Supplementary Submission No 137c

INQUIRY INTO GOVERNMENT'S MANAGEMENT OF POWERHOUSE MUSEUM AND OTHER MUSEUMS AND CULTURAL PROJECTS IN NEW SOUTH WALES

Name: Ms Kylie Winkworth

Date Received: 10 February 2021

Select committee on the NSW Government's management of the Powerhouse Museum and other museum and cultural projects in new NSW

Submission from Kylie Winkworth, museum and heritage expert; and Molino Stewart, *Parramatta Powerhouse RTS Review – Flood, November 2020*

This submission addresses Terms of Reference
1. (a) the proposed move of the Museum of Applied Arts and Sciences, the Powerhouse Museum, from Ultimo to Parramatta, including:
(ii) the governance of the project, including the effectiveness and adequacy of planning,
(iii) the risks in the move, including damage to collections,
(iv) **the consequences of flood at the site at Parramatta in light of the flood event in February 2020**

This submission concerns the flood risk issues and design changes in the Parramatta Powerhouse development in the Response to Submissions (RTS).[1]

1 Background Molino Stewart's *Parramatta Powerhouse RTS Review – Flood*, November 2020; and *Flood Risk Review,* July 2020

Museum experts in the Powerhouse Museum Alliance (PMA) have long standing concerns about the unexplained selection of the Phillip St site on the Parramatta River for the Powerhouse Parramatta development and the flood risks arising from this decision. These concerns have grown since the winning competition design was announced. The PMA believes that there is a poor understanding of the flood risk issues to people and to the museum's collections and infrastructure from the development.

To better understand the flood risk issues of both a riverine and overland flood, I commissioned Molino Stewart to provide an expert flood risk review of the EIS reports and architectural plans for the Powerhouse Museum Alliance. Their first report for the PMA *Stage 1 Assessment for the Proposed new Parramatta Powerhouse* was submitted to Museum Select Committee in May 2020.[2] The PMA commissioned Molino Stewart to provide an analysis of the EIS plans, *Parramatta Powerhouse EIS Flood Risk Review* July 2020. This was submitted to the EIS and to the Legislative Council Museum Select Committee. [3] Following the release of the Response to Submissions, the Powerhouse Museum Alliance asked Molino Stewart to review the RTS report, design modifications and technical appendices. Their November 2020 report is attached. It should be read in conjunction with the July 2020 *Flood Risk Review* of the EIS plans.

Molino Stewart are the leading consultants in flood plain risk management and planning, with particular expertise advising on flood planning and flood risk issues in the Parramatta River catchment and the Parramatta CBD.

The PMA is pleased to note that the RTS outlines notable modifications to the design of the undercroft, and the proposed use and public access to this space, (MS RTS Review 3.1). Flood evacuation routes are improved by separating overland flow paths from pedestrian paths (MS RTS

Review 3.7). And there is more detail on the emergency power supply and the Flood Emergency Response (MS RTS Review 3.4 and 3.8). These changes vindicate the criticisms of the winning design of the architectural competition, the EIS designs, analysis by Molino Stewart in their *Parramatta Powerhouse EIS Flood Risk Review* July 2020, and by the City of Parramatta Council (CoPC), among other agencies.

In a covering email to me with the RTS Review, Steven Molino notes:
in summary, they have done a good job in improving the design to lessen risk to life and other information provided gives a clearer picture about building design and flood modelling. However, the results of the flood risk assessment are highly sensitive to some key assumptions used in the modelling. Using assumptions applied by Parramatta Council to all other developments in the CBD, the project would fail on all tests. Using the less conservative assumptions adopted by ARUP, most of the risks are likely to be acceptable with the exception of the risks to collections which are indeterminate. I say they are indeterminate because all the focus so far has been on the chance of floodwaters entering the building. No one has actually determined what would happen to the contents if it does and, taking into consideration the values attached to the building contents, what would be an acceptable probability of collections and items being damaged.

2 Molino Stewart RTS Review - Flood

Key points and issues of continuing concern arising from the Molino Stewart *Parramatta Powerhouse RTS Review- Flood* November 2020 include:

- The provision of more detailed information about the design and flood modelling assumptions has allowed a better assessment of the flood risks to people and property, (6).
- Even using the least conservative assumptions, there is a greater than 12% chance of flood waters entering the ground floor of the museum during its 100 year design life, (5.2; 6)
- The RTS Report and Appendix J now make it clear that the undercroft space is necessary for flood conveyance, allowing the flood waters to flow downstream through the undercroft; (the EIS had stated the space was for flood storage) 3.1.
- Redesign of the undercroft and its connections to the podium level has reduced to risk to life for people outside the building (5.3.1).
- Questions remain about the reliability of the lockable retractable mesh screens to the undercroft, and risks to neighbouring properties and the museum should these fail to be opened prior to a flood (5.1.1; 5.3.3.a; 6).
- Assumptions used by Arup in modelling overland flows are not as conservative as the City of Parramatta Council's adopted model which assumes a 100% blockage of underground pipes, (4.3.1; 4.3.3 and 4.4.4).
- Molino Stewart's RTS Review concurs with the CoPC's concerns about the development's reliance on underground pipes to convey overland flows away from Phillip St, with potential increased flood risks to the neighbouring property of 32 Phillip St (4.3.3; 5.1.2; 6).
- The assumed degree of blockage of underground pipes has consequences for calculations around the flood immunity of the museum development and its impact on neighbouring properties, particularly for overland flows (4.3.4).
- This must be resolved, as impacts are highly sensitive to this factor (4.3.1; 4.3.3; 4.3.4; 5.1.3.c).

- If the CoPC's standards of 100% blockage are used then the Powerhouse Parramatta could **flood as frequently as a 5% AEP (1 in 20) event**, or more (4.3.4).
- If the Powerhouse Museum's collections are displayed in the P1 ground flood presentation space they will be at risk of damage in a flood event, (5.2; & 6).
- While Appendix J considers this may only be a 1 in 800 chance each year, or a 12% over the 100 year life of the building, the likelihood of flood damage is **not low**, as stated in appendix J, 8.3.2, and may not be an acceptable frequency given the value of the items and the damage they might sustain (5.2)
- The above is based on the assumption of no blockage of the underground pipe network. This is optimistic. If the CoPC's assumptions are used the flood immunity is probably not even 1 in 20 per year, and the collections could be damaged several times during the life of the development (5.2).
- The available warning time for an extreme riverine flood event may be as little as two hours, (5.2).
- However the ground floor is more likely to be impacted by overland flows than riverine flooding. In this case there may be virtually no warning that overland flows are likely to enter the building. Large items in the P1 space will not be able to be moved out of reach of the floodwaters at short notice, (5.2).
- In the event of floodwaters entering the ground floor and disabling the electrical substations, Appendix J states the building will have backup generator capacity to supply emergency lighting and power services for up to 10 hours. It does not appear that the emergency power would maintain climate control systems in the presentation spaces.
- The RTS Appendix A, section 3 MS7, p.54 states *there would not be any presentation spaces in the museum requiring AA climate control. Presentation Space 5 is the only space with A/B climate control*. This contradicts requirements in the Stage 2 Design Brief. Clarification is needed on climate control standards and the acceptable chance of damage to collections from flood waters and humidity (5.2, 5.2.1.d and e; 6).
- A risk framework is required for the collections and a design review is needed to determine how that can be achieved, **if at all**, based on the blockage factors and freeboard values which have been accepted as appropriate for the estimated flood levels at the site, (5.2.1,f).
- The building's fire safety systems are below 2.5m AHD and would likely be disabled by flood waters. If there were a fire in the building during a flood it is not clear if the fire suppression systems would function, while people may not be able to safely evacuate, (5.3.3.b; 6).
- Risks to life and the museum's collections are highly sensitive to assumptions about drainage network blockage and freeboard. A 12% chance of flooding in the 100 year life of the building may be acceptable, but it may not be given the significance of collection items and the damage they might sustain. More frequent flooding, as calculated by alternative blockage and freeboard assumptions, is less likely to be acceptable, (5.3.3,c; 6).

3 Site Selection and SEARS Requirements in the EIS

3.1 From the outset the whole question of flood risk at the Parramatta Powerhouse site has been viewed as a building design issue not a matter of public safety and the appropriateness of choosing to build a major community/ education/ museum building in a high risk flood zone. The unexplained location of the museum on this site is entirely discretionary. Contrary to the Planning Secretary's

Environmental Assessment Requirements (SEARS), the EIS/ RTS does not demonstrate that it has investigated *all remaining feasible alternatives and comparatively analyses their respective social impacts and benefits.* There are other sites for the museum in Parramatta that were never considered; notably the Fleet St/ Cumberland Hospital Precinct. Apart from the remarkable history and outstanding heritage significance of this site, a museum in this setting would pose minimal flood risks to the museum's collection, its building infrastructure and visitors.

SEARS required the EIS to consider, among a range of social impacts, **all remaining feasible alternatives and comparatively analyse their respective impacts and benefits** (EIS, p.18).[4] The analysis below demonstrates that this has not been done. The EIS/RTS is not compliant with the SEARS social impact assessment requirements, section 8.

	EIS / RTS And Amended Proposal New Powerhouse Location 8 Oct 2020[5]	Winkworth Comment
1	The then NSW Premier and Deputy Premier released the *Create in NSW: NSW Arts and Cultural Policy Framework* and announced the Government's decision **to investigate the creation of Powerhouse Parramatta**, p.11	In fact the then Premier Mike Baird announced the PHM would be moving to Parramatta in November 2014. This was reiterated in February 2015. It was a government commitment at the March 2015 election. The Cultural Policy Framework followed six months after the announcement in May 2015.[6] There was no investigation of options. There was no analysis of museum needs and opportunities for Parramatta. **The decision to move the Powerhouse had already been made. It was pre-determined before the EIS, and never analysed in the EIS.**
2	In discussion of the background and strategic need for the Powerhouse Parramatta the EIS discusses the *State Infrastructure Strategy Update* 2014, where Infrastructure NSW (INSW) proposed the development of a Parramatta Cultural Precinct and recommended that, before any further public investment was made in the Powerhouse at Ultimo, urgent consideration should be given to Powerhouse's potential relocation to the Parramatta Cultural Precinct. This was later reinforced in the NSW Government's Cultural Infrastructure Strategy 2016. [7]	The decision to relocate the Powerhouse Museum was pre-determined before the Cultural Infrastructure Strategy and before EIS. It was grounded in the INSW State infrastructure Update 2014. INSW are the client in the Powerhouse Parramatta development. The strategic need for the project was not substantiated or independently investigated in the EIS. The 24 April 2018 Final Business Case supplement notes: *Although **not defined at its inception by unmet demand** like similar large scale infrastructure projects, the Project through the act of relocation ultimately begins to address the cultural demands of Western Sydney…*[8]
3	Following the announcement that the Powerhouse would be moved to Parramatta, Create Infrastructure NSW initiated and led the development of the planning framework for Powerhouse Parramatta. This included a **site selection assessment** which concluded that the Riverbank site in Parramatta was the preferred site for the new museum, **based on a range of criteria including size, existing conditions, location and**	This 'planning framework' and site selection assessment has never been made public. The criteria including the size requirements and thematic focus of the new museum have never been revealed. What sites were assessed? The public were told that only two sites were examined: the Mays Hill Golf Course in Parramatta Park and the DJs carpark/ Phillip St site. It is odd that the Fleet St precinct was not included in the site selection assessment, given it is a more expansive

	opportunities to deliver expanded benefits in conjunction with other civic projects (i.e. the Parramatta River foreshore and the Civic Link), p.11	site in government ownership. The policy underpinnings of the project, and the site selection criteria as to size, location and opportunities remain secret. In regard to the size of the site relative to the museum's needs, the Phillip St site is obviously too constrained and flood prone, leading to numerous design compromises and risks. Far from delivering civic benefits such as the Civic Link, the development obscures views; it disconnects the River from the city; it does not provide seamless universal access to the Riverside; it destroys the landscape and heritage values of the site; and its over-scaled size reduces community access and opportunities to enjoy the foreshore.[9]
4	The EIS includes a detailed analysis of the site's suitability and project alternatives, in accordance with the requirements of the SEARs and the EP&A Regulation.	This is not correct. Where is this information? If it is section 1.4 in the EIS Report, this is not a detailed analysis of the site's suitability or project alternatives.[10] The 8 Jan 2018 Extended Final Business Case v.4.0 (EFBC) did not investigate project alternatives.[11] The base case or 'do nothing' option in the 2018 EFBC was no museum at Parramatta and no museum at Ultimo, 4.4.1, p.42. No other museum types, options or locations were ever considered. The content of option 2 on p.14 of the EIS Report is not revealed. The discussion under option 2 on p. 14 of the EIS is entirely a discussion of option 3 and its purported merits.[12] The statement that the Powerhouse Parramatta is required to activate the riverbank and support the night time economy is an assertion that is unrelated to the case for a family and education-focussed science and technology museum. Another type of cultural facility such as a theatre would be better calibrated to support the night time economy and activate the riverbank after working hours. There is no evidence a theatre or entertainment complex on the site was considered, although it may be argued the Powerhouse Parramatta plans are for an arts and entertainment centre, not a museum.
5	The Government confirmed this decision and announced its choice of the Riverbank site in April 2016. The Riverbank site was acquired by the NSW Government to facilitate the delivery of the project in early-2019. p.11.	The Government went ahead with the site acquisition **without considering other museum options or locations** that were less constrained.[13] These decisions were not independently reviewed and analysed by the EIS. It was a given. Of note, the CoPCC Cultural Strategy, which highlights the city's notable cultural themes and needs, was not considered in the decision.
6	Section 1.4 of the EIS cites the analysis of the alternatives in the publicly released INSW Final Business Case Summary, April 2018.	In fact the alternatives in the INSW FBC Summary differ markedly from the alternatives in the Johnstaff EFBC 8 Jan 2018, see 4 above and note 6

		below. The INSW options are variations on only one museum option which is relocation of the Powerhouse to the Riverbank site.[14] The three 'options' discussed are only size and cost variations for a science museum on the Parramatta Riverbank.
7	Analysis of alternative locations has already been undertaken by the NSW Government, resulting in the selection of the subject site as the most suitable, and is not relevant to this planning assessment process. P.11	This is not correct. As noted above the analysis of alternative locations has never been released. Nor has the selection of Phillip St site been explained. This missing explanation is very relevant to the EIS and the planning assessment process since the selected site is constrained, the development will see the demolition of Willow Grove, it is destructive of Aboriginal heritage, and it carries serious flood risks, among other social and heritage impacts.
8	Under 8 Social Impacts, the Secretary's Requirements asks the EIS to *consider all remaining feasible alternatives and comparatively analyse their respective social impacts and benefits.*[15]	The EIS does no address SEARS requirements for discussion of **feasible alternatives**, nor does it provide a comparative analysis of the social impacts and benefits of any alternate sites. We ask the EIS to do this analysis and consider relocation of the project to the Fleet St heritage Precinct.
9	After the EIS was on exhibition the NSW Government announced on 4 July 2020 that the Powerhouse Museum would be staying in Ultimo. Following this announcement, the RTS should have recalibrated the EIS and considered **all remaining feasible alternatives** and other site options, as required by SEARS.	The decision to keep the Powerhouse Museum in Ultimo invalidates much of the case on which the EIS rests, namely that the whole Powerhouse Museum would be relocated to Parramatta requiring a very large building to in any way approximate the real Powerhouse Museum; that the Powerhouse in Ultimo could not be renewed on its current site; that it was relatively remote and not on a cultural ribbon and must be moved to be renewed.[16] Now the NSW Government is advancing plans for the PHM's Ultimo renewal as part of arts and cultural precinct. This leaves the Powerhouse Parramatta development without a compelling rationale or purpose that justifies its over-blown size. It duplicates what the PHM at Ultimo does, instead of developing a distinctive new museum in Parramatta, based on the community's cultural priorities as expressed in the CoPC's Cultural Strategy, and developed on an alternative site which conserves heritage instead of destroying it.

3.2 To summarise; five key points flow from this analysis:

i. The EIS does not address the SEARS requirements for discussion of **feasible alternatives**, nor does it provide a comparative analysis of the social impacts and benefits of any alternate sites.

ii. There has never been a clear rationale for the selection of the flood-prone Phillip St site for the museum; apart from the assertion that the museum was needed at this location to support the night time economy. In fact there are no co-location synergies between an

education- focussed science and technology museum for children and families and a night time entertainment precinct.[17]

iii. Following the NSW Government's July 4 2020 decision to keep the Powerhouse Museum in Ultimo, there should have been a design review of the Parramatta Powerhouse project with a fresh analysis of the museum options and alternatives for a distinctive new museum for Parramatta and Western Sydney that is thematically resonant with the history and cultures of the place, and which would add to the suite of landmark museums in Sydney. The Fleet St Precinct should be considered in a robust comparative analysis of impacts and benefits, not least the potential World Heritage listing of the Female Factory.

iv. Unfortunately the NSW Government has pushed on with the EIS for the Powerhouse Parramatta resulting in a wasteful and conceptually confusing overlap between the real Powerhouse Museum at Ultimo, and the $1b Parramatta development that still has no compelling rationale, no sense of place, no thematic coherence and no distinctive brand identity.

v. The lost opportunity for a distinctive new museum for Parramatta is enormous; particularly for a history and cultures museum that would be better aligned with local audiences, the nationally significant history of Parramatta as a landscape of first contact, and the number one interest of high value cultural tourists in visiting history and heritage sites. But instead of conserving heritage, the Parramatta Powerhouse is set to demolish and 'move' Willow Grove over the passionate objections of the community.

3.3 It is of great concern that this deeply flawed planning process will result in a museum where the visitors, the collection and museum infrastructure may be at serious risk from flooding. Nevertheless the EIS appears set for approval on the recommendation to the Minister from Mr Jim Betts, the Secretary of the Department of Planning, Industry and Environment. Mr Betts was previously CEO of Infrastructure NSW from 2013-2019, during the period when the Powerhouse to Parramatta scheme was proposed and planned by INSW. He is now a board member of INSW. In a perfect circle, the client for the Powerhouse Parramatta is Infrastructure NSW.

4 Undercroft Design, Use and Risks

4.1 The MS RTS review notes in 3.1 that the RTS and related design changes now acknowledge that the undercroft is required for **flood conveyance**, not flood storage. This means high velocity flood waters flowing under the museum. It is shocking that any public building could be developed over a high risk zone for **flood conveyance**, let alone a museum aiming for 2m visitors a year, with visitors of all ages and abilities. The Powerhouse Precinct building and terrace will act as a viewing platform for flood events. People will gather to watch the flood water rushing under the museum through the undercroft. There are no details in the EIS/ RTS about how the museum will keep visitors safe across two highly permeable buildings with multiple doors and open access around the site. Consideration of public risk and flood emergency issues has been deferred until the completion of a Flood Emergency Management Plan (FEMP), kicking the public safety can down the road.

4.2 The appropriateness of selecting this flood-prone site for a museum use has not been explained or addressed in either the EIS or RTS. This is a building that is so exposed to flooding that the undercroft is required for the conveyance of floodwaters, so the **floodwaters can flow underneath the museum**. Such is the risk and volume of water that the size of the undercroft has been enlarged

after the EIS. The undercroft was not part of the competition-winning design. This raises questions about the early planning and site selection, the design competition jury's decision, and whether the design for a museum with floodwaters flowing underneath the building can ever constitute design excellence. Infrastructure NSW has not released the 2016 site selection reports or responded to questions seeking this information during the EIS and RTS phases. The safety of the museum's visitors and collections should have been the highest priority consideration in the site selection and design competition.

4.3 Design changes to the undercroft in the RTS have not resolved the conflicts and risks inherent in this space. As noted by the City of Parramatta Council in its response to the RTS

> While Council acknowledges that the undercroft space will have limited access by the public through the erection of moveable screens managed by the Powerhouse, Council maintains its concerns regarding the suitability of the undercroft as a flood solution where the conveyance of floodwater through the undercroft also passes through proposed habitable floor space. This is due to the potential threat to life, property and critical building services in a flood event (including evacuation via a single, limited capacity lift, which provides critical access to mobility impaired). Council considers this to be in contradiction of the Floodplain Development Manual and NSW Flood Policy. This space will have a level floor and the 1% AEP (100 year) floodwaters will flow with substantial velocity 2-3m deep extending to the back wall of this structure.[18]
> https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=EXH-10413236%2120201221T072801.288%20GMT

Just 30cm of floodwater is enough to wash someone off their feet. Compliance with the Floodplain Development Manual and the NSW Flood Policy is a requirement for SEARS. Council requests the undercroft be removed from the design.

4.4 Given the museum intends to use the undercroft for public programs and activities then it is arguably a 'habitable space' for the purposes of flood policy compliance. There are inherent conflicts and contradictions in the way that MAAS will have to represent and monitor this space. On the one hand the undercroft will be an identified space for play and public programs, with the mesh screens open for easy public access. But on the other hand in a flood emergency the screens will be opened to allow the high velocity flood waters to flow through the space. That is sending contradictory messages about whether the space is safe or not. It is not clear how the museum will be able to monitor the undercroft to ensure no one is sheltered there in heavy rain. An overland flood could well occur concurrently with a riverine flood. Will the emergency plan have enough people to keep visitors away from the undercroft shelter and flood spectacle, while also directing visitors to the upper floors to shelter in place, in a context where the lifts in the eastern building could be out of action? The RTS says the mesh screens will be closed when the undercroft space is not in use. Can this be reliably enforced over the 100 year life of the building?

5 Flood Risk Planning, Mitigation and Management Issues

5.1 The flood risks at the Phillip St site were well known in 2016-17 when the final business case and extended final business case was under development. The Johnstaff risk assessment digest lists: *Ineffective or inappropriate flood mitigation measures create risks to safety, security, and the collection, impacting costs.* (Risk 27)

The mitigation strategy response is: *The flooding impact analysis undertaken during the FBC indicates that appropriate mitigation measures can be undertaken which include installation of fully tanked spaces on ground, installation of flood gates, management plans etc. The FBC indicates that no function space, storage or plant can be located within the flood plain. Additional costing has been included.*[19] Johnstaff rates this risk as moderate. And the mitigation measures are noted as in place.[20] These design and construction mitigation measures have been deleted, reportedly to save money.

5.2 The in-house MAAS Risk Register in the same report rates this risk as high. The risk 'owner' is MAAS. The likelihood is possible. The consequences are rated as major. Other flood related risks identified by MAAS include:
The flood prone site will negatively impact on costs and structural requirements for the built form. (Risk 28) This risk is rated as 'likely'.
Risk that the basement and carpark will be subject to flooding requiring flood mitigation measures. (Risk 29) This risk is rated as 'almost certain'.
The mitigation measures are the same as for Risk 27. *The flooding impact analysis undertaken during the FBC indicates that appropriate mitigation measures can be undertaken which include installation of fully tanked spaces on ground, installation of flood gates, management plans etc. The FBC indicates that no function space, storage or plant can be located within the flood plain. Additional costing has been included.*

5.3 The Risk Register notes these mitigation measures are ***in place***. This is not the case. It is not clear how or when the flood mitigation measures were deleted from the building design brief and jury deliberations. Of note:

i. Funding for a fully tanked basement carpark and ground floor was evidently deleted.
ii. The hydrant sprinkler, pump and tank room is located in the undercroft, and is at risk of being disabled in a flood.
iii. A museum for 2 million visitors a year is expected to operate without any parking for visitors or service vehicles, increasing risks for visitors and staff around what will be a congested access way on Dirrabarri Lane, with potential risks for pedestrians, as noted by the CoPC.
iv. Approval of the business case to build the museum at the Phillip St location was based in part on the commitment that the identified flood risks would be mitigated in the design and construction of the museum.
v. Instead, the risks and costs have been transferred from the design and construction to MAAS and its operational budget and management. These risks will require recurrent funding and active management for the duration of the building's life.

5.4 The Powerhouse Parramatta will have a design life of 100 years. Using Arup's modelling the **best case scenario** is that there is a 12% chance of floodwaters entering the ground floor of the museum over this 100 year period; Appendix J. Using the CoPC modelling, flooding could be as frequent as a 5% AEP (1 in 20) event, or even more frequent, ((MS 4.3.4). A Probable Maximum Flood (PMF) of 11.5 AHD would be 3.5m deep in the building. A flood with a 1 in 500 chance of occurrence per year has a 1 in 6 chance of occurring in the next 80 years.[21] With climate change driving more variable and extreme climate events it is difficult to understand why the NSW Government is investing $1b in

a new museum on this constrained and compromised site, knowing the building will be subject to flooding and that will put visitors and the museum's collections at risk.

5.5 None of the EIS/ RTS planning reports have addressed public safety with the high intensity uses planned for the Powerhouse Precinct, the 24x7 operation for 2 million visitors a year, a night-time entertainment precinct with young people and alcohol, and up to 10,000 people at any one time across two buildings and terraces, and multiple commercial hire events which add layers of risk and complexity. The EIS did not contain a summary of relevant information from the Stage 2 Design Brief which underpinned the selection of the competition winner, the design and facilities in the building, and which outlines how the building and precinct will be used. The development is not the science and innovation museum concept that was endorsed by Cabinet in April 2018, having morphed into an arts, education and entertainment precinct. The primary Ethos Urban EIS report and the Response to Submissions Report do not describe the range of activities, uses and facilities spelt out in the Stage 2 Design Brief.

5.5 Of note the Stage 2 Design Brief requires a development for the following:

- The two buildings will be completely porous with multiple doors, and open terraces accessible to the river bank
- The Precinct and building will host 2 million visitors in its first year
- It will operate 24 x 7 including as a night time entertainment precinct with 10 cafes and bars
- There may be multiple large events across the two buildings for up to 10,000 people at any one time
- The P1 space will be used for major concerts and the exhibition of large objects
- There may be 5,000 people in the P1 space and terrace and another 5,000 on the riverbank
- The facility will host major community festivals, conferences, a cooking school and immersive digital experiences
- The development will include a cinema and digital production studio, a school dormitory, and 40 apartments
- Live performances may be held in all presentation spaces
- Every space is available for commercial hire
- The facility will host international travelling exhibitions and have museum objects on high rotation[22]
- The presentation spaces P 3, P4, and P5 are required to meet international museum standard environmental conditions, meaning that temperature and humidity variations are tightly controlled; p131.

5.6 There is a glaring anomaly between the Stage 2 Design Brief and the EIS/RTS around the climate control requirements in the building. Questions to DPIE and INSW about the proposed climate control standards for each of the presentation spaces have not been answered. The MAAS CEO told the current Legislative Council Museum Inquiry that all the presentation spaces will meet international museum standards for climate control.[23] However the RTS Appendix A, section 3 MS7, p.54 states *there would not be any presentation spaces in the museum requiring AA climate control. Presentation Space 5 is the only space with A/B climate control*. This leaves a concerning lack of clarity around the environmental controls for collections in the development.

5.7 The risks to collections exposed to a flood in the Powerhouse Parramatta development have not been adequately addressed in the EIS/ RTS. In dozens of reports across thousands of pages, the flood risks to the collections are dealt with in just one paragraph.

> The museum will house valuable collections. The design of the building has reflected the value of these collections by creating a ground floor level that would have an immunity of approximately 1 in 800 AEP (or 0.12%) including an allowance for freeboard. Only Presentation Space 1 will be located on this ground floor. All other presentation spaces within museum will be located on floors that sit above the PMF level. During flood events, some presentation spaces could be closed so that the humidity of the air in those presentation spaces can be maintained with air conditioning. Given the small fraction of presentation spaces below the PMF level, the warning time available for river flooding and the low probability of flooding of the ground floor, the likelihood of flood damage to the collections housed in the museum would be low.[24]

5.8 As noted by Molino Stewart, in the event of floodwaters entering the ground floor and disabling the electrical substations, the building will have backup generator capacity to supply emergency lighting and power services for up to 10 hours. With water in the building, 10 hours of back-up power will not be adequate to maintain climate control systems in the presentation spaces. The submission from the Australian Institute for the Conservation of Cultural Materials (AICCM) to this Select Committee draws attention to the flood risks for collections and climate control systems.[25] Flood damage to the electrical substations would likely take weeks to repair and leave the museum's collections vulnerable to damage from uncontrolled temperature and humidity fluctuations and possible mould infestations. The suggestion of closing presentation spaces in flood events is unlikely to control damaging spikes humidity and temperature.

5. 9 The Stage 2 Design Brief specified that *the majority of Presentation Spaces should be designed to be above the overland PMF (RL 11.3) to ensure they are suitable for display of some Museum Collection items*.[26] Nevertheless the P1 space on the ground floor of the eastern building is designated for the museum's large and very large objects. These may include some of the museum's most significant objects. The finished floor level is just 7.5 AHD. This means it only has flood immunity up to the 1% AEP. This risk may be acceptable for a commercial or residential building with replaceable fittings and fixtures. It is not acceptable for a museum housing irreplaceable collections and expensive infrastructure. The museum's large and very large objects could not be relocated in a major flood event when public safety would properly be the focus of the emergency response. Flood waters in the P1 space may wash large objects off plinths and other items out of showcases.

5.10 Dr John Macintosh notes in his submission to the Legislative Council's 2019 Museum Inquiry, *standard contemporary practice uses the assessed line of inundation of the PMF (Probable Maximum Flood) to demarcate the extent of flood hazard. That is, the location must be sited outside the PMF flood extents to avoid flood hazard.*[27] The reliance on using the level of a 100 year ARI as a guide to siting or planning a public museum is wrong in terms of visitor safety and the collections. As noted, a PMF would be 4m through the ground floor of the building. More extreme weather events are increasing as the climate warms. A senior SES official has warned that a super cell event over the Parramatta CBD could inundate the area in just nine minutes.[28] Molino Stewart notes the available warning time for an extreme riverine flood event may be as little as two hours, (5.2). There may be virtually no warning of an extreme overland flood event. In a major flood it is difficult to see how the

museum could manage thousands of visitors spread across two porous buildings, open terraces, an undercroft and riverbank, with just nine minutes notice. We saw what this means in the searing footage of the supercell flash flood in Toowoomba and Grantham.

5.11 Parramatta Council's Floodplain Risk Management Policy requires that developments with high sensitivity to flood risk (e.g. "critical" and "sensitive" land uses) are sited and designed to provide reliable access and minimise risk from flooding - in general this would **not be anywhere within the extent of the Probable Maximum Flood**.[29] Sensitive uses and facilities include community and education facilities such as the proposed Powerhouse Parramatta development. In my view the development is not consistent with Parramatta Council's DCP and LEP; nor with Council's Floodplain Risk Management Policy, see 3.6, 3.7, 3.8. Council's Flood Plain Matrix Planning and Development Controls, table 2.4.2.1.2 indicate that a museum use is unsuitable for all three levels of flood risk, part 2.4. The project is obviously a dramatic intensification of the development and use of a high flood risk precinct, contrary to 2.4.2.1, objective 0.5, and 0.8 and Design Principles P.1, and P.3 in the DCP.

5.12 One of the primary obligations of a museum is the safe custodianship of its collection from one generation to the next. Year on year, the government and the community invests a lot of money in keeping collections safe, in good condition, in buildings that we expect to be well designed and fit for purpose. Public confidence in a museum depends on its care and management of the collection and being a safe place for visitors. The discretionary siting of new museum in a location where the ground floor is likely to flood, and the floor below is designed for the conveyance of high velocity food waters, is contrary to all prudent museum planning. A flood in the museum poses risks to visitors, the collection, museum programming and to the museum's reputation. The impact of these risks on the facility's capacity to host international travelling exhibitions is unknown. The development of the museum in a high risk flood zone is taking reckless and unnecessary risks with $1b of infrastructure investment and public confidence in the museum.

5.13 MAAS has had little control over the concept and development of this project from the time it was announced that the Powerhouse would be moved to Parramatta in November 2014. The museum had no say in the site selection. It is one voice in a project committee structure otherwise deficient in museum planning expertise. It is not the client in the development. The interests of INSW in delivering a trophy building on budget are not aligned with the interests of MAAS as the 'risk owner' and future manager of the development. Rather than mitigating predictable flood risks as promised in the business case through the building design and construction, the museum will inherit the responsibility and costs for managing flood risks on the site. All the responsibility and risks rely on what will need to be an infallible Emergency Management Plan. What we've learnt from the Covid-19 pandemic is that the responsibility and execution of these plans often cascades down to poorly trained and underpaid casual staff.

Kylie Winkworth
Museum and heritage expert
Powerhouse Museum Alliance
February 2021

The Powerhouse Museum Alliance has always supported a new museum in Parramatta. Its three main goals are:

- The Powerhouse Museum must remain intact at Ultimo as the flagship museum for MAAS, where it has been part of the education, design and creative life of Sydney since 1893. The MAAS Trust must retain control over the museum's property and collection.
- Parramatta should have a new museum or cultural facility that is unique to its cultures, place and stories, based on community cultural priorities and transparent consultation.
- The government should prepare a fair and equitable museum plan for NSW, which supports museums and communities in Western Sydney and regional NSW, **and** landmark museums in Sydney.

https://powerhousemuseumalliance.com/

[1] For the EIS plans and reports and Response to Submissions see https://www.planningportal.nsw.gov.au/major-projects/project/26576?fbclid=IwAR0bB-du2l8qvLLOoTEoS-6fBmRsQNumHAwb5O2hQsqaoxFSoeAtba7vx1I

[2] Winkworth Submission 137a and attachment: https://www.parliament.nsw.gov.au/lcdocs/submissions/67966/0137a%20Ms%20Kylie%20Winkworth.pdf

[3] Winkworth Supplementary Submission 137b https://www.parliament.nsw.gov.au/lcdocs/submissions/68636/0137b%20Ms%20Kylie%20Winkworth.pdf

[4] SEARS was Issued 10 February 2020: https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-10416%2120200210T041251.723%20GMT

[5] Ethos Urban Powerhouse Parramatta Response to Submissions and Amended Proposal 8 October 2020 https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=EXH-2839%2120201008T013740.172%20GMT

[6] https://www.create.nsw.gov.au/wp-content/uploads/2015/02/ARTS-NSW-Policy_13-MAY_web-1.pdf

[7] Ethos Urban Powerhouse Parramatta, Environmental Impact Statement, May 2020, 1.2 Strategic Need, p.12 https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-10416%2120200602T052935.510%20GMT

[8] Johnstaff Final Business Case (supplement) The New Museum in Western Sydney, 24 April 2018, V.6.0, p.2 https://powerhousemuseumalliance.com/wp-content/uploads/2018/06/new-western-sydney-museum-2-final-business-case-supplement-240418.pdf See also Johnstaff Final Business case The new Museum in Western Sydney, 8 January 2018, v.4.0, 3.3, p.24

[9] City of Parramatta Council, RTS letter and appendices, 12 November 2020 https://www.planningportal.nsw.gov.au/major-projects/submission/765656

[10] Ethos Urban Powerhouse Parramatta Environmental Impact Statement, May 2020, p.13-14 https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-10416%2120200602T052935.510%20GMT

[11] For the 8 January 2018 Business case papers: https://powerhousemuseumalliance.com/wp-content/uploads/2018/06/new-western-sydney-museum-1-final-business-case-0801181.pdf

[12] Ethos Urban Powerhouse Parramatta Environmental Impact Statement, May 2020, 1.4, p.14 https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-10416%2120200602T052935.510%20GMT

[13] Powerhouse Parramatta Response to Submissions and Amended Proposal 8 October 2020, p.11 https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=EXH-2839%2120201008T013740.172%20GMT

[14] Infrastructure NSW, Final Business Case Summary: Powerhouse Museum in Western Sydney April 2018

[15] Ethos Urban Powerhouse Parramatta Environmental Impact Statement, May 2020, Social Impacts, 1.5, p.18 https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-10416%2120200602T052935.510%20GMT

[16] See also Kylie Winkworth; INSW; Stitching up the Case to sell the PHM; https://powerhousemuseumalliance.com/what-the-experts-say/infrastructure-nsw-stitching-up-the-case-to-sell-the-phm/

[17] Kylie Winkworth submission 149g https://www.parliament.nsw.gov.au/lcdocs/submissions/60866/0149g%20Ms%20Kylie%20Winkworth.pdf

[18] City of Parramatta Council Technical Feedback Flooding and the Undercroft, Appendix A 12 November 2020 and 15 December 2020 https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=EXH-10413236%2120201221T072801.288%20GMT

[19] Johnstaff, Risk Assessment and Management Framework, October 2016, Attachment E, Risk 27, p12. https://powerhousemuseumalliance.com/wp-content/uploads/2018/06/new-western-sydney-museum-18-risk-assessment-and-management-framework.pdf

[20] Ibid, MAAS New Museum FBC Risk Register, Risk 27.

[21] Molino Stewart, *Parramatta Powerhouse EIS, Flood Risk Review*, July 2020, 4.2.1, p.25. https://www.parliament.nsw.gov.au/lcdocs/submissions/68636/0137b%20Ms%20Kylie%20Winkworth%20-%20attachment%201.pdf

[22] However this may now depend on climate controls and whether the building can satisfy lending requirements. Stage 2 Design Brief, p.128, 152, 182, 186 https://maas.museum/new-powerhouse/competition-process/

[23] **Ms HAVILAH:** I am not sure where you got those figures from, but they are incorrect. There will actually be 18,000 square metres of exhibition and public space in Parramatta. The overall museum will be 30,000 square metres. All of the exhibition spaces will be climate controlled to international standard and the whole of the museum has actually been engineered to be able to present the Powerhouse collection.
Mr DAVID SHOEBRIDGE: In terms of the 19,800 square metres that was in the initial plans for the Parramatta facility, is it your evidence that all of that—all of the public exhibition spaces—will be engineered to a standard that has them at the museum standard for climate-controlled exhibitions?
Ms HAVILAH: All of the exhibition spaces at Powerhouse Parramatta will be designed to international museum standard, including climate control. I am happy to take it on notice so I can give you those accurate detailed figures.
https://www.parliament.nsw.gov.au/lcdocs/transcripts/2405/Transcript%20-%20Museums%20and%20cultural%20projects%20-%2029%20July%202020%20-%20Corrected.pdf, p.34

[24] Arup, Powerhouse Parramatta Response to Submissions Report, Flood Risk and Stormwater Management Addendum, Appendix J, 16 Sept 2020, 8.3.2, p.58

[25] https://www.parliament.nsw.gov.au/lcdocs/submissions/67878/0077%20Australian%20Institute%20of%20Conservation%20of%20Cultural%20Materials%20(AICCM)%20%20NSW%20Division.pdf

[26] Stage 2 Design Brief, p.249 https://maas.museum/new-powerhouse/competition-process/

[27] https://www.parliament.nsw.gov.au/lcdocs/submissions/59449/0174%20Dr%20John%20Macintosh.pdf

[28] https://www.smh.com.au/national/nsw/nine-minutes-to-flee-parramatta-s-catastrophic-flash-flooding-warning-20190214-p50xtv.html

[29] Parramatta City Council Floodplain Risk Management Policy, 2014, 1.b.