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Ausgrid
GPO Box 4009
Sydney NSW 2001

28 May, 2020

Refer: 6961-1.2L

Attention: Mr Dan Halton

Telephone: 02 9394 6660

Email: ausgrid@ausgrid.com.au

Dear Sir,

CONCORD SUBSTATION UPGRADE
31 GEORGE STREET, NORTH STRATHFIELD, NSW

We understand that Ausgrid is planning to upgrade its existing substation located at 31 George Street, North Strathfield, NSW. The upgrades include the replacement of aging switchgear and associated equipment. It is also proposed to construct a new switchroom to the east of the existing substation, adjacent to the T9 Train Line. This apartment building is located at 27-29 George Street, North Strathfield, NSW.

Day Design has been engaged to model the acoustic characteristics of the proposed switchroom. We understand that there is concern that the new switchroom may reflect or funnel noise from trains passing on the T9 train line and increase noise levels for the residents in the adjacent residential apartment building.

Noise Emission

In order to model the acoustic characteristics of the new switchroom, we have measured the level of noise from passing trains (including a freight train) at the east boundary of the subject site to derive a typical average noise spectrum.

We have also used the measured noise levels for each transformer as shown in the Noise Impact Assessment report prepared by Parsons Brinckerhoff (ref: 2162261A_LT_447_Draft_Rev_B, dated 8 September 2011).

Based on the averaged measured sound pressure levels for 4 existing transformers and trains (averaged from 9 passenger trains pass-by's and 1 freight train pass-by at an average distance of 15 metres), the sound power levels have been calculated to be shown in Table 1 and have been used in subsequent noise modelling calculations.



• AIRCRAFT, ROAD TRAFFIC AND TRAIN NOISE CONTROL
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Table 1 Sound Power Levels – Train Pass-by & Transformers

Description	Sound Power Levels (dB) at Octave Band Centre Frequencies (Hz)								
	dBA	63	125	250	500	1k	2k	4k	8k
Average Train Pass-by	116	109	106	101	99	115	101	95	88
Average Transformer (Tx-1 – Tx-4)	81	73	89	83	72	67	54	46	43

Calculated Noise Levels

We have used the sound power levels shown in Table 1 to calculate the noise levels during train pass-by's at various points along the façade of the apartment building, located to the south adjacent to the subject site, at ground, floor and second floor level.

The L_{eq} noise level from passing trains was measured at the eastern boundary of the site, shown as Location 'B' in the attached Appendices 1-4. The average L_{eq} noise level from 10 train pass-by's (including 1 freight train), at Location 'B' was 75 dBA. The noise model has been calibrated to this measured average noise level. It can be seen in Appendices 1-4 that the noise model calculates 75dBA at Location 'B' in accordance with the measured level.

Tables 2 and 3 summarise the calculated L_{eq} noise levels at 4 receptor locations along the façade of the adjacent apartment building from ground to second floor level. Receptors 1-4, from west to east, are shown in Appendices 1-6

Table 2 Calculated Noise Levels – Receptors 1 & 2

Receptor 1	Existing Site	Switchroom in Place	Difference
Ground (Appendix 1)	53	49	-4 dB
First Floor (Appendix 3)	55	54	-1 dB
Second Floor (Appendix 5)	59	58	-1 dB
Receptor 2	Existing Site	Switchroom in Place	Difference
Ground (Appendix 2)	57	46	-11 dB
First Floor (Appendix 4)	58	54	-4 dB
Second Floor (Appendix 6)	59	58	-1 dB



Table 3 Calculated Noise Levels – Receptors 3 & 4

Receptor 3	Existing Site	Switchroom in Place	Difference
Ground (Appendix 1)	64	61	-3 dB
First Floor (Appendix 3)	64	61	-3 dB
Second Floor (Appendix 5)	64	64	0
Receptor 4	Existing Site	Switchroom in Place	Difference
Ground (Appendix 2)	70	70	0
First Floor (Appendix 4)	70	70	0
Second Floor (Appendix 6)	70	70	0

Discussion

It can be seen from Tables 2 and 3 that the addition of the new switchroom results in a general decrease in noise levels for residents on the ground floor level of the adjacent apartment building.

Train noise being emitted from the northeast and propagating towards the north façade of the apartment building is attenuated by the switchroom building, blocking line of sight to the train line and shielding residents behind the switchroom from train noise. The majority of train noise being emitted from the southeast and propagating towards the south face of the switchroom is shielded by the existing building.

Therefore, any noise reflected from the south façade of the switchroom, propagating towards residents, is already heavily attenuated and unlikely to significantly contribute to the overall level of noise being directly emitted from the train line.

Noise levels at the upper floors with façades higher than the switchroom are likely to be similar before and after the inclusion of the switchroom building, as line of sight remains unbroken.



Conclusion

Noise modelling of a proposed new switchroom constructed on the east side of the subject site does not indicate any increase in noise levels, for any receptor within the adjacent residential apartment building, as a result of reflected noise from the switchroom façade.

As such, it is reasonable to assume that the new switchroom may be constructed without any significant increase in noise levels from train movements on the T9 train line, for the residents of the apartment building located at 27-29 George Street, North Strathfield, NSW.



Alexander Mendoza, MDesSc (Audio and Acoustics), MAAS

Acoustic Consultant

for and on behalf of Day Design Pty Ltd

AAAC MEMBERSHIP

Day Design Pty Ltd is a member company of the Association of Australasian Acoustical Consultants, and the work herein reported has been performed in accordance with the terms of membership.

APPENDICES

Appendix 1-6 – Noise Heat Maps



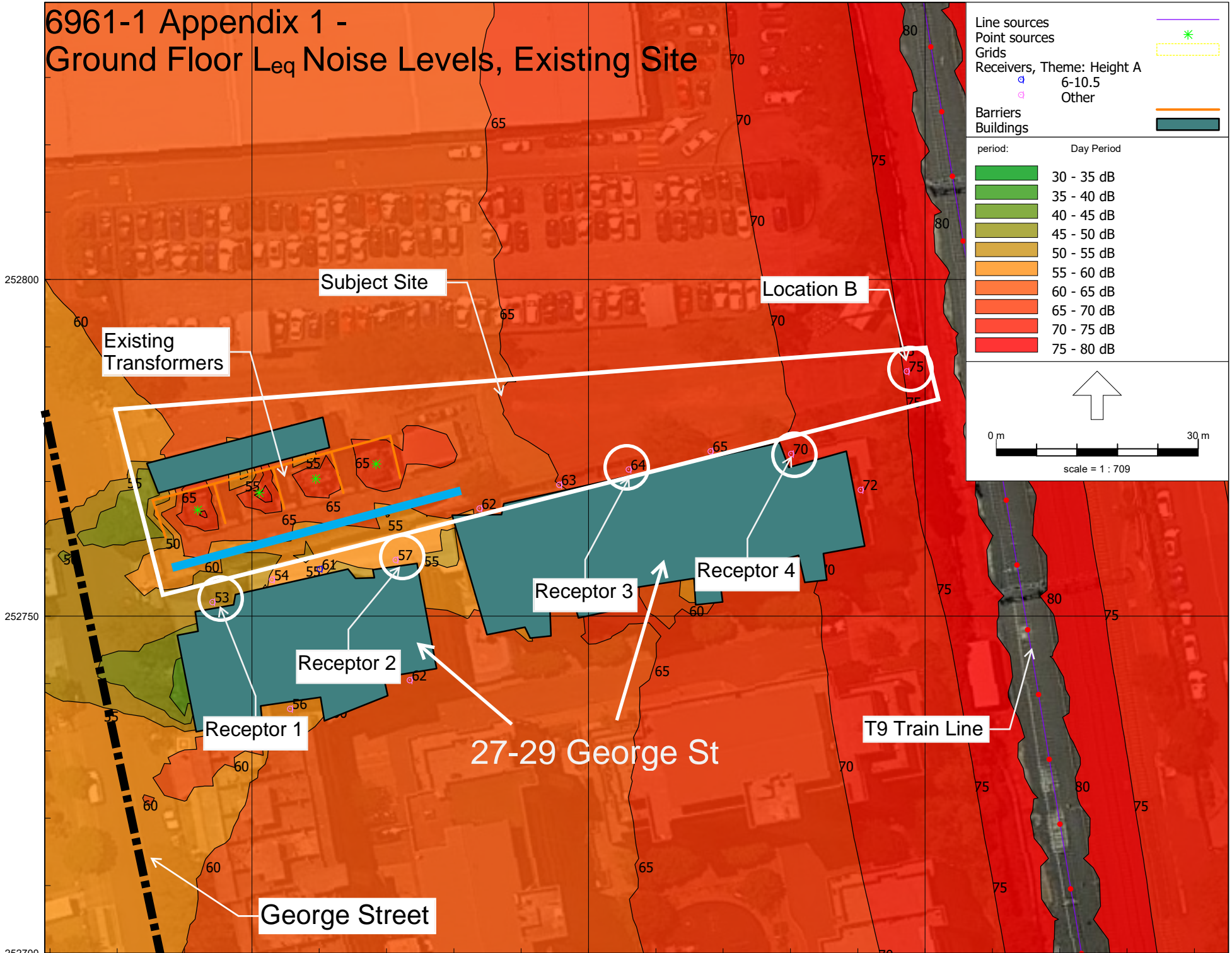
The undersigned hereby certifies that this Report has been checked and approved in accordance with our Quality Management System.





Date: 28/5/20




6961-1 Appendix 1 - Ground Floor L_{eq} Noise Levels, Existing Site






Line sources 


Point sources 

Grids 











Receivers, Theme: Height A


-  6-10.5
-  Other

Barriers 


Buildings 

period: Day Period

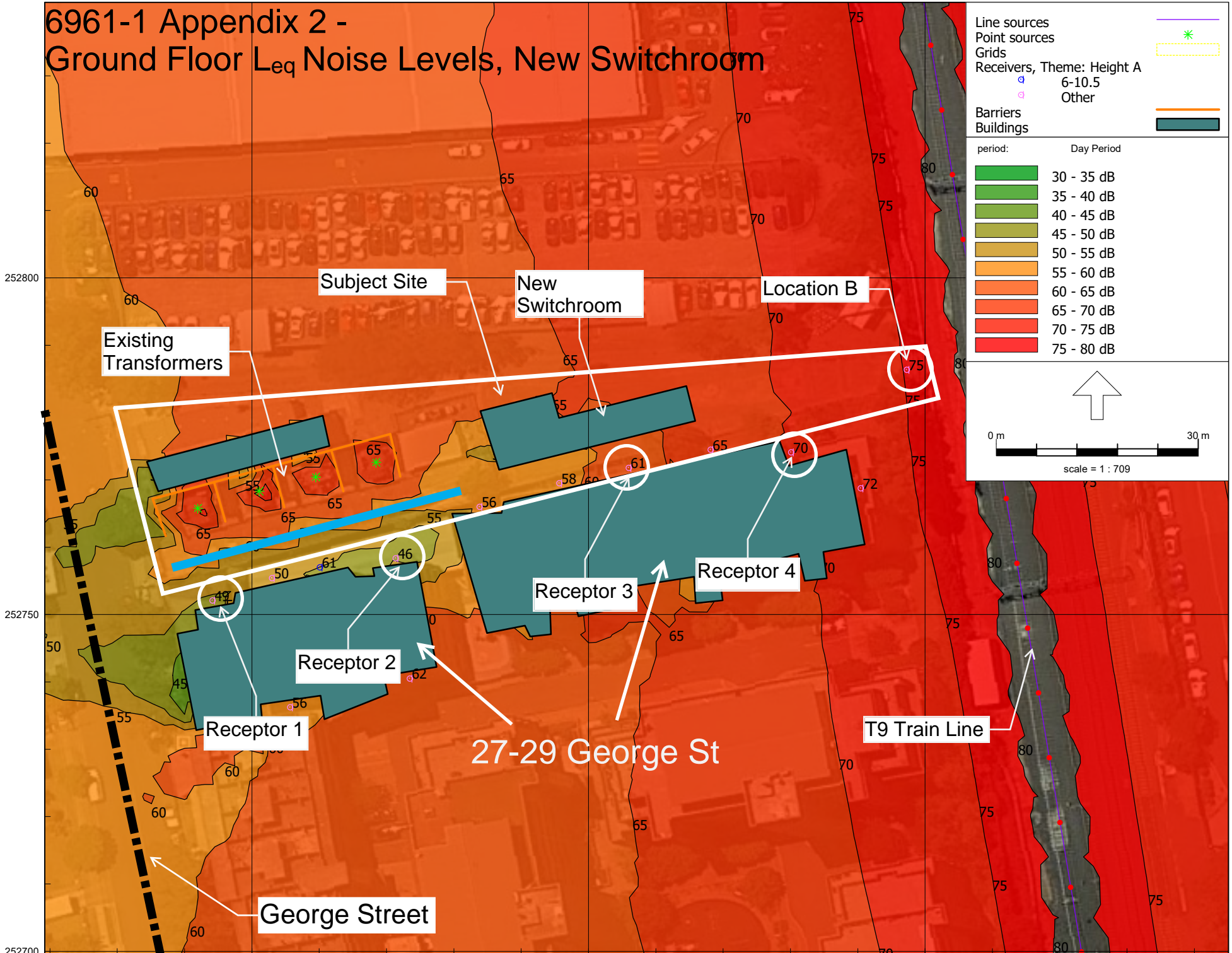
	30 - 35 dB
	35 - 40 dB
	40 - 45 dB
	45 - 50 dB
	50 - 55 dB
	55 - 60 dB
	60 - 65 dB
	65 - 70 dB
	70 - 75 dB
	75 - 80 dB

0 m  30 m

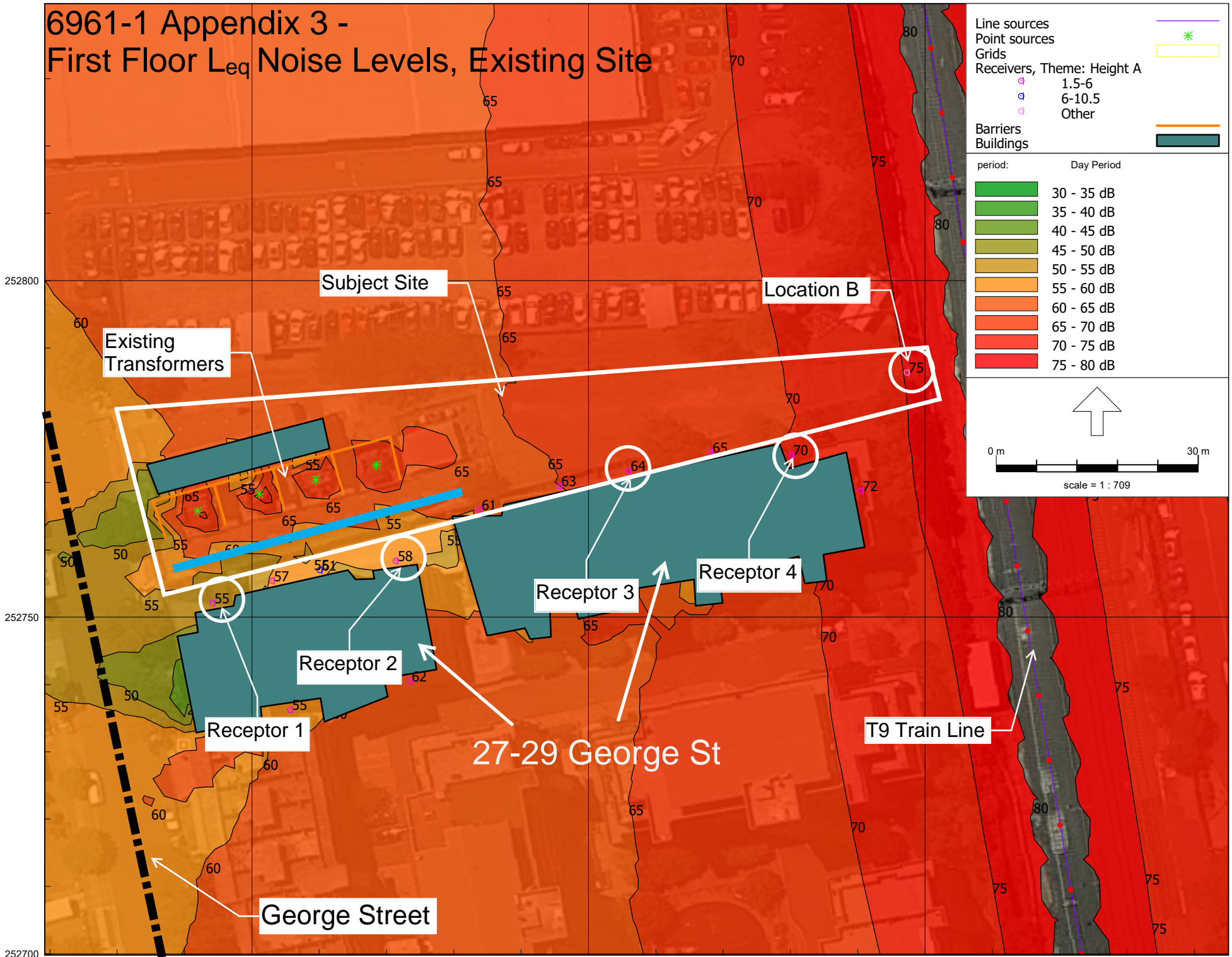
scale = 1 : 709





6961-1 Appendix 2 - Ground Floor L_{eq} Noise Levels, New Switchroom




6961-1 Appendix 3 - First Floor L_{eq} Noise Levels, Existing Site






Line sources 


Point sources 

Grids 











Receivers, Theme: Height A


-  1.5-6
-  6-10.5
-  Other


Barriers

Buildings 

period: Day Period

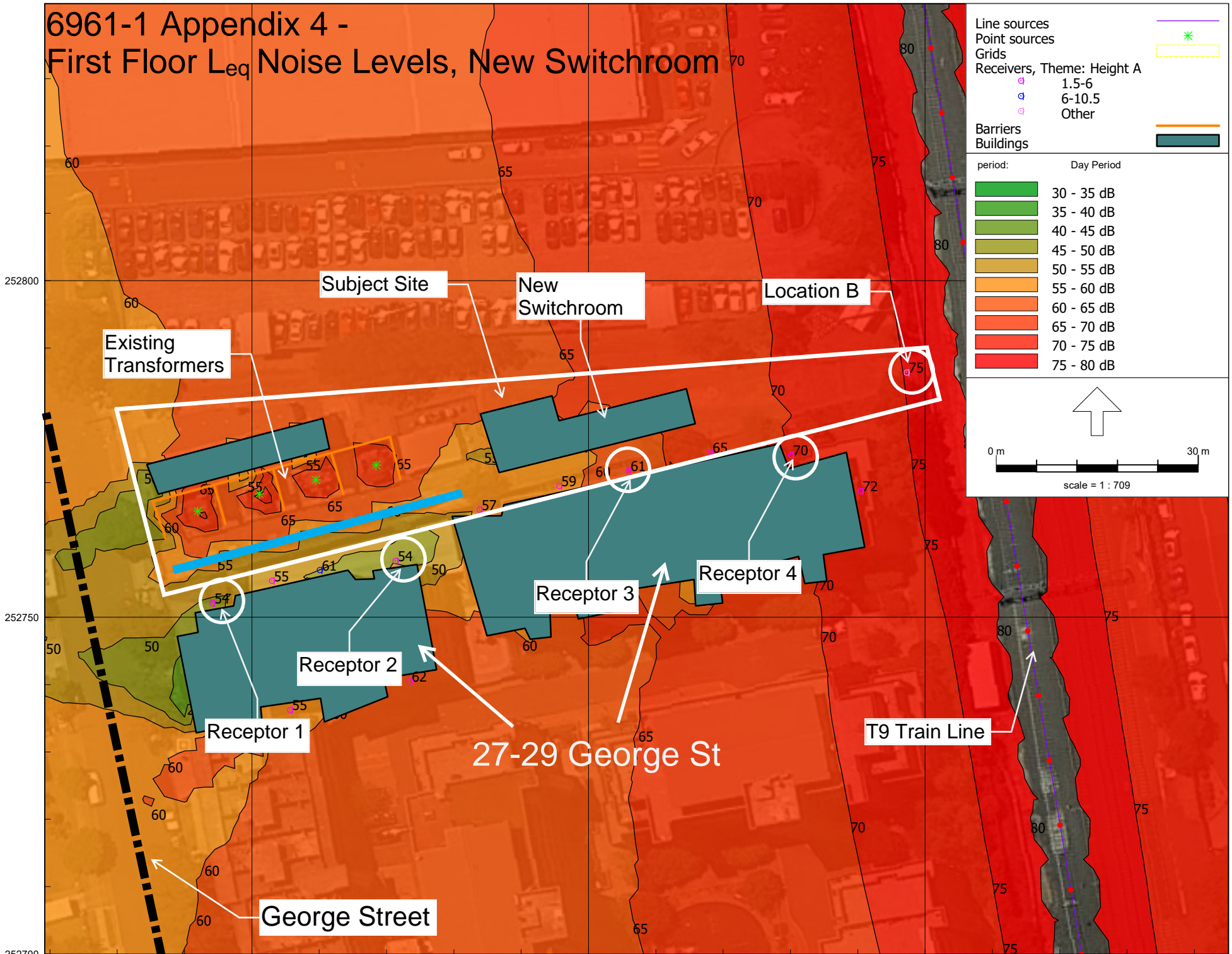
	30 - 35 dB
	35 - 40 dB
	40 - 45 dB
	45 - 50 dB
	50 - 55 dB
	55 - 60 dB
	60 - 65 dB
	65 - 70 dB
	70 - 75 dB
	75 - 80 dB



0 m  30 m

scale = 1 : 709

6961-1 Appendix 4 - First Floor L_{eq} Noise Levels, New Switchroom



Line sources
Point sources
Grids
Receivers, Theme: Height A

- 1.5-6
- 6-10.5
- Other

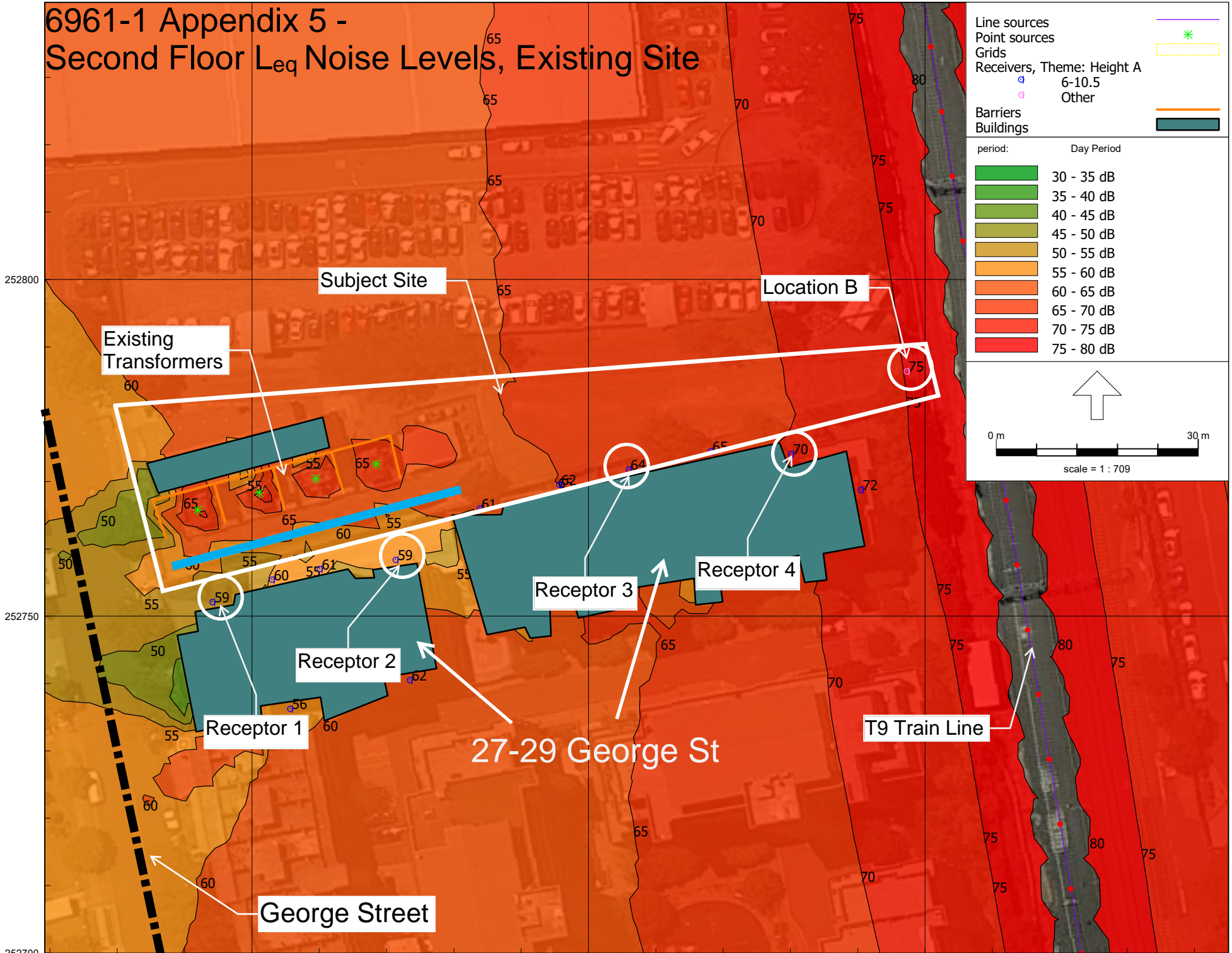
Barriers
Buildings

period: Day Period

30 - 35 dB
35 - 40 dB
40 - 45 dB
45 - 50 dB
50 - 55 dB
55 - 60 dB
60 - 65 dB
65 - 70 dB
70 - 75 dB
75 - 80 dB

0 m 30 m
scale = 1 : 709

6961-1 Appendix 5 - Second Floor L_{eq} Noise Levels, Existing Site



6961-1 Appendix 6 - Second Floor L_{eq} Noise Levels, New Switchroom

