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2510 St. Laurent Boulevard, Ottawa Noise Impact Feasibility Report



2510 St. Laurent Blvd

City of Ottawa

Noise Impact Feasibility Report

Prepared By:

NOVATECH

Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario
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Novatech File: 122040

Ref: R-2022-190

Submitted: November 1, 2022

November 1, 2022

City of Ottawa
Planning and Infrastructure Approvals
110 Laurier Street West, 4th Floor
Ottawa, ON, K1P 1J1

Attention: Kelby Lodoen Unseth, Planner II

**Reference: 2510 St. Laurent Blvd
Noise Impact Feasibility Report
Our File No.: 122040**

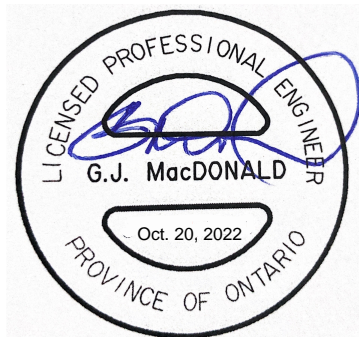
Please find enclosed the 'Noise Impact Feasibility Report' for the above noted development located in the City of Ottawa. This report is being submitted in support of the site plan application for the proposed development.

This report evaluates the environmental impact of noise from traffic and assesses the feasibility of mitigation measures to attenuate noise to acceptable levels.

Please contact the undersigned should you have any questions or comments pertaining to the enclosed report.

Yours truly,

NOVATECH



Greg MacDonald, P. Eng.
Director, Land Development and Public Sector Infrastructure

cc: Vincent Denomme, Claridge

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1.0 INTRODUCTION

This report is submitted on behalf of the developer, Claridge Homes, as part of Zoning By-Law Amendment, Site Plan Control, and Draft Plan of Condominium applications for the property located at 1900-1920 Walkley Road, 2425 Don Reid Drive, 2510 St. Laurent Boulevard, and 2990-3000 Conroy Road (referred to as 2510 St. Laurent Boulevard in this report). This report assesses the environmental impact of noise on the proposed development and outlines the recommended mitigation measures.

The subject site 5.89 ha and is surrounded the following roads:

- Walkley Road to the north,
- St. Laurent Boulevard to the south,
- Conroy Road to the east, and
- Don Reid Drive to the west.

An aerial of the subject site is provided in **Figure 1 – Key Plan – 2510 St. Laurent**.

Figure 1: Key Plan – St. Laurent



The proposed development is 5.89ha and consists of 192 back-to-back townhouse units and 36 standard townhouse units. The site does not include an Outdoor Living Area (OLA). The locations

of all nodes used to confirm the noise levels at the building are included in **Figure 2 – Node Locations**.

This report follows recommendations of the City of Ottawa’s Environmental Noise Control Guidelines (ENCG).

2.0 NOISE CRITERIA AND NOISE SOURCES

The permitted sound levels for the subject site are per Tables 2.2a and 2.2b of the ENCG and are summarized in **Table 1**. Refer to **Appendix A** for all ENCG excerpts.

Table 1: Permitted Noise Levels

Time Period	Receiver Location	Noise Level Criteria (Leq)
Daytime (7:00-23:00)	Outdoor Living Area (OLA)	55 dBA
Daytime (7:00-23:00)	Plane of Window (POW) Living/Dining Room	45 dBA
Nighttime (23:00-7:00)	Plane of Window (POW) Bedroom/Sleeping Quarter	40 dBA

The plane of window (POW) is defined as the center of the window of a noise sensitive place (i.e. living room or bedroom). POW noise levels are considered inside the building, 1.5m above the ground for the daytime and 4.5m above the ground for nighttime.

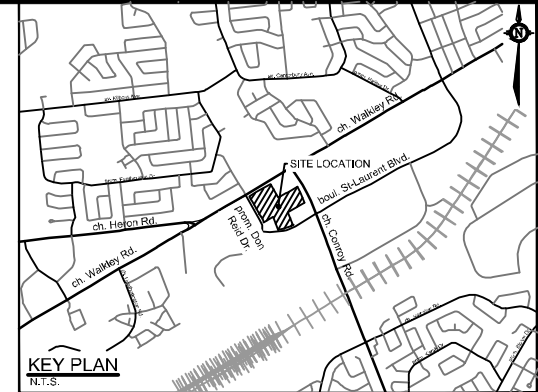
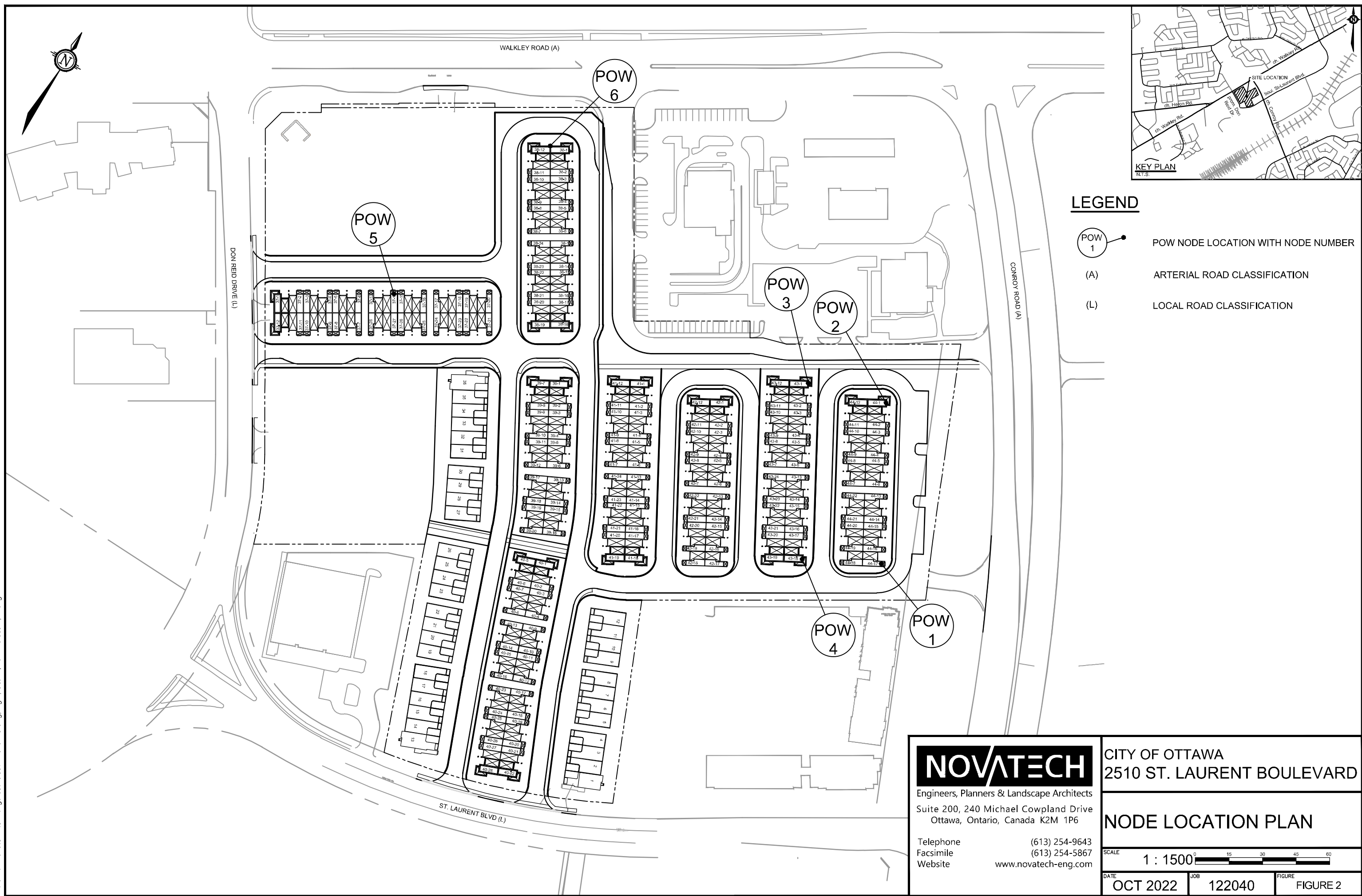
When sound levels are predicted to be less than the specified criteria listed in **Table 1** no attenuation measures are required. As the noise criteria is exceeded noise attenuation measures are recommended. These attenuation measures may include:

- Distance setback with soft ground;
- Insertion of noise insensitive land uses between the source and sensitive receptor;
- Orientation of building to provide sheltered zones;
- Construction of sound or acoustic barriers;
- Installation of air conditioning and ventilation; and
- Enhanced construction techniques and construction quality.




Due to site density, adjusting the setback, the insertion of noise insensitive lands, and reorienting the building are not feasible. Therefore, excessive noise for the subject site will be mitigated through the installation of acoustic barriers and air conditioning and enhanced construction techniques.

When predicted noise levels exceed the specified criteria, the City of Ottawa and the MOE recommend warning clauses be registered as a notice on title and incorporated into the lease/rental/sale agreements to warn potential purchaser/buyers/tenants of the possible elevated noise levels. Typical examples of noise clauses are listed below:

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LEGEND

-  POW NODE LOCATION WITH NODE NUMBER
-  ARTERIAL ROAD CLASSIFICATION
-  LOCAL ROAD CLASSIFICATION

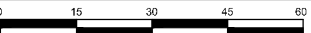


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CITY OF OTTAWA
2510 ST. LAURENT BOULEVARD

NODE LOCATION PLAN

SCALE 1 : 1500 

DATE OCT 2022 JOB 122040 FIGURE FIGURE 2

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 Ministry of Environment’s noise criteria.”

Type B

“Purchasers/tenants are advised that despite the inclusion of noise control features in this development and within the building units, sound levels due to increasing road traffic may on occasions interfere with some activities of the dwelling occupants as the sound levels exceed the Ministry of the Environment’s noise criteria.”

Type C

“This dwelling unit is fitted with a forced air heating system and the ducting, etc was sized to accommodate a central air conditioning system. Installation of central air conditioning by the occupant will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the Ministry of Environment’s noise criteria. (Note: The location and installation of the outdoor air conditioning device should be done so as to comply with noise criteria of MOE Publication NPC-216, Residential Air Conditioning Devices and thus minimize the noise impacts both on and in the immediate vicinity of the subject property.”)

Type D

“This dwelling unit has been supplied with a central air conditioning system which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the Ministry of Environment’s noise criteria.”

Table 2 confirms the noise mitigation requirements when noise levels are calculated to be in excess of the levels stated in **Table 1**.

Table 2: Noise Attenuation Requirements

Plane of Window Noise Level (dBA)		Noise Attenuation Requirements
Daytime (07:00- 23:00)	Nighttime (23:00- 07:00)	
POW < 55	POW < 50	None
55 < POW < 65	50 < POW < 60	Forced Air Ventilation, Noise Clause C
POW > 65	POW > 60	Central Air Conditioning, Noise Clause D Building Façade Analysis

The City of Ottawa Official Plan stipulates that a noise study shall be prepared when a new development is proposed within 100 metres of an arterial, major collector or collector roadway, or a rapid-transit corridor. There is no railway, airport, or stationary noise sources that affect this site. **Table 3** confirms the road noise sources for the site.

Table 3: Noise Sources

Roadway Classification						
Name	Classification	Lane	Identifier	AADT	Lanes	Speed Limit
Walkley Road	Arterial	Eastbound & Westbound	4-UAD	35,000	4	50 KPM
Conroy* Road	Arterial	Southbound	4-UAD	35,000	2	60 KPM
	Arterial	Northbound	6-UAD	50,000	3	60 KPH

* The average Conroy Road AADT assumed in this report is the average of the northbound and southbound lanes, AADT = 42,500.

The northbound and southbound lanes of Conroy Road are different and can not be best identified as any one road type in Table B1 of Appendix B: Table of Traffic and Road Parameters to Be Used For Sound Predictions of the ENCG. This report assumes the southbound lane is best classified as 4 Lane Urban Arterial Divided (4-UAD) with an AADT of 35,000 vehicles per day and the northbound lane is best described as 6 Lane-Urban Arterial-divided (6-UAD) with an AADT of 50,000 vehicles per day. This report assumes the average AADT of the Conroy Road southbound and northbound lanes, 42,500 vehicles per day.

St. Laurent Boulevard, a major collector, was not considered in this report because the expected AADT is anticipated to be on par with a local road, rather than 12,000 vehicles per day the ENCG predicts for a 2 lane urban major collector. The portion of St. Laurent nearest the site is approximately 300m long, is located between Don Reid Dr and Conroy Road and includes accesses to 4 small parking lots. Most of the St. Laurent Boulevard traffic is likely to come from the residents using the St. Laurent Boulevard as a thruway between Don Reid Drive and Conroy Rd. The portion on St. Laurent Boulevard nearest the site functions as an extension of the Don Reid Drive, a local road, and does not warrant a collector designation.

3.0 PREDICTED NOISE LEVELS

Noise levels were analyzed using Version 5.03 of the STAMSON computer program. The predicted noise levels are listed in **Table 4**.

Table 4. Predicted Noise Levels and Proposed Mitigation Measures

Receiver		Noise Level		Mitigation Method
No.	Block	Daytime (7:00-23:00)	Nighttime (23:00-7:00)	
1	44-17	62.0	56.1	Forced Air Ventilation, Noise Clause C
2	44-1	62.3	56.1	Forced Air Ventilation, Noise Clause C
3	43-1	53.9	50.0	N/A
4	43-18	51.6	49.0	N/A
5	37-14	54.5	49.5	N/A
6	38-1	64.0	57.5	Forced Air Ventilation, Noise Clause C

Based on the results above, we recommend Forced Air Ventilation and the inclusion of Noise Clause C be registered as a notice on title and incorporated into the lease/rental/sale agreements of Blocks 38 and 44. Refer to **Figure 3 – Noise Mitigation Plan** for all proposed noise mitigation measures. Refer to **Appendix B** for all noise calculations.

4.0 CONCLUSION

This report recommends forced air ventilation and the inclusion of Noise Clause C be registered as a notice on title and incorporated into the lease/rental/sale agreements of Blocks 38 and 44.

NOVATECH ENGINEERING CONSULTANTS LTD.

Report By:

Reviewed By:

Mark Bowen, B. Eng.
Project Manager
Land Development Engineering

Greg MacDonald, P. Eng.
Director - Land Development and
Public Sector Infrastructure



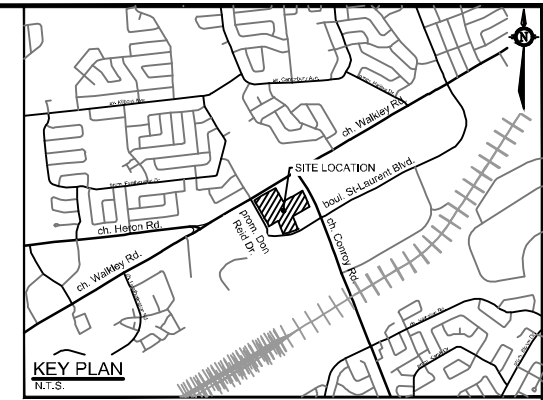


WALKLEY ROAD (A)


DON REID DRIVE (L)

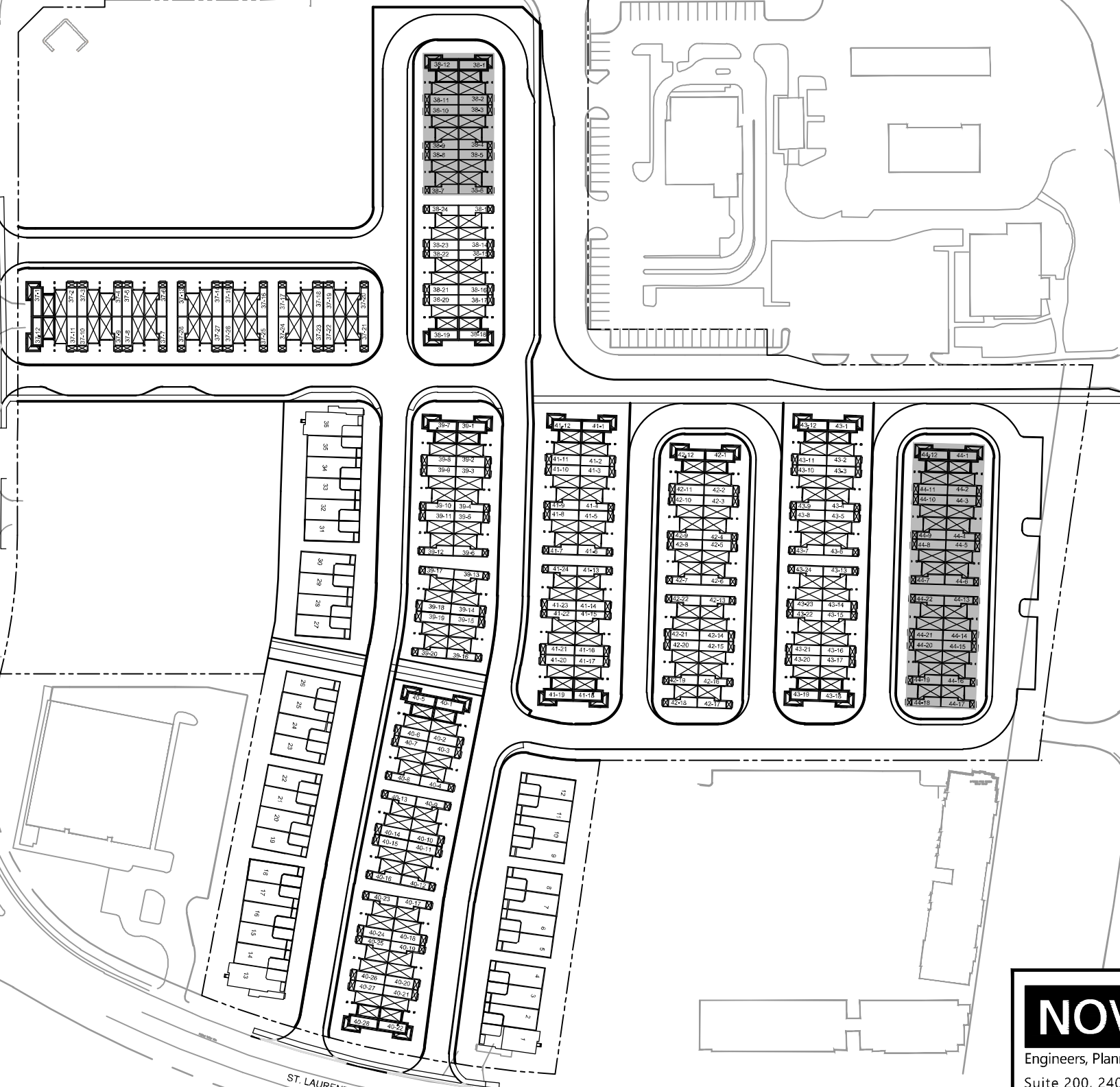
CONROY ROAD (A)

ST. LAURENT BLVD (L)



LEGEND

-  FORCED AIR VENTILATION AND NOISE WARNING CLAUSE "C"
- (A) ARTERIAL ROAD CLASSIFICATION
- (L) LOCAL ROAD CLASSIFICATION

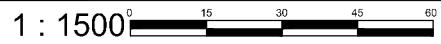


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CITY OF OTTAWA
 2510 ST. LAURENT BOULEVARD

NOISE MITIGATION PLAN

SCALE 1 : 1500 

DATE OCT 2022 JOB 122040 FIGURE FIGURE 3

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APPENDIX A:

Excerpts From The City Of Ottawa Environmental Noise Control Guidelines

Appendix B: Table of Traffic and Road Parameters To Be Used For Sound Level Predictions

Table B1 Traffic And Road Parameters To Be Used For Sound Level Predictions

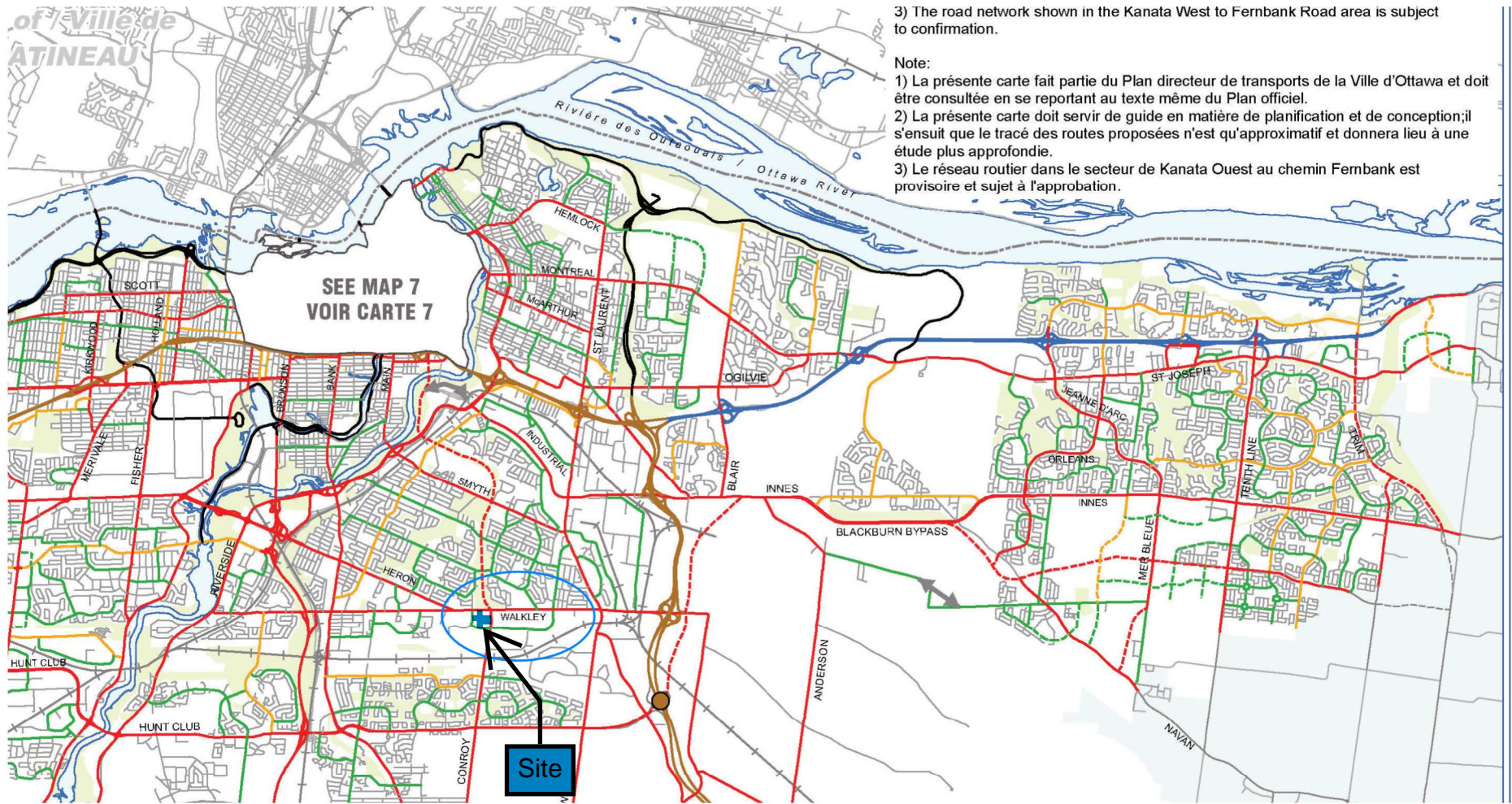
Row Width (m)	Implied Roadway Class	AADT Vehicles/Day	Posted Speed Km/Hr	Day/Night Split %	Medium Trucks %	Heavy Trucks % ¹
NA ²	Freeway, Queensway, Highway	18,333 per lane	100	92/8	7	5
37.5-44.5	6-Lane Urban Arterial-Divided (6 UAD)	50,000	50-80	92/8	7	5
34-37.5	4-Lane Urban Arterial-Divided (4-UAD)	35,000	50-80	92/8	7	5
23-34	4-Lane Urban Arterial-Undivided (4-UAU)	30,000	50-80	92/8	7	5
23-34	4-Lane Major Collector (4-UMCU)	24,000	40-60	92/8	7	5
30-35.5	2-Lane Rural Arterial (2-RAU)	15,000	50-80	92/8	7	5
20-30	2-Lane Urban Arterial (2-UAU)	15,000	50-80	92/8	7	5
20-30	2-Lane Major Collector (2-UMCU)	12,000	40-60	92/8	7	5
30-35.5	2-Lane Outer Rural Arterial (near the extremities of the City) (2-RAU)	10,000	50-80	92/8	7	5
20-30	2-Lane Urban Collector (2-UCU)	8,000	40-50	92/8	7	5

¹ The MOE Vehicle Classification definitions should be used to estimate automobiles, medium trucks and heavy trucks.

² The number of lanes is determined by the future mature state of the roadway.

Road	From	To	ROW to be Protected	Classification	Sector
Colonnade	Merivale	Prince of Wales	26	major collector	urban
Colonnade S.	Colonnade N.	Colonnade N.	24	collector	urban
Conroy	Walkley	Greenbelt boundary	44.5	arterial	urban
Conroy	Greenbelt boundary	Bank	G	arterial	urban
Constance Bay	Dunrobin	Bayview	20	arterial	village
Constellation	Centrepointe	Baseline	24	collector	urban
Cope	Entire Length		24	collector	urban
Cordova	Withrow	Baseline	24	collector	urban
Corkstown	March	Moodie	G	arterial	urban
Corkstown	Moodie	Carling	24	collector	urban
Cousineau	East-west segment only		18	local	urban
Coventry	Vanier Parkway	Belfast	30	arterial	urban
Coventry	Belfast	St. Laurent	30	arterial	urban
Cresthaven	Strandherd	Crestway	26	major collector	urban
Crystal Beach	Corkstown	Carling	24	collector	urban
Cumberland	George	Rideau	20	local	urban
Cumberland	Rideau	Besserer	20 Note: Maximum land requirement from property abutting existing ROW (1.0 m). Subject to widening/easement policy.	arterial	urban
Cummings	Montreal	Donald	24	collector	urban
Cummings	Donald	Ogilvie	26	major collector	urban
Cummings	Ogilvie	Cyrville	37.5	arterial	urban
Cyrville	Cummings	100m north of Maxime	37.5	arterial	urban
Cyrville	100m north of Maxime	Innes	37.5 Note: Subject to unequal widening: North side 15.0 m, South side 22.5 m	arterial	urban
Cyrville [Amendment #113, July 30, 2013]	St. Laurent	Cummings	26	collector	urban

Road	From	To	ROW to be Protected	Classification	Sector
Trim	Innes	East Urban Community-south limit	37.5 Note: An additional 5.0 m on the rural side may be required to construct a rural cross-section.	arterial	urban
Trim	Hydro corridor/Frank Kenny extension	Existing Trim	37.5	arterial	urban
Trim	Ottawa Road 174	Frank Kenny extension	46	arterial	urban
Trim	South of hydro corridor/Frank Kenny extension	Innes	37.5 Note: Refer to North South Link ESR	arterial	urban
Trim	North Service	Ottawa Road 174	26	major collector	urban
Triole	North of Tremblay		20	local	urban
Triole	All sections south of Tremblay		18	local	urban
Vaan	Entire length		24	collector	urban
Valin	Charlemagne	Trim	26	major collector	urban
Varley	Beaverbrook	Beaverbrook	24	collector	urban
Vaughn	Crichton	Mackay	15	local	urban
Victoria	Glen	Glenwood	23	arterial	village
Viewmount	Meadowlands	Fisher	24	collector	urban
Virgil	Stinson	Lynhar	24	collector	urban
Viseneau	Boyer	Innes	26	collector	urban
Walkley	Riverside	Bank	26	arterial	urban
Walkley	Bank	Heron	37.5	arterial	urban
Walkley	Heron	Greenbelt boundary	44.5	arterial	urban
Walkley	Greenbelt boundary	Ramsayville	G	arterial	urban
Waller	Rideau	Laurier East	23 Note: Maximum land requirement from property abutting existing ROW (1.54 m).	arterial	urban
Waterbridge	Cresthaven	Prince of Wales	24	collector	urban



3) The road network shown in the Kanata West to Fernbank Road area is subject to confirmation.

Note:

- 1) La présente carte fait partie du Plan directeur de transports de la Ville d'Ottawa et doit être consultée en se reportant au texte même du Plan officiel.
- 2) La présente carte doit servir de guide en matière de planification et de conception; il s'ensuit que le tracé des routes proposées n'est qu'approximatif et donnera lieu à une étude plus approfondie.
- 3) Le réseau routier dans le secteur de Kanata Ouest au chemin Fernbank est provisoire et sujet à l'approbation.

Table 2.2a: Sound Level Limit for Outdoor Living Areas - Road and Rail

(from NPC-300, 2013 Table C-1)

Time Period	Required Leq (16) (dBA)
16-hour, 07:00 – 23:00	55

Table 2.2b: Sound Level Limit for Indoor Living Areas Road and Rail

(from NPC-300, 2013 Table C-2)

Type of Space	Time Period	Required Leq (dBA)	
		Road	Rail
Living/dining, den areas of residences, hospitals, nursing homes, schools, daycare centres, etc.	07:00 – 23:00	45	40
Living/dining, den areas of residences, hospitals, nursing homes, etc. (except schools or daycare centres)	23:00 – 07:00	45	40
Sleeping quarters	07:00 – 23:00	45	40
	23:00 – 07:00	40	35

The Province also provides for supplementary indoor sound level limits for land uses not generally considered noise sensitive (see Table 2.2c below). These good practice design objectives should be addressed in any noise study prepared for the City. These supplementary sound level limits are based on the windows and doors to an indoor space being closed.

Table 2.2c: Supplementary Sound Level Limits for Indoor Spaces - Road and Rail (adapted from NPC-300 Table C-9)

Type of Space	Time Period	Required Leq (dBA)	
		Road	Rail
General offices, reception areas, retail stores, etc.	16 hours between 07:00 – 23:00	50	45
Theatres, places of worship, libraries, individual or semi-private offices, conference rooms, reading rooms, etc.	16 hours between 07:00 – 23:00	45	40
Sleeping quarters of hotels/motels	8 hours between 23:00 – 07:00	45	40
Sleeping quarters of residences, hospitals, nursing/retirement homes, etc.	8 hours between 23:00 – 07:00	40	35

Table 3.0: Summary of Sound Level Criteria for Surface Transportation Projects

Future Sound Level, Leq_{16hr} (07:00 - 23:00)	Change Above Ambient, dBA	Impact Rating	Mitigation
Greater than 55 dBA and less than or equal to 60 dBA	0-3	Not generally noticeable	None
	3-5	Generally noticeable	
	5-10	Significant	Investigate noise control measures and mitigate to achieve retrofit criteria (minimum attenuation is 6 dBA)
	10+	Very Significant	
Greater than 60 dBA	0-3	Not generally noticeable	Investigate noise control measures and mitigate to achieve retrofit criteria (minimum attenuation is 6 dBA)
	3-5	Generally noticeable	
	5-10	Significant	
	10+	Very Significant	

Additional Notes:

- The objective for outdoor sound levels is the higher of the Leq_{16hr} 55 dBA or the Leq_{16hr} ambient sound level that may prevail at the start of project construction (referred to as the "established ambient").
- If the future sound level is greater than Leq_{16hr} 60 dBA and the excess or change in sound level above the established ambient is less than 5 dBA, the feasibility of noise control measures within the right-of-way will be investigated under the City's Local Improvements policy and guidelines.
- Noise control measures will be maintained within the City's ROW wherever possible.
- The City prefers retrofit sound barrier walls at the flanking ends to be on City owned lands, however if required, property owners at the termination points of the noise abatement wall will be asked to register an easement to the City for the construction and maintenance of a acoustic barrier along a side lot line. The side lot line acoustic barrier will provide protection for the rear yard area of the adjacent property. If the landowner refuses to transfer the easement, the City will not attempt to purchase or expropriate the easement but will delete this section of wall from the noise abatement construction project.
- Where the dominant noise source is due to transit activities within an LRT or a Transitway terminal, a rail yard facility to accommodate the LRT service yard, or a terminal building containing mechanical systems then the City will use the "Stationary Sources" criteria.

Appendix B: Table of Traffic and Road Parameters To Be Used For Sound Level Predictions

Table B1 Traffic And Road Parameters To Be Used For Sound Level Predictions

Row Width (m)	Implied Roadway Class	AADT Vehicles/Day	Posted Speed Km/Hr	Day/Night Split %	Medium Trucks %	Heavy Trucks % ¹
NA ²	Freeway, Queensway, Highway	18,333 per lane	100	92/8	7	5
37.5-44.5	6-Lane Urban Arterial-Divided (6 UAD)	50,000	50-80	92/8	7	5
34-37.5	4-Lane Urban Arterial-Divided (4-UAD)	35,000	50-80	92/8	7	5
23-34	4-Lane Urban Arterial-Undivided (4-UAU)	30,000	50-80	92/8	7	5
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30-35.5	2-Lane Outer Rural Arterial (near the extremities of the City) (2-RAU)	10,000	50-80	92/8	7	5
20-30	2-Lane Urban Collector (2-UCU)	8,000	40-50	92/8	7	5

¹ The MOE Vehicle Classification definitions should be used to estimate automobiles, medium trucks and heavy trucks.

² The number of lanes is determined by the future mature state of the roadway.

APPENDIX B

Sound Level Calculations

Filename: pow1.te Time Period: Day/Night 16/8 hours
 Description: Daytime 1.5m Nighttime 7.5m

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

```
-----
Car traffic volume : 34408/2992 veh/TimePeriod *
Medium truck volume : 2737/238 veh/TimePeriod *
Heavy truck volume : 1955/170 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)
```

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

```
24 hr Traffic Volume (AADT or SADT): 42500
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00
```

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

```
-----
Angle1 Angle2 : -66.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 64.00 / 64.00 m
Receiver height : 1.50 / 7.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 62.00 deg Angle2 : 90.00 deg
Barrier height : 6.00 m
Barrier receiver distance : 3.00 / 3.00 m
Source elevation : 85.10 m
Receiver elevation : 86.70 m
Barrier elevation : 85.80 m
Reference angle : 0.00
```

↑
 Result summary (day)

```
-----
! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+-----
```

1.Conroy	!	1.50	!	62.00	!	62.00
-----+-----+-----+-----						
		Total				62.00 dBA

↑
Result summary (night)

	!	source	!	Road	!	Total
	!	height	!	Leq	!	Leq
	!	(m)	!	(dBA)	!	(dBA)
1.Conroy	!	1.50	!	56.11	!	56.11 *
-----+-----+-----+-----						
		Total				56.11 dBA

* Bright Zone !

↑

TOTAL Leq FROM ALL SOURCES (DAY): 62.00
(NIGHT): 56.11

↑

↑

Filename: pow2.te Time Period: Day/Night 16/8 hours
Description: Daytime 1.5m Nighttime 7.5m

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

Car traffic volume : 34408/2992 veh/TimePeriod *
Medium truck volume : 2737/238 veh/TimePeriod *
Heavy truck volume : 1955/170 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 42500
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : -63.00 deg -60.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 63.00 / 63.00 m
Receiver height : 1.50 / 7.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -63.00 deg Angle2 : -60.00 deg
Barrier height : 6.00 m
Barrier receiver distance : 3.00 / 3.00 m
Source elevation : 85.10 m
Receiver elevation : 86.95 m
Barrier elevation : 85.95 m
Reference angle : 0.00

↑

Road data, segment # 2: Conroy (day/night)

Car traffic volume : 34408/2992 veh/TimePeriod *
Medium truck volume : 2737/238 veh/TimePeriod *
Heavy truck volume : 1955/170 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 1 %

Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 42500
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 2: Conroy (day/night)

Angle1 Angle2 : -60.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 63.00 / 63.00 m
Receiver height : 1.50 / 7.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 83.00 deg Angle2 : 90.00 deg
Barrier height : 6.00 m
Barrier receiver distance : 3.00 / 3.00 m
Source elevation : 85.10 m
Receiver elevation : 86.95 m
Barrier elevation : 85.80 m
Reference angle : 0.00

↑
Result summary (day)

! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----
1.Conroy ! 1.50 ! 30.65 ! 30.65
2.Conroy ! 1.50 ! 62.29 ! 62.29
-----+-----+-----
Total 62.29 dBA

↑
Result summary (night)

! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----
1.Conroy ! 1.50 ! 38.37 ! 38.37 *

2.Conroy	!	1.50 !	56.07 !	56.07 *
-----+-----+-----+-----				
		Total		56.14 dBA

* Bright Zone !

↑

TOTAL Leq FROM ALL SOURCES (DAY): 62.29
(NIGHT): 56.14

↑

↑

Filename: pow3.te Time Period: Day/Night 16/8 hours
Description: Daytime 1.5m Nighttime 7.5m

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

Car traffic volume : 34408/2992 veh/TimePeriod *
Medium truck volume : 2737/238 veh/TimePeriod *
Heavy truck volume : 1955/170 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 42500
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : -50.00 deg -28.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 102.00 / 102.00 m
Receiver height : 1.50 / 7.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -50.00 deg Angle2 : -28.00 deg
Barrier height : 6.00 m
Barrier receiver distance : 33.00 / 33.00 m
Source elevation : 85.10 m
Receiver elevation : 86.85 m
Barrier elevation : 85.95 m
Reference angle : 0.00

↑

Road data, segment # 2: Conroy (day/night)

Car traffic volume : 34408/2992 veh/TimePeriod *
Medium truck volume : 2737/238 veh/TimePeriod *
Heavy truck volume : 1955/170 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 1 %

Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 42500
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 2: Conroy (day/night)

Angle1 Angle2 : -28.00 deg 79.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 102.00 / 102.00 m
Receiver height : 1.50 / 7.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 3.00 deg Angle2 : 79.00 deg
Barrier height : 9.00 m
Barrier receiver distance : 22.00 / 22.00 m
Source elevation : 85.10 m
Receiver elevation : 86.85 m
Barrier elevation : 86.87 m
Reference angle : 0.00

↑

Road data, segment # 3: Conroy (day/night)

Car traffic volume : 34408/2992 veh/TimePeriod *
Medium truck volume : 2737/238 veh/TimePeriod *
Heavy truck volume : 1955/170 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 42500
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 3: Conroy (day/night)

Angle1 Angle2 : 79.00 deg 88.00 deg

Wood depth : 0 (No woods.)
 No of house rows : 2 / 2
 House density : 20 %
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 102.00 / 102.00 m
 Receiver height : 1.50 / 7.50 m
 Topography : 2 (Flat/gentle slope; with barrier)
 Barrier angle1 : 79.00 deg Angle2 : 88.00 deg
 Barrier height : 6.00 m
 Barrier receiver distance : 41.00 / 41.00 m
 Source elevation : 85.10 m
 Receiver elevation : 86.85 m
 Barrier elevation : 85.80 m
 Reference angle : 0.00

↑

Result summary (day)

	! source !	Road !	Total !
	! height !	Leq !	Leq !
	! (m) !	(dBA) !	(dBA) !
1.Conroy	! 1.50 !	41.70 !	41.70 !
2.Conroy	! 1.50 !	53.42 !	53.42 !
3.Conroy	! 1.50 !	38.96 !	38.96 !
	Total		53.85 dBA

↑

Result summary (night)

	! source !	Road !	Total !
	! height !	Leq !	Leq !
	! (m) !	(dBA) !	(dBA) !
1.Conroy	! 1.50 !	43.32 !	43.32 !
2.Conroy	! 1.50 !	48.75 !	48.75 !
3.Conroy	! 1.50 !	34.55 !	34.55 !
	Total		49.97 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 53.85
 (NIGHT): 49.97

↑



Filename: pow4.te Time Period: Day/Night 16/8 hours
Description: Daytime 1.5m Nighttime 7.5m

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

Car traffic volume : 34408/2992 veh/TimePeriod *
Medium truck volume : 2737/238 veh/TimePeriod *
Heavy truck volume : 1955/170 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 42500
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : -72.00 deg 6.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 102.00 / 102.00 m
Receiver height : 1.50 / 7.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -72.00 deg Angle2 : 6.00 deg
Barrier height : 9.00 m
Barrier receiver distance : 19.00 / 19.00 m
Source elevation : 85.10 m
Receiver elevation : 86.60 m
Barrier elevation : 86.87 m
Reference angle : 0.00

↑

Road data, segment # 2: Conroy (day/night)

Car traffic volume : 34408/2992 veh/TimePeriod *
Medium truck volume : 2737/238 veh/TimePeriod *
Heavy truck volume : 1955/170 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 1 %

Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 42500
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 2: Conroy (day/night)

Angle1 Angle2 : 6.00 deg 88.00 deg
Wood depth : 0 (No woods.)
No of house rows : 2 / 2
House density : 20 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 102.00 / 102.00 m
Receiver height : 1.50 / 7.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 23.00 deg Angle2 : 88.00 deg
Barrier height : 6.00 m
Barrier receiver distance : 32.00 / 32.00 m
Source elevation : 85.10 m
Receiver elevation : 86.60 m
Barrier elevation : 85.80 m
Reference angle : 0.00

↑
Result summary (day)

! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----
1.Conroy ! 1.50 ! 42.44 ! 42.44
2.Conroy ! 1.50 ! 50.99 ! 50.99
-----+-----+-----
Total 51.56 dBA

↑
Result summary (night)

! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----

1.Conroy	!	1.50 !	43.40 !	43.40
2.Conroy	!	1.50 !	47.64 !	47.64
-----+-----+-----+-----				
		Total		49.03 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 51.56
(NIGHT): 49.03

↑

↑

Filename: pow5.te Time Period: Day/Night 16/8 hours
Description: Daytime 1.5m Nighttime 7.5m

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 35000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : -90.00 deg -53.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 1
House density : 20 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 107.00 / 107.00 m
Receiver height : 1.50 / 7.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -76.00 deg Angle2 : -53.00 deg
Barrier height : 6.00 m
Barrier receiver distance : 41.00 / 41.00 m
Source elevation : 85.80 m
Receiver elevation : 87.01 m
Barrier elevation : 86.40 m
Reference angle : 0.00

↑
Road data, segment # 2: Walkley (day/night)

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 veh/TimePeriod *
Posted speed limit : 50 km/h

Road gradient : 1 %
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 35000
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 7.00
 Heavy Truck % of Total Volume : 5.00
 Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 2: Walkley (day/night)

 Angle1 Angle2 : -53.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 1 / 1
 House density : 20 %
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 107.00 / 107.00 m
 Receiver height : 1.50 / 7.50 m
 Topography : 2 (Flat/gentle slope; with barrier)
 Barrier angle1 : 43.00 deg Angle2 : 90.00 deg
 Barrier height : 9.00 m
 Barrier receiver distance : 3.00 / 3.00 m
 Source elevation : 85.80 m
 Receiver elevation : 87.01 m
 Barrier elevation : 86.91 m
 Reference angle : 0.00

↑
 Result summary (day)

	! source !	Road !	Total !
	! height !	Leq !	Leq !
	! (m) !	(dBA) !	(dBA) !
1.Walkley	! 1.50 !	43.38 !	43.38 !
2.Walkley	! 1.50 !	54.15 !	54.15 !
	Total		54.50 dBA

↑
 Result summary (night)

	! source !	Road !	Total !
	! height !	Leq !	Leq !
	! (m) !	(dBA) !	(dBA) !

1.Walkley	!	1.50	!	41.49	!	41.49
2.Walkley	!	1.50	!	48.79	!	48.79
Total						49.53 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 54.50
(NIGHT): 49.53

↑

↑

Filename: pow6.te Time Period: Day/Night 16/8 hours
 Description: Daytime 1.5m Nighttime 7.5m

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

```
-----
Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)
```

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

```
24 hr Traffic Volume (AADT or SADT): 35000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00
```

Data for Segment # 1: Walkley (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 : 38.00 / 38.00 m
Receiver height : 1.50 / 7.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -87.00 deg
Barrier height : 6.00 m
Barrier receiver distance : 3.00 / 3.00 m
Source elevation : 85.80 m
Receiver elevation : 86.95 m
Barrier elevation : 86.40 m
Reference angle : 0.00
```

↑
 Result summary (day)

```
-----
! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+-----
```

1.Walkley	!	1.50	!	64.00	!	64.00
Total						64.00 dBA

↑
Result summary (night)

	!	source	!	Road	!	Total
	!	height	!	Leq	!	Leq
	!	(m)	!	(dBA)	!	(dBA)
1.Walkley	!	1.50	!	57.45	!	57.45 *
Total						57.45 dBA

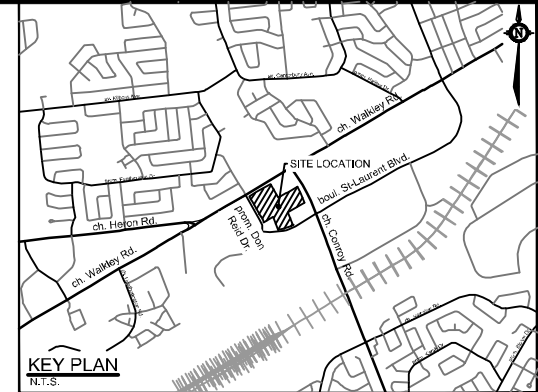
* Bright Zone !

↑

TOTAL Leq FROM ALL SOURCES (DAY): 64.00
(NIGHT): 57.45

↑

↑



WALKLEY ROAD (A)

DON REID DRIVE (L)

CONROY ROAD (A)

ST. LAURENT BLVD (L)

-66
Conroy

POW 1

62d
Conroy

90d
Conroy

64 m

LEGEND

- POW1 POW NODE LOCATION WITH NODE NUMBER
- (A) ARTERIAL ROAD CLASSIFICATION
- (L) LOCAL ROAD CLASSIFICATION

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CITY OF OTTAWA
WALKLEY CONROY

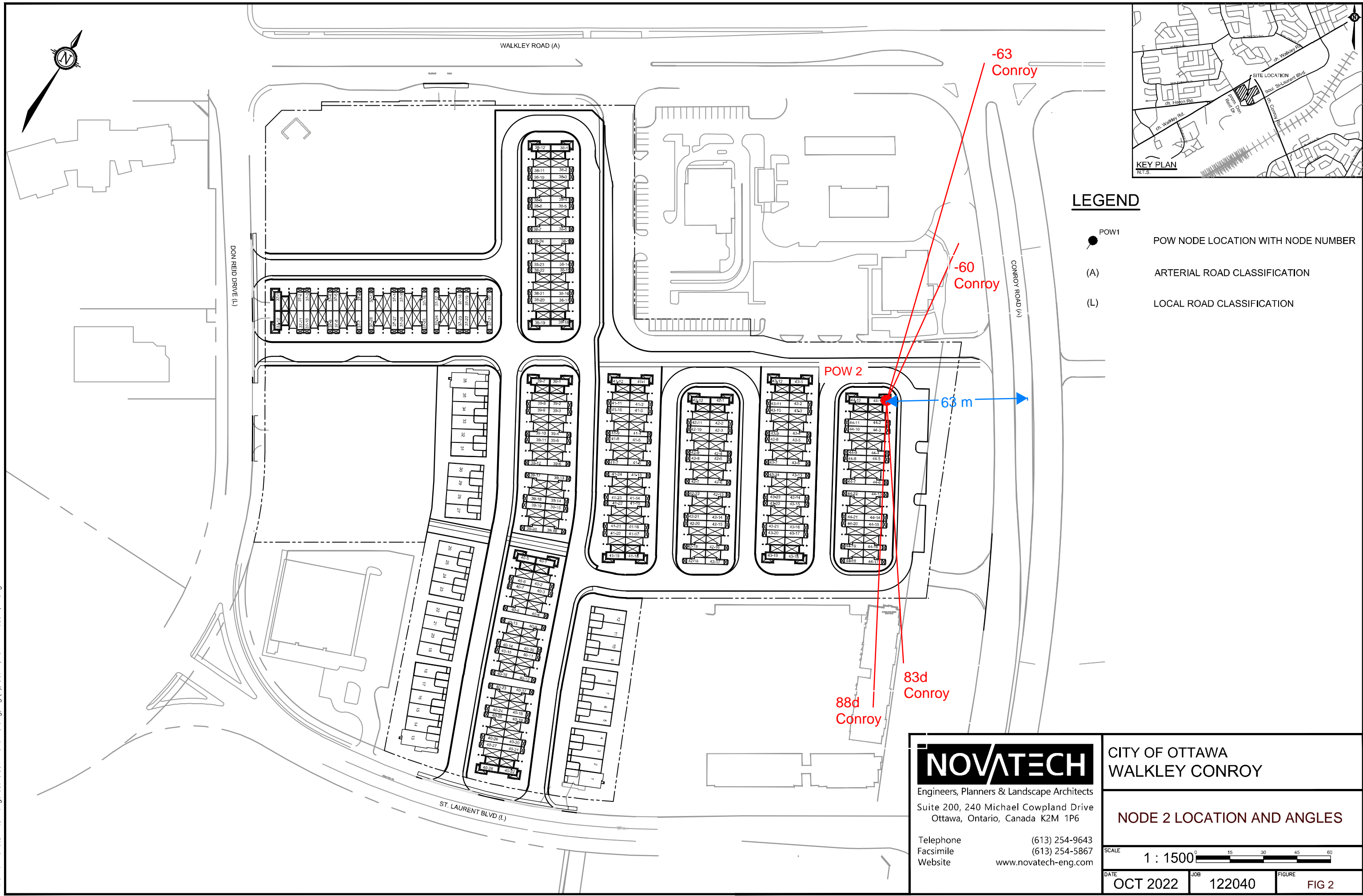
NODE 1 LOCATION AND ANGLES

SCALE 1 : 1500

DATE OCT 2022 JOB 122040 FIGURE FIG 1

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LEGEND

- POW1 POW NODE LOCATION WITH NODE NUMBER
- (A) ARTERIAL ROAD CLASSIFICATION
- (L) LOCAL ROAD CLASSIFICATION



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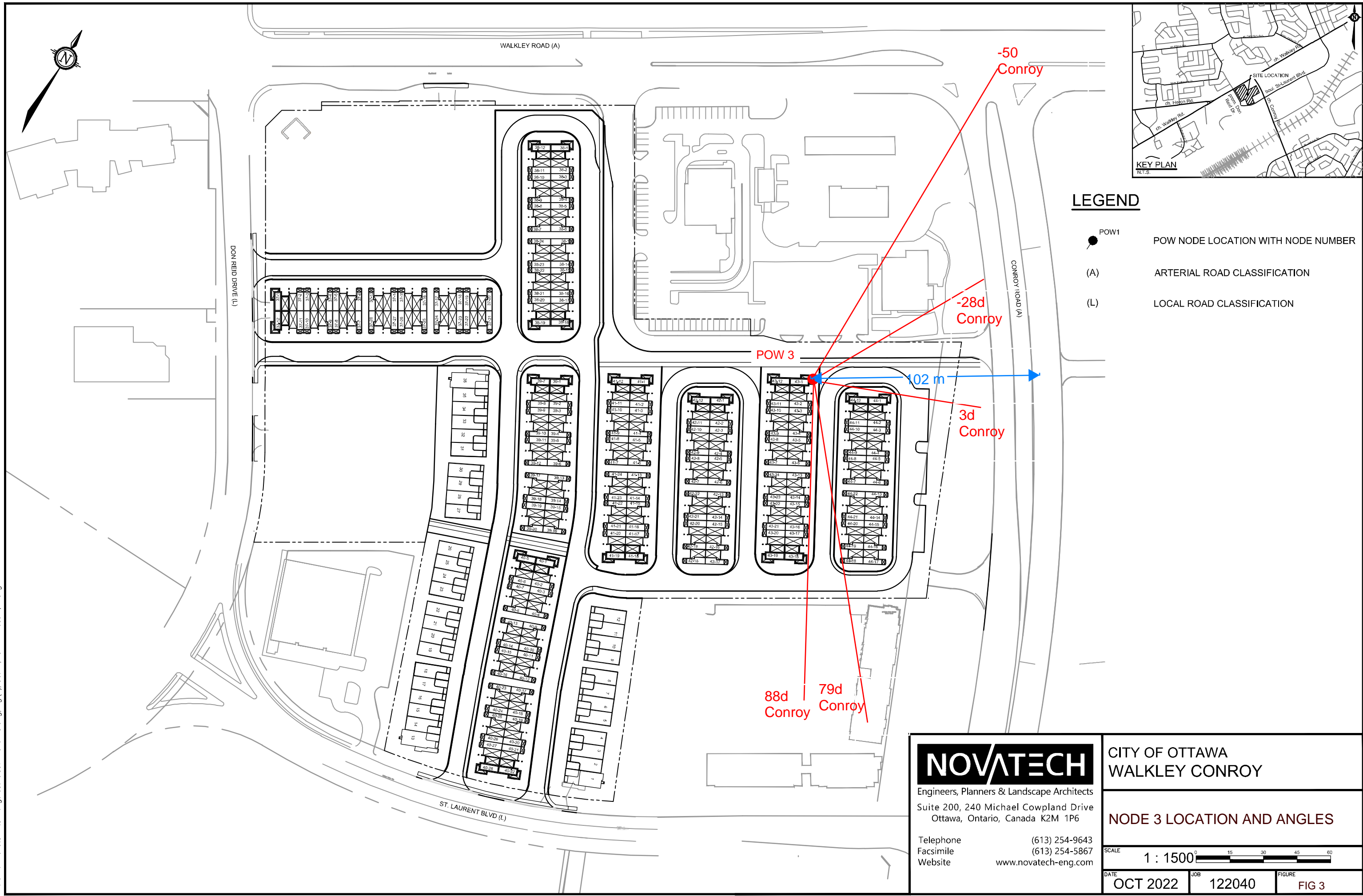
CITY OF OTTAWA
 WALKLEY CONROY

NODE 2 LOCATION AND ANGLES



DATE	JOB	FIGURE
OCT 2022	122040	FIG 2

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LEGEND

- POW1 POW NODE LOCATION WITH NODE NUMBER
- (A) ARTERIAL ROAD CLASSIFICATION
- (L) LOCAL ROAD CLASSIFICATION

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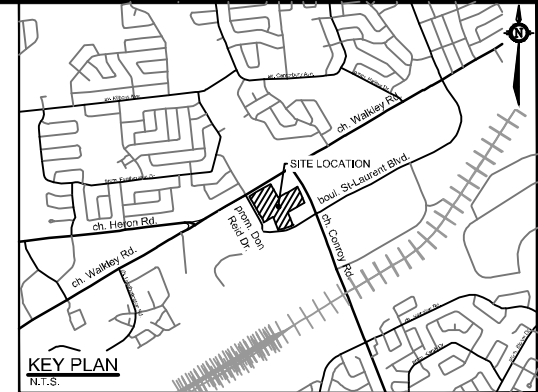
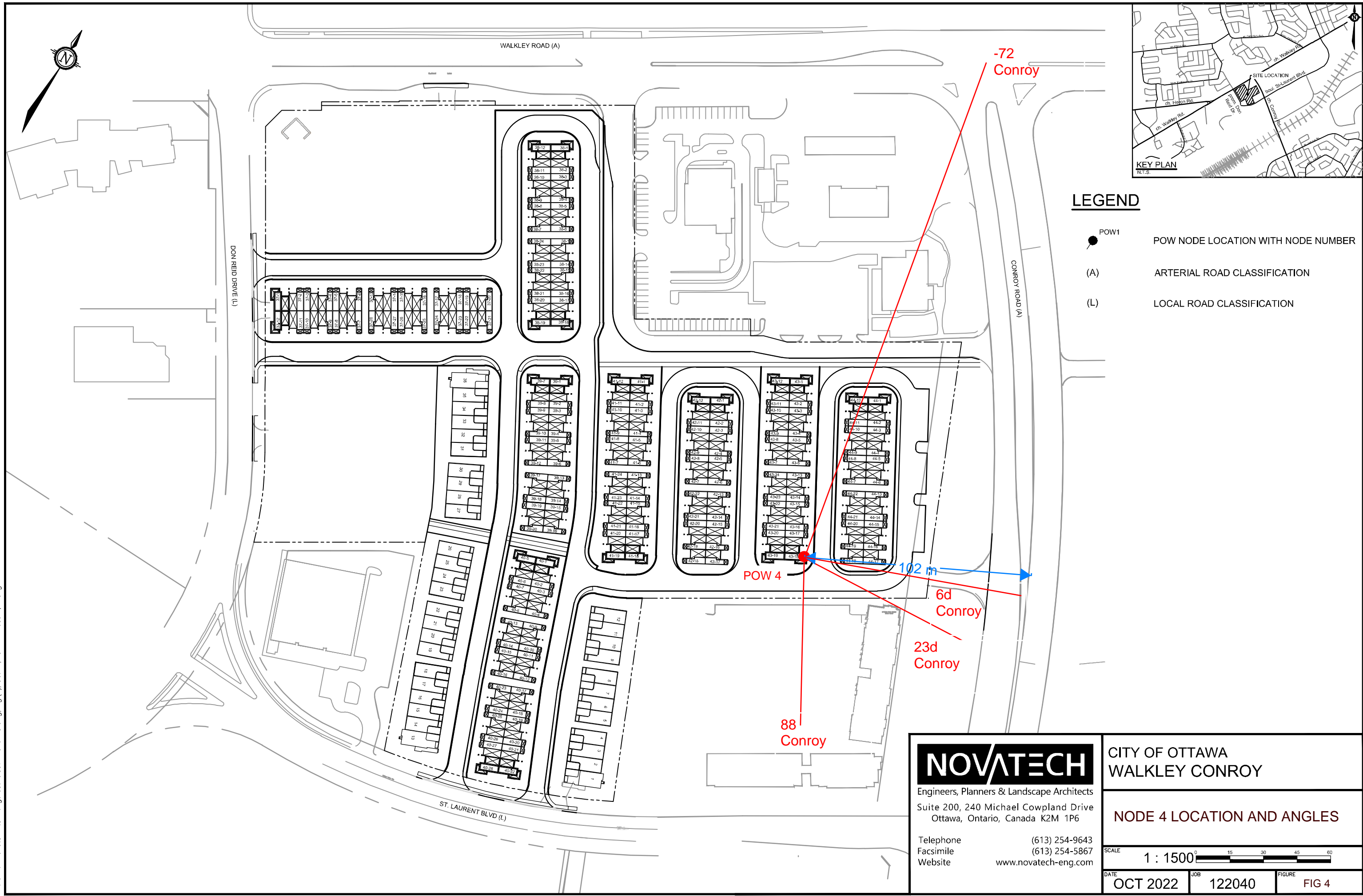
CITY OF OTTAWA
WALKLEY CONROY

NODE 3 LOCATION AND ANGLES

SCALE 1 : 1500

DATE	JOB	FIGURE
OCT 2022	122040	FIG 3

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LEGEND

- POW1 POW NODE LOCATION WITH NODE NUMBER
- (A) ARTERIAL ROAD CLASSIFICATION
- (L) LOCAL ROAD CLASSIFICATION

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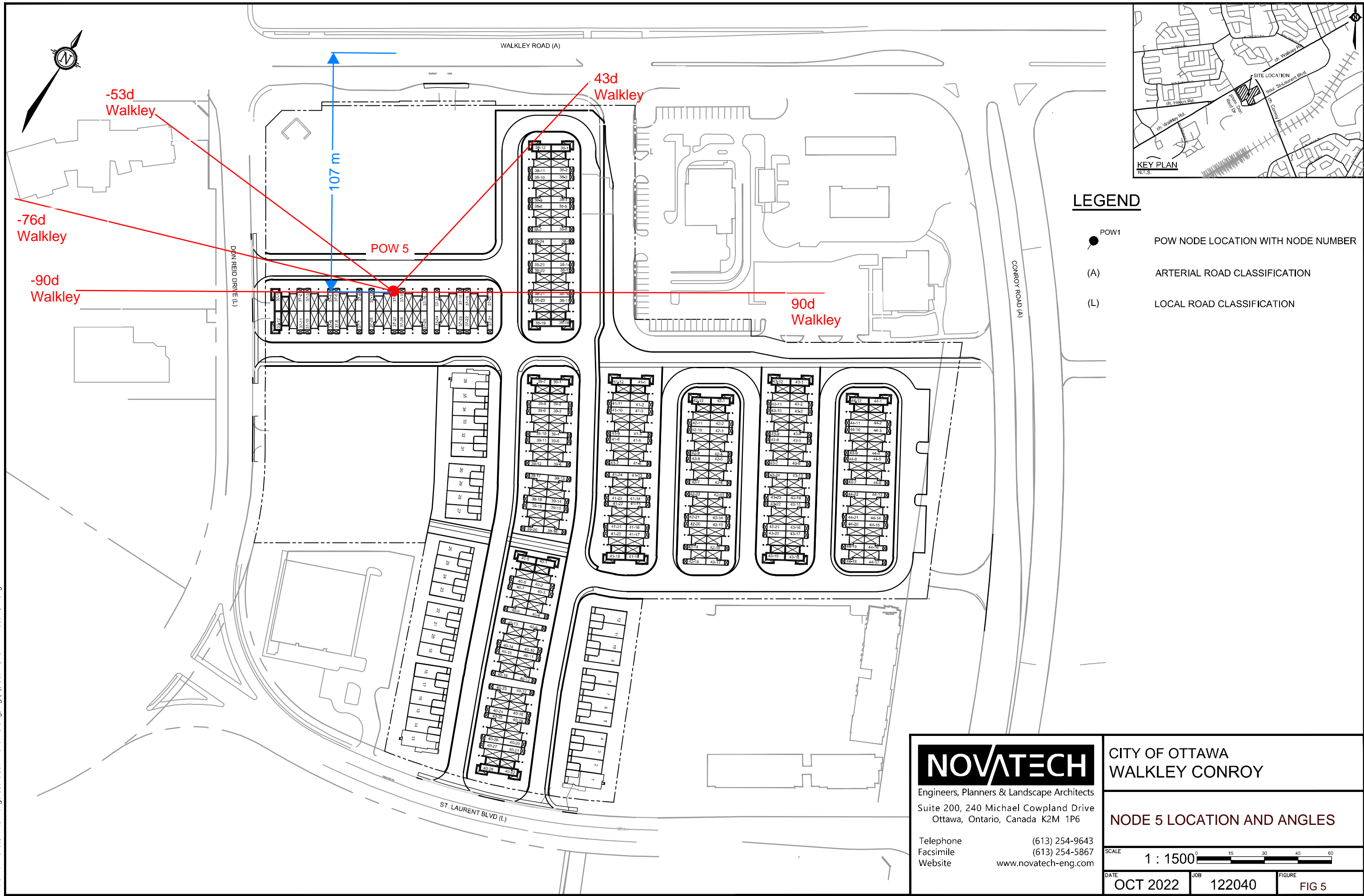
CITY OF OTTAWA
WALKLEY CONROY

NODE 4 LOCATION AND ANGLES

SCALE 1 : 1500

DATE OCT 2022 JOB 122040 FIGURE FIG 4

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LEGEND

- POW1 POW NODE LOCATION WITH NODE NUMBER
- (A) ARTERIAL ROAD CLASSIFICATION
- (L) LOCAL ROAD CLASSIFICATION

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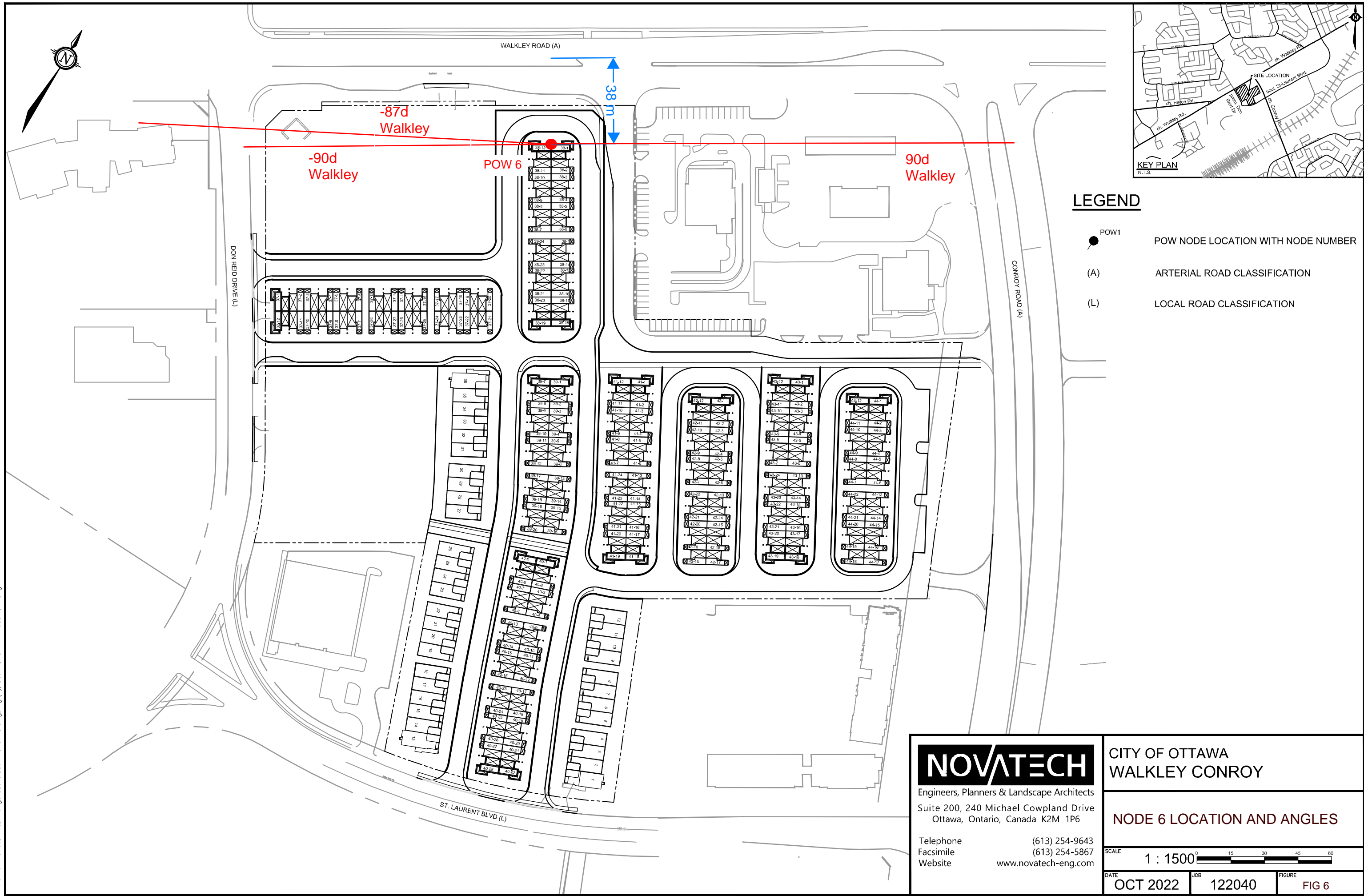
CITY OF OTTAWA
 WALKLEY CONROY

NODE 5 LOCATION AND ANGLES

SCALE 1 : 1500

DATE OCT 2022 JOB 122040 FIGURE FIG 5

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LEGEND

- POW1 POW NODE LOCATION WITH NODE NUMBER
- (A) ARTERIAL ROAD CLASSIFICATION
- (L) LOCAL ROAD CLASSIFICATION

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CITY OF OTTAWA WALKLEY CONROY

NODE 6 LOCATION AND ANGLES

SCALE 1 : 1500

DATE OCT 2022 JOB 122040 FIGURE FIG 6