



Planning Assessment Report

Development Application DA 131-5-2005

1 SUMMARY

This assessment report deals with the Chatswood Transport Precinct Project (CTPP), which is the subject of Development Application No. DA131-5-2005. The DA was lodged by CRI Chatswood Pty Limited in accordance with the Environmental Planning and Assessment Act 1979 (the Act).

The CTPP is associated with the Chatswood Transport Interchange (CTI) that comprises transport and related infrastructure in and around Chatswood railway station. The CTI is part of the Parramatta Rail Link project (PRL) that was approved in 2002 by the then Minister for Planning under Part 5 of the Act.

Pursuant to clause 6(a) of State Environmental Planning Policy (State Significant Development) 2005, the CTPP is classified as State significant development.

The development application (DA) seeks consent, under section 80(1)(a) of the Act, for the erection of three residential flat buildings, retail development associated with the Chatswood railway station concourse and bus interchange, basement car parking, site landscaping, public domain works and stratum subdivision of the site. The site's location is shown in **Attachment A**.

In accordance with section 90(2) of the Act the CTPP is classed as integrated development, as approval is required from Willoughby City Council under section 138 of the Roads Act 1993. A full description of the DA is provided in section 3 of this report.

The proposed development is permitted under Sydney Regional Environmental Plan No. 5 - Chatswood Town Centre (SREP5), as amended by State Environmental Planning Policy (State Significant Development) 2005.

Pursuant to section 76A(9) of the Act, the Minister for Infrastructure and Planning is the consent authority for State significant development.

The site is considered suitable for the proposed development. Submissions have been considered and the main issues raised are discussed in this report. On balance, the proposed development is considered to be in the public interest, and the report recommends that the DA be **granted consent**, subject to conditions

2 BACKGROUND

2.1 Site Context

As shown on the accompanying plans, the site is located under, over and E of the Chatswood railway station, on land generally bounded by Albert Ave, Thomas Lane, Railway St and Help St, and including the first floor of the Sydney Water Building and land up to, but not including, 430 Victoria Avenue, Chatswood in the Willoughby l.g.a. A general plan showing the location of the CTPP and other development in the Chatswood Town Centre is at **Attachment B**.

The State has pursued a Public Private Partnership (PPP) process for the CTPP. It allows for upgrading the CTI and associated public areas to be partly funded through the development of air space above the CTI for residential and retail development, including retail areas over the former bus interchange site to the E. CTI elements of the PRL project that were modified by an approval granted on 14 December 2004 by the Minister, under Part 5 of the Act include:

- demolition of existing operational and disused station platforms including the removal of remaining platform buildings;
- construction of new elevated twin island platforms;
- relocation and upgrade of the station concourse area under the railway tracks;
- relocation and upgrade of the bus interchange;
- provision of additional traffic facilities such as taxi spaces and layover, and 'kiss and ride' facilities;
- road network modifications;
- raising of Albert Avenue Bridge; and
- raised track works south of Albert Avenue bridge in accordance with conditions of the approved activity.

Details of the CTI are in the *Review of Environmental Factors Modifications to the Parramatta Rail Link – Proposed Chatswood Transport Interchange*, prepared on behalf of TIDC. The Director-General's Report *Chatswood Transport Interchange: Proposed Modifications to the Parramatta Rail Link – Chatswood Transport Interchange (Attachment C)* provides for the approval of the CTI.

On 17 February 2004, the Minister granted consent to a Stage 1 DA for building envelopes and residential and retail uses on the site, subject to conditions. The proposal included:

- two levels of car parking, at RL88 and RL91 for 500 car parking spaces to serve 460 residential apartments,
- 7,245m² gross floor area of retail space, mainly on the concourse level under the train station and E in the vicinity of the bus interchange,
- a podium over the train station at RL106 for a mix of public and private landscaped space,
- three residential buildings of 12, 18 and 32 storeys, occupying air space above the rail corridor from the podium level to max.RLs at RL146.55, RL163.65 and RL210.40, respectively, and
- vehicular access to residential car parking.

The Minister's consent conditions for the Stage 1 DA contained specific requirements that were to be addressed in any subsequent Stage 2 DA. The approved Stage 1 scheme was later reviewed as part of the PPP process. The review addressed various consent conditions and issues raised in submissions to the DA.

The current CTPP DA is not a Stage 2 DA and therefore is not, in a statutory sense, bound by the Minister's conditions for the Stage 1 DA. However, the conditions identify several matters for an assessment of the CTPP.

3 THE PROPOSED DEVELOPMENT

The DA seeks consent for the following:

- residential use, construction of 3 residential tower buildings containing a total of 64,513 m² of residential gross floor area (GFA) and containing a total of 509 residential units, in the following configuration:
- Tower 1 comprising 32,802m² of GFA with a building height of 40 storeys to 246.80 metres Australian Height Datum (AHD) measured to top of parapet and not including roof plant or architectural features, and containing 246 residential units,
- Tower 2 containing 11,955m² of GFA with a building height of 25 storeys to RL201.10 (AHD) measured to top of parapet and not including roof plant or architectural features, and containing 122 residential units,
- Tower 3 containing 17,196m² of GFA, with a building height of 36 storeys to RL234.30 (AHD) measured to top of parapet and not including roof plant or architectural features, and containing 141 residential units,
- construction and use (excluding fitout) of 9,969m² of gross lettable area of retail development associated with the railway concourse and the bus interchange, including 10 kiosks,
- access to and use of, 3 basement levels for car parking for 501 vehicles associated with the proposed residential development plus 5 car parking spaces set aside for RailCorp use,
- a residential loading dock,
- two retail loading docks,
- access to the residential drop-off for Towers 2 and 3, via a shareway,
- site landscaping, including communal roof terraces and facilities associated with the residential development,
- public domain works, and
- stratum subdivision.

Plans of the CTPP are at **Attachment D**. Some components are linked to elements of the CTI. **Attachment E** summarises the CTPP and the elements of the CTI that were approved under Part 5. Other features of the CTPP include:

- no retail car parking is proposed,
- a vehicle/pedestrian shareway alongside the Garden of Remembrance will provide a residential address for Towers 2 and 3, a commuter drop-off point, a N-S pedestrian footpath from Albert Ave, and access to residential car parking,
- for E retail areas, a loading dock under Sydney Water with access/egress from the dock via an existing Orchard Rd link to Albert Ave,
- for W retail areas, a loading dock on W side of the rail corridor in the car park, to be shared with RailCorp, with access/egress from the carpark via Albert Ave,
- through-site links to adjacent buildings: Lower two retail levels provide access to Post Office Lane; upper two retail levels provide part of a link to the Sydney Water & Mandarin Centre buildings; a bridge links podium level to Chatswood Central,

- except for a stepped garden N of Garden of Remembrance and the shareway, works to public areas surrounding the CTPP are not part of the DA,
- interfaces with existing developments:
 - 430 Victoria Ave: ramp access at RL102 to dental surgery and café; stair/lift access to medical centre at RL106.6; fire rated wall along W edge of No.430, a glazed lobby and stair from Chatswood Mall to its upper levels,
 - Sydney Water Plaza: terrace off the food court level RL106.6, wide landscaped pathway at RL104.5 and stairs to access the food court level.

Significant components of the CTI, that were approved under Part 5, include:

- E-W links that connect Chatswood Mall/Victoria Ave W and Orchard Way; and connect Thomas St, N end of Garden of Remembrance and Orchard Way,
- N-S link that connects N end of Garden of Remembrance, Thomas St link, Chatswood Mall and bus interchange,
- at Concourse level (RL94): bus interchange, paid and unpaid rail concourse, Victoria Ave/Chatswood Mall, Thomas St and Help St links, Orchard Way, lifts, stairs and escalators accessing the paid and unpaid concourse levels,
- at Intermediate level (RL98): public stairs/lifts/escalators on Victoria Ave W, cycle/pedestrian path along W side of rail line linking Railway St & Thomas St,
- at Platform level (RL102): rail platforms, rail area, access to paid concourse,
- at Retail podium level (RL106.6): canopies over the rail station platforms.

4 STATUTORY FRAMEWORK

4.1 *Statement of permissibility*

Sydney REP5 is the main e.p.i. for development in the Centre. It zones the CTPP site part 5(a) Special Uses (Bus/Rail Interchange) and part 5(b) Special Uses (Railways). Land uses permitted, with consent, include, inter alia:

Zone 5(a) Special Uses (Bus/Rail Interchange): bus/rail interchange, car parking, demolition, drainage, public buildings, refreshment rooms, residential flat buildings, roads, shops, subdivision and utility installations.

Zone 5(b) Special Uses (Railways): demolition, drainage, parking, railways, residential flat buildings, roads, shops, subdivision and utility installations.

The CTPP is therefore permissible on the site, subject to consent.

4.2 *Relevant environmental planning instruments and policy documents*

The e.p.i.'s, draft epi's, DCP's and policy documents of relevance to the CTPP are indicated below. They have been considered in the Section 79C Evaluation Report.

SEPP (State Significant Development) 2005

SEPP (Building Sustainability Index: BASIX) 2004

SEPP No. 11 Traffic Generating Developments

SEPP No.55 Remediation of Land

SEPP No. 65 – Design Quality of Residential Flat Development

Draft SEPP No.66 Integration of Land Use and Transport

Sydney Regional Environmental Plan No. 5 – Chatswood Town Centre

DCP No. 2 – Transport Requirements for Development
DCP No. 14 – Access, Mobility and Adaptability
DCP No.15 – Multi-Unit Residential Developments
DCP No. 30 – Sustainable Development
Local Policy for On-site Stormwater Detention;
Code for garbage handling systems;
Design Guidelines for Public Precincts;
Town Centre Strategy.

5 CONSULTATION

5.1 Public consultation

The application was notified, in accordance with the Regulations including:

Table 1. Public consultation summary

Notifications landowners/occupiers –	Letters were sent to 387 landowners/occupiers and 15 interest groups (in accordance with the previous Stage 1 DA)
Newspaper advertisements	The DA was advertised on 1 June 2005 in the Sydney Morning Herald and on 3 June 2005 in the North Shore Times.
Site notices	Four site notices were placed on the site in four locations from 1 June 2005
Exhibition dates	The DA was exhibited from 2 June 2005 to 4 July 2005 inclusive.
Exhibition venues	DIPNR Information Centre, Lee Street, Sydney (until 24 June 2005) and 23-33 Bridge Street, Sydney (from 27 June 2005). Willoughby City Council, Help & Service Centre, Victor St, Chatswood. Willoughby Library, 407 Victoria Avenue, Chatswood.

Forty-two submissions were received. They are considered at **Attachment F**. The submissions were received from the following sources:

Table 2. Submissions and comments

<i>i) Sources of submissions</i>	<i>ii) No. of submissions received</i>
Individual	29
Council	1
Government	5
Community Groups	4
Business Groups	3
Total	42

The following main issues were raised in the submissions received from individuals, business and community groups. They are considered at section 6 of this report.:

Table 3. Main issues raised in public submissions

Issues	Times mentioned
Overshadowing of Garden of Remembrance	21
Siting of towers	17

Building Heights	17
Overshadowing of Chatswood Oval	14
Loss of residential amenity	13
Traffic and parking	9
Other impacts on Garden of Remembrance	9
Wind impacts	9
Adequacy of through-site connections & links	9
Tower design and details	8

5.2 Referrals

Government agencies that were notified of the DA include the Department of Housing, Department of Education and Training (DET), Ministry of Transport, RailCorp, Department of Environment and Conservation (DEC), State Rail Authority, Roads and Traffic Authority (RTA), NSW Heritage Office and TIDC.

Comments were received from DET, RailCorp, DEC, RTA and the NSW Heritage Office. The matters raised in their comments are considered at **Attachment G**.

5.2.1 Council

The DA was referred to Council on 1 June 2005 in accordance with cl.88(1)(b) of the Regulation. Council's preliminary submission was received on 4 July 2005. Some of the issues raised by Council are discussed in detail in Section 6.2 of this report. Council's full submission is considered at **Attachment H**.

5.2.2 Design Review Panel

A design review panel established by the Transport Infrastructure Development Corporation (TIDC) reviewed the CTPP design development phase. The Panel met on four occasions between September 2004 and February 2005. The main issues raised by the panel relate to:

- a) civic links - Chatswood Mall to Victoria Ave; Gardens of Remembrance to bus interchange,
- b) design of bus interchange and visual links from it to rail station entry;
- c) tower locations in relation to the neighbouring properties;
- d) closeness of towers (potential wind generation issue);
- e) external finishes to the residential towers;
- f) overshadowing effects of the towers,
- g) design relationship between the concourse retail areas, rail station entry and associated public areas;
- h) links (Victoria Ave; Thomas St) to have emphasis and significant presence;
- i) Orchard Way to have a unique character and dramatic scale, read as station forecourt and be as open a link as possible, allowing for weather protection;
- j) potential overlooking from private use podium;
- k) need to strengthen entry foyer address to Tower 1;
- l) rail structure to provide clarity to public domain and be sensitive to interior environment.

Items (a), (b), (h), (i), and (l) relate to the Part 5 approval. The other matters, including the retail kiosks within the bus interchange, have been considered in the assessment of the DA. The panel's comments are at **Attachment J**.

Other Agencies

5.2.3 Roads and Traffic Authority

In accordance with State Environmental Planning Policy (SEPP) No. 11 – Traffic Generating Developments, the DA was referred to the Roads and Traffic Authority (RTA). The RTA's comments are summarised below.

- a) desirability of signalling the intersection of Thomas Lane and Albert Ave,
- b) desirability of modifying the western loading dock to accommodate large furniture trucks, and
- c) manoeuvring area at the loading dock conflicts with cars entering the building.

Those matters are considered at **Attachment G**.

5.2.4 Department of Environment and Conservation

The comments received from the Department of Environment and Conservation (DEC) are summarised below:

- a) residential car parking spaces should be reduced to 350 given the CTPP's proximity to public transport, employment, facilities and services,
- b) collection of rainwater for toilet flushing and landscaping is supported, but it should also be used for clothes washing,
- c) operational noise impacts should be measured against a regenerated noise level criteria of $L_{a_{max}}$ 30-35 dB(A) for residential areas, and if this cannot be achieved potential purchasers should be advised.

Those matters are considered in **Attachment G** of this report.

5.2.5 NSW Heritage Office

The comments received from the NSW Heritage Office raised concerns about the CTPP's potential effects on the Garden of Remembrance, Hotel Chatswood and Chatswood Urban Conservation Area (South Chatswood Precinct). They are summarised below.

- a) podium, towers and retail areas will intensify impacts on Garden's setting, and ground level changes will alter its relationships with that setting,
- b) glass walling on podium's S face may give increased perception of reflective material,
- c) shareway will hinder possibility of mature planting to screen Garden's W boundary, and the open fence will be not alleviate the loss of former trees,
- d) overshadowing will have a detrimental impact on the Garden and its amenity,
- e) erection of screens in the Garden to ameliorate wind impacts will detrimentally affect its significance and appearance,
- f) there will be impacts on the Hotel Chatswood due to the proposed lowering of ground levels for the bus interchange, and the large canopy over Victoria Ave,
- g) long winter shadows cast by the proposed towers will have a direct impact on the Chatswood Urban Conservation Area,

The above matters, and others, raised by the Heritage Office are considered in **Attachment G**.

5.2.6 RailCorp

The issues raised in RailCorp's comments relate to:

- a) horizontal clearances of structural supports from rail track, fire separation, and impact protection between RailCorp infrastructure and air space development,
- b) noise, vibration and electrolysis,
- c) potential for objects to be thrown onto rail tracks from windows and balconies,
- d) potential impacts of the proposed retail kiosks on crowding of the interchange,
- e) RailCorp's priority in the sharing of the loading dock with retailers,
- f) access paths to/from the rail station to have suitable emergency access,
- g) prevention of pool leakages/tree branches falling onto rail platforms and lines,
- h) general standards for disabled persons' access,
- i) general construction issues,
- j) vandalism, landscaping and development maintenance activities.

As requested by RailCorp, recommended conditions address most of those issues..

5.2.7 Department of Education and Training

The Department of Education and Training's comments indicated that:

- a) government schools serving Chatswood are already operating at capacity,
- b) Willoughby I.g.a.s recent medium density housing contributed to a turnaround in enrolments since the late 1990s,
- c) the CTPP would generate about 9 government primary school students/100 dwellings and 5 government secondary school students/ 100 dwellings.

6 CONSIDERATION

6.1 The Environmental Planning & Assessment Act

6.1.1 Section 79C

The DA and the potential impacts of the proposed development have been considered in accordance with Section 79C (a)(i) to (iii) of the Act.

The subject site is considered suitable for the proposed development. All of the submissions have been considered. The main issues raised in the submissions, and other important issues, are discussed in sections 6.2 and 6.3, respectively, of this planning report. On balance, the proposed development is considered to be in the public interest.

6.2 Main Issues

6.2.1 Overshadowing of Garden of Remembrance, Chatswood Oval and other public spaces

The DA's *Chatswood Transport Precinct Amenity Report* (Amenity Report) compares the mid winter overshadowing impacts of the existing situation, Stage 1 scheme and the CTPP on Victoria Ave W, bus interchange, Chatswood Mall and Garden of

Remembrance. It also deals with the CTPP's overshadowing impact on Chatswood Oval during April to June, and provides a comparison of the overshadowing impacts in respect of the Garden of Remembrance's roses during their growing season.

The SoEE considers CTPP's overshadowing will not affect the amenity or function of the Mall, Victoria Ave W, interchange and Oval, but there will be unavoidable impacts on the Garden. It states that the extent of overshadowing of the Mall, Victoria Ave W and interchange under the existing and CTPP situations will be similar, and for the interchange the CTPP will perform better than the Stage 1 scheme.

The Amenity Report aggregates % increases and % reductions in overshadowing of the above public spaces. The aggregated additional % areas of those spaces that would be overshadowed by the CTPP, compared to the existing situation would be:

- a) from 11 am to 2pm: increases of 4.55% to 10.9% will occur, respectively.
- b) at 12 noon and 1.45pm: increases of 10.05% and 9.1% will occur, respectively.

Compared to the Stage 1 scheme the CTPP's increases and reductions would be:

- a) from 10am to 3pm: increases of 3.85% to 1.8% will occur, respectively,
- b) increases of 10.6% and 13.45% will occur at 11am and 12 noon, respectively,
- c) small % reductions will occur from 12.30pm to 1pm and 1.45pm and 2pm.

Garden of Remembrance

The SoEE states that:

- a) the CTPP will increase shade over the Garden compared to existing situation.
- b) from 12.30pm -1.15 pm on 21 June, a large central part of the Garden will be in full sunlight; there will be generous areas on the W, E, and S-W parts before and after that period.
- c) there will be no shading of the Garden by the CTPP before 11am or from 3pm.
- d) shading is due to Tower 2 before 1 pm and to Tower 1 and podium after 1 pm.

In respect of the health of the Garden's roses, the SoEE states that:

- a) CTPP will result in 3.9% overall increase in overshadowing in the growing season. It will be distributed evenly over the Garden and occur towards the end of the season when roses are becoming dormant.
- b) there will be a slight increase in overshadowing in September, but no change during the growth period in spring.
- c) this level of overshadowing and reduction in sunlight would have a negligible effect on the roses' health.

The DA's *Horticultural Assessment* of the Garden states that its roses are in decline, and remedial works will be needed in the near future if they are to be maintained in a healthy state. Overshadowing from existing buildings is considered the primary cause of the roses' marginal growing conditions. It indicates CTPP will cause a minor increase in overshadowing of the Garden during the growing season towards the end of the growing season and in winter, when roses are dormant. There will be a slight increase in overshadowing in September, but there will be no change during the main growth period in spring. This overshadowing will have a negligible effect on the roses' health.

Chatswood Oval

SoEE states that CTPP will have minimal effect on the Oval at mid winter, as follows:

- a) a small shadow from Tower 1 will occur at 1pm at the N edge of the Oval and playing field, but will move quickly and disappears by 2pm.
- b) shading will be insignificant due to its short duration and limited extent, and will not affect the turf's health, formal sporting games or informal recreation.

Submissions – Garden of Remembrance and Chatswood Oval

Public submissions about overshadowing of the Garden were concerned equally about the impact on its vegetation growth and general amenity. For the Oval, the main concern was overshadowing of the playgrounds and adjacent park. Council's submission does not support additional any overshadowing of the Garden, and particularly the CTPP's cumulative impact.

Consideration

The Amenity Report compares the overshadowing impacts of the existing situation, CTPP, and Stage 1 scheme and indicates there will be no, or little, difference in the impacts on Victoria Ave W, the bus interchange and Chatswood Mall, between the existing situation and the CTPP. Those findings are considered reasonable.

Garden of Remembrance

The Amenity Report's findings are significant in respect of CTPP's overshadowing impacts on the Garden's amenity at midwinter (**Attachment K**). They will be considerably greater than the existing situation and Stage 1 scheme. Its detailed findings about the additional % of Garden area that will be overshadowed by the CTPP at midwinter are:

- a) Comparison between CTPP and existing situation – from 11 a.m. to 2 p.m. there will be increases of 18.2% to 43.6%, with overshadowed area increases of 40.2%, 23.9%, 12.8%, 19.8%, 29.1% and 36.4% occurring within that period.
- b) Comparison between CTPP and Stage 1 scheme – from 10 a.m. to 3 p.m. there will be increases of 12.3% to 7.2%, with overshadowed area increases of 42.8%, 57.2%, 21.5%, 10.2% and 12.1% occurring within that period.

During the rose growing season, the Amenity Report calculates % area increases and % area reductions in the shadow cast on the Garden's N half and on its S half. It calculates shadow areas on an hourly and monthly (September to May) basis and compares findings for the CTPP with those for the existing situation and the Stage 1 scheme. In summary its findings are:

- a) Comparison between CTPP and existing situation: - for the N half the CTPP will increase the shadow in September, October, and from February to May, and the increases (as a % of the N half's area) will range from 0.91% to 8.21%.

For the S half the CTPP will increase the shadow from September to November and from March to May, and the increases will range from 0.96% to 13.72%. The Amenity Report averages out the increases and reductions for each half and for the whole Garden, as follows:

N half of Garden: - an average shadow area increase of 2.82%.

S half of Garden: - an average shadow area increase of 3.75%.

Whole of Garden: -an average shadow area increase of 3.29%.

- b) between CTPP and Stage 1 scheme: - for the N half the CTPP will increase the shadow in September, and from March to May, and the increases (as a % of the N half's area) will range from 4.03% to 11.34%. For the S half the CTPP will increase the shadow in April and May, and the increases will range from 0.05% to 4.11%. The Amenity Report's averages for each half and for the whole Garden are as follows:

N half of Garden: - an average shadow area reduction of -3.09%.

S half of Garden: - an average shadow area reduction of -12.27%.

Whole of Garden: -an average shadow area reduction of -7.68%.

These findings suggest that when compared to the existing situation, the CTPP's increased impact, averaged over the whole Garden area, would be of a low order, and compared to the Stage 1 scheme, the CTPP would have a lesser impact, with shadow reductions of a low-to-moderate order,

The Amenity Report's aggregation of CTPP's midwinter overshadowing of the Garden, Victoria Ave W, Chatswood Mall and the bus interchange suggests that compared to the existing situation the CTPP would result in a 3.9% increase in overall overshadowing of those open spaces, and compared to the Stage 1 scheme it would result in a 1.62% increase in overall overshadowing of them. Also, the Applicant claims that compared to the usage of other spaces, such as Chatswood Mall, usage of the Garden of Remembrance would be relatively low.

Public submissions and the Heritage Office's comments suggest that while the Garden's usage may be low compared to other public spaces, its general amenity, social and heritage values, and the health of its roses are of particular significance and are valued. In that respect, the Amenity Report's findings on aggregated over-overshadowing of all the public spaces do not diminish the CTPP's unsatisfactory impact on the Garden.

Given the CTPP's % increases compared to the Stage 1 scheme, it could not be said to have minimised overshadowing of the Garden at mid winter. However, compared to the Stage 1 scheme it would lead to considerable reductions in overshadowing of the Garden between September and March. Also it impacts on the roses during the growing season would be of a low to moderate order.

At mid-winter, Tower 1 will overshadow the Garden from 12.45 p.m. to 4 pm, and

Towers 2 and 3 will overshadow it from 9 a.m. to 12.45 p.m. and 11 a.m. to 12.30 pm, respectively. In terms of Council's DCP requirement that public open spaces not be overshadowed between 12 noon and 2 p.m. at midwinter, Towers 2's and 3's non-compliance would not be of a major order, although Tower 1's would.

Chatswood Oval

Diagrams of the CTPP's overshadowing (**Attachment L**) of the Oval indicate that at 1pm in April, Tower 1 will overshadow the park N of the Oval but the affected area will be minor. At 1 pm in May, Tower 1 will cast a narrow shadow over the park area, but it would not reach the playground or Oval. On both days shadows cast by Tower 2 and Tower 3 would be largely contained within the shadow cast by the SageMicropay building.

At 12noon in June, Tower 1 will not overshadow the park area or Oval, but Tower 3 will overshadow a N-W portion of the park. By 1pm both Tower 1 and Tower 3 will cast

narrow bands of shadow over the park area, and Tower 1's shadow will extend over a small N-W portion of the Oval. Tower 3's shadow is likely to be contained within SageMicropay's shadow, which would overshadow the playground area.

By 2pm Tower 1 will overshadow the park, playground area and the Oval. In this case the shadow over the Oval will cover a small N-E portion.

It is considered therefore that CTPP's shadows will marginally extend over the Oval and are unlikely to significantly affect the turf. Its shadows over the park are greater, but during winter their duration would be limited. For Tower 1, it will be limited to between 1 p.m. and 2 p.m. For Tower 3, it will be limited to between 12 noon and 1pm, although at 1pm it will be mostly contained within an existing shadow.

Resolution

Although the CTPP's overshadowing of public spaces within the CBD will not, in an aggregated sense, be significant, it will be significant in relation to the Garden at mid winter. To a more limited extent it will overshadow various parts of the park adjacent to Chatswood Oval and its playground areas.

Because of the proximity of the CTPP and the Garden, a large reduction in proposed building heights will be needed to significantly reduce mid winter overshadowing of the Garden.. Consideration should be given to the following:

- CTPP's likely low-to-moderate impact on the Garden during the roses' growing season and over the March to September period,
- it will have a lesser impact on the roses than the approved Stage 1 scheme,
- the siting and alignment of CTPP's towers within the street grid, their slender forms and small floor plates are significant improvements on the Stage 1 scheme's 'wall' of slab-formed buildings strung along the railway corridor,
- the overall public infrastructure benefits of the CTI/CTPP project,.

On balance therefore reductions in the proposed building heights on the grounds of their mid winter overshadowing impacts are not recommended.

6.2.2 Siting of proposed towers

Public submissions, Council and the Heritage Office are concerned about impacts related to the tower buildings' siting. The main concerns relate to its impacts on views from public places, and on the nearby residential buildings' loss of views and privacy.

Visual impacts from public places

The SoEE's *Visual Impact Assessment* (Assessment) examines the CTPP's visual impacts from short, mid and long-range locations. The short-range locations (**Attachment M**) and some mid-range locations are considered to be more relevant to the matters raised in the public submissions, by Council and the Heritage Office.

The Assessment's overall visual impact rating is determined by combining the locations' visibility and visual absorption capacity criteria. It rated short-range views as follows:

- | | |
|-------------------------------------|---|
| a) from Help St/Orchard Rd: | Low to moderate (Attachment N), |
| b) from Victoria Mall looking west: | Moderate |
| c) from Garden of Remembrance: | Moderate to high (Attachment O), |
| d) from Chatswood Oval/Albert Ave: | Low (Attachment P) |
| e) from Thomas St: | Low, |

f) from Victoria Ave W: Moderate to high (**Attachment Q**).

The Assessment concludes that the CTPP will affect views from public open space areas in the immediate and local vicinity, but will have little impact on street corridor views along pedestrian routes. It considers that the CTPP is substantially in character with the existing visual context of the Chatswood CBD environment. It also states there would be an expectation by people of tall buildings in the CBD, and the rail station environs is an appropriate location for the tallest buildings.

Submissions - Visual impacts from public places

The main concerns raised in the public submissions relate to the CTPP's visual impacts from public places generally, but particularly from the Garden of Remembrance. Council's submission notes the Assessment's moderate to high ratings for (c) and (f). It considers the CTPP's relationship to the Garden requires further resolution due to its impact on the Garden's setting, and that the CTPP will result in significant change to the views enjoyed around Chatswood.

The Heritage Office considers the CTPP will considerably alter the Garden's wider setting and, compared to Stage 1 scheme, will intensify that impact by increasing the perception of built form. It considers the CTPP will ameliorate some impacts on the overall locality because of the towers' siting and their neutral/unfussy detailed design.

Consideration - Visual impacts from public places

Although the basis for the Assessment's rating of CTPP's visual impacts appears reasonable, the ratings, for locations (a), (c) and (f) appear to be underrated. The Assessment's conclusion that the CTPP will affect views from areas of public open space in the immediate and local vicinity is endorsed.

The CTPP will introduce significant change within the Chatswood CBD due to its scale and height. However, as noted above, the siting and alignment of its towers and their built form are significant improvements on the Stage 1 scheme.

Notwithstanding the impacts on the public open spaces, including the Garden of Remembrance, the Assessment's conclusion that the CTPP will be substantially in character with the existing visual context of the Chatswood CBD is considered valid, as are its comments about the expectation of tall buildings at the bus/rail interchange.

The Applicant's design aim to create an iconic landmark and focal point for the bus/rail interchange is endorsed, and is consistent with Chatswood CBD's sub-regional status.

Loss of views from nearby residential buildings

The SoEE states that the separation and orientation of the CTPP's towers, and their placement within the street grid have helped to minimise the loss of views. It includes a study of potential loss of views from the Regency Apartments, Sebel Apartments, the Saville Park Suites and The Bentleigh (see **Attachment R**). The view analyses consider those buildings' living spaces, view directions and view corridors. Other

nearby existing residential buildings include the Verve Apartments, the Epicure and Altura buildings.

Regency Apartments: This building is 140m from the CTPP site. The study shows the CTPP's impact will be limited to apartments with a S-W outlook. Long-range views to the Sydney CBD, Upper North Shore, Northbridge/Castle Cove and Blue Mountains would not be affected.

Sebel Apartments: This building is 300m from the CTPP site. The study shows that only apartments with a N-W outlook will be affected by the CTPP, and its long-range views are currently affected by nearby tall buildings. It will continue to enjoy views to Sydney CBD, Blue Mountains and the Upper North Shore.

Saville Park Suites: This building is 110m from the CTPP site. Its long-range views are currently affected by surrounding tall buildings. The CTPP's impact will be limited to apartments with a S-E outlook, which is already interrupted by the SageMicropay and Sebel buildings. Long-range views to Sydney CBD, Upper North Shore, Northbridge/Castlecove and the Blue Mountains would not be affected.

The Bentleigh: This building is 60m from the CTPP site. Its N and N-E views, and to some extent its S-E views, are currently affected by nearby tall buildings. The CTPP's impact will be limited to apartments with an E outlook, but it will not affect those with S-E views. Long-range views to the Sydney CBD, Northbridge/Castlecove and Blue Mountains will not be affected.

Submissions - Loss of views from nearby residential buildings

Public submission raised general concerns about the loss of views from surrounding developments.

Consideration - Loss of views from nearby residential buildings

As noted above, the CTPP's impact on views from the above residential buildings will be limited. All of those buildings will continue to enjoy scenic views from several outlooks. It is considered that, overall, the CTPP will provide reasonable view-sharing and not result in unreasonable loss of views from surrounding buildings.

Loss of privacy of nearby residential properties

The SoEE indicates the CTPP will not compromise the privacy of existing residential buildings, and the privacy of the closest buildings (Sebel and Verve Apartments), will be maintained because they are about 30m to 40m away from Tower 2.

In respect of Nos 426-430 Victoria Ave, the SoEE considers that SREP5's current development standards (max.2.5:1 FSR and 28m building height) will limit the potential for high-rise development on that property; and there is an easement of 3m to 4m, unlimited in height, that benefits Tower 3 and provides for separation between Tower 3 and any proposed future building on that property.

Submissions – Loss of privacy of nearby residential properties

Public submissions were concerned about the CTPP's potential privacy impacts on existing buildings such as The Bentleigh, Regency Apartments, Sebel Apartments, the Altura and Epica buildings. Several submissions indicated that Tower 3 would have similar impacts on a future development of the adjoining property at 426-430 Victoria Ave. In that respect, reference was made to the need to adhere to SEPP65's (RFDC) min.12m building separation guideline.

Council's submission also referred to SEPP65 building separation guideline and the relationship of Towers 2 and 3 to the Sydney Water building and Nos.426-430 Victoria Ave, respectively.

Consideration – Loss of privacy of nearby residential properties

The building separation distances between all of the CTPP towers and the nearby existing residential buildings are well in excess of RFDC's min.12m guideline. Thus, the CTPP would have no significant privacy loss impacts on those buildings.

In respect of the adjoining property at Nos. 426-430 Victoria Ave, SREP5 permits redevelopment of that property for mixed uses, with a max. 3.5:1 FSR and 28m building height.

CTPP's eastern boundary varies (relative to No.430's western boundary) between its basement levels and Platform level (RL102). From RL102 and upwards, the eastern boundary is constant and will have the benefit of an easement (3m-4m wide and of unlimited height) for light, and air over the upper part of a narrow strip of land (land parcel Lot 12 DP817116).

Lot 12 DP817116 is held as a leasehold stratum until 2088 by No. 430's owner and is zoned Special Uses (5a) Bus Rail Interchange, which under SREP5 is not limited by FSR or height controls.

The submission indicates Tower 3 will restrict the redevelopment potential of 426-430 and the leasehold stratum. It considers Tower 3 should be setback to provide a separation distance from the western side of No.430 for access ventilation and light. Such a setback would need to be a min.6m from CTPP's eastern boundary.

The easement along the Tower 3's eastern side effectively restricts the development of the narrow leasehold stratum.

No.426-430's base FSR limit under SREP5 is 2.5:1. Under SREP5, if that site provides an open area of 225m² or a community/recreation area (its size is not defined by SREP5) it could be granted a 3.5:1 FSR. It is unlikely that the open air space option would be feasible as it equates to 30% of the site area. However it would be possible to provide a community/recreation area.

The submission claims that redevelopment of Nos.426-430A could achieve a 8 to 9-storey building. This appears unlikely. A redevelopment feasibility study (**Attachment V**) shows two residential/retail options with different residential floor plates (17.2m and 20.6m depths) and building heights (5 and 4 storeys). The options are based on a 2.5:1 FSR. The 5-storey option's roof deck would be at RL113.60, which is CTPP's Residential Amenity Level.

It would be possible to achieve 3.5:1 FSR and two more residential floors (i.e. a 7-storey building). Such a building would have its roof deck at about RL119.60, which is the floor level of Tower 3's first full residential floor.

If Tower 3 were setback 6m from the boundary to accommodate redevelopment of Nos.426-430, it would severely compromise Orchard Way, which is CTPP's major N-S connection and public domain, and further overshadow the Garden at mid-winter. Its western building alignment would encroach into Orchard Way and be only about 6m from the edge of railway structure. Also, a new building on 426-430 would need a similar 6m setback. Because of that site's dimensions, such a setback would severely restrict the new building's floor plate.

An alternative solution, based on a future 7-storey building on 426-430, would be to require modification of the apartment layouts and mix on all of Tower 3's floors between RL113.60 and 128.6, with provision of mitigating measures to protect the privacy of Nos. 426-430. A recommended condition requires those modifications.

6.2.3 Building height and scale

The SoEE's justification for the proposed tower building heights refers to the following design features:

- a) bulk and visual impacts are significantly reduced, compared to the Stage 1 scheme, particularly when viewed from Chatswood Mall and Victoria Ave W,
- b) building design, articulation and facade treatments ensure a high level of visual interest,
- c) slender proportions, small floor plates and sculptured forms create an iconic landmark and focal point for the bus/rail interchange and CBD, and they minimise shadow impacts,

Submissions

Both the public and Council submissions raised concerns about the proposed tower buildings' heights and scale. The submissions referred to the following:

- a) the buildings' heights are excessive, inconsistent with surrounding tower developments and will dwarf them.
- b) they do not comply with Council-approved heights for Chatswood.
- c) they will introduce a significant change Chatswood's existing, familiar skyline.
- d) they will have overshadowing, wind and heritage impacts.

Consideration

The matters referred to in (d) are discussed in sections 6.2.1, 6.2.5 and 6.3.7 of this report. In respect of (a), (b) and (c), the CTPP tower buildings will considerably exceed and dominate existing, Council-approved tower building heights within the CBD and introduce a significant change to the CBD's skyline when viewed from some of the short- and mid-range locations that were examined in the DA's *Visual Impact*

Assessment

As discussed in section 6.6.2.1 of this report, it is considered that notwithstanding that skyline change and the visual impact on the Garden of Remembrance, the CTPP's tower buildings will be substantially in character with Chatswood CBD's environment; and CTPP's introduction of tall, iconic landmark buildings at the bus/rail interchange would be appropriate.

6.2.4 Solar access

Loss of solar access to nearby residential buildings

The SoEE identifies several residential developments that are in the vicinity of the CTPP site. On the E side of the railway they include: Regency Apartments, Sebel Apartments and Verve Apartments. On the W side they include Saville Park Suites, Epicure and Altura buildings and The Bentleigh. Their locations (except for the Verve Apartments, on Victor St) are shown on map at **Attachment S**.

The SoEE states that the Sebel Apartments and The Bentleigh could potentially be affected by shadows cast by the CTPP on June 21. In the case of The Bentleigh, it states the CTPP will have a small but insignificant impact on that building's E-facing facade (mainly apartments in S-E corner) that would be affected by Tower 1's shadow for 45 minutes from 9am on June 21. In the case of the Sebel Apartments, the SoEE states it would not be overshadowed by the CTPP at all on June 21.

Submissions - Loss of solar access to nearby residential buildings

Public submissions were concerned about the potential loss of solar access to nearby buildings such as The Bentleigh, Regency Apartments, Sebel Apartments, Altura and Epica buildings, 73 Albert Ave and 2-14 Victor St.

Consideration - Loss of solar access to nearby residential buildings

Council's DCP15 *Multi-unit Residential Buildings* and SEPP65's Residential Flat Design Code (RFDC) require residential apartments to receive at least 3 hours of direct sunlight between 9am and 3pm on June 21.

The SoEE's identification of potentially affected buildings analysis is correct. The CTPP's tower locations in relation to all of the properties identified in the submissions have been examined. As the Altura and Epica buildings, Regency Apartments and Saville Park Suites are to the N, N-E and N-W of the CTPP site, they would not be overshadowed by the CTPP between March and September. The CTPP's potential impact on the other properties' solar access at mid winter is discussed below.

The Bentleigh: at 9am Tower 1's shadow would affect more than half of The Bentleigh's E-facing facade, and by 9.30am it would affect only about half of that facade. Tower 1 would not overshadow The Bentleigh from about 10 a.m. onwards. Tower 2's shadow will not affect The Bentleigh at all. Between 9am and 9.30am Tower 3's shadow would be contained within the shadow cast by Tower 1, and from 10am onwards Tower 3's shadow will not affect The Bentleigh.

Sebel Apartments: The SoEE indicates the CTPP will not overshadow the Sebel Apartments on June 21. This is not strictly correct, but the CTPP impacts would be minimal. Tower 1's shadow would have no effect between 9 a.m. and 3 p.m. Tower 2's shadow would affect the Sebel Apartments after about 2pm and Tower 3's shadow would affect it after about 1.45pm.

Verve Apartments: This building is at 39 Victor St, between the Post Office and the Sebel Apartments, and is to the E of the CTPP site. The shadows cast by all three proposed towers would not fall on that building on June 21.

73 Albert Avenue: Tower 1 would not overshadow the building after 12.15pm. Towers 2 and 3 would not overshadow it after 11.00 a.m.

2-14 Victor Street: This building is E of the CTPP site and on the E side of the street, at the junction with Chatswood Mall. None of the proposed towers would overshadow the building between May and September.

The CTPP's overshadowing impacts on the nearby residential developments at June 21 would generally comply with DCP15's requirement for 3 hours of direct sunlight between 12 noon and 3 p.m. The exception is Tower 1's impact on 73 Albert Ave, which would receive only about 2 $\frac{3}{4}$ hours of direct sunlight. Overall, the potential loss of solar access to surrounding residential buildings is not considered significant.

6.2.5 Wind impacts

TIDC's design review panel referred to the closeness of towers as being a potential wind generation issue. The Stage 1 DA condition required wind tunnel analysis/wind assessment that would address main seasonal wind periods/directions based on local measured and modelled wind data, model the CTPP's wind effects with the CTI in place and make recommendations to minimise wind impacts in affected areas such as the CTI, Chatswood Mall, Garden of Remembrance and publicly accessible areas. The DA's *Wind and CFD Study* (the Study) has addressed those requirements.

Wind tunnel testing, sensors were positioned at locations, shown at **Attachment T**. They include Chatswood Mall, Victoria Ave W/Railway St, bus interchange, rose

garden, residential 'drop-off' area, the promenade at RL102, Thomas St entry to the E-W connection, rail platform and the residential amenities level.

The Study adopts pedestrian level wind acceptability criteria (16m/sec walking comfort criterion and 23m/sec public safety criterion) that are currently in use by Sydney City Council. It refers to the Stage 1 DA condition that set a criterion of max.13m/sec wind speed for the W half of the Garden of Remembrance. For the wind tests, two building environment configurations were examined as follows:

- 'baseline' case – CTI/CTPP without wind amelioration features (e.g. landscaping, building awnings, canopy structures), and
- 'mitigation. case – CTI/CTPP with wind amelioration options targeting specific wind conditions at various locations around the site.

For wind tests, account was taken of surrounding topography, and all buildings within 500m of the site were included in a 1:400 scale test model. Wind tunnel results were relied upon for external wind flows. Computational Fluid Dynamics (CFD) were used to predict internal flows and provide guidance on wind intensity and amelioration through pedestrian links and internal platform areas. The Study indicates that for the baseline case:

- areas within the development had the potential to exceed the standard 16m/sec walking comfort criterion.
- exterior areas experiencing the highest potential winds were the podium level between Tower 1 and Towers 2 and 3.
- no exterior locations exceeded the 23m/sec public safety criterion.

The Study's test results for the baseline case indicate that:

- of the 10 'Rose Garden' group locations, 5 exceeded the 16m/sec criterion; they included 3 of the 4 locations within the Garden (towards its centre, S-E corner and W side), and 2 on the public areas at RL102. One location midway along the Garden's W side measured 15m/sec. No locations exceeded the 23m/sec criterion.
- of the 9 'Victoria Ave' group locations, 4 exceeded the 16m/sec criterion.; two of them are at the Victoria W entry to the E-W connection/escalators and another two are on the rail platform. No locations exceeded the 23m/sec criterion.
- of the 6 'podium' group locations on the residential amenities level, all exceeded the 16m/sec criterion and only 1 to the S side of Tower 1 exceeded the 23m/sec criterion.
- areas throughout the Garden experience wind speeds from the S-E around to the W and also the N-E, which exceed 13m/sec. It found that winds throughout most of the Garden would remain at or below existing levels of intensity and that the CTPP would result in little or no change to the existing wind intensity over most of the Garden.

Using CFD and a simulated model of the existing situation, the Study indicates, for the existing situation and baseline case, wind intensity throughout the Garden is of a similar overall magnitude in both cases, but distribution of wind intensity throughout the Garden will be modified by the baseline case. Also, although winds throughout the Garden will exceed 13m/sec in the baseline case, winds throughout the majority of the Garden will remain at or below existing levels of wind intensity.

Submissions

Concerns raised in public submissions about CTPP's potential wind impacts relate to:

- a) wind conditions created in the Garden, their effects on the roses, and the unacceptable wind mitigation solutions recommended for the Garden,
- b) likely exacerbation of the CBD's existing adverse wind conditions,
- c) adverse effects of downwash winds generated by proposed tower buildings,
- d) tower facades' lack of modulation, stepped facades and projecting facade elements to address potential wind effects,
- e) dangerous wind conditions at the tower buildings' corner balconies,
- f) the adequacy of the wind study.

Council's submission also raised concerns about (a), (c) to (e), and the resolution of wind mitigation measures for Chatswood Mall/Orchard Way, Victoria Ave/Railway St, and the retail podium. These submissions are discussed at **Attachments F and H**.

Consideration

The Study's main wind impact objectives were to:

- ensure that new developments do not create wind 'hot spots' with wind gusts exceeding the 23m/sec public safety criterion.
- reduce instances where either the 16m/sec walking comfort or 23m/sec public safety criteria are already currently being exceeded.
- ensure that, as required by Stage 1 DA conditions, the Garden's sensitivity is addressed through a max.13m/sec wind speed on the W half of the Garden.

The Study indicates that for the 'mitigation' configuration:

- wind tunnel testing shows that with landscaping and awnings etc. added to the baseline case, adverse wind conditions at all locations can be adequately mitigated and reduced to 13m/sec in the Garden and 16m/sec elsewhere.
- wind conditions within pedestrian links are reduced to just below 23m/sec with simulated windbreak measures. Further studies during detailed design will be undertaken to reduce these winds to levels that meet walking comfort criteria.

Garden of Remembrance

The Study indicates that high winds in the Garden are the result of existing conditions and that the CTPP development's (baseline case) contribution will be minimal, and likely to redistribute winds throughout the Garden. Also, without wind mitigation treatments, winds through the Garden's W half will exceed the 13m/sec criterion, and pedestrian areas throughout the Garden will exceed 13m/sec and be just at 16m/sec.

Recommended treatments to achieve 13m/sec over the Garden's W half include:

- small tree and shrub landscaping around the W and S-W base of the nearby SageMicropay building to disperse downwash flow.
- vertical porous screens (at least 4m high) positioned throughout the gardens. The screens need only be added to the W half of the Garden if wind through the E half is allowed to marginally exceed the 13m/sec criterion.
- introducing 50% porosity into the side walls of the balconies on the S-E edge of Tower 2.

The Study states that when simulated landscaping/screening was added to the wind tunnel model, wind speeds at all measured locations dropped below 13m/sec making the area more suited to low wind speed tolerant activities eg. strolling, reading etc.

Although no details of the proposed landscaping and screening measures are available at this stage, their potential impact on the Garden's heritage value, layout and shading of its areas may be unsatisfactory. Public submissions, Council and the Heritage Office have raised concerns about those measures. The impacts of all proposed works that are associated with the Garden, and recommended conditions about their resolution are discussed in section 6.3.1 of this report.

Orchard Way-Garden of Remembrance

The Study states that the pedestrian connections through the podium have been shown to produce some of the highest wind velocities of the CTI/CTPP. A number of amelioration options have been considered and modelled for the Orchard Way-Garden of Remembrance connection. One, which involves partially blocking the connection's S portal, reduced wind velocities closer to the 16m/sec walking comfort criterion. Tree planting, screens and canopies are being considered to further reduce winds to levels below that criterion. The Study indicates another possible measure is the use of blade walls and ventilated skylights to the glazed roof over Orchard Way combined with planting in areas N of the Garden. The Study gives no indication of the likely effectiveness of the ventilated skylights.

Station Platform

Wind tunnel and CFD predictions of wind movement through the rail platform were found to approach safety limits inside the concourse. The Study states that wind tunnel tests of screening placed upstream of the N and S portals significantly reduced wind speeds in the vicinity of the concourse openings.

It recommends that the screening should span the width and height of the platforms and that porosity could be introduced in the form of walkway penetrations. There is no indication in the SoEE that these measures have been incorporated. Nor does the Study indicate what reduction in wind speeds would result.

South podium area

In the 'baseline' test, this area experienced elevated wind speeds for S winds that accelerated between the towers; and W winds caused a downwash flow from the W facades of Towers 2 and 3 spilling onto the podium. Wind speeds on many S podium locations were above 16m/sec and approached 23m/sec.

The Study's wind mitigation measures (a combination of porous vertical and horizontal screens and extensive planting of small trees and shrubs) were wind tunnel tested and achieved the 16m/sec criterion. Alternative measures proposed by the architects include trees along the S podium perimeter combined with blade walls and awnings traversing the central skylight, trees lining the E and W perimeter of the skylight, a continuous line of trees adjacent to the E side of the podium skylight and 2m wide canopies over the tower entrance locations

Whilst the Study expects the alternative measures would provide similar levels of protection they do not appear to have been wind tunnel tested. They should be because of the wind speeds experienced during the baseline test.

North podium area

The 'baseline' test results for this area experienced similar wind conditions and speeds as in the S podium area. The recommended mitigation measures were also similar and, when wind tunnel tested, wind speeds dropped to below 16m/sec at the measured locations. Similar alternative measures proposed by the architects include trees along the N podium perimeter combined with blade walls and awnings traversing the central skylight and trees lining the E and W perimeter of the skylight. Again, the alternative measures were not wind tunnel tested.

Victoria Avenue West

The 'baseline' wind tunnel tests found that winds at the test locations marginally exceeded 16m/sec criterion. The tested mitigation measures were found to achieve the 16m/sec criterion. They include a horizontal porous canopy lining the base of Tower's W and N facades. The DA adopts this in the form of an extended podium and an extension of the Tower 1 screen to cover the Telstra building. The building gap beneath the screen also includes a horizontal screen element.

Other tested measures were vertical porous screen elements and street planting located at the Victoria Ave W pedestrian connection entrance. The Study states that the DA adopts this in the form of street planting spanning the width of the entrance. While the Study illustrates this landscaping intention, it is not documented in the DA's Landscape Plans. The Study states that wind tunnel test results confirm that these windbreak measures will lower wind speeds at all exterior building locations below the 16m/sec criterion.

The Study states that internal wind flows through the Chatswood Mall/Victoria Ave W link were analysed via CFD methods, and are shown to produce the highest wind speeds at some isolated locations. One potential amelioration measure proposed by the architects incorporates a ventilated roof to the awning above the Victoria Ave W entrance to this link. The Study indicates that the alternative measure, amongst others, is being investigated.

Because some wind mitigation measures are still under investigation, and others that are referred to in the Study are untested, a detailed submission of all final adopted amelioration measures should be provided. It should include:

- a) detailed drawings of building elements selected for wind amelioration.
- b) details of wind testing of all mitigation measures that were not wind tested for the DA's *Wind and CFD Study*.
- c) in consultation with Council, particular attention should be given to the locations referred to in Council's submission, and to Thomas Lane at the base of Tower 1,
- d) for the mitigation measures being considered for the Garden of Remembrance, the submission should be prepared in consultation with Council and the Garden's Trustees,
- e) clearly identify all of the final, adopted measures on 1:250 scale architectural plans and elevations, and landscape plans.

A recommended condition addresses all of the above requirements. A condition also requires, prior to the occupation of each of the residential towers, a supplementary wind report(s) that verifies the findings of the DA's *Wind and CFD Study* and the above submission and, where required, recommends supplementary wind mitigation measures. That report(s) should be submitted for approval and implemented prior to the issue of an Occupation Certificate for each residential tower.

6.2.6 Traffic and parking

DIPNR engaged Stepfair-Samsa Consultants to undertake a review of traffic and transport issues arising from the CTPP. Their Transport Impact Assessment Review (the Report) is at **Attachment W**. Some of its findings are outlined below. The Report's main focus is:

- a) whether traffic impacts arising from the CTPP's construction and operation have been adequately addressed by the relevant documents submitted with the DA,
- b) the adequacy of the traffic modelling tasks undertaken,
- c) the appropriateness of the assumptions made for traffic generation forecasts for the CTPP, and
- d) the adequacy of the traffic management measures proposed.

The Report addresses the above issues in relation to construction and operational traffic impacts. In relation to the latter the Report considered traffic generation impacts, development access, provision for parking, pedestrian and cyclists facilities, and the appropriateness of the modelling process.

Construction traffic impacts

The DA indicated that the estimated traffic for the CTPP during the construction period would be between 200 and 300 vehicle trips per day. It did not include any potential cumulative trip generation in conjunction with the Part 5 CTI. It concluded that the traffic modelling undertaken for the DA did not show any adverse impact on the network, and noted that the results indicated a better peak hour network performance during the construction phase.

The Report considers it unlikely that additional traffic generated during construction would have no impact on network performance, and that while it may be argued that the bulk of construction traffic distribution would occur outside the commuter peak, it would certainly affect other periods such as the business peak which in Chatswood CBD could carry significant traffic flows on its road network.

The Report considers that at certain periods, construction may cause significant impacts on the local road network in access Pacific Highway and other higher order roads, and this may be exacerbated by the Part 5 construction activities.

The Report recommends, that:

- a) a recommended condition should set a maximum construction traffic generation rate to address the potential cumulative affects of construction traffic for both the CTPP development and the CTI project,
- b) heavy vehicle use restrictions associated with the CTPP construction activities be imposed for Railway St, Victoria Ave, Thomas St and Katherine St;
- c) traffic operations be reviewed every 6 months during the construction period, including thorough monitoring, at critical locations including, but limited to, 15 specified intersections, and
- d) traffic management plans should include an independent road safety audit of the suitability.

Recommended conditions have addressed the above matters.

Operational traffic impacts

The Report considers that the DA's estimated traffic generation rate is generally considered reasonable, although for sensitivity testing a comparison with other centres

may have been worthwhile. It considers the 2001 Journey-to-Work data used by the DA may be outdated and may not necessarily be the most relevant for assessment purposes.

The Report indicates that traffic generated by the CTPP in the commuter peak is expected to be small, but weekend and mid-day business traffic generation may be higher; and this, combined with shopping traffic could be as critical as commuter peaks. It notes that while non-commuter traffic would not be due to the CTPP alone the cumulative effects should be acknowledged.

The Report considers that traffic modelling of the network commuter peak traffic operation would not reveal any major additional impact due to the development as the existing network is congested due to major delays at intersections along Pacific Highway and Mowbray Rd. As signals operations favour movements on arterial roads, vehicle delays on local roads within the Chatswood CBD are much higher than indicated in the modelling exercise. The Report considers that the SIDRA traffic model used for the DA does not take into account the SCATS coordinated signal operation on the main roads.

It notes that while the DA identified many existing traffic and parking problems minimal assessment has been undertaken in determining the CTPP's impacts. Consequently the DA made no recommendations on improving these conditions. The Report considers that existing problems and impacts on the surrounding road network should be identified and recommendations developed as to how issues may be resolved.

Although a specific consent condition has not been recommended along the lines suggested above, Condition 127B of the PRL approval requires such an exercise to be undertaken in consultation with Council and the RTA. For Chatswood, it requires the operation of general traffic within and around Chatswood, including during Saturday mornings and other weekday periods outside of the peak periods, to be monitored and where necessary additional traffic management measures to be implemented in consultation with Council and the RTA.

It recommends that road safety audits for all transport related facilities (development access, shareway, 'kiss and ride' facilities, pedestrian and cyclist facilities) should be undertaken upon completion of the works. A recommended condition deals with operational traffic audits for the above facilities.

Development access

The Report indicates the traffic flow directions of the proposed vehicular access to/from the car park for the residential buildings are contrary to the standard convention, and while this not affect traffic assessing the car park, because the entry and exit points are separated by the rail line, clear signage will be required to ensure traffic safety within the car park.

Parking provision

The Report indicates that the proposed provision of 506 total car parking spaces, including 15 visitor spaces and 5 RailCorp spaces is about 20% less than required by Council's DCP No.2, but is about 15% higher than provided for in the RTA's revised guidelines. It considers the constraint in parking provision, with no parking proposed for the retail component, is consistent with the government's policy of reducing dependence on cars for transport, and is supported. The recommended conditions require, within the total 506 parking spaces, that 10 spaces be set aside for a car-share scheme and 10 retail spaces be provided for tenants' use.

The Report refers to the CTPP's inadequate provision for motorcycle parking. A recommended condition requires such provision to comply with DCP2. It notes that little assessment is made in the DA in respect of loading zones/areas to service the CTPP's retail component. It also indicates that the provision for bicycle racks and pedestrian access to the retail and rail concourse is generally adequate.

Recommended conditions require details of the loading arrangements to be submitted and that they demonstrate satisfactory provision for the manoeuvring of service vehicles and adequate head room clearances.

Appropriateness of modelling Process

The Report refers to a number of deficiencies of the DA's traffic modelling process. Only a.m. and p.m. peak models were constructed although these weekday peaks do not necessarily reflect the critical traffic situation in the Chatswood CBD network. It notes that this deficiency is most notable in the road network results and analysis, which indicate that impacts would be minimal, and that unless optimal peak periods can be identified, it would be prudent that business and weekend peak models also be evaluated and run to ensure the network would also operate adequately during those periods. This modelling applies to both operational and construction assessment.

The Report indicates that for the DA, many of the intersections assessed during the construction and 2007 scenarios operated at similar or even better levels (average delays) than the base case scenario. It is unlikely that the Pacific Highway intersections, in particular, would operate with less delay in 2007 as background traffic alone would result in more congested conditions.

6.2.7 Through-site connections and other links

The TIDC's design review panel referred to the importance of providing good civic links from Chatswood Mall to Victoria Avenue, from the Gardens of Remembrance to the bus/rail interchange. The Part 5 CTI includes E-W links that connect Chatswood Mall, Victoria Ave W and Orchard Way and connect Thomas St, the Garden's N end and Orchard Way. It also includes the N-S link that connects the Garden, Chatswood Mall and bus interchange.

The Stage 1 DA conditions require a high level of connectivity and permeability with adjoining sites and public areas including, but not limited to, adjoining streets and the Mall, the Pacific Plaza, Chatswood Central and gardens adjacent to, and N of, the Garden. In addition to the Part 5 links, noted above, the CTPP will provide the following connections:

- a) at RL98: between Post Office Lane, Orchard Way and the main station entry via the CTPP's E retail area,
- b) at RL102 and RL106.6: between the Sydney Water Plaza/Mandarin Centre and CTPP's retail and food court areas, and to the rail concourse via escalators,
- c) at RL106.6: between the CTPP's retail/food court and Chatswood Central, via a glazed bridge link,
- d) at RL102: between Railway St/Victoria Ave W to Sydney Water Plaza/ Mandarin Centre, via the food court and other connections noted above.

The connection to Pacific Plaza, required by the Stage 1 DA consent, is not possible as part of the CTPP proposal due to its greatly reduced podium above the rail corridor.

Submissions

Public submissions and Council raised concerns about unsatisfactory pedestrian and disabled persons' accessibility of several connections and travel paths proposed in the CTPP. Of particular concern are the following:

- a) indirect, inconvenient N-S and E-W connections.
- b) indirect and convoluted travel paths from the Sydney Water/Sebel Apartments connection to retail areas RL102 and RL106, and from there to other levels.
- c) restricted paths of travel via the food court level to RailwaySt/Victoria Ave W.
- d) access to the rail station from Chatswood Mall.
- e) unsatisfactory Victoria Ave connections, with no provision for a bicycle path connection to Chatswood Mall.
- f) the need for a comprehensive pedestrian and bicycle path study.

Consideration

The Stage 1 DA conditions state that visual and physical E-W connections should be provided between Victoria Ave and Chatswood Mall, and between Thomas St and Orchard Rd South, and the connections should be in a straight line and achieved with a minimum number and extent of grade changes. They also require adjoining areas to provide access for disabled persons.

The Part 5 connections are in a straight line, but are all subject to grade changes. At the Thomas St entrance, the E-W connection is via a flight of stairs from RL98 to RL95. It is tunnel-like and unsatisfactory as a pedestrian connection and retail environment. Its 3m ceiling height is dictated by the rail structure, and is too low, and its width (6m) is too narrow for a major connection. Its entry at Thomas St has a 3m level difference and its physical relationship with the overhanging rail structure is poor. Satisfactory disabled access between the 3m level difference is proposed.

A cycle/pedestrian path along Thomas Lane links Thomas St and Victoria St W. The connection is not part of the CTPP, although the DA proposes a retail area along it. The connection is flanked by the Telstra building, which provides little surveillance. For public safety, 24hour CCTV surveillance and good night lighting will be essential along both the Thomas St and Thomas Lane connections.

There is a grade change along the E-W connection from (RL94) at Orchard Way to Victoria Ave W (RL102). It is made accessible by escalators and a lift. The grade change along the N-S connection between Albert Ave and the shareway is slight. Access from the N end of the shareway (RL95.5) to Orchard Way, the station entry and the bus interchange (RL94) is via stairs or a ramp. Access between the shareway drop-off point (RL95.5) and Orchard Way to the retail podium and Chatswood Mall (RL98) are by lifts or stairs.

Some concerns raised in public submissions and by Council are considered valid. The ramp system proposed for pedestrians and disabled persons between the adjoining developments (Sydney Water, Council, Sebel Apartments and Mandarin Centre to the CTPP's retail areas at RL102 and RL106) are pedestrian unfriendly, indirect and convoluted. From those levels, pedestrian access to other levels and through the CTI/CTPP to the surrounding streets will be indirect and without clear travel paths.

From the E retail areas at RL102 and RL106, the direct travel path to Railway Ave/Victoria Ave W is via the food court. Access is restricted by tables, chairs and structural columns and, at the entrance to that podium level at its S-E corner, is restricted in width with "squeeze" points near escalators.

Access to/connections from the concourse or intermediate level to the Thomas St link, Chatswood Mall and bus interchange is via a small lift in the centre of the E retail area. The walkway from both ends of the E retail area to the lift is restricted in width.

When exiting Chatswood Mall, disabled persons will need to travel to the centre of the E retail area to gain access to the next level via a lift. They would then need to return to the Mall alignment to again gain access to the Mall exit level. A passenger lift should be provided adjacent to the Chatswood Mall steps. This has been also recommended in the DA's *Access Review Report*.

There is no convenient, direct access between the Sydney Water Plaza and CTPP's retail and food court areas, and generally there are difficulties in accessing various parts of the CTPP from the S-E retail areas at RL102 and RL102.

There is no access for disabled persons from the CTPP's podium level to the Sydney Water and Council's buildings. Disabled persons' access from the S end of Orchard Way to the Garden of Remembrance is unsatisfactory, as it will require a crossing of the shareway/'kiss and ride' drop-off area in a location with several vehicle driveways.

Access from the S end of Orchard Way to the Garden is midway along the Garden's E side, about 60m from Orchard Way. Council identified an alternative solution to this via a pedestrian bridge over the shareway that gave near-level access at about RL97.5 from Chatswood Mall to the top (N) end of the Garden. This was investigated by the Applicant but was found to be unsuitable because it provided insufficient headroom clearance under the bridge.

The CTPP provides a connection between Post Office Lane and the proposed E retail area at RL98. It will have a poor 'back-of-house' quality due to service elements and stair exits at the connection's entry off the Lane. The connection entry's design and presentation should be improved.

Recommended conditions require these deficiencies to be addressed in consultation with Council.

The lack of a convenient E-W bicycle connection between the bicycle path at Railway St and Chatswood Mall and the bus interchange is a significant omission. The Part 5 consent condition No.130 requires only the provision of a bicycle path along the W side of Chatswood station. An E-W bicycle path connection at grade, or by a ramp was suggested in the submissions. It does not appear feasible within CTPP's boundaries because of level difference between Victoria Ave W and the N end of Orchard Way.

6.3 Other Issues

6.3.1 Garden of Remembrance - proposed works

The Stage 1 DA conditions contain requirements for a subsequent DA in respect of the Garden. They relate to:

- (a) the preparation of a Garden of Remembrance Protection Plan in consultation with several bodies. including Council,
- (b) specifications for the Plan,
- (c) the Plan's implementation for which the Applicant is to be responsible and bear the costs.

The Applicant is currently preparing the Garden of Remembrance Protection Plan in consultation with the Garden's Trustees. The DA's *Landscape and Public Domain Statement* deals with proposed works at the CTPP/Garden interface that include new stair access to the Garden from Orchard Way, N and W perimeter walls, balustrade and

paving. They are needed because of changes to existing grades along the Garden's N and W edges (within the CTPP's boundaries) for the shareway.

The DA's Landscape Plan (**Attachment U**) includes the repositioning of the Garden's rose beds. It maintains the Garden's existing levels, is in keeping with the Garden's existing layout and is in accordance with the draft Garden of Remembrance Protection Plan. The five W rose beds will be repositioned near their existing location as part of the Plan, retaining visitor access around the roses.

The retaining wall design (along W perimeter) is intended to incorporate a modern interpretation of traditional stonework and a balustrade. Interpretive art/signage will be incorporated in the retaining wall. The balustrade is intended to provide a safe edge and visually define the Garden. A new hedge to the Garden's N perimeter will provide a backdrop to the existing memorial and a focus along the Garden's N axis. Consideration is being given to planting Cypress trees along the W perimeter balustrade to soften the railway edge and not compromise the shareway's safety or overshadowing.

Submissions

All but one of the public submissions about the Garden are concerned about the CTPP's overshadowing, wind, visual and amenity impacts, and its accessibility (see sections 6.2.1, 6.2.2.1 and 6.2.7 of this report). Council's submission also raised concerns about the following:

- a) the encroachments for the shareway's construction,
- b) poor resolution and lack of details about the Garden's W edge definition,
- c) the resolution of the Garden of Remembrance Protection Plan,
- d) the Garden's openness to rail lines and traffic thoroughfares,
- e) unresolved wind amelioration measures,
- f) the need for a 'green' enclosure, and
- g) responsibility for works to the Garden.

Consideration

The "encroachments" for the shareway are in fact contained within the railway corridor along the Garden's W perimeter. The DA's *Horticultural Assessment's* very negative view about the Garden's state of decline is accepted throughout the DA's relevant documents. It presents a picture of decline that is not the case and is contrary to the Royal Botanic Gardens' expert technical advice.

An important part of the Garden was its sense of enclosure along the W boundary that had been created by the Cypress trees in the rail corridor. Their recent removal was allowed by the Part 5 approval, subject to provision of edge and screening treatments to protect the Garden's amenity, if the trees could not be retained.

It is considered the proposed open balustrade will not achieve a suitable sense of enclosure along the W perimeter and should therefore not be approved. Any alternative solution should not involve a further reduction of Garden space and should be subject to the consultation noted below. Other security/safety arrangements, such as 24hour CCTV surveillance of the shareway, may therefore be needed.

Wind mitigation measures within the Garden, proposed in the *Wind Tunnel and CFD Study* to reduce wind speeds to 13m/sec, are not supported. They are not supported by some of the DA's other specialists' reports because they would impact on the Garden's

amenity and design, and may create additional shading. Mitigation measures for the Garden therefore remain unresolved. A recommended condition requires that they be resolved before the issue of a Construction Certificate.

A review of the Garden's layout should be carried out with the aim of achieving a more suitable arrangement of the garden beds that also addresses wind stress. The DA's Landscape Plans should therefore be amended, if necessary, following the consultation noted below.

The detailed design of all proposed work associated with the Garden, including the enclosure along the W perimeter, the N end proposals and wind mitigation measures should be undertaken in consultation with the Garden's Trustees and Council. The DA provides insufficient details for a proper assessment of those works. A recommended condition requires the preparation of detailed drawings of those works, in consultation with those bodies, and their submission for approval prior to the issue of a Construction certificate. A recommended condition also requires completion of the Garden of Remembrance Protection Plan.

6.3.2 Environmentally sustainable development

The relevant issues are discussed in detail in relation to the SEPP (Building Sustainability Index: BASIX in the Section 79C Evaluation Report.

The CTPP will satisfy the NatHERS criteria specified in Section C2 of Council's DCP30 *Sustainable Development* and improve on the criteria adopted by the Stage 1 consent that requires at least 80% of all apartments to achieve better than 3.5 stars and 20% of all apartments to achieve better than 4.5 stars.

The DA's *Solar Access Assessment* reviews the CTPP's residential component and concludes that the CTPP scores 20 points as required by the Sustainability Scorecard in Council's DCP No.30, in addition to the mandatory requirements, and complies with DCP30's Part C2 Multi-unit Residential Development.

In addition to its average 4 star NatHERS rating, the CTPP's features include:

- a commitment to a min.3 star energy efficiency rating of any appliances installed,
- a large % of apartments having good cross-ventilation potential,
- a min.4 star Energy Rating on the water heating system,
- a drip feed irrigation system with timed switching and moisture sensors,
- building materials and finishes will comply with AS2107 *Recommended Design Sound Levels and Reverberation Times for Building Interiors*,
- the minimisation or exclusion of harmful building materials.

The DA's *Solar Access Assessment* also indicates that the CTPP will include rainwater storage and reticulation to all apartments for non-potable uses. This initiative helps to achieve a score of 20 points under Council's Sustainability Scorecard. It differs from the DA's modified *Watercycle Management* report that indicates non-potable water will be used for public and railway toilet flushing and irrigation systems only.

The Section 79C Evaluation Report details other proposed CTPP features in relation to appliances, biodiversity and soils, water usage, waste management, lighting, gas and electrical supply, clothes drying and solar access.

Consideration

While SEPP (Building Sustainability Index: BASIX) 2005 does not apply to the CTPP, the proposed measures are, with some exceptions, consistent with BASIX aims and the

State government's objective of reducing greenhouse gas emissions and use of mains supply water. Exceptions are the (uncertainty about) non-reticulation of collected rainwater to the apartments for non-potable uses and a lack of details about operational waste management/minimisation for the retail areas.

Recommended conditions require the submission of adequate justification for the non-reticulation and details of proposed protocols or agreements to be entered into between CTPP managers and future retail tenants/operators for waste management and minimisation. A condition also requires the submission and approval of a revised ESD report based on the modified *Watercycle Management* report's proposal for non-potable water use.

6.3.3 Solar access – proposed apartments and amenities'

The SoEE indicates that good levels of solar access will be achieved through the orientation of apartments, building separation, apartment depths and floor-to-ceiling glazing. The DA's *Solar Access Assessment* (the Report) refers to several solar access features of the CTPP's tower buildings' design and claims that:

- solar exposure of every apartment is maximised,
- horizontal shading (balconies) to N glazing will shield against high altitude summer sun,
- vertical slotted screens to facades will provide shading from high angle sun,
- all apartments have either a N, E or W aspect and none will have only a S aspect,
- due to the building heights, many apartments will have unimpinged solar access, being only shaded at times by the other CTPP towers,
- all apartments have their primary facade glazing, windows, doors and open balconies attached to "living zone" rooms, and by attention to design details these can act as efficient solar collectors, especially during winter.

DCP30 *Sustainable Development* requires all apartments to receive 3 hours of direct solar access at mid June. The SoEE claims Tower 1 (for 72% of its apartments), Tower 2 (for 70%) and Tower 3 (for 76%) would receive at least 2 hours direct sunlight between 9 a.m. and 3 p.m. at mid winter, and would comply with SEPP65's (RFDC) 'acceptable' guideline for dense urban areas, that at least 70% of apartments should receive 2 hours of sunlight.

The Report's summary of the CTPP's solar access performance at mid winter is that only about 17 (i.e. 3%-4%) of the total 509 apartments will not receive 3 hours of direct solar access, with the minimum being 2 hours. This takes into account existing surrounding buildings, but would not apply if future developments to the E, N or W were of sufficient height to obstruct the solar path. Its assessment is outlined below.

North facing apartments: All of these in Tower 3 will have solar access throughout most of the day. Some on Tower 1's lower levels that are shaded by buildings will still receive 3 hours solar access. For most of the day Tower 2 will be largely blocked by Tower 3. Affected apartments also have E- and/or W-facing facade that would gain solar access.

East-facing apartments: These will receive at least 3 hours of direct sun in Towers 1 and 2 from 10am-1pm and 9am-12noon, respectively. In Tower 3, they will receive 4 hours of direct sun between 9am and 1pm.

West-facing apartments – Tower 1: Most of these apartments will receive at least 3 hours of direct sun between 1pm and 4pm; and two on Levels 1 and 2 will receive about 2.75 hours.

West-facing apartments – Tower 2: Most of these apartments above Level 5 will receive at least 3 hours of direct sun between 1pm and 4pm; and ten apartments below that level will receive about 2 hours of direct sun between 1pm and 3pm.

West-facing apartments – Tower 3: most of the apartments above Level 5 will receive at least 3.5 hours of direct sun between 12.30pm -4pm; and one on the lower 5 levels will receive at least 2.5 hours of direct sun between 12.30pm and 3pm..

DCP15 requires communal private open space to receive 3 hours of direct sunlight between 9am and 3pm at mid winter. The DA's *Chatswood Transport Precinct Amenity Report* (Amenity Report) examines solar access to the residential podium. This contains outdoor amenities such as pools, a landscaped sundeck, a BBQ area and general landscaped areas.

The Amenity Report's overshadowing diagrams for June 21 show that at 9am about a third of the external podium area will receive direct sunlight. At 10am slightly less than ½ of the external area will receive direct sunlight.

At 11am about ¾ of the external podium area will receive direct sunlight. At noon slightly more than ½ of that area will receive direct sunlight. By 1 pm about a third of that area will receive direct sunlight. At 2pm very little of the external podium area will receive direct sunlight.

Consideration

Perusal of the tower floor layouts, the relationships and heights of the surrounding buildings suggests that the Report's assessment of solar access to the proposed apartments is reasonable. In respect of the RFDC's guideline it is likely that in excess of 70% of all apartments would receive 3 hours.

Because of the orientation of the towers, particularly the E and W facades of Tower 2, and the W facade of Tower 2, the amount of solar access penetrating living areas would be restricted around 11.30am to 12.30pm.

In respect of the residential podium, at least about half of the external podium area would receive at least 3 hours of direct sunlight on June 21.

6.3.4 Non-indigenous heritage

The key heritage items potentially affected by the CTPP are:

- a) Garden of Remembrance, which is not an individually listed item on any heritage register, but is within the Chatswood Urban Conservation Area (South Chatswood Precinct).
- b) Chatswood Urban Conservation Area (South Chatswood Precinct), which is listed on the Register of the National Trust of Australia (NSW) and the Register of the National Estate.
- c) Hotel Chatswood is listed as a heritage item in SREP5.

The DA's *Heritage Impact Statement* concludes there would be minor impacts on the Hotel Chatswood and Urban Conservation Area, and while there would be impacts on the Garden due to the retail podium and residential towers, shareway and new Garden access, the overall impact on its heritage significance will be relatively minor.

Submissions

Many public submissions about the CTPP's adverse impacts on the Garden referred to its strong historical connection for the local community and its amenity value.

Council agrees the impact on Hotel and Urban Conservation Area will be minor. It notes the *Heritage Impact Statement* conclusion on CTPP's impact on the Garden, and considers the wind mitigation measures are unsatisfactory and insufficiently detailed to satisfy Council that their impacts are reasonable. It considers insufficient detail has been provided of the heritage strategy involving conservation of significant items from the railway station for development consent to be granted.

The Heritage Office considers that:

- a) the CTPP's podium and towers will increase the overall perception of built form on the wider setting of the Hotel, Garden and Urban Conservation Area greater than the current situation,
- b) its repositioning of the towers will ameliorate some impacts on the locality but will accentuate development impacts on the Garden, particularly overshadowing,
- c) its detail design mitigates some impacts, such as the design of the podium and the towers, which will moderate the development's appearance to some extent,
- d) other issues are not sufficiently addressed to ensure the best outcome for the Hotel and Garden.

Consideration

Council's reference to the heritage strategy and railway station items relates to Part 5 matters as the proposed glass heritage enclosure (RL102) along Thomas Lane is outside the CTPP's boundaries.

The "other issues" referred to in (d) relate to the lack of screening along the Garden's W perimeter, shareway layout, Garden's detailed layout design and new N end, wind mitigation measures, and the towers' overwhelming impact on that N end. In relation to the Hotel, they refer to the design of the bus interchange. However, except for the kiosks, the bus interchange is outside the CTPP's boundaries.

The "other issues" that relate to the layout and detailed design of the shareway and Garden can be adequately resolved by the conditions recommended in section 6.3.1 of this report. Another recommended condition will address the Heritage Office's submission about the proposed expanse of glazing on the retail podium's S face that overlooks the Garden.

The impact of the CTPP's podium, but particularly its towers, on the Garden's setting and winter overshadowing will be significant. As discussed in section 6.2.1 of this report, amelioration of those impacts would require a considerable reduction in the towers' heights. For the reasons discussed in that section, a reduction in the tower's heights has not been recommended.

Much of the Hotel's significance relates to its location on a prominent corner. While the proposed kiosk adjacent to Chatswood Mall's stairway has the potential to detract from the Hotel's significance, its design will include substantial areas of glazing and its roof will be no higher than the footpath level in front of the Hotel.

6.3.5 Safety and security

The Stage 1 DA conditions required any subsequent DA to include a Safer by Design assessment including a safety audit, in consultation with NSW Police, of all access and pedestrian routes with recommendations being implemented in the DA design.

The DA's *Crime Prevention Through Environmental Design* report (the Report) indicates that NSW Police are currently considering the CTI/CTPP, and that the development's complexity will require a certain level of consideration when most of the CTI/CTPP is complete. Further liaison with NSW Police is intended throughout the design development and construction periods.

The Report indicates that general CCTV surveillance coverage will be provided to car parks, lobbies and waiting areas, fire stairs, pedestrian subways and tunnels, toilets, lift lobbies and cars, entrances and exits, escalators/stairs along circulation areas, public telephones and concealed locations; and the CCTV system will be well advertised.

Access doors that open onto public areas will be designed to eliminate recesses, and be monitored, alarmed and kept locked to discourage unauthorised use. If recesses are unavoidable, planters with low vegetation will be introduced using plant species that restrict concealment. Vandal resistant materials and equipment will be specified in all public areas.

Lighting design will satisfy CPTED principles, apply to all station areas and surrounds and provide a wide and even spread of illumination at levels adequate to meet CCTV operational requirements. Luminaires will be vandal resistant. Where practical internal finishes will be highly reflective to improve the overall illumination level. The Report contains a detailed description of all of the safety/security measures that will be provided for the various components of the CTPP. They include, inter alia:

Bus interchange kiosks: lighting, wide spacing allowing for surveillance, use of large areas of glass for transparency.

Car parks: lighting, managed access for trades/delivery persons, monitored/alarmed fire stair and doors, CCTV monitoring of travel within the stairs and entry/exit points, and access key-operated access from outside areas.

Car park residential lift lobbies: key or remotely operated lobbies and/or lift cars, and an intercom system for authorised visitors access to the lifts/lift lobby,

Vehicular entry: roller shutters remote-controlled in off-peak hours and automatically opened on a time switch in peak hours, and an intercom system will allow authorised persons to access the car park. All entry points will CCTV covered and well lit.

Concourse/Orchard Way (RL94): clear signage/lines of travel, augmented with good lighting. Orchard Way will be visible from retail areas and will be well lit at night. Lifts will have see-through doors and viewing windows and CCTV within the cars,

Shareway/area N of Garden of Remembrance: clear and unambiguous lines of travel, recesses and concealed areas eliminated, CCTV surveillance and well lit at nights,

Intermediate level: recesses eliminated at stairs and Tower 3's secondary entrance, access routes to/from station with clear lines of travel with signage and good lighting. Elevated walkways will have CCTV surveillance, be well lit and visible from Orchard Way. Escalators/lifts linking Post Office Lane will have CCTV surveillance,

Thomas Lane (RL102): access routes from station will have clear lines of travel. CTPP has opened up view down lane to improve surveillance. Residential entrance to Tower 1 and the retail area along the lane will activate it and discourage loitering,

Eastern retail area (RL102): retail uses will activate walkways at daytime. Walkways will be visible from station, well lit, and have CCTV surveillance,

Podium-Food Court level: secured at night with shutters at junction with medical centre to the E, screens at top of stairs/escalators from Railway St/Victoria Ave W, and a shutter where bridge link abuts Chatswood Central. Toilets/corridors to have CCTV surveillance and fire doors will be alarmed. Landings to medical centre, food court access stairs/ escalators' top landing and main exit route to terraces will be well lit and have CCTV surveillance.

Residential amenities level and towers: secured from public access, only accessible by key access; all stairs/lift lobbies to be manned or kept locked. Stairs, doors and vulnerable areas will have CCTV surveillance and doors will be alarmed.

Consideration

The proposed security and safety measures generally appear to be satisfactory and comprehensive. Their incorporation within the CTPP will be reinforced by a recommended condition.

A recommended condition requires 24 hour CCTV surveillance of all isolated and/or vulnerable areas, including through-site connections, links, walkways and promenades, the retail areas along the E-W connections, Thomas Lane and the shareway.

The DA contains no information about proposed hours of opening for non-residential uses. This was discussed with the Applicant in the context of the possible closure of some areas having no late night use, and associated measures to address the safety and security of patrons and residents.

The applicant advised that the DA should be assessed on the basis of 24 hours opening of all areas. This is contrary to the Report's statement that the foodcourt will be secured at night. Also, full 24 hours' operation may not eventuate, as it could be subject to particular types of individual retail outlets.

As the applicant's DA consultation process with NSW Police is not yet completed, a recommended condition requires that a Safety and Security Plan for the CTPP, prepared in consultation with NSW Police and submitted for approval before the issue of a Construction Certificate, and that it be generally consistent with the Report's CPTED's statements and incorporate the NSW Police's recommendations.

A further condition requires that any changes to the approved 24-hour operation, and any associated after-hours closure of floors, or parts of floors, that would otherwise be available to the public on a 24hour basis, shall be subject of future application(s).

6.3.6 Accessibility

The DA's Access Report (the Report) reviews the CTPP's ingress and egress, travel paths, circulation areas and toilets in respect of compliance with relevant guidelines. In summary, it states that the building designs have accessible paths of travel that are continuous across all floors, the CTPP demonstrates a suitable degree of access and there is general compliance in respect of site access, access to common areas, residential areas and accessible parking.

The Report's recommendations are based on Australian Standards AS1428.1 and 2, AS 1735.12 and AS 4299, DCP14 *Access, Mobility and Adaptability*, RFDC, BCA and the Disability Discrimination Act. The recommendations deal with the following:

- a) residential buildings' entrances, fire stairs and emergency warning systems and paths of travel to/within those buildings and to their upper floors,
- b) external stairs that access retail levels, Tower 2 and the concourse from Chatswood Mall, Victoria Ave, Albert Ave, the Garden of Remembrance and Thomas St,
- c) ramps provided at the S side of the concourse, Thomas St, the Egis area and along the path of travel to Sydney Water,
- d) escalators adjacent to the retail lift and Victoria St W entrance,
- e) residential tower and retail lifts and lift lobbies,
- f) access from Chatswood Mall to Tower 1,
- g) the residential amenities level and access to landscaped areas,
- h) residential car parking, lighting and signage.

Consideration

The main issue identified by the Report is the CTPP's provision of only 51 adaptable apartments. This represents 10% of the total apartments, and is much less than the 50% requirement of DCP14. The Report indicates that while the number of adaptable apartments is well short of that requirement, the CTPP's accessibility provisions exceed several other regulatory requirements.

The S of EE indicates that the proposed 10% provision of adaptable apartments is in line with other similar I.g.a.s and that the CTI/CTPP's contribution of substantial public benefits (transport infrastructure and public domain improvements) to the I.g.a. should be offset against the benefits of providing additional adaptable apartments. Notwithstanding those benefits, and the DCP's excessive 50% requirement, the disparity between that requirement and the CTPP's provision should be reduced. It is understood that other developments in the Chatswood area have included a higher provision of adaptable apartments than is proposed for the CTPP. A recommended condition requires 15% of total apartments to be adaptable (in accordance with Sydney City Council policies).

The scope of the Report's recommendation is comprehensive. Except in respect of access between Chatswood Mall and Tower 1's main entry, the Report has concentrated on compliance issues. However, as discussed in section 6.2.7 of this report there are several locations where the provision for disabled persons' access is unsatisfactory. They are addressed by recommended conditions.

The travel path from Orchard Way (RL94) or from the residential drop-off point to Sydney Water/Council's offices is convoluted, via one or more lifts to RL102 and then via a series of ramps. A more direct access arrangement should be provided from RL102. Because of the isolated and indirect nature of that path from Orchard Way to Sydney Water/Council's offices, it should be well sign-posted, and well lit for nighttime use to access Council's offices.

The Report notes that access from Chatswood Mall to Tower 1 will be via a stair to Orchard Way and thence an accessible path of travel to a lift at Victoria Ave W. It also notes that the only means of wheelchair access between the Mall and Orchard Way will be a retail lift about 50m away. Because of that distance and the nature of Orchard Way's usage, it considers such access would be inequitable for wheelchair users. The

Report's recommendation, that a passenger lift be provided adjacent to the Mall's stairs for access to Orchard Way, has not been incorporated in the CTPP.

The Report's recommendations are generally incorporated in this planning report's recommended conditions. Because of the proposed reliance on external passenger lifts for disabled persons' access, a recommended condition requires details of proposed anti-vandalism measures and maintenance of external lifts to be submitted.

Because of a floor level difference, the interface between the retail podium level (RL106.6) and the existing medical centre (RL105.4) in 430 Victoria Ave is unsatisfactory in respect of visibility and security.

A concern has been raised about the need to provide improved and unrestricted access from the CTPP's retail levels to the 1st and 2nd floor levels of No.430. Recommended conditions require replanning of this interface to provide greater visibility between CTPP's retail area (RL106.6) and the stair landing/lobby at No.430; and that the proposed shutter between those two areas stays open during normal (general) retail hours. Another condition requires disabled persons' parking spaces be provided and allocated to each adaptable apartment.

6.3.7 Reflectivity impacts

The DA's *Reflectivity Assessment* (the Report) examines traffic disability glare and pedestrian discomfort glare from the CTPP building facades' glazing and other materials onto Victoria Ave, Albert Ave, Thomas St, Thomas Lane, Victor St and Orchard Rd, Chatswood Oval and the Garden of Remembrance.

It identifies reflectivity influences as being the CTPP towers' potential for reflectivity events at large distances from the site, and the potential of other buildings to affect the CTPP's reflectivity by blocking incoming solar rays or outgoing reflections. The Report's findings for various facades and reflectivity events are summarised below.

Eastern facades

- a) Early a.m. low altitude incoming solar rays will strike these facades of Towers 2 and 3 and theoretically strike Victor St with a low altitude angle (less than the cut off for a driver's sight). The towers will allow potential low altitude angle rays to create reflections further downstream to Anderson St to the E, and beyond.
- b) Mid to late a.m. rays that strike the facades of all three towers from the N will reflect towards the S onto Albert Ave and Orchard Rd (south).

Western facades

- c) Late p.m. low altitude rays in summer will strike Tower 1's W facade and reflect back towards Victoria Ave. The facades' heights will allow low altitude rays to create reflections and impact further downstream towards the Pacific Highway.
- d) Early to mid p.m. rays will strike the W facades of all 3 towers from the N and reflect back to the S onto the rail line, Garden, Thomas Lane & Albert Ave.
- e) Mid p.m. solar reflections from the upper levels of the towers' W facades have the potential to impact further a field towards the Pacific Highway.

Northern facades:

- f) Solar rays at 7a.m.-9a.m. will strike the N podium and lower level tower facades from the E and reflect to the W onto Victoria Ave.
- g) Late p.m. solar rays of short duration that, between October and February, will strike the N podium and lower level tower facades from the W and reflect to the E onto Victoria Ave/Chatswood Mall.

7 Southern facades:

- h) Early a.m. solar rays that will strike the S tower facades from the E and reflect to the W onto Thomas St. However, Tower 2 would block the same solar rays from impacting on the S facade of Tower 1.

Consideration

The Report refers to traffic and pedestrian glare acceptability criteria, expressed as TI values of the reflected conditions. For major and minor roads the criteria are less than a TI value of 10 and 20, respectively. For pedestrian crossings and footpaths the criteria are less than a TI value of 2 and 3, respectively.

Eastern facades: In the case of (a), the upstream buildings are likely to intercept most low altitude solar rays with the potential to reflect on Victor St; and Westfield development to the E of Victor St will further intercept reflections from the upper tower levels. To reduce the impacts of any remaining reflections upon ground level pedestrian locations to the E of the site, the Report recommends that curtain wall glazing of all E tower facades have a visible reflectivity value below 10% at normal incidence angles.

In the case of (b), reflected solar rays from the E facades will have limited impacts on motorists driving towards the E or W along Albert Ave, or driving towards the CTPP site along Orchard Rd (south) because reflected rays will be perpendicular to Albert Ave motorists' line of sight, or the altitude of incoming solar rays will be greater than the cut-off angle for Orchard Rd motorists' sight. The SageMicropay building will block residual reflected solar rays from impacting on locations around the Albert Ave/Orchard Rd intersection

Reflected solar rays referred to in (b) could impact on pedestrian locations within the Garden of Remembrance and Chatswood Oval. To intercept the lowest incident angle reflections responsible for the highest glare impacts the Report recommends that glazing mullions should sit proud of the glass by a min.50mm.

Western facades: In the case of (c), to reduce impacts of the lower incident angle reflections on pedestrian locations along Victoria Ave, the Report recommends curtain wall glazing to all tower facades should have a visible reflectivity value below 10% at normal incidence angles.

In the case of (d), reflected solar rays from the W tower facades will impact on downstream railway and roads locations with a high altitude angle. For motorists along Albert Ave driving towards the E or W, the reflected rays will be perpendicular to their line of sight. As Thomas Lane is one-way motorists will not face reflected glare.

Tower 1's W facade has a high % of masonry that will produce a more diffuse type of reflection than that generated by glazing. West facades of Towers 2 and 3 have a large amount of glazing and a relatively narrow spacing between mullions, and reflected rays from those facades will impact on the rail line, Garden of Remembrance and Chatswood Oval. To intercept reflections having the highest glare impacts, the Report recommends glazing mullions should sit proud of the glass by a min.100mm

In the case of (e), reflections could impact on motorists travelling along the Highway in a N direction towards the site, and further away on the railway line. Impacts will not be significant due to the distance between W facades and the Highway receiver locations. Glass with a visible reflectivity value below 10% at normal incidence angles on all facades, will reduce reflected glare impacts at receiver locations further away. To

minimise potential for glare, the Report recommends that the facades' composite aluminium panels have a low reflectivity/matt finish and that a darker tone of glass tinting and cladding colouring be used to minimise any diffuse reflection components.

Northern facades: In the case of (f) and (g), low altitude reflections could impact on motorists travelling W and E towards the site on Victoria Ave. TI values would be minimal as reflections off the N podium facades will be intercepted by other CTPP building elements.

Other N tower facade elements that could impact on Victoria Ave locations are balcony balustrades, living room glazing (Levels 1 to 10), and composite aluminium panels on Tower 3's N facade. To minimise impacts, the Report recommends several solutions viz., glazing mullions to N facades of Towers 1 and 3 that sit proud of the glazing by a min.100mm and a similar treatment to balustrade details; or a 2m deep fin at a point on both towers' N facade that extends up the 10 lowest floors to intercept reflections.

In the case of (h), low altitude reflections could impact on motorists and pedestrians travelling on Thomas St in a W direction towards the site. To minimise the impact of reflective glare from the facade the Report recommends the introduction of a fin element, similar to the one described above, at some point on the S facade.

The Report's concludes that if recommended measures are adopted, no CTPP building facade will produce reflections causing disability glare for motorists or unacceptable discomfort glare for pedestrians. The Report is considered satisfactory and its recommendations are incorporated in this report's recommended conditions.

6.3.8 Noise and Vibration - Operational

The Stage 1 DA consent required a Stage 2 DA to include a Report prepared by a suitably qualified independent acoustic consultant, and that it should, inter alia:

- a) demonstrate how the residential building designs incorporate measures to mitigate the impacts of regenerated noise from train movements,
- b) detail measures proposed and the regenerated noise level predictions at various levels in the proposed buildings, and
- c) respond, but not be limited to, the relevant findings of the Noise Report required in Condition 76A of the CTI modification of the PRL project.

Condition 76A requires:

- a) regenerated noise from train movements when measured in any habitable room or other noise sensitive premises shall not exceed L_{max} 40dB(A) (fast meter response) for 95% of train pass by events over a 24 hour period, and
- b) a Noise Report for the DG's approval demonstrating how the proponent has endeavoured to reduce the above max.40dB(A) regenerated noise level and detailing proposed mitigation measure & regenerated noise level predictions.

The DEC's submission maintains its previous advice to DIPNR that potential impacts should be assessed against a criterion based on a regenerated noise level of L_{Amax} 30-35dB(A) for residential areas. It considers if that criteria cannot be met using reasonable and feasible mitigation measures, potential purchasers should be notified of the noise environment expected in the apartments.

The DA's *Acoustic Performance Assessment* (the Report) indicates that residential facades will be detailed to attenuate airborne noise from buses, trains and traffic noise, and the proposed apartments' internal walls and floors will be designed to meet the BCA's acoustic performance requirements. It also states that mechanical plant and

enclosures will be selected and designed to meet defined noise criteria levels for the proposed apartments and adjoining residential properties.

The Report identifies the following operational noise sources for various receptors:

<u>Receptor</u>	<u>Noise Sources</u>
CTPP residential towers	rail vibration, rail noise, bus and traffic noise, plant and equipment
CTPP retail	rail vibration, rail noise, platform public address, plant and equipment
CTPP residential tower amenities level	rail noise, bus noise, plant and equipment
Garden of Remembrance	rail noise
Adjoining residential properties	CTPP plant and equipment

Noise level criteria

The adopted internal noise level criteria are:

Space	Noise Level	Assessment Parameter	Operating Conditions
	dB(A)		
Residential living areas	40	LAeq (1 hour)	All external noise sources (noisiest hour typical day)
Residential sleeping (at night)	35	LAeq (1 hour)	All external noise sources (noisiest hour typical night 10pm to 7am)
Residential living and sleeping areas	40#	Lamax (fast)	Regenerated train noise
Commercial & retail spaces	As per AS2107-2000		Unoccupied (ventilation systems & external noise)
Commercial & retail spaces	As per AS2107-2000 plus 5 dB(A)#		Regenerated train noise

Must be designed such that at least 95% of train events comply with these criteria.

Vibration levels due to train and bus movements will be required to comply with AS2670.2:1990 criteria that are relevant to specified spaces. All BCA acoustic requirements for the acoustic separation between dwellings and other adjacent spaces or services have been adopted. The total emission from ventilation systems, fixed plant and public address systems generated by CTPP's components will be required to comply with the NSW Industrial Noise Policy.

The Report indicates that all of these criteria are consistent with Condition 76A of the CTI modification of the PRL project.

Rail vibrations and regenerated noise

Mitigation measures for vibration isolation of the rail system, to meet the vibration and regenerated noise criteria in the proposed retail areas and apartments, comprise a resilient track fastening system used in conjunction with a floating slab system for the rail support within the zone of the CTI/CTPP podium structure. The measures are part of the approved CTI, and are being analysed to determine their suitability to meet both RailCorp's requirements and the criteria. Outcomes of the three options that are under consideration, are as follows:

Table 4 Tower 1

Acoustic Rail Fasteners plus Track Bed Isolation Residential Level

Option	Isolation System	Max 40 dB(A)	Max 35dB(A)
1	Gerb or Mason spring sets	1 st floor	5 th floor
2	Gerb, Mason or Trellborg elastomeric bearing systems	4 th to 5 th floor	9 th to 10 th floor
3	Resilient ballast mats or strip mats	5 th to 6 th floor	10 th to 11 th floor

Table 5 Towers 2 and 3

Acoustic Rail Fasteners plus Track Bed Isolation Residential Level

Option	Isolation System	Max 40dB(A)	Max 35dB(A)
1	Gerb or Mason spring sets		3 rd floor
2	Gerb, Mason or Trellborg elastomeric bearing systems	3 rd to 4 th floor	7 th to 8 th floor
3	Resilient ballast mats or strip mats	4 th to 5 th floor	9 th to 10 th floor

Railway public address system

In respect of the railway public address system the Report indicates that approved Part 5 acoustic treatments (partial enclosure of the approved CTI rail station for the extent of the CTPP podium and use of acoustic absorbing materials) plus the use of latest technology loudspeaker design and control will concentrate the sound on the platform with minimal sound spill over to the adjacent retail areas and concourse.

Airborne noise ingress to CTPP apartment towers

Noise ingress sources include trains operating on the rail line, buses operating from the bus interchange, motor vehicle traffic in surrounding streets, mechanical plant associated with the apartment towers or with the proposed retail uses.

The Report indicates noise ingress from trains can be controlled by façade detailing, and that in most cases heavy single glazing (10.38 mm laminated at lower floors; 6.76mm laminated at upper floors) may be appropriate. For the CTPP, façade sound insulation to airborne sound will be required to achieve the equivalent of Rw 35.

Façade detailing will control bus noise intrusion, the low frequency content of which will be controlled by heavy single glazing (10.38mm laminated). It will be assisted by the proposed awning over Victoria Ave West/Chatswood Mall link that will provide acoustic shielding for lower apartment levels.

The Report states indicates airborne sound insulation of the façade will need to be Rw+Ctr of not less than 30dB, and the facades' acoustic requirements for rail/bus operational noise will adequately control motor vehicle traffic noise ingress.

Acoustic performance of CTPP apartments' walls and floors

The Report indicates that compliance with the acoustic performance requirements of BCA 2005 is considered a minimum requirement for the CTPP. In lieu of the BCA's sound insulation requirement (for walls and floors between apartments) of Rw+Ctr being not less than 50dB, it recommends a design performance of Rw+Ctr 55dB. It considers the performance level ($L_{n,w}+C_1$ max. 62) specified in the BCA 2005 for the impact isolation of floors between apartments is unacceptable. The CTPP will be required to achieve a higher performance by at least 10dB. The proposed standard will be that $L_{n,w}$ should not exceed 50.

A higher performance level (Rw+Ctr of 28dB) will also be required for the CTPP than that specified in BCA 2005 (Rw+Ctr 25dB) for sound insulation of services passing through a non-habitable floor. Other sound insulation performance levels that will be required in respect of walls between apartments and corridors (Rw 50dB), doors from apartments to corridor (Rw 30dB), and services passing through habitable areas of another apartment (Rw+Ctr 40dB) will be the same as those specified by BCA 2005.

Noise emissions from the CTPP towers' and retail areas' mechanical plant

These emissions will be required to conform to the DEC's Industrial Noise Policy [i.e. background noise level plus 5dB(A)]. Council's noise requirements will be observed.

In the case of the proposed apartment towers, the receiver location is likely to be the tower itself or the adjacent CTPP tower, and the Report notes that compliance in respect of existing surrounding buildings is unlikely to present a problem.

For the CTPP's retail areas, all mechanical plant will be selected on the basis of low noise output. When mechanical plant and equipment have been selected, the need for additional attenuation will be determined. The Report notes in relation to surrounding buildings, that compliance with the Policy and Council's DCP will be achieved.

Concourse and Retail Area Noise and Vibration Control

The recommended rail line isolation/rail track bed isolation will provide a high degree of vibration isolation to the retail and concourse areas. Regenerated noise due to the trains will meet the criterion set in the Minister's Condition 76A for the PRL.

Consideration

Noise level criteria that were adopted for residential living and sleeping areas are 35 to 40dB(A) LAeq (1 hour) for all external noise sources, and 40dB(A) LAm_{ax} (fast) for regenerated train noise. The Report indicates that this would be consistent with Condition 76A.

However, the Report indicates that the mitigation measures for vibration isolation of the rail system to meet the vibration and regenerated noise criteria have not been selected. Also, none of the options (acoustic rail fasteners/track bed isolation) that are under consideration for Towers 2 and 3 appear to achieve the 40dB(A) criterion for some lower residential levels.

A recommended condition adopts the requirements of Condition 76A in respect of regenerated noise criteria and the preparation of a Noise Report, and the requirements of the Stage 1 DA consent condition B18 concerning the creation of easements over the appropriate residential development lots, stating that any development for residential use may be affected by noise due to rail operations.

A condition also requires the preparation of an Operational Noise and Vibration Management Plan that, inter alia, provides details of the noise and vibration measures to be undertaken for the CTPP's operational stage. It requires the examination of all feasible and reasonable noise and vibration measures, including those recommended in the *Acoustic Performance Assessment* report.

6.3.9 Water Cycle Management

The DA's modified *Watercycle Management* report (the Report) describes the proposed water cycle management system for the CTI/CTPP. It comprises fire water, water recycling, potable cold and hot water and non-potable water.

In respect of water recycling the Report indicates that the quantity of rainwater collected will be determined in accordance to the relevant authority's requirements. Management of any runoff in excess of that collected will be in accordance with Council's requirements.

Storage tanks will be located adjacent to the car park loading docks and will provide storage capacities of 600m³ for on-site detention and 600m³ for water recycling. Rain water recycling systems will collect runoff from the podium level, the retail centre's roof areas, car parks and the residential towers.

The Report states that the rainwater recycling system will be designed in accordance with Council's draft code *Integrated Management Rainwater Tanks Technical Paper 2*. Greywater and blackwater collection, transfer and treatment systems may be combined, depending on the required level of treatment and reticulation. The quality and treatment of all recycled water will be to a standard that will meet requirements of the relevant authorities and standards for discharge to the stormwater system or reticulation through the site.

The Report states that rainwater/greywater recycling tanks will supply non-potable water for washdown, public and railway toilet flushing and irrigation systems throughout the development. Thus, recycled water will not be available for toilet flushing in the residential towers or retail areas.

The hot water systems will be designed and installed in accordance with the Sustainable Energy Development Authority of NSW (SEDA) guidelines, and with Council's and SEDA's Energy Smart Homes Program. Hot water will be generated from central gas-fired plant and reticulated in an approved insulated piping system.

A water conservation and balancing system, designed to conserve water and energy whilst balancing the pressure gradient across each system, will be installed throughout the domestic water systems. The hydraulics design will incorporate conservation measures such as flow controls, low volume showers, dual-flush toilets, user active flushing, self closing taps, waterless urinals and water recycling, as discussed above.

Consideration

The DEC's submission on water management supports the proposal to collect and recycle water from the site for toilet flushing and landscaping. It recommends that collected rainwater be also used for clothes washing.

The ability to reuse rainwater for non-potable uses in the apartments is likely to be limited by, inter alia, the apartment tower roof's relatively small rainwater collection areas. As noted in section 6.3.2 of this report the DA's modified *Watercycle Management* report is contrary to the DA's *ESD and Solar Access Assessment*, which includes rainwater storage and reticulation to all apartments for non-potable uses as an ESD initiative. A recommended condition requires justification for the limited rainwater reuse proposal referred to in the *Watercycle Management Report*.

In other respects the proposed water recycling and water conservation measures described above are considered satisfactory.

6.3.10 Waste Management – Operational

The DA's *Waste Management Plan (Operation)* deals with the CTPP's retail and residential components. It also deals with CTI's railway station and bus interchange, which, except for the proposed retail kiosks, relate to Part 5 approval. The Plan states that its preparation is in accordance with DCP30 *Sustainable Development*, Council's *Code for Installation, Construction and Operation of Garbage Handling Systems* and Resource NSW's *Better Practice Guide for Waste Management in Multi-Unit Dwellings*.

For the residential component, the Plan estimates the compacted waste and co-mingled recycling volumes likely to be generated by the proposed 509 apartments and their waste and recycling bin requirements. It briefly describes the provision to be made for garbage disposal on each residential floor, garbage rooms and their locations adjacent to the loading docks for collection.

For the retail component the Plan's proposals are subject to adjustment because the final use for the retail areas have yet to be established. It assumes a retail mix based on retail consultants' advice and states that collection of retail waste and recyclables will be carried out by a private contractor on a daily basis. It estimates likely waste volumes and bin requirements. It claims no data is available for calculating recycling storage for the retail component, makes an allowance of the total waste volume for recycling and estimates the required bin requirements.

Consideration

The Plan for operational waste management refers to co-mingled recycling and assumes its collection will be unsorted. Presumably, after collection from residential floors the recyclables would be separated in the garbage room, although the Plan makes no mention of this. The Plan's assumption of 40 litres of co-mingled recycling per apartment per week is less than Council's rate (60 litres), and it indicates that a carousel type compactor will be installed, but Council does not recommend such use.

Council indicated there might be insufficient height within the Carpark Level 1 to allow access for garbage trucks. It also specified its detailed requirements for garbage service for the residential towers and for commercial waste.

The Plan does not indicate how waste management and minimisation principles for the retail component would be implemented. It refers to the collection of retail waste and recyclables by a private contractor. However it is likely, depending on the mix and management of the retail areas, that several private contractors would be involved.

A recommended condition requires the submission of a revised Waste Management Plan in consultation with Council, which complies with Council's requirements in respect of residential garbage service and commercial waste. The Plan should also provide details of the waste management/minimisation principles that would be implemented for the retail component, and of the proposed protocols or agreements between future retail tenants and building managers for the implementation those principles.

6.3.11 Construction Management

The construction will be staged to meet the program requirements of the PPP contract. Other than for stages 5, 6, and 7 (Towers 1, 2 and 3, respectively) construction will form an integrated package of works for both the Part 4 CTPP and approved Part 5 CTI components.

The Construction Management Plan (CMP) deals with construction noise and vibration, dust emissions and air quality and construction water. It also covers such matters as quality management, OHS&R issues, training, monitoring auditing and reporting requirements. Detailed management plans in respect of site access, pedestrian and passenger movements are also included.

Construction waste

Condition No.252 of the Part 5 approval requires Waste Management and Reuse Plans to be prepared in consultation with the DEC to address the management of construction and operational wastes. Their preparation is required before substantial construction

and operation, respectively. The DA's *Waste Management and Reuse Plan* covers the CTI and the CTPP's retail/residential components. It has yet to be issued to the DEC for review and comment.

The Plan establishes principles for waste avoidance, reuse, recycling and removal. For waste classification it adopts the DEC's *Environmental Guidelines: Assessment and Classification and Management of Liquid and Non-liquid Wastes*. It identifies waste sources (construction materials, putrescibles, packaging, water) and, as relevant, their management, disposal, reuse and, recycling both on- and off-site.

The Plan also deals with waste minimisation in relation to the implementation of waste hierarchy principles, energy minimisation, materials purchasing/contracts, training, monitoring, reporting and auditing procedures.

Construction noise

The DA's *Acoustic Performance Assessment* (the Report) assesses the potential noise impacts of construction work for the podium and retail areas, the towers and also for the tower construction staging. It includes recommendation for noise and vibration motoring, noise reduction strategies and community liaison.

The CTPP's podium retail and concourse areas will be constructed concurrently with Part 5 works and construction measures identified for Part 5 construction have been adopted. The Report indicates that the combined effect will be an increase in overall noise, although the actual noise levels will depend on the location of plant and equipment and the particular type of construction activities near sensitive receiver locations, with plant and equipment selection based on appropriate noise criteria.

The Report concludes that overall, the construction sound power levels allow for general construction activities to occur, providing care is taken in regard to sensitive receivers, certain construction noise activities e.g the use of vibrators during concrete pours and the selection of construction equipment eg. tower cranes.

In respect of the towers' construction, the Report identifies potential sound receivers. Their ambient sound levels and sound (façade) insulation have been determined, and the allowable sound power level of construction work on the towers has been computed from these factors. The Report includes recommendations for the use of temporary shielding and the appropriate noise and vibration monitoring locations (similar to those for Part 5 works) to protect the sensitive receivers.

The Report makes recommendations about noise amelioration strategies, such as the management of noisy work, night works and construction traffic, and about locations and requirements for construction noise monitoring, and community liaison strategies.

In respect of noise criteria, the Report refers to the requirements of the Part 5 approval Condition 47, which stipulates that the airborne construction noise expressed as a $L_{A10(15 \text{ minutes})}$ should be equal to or less than the L_{A90} background level plus 5dB(A). It indicates that the site in its normal condition grossly exceeds Condition 47, and that while the condition may appear unworkable, the design of the mitigation measures for construction noise will be on L_{A90} background plus 5dB(A) wherever practicable.

The Report also considers that the use of $L_{A90(15 \text{ minutes})}$ background noise level is generally inappropriate for the bulk of the site as it is more appropriate for a typical residential site near an industrial use.

The Report considers it is appropriate to consider the allowable maximum outside noise as the addition of the maximum design noise level for the particular area within the building and the sound insulation of the façade, together with the normal distance

attenuation between the noise source and the nominated receiver. By using that method the allowable Sound Power Levels have been determined.

The Report also notes that where the buildings are open to the outside then the $L_{A90(15 \text{ minutes})}$ background noise level could be used, and that for the tower construction any receiver with an allowable construction Sound Power Level of 100 dB(A) or above is considered acceptable during daylight hours, provided care is taken during concrete pours and appropriate ameliorating action taken if required.

Dust and air quality

The *Dust and Air Quality Management Sub-Plan* submitted with the DA relates only to the Early Works Contract, which is unrelated to the CTPP. The CMP states that an Air Quality Management Sub-Plan will be produced to assist in ensuring the air quality standards during construction comply with the Minister's conditions and requirements of DEC's and other relevant authorities. Mitigation measures will include the following as a minimum:

- truck wheel shaker/wash,
- dust control using water sprays and/or water carts,
- regular cleaning of silt fences,
- cleaning of local roads,
- amending construction activities during periods of high winds,
- covering, watering, revegetating of stockpiles and exposed areas, and
- immediate covering of spoil trucks.

Water and soils

The CMP indicates that measures will be developed through the preparation of a Water and Soils Management Sub-Plan in accordance with the Minister's conditions. The CMP states that the measures will mitigate against soil erosion and control sediments and pollutants entering surrounding land and/or waterways. It states that control measures will include as a minimum:

- stabilised ingress and egress access ways,
- run-off directed into a sediment control device,
- minimising land disturbance and duration,
- safe storage (bunded) areas for hazardous materials,
- protection of stormwater inlets,
- recycling wastewater for watering spoil stockpiles and exposed areas for dust minimisation.

Site access

The DA includes a series of management plans designed to manage site access, pedestrian movements and passenger movements, which are summarised below.

Site Access and Worksite Requirements Plan: This outlines worksite and pedestrian access arrangements during construction of Stages 1-4 (the transport, carpark and retail components up to and including Residential Amenities Level RL113.6). The work has commenced under Part 5. Site establishment is completed and includes, inter alia, the temporary pedestrian access bridge over the rail corridor and access to 430 Victoria Ave. The Plan also demonstrates how the towers would be constructed on completion of the works below RL113.6.

Passenger Management and Temporary Access Plan: This sets out the method proposed to minimise disruption to bus/rail patrons and provide pedestrian access during construction Stages 1-4. The Stage 1 access arrangements are substantially completed. The plan deals specifically with, and includes detailed pedestrian access staging diagrams for, the key access requirements throughout all four stages. The requirements for, inter alia:

- public access from Chatswood Mall , Victoria Ave W, and along Thomas St/ Thomas Lane,
- bus interchange passengers from Endeavour St,
- persons from Chatswood Central including the overbridge to Railway St,
- access to Mandarin Centre, Council in the Sebel Apartments building and the Sydney Water building,
- access to the Medical Centre and café in 430 Victoria Ave.

The Plan also illustrates permanent handover of Part 5 works during Stages 3 and 4.

Residential Towers Site Access and Management Plan: This sets out management strategies for construction of the three residential towers (Stages 5-7). It assumes that construction of the towers will overlap. It covers work site establishment, cramage, materials loading, vehicle and pedestrian access routes, public access to the Level 1 car park and vertical construction access. As each tower is completed the Plan will accommodate residents' access to low level car parks

Consideration

The Waste Management and Reuse Plan is generally satisfactory. As the DEC has yet to comment on it, as required under the Part 5 approval, a recommended condition requires the Plan to be modified as necessary in accordance with DEC's requirements.

The scope of the proposed Sub-Plans for dust and air quality, and water and soil management are satisfactory, and recommended conditions require their submission for approval prior to the issue of a Construction Certificate for the below ground works. The Plans for site access, pedestrian movements and passenger movements are generally satisfactory. In particular they address construction access issues that were raised in the public submission made on behalf of the Mandarin Centre.

The Part 5 Condition 47 states that if its specified noise objective cannot be achieved all reasonable and feasible noise mitigation and management measures are to be implemented to achieve, to the greatest extent possible, the objective to the satisfaction of the Director-General or, if relevant, the EPA. It also requires potential activities that may cause noise emissions in excess of the objective to be identified and managed in accordance with Specific Construction Noise Impact Statements. A recommended condition reiterates this condition for the CTPP.

6.3.12 *Stratum subdivision*

The DA seeks consent for stratum subdivision of the site, and states that approval for further strata subdivision will follow.

The plans submitted with the DA proposed a 12-lot subdivision. However, they dealt with stratum subdivision for the combined CTI and CTPP sites. The Applicant was advised by DIPNR that development consent cannot relate to land that is outside the land, which is the subject of the DA.

Revised subdivision plans dealing only with the CCTP site were submitted on 19 July 2005. Also submitted were a Building Management Statement and Section 88A and 88B instruments for the subdivision.

6.3.13 Section 94 Contributions

The Stage 1 DA consent did not require any section 94 contributions. Council's submission considers it reasonable to levy specific contributions for subsequent stages as details of unit mix and land use would then be resolved. Council seeks the imposition of the full amount of section 94 contributions for the CTPP DA. It notes the CTPP no longer includes the extensive landscaped podium and childcare centre that were proposed as part of the Stage 1 DA.

Council's initial calculation of a contribution under its section 94 Contributions Plan would require a contribution for Open Space and Community Facilities, Drainage, Traffic and Transport, and Car Parking at over \$20 million.

This is comparable to TIDC's estimate of \$26,193,968 that may be required under Council's section 94 Contributions Plan. TIDC's submission indicates that should section 94 contributions be required, significant financial adverse impacts on the viability of the proposed design for the new Interchange would result.

Under section 94A(1) of the Act, the Minister as consent authority may require a monetary contribution or land dedication if a development is likely to require the provision of, or increased demand for, public amenities and services within the area.

Under section 94A(5), the Minister may impose a condition even though it is not of kind allowed by, or is not in accordance with, a contributions plan, and may accept the provision of a material public benefit in part or full satisfaction of a condition imposed in accordance with subsection 94(1) or 94(3) of the Act.

TIDC's submission indicates that for the CTPP a s94 contribution towards childcare, estimated at about \$1,255,363, will be made by the CTPP developer in accordance with Council's Contributions Plan.

TIDC has requested that the Minister take into consideration, under section 94 of the Act, the following matters and not impose any additional contributions resulting from Council's Section 94 Contributions Plan:

- a) the extensive public funding and material public benefit that results from the redevelopment of the Chatswood rail station, the bus interchange and other transport infrastructure,
- b) the significant improvements to the public domain resulting from the proposed development at the CTP,
- c) all public pedestrian accessways, streetscapes and landscaping associated with the CTI/CTPP will be provided as part of the development as well as other improvements to the surrounding area, including the Garden of Remembrance, streetscape improvements on Thomas St and Thomas Lane, Victor and Railway St,
- d) public art and heritage interpretation installations proposed by CTI/CTPP.

The submission notes that, compared to the Stage 1 scheme, the CTPP will provide much enhanced community benefits comprising a completely new and superior rail station together with a new passenger concourse and bus interchange, passenger drop-off facilities and new bridges to permit the widening of Albert Ave and Help St. and public domain improvements.

The submission provides the following cost estimates of the above material public benefits:

Public domain areas, including E-W pedestrian links:	\$39,000,000
New bus interchange:	\$15,500,000
New bridges and associated roadworks	\$16,800,000
Garden of Remembrance improvements:	\$950,000
Concourse and rail station	<u>\$69,000,000</u>
	Total cost \$142,000,000

6.3.14 Affordable Housing

Section 94F of the Act applies to a DA where a SEPP identifies that there is a need for affordable housing within the area. It provides for the granting of consent subject to imposition of a condition requiring payment of a monetary contribution to be used for the provision of affordable housing or the dedication of land for such housing.

SEPP70 *Affordable Housing (Revised Schemes)* provides for the imposition of conditions in respect of affordable housing in Willoughby. Council's submission is that the DA should provide such housing consistent with DCP23 *Willoughby Local Housing Policy*, which has a target of 4% of units to be for affordable housing.

Willoughby LEP1995 is the main e.p.i. in respect of affordable housing provision within the l.g.a. It requires the affordable housing to be provided within Willoughby Local Housing Precincts and managed under the Willoughby Local Housing Program.

Land covered by SREP5, including the CTPP site, is shown hatched on Willoughby LEP1995's Map. Under the LEP's clause 3, the LEP applies to hatched land only to the extent that it amends other e.p.i.s. No listed amendments to LEP1995 deal with SREP5 land in respect of the CTPP site. The LEP, and therefore SEPP70 do not appear to apply to the CTPP site.

TIDC's *Section 94 and Affordable Housing* Submission requests that no condition requiring a contribution of land for affordable housing be imposed on a CTPP DA consent for the following reasons:

- a) DCP23 *Willoughby Local Housing Policy* does not apply to the site,
- b) the Mirvac development, N of the CTPP and on railway land was not required to provide either land or a monetary contribution for affordable housing,
- c) It is understood that no other residential developments within SREP5's area have provided contributions in accordance with DCP23.

The submission states that if an affordable housing contribution is required by the Minister, its estimated cost, under DCP23, would be about \$10,419,000 and that such an additional cost imposed on the CTPP would have major implications

for the final viability of the CTPP and jeopardise the whole project.

It concludes that notwithstanding the provisions of SREP5, LEP1995 and DCP23, TIDC considers that, for the above reasons and those submitted in relation to section 94 contributions, the CTPP should not be subject to a contribution or provision of land for affordable housing.

6.3.15 Building Code of Australia

The DA's BCA Compliance report (the Report) assesses the CTI/CTP against the BCA's Deemed-to-Satisfy (DtS) provisions. It identifies a number of departures from the DtS provisions and issues requiring performance-based solutions to comply with the BCA's *Performance Requirements*. The Report considers that all of the identified issues can be successfully resolved by either performance-based solutions or minor design changes that are unlikely to significantly impact on the CTPP.

The CTPP does not comply with the DtS provisions in respect fire resistance, protection of openings, compartmentation, egress and services and equipment.

Submissions

Council's submission notes that some of the above non-compliances affect the overall CTPP design and will require amendments to the plans. It considers that the extent of design changes should be known before the DA is determined.

Council considers the proposed resolutions are not specific, particularly for the towers' natural light and ventilation requirements and given the precinct's importance, performance-based solution should be independently peer-reviewed.

Consideration

Some elements that the Report considers will require design changes, relate to insufficient fire exits and excessive travel distances (many are identified on Concourse, Platform, Podium and Residential amenities levels) and distances between alternative exits.

In respect of identified shortfalls in the minimum horizontal distances between the walls of all three towers and their boundaries it indicates, but does not adequately explain why, a performance-based solution "*by others*" is required.

Some of the elements that will require performance-based solutions include roofs, roof lights and awnings to the towers (by a design change).

As several of the performance-based solutions may affect the buildings elevations, layouts and other external building elements, a recommended condition requires that, prior to the issue of a Construction Certificate for above-ground works, a submission providing details of all design changes and performance based solutions that affect floor layouts, building elevations and external building elements, and that are intended to address departures from the BCA's DtS provisions, be submitted for approval.

7 CONCLUSION

The Minister for Planning is the consent authority.

The application has been considered with regard to the matters raised in section 79C of the Act.

The application has been notified in accordance with the Regulations. All submissions received in the period prescribed by the Regulations have been considered.

On balance, it is considered that the proposed development should be approved.

8 CONSULTATION WITH APPLICANT – RECOMMENDED CONDITIONS

The applicant was asked to comment on the recommended conditions of consent on - 25 July 2005. The applicant responded on 27 July 2005. The applicant generally agreed to the recommended conditions on 28 July 2005.

9 RECOMMENDATION

It is recommended that the Minister for Planning, pursuant to section 80 (1) and 80A of the *Environmental Planning & Assessment Act*, 1979 and Clause 6 of State Environmental Planning Policy (State Significant Development) 2005:

- (A) grant **consent** to the application subject to conditions (Tagged “**A**”), and
- (B) authorise the Department to carry out post-determination notification.

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