

NOISE & VIBRATION STUDY

“5687 FERRY STREET DEVELOPMENT”
ALL OF LOTS 51, 57 & 58 PART of LOTS 50, 52, 53 & 56
PLAN 3
CITY OF NIAGARA FALLS, ON
REGIONAL MUNICIPALITY OF NIAGARA

Prepared for:

RKO Enterprise Inc.
1225 French Road
Mount Hope, ON
L0R 1W0



Frank Westaway
Owner/President

June 2022
Our File No: 22-2275

dBA Acoustical Consultants Inc.
P.O Box 32059
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1.0 INTRODUCTION

dBA Acoustical Consultants Inc. has been asked to provide a noise & vibration study on behalf of RKO Enterprise Inc. for the proposed “5687 Ferry Street Development” in Niagara Falls, ON. (See Attached Figure 1 Site Location).

The purpose of the study is to determine, for OPA/ZBA approval, the traffic noise impact from Ferry Street, Niagara Falls, ON. Proposed is an 8-storey mixed-used apartment building consisting of 77 apartment units and 3 commercial units on the first floor.

This study will detail noise impact relative to the proposed site plan and recommend the noise control measures necessary (if applicable) to meet Ministry of Environment, Conservation and Parks (MECP) guidelines, while satisfying the planning requirements of the City of Niagara Falls and Niagara Region.

Rail noise was not considered in this report as there are no CN/CP rail lines within the immediate area. Aircraft noise was not considered in this report as the development is located outside the 25 NEF of any area airports. Vibration is not considered in this report due to no industry in the area.

2.0 SITE DESCRIPTION

The proposed development is in an area largely comprised of commercial properties and residential properties. Highway 20 (Ferry Street) is located approximately 30m south of building façade. Main Street is located approximately 300m west of the proposed site and Stanley Avenue is located approximately 300m east of the proposed site. Both roadways are not considered main noise sources due to the distance separation and shielding from existing buildings. Ferry Street is a 2-lane roadway with a speed limit of 50km/hr. and runs east and west. Traffic volumes for other area roadways are not considered in this report due to low traffic volumes. There are no area stationary noise sources that may impact the proposed development. See Figure 2 Site Plan.

3.0 NOISE IMPACT ASSESSMENT

3.1 NOISE CRITERIA

The MECP specifies limits for road noise relative to new residential developments. The MECP Publication 300, Stationary & Transportation Sources-Approval & Planning, specifies the criteria, summarized as follows:

TABLE 1 - Road Traffic Sound Levels Limits	
Time Period	L _{eq} (dBA)
07:00 – 23:00 (16 hr.)	55 Outdoor Living Area (OLA)
23:00 – 07:00 (8 hr.)	50 Plane of Bedroom Window (POW)

The OLA refers to an outdoor patio, a backyard, a terrace or other area where outdoor passive recreation is expected to occur on the residential property. Noise levels are calculated at the upper storey bedroom window to represent nighttime (23:00 - 07:00) periods.

Where noise levels estimated in the Outdoor Living Area (OLA) and at an upper storey window (POW) are equal to or less than the values listed in Table 1, no noise control measures are required. Where noise levels exceed Table 1 values, the following action is required:

TABLE 2 –Noise Control Requirements		
Time Period	Noise Level Leq (dBA)	Action Required
07:00 - 23:00 Daytime (OLA)	55 to 60	Barrier or Warning Clause Type “A”
07:00 - 23:00 Daytime (OLA)	> 60	Barrier & Warning Clause Type “B”
07:00 – 23:00 Daytime (POW)	>55	Provision for A/C, Warning Clause “C”
	>65	Central A/C, Warning Clause “D”
	>65	Building Component Specification
23:00 to 07:00 Nighttime (POW)	> 50-60	Provision for A/C and Warning Clause Type “C”
23:00 to 07:00 Nighttime (POW)	> 60	Building Component Specification
	> 60	Central Air Conditioning and Warning Clause Type “D”

Where nighttime noise levels exceed 60 dBA, building components must be designed to meet the following Table 3 indoor sound level limits.

TABLE 3 - Indoor Road Sound Levels Limits	
Indoor Location	Leq (dBA)
	Road
Living/Dining 7:00 – 23:00	45
Bedroom 23:00 - 07:00	40

3.2 ROAD NOISE

Predicted road traffic noise levels were calculated for Ferry Street, the major road noise source in the site area. Road traffic volumes were sourced supplied from the Niagara Region relative to the roadway. MECP computer program STAMSON version 5.04 was used to carry out prediction calculations. For R1 & R2 receptor locations we have confirmed that the traffic noise from Main Street and Stanley Avenue have no noise impact on the proposed site. (See Appendix “A” Attached). Traffic data is summarized in Table 4.

The daytime/night-time volume ratio relative for Ferry Street is calculated using a 90/10 split and a 16/8-hour assessment as required by the MECP. The 2021 AADT (Annual Average Daily Traffic) volumes were forecasted over 21 years and reflective of the worst-case scenario. Truck volumes were factored at 2% medium and 2% heavy of the total vehicle volumes for Ferry Street.

TABLE 4 – Future Road Traffic Volumes (2042)			
Ferry Street	Forecasted AADT 16521 Vehicles		
	Cars	Medium Trucks	Heavy Trucks
Day	14274	297	297
Night	1586	14	14

Table 5 summarizes the “free field” traffic noise prediction results, modeled at 2 receptor location representative of the 2nd & 8th floor south building facade. (See Figure 3 Receptor Locations).

TABLE 5 – Predicted Future Traffic Noise (dBA)		
Location	07:00 – 23:00	23:00 – 07:00
R1 – 2 nd Floor Residential South Façade (7.5m)	60	54
R2 - 8 th Floor Residential South Façade (28m)	63	56

4.0 RECOMMENDATIONS - NOISE CONTROL

4.1 OUTDOOR LIVING AREAS

Calculated road noise levels exceed 55 dBA daytime criteria as outlined in Table 1. Proposed for the development are Juliette balconies.

4.2 INDOOR NOISE LEVELS

Calculated road noise levels at the Plane of Window (POW) exceed the 50 dBA criteria outlined in Table 1 for indoor spaces for all receptor locations. Specific building components (walls, windows, doors etc.) are required and confirmed using the STC (Sound Transmission Class) methods and are summarized in Table 6 following with minimum window door and wall construction specified for all residential units throughout the development.

The STC values were calculated for each room type, based on typical window to floor ratios of 20% for bedrooms and 30% for living room areas. Wall-to-floor ratio was factored at 80%. A maximum of two components were factored per room. Windows must meet STC-28 values with acoustical rating. (See Appendix “A”)

TABLE 6 – Recommended Door, Wall, and Window Construction			
LOCATION	STC To Be Used	Exterior Wall Construction	Patio Door Construction
All Units	Example	Example	
Bedroom	28	40	N/A
Living room	28	40	N/A

Recommendations assume windows are well-fitted, weather-stripped units that can be opened.

5.0 VENTILATION / WARNING CLAUSES

Ventilation and Warning Clause requirements are required for this project as noted in Table 7 following. It is recommended that the appropriate warning clauses be inserted into all Offers and Agreements of Purchase and Sale or Lease. Proposed for the development is Central Air Conditioning. It is yet to be determined the location of any HVAC units for this development.

TABLE 7 - Ventilation and Warning Clause Requirements		
LOCATION	VENTILATION	WARNING CLAUSE
All Residential Units	Central Air Conditioning	Type "B" and "D"

TYPE B:

"Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the buildings 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 Municipality's and the MECP's noise criteria."

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 Municipality's and the MECP noise criteria."

6.0 VIBRATION

Vibration is not a concern as there are no rail or heavy industry located within the site development. The City/Region may require Pre-Condition Survey (PCS) prior to construction and vibration monitoring during construction.

7.0 SUMMARY OF RECOMMENDATIONS

The following noise control measures are required to satisfy the indoor and outdoor noise level criterion:

- Window, door, and wall construction as recommended in Section 4.
- Central Air conditioners for all units.
- Warning Clauses inserted into all Offers and Agreements of Purchase and Sale or Lease for all units. (Section 5.0)
- Supply HVAC units, Generators (Outdoor) and, parking venting system mechanical sound specifications for further noise impact.
- Pre-Condition Surveys and vibration monitoring is recommended due to the close proximity of the abutting properties.
- Qualified Acoustical Consultant certifies that the required noise control measures have been incorporated into the builder's plans prior to issuance of a building permit.
- Qualified Acoustical Consultant certifies that the required noise control measures have been incorporated into the builder's plans prior to issuance of a building permit.
- Prior to issuance of an occupancy permit or equivalent, it is recommended the Qualified Acoustical Consultant certify that the approved noise control measures have been professionally installed.

8.0 CONCLUSIONS

dBA Acoustical Consultants Inc. has provided a noise & vibration study on behalf of RKO Enterprise Inc. for the proposed “5687 Ferry Street Development” in Niagara Falls, ON. (See Attached Figure 1 Site Location).

The purpose of the study determined, for OPA/ZBA approval, the traffic noise impact from Ferry Street, Niagara Falls, ON. Proposed is an 8-storey mixed-used apartment building consisting of 77 apartment units and 3 commercial units on the first floor.

This study detailed noise impact relative to the proposed site plan and recommended the noise control measures necessary to meet MECP guidelines, while satisfying the planning requirements of the City of Niagara Falls and Niagara Region.

FIGURE 1
SITE LOCATION

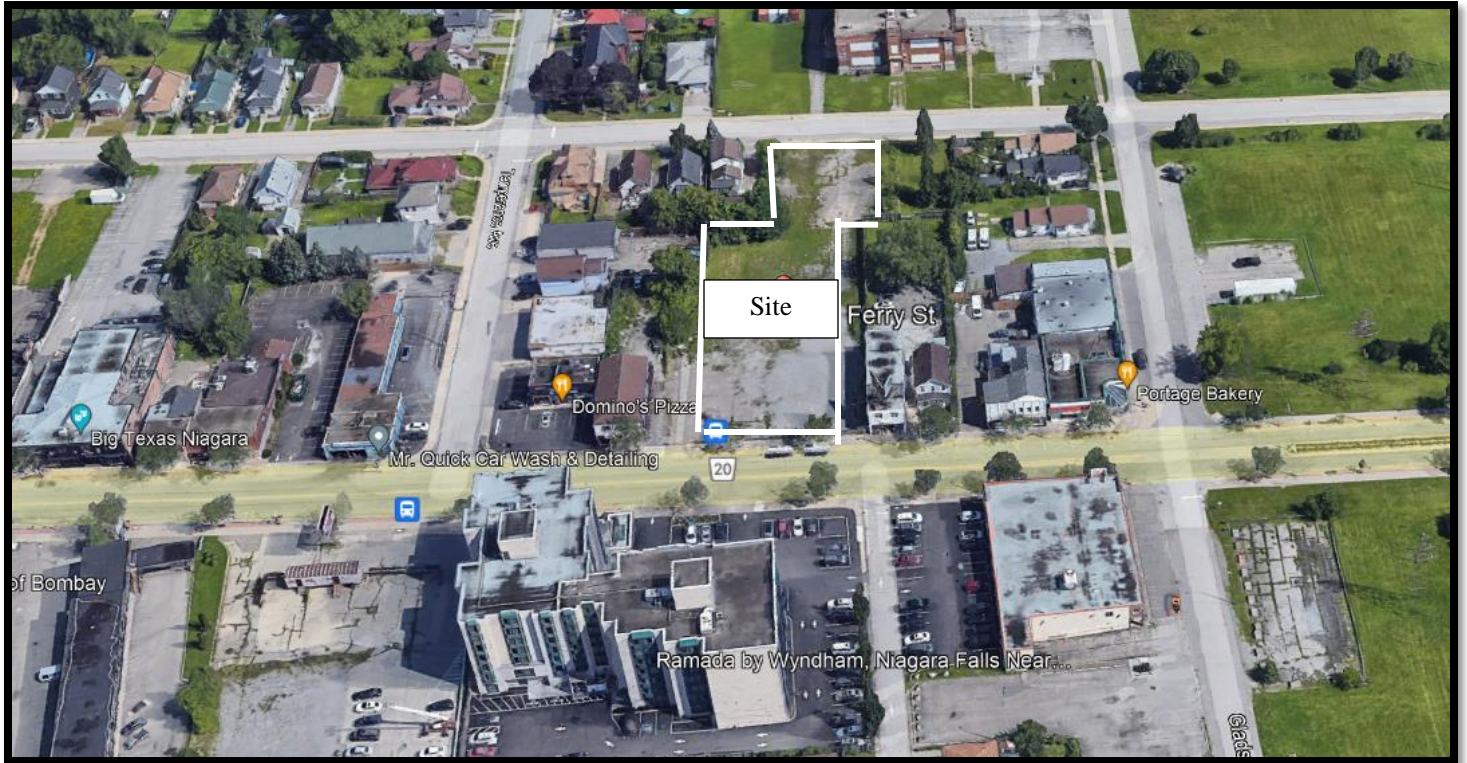
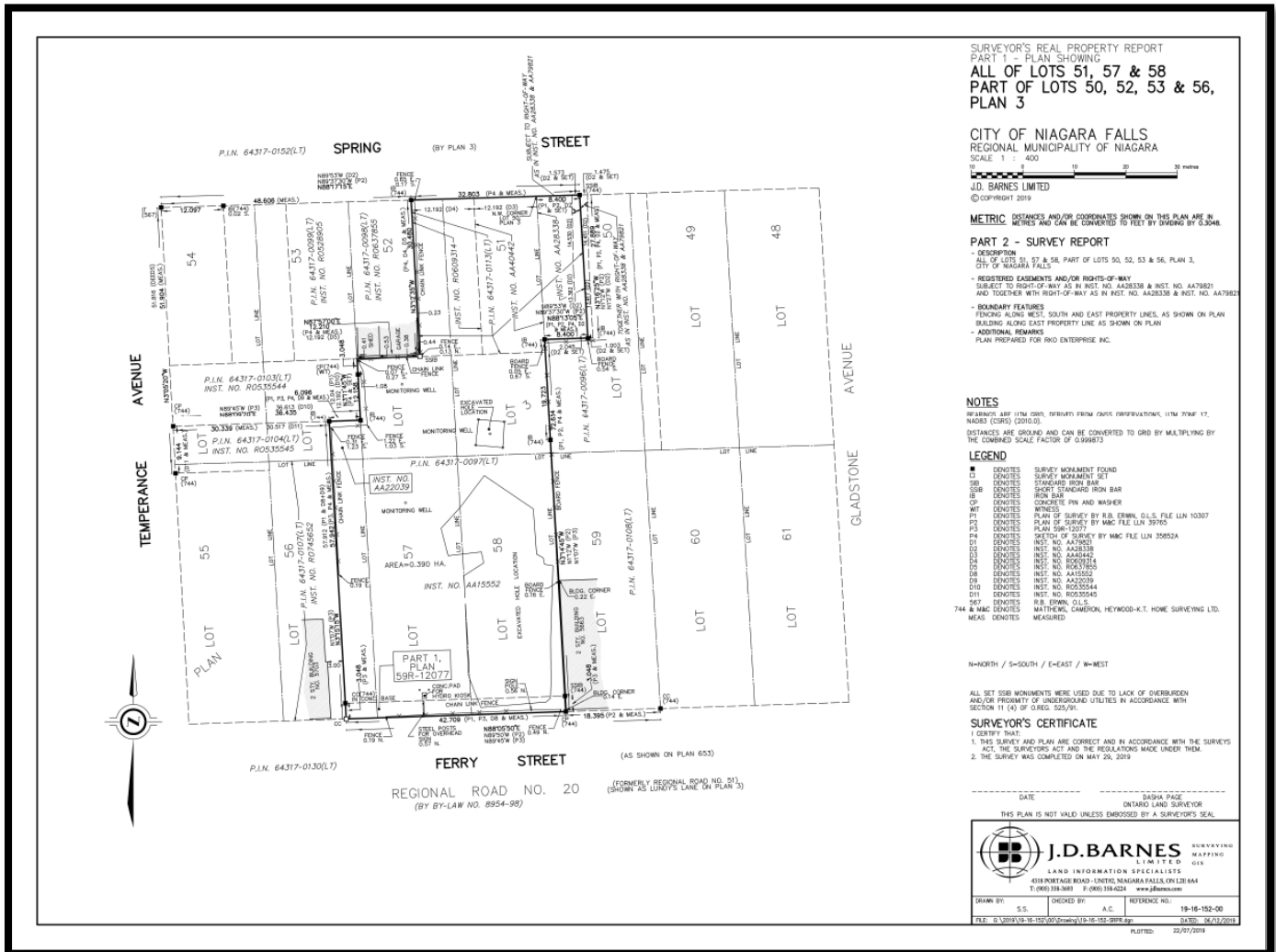


FIGURE 2 SITE PLAN



SURVEYOR'S REAL PROPERTY REPORT
PART 1 - PLAN SHOWING
ALL OF LOTS 51, 57 & 58
PART OF LOTS 50, 52, 53 & 56,
PLAN 3

CITY OF NIAGARA FALLS
REGIONAL MUNICIPALITY OF NIAGARA
SCALE 1 : 400
J.D. BARNES LIMITED
© COPYRIGHT 2019

METRIC DISTANCES AND/OR COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

PART 2 - SURVEY REPORT

- DESCRIPTION
ALL OF LOTS 51, 57 & 58, PART OF LOTS 50, 52, 53 & 56, PLAN 3.

- REGISTERED EASEMENTS AND/OR RIGHTS-OF-WAY
SUBJECT TO RIGHT-OF-WAY AS IN INST. NO. AA28338 & INST. NO. AA78821 AND TOGETHER WITH RIGHT-OF-WAY AS IN INST. NO. AA28338 & INST. NO. AA78821

- BOUNDARY FEATURES
FENCING ALONG WEST, SOUTH AND EAST PROPERTY LINES, AS SHOWN ON PLAN BUILDING ALONG EAST PROPERTY LINE AS SHOWN ON PLAN

- ADDITIONAL REMARKS
PLAN PREPARED FOR RIGO ENTERPRISE INC.

NOTES

REFERENCE: ASP 117M (2019), DERIVED FROM QUICQ PROFESSIONAL, ITRM 7096 V17, NAD83 (EPSG: 20110).

DISTANCES ARE GIVEN AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE DOWNWARD SCALE FACTOR OF 0.999873

LEGEND

■	DEMONTS	SURVEY MONUMENT FOUND
□	DEMONTS	SURVEY MONUMENT SET
SB	DEMONTS	STANDARD IRON BAR
SBW	DEMONTS	SHORT STANDARD IRON BAR
IB	DEMONTS	IRON BAR
CP	DEMONTS	CONCRETE PIN AND WADGER
WT	DEMONTS	WITNESS
P1	DEMONTS	PLAN OF SURVEY BY R.B. ERWIN, O.L.S. FILE LFN 10307
P2	DEMONTS	PLAN OF SURVEY BY MRC FILE LFN 39765
P3	DEMONTS	PLAN OF SURVEY BY MRC FILE LFN 39765
A4	DEMONTS	SECTION OF SURVEY BY MRC FILE LFN 35852A
D1	DEMONTS	INST. NO. AA79623
D2	DEMONTS	INST. NO. AA28338
D3	DEMONTS	INST. NO. AA28442
D4	DEMONTS	INST. NO. AA28514
D5	DEMONTS	INST. NO. R0257555
D6	DEMONTS	INST. NO. AA25552
D7	DEMONTS	INST. NO. AA25552
D8	DEMONTS	INST. NO. R0255244
D9	DEMONTS	INST. NO. R0255244
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D99	DEMONTS	INST. NO. R0255244
D100	DEMONTS	INST. NO. R0255244

N-NORTH / S-SOUTH / E-EAST / W-WEST


ALL SET SBM MONUMENTS WERE USED DUE TO LACK OF OVERBURDEN AND/OR PROXIMITY OF UNDERGROUND UTILITIES IN ACCORDANCE WITH SECTION 11 (3) OF O.R.O. 520/01.

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:
1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON MAY 25, 2019.

DATE: _____ DATA PAGE: _____
ONTARIO LAND SURVEYOR

THIS PLAN IS NOT VALID UNLESS EMBOSSED BY A SURVEYOR'S SEAL

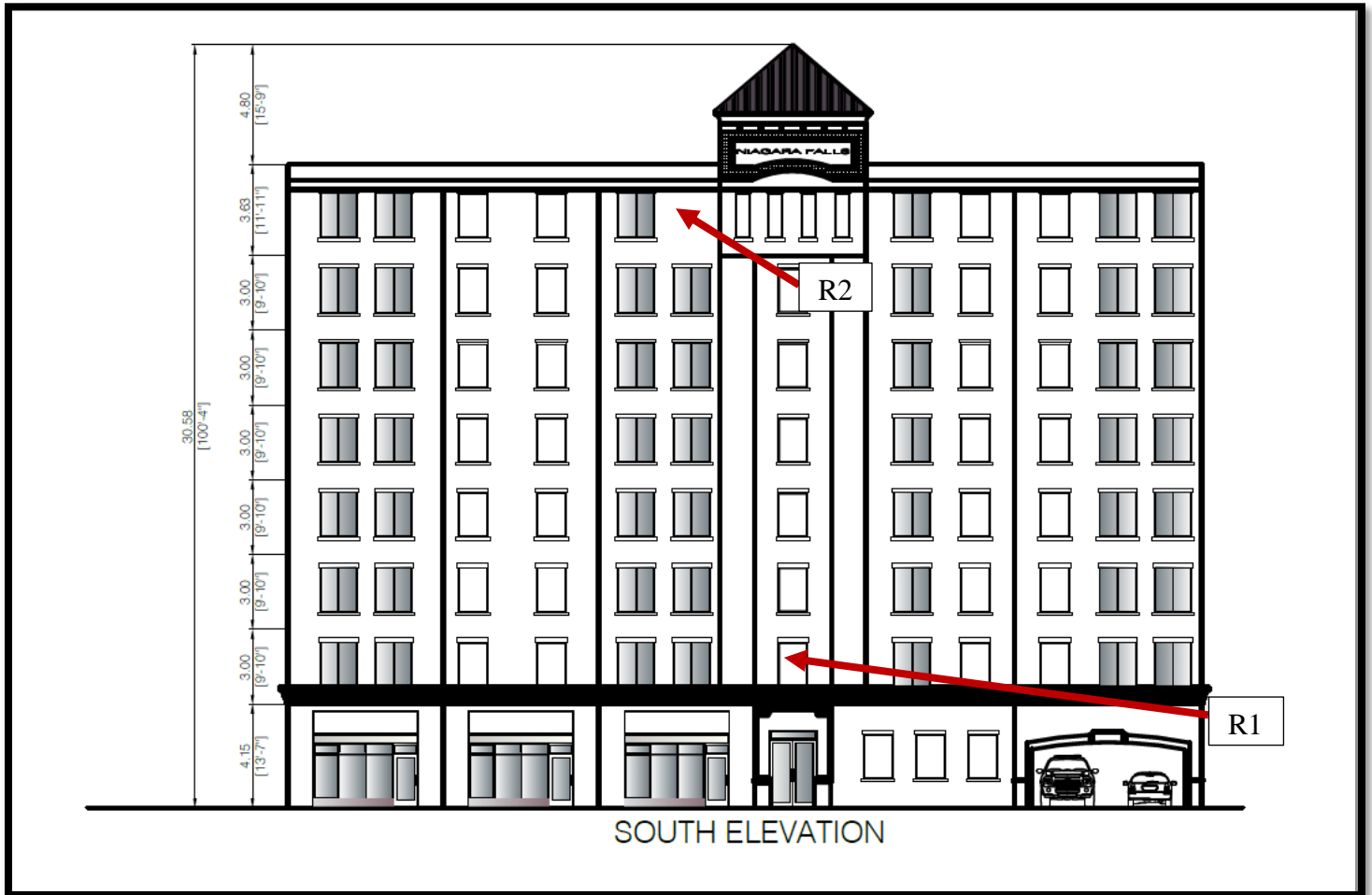


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418 PORTAGE ROAD - 1ST FLOOR NIAGARA FALLS, ON L2E 6M4
T: (905) 338-3888 F: (905) 338-4224 www.jdbarnes.com

DRAWN BY: S.S. CHECKED BY: A.C. REFERENCE NO.: 19-18-152-00
FILE: G:\2019\19-18-152\017\Drawings\19-18-152-0005.dwg DATE: 06/17/2019
PLotted: 02/01/2020

FIGURE 3
RECEPTOR LOCATIONS



APPENDIX “A”

NIAGARA REGION
AADT TRAFFIC DATA (2021)

Hi Frank:

- For Ferry Street between Main and Stanley (RR102) – 2021 AADT=10,900; 2018 AADT=12,700
- For Stanley Avenue between Hwy 420 and Ferry Street – 2021 AADT=20,600; 2018 AADT=20,500
- For Stanley Avenue between Ferry Street and Robinson Street – 2021 AADT=20,000; 2018 AADT=18,900

Regards,

Manny Rataul, C.Tech., rcji
Road Safety Technician

Transportation Services Division, Niagara Region

Phone: 905-980-6000 Ext. 3711

Email: Manny.Rataul@niagararegion.ca

Address: 1815 Sir Isaac Brock Way St., Thorold ON, L2V4T7

www.niagararegion.ca

STAMSON CALCULATIONS

STAMSON 5.04 SUMMARY REPORT Date: 07-06-2022 12:55:13
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R1Ferry.te Time Period: Day/Night 16/8 hours

Description: R1 South Front 1st Floor Residential
TOTAL Leq FROM ALL SOURCES

(DAY): 60.22
(NIGHT): 53.69

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

Car traffic volume : 14274/1586 veh/TimePeriod *
Medium truck volume : 297/33 veh/TimePeriod *
Heavy truck volume : 297/33 veh/TimePeriod *
Posted speed limit : 50 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): 10900
Percentage of Annual Growth : 2.00
Number of Years of Growth : 21.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: FERRY ST (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 20.00 / 20.00 m
Receiver height : 7.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 26976/2997 veh/TimePeriod *
Medium truck volume : 562/62 veh/TimePeriod *
Heavy truck volume : 562/62 veh/TimePeriod *
Posted speed limit : 50 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): 20600
Percentage of Annual Growth : 2.00
Number of Years of Growth : 21.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

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

Angle1 Angle2 : -45.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 285.00 / 285.00 m
Receiver height : 7.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Result summary (day)

	! source !	Road !	Total
	! height !	Leq !	Leq
	! (m) !	(dBA) !	(dBA)
1.FERRY ST	! 1.19 !	60.13 !	60.13
2.Stanley	! 1.19 !	43.24 !	43.24
	Total		60.22 dBA

Result summary (night)

	! source !	Road !	Total
	! height !	Leq !	Leq
	! (m) !	(dBA) !	(dBA)
1.FERRY ST	! 1.19 !	53.60 !	53.60
2.Stanley	! 1.19 !	36.69 !	36.69
		Total	53.69 dBA

STAMSON 5.04 SUMMARY REPORT Date: 07-06-2022 13:01:25
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r2ferry.te Time Period: Day/Night 16/8 hours

Description: R2 South Front Facade 8th Floor Residential
TOTAL Leq FROM ALL SOURCES

(DAY): 62.97
(NIGHT): 56.44

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

Car traffic volume : 14274/1586 veh/TimePeriod *
Medium truck volume : 297/33 veh/TimePeriod *
Heavy truck volume : 297/33 veh/TimePeriod *
Posted speed limit : 50 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): 10900
Percentage of Annual Growth : 2.00
Number of Years of Growth : 21.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: FERRY ST (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 20.00 / 20.00 m
Receiver height : 28.00 / 28.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 26976/2997 veh/TimePeriod *
Medium truck volume : 562/62 veh/TimePeriod *
Heavy truck volume : 562/62 veh/TimePeriod *
Posted speed limit : 50 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): 20600
Percentage of Annual Growth : 2.00
Number of Years of Growth : 21.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

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

Angle1 Angle2 : -45.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 285.00 / 285.00 m
Receiver height : 28.00 / 28.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

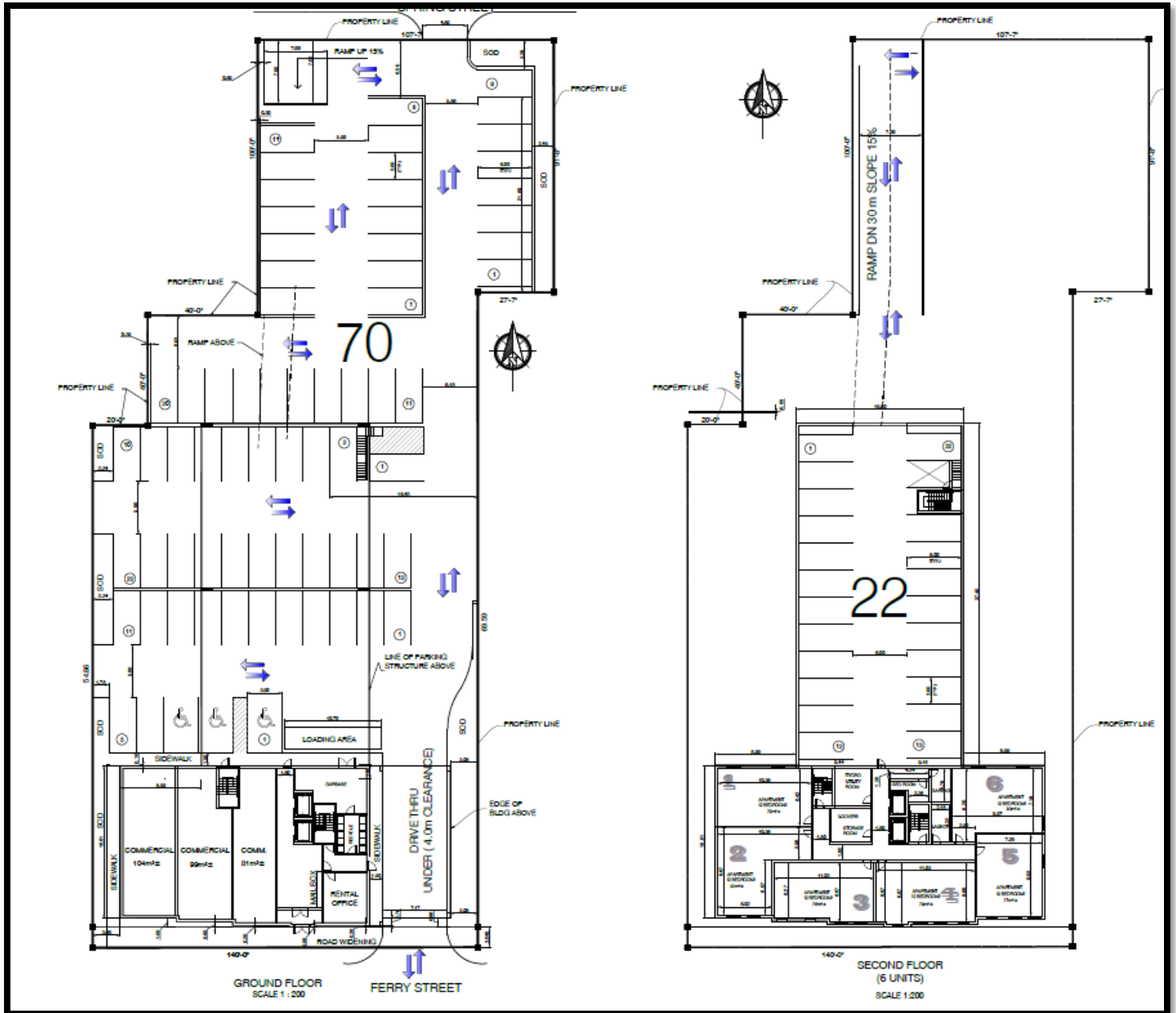
Result summary (day)

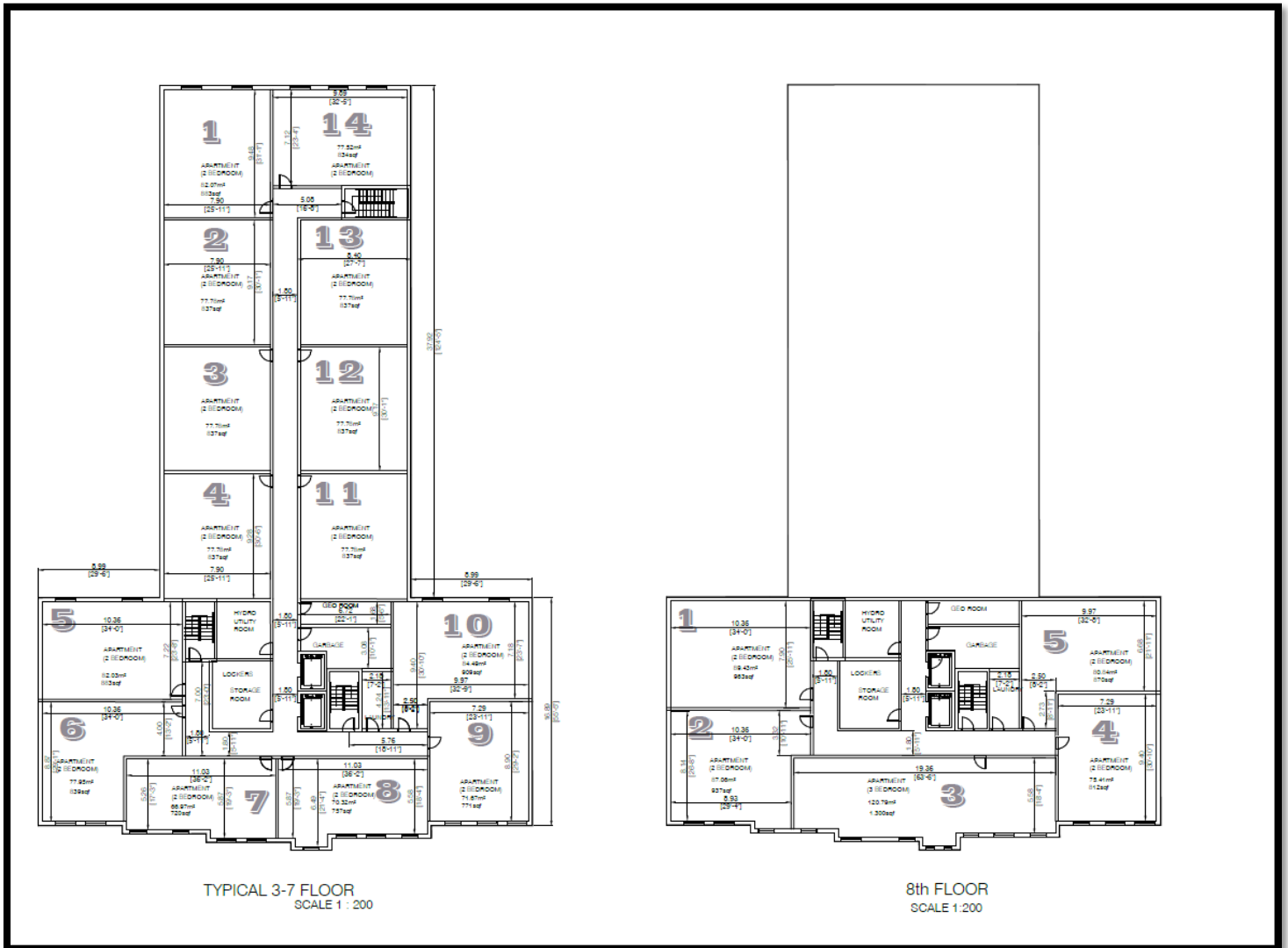
	! source !	Road !	Total
	! height !	Leq !	Leq
	! (m) !	(dBA) !	(dBA)
1.FERRY ST	! 1.19 !	62.76 !	62.76
2.Stanley	! 1.19 !	49.73 !	49.73
	Total		62.97 dBA

Result summary (night)

	! source !	Road !	Total
	! height !	Leq !	Leq
	! (m) !	(dBA) !	(dBA)
1.FERRY ST	! 1.19 !	56.23 !	56.23
2.Stanley	! 1.19 !	43.18 !	43.18
	Total		56.44 dBA

BUILDING DESIGNS





SITE STATISTICS

<u>SITE STATISTIC</u>	
SITE AREA	3765m ²
<u>BUILDING AREA</u>	
GROUND FLOOR	5,091 sqf (473m ²)
SECOND FLOOR	6,727 sqf (625m ²)
3rd-4th FLOORS (PER FLOOR)	14,154 sqf (1,315m ²)
5th-7th FLOORS (PER FLOOR)	13,024 sqf (1,210m ²)
EIGHT FLOOR	5,532 sqf (514m ²)
FIRST FLOOR LOBBY & COMMERCIAL 3 COMMERCIAL UNITS	
2nd FLOOR 6 UNITS 6 APARTMENTS	
3-4th FLOOR 14 APARTMENTS PER FLOOR 28 APT. TOTAL	
5-7th FLOOR 13 APARTMENTS PER FLOOR 39 APT. TOTAL	
8th FLOOR 4 APARTMENTS UNITS	
PROPOSED PARKING SPACES 92	
TOTAL No OF APARTMENTS 77	
TOTAL No OF COMM. UNITS 3	

EXTERIOR WALL STC RATINGS

Wall Configuration	EW1	EW2	EW3	EW4	EW1R	EW2R	EW3R	EW5	EW4R	EW6	EW7 EW5R	EW8
STC Rating	38	40	43	46	47	48	49	54	55	57	58	62

Source: National Research Council, Division of Building Research

NOTES:

- 1 The common structure of walls EW1 to EW5 is composed of 12.7mm gypsum board, vapour barrier and 38x89 mm studs with 50 mm (or thicker) mineral wool or glass fibre batts in inter-stud cavities.
 - EW1 denotes the common structure, plus sheathing, plus wood siding or metal siding and fibre backer board
 - EW2 denotes the common structure, plus rigid insulation (25 to 30 mm), and wood siding or metal siding and fibre backer board.
 - EW3 denotes simulated mansard with the common structure, plus sheathing, 28 X89 mm framing, sheathing and asphalt roofing material
 - EW4 denotes the common structure, plus sheathing and 20 mm stucco.
 - EW5 denotes the common structure, plus sheathing, 25 mm air space, 100mm brick veneer.
 - EW6 denotes exterior wall composed of 12.7 mm gypsum board, rigid insulation (25 to 50 mm), 100 mm back-up block 100 mm face brick.
 - EW7 denotes exterior wall composed of 12.7 mm gypsum board, rigid insulation (25 to 50 mm), 140mm back-up block, 100 mm face brick.
 - EW8 denotes exterior wall composed of 12.7 mm gypsum board, rigid insulation (25 to 50 mm), 200 mm concrete.
- 2 R signifies the mounting of the interior gypsum board on resilient clips.
- 3 An exterior wall conforming to rainscreen design principles and composed of 12.7 mm gypsum board, 100 mm concrete block, rigid insulation (25 to 50 mm), 25 mm air space, and 100 mm brick veneer has the same STC as EW6.
- 4 An exterior wall described in EW1 with the addition of rigid insulation (25 to 50 mm) between the sheathing and the external finish has the same STC as EW2.