Appendix A

Concept Approval
NSW Department of Planning

Concept Approval

Section 75O of the *Environmental Planning and Assessment Act 1979*

I, the Minister for Planning, under the *Environmental Planning and Assessment Act 1979* determine:

a) to approve the concept plan referred to in Schedule 1, subject to the conditions in Schedule 2;

b) pursuant to section 75P(1)(c) of the *Environmental Planning and Assessment Act 1979*, that Stage 1 of the Sydney CityGrid Project (Belmore Park Zone Substation and stub tunnel connection) requires no further environmental assessment;

c) pursuant to section 75P(1)(a) of the *Environmental Planning and Assessment Act 1979*, that the remaining components of the Sydney CityGrid Project requires further environmental assessment under Part 3A of the Act;

Hon Kristina Keneally MP
Minister for Planning

Sydney 20 Sept. 2009 File No: S07/01887

SCHEDULE 1

Application No:	08_0075
Proponent:	EnergyAustralia
Approval Authority:	Minister for Planning
Land:	The project will be located within the Sydney Central Business District, at the locations described in the Concept Plan Application, within the City of Sydney local government area.
Proposal:	Sydney CityGrid Project
Major Project:	The proposal is a project to which Part 3A of *the Environmental Planning and Assessment Act 1979* (the Act) applies by virtue of a specific Order made by the then Minister for Planning under section 75B of the Act on 11 February 2008.
Concept Plan Authorisation:	On 21 April 2008, the then Minister for Planning authorised the submission of a concept plan for the proposal.

KEY TO CONDITIONS

SCHEDULE 2

Act, the	*Environmental Planning and Assessment Act, 1979*
Concept Plan	The concept plan the subject of this approval
Council	City of Sydney Council
DECC	Department of Environment and Climate Change
Department, the	Department of Planning
Director-General, the	Director-General of the Department of Planning (or delegate).
Director-General's Approval	A written approval from the Director-General (or delegate). Where the Director-General's Approval is required under a condition the Director-General will endeavour to provide a response within one month of receiving an approval request. The Director-General may ask for additional information if the approval request is considered incomplete. When further information is requested the time taken for the Proponent to respond in writing will be added to the one month period.
EA	*Sydney CityGrid Project Concept Environmental Assessment Report*, prepared by PlanCom Consulting Pty Ltd and dated 8 December 2008.
Minister, the	Minister for Planning
Proposal	Sydney CityGrid Concept Plan Application
Proponent	EnergyAustralia
Publicly Available	Available for inspection by a member of the general public (for example available on an internet site or at a display centre).
Site	Land on which all components of the Sydney CityGrid Project will be located.
Submissions report	*Sydney CityGrid Project Submissions Response & Preferred Project Report*, prepared by PlanCom Consulting Pty Ltd and dated May 2009.

1. ADMINISTRATIVE CONDITIONS

Terms of Concept Approval

1.1 The Proponent shall carry out the project generally in accordance with the:

a) 08_0075 Major Project Application;

b) *Sydney CityGrid Project Concept Environmental Assessment Report*, prepared by PlanCom Consulting Pty Ltd and dated 8 December 2008;

c) *Sydney CityGrid Project Submissions Response & Preferred Project Report*, prepared by PlanCom Consulting Pty Ltd and dated May 2009; and

d) the conditions of this approval.

1.2 In the event of an inconsistency between:

a) the conditions of this approval and any document listed from condition 1.1a) and 1.1c) inclusive, the conditions of this approval shall prevail to the extent of the inconsistency; and

b) any document listed from condition 1.1a) and 1.1c) inclusive, and any other document listed from condition 1.1a) and 1.1c) inclusive, the most recent document shall prevail to the extent of the inconsistency.

Staging/ Scheduling of Concept Plan Components

1.3 For the purpose of this concept plan approval and any project approval granted under it, the concept plan shall be defined in components as follows:

a) **Stage 1**, being the works in and around the Belmore Park Zone substation site, comprising:

i) **Stage 1A** being the construction and operation of the Belmore Park Zone substation building and stub tunnel connect from the existing City South Cable Tunnel to Belmore Park Zone substation;

ii) **Stage 1B** being commercial/ retail development on the corner of Pitt, Campbell and Hay Streets, to be integrated with works comprising Stage 1A;

b) **Stage 2** being the balance of works required for the concept plan, other than those defined as Stage 1 works, and comprising:

i) **Stage 2A** being the construction and operation of the City East Zone substation in the vicinity of Phillip, Bent, Bligh and O'Connell Streets;

ii) **Stage 2B** being refurbishment of the existing Dalley Street Zone substation, or construction of a new building adjacent to the existing site;

iii) **Stage 2C** being the construction and operation of a sub-transmission switching station (STSS) at Riley Street;

iv) **Stage 2D** being the City East Cable Tunnel (CECT) to be constructed between Riley Street sub-transmission switching station (STSS) and the City North Zone substation, with connections to the proposed City East and existing Dalley Street Zone substations, and a potential services control room adjacent to the Riley Street STSS; and

v) **Stage 2E** being extension to the City South Cable Tunnel from Wade Place to Riley Street, Surry Hills.

2. PROJECT APPLICATION AND SPECIFIC REQUIREMENTS

Stage 1 Development

2.1 The construction and operation of Stage 1 (including Stage 1A and Stage 2B) and associated infrastructure requires no further environmental assessment and is the subject of a separate instrument of approval.

Stage 2 Development

2.2 The construction and operation of Stage 2 (including Stage 2A, 2B, 2C, 2D and 2E) is subject to further assessment under Part 3A of the *Environmental Planning and Assessment Act 1979.*

2.3 In seeking approval for Stage 2 works, the Proponent may submit an application for Stage 2 in its entirety, or may submit separate applications for each sub-stage (Stage 2A, 2B, 2C, 2D and 2E) or any combination of those sub-stages.

3. PROJECT APPLICATIONS AND SPECIFIC REQUIREMENTS

3.1 Pursuant to section 75P(1)(a) of the *Environmental Planning and Assessment Act 1979*, the following environmental assessment requirements apply with respect to the project application for Stage 2, or any sub-stage of Stage 2 (Stage 2A, 2B, 2C, 2D and 2E) or any combination of sub-stages submitted as a single project application:

General Requirements

a) a demonstration that the project is consistent with the requirements of this approval and generally consistent with the scope and intent of the concept outlined in the documents under condition 1.1 of this approval;

b) detailed description and location of all project components, including depth of tunnelling works, ancillary facilities and relevant buffer distances, as relevant. Environmental constraints shall be identified relative to the surrounding environment (including sensitive receivers), in which each component is to be situated and include a description of how the project can be carried out without causing an adverse impact to the environment and human amenity;

c) a detailed project-specific Statement of Commitments, consistent with the Statement of Commitments prepared for the concept plan, with a clear indication of any new or amended commitments relating to the project;

d) the outcomes of consultation with RailCorp and Sydney Metro in relation to any project components near existing or proposed infrastructure managed by those authorities to identify and address any potential conflicts between the project components and that infrastructure.

Issue-Specific Requirements

e) a project level **Noise and Vibration Impact Assessment**, including both construction and operation noise, prepared in accordance with the *NSW Industrial Noise Policy* (EPA, 2000) for operational noise, the interim *Noise Control Guideline - Construction Site Noise* (DECC, 2008) for construction noise, the *Environmental Noise Management - Assessing Vibration: a Technical Guideline* (DECC, 2006) for vibration and the *Environment Criteria for Road Traffic Noise* (EPA, 1999) for construction traffic noise. The assessment shall include consideration of construction vibration and regenerated noise impacts against the standards specified in this approval, and shall provide a detailed review of the potential impacts to sensitive receptors from regenerated noise as a result of any proposed night-time construction tunnelling works and must justify the need for construction works to occur outside the standard hours. The assessment shall be prepared in consultation with the Department of Environment and Climate Change.

f) a project level **Non-Indigenous Heritage Assessment**, including identification of heritage items under or adjacent to the areas affected by the project by appropriate field surveys and an assessment of the impact of the project on the heritage significance of the items. The items that the survey shall target include buildings, works, relics, gardens, landscapes, views, trees or places of non-Aboriginal heritage significance. The assessment must be prepared in consultation with the Heritage Council of New South Wales;

g) a updated **Indigenous Heritage Assessment** in order to confirm, upon determination of specific locations for the components of the project, that Aboriginal items of significance will unlikely be present within the project areas. The assessment shall be informed by the views of the Metropolitan Local Aboriginal Land Council and any other relevant, readily contactable Aboriginal community;

h) an updated **Air Quality Assessment** that identifies sensitive receptors that may be impacted by particulate matter, total suspended solids and other air pollutants generated by the project. The assessment shall include specific mitigation and management measures for identified impacts to prevent adverse impact to local air quality and sensitive receptors.

i) a **Greenhouse Gas Potential Assessment** that outlines the measures to be employed to ensure the potential generation of greenhouse gases resulting from the use of insulating fluids for proposed substation transformers will be minimised for operational activities. The assessment must be undertaken in accordance with the methodology specified in the *National Greenhouse Accounts (NGA) Factors* (Department of Climate Change, November 2008).

j) detailed information on **Water Quality Impacts** (surface water and groundwater) including, but is not necessarily limited to:
   i. potential impacts on groundwater and measures to control or mitigate excessive water inflows;
   ii. water quality impacts and proposed mitigation measures;
   iii. likelihood of disturbing potential or actual acid sulphate soils and identification of proposed mitigation measures. Reference should be made to the "Acid Sulphate Soils Manual" (Acid Sulphate Soil Management Advisory Committee, 1998) or update;
   iv. management of stormwater run-off;
   v. erosion and sedimentation controls;
   vi. dewatering of tunnels and impacts on water quality. Proposed disposal and treatment options shall be identified and the potential for re-use shall be addressed; and
   vii. details of the use of existing water treatment plants, including performance and proposed new water treatment plants and discharge points, for the purposes of treating seepage water prior to discharging into waterways. This must include water treatment techniques for the infiltrated groundwater, prior to its discharge and details of post discharge monitoring and reporting.

k) an updated **Traffic and Access Assessment** to detail transport routes to and from the construction sites and impacts on affected streets, intersections and property owners. This shall include consideration of disruption to recreational/business activities and vehicle movements/bus services, including safety impact. Proposed measures or arrangements for minimising impact on these activities shall be investigated and included.

3.2 Pursuant to section 75P(1)(a) of the *Environmental Planning and Assessment Act 1979*, the following environmental assessment requirements apply with respect to any project application including Stage 2A and/ or Stage 2B, in addition to the requirements listed under condition 3.1:

a) a **design review process** for the proposed City East Zone Substation and Dalley Street Zone Substation shall form part of the Environmental Assessment. The outcome of this design review process shall be provided in the Environmental Assessment. This design review process shall be based on the principles of the design review competition of the *Sydney Local Environmental Plan 2005*, and include consultation with Council.

3.3 Pursuant to section 75P(1)(a) of the *Environmental Planning and Assessment Act 1979*, the following environmental assessment requirements apply with respect to any project application including Stage 2D, in addition to the requirements listed under condition 3.1:

a) in confirming the preferred route for the City East Cable Tunnel component of the project, the Proponent shall consult with Sydney Water Corporation to ensure its major sewer assets, stormwater and associated infrastructure (existing or planned) are not located within the selected route and must continue to liaise with Sydney Water Corporation during the detailed design and construction stage in order to avoid any such impact;

4. COMMUNITY INFORMATION, CONSULTATION AND INVOLVEMENT

4.1 Subject to confidentiality, the Proponent shall make all documents required under this approval available for public inspection on request.

Provision of Electronic Information

4.2 Prior to the commencement of construction of the project, the Proponent shall establish a dedicated website or maintain dedicated pages within its existing website for the provision of electronic information associated with the project subject to confidentiality. The Proponent shall publish and maintain up-to-date information on this website or dedicated pages including, but not necessarily limited to:

a) information on the statutory context of project (including on any existing approvals obtained under the *Environmental Planning and Assessment Act 1979*) and the current implementation status of the project;

b) a copy of this approval, any related project approvals and any future modification to this approval;

c) a copy of each relevant environmental approval, licence or permit required and obtained in relation to the project; and

d) details of the outcomes of compliance reviews and audits of the project.

Community Information Plan

4.3 Prior to the commencement of construction of the project, the Proponent shall prepare and implement a **Community Information Plan** which sets out the community communications and consultation processes to be undertaken during construction and operation of the project. The Plan must include but not be limited to:

a) procedures to inform the local community of planned investigations and construction activities;
b) procedures to inform the relevant community of construction traffic routes and any potential disruptions to traffic flows and amenity impacts;
c) procedures to consult with local business owners with regard to construction traffic to ensure the safety of the public and to limit disruption to business operations;
d) procedures to inform the community where work has been approved to be undertaken outside the normal Construction hours, in particular noisy activities.

Complaints Procedure

4.4 Prior to the commencement of construction of the project, the Proponent shall ensure that the following are available for community complaints for the life of the project (including construction and operation):

a) a telephone number on which complaints about construction and operational activities at the site may be registered;
b) a postal address to which written complaints may be sent; and
c) an email address to which electronic complaints may be transmitted.

The telephone number, the postal address and the e-mail address must be advertised in a newspaper circulating in the locality on at least one occasion prior to the commencement of construction and at six-monthly intervals thereafter. These details must also be provided on the Proponent's internet site. The telephone number, the postal address and the email address shall be displayed on a sign near the entrance to the proposed zone substation and sub-transmission switching station sites, in a position that is clearly visible to the public. For proposed works that involve tunnelling (City East Cable Tunnel and extension to the City South Cable Tunnel), the telephone number, the postal address and the email address shall be displayed on signs, placed at appropriate locations, as agreed to by the Director-General, prior to the respective construction and operation of the project.

4.5 The Proponent shall record details of all complaints received through the means listed under condition 4.4 of this approval in an up-to-date Complaints Register. The Register shall record, but not necessarily be limited to:

a) the date and time, where relevant, of the complaint;
b) the means by which the complaint was made (telephone, mail or email);
c) any personal details of the complainant that were provided, or if no details were provided, a note to that effect;
d) the nature of the complaint;
e) any action(s) taken by the Proponent in relation to the complaint, including any follow-up contact with the complainant; and
f) if no action was taken by the Proponent in relation to the complaint, the reason(s) why no action was taken.

The Complaints Register shall be made available for inspection by the Director-General upon request.

5. COMPLIANCE MONITORING AND TRACKING

Compliance Tracking Program

5.1 Prior to the commencement of construction, the Proponent shall develop and implement a **Compliance Tracking Program** for the project, to track compliance with the requirements of this concept approval, the related project approvals and during the construction and operation of the project and shall include, but not necessarily limited to:

a) provisions for an Annual Environmental Management Report (AEMR) that is to be prepared and submitted to the Director-General throughout the operational life of the project. The AEMR must review the performance of the project against the Operational Environmental Management Plan, the conditions of this approval and other licences and approvals relating to the project;

b) provisions for periodic reporting of the compliance status to the Director-General including at least prior to the commencement of construction of the project and prior to the commencement of operation of the project;

c) a program for independent environmental auditing in accordance with *AS/NZ ISO 19011:2003 - Guidelines for Quality and/or Environmental Management Systems Auditing*;

d) procedures for rectifying any non-compliance identified during environmental auditing or review of compliance;

e) mechanisms for recording environmental incidents and actions taken in response to those incidents;

f) provisions for reporting environmental incidents to the Director-General during construction and operation; and

g) provisions for ensuring all employees, contractors and sub-contractors are aware of, and comply with, the conditions of this approval relevant to their respective activities.

6. ENVIRONMENTAL REPORTING

Incident Reporting

6.1 The Proponent shall notify the Director-General of any incident with actual or potential significant off-site impacts on people or the biophysical environment within 12 hours of becoming aware of the incident. The Proponent shall provide full written details of the incident, including demonstration that it has notified the appropriate owner of any assets which have been impacted from the incident, to the Director-General within seven days of the date on which the incident occurred.

6.2 The Proponent shall meet the requirements of the Director-General to address the cause or impact of any incident, as it relates to this approval, reported in accordance with condition 6.1 of this approval, within such period as the Director-General may require.

Appendix B

Statement of compliance

JBA

Overview

The assessment of compliance with relevant planning controls has been based on the following documentation:

- Architectural Plans prepared by Kann Finch dated 27 April 2010
- Urban Design Report prepared by Kann Finch dated 27 April 2010
- Heritage Impact Statement prepared by NBRS + Partners dated April 2010
- Wind Impact Assessment prepared by Windtech dated April 2010
- Solar Reflectivity Analysis prepared by Windtech dated April 2010

In addition to the above, the supporting planning documents relating to previous approved schemes on the site have been considered. In particular, those relating to:

- D/2001/00317 – Stage 1 Development application for a commercial building, with a maximum floor space ratio of 12.5:1 (25,475 m^2), vehicular access off O'Connell Street, basement car parking for 41 cars and a through site pedestrian link.
- D/2004/873 – Stage 2 Development application for construction of a 30 storey commercial building with ground level retail and basement car parking.
- D/2007/1270 – Stage 2 development application for a 29 Level commercial office building incorporating office uses, child care facility, café/ restaurant, wintergarden and 96 basement car parking spaces (minimum 12 courier delivery vehicles plus two large vehicle loading spaces). This included the demolition of existing buildings; excavation and the construction of a new building to a height of 135.5 m consisting of 45,760 m^2 floor space area with a floor space ratio of 13.75:1.

Tables of Compliance

Table 1 – Sydney Local Environmental Plan 2005

	Requirement	Project	Compliance
Chapter 1 General **Part 1 Preliminary** **10. Waiver of certain development standards**	(1) Consent may be granted to development of land in Central Sydney, or of land in Ultimo-Pyrmont that is not in a master plan area, even though the proposed development contravenes a maximum height or maximum floor space ratio for a building, or a maximum vehicle parking requirement, imposed by a development standard, but only if the consent authority is satisfied that: (a) all the objectives of the development standard will be fulfilled, and (b) the contravention will not: (i) create an undesirable precedent for other development, or (ii) diminish the overall effect of the development standard for development in the vicinity of the site, and (c) the particular physical attributes of: (i) the site, in terms of location, context, slope, site configuration and the like, and (ii) the proposed development, in terms of urban form, bulk, height, floor space ratio, carparking, and the like, will render the strict application of the development standard unreasonable or unnecessary in the circumstances, and (d) the proposed development will improve or contribute positively to the public domain and would achieve design excellence.	▪ The application seeks a 10% variation to the maximum Floor Space Ratio control (Clause 54). This variation is discussed in detail in Section 3 of the Environmental Assessment and is considered to be justified for the following reasons: - the design of the building envelope is affected by the provision of crucial infrastructure required for the continued growth and prosperity of the Sydney CBD; - EnergyAustralia seeks to provide electricity supply infrastructure in a form which contributes to the form and appearance of the CBD as compared to historic examples of stand-alone substations within the CBD; - Stage 2A(ii) of the project would involve consideration of options to upgrade the adjacent streetscape, including Richard Johnson Square, which would provide a secondary public benefit to the provision of crucial infrastructure; - the project provides a consistent building envelope to those of previous applications approved on the site and as such does not set an undesirable precedent; - the building envelope would not generate any adverse environmental impacts when considered in terms of overshadowing, wind etc; - the building envelope is consistent with the scale, massing and appearance of existing buildings within the same city block, in particular the adjoining Mulpha building; - the proposed FSA is provided within a building envelope which is significantly less than the maximum building height permitted on the site.	Y

	Requirement	Project	Compliance
	(2) A consent may be granted pursuant to this clause only if the building concerned: (a) does not contravene the maximum building height set for the building by Chapter 2 or 3 by more than 10% of that maximum building height or the height of one floor of the building, whichever is the greater, and (b) does not contravene the maximum floor space ratio for the building set for the building by Chapter 2 or 3 by more than 10% of that maximum floor space ratio or the proportion of the floor space ratio of the building attributable to one floor in the building, whichever is the greater, and (c) does not contravene a maximum amount of vehicle parking set for the building by Chapter 2 or 3 by more than 10% of that maximum amount.	▪ The project seeks a 10% variation to the maximum FSR control which is consistent with Clause 10(2)(b). ▪ The project would not exceed the maximum building height. ▪ The project would not contravene the maximum amount of vehicle parking permitted by Clause 10(2)(c).	Y
	(3) In determining the above, the consent authority shall have regard to whether this clause has been previously applied to the site of the proposed development.	▪ The project seeks consent for a new building, the clause has not been previously utilised on the site.	Y
	(4) If the site of the proposed development is in Central Sydney, consent may be granted for an additional amount of floor space area pursuant to this clause only if the consent authority is satisfied that an amount of heritage floor space equal to the additional amount has been or will be allocated to the site.	▪ The project would require the purchase of heritage floor space.	Y
Part 2 Aims, strategies and principles of this plan **11. Aims of this plan**	The aims of this plan are: (a) to protect and enhance the diversity and special qualities of the City of Sydney, and its surrounding areas, and (b) to establish the City of Sydney as the best place to live in, work in and visit, and (c) to foster environmental, economic, social and physical well-being so that the City of Sydney continues to develop as an integrated, balanced, sustainable and prosperous living city of world standing, and (d) to encourage orderly, sustainable and high quality development of land and other resources within the City of Sydney, and (e) to conserve the environmental heritage of the City of Sydney.	▪ The project involves the installation of a new City East Zone substation to provide upgraded electricity supply to the Sydney CBD which is essential for the provision of reliable energy supply. ▪ The provision of a substation within the building envelope of a commercial building would provide a superior urban design outcome compared to that of other examples of substations in the CBD. ▪ The provision of a new substation in this part of the city as part of the Sydney CityGrid Project would ensure that a reliable electricity supply is provided such that the City of Sydney is able to prosper and expand.	Y

	Requirement	Project	Compliance
12. Strategies for achieving aims of this plan	The strategies for achieving the aims of this plan are: (a) development of the City of Sydney as a vibrant, culturally diverse, multi-use city centre, and (b) continued growth of a permanent residential population in Central Sydney and the provision of a full range of housing including affordable housing, and (c) provision of appropriate development potential, and (d) provision of visitor and tourist accommodation, and (e) enhancement of Central Sydney as Australia's pre-eminent retail centre, and (f) protection and enhancement of the amenity of residents, workers and visitors, and (g) protection and enhancement of the quality and amenity of the public domain—the parks, places, streets and lanes, and (h) protection of the intricate urban fabric, and (i) protection of Special Areas in Central Sydney, and (j) conservation of heritage items and areas, and (k) achievement of a high quality of urban form and design in buildings and in the relationship of buildings to neighbouring development and the public domain, and (l) development of the City of Sydney with regard to the principles of ecologically sustainable development, and (m) protection and enhancement of the natural environment, including the City of Sydney's parks and Sydney Harbour, and (n) maximisation of use of public transport, walking and cycling for trips to, from and within the City of Sydney, and	▪ Noted. The project will would in achieving the aims of the plan by providing crucial infrastructure in the CBD in a form that provides a high quality urban design outcome which contributes to the urban fabric of the City.	Y

	Requirement	Project	Compliance
12. Strategies for achieving aims of this plan **Continued…**	(o) provision of a high quality pedestrian environment, which is accessible to all its residents, workers and visitors, and (p) efficient and orderly management of all phases of the development process, including the construction phase, and (q) protection and enhancement of views and vistas to the harbour, parkland and buildings and places of historic and aesthetic significance, and (r) facilitation of the provision of access for people with disabilities, and (s) continuation of maritime and port functions located at the Darling Harbour Wharves 3 to 8.		
13. Principles to be followed in implementing strategies	The principles to be followed in implementing the strategies of this plan for achieving its aims are as follows: (a) recognition of the responsibilities of this generation to future generations in relation to environmental quality and resource usage by respecting the limits of natural and physical resources, (b) acknowledgment of the diversity of Sydney's cultural heritage from pre-European occupation to the current time, (c) involvement of the community in the planning process by ensuring openness, accountability and transparency in the decision-making process, (d) consistent application of the provisions of this plan so that the aims and strategies of this plan can be achieved and implemented in practice, and provide certainty for applicants for development consents, investors, residents and the public, e) consistent and proper regard for the aims and strategies of this plan, in particular, when development applications are being determined.	▪ The project provides an additional energy supply infrastructure so as to allow for the continued growth and expansion of the CBD. ▪ The project acknowledges and respects the adjoining heritage items and provides a suitable urban design response in terms of scale and massing. Further details on proposed materials would be provided as part of Stage 2A(ii) of the City East Zone Substation project.	Y

	Requirement	Project	Compliance
Part 3 Consent for development **17. Consent for demolition**	(1) Consent must not be granted to development proposing the demolition of a building unless: (a) the application also proposes the comprehensive redevelopment of the site after the demolition has been carried out, or (b) a consent is in force for the comprehensive redevelopment of the site, or (c) a consent is at the same time granted to the comprehensive development of the site proposed by another development application.	▪ The project seeks consent for the demolition of the existing building and provides a building envelope for a substation and commercial tower that would be constructed as part of Stage 2A(ii). This is discussed further in **Section 5** of the Environmental Assessment. ▪ It is noted that Concept Approval for the provision of a substation on the eastern section of the CBD has been granted and that EnergyAustralia has secured funding for the development of the substation. There is a need for the substation to be delivered within the next 5 years and as such there is little chance of the site remaining unoccupied for a long period of time.	N
	(2) Consent must not be granted for demolition of a building unless the consent authority has compared the likely environmental impact of any replacement building proposed to be erected on the site when the site is redeveloped with the environmental impact of the building it would replace.	▪ The Environmental Assessment addresses the Director-General's requirements provided within the Concept Approval and provides sufficient information for the consent authority to consider the environmental impacts of the building envelope.	Y
Part 5 Urban form, design excellence and environmental design **Division 1 Urban form** **22. Objectives for development plans**	The objectives for development plans are as follows: (a) to promote design excellence in terms of urban form, massing, bulk and architectural treatment, (b) to provide an analysis of site constraints and opportunities that can form the basis for determining the most appropriate floor space ratio and height, within the limits set by this plan, and the most appropriate development, for certain sites, (c) to promote design concepts for certain sites that ensure separation between tower forms, (d) to provide for a high quality amenity to the streets of Sydney and to uses located to the side and rear of certain mid-block sites.	▪ A design review process is required by condition 3.2 of the Concept Approval MP08 0075 and will be implemented as part of Stage 2A(ii).	Y

	Requirement	Project	Compliance
23. Development plans	(1) This clause applies to the following development: (a) any development comprising the erection of a building exceeding 55 metres in height, (b) any development of land exceeding 1,500 square metres in area, (c) any development of the land comprising Darling Harbour Wharves 9 and 10, (d) any development of the land comprising Carlton and United Brewery site, Chippendale, as outlined in red and annotated (iv) on the Central Sydney Site Identification Map, (e) any development of the land comprising Central Railway—Western Precinct, as outlined in red and annotated (ii) on the Central Sydney Site Identification Map.	▪ The project involves a building envelope with an overall height of 134.25m and has a site area of 2,038m^2. As such, a development plan is required under the City of Sydney LEP. This issue is discussed further in Section 3 of the Environmental Assessment.	Y

	Requirement	Project	Compliance
	(3) In order to demonstrate an appropriate design response to an analysis of the site, the development plan must address the following matters: (a) the suitability of the land for development, (b) existing and proposed uses and use mix, (c) heritage issues and streetscape constraints, (d) the location of any tower proposed, having regard to the need to achieve an acceptable relationship with other towers (existing or proposed) on the same site or on neighbouring sites in terms of separation, setbacks, amenity and urban form, (e) bulk, massing and modulation of buildings, (f) street frontage heights, (g) environmental impacts such as sustainable design, overshadowing, wind and reflectivity, (h) the achievement of the principles of ecologically sustainable development, (i) pedestrian, cycle, vehicular and service access, circulation and requirements, (j) impact on, and any proposed improvements to, the public domain.	▪ These aspects have been addressed in Section 3 of the Environmental Assessment.	Y

	Requirement	Project	Compliance
	(4) The consent authority may waive compliance with the requirements of subclause (3): (a) for any alterations or additions to an existing building that, in the opinion of the consent authority, do not significantly increase the existing floor space ratio or height of the building, do not have a substantial impact on adjoining buildings and are not visible from the street, and (b) for any replacement use resulting from a change of use, any use the hours of operation of which are extended or any temporary use of an existing building, and (c) for the strata subdivision of an existing building, and (d) for any other development that, in the opinion of the consent authority, is of a similar nature to development referred to in paragraph (a), (b) or (c), and (e) for any other development for which the consent authority considers it would be unreasonable or unnecessary to require compliance with those requirements.	▪ The project application will establish building envelopes and development parameters which will guide future buildings on the site.	N/A
Division 2 Design excellence **26. Design excellence**	(1) Consent must not be granted to a new building or to external alterations to an existing building unless the consent authority has considered whether the proposed development exhibits design excellence.	▪ As noted above, a design review process would be undertaken as part of Stage 2A(ii) which would ensure that the eventual building will exhibit design excellence.	Y

	Requirement	Project	Compliance
	(2) In considering whether proposed development exhibits design excellence, the consent authority must have regard to the following matters: (a) whether a high standard of architectural design, materials and detailing appropriate to the building type and location will be achieved, (b) whether the form and external appearance of the building will improve the quality and amenity of the public domain, (c) whether the new development detrimentally impacts on view corridors identified in the relevant development control plan.	These matters would be considered as part of the design review process undertaken during Stage 2A(ii).	
Division 3 Environmental design **27. Ecologically sustainable development**	Before granting consent for development related to a building, the consent authority must have regard to the principles of ecologically sustainable development based on a "whole of building" approach by considering: (a) greenhouse gas reduction, and (b) embodied energy in materials and building processes, and (c) building design and orientation, and (d) passive solar design and daylighting, and (e) natural ventilation, and (f) energy efficiency and energy conservation, and (g) water conservation and grey water reuse, and (h) waste minimisation and recycling, and (i) reduction of car dependence, and (j) potential for adaptive reuse.	▪ Details of the environmental credentials of the building would be provided in Stage 2A(ii).	Y

	Requirement	Project	Compliance
36. Objectives of the City Centre zone	The objectives of the City Centre zone are: (a) to encourage Central Sydney's role and growth as one of the Asia-Pacific region's principal centres for finance, commerce, retailing, tourism, cultural activities, entertainment and government, and (b) to permit a diversity of uses which reinforce the multi-use character of Central Sydney, and (c) to facilitate the development of buildings and works that are of a scale and character consistent with achieving the other objectives of this zone, and (d) to provide for increased residential development with appropriate amenity and to ensure the maintenance of a range of housing choices, and (e) to enhance the amenity of parks and community places by protecting sun access, and (f) to ensure wind levels are consistent with pedestrian comfort and the amenity of the public domain, and (g) to ensure satisfactory sky exposure, levels of daylight and ventilation to the public areas of Sydney, including the parks, places, streets and lanes, and (h) to recognise and enhance the character of Special Areas, and (i) to facilitate the conservation of items and areas of heritage significance, and (j) to protect the fine-grained urban fabric of Central Sydney, especially the existing network of streets and lanes, and to provide for high quality development that contributes to the existing urban form, and (k) to extend retail uses on frontages to retail streets, and (l) to provide active frontages to streets.	▪ The project complies with the objectives of the City Centre Zone in the following ways: - Provision of a new substation which would allow for the continued expansion and prosperity of the Sydney CBD; - The building envelope is consistent with the scale of existing development in close proximity of the site, and also previous building envelopes which have been approved on the site; - The project would provide additional high quality commercial floor space within the Sydney CBD; and - Stage 2A(ii) of the City East Zone Substation project would involve consideration of upgrades of the adjacent streetscape, including Richard Johnson Square.	Y

	Requirement	Project	Compliance
Part 3 Height of buildings **47. Objectives for control of the height of buildings**	The objectives for control of the height of buildings in Central Sydney are: (a) to allow sunlight access to key areas of the public domain by ensuring that: (i) further overshadowing of certain parks and community places is avoided or limited during nominated times, and (ii) existing overshadowing of certain parks and community places is reduced in the long term, and (b) to provide a transition of building heights between localities and street blocks, and (c) to provide high quality urban form for all buildings, while maintaining satisfactory sky exposure and daylight: (i) to the public areas of Central Sydney, including the parks, places, streets and lanes, and (ii) to existing buildings and to the sides and rear of tower forms, and (d) to confine ground level wind speeds to velocities which ensure pedestrian comfort and amenity of the public domain, and (e) to allow for and promote the ventilation of the City by the free movement of air around and between tower structures, and (f) to provide sun access to significant sandstone buildings in Special Areas in order to improve the ground level environmental quality of public spaces, and (g) to ensure that tower development occurs on sites capable of providing appropriate urban form and amenity, and (h) to nominate heights that will provide a transition in built form and land use intensity between the City Centre zone and adjoining lower scale localities within and adjacent to Central Sydney, and (i) to provide for view sharing along the edges of Central Sydney, and (j) to ensure an appropriate height transition between new buildings and heritage items or Special Areas.	▪ The building envelope with an overall height of 134.25m complies with the maximum height control of 235m. ▪ Shadow diagrams prepared by the architect demonstrate that the proposal would not have an adverse shadowing impact on any special area or public open space. ▪ Wind impacts would be acceptable. ▪ The building envelope provides a suitable height transition and scale to existing buildings within the same city block.	Y

	Requirement	Project	Compliance
48. Sun access planes	(1) Subject to subclauses (2), (3) and (4), development that results in any part of a building projecting above a sun access plane for a park or community place identified in the sun access planes table in Schedule 2 is prohibited if the building is situated on land shown on the relevant map in Schedule 2 as affected by the sun access plane.	▪ The project is not subject to any sun access plane control.	N/A
50. Height of buildings	(1) The height of a building on any land is not to exceed the height shown for the land indicated on the Central Sydney Height Map.	▪ The maximum height stipulated on the Central Sydney Height Map is 235m. The building envelope has an overall height of 134.25m and has been designed to comply with this development standard.	Y
	(2) Despite subclause (1), consent must not be granted to a building on any land if the height of the building exceeds 55 metres unless: (a) the site area of the development is 800 square metres or more, or (b) the consent authority is satisfied that the proposed development achieves: (i) appropriate height to plan width proportions that are compatible with the massing, street frontage and tower forms within the locality, and (ii) a separation of any towers to achieve the "tower in the round" built form characteristic, and (iii) adequate amenity and privacy for occupants, and (iv) active street frontages, and (v) sufficient space for vehicle circulation and access ramps.	▪ The site has an area of 2,038m^2 ▪ The design report prepared by Kann Finch demonstrates that the building envelope would sit comfortably within the existing context of surrounding development and that it responds to the scale of adjacent heritage items. ▪ The project would have an entrance lobby on the Bligh Street frontage however due to the location of the substation it is not possible to provide retail frontages to either Bligh or O'Connell Streets. ▪ Vehicular access has been restricted to the O'Connell Street frontage. Two entrances are proposed, one secure access for the EnergyAustralia the substation and a second entry for the tenant car parking on the site.	Y

	Requirement	Project	Compliance
51. Architectural roof features	A person may, with development consent, carry out development in contravention of clauses 48 and 50 that results in an architectural roof feature, but only if the consent authority is satisfied that the architectural roof feature: (a) satisfies the objectives of the height controls, and (b) comprises a decorative element on the uppermost portion of a building, and (c) does not include floor space area and is not reasonably capable of modification to include floor space area, and (d) does not provide access for recreational purposes, and (e) is not a structure for signage or advertising, and (f) does not contain equipment or structures for servicing the building, such as plant, lift motor rooms, fire stairs and the like, and (g) is an integral part of the design of the building in its context, and (h) will have minimal overshadowing impact.	▪ The building envelope would not contravene clauses 48 or 50. ▪ At this stage no architectural roof feature is proposed. Should this change in the future, further details will be provided in the subsequent application for the construction of the commercial component of the building.	N/A

	Requirement	Project	Compliance
Part 4 Floor space ratios **53. Objectives for floor space ratio controls**	The objectives for the control of floor space ratios in Central Sydney are: (a) to ensure a degree of equity in relation to development potential for sites of different sizes and for sites located in different parts of Central Sydney, and (b) to ensure that proposals for new buildings are assessed with due regard to the development plan, design excellence, urban design and built form provisions of this plan, and (c) to provide a framework for the award and allocation of heritage floor space, and (d) to provide sufficient floor space for high quality development for the foreseeable future, and (e) to encourage the provision of residential and visitor accommodation, and (f) to encourage the provision of certain uses and facilities that provide a public benefit, and (g) to regulate the density of development and generation of vehicular and pedestrian traffic.	▪ The proposal involves a 10% variation to the maximum FSR control. This is discussed further in Section 3 of the Environmental Assessment.	N.
54. Maximum floor space ratios—generally	(1) The floor space ratio of a building on any land is not to exceed the floor space ratio shown for the land on the Central Sydney Floor Space Ratio Map. (2) Despite subclause (1), consent may be granted to development that will result in a building on a site within the City Centre zone that has a floor space ratio (additional to the ratio provided for by subclause (1)) up to the following maximum: (a) in Area A1 shown on the Central Sydney Floor Space Ratio Map: (i) for commercial uses—4.5:1, (ii) for residential, serviced apartment and hotel uses—6:1, (iii) for a mixed-use development—as determined in accordance with Schedule 4, and	▪ The site is located within Area A1, the maximum permissible floor space on the site for a commercial development is 12.5:1. The project seeks a 10% variation to this control and proposes a maximum FSR of 13.75:1 (FSA 28,022m^2).	N

	Requirement	Project	Compliance
	(3) The achievement of a maximum floor space ratio set by subclause (1) and (2) is subject to compliance with: (a) the height, development plan, design excellence, heritage, ecologically sustainable development and other provisions of this plan, and (b) if applicable, the allocation of heritage floor space to the site in accordance with clause 62.	▪ The project complies with the maximum height limit and would implement a design review process during Stage 2A(ii). Heritage floor space will also be purchased following receipt of project approval.	Y
63. Significant public benefit	(1) Consent may be granted to development that creates floor space that will be used to provide a significant public benefit, without the allocation of heritage floor space that would be required to be allocated to the site in the absence of this clause.	▪ The provision of a new substation would provide a significant public benefit in that it would allow Sydney's CBD to continue to grow and maintain its role as the preeminent commercial hub for NSW and Australia. ▪ It should also be recognised that EnergyAustralia are seeking to improve the appearance of the new substation by incorporating the new facility within a commercial building envelope, thus improving the appearance and amenity of the immediate area of the facility.	Y
	(2) Floor space is used to provide a significant public benefit for the purposes of this clause if the floor space is used: (a) for an historic club, or (b) for a cinema, recital hall or theatre for use by the public, or (c) for a mid-block pedestrian connection required by this plan, but only if, in the opinion of the consent authority, the use is appropriate to its location and meets an important need in the city.	▪ The project does not include any of the listed features, but is nonetheless considered to provide a significant public benefit.	N/A

	Requirement	Project	Compliance
Part 5 Car parking **64. Objectives for car parking controls**	The objectives of the car parking controls of this Part are: (a) to acknowledge that public transport is the most important and efficient means of moving people to and within Central Sydney, and (b) to encourage commuting by public transport to Central Sydney in order to reduce the number of motor vehicles travelling through and to Central Sydney, and to improve overall environmental quality and pedestrian amenity, and (c) to improve the attractiveness and competitiveness of Central Sydney for retail and commercial activities by providing a reasonable level of tenant and short-stay public car parking whilst discouraging commuter car parking, and (d) to encourage residential development in Central Sydney, and (e) to minimise adverse urban design impacts, in particular by discouraging the provision of above ground parking, and (f) to minimise adverse traffic impacts, in particular conflicts between pedestrian and vehicular traffic, and (g) to discourage the provision of public car parking, and (h) to ensure that tenant car parks are not occupied by persons other than occupiers of the building or land on which the car park is situated.	▪ A development with a total floor space area of 28,022m^2 the maximum number of parking spaces permissible is 41 spaces. ▪ A total of 40 parking spaces are provided for use by tenants of the commercial tower.	Y
Part 6 Heritage provisions **67. Objectives**	The objectives of the heritage provisions are: (a) to conserve the heritage of Central Sydney, and (b) to integrate heritage conservation into the planning and development control processes, and (c) to provide for public involvement in heritage conservation, and (d) to ensure that any development does not adversely affect the heritage significance of heritage items, and (e) to provide greater certainty in the management of the heritage of Central Sydney, and (f) to encourage high quality design and the continued use or adaptive re-use of heritage items.	▪ The project does not involve the demolition of any heritage items however it is in close proximity to several heritage items and Richard Johnson Square is nominated as an Archaeological / Townscape / Landscape item.	Y

	Requirement	Project	Compliance
74. Development within the vicinity of a heritage item	The consent authority, when considering an application for development within the vicinity of a heritage item, must take into account the impact of the proposed development on the heritage significance of the heritage item.	▪ The building envelope has been designed to respond to the form and scale of the adjoining heritage items. The NBRS + Partners Heritage Impact Statement outlines that the building envelope would minimise any adverse potential heritage impacts on neighbouring buildings by providing appropriate setbacks and podium heights.	Y

Table 2 – Central Sydney Development Control Plan 1996

Section	Requirement	Proposal	Compliance
2.0 Building form and character	**2.1 Building to the street alignment** - New buildings should have street frontages built predominantly to the street alignment. Non-compliance with this Clause is permitted if the development contributes an appropriate public space at the street frontage. The consent authority may consider the provision of open space at the street frontage on a large site in the City Centre zone where that open space will: (i) be accessible to and useable by the public (ii) be north or north west oriented for sun access (iii) be on a street other than a major pedestrian street (see Figure 2.27), (iv) occupy less than 25% of the street frontage, (v) be surrounded by a high level of active uses, (vi) be compatible with the streetscape, (vii) be designed, landscaped and furnished to the satisfaction of the consent authority.	▪ The envelope proposes street frontages to both the Bligh Street and O'Connell Street boundaries.	Y
	2.2 Street frontage heights - The street frontage height of a new building is to be between 20 metres and 45 metres above street ground level accept in Special Areas where specific street frontage heights are nominated. Within this range, the street frontage height should have regard to: (i) the street frontage heights of adjacent buildings, (ii) the predominant street frontage height in the vicinity of the proposed building (see Figures 2.5 and 2.6, (iii) the location of the site in the street block, i.e., corner sites can generally include special design emphasis, such as increased street frontage height of one or two storeys compared with adjacent sites (see Figure 2.7), (iv) site size. ie. small sites (less than 1,000 square metres) may attain a street frontage height of 45 metres regardless of the above criteria.	▪ The street frontage height to Bligh Street is 30.05m (approx 8 storeys) this component of the building provides a transition down from the taller commercial building at the corner of Bligh and Hunter Streets down to the adjoining heritage building, 31 Bligh Street. ▪ The street frontage to O'Connell Street is 36.8m (approx 10 storeys) and provides a transition between the smaller scale heritage building at 9 O'Connell Street and the taller 1970s office building at the corner of O'Connell and Hunter Streets. ▪ The site is not located within a Special Area it is however adjacent to Heritage Items. ▪ Both street wall heights are well within the range of 20m – 45m.	Y

Section	Requirement	Proposal	Compliance
	2.3 Building setbacks - Above the street frontage height, buildings are to be set back a weighted average of 8 metres. This setback may be reduced in apart by up to 2 metres (to achieve architectural variety) provided the weighed average setback from the street frontage setback is 8 metres. No part of the building is to be setback less than 6 metres. - Smaller setbacks may be acceptable: (i) on corner site up to 1,000 square metres fronting streets or lanes at least 6 metres wide; (ii) on corner sites where increased set backs are provided to other streets i.e. major pedestrian streets or north south streets; (ii on street blocks less than 30 metres deep; (iv) to accommodate architectural projections. 2.3.6 above a height of 45m, windows or balconies of commercial buildings are to be set back at least 3m from side boundaries.	▪ The tower form along the O'Connell Street frontage is built to the boundary line and does not comprise any setback. Rather the podium and tower forms are delineated by a recessed element above the podium of the building. ▪ The above variations are discussed in more detail at Section 3 of the Environmental Assessment.	Y
2.0 Building form and character *(cont…)*	**2.5 Street frontage activities** - Buildings with frontages to major pedestrian streets are to contribute to the liveliness and vitality of those streets.	▪ The site is not located on a major pedestrian street. ▪ Due to the location of the substation in the basement and podium levels, it is not possible to locate retail uses at ground level. Notwithstanding this some activity would be generated along the Bligh Street frontage by way of provision of the lobby entrance to the commercial building.	Y
	2.6 Building bulk **2.6.1 Above a height of 120m, the size of the floor plate of commercial buildings is not to exceed 1,400m^2 FSA, or 25% of the site area, which ever is the greater.**	▪ Level 22 is located at approximately 120m above ground level at O'Connell Street, the floorplates at this level can be designed to comply with this control.	Y

Section	Requirement	Proposal	Compliance
	2.7 Building exteriors - Adjoining buildings (particularly heritage buildings) are to be considered in the design of the new buildings in terms of: (i) building to the street alignment, (ii) street frontage heights, (iii) setbacks above street frontage heights, (iv) facade proportions including horizontal or vertical emphasis, (v) the provision of enclosed corners at street intersections. - Balconies and terraces should be provided, particularly where buildings overlook parks and on low rise parts of buildings. Gardens on the top of setback areas are encouraged. - The siting and configuration of buildings should take into account the impact on surrounding development and public spaces in terms of amenity, shadowing, visual privacy and view sharing for residential buildings. - The tops of buildings are to be designed so that they: (i) integrate with the design of the building and conceal plant and equipment, (ii) provide a minimum step height of 2 storeys, (iii) promote a visually distinctive and interesting Central Sydney skyline.	▪ As demonstrated in the urban form analysis contained within Section 3 of the Kann Finch design report, the podium of the building has been designed to relate to the scale and form of the adjoining heritage buildings. NBRS + Partners has been involved in the design of the proposed building envelope and consider that the building envelope would minimise negative impacts on heritage items in close proximity.	Y
	2.8 Views - No development is to encroach on significant views or silhouettes. - Taking into account other provisions of the DCP, the siting and design of new buildings that open up significant views from the public domain will be encouraged (particularly views to Sydney Harbour). - Special care is required in the design of buildings that terminate vistas or encroach on significant silhouettes.	▪ View corridors are identified along Bligh Street and O'Connell Street. The building envelope frame these view corridors by building to the street alignment. ▪ The building envelope does not terminate any vista or view corridor.	Y
3.0 Pedestrian amenity	**3.2 Midblock Connections** **3.2.1 Existing midblock connections in Central Sydney are to be retained**	▪ The site contains an existing midblock connection. Due to the floor space requirements of the new substation in the basement and	N

Section	Requirement	Proposal	Compliance
		podium levels, it is not possible to retain the existing connection or to provide a new mid-block connection. ▪ This is considered reasonable for the following reasons: - The project would provide regional infrastructure servicing the Sydney CBD; - The site is located approximately 20m from the intersection of Hunter Street and as such the loss of the through site connection would not have a significant impact on the flow of pedestrians through the city; - There is an existing link through site at Norwich House which is just north of the subject site.	
	3.3 Vehicle access and footpath crossings - New vehicle access points are restricted in retail streets and are not favoured in pedestrian priority places. Where practicable, vehicle access is to be from lanes and minor streets rather than major pedestrian streets. - Service vehicle access is to be combined with parking access and limited to a maximum of one access point per building. - Wherever practicable, vehicle access is to be a single crossing perpendicular to the kerb alignment.	▪ Two vehicular entrances are proposed on the O'Connell Street frontage of the site. Separate entrances are required for the EnergyAustralia vehicles and the commercial tenants. These crossings are not located on streets which are identified in Figure 3.5 of the DCP as being streets where new crossing are restricted or not preferred. ▪ Provision of the openings has been restricted to O'Connell Street so as to preserve the appearance and pedestrian characteristic of Richard Johnson Square.	N
	3.5 Awnings and colonnades - Awnings are to be provided to the full extent of the street frontage, except in cases where: (ii) there is no existing continuity of awnings on buildings within the same block on the same side of the street, (ii) there would be a major adverse impact on a heritage streetscape.	▪ This level of detail will be provided is a subsequent application which seeks consent for the detailed design of the building. ▪ The site is not located on a street which requires the provision of awnings or colonnades.	N/A
	3.6 Artworks - High quality artworks in new development are to be provided in publicly accessible locations such as near main entrances, lobbies and street frontages.	▪ This level of detail will be provided as part of Stage 2A(ii).	N/A

Section	Requirement	Proposal	Compliance
	3.7 Paving for footpaths and public spaces - Footpath paving is to be provided in accordance with Council's specifications and Footpath Paving Design Policy.	▪ This level of detail will be provided as part of Stage 2A(ii	N/A
	3.8 Easy access - All buildings are to be designed in accordance with Council's Access Policy. - The main entry is to be level with the street footpath where practicable, and should be located in a continuous level path of travel to the lift core.	▪ The building will be designed for universal access during Stage 2A(ii).	Y
4.0 Environmental management	**4.1 Sunlight to public spaces** - Shadowing effects of new buildings on publicly accessible space are to be considered for the hours 12 noon to 2 pm between 14 April and 21 June.	▪ Shadow diagrams have been prepared by Kann Finch and indicate that there would be negligible impact on publicly accessible space.	Y
	4.2 Wind standards - To ensure public safety and comfort the following maximum wind criteria are to be met by new buildings: - 10 metres/second in retails streets, - 13 metres/second along major pedestrian streets, parks and public places, - 16 metres/second in all other streets	▪ As outlined in the Wind Impact Assessment prepared by Windtech Pty Ltd, the building envelope is not expected to generate any adverse wind impacts on the pedestrian environment.	Y
	4.3 Energy efficiency of buildings - An Energy Efficiency Report is required to accompany the DA for any new building with a construction cost of $1 million or more. - Building designers should have regard to the Building Energy Manual (NSW Public Works 1993) and the Environment Design Guide (RAIA) when designing buildings.	▪ Details of the ESD measures to be incorporated into the design of the building during Stage 2A(ii). The proposed building will be designed to achieve a minimum 5 Star Green Star rating.	Y
	4.5 Reflectivity - New buildings and facades should not result in glare that causes discomfort or threatens safety of pedestrians or drivers. - Visible light reflectivity from building materials used on facades of new buildings should not exceed 20%	▪ A commitment has been made so as to ensure that the detailed design of the building complies with this requirement. This would also be considered as part of the design review process.	Y

Section	Requirement	Proposal	Compliance
4.0 Environmental management *Cont*...	**4.7 External lighting of buildings** - Any external lighting of buildings is to be considered with regard to: (i) the integration of external light fixtures with the architecture of the building (eg, highlighting external features of the building), (ii) the contribution of the visual effects of external lighting to the character of the building, surrounds and skyline, (iii) the energy efficiency of the external lighting system, (iv) the amenity of residents in the locality, (v) the impact on the night sky, having particular regard to observed effects from Sydney Observatory.	▪ This level of detail will be provided as part of Stage 2A(ii).	N/A
5.0 On-site parking	**5.1 Design and location of on-site parking** - Where any proposed development includes on-site parking, a Traffic and Parking Report is required. - The design of driveways (subject to Section 3.3 Vehicle Access and Footpath Crossings) and parking areas, and the location of driveways are generally to be in accordance with the RTA guidelines and AS 2890.1.	▪ The on-site parking and the location of driveways have been designed to comply with RTA guidelines and AS 2890.1.	Y
	5.3 Parking for people with mobility impairment - Car parking for people with mobility impairment is to be provided in accordance with S2890.1. This requirement requires a minimum of 1-2% of parking spaces to be provided and appropriately designated for use by people with mobility impairments.	▪ Disabled parking spaces will be provided in accordance with the Australian Standard. Details will be provided in a subsequent stage.	Y
	5.4 Delivery and service vehicles *Part 5.4 includes a range of provisions relating to delivery and service vehicle requirements.*	▪ 1 truck dock and 4 courier parking spaces are proposed on Basement level 3B. ▪ A development with 28,022m^2 requires the provision of up to 9 service spaces.	Y

Section	Requirement	Proposal	Compliance
	5.5 Bicycle parking - Facilities for cyclists are to be provided in all buildings that provide on-site parking. Facilities include parking for bicycles and at least 1 readily accessible shower change room.	▪ Areas have been designated for bicycle parking and amenities are to be provided in the basement for staff.	Y
	5.6 Motorcycle parking - Motorcycle parking is to be provided in all buildings that provide on site car parking, and is to be equal to at least one car parking space for every 100 car parking spaces or part thereof.	▪ One motorcycle space is required and two would be provided. This will be designated on the plans prepared as part of Stage 2A(ii).	Y
12.0 Design excellence and competitive process	**12.1 Competitive process** - In determining a development application, Clause 28D(1) of LEP 1996 requires the consent authority to consider whether the proposed development exhibits design excellence - For a development application where a development plan is in force. Clause 28D(2)(c) of LEP 1996 requires the consent authority to consider whether the design of the building is the result of a 'competitive process' that facilitates design excellence. - An applicant can demonstrate a competitive process in accordance with these DCP guidelines, by: - undertaking a design competition; or - preparing alternative designs on a competitive basis. - A competitive process can be undertaken at either the development plan stage or the development application stage.	▪ As noted previously a design review process would be implemented as part of Stage 2A(ii).	Y

Table 3 – City of Sydney Heritage DCP

Section	Requirement	Proposal	Compliance
Section 2 **Vicinity Controls**	**(1) Alterations and additions to buildings and structures, and new development of sites in the vicinity of a heritage item are to be designed to respect and complement the heritage item in terms of the:** **(a) building envelope;** **(b) proportions;** **(c) materials, colours and finishes; and** **(d) building and street alignment.** **(2) Development in the vicinity of a heritage item is to minimise the impact on the setting of the item by:** **(a) providing an adequate area around the building to allow interpretation of the heritage item;** **(b) retaining original or significant landscaping (including plantings with direct links or association with the heritage item);** **(c) protecting (where possible) and allowing the interpretation of archaeological features; and** **(d) retaining and respecting significant views to and from the heritage item.**	▪ The podium of the building envelope has been designed such that it provides a suitable transition in height and scale to the adjoining heritage items. ▪ A setback has been provided on the northern side of the Bligh Street frontage to expose the side elevation of the heritage item located at 31 Bligh Street such that it is seen as it would have been when it was first built. ▪ Information on the materials and detailing of the building would be determined as part of Stage 2A(ii). ▪ An archaeological assessment undertaken by Casey & Lowe indicates that the site is unlikely to contain features of archaeological importance. ▪ The Statement of Heritage Impact indicates that the project is unlikely to result in adverse impacts on the heritage significance of heritage items in the vicinity of the site.	Y

Section 4 Heritage Conservation Areas and Heritage Streetscapes	**(1) Development within a heritage conservation area or heritage streetscape is to be compatible with the surrounding built form and pattern of development by responding sympathetically to:** **(a) existing form, massing, setbacks, scale and architectural style;** **(b) site topography and landscape;** **(c) views to and from the area;** **(d) surrounding neighbourhood character and streetscape, including buildings; and** **(e) existing subdivision patterns.** **(2) Development should not project in front of the established building line towards the street.** **(3) Alterations and additions are not to dominate or detract from the original building.** **(4) Large expanses of solid walls are to be broken up by recesses, bays and modulations, vertical elements and/or the use of appropriate materials.** **(5) Alterations and additions are to respect the uniformity of properties which form part of a consistent row, semi-pair or group of buildings.** **(6) Development is to respect and minimise the impact on any significant public domain features.** **(7) Any applications for development within heritage conservation areas or heritage streetscapes are to demonstrate consistency with the area's Heritage Inventory Assessment Report, in particular the Recommended Management provisions.**	▪ The site is not located within a heritage streetscape area or heritage conservation area.	N/A

	Contributory Buildings **(1) Contributory buildings are to be retained.** **(2) Alterations and additions should not significantly alter the appearance of principal and significant facades of a contributory building, except to remove detracting elements.** **(3) Alterations and additions to a contributory building must:** **(a) respect significant original or characteristic built form;** **(b) respect significant traditional or characteristic subdivision patterns;** **(c) retain significant fabric;** **(d) retain, and where possible reinstate, significant features and building elements, including original balconies and verandahs, fences, chimneys, joinery, shop front detailing etc;** **(e) remove unsympathetic alterations and additions, including inappropriate building elements;** **(f) use appropriate materials, finishes and colours; and** **(g) respect the pattern, style and dimensions of original windows and doors.** **(4) Where an addition to the building is proposed, significant external elements are to be reinstated.** **(5) Where buildings have foyers or other significant interior features, including hallway detailing, panelling and significant staircases, that are designed to be visible from the street, these are to be retained, especially where they form part of the building's contribution to the character of the heritage conservation area or heritage streetscape.**	The building is not identified as a contributory building.	N/A
Section 5 Lot Boundary Changes	**Applies to subdivision and amalgamation of site**	▪ No changes to lot boundaries of the site.	N/A

Section 6 Additions	**(1) Additions are not to result in the removal of significant building or site elements or outbuildings.** **(2) Additions should maintain the integrity of the profile and form of the original building, including the roof form and profile, and allow the original building to be discerned.** **(3) Additions are to be smaller in height and scale than the existing building.**	▪ The project seeks consent for a new building envelope and not alterations or additions.	N/A
Section 7 Infill Development	**(1) Infill development is to be designed and detailed to complement the character of buildings within the vicinity of the site, particularly in terms of height, massing, form, bulk, setbacks and scale.** **(2) Infill development is to be compatible with the proportions of neighbouring buildings, including in terms of bulk and scale, and detailing.** **(3) The materials and finishes of infill development are to be compatible with the materials and finishes of adjoining significant or contributory buildings.** **(4) Infill development is to use colour schemes that have a hue and tonal relationship with traditional colour schemes.** **(5) Development is to respond to the established development patterns of the area as displayed by the subdivision layout, and front and side setbacks.** **(6) Infill development is not to obscure existing significant views to and from heritage items.** **(7) Infill development is not to include garages and car access to the front elevation of the development where these are not characteristic of the area.**	▪ The building envelope has been designed such that it provides a suitable built form response to the scale and massing of surrounding development. ▪ At the podium level, the street wall heights have been established to provide a suitable transition between the higher commercial building at the corners of Bligh, Hunter and O'Connell Streets and the smaller scale heritage buildings at 31 Bligh Street and 9 O'Connell Street. ▪ At the tower level, the building has been designed to correspond with the adjoining 'Mulpha' building which rises to a height of about 135m. ▪ The external materials would be established as part of Stage 2A(ii). ▪ The setback of the building at ground level on Bligh Street would enable the greater appreciation of the side elevation of 31 Bligh Street. ▪ Provision of the openings has been restricted to O'Connell Street so as to preserve the appearance and pedestrian characteristic of Richard Johnson Square.	Y

Section 8 Changes to Building Elements	**The objectives of these provisions are to ensure that changes to building elements on heritage items and on buildings within heritage conservation areas and heritage streetscapes are designed to:** **(i) minimise interference to the original form of the building;** **(ii) minimise the impact on existing and original building elements;** **(iii) encourage the reinstatement or reconstruction of original or significant detailing and building elements, based on documentary or physical evidence;** **(iv) protect, and not overwhelm, the scale and architectural integrity of the existing building; and** **(v) respect the uniformity of a semi-pair, group or coherent row of buildings.**	▪ No changes to a heritage item, streetscape element or heritage conservation area.	N/A
Section 9 Retail shopfronts and facades	**(i) encourage the retention of significant and contributory shopfronts;** **(ii) promote the reinstatement of original and characteristic shopfront elements;** **(iii) encourage the design of new shopfronts to adopt a contemporary interpretation of traditional forms; and** **(iv) ensure that alterations and additions do not compromise the integrity and consistency of heritage conservation areas or heritage streetscapes.**	▪ The site is not identified as having a significant or contributory shopfront.	N/A
Section 10 Development on Lanes	**Section 11 specifically addresses Development on Lanes within Central Sydney.**	▪ The site is not located on a laneway.	N/A
Section 12 Designing for Vehicles	**The objectives of these provisions are to ensure that the design and siting of car access and garages for heritage items, and buildings in heritage conservation areas and heritage streetscapes:** **(i) does not interfere with the setting or streetscape character of the heritage item, heritage conservation area or heritage streetscape;** **(ii) does not dominate existing buildings on the site; and** **(iii) minimises the alterations to, and removal of, significant public domain features including kerbing.**	▪ Two entrances are required to ensure safe access of commercial tenant staff and EnergyAustralia's trucks. ▪ These entrances are not on a street identified as having streetscape character or heritage status.	N

Section 13 Conserving Significant Elements in the Public Domain	**The objectives of these provisions are to ensure that development of heritage items or buildings and sites in heritage conservation areas and heritage streetscapes that impacts upon the public domain is designed so that:** **(i) street furniture and other public domain items are not intrusive in the heritage conservation area or heritage streetscape;** **(ii) significant public domain features are retained; and** **(iii) development does not have a detrimental impact on the heritage significance of public domain features.**	▪ Stage 2A(i) does not involve development of heritage items or buildings and sites in heritage conservation areas and heritage streetscapes.	N/A
Section 14 Particular Building Types	**Provided additional controls for particular building types.**	▪ The project does not involve any of the building types specified.	N/A

Appendix C

Correspondence with key stakeholders

Sydney WATER

22 June 2010

Gareth Evans
Senior Area Development Manager CBD & Sydney East
Energy Australia
GPO Box 4009
Sydney NSW 2001

Re: City East Cable Tunnel

Dear Mr Evans

Thank you for your letter of 4 May 2010 about the City East Cable Tunnel (CECT). Sydney Water has reviewed the Concept CECT alignment drawings and provides the following comments for your consideration.

City East Zone Substation at Bligh Street
The proposed substation design shows development to RL –13.55 at 20-26 O'Connell Street. This lot is located adjacent to Sydney Water water and wastewater mains and the State heritage listed Bennelong Stormwater Channel. It is possible that excavation of the bedrock at the substation site may change the existing rock stress regime acting around the pipeline and that it could also create unfavourable vibrations causing damage to the pipeline.

The integrity of the ground/rock support in the vicinity of these drainage lines needs to be maintained at all times during construction. Any rock bolting must avoid interference with the drainage lines and their trench or tunnel installation. Dilapidation assessments will be required prior to, and at the completion of construction. Condition monitoring may be required during construction.

Construction of the Substation/Building/Cable Risers must be carried out in a manner that does not compromise Sydney Water's ability to maintain, renew, replace or appropriately enlarge the drainage lines. Works are not permitted within the 3 metre curtilage around each drainage line, without the appropriate level of heritage approval.

To assess the impact of the proposed substation on the water and wastewater mains, and the stormwater channel, Sydney Water stormwater assets need to be accurately shown on the final drawings for detailed assessment, and geotechnical information needs to be provided.

William Street/Yurong Street
It appears that the top of the CECT could be relatively close to several Sydney Water drainage lines of unknown depth in this area. Although it is expected that there is sufficient vertical clearance between the top of the tunnel and these drainage lines, the drainage lines should be accurately shown on the final drawings and geotechnical information provided for more detailed assessment.

Little Albion Street Area/CECT Extension
Sydney Water understands that this tunnel extension is proposed to be tunnelled/excavated by roadheader, with excavated tunnel dimensions being about 3.6 metres wide and 4.5 metres high, with rock bolts 3 metres long. Although the Sydney Water stormwater drainage lines in the area are not likely to be interfered with by the proposed works, these drainage lines should be accurately shown on the final drawings and geotechnical information provided for a more detailed assessment.

Reservoir Street Crossing and Future Sydney Water Relief Sewer
Sydney Water has sewer works planned along Reservoir Street, Surry Hills. The planned works include a 3 metre diameter relief sewer tunnel on a grade. Any change in the tunnels elevation would be limited.

At the point where the tunnel passes beneath the proposed CECT there is currently only 2.6 metres of separation. At this point the CECT is on a –3% grade. Sydney Water would prefer the grade of the CECT be reduced until after the tunnel had passed Reservoir Street. This would increase the separation distance between the two tunnels to over 6 metres.

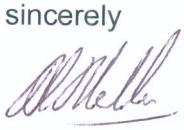
As the ground conditions at this location, and the support requirements are currently unknown a larger separation distance between the two tunnels would be beneficial.

Busby's Bore, Oxford Street
Drawing No. 208313 indicates the invert level of Busby's Bore to be 24.99 metres AHD. However, Sydney Water records indicate the invert level is about 31.6 metres AHD.

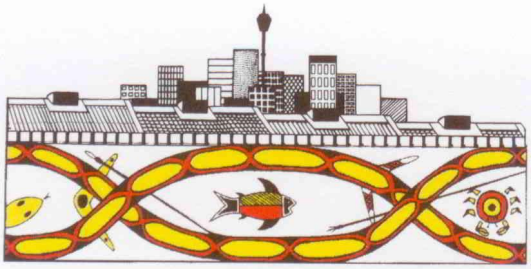
Leakage from Sydney Water assets
The CECT crosses, and runs parallel to Sydney Water wastewater assets. As such there is the potential for leakage to occur from Sydney Water's wastewater systems into the underlying CECT.

If you need further information please contact Cassie Loughlin on 8849 5243 or cassandra.loughlin@sydneywater.com.au.

Yours sincerely



Adrian Miller
Manager, Urban Growth Strategy and Planning



METROPOLITAN LOCAL ABORIGINAL LAND COUNCIL

36-38 George Street, Redfern NSW 2016
P.O. Box 1103 Strawberry Hills, NSW 2012
Telephone: (02) 8394 9666 Fax: (02) 8394 9733
Email: metrolalc@metrolalc.org.au

Monday, 3rd May 2010

Peter Carson
Senior Environmental Planner
GHD
Level 15, 133 Castlereagh Street
SYDNEY NSW 2000

Re: Aboriginal Heritage Site Assessment for 33 Bligh Street Sydney 2000 – Energy Australia's CityGrid Project

Dear Mr Carson,

A preliminary Aboriginal heritage site assessment was conducted on foot at 33 Bligh Street Sydney NSW 2000 for the purpose of identifying potential Aboriginal heritage constraints associated with the proposed Energy Australia's CityGrid project.

The site assessment was conducted on the 19th April 2010 by Allen Madden Site Officer of the Metropolitan Local Aboriginal Land Council (MLALC).

Prior to work commenced MLALC was informed about this site and discussions took place with Mr Peter Carson Senior Environmental Planner of GHD.

The surveyed area is within a highly development region of Sydney's CBD, Hunter and O'Connell Streets were also examined with this site assessment due to close proximity of Bligh Street.

There are no visible Aboriginal cultural materials in or around the surveyed area.

MLALC have no objections or issues to the proposed Energy Australia's CityGrid project. MLALC only request that in the unlikely event that an Aboriginal artefact or sites are discovered that all work is to cease MLALC and the NSW National Parks & Wildlife are contacted and consulted with immediately.

If you require any further information please do not hesitate to contact me on (02) 8394 9666 or 0411 229 217.

Regards,

Allen Madden
Sites Officer
Metropolitan Local Aboriginal Land Council

EnergyAustralia®
We're on it

Appendix D

Summary of the environmental risk analysis

Description of risk/ element	Potential impacts and consequences	Indicative management measures
Geology/ geotechnical		
◗ Poor ground conditions ◗ Settlement ◗ Contamination and disposal of contamination ◗ Geological faults	◗ Delays to the construction program ◗ Ground settlement, settlement of adjacent building foundations and potential cracking/structural damage to building structures ◗ Adverse health impacts associated with contamination ◗ Adverse environmental impacts associated with ground contamination ◗ Tunnel collapse	◗ Geotechnical investigations and analysis ◗ Building and tunnel structural design based on interpreted ground conditions and known areas of risk ◗ Dilapidation and basement survey of buildings potentially affected by building works ◗ Contamination studies and management plans to be developed for disposal of contaminated spoil ◗ Alignment design to avoid deep building basements and other structures at risk due to tunnelling ◗ Selection of road header and other specialist equipment to suit likely ground conditions
Hydrogeology/ groundwater		
◗ Groundwater chemistry, treatment and disposal ◗ Groundwater extraction ◗ Potential acid sulphate soils	◗ Contamination issues from potential acid sulphate soils ◗ Contamination of receiving waters ◗ Drawdown of groundwater table ◗ Settlement of building foundations	◗ Geotechnical investigations and analysis ◗ Building and tunnel structural design based on interpreted ground conditions and known areas of risk ◗ Contamination studies and management plans to be developed to deal with the treatment and disposal of groundwater ◗ Similar groundwater treatment system to be installed as is currently operated at the City North and Campbell Street substations.
Erosion and sedimentation		
◗ Erosion and sedimentation ◗ Stormwater runoff and disposal	◗ Pollution of waterways as a result of erosion and sedimentation ◗ Fines and/ or prosecution by DECCW under the POEO Act	◗ Local site controls and management plans ◗ Implementation of checking/maintenance of sedimentation and erosion controls ◗ Water treatment prior to disposal, including collection and analysis of water samples during construction
Ecology		
◗ Groundwater disposal and affect on	◗ Adverse impacts on aquatic ecology	◗ Water treatment prior to disposal, including collection and analysis of

aquatic habitat in receiving waters	◗ Turbidity / algae blooms in receiving waters	water samples during construction.
Existing/ proposed underground assets		
◗ Building clearances and undermining of existing buildings and other underground services, Cross City Tunnel and Southern Rail Line ◗ Clearances and undermining of existing building basements ◗ Effect on Metro Pitt and CBD Metro Stage 1 tunnel corridors ◗ Offsite service interruptions	◗ Settlement and structural damage to, existing or proposed tunnels, buildings or other underground services ◗ Collapse of existing buildings and other structures ◗ Stray currents ◗ Electrocution ◗ Compromise viability of future development of the Metro Pitt and CBD Metro Stage 1 corridors.	◗ Geotechnical investigations and analysis ◗ Review as-built data and survey from existing underground structures ◗ Building structural design based on interpreted ground conditions ◗ Dilapidation and basement survey of buildings potentially affected by building works ◗ Consultation with Rail Corp and Sydney Metro to ensure adequate clearance is provided ◗ Design the bridging structure to meet requirements for operation of the substation and accommodate possible future presence of CBD Metro Stage 1 tunnels ◗ Obtain Dial-before-you-dig searches before commencing construction
Noise and vibration / regenerated noise		
◗ Surface construction activity ◗ Ground vibration / regenerated noise ◗ Rock breaking ◗ Traffic / construction plant ◗ Ventilation plant	◗ Structural damage to buildings ◗ Loss of public amenity ◗ Complaints nuisance ◗ Sleep disturbance ◗ Works outside general construction hours (limited to defined works and work periods)	◗ Surface works generally limited to standard construction hours ◗ Limited hours for rock-breaking activities ◗ Noise attenuation measures ◗ Measurement of background levels and noise monitoring during construction works ◗ Community consultation and liaison ◗ Selection of specialist equipment to suit likely ground conditions and minimise regenerated noise ◗ Dilapidation and basement survey of buildings potentially affected by building and tunnelling works ◗ Alignment design to avoid deep building basements and other structures at risk as a result of tunnelling works
Dust / air quality		
◗ Surface works ◗ Shaft and tunnel excavation ◗ Building demolition ◗ Spoil stockpiles, handling and transport ◗ Construction ventilation	◗ General health to the public and site workers ◗ Air pollution ◗ General public amenity and comfort ◗ Breach of environmental standards ◗ Public complaints	◗ Environmental management plans ◗ Dust suppression measures utilised on site ◗ Covering of spoil stockpiles and trucks leaving the site ◗ Filtration/ scrubbers for ventilation plant ◗ Regular maintenance of vehicles/ plant used on site

◗ Bulk excavation ◗ Equipment exhausts	◗ Potential exposure to asbestos fibres	◗ Monitoring and measurement of air quality during construction works ◗ Management of asbestos in accordance with WorkCover guidelines and Australian Standards ◗ Licensed removal of asbestos
Social issues		
◗ Public perception of risks associated with demolition, excavation and tunnelling (ie building collapse, fatalities etc)	◗ Loss of reputation ◗ Increase in complaints on the project ◗ Poor publicity	◗ Community consultation ◗ Planning / information forums / community information plan ◗ Regular project updates
Traffic and transport		
◗ Disruption to local traffic due to haulage routes including spoil disposal ◗ Road dilapidation ◗ Temporary / partial road closures ◗ Loading / unloading materials and equipment ◗ Pedestrians and other road users ◗ Parking ◗ Queuing in the vicinity of construction sites ◗ Disruption to special events	◗ Noise and vibration ◗ Air quality and pollution ◗ General public safety ◗ Sediment tracking onto roads ◗ Complaints and access restrictions to local residents and businesses ◗ Traffic congestion ◗ Damage to roads ◗ Loss or disruption of parking ◗ Impact on pedestrian safety / access	◗ Selection of appropriate haulage routes ◗ Traffic assessment and route/intersection analysis ◗ Traffic management plans during construction ◗ Restrictions on working hours for loading/unloading of materials ◗ Environmental Management Plans dealing with erosion and sedimentation; truck washes, street cleaning etc ◗ Dilapidation surveys along affected roads/haulage routes in the immediate vicinity of the site ◗ Rerouting of buses and other public transport if required ◗ Consultation with RTA, City of Sydney, Sydney Metro, and State Transit ◗ Pedestrian access to be maintained around construction sites ◗ Signage in and around construction sites
Waste management and hazardous materials		
◗ Contamination (surface works) ◗ Inappropriate waste disposal ◗ Hazardous materials associated with demolition of existing assets / buildings	◗ Health and safety of workers and the general public ◗ Environmental harm and contamination as a result of waste disposal ◗ Hazardous materials associated with demolition, such as asbestos, causing damage to the environment or health of employees ◗ Disposal to landfill is an inefficient use of resources such as VENM	◗ Waste management plan to include mitigation measures for control and storage and handling of hazardous materials ◗ Contamination assessment ◗ Assessment of options for re-use and/or recycling of spoil (including VENM) and other waste materials ◗ Treatment and isolation of hazardous materials during construction activities ◗ Management of waste in accordance with DECC Waste Classification Guidelines (2008)

		◗ Assessment of sites for disposal of materials
Heritage and archaeology		
◗ Damage to heritage sites potentially affected by works ◗ Areas of archaeological significance ◗ Buried or unknown heritage items	◗ Damage to heritage buildings and other assets ◗ Delay to works ◗ Legal and statutory issues ◗ Loss of reputation / adverse publicity	◗ Cultural heritage and archaeology assessment ◗ Vibration monitoring during construction, if required ◗ Dilapidation survey of heritage listed buildings ◗ Develop protocols for notification and treatment of impacts on heritage listed structures during construction (eg stop work provisions)
Visual amenity		
◗ Construction sites ◗ Night works / lighting	◗ Complaints ◗ General public disturbance and perception ◗ Potential to delay works	◗ Consultation and planning ◗ Design review ◗ Environmental Management Plans ◗ Placement of hoardings
Urban design		
◗ Risk that Stage 2A(i) constrains design outcomes in Stage 2A(ii)	◗ Positive design outcomes in Stage 2A(ii) unable to be incorporated	◗ Stage 2A(i) designed to provide flexibility to accommodate a range of design outcomes in Stage 2A(ii)
CBD Metro Stage 1		
◗ Potential future presence of tunnels for the CBD Metro Stage 1 below the City East Zone Substation	◗ Impact on structural integrity of either the tunnels for the CBD Metro Stage 1 tunnels or the substation	◗ Design of the bridging structure in consultation with Sydney Metro to preserve the viability and structural integrity of both the substation and the tunnels for the CBD Metro Stage 1 ◗ Develop deed of agreement consultation with Sydney Metro, if necessary
Other risks		
◗ Security	◗ Damage / vandalism to construction sites and equipment ◗ OH&S risks to workers and the general public	◗ Security management plan to be developed as part of the CEMP to restrict public access to worksites

Appendix E

Noise and vibration assessment
Wilkinson Murray

SYDNEY CITYGRID PROJECT
CITY EAST ZONE SUBSTATION STAGE 2A(I)
NOISE AND VIBRATION IMPACT ASSESSMENT

ACOUSTICS AND AIR

REPORT NO. 09300
VERSION D

WILKINSON MURRAY

SYDNEY CITYGRID PROJECT
CITY EAST ZONE SUBSTATION STAGE 2A(I)
NOISE AND VIBRATION IMPACT ASSESSMENT

REPORT NO. 09300
VERSION D

JUNE 2010

PREPARED FOR

GHD PTY LTD
LEVEL 15, 133 CASTLEREAGH STREET
SYDNEY NSW 2000

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1 INTRODUCTION

Wilkinson Murray (Sydney) Pty Limited has been engaged by GHD Pty Ltd to conduct a construction noise and vibration assessment in relation to Stage 2A of the Sydney CityGrid Project cable project.

Stage 2A includes construction and operation of the City East Zone Substation at 33 Bligh Street, Sydney. For expediency, EnergyAustralia has elected to separate Stage 2A into the following sub stages:

- Stage 2A(i) – demolition of the existing building on the site, bulk excavation, excavation of a stub tunnel under Bligh Street, and (potentially) construction of a bridging structure over the proposed alignment of the Sydney Metro.
- Stage 2A(ii) – construction and operation of the City East Zone Substation and associated commercial development above the substation.

This report describes the assessment and management of noise and vibration associated with Stage 2A(i) only. Assessment relating to Stage 2A(ii) will be the subject of a separate approval application.

2 PROJECT DESCRIPTION

2.1 City East Zone Substation

The proposed new City East Zone Substation located at 33 Bligh Street, Sydney is required to allow for the connection of 132kV feeders from the Riley Street STSS, City North Zone Substation and potentially the Dalley Street Substation. Significant 11kV feeders would also connect the City East Zone Substation to various parts of the northern-eastern Sydney CBD.

This project forms part of the Sydney CityGrid Project which received Concept Approval under Part 3A of the EP&A Act 1979 from the Minister for Planning in September 2009. Under the approval the City East Zone Substation was designated as Stage 2A of the Sydney CityGrid Project.

For the purposes of expediting planning approval under the EP&A Act, Stage 2A has been divided into two sub-stages. Stage 2A(i) relates to demolition of the existing building on the site, excavation of the basement, construction of a 150m tunnel beneath Bligh Street and construction of a bridging structure over the proposed alignment for the Sydney Metro project. Stage 2A(ii) relates to construction and operation of the City East Zone Substation and a commercial development above the substation.

The staged approach has been adopted to allow Stage 2A(i) to commence prior to design details for the substation and commercial tower being finalised in Stage 2A(ii). This staging would reduce the overall timeframe to deliver the City East Zone Substation by approximately 9-12 months, which is a significant consideration given the importance of timely replacement of aging assets to ensure the CBD has a secure electricity supply.

2.2 Stage 2A(i) of the City East Zone Substation

Stage 2A(i) of the City East Zone Substation Project involves demolition and bulk excavation works at 20-22 and 24-26 O'Connell Street and 33 Bligh Street, located in the City of Sydney Local Government Area. The site is legally defined as Lot 1 Deposited Plan 626651 and is roughly rectangular in shape with an approximate site area of 2,038m^2. Stage 2A(i) also involves construction of a stub tunnel below Bligh Street to the intersection with Bent Street and potentially the construction a bridging structure over the proposed alignment of Stage 1 of the CBD Metro project.

Bligh Street is a one way south bound street consisting of two traffic lanes and two parking lanes. The existing development on the site consists of two commercial buildings, one 17 storey office building constructed in 1960 (20-22 O'Connell Street and 33-35 Bligh Street) and another 10 storey office building constructed in 1983 (24-26 O'Connell Street) and merged with the lower levels of the original building.

2.2.1 Hoardings

Hoardings or other protective structures would be installed along several site boundaries to provide a safe working environment for construction workers, as well as those in the surrounding area. All hoardings would be erected in accordance with the City of Sydney Guidelines for Temporary Protective Structures. The overhead hoardings would be designed to accommodate loads from scaffolding that may be required during demolition of the building.

2.2.2 Demolition of Kindersley House

Demolition of the existing building (Kindersley House) would be undertaken in several stages, with the internal strip out occurring first and the external walls left as long as possible to reduce dust, noise and vibration transfer to neighbouring buildings.

2.2.3 Bulk excavation

Following completion of demolition, bulk excavation would likely commence at the O'Connell Street frontage and would work in an easterly direction. Underpinning and shoring works would commence on the perimeter of the site during the initial stages of the bulk excavation. These works entail a number of different techniques including but not limited to, underpinning, rock anchors and temporary shoring. These works would occur concurrently with the bulk earth removal works.

Bulk excavation would use a range of equipment including rock saws, rock hammers and excavators.

Approximately 43,153m^3 of material would be excavated during this process.

2.2.4 Stub tunnel excavation

A stub tunnel is required below Bligh Street to connect the City East Zone Substation to the proposed City East Cable Tunnel (CECT). The stub tunnel would be approximately 150 metres long with cross sectional dimensions of 4m wide by 4m high. It would be constructed using a road header, Mitsui 200 or similar equipment. These works would not involve any surface excavation beyond the boundary of 33 Bligh Street.

Approximately 2,914m^3 of material would be excavated and removed via a shaft within the site at 33 Bligh Street.

2.2.5 Construction of a bridging structure over CBD Metro Stage 1

Stage 1 of the proposed CBD Metro project involved two tunnels that passed beneath 33 Bligh Street. This project has been deferred indefinitely by the NSW Government; however a protected corridor for the alignment may be maintained. At the time of writing the presence of the corridor is uncertain. If the corridor is confirmed then it would be important to ensure that there is a safe and efficient transfer of loads from the City East Zone Substation and commercial tower to the strata below without adversely affecting the corridor.

A concept design for an appropriate support scheme has been undertaken by EnergyAustralia which indicated a solution to transferring the building loads around the corridor was feasible and will be further developed during the detailed building design.

2.2.6 Timing and duration of construction

EnergyAustralia propose construction would generally be carried out during the following hours:

- Monday to Friday 7.00am to 7.00pm;
- Saturdays 7.00am to 5.00pm; and
- No work on Sundays or Public Holidays.

Noise intensive activities such as rock breaking would be undertaken during the following hours:

- Monday to Saturday 7.00am to 12.00pm;
- Monday to Friday 2.00pm to 5.00pm; and
- At no time on Sundays or Public Holidays.

The below ground elements of the stub tunnel would be constructed 24 hours per day; however, surface works such as loading spoil into trucks, would be limited to the standard construction hours. Other activities that may occur outside the standard construction house include, but may not be limited to, oversize truck movements and deliveries of certain plant and equipment on an occasional basis. Works may also be undertaken outside these hours in the event of a direction from police or other relevant authority for safety reasons, or emergency work to avoid the loss of lives, property and/or to prevent environmental harm.

The duration of the project is presented in Table 2-1.

Table 2-1 Duration of Construction

Task	Duration
Demolition of the existing building	26 weeks
Bulk excavation	30 weeks
Stub tunnel and shaft excavation	30 weeks
Bridging structure over the Metro tunnels	8 weeks
TOTAL	94 weeks

2.2.7 Traffic

The construction of Stage 2A(i) of the Sydney CityGrid Project cable project would generate traffic movements. The majority of the heavy vehicle movements would be from spoil haulage.

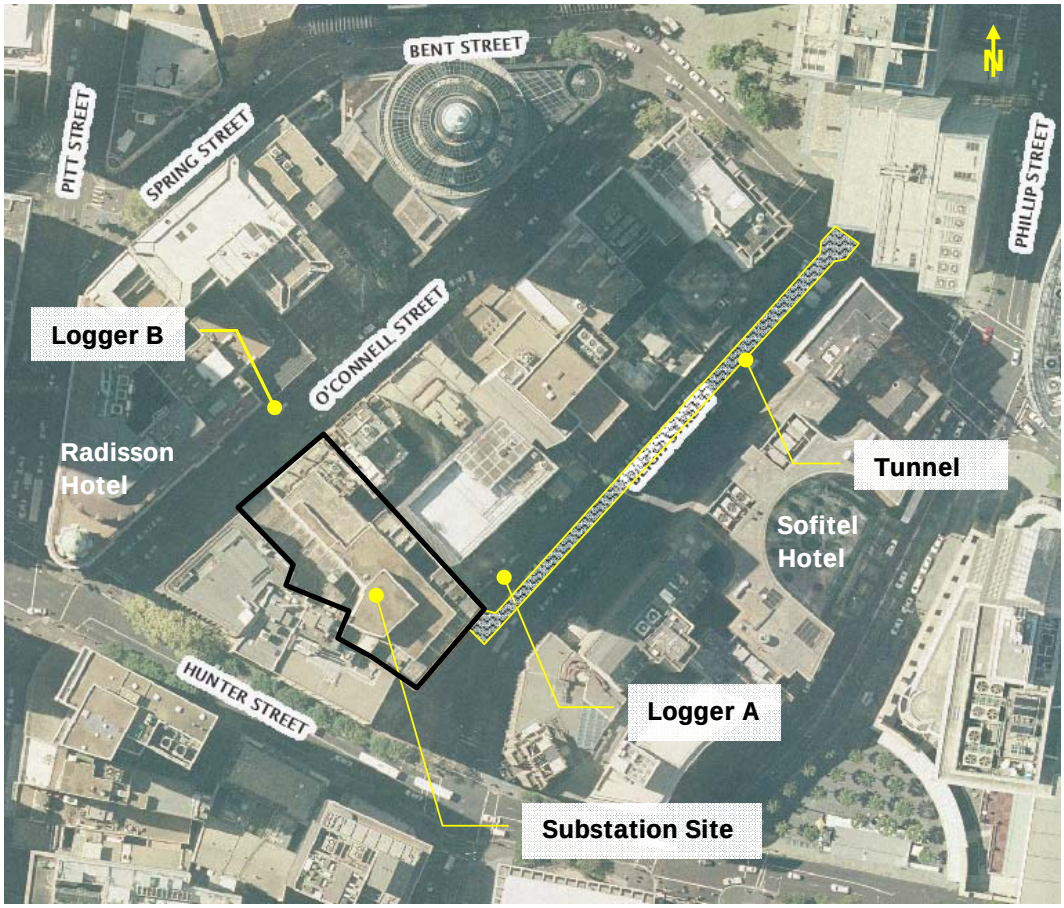
3 AMBIENT NOISE LEVELS AND SURROUNDING RECEIVERS

Long-term ambient noise levels were monitored at two locations surrounding the Stage 2A(i) site, selected to cover the range of environments in the potentially-affected areas. The locations are presented in Table 3-1. The logger locations are shown in Figure 3-2 and Figure 3-3.

Table 3-1 Long-Term Noise Monitoring Locations

Monitoring Site	Address	Relevant Noises noted on Site Visits
A	Bligh Street Sydney	Local Traffic and general city noise
B	O'Connell Street	Local Traffic and general city noise

Figure 3-1 Noise Monitoring Locations



Surrounding potentially affected receivers areas are presented in Table 3-2.

Table 3-2 Surrounding Receiver Areas

Description	Location
Radisson Hotel – O'Connell Street	Immediately to the West of the Substation Site at a distance of 20m.
Sofitel Wentworth Hotel – Backing on to Bligh Street	To the North East of the Substation Site at a distance of 65m.
Commercial Properties	Immediately to the North and South of the Substation Site.
Heritage Building – Lowy Institute	Immediately to the North of the Substation Site.

Figure 3-1, Figure 3-2 and Figure 3-3 present the logging locations and the surrounding areas.

Figure 3-2 Noise Logger Site A - 31 Bligh Street

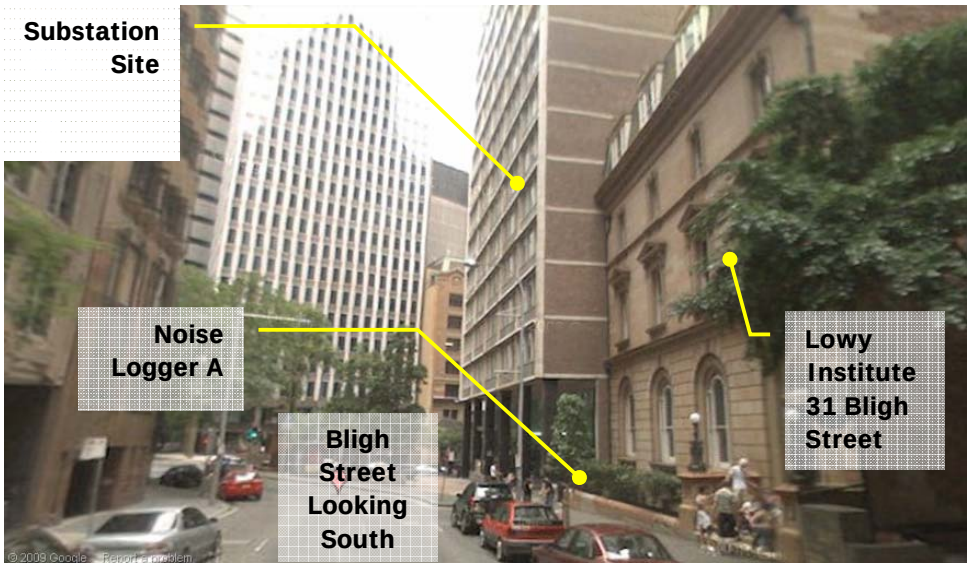
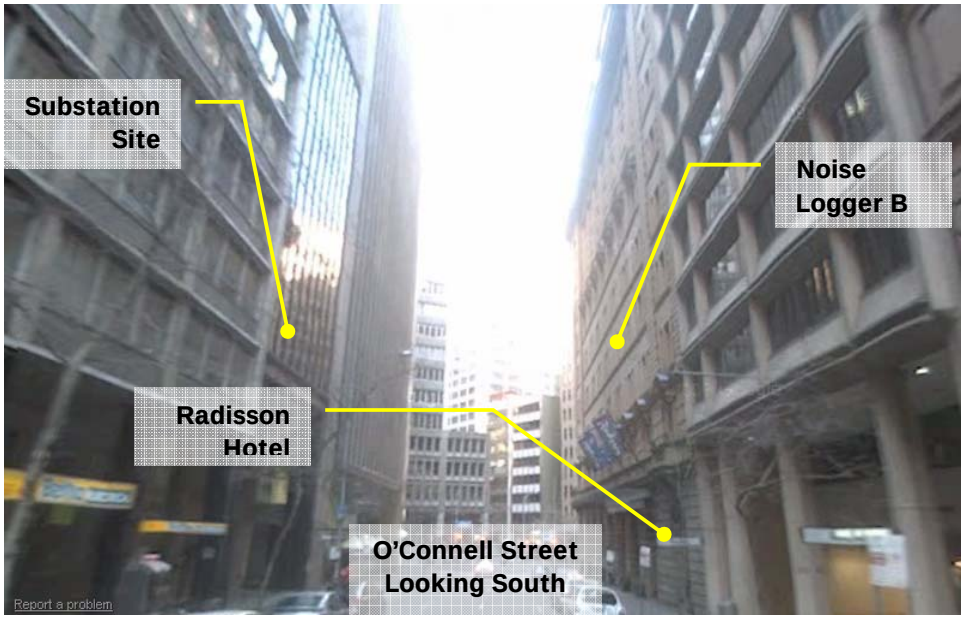


Figure 3-3 Noise Logger at Site B – Radisson Hotel – O'Connell Street



Noise monitoring was conducted between Monday, 15 February and Tuesday, 23 February 2010. The noise monitoring equipment used for these measurements consisted of ARL Type EL-215 environmental noise loggers set to A-weighted, fast response, continuously monitoring over 15-minute sampling periods. This equipment is capable of remotely monitoring and storing noise level descriptors for later detailed analysis. The equipment calibration was checked before and after the survey and no significant drift was noted.

The logger determines L_{A1}, L_{A10}, L_{A90} and L_{Aeq} levels of the ambient noise. L_{A1}, L_{A10} and L_{A90} are the levels exceeded for 1%, 10% and 90% of the sample time respectively (see Appendix A for definitions). The L_{A1} is indicative of maximum noise levels due to individual noise events such as the occasional pass-by of a heavy vehicle. The L_{A90} level is normally taken as the background noise level during the relevant period.

Detailed results for each monitoring location are shown in graphical form in Appendix B. The graphs show measured values of L_{Aeq}, L_{A90}, L_{A10} and L_{A1} for each 15-minute monitoring period.

Table 3-3 summarises the noise results, for daytime, evening, night time periods as defined in CNG. Additionally, noise monitoring results for Saturday (7.00am-5.00pm) has been included as EnergyAustralia propose to operate outside of CNG hours during that time. The summary values are:

- L_{Aeq} (period) – the equivalent continuous L_{Aeq} noise level measured over the assessment period; and
- RBL – Rating Background Level is a measure of typical background noise levels which are used in determining noise criteria.

Table 3-3 Summary of Measured Noise Levels

Noise Logging Site	RBL (dBA)				$L_{Aeq,period}$ (dBA)			
	Daytime 7am-6pm	Evening 6-10pm	Night Time 10pm-7am	Saturday 7am-5pm	Daytime 7am-6pm	Evening 6-10pm	Night Time 10pm-7am	Saturday 7am-5pm
A	58	59	56	58	63	64	66	63
B	65	61	59	65	70	67	65	70

Weather conditions were suitable for noise measurements during the monitoring period.

The noise logger at Site A was deployed at the Lowy Institute. Consultation with the Lowy Institute indicated that the building façade was being restored and that work hours were 6.00am to 2.00pm weekdays. This is consistent with noise logging results and observations at the time of deployment.

As construction was occurring between 6.00am – 2.00pm at the Lowy Institute, data for this period was excluded from measurements for the purpose of calculating background noise levels.

The noise logger at Site B was deployed in O'Connell Street and was not affected by noise from sources such as fans that emit constant noises. There was no plant or construction noise that affected logger results in this location.

In summary, background levels determined at both locations were free of the influence of extraneous noise sources such as plant or construction activities.

4 PERFORMANCE CRITERIA

The following sections detail the applicable site specific construction noise and vibration criteria based on the guidelines from DECCW, being;

- *Interim Construction Noise Guideline*, and;
- *Assessing Vibration: A Technical Guideline*.

4.1 Construction Noise Criteria

DECCW released the "*Interim Construction Noise Guideline*" *(CNG)* in July 2009 the guideline provides noise goals that assist in assessing the impact of construction noise.

For residences, the basic daytime construction noise goal is that the noise should not exceed the L_{A90} background noise by more than 10dBA. This is for standard hours: Monday to Friday 7.00am to 6.00pm, and Saturday 8.00am to 1.00pm. Outside the standard hours, the criterion would be background + 5dBA. A more complete description of the guidelines is in Table 4-1.

Table 4-1 Construction Noise Goals at Residences using Quantitative Assessment

Time of Day	Management Level $L_{Aeq,(15min)}$ *	How to Apply
Recommended Standard Hours: Monday to Friday 7am to 6pm Saturday 8am to 1pm No work on Sundays or Public Holidays	Noise affected RBL + 10dBA	• The noise affected level represents the point above which there may be some community reaction to noise. • Where the predicted or measured $L_{Aeq,(15min)}$ is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to minimise noise. • The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected 75dBA	• The highly noise affected level represents the point above which there may be strong community reaction to noise. • Where noise is above this level, the proponent should consider very carefully if there is any other feasible and reasonable way to reduce noise to below this level. • If no quieter work method is feasible and reasonable, and the works proceed, the proponent should communicate with the impacted residents by clearly explaining the duration and noise level of the works, and by describing any respite periods that will be provided.

Time of Day	Management Level $L_{Aeq,(15min)}$ *	How to Apply
Outside recommended standard hours	Noise affected RBL + 5 dB	A strong justification would typically be required for works outside the recommended standard hours. • The proponent should apply all feasible and reasonable work practices to meet the noise affected level. • Where all feasible and reasonable practices have been applied and noise is more than 5dB(A) above the noise affected level, the proponent should negotiate with the community. • For guidance on negotiating agreements see section 7.2.2.

In addition the following construction noise management levels $L_{Aeq\ (15\ min)}$ are recommended for other receivers and areas as follows.

- Active recreation areas (such as parks) external $L_{Aeq\ (15\ min)}$ 65dBA;
- Industrial premises: external $L_{Aeq\ (15\ min)}$ 75dBA; and
- Offices, retail outlets external $L_{Aeq\ (15\ min)}$ 70dBA.

Based on the above, Table 4-2 presents the applicable noise management levels for construction activities.

Table 4-2 Site Specific Construction Noise Management Levels

Location	Construction Noise Management Level, L_{Aeq} - dBA				Maximum Construction Noise Level, L_{Aeq} - dBA
	Day	Evening	Night	Saturday (extended)	
Bligh Street	68	64	61	63	75
O'Connell Street	75	66	64	70	75
Commercial Properties	70				75

4.2 Construction Vibration Criteria

Criteria for assessment of the effects of vibration on human comfort are set out in British Standard 6472-1992. Methods and criteria in that Standard are used to set "preferred" and "maximum" vibration levels in the document "*Assessing Vibration: A Technical Guideline*" (2006) produced by the NSW DECCW.

Acceptable values of human exposure to continuous vibration, such as that associated with underground drilling, are dependent on the time of day and the activity taking place in the occupied space (eg workshop, office, residence or a vibration-critical area). Guidance on preferred values for continuous vibration is set out in Table 4-3.

Table 4-3 Criteria for Exposure to Continuous and Impulsive Vibration

Place	Time	Peak velocity (mm/s)	
		Preferred	Maximum
Critical working areas (e.g. hospital operating theatres precision laboratories)	Day or night time	0.14	0.28
Residences	Daytime	0.28	0.56
	Night time	0.20	0.40
Offices	Day or night time	0.56	1.1
Workshops	Day or night time	1.1	2.2

In the case of intermittent vibration, which is caused by plant such as rockbreakers, the criteria are expressed as a Vibration Dose Value (VDV) which is presented in Table 4-4.

Table 4-4 Acceptable Vibration Dose Values for Intermittent Vibration ($m/s^{1.75}$)

Location	Daytime		Night Time	
	Preferred Value	Maximum Value	Preferred Value	Maximum Value
Critical areas	0.10	0.20	0.10	0.20
Residences	0.20	0.40	0.13	0.26
Offices, schools, educational institutions and places of worship	0.40	0.80	0.40	0.80
Workshops	0.80	1.60	0.80	1.60

Calculation of VDV requires knowledge of the number of events in the relevant time period.

4.3 Building Damage

In terms of the most recent relevant vibration damage objectives, Australian Standard AS 2187: Part 2-2006 “Explosives - Storage and Use - Part 2: Use of Explosives” recommends the frequency dependent guideline values and assessment methods given in BS 7385 Part 2-1993 “Evaluation and measurement for vibration in buildings Part 2” as they “are applicable to Australian conditions” BS7385.

The British Standard sets guide values for building vibration based on the lowest vibration levels above which damage has been credibly demonstrated. These levels are judged to give a minimum risk of vibration-induced damage, where minimal risk for a named effect is usually taken as a 95% probability of no effect.

The recommended limits (guide values) from BS7385 for transient vibration to ensure minimal risk of cosmetic damage to residential and industrial buildings are presented numerically in Table 4-5.

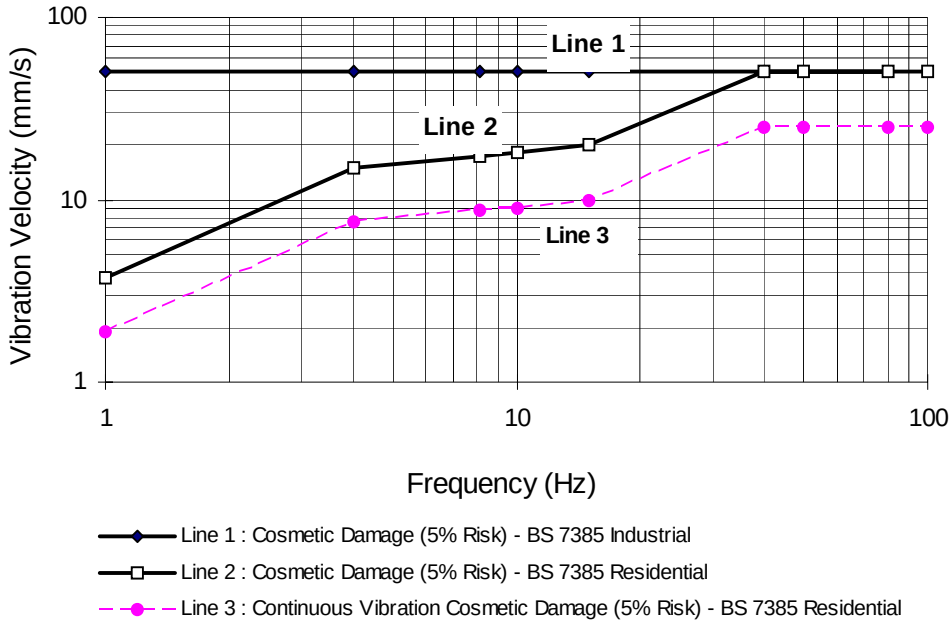
Table 4-5 Transient Vibration Guide Values - Minimal Risk of Cosmetic Damage

Type of building	Peak component particle velocity in frequency range of predominant pulse	
	4 Hz to 15 Hz	15 Hz and above
Reinforced or framed structures Industrial and heavy commercial buildings	50mm/s at 4 Hz and above	N/A
Unreinforced or light framed structures Residential or light commercial type buildings	15mm/s at 4 Hz increasing to 20mm/s at 15 Hz	20mm/s at 15 Hz increasing to 50mm/s at 40 Hz and above

The standard states that the guide values in Table 4-5 relate predominantly to transient vibration which does not give rise to resonant responses in structures, and to low-rise buildings. Note that rockbreaking/hammering and sheet piling activities are considered to have the potential to cause dynamic loading in some structures (eg residences) and it may therefore be appropriate to reduce the transient values by 50%.

The British Standard goes on to state that "*Some data suggests that the probability of damage tends towards zero at 12.5 mm/s peak component particle velocity*". In addition, a building of historical value should not (unless it is structurally unsound) be assumed to be more sensitive.

Figure 4.1 Graph of Transient Vibration Guide Values for Cosmetic Damage



In addition to the British Standard, for the case of nearby heritage buildings at 16-18 O'Connell Street and 31 Bligh Street, guidance for structural damage is derived from the German Standard DIN 4150 -3 "Structural Vibration Part 3 – Effects of Vibration on Structures. The following Table details these recommendations for heritage buildings.

Table 4-6 DIN 4150 recommend PPV vibration level for Heritage Buildings

Guideline Values for Velocity – mm/s		
1-10 Hz	10 to 15 Hz	40 to 50 Hz
3	3 to 8	8-10

Based on the foregoing information, the recommended site vibration control criteria are presented in **Table** 4-7**.**

Table 4-7 Recommended Site Vibration Control Criteria (ie Operator Warning and Halt Levels)

Structures	Site Control Criteria*		Minimal Risk of Cosmetic Damage Criteria
	Operator Warning Level	Operator Halt Level	
Commercial Building	20mm/s	25mm/s	25mm/s (4 Hz and above)
Residential Building	8mm/s	10mm/s	7.5mm/s to 10mm/s (4Hz to 15Hz) 10mm/s to 25mm/s (15Hz to 40Hz)
Heritage Buildings	2.4mm/s	3mm/s	1.5mm/s to 4mm/s (10 Hz to 15Hz) 4mm/s to 5mm/s (15Hz to 40Hz)

*Note: Based on rockbreaking generating frequencies greater than 10 Hz.

It is noted that the British Standard notes that a building of historical value should not (unless it is structurally unsound) be assumed to be more sensitive. Therefore, the surrounding heritage buildings should be inspected by a structural engineer for soundness. If these buildings are found to be structurally sound there may be scope for increasing vibration criteria to that of residential buildings.

It is also recommended that a vibration monitoring system be installed and configured to record the peak vibration levels as well as to trigger a visual and audible alarm when predetermined vibration levels are exceeded. These thresholds would correspond to an "Operator Warning Level" and an "Operator Halt Level", where the warning level is 80% of the halt level.

An exceedance of the "Operator Warning Level" would not require sheet piling activities to cease, but rather alerts the Site Superintendent to proceed with caution at a reduced force or load.

An exceedance of the "Operator Halt Level" would require the Site Superintendent to implement alternative techniques.

Exceedances of the "Operator Halt Level" are only permissible when the vibration criteria in Error! Reference source not found.**Table 4.7** are achieved (based on the frequency content of the vibration signal) or new vibration criteria are approved by the Site Superintendent.

4.4 Ground-borne Noise

Ground-borne noise refers to noise produced by vibration of floor slabs and other building elements, which radiates noise into the interior of a building. The *Interim NSW Construction Noise Guideline* addresses ground-borne noise as follows;

Ground-borne noise is noise generated by vibration transmitted through the ground into a structure. Ground-borne noise caused, for example by underground works such as tunnelling, can be more noticeable than airborne noise. The following ground-borne noise levels for residences indicate when management actions should be implemented. These levels recognise the temporary nature of construction and are only applicable when ground-borne noise levels are higher than airborne noise levels. The ground-borne noise levels are for evening and night time periods only, as the objectives are to protect the amenity and sleep of people when they are at home.

- Evening (6.00pm to 10.00pm) Internal: $L_{Aeq\ (15\ min)}$ 40dBA
- Night time (10.00pm to 7.00am) Internal: $L_{Aeq\ (15\ min)}$ 35dBA

The internal noise levels are to be assessed at the centre of the most-affected habitable room. For a limited number of discrete, ongoing ground-borne noise events, such as drilling or rock-hammering, $L_{A\ (max)}$ using a slow response on the sound level meter may be better than $L_{Aeq\ (15\ min)}$ in describing the noise impacts.

4.5 Traffic Noise Criteria

The DECCW's *Environmental Criteria for Road Traffic Noise (ECRTN)* presents the NSW Government's guidelines for road traffic noise criteria. The policy document provides road traffic noise criteria for proposed roads or residential land use developments as well as criteria for other sensitive land uses.

Table 4-8 presents the relevant noise criteria for this project, extracted from the *ECRTN* document.

Table 4-8 Traffic Noise Criteria Extracted from the NSW *ECRTN*

Type of Development	Criteria		
	Day (7am-10pm) dB(A)	Night (10pm-7am) dB(A)	Where Criteria are Already Exceeded
Land use development with the potential to create additional traffic on existing freeways and arterial roads	$L_{Aeq(15hour)}$ 60dBA	$L_{Aeq(9hour)}$ 55dBA	Where feasible and reasonable, existing noise levels should be reduced to meet the noise criteria via judicious design and construction of the development. Locations, internal layouts, building materials and construction should be chosen so as to minimise noise impacts. In all cases, traffic arising from the development should not lead to an increase in existing noise levels of more than 2dB.
Land use development with the potential to create additional traffic on collector road	$L_{Aeq(1hour)}$ 60dBA	$L_{Aeq(1hour)}$ 55dBA	
Land use development with the potential to create additional traffic on local roads	$L_{Aeq(1hour)}$ 55dBA	$L_{Aeq(1hour)}$ 50dBA	

Accordingly, all residences potentially affected by traffic noise will be assessed with respect to the above criteria.

It should be noted that existing traffic noise already exceeds the traffic noise criteria and as there is no expectation of traffic noise in the area decreasing therefore the 2dBA allowance goal applies for all roads.

5 NOISE SOURCE LEVELS

5.1 Construction and Demolition of the Building

Noise sources that are likely to be associated with the site demolition, excavation and construction of the project are identified in the following sections.

In order to assess the potential noise and vibration impacts during construction, a number of scenarios and typical equipment has been developed. These are summarised in Table 5-1.

Table 5-1 Construction Scenarios

Reference	Scenario	Equipment
1	Demolition	1 x Bobcat 1 x Jack hammer 1 x Dump truck (10 tonne) 1 x Concrete Saw 2 x Bobcat 1x Excavator
2	Excavation	1 x Front End Loader 2 x Dump Truck 2 x Rock Breakers 1 x Excavator 1 x Mobile Crane
3	General construct on site particularly the bridging structure	1 x Jack hammer 1 x Generator 1 x Concrete Pump 2 x Concrete Truck Hand Tools

Typical of the plant likely to be used during demolition, excavation and construction are identified in Table 5-2. These SWLs have recently been measured at other similar construction sites. The table gives both Sound Power Level (SWL) and Sound Pressure Levels (SPL) at 7m for the equipment. Sound Power Levels (SWL) is independent of measurement position. (Refer to Appendix A for further explanations.)

Table 5-2 Typical Construction Plant Sound Levels - dBA

Plant	Sound Power Level	Sound Pressure Level at 7m
Excavator	107	82
Dump Trucks	112	87
Rock Breaker	122	97
Concrete Pump	112	87
Saws	116	91
Saw Cutter	115	90
Small Excavators	90	65
Concrete Trucks	109	84
Small Generators	95	71
Front End - Low Loader	112	87
Compressor	100	75
Bobcat	103	78
Hand Tools	90	65
Jackhammer	105	80

Predicted noise levels at receivers are based on 15-minute periods. This equipment has been distributed across the site for the noise predictions.

5.2 Tunnelling Construction

Noise from a roadheader is not acoustically significant as any noise associated with this equipment is contained by the tunnel walls. It is the ancillary equipment, including the exhaust fan and dust collector, which generate noise associated with this construction activity.

Typical sound levels of the construction plant likely to be used during the project tunnel construction are identified in Table 5-3. These levels have recently been measured at other similar construction sites.

Table 5-3 Typical Tunnelling Equipment Plant Sound Levels (SWL)

Plant	Sound Power Level	Sound Pressure Level at 7m
Excavator with Header	112	87
Bogie (Dump) Truck	112	87
Crane	110	85
Power Tools	115	90
Concrete Trucks	109	84
Small Generators	95	70
Exhaust Fan* and Dust Collector	105	80

Note: *Assumes a silencer on the fan.

6 CONSTRUCTION NOISE ASSESSMENT

6.1 Construction Noise

Assessment of likely noise at surrounding commercial and residential receivers has been assessed for the Substation site during demolition, excavation and general construction.

Table 6-1 presents predicted demolition, excavation and general construction noise levels at residential receivers and commercial premises. Daytime, evening, night time and Saturday construction noise management criteria are also presented in Table 6-1 to gauge compliance when compared to the predicted noise levels. The predicted noise levels are based on equipment noise levels, distance attenuation and shielding from existing building and structures etc, where applicable. The CADNA-A noise prediction program was used to conduct the noise predictions using ISO 9613 noise prediction algorithm.

Figure 6-1 illustrates the noise propagation from the site for the worst case excavation scenario.

Figure 6-1 Predicted Construction Noise from Excavation

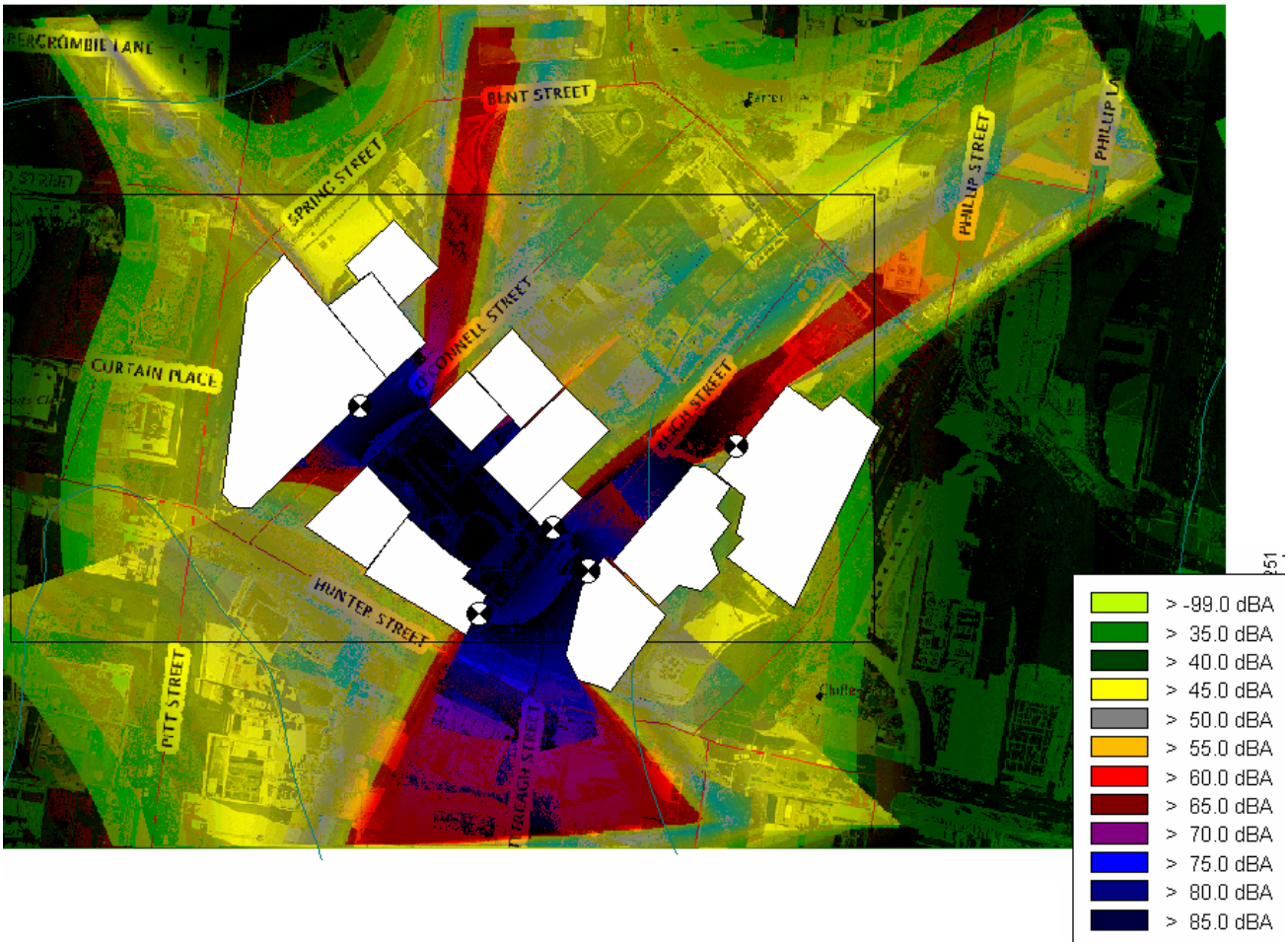


Table 6-1 Predicted Noise Levels at Receivers

Location	Predicted	Day			Evening			Night			Saturday (Extended)		
	Noise dBA	Criteria dBA	Exceedance dBA	Compliance	Criteria dBA	Exceedance dBA	Compliance	Criteria dBA	Exceedance dBA	Compliance	Criteria dBA	Exceedance dBA	Compliance
Demolition													
Sofitel Wentworth	45	68	-	Yes	64	-	Yes	61	-	Yes	63	-	Yes
Radisson Hotel	66	75	-	Yes	66	-	Yes	64		Yes	70	-	Yes
Lowy Institutes	67	70	-	Yes	70	-	Yes	70	-	Yes	70	-	Yes
Southern Commercial	70	70	-	Yes	70	-	Yes	70	-	Yes	70	-	Yes
Commercial across Bligh St	68	70	-	Yes	70	-	Yes	70	-	Yes	70	-	Yes
Excavation													
Sofitel Wentworth	55	68	-	Yes	64	-	Yes	61	-	Yes	63	-	Yes
Radisson Hotel	76	75	1	**No - Marginal**	66	10	**No**	64	12	Yes	70	6	**No**
Lowy Institutes	77	70	7	**No**	70	7	**No**	70	7	Yes	70	7	**No**
Southern Commercial	80	70	10	**No**	70	10	**No**	70	10	Yes	70	10	**No**
Commercial across Bligh St	78	70	8	**No**	70	8	**No**	70	8	Yes	70	8	**No**
General Construction													
Sofitel Wentworth	40	68	-	Yes	64	-	Yes	61	-	Yes	63	-	Yes
Radisson Hotel	61	75	-	Yes	66	-	Yes	64	-	Yes	70	-	Yes
Lowy Institutes	62	70	-	Yes	70	-	Yes	70	-	Yes	70	-	Yes
Southern Commercial	65	70	-	Yes	70	-	Yes	70	-	Yes	70	-	Yes
Commercial across Bligh St	63	70	-	Yes	70	-	Yes	70	-	Yes	70	-	Yes

Note: The only excavation that would occur at night would be related to tunnelling. Noise from tunnelling would be limited to operation of fans for the ventilation system and other plant and equipment, such as cranes, trucks, etc would not be used at night time.

Exceedance of noise criteria of up to 10dBA is predicted when excavation occurs and rockbreakers are used. These items of plants are significantly louder than other site equipment and compliance with criteria can be expected when the large rockbreakers are not operating.

Noise control measures that can be adopted to reduce noise levels at surrounding receivers are:

- Use rocksaws and rippers where feasible.
- Install a noise barrier between the site and the street frontages; (the site will be surrounded by hoardings erected in accordance with the City of Sydney Guidelines. These will also act as noise barriers)
- Use smaller rockbreakers with quiet “cityhammers”.

It is likely that a combination of the above measures will be required to ensure the acoustic amenity of nearby properties is protected during this stage of the project.

For demolition and general construction works the predicted noise levels comply with the evening and extended Saturday construction noise criterion. Therefore the extended operating hours proposed by EnergyAustralia are appropriate for demolition and general construction works.

As a noise control it is proposed that any noise intensive activities such as rock breaking would only be undertaken during the following limited construction hours:

- Monday to Saturday 7.00am to 12.00pm;
- Monday to Friday 2.00pm to 5.00pm; and
- At no time on Sundays or Public Holidays.

6.2 Tunnelling Noise

Assessment of likely construction airborne noise at surrounding residential receivers has been assessed for tunnelling along Bligh Street based on the typical sound power levels presented in Section 5.2. The noise will emanate from the substation site to surrounding hotels.

Table 6-2 presents maximum predicted construction noise levels at nearby residences during tunnelling at night. The modelling is based on noise from exhaust fans and dust collectors as these are the main noise sources that would, at the surface, operate at night. Other plant and equipment associated with tunnelling, such as cranes and trucks, would not operate at night.

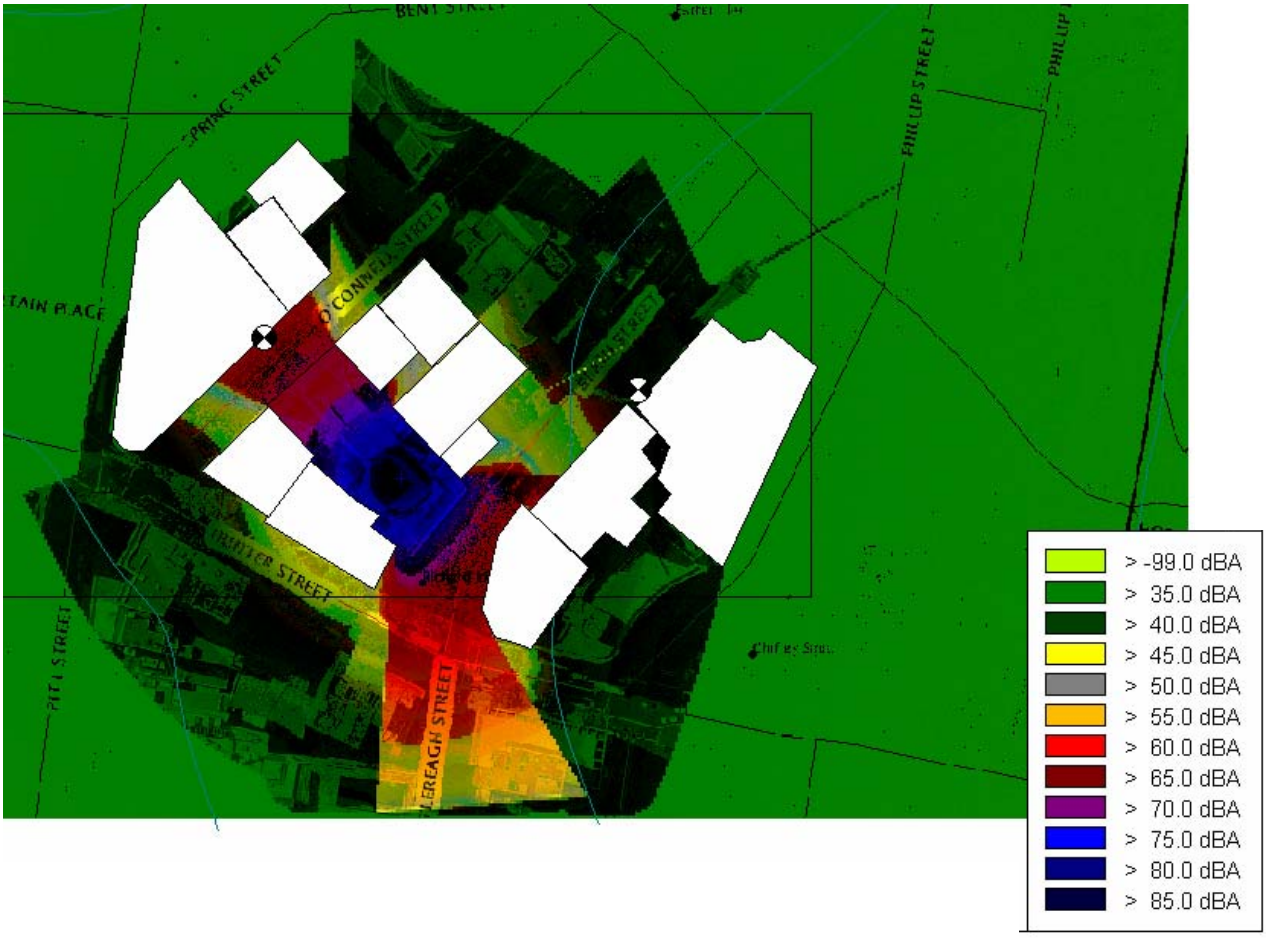
Table 6-2 Predicted Noise Levels at Residences from Tunnelling Works

Location	Predicted Noise Level dBA	Night Criteria dBA	Exceedance dBA	Compliance
Sofitel Wentworth	44	61	-	Yes
Radisson Hotel	64	64	0	Yes

The modelling indicated that acceptable noise levels will occur at the surrounding hotels. In addition, it is noted that these hotels have fixed windows and therefore internal noise levels will be further attenuated by this feature.

Figure 6-2 illustrates the noise propagation from the site.

Figure 6-2 Noise from Tunnelling



7 CONSTRUCTION VIBRATION ASSESSMENT

Construction, demolition and excavation activities have the potential to generate significant levels of vibration. Rockbreakers (Figure 7-1) involved in site excavation and road headers (Figure 7-2) conducting tunnelling activities under properties associated with the Stage 2A (i) works would generate the highest vibration levels compared to other activities. The following sections detail the assessment of these sources.

7.1 Excavation Vibration

Whilst tunnelling equipment (used underground) can generate relatively high airborne noise levels within the tunnels, noise transmission to locations outside the tunnels will be satisfactorily attenuated by the intervening soil or rock.

Operation of roadheaders and rockbreakers also generates ground vibration that has the potential to transmit to nearby buildings as audible (regenerated) noise. Regenerated roadheader noise usually has a low frequency "rumbling" character, whereas rockbreaker noise can be described as having repetitive impulsive character. Regenerated noise is of potentially greater significance than the accompanying tactile vibration, as it is normally perceptible at a greater distance from the source.

It should be noted that for tunnelling operations, regenerated noise is usually transitory in nature, increasing in level as the tunnelling works approach a particular building, reaching a maximum when the works are immediately nearby, and then decreasing in level as tunnelling moves on. The rise and fall of the noise level is controlled by the rate of tunnel advance, which typically ranges from 5m to 10m per day, depending on ground conditions and excavation methods.

Figure 7-1 Hydraulic Rock Breakers

The impulsive vibration from large rockbreakers can cause audible regenerated noise in buildings out to distances of 50 m to 100 m from an excavation site, depending on ground conditions, type of structure and on ambient noise conditions. Levels in the order of 45dBA to 50 dBA have been measured in the basement of properties 70m from a large rockbreaker operating to remove the lower bench in a tunnel.

Table 7-1 sets out the typical ground vibration levels at various distances from rock breakers operating in hard sandstone.

Table 7-1 Rockbreaker PPV Vibration Levels (mm/s) versus Distance

Operation	PPV Vibration Level (mm/s) at given Distance					
	5 m	10 m	20 m	30 m	40 m	50 m
Heavy Rock Hammer (eg 1500kg)	4.5	1.3	0.4	0.2	0.15	0.02
Medium Rock Hammer (eg 600kg)	0.2	0.06	0.02	0.01	-	-

Excavation will be conducted using rocksaws and rockbreakers whereby the perimeter of site will be sawn with rocksaws and the remainder of the site will be excavated by rockbreakers.

Vibration from rockbreaker operations has the potential to generate perceptible vibration at surrounding properties. Previous measurements indicate that PPV vibration levels from heavy (1500kg) and medium sized (600kg) rock breakers will be in the order 4.5mm/s and 0.2mm/s at a distance of 5m from the boundary.

At these levels of vibration, the preferred vibration dose (VDV) of 0.4mm/$s^{1.75}$ will be exceeded for heavy rockbreakers after less than 2 hours whilst lighter rock hammers could operate all day without exceeding the VDV. Clearly, this is not feasible for a large size rock breaker to operate the entire day without exceeding the nominated human comfort criteria.

Structural damage vibration criteria in commercial and residential buildings are much higher than human comfort criteria; therefore, compliance with the latter ensures that damage requirements will be satisfied.

In the case of nearby heritage buildings, structural damage vibration may be exceeded by heavy rockbreakers operating in the vicinity of these buildings. Therefore, it is recommended that vibration monitoring be conducted at nearby sensitive receivers to determine vibration levels in heritage structures with respect to established vibration criteria.

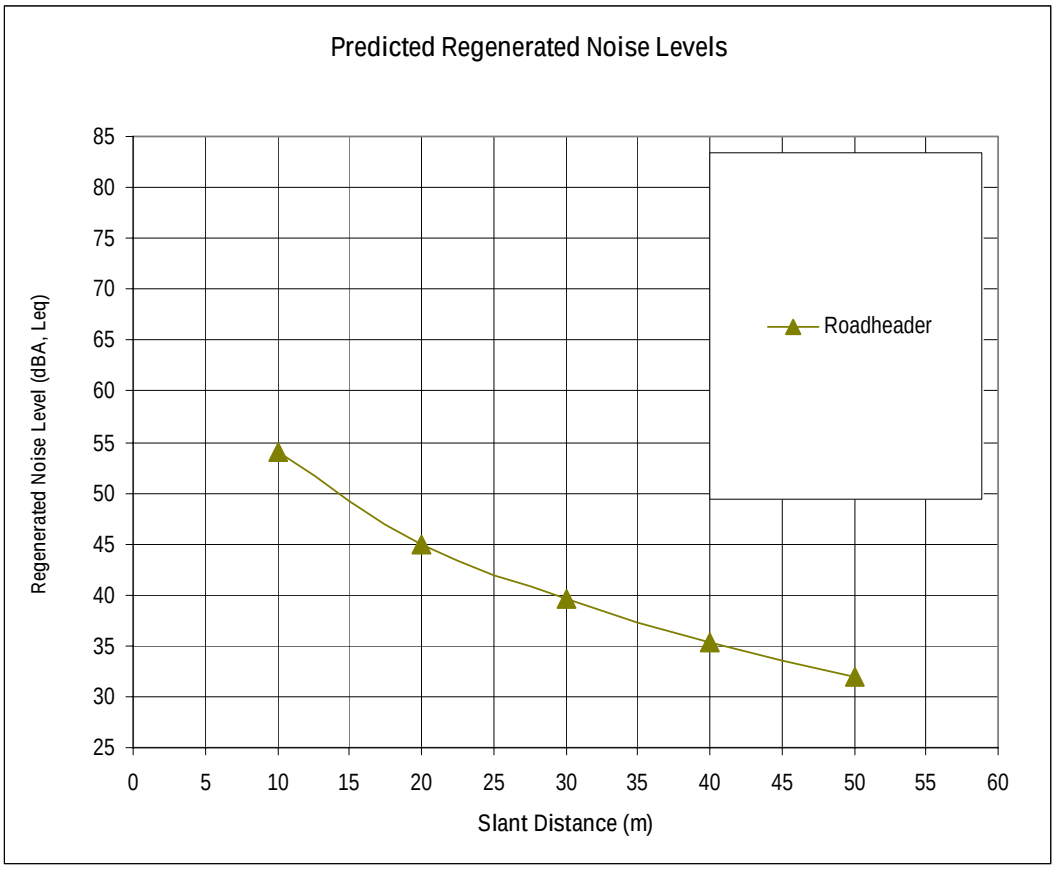
Figure 7-2 Roadheader Tunnelling Operations

Roadheaders remove rock using a controlled “grinding” action that provides close control over the excavated profile of the tunnel roof and upper walls.

This type of machine can safely perform detailed excavations quite close to sensitive structures such as historic buildings, and generates relatively low levels of vibration (and regenerated noise). Experience has shown that they can be used on a 24 hour basis in tunnels near residences with minimal disturbance to the occupants.

Wilkinson Murray has measured ground-borne noise levels from a roadheader. The results of the measurements are shown in Figure 7-3. These results were used to predict noise in basements of buildings near the part of the tunnel excavated by roadheader.

Figure 7-3 Predicted Regenerated Noise from Roadheader



Slant distances from the tunnel to buildings in Bligh Street have been provided by Energy Australia. A review of this information indicates the minimum distance from the head of the tunnel to the basements of commercial properties and the Sofitel Wentworth Hotel is in the order of 30m.

At distances of 30m a regenerated noise level of 39dBA can be expected. This level complies with the daytime regenerated noise criterion. In the case of noise levels in the Sofitel Wentworth, it is noted that the basements of the building are 15m below ground levels which presents 4 levels. Allowing for an attenuation of 2dBA per level, the noise levels at ground floor of the hotel are predicted to be in the order of 31dBA. This level is well below the night regenerated noise criterion of 35dBA.

It should be noted the vibration levels associated with ground-borne noise are well below human comfort or structural damage criteria. No adverse impact with respect to perceptible vibration or structural damage at any residences is predicted.

8 CONSTRUCTION NOISE AND VIBRATION MANAGEMENT MEASURES

8.1 Construction Noise and Vibration Mitigation Measures

Without mitigation, noise levels from some construction activities have been predicted to exceed the noise management levels nominated in the guidelines at some surrounding receivers. Therefore, noise control measures have been recommended to ensure that noise is reduced where feasible.

A range of possible approaches to reducing the impact of construction noise is described below. It is proposed that these strategies be applied to areas of potential exceedance identified in the preceding section.

- *Plant Noise Audit* – Noise emission levels of all critical items of mobile plant and equipment should be checked for compliance with noise limits appropriate to those items prior to the equipment going into regular service. To this end, testing should be established with the contractor.
- *Operator Instruction* – Operators should be trained in order to raise their awareness of potential noise problems and to increase their use of techniques to minimise noise emission.
- *Equipment Selection* - All fixed plant at the work sites should be appropriately selected, and where necessary, fitted with silencers, acoustical enclosures and other noise attenuation measures in order to ensure that the total noise emission from each work site complies with DECCW guidelines.
- *Site Noise Planning* - Where practical, the layout and positioning of noise-producing plant and activities on each work site should be optimised to minimise noise emission levels.
- Use rocksaws and rippers where feasible.
- Install a noise barrier between the site and the street frontages with minimum 17mm thick structural plywood; (the site would be surrounded by hoardings erected in accordance with the City of Sydney Guidelines.)
- Use smaller rockbreakers with quiet “cityhammers”.
- Noise intensive activities such as rock breaking would be undertaken during the following hours: Monday to Saturday 7.00am to 12.00pm and Monday to Friday 2.00pm to 5.00pm providing a respite period between 12.00pm and 2.00pm.
- Install vibration monitors in adjacent commercial building, in particular the Lowy Building, to ensure that vibration in these buildings do not exceed acceptable levels.

8.2 Community Liaison & General Approaches to Mitigation

An effective community relations programme should be put in place to keep the community that has been identified as being potentially affected appraised of progress of the works, and to forewarn potentially affected groups (eg by letterbox drop, meetings with surrounding tenants, etc) of any anticipated changes in noise and vibration emissions prior to critical stages of the works, and to explain complaint procedures and response mechanisms. This programme will be included in EnergyAustralia's Community Information Plan that has been specifically developed for the Sydney CityGrid Project.

Close liaison should be maintained between the communities overlooking work sites and the parties associated with the construction works to provide effective feedback in regard to perceived emissions. In this manner, equipment selections and work activities can be coordinated where necessary to minimise disturbance to neighbouring communities, and to ensure prompt response to complaints, should they occur.

8.3 Noise and Vibration Management Plan

A Noise and Vibration Management Plan should be included in the Construction Environmental Management Plan for the project. The plan should be prepared during the project planning process, including components relating to noise and vibration. This plan should detail the mitigation, monitoring and community liaison measures. The plan will be updated to incorporate any additional measures that emerge as the project design evolves and work methodologies become better defined.

Areas that should be addressed in plan include:

- Noise and vibration monitoring.
- Response to complaints**.**
- Responsibilities.
- Monitoring of noise emissions from plant items.
- Reporting and record keeping.
- Non compliance and corrective action.
- Community consultation and complaint handling.

9 CONSTRUCTION TRAFFIC

The construction of Stage 2A(i) of the Sydney CityGrid Project cable project would generate additional construction traffic movements. Majority of the heavy vehicle movements would be from spoil haulage. Transport of equipment to the site would occur during the initial stage involving site preparation works and intermittently in between stages. Approximately 1-2 deliveries per day are estimated. The number of vehicles per day attributed to the spoil removal are summarised in Table 9-1.

Table 9-1 Heavy vehicle movements attributed to spoil removal

Construction Activity/Source	Expected spoil generation (Bulked volume)	Duration (days) [1]	Truck Trips per day [2]	Maximum Truck Movements per hour [3]
Bulk excavation of basement	72,066 m^3 (158,544 t)	150	192	20
Stub tunnel and shaft excavation	4,866 m^3 (10,706 t)	150	13	2
Bridging structure over Metro tunnels	4,659 m^3 (10,250 t)	40	47	5

Notes: 1 At 5 days per week.
2 Number of truck trips per day estimated on the basis of 5m^3 per single unit dump truck and each trip generating one inbound movement and one outbound movement.
3 Maximum truck trips per hour is based on a 10-hr work day or maximum throughput of one truck movement every 5 minutes.

A Traffic Management Plan would be prepared as part of the Construction Environmental Management Plan to manage materials delivery and spoil disposal. Potential spoil disposal sites have been identified and the final disposal site will be selected by the contractor. Haulage routes to and from the site and the major road network would generally utilise designated heavy vehicles routes where possible. The proposed routes for the site are:

Departure Routes:

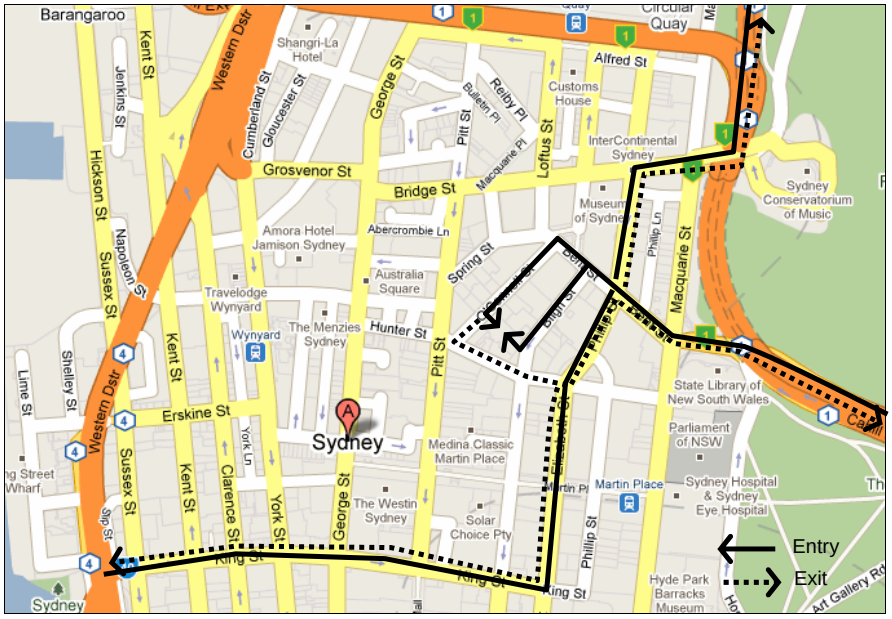
- To the South: Hunter Street – Macquarie Street – Eastern Distributor – Southern Cross Drive;
- To the East: Hunter Street – Macquarie Street – Eastern Distributor – Moore Park Road/Anzac Parade;
- To/from the West: Hunter Street – Macquarie Street - Eastern Distributor – Southern Cross Drive – M5 East Motorway;
- To the Inner West: Hunter Street - Phillip Street – Elizabeth Street – Market Street – Western Distributor – Anzac Bridge – Victoria Road/City West Link;
- To the North: Hunter Street – Macquarie Street – Conservatorium Road – Cahill Expressway.

Arrival Routes:

- From the South: Southern Cross Drive – Eastern Distributor – Bent Street;
- From the East: Anzac Parade / Moore Park Road – Eastern Distributor – Bent Street;
- From the West: M5 East Motorway – Southern Cross Drive – Easter Distributor – Bent Street;
- From the Inner West: Victoria Road / City West Link – Anzac Bridge – Western Distributor – King Street – Elizabeth Street – Phillip Street – Bent Street; and
- From the north: Cahill Expressway – Conservatorium Road – Bridge Street – Phillip Street – Bent Street.

Figure 9-1 presents the haulage routes to and from the site and the major road network.

Figure 9-1 Proposed Heavy Vehicle Routes



For the purpose of this assessment, the following distribution is assumed:

- 60% - South, East and West via the Eastern Distributor
- 20% - North via the Cahill Expressway; and
- 20% - Inner West via Western Distribution.

The average daily traffic through the various road sections in the northern CBD range from 7,000 vehicles per day (Castlereagh Street) up to 30,000 vehicles per day (Macquarie Street) and with the Eastern Distributor/South Dowling Street around 60,000 vehicles per day. The peak hour volumes are estimated to range from 500-1,500 vehicles per hour for the local roads and up to 7,000 vehicles per hour for Eastern Distributor/South Dowling Street.

In the case of Eastern Distributor, Southern Cross Drive, Anzac Parade, Moore Park Road, M5 East Motorway, Western Distributor, Victoria Road and City West Link the roads can be classified as an arterial Road. In the case of Macquarie Street, Hunter Street, Elizabeth Street, Market Street the roads can be classified as a collector road. Bent Street; Phillip Street, King Street and Bridge Street are classified as local roads.

Analysing the traffic data and the estimated vehicle movements during the construction phase as supplied by GHD the 2dB limit applies. Calculations indicate there will be minor increases in road noise during the peak construction activities of less than 0.4dB.

10 SUMMARY OF RECOMMENDATIONS

Based on our investigations of the project the following findings have been determined.

10.1 Noise Criteria

Noise criteria for construction have been established based on DECCW procedures. These criteria should be adopted as objectives to work towards in minimising any noise impact at surrounding residences.

The following Table 10-1 presents applicable noise criteria at residential receivers in the vicinity of works that are part of Stage 2A(i).

Table 10-1 Site Specific Construction Noise Management Levels – dBA

Location	Construction Noise Management level, L_{Aeq} - dBA				Maximum Construction Noise Level, L_{Aeq} - dBA
	Day	Evening	Night	Saturday (Extended)	
Bligh Street	68	64	61	63	75
O'Connell Street	75	66	64	70	75
Commercial Properties	70				75

10.2 Vibration Criteria

Vibration criteria are presented in Table 10-2 as follows:

Table 10-2 Preferred and Maximum Weighted rms Values for Continuous and Impulsive Vibration Acceleration (m/s^2)1-80 Hz

Location	Assessment Period[1]	Preferred Values		Maximum Values	
		z-axis	x- and y-axes	z-axis	x- and y-axes
Critical areas	Day or night time	0.0050	0.0036	0.010	0.0072
Residences	Daytime	0.010	0.0071	0.020	0.014
	Night-time	0.007	0.005	0.014	0.010

A regenerated noise goal of 40dBA between 6.00pm – 10.00pm and 35dBA between 10.00pm – 7.00am at commercial and residential receivers respectively is recommended for noise associated with tunnelling operations. It is recommended this goal be incorporated in the project Environmental Management Plan to ensure that any issues associated with this noise can be effectively managed.

10.3 Construction Noise and Vibration

It has been determined that noise from construction activities during the day period will potentially exceed established noise goals. Therefore, the planning and management of construction activities must take into account the sensitivities of surrounding residents so as to minimise the impact of construction activities at these receivers.

Table 10-3 summarises the findings of the construction noise and vibration assessment.

Table 10-3 Summary of Construction Noise and Vibration Findings

Activity	Findings	Comments / Recommendation
Demolition and General Construction	Works would comply with day, evening and Saturday noise management levels	• Noise impact is greatest at adjacent commercial properties. • Best practice noise management of plant should be adopted. That is equipment in good condition should be used on site.
Excavation	Exceedances of up to 10dBA are predicted whilst equipment, principally heavy rock breakers, is adjacent to commercial properties. Vibration associated with a large rockbreaker will be above acceptable Human Comfort Criteria at adjacent commercial receivers.	• The use of rock saws should be used in preference to rock breakers. • Where practicable, heavy rock breakers should not be used. • Rock breakers should be fitted with city heads. • Vibration Monitoring should be conducted at Heritage buildings during excavation.
Tunnelling using a Road header	Works would comply with the night time noise criteria. Ventilation plant will require silencers. A barrier on both site boundaries is recommended the barrier should be in the order of 3m in height. Ground-borne noise from roadheader operation is predicted to comply with criteria for regenerated noise	• Barriers / hoarding are required at site boundaries. • Silencers on Ventilation Plant

The control of construction noise and vibration should form a part of the Construction Environmental Management Plan that would detail reasonable and feasible management measures and community consultation that would be employed.

11 CONCLUSION

This assessment of Stage 2A(i) of the proposed new City East Zone Substation Project has established site specific noise and vibration criteria appropriate for the demolition, excavation and tunnelling activities.

Noise and vibration associated with tunnelling construction activities under Bligh Street is likely to comply with established noise goals at residences.

Daytime excavation noise is predicted to occasionally exceed noise management goals at adjacent commercial properties for excavation activities. The exceedance is primarily due to the use of rock breakers. Accordingly, management of this issue to limit noise to established goals and minimise exceedance events will require implementation of all reasonable and feasible mitigation measures to minimise acoustic impact at receivers.

For demolition and general construction works, the predicted noise levels comply with the evening and extended Saturday construction noise criterion. Therefore, the extended operating hours proposed by EnergyAustralia are appropriate for demolition and general construction works.

Vibration associated with excavation activities is predicted to exceed established human comfort criteria unless mitigation measures are implemented. Therefore, it is recommended that vibration testing be conducted at an early stage during excavation to determine the magnitude of vibration levels. Should levels above the established vibration goals be indicated, mitigation measures should be implemented. If exceedances are unavoidable on specific occasions then residents should be kept informed of the nature and duration of any identified noise or vibration impact.

Note
All materials specified by Wilkinson Murray (Sydney) Pty Limited have been selected solely on the basis of acoustic performance. Any other properties of these materials, such as fire rating, chemical properties etc. should be checked with the suppliers or other specialised bodies for fitness for a given purpose.

Quality Assurance
We are committed to and have implemented AS/NZS ISO 9001:2008 “Quality Management Systems – Requirements”. This management system has been externally certified and Licence No. QEC 13457 has been issued.

AAAC
This firm is a member firm of the Association of Australian Acoustical Consultants and the work here reported has been carried out in accordance with the terms of that membership.

Version	Status	Date	Prepared by	Checked by
A	Draft	29 March 2010	Brian Clarke	-
B	Draft	19 April 2010	Brian Clarke	John Wassermann
C	Draft	10 May 2010	Brian Clarke	John Wassermann
D	Final	23 June 2010	John Wassermann	-

APPENDIX A

GLOSSARY OF TERMS

GLOSSARY

Most environments are affected by environmental noise which continuously varies, largely as a result of road traffic. To describe the overall noise environment, a number of noise descriptors have been developed and these involve statistical and other analysis of the varying noise over sampling periods, typically taken as 15 minutes. These descriptors, which are demonstrated in the graph overleaf, are here defined.

Maximum Noise Level (L_{Amax}) – The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.

L_{A1} – The L_{A1} level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the L_{A1} level for 99% of the time.

L_{A10} – The L_{A10} level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the L_{A10} level for 90% of the time. The L_{A10} is a common noise descriptor for environmental noise and road traffic noise.

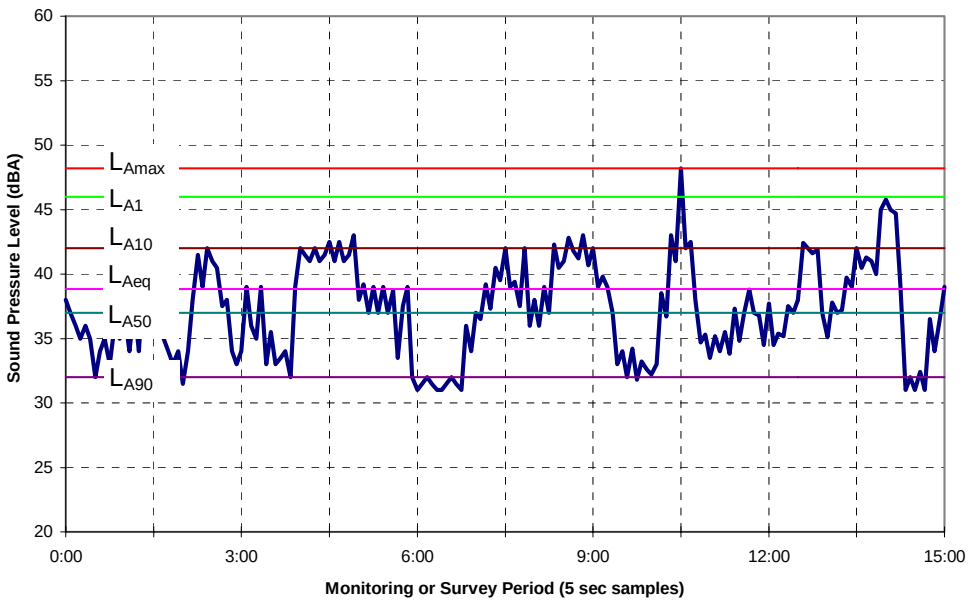
L_{Aeq} – The equivalent continuous sound level (L_{Aeq}) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

L_{A50} – The L_{A50} level is the noise level which is exceeded for 50% of the sample period. During the sample period, the noise level is below the L_{A50} level for 50% of the time.

L_{A90} – The L_{A90} level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the L_{A90} level for 10% of the time. This measure is commonly referred to as the background noise level.

ABL – The Assessment Background Level is the single figure background level representing each assessment period (daytime, evening and night time) for each day. It is determined by calculating the 10^{th} percentile (lowest 10^{th} percent) background level (L_{A90}) for each period.

RBL – The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period **–** daytime, evening and night time.



Sound pressure level (SPL) or sound level L_p is a logarithmic measure of the effective sound pressure of a sound relative to a reference value. It is measured in decibels (dB) above a standard reference level.

$$L_p = 10 \log_{10} \left(\frac{{p_{\mathrm{rms}}}^2}{{p_{\mathrm{ref}}}^2} \right)$$

where p_{ref} (20 µPa)is the reference sound pressure and p_{rms} is the rms sound pressure being measured.

Sound power level is a logarithmic measure of the sound power in comparison to a specified reference level. While sound pressure level is given in decibels SPL, or dB SPL, sound power is given in dB SWL. The dimensionless term "SWL" can be thought of as "sound watts level," the acoustic output power measured relative to a very low base level of watts given as 10^{-12} watts.

$$L_{\mathrm{W}} = 10 \log_{10} \left(\frac{W}{W_0} \right) \ \mathrm{dB}$$

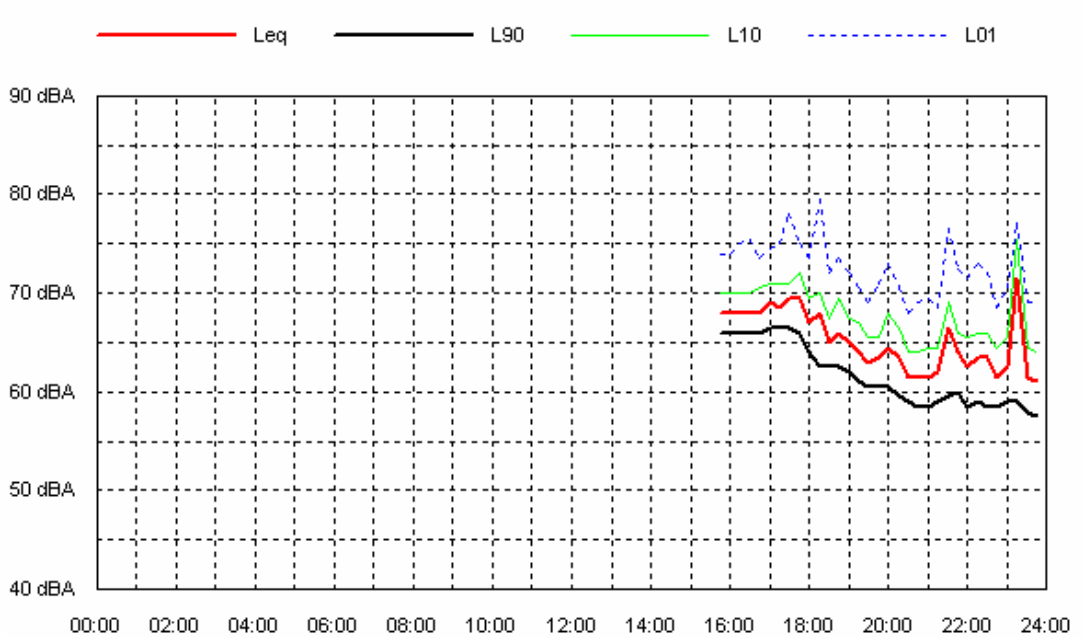
APPENDIX B

NOISE MEASUREMENT RESULTS

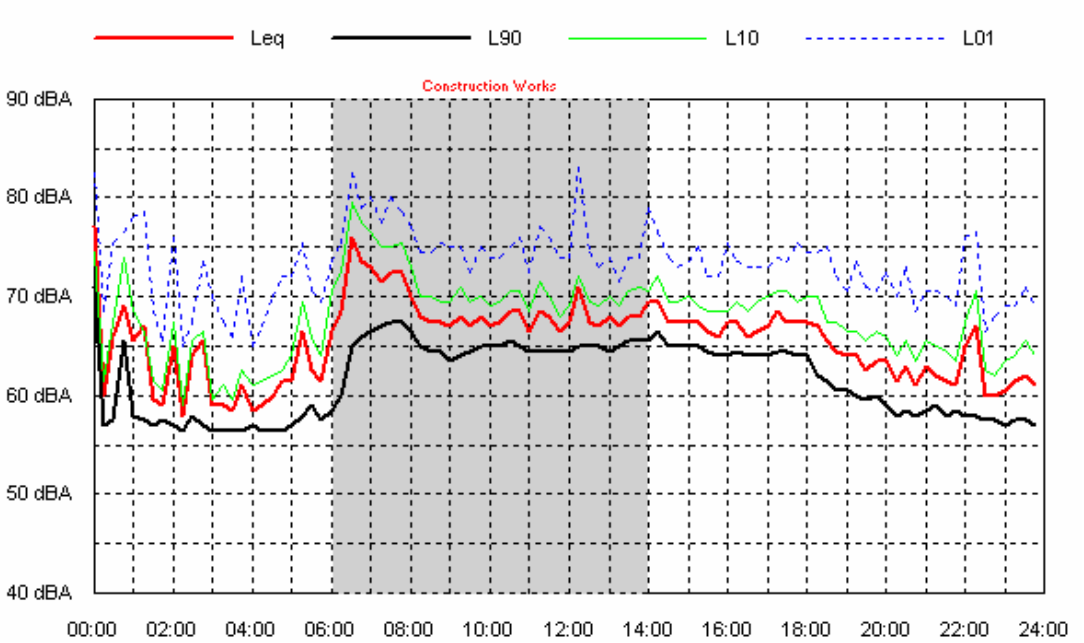
Location: Bligh Street

Data shaded: Construction Works

Mon 15 Feb 10



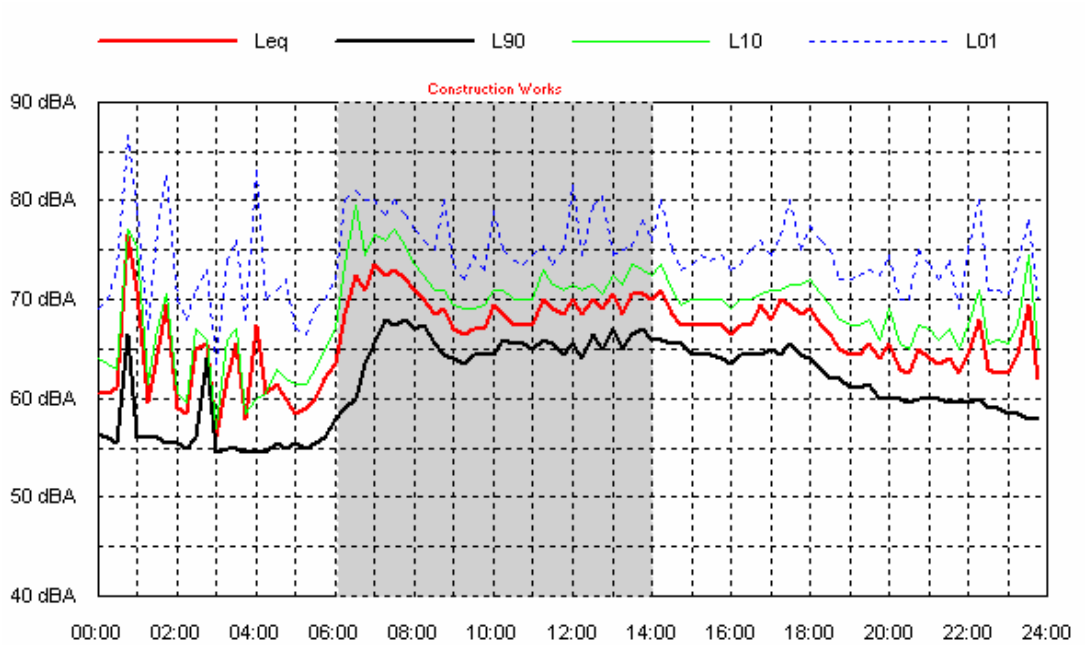
Tue 16 Feb 10



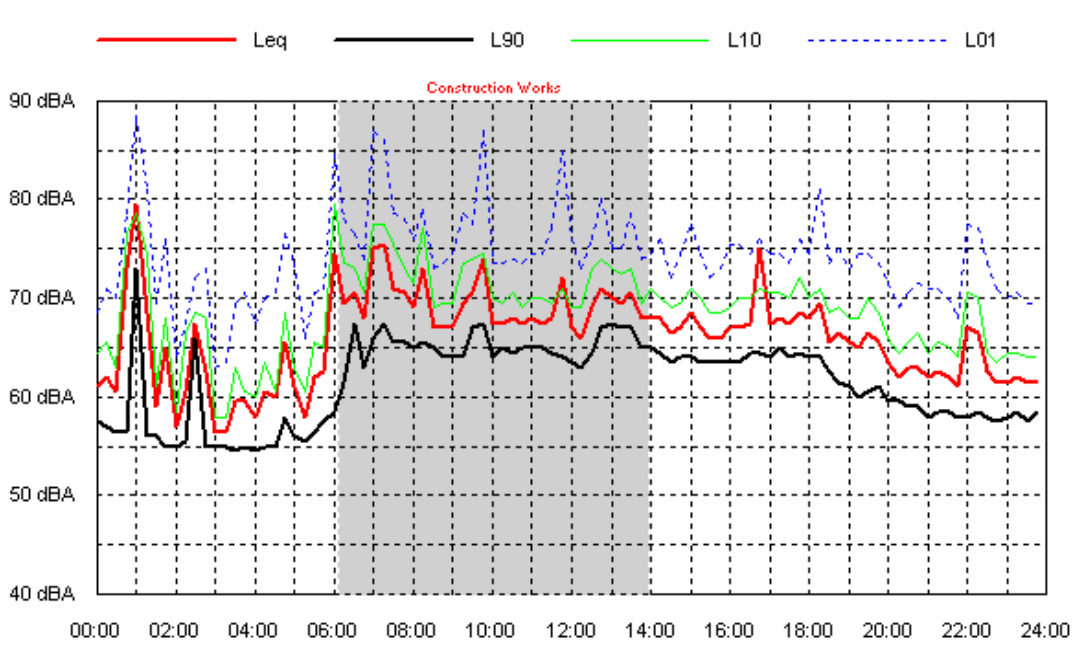
Location: Bligh Street

Data shaded: Construction Works

Wed 17 Feb 10



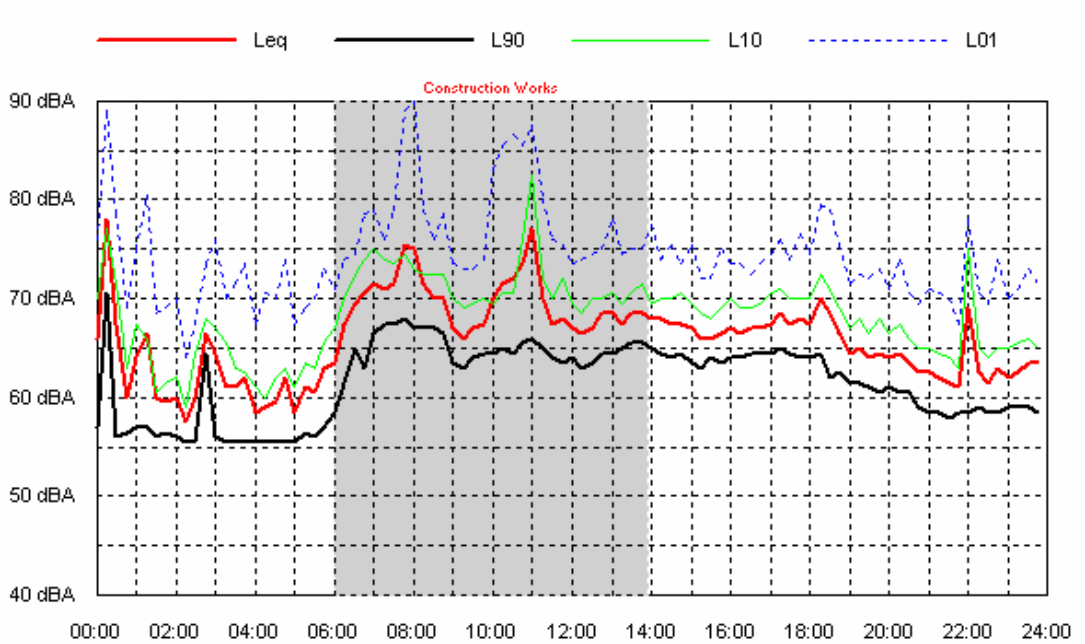
Thu 18 Feb 10



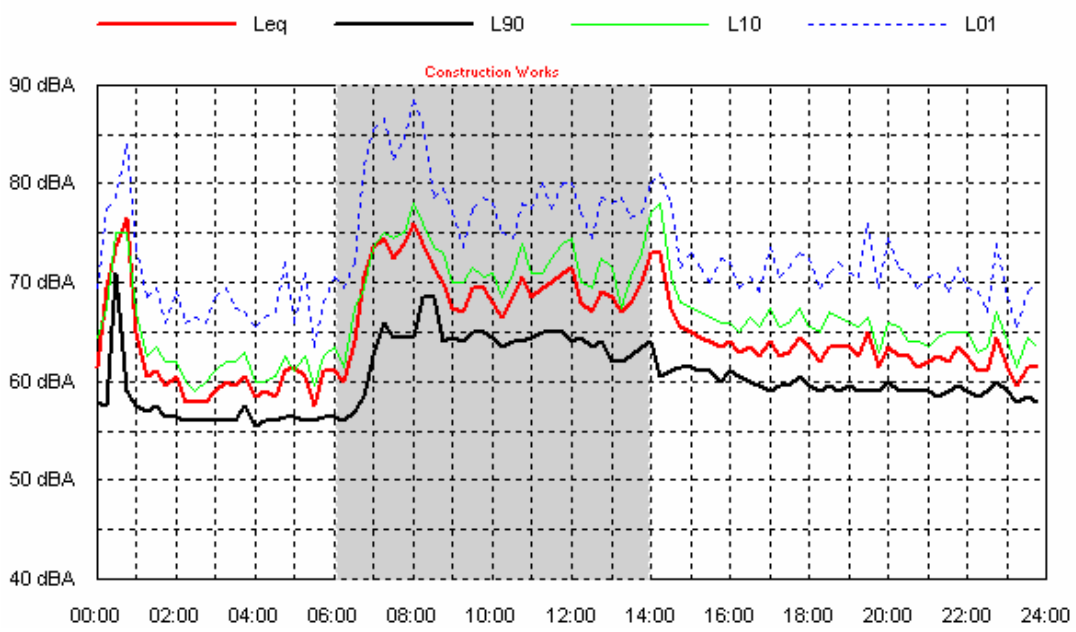
Location: Bligh Street

Data shaded: Construction Works

Fri 19 Feb 10



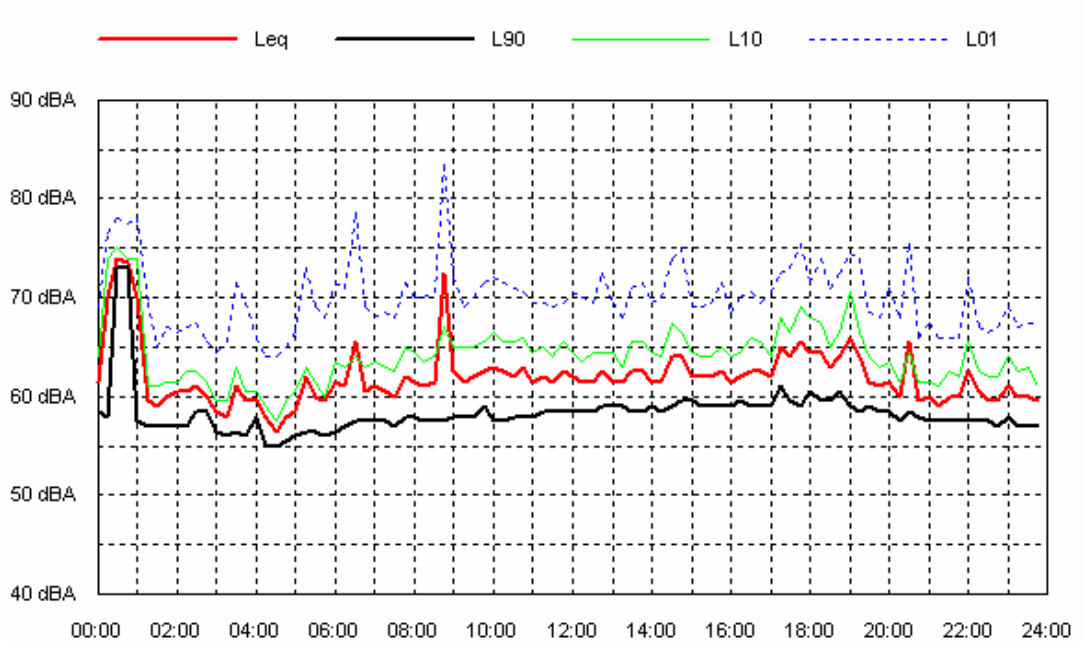
Sat 20 Feb 10



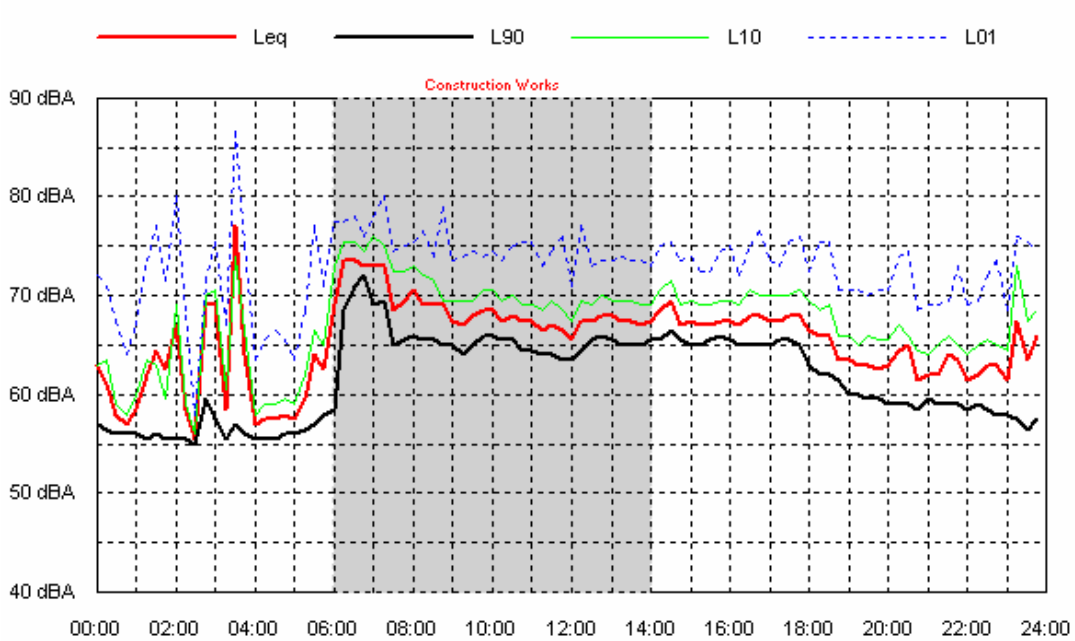
Location: Bligh Street

Data shaded: Construction Works

Sun 21 Feb 10



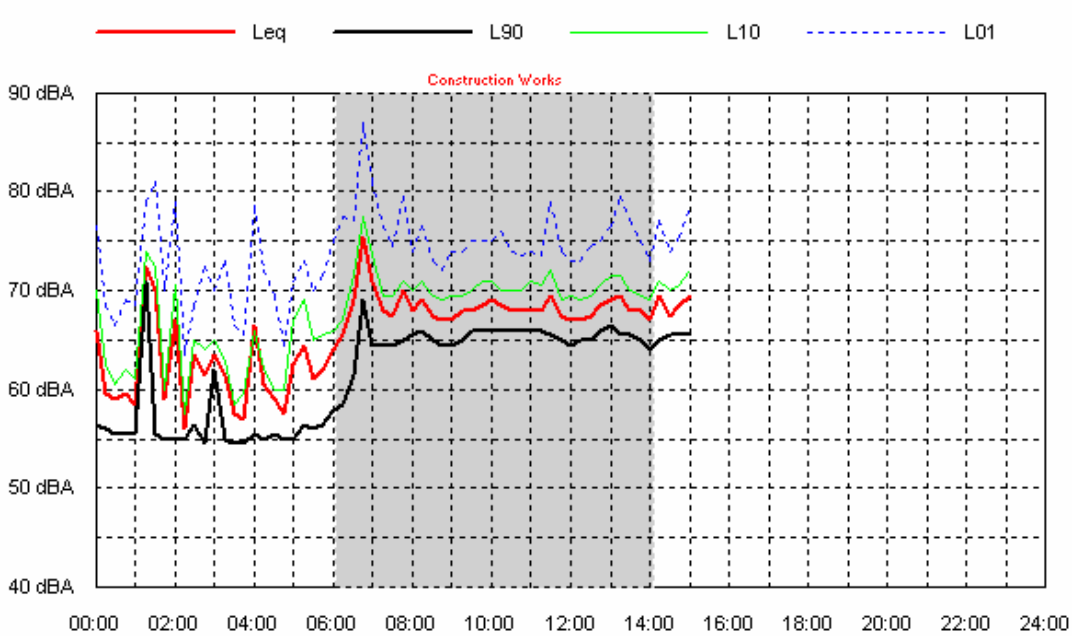
Mon 22 Feb 10



Location: Bligh Street

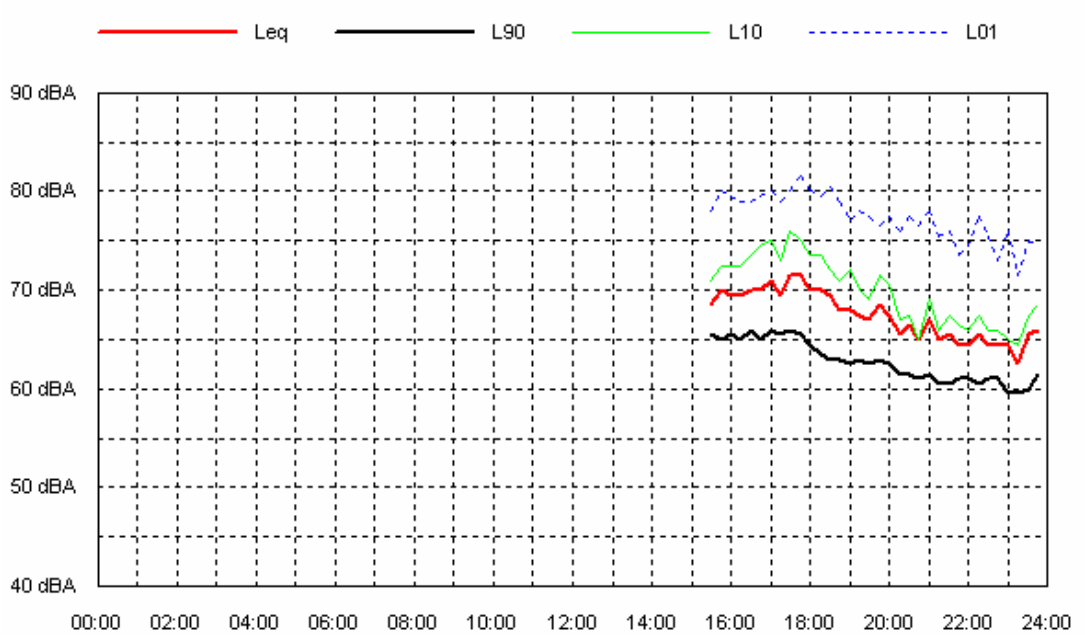
Data shaded: Construction Works

Tue 23 Feb 10

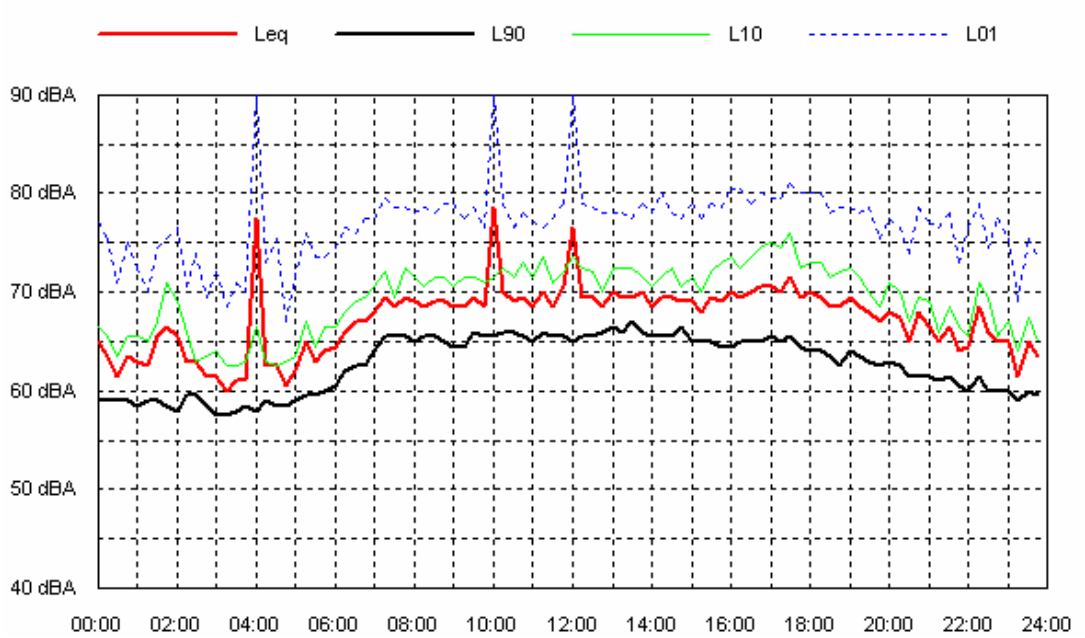


Location: O Connell Street

Tues 16 Feb 09

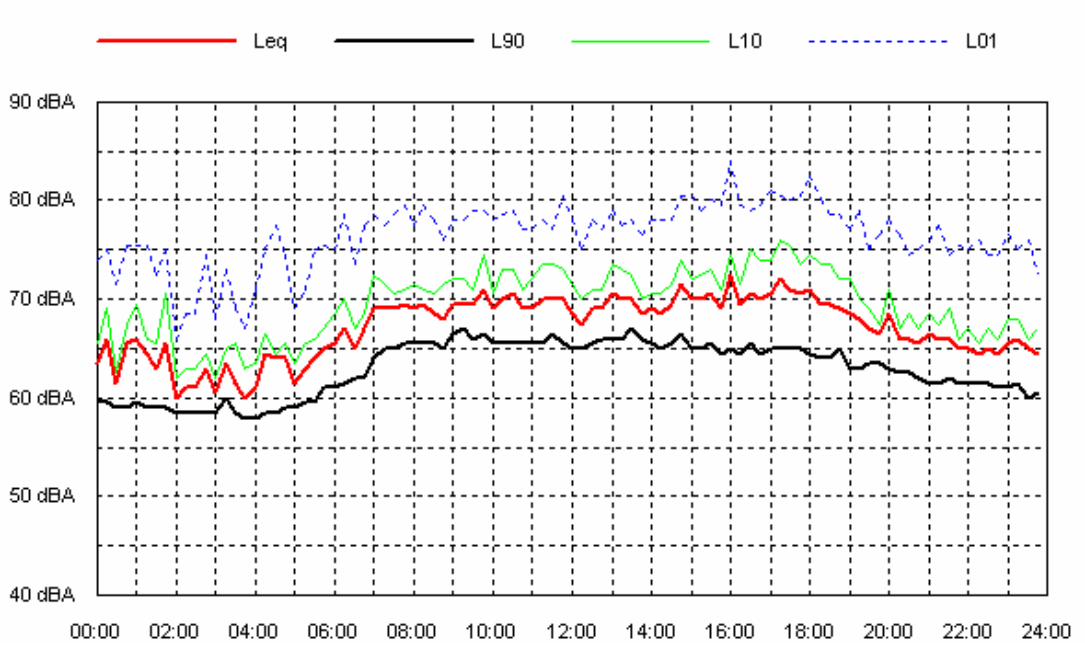


Wed 17 Feb 09

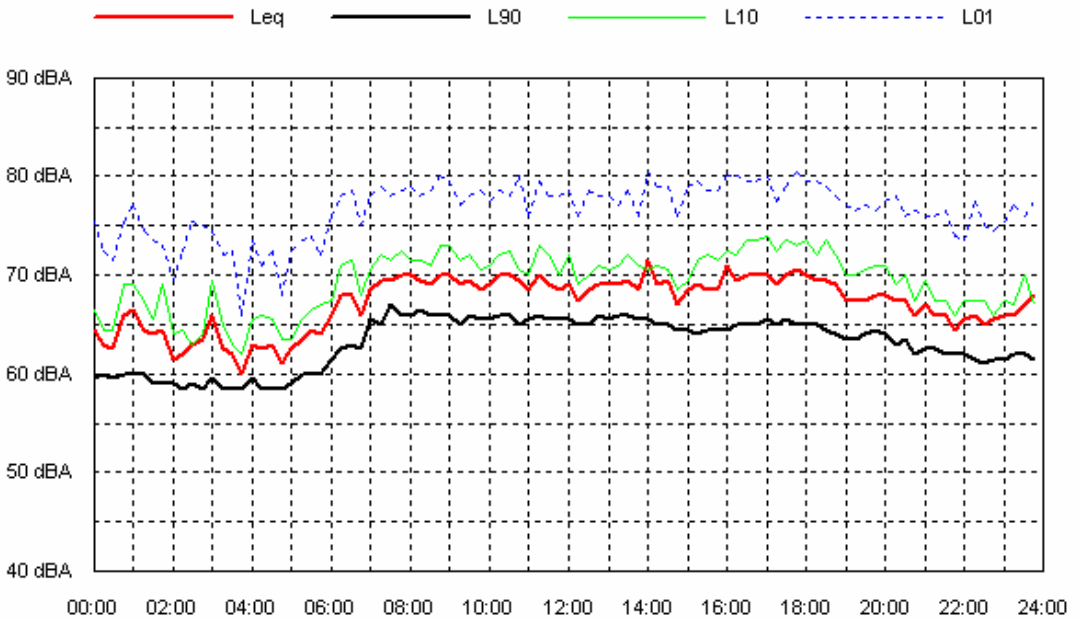


Location: O Connell Street

Thurs 18 Feb 09

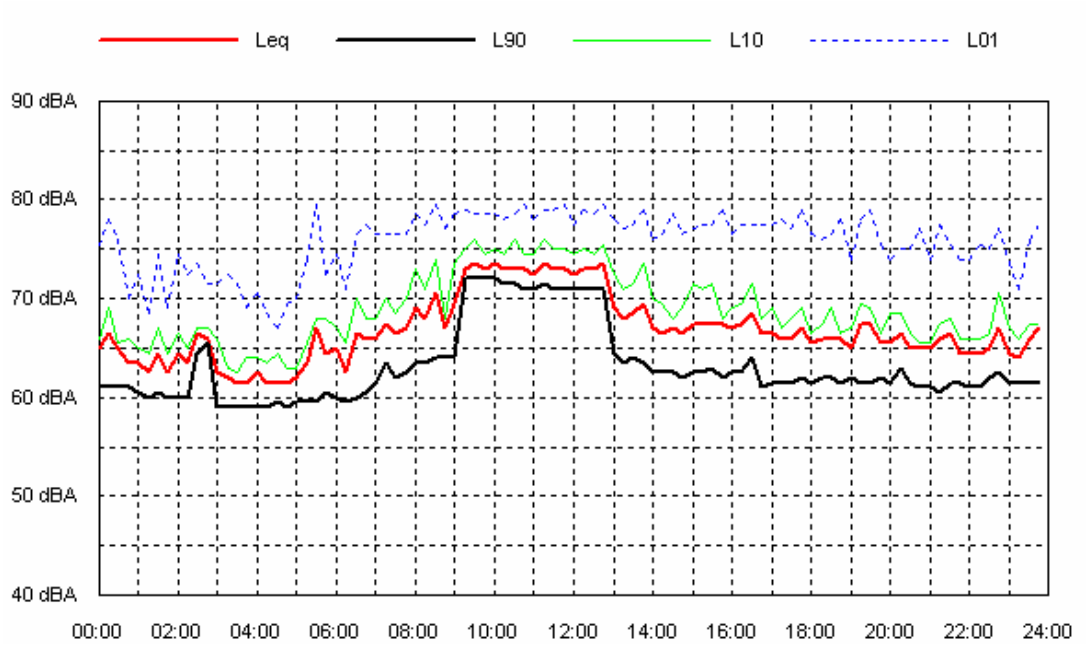


Fri 19 Feb 09

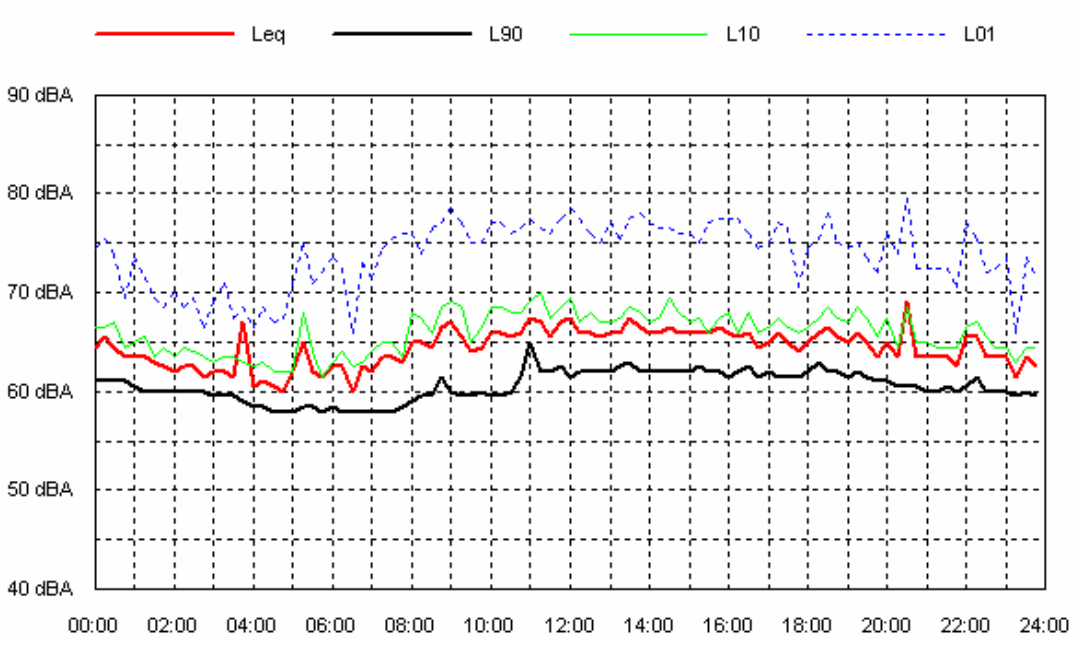


Location: O Connell Street

Sat 20 Feb 09

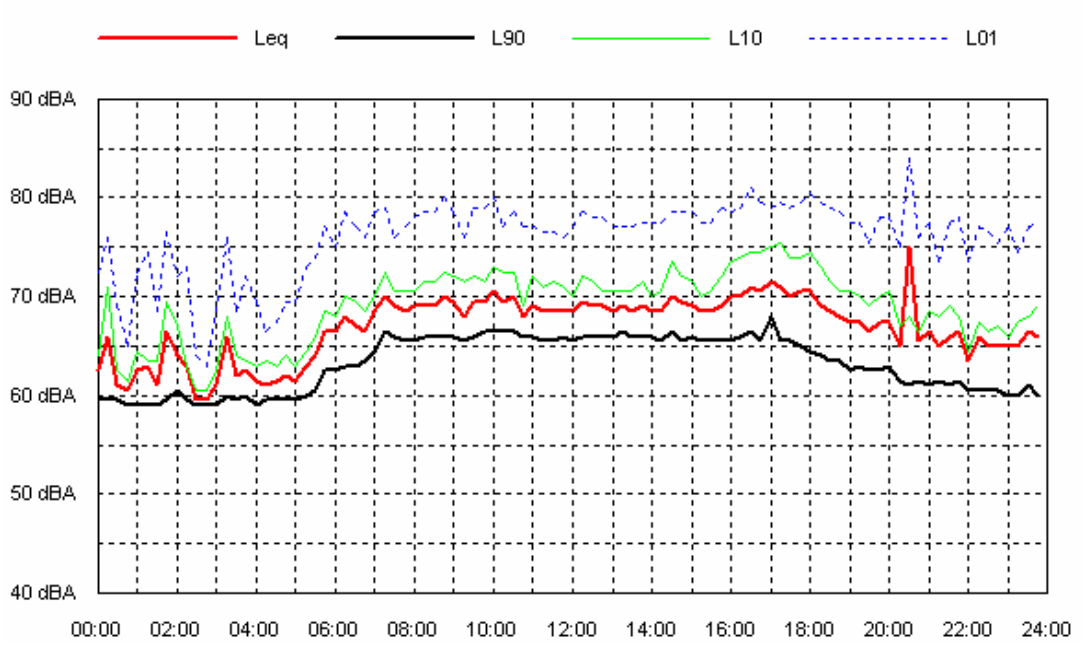


Sun 21 Feb 09

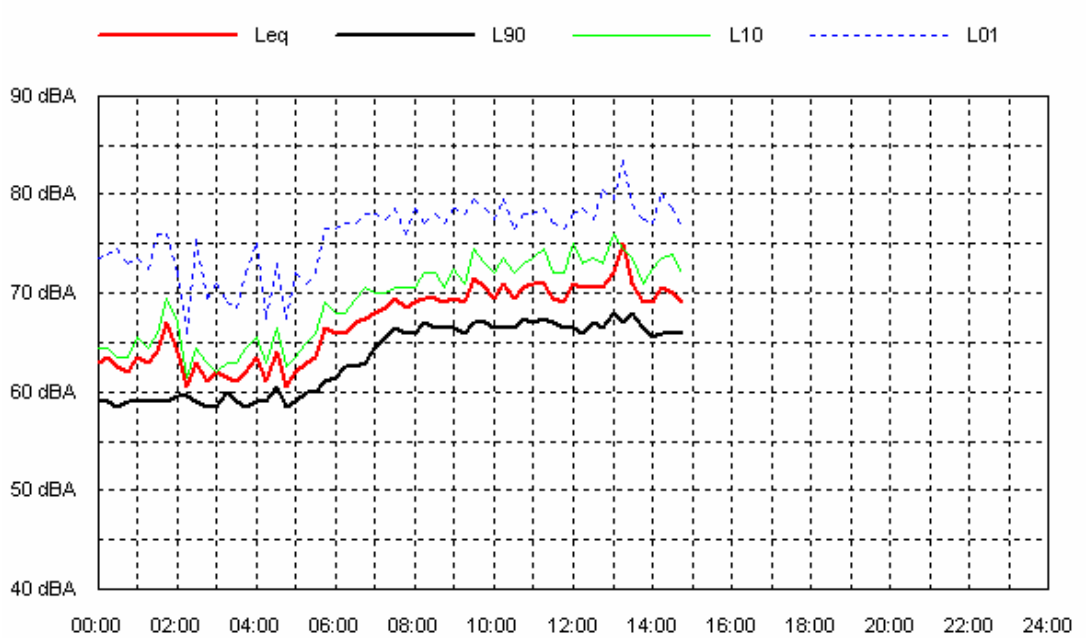


Location: O Connell Street

Mon 22 Feb 09



Tues 23 Feb 09



Appendix F

Statement of heritage impact
Noel Bell Ridley Smith & Partners

NBRS+PARTNERS
ARCHITECTURE-HERITAGE-INTERIORS-PLANNING

STATEMENT OF HERITAGE IMPACT
FINAL

CITY EAST ZONE SUBSTATION AND INTEGRATED COMMERCIAL DEVELOPMENT
33 BLIGH STREET
SYDNEY NSW 2000

21 May 2010

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ABN: 16 002 247 565

Nominated Architects
Ridley Smith : Reg No.2268; Graham Thorburn : Reg No.5706; Geoffrey Deane : Reg No.3766

This report has been prepared under the guidance of the Expert Witness Code of Conduct in the Uniform Civil Procedure Rules and the NSW Land & Environment Court Practice Directions relating to the provision of evidence by expert witnesses. The opinions in the report represent the professional opinions of the author based on an assessment of the available information cited in the report.

STATEMENT OF HERITAGE IMPACT FOR

CITY EAST SUBSTATION AND INTEGRATED COMMERCIAL DEVELOPMENT, 33 BLIGH STREET, SYDNEY

1.0 INTRODUCTION

NBRS+Partners has been commissioned by EnergyAustralia and Investa to prepare this Statement of Heritage Impact (SHI). The subject site consists of a single allotment (Lot 101 DP 626651) with two street frontages. The subject site comprises two buildings with street addresses given as No 33 Bligh Street, Sydney and No 20-26 O'Connell Street, Sydney. The site faces onto Richard Johnson Square within the northern sector of the Sydney CBD. Hunter Street is located immediately south of the subject site.

While it is not listed as a heritage item, it is located in close proximity to a number of heritage items. This SHI has been prepared in accordance with the standard guidelines of the NSW Heritage Office to accompany a development application for proposed works to demolish the existing building on the site and construct an EnergyAustralia City East Zone Substation and integrated commercial development with office tower envelope.

The assessment of potential heritage impact has been undertaken by Lynette Gurr, Senior Heritage Consultant, under the direction of Robert Staas, Director / Heritage Consultant of NBRS+Partners. Details of the development proposal have been prepared by Kann Finch Group.

1.1 Site Location

The subject site is located in a city block defined by O'Connell, Bligh, Hunter and Bent Streets. The development site is located at the southern end of Bligh Street fronting Richard Johnson Square and extends through the block to a frontage in O'Connell Street. The northern boundary is straight and the southern boundary steps around existing development fronting Hunter Street (not part of the site). The development site is occupied by Kindersley House, a 1960s high-rise development erected to house the Sydney Stock Exchange. The existing building has no identified architectural merit and with the adjoining development to its south, detracts from the overall heritage and streetscape significance of the surrounding precinct.

1.2 Heritage Listings

The heritage items in close proximity (either adjoin the site or within the visual catchment) include the following heritage items that are listed on the Sydney Local Environmental Plan 2005 (Sydney LEP), Schedule 8 Central Sydney Heritage Items – Part 1 Heritage Items:

- 31 Bligh Street, NSW Club Building (State listed) – (No 26, CHSI No 2028);
- 16-18 O'Connell Street, AFT House (former Delfin House) - (No 319, CHSI No 2026);
- 60-66 Hunter Street, CML Building (City Mutual Life Assurance Society Building), (State listed) - (No 183, CHSI No 2013);
- 19-21 O'Connell Street, Public Trust Office - (No 320, CHSI No 2027); and
- 64-66 Pitt Street / 27 O'Connell Street, Radisson Plaza Hotel (former Bank NSW), - (No 330, CHSI No 2017).

The following heritage item is listed on the Sydney LEP, Schedule 8 Central Sydney Heritage Items – Part 3 Archaeological / townscape / landscape items:

- Bligh Street, Richard Johnson Square - (No 30, CHSI No 8079).

2.0 HISTORIC OVERVIEW

The site has been the subject of a number of designs over a period of nearly 10 years as a result of pressures in the area for increased office accommodation. A staged design competition and a Stage 1 Development Application for the site were undertaken by Investa and a development was approved but not proceeded with for financial reasons. The current application is compatible with the existing approvals for the site and with design guidelines established in earlier discussions with Council for redevelopment of the site.

An initial discussion on the basic design principles relating to potential heritage impacts for this application was held with the Council's Heritage Officer, Mr Anthony Smith, before the present design was finalised. This discussion indicated a general acceptance of the principles of the design and their compatibility with the surrounding heritage context.

3.0 PHYSICAL DESCRIPTION AND HERITAGE SIGNIFICANCE

3.1 The Precinct

The surrounding Precinct is of particular heritage significance for historic, aesthetic and social values related to the early Colonial period of development of Sydney and its subsequent development in the late Victorian era and early 20th Century.

A number of very significant heritage items are located adjacent to and in the vicinity of the development site representing these phases of historic development, these include:

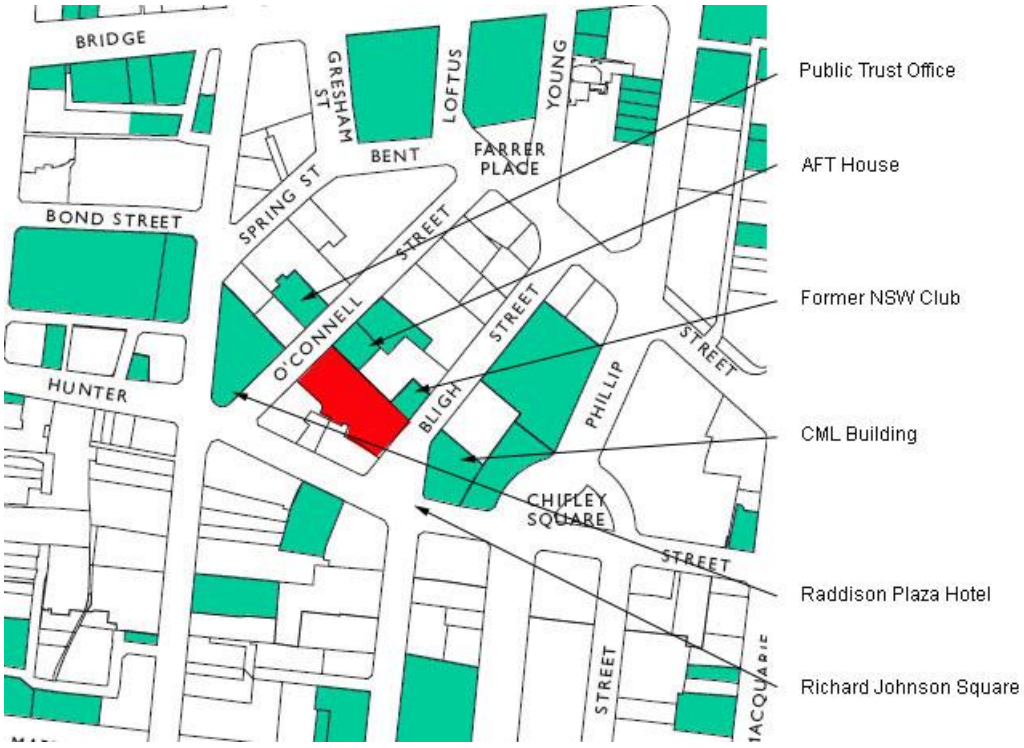


Figure 1 - Part Heritage Map, Sydney LEP 2005 showing heritage items in the vicinity of the subject site shown in green with identifying markers. The subject site is shaded in red (Source: City of Sydney LEP 2005 annotated by NBRS+Partners)

Richard Johnson Square

The following is taken from the City of Sydney Heritage Inventory No. 8079, Schedule 4 of the Heritage LEP 1992:

> *At the junction of Bligh Street and Hunter Street Sydney, fronting the development to the east. The Square created by a street closure commemorates the first Christian Worship Service held in the Colony of NSW and the erection of the first Church in 1793 by the colony's first Chaplain, Rev. Richard Johnson.*

Figure 2 - Rev.Richard Johnson - "The First Fleet anchored in Sydney Cove on January 28, 1788. On the following Sunday, February 3, the first church service was held for the officers, marines and convicts on Australian soil. The service was led by the colony's Chaplain, the Reverend Richard Johnson, on a grassy hill under a tree. He chose for his text the twelfth verse of Psalm 116, "What shall I render unto the Lord for all his benefits towards me?" (Source State Library of NSW)

An elaborate Gothic Revival style monument erected in 1925 and a late Victorian light fitting, originally from Martin Place, are located in the square. The Square and its monument are listed as items on The Register of The National Estate and are listed by The National Trust of Australia (NSW).

The design of the square is simple and allows pedestrian use of a former street intersection and provides a sympathetic scale and setting for the surrounding heritage items. The existence of the Square provides an opportunity to extend the paving to establish further pedestrian amenity in the proposed development.

Should new work to, or an upgrade of Richard Johnson Square be undertaken as part of this development, consideration needs to be given to the scale and texture of paving units, the connection of the existing levels with the new proposal, location of new street trees and compliance with Council's requirements for modifications to the Square. Potential for the interpretation of the significance of this location exists in association with the proposed new development. While an Interpretation Strategy should be prepared as part of

Stage 2 of the project, themes to consider might include historic streetscapes and historic site development.

Figure 3 - Richard Johnson Memorial and Square in the 1930s showing the road prior to closure (Source: State Library of NSW)

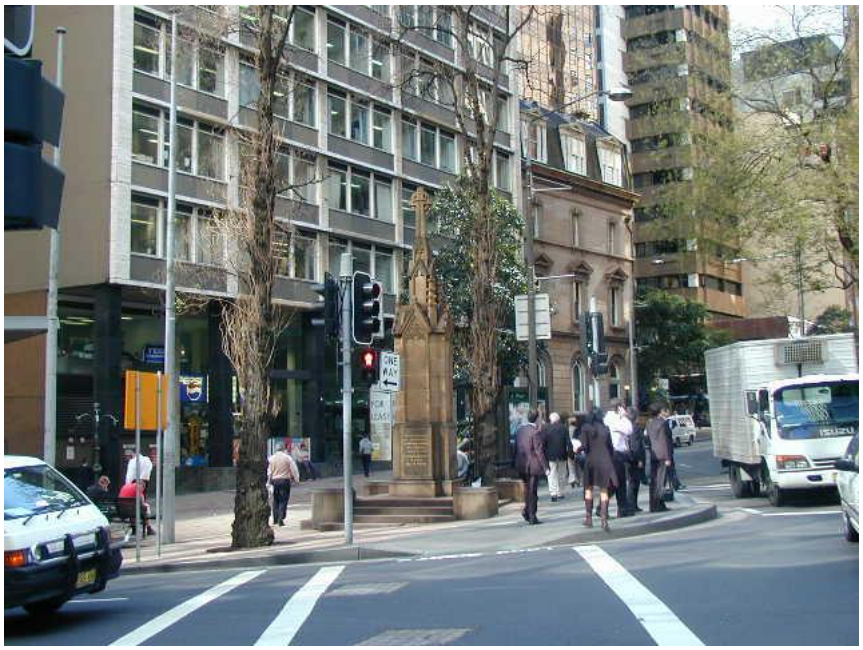


Figure 4 - Richard Johnson Memorial and Square showing 'Kindersley House' and the former NSW Club building in Bligh Street (Source NBRS+Partners 2007)

The former New South Wales Club Building

City of Sydney Heritage Inventory No. 2028, Schedule 1 of the Heritage LEP 1992 has the following listing:

- 31 Bligh Street Sydney, adjoining the development site to the north.

Figure 5 - The former NSW Club Building as originally constructed before the addition of the Mansard roof C1900 (Source: State Library of NSW)

The building was designed in the Victorian Academic Classical style by architect William Wardell and built by John Fry between 1884 and 1887. The Mansard roof form is a later addition to the original but executed in the same style. The building is listed on the NSW State Heritage Register under the provisions of the NSW Heritage Act because of an earlier Permanent Conservation Order under the Heritage Act on the site. It is identified as an item on the Register of The National Estate and is listed by The National Trust of Australia (NSW). The Inventory description for the item states in part:

> *"The NSW Club House is a fine sandstone city building which now stands in isolation as a remnant of Victorian Sydney amid intense office and hotel development. Barclays House Tower is physically connected to the building to the west. The NSW Club House is symmetrically designed, with the exception of the front door which is located to the north. The building features restrained classical decoration, featuring an ashlar sandstone plinth and slate mansard roof with classically detailed gable windows. The roof gable is a later Edwardian addition made in 1916. The building is divided by string courses at each floor and is topped by a classical cornice with dental detail. The ground floor stonework has recessed joints and the upper stonework is plain ashlar. The windows are in three groups with, curved head with quoins and keystones on the ground floor, pedimented on the first floor, and with smaller curved headed windows on the second floor. The building retains its iron palisade fence and stone base along Bligh Street."*

The Statement of Significance identifies the exceptional 'Italian Palazzo' Facade treatment as being highly significant for its streetscape character in Bligh Street.

Figure 6 - The former NSW Club, Bligh Street c1925 following the addition of the Mansard roof and the construction of Adyar House to the north (Source: State Library of NSW)

The important heritage and urban design constraints presented by the proximity of this building to the development site are:

- The necessity for recognition of the established scale of the Club building in the design of any new structure on the adjoining site in context in the street.
- A recognition of the dominant existing horizontal divisions of the Club facade.
- Consideration of the proportions of openings and vertical elements in the new work to harmonise with the existing building without imitating or detracting from it.
- The necessary use of compatible recessive materials and facade detailing to compliment the surrounding established architectural character and to limit any impact on perception of the heritage qualities of the item.

Figure 7 - The former NSW Club and its relationship to Kindersley House. Note 'finished' detail of exposed side elevation (Source: NBRS+Partners, 2007

AFT House formerly Delfin House

City of Sydney Heritage Inventory No. 2026, Schedule 1 of the Heritage LEP 1992 identifies:

- 16-18 O'Connell Street Sydney, adjoining the development site to the north.

The building was designed in the Inter-War Art Deco style by architect C. Bruce Delit and built by Stuart Brothers between 1939 and 1940. The building is an item on the Register of The National Estate and is listed as a significant 20th century design by the Royal Australian Institute of Architects (NSW Chapter), The National Trust of Australia (NSW) and The Art Deco Society.

The inventory description states in part:

> *AFT House, originally a banking chamber with offices above, exemplifies the Art Deco style. The facade comprises two zones. The first consists of a decorative archway clad in granite, rising four floors in height, which dominates the streetscape. Above rises an expanse of sandstone. The building features stylised and geometric semi-abstract decoration. On bronze doors and carved panels beneath the arch, the architect has allegorized the spirit of the machine age and NSW, 'The Age of Plenty'.*
>
> *The entrance foyer has travertine clad walls and a marble floor, and retains original metal and glass light fittings and decorative lift doors. The former Egyptian Art Deco banking chamber is monumental. Two stories in height, the chamber retains a vaulted ceiling and rich detailing.*

The building is visually linked by design and materials to Manufacturers House adjacent, and fits well into the streetscape.

Figure 8 - AFT House formerly Delfin House, 16 –18 O'Connell Street adjoining Kindersley House (Source: NBRS+Partners, 2007)

The Statement of Significance identifies the facades style and detail to be of exceptional significance representing a departure from traditional forms and expressing contemporary modern design concepts and building technologies by integrating materials with function and structure. The streetscape contribution of the building to O'Connell Street is considerable.

Figure 9 - The entry arch to AFT House and the surrounding granite façade treatment (Source NBRS+Partners, 2007)

The important heritage and urban design constraints presented by the proximity of this building to the development site are:

- A need for recognition of the scale of the base section of the building in the design of any attached section of the new development in relation to the lower portion of A.F.T. House.
- Consideration of the potential for new suitably scaled elements on the south of A.F.T. House to 'book-end' with Manufacturers House to the north.
- The necessity for the use of sympathetic materials on the new development to reduce impact on the heritage item and its visual dominance in the streetscape.
- Recognition of the balance of vertical and horizontal elements predominating in the adjoining streetscape.

Other listed buildings in the vicinity of the development include:

The City Mutual Life Assurance Society Building

No 60-66 Hunter Street is located opposite the development site in Bligh Street to the east. This building is Item No. 2013 in the City of Sydney Heritage Inventory and is a remarkable Inter-War Art Deco design of 1936 by architect Emile Sodersten and addresses its corner location. The stepped facade is constructed of Sydney sandstone with metal fenestration and decorative detailing at the entrance. The building is listed on the Register of The National Estate and formerly had a PCO under the NSW Heritage Act. It is now Included on the NSW State Heritage Register. It is also listed by the Royal Australian Institute of Architects (NSW Chapter) as a significant 20th Century building, by The National Trust of Australia (NSW), and by the Art Deco Society.

The building forms an important focus to the intersection of Bligh Street with Hunter Street and is a backdrop to the Richard Johnson Square memorial. Its scale and form are important urban design features of the setting of the proposed development. The separation between the building and the proposed development is sufficient for the use of distinctive design character on the new development.

Figure 10 - Richard Johnson Square, Bligh Street and City Mutual Life Assurance Society Building in 1936 (Source: State Library of NSW)

Figure 11 - City Mutual Life Assurance Building and Richard Johnson Square (Source NBRS+Partners 2007)

Radisson Plaza Hotel (formerly Wales House)

Nos 64-66 Pitt Street / 27 O'Connell Street, is located opposite the development site in O'Connell Street to the west. This building is identified as Item No. 2017 in the City of Sydney Heritage Inventory and is an important and prominent 10-storeyed Inter-War Classical style building, designed by architects Manson & Pickering, for John Fairfax and built by Stuart Brothers from 1928.

The finely detailed classical facade has a granite base and sandstone upper floors with metal fenestration and a strong classical cornice treatment. The building is listed on the Register of The National Estate and formerly had a PCO under the NSW Heritage Act. It is now included on the NSW State Heritage Register. It is also listed by The National Trust of Australia (NSW) and the Art Deco Society. The building has been adapted for use as a hotel and forms an important feature at the entrance to O'Connell Street.

Figure 12 - The Radisson Plaza Hotel, O'Connell Street (Source: NBRS+Partners 2007)

The Public Trust Office

Nos 19-21 O'Connell Street is located opposite the development site to the west. This building is identified as Item No.2027 in the City of Sydney Heritage inventory and is an 8 storey Inter-War Commercial Palazzo style design by architects Ross & Rowe of 1924.

The restrained sandstone facade features a rusticated base with three double height arches, and a strong projecting cornice treatment at the top. The building is also listed by the Art Deco Society.

Figure 13 - 19 O'Connell Street, The Public Trust Office opposite the subject site (Source State Library of NSW)

Figure 14 - Public Trust Office, O'Connell Street (Source: NBRS+Partners 2007)

4.0 THE PROPOSAL

This Statement of Heritage Impact has been prepared based on the review of the following drawings and documentation prepared by Kann Finch Group as part of Stage 2A(i) of the City East Zone Substation and Integrated Commercial Development:

Title	Scale	Date
Site Analysis Report	NTS	April 2010
Urban Form Analysis	NTS	April 2010
Massing Study	NTS	April 2010
Podium – Zone Substation	NTS	April 2010
Commercial Tower	NTS	April 2010
Building Elevations	NTS	April 2010
3-D Views	NTS	April 2010
Plan View Solar Study	NTS	April 2010

Listed below is a summary description of the proposed works that would be undertaken as part of Stage 2A(i):

- Demolition of two buildings known as Kindersley House (33-35 Bligh Street and 20-22 O'Connell Street) – including basements (approximately four metres below O'Connell Street frontage and up to six metres below Bligh Street frontage;
- Excavation of the basement for the substation;
- Construction of a shaft and stub tunnel below Bligh Street from the site to the intersection of Bligh and Bent Streets; and
- Construction of a bridging structure over the tunnels for Stage 1 of the CBD Metro project.

Stage 2A(i) also seeks approval for the following building envelope for the subsequent development of the site during Stage 2A(ii):

- Construct a building at 33 Bligh Street comprising an integrated EnergyAustralia substation (serving the city east zone of Sydney), located within the basement and podium;
- Basement parking for 45 cars for office and substation users with vehicular level off O'Connell Street;
- Height of substation podium, with height at RL 50.250 above Bligh Street;
- Construct commercial tower above podium with height at RL 147.000 above Bligh Street.

Approval will be sought to construct and operate the City East Zone Substation and commercial tower as part of Stage 2A(ii). This will involve a

design review process to refine the building envelope for which approval is sought in Stage 2A(i).

The following Design Statement, prepared by Kann Finch, describes the proposed works:

> *33 Bligh Street will be an integrated development incorporating a zone substation, being a critical infrastructure project for this precinct of the city, and a commercial development of approximately 25,000 m^2 net area.*
>
> *The substation component will be housed within a basement and podium type structure with the podium structure finishing approximately 42m above the Bligh Street frontage and approximately 48m above the O'Connell Street frontage.*
>
> *The commercial component will rise above the substation to an RL of approximately 147m. The commercial component will be separated from the podium substation with a 'sky-lobby' level of approximately 7 metres in height.*
>
> *The proposed building envelope addresses the minimal spatial and functional requirements of the substation. A setback of approximately 9 metres has been provided to the adjacent heritage building at 31 Bligh Street.*
>
> *The design development of the building as a whole will address the contextual features of the adjacent buildings in this city precinct in urban design terms of form, materiality and heritage appreciation.*

5.0 HERITAGE IMPACT ASSESSMENT

5.1 Introduction

The following assessment is based on the guidelines set out by the NSW Heritage Office publication 'Statements of Heritage Impact', 2002.

The following aspects of the proposal respect or enhance the heritage significance of the item or conservation area for the following reasons:

- The proposed design of the substation and integrated commercial development has been carefully considered to ensure it minimises any negative heritage impact and enhance the heritage significance of the adjacent heritage items.

The following aspects of the proposal could detrimentally impact on heritage significance. The reasons are explained as well as the measures to be taken to minimise impacts:

- The O'Connell Street Elevation requires greater modulation then is apparent in the massing studies and would be achieved through the use of a variety of materials, articulation and modulation of the podium. We understand this is the intention of Stage 2(ii) of the City East Zone Substation project.
- The southeastern corner to Bligh Street is a critical corner and presentation to Richard Johnson Square and Hunter Street. Care should be taken in the articulation of this corner to the substation.

The following sympathetic solutions have been considered and discounted for the following reasons:

- A previous development was considered which proposed commercial development providing access through the site at Ground Level to connect Bligh and O'Connell Streets. While, this scheme was considered sympathetic, it did not provide potential for an EnergyAustralia substation.

5.2 Demolition of a building or structure

Have all options for retention and adaptive reuse been explored?

- The two existing buildings, located at 33 Bligh Street and 20-26 O'Connell Street, Sydney, are proposed for demolition. The buildings date to the 1960s and 1980s and are concrete frame and glass infill construction. The buildings are 17-storey and 13-storey in height. The buildings have little heritage significance and are not listed as heritage items. From a heritage perspective, there is no impediment for removal. Council had supported demolition in a previous development of the site.

Can all the significant elements of the heritage item be kept and any new development be located elsewhere on the site?

- The subject site is not a heritage item nor is it listed as having archaeological potential. Therefore, this criterion is not relevant.

Is demolition essential at this time or can it be postponed in case future circumstances make it retention and conservation more feasible?

- The desire to demolish the buildings comes from the need to provide a new electrical zone substation within the eastern zone of Sydney CBD to meet existing and future electrical loads, usage and standards. The current infrastructure requires refurbishment, replacement and augmentation to provide a secure supply of electricity to the Sydney CBD that complies with new licensing requirements.
- The need to upgrade electrical substations within the Sydney CBD has become urgent and cannot be delayed. EnergyAustralia see development of this site within the eastern zone of the Sydney CBD as an imperative.

Has the advice of a heritage consultant/specialist been sought? Have the consultant's recommendations been implemented? If not, why not?

- NBRS+Partners is an architectural practice which has provided heritage consultancy services for over thirty years. The heritage consultancy has been involved in the design of the proposed development and supports the demolition of the two buildings. To minimise negative heritage impact on heritage items in close proximity, the consultancy has advised on the design of the proposed substation and office tower.

5.3 New development adjacent to a heritage item (including additional buildings and dual occupancies)

How is the impact of the new development on the heritage significance of the item or area to be minimised?

- There are a variety of street alignments and building heights along the existing Bligh and O'Connell Streets streetscapes and buildings from a variety of periods and styles. The proposed development on the subject site is adjacent the four-storey former NSW Club building, located at 31 Bligh Street, and those heritage buildings on O'Connell Street have an overall scale ranging from 10 to 17 levels. The proposed massing study acknowledges the need to sensitively address the heritage significance, scale and proportions of these buildings, while constructing a relatively bulky substation. It is recommended the negative impact of the bulk be minimised through careful modulation of the large facade planes, using a rich palette of design articulation. Peer review and an iterative design process with stakeholders and design review panel will form part of the Stage 2A(ii) of the City East Zone Substation project and should ensure a high level of design outcome is achieved in conjunction with contributing to the streetscape and heritage significance of adjoining buildings.

- The Bank of NSW building and Manufacturing House are heritage listed buildings with façades that are highly articulated. Documentation of the proposed works does not provide details of facade articulation of the podium. Therefore, no assessment can be made at this stage. It is recommended that Stage 2 detailing to the facades would need to be carefully considered and treated to minimise negative heritage impacts of bulk and scale on the heritage items in close proximity on O'Connell and Bligh Street facades.
- It is proposed the building retain the existing street alignment. While this has the potential to negatively impact on the sensitive junction between the new proposed building and the Former NSW Club, this negative heritage impact has been minimised by void created by the proposed entry "slot" on Bligh Street. It has also enabled the articulation and allowing visibility of the southern facade of the Former NSW Club. This reduces the negative heritage impact on views and vistas to the heritage listed building, and frames the southern facade of the heritage building by providing a scale that is sympathetic to the heritage listed building.
- To minimise the visual appearance of height of the proposed 26-storey building, a 7m-high landscaped "Sky Lobby", located on Level 12 above the substation podium (RL50.25) has been proposed. This proposed "void" delineates and addresses the scale of the reduced heights of the heritage listed buildings on both Bligh and O'Connell Streets.

Why is the new development required to be adjacent to a heritage item?

- EnergyAustralia undertook a process to select a site for the City East Zone Substation in the vicinity of Phillip, Bent, Bligh and O'Connell Streets. The substation is required to be located as close as possible to the alignment of the City East Cable Tunnel to minimise the extent of infrastructure required to connect these elements. This process identified 33 Bligh Street as the preferred site because it is of a suitable size and the connection to the proposed City East Cable Tunnel could be provided by constructing a short 150 m long stub tunnel. Importantly, there is also development consent to demolish the existing buildings on the site and construct a commercial tower, however this development did not proceed for commercial reasons.

How does the curtilage allowed around the heritage item contribute to the retention of its heritage significance?

- It is proposed the building mass of the building be pulled back from the former New South Wales Club Building by approximately 9m to expose its southern wall and to enable appreciation of its east elevation. This provides the opportunity for the public to appreciate the heritage significance of the fabric and the building's setback from the street alignment.

How does the new development affect views to, and from, the heritage item? What has been done to minimise negative effects?

- The proposed development will not interrupt views and vistas to and from the heritage items on O'Connell Street as it maintains the existing street alignment.
- The proposed development is setback from the southern facade of No 31 Bligh Street to ensure there is minimal interruption of views and vistas to and from the heritage item and addresses Richard Johnson Square a heritage item.

Is the development sited on any known, or potentially significant archaeological deposits? If so, have alternative sites been considered? Why were they rejected?

- Casey & Lowe Pty Ltd, Archaeologists, prepared a statement on Non-Indigenous Archaeology associated with the site, dated 15 March 2010;
- The property is zoned in the City of Sydney's Archaeological Zoning Plan (1992) as having no archaeological potential (reflects the presence of basements of sufficient depth to have removed most if not all of the site's archaeological remains);
- Casey & Lowe Pty Ltd stated: "The excavation involved for the existing structures and their basements is considered to have removed all except for possibly the bases of wells if they were deeper than four metres in this area. All other structural remains and features relating to the nineteenth - century land - use of the property will have been removed."
- Casey & Lowe Pty recommend: "*the initial bulk excavation of the substation site be monitored by an experienced historical archaeologist. Monitoring would only be necessary when the basement floor slab is being removed."*

Is the new development sympathetic to the heritage item? In what way (eg form, siting, proportions, design)?

- The proposed O'Connell Street facade is sited on the existing street alignment. The proposed alignment follows that of the adjacent heritage listed buildings. This siting is sympathetic with the significance of the heritage items.
- The subject proposal (Stage 2A(i)) provides massing of the building. The proposed massing, in particular the height of the podium, sympathetically addresses the heights and proportions of the heritage items in close proximity on Bligh and O'Connell Streets. The proportions and design detailing of the proposed building will be further addressed in Stage 2A(ii) of the design process when proposed materials will be determined and details relating to articulation and modulation of the podium will be developed. It is proposed advice will be provided by the heritage consultant during Stage 2A(ii) of the City East Zone Substation project.

Will the additions visually dominate the heritage item? How has this been minimised?

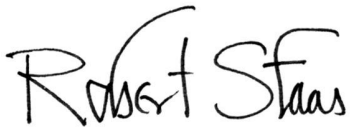
- While the proposed tower structure is considerably higher than the heritage items in close proximity, the impact of the contrast in scale has been minimised by articulating the scale of the podium structure, by proposing a "Sky Lobby" which is related to the height and scale of the adjacent late-nineteenth and early-twentieth century heritage items.

Will the public, and users of the item, still be able to view and appreciate its significance?

- The proposed development will enhance views to the existing heritage items and allow the continued public appreciation of the heritage items located in close proximity.

6.0 CONCLUSION

In conclusion, the proposed works described above do not adversely affect the identified heritage significance of the heritage items in close proximity to the site. We would recommend the heritage aspects of this application be approved.



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NBRS+PARTNERS ARCHITECTS

21 May 2010