

Noise Feasibility Study

Proposed Residential Development

Hillsburgh Residential Subdivision

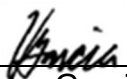
Erin, Ontario

Prepared for:

Thomasfield Homes Limited
295 Southgate Drive
Guelph, Ontario, N1G 3M5

Prepared by




Victor Garcia, PEng

January 10, 2024

HGC Project Number: 02300273

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1 Introduction and Summary

HGC Engineering was retained by Thomasfield Homes Limited to conduct a noise feasibility study for a proposed residential development known as the Hillsburgh Residential Subdivision located north of Wellington Road 22, approximately 500 m to the west of Wellington Road 24 in Erin, Ontario. The surrounding area is primarily existing agricultural/vacant lands. A noise study is required by the municipality as part of the planning and approvals process.

The proposed development is feasible; sound level predictions indicate there are no specific ventilation requirements due to transportation noise for the proposed development. Any exterior wall, and double-glazed window construction meeting the minimum requirements of the Ontario Building Code (OBC) will provide adequate sound insulation for all the dwelling units in this development. When siting information is available for the proposed condo tower and/or townhouse block adjacent to Wellington Road No. 22, a detailed noise study should be conducted to determine if there are any acoustic requirements.



2 Site Description and Noise Sources

Figure 1 is a key plan of the site. Figure 2 is a proposed site development concept plan prepared by GSP Group dated March 8, 2023. The proposed residential development will consist of single detached dwellings and townhouse blocks, along with associated roadways.

The immediate surrounding lands are agricultural/vacant lands. The primary source of noise in the area is Wellington Road No. 22. There are no significant sources of stationary noise within 500 m of the subject site.

3 Criteria for Acceptable Sound Levels

3.1 Road Traffic Noise Criteria

Guidelines for acceptable levels of road traffic noise impacting residential developments are given in the MECP publication NPC-300, “Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning”, Part C release date October 21, 2013 and are listed in Table 1 below. The values in Table 1 are energy equivalent (average) sound levels [L_{EQ}] in units of A weighted decibels [dBA].

Table 1: Road Traffic Noise Criteria

	Daytime $L_{EQ}(16 \text{ hour})$ Road	Nighttime $L_{EQ}(8 \text{ hour})$ Road
Outdoor Living Areas	55 dBA	--
Inside Living/Dining Rooms	45 dBA	45 dBA
Inside Bedrooms	45 dBA	40 dBA

Daytime refers to the period between 07:00 and 23:00, while nighttime refers to the period between 23:00 and 07:00. The term "Outdoor Living Area" (OLA) is used in reference to an outdoor patio, a backyard, a terrace or other area where passive recreation is expected to occur. Balconies that are less than 4 m in depth are not considered to be outdoor living areas under MECP guidelines.

The guidelines in the MECP publication allow the sound level in an Outdoor Living Area to be exceeded by up to 5 dBA, without mitigation, if warning clauses are placed in the purchase and

rental agreements and offers of purchase and sale for the property. When OLA sound levels exceed 60 dBA, physical mitigation is required to reduce the OLA sound level to below 60 dBA and as close to 55 dBA as technically, economically and administratively feasible.

A central air conditioning system as an alternative means of ventilation to open windows is required for dwellings where nighttime sound levels outside bedroom/living/dining room windows exceed 60 dBA or daytime sound levels exceed 65 dBA outside living/dining room windows. A forced air ventilation system with ducts sized for the future provision of air conditioning by the occupant, or some other alternative form of mechanical ventilation, is required where nighttime sound levels at bedroom/living/dining room windows are in the range of 51 – 60 dBA or daytime sound levels are in the range of 56 – 65 dBA.

Building components such as walls, windows and doors must be designed to achieve indoor sound level criteria when the plane of bedroom/living/dining room window sound level is greater than 60 dBA or the daytime sound level is greater than 65 dBA due to road traffic noise.

Warning clauses are required to notify future residents of possible excesses when nighttime sound levels exceed 50 dBA at the plane of the bedroom/living/dining room window and daytime sound levels exceed 55 dBA in the outdoor living area and at the plane of the bedroom/living/dining room window due to road traffic.

3.2 Traffic Sound Level Assessment

3.2.1 Road Traffic Data

Road traffic data for Wellington Road No. 22 were obtained from the Transportation Impact Study entitled, “Hillsburgh Residential Subdivision, Transportation Impact Study”, prepared by Salvini Consulting and dated April 2023. The data was provided in the form of projected peak hour volumes for the year 2033 and is provided in Appendix A. This data was converted to Average Annual Daily Traffic (AADT) in order to be used in the analysis and further projected to the year 2034 using a 2.5%/year growth rate. A commercial vehicle percentage of 13% was assumed and split into 5.0% medium trucks and 8.0% heavy trucks, along with an assumed day/night split of 90%/10%. Wellington Road No. 22 has a posted speed limit of 70 km/h. Table 2 summarizes the traffic data.



Table 2: Projected Road Traffic Data to Year 2034

Road Name		Cars	Medium Trucks	Heavy Trucks	Total
Wellington Road No. 22	Daytime	3 796	218	349	4 363
	Nighttime	422	24	39	485
	Total	4 218	242	388	4 848

3.2.2 Road Traffic Noise Predictions

To assess the levels of road traffic noise which would impact the site in the future, road traffic predictions were made using STAMSON version 5.04, a computer algorithm developed by the MECP. Sample STAMSON output is included in Appendix B.

Prediction locations were chosen around the site to obtain a good representation of the future sound levels at the proposed development with exposure to the surrounding roadways. The worst-case prediction locations were chosen at the top storey of the proposed dwellings, as indicated in Figure 2. The results of these predictions are summarized in Table 3.

Table 3: Future Road Traffic Sound Levels, [dBA], Without Mitigation

Prediction Location	Description	Daytime in OLA L _{EQ-16 hr}	Daytime at Façade L _{EQ-16 hr}	Nighttime at Façade L _{EQ-8 hr}
[A]	Dwellings with backing exposure to Wellington Road No. 22	<55	<55	<50

4 Traffic Noise Recommendations

The predictions indicate that the future traffic sound levels will be within MECP guidelines at the proposed dwellings.

4.1 Outdoor Living Areas

The predicted sound level in the rear yards of the proposed townhouses (prediction location [A]) and in the rear yards will be less than 55 dBA. No further mitigation is required.

Condo Tower and/or Townhouse Block

The Condo Tower and/or Townhouse Block, with direct exposure to Wellington County Road No. 22 have not been considered in this analysis because the land use has not been finalized. A detailed noise study should be conducted to determine the acoustic requirements such as acoustic barriers, ventilation requirements and to specify building components when the siting, grading information is available. The noise study should be completed in accordance with NPC-300.

4.2 Indoor Living Areas

The predicted future sound levels outside the top storey windows of the proposed residential dwellings (prediction location [A]) will be less than 55 dBA during the day and less than 50 dBA during the night. There are no specific ventilation requirements for the proposed dwellings.

Individual HVAC units may be used for each townhouse unit. As a general note, the location, installation and sound ratings of the outdoor air conditioning devices should minimize noise impacts and comply with criteria of MECP publication NPC-300, as applicable.

4.3 Building Façade Constructions

Since the daytime and nighttime sound levels at the facades of the residential units will be less than 65 dBA during the day and less than 60 dBA during the night, any exterior wall, and double-glazed window construction meeting the minimum requirements of the Ontario Building Code (OBC) will provide adequate sound insulation for all the dwelling units in this development.



5 Summary of Noise Control Recommendations

Analysis indicates that the predicted sound level will be within MECP guidelines limits at the proposed building. The following recommendations are provided.

1. There are no specific ventilation requirements or noise warning clauses for the proposed dwellings.
2. Any exterior wall, and double-glazed window construction meeting the minimum requirements of the OBC will provide adequate sound insulation for the proposed dwellings.
3. When siting information is available for the condo tower and/or townhouse block, a detailed noise study should be conducted to determine the acoustic requirements.

The reader is referred to the previous sections of the report where these recommendations are discussed in more detail.



Limitations

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Any conclusions and/or recommendations herein reflect the judgment of HGC Engineering based on information available at the time of preparation, and were developed in good faith on information provided by others, as noted in the report, which has been assumed to be factual and accurate. Changed conditions or information occurring or becoming known after the date of this report could affect the results and conclusions presented.



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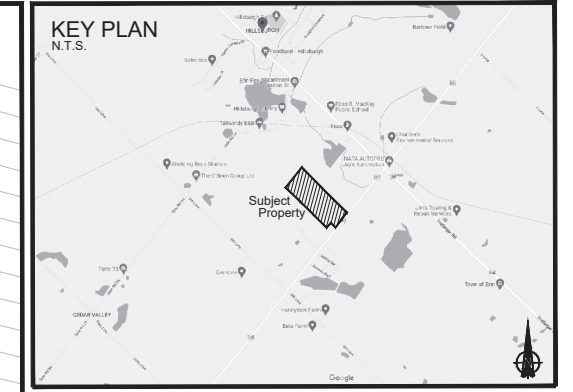
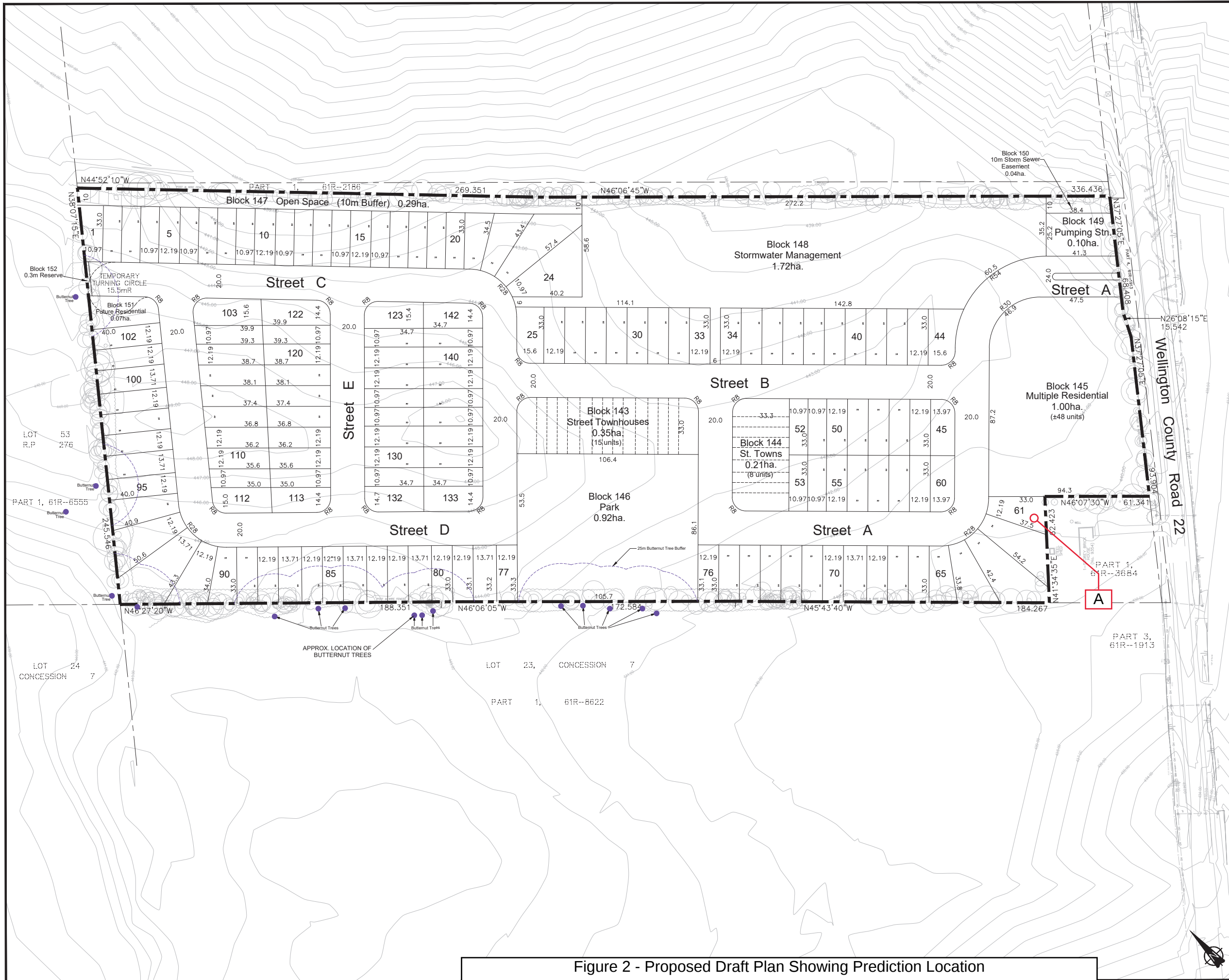


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Figure 1 - Key Plan



DRAFT PLAN OF SUBDIVISION

Part of Lot 23, Concession 7
(Geographic Township of Erin)
Town of Erin
Wellington County
9354 Wellington County Road 22

DESCRIPTION	LOTS/BLKS.	UNITS	AREA (ha.)
Single Detached Residential	1-142	142	6.39
Street Townhouses	143,144	24	0.56
Multiple Residential	145	±48	1.00
Park	146		0.92
Open Space	147		0.29
Stormwater Management	148		1.72
Pumping Station	149		0.10
10m Sewer Easement	150		0.04
Future Residential	151	1	0.07
0.3m Reserve	152		0.00
Roads			3.05
Total		±215	14.14

NOTES

1. TOPOGRAPHIC SURVEY PREPARED BY VAN HARTEN SURVEYING INC.,
DECEMBER 2021

ADDITIONAL INFORMATION
(UNDER SECTION 51(17) OF THE PLANNING ACT)
INFORMATION REQUIRED BY CLAUSES a,b,c,d,e,f,g,j and l ARE AS SHOWN ON THE DRAFT PLAN.

h) Municipal water supply

j) All sanitary and storm sewers as required

OWNER'S CERTIFICATE
I AUTHORIZE THE GSP GROUP INC. TO PREPARE AND SUBMIT THIS DRAFT PLAN
OF SUBDIVISION TO THE COUNTY OF WELLINGTON.

THOMASFIELD HOMES LIMITED

October 27, 2022

DATE

SURVEYOR'S CERTIFICATE
I CERTIFY THAT THE BOUNDARIES OF THE LAND TO BE SUBDIVIDED AND THEIR
RELATIONSHIP TO THE ADJACENT LANDS ARE CORRECTLY SHOWN.

JAMIE LAWS, O.L.S.
Val Harten Surveying Inc.

October 19, 2022

DATE

 GSP group PLANNING URBAN DESIGN LANDSCAPE ARCHITECTURE gspgroup.ca	REVISIONS <table><tr><td>March 8, 2023</td></tr><tr><td> </td></tr><tr><td> </td></tr><tr><td> </td></tr><tr><td> </td></tr><tr><td> </td></tr></table>		March 8, 2023					
	March 8, 2023							
Date: February 16, 2023 Scale: 1:1,000 metric	Drawn By: S.L. Project No.: 20200	Dwg. File Name: dp20200c.dwg						

Figure 2 - Proposed Draft Plan Showing Prediction Location

APPENDIX A

Road Traffic Data



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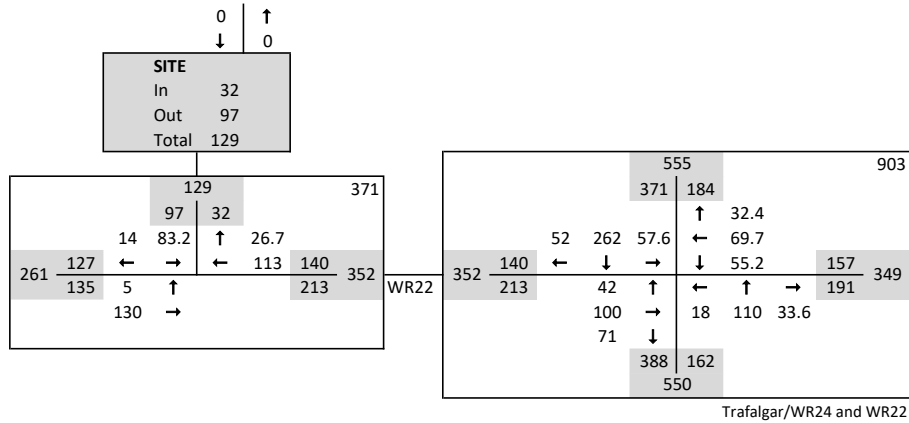


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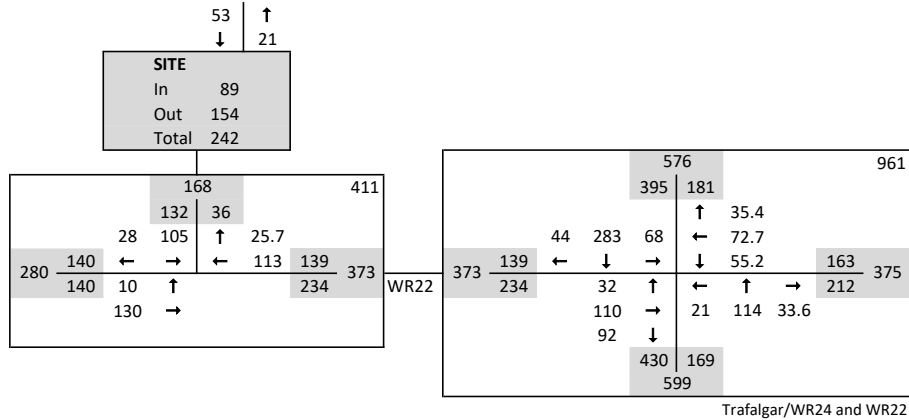
2033 Horizon Year

AM Peak Hour

Future Total Traffic WR22

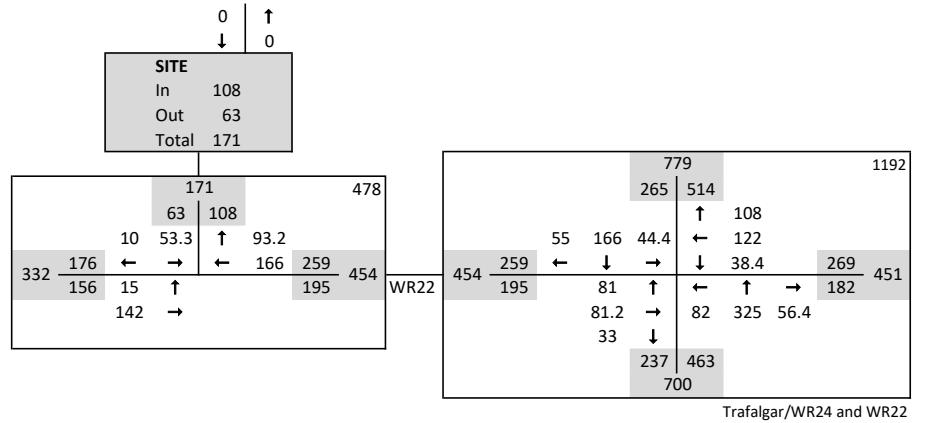


Future Total Traffic with Carson

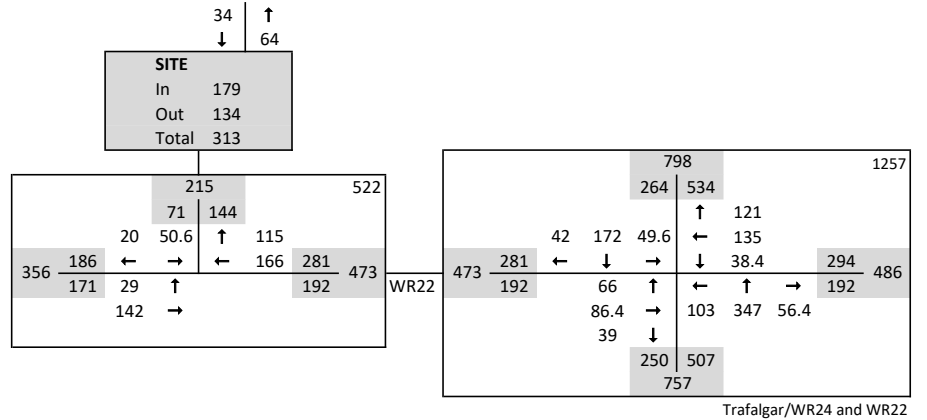


PM Peak Hour

Future Total Traffic WR22



Future Total Traffic with Carson



APPENDIX B

Sample STAMSON 5.04 Output



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Filename: a.te Time Period: Day/Night 16/8 hours

Description: Dwellings with backing exposure to Wellington Road No. 22

Road data, segment # 1: 22 (day/night)

Car traffic volume : 3796/422 veh/TimePeriod *
Medium truck volume : 218/24 veh/TimePeriod *
Heavy truck volume : 349/39 veh/TimePeriod *
Posted speed limit : 70 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 4730
Percentage of Annual Growth : 2.50
Number of Years of Growth : 1.00
Medium Truck % of Total Volume : 5.00
Heavy Truck % of Total Volume : 8.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: 22 (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 93.80 / 93.80 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: 22 (day)

Source height = 1.68 m

ROAD (0.00 + 53.52 + 0.00) = 53.52 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.56	67.27	0.00	-12.46	-1.29	0.00	0.00	0.00	53.52

Segment Leq : 53.52 dBA

Total Leq All Segments: 53.52 dBA



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Results segment # 1: 22 (night)

Source height = 1.68 m

ROAD (0.00 + 47.00 + 0.00) = 47.00 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.56	60.75	0.00	-12.46	-1.29	0.00	0.00	0.00	47.00

Segment Leq : 47.00 dBA

Total Leq All Segments: 47.00 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 53.52 dBA
(NIGHT): 47.00 dBA



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