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Final

Historical Archaeological Research Design and Excavation Methodology

Parramatta Powerhouse site

Document Information.

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Local Government Area

Parramatta City Council

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1. Introduction

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1. 1. Introduction

1.1. Background

In April 2020 Curio Projects completed an Archaeological Research Design for the development of the Phillip Street site for the proposed Parramatta Powerhouse Museum.[1] That report assessed the impacts to the archaeology, by the development, and devised an archaeological investigation program based on those impacts.

In September 2020 new development impacts were addressed in an addendum report. [2] This later report developed a revised archaeological investigation program based on 12 test trenches on selected areas of the site. In addition to the test trenching, it was proposed that archaeological monitoring be undertaken of other excavations, such as services lines, additional piling and pile removal and landscaping.

In February 2021 the State Significant Development Application (SSDA) was approved allowing works to commence on site. The early works program has provided Curio with the opportunity to undertake excavation on those test trench locations and monitor excavation works on the remainder of the site. Work was commenced on site in late May 2021 and by June sufficient testing had been undertaken to reveal substantial archaeological remains. In accordance with the Consent Conditions (see below) a HARDEM was submitted to HNSW for consultation in July.[3] On the basis of that report salvage work was undertaken on the site through August to October.

Further testing was planned and this work was able to be completed in November 2021 with the dismantling of Willow Grove. This testing/monitoring work has revealed archaeological remains of local and potentially State level significance in some areas of the site. The remains that have been assessed as of local significance have been archaeologically recorded. Those that have been assessed as potentially of State Significance will be largely retained on site. These include:

- Sandstone floor and steps associated with a structure dating from the 1820s to the 1840s (portions of these remains will have to be removed due to engineering requirements of the Powerhouse undercroft);
- A sandstone floor possibly associated with the same suite of buildings;
- A well dating to the 1840s or earlier.

1.2. The Purpose of this Report

The Consent Conditions issued with the project determination in February 2021 contained several conditions related to Non-Aboriginal Archaeology.[4] Condition C47 related to undertaking the archaeological testing on the site. Condition C48 states:

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[1] Curio Projects 2020, Powerhouse Parramatta, Historical Archaeological Research Design, prepared for Infrastructure NSW.
[2] Curio Projects 2020, Addendum Historical Archaeology Impact Assessment Report, Powerhouse Parramatta, prepared for Infrastructure.
[3] Curio Projects, July 2021, Historical Archaeological Research Design and Excavation Methodology (HARDEM), Parramatta Powerhouse site.
[4] Development Consent, SSD Appln: 10416.

If testing (Condition C47) identifies an archaeological resource of significance (local, State or both) which cannot be avoided through detailed design, the project shall undertake archaeological open area salvage.

While Condition C49 states:

Prior to the commencement of any works associated with the archaeological open area salvage associated with Condition C48, the Applicant must prepare a revised historical archaeological research design and excavation methodology (HARDEM). The HARDEM shall be prepared ahead of the salvage stage in consultation with the Heritage Council of NSW and submitted to and approved by the Planning Secretary.

This report has been completed to provide a further revised HARDEM to be submitted to the NSW Heritage Council for consultation and discussion for final approval by the Planning Secretary. This report will outline the methodology for recording and removal of a portion of the sandstone features noted above.

1.3. Site Identification

The study area is located at the northern edge of the Parramatta CBD on the southern bank of the Parramatta River (Figure 1-1). It occupies an area of approximately 2.5 hectares and has extensive frontages to Phillip Street, Wilde Avenue and the Parramatta River. A small portion of the study area extends along the foreshore of the Parramatta River to the west, close to the Lennox Street Bridge on Church Street. The study area boundary is identified in. The study area excludes the GE Office Building at 32 Phillip Street. The site has been subject to the demolition of the car park and the rear of St Georges terrace and many of the features identifiable in 2020 no longer remain (Figure 1-2)

Figure 1-1 Study area boundary, key features (prior to demolitions), and immediate local context. (Source: Ethos Urban 2020)

Figure 1-2 The site in mid-October 2021 with the site generally cleared. (Source: Near Map)

2. Archaeological Investigation Program

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2. Archaeological Investigation Program

2.1. Archaeological Research Design Addendum, 2020

As noted above an ARD Addendum was completed based on revised impacts for the Powerhouse Museum design. That Addendum proposed that 12 test trenches be undertaken across the site based on the assessed level of archaeological potential and development impacts upon that potential (see Figure 2-1). Those test trenches were:

- Trench 1 (dimensions 10 metre x 2 metre) has been sited to investigate the potential for potential archaeological remains along the course of the major service lines in the north-west of the impact zone; (yet to be completed)
- Trench 2 (dimensions 10 metre x 2 metre) has been sited to investigate the potential for potential archaeological remains associated with late 19th century occupation on the Phillip Street frontage; (yet to be completed)
- Trench 3 (dimensions 5 metre x 2 metre) has been sited to investigate the location of a brick barrel drain running to the river on the northern side of the study area; (completed)
- Trench 4 (dimensions 5 metre x 2 metre) has been sited to investigate the location of a brick barrel drain running to the river on the southern side of the study area; (completed)
- Trench 5 (dimensions 5 metre x 2 metre) has been sited to investigate the location of a brick barrel drain running to the river in the centre of the study area; (completed)
- Trench 6 (dimensions 15 metre x 2 metre) has been sited to investigate the potential for State Significant archaeological remains through the site of 'Willow Grove'; (completed)
- Trench 7 (dimensions 15 metre x 2 metre) has been sited to investigate the potential for State Significant archaeological remains through the site of 'Willow Grove'; (completed)
- Trench 8 (dimensions 10 metre x 2 metre) has been sited to investigate the potential for State Significant archaeological remains north of Phillip Street; (completed)
- Trench 9 (dimensions 10 metre x 2 metre) has been sited to investigate the potential for State Significant archaeological remains to the rear of St George's terrace; (completed)
- Trench 10 (dimensions 15 metre x 2 metre) has been sited to investigate the potential for State Significant archaeological remains to the north of St George's terrace; (completed)
- Trench 11 (dimensions 15 metre x 2 metre) has been sited to investigate the potential for State Significant archaeological remains to the west of Wilde Avenue; (completed)
- Trench 12 (dimensions 15 metre x 2 metre) has been sited to investigate the potential for State Significant archaeological remains on the south-eastern corner of the study area. (completed)

The result of the testing works and proposed salvage associated with TT 3, 4, 5, 6, 9, 10 and 11, were outlined in the Curio July 2021 HARDEM.[5]

[5] Curio Projects, July 2021, Historical Archaeological Research Design and Excavation Methodology, Parramatta Powerhouse site.

Trenches 1 and 2 fall within Dirrabarri Lane which will remain open as road access until later in the construction program. Testing here will take place under Lend Lease in 2022.

Trenches 6 and 7 have now been excavated within the boundary of Willow Grove and the results of that work are outlined below.

2.2. Test Excavation Results

2.2.1. Test Trenches

TT 06 and TT07 were excavated in November 2021. As noted above they were situated to test for structures shown in the 1804, 1822/3 and 1844 plans of the area.

TT06 was sited at the northern side of Willow Grove. The excavation of this trench revealed a small line of sandstone which on further expansion of the trench by machine and hand revealed a dressed sandstone floor (Sandstone Feature 1) with steps from the south on a different alignment to the alignment of Willow Grove (Figure 2-2 and Figure 2-7 to Figure 2-9). This feature has been tentatively associated with the 1823-1844 structure shown in this area and appears to be a shallow cellar. The surrounding context was severely disturbed with no intact stratigraphy to indicate any stratigraphic association between the feature and Willow Grove.

Further machining work to the north-east of Willow Grove revealed a second sandstone feature (Sandstone Feature 2) approximately 10 m to the east (Figure 2-3 and Figure 2-9). This surface is much rougher dressed than Sandstone Feature 1 and was situated within similarly disturbed deposits.

TT07 was sited at the eastern side of Willow Grove (Figure 2-7). The initial excavation, under trying circumstances in the rain revealed a single sub-rectangular posthole. Excavation of this posthole did not reveal any artefacts within the post packing or postpipe. Further expansion of this trench did not reveal any alignment or return of additional postholes that may have suggested a structure (Figure 2-4 and Figure 2-5). Substantial disturbance within this area of Willow Grove from services and a large tree were recorded.

The well within the sandstone structure revealed in TT08 was partially excavated to determine the date of any artefacts within the well fill. The upper levels revealed domestic artefacts dating to the early twentieth century. On this basis it was decided to clear the well and excavate its exterior to identify any cut for its construction. Further excavation of the well's contents revealed a consistent bracket of dates for deposits 1.5 m from the surface around the 1840s and 1850s. Excavation ceased at this point and it was decided to retain the remaining well and fill below this level (Figure 2-6).

2.3. Conclusions and Recommendations

Two substantial areas, Dirrabarri Lane (TT01 and TT 02) remain to be investigated. In addition:

- TT06 revealed a sandstone floor (Sandstone Feature 1) that is possibly associated with the 1823/44 structure in this location.
- In addition Sandstone Feature 2 may also be associated with this phase of occupation.
- These two features are likely to be of State Significance
- Excavation of TT07 revealed a single posthole with substantial disturbance, the result of a mature tree in this location and in ground services.

The archaeological testing and monitoring that has been completed after the removal of Willow Grove demonstrates that this area of the site retains substantial structural remains (all identified) that may relate to occupation on the site possibly earlier than the 1820s. On that basis these features would be assessed as of potential State significance and be recommended for retention.

Figure 2-1 Test Trench locations on the Powerhouse site. (Source: Curio 2021)

Figure 2-2 sandstone 'floor' north of Willow Grove.

Figure 2-3 Sandstone surface north-east of Willow Grove.

Figure 2-4 TT07 east of Willow Grove looking north.

Figure 2-5 TT 07 looking south.

Figure 2-6 Elevation of the well from TT08 with no evident cut for construction.

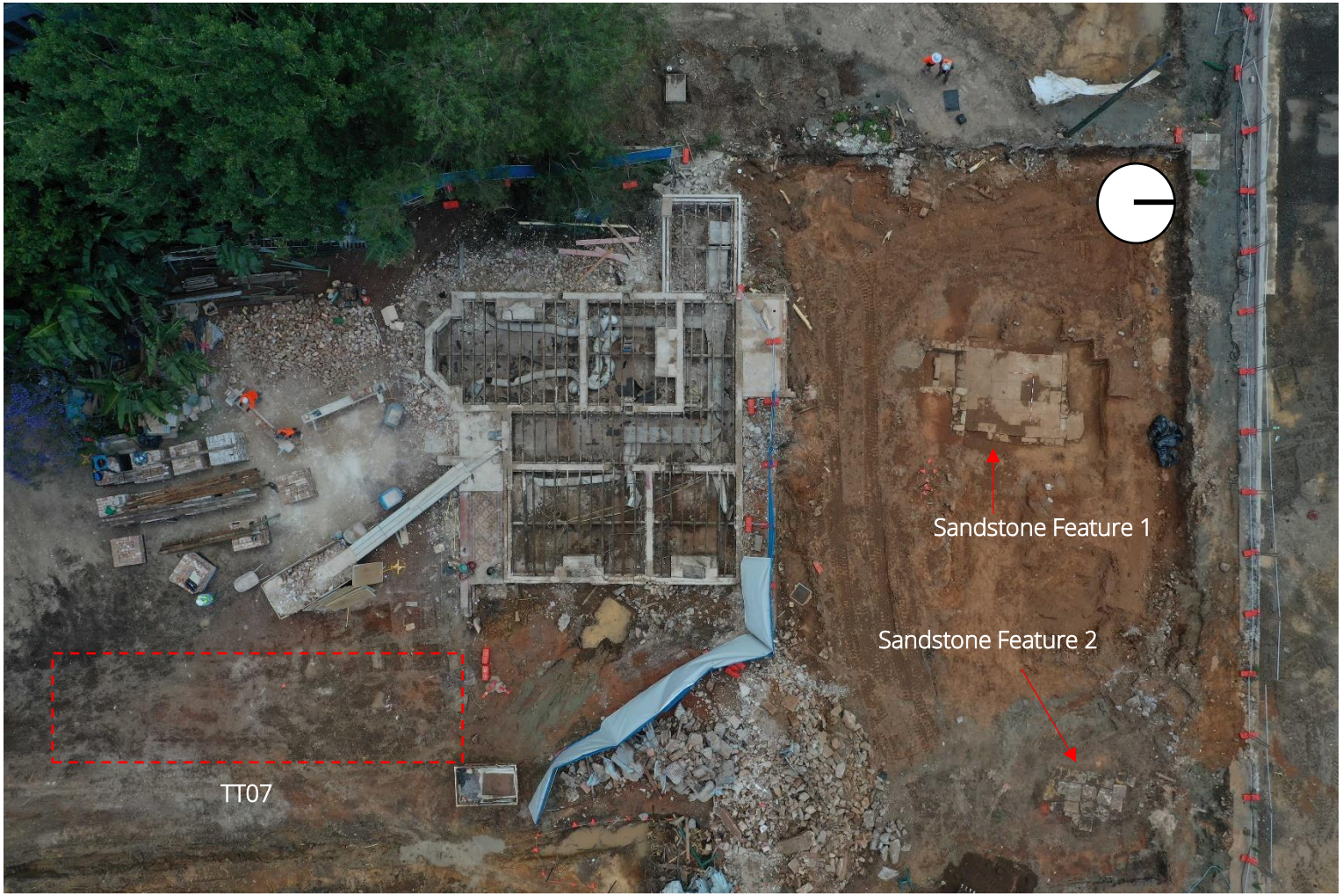

Figure 2-7 Aerial photo of Willow Grove area showing the two sandstone features and the area of TT07.

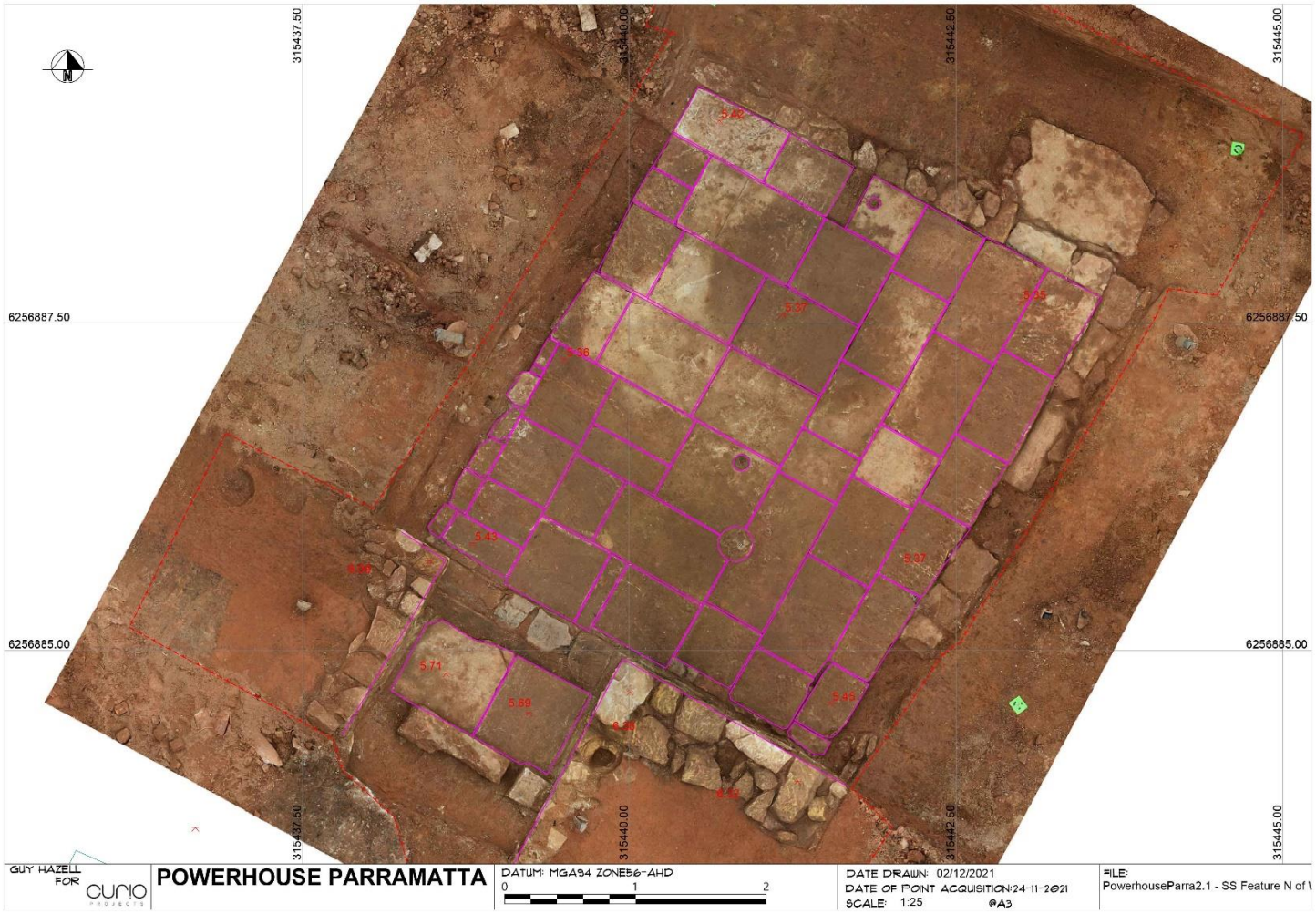

Figure 2-8 Orthophoto of Sandstone Feature 1.

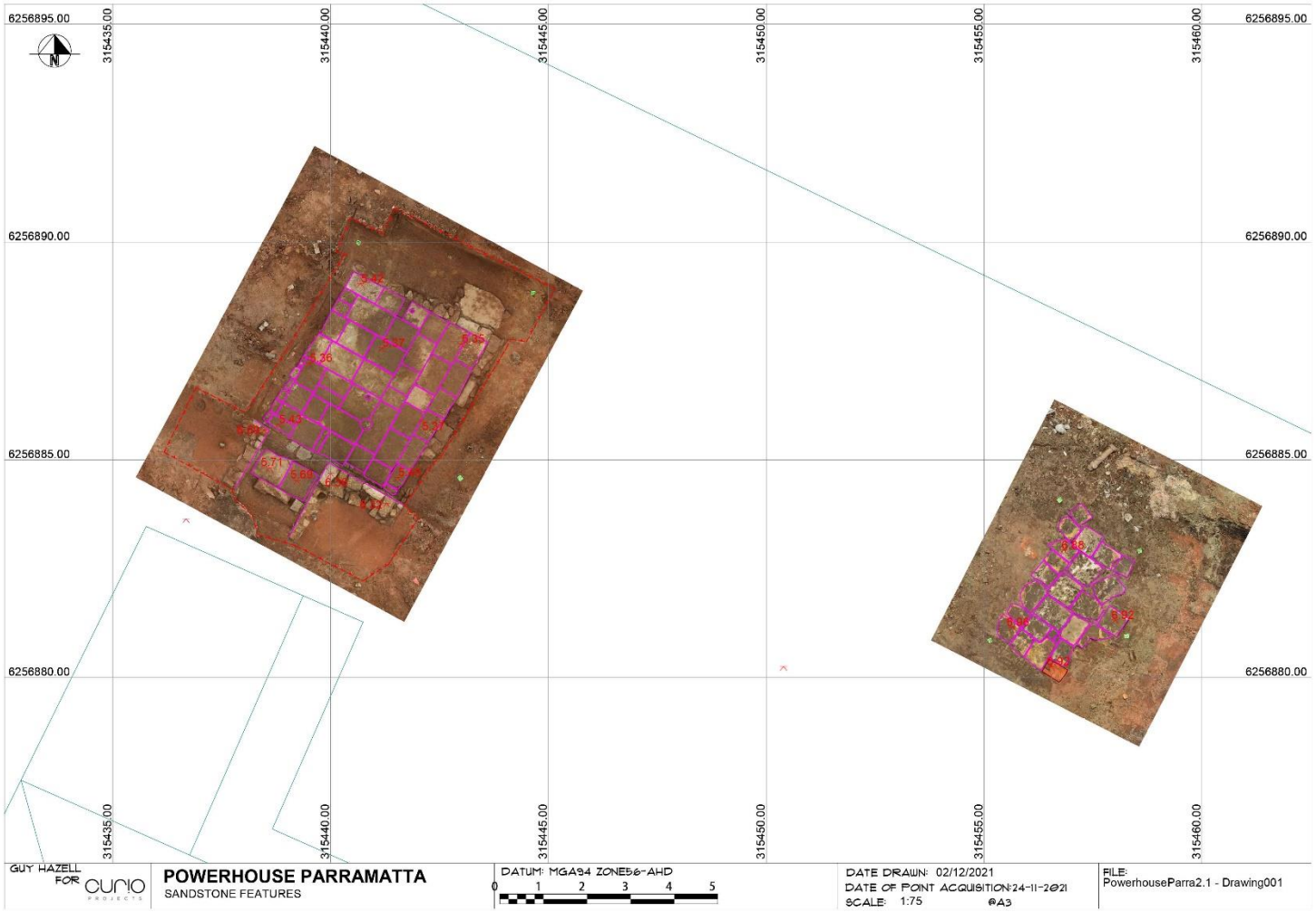

Figure 2-9 Orthophoto of Sandstone Features 1 and 2. .

3. Development Impacts

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3. Development Impacts

3.1. Proposed Development Work

The area with Sandstone Features 1 and 2 will suffer from some development impacts. These impacts are outlined below.

The construction of the Powerhouse identified the need for an undercroft area to be used as a semi-permeable space to act as a flow path during flood events associated with the nearby river. This area of the site required complex design solutions to meet the needs of the structure and the potential flood events that need to be managed (Figure 3-1).

The undercroft sits at two levels, the riverbank and the civic link levels. These two levels are connected by stairs. The sandstone features have been surveyed in and found to be in-line with the central set of stairs that connect the two levels (Figure 3-2 and Figure 3-3).

Advice has been sought from the design team regarding the potential for redesign to retain these features. Their response is presented in the Appendix (see p. 35).

In summary the retention of the sandstone features would result in significant redesign issues with the entire structure and a potential impact on neighbouring properties through the necessary redesign of the undercroft retaining wall.

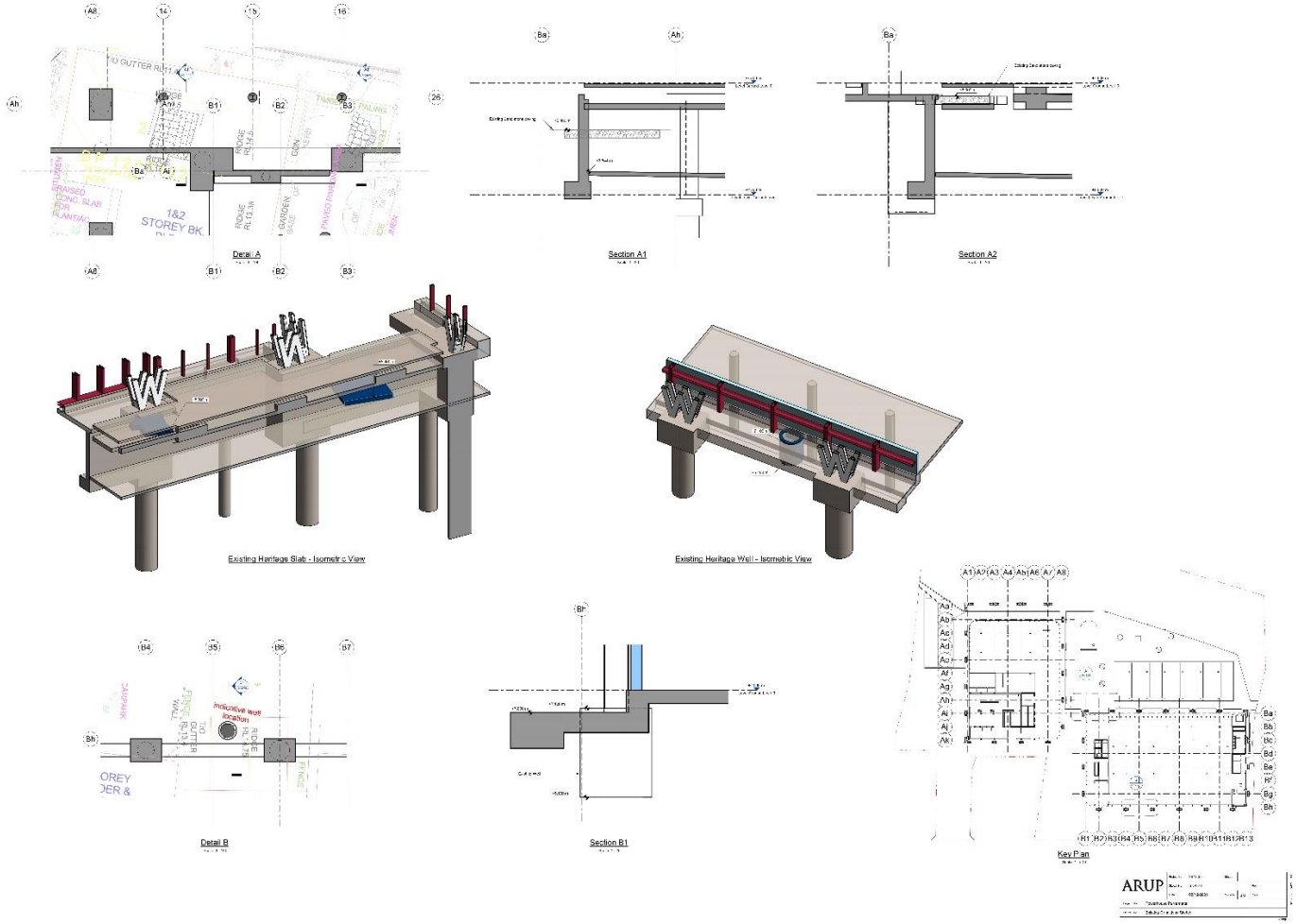
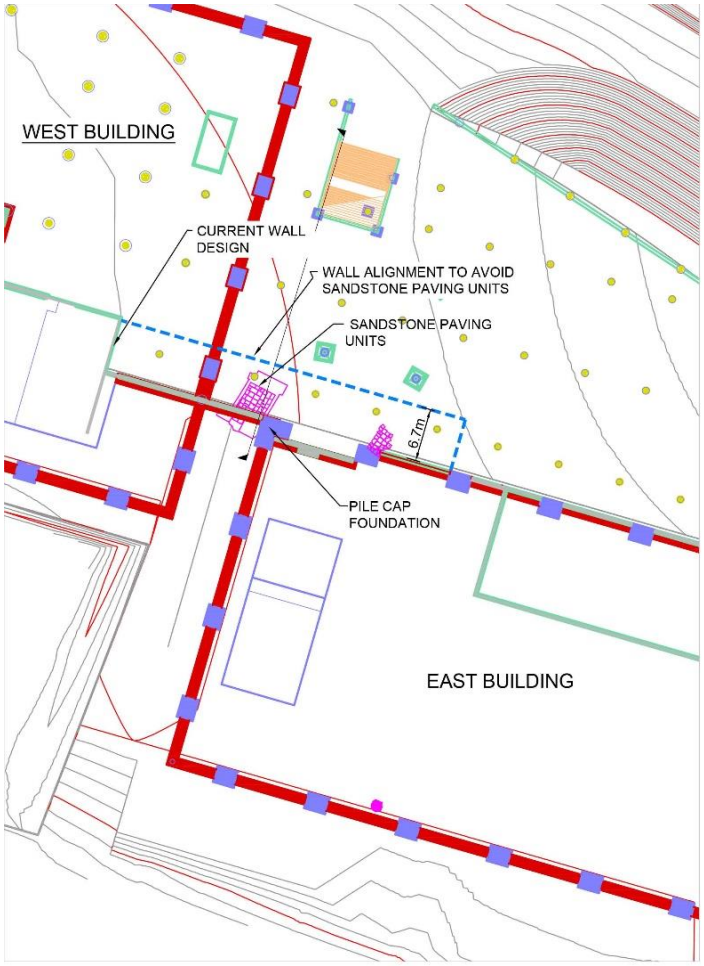
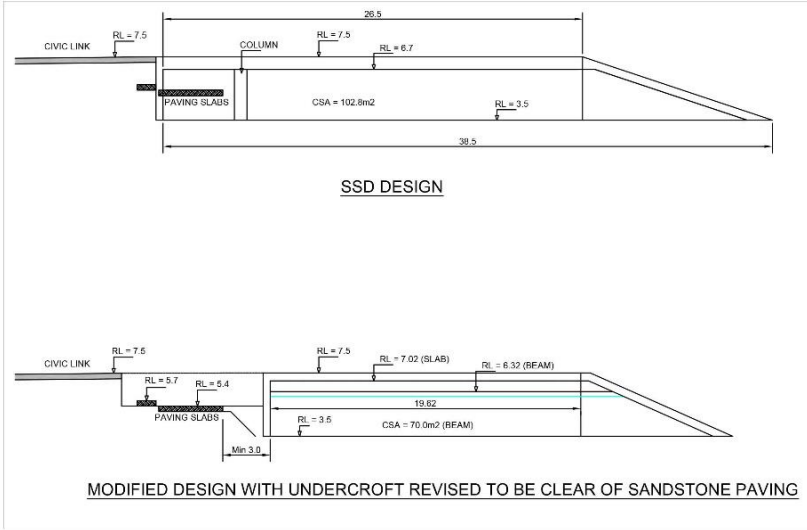


Figure 3-1 Current design in the area of the sandstone features.



PLAN - SCALE 1:500



SECTIONS - SCALE 1:250

ATTACHMENT A

Figure 3-2 Overlay showing the location of Sandstone Features 1 and 2 and the development impacts identified in that area.

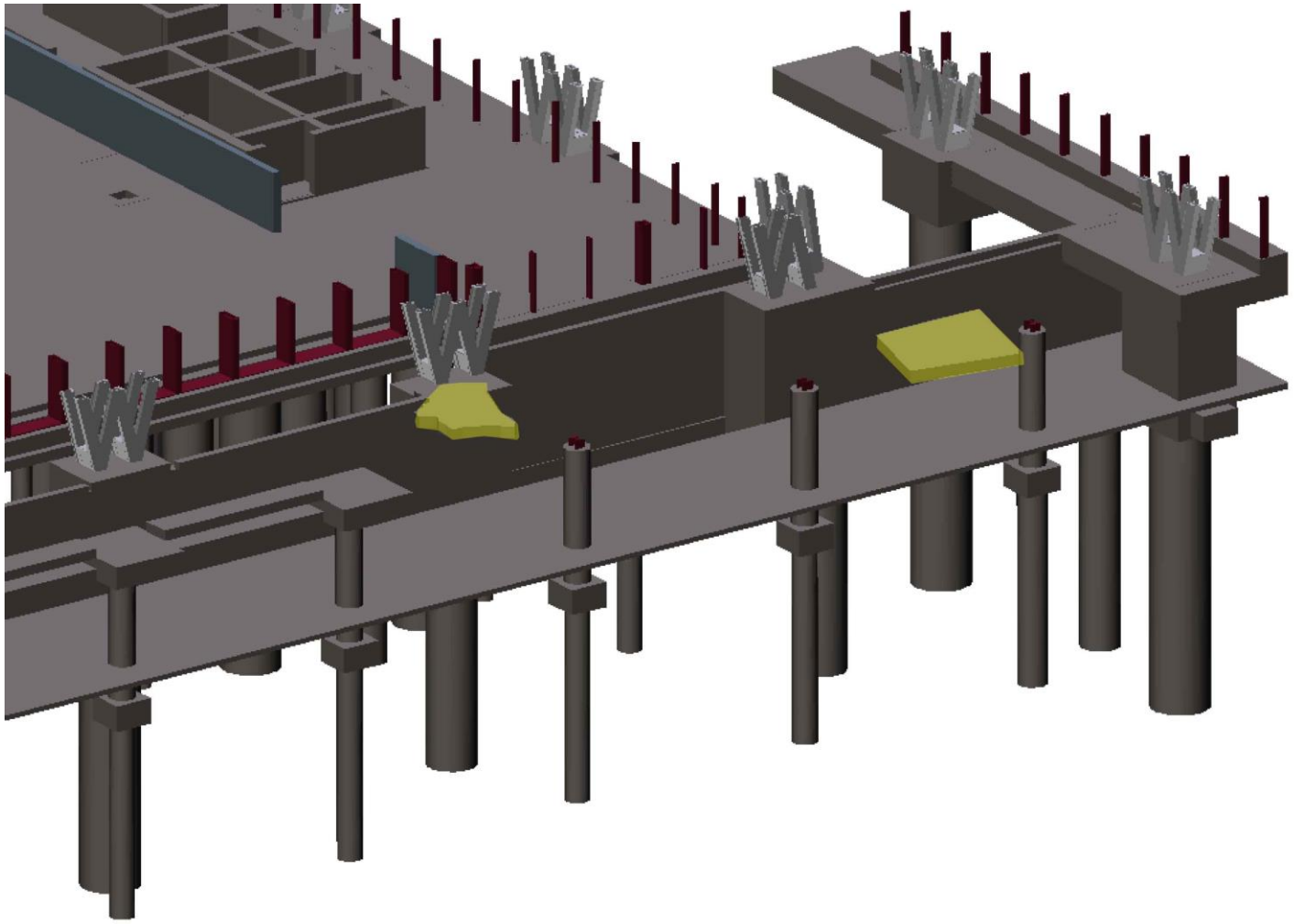


Figure 3-3 A 3-D render of the location of the sandstone features and their intersection with structural members.

4. Archaeological Methodology

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4. Archaeological Methodology

4.1. Further Test Excavations

No further test trenches are warranted on site.

4.2. Monitoring and Unexpected Finds

Areas indicated as green in Figure 4-1should be subject to archaeological monitoring during excavation works. In addition, the Unexpected Finds procedure will continue to operate on the remainder of the site. That procedure comprised:

- STOP ALL WORK in the vicinity of the find and immediately notify the relevant Site Supervisor or the Project Archaeologist/Excavation Director and demark the area to protect the potential relic.
- The Site Supervisor is to record the details, take photos of the find and ensure that the area is adequately protected from additional disturbance.
- If the Archaeological Excavation Director advises that the find is not a potential Aboriginal object or significant historical relic, work will recommence in accordance with the established program.
- If the Archaeological Excavation Director advises that the find is a potential relic, the Site Supervisor/Project Manager should undertake the following procedure:
    - Liaise with the Archaeological Excavation Director to determine the significance of the heritage item; and
    - Implement any appropriate mitigations dependent on the advised significance of the relic.

4.3. Salvage Excavation

The two sandstone features identified in Section 2.2 should be subject to salvage excavation and recording prior to development of the area to mitigate the development impacts set out in Section 3.

At this stage the features have both been completely exposed by excavation and have been photographed, planned and surveyed into the site grid (refer to Figure 2-9 and Figure 4-2). They will be removed piece by piece and excavation will proceed below as determined by the Excavation Director to investigate deposits below the features. The sandstone feature will be dismantled and reconstructed at the undercroft level as an interpretive element within the precinct. The detail of the interpretation design will be developed along with the broader interpretation plan for the project. .

The main salvage excavation recording and reporting methods which will be employed in this work include:

- Manual (hand) excavation of exposed deposits and features using hand tools (shovels and trowels);
- Structural elements of each of the features will be numbered and recorded in place (using that numbering) to provide an option for reinstatement/interpretation in the future museum;
- They will be removed by hand where possible or using slings and a small excavator where necessary;

- The elements will be stored on pallets in a secure covered repository while options to reinstate and interpret are explored;
- Where deposits are found below the features undertake detailed stratigraphic excavation and recording;

Where further excavation is warranted below the removed features the following archaeological techniques will be employed.

- Use of context recording forms and context numbers to record all archaeological information;
- Use of Harris matrix as part of the recording program;
- Underfloor deposits to be recorded within a 500 mm grid, 50 mm spits and 100 per cent sieved;
- Wells and cesspits excavated in 200 mm spits or tip lines (where identifiable and the deposits sieved;
- All structural remains, post holes, and features will be planned at a scale of 1:20 or 1:50;
- A site grid would be established based on AGD94. Detailed digital survey and mapping of the area based on that grid would be undertaken which will record all features etc to AHD;
- Detailed photographic recording;
- All artefacts will be collected except from unstratified fills;
- Samples of bricks and mortar will be collected from structures;
- Collection, labelling, safe storage, washing, sorting and boxing of artefacts by artefact specialists along with palynological analysis and materials conservators as appropriate.

4.4. Final Report

The previous excavations and the new work will provide a final report detailing the excavations, its results and addressing the Research Design questions would be completed within 12 months of the work being completed on the site, The report would include;

- ⋅ An introduction and executive summary.
- ⋅ Planning framework.
- ⋅ Site history supplemented by additional research.
- ⋅ Archaeological background.
- ⋅ Archaeological investigation methodology, results and site recordings.
- ⋅ Analysis and catalogue detailing all historical cultural material recovered.
- ⋅ Maps and site plans etc.
- ⋅ Photo catalogue.
- ⋅ Artefact catalogue.
- ⋅ Re-assessments of significance.
- ⋅ Interpretation of results and addressing of Research Design questions.
- ⋅ Conclusions and recommendations.
- ⋅ Identification of repository for artefacts and site records.

The artefacts, site records and final report would be presented to the client/site owner for curation.

4.5. Artefact Management

Artefacts are currently being managed on site by Alexandra Thorn (Curio Projects artefact manager). Recovered artefacts have been sorted, cleaned, separated and bagged for cataloguing and analysis off site. The artefacts will be eventually catalogued using a variant of the "Exploring the Archaeology of the Modern Cities" database. The artefact collection will have a Type Series established and the collection will be divided into material types and standard Activity/Function/Sub-function groupings. Analysis will include comparison with similar collections within the Parramatta region and if possible, across Sydney. Artefacts will be bagged and labelled with unique database ID numbers linked through the catalogue to context, Type Series, Images, and historical information. Anne Cummins (Sydney Artefacts Conservation) will provide advice on any conservation requirements.

4.6. Repository and Interpretation

The client (INSW) will need to provide a repository for storage, in perpetuity, of any artefacts recovered from the site. This is to be discussed following the conclusion of the archaeological program at the site and would be confirmed in the post excavation report. The final location of this repository, whether on-site or not, would be determined after negotiations with the client. However, the opportunity to curate this archaeological collection within the Museum on the site would appear to be the most practical option.

The sandstone features will be removed using techniques that will enable it to be stored and reinstated as interpretive features, if possible, in the future museum.

Figure 4-1 Area in green indicates the area remaining to be monitored during excavations.

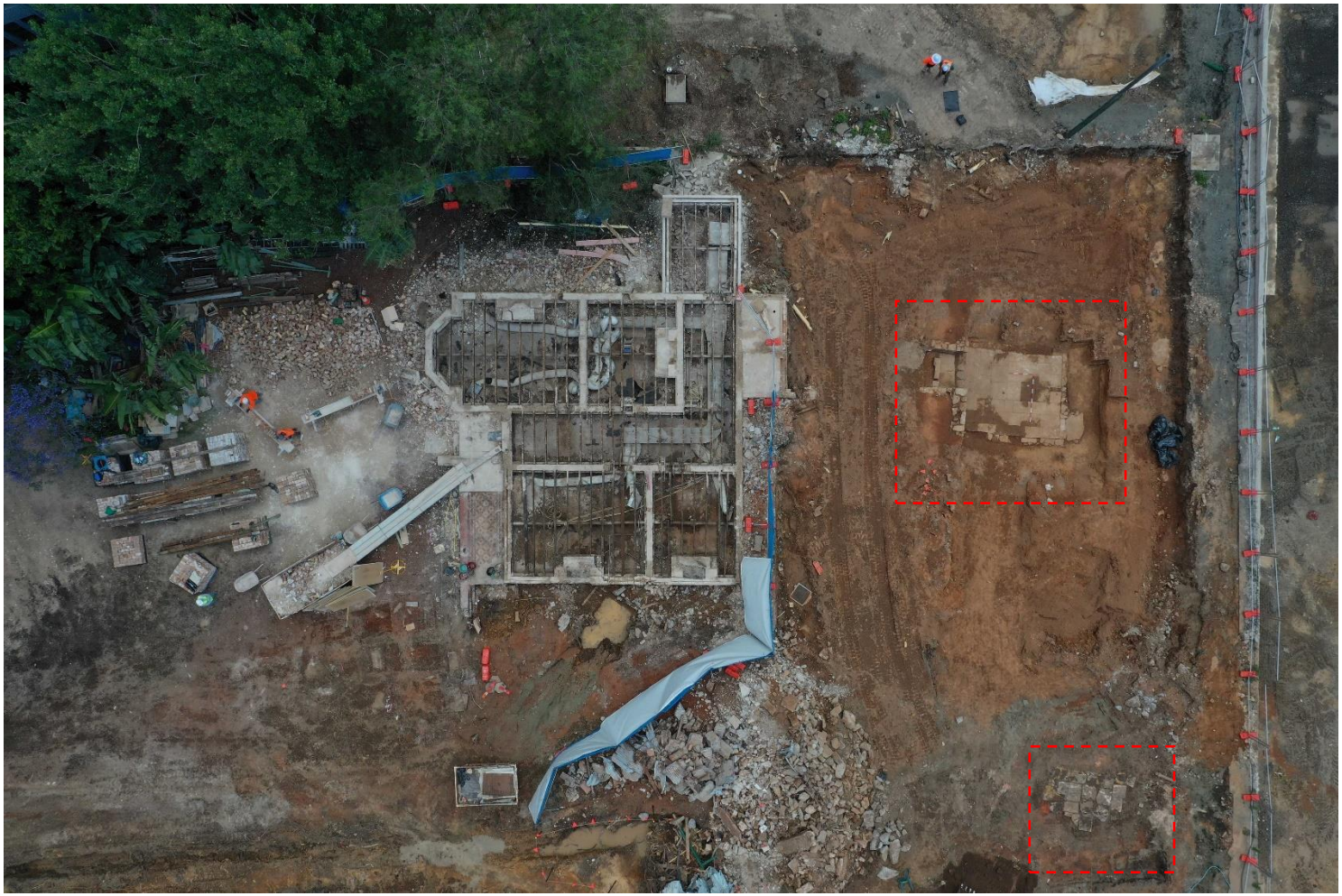

Figure 4-2 Aerial view of the two sandstone features to be subject to salvage excavation and removal (indicated in red outline).

5. Research Design

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5. Research Design

The research potential of the study area should be considered in a broad context, as well as in a site-specific context. Archaeological test excavation of the study area should consider physical evidence of its historical development and occupation within a broad thematic context. The Heritage Council of NSW has composed a table of NSW Historical Themes to ensure that the initial information recovered from a site can be understood within a broader research framework. In addition, the PHALMS project established broad research aims to provide higher level research questions for sites in Parramatta. The PHALMS Archaeological Management Units (AMU) 3083, 2882 and 3092 encompass the site. The AMU's 3083 and 2882 identify the site as having high archaeological potential and research potential on the site.

5.1. General Research Questions

An archaeological research design can be formulated to answer general questions about any deposits or features exposed during the work. These general questions are applicable to most archaeological sites investigated. These general questions are:

- What features or deposits are present on the study area;
- What is their nature and extent;
- What date can be assigned to them;
- How does this information compare to available historical information relating to the study area.

5.2. Site Specific Research Questions

Site-specific research questions related to this current work include:

- What phase of occupation do these features relate to?
- How do the features relate to each other and the occupation in this area of the site?
- What was the purpose for each feature?
- Why is the construction technique different?
- Is there evidence for natural soil profiles to be present below them?
- Are there structural elements or other features which pre-date these remaining in deposits below them?

6. Appendices

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6. Appendices

6.1. Letter from ARUP Regarding Development Impact on Archaeology

Your ref
Our ref 284365-00/XN
File ref

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8 December 2021

Dear Angus

Powerhouse Parramatta - Archaeology Finds

Early site investigations have uncovered the presence of sandstone paving within the footprint of the proposed Powerhouse Parramatta. This letter confirms the impacts on the design if the paving was retained.

Flooding Impacts

The identified paving units sit either side of the proposed retaining wall which separates the undercroft at lower level (RL = 3.5mAHD) and the north end of Civic Link, which sits at a higher level (RL = 7.5mAHD) – see Attachment A. The paving slabs have been surveyed at RL 5.45mAHD and are in line with the proposed central stairs that connect the riverbank level to civic link level.

As part of the flood modelling completed in support of SSD, the undercroft area was identified as a semi-permeable space which acts as a flowpath during Parramatta River flooding to generally replicate the flood conditions of the existing site. Key to the performance of undercroft's conveyance capacity is the cross-sectional area. In the site layout submitted for SSD, the narrowest locations of the undercroft were:

1. Eastern end of the eastern embankment – 25.4m wide from the face of the undercroft wall to the retaining wall supporting the eastern embankment.
2. Central stairs, 26.5m wide from the face of the undercroft wall to the top of the suspended stairs.

At the central stairs in the arrangement submitted for SSD, these dimensions achieved a cross-sectional area in the undercroft of 102.8m2 and was fundamental in ensuring that the post development flood levels did not adversely impact flood levels at surrounding properties.

To maintain the paving slabs in-situ, the undercroft retaining wall would require to be re-located approximately 6.7m towards the river, providing sufficient clearance to construct without impacting the paving slabs. Re-locating this wall would reduce the width of opening to 19.6m and would make this location the determining factor in the flood performance of the undercroft. The cross-sectional area of the undercroft would reduce by

approximately 30%. This would result in reduced flood conveyance through the undercroft and increased flow velocities. The reduced flow capacity of the narrowed undercroft would result in an adverse impact on the flood behaviour at neighbouring properties, primarily as a result of flood water backing up from this pinch point. This adverse flood impact would be in breach of the SSD consent conditions. It is therefore recommended to retain the wall in its current position.

A plan and section of this arrangement is shown in Attachment A with the revised wall alignment shown in blue dashed line.

Structural Impacts

The location of the sandstone paving is immediately adjacent / beneath pile-caps on Grids B1/ Ba and B3/Ba respectively. These pile-caps support the northern elevation of the exoskeleton and hence large verticals loads associated with the long span presentation spaces above. Retaining the sandstone paving, whilst theoretically possible, has significant structural and architectural implications as demonstrated through each of the three options below:

- Shuffling the entire exoskeleton of the eastern building half of one grid. This would place piles between the sandstone paving, however requires an architectural realignment and structural redesign of the entire exoskeleton, as well as all of the exoskeleton interfaces with the internal structures; or
- Move the entire eastern building either north east or south east, whilst retaining the current structural grid set outs. This will have significant architectural implications at ground plane and for the link bridge; or
- Reduce the scale of the eastern building, realigning grid Ba south of the sandstone paving. This reduces the areas of each floorplate, posing significant architectural challenges and forces a structural redesign of every element within the building.

Conclusion

In summary, the flooding and structural implications of retaining the sandstone paving units in their current position are significant. Specifically:

- the change in undercroft wall position would cause a negative flood impact on neighbouring properties which would invalidate the basis of the SSD consent; &
- whilst from a structural perspective it will lead to redesigns of significant portions of the eastern building as well as compromising the architecture

Yours sincerely

Xavier Nuttall
Associate

Enc Attachment A – Plan and Section of Possible Wall Relocation

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