

ACOUSTIC LOGIC CONSULTANCY
noise and vibration consultants
abn 11 068 954 343

EAST DARLING HARBOUR
NOISE AND VIBRATION ASSESSMENT

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Prepared for: SYDNEY HARBOUR FORESHORE AUTHORITY

Directors | Matthew Palavidis | Victor Fattoretto

Sydney | Ph 02 8338 9888 | fax 02 8338 8399 | 9 Sarah Street Mascot NSW 2020

Melbourne | Ph 03 9614 3199 | fax 03 9614 3755 | Level 7, 31 Queen Street Melbourne VIC 3000

Canberra | Ph 02 6162 9797 | fax 02 6162 9711 | Unit 14/71 Leichhardt Street Kingston ACT 2604

TABLE OF CONTENTS

EXECUTIVE SUMMARY

1. INTRODUCTION	2
2. EXISTING NOISE ENVIRONMENT	2
3. PROPOSED DEVELOPMENT	4
4. NOISE AND VIBRATION ASSESSMENT	5
4.1 POTENTIAL IMPACTS ON EXISTING LAND USES SURROUNDING EAST DARLING HARBOUR	5
4.1.1 Noise Emissions from Existing Activities	5
4.1.2 Noise Emissions from New Buildings or Activities	5
5. NOISE EMISSIONS FROM TRANSPORTATION NOISE	6
5.1 POTENTIAL ACOUSTIC CONFLICTS WITHIN EAST DARLING HARBOUR	6
5.2 AMENITY FOR FUTURE USERS OF EAST DARLING HARBOUR	7
5.3 CONSTRUCTION NOISE AND VIBRATION	7
6. CONCLUSION	8

EXECUTIVE SUMMARY

An assessment of the potential noise and vibration impacts associated with the redevelopment of East Darling Harbour (EDH) has been undertaken on behalf of Sydney Harbour Foreshore Authority for use in a Concept Plan submission for EDH.. The principles used in the assessment are:

- The operation of existing commercial and non residential activities that will be retained in the proposed redevelopment should not unreasonably be restricted by any new activity or development within the precinct.
- Noise or vibration emissions from the redeveloped East Darling Harbour should not adversely impact existing land uses adjacent to the precinct.
- Acceptable acoustical amenity should be provided for the occupants of buildings and outdoor activities proposed in the redevelopment from continuing existing land uses as well as any new noise or vibration sources arising from the proposed redevelopment.
- Noise emissions from community facilities proposed in the redevelopment should be managed and ameliorative measures incorporated into the design of new buildings surrounding these facilities to provide balanced development and maximise the use of these facilities.
- Noise and vibration emissions from demolition and construction activities should not unreasonably impact existing land uses, and the occupants of buildings that might be erected during the staged development of the precinct.

It is concluded that:

- The proposed development would not adversely impact existing land uses surrounding the precinct provided appropriate planning conditions and controls are placed on new development, as recommended in the report. The increased vehicle movements generated would produce a small increase in traffic generated noise levels over the long term, and would consequently be unnoticed.
- Buildings that would be constructed in East Darling Harbour can be designed to adequately exclude ambient traffic noise, and from the normal operation of existing and anticipated noise generating uses such as the passenger terminal, recreation spaces, etc.
- Plans of management should be developed to manage noise emissions from community facilities. This, in combination with treatment of nearby buildings, will allow a range of community activities to be carried out.
- Noise and vibration emissions from construction activity is likely to be present over the long term as development of East Darling Harbour progresses. Management plans should be developed for individual construction sites so that emissions are minimised.

A series of Statement of Commitments is incorporated in the main body of the report.

1. INTRODUCTION

An assessment of the potential noise and vibration impacts associated with the redevelopment of East Darling Harbour has been undertaken. The principles used in the assessment are:

- The operation of existing commercial and non residential activities that will be retained in the proposed redevelopment should not unreasonably be restricted by any new activity or development within the precinct.
- Noise or vibration emissions from the redeveloped East Darling Harbour should not adversely impact existing land uses adjacent to the precinct.
- Acceptable acoustical amenity should be provided for the occupants of buildings and outdoor activities proposed in the redevelopment from continuing existing land uses as well as any new noise or vibration sources arising from the proposed redevelopment.
- Noise emissions from community facilities proposed in the redevelopment should be managed and ameliorative measures incorporated into the design of new buildings surrounding these facilities to provide balanced development and maximise the use of these facilities.
- Noise and vibration emissions from demolition and construction activities should not unreasonably impact existing land uses, and the occupants of buildings that might be erected during the staged development of the precinct.

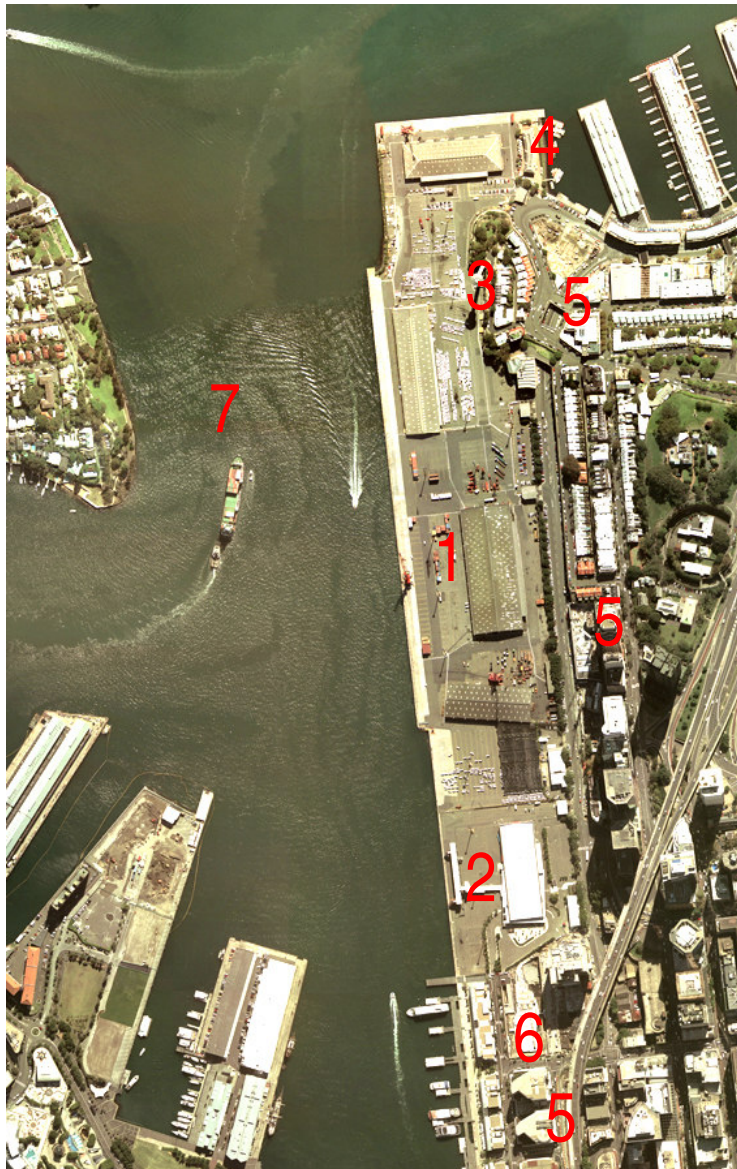
These principles have been used to assess potential conflicts between adjacent land uses and the measures and planning principles and controls that may be adopted to adequately ameliorate any potential impacts.

2. EXISTING NOISE ENVIRONMENT

Existing land uses in East Darling Harbour are:

- Port activities including overseas passenger terminal, docks for the unloading of commercial shipping
- Sydney Ports the Harbour Control Tower and Security and Emergency Response Centre.
- Commercial office buildings south of the proposed redevelopment and to the east of Hickson Road.
- Residential dwellings consisting of terrace housing at the northern end of Hickson Road and to the east of Hickson Road, and multilevel apartment and hotel buildings located on Kent Street. There are also multi-level residential dwellings within the King Street Wharf development to the south.

Figure 1 identifies the existing land uses on and around East Darling Harbour.

**Legend**

1. Port Activities
2. Overseas Passenger Terminal
3. Harbour Control Tower
4. Moore's Wharf
5. Surrounding Residential
6. Future Commercial
7. Sydney Harbour

FIGURE 1 – EXISTING NOISE ENVIRONMENT

The existing noise environment is dominated by:

- Noise sources associated with the loading and unloading of commercial shipping including noise emitted by berthed ships, materials handling equipment such as cranes and forklifts and trucks delivering goods to and from the site.

These activities may occur at any time, and the intensity of activity and noise emissions varies considerably depending on whether a ship is berthed the stages of activities associated with the servicing of these vessels. Trucks accessing the site generally do so using Sussex Street/Hickson Road.

The proposed redevelopment will see the phasing out of Port activities excluding the cruise ship berth and associated tourist activities such as bus layovers.

- Transportation noise from private passenger vehicles, Trucks associated with Port activities, other commercial vehicles and Sydney transit authority buses, primarily along Hickson Road. There are also tourist coach movements that occur spasmodically throughout the day.
- Vessels on Sydney Harbour.
- Low level background noise from the Sydney CBD.

3. PROPOSED DEVELOPMENT

The land uses that are included in the proposed redevelopment are:

- Retain and redevelop passenger ship terminal and associated operations and activities.
- Retain the Sydney Ports Harbour Control Tower and Security and Emergency Response Centre.
- Open passive and active recreation space.
- Multi-level residential dwellings.
- Commercial office buildings and other mixed use activities.

It is envisaged that the redevelopment of the East Darling Harbour precinct would occur over a 10-15 year timeframe.

4. NOISE AND VIBRATION ASSESSMENT

4.1 POTENTIAL IMPACTS ON EXISTING LAND USES SURROUNDING EAST DARLING HARBOUR

Potential impacts on existing land uses can be divided into 3 groups:

- Noise emissions from existing activities that may be changed by the proposal.
- Noise emissions from new buildings or activities associated with the redevelopment.
- Noise emissions from transportation noise associated with the redevelopment.

4.1.1 Noise Emissions from Existing Activities

In general the proposed redevelopment would have a positive impact since it removes relatively uncontrolled open air industrial activities that are replaced by uses within enclosed buildings and open air community facilities that are separated from existing sensitive land uses.

In addition, the higher structures proposed for the southern end of the new development will provide a significant barrier to sound propagation to the east from activities on or around the passenger ship berth that does not currently exist.

4.1.2 Noise Emissions from New Buildings or Activities

Noise emissions from plant and equipment associated with new buildings and structures can be controlled using appropriate engineering methods. An appropriate guideline for assessing and regulating noise emissions is the NSW EPA Industrial Noise Policy (INP). When setting noise targets for individual sites allowances should be made for the cumulative impact of noise emissions from the relatively large number of new buildings and noise sources that will be contained within the precinct. A procedure for this is provided in the INP. Development approval conditions for individual sites should include a requirement to comply with the guidelines contained in the INP.

Noise emissions from patrons and activities within licensed premises should be required to comply with NSW Liquor Administration Board guidelines.

Noise emissions from open air community and recreation activities can be managed using guidelines such as the EPA "Lawful Sporting Activities" Guideline. For open air community and recreation activities some level of noise emissions are accepted given that such activity is socially desirable. The approach adopted is to minimise noise emissions by appropriate planning and the incorporation of measures such as noise barriers where practical. For noise generating activities additional limits on the time of use and frequency of use for noise generating activities may be employed, and provides an adequate balance between community use of facilities and amenity for nearby building occupants.

Given the location of the site it is envisaged that the public spaces would be used for occasional large gatherings such as New Years Eve or other potential festivals etc, which should be regulated in a similar manner to manage noise impacts.

Given the relatively high ambient noise levels, and the significant distance separation from sites having louder activities such as playgrounds and fields of play, noise impacts from these sites to existing land uses would be adequately ameliorated with appropriate management of the uses. In general, noise emissions from these sites to sensitive land uses within East Darling Harbour will provide a greater constraint due to their closer proximity.

5. NOISE EMISSIONS FROM TRANSPORTATION NOISE

The development of East Darling Harbour is expected to result in:

- A reduction in commercial heavy vehicle traffic resulting from the removal of the ports.
- Increased public transport movements on Hickson Road from buses and possibly a light rail system.
- Increased vehicle movements generated by new commercial and residential uses in East Darling Harbour which will be minimised by appropriate planning of the road network, parking restrictions, enhanced public transport and pedestrian facilities.

East Darling Harbour Traffic Impact Assessment (Masson Wilson Twiney, Aug 2006) indicates that traffic volumes along Hickson Road would increase by 150 to 200 %. This would result in a traffic noise level increase of 2-3 dB(A). Such a noise increase would be imperceptible to barely perceptible. The increase would occur over a 10-15 year period and would not be noticed.

It is acknowledged that a light rail system does not currently form part of the current redevelopment proposal for East Darling Harbour. However, the current proposal is such that it does not preclude light rail and accordingly, planning associated with a possible light rail system should include an assessment of potential noise and vibration impacts.

5.1 POTENTIAL ACOUSTIC CONFLICTS WITHIN EAST DARLING HARBOUR

Significant sources of noise emissions would include:

- Overseas passenger terminal
- Playing fields and playgrounds
- Increased water based activity adjacent to the site
- Proposed Headland Park
- Plant and equipment located within buildings.
- Licensed Premises
- Service Vehicles
- Public Transport

The potential sources of noise within the proposed Headland Park are quite distant from any buildings proposed in the redevelopment and would therefore not impact these buildings.

The proposed buildings immediately adjacent to the overseas passenger terminal are either commercial buildings and/or are related uses. The facades of these buildings can be designed to prevent excessive sound transmission into the buildings. An appropriate design standard for noise intrusion into buildings around the passenger terminal is contained in AS 2107-2000 Acoustics - Recommended design sound levels and reverberation times for building interiors. The nearest proposed residential buildings are distant from the terminal, but should also be designed to reduce noise intrusion to levels complying with the standard.

Playing fields and playgrounds are proposed adjacent to a residential precinct to the northern end of the new built form. Plans of management should be developed for the activities occurring on these sites which provide recommendations appropriate to the intended use. Notwithstanding this, amenity of

nearby buildings can be further safeguarded by designing the facades of these buildings to limit noise intrusion to levels complying with AS2107 for typical peak noise events.

Noise emissions from plant and equipment within buildings can be controlled by applying appropriate conditions in development approvals such as the INP.

Noise emissions from licensed premises are regulated by applying normal NSW Liquor Administration Board guidelines with noise emission assessments and resultant limits and management controls provided as part of the normal assessment and approval process for such uses.

5.2 AMENITY FOR FUTURE USERS OF EAST DARLING HARBOUR

This section examines the impact of environmental noise sources on proposed uses, both open air activities and activities within buildings.

The proposed public spaces would not be adversely impacted by existing environmental noise sources being located away from major sources of noise. There are no other uses proposed that would significantly impact on these spaces.

The facades of residential and commercial buildings should be designed to ameliorate anticipated traffic noise levels within the buildings. Internal noise levels should comply with the recommendations in AS 2107 and the design basis for traffic noise intrusion should be the traffic volumes anticipated upon completion of development within the precinct.

5.3 CONSTRUCTION NOISE AND VIBRATION

Construction related vibration would primarily impact properties immediately surrounding the construction site. Consequently, vibration would primarily potentially impact adjacent properties within East Darling Harbour due to the staged development of the precinct. Existing sensitive land uses adjacent to East Darling Harbour are sufficiently separated for vibration to be adequately attenuated by distance separation.

Because of the size of the precinct and the staggering of construction activity that is likely to occur before the precinct is fully developed, certain sensitive receivers are likely to be exposed to construction noise for a significant length of time.

Construction noise can be ameliorated by applying limits on permissible construction times in the normal way and processes should be selected to minimise noise emissions as far as practicable. Construction noise management plans should be developed and implemented for each site which provides the following:

- Noise and vibration emission goals.
- Assessment of potential impacts
- Monitoring, reporting and response procedures.
- Recommended management controls.
- Recommended engineering controls.
- Assessment of alternative methods and controls to limit noise and vibration emissions.
- Staff training.

6. CONCLUSION

An assessment of the potential noise and vibration impacts associated with the redevelopment of East Darling Harbour has been undertaken. The principles used in the assessment are:

- The operation of existing commercial and non residential activities that will be retained in the proposed redevelopment should not unreasonably be restricted by any new activity or development within the precinct.
- Noise or vibration emissions from the redeveloped East Darling Harbour should not adversely impact existing land uses adjacent to the precinct.
- Acceptable acoustical amenity should be provided for the occupants of buildings and outdoor activities proposed in the redevelopment from continuing existing land uses as well as any new noise or vibration sources arising from the proposed redevelopment.
- Noise emissions from community facilities proposed in the redevelopment should be managed and ameliorative measures incorporated into the design of new buildings surrounding these facilities to provide balanced development and maximise the use of these facilities.
- Noise and vibration emissions from demolition and construction activities should not unreasonably impact existing land uses, and the occupants of buildings that might be erected during the staged development of the precinct.

It is concluded that:

- The proposed development would not adversely impact existing land uses surrounding the precinct provided appropriate planning conditions and controls are placed on new development, as recommended in the report. The increased vehicle movements generated would produce a small increase in traffic generated noise levels over the long term, and would consequently be unnoticed.
- Buildings that would be constructed in East Darling Harbour can be designed to adequately exclude ambient noise traffic, and from the normal operation of existing and anticipated community uses such as the passenger terminal, recreation spaces, etc.
- Plans of management should be developed to manage noise emissions from community facilities. This, in combination with treatment of nearby buildings, will allow a range of community activities to be carried out.
- Noise and vibration emissions from construction activity is likely to be present over the long term as development of East Darling Harbour progresses. Management plans should be developed for individual construction sites so that emissions are minimised.

Appropriate statements of commitment have been developed to protect the acoustical amenity of the East Darling Harbour precinct and surrounding properties. These are contained in the main body of the report.

Report prepared by

ACOUSTIC LOGIC CONSULTANCY PTY LTD

Victor Fattoretto