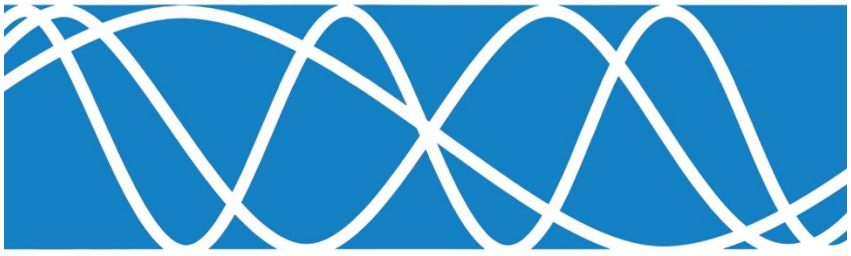
Land Use Compatibility Study (Noise)

Proposed Residential Development
Eliza Street
Arthur, Ontario

March 3, 2025
HGC Project #: 02000939



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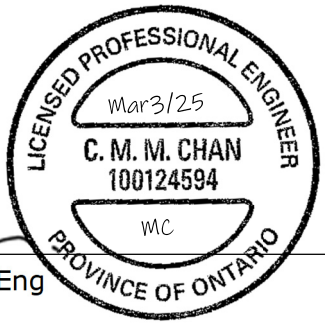

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1 INTRODUCTION AND SUMMARY

HGC Noise Vibration Acoustics was retained by Tribute/Sorbara Arthur Holdings Inc. to investigate the land use compatibility with respect to noise of a proposed residential development located at 665 Eliza Street and the property bounded by Wells Street, Macauley Street and Eliza Street in Arthur, Ontario.

This study has been prepared for submission to the municipality as part of a Zoning By-Law and Official Plan Amendment and Draft Plan of Subdivision application. It follows Ministry of the Environment, Conservation and Parks (MECP) guidelines with regard to land use compatibility and noise assessment. HGC personnel visited the site in July 2024 in order to investigate the acoustical environment, the site topography and the surrounding land uses.

The results of the study indicate that the presence of the existing and future industrial uses to the south and northeast of the site have the potential to exceed the MECP guidelines at the proposed development. Mitigation is required for the proposed dwellings located closest to the industrial uses to achieve compliance with MECP guidelines. A Class 4 designation is recommended for the subject lands.

When detailed siting and floor plans are available for the proposed dwellings on the lots closest to the industrial/commercial uses or when additional details for the concrete batch plant are available, a detailed noise study shall be conducted for the residential dwellings to assess the sound levels and refine any mitigation requirements based on the determined Class of the acoustic environment.

2 SITE DESCRIPTION AND NOISE SOURCES

The lands under consideration are presently zoned for Future Development (FD) and is located to east and west of Eliza Street, South of Wells Street in Arthur, Ontario. A key plan is provided as Figure 1. The site proposes to include single detached and semi-detached dwellings and townhouse blocks. A proposed draft plan prepared by Biglieri Group dated January 14, 2025 is included in Figure 2.

The lands are currently in an area with some existing residential, agricultural and industrial uses surrounding the lands. The property located at 510 Eliza Street (Clark Brothers Contracting) has recently received approval for a land severance and Zoning By-law Amendment to permit for a future ready-mix concrete batching (RMC) plant. Figure 3 includes a zoning map of the subject site. To the northeast of the development is an Ivan Amstrong Trucking facility (8035 2 Line). Further south is Jim's Auto Service (327 Tucker Street), Krown Rust Control (490 Eliza Street) and True North Carwash & Storage. Lands immediately to the south of the site are zoned industrial H(M1) but are currently vacant. Additional Zoning By-Law information is provided in Appendix A. The potential noise impact of road traffic and the nearby industrial and commercial uses has been assessed in the subsequent sections.

3 THE POLICY AND REGULATORY CONTEXT

3.1 MECP Guidelines for Land Use Compatibility and Distance Separation

MECP Guidelines D-1, "Land Use Compatibility" [1] and D-6 "Compatibility Between Industrial Facilities and Sensitive Land Uses" [2] were prepared to minimize adverse effects caused by sources regulated by the EPA on existing land uses or in relation to land use approvals under the Planning Act. They recommend that studies be conducted to investigate the feasibility of providing sufficient mitigation when noise sensitive land uses are proposed within the potential zone of influence of an existing industry/commercial facility. The mitigation can be provided at the source, or can be incorporated on the

development lands where the industrial/commercial facility is operating in compliance with legislated Ministry requirements.

For planning purposes, the potential zone of influence is 70 m for light industry (Class I), 300 m for medium industry (Class II) and 1000 m for heavy industry (Class III). If it can be shown through technical studies which determine actual zone of influence and illustrate that any potential noise impacts can be mitigated through the implementation of site-specific control measures the actual zone of influence can be reduced. These technical studies may be requested by a Municipality under the Planning Act and are required by the MECP to obtain approvals under the EPA depending on the nature of the industrial use.

Per MECP Guidelines D-1 and D-6, a Class I industry is described as a small-scale plant with no outside storage, sound not audible off property, daytime operations and infrequent movement of products or heavy trucks. A Class II industry is described as having a medium level of production with outside storage permitted. Sound may occasionally be audible off site, shift operations are permitted and there are frequent movements of products or heavy trucks. Class III industry is described as a large-scale facility with sound frequently audible off property, shift operations and the continuous movement of products or heavy trucks.

The nearby future and existing industrial uses at 510 Eliza Street and 8035 2nd Line are considered Class II industries. The development plan has been designed such that existing and future roadways plus public park lands will provide more than 100 m from the industrial uses at 510 Eliza Street for future residential uses, satisfying the D1 and D-6 distance setback recommendations. The subject site adjoins the industrial property to the northeast thus there is no setback.

The minimum separation distances generally apply between the property line of the industrial and sensitive uses, but portions of the industrial land can be considered as some or all of the setback if the specific use of that portion of the industrial land is controlled in a site-specific zoning bylaw. For example, parking

lots and planting strips are not considered to be noise producing and could be included in the distance setback in that case. For infill projects or projects located in transitional areas, the recommended minimum distance setbacks can be reduced, based on the results of technical studies such as this study.

3.2 MECP Guidelines for Road Traffic Noise

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 [3] 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

Space	Daytime LEQ(16 hour) Road	Nighttime LEQ(8 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/elevated terraces 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 to the property. Where 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 and living/dining room windows exceed 60 dBA or daytime sound levels outside bedroom/living/dining room windows exceed 65 dBA. Forced air ventilation with ducts sized to accommodate the future installation of air conditioning is required when nighttime sound levels at bedroom/living/dining room windows are in the range of 51 to 60 dBA or when daytime sound levels at bedroom and living/dining room windows are in the range of 56 to 65 dBA. The location and installation of the outdoor air conditioning device should be done so as to minimize the noise impacts and comply with criteria of MECP publication NPC-216, Residential Air Conditioning Devices, within NPC-300.

Building components such as walls, windows and doors must be designed to achieve indoor sound level criteria when the plane of bedroom window sound levels are greater than 60 dBA or the daytime sound levels are greater than 65 dBA due to road traffic noise. Warning clauses are required to notify future residents of the possible noise 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.

3.3 MECP Guidelines for Stationary Sources

MECP Publication NPC-300, entitled "Environmental Noise Guideline, Stationary and Transportation sources – Approval and Planning" establishes sound level limits for stationary sources of sound. Stationary sources of sound can be individual facilities or pieces of equipment or the cumulative sound of activity or conveyances operating on industrial property such as trucking yards or loading areas. NPC-300 is used by industry to determine the impact of their operations at neighbouring noise sensitive receptors to demonstrate compliance for the purpose of obtaining approvals. It is also used by the development industry to determine if there may be significant noise impacts on lands considered for the

development of noise sensitive uses. Given the presence of Eliza Street, the lands would be considered to be in Class 2 acoustic environment for any noise assessments.

NPC-300 recommends sound level limits as a function of the background sound levels due to road traffic and other industry. The objective of the guidelines is to establish a sound level limit at each noise sensitive receptor on the basis of "predictable worst case" impact. In general, the sound level limit must represent the minimum background sound level that occurs during an hour of the day in which the stationary source may operate, subject to exclusionary minima of 45 to 50 dBA, depending upon time of day (daytime, evening or nighttime) and proximity to the roadways. In this case, the minimum daytime criterion of 50 dBA and 45 dBA at night at the dwelling; along with a 50 dBA during the day and 45 dBA during the evening in the outdoor living area (OLA) would likely apply to the future residential dwellings.

There are no indoor sound level criteria associated with NPC-300 for industrial noise sources. This is because the point of reception is generally considered to be outside the building on any useable property associated with its operations.

3.4 Municipal Noise By-Law

By-Law No. 5001-05 of the Township of Wellington North (attached) has specific prohibitions for noise generated by noise sources such as vehicles, construction equipment, refrigeration equipment and electronic devices. It also has prohibitions by time and place. Generally, there are no prohibitions for industrial noise sources which are in conformance with the applicable zoning. Municipal Bylaw Enforcement staff is responsible for investigating complaints concerning commercial/industrial occupancies such as are proposed.

3.5 Outdoor Living Areas

As an overview of the above regulations, policies and agreements, the developer is obliged to provide a suitable distance setback and any additional mitigation for any noise impact on the proposed noise sensitive land uses in

accordance with the Municipal Noise Control Bylaw and the requirements of the EPA as per MECP D1, D6 and NPC-300 Guidelines and related documents.

4 ROAD TRAFFIC NOISE ASSESSMENT

4.1 Road Traffic Data

Road traffic data for Eliza Street was provided by County of Wellington personnel in the form of an Annual Average Daily Traffic volume. A commercial vehicle percentage of 6.5% heavy trucks and 4.0% medium trucks was used. The data was projected 20 years to the year 2035 as per MECP guidelines using a 2.5% growth rate. A day/night split of 90%/10% and a posted speed limit of 80 km/h was used in the analysis. Table 2 summarizes the traffic volume data used in this study.

Table 2: Project Road Traffic Data Used in Assessment

Roadway	AADT	Day / Night Split [%]	Trucks Percentage (%)		Speed Limit [km/h]
			Medium	Heavy	
Eliza	3 953	90 / 10	6.5	4.0	80

4.2 Traffic Noise Predictions

Future traffic sound levels were predicted using STAMSON version 5.04, a computer algorithm developed by the MECP. Sample STAMSON output is included in Appendix C.

Predictions of the traffic sound levels were made at the window at the upper storey of the townhouses and detached units. Blocks 160 to 170 are dual frontage homes with no rear yards. The results of these predictions are summarized in Table 3. The acoustic requirements may be subject to modifications if the site plan is changed significantly.

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

Prediction Location	Lot No.	Daytime at OLA $L_{EQ(16\ hour)}$	Daytime at Façade $L_{EQ(16\ hour)}$	Nighttime at Façade $L_{EQ(8\ hour)}$
A	Block 3	--	<55	<50
B	Block 4	--	63	56
C	Block 28	--	63	56
D	Block 29	<55	55	<50
E	Block 31	<55	<55	<50

4.3 Traffic Noise Recommendations

The predictions indicate that the future traffic sound levels at the façades with exposure to the roadways will exceed MECP guidelines. Recommendations to address these excesses are discussed below.

4.3.1 Outdoor Living Areas

All other rear yards are well shielded from road traffic noise and do not require further mitigation.

4.3.2 Indoor Living Areas

For all dwellings adjacent to Eliza Street, the predicted sound levels are predicted between 51 and 60 dBA during the night and between 56 dBA and 65 dBA during the day. To address these excesses, the MECP guidelines recommend that these dwelling units be equipped with a forced air ventilation system with ducts sized to accommodate the future installation of air conditioning by the occupant. The guidelines also recommend warning clauses for these blocks and lots. Window or through-the-wall air conditioning units are not recommended for any residential units because of the noise they produce and because the units penetrate through the exterior wall which degrades the overall noise insulating properties of the envelope. 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. Blocks requiring forced air heating are shown on Figure 4.

For the remaining dwelling units in the development, there are no specific ventilation requirements.

4.3.3 Building Façade Constructions

The predicted sound levels at the plane of the bedroom and living/dining room windows and offices will be less than 65 dBA during the day and less than 60 dBA at night for, any exterior wall and glazing construction meeting OBC will be acceptable. Any insulated metal exterior door meeting OBC requirements will be sufficient to provide noise insulation.

4.3.4 Warning Clauses

The MECP guidelines recommend that warning clauses be included in the property and tenancy agreements for all the dwellings with anticipated traffic noise sound level excesses. The following noise warning clauses are required for the proposed development. The warning clause Type labels follow the same lettering system outlined MECP NPC-300.

A suggested wording for future dwellings with sound level excesses of the MECP criteria but do not require physical mitigation measures is given below.

Type A:

> Purchasers/tenants are advised that sound levels due to increasing road traffic may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment.

A suggested wording for future dwellings requiring the provision of adding central air conditioning at the occupant's discretion is given below.

Type C:

> This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning by the occupant in low and medium density developments will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound

> levels are within the sound level limits of the Municipality and the Ministry of the Environment.

A warning clause is recommended to inform future residents of the surrounding commercial/industrial uses. A suggested wording to identify the proximity of the existing commercial/industrial facilities is given below.

Type E:

> Purchasers/tenants are advised that due to the proximity of the adjacent commercial/industrial facilities, noise from these facilities may at times be audible

These sample clauses are provided by the MECP as examples and can be modified by the Municipality as required.

5 STATIONARY NOISE SOURCE ASSESSMENT

5.1 Sound Level Criteria & Receptors

There are various commercial/retail/industrial facilities in the area of the site including Jim's Auto Service; Krown Rust Control; Clark's Brothers Contracting and True North Carwash & Storage to the south of the site. To the northeast of the site is the Ivan Armstrong Trucking facility.

Additionally, noise from the recently approved zoning amendment which will allow the operation of an RMC at 510 Eliza Street has also been considered. Information regarding the RMC plant is not available. As such, a conservative approach was considered based on the information that the proponent presented to the municipality and HGC's experience with RMC plants given the size of the property regarding potential noise sources, noise source locations and its operating times. Note that they have indicated the facility will operate during daytime hours only. It is likely that the RMC plant will incorporate various noise mitigation measures such that the applicable MECP limits can be met at existing residential uses to the south and southeast of their property.

This assessment can be refined when details are available. The RMC plant noise sources considered for this assessment is summarized in the following sections.

Building locations and heights of the proposed development have not been designed. Sensitive receptor locations were taken at the façades of the proposed residences on the subject site and in the outdoor amenity areas. Single detached, semi-detached dwellings and townhouse blocks are assumed to be 2-storeys in height.

5.2 Sound Level Criteria at the Sensitive Receptors

Typical ambient sound levels can be determined through prediction of road traffic volumes in areas where traffic sound is dominant. Where it can be demonstrated that the hourly ambient sound levels are greater than the exclusionary minimum limits listed above, the criterion becomes the lowest predicted one-hour LEQ sound level during each respective period. At locations where the ambient sound levels are low, the exclusionary minimum criteria apply.

The recommended criteria during the daytime and nighttime at each receptor are indicated in Table 4. In each case, the limits apply at any point on the property, and at residential window locations. Some of the townhouse blocks are designed with no rear yard OLAs.

Table 4: Predicted Steady Source Sound Levels at the Proposed Development [dBA]

Receptor	Description	Criteria in OLA		Criteria at Façade	
		Day	Eve	Day/ Eve	Night
R1	Proposed single detached dwelling	50	45	50	45
R2	Proposed single detached dwelling	50	45	50	45
R3	Proposed single detached dwelling	50	45	50	45
R4	Proposed single detached dwelling	50	45	50	45
R5	Proposed townhouse block	--	--	50	45
R6	Proposed townhouse block	50	45	50	45
R7	Proposed townhouse block	--	--	50	45
R8	Proposed townhouse block	--	--	50	45
R9	Proposed semi- detached dwelling	50	45	50	45
R10	Proposed semi- detached dwelling	50	45	50	45
R11	Proposed semi- detached dwelling	50	45	50	45
R12	Proposed townhouse block	--	--	50	45
R13	Proposed townhouse block	50	45	50	45
R14	Proposed townhouse block	50	45	50	45
R15	Proposed townhouse block	50	45	50	45
R16	Proposed semi- detached dwelling	50	45	50	45
R17	Proposed semi- detached dwelling	50	45	50	45
R18	Proposed semi- detached dwelling	50	45	50	45

5.3 Stationary Source Assessment

Predictive noise modelling was used to assess the potential sound impact of the nearby land uses at the closest proposed sensitive receptors on the subject site. The noise prediction model was based on sound emission levels for the nearby land uses, assumed operational profiles (during the day, evening and night), and established engineering methods for the prediction of outdoor sound propagation. These methods include the effects of distance, air absorption, and acoustical screening by barrier obstacles.

5.3.1 Existing Commercial & Industrial Noise Sources

Potentially significant noise sources associated with the nearby commercial and industrial uses are summarized below. Noise source locations are provided in Appendix B.

The bay doors of Jim's Auto Service and Krown Rust Control, as well as the vacuums and bay doors of the nearby car wash. Jim's Auto Service and Krown Rust Control are expected to operate during daytime hours only (07:00 to 19:00). The bay doors are typically open during the warm months and noise from auto servicing activities will emanate through the open doors. It has been assumed that the facilities at the car wash could be used during daytime and nighttime hours. Deliveries are expected to be occasional, light and during daytime hours only. The Clark Brothers Contracting yard will have a crusher and a front end loader that operates during the daytime hours. For Ivan Armstrong Trucking, trucking activities in the yard are expected to occur during both daytime/evening and nighttime hours.

The source levels associated with the equipment and activities are listed in Table 5 below in terms of sound power level.

Table 5: Source Sound Power Levels [dB re 10-12 W]

Source	Octave Band Centre Frequency [Hz]								Overall [dBA]
	63	125	250	500	1k	2k	4k	8k	
Jim's Auto Bay Door	80	79	82	84	87	85	85	88	93
Krown Entrance Door	79	79	78	83	85	84	85	89	93
Krown Exit Door	85	77	79	82	89	83	79	80	91
*Vacuum	91	79	92	87	89	94	95	93	100
Car Wash Bay Door	85	76	75	77	76	79	81	83	87
Idling Truck	101	100	94	96	97	95	91	86	97
Tractor Trailer Truck Movements	96	91	88	88	91	90	81	70	101
Trailer Coupling/Decoupling (Impulsive)	97	111	107	112	113	108	103	103	116
Crusher	88	98	101	107	111	111	108	103	116

Note: *Includes a 5 dB tonal penalty

5.3.2 Ready-Mix Batching Plant

Information regarding the RMC plant is not available. As such, a conservative approach was considered based on the information that the proponent presented to the municipality and HGC's experience with RMC plants given the size of the property regarding potential noise sources, noise source locations

and its operating times. Note that in their presentation to the Town, they have indicated the facility will operate during daytime hours only. It is likely that the RMC plant will incorporate various noise mitigation measures such that the applicable MECP limits can be met at existing residential uses to the south and southeast of their property. This assessment can be refined when details are available. The RMC plant noise sources considered for this assessment is summarized below.

Cement Tanker Trucks

Tanker trucks delivering cementitious materials to the plant will be unloaded from the tanker trucks using truck mounted blowers. This assessment also considers sound emissions from the truck engines and exhausts. Two tanker trucks are assumed to visit the site in a predictable worst-case hour of operation with unloading occurring continuously.

Ready-Mix Trucks

Ready-mix trucks will enter the site and drive under the loading area. Trucks will be loaded while operating at an elevated engine idle and sound emissions from the truck engines and combustion exhausts are included in the assessment. Once loading is completed, ready-mix trucks will move to the slumping rack, located west of the plant. In this area, the trucks will operate at an elevated idle to complete raw material mixing and to adjust for product consistency as required. Up to two ready-mix trucks could be operating at an elevated engine idle at the slumping rack at any given time. Eight ready-mix trucks can enter and exit the facility during a predictable worst-case hour of operation. Each truck is assumed to idle for up to 5 minutes while loading, and for up to 10 minutes while slumping.

Loading Point Sources

A dust collector will be used to control particulate emissions during the loading of ready-mix trucks and is typically equipped with a secondary exhaust silencer.

The loading point is also equipped with a horn, which typically operates for approximately 5 seconds at the end of each loading cycle.

Aggregate/Cement Scale Vibrators

The loading point will be equipped with an aggregate scale vibrator and a cement scale vibrator, which will operate for short periods to loosen clumping materials. The vibrators were assumed to operate for ten seconds conservatively per ready-mix truck, based on typical site.

Silo Baghouse Outlet and Air Compressor

A baghouse will be located on top of the cementitious material storage silo which will control dust emissions during the unloading of a tanker truck. It is understood that zoning will permit a dwelling up to 24 m in height. This assessment also considers sound emissions from an air compressor.

Loading Point Dust Collector

The loading point will be equipped with a dust collector to control particulate emissions during loading of RMC trucks. The dust collector was assumed to operate conservatively for ten minutes per ready-mix trucks.

Aggregate Trucks, Front-end Loader & Hopper

Aggregate trucks will enter the site and unload aggregate into one of the several stockpiles, assumed to be located on the north side of the plant. Up to 2 aggregate trucks are assumed to enter and exit the facility in a busy hour. A front-end loader is used to transfer aggregate materials between the stockpiles and the hopper, which is equipped with a vibrator to loosen clumped materials onto and enclosed conveyor belt (acoustically negligible) which will transport the materials to elevated storage compartments within the plant.

Sources associated with the RMC are included in Table 6 below.

Table 6: Source Sound Power Levels for RMC Facility [dB re 10-12 W]

Source	Octave Band Centre Frequency [Hz]								Overall [dBA]
	63	125	250	500	1k	2k	4k	8k	
Unloading Aggregate Trucks	109	94	94	94	93	97	98	97	104
Front End Loader	117	110	107	102	101	96	96	96	107
Tanker Truck Movements	100	100	90	93	95	93	85	78	99
Ready-Mix Trucks Movements	104	101	101	99	97	94	89	81	102
Loading Ready-Mix Trucks	109	107	112	109	105	108	96	89	113
Slumping Ready-Mix Trucks	97	104	101	101	102	99	95	88	106
Slumping Ready-Mix Trucks, Exhaust	87	94	91	91	92	89	85	78	96
*Aggregate Scale Vibration	118	107	97	96	95	92	92	83	101
Dust Collector	98	101	102	96	91	87	82	75	98
Baghouse Outlet	104	102	102	95	86	81	73	64	97
*Cement Scale Vibrator	122	116	110	109	109	109	111	109	117

Note: *Includes a 5 dB tonal penalty

5.3.3 Vacant Industrially Zoned Lands

To the southwest of the subject site the lands are currently zoned (H)M1, M1 Industrial Zone with holding provision. There are residential development plans for the southern property and are no development plans for the southwest lands currently. A review of the uses permitted in M1 Industrial Zone from the Zoning Bylaw (Appendix A) indicates that most would be considered to be light (Class 1) or medium (Class 2) depending on the specific nature of their operations but several could be considered heavy. For example; a large-scale grain elevator with an outdoor process (grain drier), a feed mill which may incorporate elevators and driers which are not enclosed within the building; or a large scale manufacturing, processing, assembly, repair, fabricating or milling facility with high levels of truck traffic which may operate 24 hours a day.

The permitted uses with the greatest potential for adverse impact from our experience are a large-scale feed mill or grain elevator with outdoor processes like grain drying and high levels of truck traffic and 24-hour operations. Given the proximity of existing residences to the south, large-scale feed mill or grain elevators are not expected. Permitted uses which are more commercial type

such as business or professional offices or mini-storage facility are not likely to have significant noise impact.

When designing the layout on the industrial lands, building orientations should be taken into consideration such that physical noise mitigation can be minimized. For example, if warehousing uses are proposed for the industrial lands, the loading bays should be located on the west side of the building so that the building itself can act as a barrier itself and reduce the requirement for high noise barriers. Other possibilities may include a row of commercial or light industrial buildings between Class II type industrial buildings and residential uses to act as a noise buffer.

It is understood there are no specific development plans for these lands at this time but will likely include light industrial uses. If industrial developments are proposed for these lands, noise studies are required as part of the approvals process and at the time of Site Plan approval when the siting plans including building elevations and potential uses are available to determine the impact of its activities on the surrounding existing and future residential uses in accordance with MECP guidelines limits contained in NPC-300.

It is noted that the future Macauley Street will provide a minimum 20 m distance setback between the subject lands and the industrially zoned lands to the south, meeting the recommended D1 D6 distance setback for Class I industries. It is also expected that noise control mitigation recommendations outlined in Section 4.5 will likely provide sufficient noise control such as Class 4.

5.3.4 Summary of Predictable Worst-Case Hour Activities

The following information and assumptions were used in the analysis.

Commercial/Industrial Buildings

- Typical hours of operation for Jim's Auto and Krown is daytime only (07:00 to 19:00) and for the car wash, the facilities could be used during the day and night.
- Ivan Armstrong Trucking operates during daytime and nighttime hours.
- The RMC is expected to operate during daytime hours only. Contractor's yard is also daytime operations only.

Receptors

- 2-storey residences in proposed development.

An approximately 3 m high berm is already proposed on the proposed park land closest to the future RMC facility and is included in the assessment. Proposed grading for the development and existing grading in the surrounding areas was included in the modeling per the Grading Plan prepared by SCS Consulting dated February 2025.

The following table summarizes the "predictable worst-case hours" of operation at the surrounding commercial/industrial facilities for the purpose of this assessment.

Table 7: Summary of Predictable Worst-Case Hours of Operation for Surrounding Commercial/Industrial Facilities

Source Description	Operation/No. per Hour		
	Daytime	Evening	Nighttime
Jim's Auto Bay Doors	30 min/hr	N/A	N/A
Krown Rust Control Bay Doors	40 min/hr	N/A	N/A
Car Wash Bays	30 min/hr	30 min/hr	10 min/hr
Vacuums at Car Wash	15 min/hr	15 min/hr	10 min/hr
Ivan Armstrong trucks (Total)	12 trucks/hr	12 trucks/hr	12 trucks/hr
Contractors Yard trucks (Total)	4 trucks/hr	N/A	N/A
RMC Facility Trucks (Total)	12 trucks/hr	N/A	N/A
Loading Ready-Mix Trucks	30 min/hr	N/A	N/A
Slumping Ready-Mix Trucks	30 min/hr	N/A	N/A
Unloading Aggregate Trucks	5 min/hr	N/A	N/A
Front End Loader	30 min/hr	N/A	N/A
Aggregate/Cement Scale Vibrators	30 sec/hr	N/A	N/A
Load Point Horn	2 min/hr	N/A	N/A
Silo Baghouse Outlet	60 min/hr	N/A	N/A
Air Compressor	30 min/hr	N/A	N/A
Dust Collector	30 min/hr	N/A	N/A
Crusher	60 min/hr	N/A	N/A

5.4 Results

The above outlined sound level and site features were used as input to a predictive computer model. The sound levels for the RMC facility were further adjusted such that sound levels at 504 Tucker Street will be within the applicable Class 2 criteria in accordance with MECP NPC-300 which is required as part of their application for an Environmental Compliance Approval.

The software used for this purpose (Cadna-A Version 2024 MR 1 (build: 205.5427)) is a computer implementation of ISO Standard 9613-2.2 "Acoustics - Attenuation of Sound During Propagation Outdoors." [5] The ISO method accounts for reduction in sound level with distance due to geometrical spreading, air absorption, ground attenuation and acoustical shielding by intervening structures such as barriers.

The calculations consider the acoustical effects of distance and shielding by the buildings. Sound emission data/assumptions are contained above, and sound emission data for typical open doors at Jim's Auto, Krown Rust Control, Ivan Armstrong trucking facility and the car wash were taken from HGC files for similar projects. The sound level results are summarized in the following table and unmitigated daytime noise contours are shown in Figures 5 to 7.

Table 8: Predicted Steady Source Sound Levels at the Proposed Development [dBA]

Receptor	Sound Levels		Criteria		Meet Criteria (Y/N)
	Façade (Day/Eve/ Night)	OLA (Day/Eve)	Façade (Day/Eve/ Night)	OLA (Day/Eve)	
R1	51 / 51 /51	52 / 52	50 / 50 / 45	50 / 45	N
R2	45 / 45 / 45	45 / 45	50 / 50 / 45	50 / 45	Y
R3	41 / 41 / 39	40 / 40	50 / 50 / 45	50 / 45	Y
R4	43 / 43 / 43	45 / 45	50 / 50 / 45	50 / 45	Y
R5	60 /<40 / <40	--	50 / 50 / 45	50 / 45	N
R6	60 /<40 / <40	42 / 42	50 / 50 / 45	50 / 45	N
R7	60 /<40 / <40	--	50 / 50 / 45	50 / 45	N
R8	57 /<40 / <40	--	50 / 50 / 45	50 / 45	N
R9	53 / <40 / <40	<40	50 / 50 / 45	50 / 45	N
R10	55 / <40 / <40	49	50 / 50 / 45	50 / 45	N
R11	46 / <40/ <40	45	50 / 50 / 45	50 / 45	Y
R12	57 / <40 /<40	--	50 / 50 / 45	50 / 45	N
R13	60 / <40 / <40	<45	50 / 50 / 45	50 / 45	N
R14	58 / <40 /<40	50	50 / 50 / 45	50 / 45	N
R15	61 / <40 / <40	59	50 / 50 / 45	50 / 45	N
R16	52 / <40 /<40	<45	50 / 50 / 45	50 / 45	N
R17	48 / <40 / <40	<45	50 / 50 / 45	50 / 45	Y
R18	51 / <40 / <40	49	50 / 50 / 45	50 / 45	N

The predicted impulsive source sound level results for the receptors near Ivan Armstrong Limited are summarized in Table 9 and shown on Figure 8.

Table 9: Predicted Impulsive Source Sound Levels at the Proposed Development [dBAI]

Receptor	Sound Levels		Criteria		Meet Criteria (Y/N)
	Façade (Day/Eve/ Night)	OLA (Day/Eve)	Façade (Day/Eve/ Night)	OLA (Day/Eve)	
R1	55 / 55 / 55	56	50 / 50 / 45	50 / 45	N
R2	50 / 50 / 50	50	50 / 50 / 45	50 / 45	N
R3	45 / 45 / 45	44	50 / 50 / 45	50 / 45	Y
R4	47 / 47 / 47	49	50 / 50 / 45	50 / 45	N

These results indicate that sound levels under a worst-case operational scenario, noise from the surrounding facilities may exceed the criteria at the closest residential receptors due to activities at the RMC, contractor's yard and trucking facility to the northeast of the site. Recommendations are provided in the following section.

5.5 Recommendations

In order to reduce sound levels to within the applicable Class 2 criteria for the entire site, primarily from noise from the proposed concrete batch plant and contractor's yard, significant mitigation would be required at the development site.

The MECP does not accept mechanical ventilation as a mitigation measure for stationary noise sources since the criteria apply outside the residential windows. On-site mitigation is thereby generally implemented through the provision of property line noise barriers, and in this case such barriers would be ineffective at upstairs windows due to the height of the receptors, height of the sources and the frontage onto the roadways.

Two options are presented. The recommended Option 1 requests a Class 4 designation from the municipality for the subject lands. Higher sound level criteria apply for lands designated as Class 4. If Class 4 is not granted, Option 2 provides mitigation measures to meet Class 2 limits.

5.5.1 Option 1 Mitigation – Class 4

Request the Town to designate the subject lands as a Class 4 area. This designation provides relaxed (higher) daytime and nighttime sound level limits from that otherwise permitted in an urban area, for both indoor and outdoor areas. A Class 4 Area permits receptor-based noise control measures (noise walls, specific construction techniques and materials, etc.) to be used within a proposed new sensitive land use within the vicinity of industrial uses. Class 4 Areas require formal recognition of the classification by the land use planning authority.

A Class 4 designation for the proposed site is recommended since the mitigation measures required to achieve Class 1 criteria would generally be considered onerous for a stacked townhouse units. Class 4 would allow 60 dBA during the day and 55 dBA at night at the facades and 55 dBA in rear yards.

A Class 4 area is defined in NPC-300 as:

- is an area intended for development with new noise sensitive land use(s) that are not yet built;
- is in proximity to existing, lawfully established stationary source(s); and
- has formal confirmation from the land use planning authority with the Class 4 area classification which is determined during the land use planning process.

This designation provides relaxed (higher) daytime and nighttime sound level limits from that otherwise permitted in an urban area, for both indoor and outdoor areas. The sound level limits for a Class 4 area is 60 dBA during the day in an OLA and at the façade, and 55 dBA during the night at the façade. A Class 4 Area permits receptor-based noise control measures (noise walls, specific construction techniques and materials, etc) to be used within a proposed new sensitive land use within the vicinity of an industrial use. Class 4 Areas require formal recognition of the classification by the land use planning authority.

With a Class 4 designation, the following mitigation is required:

1. The buildings are required to include air conditioning.

2. An additional clause is required to be included in the property and tenancy agreements and offers of purchase and sale for all dwelling units with a Class 4 designation.

   Type F:
   Purchasers/tenants are advised that sound levels due to the adjacent facility are required to comply with sound level limits that are protective of indoor areas and are based on the assumption that windows and exterior doors are closed. This dwelling unit has been supplied with a ventilation/air conditioning system which will allow windows and exterior doors to remain closed.

3. Additionally, upgraded building and glazing constructions are recommended for all dwellings with a Class 4 designation, for example windows with a minimum rating of STC-33, for all windows into sensitive spaces to further protect the interior spaces with exposure to the industrial uses to the south and northeast with a Class 4 designation.

All of the predicted sound levels would be within the Class 4 sound level limits at most of the building facades if it is granted. A 2.5 m high noise barrier will be required at the northeast corner adjacent to Ivan Armstrong Trucking facility to protect the dwellings to closest to the truck yard as shown on Figure 9.

5.5.2 Option 2 Mitigation

If a Class 4 designation is not granted by the municipality, the preliminary mitigation measures to meet Class 2 criteria are described here for Option 2, and are as follows.

4. A 4.5m to 6.0m high noise barrier at the northeast boundary, adjacent to Ivan Armstrong Trucking as shown on Figure 10.

5. A 2.5 m high noise wall on top of the proposed parkland berm, near the future RMC facility.

6. A 5.5 m high noise barrier along the park lands, east of Eliza Street.

7. For dwelling facades with remaining sound level excesses, they could be designed such that there are no windows to noise sensitive spaces. Facades requiring mitigation are indicated on Figure 10. Note that dwelling locations will affect the number of facades with excesses and design consideration can be incorporated to reduce the number of impacted facades. Further input can be provided as design progresses.

These measures to meet Class 2 limits are generally considered to be relatively onerous in the context of residential townhouse and single detached construction.

6 IMPACT OF DEVELOPMENT ON ITSELF & ENVIRONMENT

As part of the development, a sanitary pumping station and a well pumphouse are proposed, noted as Blocks 67 and 70. There are two existing residences near Block 70.

Preliminary design for these blocks by DLW Engineering Services were reviewed. It is understood that there will be emergency backup generators located at both blocks. The testing of the emergency generators are subjected to the requirements of NPC-300 and the criteria are 5 dBA above the applicable limits. The limits do not apply during emergency use. Typically, a noise enclosure for the generator will provide adequate noise attenuation. When detailed design of the pumping station and well pumphouse is available, the noise sources associated with these two blocks shall be reviewed and confirmed that there are no offsite noise impact at the proposed and existing residential uses.

7 RECOMMENDATIONS

The results of the study indicate that the proposed residential development is feasible on this site with respect to noise. We have the following recommendations.

Traffic Noise

1. A Forced air ventilation with ductwork sized for the future installation of central air conditioning by the occupant is required for the dwelling units adjacent to Eliza Street as shown on Figure 4.

2. Warning clauses should be included in the property and tenancy agreements and offers of purchase and sale to inform the future owners/residents of the road traffic noise impact.

Stationary Noise

3. Option 1: Mitigation Measures with a Class 4 designation is recommended.

    a. Class 4 designation for the subject lands.
    b. Air conditioning is required for all buildings.
    c. Brick exterior façade constructions and upgraded glazing is required for specific facades with direct exposure to the nearby industries.
    d. A 2.5 m high noise barrier at the northeast corner, adjacent to Ivan Armstrong Trucking facility, refer to Figure 9.
    e. A warning clause should be included in the property and tenancy agreements and offers of purchase and sale for the dwelling units to inform the future/occupants that the lot has been designated as Class 4.

4. Option 2: Mitigation Measures to achieve Class 1 Criteria if Class 4 designation is not granted.

    a. A 4.5m to 6.0m high noise barrier at the northeast boundary, adjacent to Ivan Armstrong Trucking shown on Figure 10.
    b. A 2.5 m high noise wall on top of the proposed parkland berm, near the future RMC facility.
    c. A 5.5 m high noise barrier along the park lands, east of Eliza Street.
    d. Design the buildings with no windows into sensitive spaces for facades with exposure to neighbouring facilities. Refer to Figure 10.

    e. Warning clauses should be included in the property and tenancy agreements and offers of purchase and sale to inform the future owners/residents of the presence of the nearby industrial uses.

    These measures to meet Class 2 limits are generally considered to be relatively onerous in the context of residential townhouse construction.

5. A detailed noise study shall be conducted when siting, floor plans and building elevations are available for the dwellings proposed to be designated Class 4, and/or requiring mitigation, the drawings should be reviewed to refine acoustic mitigation requirements.

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

8 REFERENCES

1. *Ontario Ministry of the Environment Publication Guideline D1, Land Use Compatibility, July 1995*

2. *Ontario Ministry of the Environment Publication Guideline D6, Compatibility Between Industrial Facilities and Sensitive Land Uses, July 1995*

3. Ontario Ministry of the Environment Publication NPC-300, Environmental Noise Guideline – Stationary and Transportation Sources – Approval and Planning, August 2013.

4. *Town of Wellington North, Arthur, Zoning By-law 66-01, Consolidated November 2018*

5. International Organization for Standardization, Acoustics – Attenuation of Sound during Propagation Outdoors – Part 2: General Method of Calculation, ISO-9613-2, Switzerland, 1996.

6. Google Maps and Aerial Imagery, Internet application: maps.google.com

Figure 1: Key Plan

LEGEND

- 36' AND 40' SINGLES
- 20' FREEHOLD TH
- 25' SEMIS
- PARK
- STORMWATER MANAGEMENT POND
- NHS
- ROADS
- MEANDER BELT LIMIT
- EROSION ACCESS ALLOWANCE
- EROSION HAZARD ALLOWANCE

Schedule of Land Use

Description	Lot / Block No.	Residential Units	Area (ha)
Single Detached Residential	5, 21-24, 26, 27, 32-61	454-504	19.96
Semi-Detached	7, 15-20, 25, 31	112-113	3.21
Street Townhouse	1-4, 6, 8-14, 28-30	249	6.05
Net Developable Total		**815-866**	**29.22**
Park	62-64		3.62
Stormwater Management Pond	65, 66		4.38
Well	67		0.27
Natural Heritage Systems	68, 69		5.90
Sanitary Pumping Station	70		0.05
Servicing Block	71		0.02
Right of Way	STREET A-R		11.88
Total Site Area			**55.34**

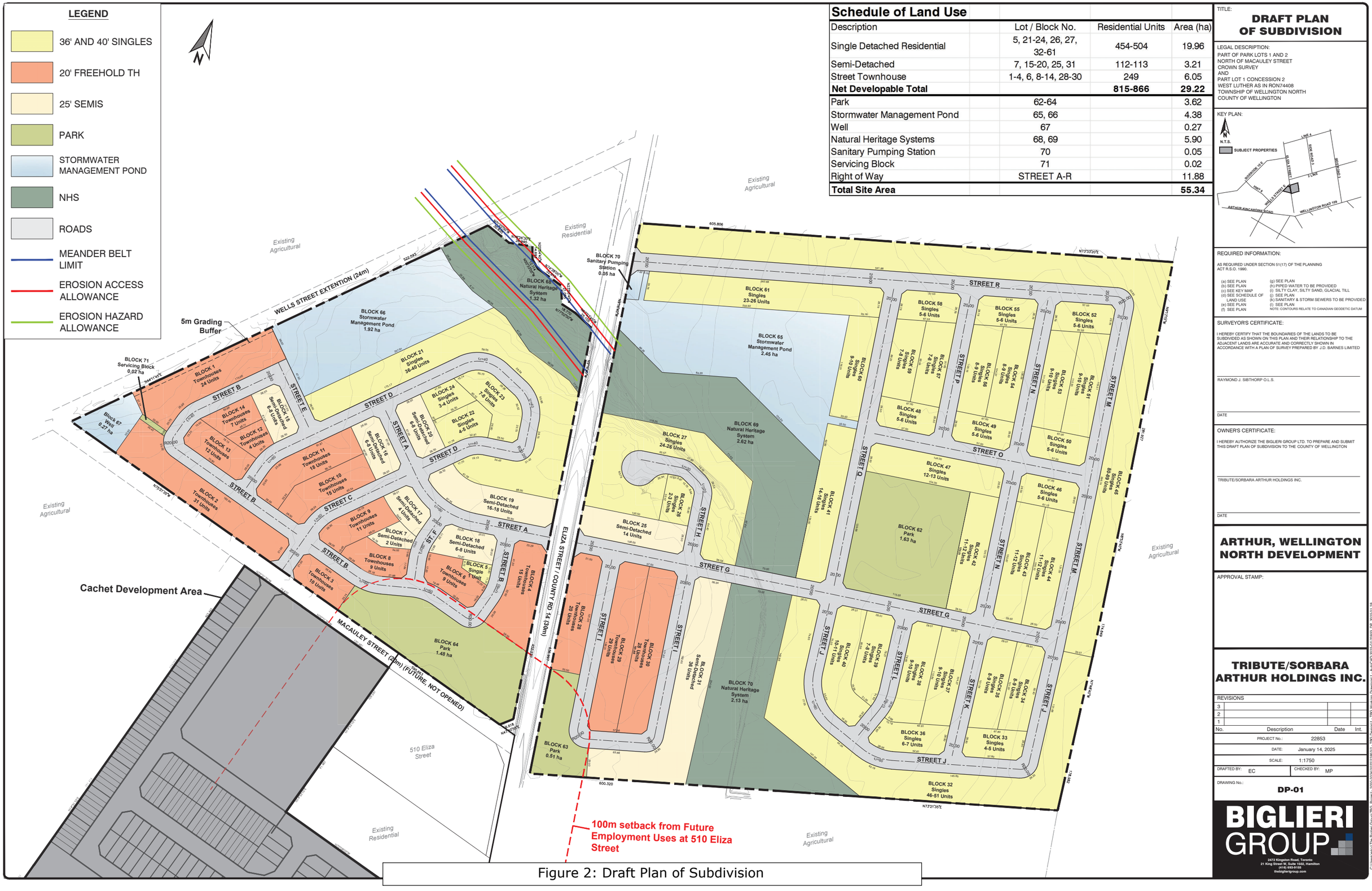

Figure 2: Draft Plan of Subdivision

TITLE:

DRAFT PLAN OF SUBDIVISION

LEGAL DESCRIPTION:
PART OF PARK LOTS 1 AND 2
NORTH OF MACAULEY STREET
CROWN SURVEY
AND
PART LOT 1 CONCESSION 2
WEST LUTHER AS IN RON74408
TOWNSHIP OF WELLINGTON NORTH
COUNTY OF WELLINGTON

KEY PLAN:

REQUIRED INFORMATION:

AS REQUIRED UNDER SECTION 51(17) OF THE PLANNING ACT R.S.O. 1990.

(a) SEE PLAN
(b) SEE PLAN
(c) SEE KEY MAP
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(h) PIPED WATER TO BE PROVIDED
(i) SILTY CLAY, SILTY SAND, GLACIAL TILL
(j) SEE PLAN
(k) SANITARY & STORM SEWERS TO BE PROVIDED
(l) SEE PLAN
NOTE: CONTOURS RELATE TO CANADIAN GEODETIC DATUM

SURVEYOR'S CERTIFICATE:

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED AS SHOWN ON THIS PLAN AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATE AND CORRECTLY SHOWN IN ACCORDANCE WITH A PLAN OF SURVEY PREPARED BY J.D. BARNES LIMITED

RAYMOND J. SIBTHORP O.L.S.

DATE

OWNER'S CERTIFICATE:

I HEREBY AUTHORIZE THE BIGLIERI GROUP LTD. TO PREPARE AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION TO THE COUNTY OF WELLINGTON

TRIBUTE/SORBARA ARTHUR HOLDINGS INC.

DATE

ARTHUR, WELLINGTON NORTH DEVELOPMENT

APPROVAL STAMP:

TRIBUTE/SORBARA ARTHUR HOLDINGS INC.

REVISIONS			
3			
2			
1			
No.	Description	Date	Int.

PROJECT No.: 22853
DATE: January 14, 2025
SCALE: 1:1750
DRAFTED BY: EC
CHECKED BY: MP
DRAWING No.: **DP-01**

BIGLIERI GROUP
2472 Kingston Road, Toronto
21 King Street W, Suite 1502, Hamilton
(416) 693-9155
thebiglierigroup.com

Township of Wellington North
Schedule A
Map 2
Arthur Detail

Zone Definitions

	AGRICULTURAL
R1A	UNSERVICED RESIDENTIAL
R1B	LOW DENSITY RESIDENTIAL
R1C	LOW DENSITY RESIDENTIAL
R2	MEDIUM DENSITY RESIDENTIAL
R3	HIGH DENSITY RESIDENTIAL
ER	ESTATE RESIDENTIAL
MH	MOBILE HOME PARK
C1	CENTRAL COMMERCIAL
C2	HIGHWAY COMMERCIAL
C3	NEIGHBOURHOOD COMMERCIAL
C4	SHOPPING CENTRE COMMERCIAL
C5	HAMLET COMMERCIAL
MU1	MIXED USE
MU2	MAIN STREET MIXED USE
AC	AGRICULTURAL COMMERCIAL
M1	INDUSTRIAL
RIN	RURAL INDUSTRIAL
EI	EXTRACTIVE INDUSTRIAL
IN	INSTITUTIONAL
OS	OPEN SPACE
FD	FUTURE DEVELOPMENT
NE	NATURAL ENVIRONMENT
(H)	HOLDING

Legend

- WELLHEAD PROTECTION AREA OVERLAY
- SITE SPECIFIC EXEMPTION

N

0 150 300 600

Metres

Consolidation Date: February 2022
Date printed: February 2022

Sources:
County of Wellington Planning and Development Department 2022
Ministry of Natural Resources

Document Path: F:\LIS\Projects\Zoning\Municipal Zoning By-law Schedules\Wellington North\ZBL SCHEDULE

Figure 3 - Zoning Map

LEGEND

- 36' AND 40' SINGLES
- 20' FREEHOLD TH
- 25' SEMIS
- PARK
- STORMWATER MANAGEMENT POND
- NHS
- ROADS
- MEANDER BELT LIMIT
- EROSION ACCESS ALLOWANCE
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Well	67		0.27
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Sanitary Pumping Station	70		0.05
Servicing Block	71		0.02
Right of Way	STREET A-R		11.88
Total Site Area			**55.34**

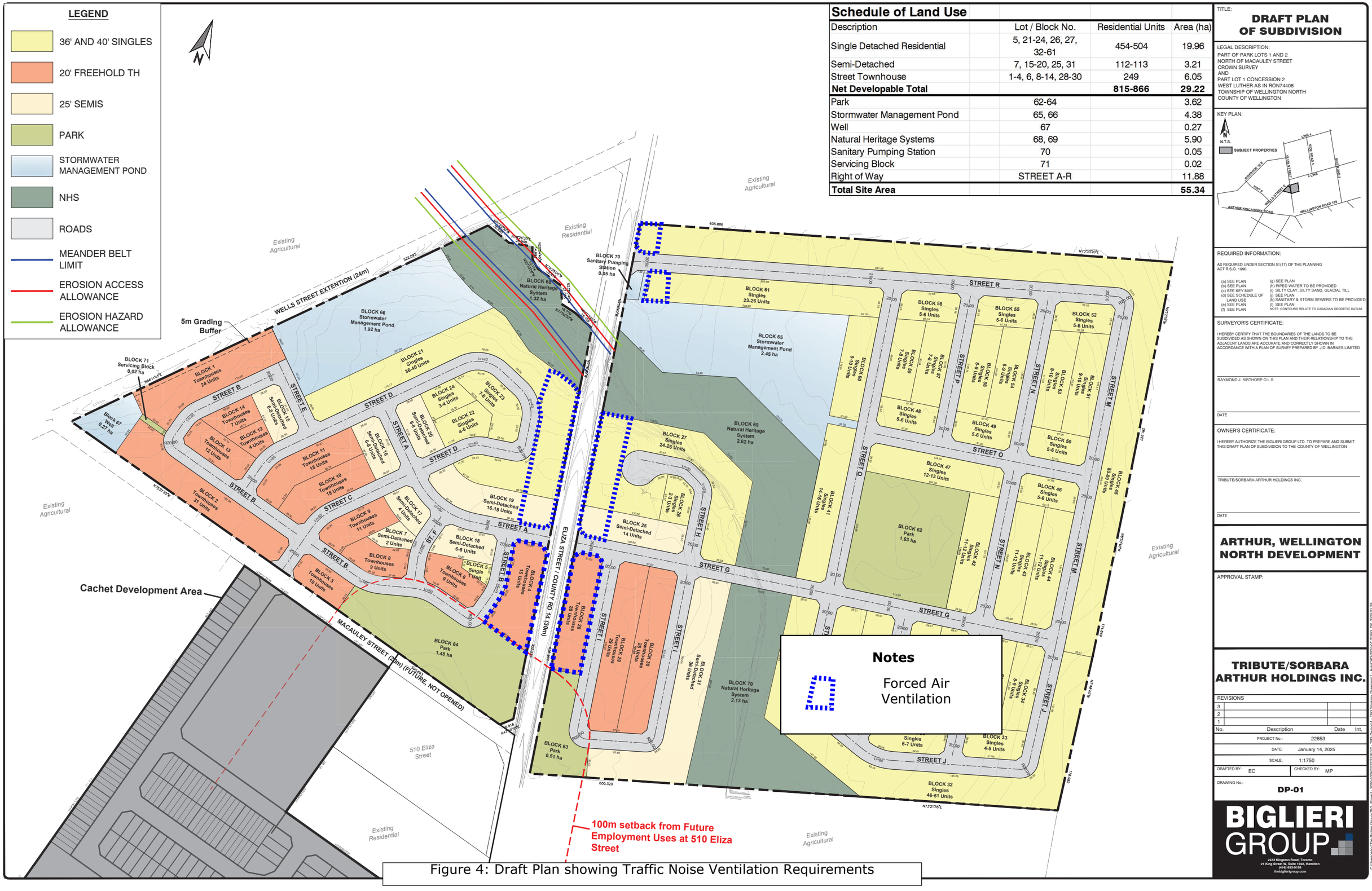

Figure 4: Draft Plan showing Traffic Noise Ventilation Requirements

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thebiglierigroup.com

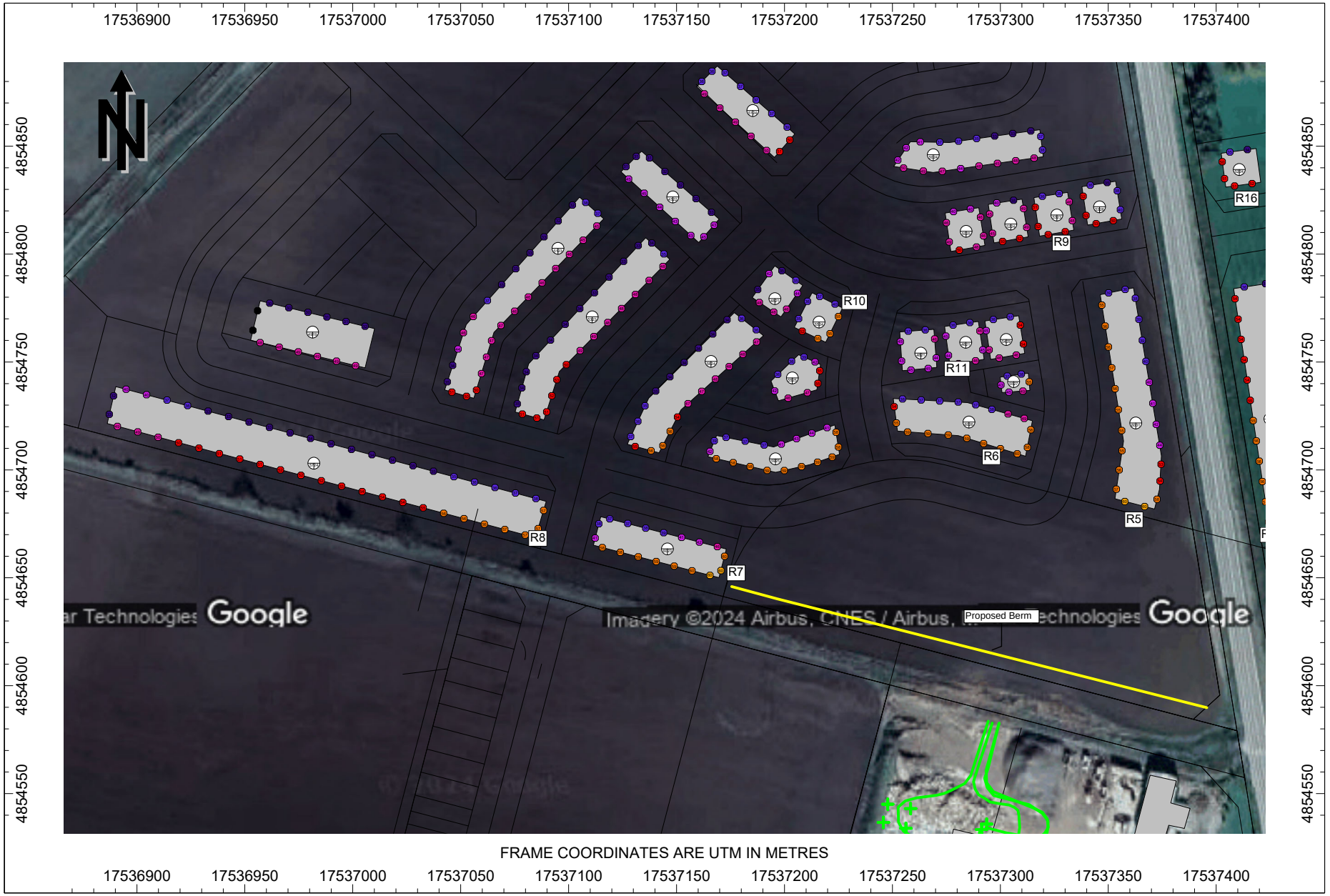

Figure 5: Predicted Daytime Non-Impulsive Sound Levels, West of Eliza, Leq [dBA]

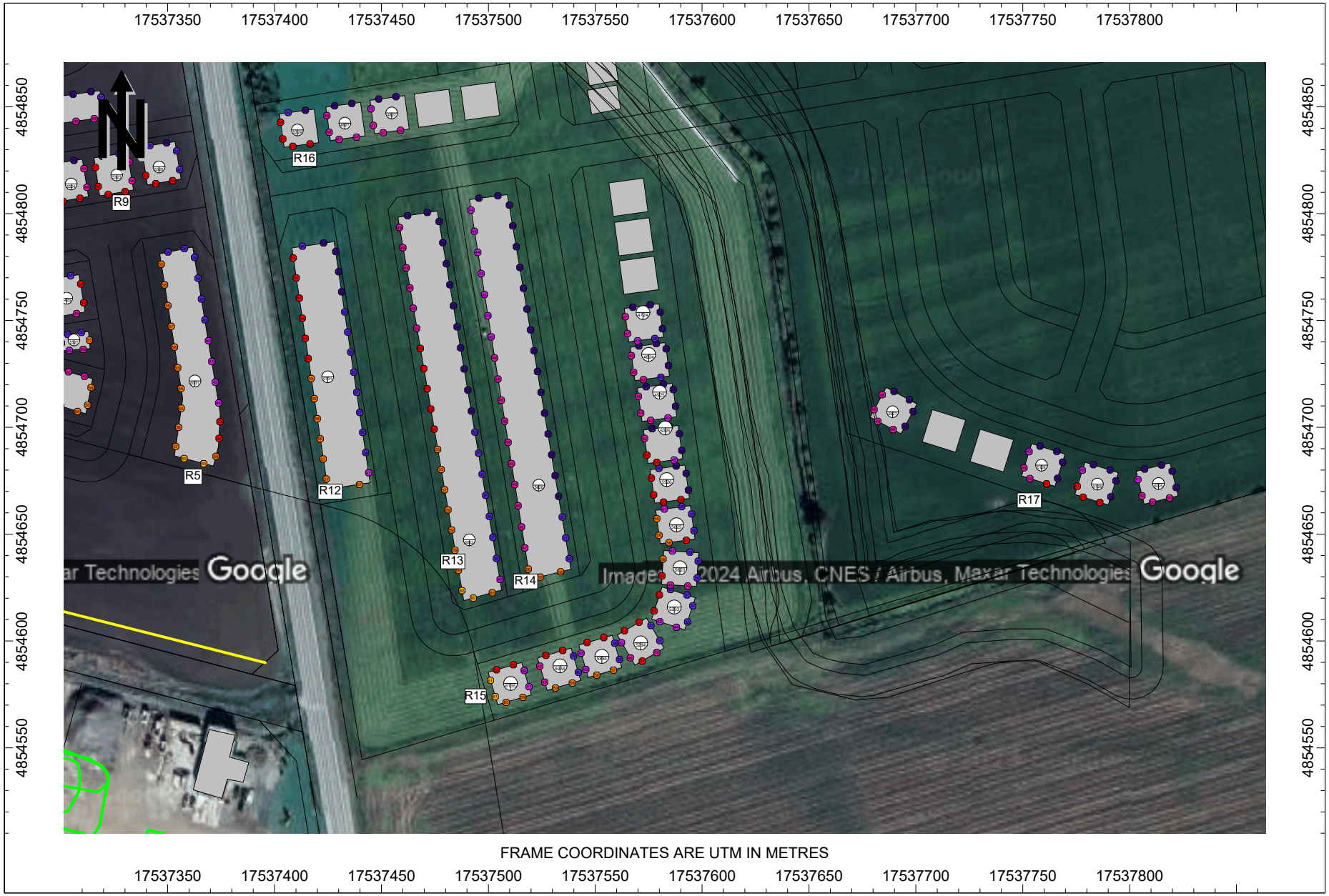

Figure 6: Predicted Daytime Non-Impulsive Sound Levels, East of Eliza, Leq [dBA]

Figure 7: Predicted Daytime Non-Impulsive Sound Levels, Near Ivan Armstrong Trucking, Leq [dBA]

Figure 8 Predicted Impulsive Sound Levels, Near Ivan Armstrong Trucking, LLM[dBAI]

Schedule of Land Use

Description	Lot / Block No.	Residential Units	Area (ha)
Single Detached Residential	5, 21-24, 26, 27, 32-61	454-504	19.96
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Total Site Area			**55.34**

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- ROADS
- MEANDER BELT LIMIT
- EROSION ACCESS ALLOWANCE
- EROSION HAZARD ALLOWANCE

min 2.5 m high Noise Barrier (Approx. 110 m in length)

WELLS STREET EXTENTION (24m)

5m Grading Buffer

BLOCK 71 Servicing Block 0.02 ha

Block 67 Well 0.27 ha

BLOCK 1 Townhouses 24 Units

BLOCK 2 Townhouses 31 Units

BLOCK 3 Townhouses 10 Units

BLOCK 4 Townhouses 16 Units

BLOCK 5 Single 1 Unit

BLOCK 6 Townhouses 9 Units

BLOCK 7 Semi-Detached 2 Units

BLOCK 8 Townhouses 9 Units

BLOCK 9 Townhouses 11 Units

BLOCK 10 Townhouses 15 Units

BLOCK 11 Townhouses 18 Units

BLOCK 12 Townhouses 4 Units

BLOCK 13 Townhouses 12 Units

BLOCK 14 Townhouses 7 Units

BLOCK 15 Semi-Detached 6-8 Units

BLOCK 16 Semi-Detached 6-8 Units

BLOCK 17 Semi-Detached 4 Units

BLOCK 18 Semi-Detached 6-8 Units

BLOCK 19 Semi-Detached 16-18 Units

BLOCK 20 Semi-Detached 6-8 Units

BLOCK 21 Singles 36-40 Units

BLOCK 22 Singles 4-5 Units

BLOCK 23 Singles 7-8 Units

BLOCK 24 Singles 3-4 Units

BLOCK 25 Semi-Detached 14 Units

BLOCK 26 Singles 2-3 Units

BLOCK 27 Singles 24-26 Units

BLOCK 28 Townhouses 20 Units

BLOCK 29 Townhouses 25 Units

BLOCK 30 Townhouses 36 Units

BLOCK 31 Semi-Detached 36 Units

BLOCK 36 Singles 6-7 Units

BLOCK 37 Singles 9-10 Units

BLOCK 38 Singles 7-8 Units

BLOCK 39 Singles 7-8 Units

BLOCK 40 Singles 10-11 Units

BLOCK 41 Singles 14-16 Units

BLOCK 42 Singles 11-12 Units

BLOCK 43 Singles 11-12 Units

BLOCK 44 Singles 11-12 Units

BLOCK 45 Singles 80-89 Units

BLOCK 46 Singles 5-6 Units

BLOCK 47 Singles 12-13 Units

BLOCK 48 Singles 5-6 Units

BLOCK 49 Singles 5-6 Units

BLOCK 50 Singles 5-6 Units

BLOCK 51 Singles 9-10 Units

BLOCK 52 Singles 5-6 Units

BLOCK 53 Singles 9-10 Units

BLOCK 54 Singles 8-9 Units

BLOCK 55 Singles 5-6 Units

BLOCK 56 Singles 6-9 Units

BLOCK 57 Singles 7-8 Units

BLOCK 58 Singles 5-6 Units

BLOCK 59 Singles 7-8 Units

BLOCK 60 Singles 8-10 Units

BLOCK 61 Singles 23-26 Units

BLOCK 62 Park 1.63 ha

BLOCK 63 Park 0.51 ha

BLOCK 64 Park 1.48 ha

BLOCK 65 Stormwater Management Pond 2.45 ha

BLOCK 66 Stormwater Management Pond 1.92 ha

BLOCK 67 Well 0.27 ha

BLOCK 68 Natural Heritage System 1.32 ha

BLOCK 69 Natural Heritage System 2.62 ha

BLOCK 70 Natural Heritage System 2.13 ha

BLOCK 70 Sanitary Pumping Station 0.05 ha

STREET A

STREET B

STREET C

STREET D

STREET E

STREET F

STREET G

STREET H

STREET I

STREET J

STREET L

STREET M

STREET N

STREET O

STREET P

STREET Q

STREET R

ELIZA STREET / COUNTY RD 14 (30m)

MACAULEY STREET (20m) (FUTURE, NOT OPENED)

Cachet Development Area

510 Eliza Street

100m setback from Future Employment Uses at 510 Eliza Street

Existing Agricultural

Existing Residential

Notes

Noise Barrier

Subject to refinement when further details are available and design progresses

Figure 9: Plan Showing Noise Barrier Requirements to meet Class 4 Limits

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AND
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WEST LUTHER AS IN RON74408
TOWNSHIP OF WELLINGTON NORTH
COUNTY OF WELLINGTON

KEY PLAN:

N.T.S.

SUBJECT PROPERTIES

LINE 4
SIDE ROAD 1
SIDE ROAD 2
2 LINE
ERIN/ROSE ST E
ELIZA STREET
HWY 6
WELLS STREET E
ARTHUR-KINCARDINE ROAD
WELLINGTON ROAD 109

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DATE

ARTHUR, WELLINGTON NORTH DEVELOPMENT

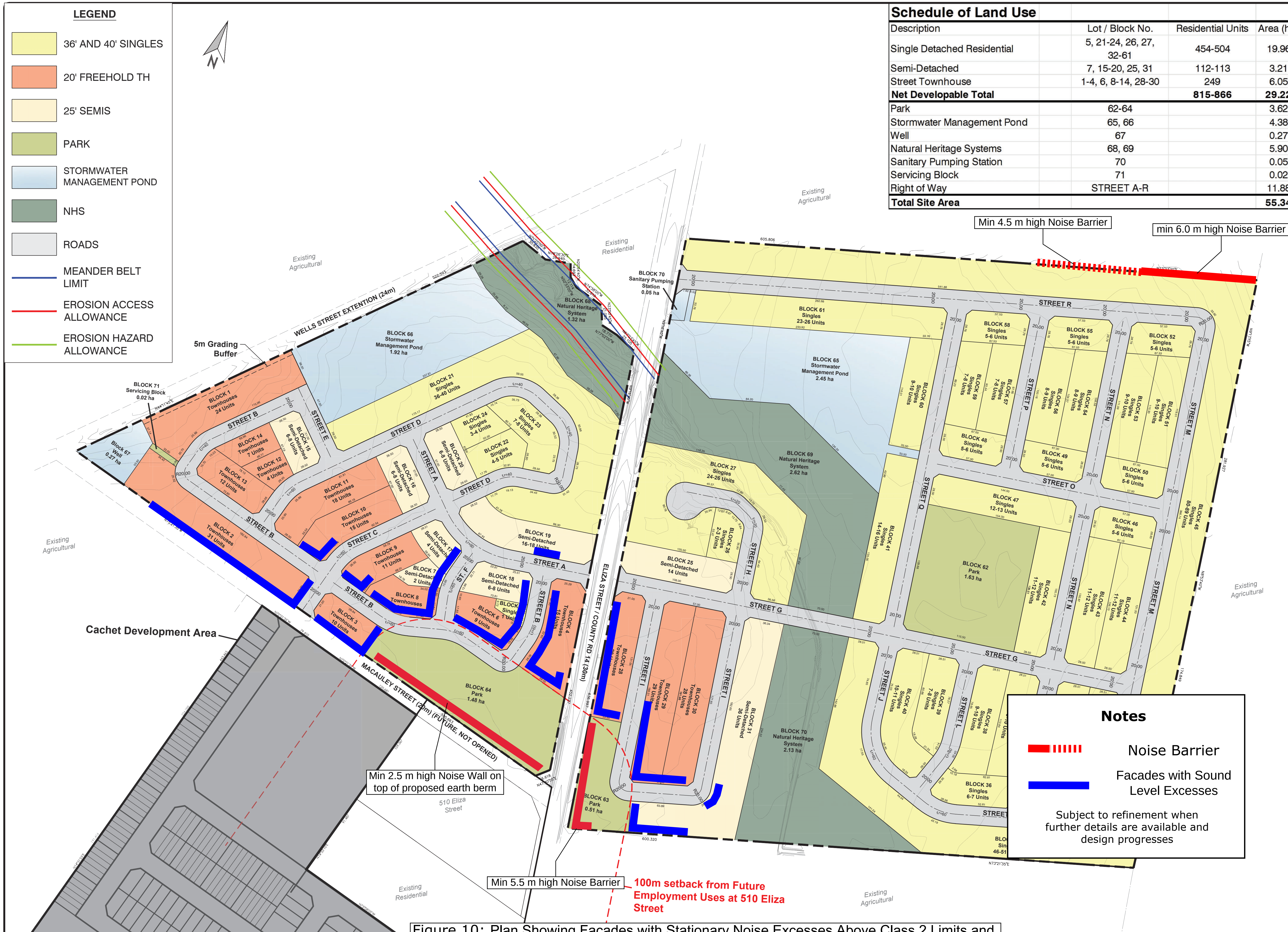
APPROVAL STAMP:

TRIBUTE/SORBARA ARTHUR HOLDINGS INC.

REVISIONS			
3			
2			
1			
No.	Description	Date	Int.

PROJECT No.: 22853
DATE: January 14, 2025
SCALE: 1:1750
DRAFTED BY: EC
CHECKED BY: MP
DRAWING No.: **DP-01**

BIGLIERI GROUP
2472 Kingston Road, Toronto
21 King Street W, Suite 1502, Hamilton
(416) 693-9155
thebiglierigroup.com



Schedule of Land Use

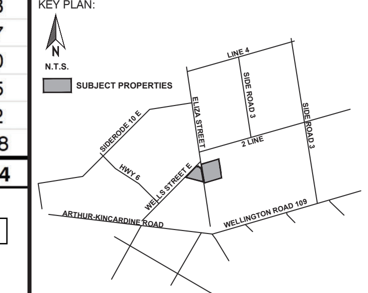
Description	Lot / Block No.	Residential Units	Area (ha)
Single Detached Residential	5, 21-24, 26, 27, 32-61	454-504	19.96
Semi-Detached	7, 15-20, 25, 31	112-113	3.21
Street Townhouse	1-4, 6, 8-14, 28-30	249	6.05
Net Developable Total		**815-866**	**29.22**
Park	62-64		3.62
Stormwater Management Pond	65, 66		4.38
Well	67		0.27
Natural Heritage Systems	68, 69		5.90
Sanitary Pumping Station	70		0.05
Servicing Block	71		0.02
Right of Way	STREET A-R		11.88
Total Site Area			**55.34**

TITLE:

DRAFT PLAN OF SUBDIVISION

LEGAL DESCRIPTION:
PART OF PARK LOTS 1 AND 2
NORTH OF MACAULEY STREET
CROWN SURVEY
AND
PART LOT 1 CONCESSION 2
WEST LUTHER AS IN RON74408
TOWNSHIP OF WELLINGTON NORTH
COUNTY OF WELLINGTON

KEY PLAN:



REQUIRED INFORMATION:

AS REQUIRED UNDER SECTION 51(17) OF THE PLANNING ACT R.S.O. 1990.

(a) SEE PLAN
(b) SEE PLAN
(c) SEE KEY MAP
(d) SEE SCHEDULE OF LAND USE
(e) SEE PLAN
(f) SEE PLAN
(g) SEE PLAN
(h) PIPED WATER TO BE PROVIDED
(i) SILTY CLAY, SILTY SAND, GLACIAL TILL
(j) SEE PLAN
(k) SANITARY & STORM SEWERS TO BE PROVIDED
(l) SEE PLAN

NOTE: CONTOURS RELATE TO CANADIAN GEODETIC DATUM

SURVEYOR'S CERTIFICATE:

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED AS SHOWN ON THIS PLAN AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATE AND CORRECTLY SHOWN IN ACCORDANCE WITH A PLAN OF SURVEY PREPARED BY J.D. BARNES LIMITED

RAYMOND J. SIBTHORP O.L.S.

DATE

OWNER'S CERTIFICATE:

I HEREBY AUTHORIZE THE BIGLIERI GROUP LTD. TO PREPARE AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION TO THE COUNTY OF WELLINGTON

TRIBUTE/SORBARA ARTHUR HOLDINGS INC.

DATE

ARTHUR, WELLINGTON NORTH DEVELOPMENT

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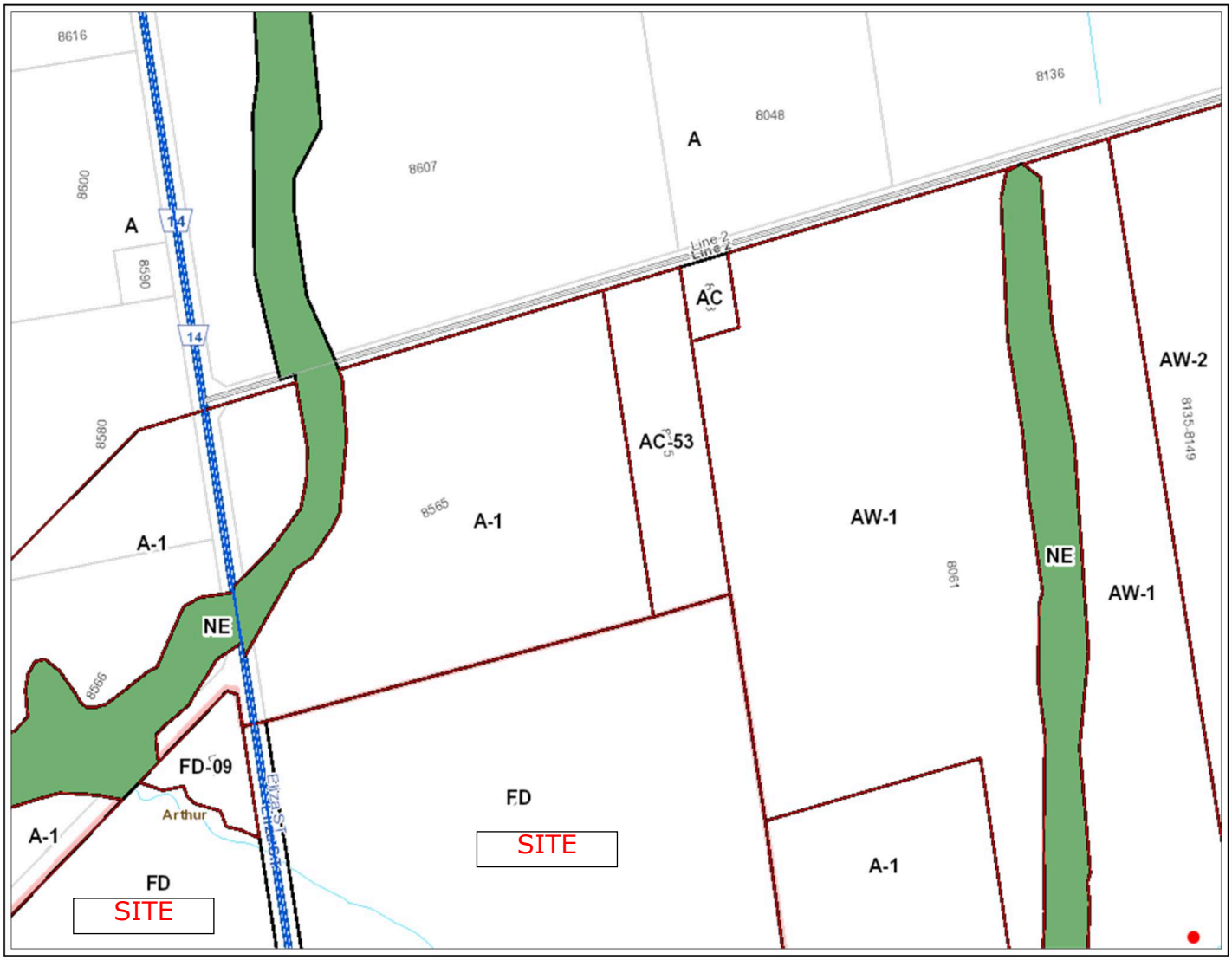
BIGLIERI GROUP
2472 Kingston Road, Toronto
21 King Street W, Suite 1502, Hamilton
(416) 693-9155
thebiglierigroup.com

C:\Users\ericc\The Biglieri Group\TBG_Project - 2020-2024\2022\22853\2 - TBG Design\1 - TBG Working Drawings\1 - AutoCAD\2025-01\22853_DP_2025.01.28

Figure 10: Plan Showing Facades with Stationary Noise Excesses Above Class 2 Limits and Noise Barrier Requirements

Appendix A
Zoning Information


8616
8600
A
14
8590
8607
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8048
8136
Line 2
AC
AW-2
8135-8149
14
8580
AC-53
8565
A-1
AW-1
A-1
NE
8061
NE
AW-1
8566
FD-09
Arthur
FD
SITE
A-1
A-1
FD
SITE

SECTION 23 – AC AGRICULTURAL COMMERCIAL ZONE

23.1 PERMITTED USES

- Agriculturally related Commercial or Industrial use
- Agricultural products Processing, Storing and Sales
- Companion Animal Office
- Commercial Greenhouse and/or Nursery
- Farm Implement Sales and Service
- Farm Supply Outlet
- Farm Produce Sales Outlet
- Fertilizer Processing Establishments
- Grain Drying Establishments
- Livestock Yards
- Veterinarian Clinic
- Accessory residential dwelling unit
- Accessory Uses, Buildings and Structures to the above permitted uses

23.2 REGULATIONS

23.2.1	**LOT AREA, Minimum**	0.4 ha (1 ac)
23.2.2	**LOT FRONTAGE, Minimum**	61.0 m (200.0 ft.)
23.2.3	**FRONT YARD, Minimum** 7.6 m (24.9 ft.) plus any applicable distance required by the applicable road authority as specified in Section 6.31 of this By-law	
23.2.4	**INTERIOR SIDE YARD, Minimum** 6.0m (19.7 ft.); 12 m (39.4 ft.) abutting any residential zone	
23.2.5	**EXTERIOR SIDE YARD, Minimum** 7.6 m (24.9 ft.) plus any applicable distance required by the applicable road authority as specified in Section 6.31 of this By-law.	
23.2.6	**REAR YARD, Minimum** 7.6 m (24.9 ft.) plus any applicable distance required by the applicable road authority as specified in Section 6.31 of this By-law.	
23.2.7	**LOT COVERAGE, Maximum**	30% for the main building
23.2.8	**SETBACK FROM RESIDENTIAL** No Agricultural Commercial use, including outdoor storage and display areas shall be located with 121.9 m (400.0 ft.) of a residence on an adjacent lot.	

23.3 ACCESSORY RESIDENTIAL USES

A single detached residential use in compliance with the following:

a) Subject to the yard setbacks of Section 9.2 of this By-law

b) Building Height, Maximum 10.5 m (34.5 ft.)

c) Floor Area, Minimum 102.2 m^2 (1,100.0 ft^2)

23.4 MINIMUM DISTANCE SEPARATION REQUIREMENTS

The minimum distance separation requirements – MDS 1 and MDS II – of Section 6.17 shall apply to the establishment of all permitted uses within the Agricultural Zone.

23.5 OTHER PROVISIONS

Accessory uses, off-street parking, off-street loading, buffer areas, garbage storage areas, outdoor display areas and outdoor storage areas shall be provided in accordance with the applicable regulations of Section 6 – General Provisions

SECTION 24 – M1 INDUSTRIAL ZONE

24.1 PERMITTED USES

- Manufacturing, processing, assembly, repair, fabricating, milling except for a motor vehicle recycling and salvage or wrecking facility, junk or scrap yard, fertilizer manufacturer, abattoir, rendering plant or any use considered offensive by the Public Health Act or uses restricted in all zones as per section 6.35.
- Automotive Body Repair Shop
- Bakeries
- Builder or Contractor's Yard
- Building Supply Outlet
- Bulk Fuel Depot
- Business or Professional Office
- Custom Workshop
- Dry Cleaning Plant
- Farm Machinery Sales and Service
- Feed Mill, Seed plant, Grain Elevator
- Heavy Equipment Sales and Rental
- Industrial Mall
- Mini-Storage Facility
- Parking Area
- Parking Lot
- Rental Outlet
- Research and Laboratory Facilities
- Service Industry
- Service or Repair Shop
- Printing Establishment
- Public Works Yard
- Sewage Treatment Facility
- Transport Establishment
- Warehouse
- Water Treatment Facility
- Wholesale Outlet
- Accessory Uses, Buildings and Structures including cafeteria factory outlet, storage yards, Showrooms and places of recreation

24.2 REGULATIONS

24.2.1	**LOT AREA, Minimum**	929.0 m² (10,000 ft²)
24.2.2	**LOT FRONTAGE, Minimum**	20.0 m (65.6 ft.)
24.2.3	**FRONT YARD, Minimum**	7.6 m (24.9 ft.)
24.2.4	**INTERIOR SIDE YARD, Minimum** 3.0 m (9.8 ft.); 9.2 m (30.2 ft.) where an M1 Zone abuts any residential zone.	
24.2.5	**EXTERIOR SIDE YARD, Minimum**	7.6 m (24.9 ft.)
24.2.6	**REAR YARD, Minimum** 7.6 m (24.9 ft.); 9.2 m (30.2 ft.) where an M1 Zone abuts any residential zone.	
24.2.7	**LOT COVERAGE, Maximum**	60%
24.2.8	**BUILDING HEIGHT, Maximum**	12.0m (39.4 ft.)

24.3 (Deleted by Housekeeping By-law 014-22)

24.4 PARKING SPACE REGULATION

In addition to the required number of parking spaces set out in Section 6.27, a maximum of three visitor parking spaces for passenger vehicles may be provided in the required front yard for the first 15.0 m (49.2 ft.) of front wall of the principal building plus one additional visitor parking space for each additional 7.6 m (24.9 ft.) of front wall in excess of the first 15.0 m (49.2 ft.).

24.5 ACCESSORY RETAIL

Accessory retailing of products shall be permitted subject to the following regulations:

a) A maximum of 25% of the gross floor area is used within:
   i) The main industrial building, or
   ii) Each individual unit in an industrial mall

b) The products to be sold must be produced on the site.

24.6 LANDSCAPING REQUIREMENTS

A landscaping area shall be provided and thereafter maintained in the entire required front yard except where front yard parking is established under the provisions of Section 24.4 in which case the remainder of the area shall be landscaped and a planting strip shall be provided across the entire lot frontage including exterior side yard except for provisions of ingress and egress.

24.7 OTHER PROVISIONS

Accessory uses, off street parking, off-street loading, buffer areas, garbage storage areas, outdoor display areas and outdoor storage areas shall be provided in accordance with the applicable regulations of Section 6 – General Provisions.

Appendix B
Assessment Modeling Infomation

The predictive model used for this Assessment (*Cadna-A version 2025 Build 209.5501*) is based on methods from ISO Standard 9613-2.2 "Acoustics - Attenuation of Sound During Propagation Outdoors", which accounts for reduction in sound level with distance due to geometrical spreading, air absorption, ground attenuation and acoustical shielding by intervening structures such as buildings. This modeling technique is acceptable to the MECP.

The subject site and surrounding area were modelled based on observations during the site visit. Foliage was not included in the modelling. Ground attenuation was assumed to be spectral for all sources, with a ground factor (G) of 0.25 in paved areas including the site, 0.5 for 510 Eliza Street and 0.9 for soft-ground areas. The temperature and relative humidity were assumed to be 10° C and 70%, respectively.

The predictive modelling considered one order of reflection, the sufficiency of which was verified through an iterative convergence analysis, using successively increasing orders of reflection.

All mechanical sources, with the exception of on-site truck/employee vehicle movements, were modeled as point sources of sound, shown as crosses in relevant Figures. On-site truck and employee vehicle movements were modeled as line sources (moving points source) that are shown as green lines in the relevant Figures.

Figure B1: Non-Impulsive Noise Source Locations

Appendix C
Sample Calculations

STAMSON 5.0 NORMAL REPORT Date: 03-03-2025 12:14:43
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: b.te Time Period: Day/Night 16/8 hours
Description: Predicted daytime and nighttime sound levels at the upper storey windows of Block 4, typical of first row of dwellings adjacent to Eliza Street.

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

Car traffic volume : 3184/354 veh/TimePeriod *
Medium truck volume : 142/16 veh/TimePeriod *
Heavy truck volume : 231/26 veh/TimePeriod *
Posted speed limit : 80 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): 3013
Percentage of Annual Growth : 2.50
Number of Years of Growth : 11.00
Medium Truck % of Total Volume : 4.00
Heavy Truck % of Total Volume : 6.50
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Eliza (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 : 22.00 / 22.00 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Eliza (day)

Source height = 1.60 m

ROAD (0.00 + 62.88 + 0.00) = 62.88 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	66.79	0.00	-2.61	-1.30	0.00	0.00	0.00	62.88

Segment Leq : 62.88 dBA

Total Leq All Segments: 62.88 dBA
Results segment # 1: Eliza (night)

Source height = 1.60 m

ROAD (0.00 + 56.39 + 0.00) = 56.39 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	60.30	0.00	-2.61	-1.30	0.00	0.00	0.00	56.39

Segment Leq : 56.39 dBA

Total Leq All Segments: 56.39 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 62.88
(NIGHT): 56.39

R1F	17537878	4855322	470.6																				
Src ID	X	Y	Z	LxD	LxE	LxN	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	CmetE	CmetN	RefID	RefIE	RefIN	LrD	LrE	LrN
AggregateTruck	17537366	4854529	466.9	89	--	--	70.8	0	0.0	-2.4	21.6	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
AggVibrator	17537288	4854529	488.4	80	--	--	70.9	0	0.0	-2.8	13.7	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
ArmstrongTrucking	17537860	4855497	469.9	93	--	93	53.4	0	0.0	-2.3	0.0	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38	--	38
BaghouseOulet	17537282	4854528	488.7	97	--	--	70.9	0	0.0	-2.1	13.3	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13	--	--
CementScaleVibration	17537282	4854522	472.3	96	--	--	70.9	0	0.0	-3.2	22.6	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	--	--
ClarkCrusher	17537352	4854496	466.9	114	--	--	70.8	0	0.0	-3.5	24.1	5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17	--	--
Horn	17537288	4854528	471.8	99	--	--	70.9	0	0.0	-3.2	22.9	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	--	--
IdlingRMT	17537290	4854526	466.3	94	--	--	70.9	0	0.0	-2.4	22.9	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
LoaderRMT	17537274	4854516	466.9	106	--	--	71.1	0	0.0	-2.8	21.1	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14	--	--
LoaderRMT	17537410	4854506	466.2	104	--	--	70.8	0	0.0	-3.0	20.7	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13	--	--
MovingAggregate	17537304	4854496	468.0	93	--	--	71.1	0	0.0	-3.7	23.9	5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
RMTTrucks	17537170	4854542	466.1	105	--	--	70.8	0	0.0	-2.2	21.9	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11	--	--
SlumpingRMT	17537250	4854536	466.3	106	--	--	71.0	0	0.0	-1.6	22.1	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11	--	--
SlumpingRMT	17537256	4854544	465.8	106	--	--	71.0	0	0.0	-1.6	22.1	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11	--	--
SlumpingRMTExhaust	17537246	4854537	465.9	96	--	--	71.1	0	0.0	-1.6	22.0	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1	--	--
SlumpingRMTExhaust	17537248	4854545	466.5	96	--	--	71.0	0	0.0	-1.6	22.0	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1	--	--
Tanker	17537288	4854536	470.4	95	--	--	70.8	0	0.0	-2.6	21.5	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3	--	--
TankerTruck	17537346	4854535	465.8	85	--	--	70.7	0	0.0	-2.7	22.6	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Vacuum	17537482	4854304	467.0	94	94	92	71.8	0	0.0	0.0	21.7	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Vacuum	17537482	4854302	467.0	94	94	92	71.8	0	0.0	-0.6	22.7	9.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Armstrong_TT Idle	17537890	4855402	469.5	89	89	89	49.3	0	0.0	-2.2	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	41	41	41
Armstrong_TT Idle	17537896	4855376	469.3	89	89	89	46.1	0	0.0	-2.2	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45	45	45
Armstrong_TT Idle	17537858	4855361	468.4	89	89	89	43.7	0	0.0	-2.2	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	47	47	47
Armstrong_TT Idle	17537832	4855416	468.5	89	89	89	51.2	0	0.0	-2.2	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	39	39	39
Armstrong_TT Idle	17537826	4855448	468.9	89	89	89	53.6	0	0.0	-2.2	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.7	0.7	0.7	37	37	37
Armstrong_TT Idle	17537858	4855391	468.6	89	89	89	48.0	0	0.0	-2.2	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43	43	43
DustCollector	17537288	4854535	469.9	95	--	--	70.9	0	0.0	-2.7	19.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6	--	--
Clark_Moving Haul Truck	17537378	4854503	465.7	98	--	--	70.6	0	0.0	-2.1	21.8	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	--	--
BayDoor	17537378	4854246	465.0	87	--	--	72.5	3	0.0	-3.2	23.5	6.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
BayDoor	17537378	4854241	464.6	87	--	--	72.5	3	0.0	-3.1	23.4	6.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Carwash Door	17537508	4854298	467.0	84	84	79	71.8	3	0.0	-2.3	24.1	9.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Carwash Door	17537526	4854302	467.0	84	84	79	71.7	3	0.0	-2.4	24.2	9.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Carwash Door	17537508	4854302	467.0	84	84	79	71.8	3	0.0	-2.4	24.1	9.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
KrownExitDoor	17537468	4854272	465.9	89	--	--	72.2	3	0.0	-2.4	23.6	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Krown Entrance	17537436	4854273	466.2	88	--	--	72.1	3	0.0	-2.2	23.4	7.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Krown Entrance	17537436	4854272	466.3	88	--	--	72.1	3	0.0	-2.5	23.5	7.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--

R2F	17537774	4855295	470.6																				
Src ID	X	Y	Z	LxD	LxE	LxN	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	CmetE	CmetN	RefID	RefIE	RefIN	LrD	LrE	LrN
AggregateTruck	17537366	4854529	466.9	89	--	--	70.1	0	0.0	-2.3	21.1	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
AggVibrator	17537288	4854529	488.4	80	--	--	70.1	0	0.0	-2.6	12.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
ArmstrongTrucking	17537836	4855568	470.2	93	--	93	57.1	0	0.0	-2.3	0.5	5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33	--	33
BaghouseOulet	17537282	4854528	488.7	97	--	--	70.2	0	0.0	-1.9	12.4	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15	--	--
CementScaleVibration	17537282	4854522	472.3	96	--	--	70.2	0	0.0	-3.1	20.8	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6	--	--
ClarkCrusher	17537352	4854496	466.9	114	--	--	70.1	0	0.0	-3.4	24.0	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18	--	--
Horn	17537288	4854528	471.8	99	--	--	70.2	0	0.0	-3.2	22.3	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6	--	--
IdlingRMT	17537290	4854526	466.3	94	--	--	70.1	0	0.0	-2.3	22.6	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	--	--
LoaderRMT	17537274	4854515	466.9	106	--	--	70.4	0	0.0	-2.8	20.5	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16	--	--
LoaderRMT	17537422	4854508	466.3	104	--	--	70.1	0	0.0	-2.9	19.9	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15	--	--
MovingAggregate	17537304	4854496	468.0	93	--	--	70.4	0	0.0	-3.6	23.6	4.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
RMTTrucks	17537188	4854533	466.1	105	--	--	70.0	0	0.0	-2.2	21.5	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12	--	--
SlumpingRMT	17537250	4854536	466.3	106	--	--	70.3	0	0.0	-1.6	21.5	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12	--	--
SlumpingRMT	17537256	4854544	465.8	106	--	--	70.2	0	0.0	-1.6	21.6	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12	--	--
SlumpingRMTExhaust	17537246	4854537	465.9	96	--	--	70.3	0	0.0	-1.6	21.5	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	--	--
SlumpingRMTExhaust	17537248	4854545	466.5	96	--	--	70.2	0	0.0	-1.6	21.5	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	--	--
Tanker	17537288	4854536	470.4	95	--	--	70.1	0	0.0	-2.5	20.9	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5	--	--
TankerTruck	17537346	4854535	465.8	85	--	--	69.9	0	0.0	-2.7	22.2	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Vacuum	17537482	4854304	467.0	94	94	92	71.3	0	0.0	-0.1	21.9	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Vacuum	17537482	4854302	467.0	94	94	92	71.3	0	0.0	-0.3	22.0	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Armstrong_TT Idle	17537890	4855402	469.5	89	89	89	55.1	0	0.0	-2.2	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35	35	35
Armstrong_TT Idle	17537896	4855376	469.3	89	89	89	54.4	0	0.0	-2.2	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36	36	36
Armstrong_TT Idle	17537858	4855361	468.4	89	89	89	51.6	0	0.0	-2.2	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	39	39	39
Armstrong_TT Idle	17537832	4855416	468.5	89	89	89	53.6	0	0.0	-2.2	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37	37	37
Armstrong_TT Idle	17537826	4855448	468.9	89	89	89	55.2	0	0.0	-2.2	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.9	0.9	0.9	36	36	36
Armstrong_TT Idle	17537858	4855391	468.6	89	89	89	53.1	0	0.0	-2.2	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37	37	37
DustCollector	17537288	4854535	469.9	95	--	--	70.1	0	0.0	-2.6	18.8	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8	--	--
Clark_Moving Haul Truck	17537366	4854505	465.7	98	--	--	69.9	0	0.0	-2.1	21.4	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6	--	--
BayDoor	17537378	4854246	465.0	87	--	--	72.0	3	0.0	-3.0	23.2	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
BayDoor	17537378	4854241	464.6	87	--	--	72.0	3	0.0	-2.9	23.1	6.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Carwash Door	17537508	4854298	467.0	84	84	79	71.3	3	0.0	-2.3	24.1	9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Carwash Door	17537526	4854302	467.0	84	84	79	71.3	3	0.0	-2.3	24.1	9.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Carwash Door	17537508	4854302	467.0	84	84	79	71.3	3	0.0	-2.3	24.1	9.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
KrownExitDoor	17537468	4854272	465.9	89	--	--	71.7	3	0.0	-2.3	23.1	4.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Krown Entrance	17537436	4854273	466.2	88	--	--	71.6	3	0.0	-2.1	23.2	7.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Krown Entrance	17537436	4854272	466.3	88	--	--	71.6	3	0.0	-2.4	23.4	7.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--

R5	17537354	4854686	469.3																				
Src ID	X	Y	Z	LxD	LxE	LxN	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	CmetE	CmetN	RefID	RefIE	RefIN	LrD	LrE	LrN
AggregateTruck	17537376	4854530	467.0	89	--	--	55.2	0	0.0	-0.7	4.2	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30	--	--
AggVibrator	17537288	4854529	488.4	80	--	--	55.6	0	0.0	-1.4	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25	--	--
ArmstrongTrucking	17537908	4855566	470.2	93	--	93	70.9	0	0.0	-3.9	24.7	7.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
BaghouseOulet	17537282	4854528	488.7	97	--	--	55.8	0	0.0	-0.8	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	41	--	--
CementScaleVibration	17537282	4854522	472.3	96	--	--	55.9	0	0.0	-1.2	0.2	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38	--	--
ClarkCrusher	17537352	4854496	466.9	114	--	--	56.7	0	0.0	-1.4	4.8	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52	--	--
Horn	17537288	4854528	471.8	99	--	--	55.7	0	0.0	-1.2	0.2	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43	--	--
IdlingRMT	17537290	4854526	466.3	94	--	--	55.7	0	0.0	-0.7	4.5	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34	--	--
LoaderRMT	17537274	4854518	466.9	106	--	--	56.9	0	0.0	-0.4	5.9	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42	--	--
LoaderRMT	17537368	4854495	466.2	104	--	--	57.0	0	0.0	-0.5	4.2	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	41	--	--
MovingAggregate	17537304	4854496	468.0	93	--	--	57.0	0	0.0	-1.2	4.2	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29	--	--
RMTTrucks	17537186	4854533	466.1	105	--	--	54.8	0	0.0	-0.7	4.8	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45	--	--
SlumpingRMT	17537250	4854536	466.3	106	--	--	56.2	0	0.0	-0.4	4.2	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45	--	--
SlumpingRMT	17537256	4854544	465.8	106	--	--	55.7	0	0.0	-0.4	4.3	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45	--	--
SlumpingRMTExhaust	17537246	4854537	465.9	96	--	--	56.3	0	0.0	-0.5	4.2	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34	--	--
SlumpingRMTExhaust	17537248	4854545	466.5	96	--	--	56.0	0	0.0	-0.4	4.2	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35	--	--
Tanker	17537288	4854536	470.4	95	--	--	55.2	0	0.0	-1.1	0.9	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	39	--	--
TankerTruck	17537360	4854537	465.9	85	--	--	54.3	0	0.0	-1.1	4.8	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26	--	--
Vacuum	17537482	4854304	467.0	94	94	92	63.1	0	0.0	-1.0	4.2	5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22	22	20
Vacuum	17537482	4854302	467.0	94	94	92	63.2	0	0.0	-1.1	4.2	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22	22	20
Armstrong_TT Idle	17537890	4855402	469.5	89	89	89	70.0	0	0.0	-3.7	24.1	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Armstrong_TT Idle	17537896	4855376	469.3	89	89	89	69.9	0	0.0	-3.7	24.1	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Armstrong_TT Idle	17537858	4855361	468.4	89	89	89	69.5	0	0.0	-3.7	24.2	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Armstrong_TT Idle	17537832	4855416	468.5	89	89	89	69.8	0	0.0	-3.7	24.1	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Armstrong_TT Idle	17537826	4855448	468.9	89	89	89	70.1	0	0.0	-3.7	24.0	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Armstrong_TT Idle	17537858	4855391	468.6	89	89	89	69.7	0	0.0	-3.7	24.1	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
DustCollector	17537288	4854535	469.9	95	--	--	55.4	0	0.0	-0.8	2.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37	--	--
Clark_Moving Haul Truck	17537390	4854501	465.7	98	--	--	56.5	0	0.0	-0.4	4.5	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36	--	--
BayDoor	17537378	4854246	465.0	87	--	--	63.8	3	0.0	-1.8	4.8	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18	--	--
BayDoor	17537378	4854241	464.6	87	--	--	63.9	3	0.0	-1.9	4.8	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18	--	--
Carwash Door	17537508	4854298	467.0	84	84	79	63.4	3	0.0	-1.1	19.4	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	2	--
Carwash Door	17537526	4854302	467.0	84	84	79	63.4	3	0.0	-1.0	21.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Carwash Door	17537508	4854302	467.0	84	84	79	63.4	3	0.0	-1.1	20.5	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1	1	--
KrownExitDoor	17537416	4854272	465.9	89	--	--	63.5	3	0.0	-1.1	4.5	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23	--	--
Krown Entrance	17537436	4854273	466.2	88	--	--	63.5	3	0.0	-1.0	4.6	5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18	--	--

Where: Lr = Lx - Adiv + K0 + Dc - Agnd - Abar - Aatm - Afol - Ahous + Cmet + Refl

Krown Entrance	17537436	4854272	466.3	88	--	--	63.6	3	0.0	-1.2	4.6	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18	--	--

R6	17537310	4854706	469.3																				
Src ID	X	Y	Z	LxD	LxE	LxN	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	CmetE	CmetN	ReflD	ReflE	ReflN	LrD	LrE	LrN
AggregateTruck	17537376	4854529	467.1	89	--	--	55.7	0	0.0	-0.7	4.6	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29	--	--
AggVibrator	17537288	4854529	488.4	80	--	--	56.0	0	0.0	-1.4	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	--	--
ArmstrongTrucking	17537896	4855556	470.1	93	--	93	71.0	0	0.0	-3.9	24.5	7.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
BaghouseOulet	17537282	4854528	488.7	97	--	--	56.1	0	0.0	-0.8	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	41	--	--
CementScaleVibration	17537282	4854522	472.3	96	--	--	56.3	0	0.0	-1.2	0.4	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38	--	--
ClarkCrusher	17537352	4854496	466.9	114	--	--	57.7	0	0.0	-1.4	4.8	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	51	--	--
Horn	17537288	4854528	471.8	99	--	--	56.1	0	0.0	-1.3	0.4	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42	--	--
IdlingRMT	17537290	4854526	466.3	94	--	--	56.2	0	0.0	-0.8	4.5	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33	--	--
LoaderRMT	17537276	4854516	466.9	106	--	--	57.2	0	0.0	-0.5	6.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42	--	--
LoaderRMT	17537332	4854489	466.2	104	--	--	58.1	0	0.0	-0.6	4.2	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40	--	--
MovingAggregate	17537304	4854496	468.0	93	--	--	57.5	0	0.0	-1.3	4.5	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28	--	--
RMTTrucks	17537186	4854537	466.1	105	--	--	55.1	0	0.0	-0.7	5.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	44	--	--
SlumpingRMT	17537250	4854536	466.3	106	--	--	56.1	0	0.0	-0.5	4.3	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45	--	--
SlumpingRMT	17537256	4854544	465.8	106	--	--	55.6	0	0.0	-0.5	4.3	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45	--	--
SlumpingRMTExhaust	17537246	4854537	465.9	96	--	--	56.1	0	0.0	-0.5	4.3	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35	--	--
SlumpingRMTExhaust	17537248	4854545	466.5	96	--	--	55.7	0	0.0	-0.5	4.3	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35	--	--
Tanker	17537288	4854536	470.4	95	--	--	55.6	0	0.0	-1.2	1.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38	--	--
TankerTruck	17537346	4854535	465.8	85	--	--	54.9	0	0.0	-1.1	4.9	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25	--	--
Vacuum	17537482	4854304	467.0	94	94	92	63.9	0	0.0	-1.0	4.6	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21	21	19
Vacuum	17537482	4854302	467.0	94	94	92	63.9	0	0.0	-1.0	4.6	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20	20	19
Armstrong_TT Idle	17537890	4855402	469.5	89	89	89	70.2	0	0.0	-3.6	23.3	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Armstrong_TT Idle	17537896	4855376	469.3	89	89	89	70.0	0	0.0	-3.6	23.5	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Armstrong_TT Idle	17537858	4855361	468.4	89	89	89	69.6	0	0.0	-3.6	23.5	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Armstrong_TT Idle	17537832	4855416	468.5	89	89	89	69.9	0	0.0	-3.6	23.3	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Armstrong_TT Idle	17537826	4855448	468.9	89	89	89	70.1	0	0.0	-3.6	23.2	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Armstrong_TT Idle	17537858	4855391	468.6	89	89	89	69.9	0	0.0	-3.6	23.4	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
DustCollector	17537288	4854535	469.9	95	--	--	55.8	0	0.0	-0.9	3.4	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36	--	--
Clark_Moving Haul Truck	17537396	4854500	465.7	98	--	--	57.7	0	0.0	-0.5	4.6	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35	--	--
BayDoor	17537378	4854246	465.0	87	--	--	64.3	3	0.0	-1.4	4.7	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17	--	--
BayDoor	17537378	4854241	464.6	87	--	--	64.4	3	0.0	-1.4	4.7	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17	--	--
Carwash Door	17537508	4854298	467.0	84	84	79	64.1	3	0.0	-1.2	20.4	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	--
Carwash Door	17537526	4854302	467.0	84	84	79	64.1	3	0.0	-1.1	21.5	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Carwash Door	17537508	4854302	467.0	84	84	79	64.1	3	0.0	-1.1	21.0	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
KrownExitDoor	17537416	4854272	465.9	89	--	--	64.1	3	0.0	-1.2	4.4	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22	--	--
Krown Entrance	17537436	4854273	466.2	88	--	--	64.1	3	0.0	-1.1	4.7	5.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17	--	--
Krown Entrance	17537436	4854272	466.3	88	--	--	64.2	3	0.0	-1.3	4.7	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17	--	--

R7	17537168	4854649	469.3																				
Src ID	X	Y	Z	LxD	LxE	LxN	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	CmetE	CmetN	ReflD	ReflE	ReflN	LrD	LrE	LrN
AggregateTruck	17537398	4854530	466.9	89	--	--	55.9	0	0.0	-1.4	0.4	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33	--	--
AggVibrator	17537288	4854529	488.4	80	--	--	55.7	0	0.0	-2.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25	--	--
ArmstrongTrucking	17537866	4855555	470.1	93	--	93	72.0	0	0.0	-3.9	23.2	6.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
BaghouseOulet	17537282	4854528	488.7	97	--	--	55.6	0	0.0	-1.6	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42	--	--
CementScaleVibration	17537282	4854522	472.3	96	--	--	55.8	0	0.0	-1.7	18.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23	--	--
ClarkCrusher	17537352	4854496	466.9	114	--	--	58.7	0	0.0	-1.8	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	55	--	--
Horn	17537288	4854528	471.8	99	--	--	55.7	0	0.0	-1.9	14.5	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29	--	--
IdlingRMT	17537290	4854526	466.3	94	--	--	56.0	0	0.0	-1.2	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38	--	--
LoaderRMT	17537300	4854514	466.8	106	--	--	55.7	0	0.0	-1.4	3.2	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	47	--	--
LoaderRMT	17537372	4854494	466.3	104	--	--	59.3	0	0.0	-1.3	0.2	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	44	--	--
MovingAggregate	17537304	4854496	468.0	93	--	--	57.2	0	0.0	-1.7	1.8	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	32	--	--
RMTTrucks	17537188	4854537	466.1	105	--	--	54.6	0	0.0	-1.5	0.4	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50	--	--
SlumpingRMT	17537250	4854536	466.3	106	--	--	54.2	0	0.0	-1.3	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52	--	--
SlumpingRMT	17537256	4854544	465.8	106	--	--	53.9	0	0.0	-1.5	0.3	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52	--	--
SlumpingRMTExhaust	17537246	4854537	465.9	96	--	--	53.7	0	0.0	-1.6	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43	--	--
SlumpingRMTExhaust	17537248	4854545	466.5	96	--	--	53.3	0	0.0	-1.6	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43	--	--
Tanker	17537288	4854536	470.4	95	--	--	55.6	0	0.0	-1.8	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40	--	--
TankerTruck	17537360	4854537	465.9	85	--	--	55.5	0	0.0	-1.6	0.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30	--	--
Vacuum	17537482	4854304	467.0	94	94	92	64.4	0	0.0	-0.7	17.8	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9	9	7
Vacuum	17537482	4854302	467.0	94	94	92	64.5	0	0.0	-0.8	17.7	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9	9	7
Armstrong_TT Idle	17537890	4855402	469.5	89	89	89	71.4	0	0.0	-3.6	20.5	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Armstrong_TT Idle	17537896	4855376	469.3	89	89	89	71.3	0	0.0	-3.5	20.8	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Armstrong_TT Idle	17537858	4855361	468.4	89	89	89	70.9	0	0.0	-3.5	21.0	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Armstrong_TT Idle	17537832	4855416	468.5	89	89	89	71.1	0	0.0	-3.6	20.5	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Armstrong_TT Idle	17537826	4855448	468.9	89	89	89	71.3	0	0.0	-3.6	20.4	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Armstrong_TT Idle	17537858	4855391	468.6	89	89	89	71.1	0	0.0	-3.6	20.7	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
DustCollector	17537288	4854535	469.9	95	--	--	55.6	0	0.0	-1.6	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	41	--	--
Clark_Moving Haul Truck	17537398	4854498	465.7	98	--	--	59.2	0	0.0	-1.3	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38	--	--
BayDoor	17537378	4854246	465.0	87	--	--	64.0	3	0.0	-1.2	4.2	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18	--	--
BayDoor	17537338	4854257	464.6	87	--	--	64.1	3	0.0	-1.4	7.2	4.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15	--	--
Carwash Door	17537508	4854298	467.0	84	84	79	64.7	3	0.0	-1.7	24.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Carwash Door	17537526	4854302	467.0	84	84	79	64.8	3	0.0	-1.7	24.1	6.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Carwash Door	17537508	4854302	467.0	84	84	79	64.7	3	0.0	-1.7	24.0	6.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
KrownExitDoor	17537416	4854272	465.9	89	--	--	64.2	3	0.0	-1.8	4.5	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23	--	--
Krown Entrance	17537436	4854273	466.2	88	--	--	64.4	3	0.0	-1.6	4.7	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17	--	--
Krown Entrance	17537436	4854272	466.3	88	--	--	64.4	3	0.0	-1.8	4.7	6.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17	--	--

Where: Lr = Lx - Adiv + K0 + Dc - Agnd - Abar - Aatm - Afol - Ahous + Cmet + Refl