AMBIENT NOISE SURVEY

Unattended Continuous Noise Monitoring

In order to establish the existing noise environment within and around the Frasers Broadway project area, environmental noise monitoring was conducted at representative locations during August 2006. These locations were selected after a detailed inspection of the project area. The monitoring locations were selected with consideration to noise sources which may influence the recordings, including sensitive locations (eg residential receivers), security issues for the noise monitoring devices and gaining access to the monitoring locations.

The unattended noise monitoring was conducted in order to determine project specific criteria and to verify and inform the computer noise modelling exercise for the proposed development at the Frasers Broadway site.

Weather data recorded by the Bureau of Meteorology during the noise monitoring survey periods was used to assist in identifying potentially adverse weather conditions that could have an adverse effect on the measured noise levels such as rainy periods, etc.

Noise Monitoring Instrumentation

Unattended noise monitoring was conducted at five (5) locations on site between Monday 7 August 2006 and Wednesday 16 August 2006. Equipment for the continuous unattended noise surveys comprised Acoustic Research Laboratories Environmental Noise Loggers Type EL-316 (serial numbers 16-203-526, 16-203-506, 16-004-039, 16-302-482, and 16-301-472) fitted with microphone windshields. Attended noise measurements were conducted using a Brüel & Kjær Type 2260 integrating sound level meter.

Calibration of the loggers and the sound level meter was checked prior to and following measurements using a Brüel & Kjær Electronic Calibrator Type 4230. Drift in calibration did not exceed ±0.5 dBA. For the noise loggers, the sample time interval was set at 15 minutes and the time weighting function set to "Fast"

All items of acoustic instrumentation employed during the noise monitoring surveys were designed to comply with the requirements of AS 1259.2-1990 "*Acoustics - Sound Level Meters. Part 2: Integrating - Averaging*" and carried appropriate and current NATA (or manufacturer) calibration certificates.

The noise loggers were deployed at five (5) locations in order to assess noise emission from the proposed development to nearby residential premises and to assess noise intrusion into the site. Noise monitoring locations are as shown in **Figure 3**, specifically, the loggers were located as follows:

- **Location 1**: Inside the existing Frasers Broadway site, on top of the walkway, in order to assess continuous mechanical plant noise emission from the site to neighbouring properties and to future residential apartments within the Frasers Broadway site.
- **Location 2**: O'Connor Street, in order to assess continuous mechanical plant noise emission from the site to neighbouring properties and to future residential apartments within the Frasers Broadway Site.
- **Location 3**: Regent Street, in order to approximate the noise environment experienced to the east of the site and to assess noise intrusion from road traffic, railway and general Sydney "CBD" noise.
- **Location 4**: Broadway, in order to approximate the noise environment experienced to the north of the site and to assess noise intrusion from road traffic and general Sydney "CBD" noise.

- **Location 5**: Abercrombie, in order to approximate the noise environment experienced to the west of the site and to assess noise intrusion from road traffic and general Sydney "CBD" noise.

Figure 3 Noise Monitoring Locations

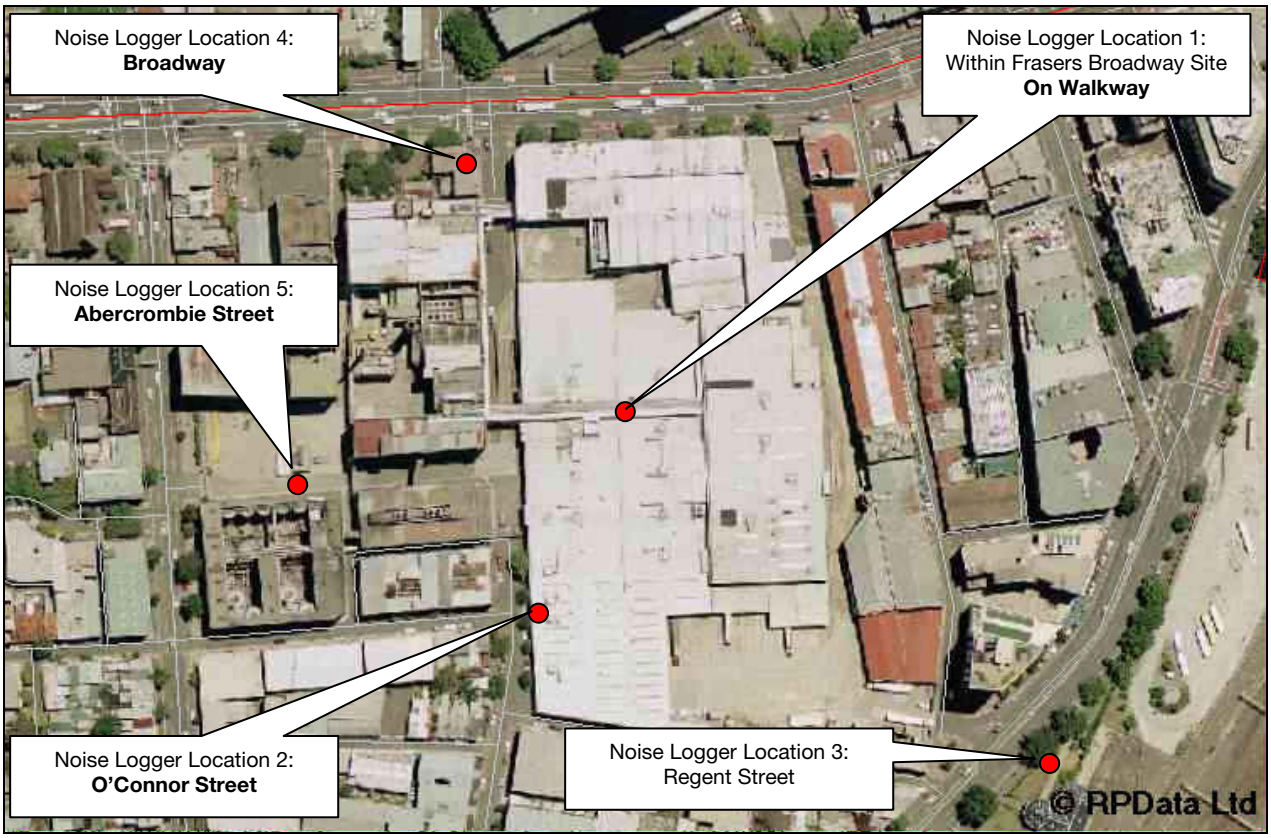


Image Courtesy of RPDATA

Ambient Noise Monitoring Results

Unattended noise survey results were accumulated to obtain a representative 24 hour period for each location. The following graphs (**Figure 4 to Figure 8**) show representative 24 hour period of site noise levels at each of the monitoring locations.

Figure 4 24 hour Period of Noise Levels at Location 1 (Within FRASERS BROADWAY Site)

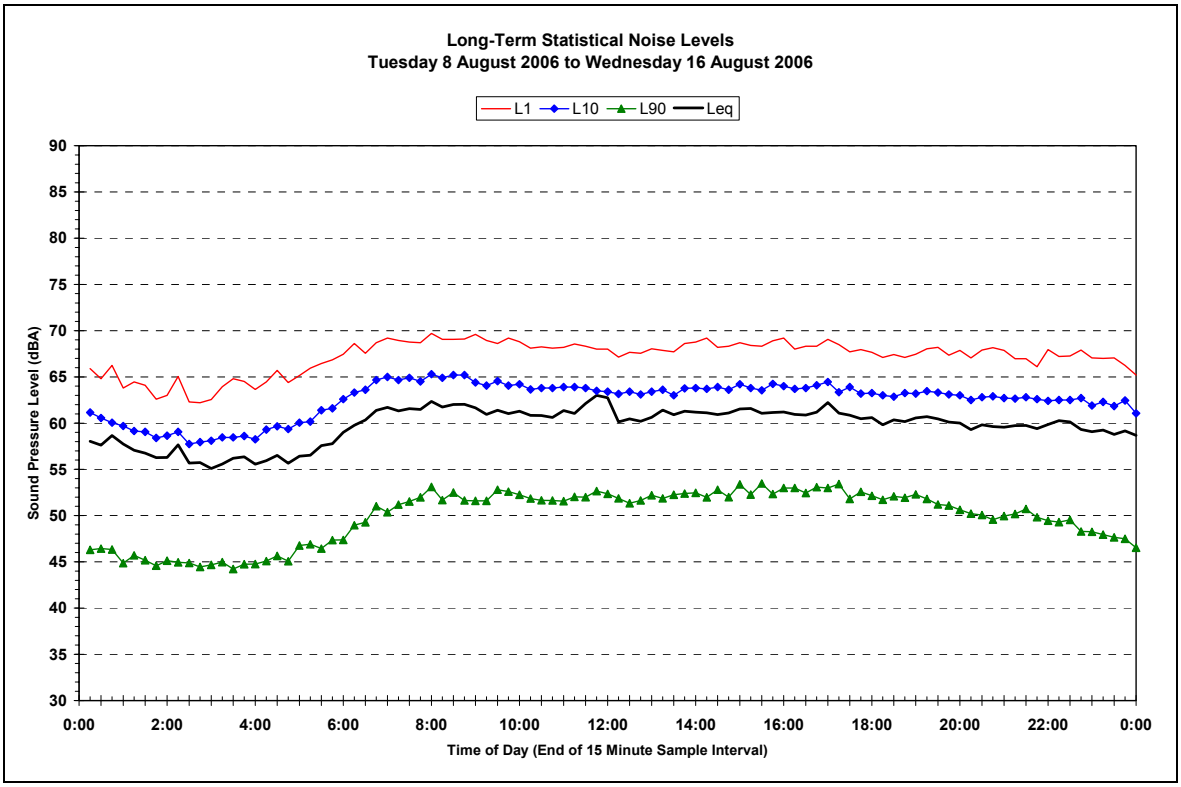


Figure 5 24 hour Period of Noise Levels at Location 2 (O'Connor Street)

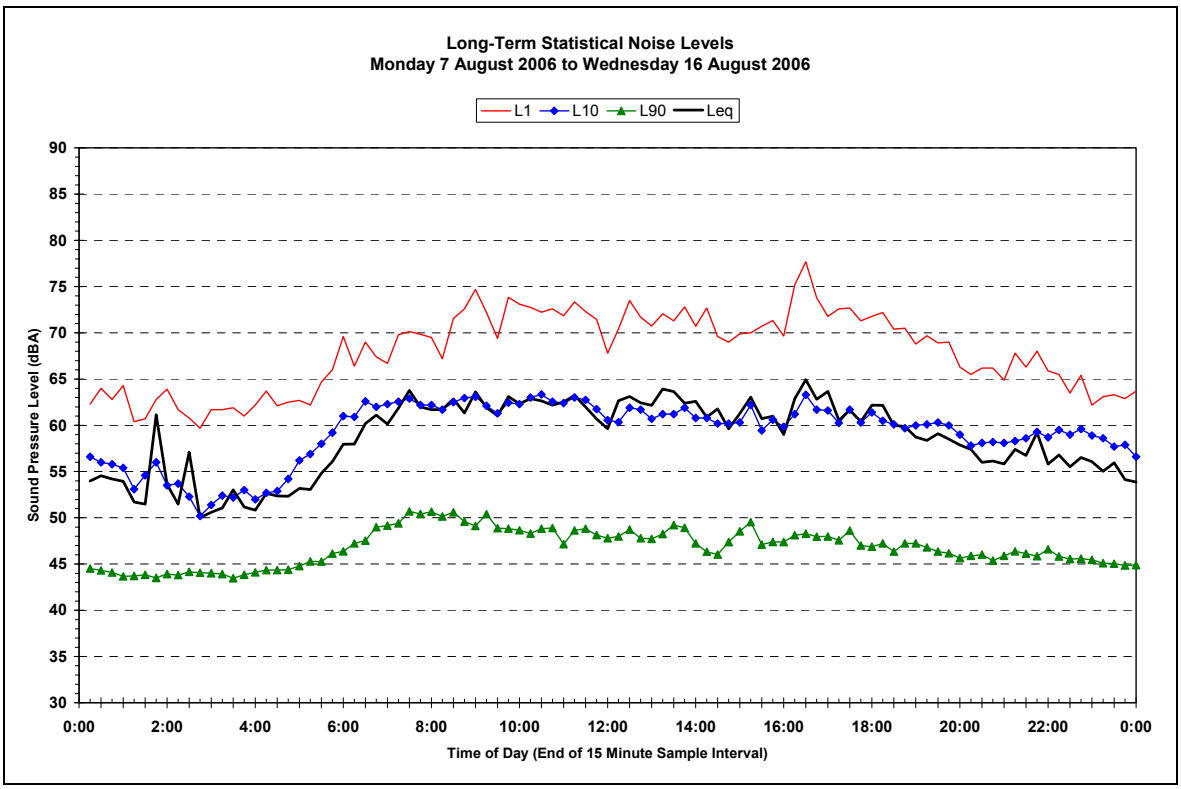


Figure 6 24 hour Period of Noise Levels at Location 3 (Regent Street)

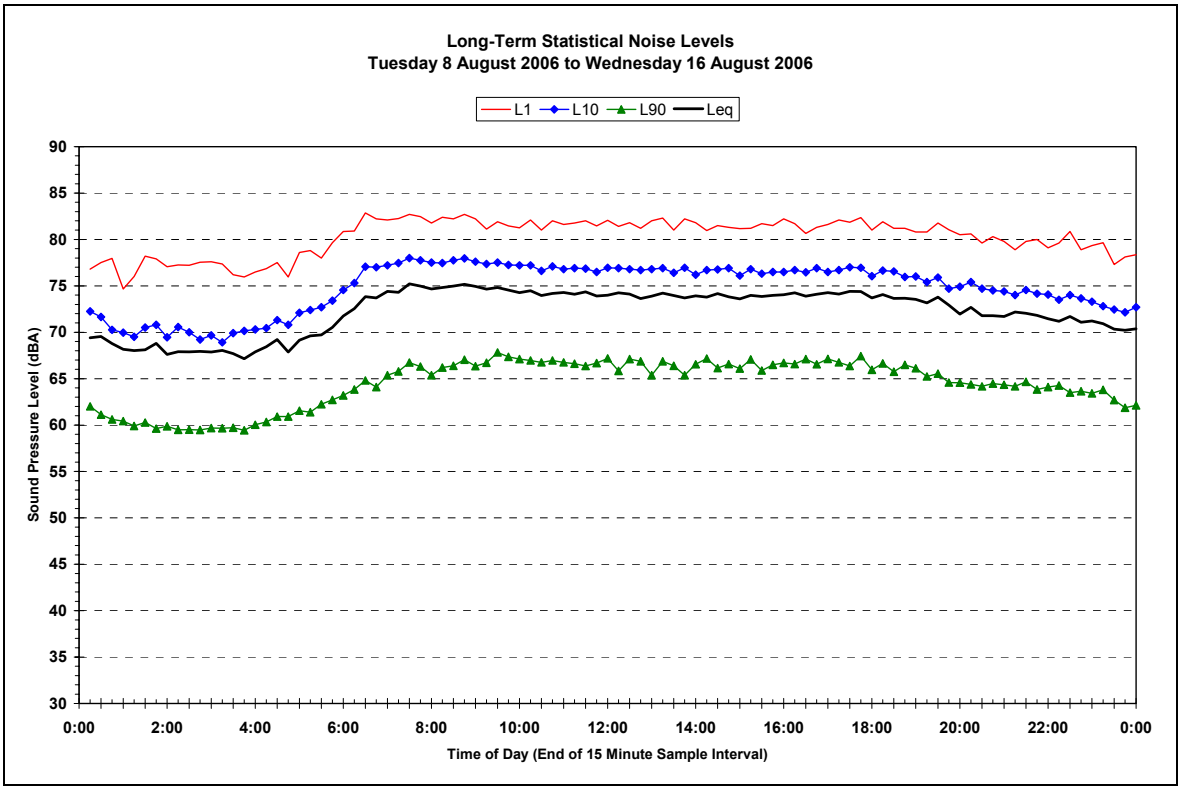


Figure 7 24 hour Period of Noise Levels at Location 4 (Broadway)

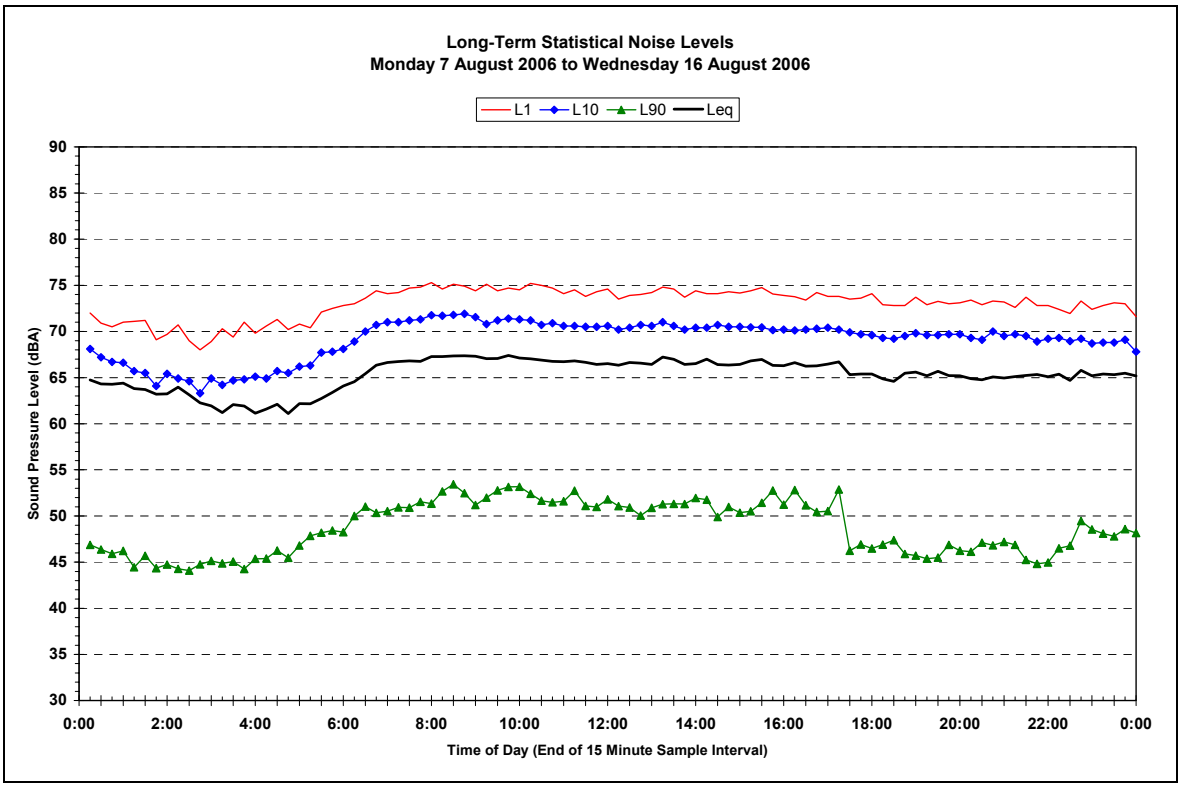
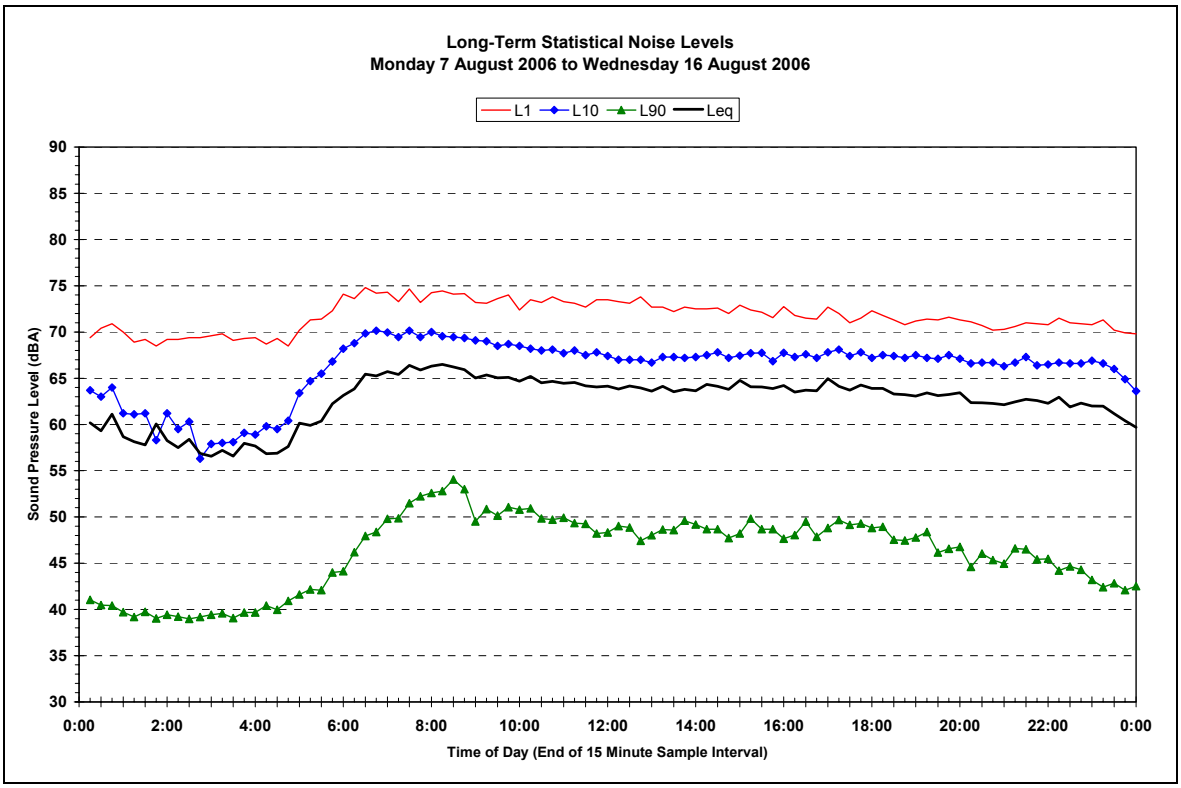


Figure 8 24 hour Period of Noise Levels at Location 5 (Abercrombie Street)



Statistical Noise Levels

The statistical descriptors shown on the graphs are described below:

- L_{A90} The noise level exceeded for 90% of the sample time (15 minutes). The L_{A90} noise level is described as the average minimum background sound level or simply the background level.
- L_{Aeq} The L_{Aeq} is the energy-average sound level. It is defined as the steady sound level that contains the same amount of acoustical energy as a given time-varying sound.
- L_{A10} The noise level exceeded for 10% of the sample time (15 minutes) and is typically described as the average maximum noise level.
- L_{A1} The noise level exceeded for 1% of the sample time (15 minutes) and representative of the highest noise level events, (eg passing heavy vehicles, aircraft etc).

Unattended Noise Monitoring Results

The results of the ambient noise surveys are presented in **Table 9** and **Table 10** (noise levels rounded to the nearest 1 dBA).

In order to derive noise criteria relating to the control of industrial-type noise emission, the results of the noise monitoring have been processed in accordance with the procedures contained in the Department of Environment and Climate Change (DECC, formerly EPA) *Industrial Noise Policy* (INP) so as to establish representative noise levels that can be expected on site. The results of this analysis are presented in **Table 9.** The criteria established from these measured levels are presented and discussed in **Section 3**.

Table 9 Measured Ambient Noise Levels at Frasers Broadway Site.

Location	Industrial Noise Indices - dBA re 20 µPa					
	Daytime 7.00 am - 6.00 pm		Evening 6.00 pm - 10.00 pm		Night-time 10.00 pm - 7.00 am	
	RBL[1]	LAeq[2]	RBL	LAeq	RBL	LAeq
Location 1	53	62	51	60	45	58
Location 2	50	61	47	58	45	56

Note 1: RBL - Rating Background Noise Level (RBL) is representative of the average minimum background sound level (in the absence of the source under consideration), or simply the background level. It is the median of the daily background noise levels during each assessment period, being day, evening and night.

Note 2: The LAeq is essentially the average sound level. It is defined as the steady sound level that contains the same amount of acoustical energy as a given time-varying sound.

In order to assess noise intrusion, and to assist with and verify the SoundPLAN noise modelling exercise, the measured noise levels were processed in accordance with the DECC's *Environmental Criteria for Road Traffic Noise* (ECRTN) document to provide an indication of external road traffic noise levels during the daytime and night-time periods. The results of this process are presented in **Table 10**.

Table 10 Road Traffic Noise Indices - Summary of Ambient LAeq Noise Survey Results

Location	Road Traffic Noise Indices - dBA re 20 µPa			
	Daytime (7.00 am - 10.00 pm)		Night-time (10.00 pm - 7.00 am)	
	LAeq(15hour)	LAeq(1hour)	LAeq(9hour)	LAeq(1hour)
Location 3	74	75	70	72
Location 4	67	68	64	67
Location 5	64	66	61	63