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330 Church Street Parramatta

Part 3A Application Acoustic Assessment

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1 INTRODUCTION

This report presents our assessment of potential noise impact associated with the proposed development at 330 Church Street, North Parramatta.

The following have been addressed to determine the potential for adverse noise impacts:

- Potential impact associated with traffic movements generated by the development and other noise emitted by the proposed development on surrounding receivers;
- Potential impact associated with noise generated on Church Street and surrounding local streets; and
- Establish noise emissions goals for noise generation from the site construction and operation.

This assessment has been conducted as required by the Director General's Requirement number 6 for Application Number MP 10_0171.

On site noise and vibration results have been measured and used to predict internal noise levels within the development. If necessary, appropriate, noise attenuation treatments will be recommended to prevent excessive impacts on residents.

2 SITE DESCRIPTION & PROPOSED DEVELOPMENT

The project is a development containing residential and non-residential areas. It consists of two towers above a four storey podium that includes retail areas and car parking. Parking is also included in 4 basement levels below street level. The eastern tower contains 266 serviced apartments and is 26 storeys above the podium. The western tower contains 378 residential apartments and is 49 storeys above the podium.

The subject site is located at the south-eastern corner of the intersection of the Parramatta River and Church Street, which carries medium volumes of traffic. A car park is located to the east of the site.

Figure 1 details the site and measurement locations.

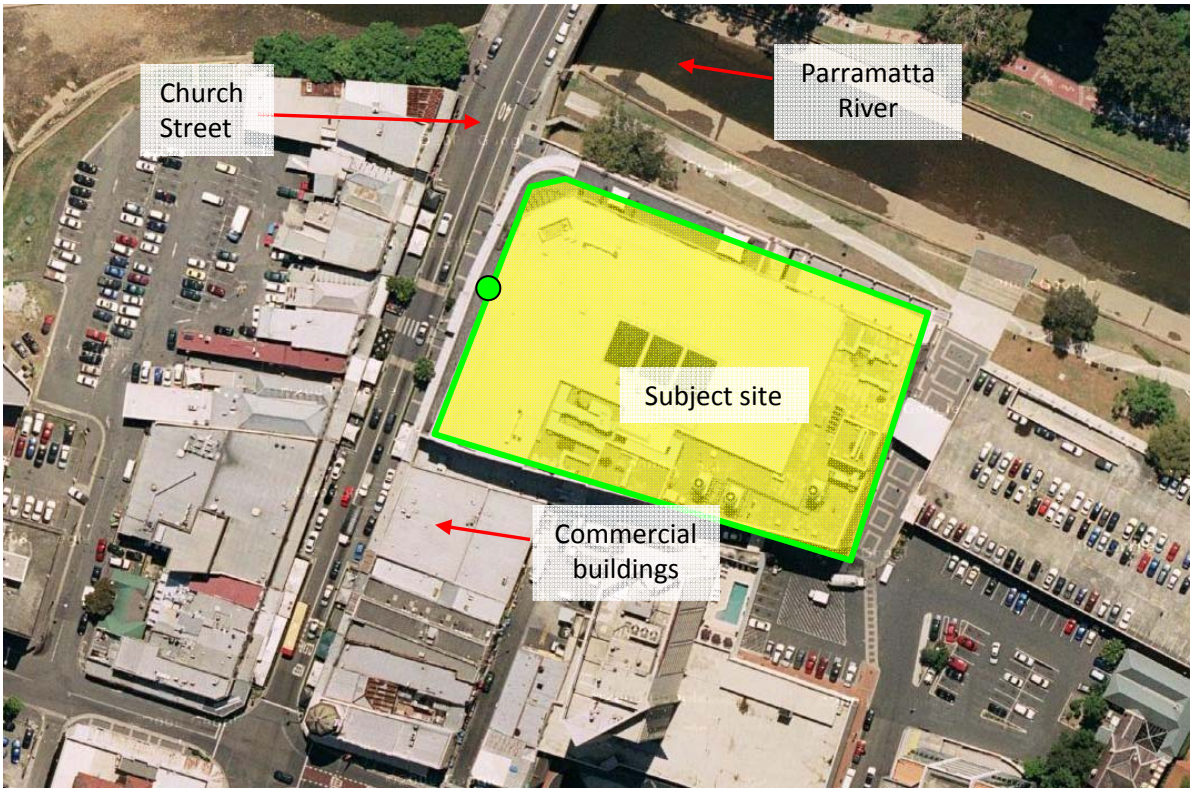


Figure 1 – Site and Measurement Locations

● Unattended noise measurements

3 NOISE DESCRIPTORS

Traffic noise constantly varies in level, due to fluctuations in traffic speed, vehicle types, road conditions and traffic densities. Accordingly, it is not possible to accurately determine prevailing traffic noise conditions by measuring a single, instantaneous noise level. To accurately determine the effects of traffic noise a 15-20 minute measurement interval is utilised. Over this period, noise levels are monitored on a continuous basis and statistical and integrating techniques are used to determine noise description parameters. These parameters are used to measure how much annoyance would be caused by a particular noise source.

In the case of environmental noise three principle measurement parameters are used, namely L_{10}, L_{90} and L_{eq}.

The L_{10} and L_{90} measurement parameters are statistical levels that represent the average maximum and average minimum noise levels respectively, over the measurement intervals.

The L_{10} parameter is commonly used to measure noise produced by a particular intrusive noise source since it represents the average of the loudest noise levels produced at the source.

Conversely, the L_{90} level (which is commonly referred to as the background noise level) represents the noise level heard in the quieter periods during a measurement interval. The L_{90} parameter is used to set the allowable noise level for new, potentially intrusive noise sources since the disturbance caused by the new source will depend on how audible it is above the pre-existing noise environment, particularly during quiet periods, as represented by the L_{90} level.

The L_{eq} parameter represents the average noise energy during a measurement period. This parameter is derived by integrating the noise levels measured over the measurement period. L_{eq} is important in the assessment of traffic noise impact as it closely corresponds with human perception of a changing noise environment; such is the character of traffic noise.

4 TRAFFIC NOISE ASSESSMENT

4.1 ACOUSTIC CRITERIA

The Director General's Requirement number 6 for Application Number (MP 10_0171) states that:

> *"**6. Environmental and Residential Amenity***
>
> *The EA must address solar access, acoustic and visual privacy, view loss and overshadowing and achieve a high level of environmental and residential amenity."*

In the absence of any criteria outlined in this section, a development located near a busy road is to be assessed in accordance with the SEPP (Infrastructure) 2007 and the NSW Department of Planning's policy *Development near Rail Corridors and Busy Roads –Interim Guideline*. As the guideline does not provide internal noise criteria for commercial areas, Australian Standard 2107:2000 will be the subject of application for the purposes of nominating criteria for these commercial spaces. These are detailed in Table 1 below.

The Infrastructure SEPP defines busy roads that are subject to an acoustic assessment as:

> *"Roads specified in Clause 102 of the Infrastructure SEPP: a freeway, tollway or a transitway or any other road with an average annual traffic (AADT) volume of more than 40,000 vehicles (based on the traffic volume data provided on the website of the RTA).*
>
> *Any other road – with an average annual daily traffic (AADT) volume of more than 20,000 vehicles (based on the traffic volume data published on the website of the RTA).*
>
> *Any other road – with a high level of truck movements or bus traffic."*

For commercial and retail occupancies, recommended noise levels in AS2107-2000 "Recommended Design Sound Levels and Reverberation Times for Building Interiors" will be adopted. The absence of any other standard or guideline relating to traffic noise intrusion to commercial and retail premises means AS2107-2000 is used.

Table 1 - Traffic Noise Criteria for All Spaces

Space/Activity Type	Noise Level dB(A) Leq
Bedrooms	35 (9 hour)
Living Areas	40 (15 hour)
Commercial Areas	45 (9 Hour)
Retail Areas	50 (9 Hour)

4.2 MEASUREMENTS PROCEDURE

Unattended noise monitoring was conducted on Church Street during the period of 14 to 21 February 2011 using an Acoustic Research Laboratories Pty Ltd noise monitor. The monitor was programmed to store 15-minute statistical noise levels throughout the monitoring period. The noise monitors were calibrated at the beginning and the end of the measurement using a Rion NC-73 calibrator; no significant drift was detected. Measurements were taken on A-frequency weighting and fast time weighting.

4.3 MEASURED NOISE LEVELS

The results of traffic noise monitoring are detailed in the table below.

Table 3 - Measured Traffic Noise Levels

Location	Time of Day	Noise Level - L_{Aeq}	Noise Level - L_{90}
Church Street – at façade/4m from the kerb.	7:00am – 10:00pm	66dB(A) $L_{Aeq\ (15Hr)}$	59dB(A) $L_{90\ (15Hr)}$
	10:00pm – 7:00am	62dB(A) $L_{Aeq\ (9Hr)}$	55dB(A) $L_{90\ (9Hr)}$

5 EVALUATION OF NOISE INTRUSION

Internal noise levels will primarily be as a result of noise transfer through the windows and doors and roof, as these are relatively light building elements that offer less resistance to the transmission of sound. **All external walls are proposed to be heavy masonry elements that will not require upgrading.**

The predicted noise levels through the windows, doors and roof are discussed below. The predicted noise levels have been based on the measured level and spectral characteristics of the external noise, the area of building elements exposed to traffic noise, the absorption characteristics of the rooms and the noise reduction performance of the building elements.Calculations were performed taking into account the orientation of windows, barrier effects (where applicable), the total area of glazing, facade transmission loss and the likely room sound absorption characteristics. In this way the likely interior noise levels can be predicted.

Recommended acoustic treatments presented below will satisfactorily control traffic noise.

5.1 RECOMMENDED GLAZING

The following constructions are recommended to comply with the traffic noise objectives stated in Section 4. Aluminium framed/sliding glass doors and windows will be satisfactory provided they meet the following criteria listed below.

Table 4 – Residential Glazing – West Tower (Including Podium Level)

Facade	Room		Glazing requirements	Acoustic seals
East - Church Street (including south/north façade of corner units)	Bedrooms	Glazed area less than 6.0m^2	6.38mm laminated	Yes
		Glazed area greater than 6.0m^2	10.38mm laminated	
	Living Rooms	Glazed area less than 16.0m^2	6.38mm laminated	
		Glazed area greater than 16.0m^2	10.38mm laminated	
North Parramatta River	Bedrooms		6.38mm laminated	
	Living Rooms		6.38mm laminated	
South Commercial properties	Bedrooms		6.38mm laminated	
	Living Rooms		6.38mm laminated	
West East Tower	Bedrooms		6.38mm laminated	
	Living Rooms		6.38mm laminated	

Table 4 – Residential Glazing – East Tower

Facade	Room	Glazing requirements	Acoustic seals
East – Facing west tower (including south/north façade of corner units)	Bedrooms	6.38mm laminated	Yes
	Living Rooms	6.38mm laminated	
North Parramatta River	Bedrooms	6.38mm laminated	
	Living Rooms	6.38mm laminated	
South Commercial properties	Bedrooms	6.38mm laminated	
	Living Rooms	6.38mm laminated	
West West Tower	Bedrooms	6.38mm laminated	
	Living Rooms	6.38mm laminated	

Table 5 – Commercial/Retail Glazing

Space Type	Facade	Glazing requirements	Acoustic seals
Commercial / Retail areas generally.	All	6mm / 12mm air gap / 6mm OR 6mm	Yes

It should be noted that the above glazing types are indicative, and should be further reviewed at Construction Certificate stage.

In addition to meeting the minimum glazing thickness requirements given, the design of the window mullions, perimeter seals and the installation of the windows/doors in the building openings shall not reduce the STC rating of the glazing assembly below the values nominated in the table above. Note that mohair type seals will not be acceptable for the windows requiring acoustic seals.

The window/door suppliers should provide evidence that the systems proposed have been tested in a registered laboratory with the recommended glass thicknesses and comply with the minimum listed STC requirements. Also, the glazing installer should certify that the window/doors have been constructed and installed in a manner equivalent to the tested samples.

Table 6 – Minimum STC/R_W of Glazing (with Acoustic Seals)

Glazing Assembly	Minimum STC of Installed Window
6mm float	29
6.38mm laminated	31
10.38mm laminated	35
6mm / 12mm air gap / 6mm	30

Noise intrusion through the masonry walls will be negligible and will not contribute to internal noise levels. Similarly, noise intrusion through the concrete slab roof construction will not be significant.

Thicker glazing may be required for structural, safety or other purposes. Where it is required to use thicker glazing than scheduled, this will also be acoustically acceptable.

5.1.1 Roof / Ceiling

The roof over the office is to be constructed of a concrete slab and will not require upgrading. The metal deck roof over the warehouse will not require any acoustic upgrading.

5.1.2 External Walls

External walls composed of concrete or masonry elements would not require upgrading.

5.1.3 Mechanical Ventilation

As internal noise levels cannot be achieved with windows open it is required that an alternative outside air supply system or air conditioning be installed to meet AS 1668.2 requirements. Any mechanical ventilation system that is installed should be acoustically designed such that the acoustic performance of the recommended constructions are not reduced by any duct or pipe penetrating the wall/ceiling/roof. Noise emitted to the property boundaries by any ventilation system shall comply with Council requirements.

6 NOISE EMISSIONS

The DGR requires:

> *"**An Acoustic Report** addressing any impacts of noise generation from the site during construction and noise from future land uses , as well as the impact of noise from surrounding uses on the site."*

6.1 ACOUSTIC CRITERIA

6.1.1 Construction Noise

The applicable guidelines and standards are:

- *"Australian Standard 2436-1981 "Guide to Noise Control on Construction Maintenance and Demolition Site". The requirements stipulated in Section 3 of the standard will be followed.*
- *DECCW Interim Construction Noise Guideline*

Section 3 of AS 2436 states that care shall be taken in applying criteria that normally would be used to regulate noise emitted from industrial, commercial and residential premises to construction, particularly for those activities which are transitory and of short duration. For the control and regulation of noise from construction sites AS2436 nominates the following:

- *That reasonable suitable noise criterion is established. In this case, the DECCW Interim Guideline recommended level of 10dB(A) above the background noise level is recommended.*
- *In the event that strict compliance with the Interim Guideline is not achievable, that all practicable measures be taken on the building site to regulate noise emissions, including the siting of noisy static processes on parts of the site where they can be shielded, selecting less noisy processes, and if required regulating construction hours.*
- *The undertaking of noise monitoring where non-compliance occurs to assist in the management and control of noise emission from the building site."*

6.1.2 Operational Noise

Noise emissions goals for the site will be developed to ensure that the amenity of nearby land users (both new occupants in the development and residents in nearby properties) is not adversely affected.

As the Parramatta Council DCP does not set out any specific noise emission criteria, noise emissions generated by the site will be assessed using the criteria set out in the DECC Industrial Noise Policy:

Noise emissions to residential receivers are to be assessed using the Industrial Noise Policy criteria, as set out below.

Table 7 - Noise Emission Requirements – Residential Receivers

Receiver Type	Time of Day	Intrusiveness Noise Objective (Background+5) dB(A)$L_{eq(15min)}$	Amenity Noise Objective dB(A)$L_{eq(Period)}$
Suburban	Day	63	55
	Evening	65	45
	Night	60	40

6.2 ASSESSMENT

6.2.1 Mechanical Plant

Mechanical plant items are not typically selected at Part 3A stage.

Detailed review of all external mechanical plant should be undertaken at construction certificate stage (once plant selections and locations are finalised). Acoustic treatments should be determined in order to control plant noise emissions to the levels set out in section 6.2 of this report.

All plant can be satisfactorily attenuated to levels complying with noise emission criteria through appropriate location and (if necessary) standard acoustic treatments such as noise screens, enclosures, in-duct treatments (silencers/lined ducting) or similar.

6.2.2 Construction Noise

We note that detailed methodology statements for the demolition, excavation and construction of the development are not available at Part 3A Application stage, and as such, an assessment and subsequent treatment of items cannot be undertaken at this stage. We recommend that a detailed assessment of noise emissions from construction activities be undertaken at Construction Certificate Stage.

Management of construction noise and vibration is typical acoustic practice. Typical acoustic treatments include:

- Selection of equipment and process.
- Location of static plant.
- Use of screens or enclosures.
- Scheduling of noisy activities and provision of respite periods.

Detailed construction noise planning is typically undertaken after engagement of a builder (ie – after DA stage) and therefore, obviously, detailed noise planning is not possible at this stage. However, a plan for the management of noise as is consistent with AS2436 and the DECCW Interim Construction Noise Guidelines can be undertaken once construction program is determined.

7 CONCLUSION

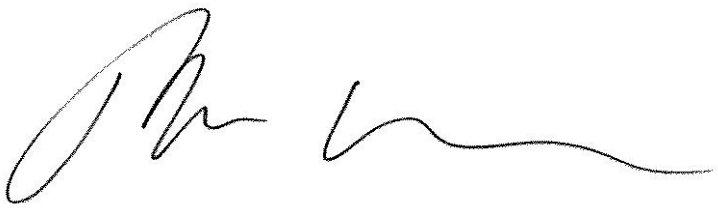
This report presents our assessment of potential noise impact associated with the proposed mixed use development, Church Street Apartments, located at 330 Church Street, Parramatta.

External noise impacts on the development from surrounding streets have been assessed in accordance with Director General Requirement number 6, the State Environmental Planning Policy (Infrastructure) 2007, the NSW Department of Planning's policy *Development near Rail Corridors and Busy Roads –Interim Guideline* and the Parramatta City Council and will comply with internal noise goals at all times with the implementation of constructions detailed in Section 5 and 7.4.

As a result, noise impact associated with the proposed development will comply with the requirements of the Director General Requirements and other relevant statutory authorities.

Potential operational and construction noise guidelines and have been identified in section 6. As detailed in section 6.2, further detailed analysis should be undertaken during design development (between DA and CC) to ensure that operational noise and construction noise is suitable managed to maintain the amenity of nearby land users.

Yours faithfully,

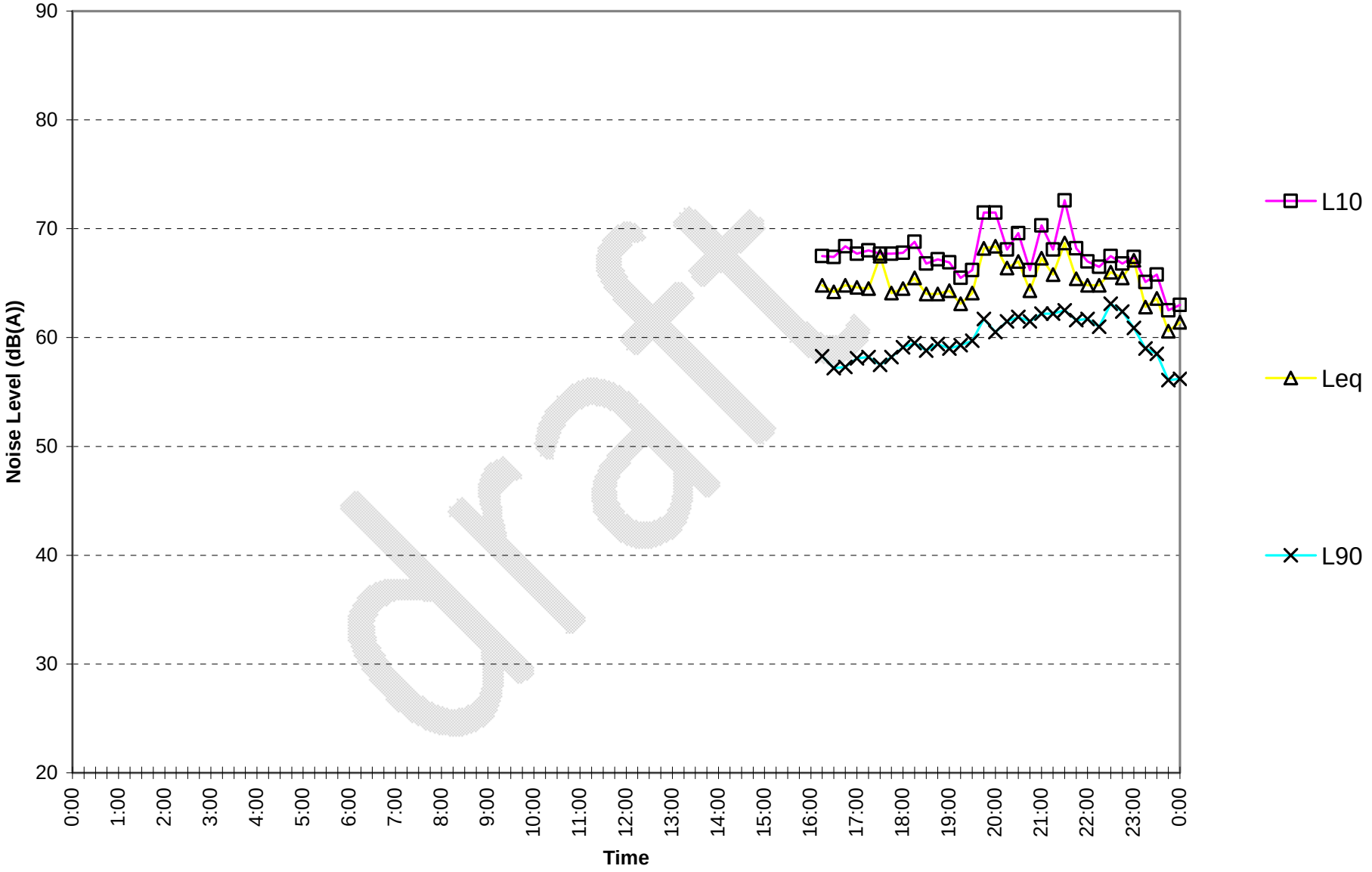


Acoustic Logic Consultancy Pty Ltd
Thomas Aubusson

Appendix 1 - Unattended Noise Monitoring Data

330 Church St.

Monday February 14,2011



330 Church St.

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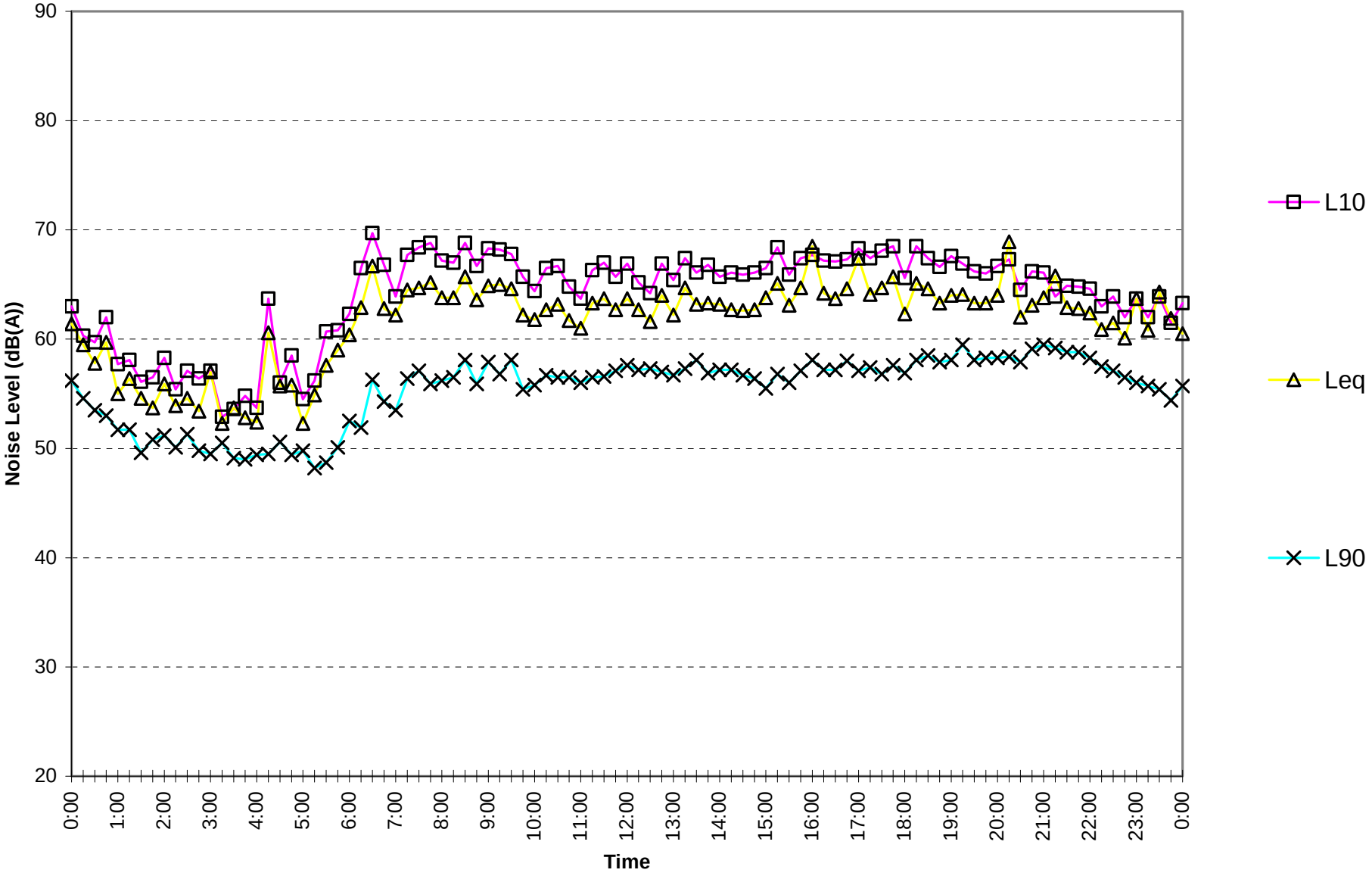
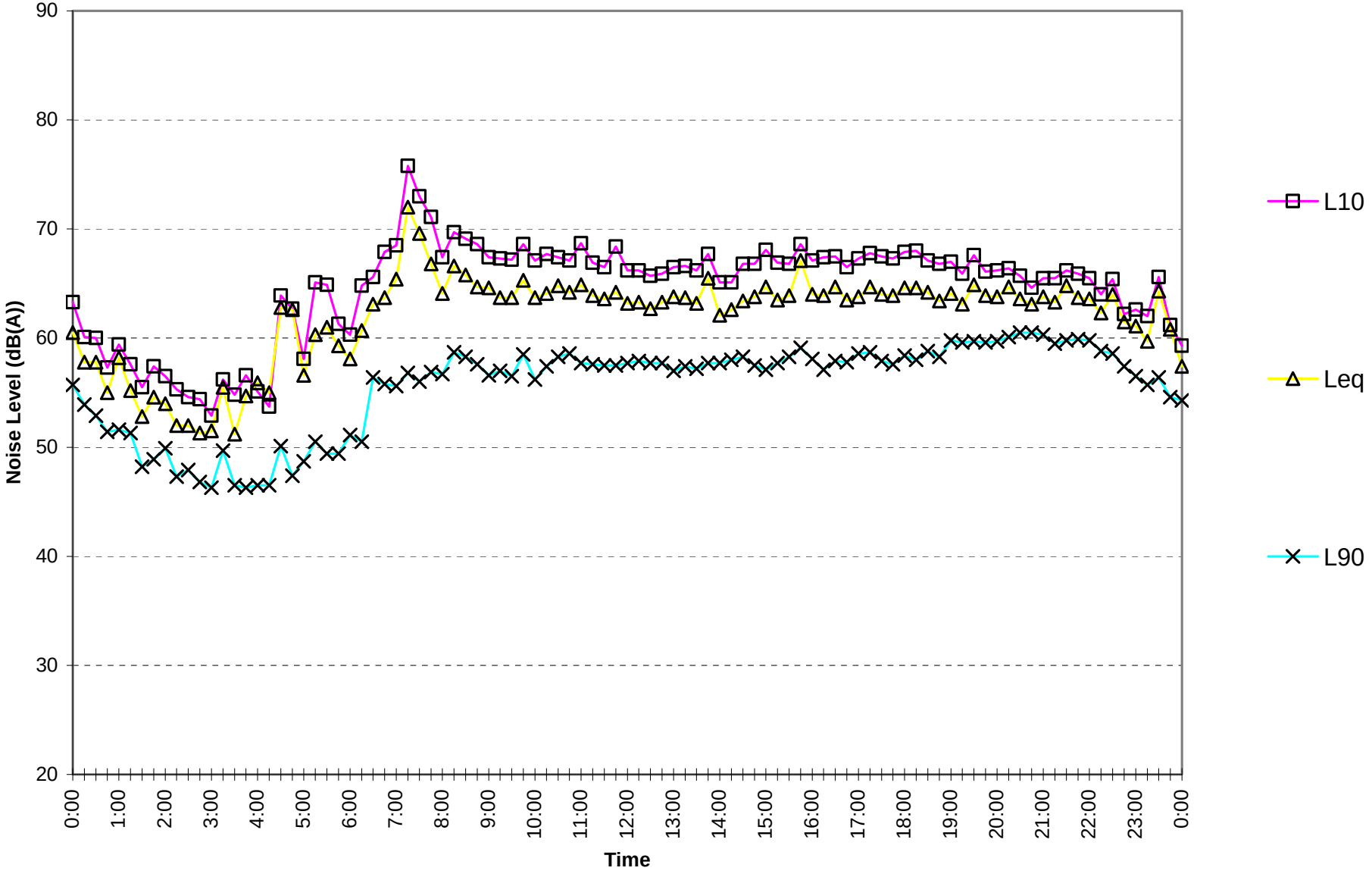


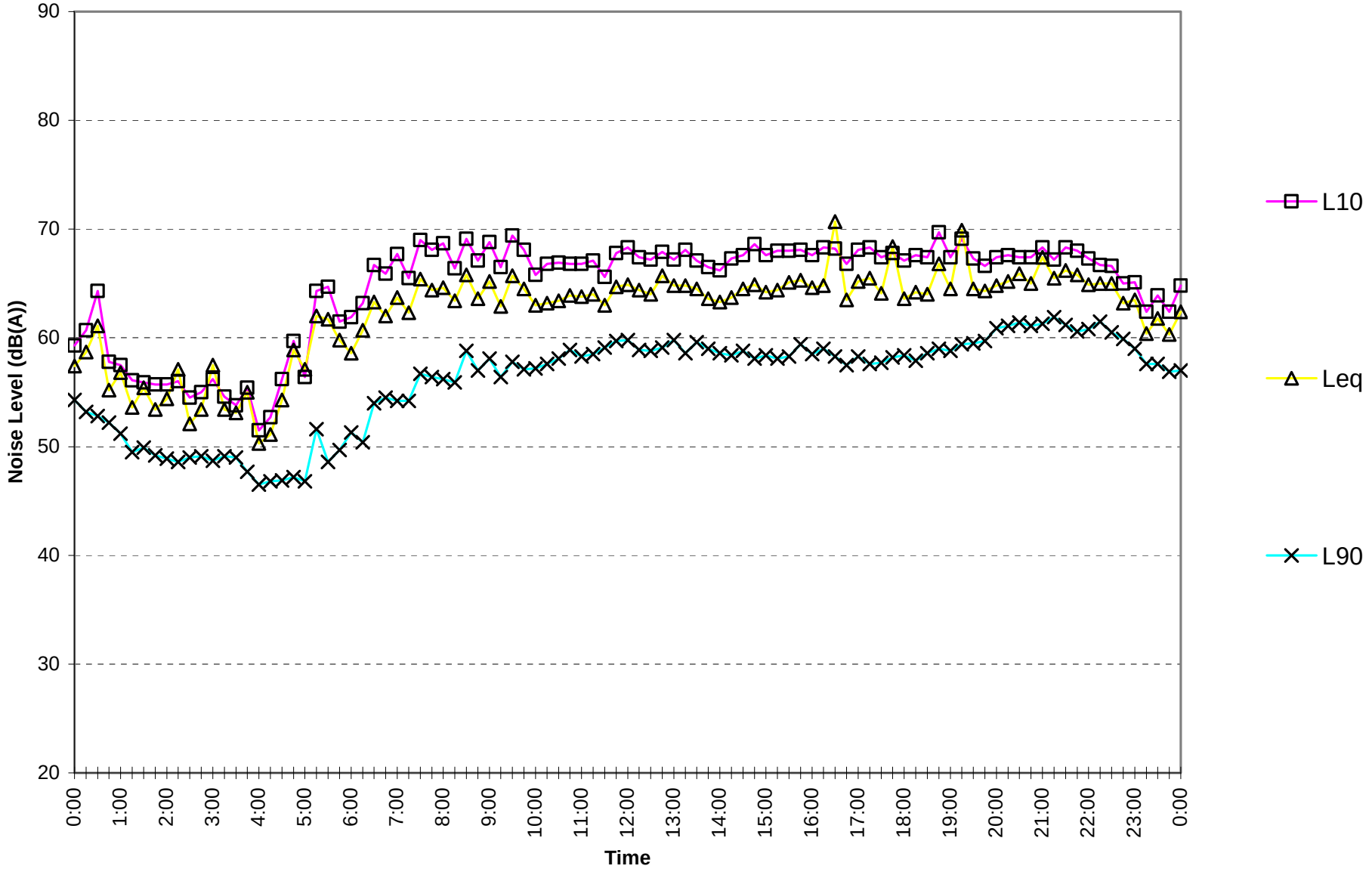
330 Church St.

Wednesday February 16,2011



330 Church St.

Thursday February 17,2011



330 Church St.

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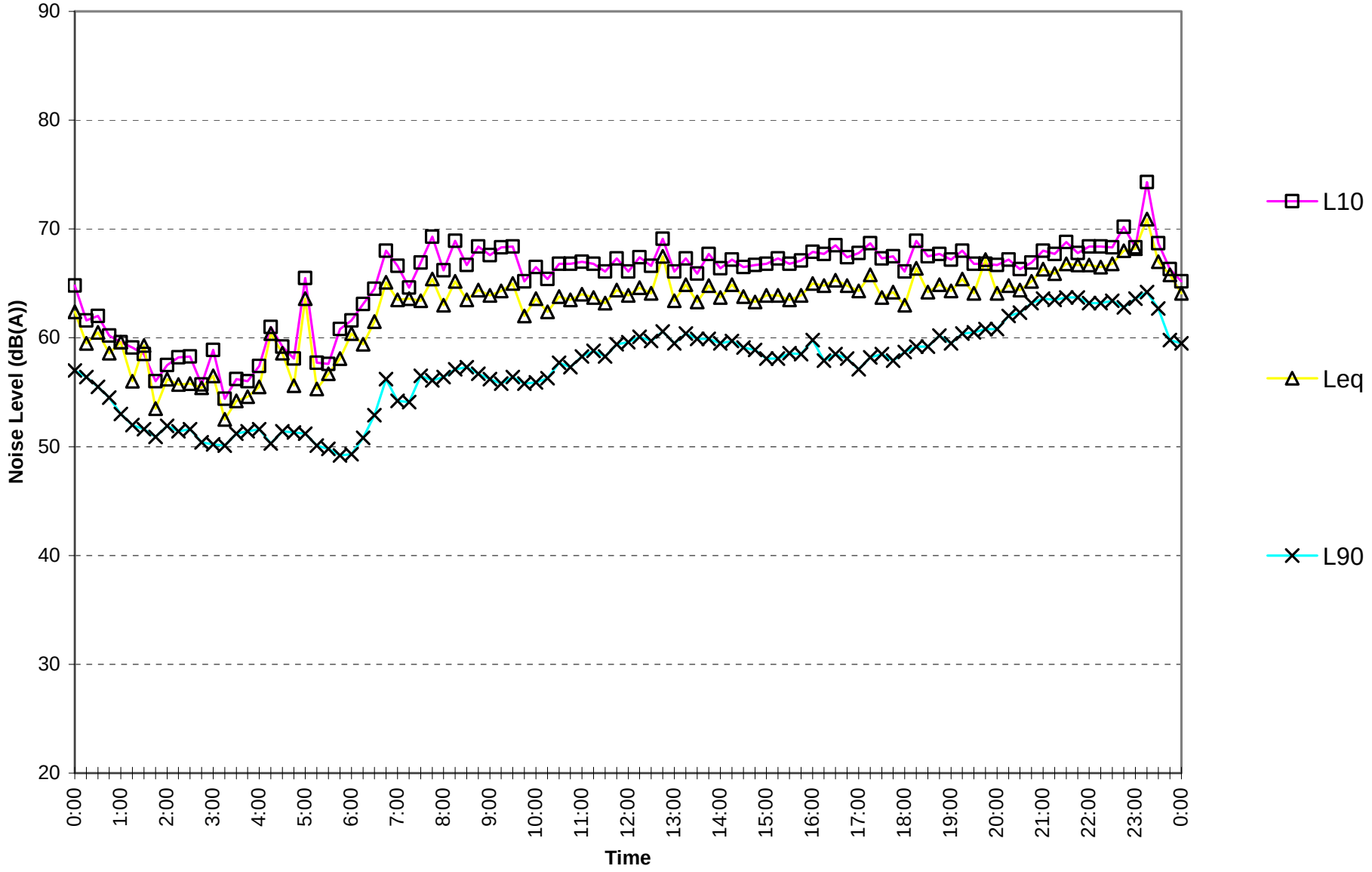
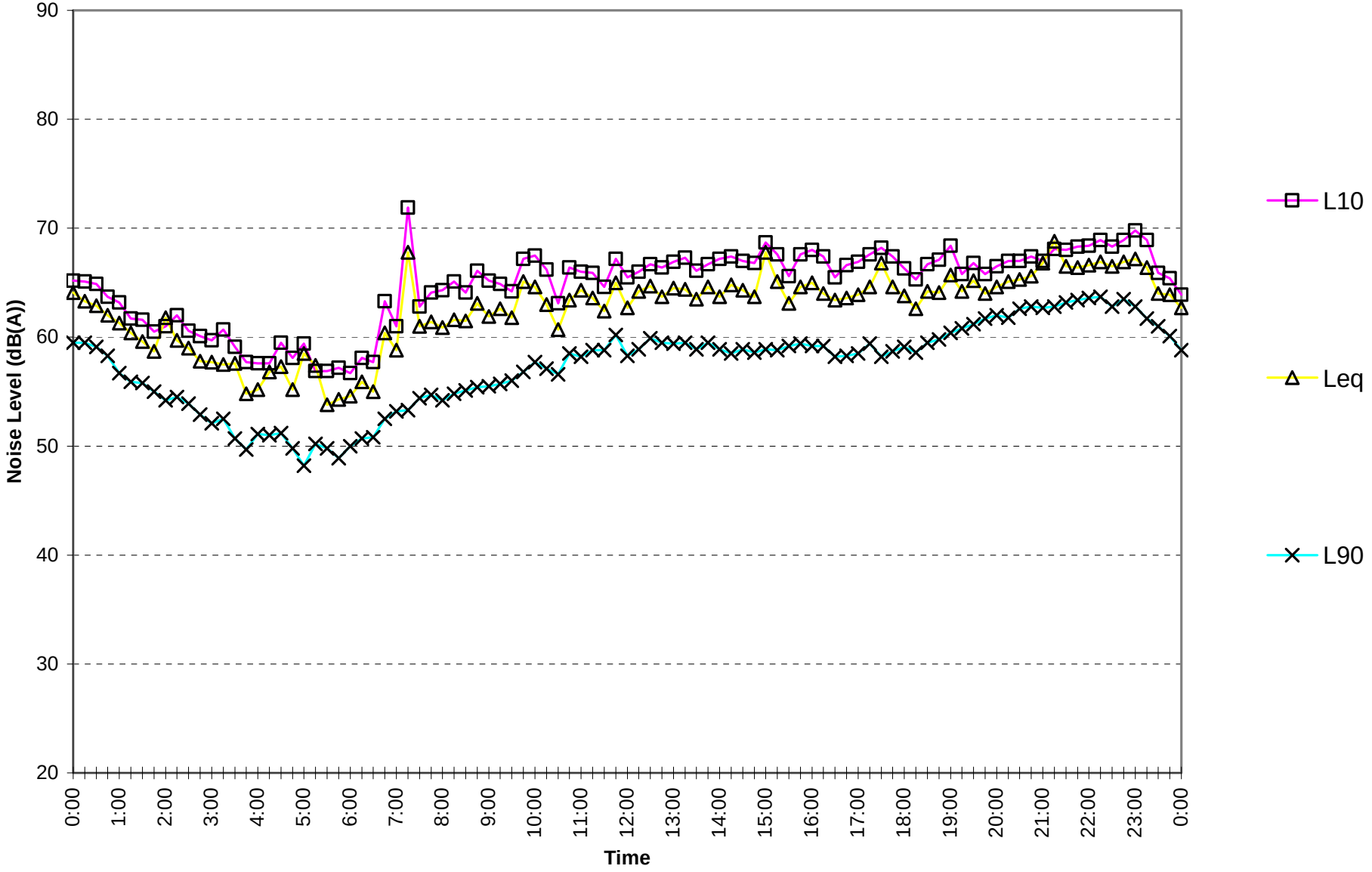


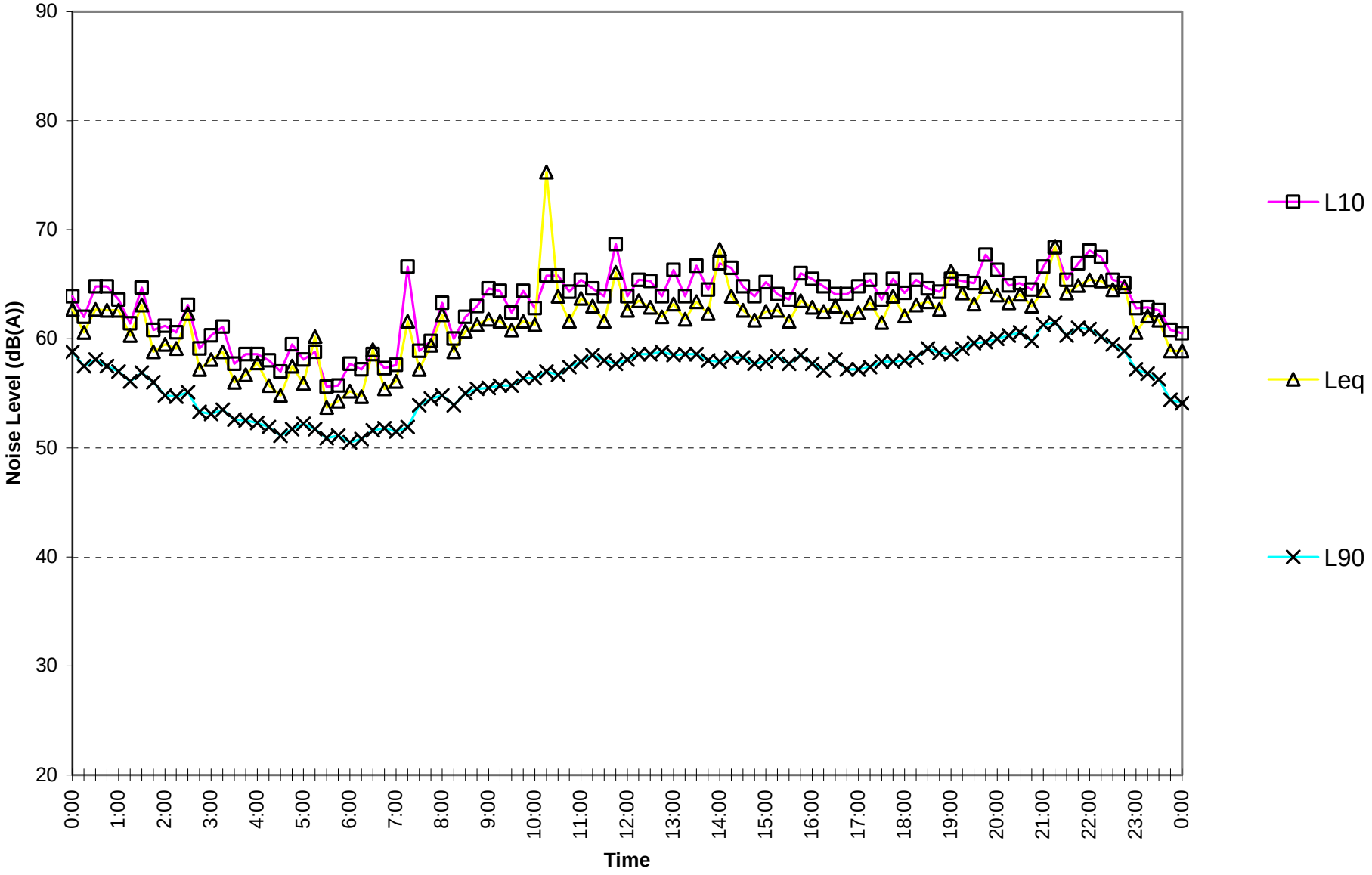
330 Church St.

Saturday February 19,2011



330 Church St.

Sunday February 20,2011



330 Church St.

Monday February 21,2011