OVERSHADOWING ANALYSIS –
I-7 WATERFRONT PLACE

TERMS EXPLAINED

What is the Equinox?
- Measured on 22 September (in Spring)
- The typical standard applied in the planning scheme (e.g. used in ResCode to measure overshadowing of private open space).
- Shows mid-point of overshadowing – not the worst case and not the best case.

What is the Winter (June) Solstice?
- Measured on 22 June (shortest day - in Winter).
- Is a more restrictive standard.
- Sometimes used as the standard for high priority public realm spaces (foreshore/key open space).
- Shadows are longer (more extreme) than at the equinox because the sun is lower in the sky.

1. OVERVIEW OF THE EXISTING OVERSHADOWING CONTROLS IN THE PORT PHILLIP PLANNING SCHEME

- City-wide controls
  - Policy in the Port Phillip Planning Scheme currently uses the winter solstice (22 June) as the default measurement for assessing overshadowing of key public space areas, including the foreshore.
  - Clause 21.05: Built Form specifies policy that seeks to:
    - Ensure there is no overshadowing of any part of the foreshore between 10.00am and 4.00pm on 22 June (Winter Solstice).
    - Protect important public realm areas from overshadowing in mid-winter including the foreshore, Bay Street and Rouse Street in Port Melbourne and the Esplanade and Fitzroy Street in St Kilda.
  - Clause 22.06 – Urban Design Policy for Non-residential development and multi-unit residential seeks to ensure that new development does not overshadow public parkland between 10am and 4pm on 22 June (Winter solstice), unless otherwise specified by a Design and Development Overlay (DDO).
  - Existing DDO’s in the Port Phillip Planning Scheme vary in their application of the winter solstice standard – some establish mandatory controls whilst most are established as discretionary requirements. DDO1 – Port Melbourne specifies that buildings and works should be designed to avoid casting shadows beyond the kerbline on the southern side of the road reserve adjoining the Port Phillip Bay foreshore after 10:00 AM on 22 June (the winter solstice). (Note: DDO1 does not cover the subject site.)

- Existing provisions (controls) for the Subject Site
  - There are no existing overshadowing scheme controls applying specifically to 1-7 Waterfront Place under the existing Comprehensive Development Zone. No DDO currently applies.

2. PROPOSED OVERSHADOWING PERFORMANCE STANDARDS

2.1 Council’s exhibited controls / Council’s modified controls (post exhibition and recommended to the Panel) and the Panel’s recommended controls

<table>
<thead>
<tr>
<th>STAGE OF THE AMENDMENT PROCESS</th>
<th>TYPE OF CONTROL</th>
<th>WHEN OVERSHADOWING IS MEASURED</th>
<th>TIME OF DAY THE CONTROL APPLIES</th>
<th>WHERE THE CONTROL APPLIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exhibition</td>
<td>Mandatory</td>
<td>22 September (Equinox)</td>
<td>11am - 3pm</td>
<td>The beach</td>
</tr>
<tr>
<td>Council’s recommendation to Panel</td>
<td>Discretionary</td>
<td>22 June (Winter Solstice)</td>
<td>10am - 4pm</td>
<td>Foreshore (as defined by the retaining wall).</td>
</tr>
<tr>
<td>Panel’s recommendation</td>
<td>Mandatory</td>
<td>22 September (Equinox)</td>
<td>9am - 3pm</td>
<td>Beyond the beach wall (defined as the stone wall separating the paved promenade and the sandy beach).</td>
</tr>
<tr>
<td></td>
<td>Discretionary</td>
<td>22 June (Winter Solstice)</td>
<td>9am – 3pm</td>
<td></td>
</tr>
</tbody>
</table>

(NB – Applies the two controls.)
2.2 Controls supported by the community (post-Panel community meetings)

- The community articulated a strong preference for **no shadowing of the Promenade at the Winter Solstice**.
- It was sought that Planning Scheme controls:
  - Specify the ‘southern kerb line’ (replacing beach wall) as the reference point for shadowing impacts, to highlight the importance of protecting solar access to the promenade in winter. This reflects greater use of the promenade in mid-winter, than the beach.
  - Apply a mandatory control for 22 September (Equinox) between 9am-3pm and
  - Apply a discretionary control for 21 June (Winter solstice) between 9am-3pm with additional design objectives / requirements to guide the interpretation of ‘no unreasonable overshadowing’ (ie narrow / moving shadow of the promenade or the beach, maximising of solar access to seating spaces).

3. MODELLING OF DEVELOPMENT THAT COULD BE ACHIEVED UNDER THE PANEL’S RECOMMENDED CONTROLS (for both the Equinox and Solstice)

Figures 1 and 2 illustrate the scale / massing of development that could be achieved under the Panel’s recommended controls. (It should be noted that the figures show a building envelop and do not depict an actual building design.)

**The scale of development possible under the two overshadowing performance standards recommended by the Panel differ markedly:**

- **The Equinox Mandatory Standard**: Would allow for an overall building height to a maximum of **22 storeys** – with recessing above 12 storeys (combined with the 3 storey podium proposed by the Panel).
- **The June Solstice Discretionary Standard**: Would allow for an overall building height to a maximum of **13 storeys** – with gradual recessing above the 3 storey podium proposed by the Panel.

**Equinox (see Figure 1)**

- The building envelope in Figure 1 meets the mandatory requirement of no overshadowing beyond the beach wall (ie of the beach) at 22 September (equinox).
- It is notable that under this development scenario, the promenade is in shadow all morning and until 1pm. (This is in part due to the 3 storey podium.)

**Solstice (see Figure 2)**

- The building envelope in Figure 2 is considered likely to meet the discretionary requirement to ‘minimise’ overshadowing beyond the beach wall (ie on to the beach) at 21 June (solstice). A limited shadow is cast on the beach ‘inset’ area which is more significant in the late afternoon, however this is likely to be argued as a ‘reasonable’ degree of overshadowing.
- The area beyond the southern kerb line (ie Promenade) is in shadow across the entire period modelled (ie 9am to 3pm).
- The seating area to the south-east of the TT hard stand area is also in shadow 9am to 3pm. (The seating area at the west end of the pier is not in shadow.)
- Under this scenario, the majority of the shadow falls on the TT freight yard (especially in the morning).

**Summary**

- Application of the Panel’s recommendation for two performance standards – reveals that there is a major variation in the building scale / height that could be achieved under the winter solstice standard and the equinox standard (ie 13 storeys versus 22 storeys respectively).
- The definition of what would be ‘reasonable’ or ‘minimal’ overshadowing mid-winter is also open to interpretation.
- In addition, the modelling shows that overshadowing standards that protect the beach may still significantly overshadow the foreshore promenade.
- Given this, there is a need for additional performance standards to guide discretion at the planning permit stage regarding what would be ‘reasonable’ overshadowing at the Winter (June) Solstice.
FIGURE 1 - Modelling of development that could be achieved under the Panel’s recommended controls

Note – Diagrams do not show actual building designs with appropriate articulation and detail. They illustrate built form massing for the purposes of understanding overshadowing impacts.
FIGURE 2 - Modelling of development that could be achieved under the Panel’s recommended controls

SOLSTICE

Note – Diagrams do not show actual building designs with appropriate articulation and detail. They illustrate built form massing for the purposes of understanding overshadowing impacts.
4. MODELLING OF THE DEVELOPMENT ENVELOPE REQUIRED TO ACHIEVE NO OVERSHADOWING OF THE FORESHORE PROMENADE AT THE JUNE SOLSTICE

FIGURE 3 – Section showing limits to building height/massing that would be required to achieve no overshadow beyond the southern kerb line at the June Solstice

- Figure 3 illustrates the maximum building height/massing that would meet a performance standard of no shadowing beyond the southern kerb line at the winter (June) solstice.
- Applying this Winter Solstice performance standard would limit the height of buildings on the site to 6 storeys with a 2 level podium.
- Above the second storey (podium), each subsequent level would need to be progressively recessed (stepped back 6.5-7.5m).

5. MODELLING OF THE PERFORMANCE STANDARDS RECOMMENDED BY OFFICERS FOR ADOPTION AS PART OF AM C104 (including at the June Solstice - worst case - and the 2 months either side)

Figure 4 illustrates the shadow impacts of a possible building envelope/massing that meets the performance standards recommended for adoption as part of Amendment C104 (at the June Solstice). The example built form comprises:

- A 3 storey podium (11m) with a recessed third level to Waterfront Place.
- A single tower of 10 storeys, with a floor plate of up to 1,600m² located towards the western side of the podium.

Shadows at the Equinox are largely contained to the roadway of Waterfront Place. At the Winter Solstice:

- The Promenade is in shadow as a result of the podium until 10am, however by 11am the shadow is largely confined to the kerb line.
- A portion of the promenade remains affected by the tower, however this shadow moves quickly across the promenade allowing users to easily move to an area with access to sunlight.
- As required by the proposed standards, less than 40% of the promenade opposite the site is in shadow at any time resulting from the tower form - between 10am and 2pm.
- The seating area to the south-east is not in shadow for more than 2 hours between 10am and 2pm. (The seating area at the west end of the pier is not in shadow.)
- Only a small proportion of the beach (ie beyond the beach wall) is overshadowed. The tower shadow falls on the TT freight yard between 9am-12pm. After 12pm, only a small amount of the beach would be overshadowed by the development.
- Shadowing on to the beach would present in the form of a relatively narrow rather than broad / extensive shadow.
FIGURE 4 - Modelling of the performance standards recommended for adoption as part of AM C104

SOLSTICE/EQUINOX
Shadows between 22 April and 22 August

Figures 5 & 6 illustrate the shadow impacts - of the ‘possible development’ under the performance standards recommended for adoption as part of Amendment C104 - for an extended period either side of the June Solstice:

- 22 May / 22 July) (4 weeks either side of the June Solstice), and
- 22 April / 22 August) (2 months either side of the June Solstice).

This shows that the overshadowing impacts of the ‘possible development’ are notably reduced four (4) weeks either side of mid-winter.

- In the 4 weeks before and after the Winter Solstice (ie 22 May and 22 July), there is access to sunlight on the promenade after 10am (except where the tower form creates a narrow shadow).
- The shadow from the tower form moves quickly across the promenade and covers no more than 40% of the area.
- Two months either side of the solstice, the promenade is free of overshadowing from 9am, with the exception of narrow and limited shadowing by the tower form.

Figure 7 illustrates the shadow impacts at 21 June for comparison purposes.
FIGURE 5 - Modelling of the performance standards recommended for adoption as part of AM C104

22 MAY / 22 JULY
FIGURE 6 - Modelling of the performance standards recommended for adoption as part of AM C104

22 APRIL / 22 AUGUST
FIGURE 7 - Modelling of the performance standards recommended for adoption as part of AM C104

22 JUNE – WINTER SOLSTICE
6. COMPARISON OF OVERSHADOWING IMPACTS - EXHIBITED CONTROLS VERSUS CONTROLS RECOMMENDED FOR ADOPTION

Figure 8 illustrates the shadow impacts of the development envelope/massing proposed in ‘Figure 1’ under the exhibited DDO23 / Amendment C104.

The built form comprises:
- A 7 storey building on the western side of the site.
- A tower podium form on the eastern side of the site with a street-wall of 3 storeys with a tower above the podium (to a maximum of 10 storeys).

Overshadowing impact at the Winter Solstice:
- The Promenade is entirely in shadow until 1pm.
- Approximately 90% of the promenade opposite the site is in shadow between 10am and 2pm (and also beyond these hours).
- The seating area to the south-east is in shadow most of the day (The seating area at the west end of the pier is not in shadow.)
- Part of the beach (ie beyond the beach-wall) is overshadowed (between 11am and 1pm). However the shadow largely falls on the TT freight yard between 9am-12pm.

Comparison of exhibited controls versus controls recommended for adoption

<table>
<thead>
<tr>
<th>KEY INDICATOR</th>
<th>EXHIBITED CONTROLS</th>
<th>CONTROLS RECOMMENDED FOR ADOPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion of the promenade, beyond the shadow cast by the podium, opposite the site in shadow between 10am and 2pm</td>
<td>90% (est)</td>
<td>40%</td>
</tr>
<tr>
<td>Shadowing of seating area to the south-east between 10am and 2pm</td>
<td>In shadow for all 4 hours.</td>
<td>Not in shadow for more than 2 hours.</td>
</tr>
<tr>
<td>Overshadowing of the beach (ie beyond the beach wall)</td>
<td>Significant overshadowing between 11am and 1pm.</td>
<td>Limited overshadowing – mostly at 2pm.</td>
</tr>
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FIGURE 8 - Modelling of development envelope proposed by the Exhibited DDO controls