
Section 4

BOATSHEDS AND BATHING BOXES

4.1 History of Boat Shed and Bathing Box Construction

Boat sheds and bathing boxes were built along the foreshore of Port Phillip Bay, mostly in the period following the Second World War. In line with their proposed usage, the owners constructed them as close to the beach as was practical, but usually set back sufficiently, that they would not be undermined during the storms of the day. Usually they were at the edge of the vegetation (bush) line.

From the 1935 and 1951 aerial photographs it can be seen that the boatsheds at Shelley Beach were located in this manner. The boat sheds at the western end of Shelley Beach had a sandy beach in front of the sheds and it is assumed that some sand remained on the beach in front of the sheds throughout the year. Along the eastern portion of Shelley Beach the boat sheds were also close to the water when they were first constructed. Accretion in front of the boat sheds has meant that they are now typically 50 metres from high water.

There was little understanding of the concept of beach stability and the possibility that the beach may not be stable when these structures were built.

Boat sheds along eroding shorelines have progressively been upgraded, either following damage, after the owners observed damage to adjacent boat sheds. Upgrading has typically involved:

- Deepening of the founding depth of piles;
- Raising of the floor level of the boat shed; and
- Bracing of the support structure.

Very few boat sheds have been relocated, probably because of the difficulty in obtaining a suitable site.

4.2 Foundations

Most boat sheds are constructed on dry land and consequently the depth at which support piles were founded was typically about a metre beneath the surface where the underlying material is sand. If there is a rock substrate the foundation would usually be into that rock.

When erosion can occur and remove the sand, the foundation depth needs to be increased, if possible, into an underlying rock. At the western end of

Shelley Beach, even though there are cliffs behind the beach, the level of underlying rock appears to be quite deep.

In parallel with this study, the owners of the boat sheds destroyed in June 2002 engaged CivilTest (Soil Testing and Geotechnical Consultants) to investigate the soil profile at the sites of their destroyed sheds. Their report is contained in Appendix C. They found that at both sites the depth of sand was about 900 mm and underneath the sand the strata still consisted of loose materials, rather than sound rock, to a depth of 4.5 metres. The materials at depth were gravels, cobbles and boulders.

The inference is that with the present erosion regime, which is likely to continue, that the loose sand will be eroded. Civiltest's recommendation for this scenario is that the piles be founded at a depth of about 4 metres below present ground levels. Since the materials into which the piles will be founded would be gravel/cobbles and boulders, it is likely that erosion would be minimal once the sand has been removed. Therefore a founding depth of 4 metres below existing beach level, which is at about -3 metres AHD is recommended if boat sheds are to be reconstructed in this area.

It is likely that the depth of underlying rock and reef will vary and the founding requirements for boatsheds to the west of those destroyed in 2002 may be different. Only soil tests can determine the depth of underlying rock.

4.3 Floor Levels

It is preferable that the floors of boat sheds be above the level of wave crests during storms. Many of the existing boat sheds are not faced with this problem at present because of the presence of the timber vertical wall. If sand losses continue, that is the wall is not founded onto rock, the wall is likely to be undermined and eventually fail. The boat sheds behind the wall will then be subject to wave forces. The design wave height has been estimated at 1.5 metres.

Design Water Level

It is estimated that for a storm event with a 50 year return period, the maximum likely water level at Shelley Beach would be about 1.2 m AHD. This excludes potential water level increase due to the Greenhouse effect, but does include wave set-up.

It should be noted that the term 50 year return period does not mean that the storm event can only occur every 50 years. There is in fact a reasonable probability that the storm could occur sooner. For example there is a:

- 4% chance of occurring within 2 years;
- 18% chance of occurring within 10 years;
- 64% chance of occurring within 50 years.

Wave Crest Level

The height of the wave crest above sea level depends on wave height, wave period and water depth. For the 50 year return period storm it is expected that 78% of the wave will be above the mean sea level, and 22% below sea level. Therefore the 50 year return period wave crest elevation is 1.2m (still water level) + 78% of 1.5m (wave height) = 2.4 metres AHD.

The floor level of the boat sheds and bathing boxes should be above 2.4m AHD in order for waves to pass beneath the structure during a 50 year return period storm.

Note that these levels do not allow for the possible sea level increase due to the Greenhouse effect. In 50 years time the predicted water level increase of 300mm would result in:

- the design still water level increasing by 300mm to 1.5m AHD;
- the design wave height increasing by about 180mm, to 1.7m;
- the design wave crest elevation increasing to 2.8 metres AHD.

Note that these wave crest levels assume that the wave passes beneath the boat shed and the wave energy is dissipated at the shoreline. If there is a vertical cliff or wall behind the structure, the wave can be reflected. The combination of the reflected wave with the incident wave will result in a higher wave crest elevation.

4.4 Access to Structures

There is no indication that the present erosion regime will cease. This implies that the sand level will continue to be lowered as sand is eroded off the beach in front of the timber seawall and the cliff. This erosion is likely to continue until a harder substrate such as gravel, cobbles and boulders are reached, probably about one metre below present beach levels. This erosion will undermine the timber seawall and erosion of the cliff face will occur. The access path behind the structures would become unusable.

This scenario implies that the boatsheds and bathing boxes will become isolated structures with their floor levels 2 metres or more above seabed level. Access from land would not be available without wading through water.

Even if the cliff face is stabilised (See Section 5), there would still be the situation that the structures would be surrounded by water with drop of 2 or more metres to the seabed, still raising issues of safety and access.

4.5 Relocating Structures

The purpose of relocating boat sheds and bathing boxes would be to remove them from direct wave attack and to provide a safer environment for their

access and use. All of the Shelley Beach foreshore to the west of Campbells Road is presently vulnerable to wave attack back to the cliff line. Therefore if structures were to be relocated they would need to be located to the east of Campbells Road, or elsewhere along the bayside foreshore. Photograph 8 shows a typical view looking from the beach back to the existing boat sheds on the eastern side of Campbells Road. The boat sheds are well set back from the water line and are unlikely to be subjected to wave action over a 50 year period. The boat sheds do not form a continual line and there is space between existing boat sheds to accommodate more sheds.

However, the Ti tree vegetation between existing structures is dense (as can be seen in photograph 8) and some of this vegetation would need to be removed to make way for re-located structures.



Photograph 8: Typical boat shed – eastern part of Shelley Beach

If boatsheds and bathing boxes are to be relocated elsewhere along the bayside foreshore, it would be necessary to ensure that the beach would not be subject to erosion in the foreseeable future.

It is noted that much of the shoreline between Portsea and Rosebud has changed considerably over the last 50 years. Most of the changes between Sorrento and Tootgarook have been as a result of construction along the

foreshore of marine facilities seawalls and groynes. Consequently a coastal process assessment should be made before sites for relocation of structures are nominated.