Preferred Project Report

prepared in respect of MP06_0273 (MOD 1)
for the Development of

SITE 4B

SYDNEY OLYMPIC PARK

June 2011

1 Introduction

This report has been prepared by Helen Mulcahy Urban Planning on behalf of Lend Lease Project Management and Construction (Australia) Pty Limited (formerly Bovis Lend Lease) and constitutes the Preferred Project Report (PPR) prepared in respect of the application made pursuant to Section 75 of the *Environmental Planning and Assessment Act, 1979* in respect of MP06_0273 Site 4B Sydney Olympic Park.

The purpose of this Preferred Project Report is to:

(i) address the issues raised in the aforementioned submissions;
(ii) describe any further amendments made to the scope and content of the Section 75W application arising from consideration of those issues; and
(iii) provide an amended Statement of Commitments

to enable the Department of Planning and Infrastructure to finalise its assessment of the application and the Minister to make a determination in this matter.

This report should be read in conjunction with the Environmental Assessment dated January 2011 prepared by Helen Mulcahy Urban Planning, including all supporting specialist documentation to accompany the application for Modification of the Project Approval.

1.1 Background

On 19 October 2007, the Minister for Planning granted Project Approval, subject to conditions, to MP 06_0273 for the following:

- construction of an "A" grade, 7 storey commercial office building;
- 5 basement car park levels with approximately **369** parking spaces;
- ground floor comprising retail, quasi-commercial lobby and loading;
- six (6) levels of commercial office space with a gross floor area of **24,143** sqm (which translates to a floor space ratio of 6.05:1);
- landscape treatment of the public domain between the subject site and the Sofitel Hotel which is currently under construction on Site 4A, as set out in the Public Domain Plan prepared by Aspect Sydney; and
- the removal of 22 trees.

The original building was designed as part of the Commonwealth Bank campus at Sydney Olympic Park. The Bank subsequently re-evaluated its space requirements and decided that it no longer required the floor space to be provided in the building approved on Site 4B.

Current market trends for commercial office space indicate that the floor space in the development is more likely to be taken up by multiple tenants (as opposed to the single Bank tenant). Accordingly, various amendments to the proposed development are required to improve the efficiency and flexibility of the development to render it more suitable for multiple tenancies.

The extent of the modifications to the approved development can be summarised as follows:

- construction of two (2) "A" grade commercial buildings, comprising an 8 storey building which addresses Herb Elliott Avenue (hereinafter referred to as the North Building) and a 10 storey building which is oriented to Olympic Boulevard (South Building);
- additional 1,956sqm GFA resulting in at total GFA of 26,099sqm and a corresponding FSR of 6.48:1;
- 735sqm increase in the landscaped area including the through-site link (total now provided 2,545sqm);
- removal of 17 trees (which represents a net increase in the number of existing trees retained from 4 to 9); and
- reconfiguration of the basement car park which results in the provision of 273 parking spaces provided over 5 basement levels (a net reduction of 96 spaces from the approved scheme).

The Environmental Assessment and supporting documentation for this project was placed on public exhibition between 2 March and 1 April 2011.

1.2 Submissions

In correspondence dated 13 April 2011, the Department of Planning and Infrastructure:

- advised that copies of all submissions received by the Department are available to view on its website; and
- requested that the following additional matters be addressed in further detail:

    - *Proposed non-compliant 10 storey height of the eastern end of the "South Building". Further justification is required in relation to the proposed departure from the maximum 8 storey height control, as stipulated by the Sydney Olympic Park Master Plan 2030;*

    - *Demonstrate compliance with the minimum 5m podium setback requirement from Olympic Boulevard, minimum 4m Olympic Boulevard colonnade width requirement and maximum 5m height rooftop services zone, as stipulated within the Sydney Olympic Park Master Plan 2030; and*

    - *It is acknowledged that the modified proposal increases the number of bicycle parking provision by approximately 75 spaces. However, the proposed 150 spaces fail to comply with the minimum bicycle parking rates for commercial development as stipulated within Table 4.12 of the Sydney Olympic Park Master Plan 2030.*

Submissions were received from the following agencies and organisations:

- Sydney Olympic Park Authority (7 February 2011)
- Sydney Water (29 March 2011)
- RTA (28 February 2011)
- Silanna Pty Ltd (8 March 2011)
- The GPT Group (1 April 2011)

The issues raised in each of the aforementioned submissions are addressed in Section 2.0 of this report.

2 Response to Issues

This section of the report provides a summary of the various issues raised in the submissions, together with a response and reference to supplementary information where relevant.

Issue	Response
Department of Planning and Infrastructure correspondence of 13 April 2011	
Proposed non-compliant 10 storey height of the eastern end of the "South Building". Further justification is required in relation to the proposed departure from the maximum 8 storey height control, as stipulated by the Sydney Olympic Park Master Plan 2030	This issue is discussed in detail below in response to the same issued raised by SOPA in its submission dated 7 February 2011.
Demonstrate compliance with the: • minimum 5m podium setback requirement from Olympic Boulevard, • minimum 4m Olympic Boulevard colonnade width requirement and • maximum 5m height rooftop services zone, as stipulated within the Sydney Olympic Park Master Plan 2030.	The setback observed by the Southern Building podium to Olympic Boulevard responds to the street alignment to achieve an improved urban form and relationship to adjoining properties. The setback at the northern corner of the building is 5m and tapers to approx. 4.2m at the southern corner. The siting of the Southern Building and its relationship to Olympic Boulevard is the same as that adopted for the Pullman Hotel immediately to the north on Site 4A. It is considered that this arrangement provides a stronger architectural / urban design response to the street block. Furthermore, SOPA's Design Review Panel has not raised this as an issue (refer copy of Minutes included at **Appendix 1**) and was generally supported by SOPA at officer level. The colonnade to Olympic Boulevard follows the line of the podium and as a consequence tapers from 5m at the northern corner to approx. 3.5m at the southern corner (resulting in an average of 4.25m). It is noted that the southern end of the colonnade is unencumbered by columns and therefore provides 3.5m clear. Bates Smart has confirmed that the plant on both buildings will be located within the 5m (maximum height) rooftop services zone specified in the Master Plan (refer Design Report at **Appendix 2**) and observes the 3m setback from the parapet. It is noted that certain elements (vent pipes, lift overrun and the like) may project marginally beyond the 5m zone.
It is acknowledged that the modified proposal increases the number of bicycle parking provision by approx. 75 spaces. However, the proposed 150 spaces fail to comply with the minimum bicycle parking rates for commercial development as stipulated within Table 4.12 of the Sydney Olympic Park Master Plan 2030	The approved scheme provided 75 bicycle parking spaces, based on a GFA of 24,143m^2 which satisfied the requirements of the 2002 Master Plan. The proposed development (as amended) will result in a net increase in GFA of 1,956m^2 which results in a requirement to provide (using the current Master Plan rates) an additional 13 permanent spaces (1 space / 150m^2 GFA) PLUS 26 visitor spaces (1 space / 75m^2 GFA).

Issue	Response
	This results in an overall bicycle parking requirement for the development (as amended) of 114 spaces – a significant increase on the 75 spaces as originally approved. This application seeks a modification of an existing approval and on this basis, it would be unreasonable to apply the Master Plan 2030 bicycle parking rate for the total quantum of gross floor area given the development complied with the planning controls at the time of the original approval.
The GPT Group submission of 1 April 2011	
At high level review we acknowledge that the revised modification appears to fall within the guidelines set out by the SOP Master Plan 2030	Noted
We would like to note that as a neighbouring land holder on both sides of the property we have not been consulted on the changes. We have found this disappointing as we were not able to understand the modifications in the detail a presentation would provide to us	The Proponent consulted with adjoining property owners subsequent to lodgement of the S75W application and engaged in discussion with SOPA's Design Review Panel. The Proponent met with representatives of the GPT Group on 18 May 2011 to explain the proposed modifications to the approved scheme. It is understood that no specific concerns / issues were raised by GPT and the purpose of the meeting was primarily to ensure that the adjoining property owner was fully informed about both the rationale for, and the nature of the proposed amendments.
Further to the above point we are aware that this change has been classified as a modification. We would like to understand the guidelines that constitute a modification given this development has now been reconfigured from one building to two	Part 3A of the Act is not constrained by the requirement that the development as modified needs to be "substantially the same" as the development that was originally approved. The Proponent believes the development remains substantially the same and this was presented to the GPT Group on 18 May 2011.
Silanna submission of 6 March 2011	
Operation of high technology manufacturing plant 24 hours, 7 days. Uses sensitive equipment and is particularly sensitive to vibration. Submitted noise reports by Renzo Tonin do not consider vibration. Concerns relate to excess vibration during construction or ongoing heavy vehicles. Potential loss of production loss of contracts, loss of jobs	Renzo Tonin & Associates (NSW) Pty Ltd has prepared an updated and detailed Vibration Management Plan (refer **Appendix 3**) which makes an assessment of the likely vibration impacts during the construction phase on adjoining properties including the Silanna premises at No. 8 Herb Elliott Avenue. The report acknowledges the vibration limits for the equipment housed within the adjoining premises (provided by the manufacturer), which are based on vibration levels measured on the floor or concrete platform where the equipment is installed. The report identifies specific management measures to be employed during the construction phase to achieve compliance with relevant guidelines and standards. The report notes that buffer distances for vibration compliance have been provided as guidance but recommends that these should be verified prior to the commencement of construction works through more detailed on-site measurements of vibration.

Issue	Response
	The report concludes that given the type of plant and equipment proposed to be used in the construction, together with the type of construction methods to be adopted, it is expected that the vibration impacts will be minimal. Furthermore, that vibration levels are expected to comply with the applicable vibration limits. As part of the Statement of Commitments for this Project, the Proponent has undertaken to install a vibration monitoring system to monitor vibration levels for the duration of the works, particularly as they affect the adjoining rail corridor. The Proponent will provide the results of the monitoring and a mechanism for communication with the adjoining property owner throughout the construction phase of the Project. In addition, the Proponent has discussed the vibration issue with Silanna and has forwarded a copy of the aforementioned Vibration Management Plan to Silanna for its records.
Roads and Traffic Authority submission of 28 February 2011	
No objection to the proposed modification.	Noted.
Sydney Olympic Park Authority submission of 7 February 2011	
Height of South Building The South Building at its eastern end exceeds the 33m height limit by approximately 2 storeys. The documentation provided does not address this aspect of the modification. The proponent should provide justification for the additional height taking into consideration clause 21 of the SEPP (Major Development) 2005.	Clause 21 of Schedule 3 of the Major Projects SEPP provides that: *A development standard imposed by this or any other environmental planning instrument on development that is part of a project to which Part 3A of the Act applies, and is within the Sydney Olympic Park site, does not apply to that development if the Director-General is satisfied, and issues a certificate to the effect, that:* *(a) compliance with the development standard is unreasonable or unnecessary in the circumstances of the case, and* *(b) there are sufficient environmental planning grounds to justify exempting the development from that development standard.* *In deciding whether to issue a certificate, the Director-General must consider:* *(a) whether contravention of the development standard raises any matter of significance for State or regional environmental planning, and* *(b) the public benefit of maintaining the development standard, and* *(c) any other matters required to be taken into consideratio Director-General.* The Sydney Olympic Park Master Plan 2030 (Figure 5.8 – Central Precinct Building Heights) illustrates the height of development on the site and provides for a 50m deep "tower zone" along the Olympic Boulevard frontage of 20 – 30 storeys. The eastern portion of the site is restricted to 8 storeys.

Issue	Response
	The Southern Building addresses Olympic Boulevard and achieves a height of 10 storeys (well below the maximum height of 20 – 32 storeys permitted under the Master Plan) however the eastern end of the building (for a distance of approx. 24 metres or 32% of the length of the building encroaches into the 8 storey height zone. The height standard is part of a suite of built form controls which are designed to control the siting, bulk and scale and density of development. Section 4.6.4 of the Master Plan sets out the objective of the Height Control as follows: *To reinforce the primacy of Olympic Boulevard and the town and create consistent building heights along main streets, maintain solar access to the public domain and maintain the iconic Olympic skyline.* Subclause 2 enables minor increases to the heights nominated in the Building Heights Plans to be considered in the following circumstances: • special site conditions make strict compliance with the controls unworkable • there are demonstrable improvements to urban form and height transition • resident amenity in terms of privacy and solar access is not adversely affected • there is no impact on public open space and parklands. Having regard to the above, the minor non-compliance with the height control over a portion of the development site is considered to be reasonable in this instance because: • the site is awkwardly configured and is constrained by the requirement to preserve the through-site link whilst achieving large, regular floor plates with optimal solar access; • the additional two storeys at the south eastern corner of the site serve to reinforce this corner, resulting in a built form which provides an appropriate transition to future development to the east (which is separated by the future road); and • the proposed non-compliance does not manifest itself in any substantive impacts in terms of overshadowing to the proposed area of open space to the south east (refer Shadow Diagrams at **Appendix 2**) or loss of privacy / solar access to residential properties. In relation to privacy, it is noted that the nearest site designated for future residential development in the Sydney Olympic Park Master Plan 2030 is located some 100 metres to the south east on Figtree Drive (refer Figure 5.7 Central Precinct Land Use Plan). As the Department is aware, the proposal (as amended) is within the maximum permissible FSR of 6.5:1 (achieving an FSR of 6.48:1), which is required to be achieved in order to make the project economically viable. Strict compliance with the height control would require the

Issue	Response
	redistribution of this GFA and could potentially result in either a less elegant architectural solution, a poor urban form or could compromise the quantum of outdoor / public spaces around the base of the buildings. On this basis, it is considered that notwithstanding the breach of the height control, the proposed development results in a better urban form design outcome.
Building Design The loading dock and car park access has been combined in the modification. Consideration should be given to the provision of shutters or folding doors to improve the appearance of this combined entrance to the public domain.	The loading dock and car park access are immediately adjacent but are physically separated by a wall (refer Drawing Nos. A07.002 for the elevation and A3.000 for the plan of this area). Roller shutter doors will be provided to these vehicular access points. It should be noted that these doors are shown on the drawings which accompanied the S75W application.
Retail tenancies should be provided with a service corridor for management of garbage and general loading. Service access via building lobby areas is not supported.	The ground floor retail tenancies are comparatively small and by virtue of their size, cannot accommodate uses which are likely to generate high volumes of deliveries of goods or large quantities of waste. Furthermore, all the tenancies are front loaded from the colonnade. A service corridor connects the loading dock with the colonnade which will facilitate access to the majority of the tenancies. The retail tenancy located on the south eastern corner of the ground floor of the Southern Building (with frontage to the two new roads) will be serviced from the loading dock via the footpath in the new eastern access road (a distance of less than 20 metres). Future use of these tenancies will require consent, at which time the nature of individual uses can be assessed (in terms of the frequency of deliveries, generation of waste) and a condition can be imposed on any consent for use which restricts deliveries and waste removal to periods outside core business hours and using appropriate delivery procedures.
Continuous sheltered access should be provided along the Southern elevation of the South Building.	The podium in the Southern Building presents to Olympic Boulevard and returns for approximately 30% of the length of the southern elevation providing continuous and covered access in the primary circulation area around the building. Public access to the buildings and the primary points of access for employees are from Herb Elliott Avenue and Olympic Boulevard, both of which coincide with large sheltered areas. A single door, designed to provide secondary security access (employees only) to the ground floor service corridor is provided in the southern elevation of the Southern Building. The architectural plans (attached at **Appendix 2**) have been amended to incorporate a canopy structure above this doorway to provide shelter in this location. Whilst this arrangement does not provide continuous sheltered access in this location, it is consistent with:

Issue	Response
	• Section 4.3.1 of the Master Plan (Building Interface with the Public Domain) provides that weather protection should be provided at communal entrances; • Figure 4.2 Awnings and Colonnades Plan, which does not require the provision of an awning on the southern edge of Site 4B On this basis, the proposal as amended is considered to be appropriate in this context and responds to the functional needs of the building and its context.
The Olympic Boulevard colonnade should have a width of 4 metres in accordance with the provisions of the Master Plan 2030.	Refer response to this issue raised by the Department of Planning and Infrastructure.
The revolving door on the Olympic Boulevard frontage should not project into the colonnade zone as it presents a hazard to the visual and mobility impaired.	The swept paths of the revolving doors in both the Olympic Boulevard and Herb Elliot Avenue elevations as proposed, will not compromise the integrity of the pedestrian circulation in and around these points of access to the buildings. In addition, Morris Goding has examined the implications of this arrangement on the visually and mobility impaired and has provided additional advice (refer **Appendix 4**) which confirms that the proposed design (with the door projecting into the colonnade) provides a better solution than recessing the door behind the glass line.
The Statement of Commitments should include a requirement that all public domain interfaces meet the standards of the UDEM 2008.	SOPA's Urban Elements Design Manual (UEDM) is a technical manual and sets standards of performance and design quality which considers robustness, fitness for purpose, sustainability of material selection, operational efficiency and integration with the existing public domain as a legacy of the 2000 Olympics. The UEDM also sets standards for public safety, amenity and universal access. The UEDM aims to achieve correct placement and coordination of urban elements to: • Reinforce street hierarchy and special character • Nominate required paths of travel for pedestrians, cyclists, wheelchairs, prams and the integration with uses such as outdoor eating • Achieve a seamless integration of elements into the paved ground plane The Statement of Commitments as included in Section 3.0 of this report has been amended to confirm that all public domain interfaces will be designed in accordance with the standards of the UDEM 2008.
Proposed Staging Appendix 2 of the documentation contains a Site Establishment Plan which shows a one way truck exit point onto Olympic Boulevard. Given that this a high-use pedestrian street and subject to road closures particularly during major events, it is considered that alternative arrangements should be conditioned accordingly.	Noted. The Statement of Commitments included in Section 3.0 of this report has been amended to ensure that the Construction Traffic Management Plan (Point 29) to be prepared and submitted to SOPA for approval prior to the commencement of construction includes alternative arrangements to be employed during Major Events to accommodate road closures and increased pedestrian activity.

Issue	Response
Sydney Water submission dated 29 March 2011	
Water The existing water system has capacity to service the proposed development. The developer needs to design and construct a connection to the available 250mm water main on the southern side of Herb Elliott Avenue. The connection will need to be sized and configured according to the Water Supply Code of Australia (Sydney Water Edition WSA 03-2002). Evidence of Code compliance should be attached with the extension design.	Noted. The Proponent will liaise with Sydney water throughout both the detailed design phase and during construction, as may be necessary.
Waste Water The existing wastewater system has capacity to service the proposed development. The developer will need to design and construct a connection to the available 225mm wastewater main traversing the property. The connection, in addition to any adjustment or deviation, will need to be sized and configured according to the Sewerage Code of Australian (Sydney Water Edition WSA 02-2002). Evidence of compliance should be attached with the extension and/or adjustment design.	As above.
Recycled Water The existing recycled water system has capacity to service the proposed development. The developer will need to design and construct a connection to the available 200mm main on the northern side of Herb Elliott Avenue. The connection will need to be sized and configured according to the Water Supply Code of Australia (Sydney Water Edition WSA 03-2002). Evidence of compliance should be attached to the extension design.	As above.
Trade Waste In the event that trade wastewater is generated, the property owner is required to submit an application for permission to discharge trade wastewater to the sewerage system before business activities commence.	As above.
Sydney Water Servicing Sydney Water will further assess the impact of the development when the proponent applies for a Section 73 Certificate. This assessment will enable Sydney Water to specify any works required as a result of the development and to assess if amplification and/or changes to the system are applicable. The proponent must fund any adjustments needed to Sydney Water infrastructure as a result of any development. The proponent should engage a Water Servicing Coordinator to get a Section 73 Certificate and manage the servicing aspects of the development. The Water Servicing Coordinator will ensure submitted infrastructure designs are sized & configured according to the Water Supply Code of Australia (Sydney Water Edition WSA 03−2002) and the Sewerage Code of Australia (Sydney Water Edition WSA 02−2002).	As above.

Issue	Response
Sydney Water e-planning Sydney Water has created a new email address for planning authorities to use to submit statutory or strategic planning documents for review. This email address is: urbancrowth@sydneywater.com.au. This email should be used for: • Section 62 consultations under the Environmental Planning and Assessment Act 1979 • consultations where Sydney Water is an adjoining land owner to a proposed development • Major Project applications under Part 3A of the Environmental Planning and Assessment • Act 1979 • consultations and referrals required under any Environmental Planning Instrument • draft LEPs, SEPPs or other planning controls, such as DCPs • any proposed development or rezoning within a 400m radius of a Sydney Water • Wastewater Treatment Plant • any proposed planning reforms or other general planning or development inquiries	As above.

3 Statement of Commitments

The proposed Modification has given rise to the need to revise the Statement of Commitments which forms part of the Project Approval issued by the Minister in respect of MP06_0273 on 19 October 2007. Additions are shown in ***red bold italics*** and deletions are shown in ~~strikethrough~~ text.

General

1. The development will be carried out generally in accordance with the plans and material submitted as part of this Environmental Assessment for Major Project No. 06_0273, as described in:

   (a) the Environmental Assessment Report prepared by Helen Mulcahy Urban Planning (and accompanying Appendices), dated January 2007 and the Preferred Project Report dated June 2007;

   (b) the Environmental Assessment Report prepared by Helen Mulcahy Urban Planning (and accompanying Appendices) in respect of Modification 1 dated December 2010 and the Preferred Project Report dated May 2011;

   ~~(b)~~***(c)*** Architectural Drawings prepared by Bates Smart ***submitted in respect of MOD 1***; and

   ~~(c)~~***(d)*** Landscape Plans prepared by Aspect Studios Sydney ***and submitted in respect of MOD 1***.

2. The Proponent is committed to the principles of sustainability as defined in the Local Government Act 1993. The construction and operation of the proposed commercial office building will be undertaken in accordance with SOPA's Environmental Guidelines and Sustainability Strategy.

3. The visible light reflectivity from building materials used on the facades of the building will not exceed 20% and will be designed so as not to result in glare that causes any nuisance or interference to any person or place.

4. Final design details of the proposed external materials and finishes, including schedules and a sample board of materials and colours will be submitted to SOPA's Design Review Panel for review and comment prior to installation of the elevational treatments.

Public Domain

5. All public domain interfaces will be designed in accordance with the standards included in SOPA's Urban Design Elements Manual 2008.

~~5.~~***6.*** Any existing public domain infrastructure damaged due to construction works, will be replaced or repaired to the condition in which the infrastructure was found immediately prior to the commencement of works. The repair / replacement will be completed to the satisfaction of SOPA prior to the issue of the Occupation Certificate.

~~6.~~***7.*** The construction and operation of the commercial office building***s*** will be undertaken in accordance with the recommendations of the ESD Report prepared by Bovis Lend Lease (dated ~~6 October 2006~~ ***16 December 2010***) so as to achieve energy and water consumption reduction targets as well as other ESD initiatives.

Tree Management

~~7.~~***8.*** An arborist experienced in tree retention on building sites will be engaged prior to the commencement of work on the site. The Site Arborist will be required to monitor the impact of the building works on the ***existing Brush Box*** trees and provide quarterly reports to the PCA and the Proponent on the condition of the trees. Any recommendations in the quarterly reports relating the protection and / or management of the trees will be implemented.

~~8.~~***9.*** The Site Arborist will be present to supervise any excavation, trenching or tunneling within the Primary Root Zone of any retained trees on adjoining properties. The Site Arborist will supervise the root mapping works required prior to commencement of site preparation works.

Noise and Vibration

~~9~~.***10.*** A revised Noise and Vibration Management Plan will be prepared by a suitably qualified consultant and will be submitted to and approved by the PCA prior to the Construction Certificate being issued.

~~10~~.***11.*** Plastic sheeting shall be installed below the concrete slab but not below footings because of bearing pressure requirements. To increase corrosion protection below footings the cover to reinforcement will be increased from the provisions included in the Concrete Structures Code.

~~11~~.***12.*** All reinforcement below ground will be embedded in concrete providing at least a B1 exposure classification for durability in accordance with the Concrete Structures Code.

~~12~~.***13.*** Prior to the commencement of works, during works, prior to the issue of the Occupation Certificate and following occupation, a joint inspection of the rail infrastructure and property in the vicinity of the project will be carried out by representatives from RailCorp and the Proponent. These dilapidation surveys will establish the extent of any existing damage and enable any deterioration during and after construction to be observed. The timing of the surveys will be agreed with RailCorp. It is noted that the submission of a detailed dilapidation report will be required unless otherwise notified by RailCorp.

~~13~~.***14.*** A Risk Assessment / Management Plan and detailed Safe Work Method Statements for the proposed works will be submitted to RailCorp for review and comment prior to the works commencing on site. It is noted that RailCorp's representative may impose conditions on the methods to be used and require the provision of on-site Safe Working supervision for certain aspects of the works.

~~14~~.***15.*** No excavation or boring will occur within 2.0m (measured horizontally) of high voltage underground cable and 1.0m (measured horizontally) for low voltage cables.

~~15~~.***16.*** As large-scale excavation is involved, the Proponent will install a vibration monitoring system to monitor vibration levels on the adjoining rail corridor for the duration of the works. The plan for this will be submitted to RailCorp for review prior to the commencement of works.

~~16~~.***17.*** Details of any proposed piling, sheet piling, batter and anchors will be provided to RailCorp for review and comment prior to work commencing. RailCorp may require the removal of such construction aids.

Transport

~~17~~.***18.*** Secure parking for bicycles will be provided in the basement.

~~18~~.***19.*** All deliveries and service vehicles to the site will use the loading dock accessed via the driveway from Herb Elliott Avenue.

~~19~~.***20.*** Access, servicing and parking layout arrangements will be provided in accordance with AS2890.1(2004) and AS2890.2(2002).

Contamination

~~20~~.***21.*** An inspection and test program including a contingency plan will be designed and implemented during earthworks, setting out the procedures to be followed in the event that any as yet unidentified potentially contaminated material, including asbestos is identified.

~~21~~.***22.*** Any soil requiring disposal off-site will be classified in accordance with NSW EPA (1999) Environmental Guidelines: Assessment, Classification and Management of Liquid and non-liquid wastes.

Archaeology

~~22~~.***23.*** Should any archaeological features be discovered during excavation, works will cease ~~and~~ ***until*** the findings ~~will be~~ ***have been*** reported ~~to~~ and assessed by an archaeologist at the time of discovery.

Services

~~23~~.***24.*** The relocation of any services displaced as a result of the construction will be undertaken in consultation and after agreement with the relevant service provider and SOPA. Relocation of all services off-site will be completed prior to commencement of construction works.

Construction

~~24~~.***25.*** Prior to the commencement of construction, a Construction Management Plan will be prepared and submitted to SOPA for approval. The Plan will include:

- A site specific Soil Erosion and Sediment Control Plan
- Hours of Operation during Construction
- Air quality / dust control procedures
- Noise management procedures
- Waste Management Plan for the Construction Phase
- Storage and handling of materials procedures
- Details of hoardings
- Procedures to be implemented during events, including pedestrian movements, signage etc
- Environmental training and awareness
- Emergency procedures

~~25~~.***26.*** Construction hours for early works (first 12 months) will be as follows:

Monday to Friday 6.00am to 6.00pm
Saturday 6.00am to 4.00pm
Sundays / Public Holidays Nil ***works***
Special Event Days (as specified by SOPA) Nil works

It is noted that any variation to the approved hours as included in the SOPA Interim Code of Development Construction Practice would be subject to SOPA approval.

~~26~~.***27.*** General construction hours will be as follows:

Monday to Friday 7.00am to 6.00pm
Saturday 7.00am to1.00pm
Sundays / Public Holidays Nil
Special Event Days Nil works (unless approved by SOPA)

~~27~~.***28.*** Hours of work may be varied as required to minimize impacts on special events such as State of Origin or the Easter Show. It is noted that works may be undertaken outside the hours specified above in instances where:

- The delivery of materials is required outside these hours by the Police or other authorities;
- It is required in an emergency to avoid the loss of life, damage to property and / or to prevent environmental harm;
- The work is approved through the Construction Noise and Vibration Management Plan; and
- Residents likely to be affected by the works are notified of the timing and duration of these works at least 48 hours prior to the commencement of the works.

~~28~~.***29.*** A Construction Traffic Management Plan will be prepared and submitted to SOPA for approval prior to commencement of works on site. The Plan will detail the means of controlling the flow of traffic throughout the construction phase***, including alternative arrangements to be employed during Major Events to accommodate road closures and increased pedestrian activity***.

~~29~~.***30.*** The Proponent (or its representatives) will maintain regular communications with SOPA, adjoining landowners and other stakeholders throughout the construction phase to ensure that the impacts to the surrounding area associated with construction activities on Site 4B are minimised.

BCA

~~30~~.***31.*** The architectural drawings will be subject to review to enable compliance with the deemed-to-satisfy provisions of the BCA, or compliance with the relevant provision through an alternate solution.

~~31~~.***32.*** All works will comply with the provisions of the BCA either in terms of the deemed-to-satisfy provisions or by way of an alternate solution.

Operation

~~32~~.***33.*** An Operational EMP will be prepared and submitted to SOPA for approval. The OEMP must demonstrate that the building achieves appropriate environmental standards to no less than currently required by SOPA.

4 Conclusion

This Preferred Project Report has been prepared following the exhibition of the application made pursuant to Section 75W of the Environmental Planning and Assessment Act in respect of MP06_0273. The purpose of this report is to address each of the issues raised in the submissions received and detail any further amendments to the proposal which have arisen in response.

The content of this report, together with the Environmental Assessment prepared in respect of the S75W application for MOD 1 demonstrates that the proposal (as amended) will have no adverse environmental impacts that cannot be managed or mitigated.

Having regard to the characteristics of the site and its location, the proposed development (as amended) is considered to be appropriate in that:

- it is permissible with the consent under the provisions of the Major Development SEPP 2005;
- the scale, height and form is generally consistent with the built form controls which apply to the site as set out in SOPA's Master Plan 2030, with the exception of a minor breach of the height control in the south eastern corner of the Southern Building;
- setbacks and colonnades are consistent with existing and likely future built form on adjoining properties and SOPA's design objectives for the precinct;
- the commercial land use is compatible with existing and anticipated future development in the immediate vicinity and contributes to a strong commercial core at Sydney Olympic Park;
- the size, dimensions and configuration of the land can accommodate the form and scale of the proposed development;
- the site will have access to all utility services to accommodate the demand generated by future tenants of the building;
- the scale and nature of the development will not result in any adverse traffic impacts;
- the proposal (as amended) will not result in any unacceptable or material environmental impacts in relation to adjoining and surrounding properties, particularly in terms of heritage, overshadowing and views.

Furthermore, the proposed development will result in a number of positive outcomes, as follows:

- the high quality architecture, design and finishes acknowledges the strategic importance of Sydney Olympic Park in the context of metropolitan area;
- provides a commercial office development which will result in a high standard of worker amenity without adversely impacting on the amenity of surrounding properties / development or (future) areas of open space;
- will be integrated on a physical level with the existing business community in and around Sydney Olympic Park;
- will facilitate and reinforce public access in the public domain via the through-site link between Olympic Boulevard and Herb Elliott Avenue;
- will have a positive visual impact which will reinforce the primacy of Olympic Boulevard;
- will make a positive contribution to ecological sustainability by implementing a variety of ESD initiatives;
- reinforces the proposed street network and facilitates accessibility / permeability through the site and creates strong connections to the existing (and future) road infrastructure;
- increases the number of the existing Brush Box trees to be retained;
- makes provision for active uses at ground level, both on the through-site link and on the south eastern corner of the site to provide an active use at the future intersection to be created in that location, thereby contributing to the overall vitality of the public domain; and
- addresses the street(s) and provides a high level of pedestrian amenity and safety.

APPENDIX 1

Design Review Panel Minutes 16/12/10

SOPA

SYDNEY OLYMPIC PARK AUTHROTIY
DESIGN REVIEW PANEL
ADVICE SHEET

Project	3.1 Site 4B
Presentation / Review Date	16 December 2010
Panel Present	Peter Mould Catherin Bull Darlene van der Breggen Bill Tsakalos Peter Webber
COI Declaration	nil
Also Present	Alan Marsh, Andrew Brown (SOPA)
Presenters	Guy Lake and Julian Anderson (Batessmart) Rod McCoy (Bovis Lend Lease) Helen Mulchay Apologies Paul Mottek
Documents made available	PP presentation and A3 handout
Previous SOPA Advice	August and December 2006, January 2007, October 2010
General Observations/ Overall Comment	The design has developed to address previous DRP concerns with the extent of brush box trees to be removed and the resolution of building massing on the Olympic Boulevard frontage. The DRP was generally quite positive and supported the retention of 4 extra trees and the attention that has been given to refining building massing and external finishes.
	The DRP supported: ▪ Resolution of building massing on the boulevard to achieve the required podium setback for most of the building frontage. ▪ Reduction in underground parking enables more of the existing brush box trees to be retained ▪ opportunity for natural ventilation in the 'mixed mode spaces' and the positioning of the mixed mode spaces at key points of high visibility ▪ Introduction of timber finishes and the louvred system enclosing the 'mixed mode spaces'. ▪ Good resolution of the figure ground - providing pedestrian cross linkages and finished levels that integrate well with future ground level uses.
Issues	The DRP had the following concerns: ▪ That the building presents a sheer and unprotected face to the future east-west street to the south, and the lack of continuous protection along that frontage. ▪ Revolving door projects into the pedestrian colonnade on Olympic Boulevard
Matters for consideration	The DRP recommends that the proponents address the above issues, in particular: ▪ Review the southern elevation to incorporate continuous sheltered access at ground level
Recommended Supporting Action	
Circulation of Advice	SOPA, proponents

APPENDIX 2
PPR Design Report
Bates Smart

BATESSMART™

Lend Lease

Colonial First State

Site 4B Sydney Olympic Park

06 June 2011 Response to S75W Submissions Received and Recommendations

BATESSMART™

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Interior Design
Urban Design
Strategy

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Lend Lease

Colonial First State

Site 4B Sydney Olympic Park

Response to S75W Submissions Received and Recommendations

BS Project Number: S10665
6 June 2011

Introduction
This document includes a series of drawings which respond to commentary from the Department of Planning (DOP) and the Sydney Olympic Park Authority (SOPA). The issues addressed here include:

1A. Shadow Analysis South Building Planning Application Proposal 17 December 2010

1B. Shadow Analysis South Building 10/8 Level Building

2. Building Setback Along Olympic Boulevard

3. Revolving Doors

4. Plant Height

5. Canopy to South Building

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Site 4B Sydney Olympic Park

Response to S75W Submissions Received and Recommendations

BS Project Number: S10665
6 June 2011

1A. Shadow Analysis South Building - Planning Application Proposal 17 December 2010

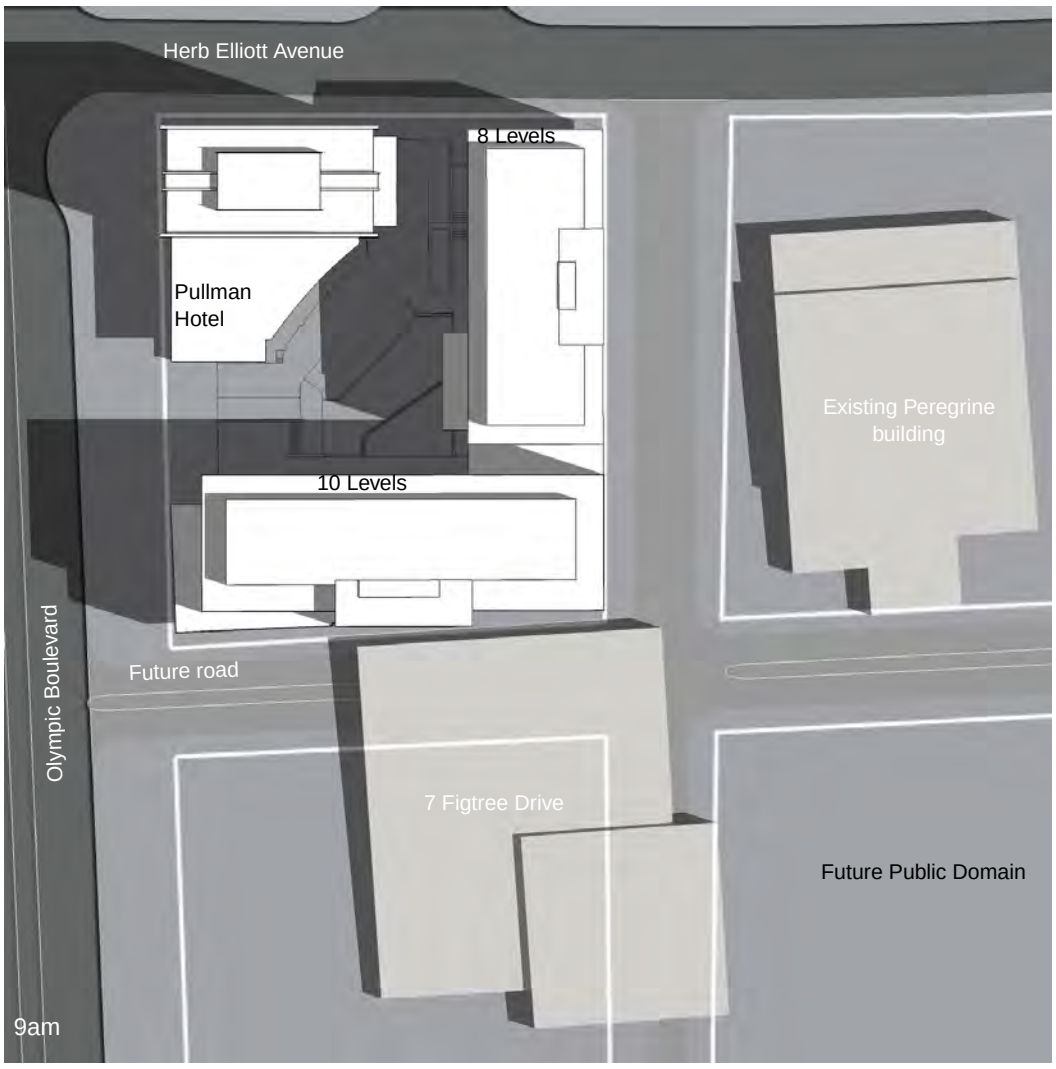
DOP Commentary

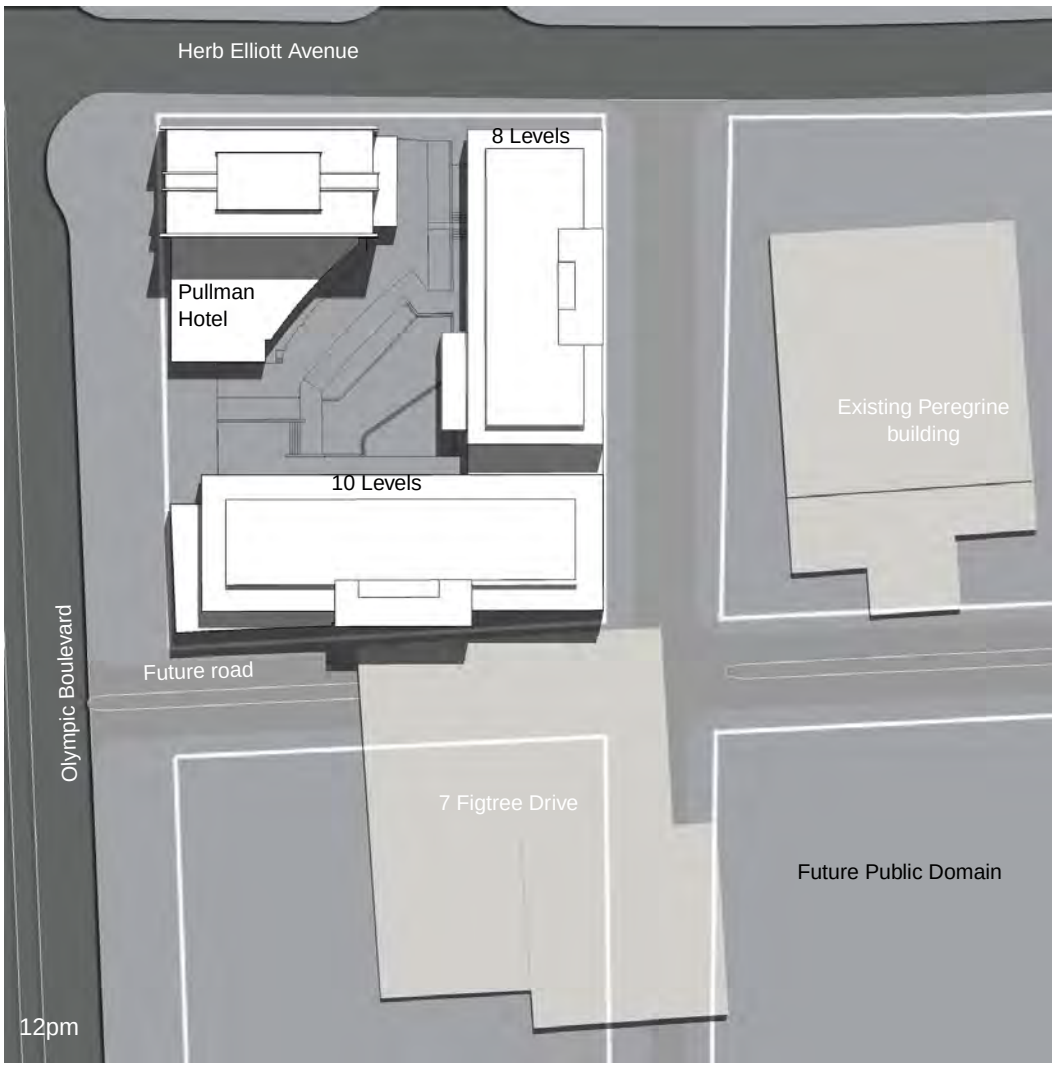
Proposed noncompliant 10 storey height of the Eastern side of the 'South Building'. Further justification is required in relation to the proposed departure from a maximum 8 storey height control, as stipulated by the Sydney Olympic Park Master Plan 2030.

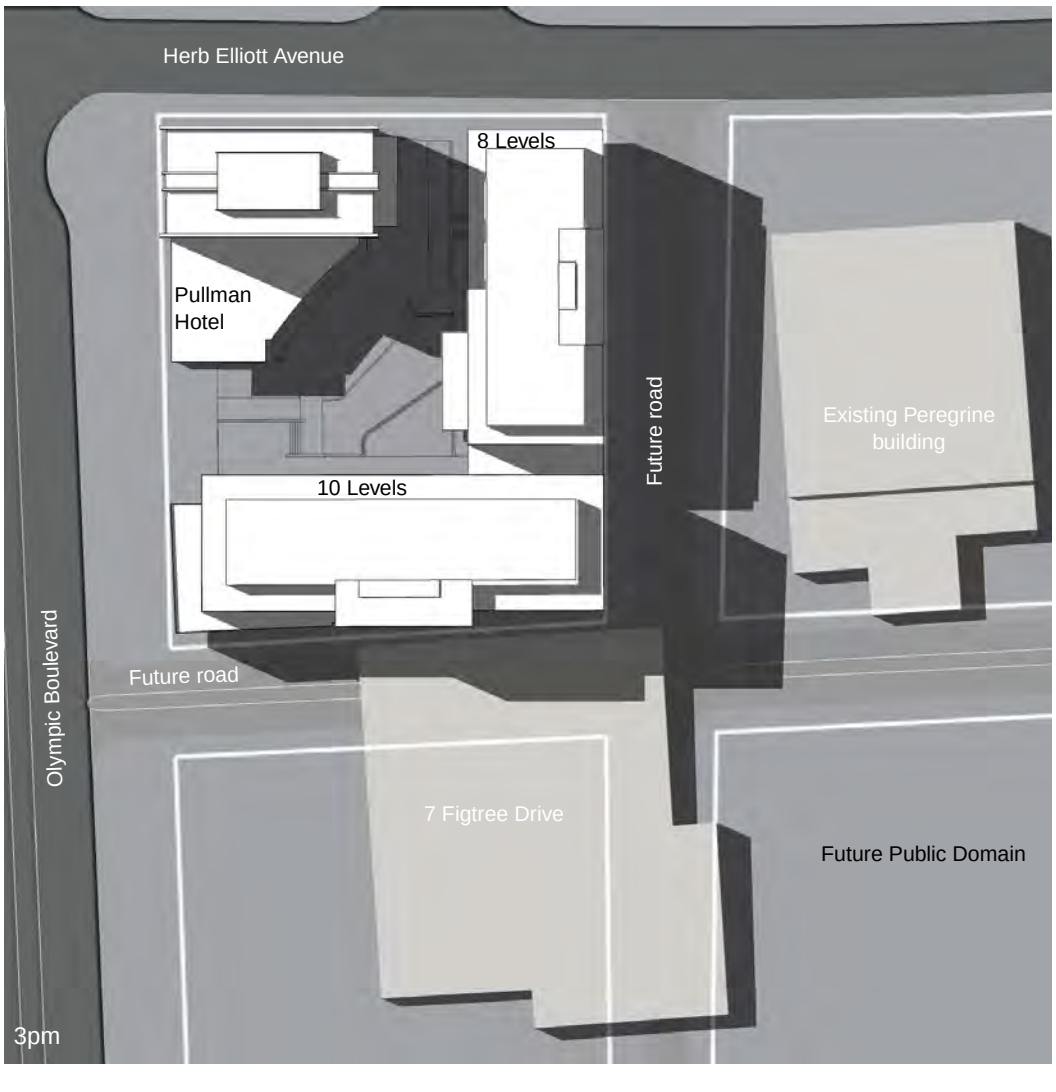
Response

The proposed increase in building massing does not result in loss of amenity due to overshadowing of the future public domain to the east. Pages 3-5 of this document show the shadow diagrams for the 10 Level South Building as included in the planning application submission of 17 December. Pages 6-8 of this document show the shadows resulting from a building with a height reduction of two levels at the eastern end of the South Building.

December 21







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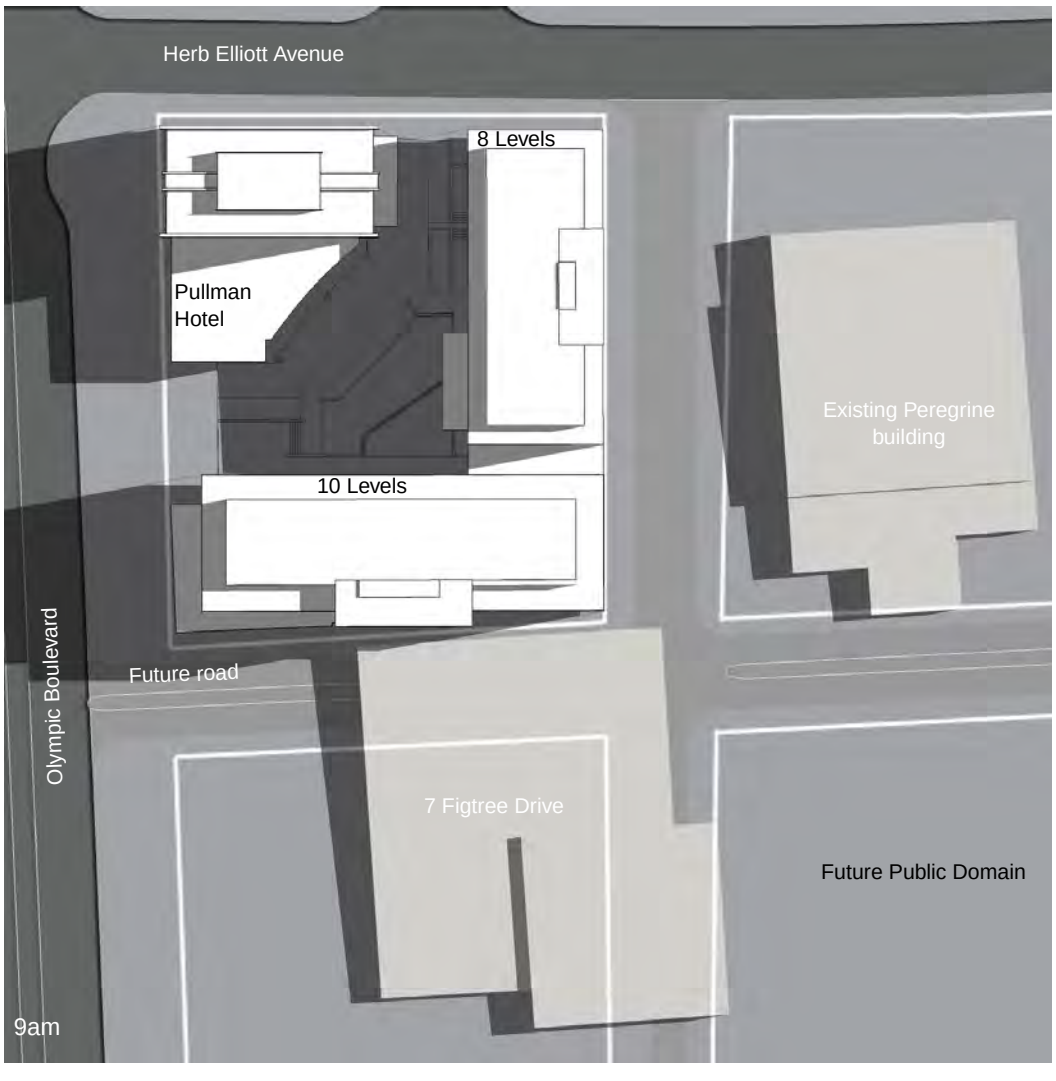
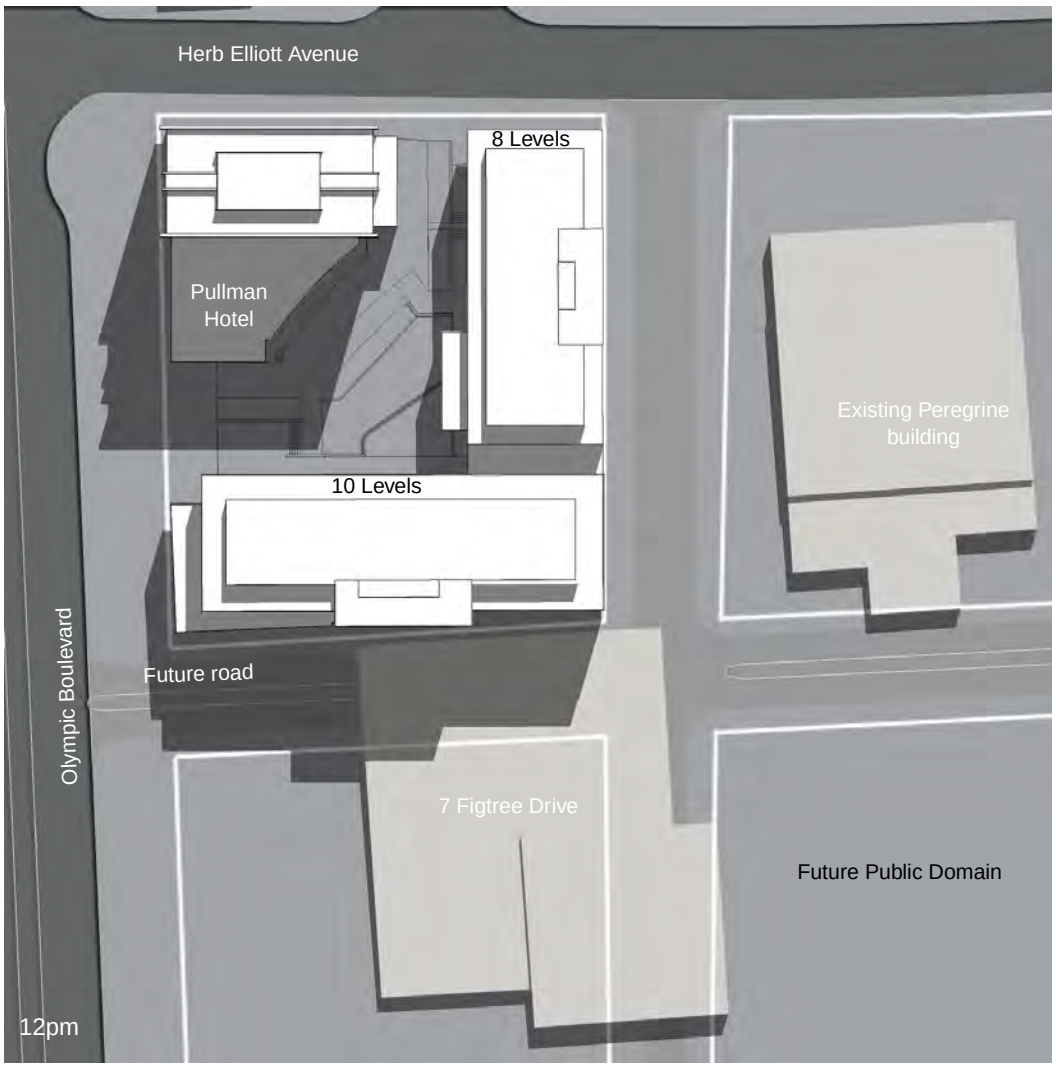
Site 4B Sydney Olympic Park
Response to S75W Submissions Received and Recommendations

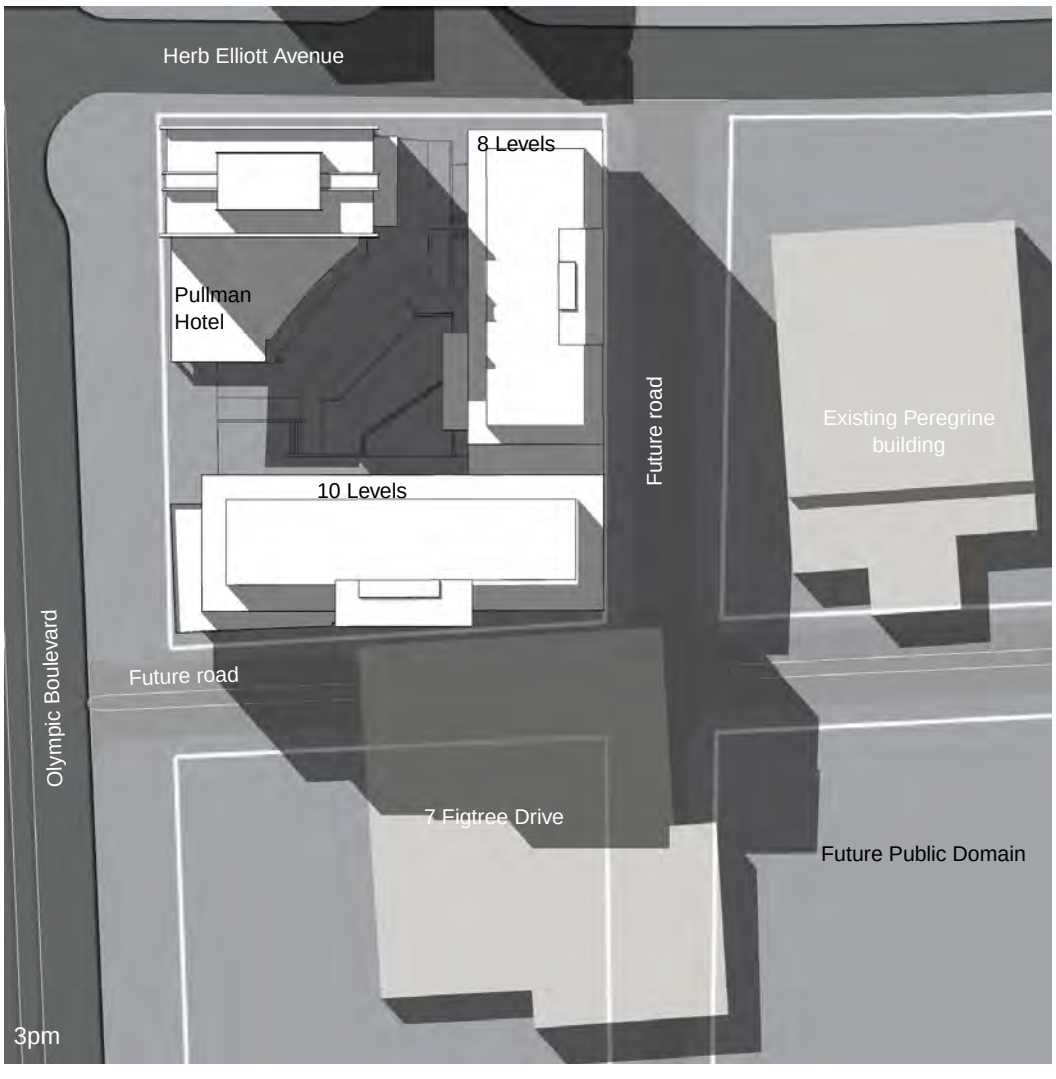
BS Project Number: S10665
6 June 2011

1A. Shadow Analysis South Building - Planning Application Proposal 17 December 2010

March 21 / September 23







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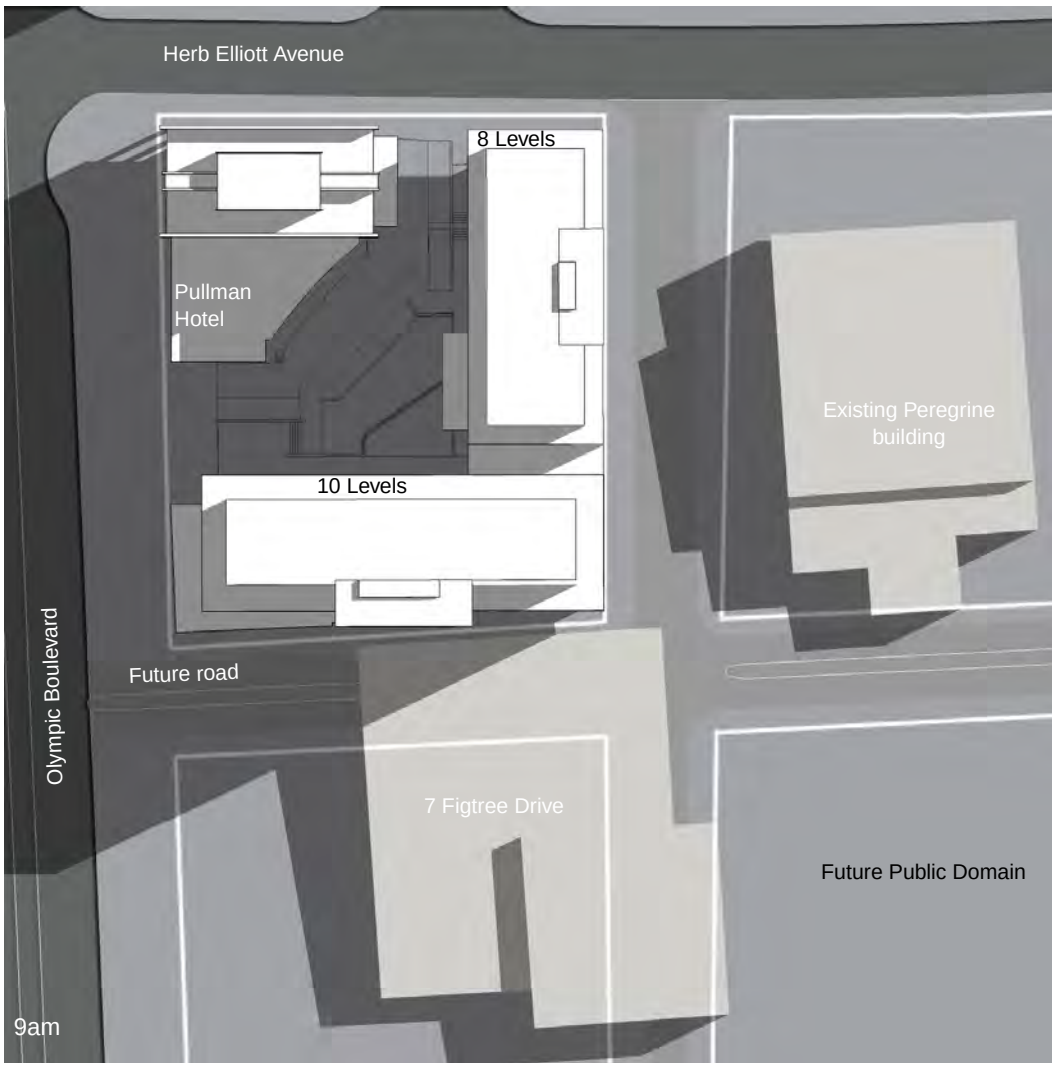
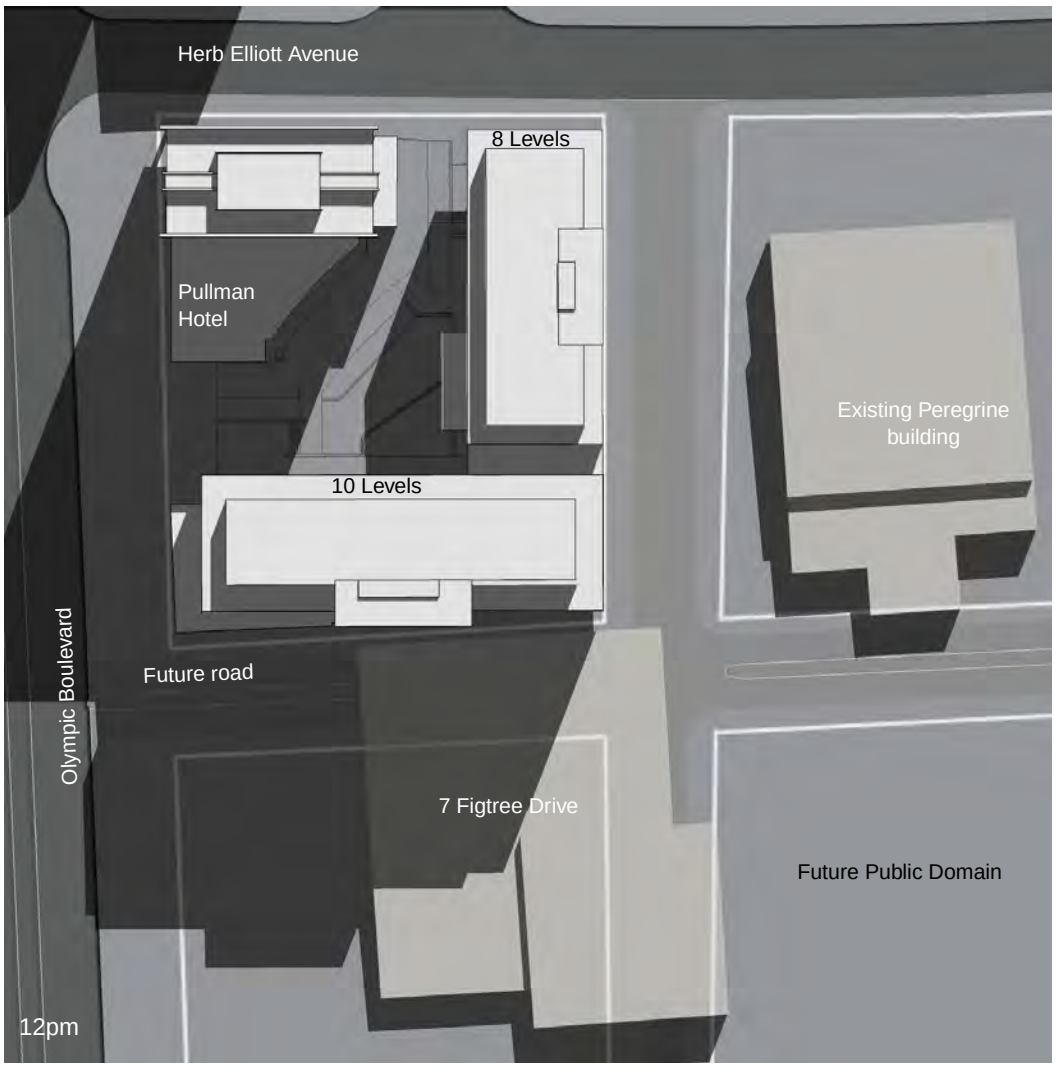
Site 4B Sydney Olympic Park
Response to S75W Submissions Received and Recommendations

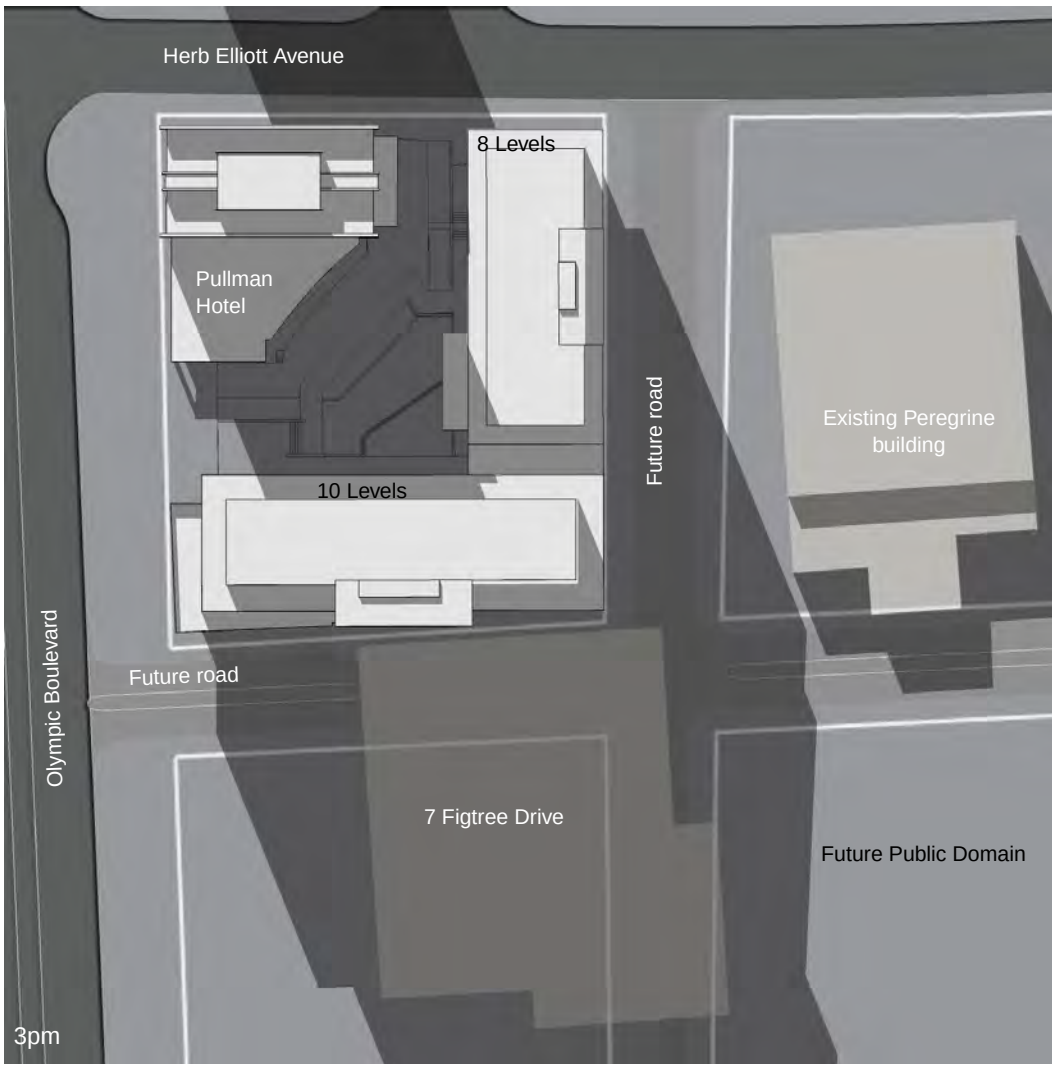
BS Project Number: S10665
6 June 2011

1A. Shadow Analysis South Building - Planning Application Proposal 17 December 2010

June 21







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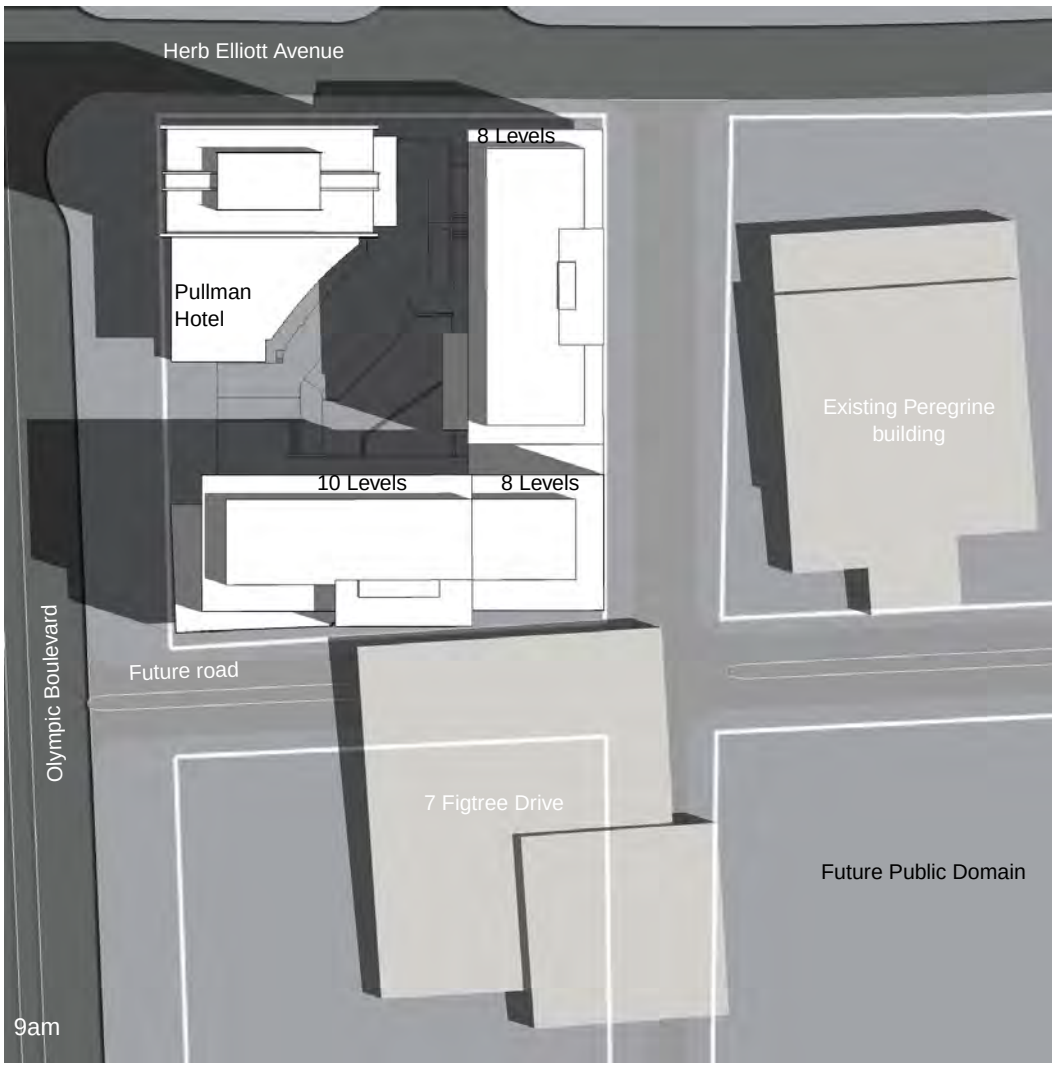
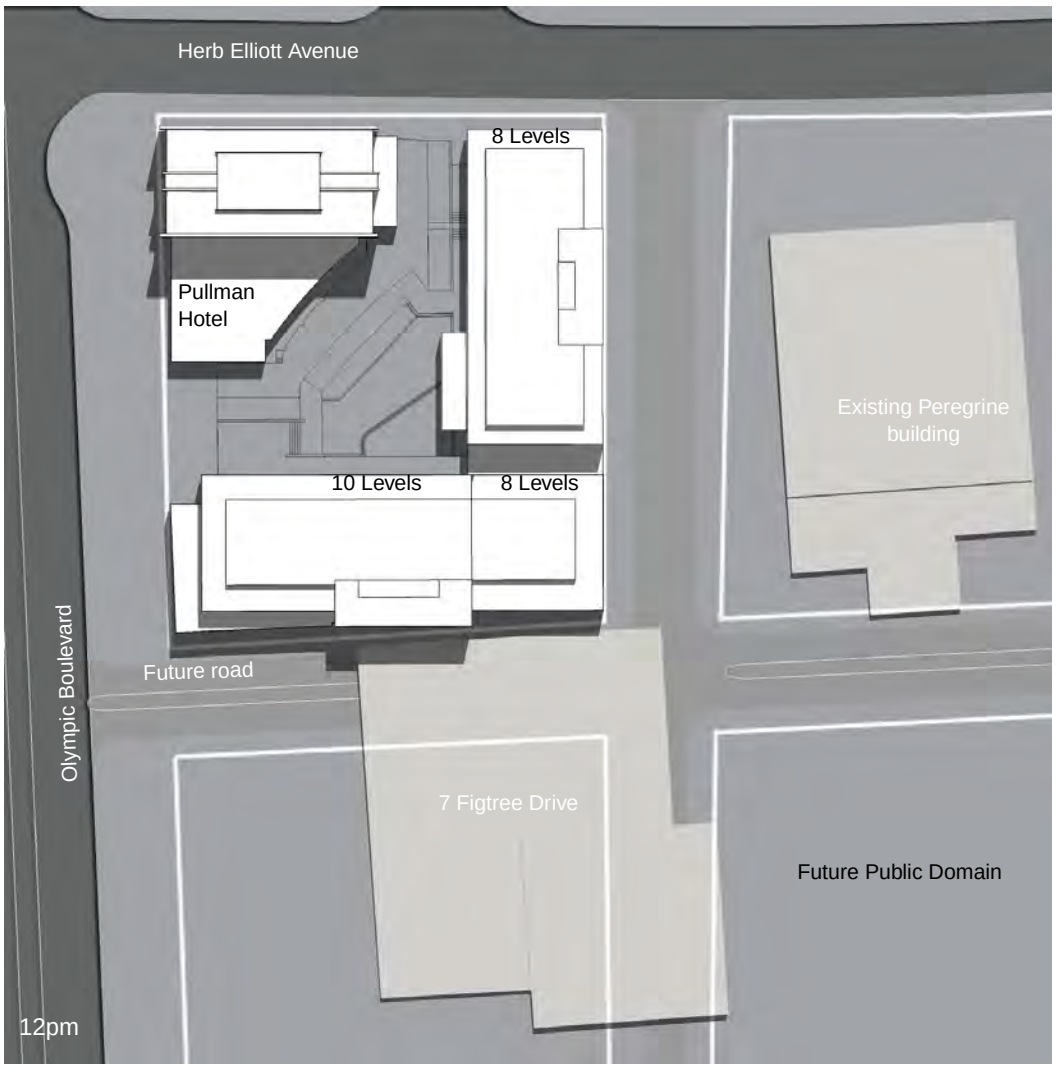
Site 4B Sydney Olympic Park
Response to S75W Submissions Received and Recommendations

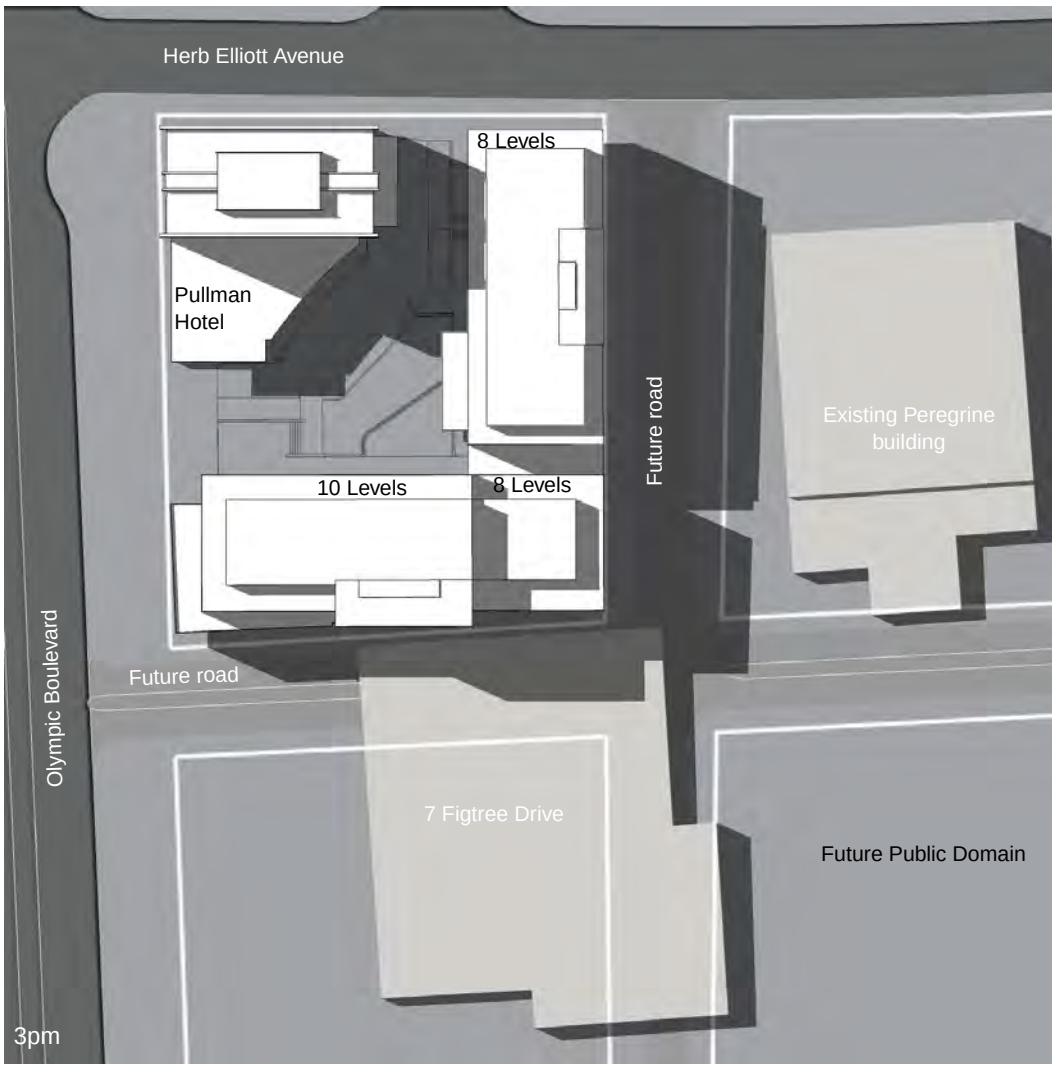
BS Project Number: S10665
6 June 2011

1B. Shadow Analysis South Building - 10/8 Level Building

December 21







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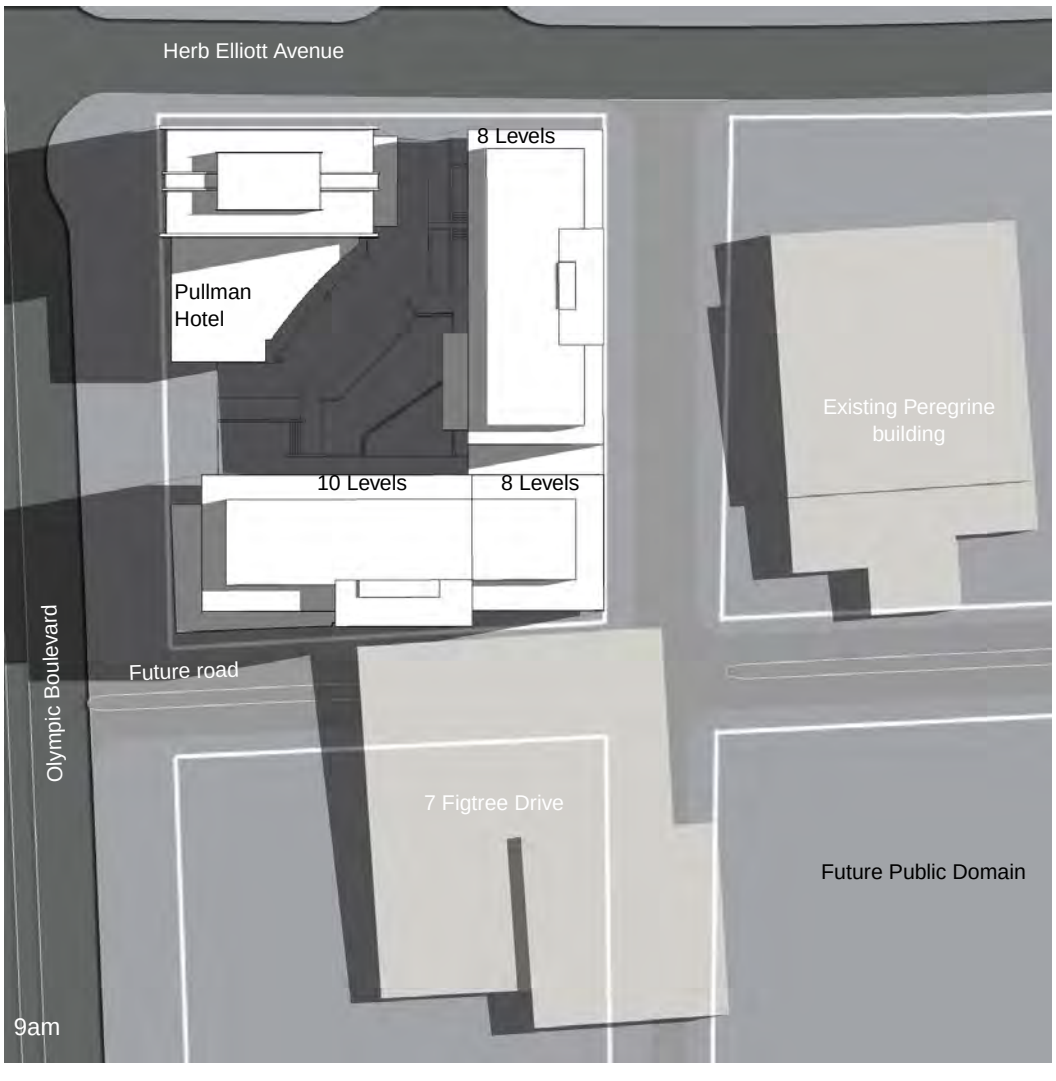
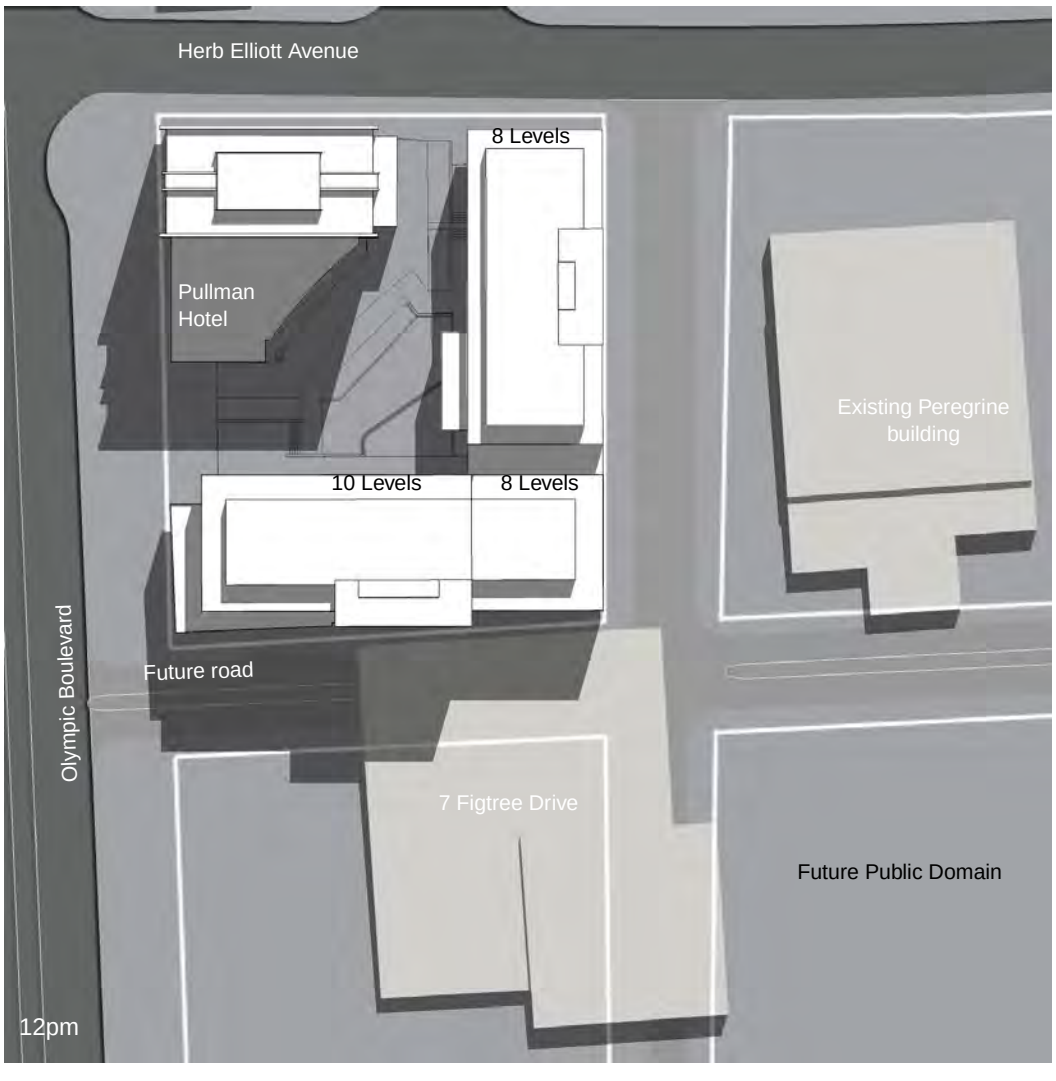
Site 4B Sydney Olympic Park
Response to S75W Submissions Received and Recommendations

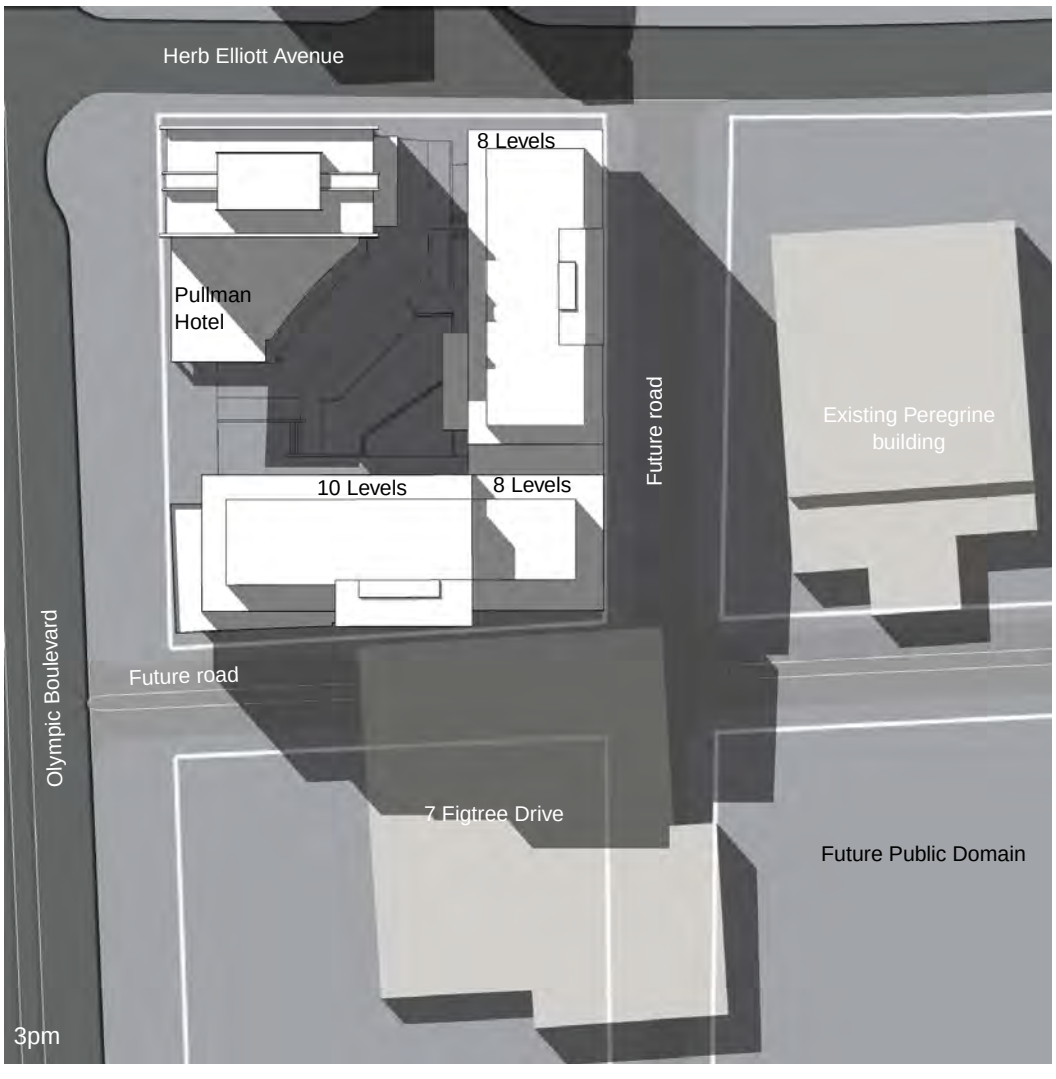
BS Project Number: S10665
6 June 2011

1B. Shadow Analysis South Building - 10/8 Level Building

March 21 / September 23







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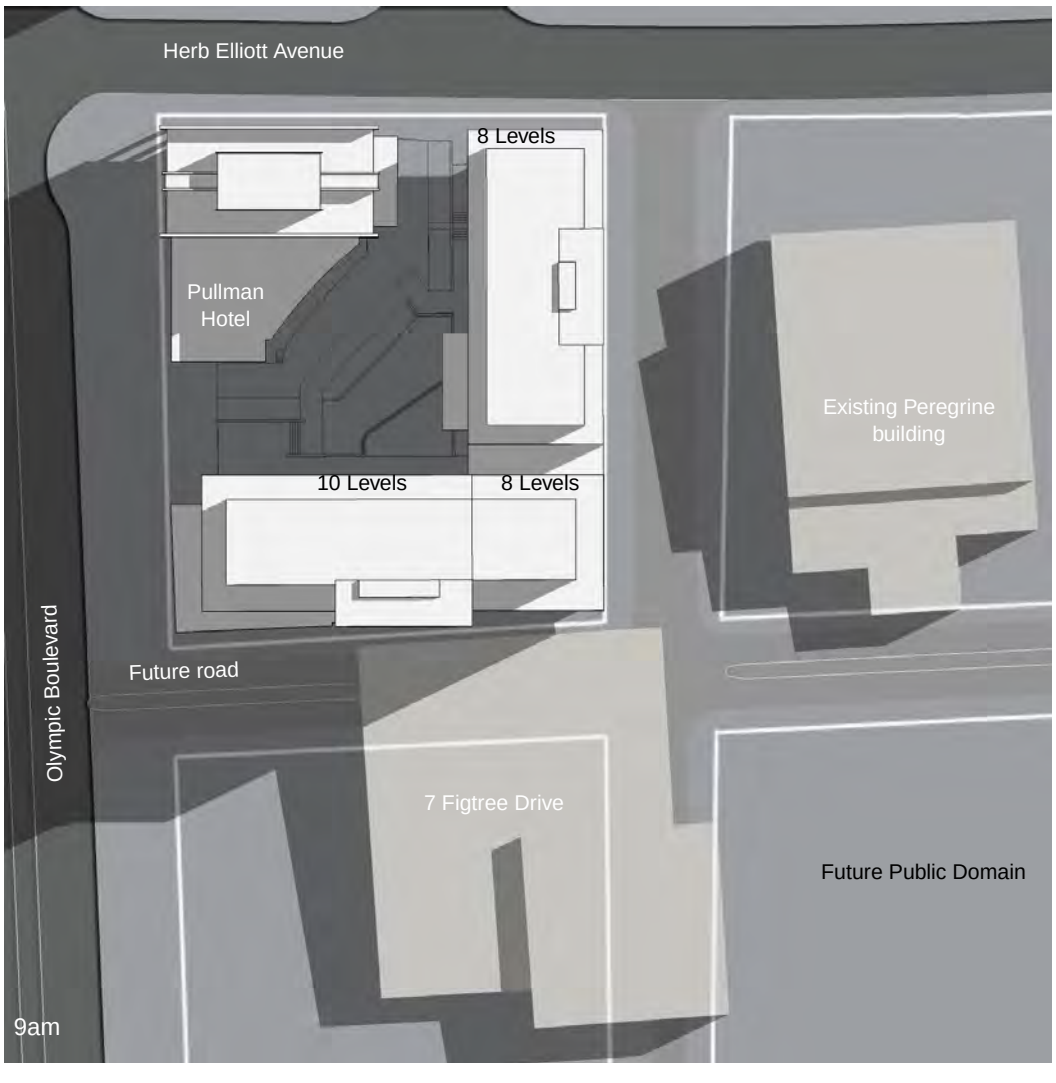
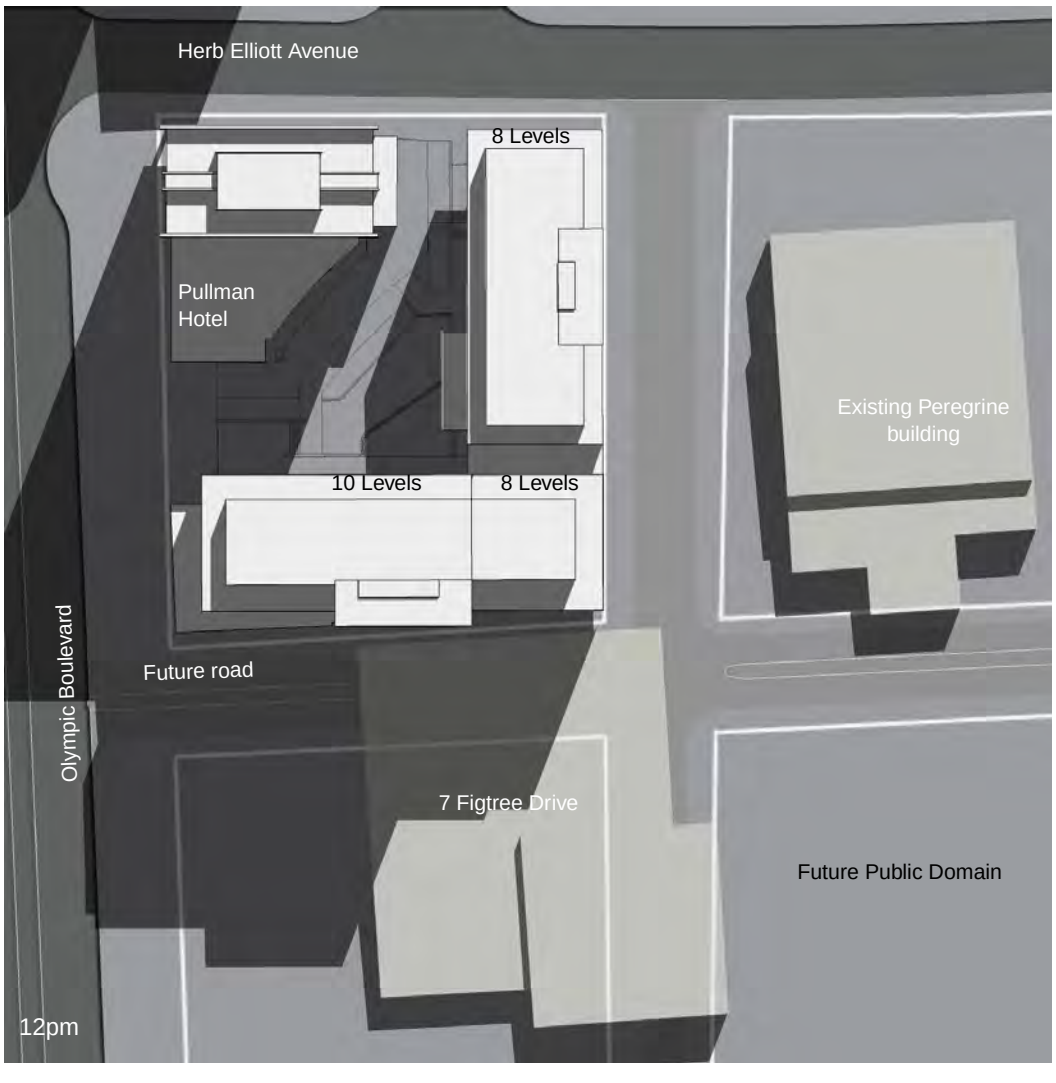
Site 4B Sydney Olympic Park
Response to S75W Submissions Received and Recommendations

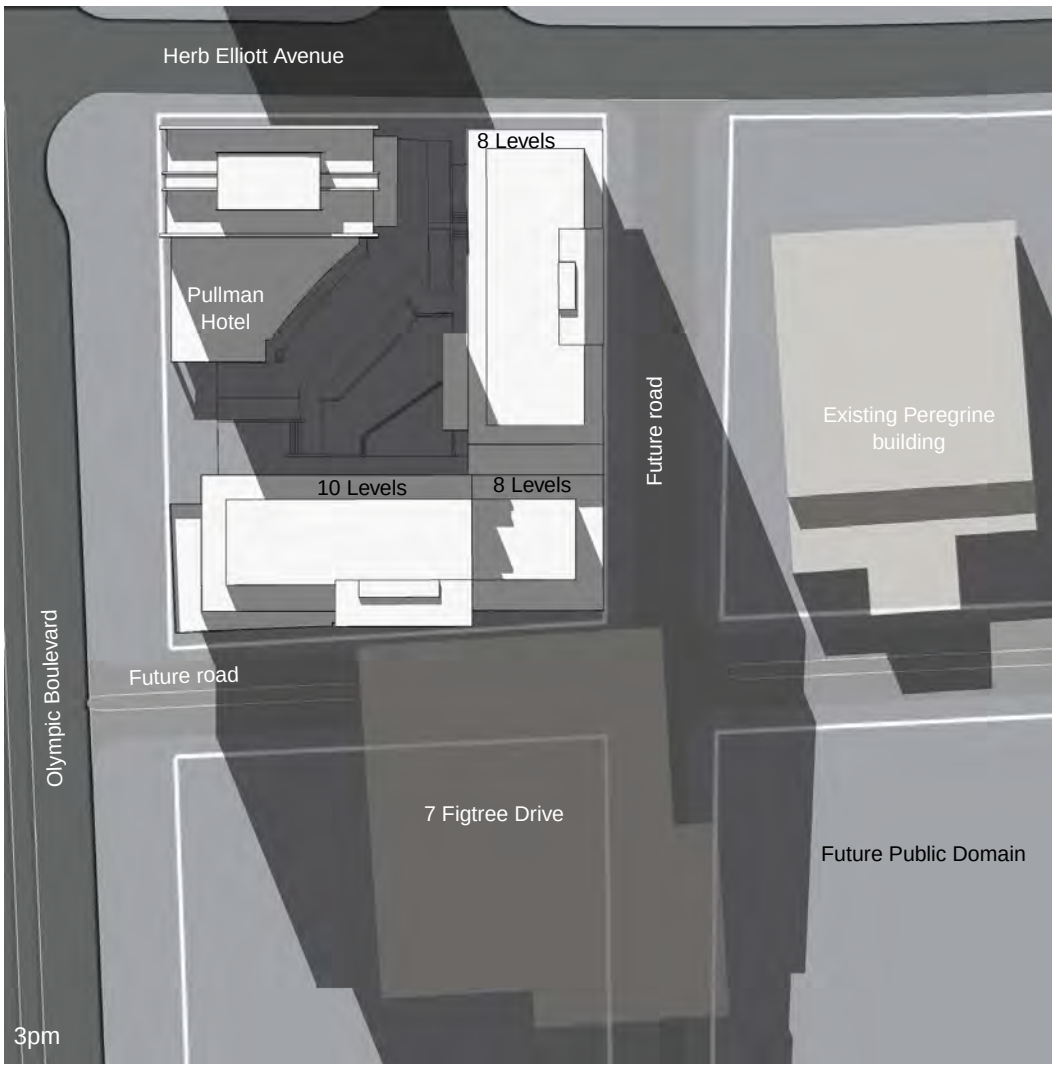
BS Project Number: S10665
6 June 2011

1B. Shadow Analysis South Building - 10/8 Level Building

June 21







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Site 4B Sydney Olympic Park
Response to S75W Submissions Received and Recommendations

BS Project Number: S10665
6 June 2011

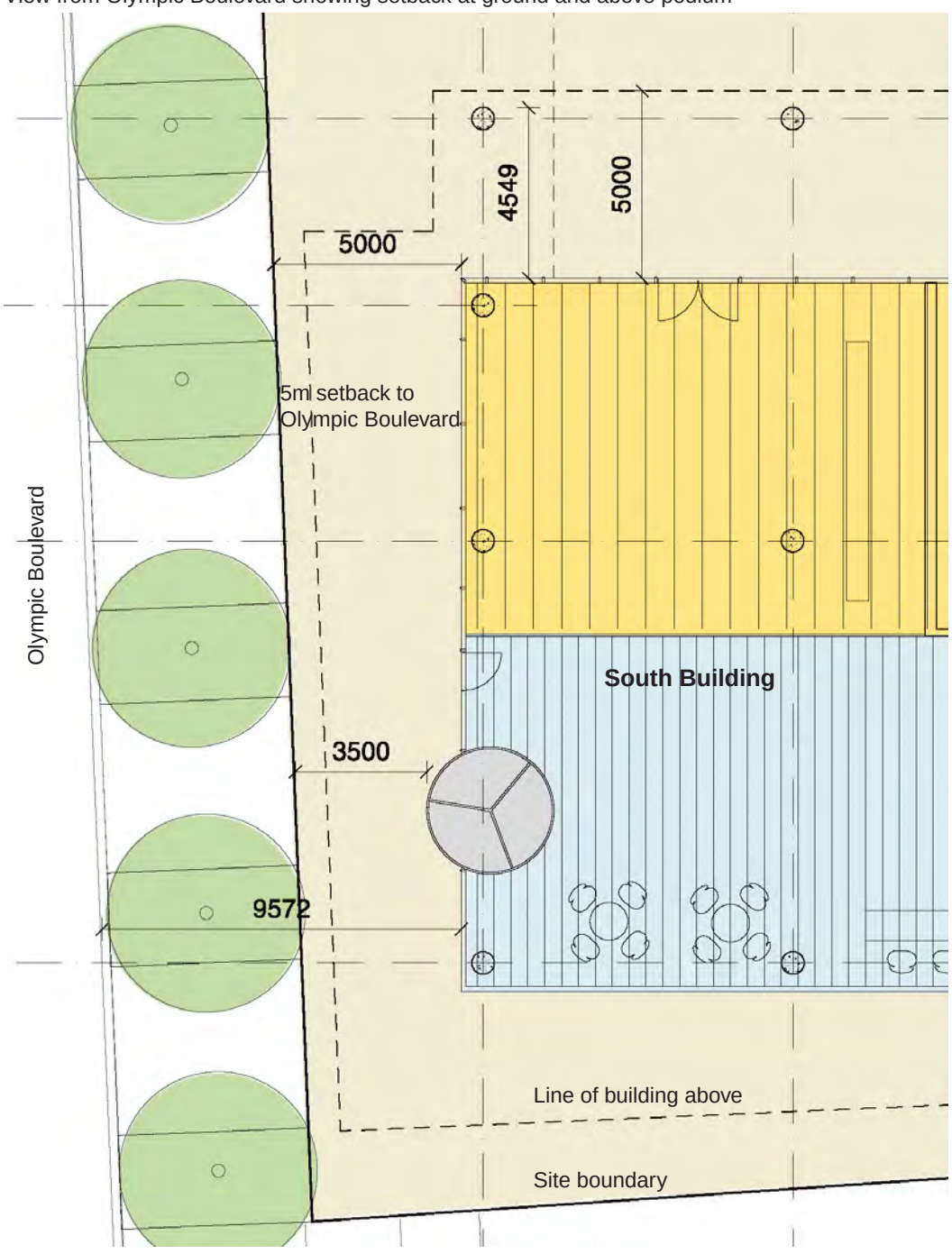
2. Building Setback Along Olympic Boulevard

DOP Commentary
Demonstrate compliance with the minimum 5m podium setback requirement from Olympic Boulevard and minimum 4m Olympic Boulevard colonade width requirement as stipulated within the Sydney Olympic Masterplan 2030.

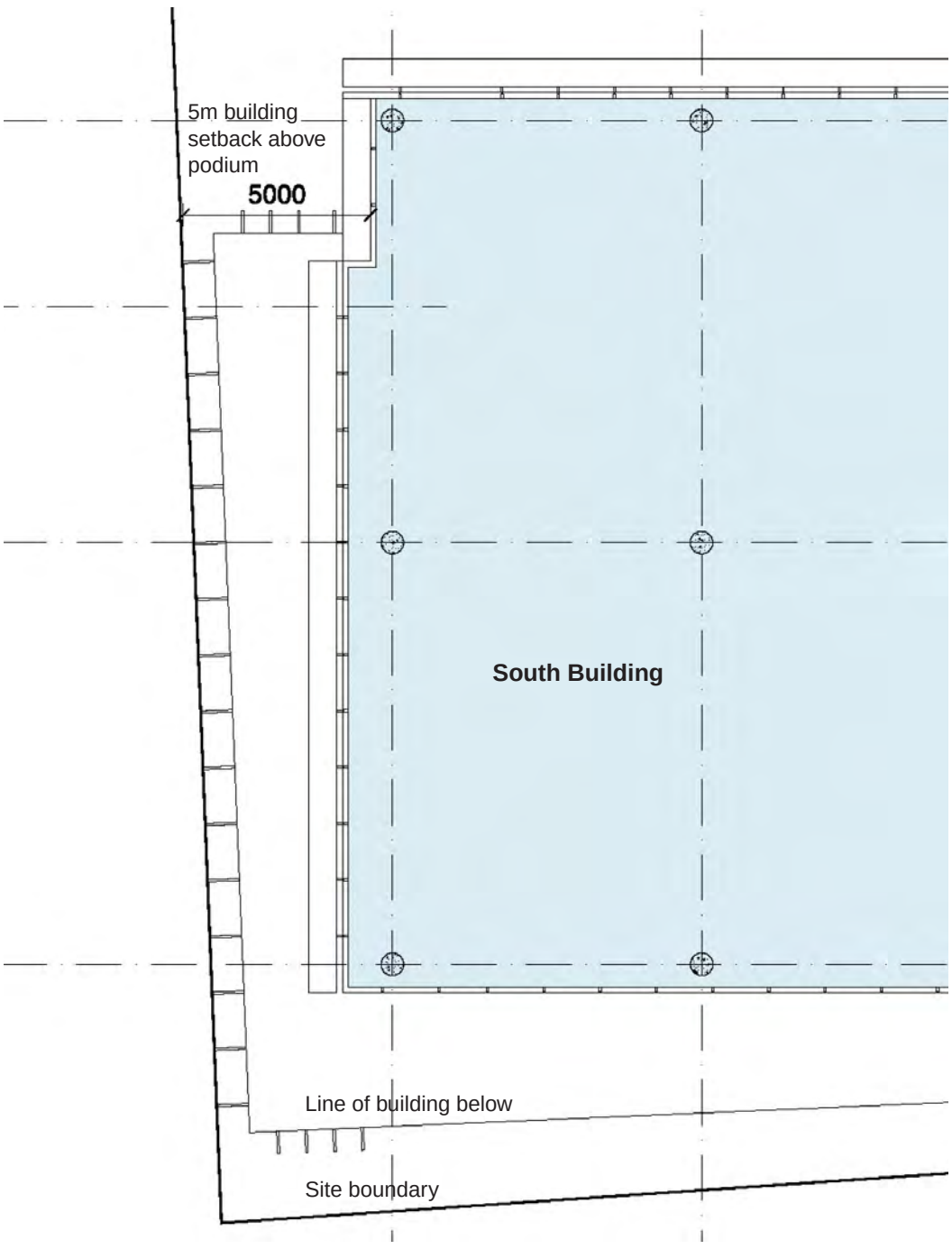
Response
As shown below the South building has a setback at ground from the property boundary along Olympic Boulevard which has a maximum width of 5m and a minimum width of 4.2m at the southern end. The setback from the Olympic Boulevard kerb edge is between 9.5 and 11metres. This zone is unencumbered by columns. The perspective adjacent shows this arrangement in more detail, including the notch to the west face of the facade articulating the corner.

Of importance is this building's relationship to the Pullman Hotel to the North. This hotel has a setback from Olympic Boulevard of 4.1m at its northern edge and a setback of 3m at its southern edge. The setbacks proposed for the South Building are greater therefore than the setbacks at the Pullman Hotel. The South building alignment along Olympic Boulevard is intended to mediate between the Pullman Hotel to the north and any new development proposed to the south on site 48.

View from Olympic Boulevard showing setback at ground and above podium



South Building Entry West side



South Building Typical Levels 7-9

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Site 4B Sydney Olympic Park

Response to S75W Submissions Received and Recommendations

BS Project Number: S10665
6 June 2011

3. Revolving Doors

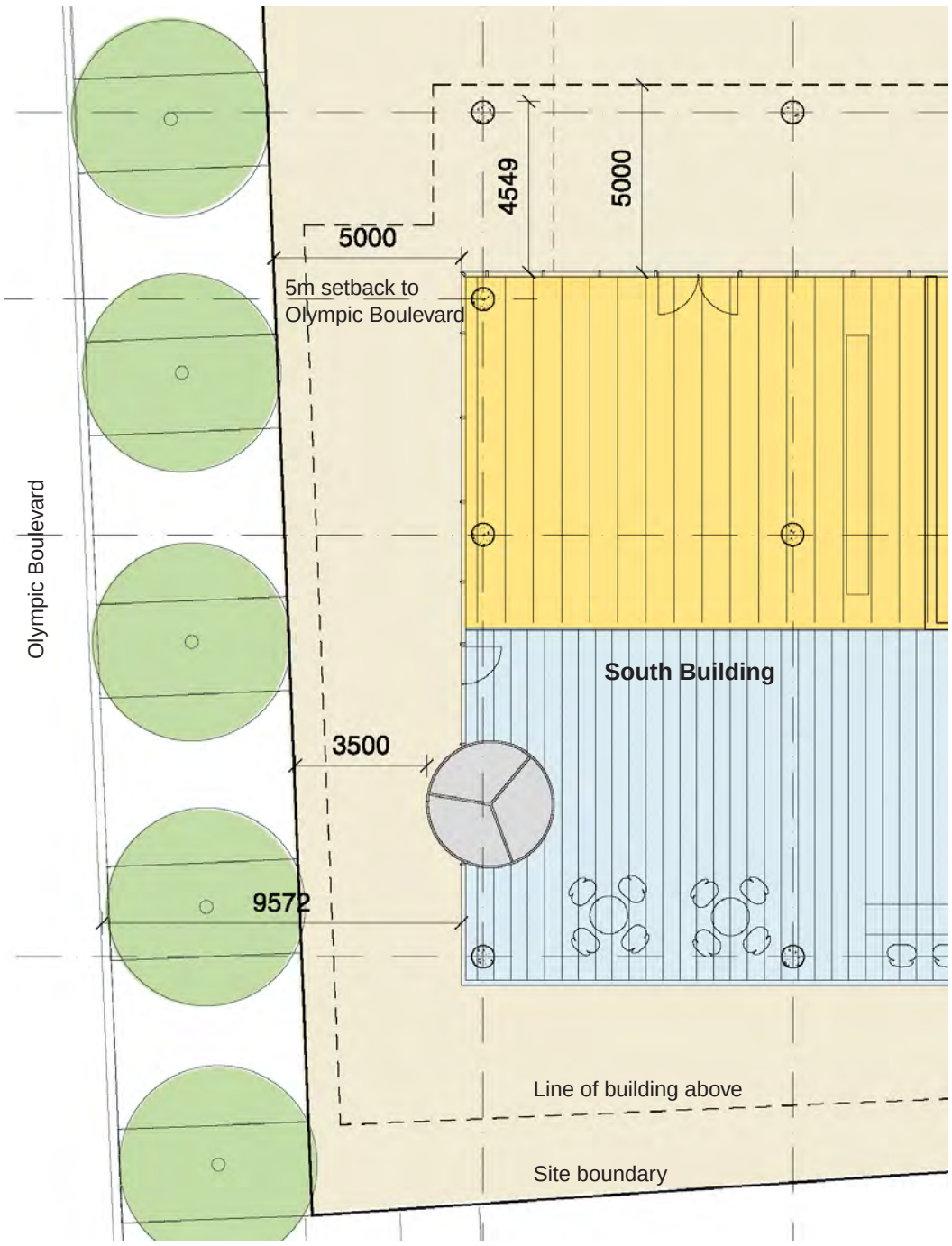
SOPA Commentary

The Revolving door on the Olympic Boulevard frontage should not project into the colonnade zone as it presents a hazard to the visual and mobility impaired.

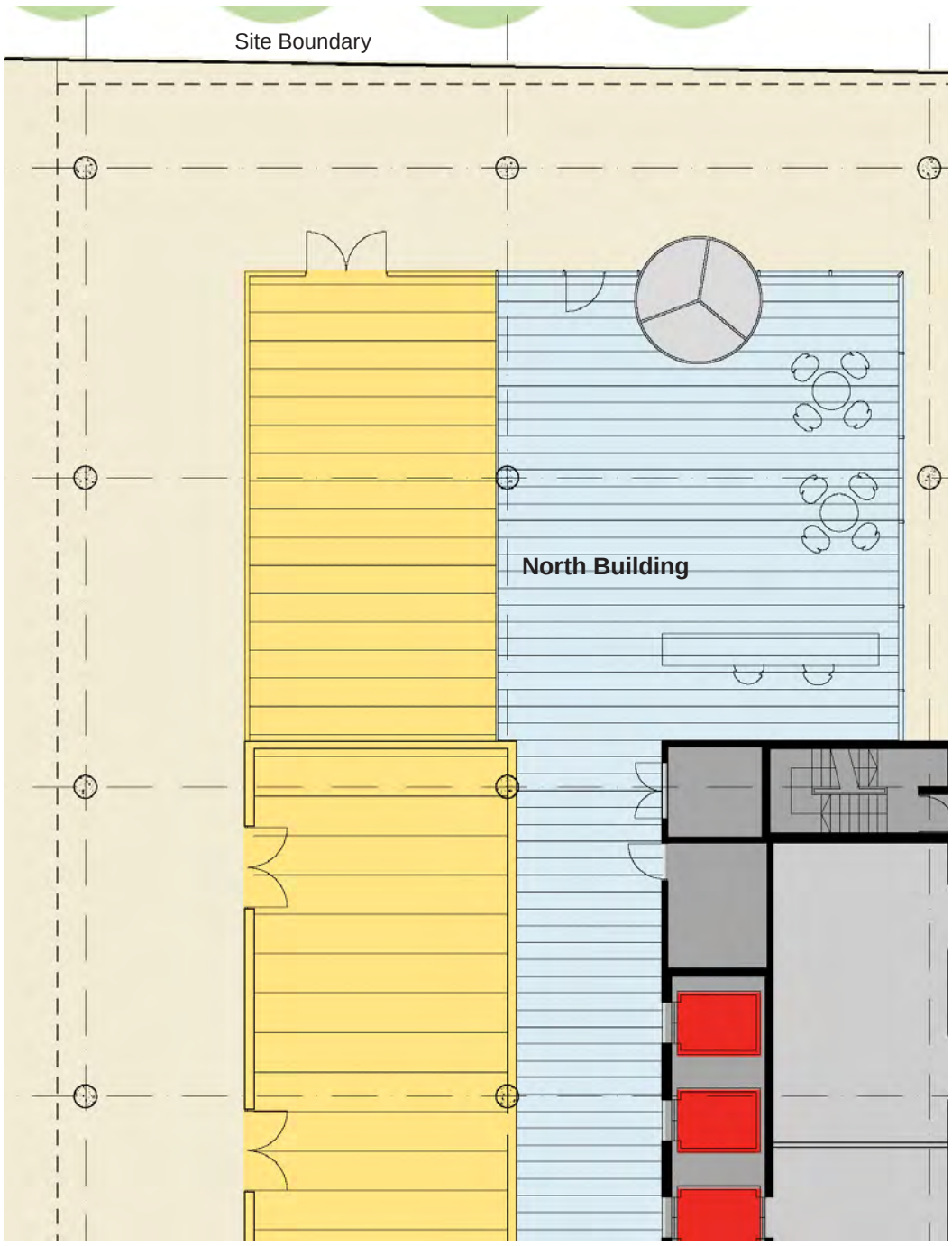
Response

The doors will be setback 3.5m from the property boundary and 9.5m from the Olympic Boulevard kerb edge allowing for a generous, open clear zone in which to circulate. around the edge of the building.

The advice, as provided by David Goding of Morris Goding Accessibility Consultant, is that 'where the door protrudes into the colonnade, there is a rounded obstruction (door casing) that warns/affords a person a better degree of safety when negotiating the door. The proposed design with the door projecting into the colonnade is in my opinion a better option than the recessing of the door into the façade line and therefore the recommended solution.'



South Building Entry

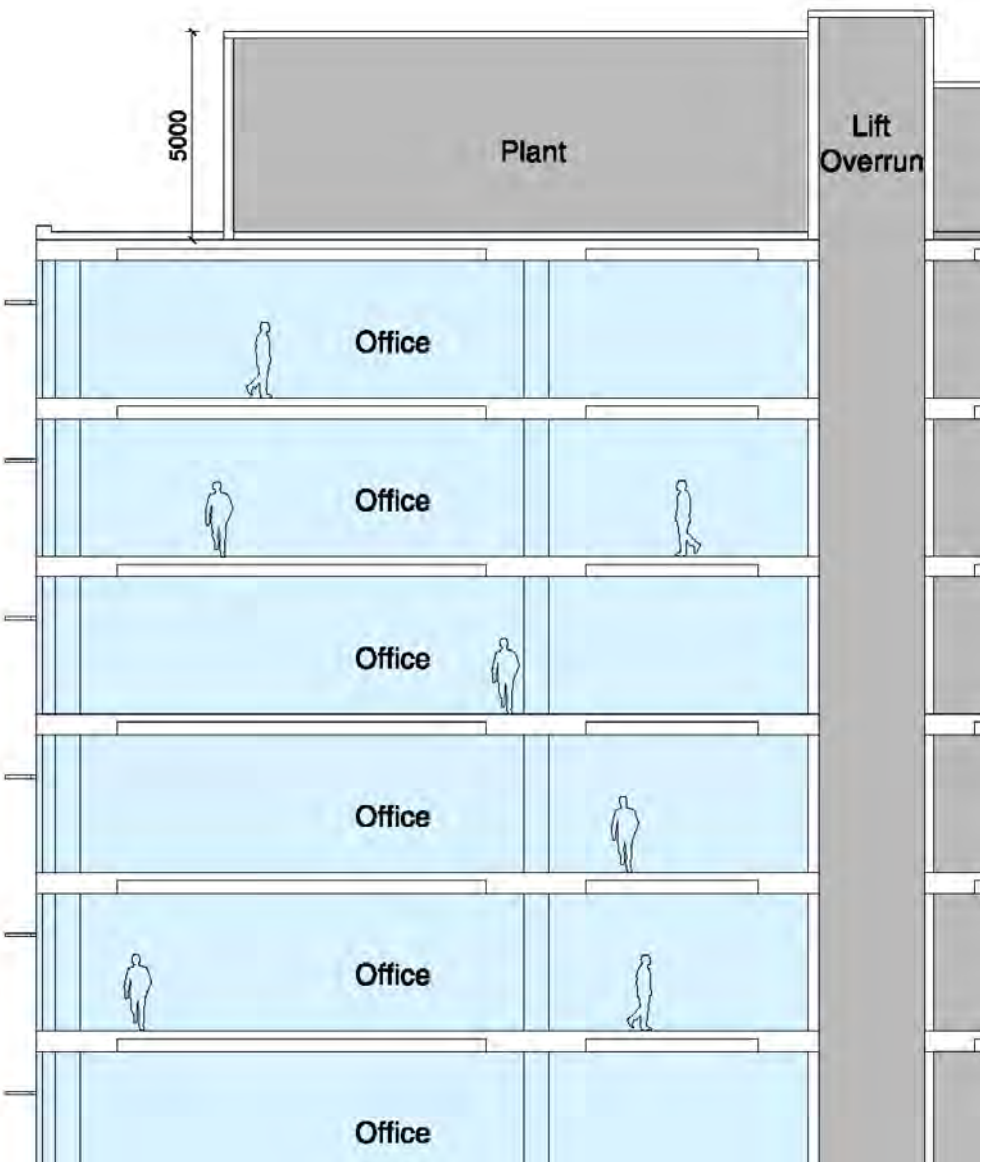


North Building Entry

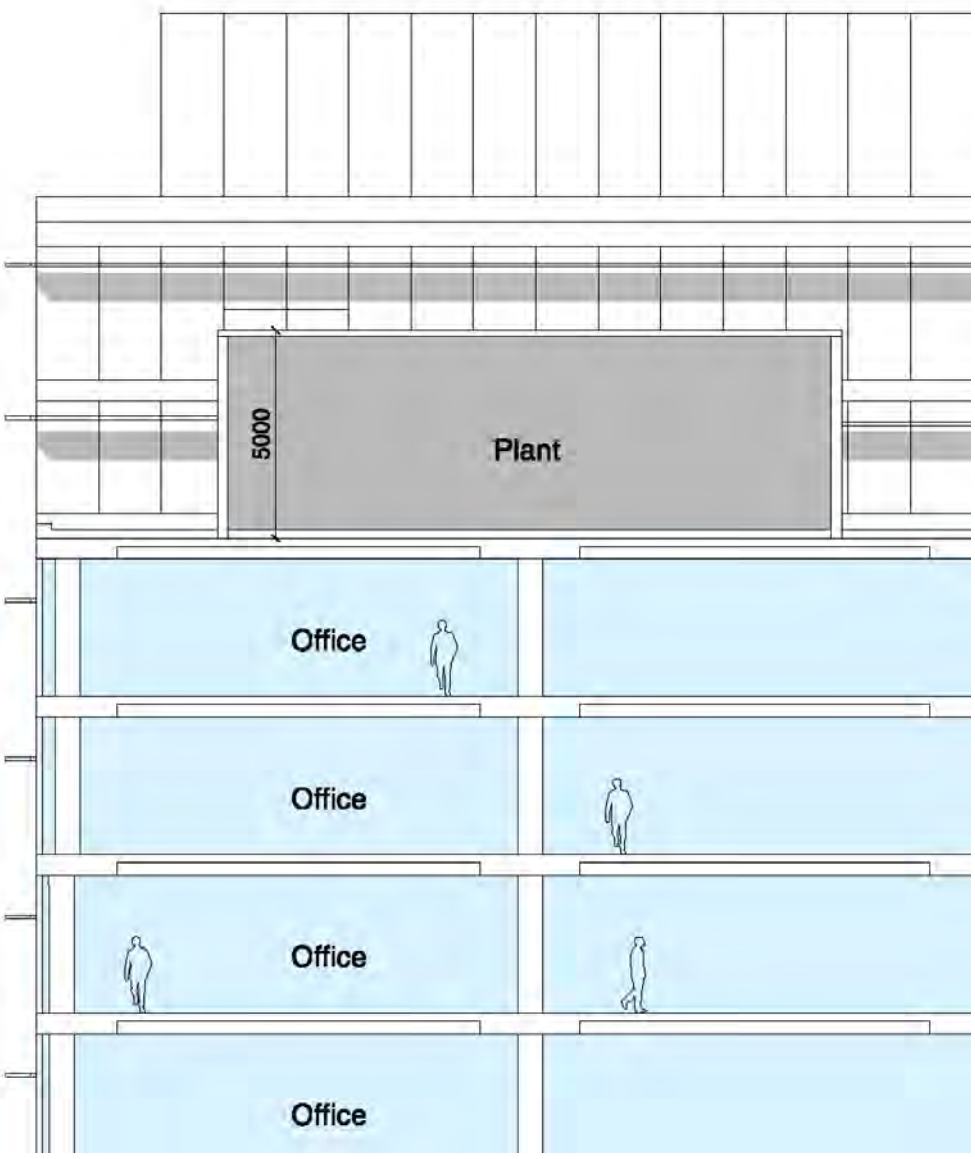
4. Plant Height

DOP Commentary
Demonstrate compliance with the maximum 5m height rooftop services zone, as stipulated within the Sydney Olympic Masterplan 2030.

Response
Generally, the maximum height of the rooftop plant zone is 5m with plant such as lift over runs and the like exceeding 5m to a maximum of 20% of the roof area.



South Building Plant



North Building Plant

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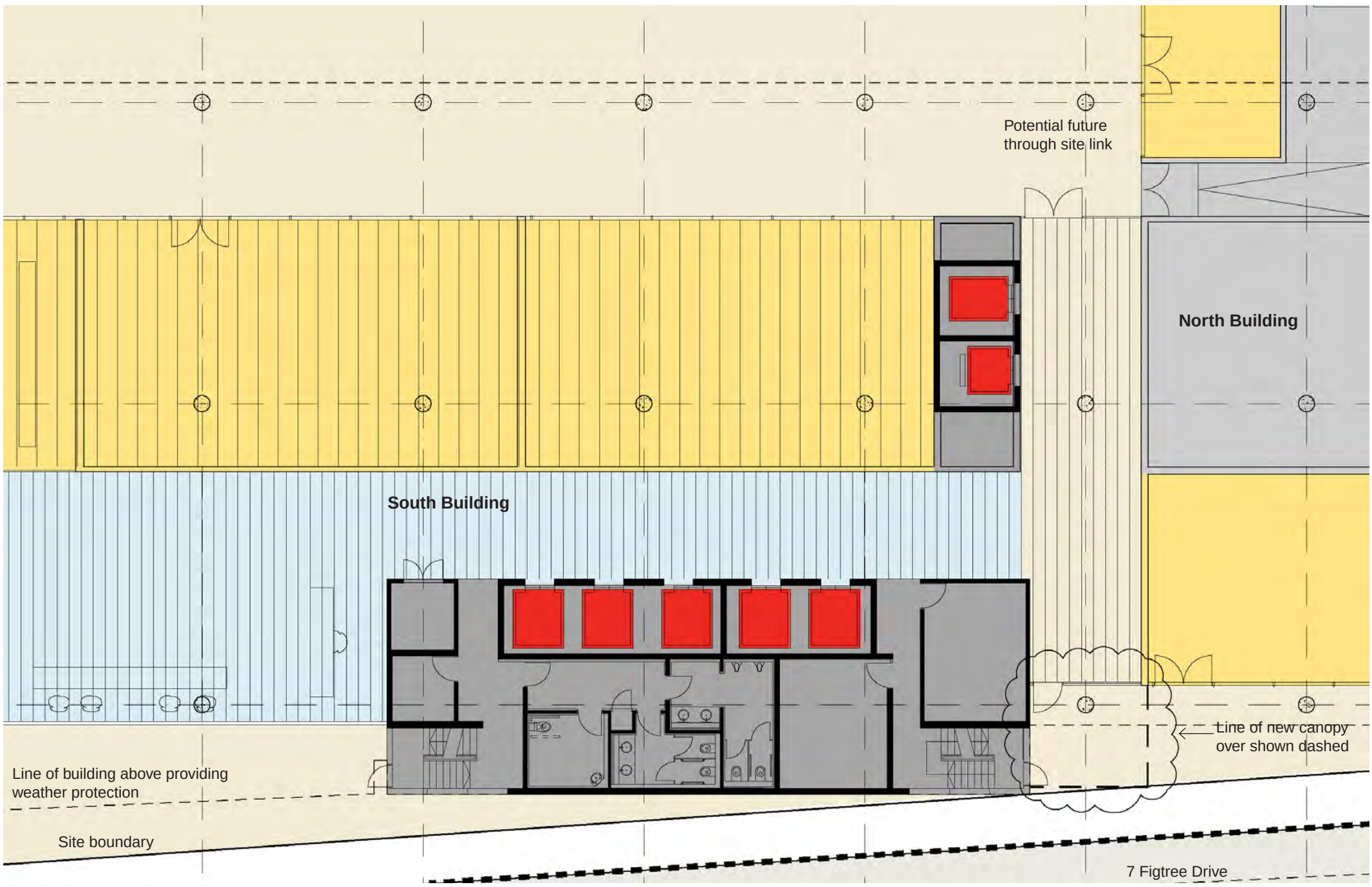
Site 4B Sydney Olympic Park
Response to S75W Submissions Received and Recommendations

BS Project Number: S10665
6 June 2011

5. Canopy to South Building

SOPA Commentary
Continuous sheltered access should be provided along the Southern elevation of the South Building.

Response
A canopy will be provided on the eastern side of the South Building as shown below. In addition the building overhang on the west side of the South Building provides extensive weather protection as shown below.



South Building New Canopy at Entry

APPENDIX 3

Vibration Impact Assessment
Renzo Tonin & Associates

RENZO TONIN & ASSOCIATES
inspired to achieve

Consultants in Acoustics, Vibration & Structural Dynamics
email: sydney@renzotonin.com.au
website: www.renzotonin.com.au

SITE 4B, SYDNEY OLYMPIC PARK

CONSTRUCTION VIBRATION MANAGEMENT PLAN

TD426-02F02 (REV 2) VIBRATION MANAGEMENT PLAN.DOC

3 JUNE 2011

Prepared for:

Lend Lease Project Management and Construction (Australia) Pty Limited

Level 4, 30 The Bond

30 Hickson Road

Millers Point NSW 2000

Attention: MS SARAH CRENNAN

25 1982-2007 ACOUSTIC ENGINEERING EXCELLENCE

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DOCUMENT CONTROL

Date	Revision History	Non-Issued Revision	Issued Revision	Prepared By (initials)	Instructed By (initials)	Reviewed & Authorised by (initials)
23/05/2011	Report generation	-	0	MCH	-	MCH
25/05/2011	Revise report	-	1	MCH	-	MCH
03/06/2011	Finalise report	-	2	MCH	-	MCH

The work presented in this document was carried out in accordance with the Renzo Tonin & Associates Quality Assurance System, which is based on Australian Standard / NZS ISO 9001.

This document is issued subject to review and authorisation by the Team Leader noted by the initials printed in the last column above. If no initials appear, this document shall be considered as preliminary or draft only and no reliance shall be placed upon it other than for information to be verified later.

This document is prepared for our Client's particular requirements which are based on a specific brief with limitations as agreed to with the Client. It is not intended for and should not be relied upon by a third party and no responsibility is undertaken to any third party without prior consent provided by Renzo Tonin & Associates. The information herein should not be reproduced, presented or reviewed except in full. Prior to passing on to a third party, the Client is to fully inform the third party of the specific brief and limitations associated with the commission.

The information contained herein is for the purpose of acoustics only. No claims are made and no liability is accepted in respect of design and construction issues falling outside of the specialist field of acoustics engineering including and not limited to structural integrity, fire rating, architectural buildability and fit-for-purpose, waterproofing and the like. Supplementary professional advice should be sought in respect of these issues.

CONTENTS

List of Tables

1 INTRODUCTION

Renzo Tonin & Associates were engaged to prepare a Construction Vibration Management Plan (CVMP) for the proposed development at Site 4B, Sydney Olympic Park. More specifically, this management plan will address concerns from a neighbouring premise, Silanna Semiconductor, about vibration impacts to sensitive equipment as a result of the proposed construction activities at Site 4B.

As part of the management plan, this document will:

- Identify the potential sources of vibration during the proposed works;
- Specify the vibration criteria for the proposed works;
- Describe in detail what actions and measures could be implemented to enable these works to comply with the relevant vibration criteria;
- Describe how the effectiveness of these actions and measures would be monitored during the proposed works, clearly indicating who would conduct the monitoring, how often this monitoring would be conducted, how the results of this monitoring would be recorded and if any non-compliance is detected; and
- Describe procedures to handle complaints.

The work documented in this report was carried out in accordance with the Renzo Tonin & Associates Quality Assurance System, which is based on the Australian Standard / NZS ISO 9001.

2 PROJECT DESCRIPTION

2.1 Site Description

The project involves the construction of a multi-storey commercial complex on Site 4B located in Sydney Olympic Park. Herb Elliot Avenue bounds the site to the north; Olympic Boulevard to the west; the Sydney Olympic Park Authority (SOPA) building to the south and the Silanna Semiconductor premise to the east. The IBIS Hotel and the Australian Paralympic Committee (APC) buildings are also located to the north across Herb Elliot Avenue. There are no residential areas located within the vicinity of Site 4B.

Following concerns raised by Silanna Semiconductors the applicable receiver is as follows:

- **Receiver R1 – Silanna Semiconductor**
  Commercial premises directly east of the site and sharing a common boundary with the site. Sensitive equipment is used for the manufacturing operation within the premises.

Figure 1 shows the site, surrounds and receiver location.

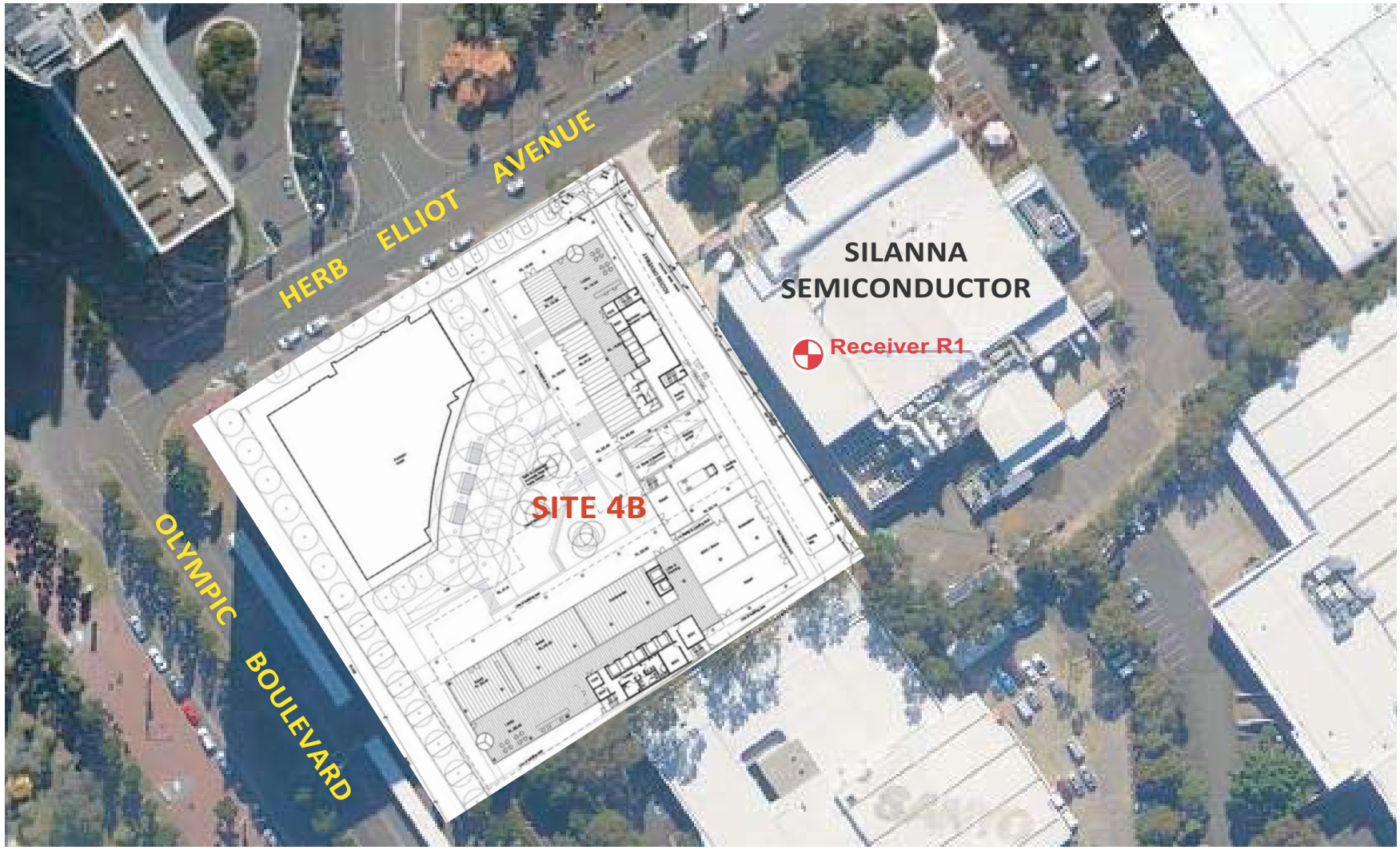
2.2 Hours of Work

The expected hours for construction works are as follows:

- Mondays to Fridays – 7am to 6pm
- Saturdays – 8am to 3pm
- Sundays & Public Holidays – No work performed
- Special events days as specified by SOPA – No work performed

It must be noted work may occasionally be conducted outside of the above hours due to unforseen circumstances, eg. requirements of the Police or other authorities, during emergencies, etc. However, owners and occupants of affected properties will be notified at least 48 hours prior to the commencement of the out of hours work.

The duration of the construction works is anticipated to be for 90 weeks.



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Kuwait - Ph: +0011 965 653 1520
Member of the Association of Australian Acoustical Consultants

Title: Figure 1 : Site, Surrounds & Receiver Locations

Date : 03/06/11

Scale:

Project: TD426-02 Site 4B Sydney Olympic Park

Ref : TD426-02P01 (rev 1)

3 VIBRATION SOURCES

Typical vibration levels from construction plant and equipment most likely to cause significant vibration are summarised below. The information was sourced from a variety of reference materials available in the Renzo Tonin & Associates library.

Table 3.1 – Typical Ground Vibration Generated by Construction Plant

Plant	Typical ground vibration
Excavator	Typical ground vibration levels from excavators are similar to those from jackhammers. They range from 1 mm/s to 2 mm/s at distances of approximately 5m and at distances greater than 20m, vibration levels are usually below 0.2 mm/s.
Drill Rig / Bored Piling	Typical ground vibration levels from a drilling rig undertaking bored piling activities are approximately 3.2 mm/s at distances of approximately 5m and 1 mm/s at distances of 10m. At distances greater than 20m, vibration levels are usually below 0.1 mm/s. Bored piling typically has low vibration emissions and is the preferred method when piles are required near sensitive receivers.
Rock Ripper	Typical ground vibration levels from rock rippers ripping hard rock and sandstone are approximately 1 mm/s at distances of approximately 4m.
Truck traffic	Typical vibration from heavy trucks passing over normal (smooth) road surfaces generate relatively low vibration levels in the range of 0.01 - 0.2mm/s at the footings of buildings located 10 - 20m from a roadway. Very large surface irregularities can cause levels up to five to ten times higher. In general, ground vibration from trucks is usually imperceptible in nearby buildings. The rattling of windows and other loose fittings that is sometimes reported is more likely to be caused by airborne acoustic excitation from very low frequency (infrasonic) noise radiated by truck exhausts and truck bodies. While this may cause concern to the occupants, the phenomenon is no different from the rattling caused by wind or people walking or jumping on the floor and fears of structural damage or even accelerated ageing are usually unfounded.

Vibration management strategies implemented on site shall consider these items of plant and construction activities involving these items of plant.

4 VIBRATION CRITERIA

The vibration management objective for the site is to limit vibration from construction activities so as to avoid impacts to sensitive equipment used as part of the manufacturing operations of Silanna Semiconductors (Receiver R1).

The effects of ground vibration on Receiver R1 may be broadly defined by the following three categories:

1. Disturbance to building occupants - Vibration in which the occupants or users of the building are inconvenienced or possibly disturbed,
2. Effects on building contents - Vibration where the building contents may be affected, and,
3. Effects on building structures - Vibration in which the integrity of the building or structure itself may be prejudiced.

In general, vibration criteria for human disturbance (1) are more stringent than vibration criteria for effects on building contents (2) and building structural damage (3). Hence, compliance with the more stringent limits dictated by Category 1, would ensure that compliance is also achieved for the other two categories.

4.1 Disturbance to Buildings Occupants

For disturbance to human occupants of buildings, we refer to the NSW Office of Environment and Heritage's (OEH – formerly DECCW) *'Assessing Vibration; a technical guideline'*, published in February 2006. This document provides criteria which are based on the British Standard BS 6472-1992, *'Evaluation of human exposure to vibration in buildings (1-80Hz)'*.

Vibration sources are defined as C*ontinuous, Impulsive or Intermittent.* Section 2 of the technical guideline defines each type of vibration as follows:

> ***'Continuous*** *vibration continues uninterrupted for a defined period (usually throughout the day-time and/or night-time).*
>
> ***Impulsive*** *vibration is a rapid build up to a peak followed by a damped decay that may or may not involve several cycles of vibration (depending on frequency and damping). It can also consist of a sudden application of several cycles at approximately the same amplitude, providing that the duration is short, typically less than 2 seconds.*
>
> ***Intermittent*** *vibration can be defined as interrupted periods of continuous or repeated periods of impulsive vibration that varies significantly in magnitude'.*

The criteria are to be applied to a single weighted root mean square (rms) acceleration source level in each orthogonal axis. Section 2.3 of the guideline states:

'Evidence from research suggests that there are summation effects for vibrations at different frequencies. Therefore, for evaluation of vibration in relation to annoyance and comfort, overall weighted rms acceleration values of the vibration in each orthogonal axis are preferred (BS 6472).'

Preferred and maximum values for continuous and impulsive vibration are defined in Table 2.2 of the guideline and are reproduced below.

Table 4.1 – Preferred and Maximum Weighted rms Values for Continuous and Impulsive Vibration Acceleration (m/s^2) 1-80Hz

Location	Assessment period[1]	Preferred values		Maximum values	
		z axis	x & y axis	z axis	x & y axis
Continuous vibration					
Critical areas[2]	Day- or night-time	0.005	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
Offices, schools, educational institutions and places of worship	Day- or night-time	0.020	0.014	0.040	0.028
Workshops	Day- or night-time	0.04	0.029	0.080	0.058
Impulsive vibration					
Critical areas[2]	Day- or night-time	0.005	0.0036	0.010	0.0072
Residences	Daytime	0.30	0.21	0.60	0.42
	Night-time	0.10	0.071	0.20	0.14
Offices, schools, educational institutions and places of worship	Day- or night-time	0.64	0.46	1.28	0.92
Workshops	Day- or night-time	0.64	0.46	1.28	0.92

Notes: *1. Daytime is 7.00 am to 10.00 pm and night-time is 10.00pm to 7.00 am*

2. Examples include hospital operating theatres and precision laboratories where sensitive operations are occurring. There may be cases where sensitive equipment or delicate tasks require more stringent criteria than the human comfort criteria specified above. Stipulation of such criteria is outside the scope of their policy and other guidance documents (e.g. relevant standards) should be referred to. Source: BS 6472-1992

Intermittent vibration is to be assessed using vibration dose values (VDVs). The VDV method is a fourth power approach which is more sensitive to peaks in the acceleration waveform and makes corrections to the criteria based on the duration of the source's operation. The VDV can be calculated using the overall weighted rms acceleration of the vibrating source in each orthogonal axis and the total period during which the vibration may occur. Weighting curves are provided in each orthogonal axis in the guideline. Preferred and maximum VDV values are defined in Table 2.4 of the guideline and are reproduced below.

Table 4.2 – Acceptable Vibration Dose Values for Intermittent Vibration ($m/s^{1.75}$)

Location	Daytime [1]		Night-time [1]	
	Preferred values	Maximum values	Preferred values	Maximum values
Critical areas[2]	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

Notes: *1. Daytime is 7.00 am to 10.00 pm and night-time is 10.00pm to 7.00 am*

2. Examples include hospital operating theatres and precision laboratories where sensitive operations are occurring. These criteria are only indicative, and there may be a need to assess intermittent values against the continuous or impulsive criteria for critical areas. Source: BS 6472-1992

Based on Table 4.1 and Table 4.2 above, areas where sensitive equipment are located within the Silanna Semiconductor premises (Receiver R1) shall be assessed against the criteria for *'Critical Areas'*.

4.2 Specific Vibration Limits for Sensitive Equipment

Vibration limits for the sensitive equipment within the Silanna Semiconductor premises have also been provided in a letter issued by Silanna Semiconductor, dated 8th March 2011. The vibration limits were provided by the manufacturer of the sensitive equipment and are expressed as Power Spectrum Density (PSD) and are based on vibration levels measured on the floor or concrete platform where the equipment is installed.

The vibration limits as provided by the manufacturer are presented in Figures 2 and 3 below.

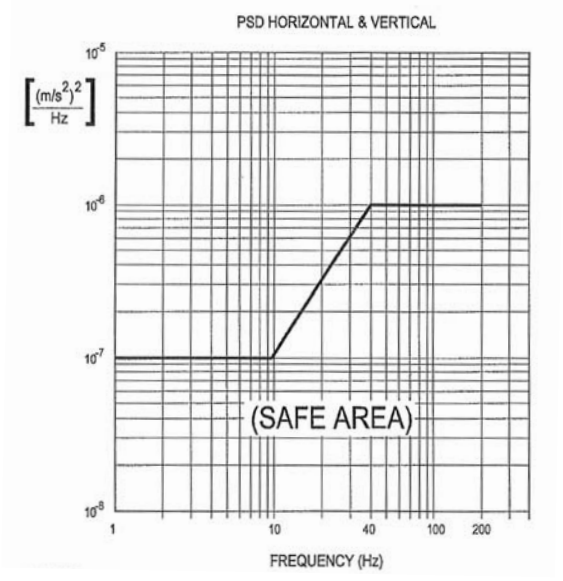


Figure 2: Exposure unit, bottom module and WTS – Floor vibration PSD specifications

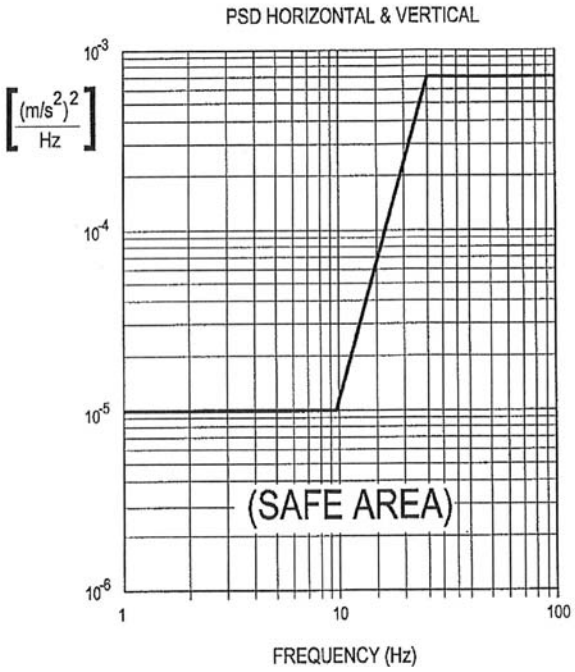


Figure 3: Excimer laser and beam delivery – floor vibration PSD specifications

In order to confirm compliance with the above PSD specifications, it is recommended that measurements of PSD levels at or near the floor or concrete platform where the sensitive equipment are located within the Silanna Semiconductor premises be undertaken prior to construction works on site.

5 BUFFER DISTANCES FOR VIBRATION CONTROL

The relationship between vibration and the probability of causing human annoyance or damage to structures is complex. This complexity is mostly due to the magnitude of the vibration source, the particular ground conditions between the source and receiver, the foundation-to-footing interaction and the large range of structures that exist in terms of design (eg dimensions, materials, type and quality of construction and footing conditions). The intensity, duration, frequency content and number of occurrences of a vibration, all play an important role in both the annoyance caused and the strains induced in structures.

As the pattern of vibration radiation is very different to the pattern of airborne noise radiation, and is very site specific, below are some indicative minimum 'buffer' distances determined for some common construction plant with data available from recent projects, which assist to avoid exceeding the human comfort criteria for 'critical areas' in terms of perceptible (or tactile) vibration during construction activities associated with the Site 4B development.

Table 5.1 – Recommended Minimum Buffer Distances for Construction Plant

Plant Item	Recommended Minimum Buffer Distance (m)
Excavators	15
Drill Rig / Bored Piling	20
Rock Ripper	10
Truck movements	10

Note: Above buffer distances are applicable to critical areas

Given that the nearest building at the Silanna Semiconductor site is a minimum of approximately 15m from the proposed buildings on Site 4B where construction activities will be undertaken, vibration limits for critical areas will be met when the above equipment is in operational, except for the drilling / bored piling rig.

It is noted that these are indicative distances only, relevant to critical areas for which Receiver R1 has been assessed against. More detailed site specific buffer distances should be determined once vibration emission levels are measured from each high vibrating plant item prior to the commencement of their regular use on site to confirm actual site specific buffer distances.

Furthermore, periodic vibration monitoring should be conducted at or near sensitive equipment of the Silanna Semiconductor premises when equipment are being used near the common boundary shared between the site and the Silanna Semiconductor property. Measured vibration levels are to be tested for compliance with the set vibration limits for human comfort and PSD limits provided by the manufacturer of the sensitive equipment. This monitoring shall be undertaken in accordance with the vibration monitoring methods described in Appendix D of this report.

6 VIBRATION MANAGEMENT MEASURES

Further to buffer distances, to ensure vibration impacts are minimised during the construction period, the following vibration management control measures are provided:

1. The proper implementation of a vibration management plan is required to avoid adverse vibration disturbance to affected occupancies. Consultation with occupants and property owners is recommended and should be aimed at providing a communication path directly to the contractor.

2. A management procedure will be implemented to deal with vibration complaints. Each complaint will be investigated and where vibration levels are established as exceeding the set limits, appropriate amelioration measures shall be put in place to mitigate future occurrences. An example of a vibration complaint management procedure and complaint form is presented in Appendix E of this report.

3. Carry out vibration testing of actual equipment on site prior to the construction works to determine acceptable buffer distances to the sensitive receivers.

4. Where required (eg. when complaints arise), carry out periodic vibration monitoring at all critical or sensitive areas and assess the vibration levels for compliance with the set vibration limits.

The table below provides a summary of the construction vibration management options to be considered.

Table 6.1 – Construction Vibration Management Options

Construction Vibration Management Options	
Source controls	
Equipment restrictions	Select low-vibration plant and equipment.
Substitute methods	Use less vibration emitting construction methods where possible. Bored piles are being used rather than impact-driven piles, which will minimise vibration impacts.
Limit equipment on site	Only have necessary equipment on site.
Equipment maintenance	Ensure equipment is well maintained.
Reduced equipment power	Use only necessary size and power.
Path controls	
Site access	Given that site access is located between the site and the Silanna Semiconductor premises, ensure the site access road is smooth with no bumps or potholes and is continually maintained. This will reduce the likelihood of vibration impacts as a result of vehicles travelling on the road.

Receptor controls	
Structural surveys and vibration monitoring	Pre-construction surveys of the structural integrity of vibration sensitive buildings may be warranted. At locations where there are high-risk receptors, vibration monitoring should be conducted during the activities causing vibration.
Consultation	Community consultation, information, participation and complaint responses are essential aspects of all construction management programs. They typically involve: • A community information program before construction and/or high risk activities are commenced. This usually involves a leaflet distribution and direct discussions and negotiations with affected residents, explaining the type, time and duration of expected vibration emissions. • The involvement of affected residents in the development of acceptable vibration management strategies. • A nominated community liaison officer with a contact telephone number. • . A complaints hotline. Timely responses to complaints, providing information on planned actions and progress towards the resolution of concerns.
Vibration Monitoring	Vibration compliance monitoring for all major equipment and activities on site should be undertaken.

7 COMPLAINTS MANAGEMENT

Vibration levels generated by construction activities associated with the construction of the Site 4B development aim to comply with the vibration goals set by the relevant regulations and guidelines.

The building contractor is responsible for implementing this Vibration Management Plan and ensuring that all reasonable measures are implemented such as the provision of a Complaints Program, to minimise the generation of excessive vibration levels from the site to the sensitive areas of the Silanna Semiconductor premises.

Silanna Semiconductor shall be informed by direct mail of a direct 24-hour telephone line where any vibration complaints related to the construction activities will be recorded. Additionally, Silanna Semiconductor should be notified of any periods of high vibration construction activities at least 24 hours prior to their commencement.

All vibration complaints shall be investigated by the site in accordance with the Complaint Management Procedure identified in Appendix C of this report.

8 CONCLUSION

A Construction Management Plan (CMP) will be been prepared for the proposed development at Site 4B, Sydney Olympic Park. Specifically, this report aims to manage vibration during the construction of the development impacting the neighbours including Silanna Semiconductor premises and sensitive equipment within the premises used for the manufacturing operations and to achieve compliance with relevant guidelines and standards.

Vibration management measures are provided in Section 6 to limit the potential impact of vibration generated by construction activities. In addition, buffer distances for vibration compliance have been provided as guidance; however, should be determined in more detail prior to the start of construction works through on-site measurements of vibration.

Procedures to manage complaints are also provided in Section 4 and Appendix C to ensure complaints are dealt with accordingly.

Given the type of plant and equipment to be used as outlined in Section 3 and the type of construction methods to be adopted, vibration impacts are to be minimal and vibration levels are expected to comply with the applicable vibration limits.

APPENDIX A - GLOSSARY OF ACOUSTIC TERMS

The following is a brief description of the technical terms used to describe vibration to assist in understanding the technical issues presented.

Accelerometer	Transducer whose output is directly proportional to acceleration.
Active vibration isolation	Preventing or reducing the transmission of vibrational energy from one body to another by the use of 180^0 out of phase vibrational waves that cancel unwanted vibrations.
Amplitude	The magnitude of dynamic motion or vibration. Amplitude is expressed in terms of 'peak' or 'rms' values.
Coherence	The proportion of two signals in which there is a time-stable phase relationship over time. Coherence ranges from 0 to 1 and the closer the coherence function is to 1.0, the more the two signals are likely to be related.
Dynamic magnification	The motion measured at a given point (usually in the structure) divided by the motion measured at a reference point (usually at the base of the structure or on the foundation).
Dynamic stiffness	The stiffness of a spring or flexible element when it is deformed by forces that vary rapidly over time (ie dynamically) in contrast to an average stiffness calculated under constant load or static conditions.
Fast Fourier Transform	(This is commonly referred to as 'FFT') A computer procedure for calculating discrete frequency components from sampled time data.
Frequency	Of a periodic quantity: the time rate of repetition. The reciprocal of the period. Frequency is measured in hertz (Hz).
Frequencies, resonant	Frequencies at which a system will most strongly respond to excitation.
Frequency Response	The amplitude and phase response characteristics of a system.
Ground-borne noise	Ground-borne noise propagating through the ground as vibration and then radiated by vibrating building elements such as wall and floor surfaces. This noise is normally noticeable only in areas that are well protected from airborne noise.
Hertz	The Sl Unit of frequency. One hertz is the frequency of a periodic phenomenon of which the period is one second. (Heinrich Hertz in 1885 showed electro-magnetic waves propagated through the open air at a finite rate, in straight lines, were able to be blocked, polarised,

	reflected and refracted). Unit symbol: Hz
Impulsive vibration	Having a high peak of short duration or a sequence of such peaks. A sequence of impulses in rapid succession is termed repetitive impulsive vibration.
Intermittent vibration	Vibration that starts and stops with or without a set level, duration or pattern. Opposite to continuous or constant vibration.
Modal analysis	Frequency and phase response of a structure. Determined experimentally using either a steady dynamic excitation or an impact force applied to the structure at one point while measuring frequency response elsewhere. Resonant frequencies and mode shapes can also be economically calculated using finite elements analysis.
One-third octave band	The frequency band that has its upper band-edge frequency at 1/3 the lower band-edge frequency.
Peak Particle Velocity	(This is commonly shown as 'ppv') The maximum instantaneous velocity of a particle at a point during a given time interval.
Peak component particle velocity	The maximum value of any one of three orthogonal component particle velocities measured during a given time interval.
Root-Mean-Squared	(This is commonly referred to as 'rms') The peak or maximum vibration amplitude divided by the square root of two.
Resonance	The phenomenon caused by systems responding very strongly to excitation at frequencies near their natural frequencies; the prolongation of sound.
Resonant frequency	The frequency at which resonance takes place.
Spectrum	Vibration signals can be analysed to reveal their frequency content. A spectrum is a plot of a variable (eg vibration) against frequency.
Spectrum Analyser	An instrument which performs FFT calculations and displays the frequency spectrum of an input signal.
Structural damage	Cosmetic – The formation of hairline cracks on drywall surfaces or the growth of existing cracks in plaster or drywall surfaces; in addition, the formation of hairline cracks in mortar joints of brick/concrete block construction. Minor – The formation of large cracks or loosening and falling of plaster or drywall surfaces, or cracks through bricks/concrete blocks.

	Major – Damage to structural elements of the building, cracks in support columns, loosening of joints, splaying of masonry cracks, etc.
Structure-borne noise	Vibration propagating through solid structures in the form of compressional or bending waves, heard as sound.
Transducer	A device actuated by waves from transmission systems (usually mechanical) which in turn transfers waves to other transmission systems (usually electrical).
Vector	A quantity which has both magnitude and direction (phase).
Vibration	Oscillation where the quantity is a parameter that defines the motion of a mechanical system.
Vibration isolation	Any of several means to reduce the transmission of vibrational energy from a body to a structure, or visa versa, in which or on which it is mounted.

APPENDIX B - SPECIFICATION FOR CONSTRUCTION VIBRATION MONITORING

B.1 SCOPE

This document specifies requirements for vibration monitors potentially used during the construction phase of the project.

B.2 REFERENCED STANDARDS & GUIDELINES

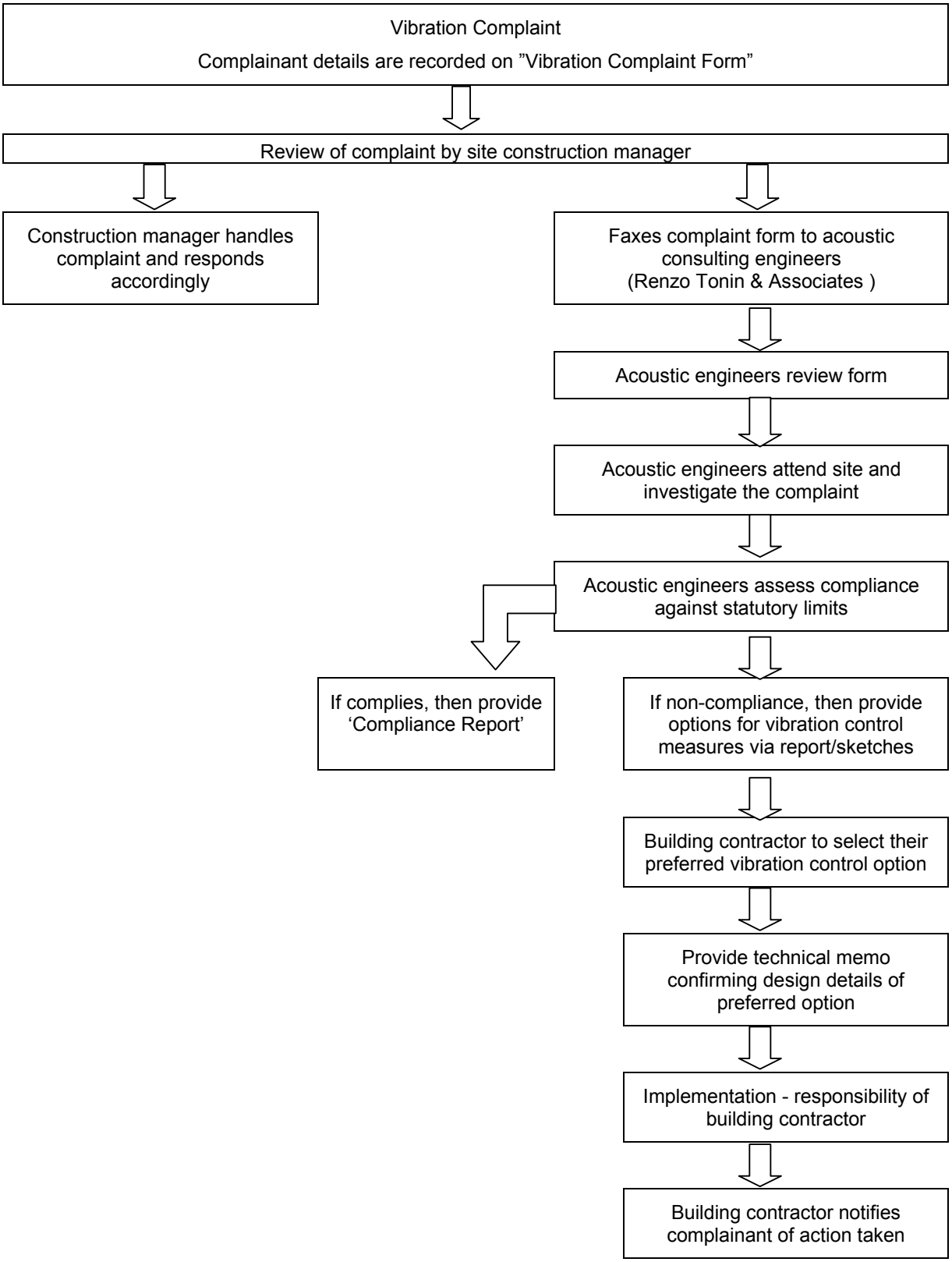
- AS 2775 Mechanical Mounting of Accelerometers
- AS 2670.2 Part 2: Evaluation of human exposure to whole body vibration
- EPA ENCM Chapter 174 – Vibration in Buildings
- DIN 4150.3 Structural Vibration in Buildings – Effects on Structures
- BS 7385:1 Evaluation and Measurement for Vibration in Buildings – Part 1: Guide for measurement of vibrations and evaluation of their effects on buildings
- BS 7385:2 Evaluation and Measurement for Vibration in Buildings – Part 2: Guide to Damage Levels from Groundborne Vibration
- ISO 4866 Mechanical Vibration & Shock – Vibration of Buildings – Guidelines for the Management of the Vibrations and Evaluation of their Effects on Buildings

B.3 REQUIREMENTS FOR EQUIPMENT

All vibration monitoring equipment used must be calibrated at least once every two years to standards that are traceable to Australian Physical Standards held by the National Measurement Laboratory (CSIRO Division of Applied Physics). The monitoring system should also have a measurement frequency range down to 1Hz.

Long-term vibration monitoring equipment or Vibration Loggers consist of a computer unit connected by cable to a triaxial vibration transducer which senses vertical, axial and horizontal vibration. Vibration levels are continuously monitored, and the data is processed statistically and stored in the computer memory. The operator may either retrieve the data at the conclusion of each monitoring period either in person or via a telephone modem if the logger is fitted with a mobile phone option.

APPENDIX C - VIBRATION COMPLAINT MANAGEMENT PROCEDURE



VIBRATION COMPLAINT FORM

COMPLAINANT'S DETAILS

Date :		**Received by** (tick a box) **:**	**Phone** ☐	**Written in** ☐	**Person** ☐		
Complaint Received By:			**Complainant's Name:**				
Complainant's Address:							
Complainant's Contact Numbers:	**Home:**		**Work:**		**Mob:**		

COMPLAINT DETAILS

Describe when the problem occurred (date and time), what equipment caused the complaint (if known) and where person was standing when he/she experienced the vibration:

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INVESTIGATION

Question foreman responsible on site and obtain information on what equipment or processes would most likely have caused the complaint:

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Please fax this form to Renzo Tonin & Associates Pty Ltd for processing after obtaining approval from the Project Manager - Fax: (02) 8218 0501

APPENDIX 4

Impacts of Revolving Doors

Morris Goding Accessibility Consulting

6 June 2011

Michael Antonelli
Lend Lease
30 The Bond, 30 Hickson Road,
Millers Point NSW 2000

Dear Michael,

RE: SITE 4B RELVOLVING DOOR DRAFT PPR - ACCESSIBILITY

Under the DDA Premises Standards, there appears to be plenty of circulation area around the original design of the revolving door for wheelchair users.

So the point of conjecture is the provision for persons with visual impairments. There is no prescriptive requirement within the DDA Premises Standards that states that the original design of the revolving door is non-compliant.

Recessing the door into the façade line would allow a person with a visual impairment to follow the building line, which is normally good practice. However in this case, my opinion is that this could lead to a safety issue as a person whilst following the external building line could possibly be hit by the moving doors which would not be protected by a door casing at the point of contact.

The original design, as shown on the Bates Smart drawing, where the door protrudes into the colonnade, there is a rounded obstruction (door casing) that warns/affords a person a better degree of safety when negotiating the door.

The proposed design with the door projecting into the colonnade is in my opinion a safer option for visually impaired persons than the recessing of the door into the façade line and therefore the recommended solution.

Yours Sincerely

David Goding
Morris Goding Accessibility Consulting