

Noise Feasibility Study

Proposed Residential Development

2207 Dixie Road

Mississauga, Ontario

Prepared for:

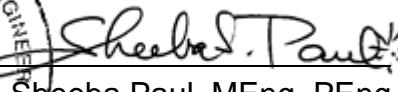
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HGC Project No: 01900470

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1 Introduction and Summary

HGC Engineering was retained by Fountain Hill Construction and Consulting Ltd. to conduct a noise feasibility study for a proposed residential development located at 2207 Dixie Road, Mississauga, Region of Peel, Ontario. Lands surrounding the subject site are predominantly residential. The residential development will consist of one block of 4 townhouse units including a deck over the laneway at the rear. The study is required by the City of Mississauga and Region of Peel as part of the planning and approvals process.

The primary sources of noise were determined to be road traffic from Dixie Road and The Queensway. Road traffic data was obtained from the Region of Peel for both Dixie Road and The Queensway. The predicted sound levels were compared to the guidelines of the Ministry of Environment, Conservation and Parks (MECP), the Region of Peel and the City of Mississauga to develop noise control recommendations.

The results of the study indicate that the future daytime and nighttime sound levels of all facades with exposure to Dixie Road will exceed MECP guidelines and will require noise control measures. Central air conditioning units are required for all 4 residential units, and upgraded building components are required for the façades facing The Queensway and Dixie Road. Noise warning clauses are also required for those units to inform future occupants of traffic noise impact and to address sound level excesses. For the east façade, any building construction meeting the minimum requirements of the Ontario Building Code will provide sufficient acoustical insulation for indoor spaces.

2 Site Description and Noise Sources

Figure 1 is a key plan indicating the location of the proposed site. The site is located at the northeast intersection of Dixie Road and Venta Ave in the City of Mississauga, Ontario. Figure 2 shows the proposed site plan by Otto Palfy dated August 26, 2019. The proposed development will consist of one block of 4 townhouse residential units with landscaped area and elevated decks at the rear.

HGC Engineering personnel visited the site on July 25, 2019 to make observations of the acoustical environment. During the site visit, it was noted that the primary source of noise impacting the site is road traffic on Dixie Road, with minor impact from traffic on The Queensway. Negligible impact from road traffic was observed from Venta Ave. The site is currently occupied by a single storey residential building, which will be demolished for the construction of the proposed townhouse block. Existing two storey residences surround the site area immediately to the north and east. Areas around the site area is flat and mostly residential. There are some commercial/medical uses on the west side of Dixie Road. There are no significant sources of stationary noise within 500 m of the subject site.

3 Noise Level Criteria

3.1 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”, release date October 21, 2013, and are listed in Table I below. The values in Table I are energy equivalent (average) sound levels [L_{EQ}] in units of A-weighted decibels [dBA].

Table I: MECP Road Traffic Noise Criteria (dBA)

Area	Daytime L_{EQ} (16 hour) Road	Nighttime L_{EQ} (8 hour) Road
Outdoor Living Area	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. Nighttime refers to the time 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. Small balconies are not considered OLAs for the purposes of assessment. Terraces greater than 4 m in depth (measured perpendicular to the building façade) are considered to be OLAs.

The guidelines in the MECP publication allow the daytime sound levels 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 practical. The maximum acoustic fence height in the Region of Peel is 2.0 m with a maximum combined berm and fence height of 4 m, and fence heights up to 2.4 m have been considered in the past. In the case that the guideline criterion of 55 dBA cannot be met, it must be demonstrated to the Region of Peel that it is not technically feasible to meet the 55 dBA criterion with a warning clause. The City of Mississauga allows up to a 5 dBA excess from the MECP guideline criteria for OLA sound levels if tenants and purchasers are notified by

appropriate warning clauses, and road noise necessitating central air conditioning or provisions for central air conditioning will also require notices stipulated by the MECP guideline.

A central air conditioning system as an alternative means of ventilation to open windows is required for dwellings where nighttime sound levels outside bedroom or living/dining room windows exceed 60 dBA (60 dBA or greater for the Region of Peel) or daytime sound levels outside bedroom or 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 or living/dining room windows are in the range of 51 to 59 dBA or when daytime sound levels at bedroom or living/dining room windows are in the range of 56 to 65 dBA.

Building components such as walls, windows and doors must be designed to achieve indoor sound level criteria when the plane of window nighttime sound level is greater than 60 dBA (60 dBA or greater for the Region of Peel) or the daytime sound level is greater than 65 dBA due to road traffic noise.

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

4 Traffic Sound Level Assessment

4.1 Road Traffic Data

Traffic data for Dixie Road was obtained from the Region of Peel in the form of ultimate AADT traffic values, and is provided in Appendix A. An ultimate volume of 48 600 vehicles per day at a posted speed limit of 60 km/h was applied for the analysis. A commercial vehicle percentage of 3.3% for medium trucks and 2.1% for heavy trucks was applied. A day/night split of 92%/8% was used as provided in the data.

Traffic data for The Queensway was obtained from the Region of Peel in the form of ultimate AADT traffic values, and is provided in Appendix A. An ultimate volume of 32 400 vehicles per day at a posted speed limit of 60 km/h was applied for the analysis. A commercial vehicle percentage of 3.4% for medium trucks and 3.9% for heavy trucks was applied. A day/night split of 97%/3% was used as provided in the data. Table II summarizes the traffic volume data used in this study.

Table II: Ultimate Road Traffic Data

Road Name		Cars	Medium Trucks	Heavy Trucks	Total
Dixie Road	Daytime	42 298	1 475	939	44 712
	Nighttime	3 678	128	82	3 888
	Total	45 976	1 604	1 021	48 600
The Queensway	Daytime	29 134	1 069	1 226	31 428
	Nighttime	901	33	38	972
	Total	30 035	1 102	1 264	32 400

4.2 Road Traffic Noise Predictions

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

Predictions of the traffic sound levels were chosen around the proposed residential building to obtain an appropriate representation of future sound levels at various façades. Sound levels were predicted at the plane of the 4th storey bedroom and/or living/dining room windows during daytime and

nighttime hours to investigate ventilation and façade construction requirements. Figure 2 shows the concept plan of the site with prediction locations. The results of these predictions are summarized in Table III.

Table III: Predicted Road Traffic Sound Levels [dBA], Without Mitigation

Prediction Location	Description	Daytime – in the OLA $L_{EQ-16\ hr}$	Daytime – at the Façade $L_{EQ-16\ hr}$	Nighttime – at the Facade $L_{EQ-8\ hr}$
A	Façade facing Queensway	--	68	60
B	Façade facing Dixie Rd	--	71	63
C	Façade facing Venta Ave	--	67	59
D	Façade facing deck	--	55	<50

5 Discussions and Recommendations

The sound level predictions indicate that the future traffic sound levels at the facades with direct or flanking exposure to Dixie Road and The Queensway are above the MECP guideline criteria. The following discussion outlines the recommendations for acoustic barrier requirements, ventilation requirements, upgraded building façade construction, and warning clauses to achieve the noise criteria stated in Table I.

5.1 Outdoor Living Areas

The dwelling units in the proposed residential building have elevated decks at the rear that are less than 4 m in depth. These areas are not considered to be outdoor living areas under MECP guidelines, and therefore are exempt from traffic noise assessment.

There are no other common outdoor amenity areas indicated on the site plan.

5.2 Indoor Living Areas and Ventilation Requirements

Air Conditioning

The predicted future sound levels outside the 4th storey window with direct or flanking exposure to Dixie Road are greater than 65 dBA during daytime hours and/or 59 dBA during nighttime hours. To address these excesses, all 4 townhouses units are required to be equipped with central air conditioning systems so that windows may remain closed. These townhouse units are shown in Figure 3. Window or through-the-wall air conditioning units are not recommended because of the noise they produce and because the units penetrate through the exterior wall which degrades the overall sound 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, as applicable.

5.3 Building Façade Constructions

The predicted sound levels at the façades with exposure Dixie Road will exceed 65 dBA during daytime and/or 60 dBA during nighttime. MECP guidelines stipulate that in such cases, building components including windows, walls, and doors be designed so that the indoor sound levels comply

with the noise criteria in Table I.

The required building components are selected based on the Acoustical Insulation Factor (AIF) value for road traffic. Calculations were performed to determine the acoustical insulation factors to maintain indoor sound levels within MECP guidelines. The calculation methods were developed by the National Research Council (NRC). They are based on the predicted future sound levels at the building facades, and the area ratios of the facade components (walls, windows and doors) and the floor area of the adjacent room.

A summary of the Sound Transmission Class (STC) requirements are provided in Table IV based on the possibility of sound entering the building through windows only since the exterior wall is mainly brick. Window to floor area ratios and wall to floor area ratios were calculated from the elevation details dated August 26, 2019, provided in Appendix C, to determine window STC ratings to mitigate road traffic noise. The window to floor ratios was measured to be 25 % for living/dining rooms, and ranges from 12 % to 23 % for bedrooms.

Table IV: Minimum STC Requirements

Prediction Location	Description	Space	STC Glazing Requirements
A	Façade facing Queensway	Living/Dining	STC-30
		Bedroom	STC-30
B	Façade facing Dixie Rd	Living/Dining	STC-30
		Bedroom	STC-30
C	Façade facing Venta Ave	Living/Dining	STC-30
		Bedroom	OBC

Notes: OBC – Ontario Building Code

The other façade of the proposed residential building, which is facing away from the road traffic noise source, has predicted sound levels less than or equal to 65 dBA during daytime and less than or equal to 60 dBA during nighttime. Thus, any exterior wall and double-glazed window construction meeting the minimum requirements of the Ontario Building Code (OBC) will provide adequate sound insulation.

6 Warning Clauses

The MECP guidelines recommend that warning clauses be included in the property and tenancy agreements and offers of purchase and sale for all lots/units with anticipated traffic sound level excesses. The following noise warning clauses are required for specific dwellings as indicated in Table V.

Suggested wording for future dwellings with façade sound levels exceeding the MECP criteria for which building design and air conditioning have been specified is given below.

Type A:

Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road traffic may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the Municipality's and the Ministry of the Environment, Conservation and Parks noise criteria.

Suggest wording for future dwellings which will have central air conditioning units to be installed is given below.

Type B:

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 sound level limits of the Municipality and the Ministry of the Environment, Conservation and Parks.

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

7 Summary and Recommendations

The following list and Table V summarize the recommendations made in this report. The reader is referred to Figure 3 and previous sections of the report where these recommendations are applied and discussed in more detail.

1. Central air conditioning units will be required for the four townhouse units such that windows may remain closed.
2. Upgraded glazing construction will be required for the façade facing Dixie Road, as indicated in Table IV and V. Building constructions meeting the minimum requirements of the Ontario Building Code will provide sufficient acoustical insulation for the remaining façades.
3. The use of warning clauses in the property and tenancy agreements is recommended to inform future residents of traffic noise issues.

Table V: Summary of Noise Control Requirements and Noise Warning Clauses

Description	Acoustic Barrier	Ventilation Requirements*	Type of Warning Clause	STC Glazing Requirements
Façade facing Queensway	--	Central A/C	A, B	LR/DR: STC-30 BR: STC-30
Façade facing Dixie Rd	--	Central A/C	A, B	LR/DR: STC-30 BR: STC-30
Façade facing Venta Ave	--	Central A/C	A, B	LR/DR: STC-30 BR: OBC
Façade facing deck	--	Central A/C	A, B	OBC

Notes:

* The location, installation and sound rating of the air conditioning condensers must be compliant with MECP Guideline NPC-300, as applicable.

-- no specific requirement

OBC – Meeting the minimum requirements of the Ontario Building Code

LR/DR: Living Room/Dining Room

BR: Bedroom

7.1 Implementation

To ensure that the noise control recommendations outlined above are properly implemented, it is recommended that:

1. Prior to the issuance of occupancy permits, the Municipality's building inspector or a Professional Engineer qualified to perform acoustical engineering services in the Province of Ontario should certify that the noise control measures have been properly installed, and constructed.

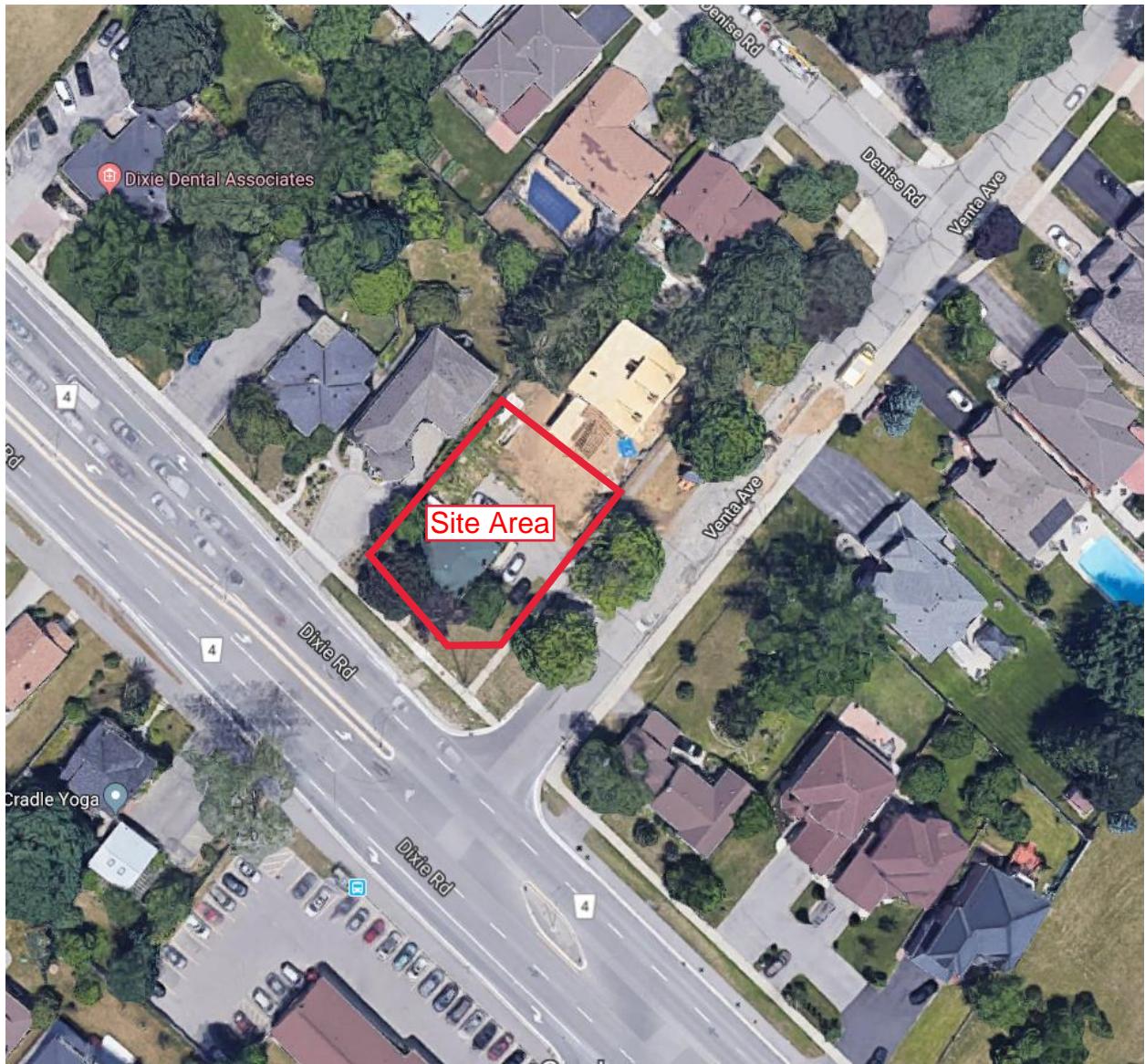


Figure 1: Key Plan

Appendix A

Road Traffic Information

Date: July 22, 2019
 From: Harry Cai, HGC Engineering
 Re: Ultimate Traffic Data Request – 2207 Dixie Rd

Harry,
 As per your request, we are providing the following traffic data:

	Existing	Ultimate
24 Hour Traffic Volume	26,880	48,600
# of Lanes	4	6
Day/Night Split	92/8	92/8
Day Trucks (% of Total Volume)	2.2% Medium 2.1% Heavy	2.2% Medium 2.1% Heavy
Night Trucks (% of Total Volume)	3.3% Medium 2.1% Heavy	3.3% Medium 2.1% Heavy
Right-of-Way Width	45 meters	
Posted Speed Limit	60 km/h	

Please note:

1. The current volume is not the Annual Average Daily Traffic, but the averaged raw volumes over three data collection days. If you need the Annual Average Traffic Volume, please visit the Peel Open Data website below:
<http://opendata.peelregion.ca/data-categories/transportation/traffic-count-stations.aspx>
2. The ultimate volume is the planned volume during a level of service 'D' where a 2 second vehicle headway and a volume to capacity ratio of 0.9 is assumed. Traffic signals and hourly variations in traffic are also incorporated into the ultimate volume.

If you require further assistance, please contact me at (905) 791-7800 ext. 4810

Regards,

Viktoriya Zaytseva
 Transportation Analyst, Transportation System Planning
 Transportation Division, Public Works, Region of Peel
 10 Peel Centre Drive, Suite B, 4th Floor, Brampton, ON, L6T 4B9
 E: viktoria.zaytseva@peelregion.ca • W: 905-791-7800 x4810

Date: July 22, 2019

From: Harry Cai, HGC Engineering

Re: Ultimate Traffic Data Request – Queensway at Dixie Rd

Harry,

As per your request, we are providing the following traffic data:

	Existing	Ultimate
24 Hour Traffic Volume	32,214	32,400
# of Lanes	4	4
Day/Night Split	97/3	97/3
Day Trucks (% of Total Volume)	2.1% Medium 3.9% Heavy	2.1% Medium 3.9% Heavy
Night Trucks (% of Total Volume)	3.4% Medium 3.2% Heavy	3.4% Medium 3.2% Heavy
Right-of-Way Width	45 meters	
Posted Speed Limit	60 km/h	

Please note:

1. The current volume is not the Annual Average Daily Traffic, but the averaged raw volumes over three data collection days. If you need the Annual Average Traffic Volume, please visit the Peel Open Data website below:
<http://opendata.peelregion.ca/data-categories/transportation/traffic-count-stations.aspx>
2. The ultimate volume is the planned volume during a level of service 'D' where a 2 second vehicle headway and a volume to capacity ratio of 0.9 is assumed. Traffic signals and hourly variations in traffic are also incorporated into the ultimate volume.

If you require further assistance, please contact me at (905) 791-7800 ext. 4810

Regards,

Viktoriya Zaytseva

Transportation Analyst, Transportation System Planning

Transportation Division, Public Works, Region of Peel

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Appendix B

Sample STAMSON 5.04 Output



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STAMSON 5.0 NORMAL REPORT Date: 06-11-2019 16:55:01
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: a.te Time Period: Day/Night 16/8 hours
Description: Location A, Facade Facing Queensway

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

Car traffic volume : 14567/451 veh/TimePeriod *
Medium truck volume : 534/17 veh/TimePeriod *
Heavy truck volume : 613/19 veh/TimePeriod *
Posted speed limit : 60 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): 16200
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 3.40
Heavy Truck % of Total Volume : 3.90
Day (16 hrs) % of Total Volume : 97.00

Data for Segment # 1: Queensway (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 : 135.00 / 135.00 m
Receiver height : 10.50 / 10.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 30.00 deg Angle2 : 90.00 deg
Barrier height : 7.00 m
Barrier receiver distance : 5.00 / 5.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Car traffic volume : 14567/451 veh/TimePeriod *
Medium truck volume : 534/17 veh/TimePeriod *
Heavy truck volume : 613/19 veh/TimePeriod *
Posted speed limit : 60 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): 16200
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 3.40
Heavy Truck % of Total Volume : 3.90
Day (16 hrs) % of Total Volume : 97.00

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

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 3 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 160.00 / 160.00 m
Receiver height : 4.50 / 10.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 30.00 deg Angle2 : 90.00 deg
Barrier height : 7.00 m
Barrier receiver distance : 5.00 / 5.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00
Road data, segment # 3: Dixie (day/night)

Car traffic volume : 21149/1839 veh/TimePeriod *
Medium truck volume : 738/64 veh/TimePeriod *
Heavy truck volume : 469/41 veh/TimePeriod *
Posted speed limit : 60 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): 24300
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 3.30
Heavy Truck % of Total Volume : 2.10
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 21.00 / 21.00 m
Receiver height : 10.50 / 10.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 4: Dixie (day/night)

Car traffic volume : 21149/1839 veh/TimePeriod *
Medium truck volume : 738/64 veh/TimePeriod *
Heavy truck volume : 469/41 veh/TimePeriod *
Posted speed limit : 60 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): 24300
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 3.30
Heavy Truck % of Total Volume : 2.10
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 4: Dixie (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 34.00 / 34.00 m
Receiver height : 10.50 / 10.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
Results segment # 1: Queensway (day)

Source height = 1.41 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
+ + + +
1.41 ! 10.50 ! 10.16 ! 10.16

ROAD (53.65 + 49.88 + 0.00) = 55.17 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 30 0.39 69.43 0.00 -13.29 -2.49 0.00 0.00 0.00 53.65

30 90 0.00 69.43 0.00 -9.54 -4.77 0.00 0.00 -0.13 54.98*
30 90 0.39 69.43 0.00 -13.29 -6.26 0.00 0.00 0.00 49.88

* Bright Zone !

Segment Leq : 55.17 dBA

Results segment # 2: Queensway (day)

Source height = 1.41 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.41	4.50	4.40	4.40

ROAD $(44.96 + 40.87 + 0.00) = 46.39$ dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	30	0.57	69.43	0.00	-16.17	-2.74	0.00	-5.57	0.00	44.96
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30	90	0.57	69.43	0.00	-16.17	-6.83	0.00	-5.57	0.00	40.87
30	90	0.15	69.43	0.00	-11.85	-5.40	0.00	0.00	-11.19	40.99

Segment Leq : 46.39 dBA

Results segment # 3: Dixie (day)

Source height = 1.20 m

ROAD $(0.00 + 65.15 + 0.00) = 65.15$ dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	0	0.00	69.62	0.00	-1.46	-3.01	0.00	0.00	0.00	65.15
-----	---	------	-------	------	-------	-------	------	------	------	-------

Segment Leq : 65.15 dBA

Results segment # 4: Dixie (day)

Source height = 1.20 m

ROAD $(0.00 + 63.06 + 0.00) = 63.06$ dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	0	0.00	69.62	0.00	-3.55	-3.01	0.00	0.00	0.00	63.06
-----	---	------	-------	------	-------	-------	------	------	------	-------

Segment Leq : 63.06 dBA

Total Leq All Segments: 67.53 dBA

Results segment # 1: Queensway (night)

Source height = 1.41 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
+-----+-----+-----+
1.41 ! 10.50 ! 10.16 ! 10.16

ROAD $(41.59 + 37.82 + 0.00) = 43.11$ dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 30 0.39 57.37 0.00 -13.29 -2.49 0.00 0.00 0.00 41.59

30 90 0.00 57.37 0.00 -9.54 -4.77 0.00 0.00 -0.13 42.92*
30 90 0.39 57.37 0.00 -13.29 -6.26 0.00 0.00 0.00 37.82

* Bright Zone !

Segment Leq : 43.11 dBA

Results segment # 2: Queensway (night)

Source height = 1.41 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
+-----+-----+-----+
1.41 ! 10.50 ! 10.22 ! 10.22

ROAD $(40.56 + 36.79 + 0.00) = 42.08$ dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 30 0.39 57.37 0.00 -14.32 -2.49 0.00 0.00 0.00 40.56

30 90 0.00 57.37 0.00 -10.28 -4.77 0.00 0.00 -0.13 42.19*
30 90 0.39 57.37 0.00 -14.32 -6.26 0.00 0.00 0.00 36.79

* Bright Zone !

Segment Leq : 42.08 dBA

Results segment # 3: Dixie (night)

Source height = 1.21 m

ROAD (0.00 + 57.56 + 0.00) = 57.56 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	0	0.00	62.03	0.00	-1.46	-3.01	0.00	0.00	0.00	57.56
-----	---	------	-------	------	-------	-------	------	------	------	-------

Segment Leq : 57.56 dBA

Results segment # 4: Dixie (night)

Source height = 1.21 m

ROAD (0.00 + 55.47 + 0.00) = 55.47 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90	0	0.00	62.03	0.00	-3.55	-3.01	0.00	0.00	0.00	55.47
-----	---	------	-------	------	-------	-------	------	------	------	-------

Segment Leq : 55.47 dBA

Total Leq All Segments: 59.82 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 67.53
(NIGHT): 59.82

Appendix C

Supportive Drawings



ACOUSTICS

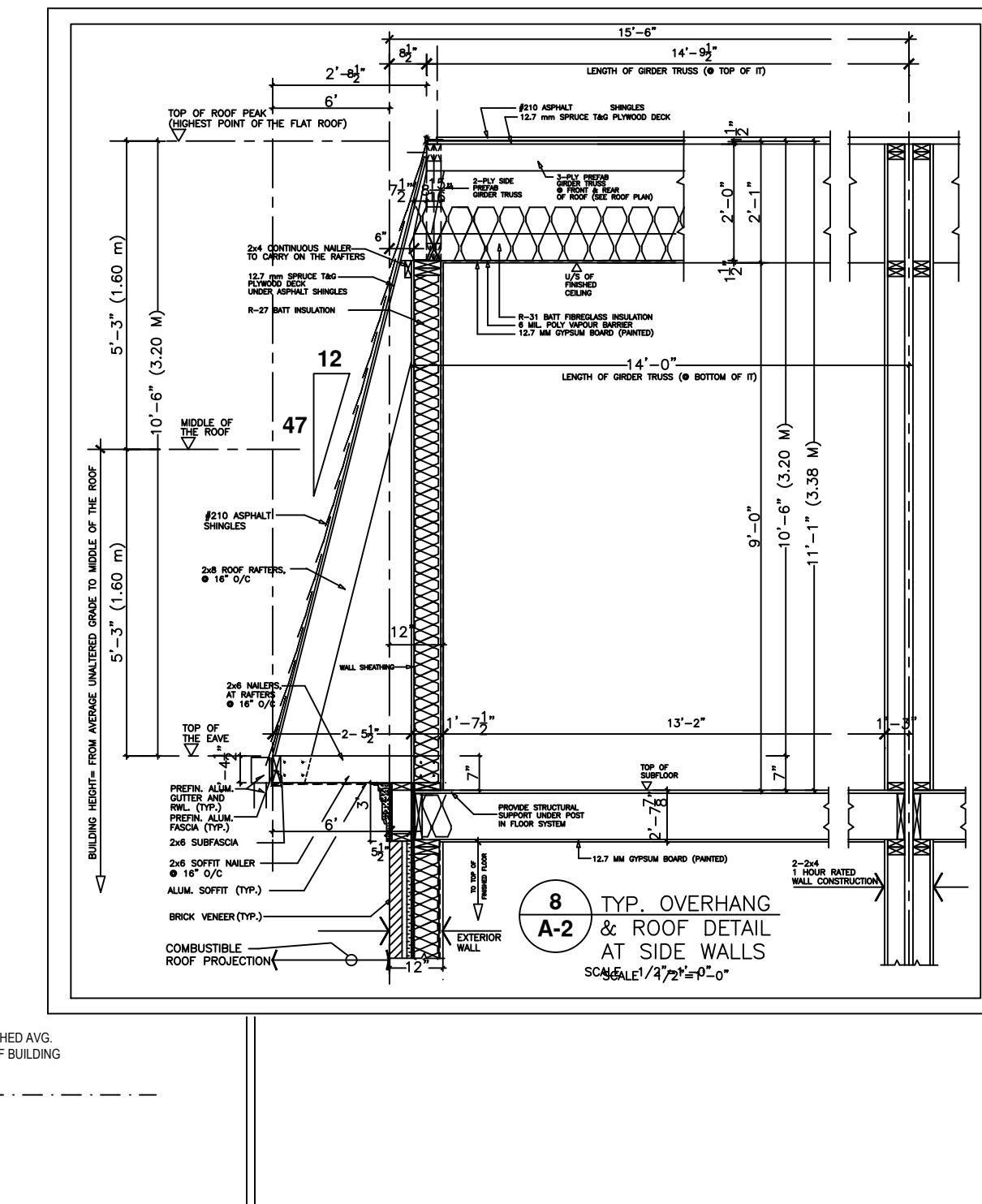
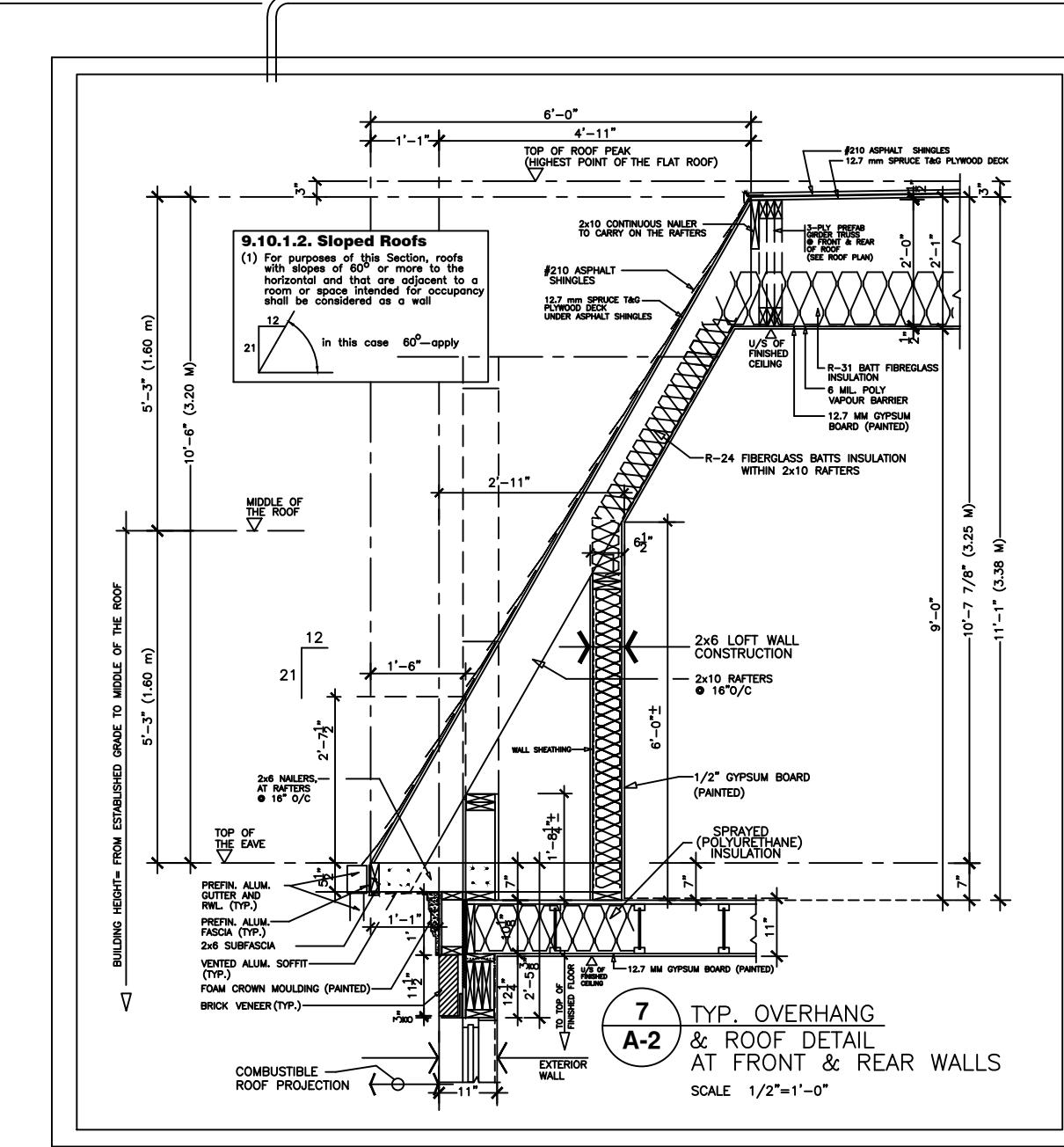
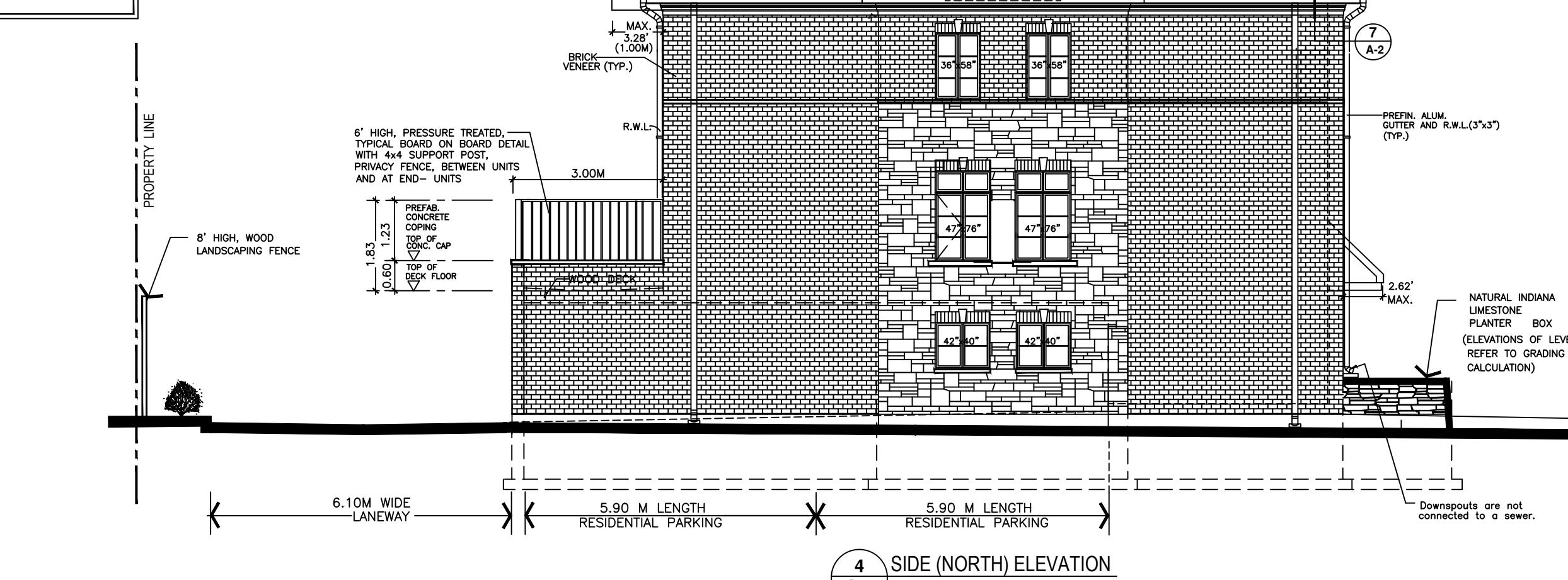
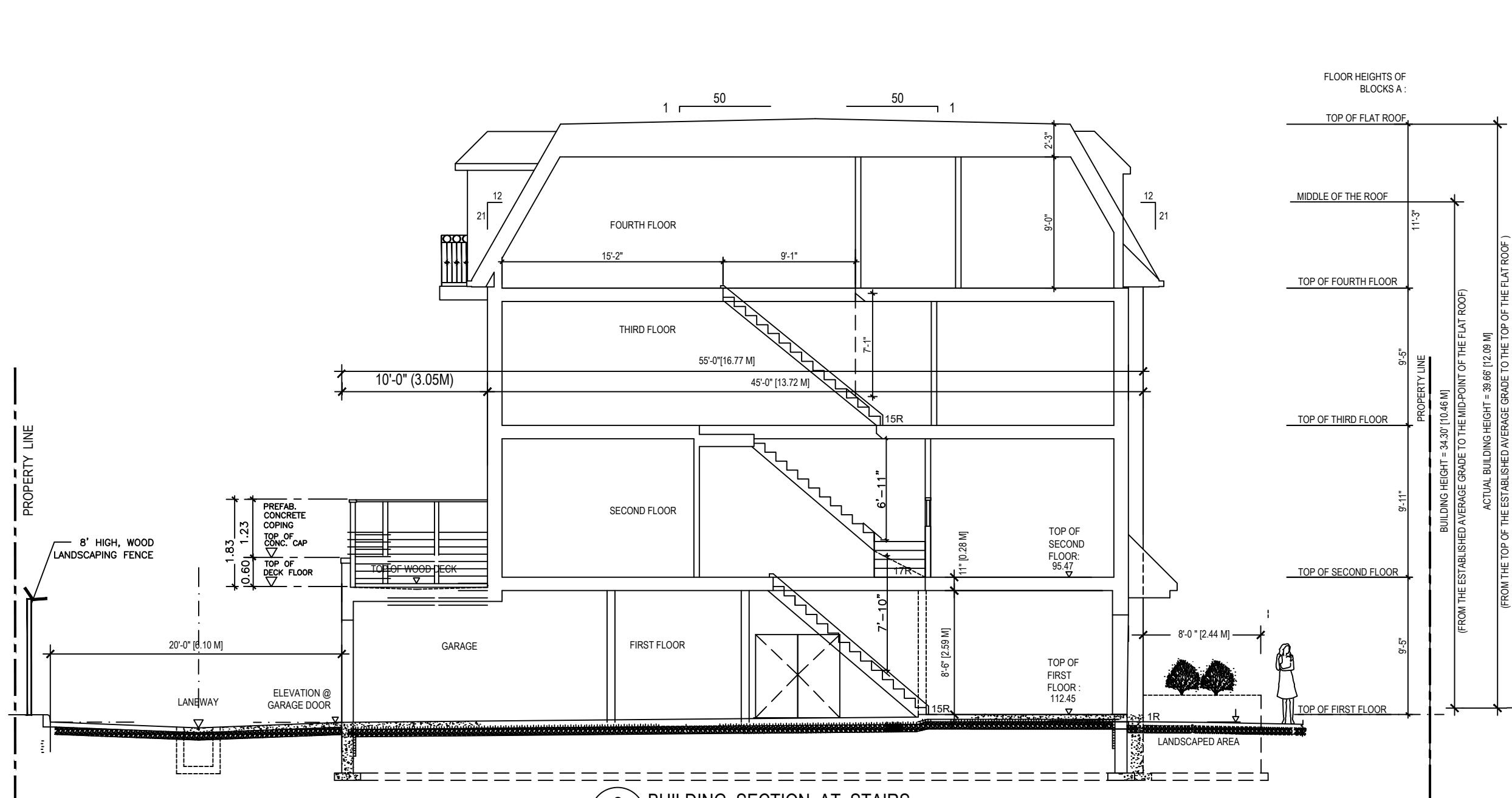
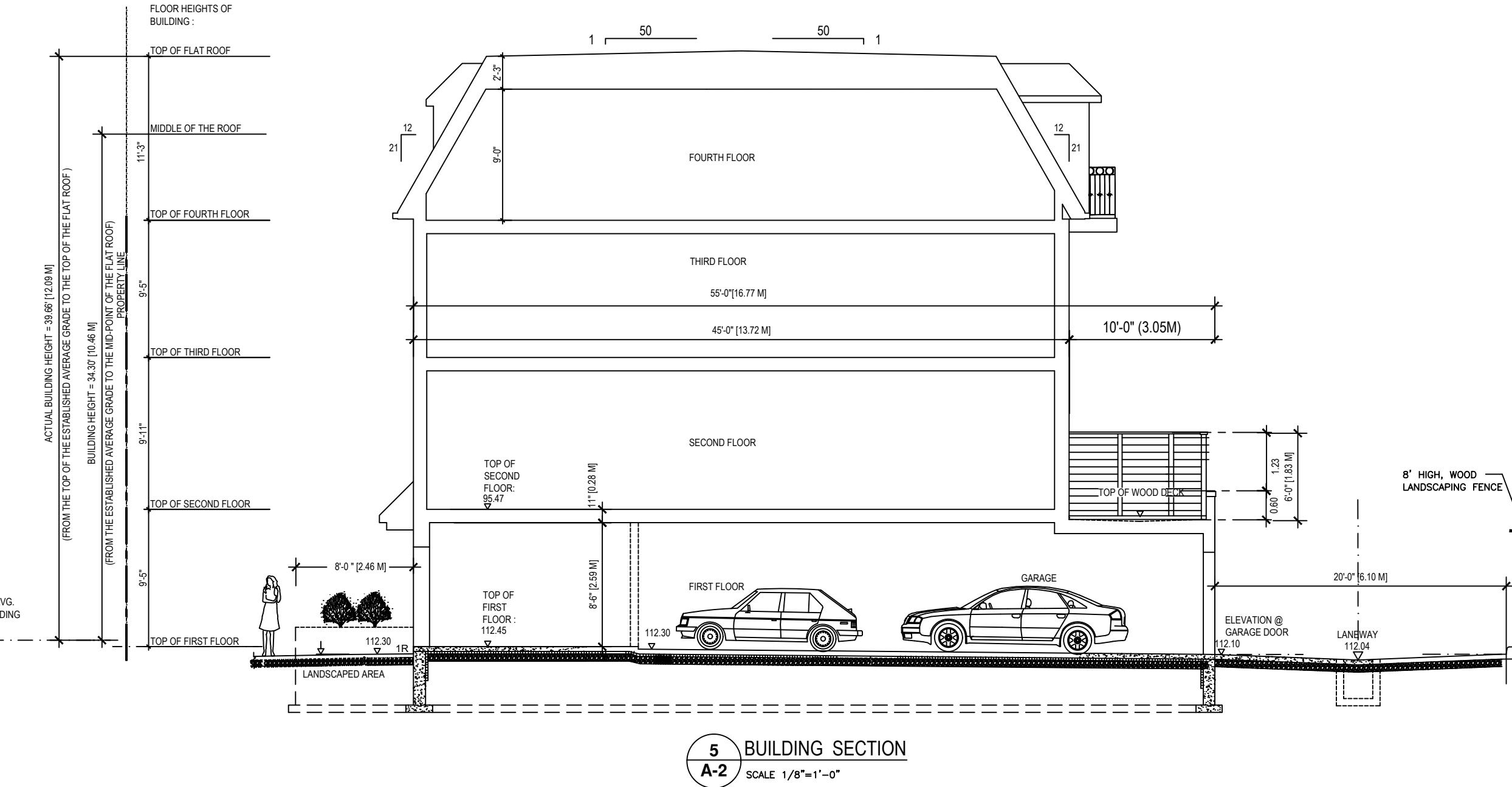
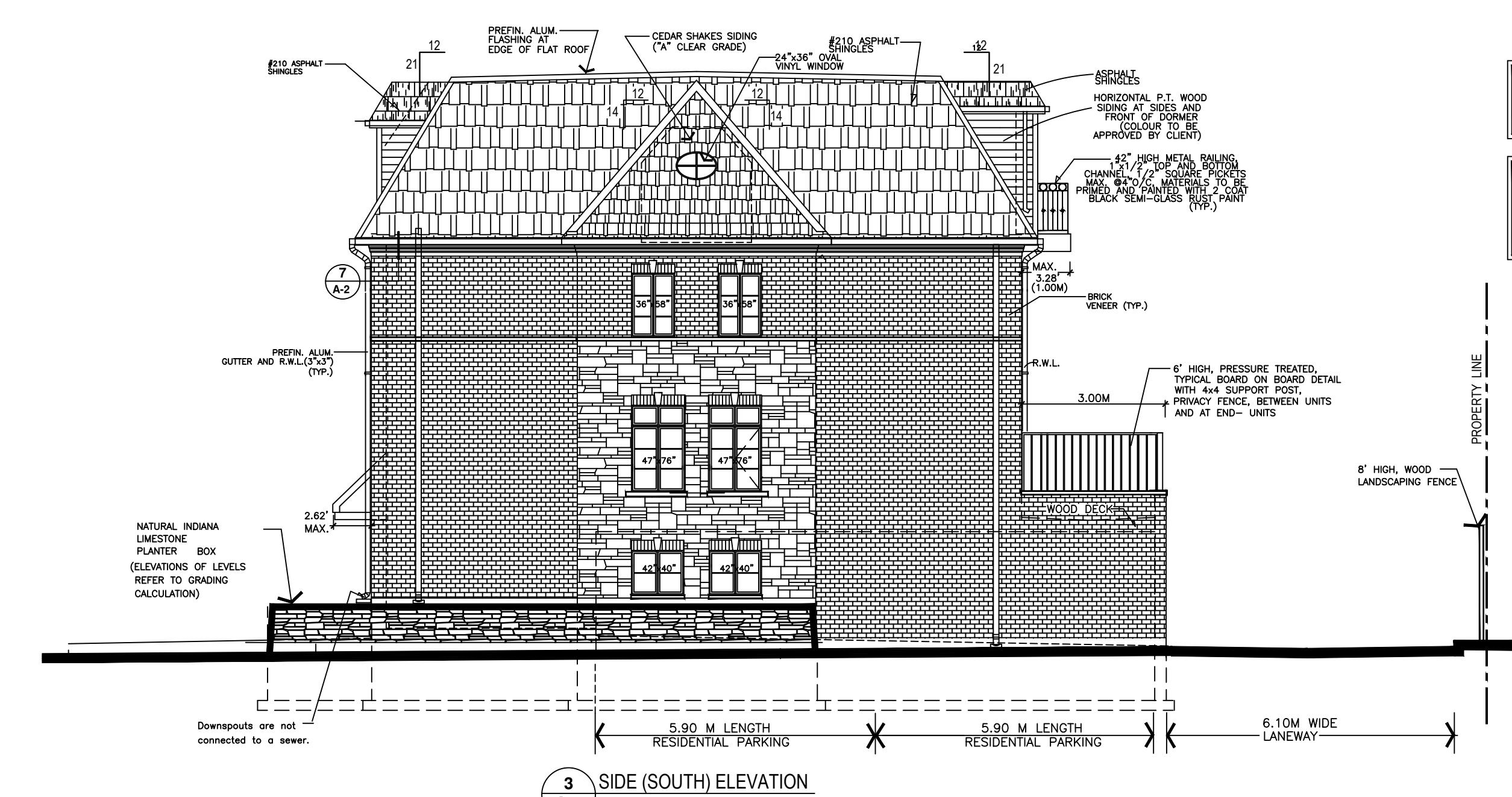
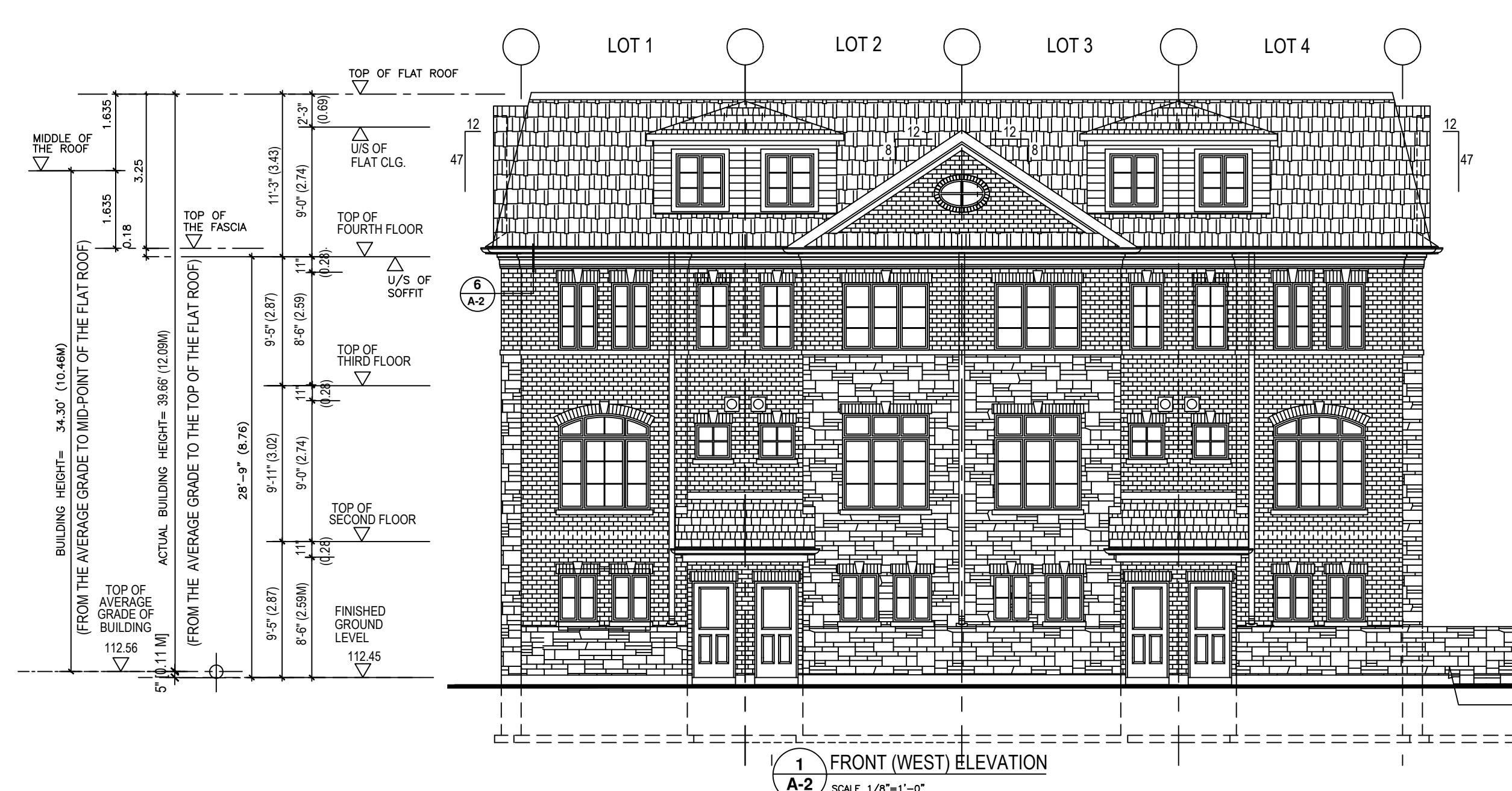
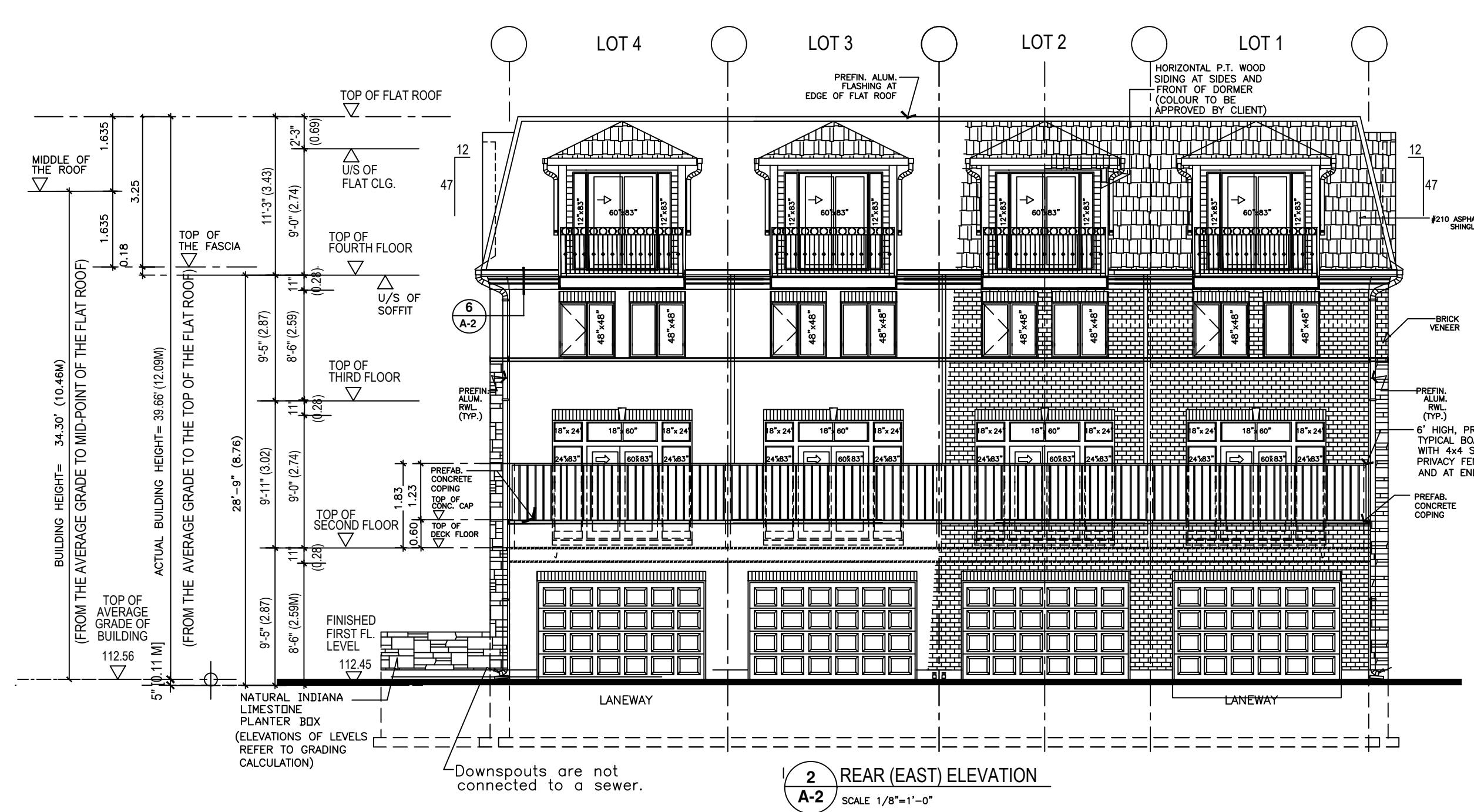


NOISE



VIBRATION

www.hgengineering.com



9.27.7. Wood Shingles and Shakes

9.27.7.1. Materials

- (1) Shingles onto shales shall conform to:
(a) CSA O118.1, "Western Cedar Shingles and Shingles", or
(b) Eastern White Cedar Shingles.
- (2) Western cedar shingles shall be not less than No. 1 grade or Handsplit grade, and western cedar shingles no less than No. 2 grade, except that No. 3 grade may be used for undercoursing.
- (3) No. 3 grade shingles shall be at least B (clear) grade, except that C grade may be used for undercoursing.

2 ISSUED FOR ZONING APPROVAL SEPT. 3 /2019 OP
1 FOR REVIEW AUG. 26 /2019 OP
NO REVISIONS DATE BY

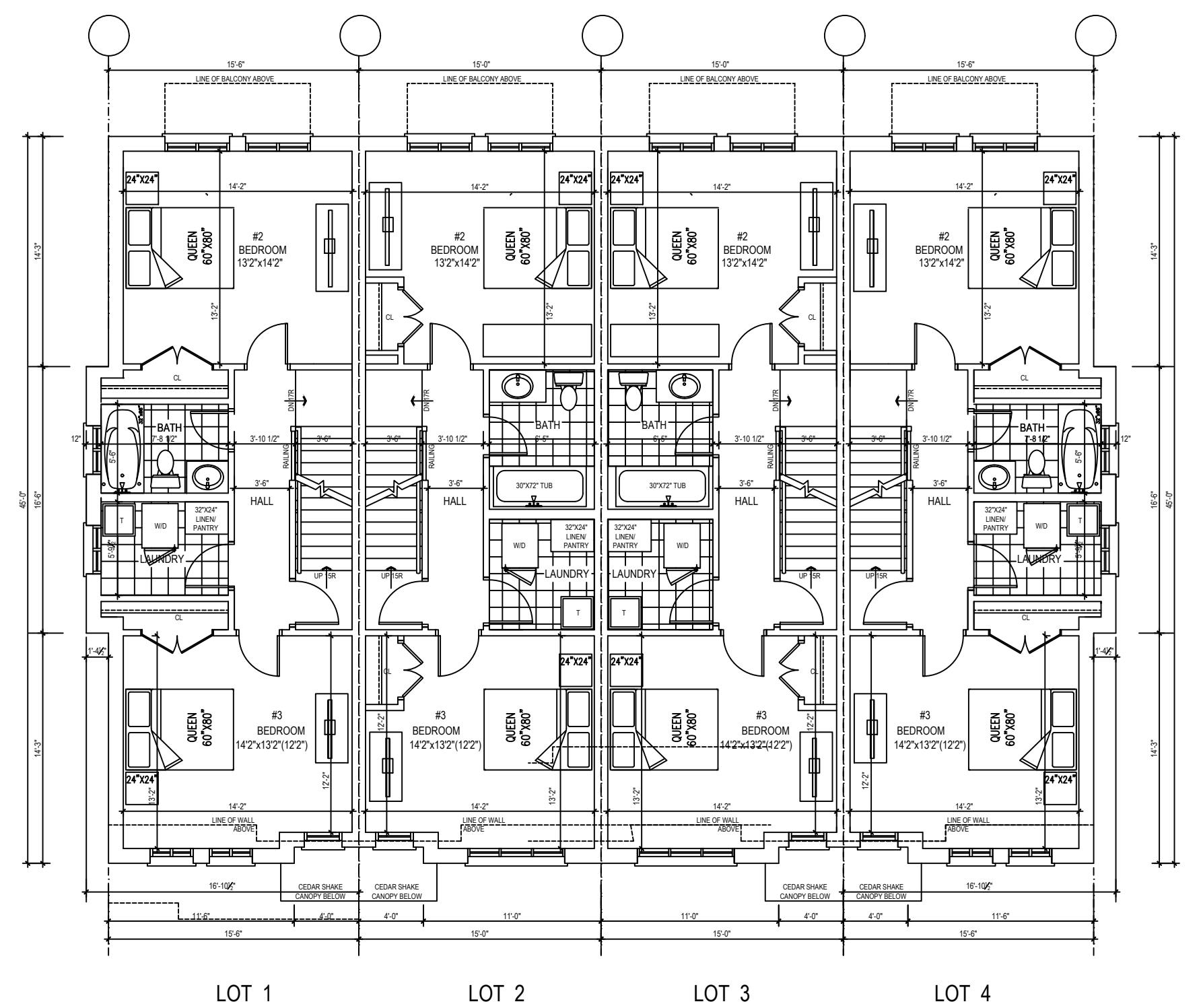
CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND REPORT ANY DISCREPANCIES TO THE DESIGNER BEFORE PROCEEDING WITH THE WORK
DO NOT SCALE THE DRAWINGS

PROJECT 4-UNIT TOWNHOMES
2207 DIXIE ROAD
Mississauga, Ontario
SCALE 1/8"=1'-0"
DRAWING TITLE

ELEVATIONS, SECTIONS, DETAILS

DEVELOPER Fountain Hill Construction & Consulting Ltd.
200 Ronson Drive, Suite 101
Etobicoke, Ontario
M9W 5Z9

DESIGNED AND	OTTO PALFY	PROJECT NO	2019-XX
CHECKED BY	J D	DRAWING NO	A-2
DATE	AUG. 26 /2019	PROJ. NO	PROJ. 11 2207 DIXIE RD-A-2-elevations-2
ISSUED			

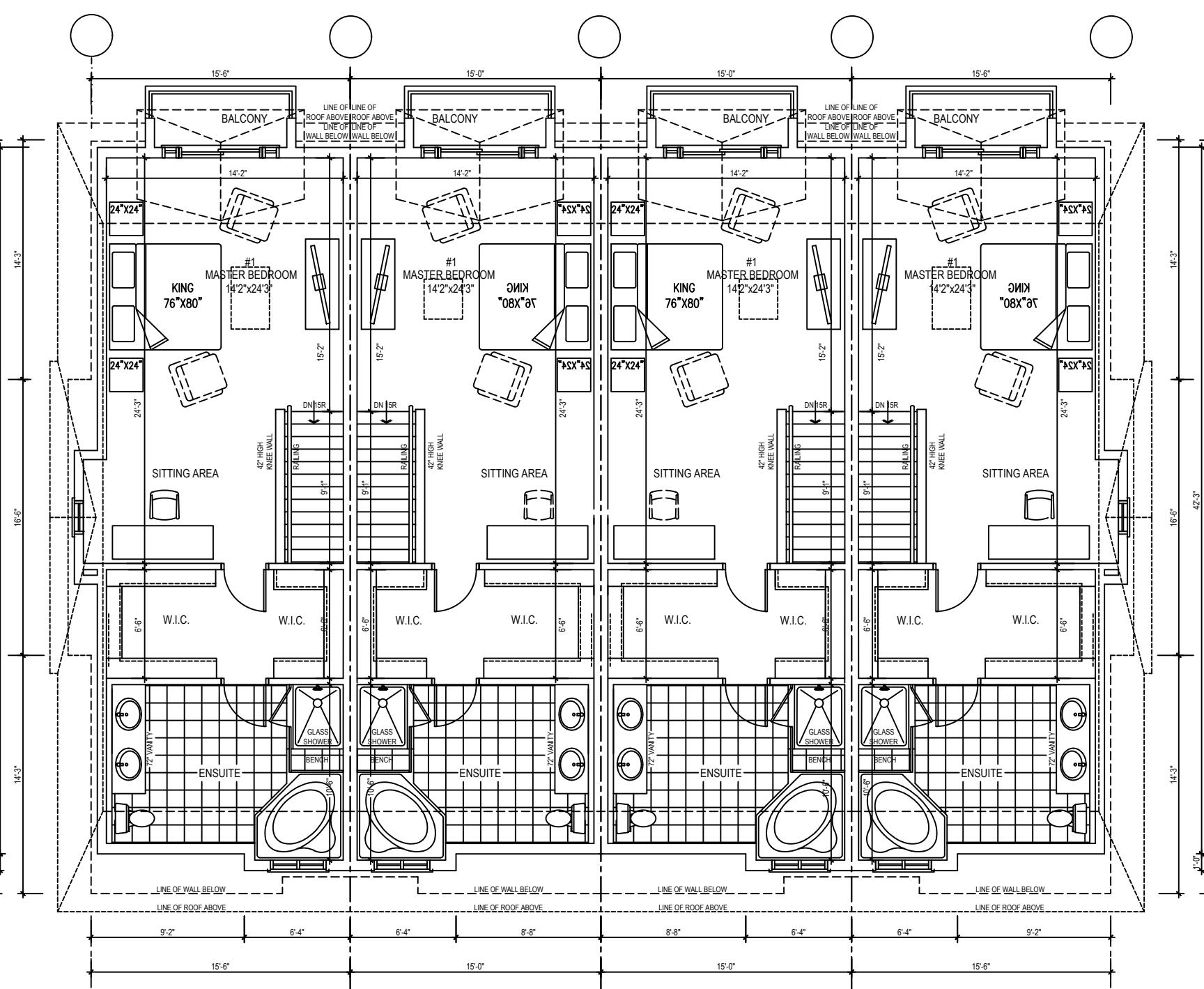


LOT 1 LOT 2 LOT 3 LOT 4

3RD FLOOR-BLOCK PLAN

A-3

SCALE 1/8"=1'-0"



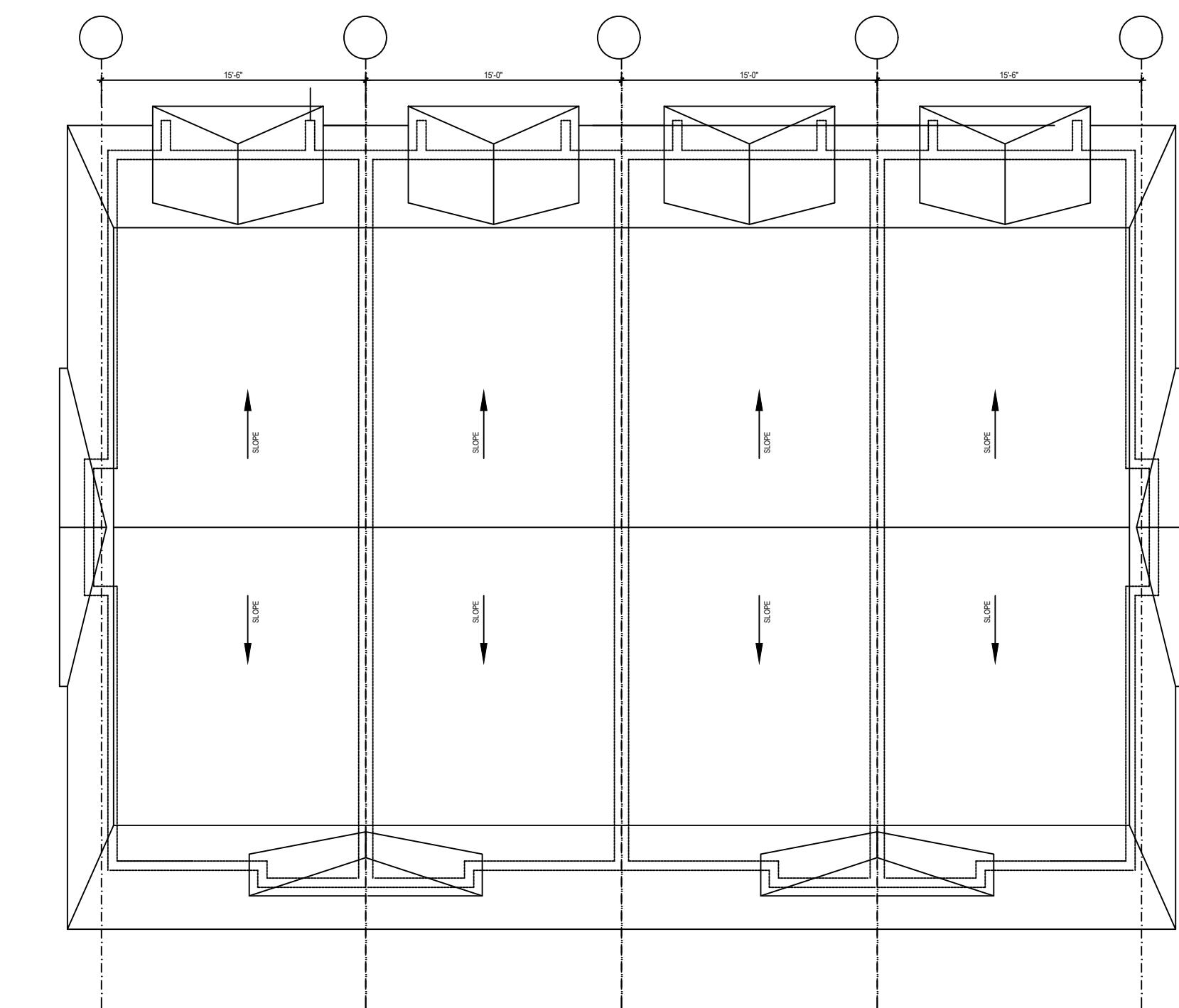
LOT 1 LOT 2 LOT 3 LOT 4

4TH FLOOR-BLOCK PLAN

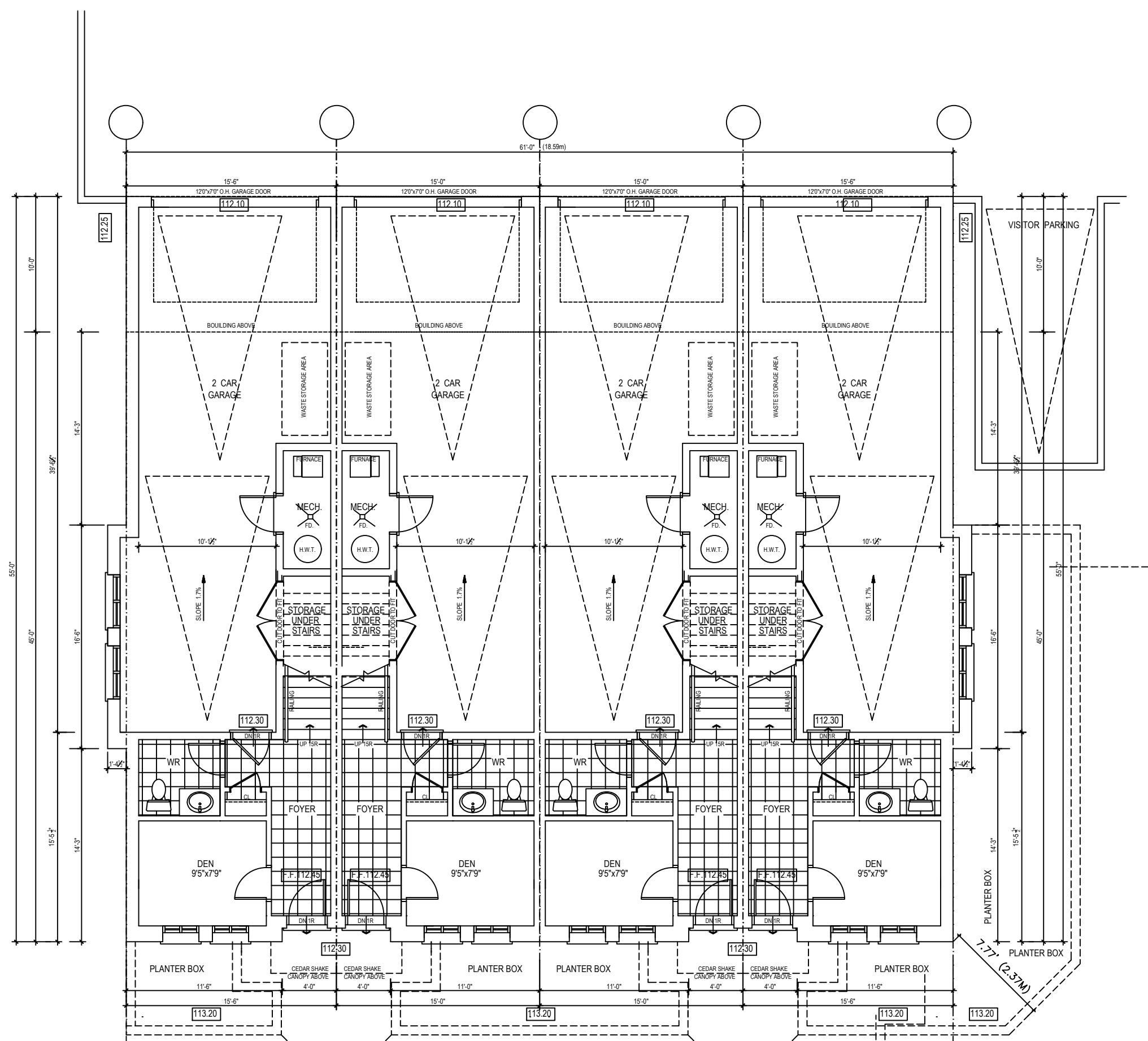
5TH ROOF-BLOCK PLAN

A-3

SCALE 1/8"=1'-0"



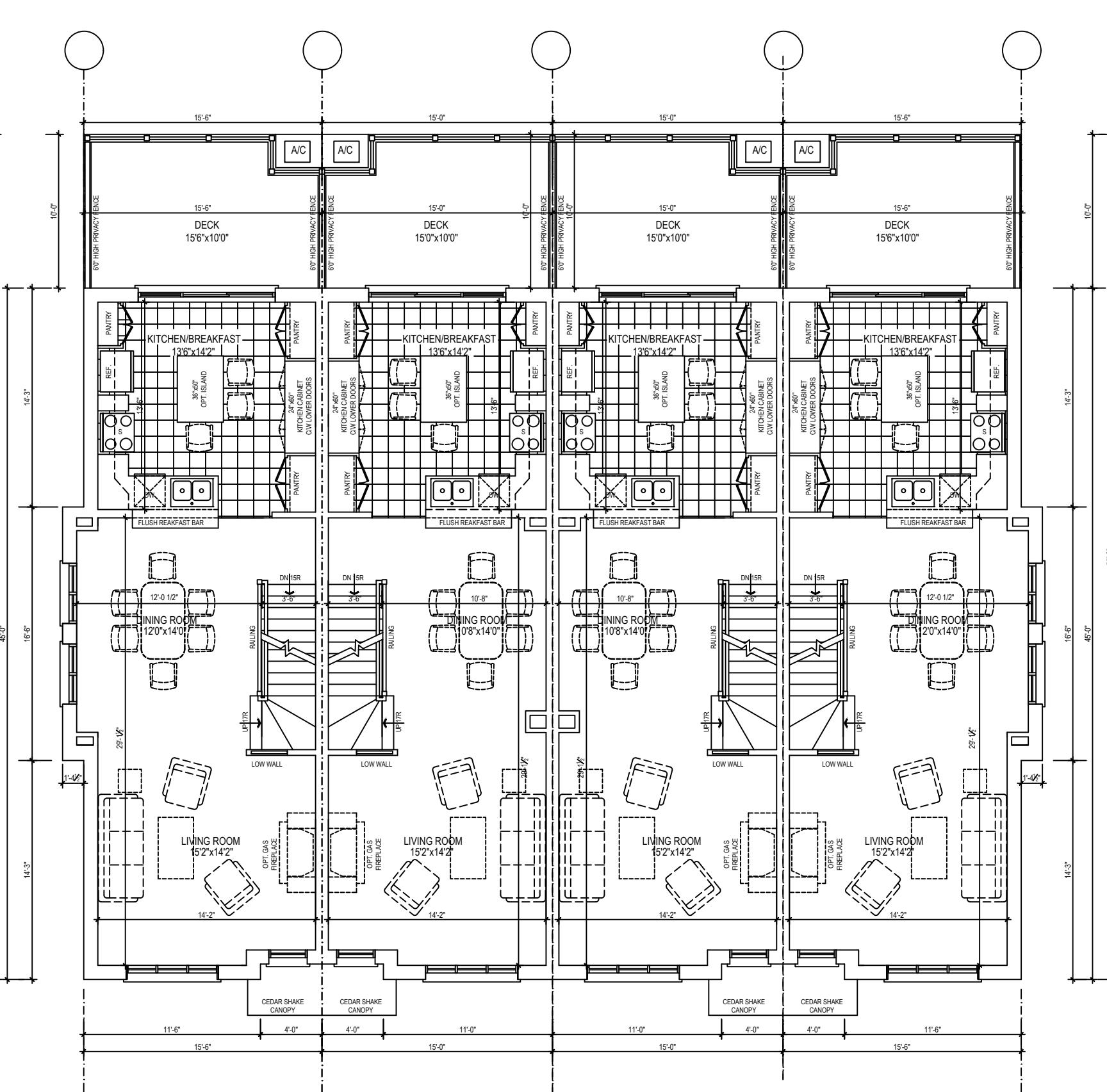
LOT 1 LOT 2 LOT 3 LOT 4



1ST FLOOR-BLOCK PLAN

A-3

SCALE 1/8"=1'-0"



2ND FLOOR-BLOCK PLAN

A-3

SCALE 1/8"=1'-0"

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PROJECT
4-UNIT TOWNHOMES
2207 DIXIE ROAD
Mississauga, Ontario

SCALE

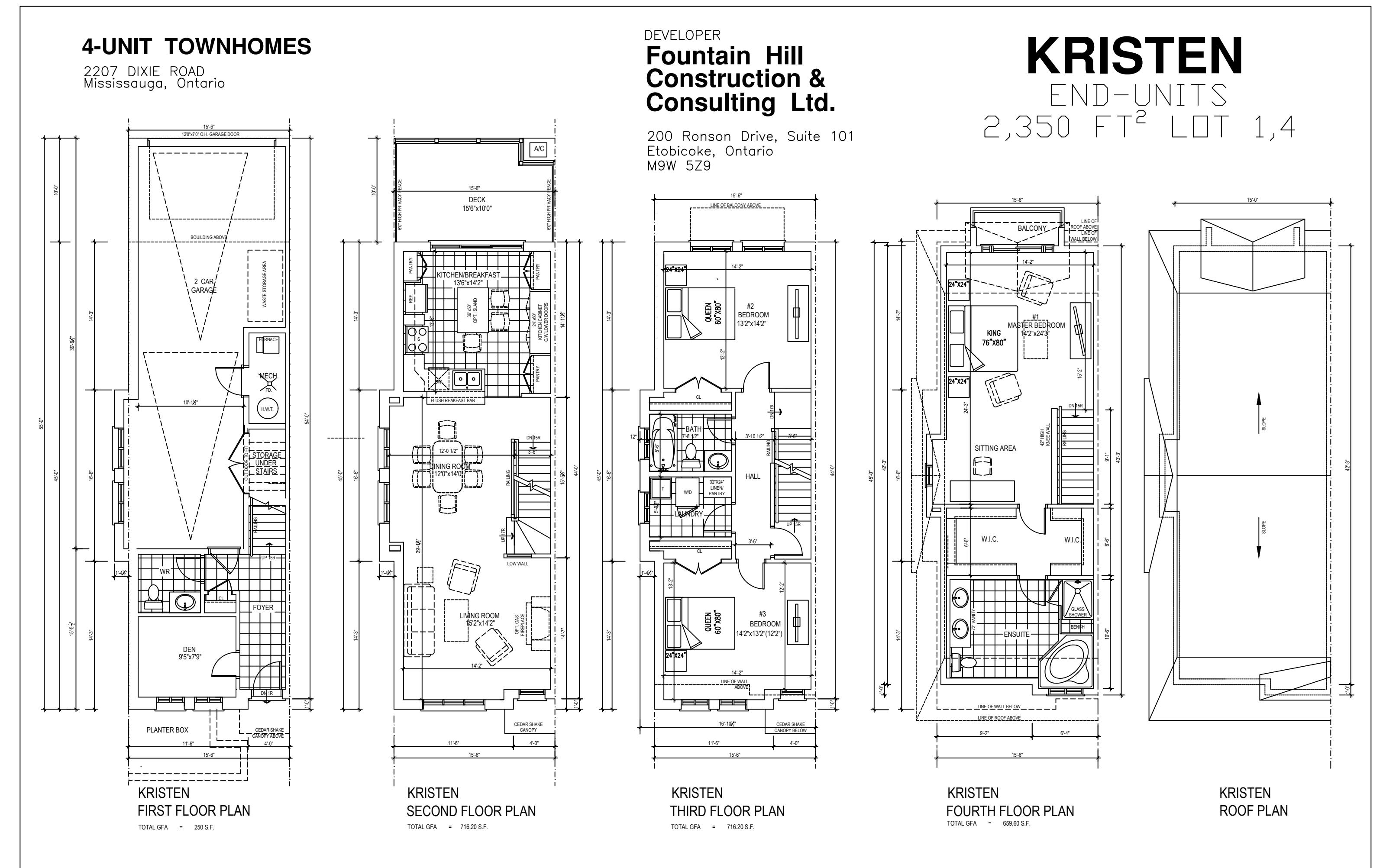
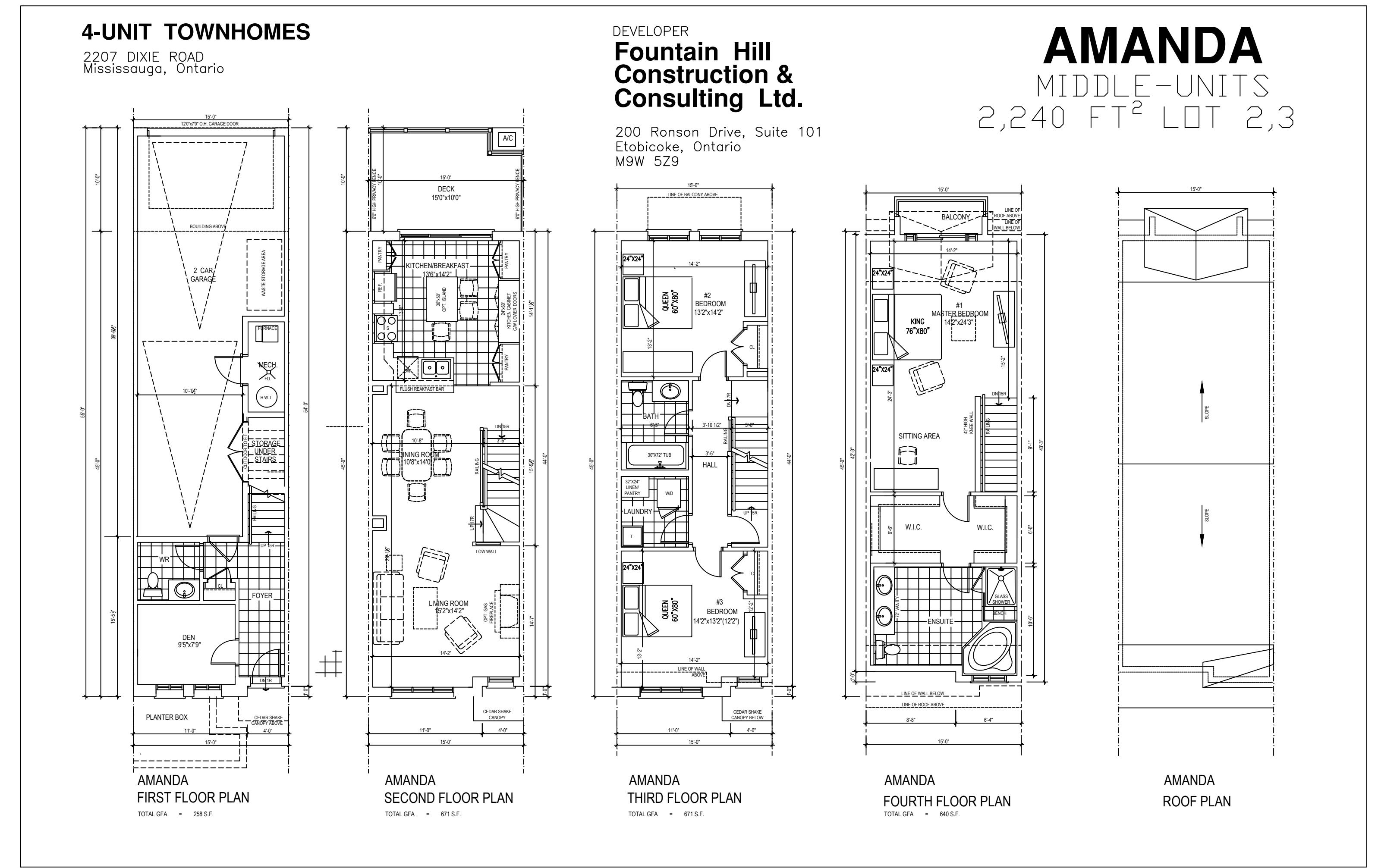
1/8"=1'-0"

DRAWING TITLE
1ST 2ND 3RD 4TH FLOOR-BLOCK PLANS

DEVELOPER
Fountain Hill Construction & Consulting Ltd.
200 Ronson Drive, Suite 101
Etobicoke, Ontario
M9W 5Z9

DESIGNED AND PREPARED BY OTTO PALFY
CHECKED BY J D
DATE AUG. 26 /2019
ISSUED

PROJECT NO 2019-XX
DRAWING NO A-3
PROT 11
2207 DIXIE RD-A-3 block plans-4



2 ISSUED FOR ZONING APPROVAL FOR REVIEW NO	SEPT.12/2019 AUG. 26/2019 REVISIONS	OP BY
CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND REPORT ANY DISCREPANCIES TO THE DESIGNER BEFORE PROCEEDING WITH THE WORK DO NOT SCALE THE DRAWINGS		
PROJECT 4-UNIT TOWNHOMES 2207 DIXIE ROAD Mississauga, Ontario		
SCALE 1/8"=1'-0"		
DRAWING TITLE TYPICAL FLOOR PLANS		
DEVELOPER Fountain Hill Construction & Consulting Ltd.		
200 Ronson Drive, Suite 101 Etobicoke, Ontario M9W 5Z9		
DESIGNED AND PREPARED BY CHECKED BY DATE ISSUED	OTTO PALFY J D AUG. 26 /2019 PROT 11 2207 DIXIE RD-A-4-typ. floor plans-5	PROJECT NO 2019-XX DRAWING NO A-4