richmond Hill, Ontario, L4B 3H7

Tel: (905) 707-5800 e-mail: engineering@sswilsonassociates.com

www.sswilsonassociates.com & www.noisetraining.com

currently approved residential lots and the two proposed lots and to also provide the City of Hamilton with our professional opinion on the extent of the current and future environmental noise impacts due to all potential sources of noise. In addition, SSWA will also provide the reviewers with the best technical advice on how to deal with the issues related to environmental noise as it pertains to the specific proposal.

At the present time, there are no specific details on the residential lots discussed herein, however, there is adequate technical information that enabled SSWA to provide adequate technical guidance on how to proceed with this development application.

3.0 THE SUBJECT DEVELOPMENT AREAS

Figure 1.a is an aerial of the subject area and Figure 1.b illustrates the subject residential development areas; i.e. Parts 5 and 6 being the proposed future residential lots on the existing Golf Course, Part 4 as well as the currently vacant residential Parts 1 and 2 as well as lots which are currently vacant agricultural land.

Figure 2 is a drawing of the subject area showing the land parcels discussed in this report and Figures 3.a and 3.b illustrate the official 2012 City of Hamilton John C. Munro International Airport Noise Exposure Forecast (NEF) contours from 25 to 40 NEF as well as the same contours illustrating the approximate locations of Parts 1, 2, 5 and 6.

4.0 AIRCRAFT NOISE CRITERIA IN THE CITY OF HAMILTON

When dealing with aircraft noise in a municipality in Ontario, reference is made to aircraft noise in 2 distinct municipal documents; first when dealing with new land use planning where the municipality undertakes new land use investigations for noise compatibility purposes under the authority of the Planning Act and other local development procedures and policies passed under the enabling Provincial jurisdiction.

For investigation of public complaints about aircraft noise, the former City of Hamilton Noise By-Law PD02166 stated the following:

The jurisdiction over noise originating from the airport itself, or from planes flying, landing or taking off, is entirely a matter of federal law. Neither provincial law or municipal by-law has any control. There are regulations dealing with the nature and extent of noise, which are enforced by the Ministry of Transportation (Canada). There is an obligation as well, with the managers of the airport to address noise issues. Complaints are referred to the management of the airport and for enforcement are referred to the Federal Ministry of Transportation.

Therefore, in the event of complaints about aircraft/airport noise, the City refers the matter to the Federal Government through the Regional Manager, Aerodrome Safety Ontario Region.¹

For land use planning purposes, there are numerous City of Hamilton public documents and studies related to aircraft and airport noise citing the use of several NEF/NEP limits/criteria for noise such as 28, 30 & 35 NEF and/or NEP in connection with new subdivision proposals.

5.0 **AIRCRAFT NOISE CRITERIA AT THE PROVINCIAL LEVEL**

The fundamental source of the Provincial aircraft noise criteria is the 2014 Provincial Policy Statement (and its previous 2005 version) as shown below:

1.6.9.2 Airports shall be protected from incompatible land uses and development by:

- a) prohibiting new residential development and other sensitive land uses in areas near airports above 20 NEF/NEP;***
- b) considering redevelopment of existing residential uses and other sensitive land uses or infilling of residential and other sensitive land uses in areas above 30 NEF/NEP only if it has been demonstrated that there will be no negative impacts on the long-term function of the airport***

Therefore, it is to be noted that the Province is prepared to accept infilling of residential uses in areas having aircraft noise exposures, NEF/NEP in excess of 30.

Although not specifically stated in the Policy, there is no limit on the extent of the acceptable NEF/NEP contours lines as can be read in the policy itself, and the national application of this Policy should require all concerned parties to take the necessary measures to safeguard the overall interests of all concerned parties including the airport operations, the various levels of government, the prospective developers and the Acoustical Consultants of the land uses that may be developed in such case.

The following is a summary of the MECP (formerly MOECC) aircraft noise assessment criteria:

Aircraft noise impact assessment is based on the higher value of the Noise Exposure Forecast (NEF) and the Noise Exposure Projection (NEP) contours determined by methods approved by Transport Canada. The MECP (formerly MOECC) requires the preparation of a noise study for noise-sensitive land use proposals that are located at or above NEF/NEP 25.

¹ Consolidated City Noise-By-Law-2017 (11-285) does not make reference to aircraft/airport noise being dealt with by the City of Hamilton.

Outdoor Areas

The planning criterion for land uses containing noise-sensitive outdoor areas including Outdoor Living Areas is as follows:

MECP Sound Level Limits for Outdoor Areas

Area & Time Period	Higher Value of NEF/NEP
Outdoor Areas including Outdoor Living Areas (24 hours)	30 ²

Indoor Areas

The technical criteria for acoustical design of buildings in land uses containing noise-sensitive indoor areas are as follows:

Type of Space	Indoor NEF/NEP*
Living/dining/den areas of residences	5
Sleeping quarters	0

* The indoor NEF/NEP values are used to determine acoustical insulation requirements based on the NEF/NEP contour maps.

Application of Criteria

The following table summarizes the requirements for noise control measures for the various NEF/NEP ranges:

LAND USE	NEF/ NEP	AIR COND.	FORCED AIR VENTILATION WITH PROVISION FOR FUTURE AIR COND.	WARNING CLAUSE	ACOUSTIC INSULATION
Residential	<25	-	-	-	-
	25-29	-	Yes	Yes	Yes
	30-35	Yes	-	Yes	Yes
	>35	--- As deemed necessary by the Acoustic Consultant ---			

² Policy 1.6.9.2 of the 2014 Provincial Policy Statement, establishes the applicable development criterion. The 2014 Provincial Policy Statement (PPS) is prepared to accept redevelopment of existing residential uses and other sensitive land uses or infilling of residential and other sensitive land uses in areas above 30 NEF/NEP only if it has been demonstrated that there will be no negative impacts on the long-term function of the airport

6.0 THE PREDICTED EXPOSURES OF THE SUBJECT LOTS TO ENVIRONMENTAL NOISE

Figures 1.b, 2 and 3.b illustrate the approximate locations of the four (4) subject lots:

- Parts 1 and 2: The existing residential lots
- Parts 5 and 6: The existing vacant land lots that are desired to be approved as residential lots instead of Parts 1 and 2.

When we examine the locations of the subject lots, the following is concluded:

- Parts 1 and 2 are currently exposed to high levels of road traffic noise as well as high levels of aircraft noise as summarized below (the details of the predicted road traffic sound levels are included in Appendix A):
 - Parts 1 and 2 (Receptors R1 and R2): Traffic Noise: L_{eq} day (future): 70dBA
 - Parts 1 and 2(Receptors R1 and R2) : Traffic Noise: L_{eq} night (future): 62dBA
 - Part 1(Receptor R1): Aircraft Noise: NEF day/night: 37NEF
 - Part 2(Receptor R2): Aircraft Noise: NEF day/night: 36NEF

Based on the MECP (MOECC) conversion factors from NEF/NEP to L_{eq} , the following are the equivalent aircraft sound levels when converted to L_{eq} :

- Part 1 (Receptor R1): Aircraft Noise = 68dBA
- Part 2 (Receptor R2): Aircraft Noise = 67dBA

From the acoustic energy basis, the following is an approximation of the overall acoustic energy the following lots are exposed to:

- Part 1 (Receptor R1): Road + Aircraft: 72dBA
- Part 2 (Receptor R2): Road + Aircraft: 71dBA

Therefore, it is expected that Parts 1 and 2 to be expected to an overall acoustic energy levels 71 to 72 dBA.

- Parts 5 and 6 current exposures to aircraft noise is estimated to be approximately $40 \pm$ NEF, i.e. equivalent to $L_{eq} \approx 71$ dBA.

Therefore, it is concluded, on the account of the overall acoustic energy exposure that the Parts 1 and 2 are equally exposed to Parts 5 and 6.

Of course, there are expected differences in terms of the two sources of noise; vehicular traffic vs. aircraft noise nevertheless both sources are expected to create high degrees of unacceptability to the future owners/occupants of with tradeoffs such as:

- a) Vehicular traffic noise is "on" around the clock at every second and every minute of the day.
- b) Aircraft noise signals are short and intermittent, but at higher levels.

- c) Both noise sources are likely to interfere with outdoor and indoor human activities with various degrees of human acceptance.
- d) Both noise sources can be put under control within the indoors of the dwellings with proper application of acoustic insulation and the definite need for central air conditioning of the dwellings.

The one deviation, however is the fact that aircraft noise will require a little more extra care when selecting the necessary building acoustical insulation as aircraft noise produces higher “maximum” (or peak) sound levels in addition to the creation of “low frequency” noise events. Both issues can be easily addressed during the design stage of both dwellings based on the application of conditions requiring the detailed design of the dwellings to address these two technical/acoustic considerations.

7.0 TRANSPORTATION NOISE IMPACT

The major surface transportation noise sources (current and future) of concern are Upper James Street and English Church Road East, for which traffic data was obtained from the City of Hamilton’s Transportation Data Management System, as per the City of Hamilton’s direction.

As truck percentages were not available, assumptions were made based on similar roadways in the vicinity.

For the purposes of this study, transportation sound level predictions were carried out based on the MECP’s sound level prediction modeling procedures; (Ontario Road Noise Analysis Method for Environment and Transportation, Technical Document, 1989), which takes into account such factors as the topography of the receiver relative to the source, the current and future traffic volumes (AADT), truck percentages (medium/heavy), day/night split, speed limits, intermediate surfaces (ground reflection/absorption), angles of exposure to the sources of noise, etc.

Based on our investigation, the current (year 2018) unattenuated daytime sound levels in the designated OLAs for Parts 1 and 2 are predicted to be in the range of L_{Aeq} 62 dBA to 66 dBA, while the future 2031 predicted sound levels are predicted to range from 63 dBA to 67 dBA.

For the proposed dwellings on Parts 5 and 6, the current (year 2018) unattenuated daytime sound levels in the designated OLAs are predicted to be L_{Aeq} 42 dBA, while the future 2031 predicted sound levels are predicted to be 44 dBA.

The criteria for indoor L_{Aeq} sound levels are based on projected L_{Aeq} levels at the outside face of the dwellings (at the building facades) with appropriate assumptions for the differences between the outdoor and indoor sound levels. If the outside L_{Aeq} levels do not exceed the recommended objective sound levels,

then the indoor L_{Aeq} levels will not be exceeded, assuming standard building construction and operable windows.

Based on our calculations, the predicted daytime/nighttime sound levels at the building facades for Parts 1 and 2 (within any habitable room on any floor) are predicted to be L_{Aeq} 70 dBA/62 dBA respectively, (future 2013 sound levels are predicted to be L_{Aeq} (day) 71 dBA and L_{Aeq} (night) 63 dBA).

For Parts 5 and 6, the predicted daytime/nighttime sound levels at the building facades (within any habitable room on any floor) are predicted to be L_{Aeq} 49 dBA/41 dBA, (future 2031 sound levels are predicted to be L_{Aeq} (day) 50 dBA and L_{Aeq} (night) 42 dBA).

8.0 ACOUSTIC INSULATION OF THE DWELLING UNITS TO MEET THE INDOOR GOVERNMENT SOUND LEVEL OBJECTIVES

Without going into details of the MECP's (MOECC) technical acoustic insulation procedures to meet their indoor sound level objectives, it suffices to state the fact that acoustic insulation practices recommended by the MECP (MOECC) in their well accepted technical documents are designed to meet their technical indoor standards.

Another point to mention is that the current MECP indoor sound level criteria for aircraft noise is more conservative than that for vehicular traffic noise.

Therefore, in conclusion of this point, it is our position that the current MECP acoustic insulation practices can result in meeting the set indoor objectives irrespective of how high the outdoor sound levels are or the type of noise source.

For the purposes of providing definitely acceptable indoor sound levels for the new proposed Parts 5 and 6, SSWA is recommending the following additional noise control measures:

- a) All exterior building components to designed and selected by the Acoustic Consultant to be equivalent to heavy weight construction material such as brick walls (this should include walls, ceiling/roof).
- b) All exterior windows to rely on the use of "double-laminated" glazing construction with special sash and airspace between layers of windows.
- c) All exterior vents to the outside (HVAC, chimney, etc.) to have sound transmission loss features.
- d) All exterior doors to be acoustically insulated to be equivalent to the selected wall acoustic insulation.
- e) The selected HVAC system to also contain a mechanical feature to all "free cooling" during mild temperature season (spring and fall).

- f) Specially worded warning clauses, to the satisfaction of the City and the Airport Authority, to be included in all Development Agreements.
- g) An acoustically sheltered outdoor area to be created south of the dwelling units itself to provide an additional relatively quieter Outdoor Living Area (OLA).

9.0 SUMMARY OF THE FACTORS THAT MERIT POSITIVE CONSIDERATION AND APPROVAL OF THE PROPOSED TWO RESIDENTIAL LOTS

This section address other rational considerations that merit positive review of this technical submission towards approval of the two new residential lots in exchange for comparable near-by two residential lots:

- a) The 2014 Provincial Policy Statements does not impose a cap on the upper acceptable NEF/NEP limits, possibly to accommodate very unique site specific considerations such as the ones under consideration.
- b) Traditional infill residential land development encompasses a small or a larger group of lots to be made suitable for a residential land use, however, in this case we are dealing with single residential lots that are not related and most importantly located right within over 30 existing single family residential dwellings.
It is important to note that most of 30 existing dwellings are subject to higher levels of aircraft noise and some to additional high levels of road traffic noise.
- c) The proponent, in lieu of being given approval to proceed within their two separate lots, is prepared to release two other near-by residential lots for being part of the agricultural land use adjacent to the lots.
- d) The overall road traffic plus aircraft sound levels at the two currently designated residential lots are predicted to be acoustically comparable to the two proposed residential lots.
- e) SSWA is confident that the acoustic design of the two vacant lots for residential buildings can be undertaken to produce fairly low levels of indoor sound levels due to aircraft/flyover provided that the necessary developed conditions are taken into consideration towards approval of the two lots.

In closing, it is SSWA's opinion that approval of the two unrelated lots should not be considered as a precedent setting for allowing other development applications to proceed in high aircraft noise NEF/NEP zones as this case has very unique factors as summarized above, that can only apply to individual and unrelated residential lots that are part of a well-established and comparable residential neighbourhood.

10.0 RECOMMENDATIONS

Based on the foregoing submission, it is our recommendation that the requested exchange of the two existing residential lots for two other vacant lots be approved subject to several conditions based on this technical submission.

Implementation of the necessary technical conditions for noise control should take place prior to site plan approval and prior to application for a Building Permit.

We trust this information will be of assistance, if you have any questions or concerns, please do not hesitate to contact our office.

Best regards,



Hazem Gidamy, M.Eng., P.Eng.
Principal

FIGURES



FIGURE 1.a: AERIAL PHOTOGRAPH OF THE SUBJECT AREAS



FIGURE 1.b: AERIAL PHOTOGRAPH OF THE SUBJECT AREAS SHOWING THE LAND PARCELS (LOTS 1 TO 5) DISCUSSED IN THIS REPORT

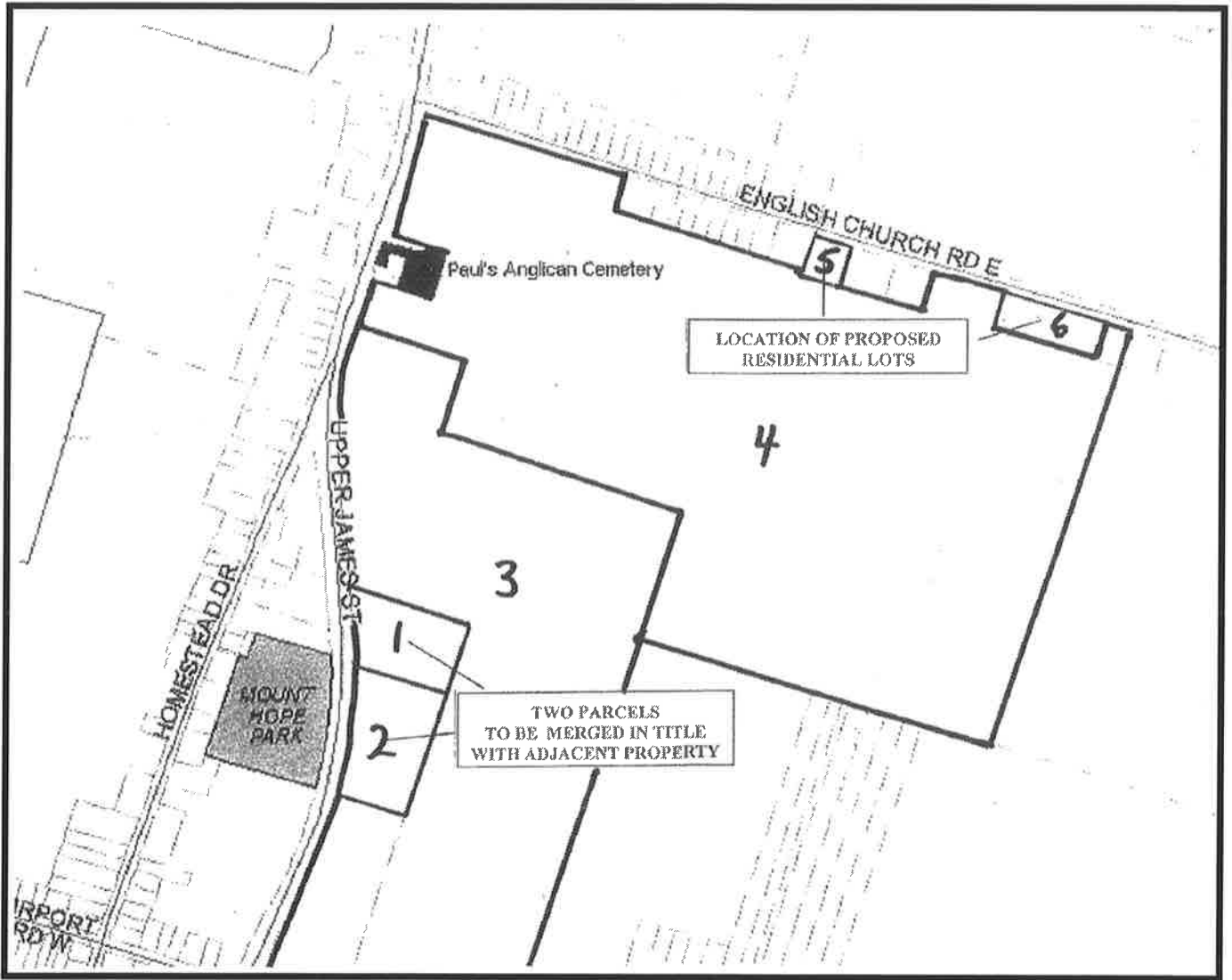


FIGURE 2: DRAWING OF THE SUBJECT AREAS SHOWING THE LAND PARCELS (LOTS 1 TO 5) DISCUSSED IN THIS REPORT

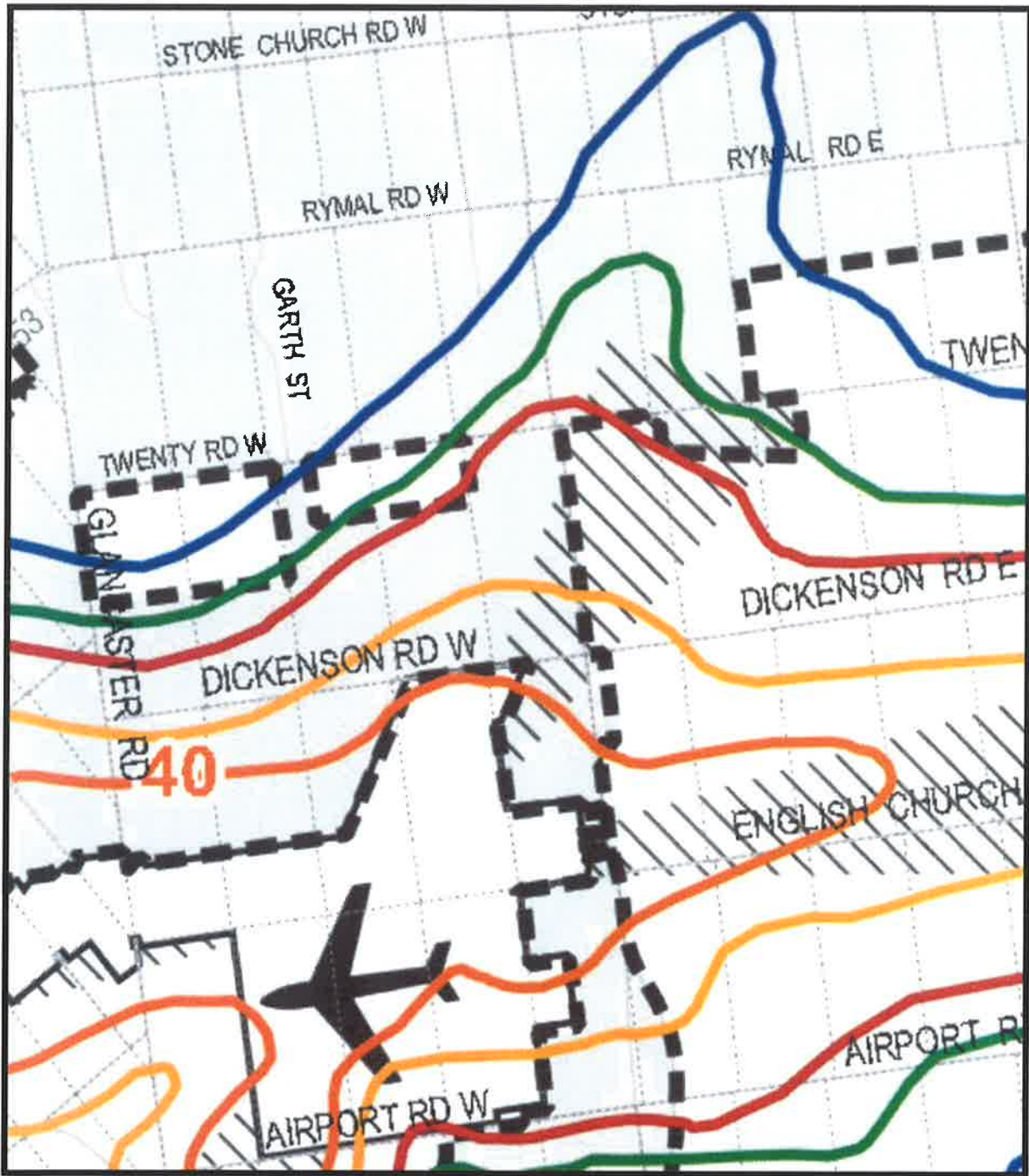


FIGURE 3.a: EXTRACTS OF THE NEF CONTOURS AND PRIMARY ZONING REGULATION AREA OF THE CITY OF HAMILTON JOHN C. MUNRO INTERNATIONAL AIRPORT

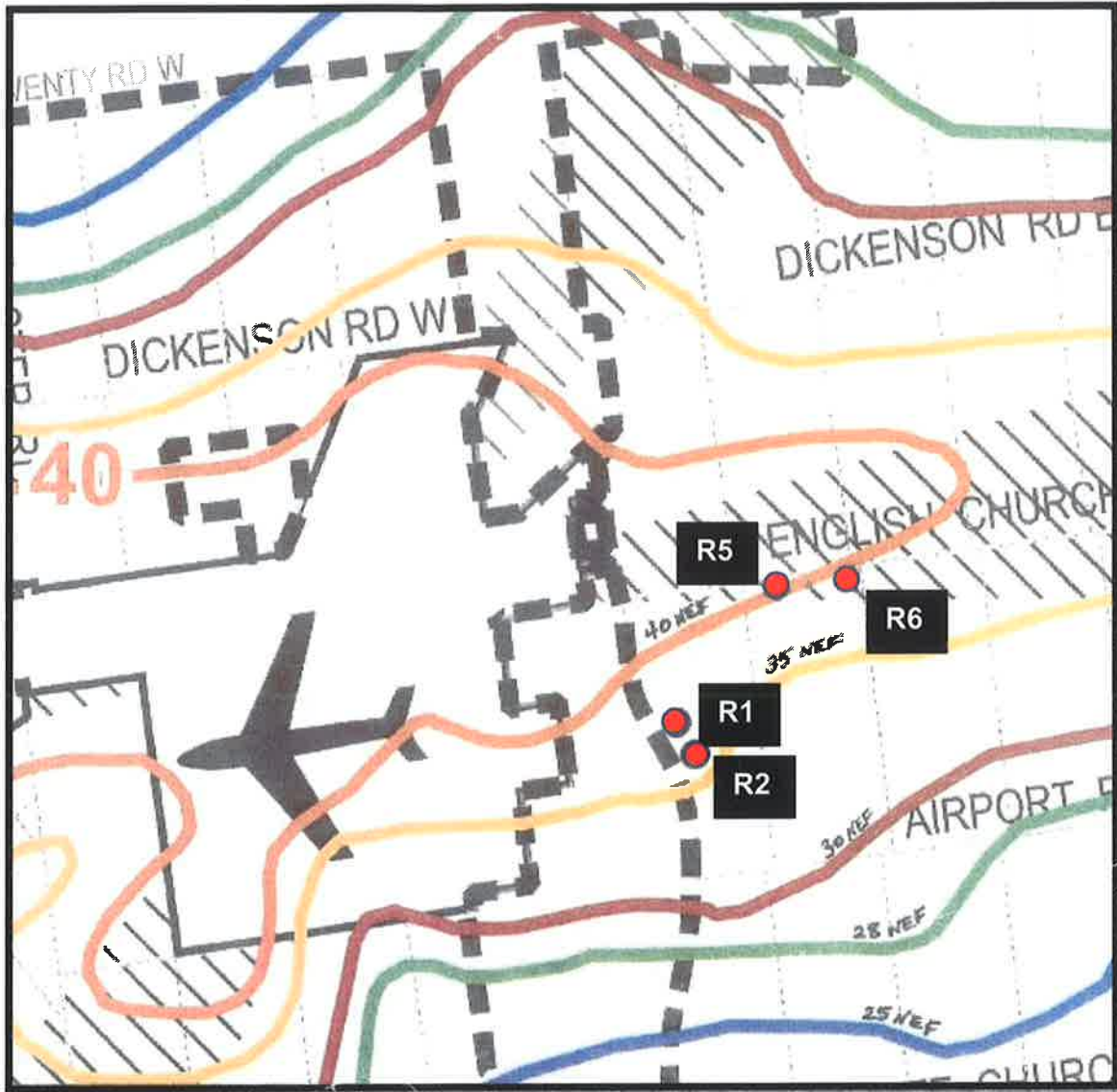


FIGURE 3.b: THE NEF CONTOURS AND THE APPROXIMATE LOCATIONS OF RECEPTORS R1, R2, R5 AND R6