

22 February 2017



The Secretary
Department of Planning and Environment
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Attention: Ms Carolyn McNally

Dear Ms McNally

Draft Land Use and Infrastructure Strategy - Bayside West Precincts (Arncliffe, Banksia and Cooks Cove); Arncliffe and Banksia Precinct Plan

Thank you for the opportunity to provide a submission on the Draft Land Use and Infrastructure Strategy - Bayside West Precincts (Arncliffe, Banksia and Cooks Cove) and the Arncliffe and Banksia Precinct Plan.

The NSW State Emergency Service (NSW SES) is the lead agency responsible for the emergency management of floods (including dam failure), storms (including coastal erosion and coastal inundation) and tsunamis. The NSW SES has an interest in the public safety aspects of the development of land with reference to these hazards, in particular, the potential for changes to land use that either exacerbate existing risk or create new risk for communities.

The NSW SES suggests the principles within the National Strategy for Disaster Resilience (adopted by COAG) and Emergency Risk Management frameworks, as strategic drivers for better land use planning. The National Strategy for Disaster Resilience promotes the principle that the acceptability of risk in the context of land use planning and development design, requires consideration of loss of life, as well as social, economic and infrastructure loss.

Draft Land Use and Infrastructure Strategy - Bayside West Precincts

The Draft Land Use and Infrastructure Strategy - Bayside West Precincts (Arncliffe, Banksia and Cooks Cove) ('Strategy') proposes that the Arncliffe and Banksia precincts could provide an additional 5100 properties by 2036.¹ The Strategy also states that the Cooks Cove precinct could provide an additional 2000-5000 dwellings.² The Cooks Cove precinct is the most flood prone area of the precincts covered in the Strategy. However all precincts are affected by flooding.³ The flood risk at Cooks Cove precinct is partially addressed in the supporting documents.

¹ Department of Planning, Bayside West Precincts (Arncliffe, Banksia and Cooks Cove) - Draft Land Use and Infrastructure Strategy, October 2016, p 14.

² Ibid.

³ Ibid, 22.

Cooks Cove

The Strategy has identified that there are areas within the Cooks Cove precinct that are flood prone. This is especially more significant at the site of the current Kogarah Golf Course. The supporting *Cooks Cove Flood Impact Assessment* has assessed the flood extent for the 1% AEP and 0.5 % AEP floods. The *Flood Impact Assessment* has also assessed the joint effects of elevated water levels in Botany Bay for the 1% AEP flood. In this scenario, there are flood depths of up to 2m in the 1% flood and between 1.4-2.2m in the 0.5% AEP flood.⁴ This increases to up to 3-3.2m AHD during a probable maximum flood (PMF).⁵

Although referred to in the concluding comments of the Flood Assessment, there is no assessment of the current flood effects at the site in floods larger than a 0.5% AEP flood. There is also no assessment of what the flood effects will be above a 1% AEP flood with the proposed development.

Arncliffe and Banksia Precinct Proposal

The precinct plan proposal states that '(b)oth Arncliffe and Banksia are subject to some flooding following significant rainfall events (see Figure 11 and 12)'.⁶ It points to the Rockdale LEP to highlight the current properties subject to flood controls in the Rockdale LEP. It states these are identified on the Rockdale LEP Flood Planning Map.⁷ It also states 'any redevelopment of these properties will continue to be subject to the controls applied by the Rockdale LEP which specifies that residential uses be raised ('freeboard') 500mm above the 1:100 flood planning level.'⁸

The proposal also states that '(g)enerally flooding in these areas is below 100mm and is therefore categorised as a low hazard. In some locations, in particular on Walters Street and Kembla Street southwest of Arncliffe Park and land around the rail underpass, flood depths are greater than 1m and therefore have a medium to high flood hazard.'⁹

There has been no assessment of the current flood effects at the site in floods larger than a 1% AEP flood with proposed development; however the *Cooks River Flood Study* (Sydney Water Corporation, 2009) has assessed the PMF, indicating the current extent of flooding across the precincts. (Attachment 1)

Issues with the Strategy and Precinct Plan

The Strategy and Precinct Plan have not considered flooding up to the PMF although they have assessed the flooding extents for the 1% AEP and 0.5 % AEP floods for Cooks Cove precinct. To truly understand the flood risk in each precinct, the flood risk in floods up to and

⁴ AECOM, Cooks Cove Flood Impact Assessment, 13 September 2016, 10.

⁵ Ibid, 12.

⁶ Department of Planning, Arncliffe and Banksia Precinct Proposal, November 2016, 15.

⁷ Ibid.

⁸ Ibid.

⁹ Ibid.

including the PMF should be assessed. This is especially important for the Cooks Cove precinct which is more vulnerable to flooding than Arncliffe and Banksia.

Within the supporting documents for the Strategy, figure 10 in the *Cooks Cove Flood Impact Assessment* (AECOM, 13 September 2016) is deceptive,¹⁰ suggesting that with the modifications to the floodplain in the proposed development scenario, the area is no longer inundated. This may be for the 1% AEP flood but there is no subsequent analysis of what the potential flood impacts would be for flooding up to the probable maximum flood. It could be that above these levels the consequences are the most severe.

Furthermore, in the conclusion to the *Cooks Cove Flood Impact Assessment* (AECOM, 13 September 2016) it was acknowledged that due to the difference in height between the roads leading out of the precinct and the potential PMF flood heights determined by the Cooks River Flood Study (2009), that 'during such an event it is likely that people on the site will be required to shelter in place.'¹¹

Development strategies relying on deliberate isolation or sheltering in buildings (i.e. the so called 'vertical evacuation') surrounded by flood water are not equivalent, in risk management terms, to evacuation. In the context of future development, self-evacuation of the community should be achievable in a manner which is consistent with the NSW SES's principles for evacuation.

Generally, sheltering in buildings surrounded by flood water presents a greater risk than a well-conducted evacuation as people are not removed from the risks attributable to the hazard. 'Sheltering in place' should only be used where evacuation is not possible due to greater risks of evacuating, or where evacuation from an at-risk area has failed. Where evacuation is not possible, the risks of sheltering should be adequately assessed to determine the tolerability of isolation, before any strategy of sheltering in place can be considered.

Encouraging a strategy of isolation or 'shelter in place' must take into account risks such as the unpredictable nature of human behaviour during a flood including the desire to escape from a hazard when it is unsafe to do so. People may also have the desire to access isolated areas to reunite with loved ones or return to a home away from the impacted area. This may be especially relevant if the future population is commuting to work in Sydney or other areas and are away from their place of residence during a flood.

Other secondary emergencies such as fires and medical emergencies may occur in buildings isolated by floodwater. During flooding it is likely that there will be a reduced capacity for the relevant emergency service agency to respond in these times. Even relatively brief periods of isolation, in the order of a few hours, can lead to personal medical emergencies requiring emergency response.

¹⁰ Ibid, 11.

¹¹ Ibid, 12.

In the event that a community is isolated and the egress roads are closed in a flood, such as what will happen to the proposed community in Cooks Cove and potentially other locations in the Arncliffe and Banksia precincts, the tolerability of isolation needs to be assessed to determine if it is acceptable to the community and future occupants.

Having a 'shelter in place' strategy for such a community, can mean there will be an increase in risk to emergency service personnel who may have to rescue people either from an isolated building or surrounding flood water. Before attempting rescue, emergency service personnel will assess the risk to their own safety. There is therefore no guarantee that rescue will be available to residents who are effectively entrapped in a building during a flood. This will be the case if the risks are considered unacceptable for emergency service personnel to undertake such rescue.

Furthermore, where the flood risk is considered too high after mitigation strategies have been implemented or considered, it may be that the proposed development or zoning is not suitable for the location, given the flood risk to the community at the site. This should be a realistic alternative if the safety of the future occupants and emergency service personnel will be compromised by the flood risk at the site and no acceptable solution can be devised.

Recommendations

The NSW SES recommends that the full range of flood risk up to the probable maximum flood be mapped and considered in the precinct planning stage for Cooks Cove precinct and be undertaken to inform the Arncliffe and Banksia precinct proposal.

There also needs to be careful consideration of how the community, that is proposed to be located in the precincts and which may become isolated in a flood, will remain safe during a flood. This is especially important for the Cooks Cove precinct. To address this issue it may be necessary to determine the tolerability of isolation for the residents in the area. An alternate option would be to look at improvements to the road infrastructure to enable continual access for those residents during a flood up to and including the PMF. Furthermore, where the flood risk is considered too high after mitigation strategies have been implemented or considered, it may be that the proposed development or zoning is not suitable for the location, given the flood risk to the community at the site. This should be a realistic alternative if the safety of the future occupants and emergency service personnel will be compromised by the flood risk at the site and no acceptable solution can be devised.

Concluding Remarks


Thank you for the opportunity to provide a submission on the Draft Land Use and Infrastructure Strategy - Bayside West Precincts (Arncliffe, Banksia and Cooks Cove) and the Arncliffe and Banksia Precinct Plan.

The Strategy and precinct proposal has considered flood risk up to the flood planning level but has not considered flood risk up to and including the PMF. With full understanding of the flood risk this can assist in decisions to steer development away from the higher risk flood

areas within the precincts and ensure the safety of the community during floods. Where part of the precinct becomes isolated during floods, the tolerability of isolation of this future community needs to be assessed. Alternatively road infrastructure could be improved to mitigate the risk of isolation of this community. Where the flood risk is considered too high after mitigation strategies have been implemented or considered, it may be that the proposed development or zoning is not suitable for the location, given the flood risk to the community at the site.

Thank you for considering the NSW SES submission. Please contact Marcus Morgan on (02) 4251 6665 if you wish to discuss any of the matters raised in this correspondence further.

Yours sincerely,



Nicole Hogan
A/Director, Emergency Management
NSW State Emergency Service

Cc: A/Commissioner

Manager Emergency Risk Management;
Deputy Region Coordinator, Sydney Southern
Planning Coordinator

Attachment 1: Extract from the *Cooks River Flood Study* (Sydney Water Corporation, 2009) and precinct plan.

